Managing stands of Willamette Valley ponderosa pine

R. Fletcher

Both natural and planted stands of ponderosa pine can be managed using thinning, pruning, and fertilization, although little research has been done on these practices for the Willamette Valley race of ponderosa pine. What is known has been gathered from general observation, from small test plots, and from a survey of native stands by OSU Extension forester Max Bennett.

Natural stand development

It is difficult to define what normal stand development means for ponderosa pine in the Willamette Valley.

Historical stands apparently were either scattered groves of large trees in grassy bottoms or mixed-species stands in the foothills. In either case, the indigenous tribes' broad-scale burning shaped those forests in ways not available today.

Current stands have come about by colonizing neglected areas or soils with severe limitations for other tree species. The stands we see today are much denser than their counterparts in the past. What this means for future development and growth is uncertain. However, because ponderosa pine is a shade-intolerant species, preferring open spaces, it is likely that the high stocking will be reduced over time, either through insect and disease outbreaks, or some weather-related event, or by selective thinning.

Expected growth of Valley ponderosa pine stands

Anderson's 1938 study on central Willamette Valley ponderosas reported young ponderosas grew rapidly, but growth rates peaked by about 30 years of age. The small sample of trees had a 20-year-old tree with a 15-inch diameter at breast height (DBH), while a 100-year-old tree was only 34 inches in diameter. The pine races study that Munger began in 1928 showed a height growth spurt between 20 and 30 years of age, but the trees from the best seed source in the study have continued to grow well in height up to their last measurement at 65 years of age.

Max Bennett's recently completed study of 16 native Willamette Valley ponderosa stands on 12 different soil types found a wide variety of growth rates, depending on soil type (Table 3, page 12). Site indexes (estimates of site productivity based on

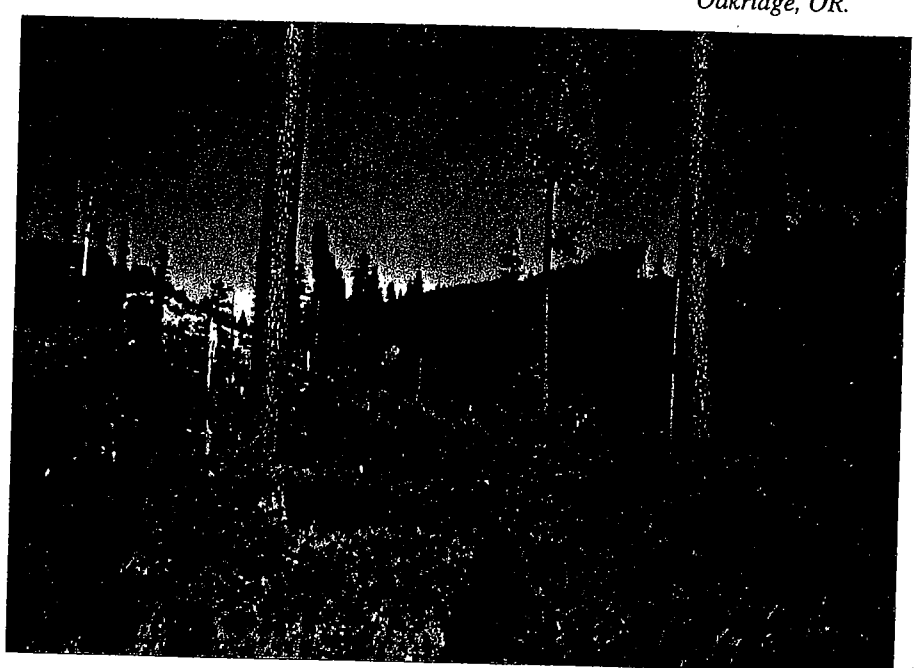

Figure 13.— Regeneration of a natural stand of ponderosa pine old growth on Willamette National Forest, near Oakridge, OR.

Figure 14.—Native, 40-year-old ponderosa pine stand on wet soil near Lacomb, OR.

how tall a tree of a given species will grow on a site in a given number of years) for each site were extrapolated from existing site index curves from ponderosa pine in southwest Oregon, based on expected total height at 50 years.

On most sites, ponderosas are expected to grow nearly 100 feet in the first 50 years. Exceptions were on very severe sites where the high water table and shallow soils converged. When these trees will slow down or stop growing taller is not known and undoubtedly will vary widely by soil type, but large specimen trees on suitable soils have grown up to 150 feet tall.

Soil type	Height	Age	Site index (50)
Bashaw silty clay loam	98	59	92
Dayton silt loam	84	42	98
Dixonville/Hazelair/Philomath	96	98	63
Dupee silt loam	110	56	101
Hazelair silty clay* loam	93	52	92
McBee silty clay loam	104	59	92
Philomath cobbly, silty clay*	87	42	104
Ritner cobbly, silty clay loam	101	54	95
Salem gravelly loam	111	63	93
Waldo silty clay loam	83	41	96
Witzel very cobbly loam	92	98	59

* An average of more than one site

No studies of volume growth per acre have been done. Currently, large stands of ponderosa are few, but they appear to have volumes similar to local Douglas-fir stands of similar ages. The exception may be on the very severe (either wet or dry) sites, where volumes per acre will be less.

Managing natural stands of Valley ponderosa pine

If you are one of the lucky Willamette Valley landowners with a natural stand of ponderosas on your property, your trees might benefit from thinning or possibly pruning if they are still pole size.

Thinning

Thinning spaces out trees and improves the health and vigor of the overall stand. The key feature is not what you cut but the stand left behind after harvest. It is these trees, generally referred to as crop trees, that will determine future growth and overall stand health. In deciding which will be crop trees, and which ones you'll remove, consider the following factors.

1. Overall stand age and stocking Stands that respond best to thinning are young, moderately stocked ones. Older stands (50 years plus) likely have passed the time when thinning will greatly benefit growth rates, unless the stand was previously thinned. Thinning an older stand still might make sense, however, if you want to reduce longer term competition for crop trees or to remove unhealthy trees. Very dense stands may need several light thinnings, spaced by recovery periods, to move the stand gradually to a healthy density.

Possibly the most important thinning is a very early one, while the trees are not yet of merchantable size. This precommercial thinning sets the growth curve for the future stand and can have a dramatic, positive impact on growth if done at the right time.

2. Type of future stand desired If you want an even-age stand, then it makes sense to space crop trees evenly for maximum

1-14

growth. If you want to develop an uneven-age stand, your selection may be more in groups, to provide open areas for young trees to establish.

3. Individual tree characteristics The arboricultural principle of "right tree, right place" works well for forest thinning, also. If your need in a particular spot is high growth, then leave the best growers. If you want to leave a wildlife tree, look for one with big branches and good nesting opportunities. Even trees with obvious defects can be valuable in providing habitat for cavity-nesting birds such as woodpeckers. If you plan a continual-selection thinning system to promote natural regeneration, then you want to get rid of the super-dominant trees and keep the vigorously growing medium-size trees that have narrow crowns and fine branches.

4. Individual tree spacing As trees get larger, they need more room to grow. Foresters' rule of thumb for this size–space relationship is based on diameter of the tree at breast height (DBH).

For example, a tree 12 inches in diameter might need 16 feet of space to be happy, while a 20-inch-diameter tree might need 24 feet. This often is referred to as the "D+ rule."

Although there is no known D+ relationship for Valley ponderosa pine, they likely need a bit more space than Douglas-fir because of their intolerance of shade. Ponderosa might be more comfortable at a minimum spacing of D+2 or D+3. For a tree 12 inches in diameter, this means the next closest 12-inch tree should be at least 14 or 15 feet away. You might want to space your 12-inch trees 18 to 20 feet apart (i.e., at D+6 or D+8), anticipating that they will continue to grow in diameter over time and eventually get back to the minimum D+2 spacing.

Other ways to keep track of tree spacings:

- On a per-acre basis, either by total number of trees, or
- Some other measure of density such as basal area (the cross sectional area of a tree, measured at breast height), or
- Relative density (the amount of basal area on a given stand compared to the maximum that can possibly grow)

For more information on measuring stand density, refer to OSU Extension publication EC 1190, "Stand Volume and Growth: Getting the Numbers" (see page 39).

As more becomes known about the Valley ponderosas, better per-acre guidelines will be developed.

Managing plantations of Valley ponderosa pine

During the past decade, thousands of acres of Valley pine plantations have been established in the Willamette Valley. These represent a very different type of forest stand than has ever existed naturally.

Historical records indicate that natural stands were widely spaced groves of large trees, intermixed with hardwood species such as oak and ash. The pine plantations of today represent fast-growing monocultures whose growth far exceeds that of their natural cousins. No management history of similar stands exists, so only time will reveal how these plantations will develop. Experience to date, however, suggests some practices that are useful in tending young plantations.

Thinning

One genetic trait in the Valley pine population is a wide variance in tree forms. Progeny from various parent trees differ vastly in such characteristics as forking, branch angle, number of branches, and growth rate. By years 5 to 10, characteristics of individual trees in plantations are easily distinguishable, and you can favor trees with characteristics suited to your objectives. For example, if timber production is a primary goal, trees with high wood-to-branch ratios and good growth can be favored in thinning programs. Likewise, in riparian plantings where lots of branching can be good for

Figure 15.—Five-year-old pine plantation on a good site near Albany, OR.

birds and other wildlife, the heavily branched trees can be favored.

When to thin and how many trees to remove is largely unknown at this time. Answers will depend to some degree on what types of future products and stand are desired. Guidelines for thinning in plantations are similar to those discussed under thinning natural stands (pages 13–14). The same D+ relationship applies; i.e., D+2 minimum and D+6 desirable.

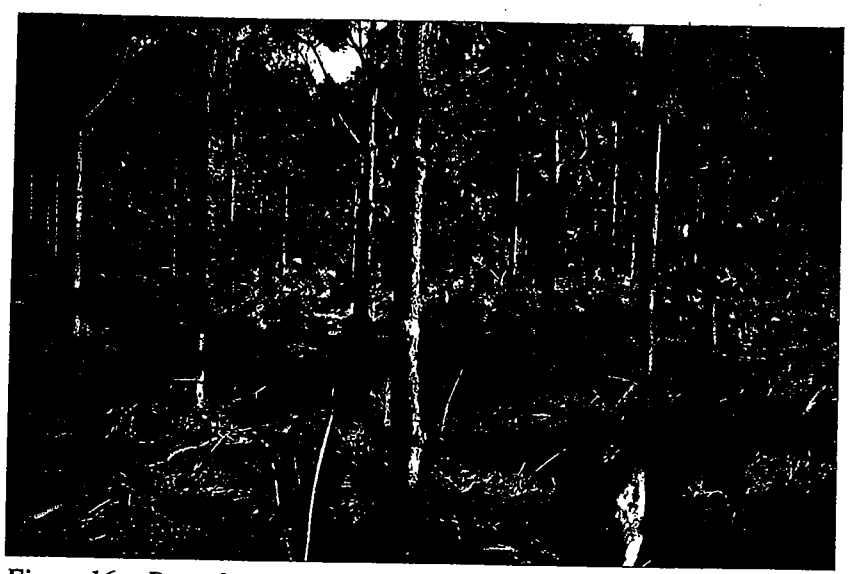

Figure 16.—Pruned 8-year-old ponderosa pine stand near Albany, OR. Orange paint marks branch scars where live limbs were removed.

One feature that is particularly observable in young pine plantings is the much lower ratio of needle biomass to wood compared with other species such as Douglas-fir. Thinning is best timed according to live crown ratio (the percent of the total tree height that is occupied by green limbs); try to keep it at 30 percent or higher.

You also might want to take periodic increment core samples to determine growth rate. Ponderosa pine is an excellent producer of diameter growth and might maintain rates of three to six rings per inch in vigorously growing, young pole-size stands. Thinning directs this growth into the most productive trees in the stand.

For more information on harvesting and marketing, see Chapter 8.

Pruning

The fact that ponderosa is a naturally limby species, combined with the fact that clear pine wood has high value, makes pruning important in young Valley pine stands.

If done correctly, pruning scars will heal quickly, and the tree will produce a rind of clear, valuable wood outside the pruning scars. You might also improve the form of young trees—the taper point of the tree is at the base of the live crown, so when you remove live limbs, you are pushing the bottom of the live crown up the tree.

Pruning ideally should begin once the trees reach 10 to 15 feet tall. Carefully clip all lower limbs as near the stem as possible without damaging the branch collar. Removing too many limbs in one pruning may impair tree growth, so leave at least 30 to 50 percent live crown at all times. For example, if your trees are 16 feet tall, you could prune up about 8 feet without being concerned about harming growth. If you delay limb pruning too long, the limbs will be larger and harder to remove. This also will increase the size of the knotty core of wood in the center of the tree and reduce recovery of clear wood.

Prune between September and March to avoid pitch moth attacks on pruning wounds. Pile and burn larger limbs and stems to avoid bark beetle infestations.

For information on potential insect problems, see Chapter 5. For a fuller description of proper tree pruning, refer to OSU Extension publication EC 1457, "Pruning to Enhance Tree and Stand Value" (see page 39).

Fertilizing

To date, not much is known about fertilizing Valley pine. A few growers have had some success applying balanced fertilizers, based on foliar and soil analyses, but you should get professional assistance from a fertilizer dealer or professional consultant before investing too much in fertilizers.

In any case, apply fertilizers only to well-weeded trees that have good root systems to take up the fertilizer.

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THE WOODLAND WORKBOOK

REFORESTATION

EC 1498 • Reprinted April 2002 $1.50

EXHIBIT 2

Successful Reforestation: An Overview

M.M. Atkinson and S.A. Fitzgerald

Contents

Mary M. Atkinson, former communications forester, Willamette Industries; and Stephen A. Fitzgerald, Extension forester, Central Oregon, Oregon State University.

So you'd like to plant some trees! As the saying goes, "The best time to plant a tree was 30 years ago—the next best time is now." This publication gets you started on the right track and answers some common reforestation questions. It provides a brief overview of the steps involved in a typical reforestation operation, including:

- Preparing the planting site
- Obtaining suitable seedlings
- Planting seedlings
- Plantation maintenance
- Financing reforestation activities

Also, you'll find references to other publications that provide more detail on reforestation. They are highly recommended reading.

OREGON STATE UNIVERSITY
EXTENSION SERVICE

Why reforest? Well, for one thing, it's the law. Reforestation is required when timber harvesting reduces the number of trees below specified stocking* levels (see EC 1194, *Oregon's Forest Practice Rules*). You must complete reforestation within 24 months after completing a harvest operation. Depending on site productivity, at least 100 to 200 seedlings per acre must be established. In addition, seedlings must be well distributed across the area and "free to grow" (vigorous and above competing vegetation) within 6 years.

In general, commercial tree species suited for your site conditions are acceptable species for reforestation. Contact your local Oregon Department of Forestry office about your particular reforestation situation.

Because reforestation is labor intensive and expensive, planning is essential to assure success. Lack of attention to any one step can result in costly reforestation failures.

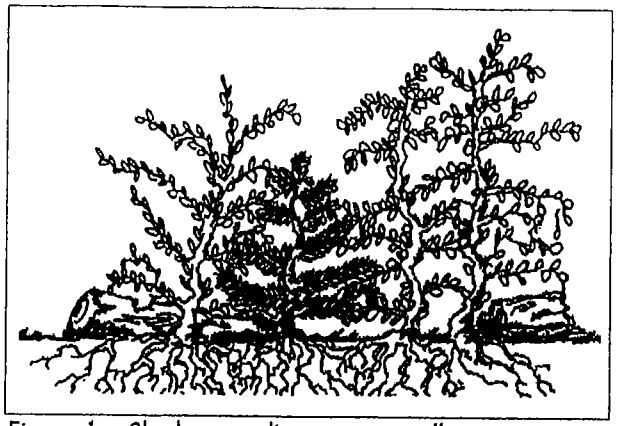

Figure 1.—Shrubs crowding a tree seedling.

Site preparation

The first thing to consider is the condition of the planting site. This includes the kind of vegetation present, soil type, aspect (compass direction the slope faces), and even the kinds of animals that might damage your trees.

Site characteristics are important because they affect critical site resources—water, light, temperature, and nutrients—necessary for seedling survival and growth.

Site preparation has three major objectives:

- Reduce the amount of vegetation that competes with tree seedlings
- Reduce habitat of animals that damage (browse and/or clip) seedlings
- Create plantable spots

Water is the most critical factor for seedling survival and growth, particularly the first few years after seedlings are planted. Grass, shrubs, and larger weeds are obvious competitors for moisture and light (Figure 1). It's important to remember that the root systems of grass and other vegetation are very extensive, spreading well beyond the aboveground portion of the plant.

Grass also provides habitat for meadow mice, voles, and gophers, which can severely damage or kill tree seedlings. You must keep grass away from newly planted seedlings for a few years to reduce habitat for these animal species.

Several methods or combinations of methods are available to prepare sites for planting. Costs depend on site conditions, methods used, existing vegetation, and amount of logging debris or slash. See EC 1188, *Site Preparation: An Introduction for the Woodland Owner.*

Mechanical methods

If there is a lot of slash or brush, you may need to use mechanical (tractor) or manual methods to create planting spots as well as to reduce brush competition. Heavy slash can make it difficult to plant an area and can pose a fire hazard. Disadvantages of mechanical methods are that they can remove topsoil, compact soil, and encourage grass and other vegetation to reestablish.

Burning also can reduce slash and brush competition, but it can be difficult to control. You first must move the slash into piles so you can control the fire more

* Stocking is the number of trees in a forest. Usually this is expressed as trees per acre or some relative measure—well-stocked, fully stocked, overstocked, understocked.

2.2

easily. Contact your local Oregon Department of Forestry office before doing any burning.

Manual methods

Hand-scalping is difficult, gives only short-lived vegetation control, and is very expensive. You can place mulch mats made of heavy kraft paper or plastic at least 3 to 4 feet square around seedlings immediately after planting. These mats effectively control local vegetation, but they are expensive (Figure 2).

Chemical methods

When selecting chemical methods, know which weeds you want to control, select the appropriate herbicides that are registered for forestry use, and always *read* and *follow label directions.* Pesticide registrations change often, so always consult the label; it is your best source of information. Chemical site preparation methods are most cost effective and generally offer better long-term control of competing vegetation.

If you are planting in an old pasture or field or if the site isn't too brushy (that is, you can walk easily through the area), you can use a combination of chemical and manual methods. The purpose of preparing a site is not so much to clear a planting spot completely but rather to expose mineral soil and reduce the amount of vegetation that competes with seedlings for moisture and light.

Finally, remember that you have more options and that it's easier to control competing vegetation *before* you plant seedlings. Also, maintaining a weed-free environment the first 2 years after planting helps ensure good survival and vigorous seedlings.

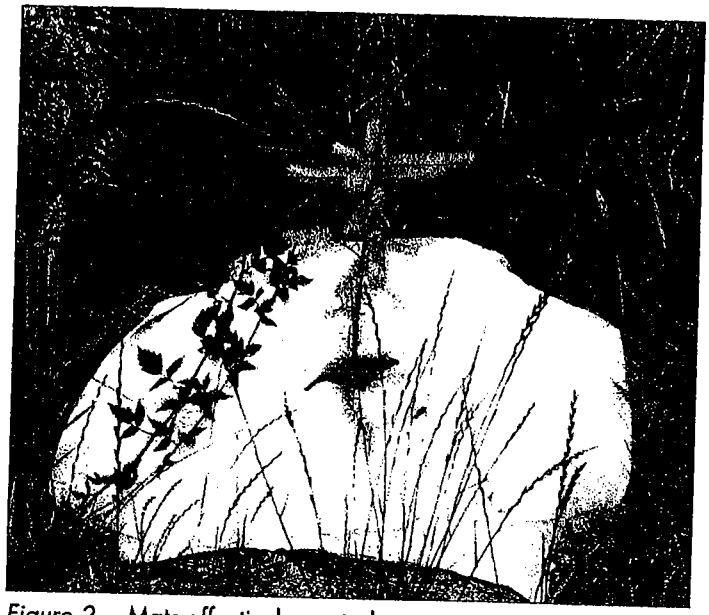

Figure 2.—Mats effectively control competing vegetation, but they are expensive.

Use herbicides safely!

- **Wear** protective clothing and safety devices as recommended on the label. **Bathe** or shower after each use.
- **Read** the herbicide label—even if you've used the herbicide before. **Follow closely** the instructions on the label (and any other directions you have).
- **Be cautious** when you apply herbicides. **Know** your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from herbicide use.

Obtaining seedlings

You can get tree seedlings for your site by encouraging natural seeding, by transplanting wildlings (seedlings growing in the wild), or by purchasing high-quality, nursery-grown seedlings.

Natural seeding of new trees (natural regeneration) from remaining or nearby "parent" trees can be effective under the right circumstances. Species such as hemlock, alder, and lodgepole pine produce regular cone crops and regenerate rapidly from natural seeding. In other cases, relying on natural seeding to regenerate a site is risky because cone crops of many other tree species (including Douglas-fir and ponderosa pine) are sporadic, and site conditions must be right for seeds to germinate and grow.

Using natural regeneration requires a written plan that is reviewed by the Oregon Forest Practices Forester. The written plan must be submitted within 12 months after timber harvesting has reduced tree stocking.

The written plan should estimate the time needed to regenerate adequately stocked, free-to-grow seedlings and alternative strategies that you will use if natural regeneration does not go as planned. Consult a Forest Practices Forester with the Oregon Department of Forestry if you are considering using natural regeneration to reforest your site.

For smaller planting projects (a few acres or less), you can use wildlings, provided they are of the correct species and taken from the same geographic area and elevation where you will replant them. Wildlings should appear healthy, be about 2 feet tall, and have an adequate root system left intact after digging. Ask owners' permission before removing wildlings from land that is not yours.

Nursery-grown tree seedlings are used most widely and are available from many sources. A list of nurseries is available from the OSU Extension Service and the Oregon Department of Forestry. To ensure that you'll have enough seedlings for your reforestation project, be sure to order several months in advance. Some nurseries allow you to order seedlings 6 months before the planting season.

Seedling costs range from $150 to $300 per 1,000 seedlings. Costs vary by nursery and by type of seedling (stock-type) purchased. Be cautious of buying "good deal" surplus trees that are given away or sold at low cost at the end of the planting season. These trees may not be suitable for your planting location or may be of low quality after a long period of storage. Low quality will result in poor survival and growth—and so, these trees may cost you more in the long run.

To improve seedling survival and growth, you need to match the seedling properly to the site (environment) where it will be planted. A proper match begins when you order seedlings. You must tell the nursery what species and stock-type you want, the seed zone and approximate elevation where they will be planted, and how many seedlings you need. See EC 1196, *Selecting and Buying Quality Seedlings*, for more detailed information.

The following sections review some of the basic considerations for matching trees to your planting site.

Species selection

Different tree species are adapted to different site conditions. Ponderosa pine does well in eastern Oregon and on the drier, heavy clay soils of the Willamette Valley. Douglas-fir does best in many western Oregon locations except on wet sites or in shady areas, where western hemlock or western redcedar may be a better choice. Some species, such as western redcedar, are more susceptible to animal browse.

It is possible to plant more than one species in an area. To be successful, you should become familiar with the ecological requirements (tolerance to frost, high temperatures, light, and moisture) of the

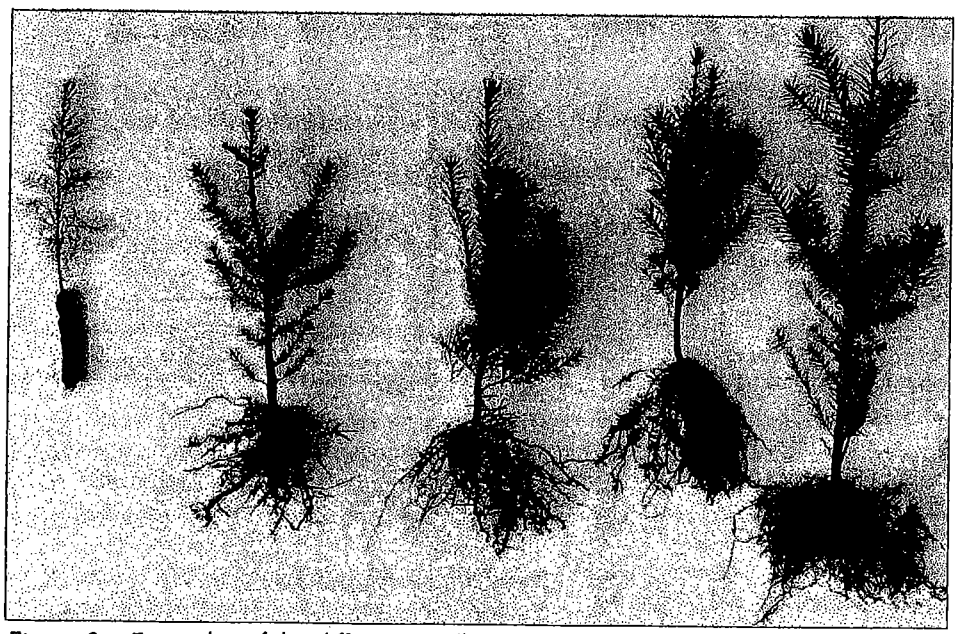

Figure 3.—Examples of the different seedling stock-types. From left: container; plug + 1; 2 + 0; 1 + 1; and 2 + 1.

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different species and their growth habits. Investigate very carefully before planting nonnative (also called "exotic") tree species. Consult a local forester for specific information on selecting species suitable for your area.

Seed zone and elevation

To ensure that trees are adapted to your site conditions, order seedlings that are specifically for your seed zone and elevation. Seed zone maps and related information are in EC 1196, *Selecting and Buying Quality Seedlings*; or, contact a forester with the OSU Extension Service or Oregon Department of Forestry.

Stock-type

Stock-type is a *general* indication of seedling size, age, and other characteristics (Figure 3). For example, a 2-0 seedling is grown for 2 years in a seedbed. A 1-1 seedling is grown for 1 year in a seedbed and then transplanted at wider spacing and grown for another year in a transplant bed. Both trees are 2 years old, but because the 1-1 was transplanted, it is a larger seedling (larger diameter, taller, more root mass). A 1-1 seedling is more expensive, but it may be worth the extra cost in terms of better survival and faster growth.

Larger seedlings can withstand more deer browse and are better able to compete with fast-growing shrubs. On the other hand, on hot, dry sites a smaller stock-type may be a better choice because the seedling has a better balance between shoots and roots, enabling the seedling to survive under harsher conditions.

Planting seedlings

Careful handling and proper planting of seedlings are important steps to successful reforestation. You can find more detailed information in EC 1095, *Seedling Care and Handling,* and EC 1504, *The Care and Planting of Tree Seedlings on Your Woodland.* The following sections review some of the basics for successful planting.

***Table 1.*—Trees per acre at various spacings.**

Trees/acre	Spacing (ft.)
1,210	6 x 6
681	8 x 8
436	10 x 10
302	12 x 12
222	14 x 14
170	16 x 16

Spacing and selecting planting spots

Trees usually are planted at a 10' x 10' spacing in western Oregon and 12' x 12' on drier sites in central and eastern Oregon. If you anticipate severe (hot and dry) site conditions and heavier than normal mortality, you could consider planting trees closer together to ensure that enough survive to occupy the site. Table 1 is a guide to the number of trees to plant at a given spacing.

Your planting pattern need not be square. It is more important to select good planting spots—areas of exposed mineral soil, free of weeds—than to space trees precisely. On hot, south-facing slopes, selecting good planting spots, such as those areas shaded by stumps or logs, can be more effective than planting additional trees. Following up with good weed control can improve seedling survival on these severe sites.

Timing

The best time to plant conifer seedlings in western Oregon is from January through March. Hardwood seedlings do best if planted from mid-March to mid-April. Seedlings are dormant during these months and can withstand handling and planting.

Soils in eastern Oregon or at higher elevations may be frozen or snow covered during this time. Plant these areas as soon as possible after snow melts and the ground thaws (late March through April).

Some growers have tried planting in the fall. This is risky because seedlings are not fully dormant and so are susceptible to damage. Also, fall rains are unpredictable, and dry soils generally result in poor seedling survival.

Care and handling

Keep seedlings cool (34 to 40°F) and moist and handle them gently at *all* times. When transporting seedlings to the planting site, keep them away from direct sunlight and cover them with a reflective tarp. Store extra seedlings temporarily in a shaded, cool spot at the planting site until needed. Do not allow seedlings to freeze.

Tools and planting

Special long-bladed shovels, planting spades, planting hoes (called hoedads), or power augers are used to plant seedlings. Planting holes should be deep enough to accommodate roots. Plant the seedling so its roots spread downward in the planting hole and are not crammed in, forming "J-roots." Plant seedlings upright so that all roots are well covered, and firm the soil around roots to eliminate air pockets. Avoid mixing any organic debris, such as rotten wood, branches, or needles, in the planting hole.

Fertilizing seedlings at planting time is not recommended under most conditions. Soil fertility usually is adequate. Fertilization actually may harm seedlings by burning the roots, encouraging excessive top growth, or by encouraging the growth of weeds that compete with seedlings.

If you hire a planting contractor, obtain and check references first. Names of local contractors may be available from an OSU Extension forester or the Oregon Department of Forestry. It is important to monitor tree planters to be sure they do a good job.

Planting costs vary with site conditions, size of seedling, spacing, and availability of planting crews. Costs may range from 25 to 45 cents per seedling or roughly from $100 to $200 per acre. This includes the costs of seedlings and labor.

Seedling protection

If populations of deer, elk, gophers, or mountain beavers are large, you may need to protect newly planted seedlings. To deter deer and elk, you can place protective devices (Figure 4) around seedlings or use repellents. Control gophers by baiting and trapping; mountain beavers usually are trapped to control their populations. For specific information on animal damage protection, see:

- EC 1144, *Controlling Mountain Beaver Damage in Forest Plantations*
- EC 1201, *Understanding and Controlling Deer Damage in Young Plantations*
- EC 1255, *Controlling Pocket Gopher Damage to Conifer Seedlings*
- EC 1256, *Controlling Vole Damage to Conifer Seedlings*

On south-facing slopes, seedlings may be damaged or killed by intense sunlight and heat. Shading the seedling's lower stem with shade cards (available commercially or homemade) can improve seedling survival on these harsh sites, particularly if there is little shade from stumps, logs, and slash.

Plantation maintenance

Once seedlings are planted, additional maintenance often is needed to ensure their continued survival and growth. A systematic walk through the plantation each year can reveal whether seedlings are alive and growing well and whether action is needed to control weeds or protect trees from animal damage.

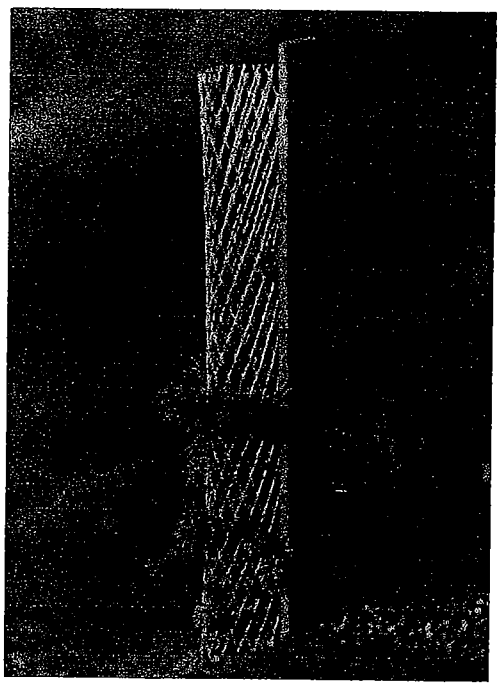

Figure 4.—A vexar tube protects against browsing deer.

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Seedling growth is slow the first year or two (4 to 6 inches). Some hardwood species, such as alder, can grow much faster. After the first year or two, and depending on site conditions, you should get 1 to 3 feet of height growth on Douglas-fir seedlings as they become established and growth improves.

Be sure to watch the site closely so that weeds don't reinvade before your seedlings take hold and grow. The first 2 years are critical, and retreatment may be necessary to ensure survival. A healthy plantation is your reward for a job well done! Find additional information on weed control in EC 1388, *Introduction to Conifer Release.*

For more information on plantation maintenance and protection from animal damage, contact the OSU Extension Service and the Oregon Department of Forestry.

Steps for successful reforestation

- Carefully plan and evaluate your site.
- Do an excellent job of site preparation.
- Select the proper species and seedling stock-type for your site, and order early.
- Carefully handle and plant seedlings.
- Follow up with weed and animal damage control, if needed, the first 2 years.
- Enjoy your young forest and watch it grow!

Financial assistance for reforestation

Many landowners are interested in financial assistance for reforestation: either reimbursement for some costs of reforestation, or tax savings from having your property assessed as forest land, or state and federal reforestation tax credits.

Cost-share money may be available for reforestation in some situations under the Forestry Incentive Program (FIP) and the Stewardship Incentive Program (SIP). For more information, contact your local Farm Services Agency (FSA). The FSA is listed in the phone book under "United States Government—Agriculture Dept. of." FSA administers these cost-share programs and works closely with your local Service Forester from the Oregon Department of Forestry. You can find additional information in EC 1119, *Incentive Programs for Woodland Management and Resource Conservation.*

If your land currently has no trees but could support native, commercial tree species, you might qualify for "forest deferral" if you plant seedlings and manage your land for timber. This special tax designation provides significant property tax savings to you. To qualify, you must have a management plan and own at least 2 acres that are contiguous (not including area for residence), *and* you must establish enough trees to meet or exceed the forest practices minimum reforestation stocking requirements. Apply for forest deferral between January 1 and April 1 with your county assessor's office. The county assessor can give you additional details.

Reforestation tax credits are available to help offset reforestation costs. Information on state reforestation tax credits can be obtained from the local Oregon Department of Forestry Service Forester. Contact the IRS for information on federal reforestation tax credits.

For further reading

OSU Extension publications

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Controlling Mountain Beaver Damage in Forest Plantations, EC 1144. 1993. D.S. deCalesta, R.E. Duddles, and M.C. Bondi. Corvallis: Oregon State University Extension Service. $1.00

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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.

For information about how to order, and for a current list of titles and prices, inquire at the office of the OSU Extension Service that serves your county.

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EXHIBIT 3

DOUGLAS FIR LOG PRICES 1978-1982, 1983

REGION 1 - WESTERN OREGON UNIT
Reporting format: ODF reporting as of 4th quarter 1981
Source: Oregon Department of Forestry Forest Management Division
http://www.odf.state.or.us/divisions/management/asset_management/logprices/logP483.HTM

Domestically Processed Logs (Delivered to a mill; "Pond Value")

1978

Douglas-Fir Grade	Quarter				Average
	1st	2nd	3rd	4th	
#1P	$ 460	475	475	475	471
#2P	$ 415	435	435	435	430
#3P	$ 358	389	389	389	381
SM	$ 283	338	338	338	324
#2S	$ 242	287	287	287	276
#3S	$ 191	250	250	250	235
#4S	$ 161	200	200	200	190
SC	$ 125	157	157	157	149
Utility	$ 70	80	80	80	78

1979

Douglas-Fir Grade	Quarter				Average
	1st	2nd	3rd	4th	
#1P	$ 531	531	584	584	555
#2P	$ 476	476	523	523	500
#3P	$ 425	425	467	467	446
SM	$ 385	385	423	423	404
#2S	$ 322	322	354	354	338
#3S	$ 282	282	310	310	296
#4S	$ 256	256	281	281	269
SC	$ 160	160	176	176	168
Utility	$ 90	90	99	99	95

1980

Douglas-Fir Grade	Quarter				Average
	1st	2nd	3rd	4th	
#1P	$ 584	584	584	584	584
#2P	$ 523	523	523	523	523
#3P	$ 467	467	467	467	467
SM	$ 423	423	423	423	423
#2S	$ 354	354	354	354	354
#3S	$ 310	310	310	310	310
#4S	$ 281	281	281	281	281
SC	$ 176	176	176	176	176
Utility	$ 99	99	99	99	99

1981

Douglas-Fir Grade		Quarter 1st	2nd	3rd	4th	Average
#1P	$	584	584	584	648	648
#2P	$	523	523	523	550	550
#3P	$	467	467	467	439	439
SM	$	423	423	423	390	415
#2S	$	354	354	354	323	346
#3S	$	310	310	310	238	292
#4S	$	281	281	281	208	263
SC	$	176	176	176	212	185
Utility	$	99	99	99	104	100

360

1982

Douglas-Fir Grade		Quarter 1st	2nd	3rd	4th	Average
1P	$	600	512	512	512	534
2P	$	510	439	439	439	457
3P	$	425	370	370	370	384
SM	$	375	316	316	316	331
2S	$	295	258	258	258	267
3S	$	225	202	202	202	208
4S	$	190	169	169	169	174
SC	$	190	164	164	164	171
Utility	$	90	123	123	123	115
CR (2S & better)	$	--	303	303	303	303
CR (2S, 3S, and 4S)	$	--	243	243	243	243

1983

Douglas-Fir Grade		Quarter 1st	2nd	3rd	4th	Average
1P	$	512	505	505	505	507
2P	$	439	410	425	425	425
3P	$	370	325	340	340	343
SM	$	316	275	285	285	290
2S	$	258	250	255	255	255
3S	$	202	210	215	215	211
4S	$	169	195	200	200	191
SC	$	164	130	140	140	144
Utility	$	123	75	75	75	87
CR (2S & better)	$	303	--	--	--	303
CR (2S, 3S, and 4S)	$	243	240	240	240	241

DOUGLAS FIR LOG PRICES 1978-1982, 1983

DF Grade	1978-1982 Average	1983 Average	%+	% -
1P	$ 558	507		- 9.1%
2P	$ 492	425		-13.6%
3P	$ 423	343		-18.9%
SM	$ 379	290		-23.5%
2S	$ 316	255		-19.3%
3S	$ 268	211		-21.3%
4S	$ 235	191		-18.7%
SC	$ 170	144		-15.3%
Utility	$ 97	87		-10.3%
CR (2S & better)	$ 303	303		n/c
CR (2S, 3S, and 4S)	$ 243	241		- 0.8%
Average*	$ 326	273	19.4**	-16.3

*In the absence of information concerning distribution of grades, it is not possible to assign the different grades their proper weight in calculating an overall average. This calculation assigns each grade equal weight, with the exception of the CR grades which were used only during the years 1982 and 1983 years and are not included.

** % by which 1978-82 prices exceed 1983 prices

EXHIBIT 4

PONDEROSA PINE LOG PRICES 1978-1982, 1983

Reporting format: ODF reporting as of 4th quarter 1981

Source: Oregon Department of Forestry Forest Management Division
http://www.odf.state.or.us/divisions/management/asset_management/logprices/logP483.HTM

Domestically Processed Logs (Delivered to a mill; "Pond Value")

Roseburg prices used where available; otherwise, Grants Pass prices

1978 (Grants Pass)

Grade	Quarter				Average
	1st	2nd	3rd	4th	
#1S	$ 300	347	347	347	335
SM	-	221	221	221	221
#2S	$ 225	305	305	305	285
#3S	$ 180	263	263	263	242
#4S	$ 152	187	187	187	178
#5S	$ 140	173	173	173	165
#6S	$ 110	147	147	147	138
Utility	-	-	-	-	-

1979 (Roseburg)

Grade	Quarter				Average
	1st	2nd	3rd	4th	
1S	$ 479	479	527	527	503
SM	$ 274	274	301	301	288
2S	$ 353	353	388	388	371
3S	$ 315	315	347	347	331
4S	$ 244	244	269	269	257
5S	$ 222	222	244	244	233
6S	$ 217	217	238	238	228
Utility	$ 130	130	130	130	130

1980 (Roseburg)

Grade	Quarter				Average
	1st	2nd	3rd	4th	
1S	$ 527	521	521	521	521
SM	$ 301	301	301	301	301
2S	$ 388	388	388	388	388
3S	$ 347	347	347	347	347
4S	$ 269	269	269	269	269
5S	$ 244	244	244	244	244
6S	$ 238	238	238	238	238
Utility	$ 130	130	130	130	130

1981 (Roseburg)

Grade	Quarter 1st	2nd	3rd	4th	Average
Peeler	-	-	-	610	610
1S	$ 527	521	521	500	516
SM	$ 301	301	301	275	295
2S	$ 388	388	388	430	399
3S	$ 347	347	347	300	335
4S	$ 269	269	269	275	271
5S	$ 244	244	244	250	246
6S	$ 238	238	238	210	231
CR	-	-	-	315	315
Utility	$ 130	130	130	115	126

1982 (Roseburg)

Grade	Quarter 1st	2nd	3rd	4th	Average
Peeler	$ 575	575	575	575	575
1S	$ 495	495	495	495	495
SM	$ 300	300	300	300	300
2S	$ 390	390	390	390	390
3S	$ 300	300	300	300	300
4S	$ 250	250	250	250	250
5S	$ 175	175	175	174	175
6S	$ 150	150	150	150	150
CR	$ 250	250	250	250	250
Utility	$ 100	100	100	100	100

1983 Roseburg (1st quarter); Grants Pass (2nd-4th quarters)

Grade	Quarter 1st	2nd	3rd	4th	Average
Peeler	$ 575	-	-	-	575
1S	$ 495	-	-	-	495
SM	$ 300	300	300	300	300
2S	$ 390	450	450	450	435
3S	$ 300	375	375	375	356
4S	$ 250	225	225	225	231
5S	$ 175	200	200	200	194
6S	$ 150	160	160	160	158
CR	$ 250	240	240	240	243
Utility	$ 100	55	-		78

PONDEROSA PINE LOG PRICES 1978-1982, 1983

PP Grade	1978-1982 Average	1983 Average	%+	%+/-
Peeler	$ 593	575		- 3.0%
1S	$ 474	495		+ 4.4%
SM	$ 281	300		+ 6.7%
2S	$ 366	435		+18.9%
3S	$ 311	356		+14.5%
4S	$ 245	231		- 5.7%
5S	$ 213	194		- 8.9%
6S	$ 197	158		-19.8%
CR	$ 283	243		-14.1%
Utility	$ 122	78		-36.1%
Average*	$ 309	307	0.065**	-.0065%

*In the absence of information concerning distribution of grades, it is not possible to assign the different grades their proper weight in calculating an overall average. This calculation assigns each grade equal weight, with the exception of the CR grades which were used only during the years 1982 and 1983 years and are not included.

** % by which 1978-82 prices exceed 1983 prices

Base 100 Ponderosa Pine Site Index Tables

EXHIBIT 5

Site Index		130	135	140	145			150
Tot. Age	BH Age	Site Ht. feet	Site Ht. feet	Site Ht. feet	Site Ht. feet	Tot. Age	BH Age	Site Ht. feet
20	10	39	40	42	43	20	11	45
25	15	49	51	52	54	25	16	56
30	20	58	60	62	64	30	21	66
35	25	64	67	70	72	35	26	75
40	30	71	74	77	80	40	31	83
45	35	78	81	84	87	45	36	90
50	40	84	87	90	94	50	41	97
55	45	89	93	96	100	55	46	104
60	50	95	99	102	106	60	51	110
65	55	100	104	108	112	65	56	116
70	60	105	109	113	117	70	61	121
75	65	109	114	118	122	75	66	127
80	70	114	118	123	127	80	71	132
85	75	118	123	127	132	85	76	137
90	80	122	127	132	137	90	81	141
95	85	126	131	136	141	95	86	146
100	90	130	135	140	145	100	91	150
105	95	134	139	144	149	105	96	155
110	100	137	143	148	153	110	101	159
115	105	141	146	152	157	115	106	163
120	110	144	150	155	161	120	111	167
125	115	147	153	159	165	125	116	170
130	120	151	156	162	168	130	121	174
135	125	154	160	166	172	135	126	178
140	130	157	163	169	175	140	131	181
145	135	160	166	172	178	145	136	184
150	140	162	169	175	181	150	141	187
155	145	165	172	178	184	155	146	191
160	150	168	174	181	187	160	151	194

PHILOMATH 131

Ibid Ponderosa Pine Site Index Tables

5. 1

EXHIBIT 5

TECHNICAL NOTES

34-C-OR U.S. DEPARTMENT OF AGRICULTURE Portland, Oregon SOIL CONSERVATION SERVICE

FORESTRY NO. 2 Revised June 1986

CULMINATION OF MEAN ANNUAL INCREMENT FOR COMMERCIAL FOREST TREES OF OREGON

The productivity of a particular soil is of considerable importance to land managers. The most common expression of productivity on forestland is site index (total height of trees in the dominant crown canopy at a base age, usually 50 or 100 years). Service employees recognize the significance of site index in relative terms, that is, land with a site index of 160 is more productive than site index 140, but less productive than site index 180. However, most technical materials refer to site index without explaining what it represents in terms of cubic feet or board feet volumes.

The attached tables, express site index in such a way it can be related to volumes. It is necessary, for comparative purposes, to use a method that expresses one value for each site index. The method chosen is culmination of mean annual increment (CMAI).

This age or point may be thought of as the most efficient time to harvest as far as tree growth is concerned. Other factors, such as stumpage values, taxes, interest rates, and management objectives affect the "art" of choosing when to harvest.

In the following tables, the culmination of mean annual increment (CMAI) and the age when it occurs is shown for the corresponding site indices. For example, using a site index of 156 for Douglas-fir, the following volumes can be expressed:

1. A 60 year old stand will produce 165 cubic feet volume per acre per year at CMAI, or 9,900 (60X165) total cubic feet volume.

2. A 100 year old stand will produce 780 board feet (Scribner) volume per acre per year at CMAI or 78,000 (100x780) total board feet volume.

CMAI FOR DOUGLAS FIR

SITE INDEX	100 YR. TABLE (PSME) 790-McARDLE						WEST SIDE 50 YR. (PSME) 795-KING			EAST SIDE 50 YR. (PSMEG) 765-COCHRAN		
	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	SCRIBNER BD.FT./ AC./YR.	TOTAL AGE	INTER.1/8" BD.FT./ AC./YR.	TOTAL AGE	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE
50											29	2.0	116
51											30	2.1	115
52											32	2.2	115
53											34	2.4	114
54											35	2.4	114
55											36	2.5	113
56											38	2.7	112
57											40	2.8	112
58											41	2.9	111
59											42	2.9	111
60											44	3.1	110
61											46	3.2	109
62											47	3.3	109
63											49	3.4	108
64											51	3.6	107
65											52	3.6	106
66											54	3.8	106
67											56	3.9	105
68											58	4.1	104
69											59	4.1	104
70													
71								79	5.5	90	61	4.3	103
72								81	5.6	90	63	4.4	102
73								83	5.8	90	65	4.5	102
74								84	5.9	90	67	4.7	101
75								86	6.0	90	69	4.8	101
76								89	6.2	90	71	5.0	100
77								91	6.3	90	73	5.1	99
78								93	6.5	90	75	5.2	99
79								94	6.6	90	77	5.4	98
								96	6.7	90	79	5.5	98
80	58	4.1	70	146	160	291	110						
81	60	4.2	70	151	160	299	110	98	6.8	90	81	5.7	97
82	61	4.3	70	156	160	307	110	100	7.0	90	83	5.8	96
83	62	4.3	70	162	160	316	110	102	7.1	90	86	6.0	96
84	63	4.4	70	167	160	324	110	103	7.2	90	88	6.2	95
85	64	4.5	70	172	160	332	110	105	7.4	90	90	6.3	94
86	66	4.6	70	178	160	340	110	107	7.5	90	92	6.4	94
87	67	4.7	70	183	160	348	110	109	7.6	90	95	6.6	93
88	68	4.8	70	189	160	356	110	111	7.7	90	97	6.8	92
89	69	4.8	70	194	160	365	110	113	7.9	90	99	6.9	91
								114	8.0	90	102	7.1	91

CMAI FOR DOUGLAS FIR

SITE INDEX	100 YR. TABLE (PSME) 790-McARDLE								WEST SIDE 50 YR. (PSME) 795-KING			EAST SIDE 50 YR. (PSMEG) 765-COCHRAN		
	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	SCRIBNER BD.FT./ AC./YR.	SCRIBNER TOTAL AGE	INTER.1/8" BD.FT./ AC./YR.	INTER.1/8" TOTAL AGE		CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE
90	70	4.9	60	199	160	373	110		116	8.1	90	104	7.3	90
91	72	5.0	60	206	160	382	110		118	8.2	90	107	7.5	89
92	73	5.1	60	212	160	391	110		120	8.4	90	109	7.6	88
93	74	5.2	60	219	160	401	110		122	8.5	90	112	7.8	87
94	75	5.3	60	225	160	410	110		123	8.6	90	114	8.0	86
95	77	5.4	60	232	160	420	110		125	8.8	90	117	8.2	84
96	78	5.5	60	238	160	429	110		128	9.0	90	120	8.4	83
97	79	5.5	60	244	150	438	110		130	9.1	90	122	8.5	82
98	81	5.7	60	251	150	448	110		132	9.2	90	125	8.7	81
99	82	5.7	60	258	150	457	110		134	9.4	90	127	8.9	80
100	84	5.9	60	265	150	467	100		136	9.5	90	130	9.1	79
101	85	5.9	60	273	150	478	100		138	9.6	90	133	9.3	78
102	86	6.0	60	280	150	490	100		140	9.8	90	136	9.5	78
103	88	6.2	60	288	150	501	100		141	9.9	90	139	9.7	77
104	89	6.2	60	296	150	512	100		143	10.0	90	142	9.9	76
105	91	6.3	60	304	150	524	100		145	10.1	90	145	10.1	76
106	92	6.4	60	312	150	535	100		147	10.3	90	148	10.3	75
107	94	6.6	60	320	140	547	100		149	10.4	90	151	10.6	74
108	95	6.6	60	329	140	558	100		150	10.5	90	154	10.8	73
109	97	6.8	60	337	140	569	100		152	10.6	90	157	11.0	73
110	98	6.9	60	345	140	581	100		154	10.8	90	160	11.2	72
111	100	7.0	60	354	140	594	100		156	10.9	90			
112	101	7.1	60	363	140	606	100		158	11.0	90			
113	103	7.2	60	372	130	619	100		160	11.2	90			
114	105	7.3	60	381	130	631	100		162	11.3	90			
115	106	7.4	60	390	130	644	90		163	11.4	90			
116	108	7.6	60	399	130	656	90		167	11.7	90			
117	110	7.7	60	408	130	669	90		169	11.8	90			
118	111	7.8	60	418	130	681	90		171	11.9	90			
119	113	7.9	60	427	130	694	90		173	12.1	90			
120	115	8.0	60	437	120	710	90		175	12.2	90			
121	116	8.1	60	446	120	723	90		176	12.3	90			
122	118	8.3	60	456	120	736	90		178	12.5	90			
123	119	8.3	60	465	120	749	90		180	12.6	90			
124	121	8.5	60	475	120	762	90		182	12.7	90			
125	122	8.5	60	485	120	776	90		184	12.9	90			
126	124	8.7	60	494	120	789	90		186	13.0	90			
127	125	8.7	60	504	120	802	90		188	13.1	90			
128	127	8.9	60	513	120	815	90		190	13.2	90			
129	128	9.0	60	523	120	828	90		191	13.4	90			

CMAI FOR DOUGLAS FIR

SITE INDEX	100 YR. TABLE (PSME) 790-McARDLE								WEST SIDE 50 YR. (PSME) 795-KING		
	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	SCRIBNER BD.FT./ AC./YR.	SCRIBNER TOTAL AGE	INTER.1/8" BD.FT./ AC./YR.	INTER.1/8" TOTAL AGE	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE
130	129	9.0	60	532	110	841	90	193	13.5	90
131	131	9.2	60	542	110	853	90	195	13.6	90
132	133	9.3	60	552	110	865	90	197	13.8	90
133	134	9.4	60	562	110	877	90	199	13.9	90
134	136	9.5	60	572	110	889	90	201	14.0	90
135	138	9.7	60	581	110	901	80	203	14.2	90
136	139	9.7	60	591	110	914	80	207	14.5	90
137	140	9.8	60	601	110	927	80	209	14.6	90
138	142	9.9	60	611	110	940	80	210	14.7	90
139	144	10.1	60	621	110	953	80	212	14.8	90
140	145	10.1	60	631	110	966	80	214	15.0	90
141	146	10.2	60	640	110	978	80	216	15.1	90
142	148	10.3	60	649	110	990	80	218	15.2	90
143	149	10.4	60	658	110	1002	80	220	15.4	90
144	150	10.5	60	667	110	1014	80	222	15.5	90
145	152	10.6	60	676	110	1026	80	224	15.6	90
146	153	10.7	60	686	100	1037	80	226	15.8	90
147	154	10.8	60	695	100	1049	80	227	15.9	90
148	156	10.9	60	705	100	1061	80	229	16.0	90
149	157	11.0	60	714	100	1073	80	231	16.2	90
150	158	11.1	60	724	100	1085	80	233	16.3	90
151	159	11.1	60	733	100	1096	80	235	16.4	90
152	161	11.3	60	743	100	1106	80	237	16.6	90
153	162	11.3	60	752	100	1117	80	239	16.7	90
154	163	11.4	60	762	100	1127	80	241	16.8	90
155	164	11.5	60	771	100	1138	80	243	17.0	90
156	165	11.5	60	780	100	1148	80	244	17.1	90
157	167	11.7	60	790	100	1159	80	246	17.2	90
158	168	11.8	60	799	100	1169	80	248	17.4	90
159	169	11.8	60	809	100	1180	80	250	17.5	90
160	170	11.9	60	818	100	1190	80	252	17.6	90
161	171	12.0	60	827	100	1200	80			
162	172	12.0	60	835	100	1209	80			
163	173	12.1	60	844	100	1219	80			
164	174	12.2	60	852	100	1228	80			
165	176	12.3	60	861	100	1238	80			
166	177	12.4	60	870	100	1247	80			
167	178	12.5	60	878	100	1257	80			
168	179	12.5	60	887	100	1266	80			
169	180	12.6	60	895	100	1276	80			

CMAI FOR DOUGLAS FIR

100 YR. TABLE
(PSME)
790-McARDLE

SITE INDEX	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	SCRIBNER BD.FT./ AC./YR.	TOTAL AGE	INTER.1/8" BD.FT./ AC./YR.	TOTAL AGE
170	181	12.7	60	904	100	1285	80
171	182	12.7	60	912	100	1295	80
172	183	12.8	60	921	100	1305	80
173	184	12.9	60	930	100	1315	80
174	185	12.9	60	938	100	1325	80
175	186	13.0	60	946	100	1336	80
176	187	13.1	60	955	100	1346	80
177	188	13.2	60	964	90	1356	80
178	189	13.2	60	973	90	1366	80
179	190	13.3	60	982	90	1376	80
180	191	13.4	60	991	90	1386	80
181	192	13.4	60	1000	90	1395	80
182	193	13.5	60	1009	90	1404	80
183	194	13.6	60	1018	90	1413	80
184	194	13.6	60	1027	90	1422	80
185	195	13.6	60	1036	90	1431	80
186	196	13.7	60	1044	90	1440	80
187	197	13.7	60	1053	90	1449	80
188	198	13.9	60	1062	90	1458	80
189	199	13.9	60	1071	90	1467	80
190	200	14.0	60	1080	90	1476	80
191	201	14.1	60	1088	90	1484	80
192	202	14.1	60	1097	90	1493	80
193	202	14.1	60	1105	90	1501	80
194	203	14.2	60	1114	90	1509	80
195	204	14.3	60	1122	90	1518	80
196	205	14.3	60	1131	90	1526	80
197	206	14.4	60	1139	90	1534	80
198	207	14.5	60	1148	90	1542	80
199	208	14.6	60	1156	90	1551	80
200	208	14.6	60	1164	90	1559	80
201	209	14.6	60	1173	90	1567	80
202	210	14.7	60	1181	90	1575	80
203	211	14.8	60	1189	90	1583	80
204	211	14.8	60	1198	90	1591	80
205	212	14.8	60	1206	90	1599	80
206	213	14.9	60	1214	90	1607	80
207	214	15.0	60	1223	90	1615	80
208	214	15.0	60	1231	90	1623	80
209	215	15.0	60	1239	90	1631	80
210	216	15.1	60	1248	90	1639	80

SITE INDEX	CMAI FOR PONDEROSA PINE 100 YR. TABLE (PIPO) 600-MEYER CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	SCRIBNER BD.FT./ AC./YR.	TOTAL AGE	INTER.1/8" BD.FT./ AC./YR.	TOTAL AGE	CMAI FOR LODGEPOLE PINE: 100 YR. TABLE (PICO) 520-ALEXANDER CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	CMAI FOR WESTERN LARCH: 50 YR. TABLE (LAOC) 265-SCHMIDT CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE
30											31	2.2	70
31											32	2.2	70
32											34	2.4	70
33											36	2.5	70
34											37	2.6	70
35											39	2.7	70
36											40	2.8	70
37											42	2.9	70
38											43	3.0	70
39											45	3.1	70
40	30	2.1	60	55	200	84	200						
41	31	2.2	60	59	200	88	200				46	3.2	70
42	31	2.2	60	63	200	93	200				48	3.4	70
43	32	2.2	60	67	200	98	200				50	3.5	70
44	33	2.3	60	71	200	102	200				51	3.6	70
45	34	2.4	60	75	200	107	200				53	3.7	70
46	34	2.4	60	79	200	111	200	36	2.5	100	55	3.8	70
47	35	2.4	60	83	200	116	200	37	2.6	100	56	3.9	70
48	36	2.5	60	87	200	121	200	38	2.7	100	58	4.1	70
49	37	2.6	60	91	200	125	200	39	2.7	90	60	4.2	70
50	38	2.7	60	95	200	130	200	40	2.8	90	61	4.3	70
51	38	2.7	60	98	200	134	200	41	2.9	90	63	4.4	70
52	39	2.7	60	102	200	139	200	41	2.9	90	65	4.5	70
53	40	2.8	60	105	200	143	200	42	2.9	90	67	4.7	70
54	41	2.9	60	109	200	147	200	43	3.0	90	69	4.8	70
55	42	2.9	60	112	200	152	200	44	3.1	90	70	4.9	70
56	42	2.9	60	115	200	156	200	45	3.1	90	72	5.0	70
57	43	3.0	60	119	200	160	200	46	3.2	90	74	5.2	70
58	44	3.1	60	122	200	164	200	47	3.3	90	76	5.3	70
59	45	3.1	60	126	200	169	200	48	3.4	90	78	5.5	70
60	46	3.2	50	129	190	177	160	49	3.4	90	80	5.6	70
61	47	3.3	50	133	190	182	160	50	3.5	90	81	5.7	70
62	48	3.4	50	137	190	187	160	50	3.5	90	83	5.8	70
63	49	3.4	50	142	190	192	160	51	3.6	90	85	5.9	70
64	50	3.5	50	146	190	198	160	52	3.6	90	87	6.1	70
65	50	3.5	50	150	190	203	160	53	3.7	90	89	6.2	70
66	51	3.6	50	154	190	208	160	54	3.8	90	91	6.4	70
67	52	3.6	50	158	190	213	160	55	3.8	90	93	6.5	70
68	53	3.7	50	166	190	218	160	56	3.9	90	95	6.6	70
69	54	3.8	50	167	190	224	160	57	4.0	90	97	6.8	70
								58	4.1	90	99	6.9	70

suggest cut by 1/3 to 1/4

CMAI FOR PONDEROSA PINE

100 YR. TABLE
(PIPO)
600-MEYER

SITE INDEX	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	SCRIBNER BD.FT./ AC./YR.	SCRIBNER TOTAL AGE	INTER.1/8" BD.FT./ AC./YR.	INTER.1/8" TOTAL AGE
70	55	3.8	50	172	160	232	130
71	56	3.9	50	177	160	240	130
72	58	4.1	50	182	160	247	130
73	59	4.1	50	188	160	255	130
74	60	4.2	50	193	160	263	130
75	62	4.3	50	198	160	270	130
76	63	4.4	50	203	160	278	130
77	64	4.5	50	209	160	285	130
78	65	4.5	50	214	160	293	130
79	67	4.7	50	219	160	300	130
80	69	4.8	40	225	150	313	110
81	70	4.9	40	232	150	321	110
82	72	5.0	40	238	150	330	110
83	74	5.2	40	245	150	339	110
84	75	5.2	40	252	150	347	110
85	77	5.4	40	258	150	356	110
86	78	5.5	40	265	150	365	110
87	80	5.6	40	271	150	373	110
88	82	5.7	40	278	150	382	110
89	83	5.8	40	284	150	391	110
90	85	5.9	40	292	130	403	100
91	87	6.1	40	300	130	413	100
92	88	6.2	40	308	130	423	100
93	90	6.3	40	316	130	433	100
94	92	6.4	40	324	130	443	100
95	94	6.6	40	332	130	453	100
96	96	6.7	40	340	130	463	100
97	97	6.8	40	348	130	473	100
98	99	6.9	40	356	130	483	100
99	101	7.1	40	364	130	493	100
100	102	7.1	40	372	120	507	90
101	104	7.3	40	381	120	519	90
102	106	7.4	40	390	120	530	90
103	108	7.6	40	399	120	542	90
104	110	7.7	40	408	120	554	90
105	112	7.8	40	417	120	566	90
106	114	8.0	40	426	120	578	90
107	116	8.1	40	435	120	590	90
108	118	8.3	40	444	120	602	90
109	120	8.4	40	453	120	614	90

CMAI FOR LODGEPOLE PINE

100 YR. TABLE
(PICO)
520-ALEXANDER

CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE
59	4.1	90
60	4.2	90
61	4.3	90
62	4.3	90
63	4.4	90
64	4.5	90
65	4.5	90
66	4.6	90
67	4.7	90
68	4.8	90
69	4.8	90
70	4.9	90
71	5.0	90
72	5.0	90
73	5.1	90
74	5.2	90
75	5.2	90
76	5.3	90
77	5.4	90
78	5.5	90
79	5.5	90
80	5.6	90
81	5.7	90
82	5.7	90
83	5.8	90
84	5.9	90
85	5.9	90
86	6.0	90
87	6.1	90
88	6.2	90
89	6.2	90
90	6.3	90
91	6.4	90
92	6.4	90
93	6.5	90
94	6.6	90
95	6.6	90
96	6.7	90
97	6.8	90
98	6.9	90

CMAI FOR WESTERN LARCH

50 YR. TABLE
(LAOC)
265-SCHMIDT

CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE
101	7.1	70
103	7.2	70
105	7.3	70
107	7.5	70
109	7.6	70
111	7.8	70
113	7.9	70
116	8.1	70
118	8.3	70
120	8.4	70
122	8.5	70

CMAI FOR PONDEROSA PINE

100 YR. TABLE
(PIPO)
600-MEYER

SITE INDEX	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	SCRIBNER BD.FT./ AC./YR.	SCRIBNER TOTAL AGE	INTER.1/8" BD.FT./ AC./YR.	INTER.1/8" TOTAL AGE
110	122	8.5	40	462	110	626	80
111	124	8.7	40	473	110	641	80
112	126	8.8	40	484	110	657	80
113	128	9.0	40	495	110	672	80
114	130	9.1	40	506	110	687	80
115	132	9.2	40	517	110	702	80
116	134	9.4	40	528	110	717	80
117	136	9.5	40	539	110	732	80
118	137	9.6	40	550	110	747	80
119	139	9.7	40	561	110	762	80
120	141	9.9	40	572	110	776	70
121	144	10.1	40	584	110	793	70
122	146	10.2	40	597	110	810	70
123	149	10.4	40	610	110	827	70
124	151	10.7	40	622	110	844	70
125	154	10.8	40	635	110	861	70
126	156	10.9	40	647	110	879	70
127	159	11.1	40	660	110	896	70
128	161	11.3	40	672	110	913	70
129	164	11.5	40	685	110	930	70
130	166	11.6	40	700	100	947	70
131	168	11.7	40	714	100	964	70
132	170	11.9	40	729	100	981	70
133	173	12.1	40	743	100	998	70
134	175	12.2	40	758	100	1015	70
135	177	12.4	40	772	100	1031	70
136	179	12.5	40	786	100	1048	70
137	181	12.7	40	801	100	1065	70
138	183	12.8	40	815	100	1082	70
139	185	12.9	40	830	100	1099	70
140	188	13.1	40	844	100	1116	70
141	190	13.3	40	859	100	1133	70
142	192	13.4	40	873	100	1150	70
143	194	13.6	40	888	100	1168	70
144	197	13.8	40	903	100	1185	70
145	199	13.9	40	918	100	1202	70
146	201	14.1	40	932	100	1219	70
147	203	14.2	40	947	100	1237	70
148	205	14.3	40	962	100	1254	70
149	208	14.5	40	976	100	1271	70

CMAI FOR LODGEPOLE PINE

100 YR. TABLE
(PICO)
520-ALEXANDER

CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE
99	6.9	90
100	7.0	90
101	7.1	90
102	7.1	90
103	7.2	90
104	7.3	90
105	7.3	90
106	7.4	90
107	7.5	90
108	7.6	90
109	7.6	90

CMAI FOR PONDEROSA PINE

100 YR. TABLE
(PIPO)
600-MEYER

SITE INDEX	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	SCRIBNER BD.FT./ AC./YR.	TOTAL AGE	INTER.1/8" BD.FT./ AC./YR.	TOTAL AGE
150	210	14.7	40	991	90	1289	70
151	212	14.8	40	1006	90	1307	70
152	215	15.0	40	1022	90	1325	70
153	217	15.2	40	1037	90	1343	70
154	220	15.4	40	1052	90	1361	70
155	222	15.5	40	1068	90	1379	70
156	224	15.7	40	1083	90	1397	70
157	227	15.9	40	1098	90	1416	70
158	229	16.0	40	1114	90	1434	70
159	232	16.2	40	1129	90	1452	70
160	234	16.4	40	1134	90	1472	60

6.5

EXHIBIT 6

Forestland Productivity

Lane County Area, Oregon

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			Cu ft/ac	
41C:				
Dixonville	Douglas-fir	109	152	Douglas-fir, Ponderosa pine
	Grand fir	—	—	
	Oregon white oak	—	—	
	Pacific madrone	—	—	
41E:				
Dixonville	Douglas-fir	109	152	Douglas-fir, Ponderosa pine
	Grand fir	—	—	
	Oregon white oak	—	—	
	Pacific madrone	—	—	
43C:				
Dixonville	Douglas-fir	109	152	Douglas-fir, Ponderosa pine
	Grand fir	—	—	
	Oregon white oak	—	—	
	Pacific madrone	—	—	
Philomath	—	—	—	—
Hazelair	—	—	—	—
43E:				
Dixonville	Douglas-fir	109	152	Douglas-fir, Ponderosa pine
	Grand fir	—	—	
	Oregon white oak	—	—	
	Pacific madrone	—	—	
Philomath	—	—	—	—
Hazelair	—	—	—	—
81D:				
McDuff	Bigleaf maple	—	—	Douglas-fir
	Douglas-fir	112	158	
	Red alder	—	—	
	Western hemlock	—	—	
102C:				
Panther	—	—	—	—
107C:				
Philomath	—	—	—	—

Forestland Productivity

Lane County Area, Oregon

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			Cu ft/ac	
108C:				
Philomath	—	—	—	—
113C:				
Ritner	Bigleaf maple	—	—	Douglas-fir, Ponderosa pine
	Douglas-fir	107	149	
	Ponderosa pine	—	—	
113E:				
Ritner	Bigleaf maple	—	—	Douglas-fir, Ponderosa pine
	Douglas-fir	107	149	
	Ponderosa pine	—	—	
113G:				
Ritner	Bigleaf maple	—	—	Douglas-fir, Ponderosa pine
	Douglas-fir	107	149	
	Ponderosa pine	—	—	
125C:				
Steiwer	—	—	—	—

SOIL INTERRRETATIONS RECORD

43E DIXONVILLE-PHILOMATH-HAZELAIR COMPLEX, 12 TO 35 PERCENT SLOPES
DIXONVILLE PART

THE DIXONVILLE SERIES CONSISTS OF WELL DRAINED SOILS FORMED IN FINE TEXTURED COLLUVIAL AND RESIDUAL MATERIALS FROM BASI IGNEOUS ROCK IN THE FOOTHILLS. TYPICALLY, THE SURFACE LAYER IS VERY DARK BROWN SILTY CLAY LOAM ABOUT 14 INCHES THICK. THE SUBSOIL IS DARK BROWN SILTY CLAY AND COBBLY CLAY ABOUT 12 INCHES THICK. THE SUBSTRATUM IS WEATHERED BASIC ROCK. ELEVATIONS ARE 300 TO 1800 FEET. MEAN ANNUAL PRECIP IS 40 TO 60 INCHES. MEAN ANNUAL AIR TEMP IS 52 TO 54 DEGREES. FROST FREE PERIOD IS 165 TO 210 DAYS.

ESTIMATED SOIL PROPERTIES

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT >3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
0-14	SICL	CL	A-6	0-10	90-100	90-100	85-100	75-95	35-40	15-20
14-26	C, CB-C, SIC	CH	A-7	0-30	75-100	70-100	65-100	50-95	50-80	30-50
26	WB									

DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY STEEL	CORROSIVITY CONCRETE
0-14	27-40	1.30-1.50	0.6-2.0	0.18-0.21	5.6-6.5	-	MODERATE	.32	3	-	3-6	MODERATE	MODERATE
14-26	40-60	1.30-1.60	0.06-0.2	0.12-0.17	5.6-6.5	-	HIGH	.24					
26													

FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INIT. (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
NONE			>6.0			-		20-40	SOFT	-		C	-

SANITARY FACILITIES

SEPTIC TANK ABSORPTION FIELDS	SEVERE-DEPTH TO ROCK,PERCS SLOWLY,SLOPE
SEWAGE LAGOON AREAS	SEVERE-DEPTH TO ROCK,SLOPE
SANITARY LANDFILL (TRENCH)	SEVERE-DEPTH TO ROCK,SLOPE,TOO CLAYEY
SANITARY LANDFILL (AREA)	SEVERE-DEPTH TO ROCK,SLOPE
DAILY COVER FOR LANDFILL	POOR-DEPTH TO ROCK,TOO CLAYEY,HARD TO PACK

CONSTRUCTION MATERIAL

ROADFILL	POOR-DEPTH TO ROCK,LOW STRENGTH
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	POOR-LARGE STONES,SLOPE

WATER MANAGEMENT

POND RESERVOIR AREA	SEVERE-SLOPE
EMBANKMENTS DIKES AND LEVEES	SEVERE-HARD TO PACK
EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER
DRAINAGE	DEEP TO WATER
IRRIGATION	LARGE STONES,PERCS SLOWLY,DEPTH TO ROCK
TERRACES AND DIVERSIONS	SLOPE,LARGE STONES,DEPTH TO ROCK
GRASSED WATERWAYS	LARGE STONES,SLOPE,DEPTH TO ROCK

BUILDING SITE DEVELOPMENT

SHALLOW EXCAVATIONS	SEVERE-SLOPE
DWELLINGS WITHOUT BASEMENTS	SEVERE-SHRINK-SWELL,SLOPE
DWELLINGS WITH BASEMENTS	SEVERE-SLOPE,SHRINK-SWELL
SMALL COMMERCIAL BUILDINGS	SEVERE-SHRINK-SWELL,SLOPE
LOCAL ROADS AND STREETS	SEVERE-LOW STRENGTH,SLOPE,SHRINK-SWELL
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	SEVERE-SLOPE

RECREATIONAL DEVELOPMENT

CAMP AREAS	SEVERE-SLOPE	PLAYGROUNDS	SEVERE-SLOPE
PICNIC AREAS	SEVERE-SLOPE	PATHS AND TRAILS	MODERATE-SLOPE

CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

	CAPABILITY	FILBERTS (TONS)		PASTURE (AUM)				BARLEY (BU)		WHEAT, WINTER (BU)		CORN, SWEET (TONS)			
	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	4E		0.5		6				30		40					

WOODLAND SUITABILITY

	ORD SYM	MANAGEMENT PROBLEMS: EROS'N HAZARD	EQUIP. LIMIT	SEEDL. MORT'Y	WINDTH HAZARD	PLANT COMPET	POTENTIAL PRODUCTIVITY: COMMON TREES	SITE INDX	PROD CLAS	TREES TO PLANT
	8C	SLIGHT	MODER.	MODER.	SLIGHT	SEVERE	DOUGLAS-FIR PACIFIC MADRONE OREGON WHITE OAK GRAND FIR	120	8	DOUGLAS-FIR PONDEROSA PINE

WINDBREAKS

SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
NONE							

WILDLIFE HABITAT SUITABILITY

	POTENTIAL FOR HABITAT ELEMENTS									POTENTIAL AS HABITAT FOR:			
	GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLD WILDLF	WOODLD WILDLF	WETLAND WILDLF	RANGELD WILDLF
	POOR	FAIR	FAIR	GOOD	GOOD	GOOD	V. POOR	V. POOR	FAIR	GOOD	V. POOR	-

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT)				
POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS NORMAL YEARS UNFAVORABLE YEARS						

FOOTNOTES

• SITE INDEX IS A SUMMARY OF 5 OR MORE MEASUREMENTS ON THIS SOIL.

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SOIL INTERPRETATIONS RECORD

43E DIXONVILLE-PHILOMATH-HAZELAIR COMPLEX, 12 TO 35 PERCENT SLOPES
PHILOMATH PART

THE PHILOMATH SERIES CONSISTS OF SHALLOW, WELL DRAINED SOILS FORMED IN FINE TEXTURED COLLUVIAL AND RESIDUAL MATERIALS FROM BASALT. THEY OCCUR IN THE FOOTHILLS. TYPICALLY THE SURFACE LAYER IS VERY DARK BROWN COBBLY SILTY CLAY ABOUT 6 INCHE THICK. THE SUBSOIL IS VERY DARK BROWN COBBLY SILTY CLAY ABOUT 8 INCHES THICK. WEATHERED BASALT BEDROCK IS AT A DEPTH OF 14 INCHES. ELEVATION IS 300 TO 1800 FEET. MEAN ANNUAL PRECIP IS 40 TO 60 INCHES. MEAN ANNUAL AIR TEMP IS 52 TO 54 DEGREES. FROST FREE PERIOD IS 165 TO 210 DAYS.

ESTIMATED SOIL PROPERTIES

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT >3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
0-6	CB-SIC	CH	A-7	15-30	85-100	75-90	70-85	60-80	50-60	35-45
6-14	C CB-SIC, CB-C	CH	A-7	0-30	90-100	70-95	60-90	60-85	60-80	40-60
14	MB									

DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	K	T	EROSION FACTORS GROUP	WIND EROD. (PCT)	ORGANIC MATTER (PCT)	CORROSIVITY STEEL	CORROSIVITY CONCRETE
0-6	40-55	1.30-1.40	0.6-2.0	0.14-0.17	5.6-6.5	-	HIGH	.28	1	-	2-4		MODERATE	MODERATE
6-14	40-60	1.30-1.40	0.06-0.2	0.14-0.16	5.6-7.3	-	HIGH	.24						
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FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INIT. (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
NONE			>6.0			-		12-20	SOFT	-		D	-

SANITARY FACILITIES

SEPTIC TANK ABSORPTION FIELDS	SEVERE-DEPTH TO ROCK,SLOPE
SEWAGE LAGOON AREAS	SEVERE-DEPTH TO ROCK,SLOPE
SANITARY LANDFILL (TRENCH)	SEVERE-DEPTH TO ROCK,SLOPE,TOO CLAYEY
SANITARY LANDFILL (AREA)	SEVERE-DEPTH TO ROCK,SLOPE
DAILY COVER FOR LANDFILL	POOR-DEPTH TO ROCK,TOO CLAYEY,HARD TO PACK

BUILDING SITE DEVELOPMENT

SHALLOW EXCAVATIONS	SEVERE-DEPTH TO ROCK,SLOPE
DWELLINGS WITHOUT BASEMENTS	SEVERE-SHRINK-SWELL,SLOPE
DWELLINGS WITH BASEMENTS	SEVERE-DEPTH TO ROCK,SLOPE,SHRINK-SWELL
SMALL COMMERCIAL BUILDINGS	SEVERE-SHRINK-SWELL,SLOPE
LOCAL ROADS AND STREETS	SEVERE-LOW STRENGTH,SLOPE,SHRINK-SWELL
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	SEVERE-SLOPE,DEPTH TO ROCK,TOO CLAYEY

CONSTRUCTION MATERIAL

ROADFILL	POOR-DEPTH TO ROCK,LOW STRENGTH
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	POOR-DEPTH TO ROCK,TOO CLAYEY,LARGE STONES

WATER MANAGEMENT

POND RESERVOIR AREA	SEVERE-DEPTH TO ROCK,SLOPE
EMBANKMENTS DIKES AND LEVEES	SEVERE-HARD TO PACK
EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER
DRAINAGE	DEEP TO WATER
IRRIGATION	LARGE STONES,SLOW INTAKE,PERCS SLOWLY
TERRACES AND DIVERSIONS	SLOPE,LARGE STONES,DEPTH TO ROCK
GRASSED WATERWAYS	LARGE STONES,SLOPE,DEPTH TO ROCK

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43E DIXONVILLE-PHILOMATH-HAZELAIR COMPLEX, 12 TO 35 PERCENT SLOPES
HAZELAIR PART

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RECREATIONAL DEVELOPMENT

CAMP AREAS	SEVERE-SLOPE,WETNESS	PLAYGROUNDS	SEVERE-SLOPE,WETNESS
PICNIC AREAS	SEVERE-SLOPE	PATHS AND TRAILS	MODERATE-WETNESS,SLOPE

CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

	CAPABILITY	WHEAT, WINTER (BU)		BARLEY (BU)		BLACKBERRIES (TONS)		GRASS HAY (TONS)		PASTURE (AUM)					
	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	6E										6					

WOODLAND SUITABILITY

ORD SYM	MANAGEMENT PROBLEMS: EROS'N HAZARD	EQUIP. LIMIT	SEEDL MORT'Y	WINDTH HAZARD	PLANT COMPET	POTENTIAL PRODUCTIVITY: COMMON TREES	SITE INDX	PROD CLAS	TREES TO PLANT
						NONE			

WINDBREAKS

SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
NONE							

WILDLIFE HABITAT SUITABILITY

POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLD WILDLF	WOODLD WILDLF	WETLAND WILDLF	RANGELD WILDLF
POOR	FAIR	GOOD	GOOD	FAIR	GOOD	V. POOR	V. POOR	FAIR	GOOD	V. POOR	-

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT)				
COMMON SNOWBERRY	SYAL					
RUSH	JUNCU					
OTHER ANNUAL GRASSES	AAGG					
OTHER ANNUAL FORBS	AAFF					
ROSE	ROSA+					
POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS						
NORMAL YEARS						
UNFAVORABLE YEARS						

FOOTNOTES

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