THE WOODLAND WORKBOOK

REFORESTATION

EC 1196 • Reprinted November 1999 $2.00

Selecting and Buying Quality Seedlings

R.E. Duddles and C.G. Landgren

Contents

Ralph E. Duddles, Extension forestry agent, Coos and Curry counties; and Chal G. Landgren, area Extension forestry agent, Columbia and Washington counties; both of Oregon State University.

Successful reforestation of your harvested timberland is more than just planting a few trees and hoping they will grow. To ensure success, you first must answer several key questions:

- What species should I plant?
- What kind of seedlings should I select?
- How can I tell whether their quality is good ?
- From which nursery should I order?
- How much lead time do I need?
- When is the best time to plant?

We will answer these questions in this publication, which is divided into three parts. Part 1 helps you select trees that are adapted to grow well long-term under your local conditions. Part 2 helps you choose nursery stock that has a high probability of surviving and showing good initial growth. Part 3 provides tips on selecting a nursery, ordering, and purchasing.

Part 1. Seed zones and selecting adapted species

Our focus is on selecting trees suitable for long-term timber production. If you have other objectives, such as short-term fiber production or Christmas trees, read publications that relate directly to those subjects.

To determine whether a particular tree species is adapted to grow on your site, identify the species that grew there naturally before the first logging. This can be done by identifying old stumps on the site or nearby areas. If no stumps are present, you may have to rely on historical records or the knowledge of long-term residents. Species guides also are found in soil surveys of your area made by the USDA Natural Resources Conservation Service (formerly, the USDA Soil Conservation Service). Soil surveys indicate site productivity, soil and environmental conditions, and site–species relationships.

OREGON STATE UNIVERSITY
EXTENSION SERVICE

App 3-1

***Table 1.*—Relative performance ratings for various tree species in climatic regions of western Oregon.**

Coast	Tree performance: Level of use[1]	Growth[2]	Shade tolerance[3]	Big game damage[4]	Frost[5]	Drainage[6]	Comments
Douglas-fir	5	5	2	3	2	1	Good on most forest sites with good soil and drainage. Control brush before it overtops seedlings.
Western hemlock	3	5	5	3	3	2	Will tolerate more brush competition than Douglas-fir.
Western redcedar	2	4	4	2	1	4	Good in areas with high water table. Can be browsed heavily.
Grand fir	2	5	3	3	4	4	Good on moist sites.
Sitka spruce	1	5	4	2	5	3	Good only near coast. Spruce tip weevil is a serious pest.
Shore pine	1	1	1	5	5	5	Grows on droughty sand or hardpan sites. Good early growth but slower long-term growth.
Noble fir	1	3	3	4	4	1	For timber planting above 2,000 feet in the Coast Range.
Red alder	1	3	1	3	3	3	Used in riparian and root-rot areas.

Willamette Valley Cascades—west slopes	Level of use[1]	Growth[2]	Shade tolerance[3]	Big game damage[4]	Frost[5]	Drainage[6]	Comments
Douglas-fir	4	5	2	3	2	2	Brush and grass control is important.
Noble fir	2	3	3	4	4	2	Used above 1,500 feet elevation; avoid clay soils.
Grand fir	1	4	3	3	4	3	Good for valley uplands where game damage can be a problem.
Western redcedar	1	3	4	2	1	4	Do not plant on poorly drained clay soils.
Ponderosa pine	1	3	1	5	4	1	Good on sandy soils or clay soils that become droughty in summer.
Western hemlock	1	3	5	3	3	2	Used on north-facing sites.
Cottonwood	1	4	1	3	1	5	Used on river bench alluvial soils.

[1]Level of reforestation use — 5 = planted on more than 90% of the sites; 1 = infrequently planted

[2]Height and volume growth — 5 = superior; 1 = slow/poor

[3]Shade tolerance — 5 = able to grow well with overstory shade; 1 = requires full sunlight

[4]Big game damage — 5 = infrequently browsed by deer or elk; 1 = frequently browsed

[5]Frost resistance — 5 = high resistance to low temperatures; 1 = easily damaged by frost

[6]Drainage — 5 = tolerates poor drainage or some standing water for short periods; 1 = requires well-drained soils

App 3-2

Table 1 divides western Oregon into coastal and Willamette Valley regions.

Table 2 covers southwest Oregon and eastern Oregon. These tables present considerations in selecting species for reforestation in each region. For example, on a coastal site with moist soils and shade from standing trees, you can consider a shade-tolerant species such as western hemlock.

Growing exotic trees

Exotic species are trees that are not native to the local area. It would be ideal to find one that would grow faster and taller than the native species. Most tree species from around the world have been tested in the Northwest, but few have proved successful. One exception is "KMX" pine. It's a hybrid cross between knobcone pine and

***Table 2.*—Relative performance ratings for various native tree species in southwestern and eastern Oregon.**

	Tree performance						
Southwest Oregon	Level of use[1]	Growth[2]	Shade tolerance[3]	Frost[4]	Heat[5]	Drought[6]	Comments
Douglas-fir	4	5	3	3	3	4	Shade cards may be needed on hot, dry sites.
Ponderosa pine	2	5	2	5	4	5	Gopher control is needed in many areas. Porcupines also can cause damage.
White fir (mid to upper Cascades)	2	4	5	4	2	3	Plant above 3,000 feet on moist, well-drained soil
Grand fir (mid to lower coast)	2	4	5	3	2	2	Avoid poorly drained soils.
Incense-cedar	1	2	3	4	5	5	Somewhat tolerant of serpentine soils. Pocket rot can be a problem.
Eastern Oregon	Level of use[1]	Growth[2]	Shade tolerance[3]	Frost[4]	Heat[5]	Drought[6]	Comments
Ponderosa pine	5	4	1	4	5	5	Most widely planted eastside species. Good survival and early growth.
Lodgepole pine	3	4	2	5	5	4	Adaptable to a variety of harsh sites.
Douglas-fir	3	3	3	2	3	4	Risky on south slopes with less than 20 inches annual rainfall.
Grand and white fir	2	3	5	1	2	3	Tolerates some shade in partial-cut situations. Slow growth first 2 years.
Western larch	1	5	1	4	3	3	Excellent juvenile growth.
Engelmann spruce	1	3	4	5	2	2	Planted above 3,500 feet. Good on moist sites.

[1]Level of reforestation use — 5 = planted on more than 90% of the sites; 1 = infrequently planted

[2]Height and volume growth — 5 = superior; 1 = slow/poor

[3]Shade tolerance — 5 = able to grow well with overstory shade; 1 = requires full sunlight

[4]Frost resistance — 5 = high resistance to low temperatures; 1 = easily damaged by frost

[5]Heat resistance — 5 = can stand high temperatures; 1 = sensitive to heat

[6]Drought — 5 = can withstand drought; 1 = dies when drought stressed

App 3-3

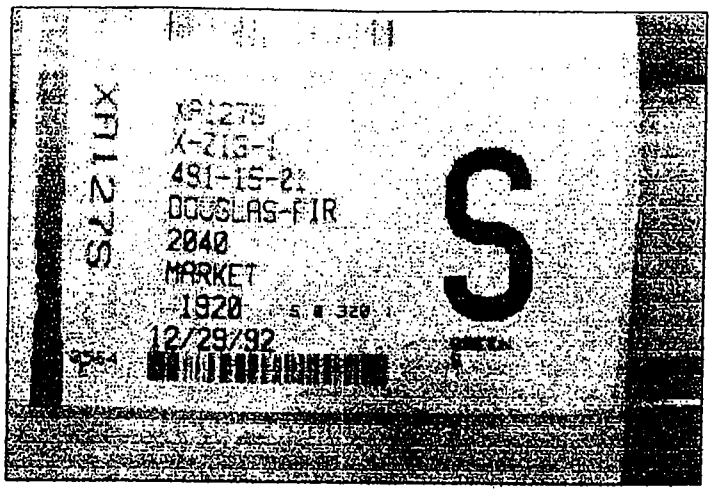

Figure 1.—Tree bag label showing the seedlings' origin.

Monterey pine. KMX is being grown successfully on dry sites in southwestern Oregon.

It may take years to discover problems when testing a new species. An early frost, a prolonged drought, or some other unusual event may destroy the hard work and money you've invested in the plantation. If you're interested in planting an exotic species, carefully check out what's known about its performance in your area. Discuss the idea with your Extension forestry agent and with other foresters.

Seed zones and elevations

Trees are adapted to the environmental conditions within the area from which they originate. For example, trees from lower elevations or more southerly latitudes tend to start growing earlier than trees from higher elevations or more northerly latitudes. This increases their susceptibility to frost damage if they are planted at higher elevations or in frost pockets. Likewise, trees from warmer, drier climates are likely to be more drought resistant. Pacific Northwest climates become warmer and generally drier moving inland from the coast. It's important to remember this if you're moving trees from west to east. Never transplant trees from one side of the Cascades to the other. It's important to plant seedlings grown from seed collected in an area where environmental conditions closely match those in your area. This is especially important in areas such as the Cascades or southwest Oregon where conditions can change dramatically in a short distance.

When ordering trees, you will encounter codes such as "DOUGLAS-FIR 491-15-01" (Figure 1). The code gives the zone—for example, 491—where the seed was collected. Seed zones (Figures 2a and 2b) have been established throughout the region; each has a three-digit number. The zones encompass areas within which growing conditions are similar. Zones often are defined by major geographic features such as river drainages, mountain ranges, and major valleys.

Remember that nursery location is not the important factor—it's the seed collection area that is critical. Elevation is given in 500-foot elevation bands within each seed zone. The "15" indicates the elevation band from which the seed was collected—in this case, between 1,000 to 1,500 feet. Other numbers that may appear on the bags or boxes provide added information.

When you order seedlings, specify that they must be grown from seed collected from the same zone and elevation band as your property. This will ensure you're planting trees adapted to grow well in your area. The seed zone and elevation should always appear on every bag or box. Never accept unidentified seedlings.

If you must indicate a substitute for either seed zone or elevation when ordering, you shouldn't move more than one zone or one elevation band away from your property's zone or elevation. Avoid west-to-east movements in zones because drought adaptation can be affected. A good rule of thumb is that it's safest to move seedlings from north to south and from higher elevation to lower.

The term "genetically improved" planting stock refers to seedlings grown from seed produced in a seed orchard. These seedlings are the result of a long-term genetic selection process. Vigorous parent trees were selected for their superior growth and form. Offspring from these parent trees then were tested in controlled plantings called progeny tests. Once the best growers were identified, grafts or seeds from the parents were placed in an orchard to produce seed of known genetic quality. Genetically improved seedlings are more expensive but make sense. If planted properly and

App 3-4

Agrosilvopastoral Experience in Western Oregon

by Steven H. Sharrow and Richard A. Fletcher

Agroforestry and Sustainable Systems: Symposium Proceedings August 1994[i]

Abstract

Agroforestry research in western Oregon hill lands began as a joint effort of the Agriculture and Forestry faculties at Oregon State University in 1952 and continues today. Silvopastoral agroforestry presents opportunities to sustainably increase land productivity, improve cash flow, and to increase the diversity of plants and animals present on western Oregon hill lands. Agroforestry has yet to become widespread in western Oregon. However, agroforestry in western Oregon is now sufficiently developed that economically, biologically, and socially sound production systems have been designed and implemented by a core of early innovators. Awareness of agroforestry solutions to agricultural and silvicultural problems is slowly growing among local land owners. The relatively high profitability and social acceptability of well designed agroforestry systems ensure them a bright future in western Oregon.

Introduction

Agroforestry refers to the joint production of forest and agricultural products by actively managing the interactions between forest and agri-cultural plants and animals. Forestry and agri- culture are the pillars of Oregon's natural resource based economy. Livestock production is the largest single component within Oregon agri- culture. Therefore, it is natural that Oregon agroforestry emphasizes forest/livestock systems. Agroforestry in Oregon takes many diverse forms including grazing of native understory vegetation in young commercial forests and woodlots, tree/livestock production in forested rangelands, and livestock/timber production in thinned, mid-rotation forests. Trees planted into high producing, improved pastures on non-irrigated hill lands in the Willamette Valley and southwestern Oregon is our most intensely managed agroforestry system.

There are approximately 1 million hectares of hill land in western Oregon. Much of this land historically supported oak (Quercus garryana) woodlands and savannahs. Hill lands are seldom used as croplands because of their steep slopes and shallow soils. Livestock grazing is the primary agricultural use. The original inhabitants of western Oregon were active land managers who used fire as a tool to produce grassy meadows and to keep oak

woodlands open and parklike. Fire suppression in the last 150 years has supported a successional process by which hardwood trees have invaded previously open grasslands and formerly open hardwood forests have become closed canopy forests. Conifers, primarily Douglas-fir (Pseudotusga menziesii), grand fir (Abies grandis), and ponderosa pine (Pinus Ponderosa) are now beginning to break through the canopy of hardwoods in many areas. Apparently, many hill lands will support conifer forests, but trees may be difficult to establish, and growth rates are relatively slow compared to other commercial forest sites in western Oregon.

Agroforestry may present opportunities to increase land productivity by producing both trees and pasture/livestock products, to increase the diversity of plants and animals present, and to improve cash flow by combining immediate income from grazing with later income from sale of trees. Because agroforestry systems tend to be self-sustaining, they may require little pesticide or fertilizer use. They are often park-like in appearance, and social acceptability is higher than traditional forest plantations. Social acceptability is becoming a significant issue because many hill lands are near urban centers, so land use must be especially sensitive to environmental quality issues including environmental contamination, destruction of native plant or animal habitat, and visual appeal.

Agroforestry research in western Oregon hill lands began as a joint effort of Agricultural, Forestry , and Agricultural Extension faculty at Oregon State University in 1952 (Hall et al. 1959) and continues today. To date, five experimental agroforests have been established and over a dozen privately owned commercial agroforests are in operation. We will attempt to synthesize the resulting 40 years of experience and to describe current agroforestry design principles for trees in pastures in this paper.

Hill Land Agroforest Development

Many southwestern Oregon hill lands were converted from oak woodland to improved grass/clover pasture during the 1950's through 1970's by clear cutting the hardwood trees and associated shrubs, then planting with a mixture of perennial grasses and subterranean clover. Although Douglas-fir is generally considered to be a relatively shade intolerant tree, it will successfully establish and grow under open canopy oak stands. In the Willamette Valley, survival and growth of Douglas-fir planted under thinned oak stands was equal to that where oaks were clearcut prior to planting (Jaindl and Sharrow 1988).

The option of thinning rather than clear cutting oaks to establish an agroforest offers opportunities to increase both the biodiversity and the social acceptability of young agroforests. Oak woodlands are both aesthetically pleasing and provide important habitat for native plants and animals. The potential to jointly grow oaks, Douglas-fir, and pasture in hill land agroforestry systems may prove especially useful in designing productive, biodiverse, socially acceptable land use systems for the urban fringe.

The price of timber has risen dramatically in western Oregon during the early 1990's, with trees that formerly sold for $200-300 per thousand Scribner board feet (MBF) now bringing $700-800/MBF. Landowners who would like to reap this potential windfall may be hampered by the long crop cycle of traditional forestry. The rotation length of a Douglas-fir forest is commonly 50-70 years in western Oregon. The initial cost of forest establishment (typically about $1200/ha) must be carried without any income until the first commercial thinning at approximately age 20 years. Since most of the income is generated when mature timber is harvested many years in the future, profits must be discounted for the decreasing buying power of money over time.

Producers may use fast growing trees such as KMX pine to speed up the crop cycle of forests and agroforests. The KMX hybrid pine is a cross between knobcone (Pinus attenuata) and monterey (Pinus radiata) pines. Local experience with KMX is that it grows over twice as fast as Douglas-fir or ponderosa pine on the same sites. This makes possible a 20-25 year timber rotation with KMX.

Agroforestry offers an approach to the cash flow problems of forestry by generating agricultural income during the early years following tree planting (Table 1). In effect, agroforestry offers landowners the steady annual cash flow of agriculture together with the high final payoff from forestry investments. This is the most common reason for our producers to undertake agroforestry. It appears to be a better investment than either agriculture or forestry alone.

Agroforest Establishment

A pasture-based agroforest can be started from a brushfield, pasture, young forest plantation, or under a well thinned older forest. Whatever the origin, careful planning is needed to meet the needs of trees, forage, and livestock.

Moisture competition is generally the most critical factor limiting establishment of young conifers planted into pasture. Many studies (Cleary 1971, Cole and Newton 1986, Gourley 1990) have demonstrated increased survival and growth of conifers by keeping a weed free area within 1 meter of newly planted trees for the first three years after planting. Increased tree growth observed in silvopastoral agroforests compared to traditionally managed forests is often attributed to reduced competition between trees and other ground vegetation for soil moisture (Doescher, et al. 1989, Hedrick and Keniston, 1966, Sharrow 1994).

Trees can be planted either before or after forage establishment. However, field trials (Fletcher et al. 1992, Logan 1986) have proven the practicality of establishing forage first, then spraying out a small area to plant young trees into. These weed free areas can then be maintained easily for the first few years and will provide adequate space for rapid growth of new trees. This scenario involves spring or fall pasture establishment, followed

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GOAL ONE COALITION

39625 Almen Drive
Lebanon, Oregon 97355
Phone: 541-258-6074
Fax: 541-258-6810
goal1@pacifier.com

RECD JUL 23 2004

July 22, 2004

REC'D JUL 23 2004

Lane County Board of Commissioners
125 East 8th Avenue
Eugene, Oregon 97401

RE: PA 02-5838, Ogle marginal lands application, supplemental information

Dear Commissioners:

At the July 14 hearing the Board expressed interest in receiving additional information regarding two issues relevant to the identification of marginal lands under ORS 197.247 (1991 edition): 1) the price data to be used to determine average gross income over the growth cycle, and 2) species constituting "merchantable timber." The purpose of this letter is to provide additional information regarding these two issues.

1. What time frame should be used for calculating average income over the growth cycle?

To designate land as marginal land, ORS 197.247(1)(a) requires a finding that "the proposed marginal land was not managed, during three of the five calendar years preceding January 1, 1983, as part of a . . . forest operation capable of producing an average, over the growth cycle, of $10,000 in annual income."

LUBA has explained that ORS 197.247(1)(a) imposes a two-part inquiry: 1) was the land managed as part of a forest operation during three of the five years from 1978 through 1982?; and 2) is the forest operation in question capable of producing an average of $10,000 in annual gross income over the growth cycle? *DLCD v. Lane County,* 23 Or LUBA 33 (1992) (*Ericsson).*

In *Ericsson,* LUBA cites Lane County's decision, which states, in relevant part:

> "'2. [The applicant's expert] conducted an on-site evaluation to determine the volume of timber located on the Subject Property prior to its partial harvesting in 1988-89. After determining that volume he calculated, *using current timber values*, the amount of revenue that could be generated on a yearly average over the growth cycle of the trees." *Ericsson* at 38 (emphasis added.)

LUBA held:

> "We conclude the challenged decision correctly applies ORS 197.247(1)(a), and determines that the property is not capable of producing, if reasonably managed, an average annual gross income of $10,000 over the growth cycle of the trees." *Ericsson* at 39.

Thus LUBA has held that using current timber values correctly applies ORS 197.247(1)(a).

Regarding the "capability" issue, LUBA reasoned that "what occurred on the subject parcel during the 1978-82 time period is not the sole determinant of the "capability" of the subject parcel to produce trees, because the growth cycle of trees may greatly exceed the specified five year period." *Ericsson* at 36.

The same reasoning applies to the pricing issue. What occurred at any specified time during or at the end of the 1978-82 period is not the sole determinant. ORS 197.247 imposes no requirement to use 1983 timber prices, and there is no logical reason to do so.

Attached is a summary of log prices over the period 1983-2004 for two species, Douglas-fir and ponderosa pine, for a selected grade (2S). As can be seen, log prices fluctuate substantially. Prices were low during the 1983-87 period; rose to a peak during the 1993-96 period; then settled to their current plateau at more than double the 1983-87 level. See Exhibit 1.

It would be unreasonable to use 1983 pricing to designate land as marginal land when that pricing is dramatically lower than historical or current levels.

2. Does "merchantable timber" include species other than Douglas-fir?

ORS 197.247(1)(C) requires that, west of the summit of the Cascades, marginal land not be capable of producing 85 cf/ac/yr of "merchantable timber."

In addition to ORS 197.247, the phrase "merchantable timber" also appears in ORS 215.263, which governs land divisions in EFU zones; and ORS 215.284, which governs nonfarm dwellings in EFU zones. In addition, OAR 660 Division 33, which governs agricultural land, refers to "merchantable tree species." The issue of which forest tree species constitute "merchantable timber" or "merchantable tree species" has not been directly addressed in the case law that has developed in any of these contexts.

Goal 4 protects "forestland." It is capability or potential for production, measured as cf/ac/yr of commercial tree species, that is at issue in determining a property's suitability for commercial forest uses. *Potts v. Clackamas County,* 42 Or LUBA 1 (2002). The proposed marginal land in this case is forest land protected by Goal 4.

OAR 660-006-0003(1) provides:

> "OAR Chapter 660, Division 006 applies to all forest lands as defined by Goal 4."

OAR 660-006-0010 provides, in relevant part:

> "Governing bodies shall include an inventory of 'forest lands' as defined by Goal 4[.] * * * If site information is not available then an equivalent method of determining forest site suitability must be used."

OAR 660-006-0005(2) provides:

> "'Cubic Foot Per Acre' means the average annual increase in cubic foot volume of wood fiber per acre for fully stocked stands at the culmination of mean annual increment as reported by the USDA Natural Resources Conservation Service (NRCS). Where NRCS data *are not available or are shown to be inaccurate*, an alternative method for determining productivity may be used. *An alternative method must provide equivalent data and be approved by the Department of Forestry.*" (Emphasis added.)

Thus in inventorying its forest lands, the county must determine forest site suitability by using NRCS or equivalent data approved by ODF. If such information indicates that the subject lands are not capable of producing 85 cf/ac/yr of commercial tree species, a finding could be made that the lands are not capable of producing 85 cf/ac/yr of "merchantable timber" and can therefore be designated "marginal land."

Thus, for purposes of ORS 197.247(1)(C), "merchantable timber" is equivalent to "commercial tree species."

The Court of Appeals has explained that the term "commercial tree species" includes species other than and in addition to Douglas-fir. *Carlson v. Benton County*, 154 Or App 62, 961 P2d 248 (1998). Similarly in the context of marginal lands, limiting the inquiry to Douglas-fir would be contrary to what the statute plainly says.

Attached is a summary of log prices over the period 1983-2004 for two species, Douglas-fir and ponderosa pine, for a selected grade (2S). It is evident that, for an equivalent grade, ponderosa pine historically has and is currently receiving a substantial premium of approximately 50% over Douglas-fir. Ponderosa pine is therefore obviously "merchantable timber."

An argument has been made that the cost of hauling ponderosa pine to mills precludes managing for that species. Historically, ponderosa pine was widespread throughout the Willamette Valley. Those early stands were logged and not replanted, although there has been sufficient supply such that local mills have bought ponderosa pine in the recent past. Over the last decades, widespread replanting of ponderosa pine has occurred. As those stands reach maturity, the local supply of and demand for ponderosa pine can be expected to increase. See App. 2-1 of Goal One letter dated July 14, 2004.

CONCLUSION

1. ORS 197.247(1)(a) is correctly applied by using current timber values.

2. "Merchantable timber" is equivalent to "commercial tree species" and includes species other than and in addition to Douglas-fir.

The Coalition requests notice and a copy of any decision in this matter.

Respectfully submitted,

Jim Just
Executive Director

LOG PRICES 1983-2004[1]

Douglas Fir, grade 2S, 1st Quarter, Region 1 (Northwest Oregon & Willamette)

83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04
258	255	245	250	240	295	360	490	365	490	825	740	705	710	690	590	610	660	535	545	550	605

Ponderosa Pine, Grade 2S, 1st Quarter, Region 4 (Grants Pass Unit)

83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04
400	450	425	530	265	565	360	505	800	990	1350	1250	1215	1065	950	950	950	950	900	900	840	885

[1] Source: ODF Timber Sales, Log Price & Scaling Information, delivered to a mill, "pond value."
http://www.odf.state.or.us/divisions/management/asset_management/LOGPPAGE.asp

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WETLAND LAND USE NOTIFICATION FORM

(this form is to be completed only by planning department staff for mapped wetlands)

DIVISION OF STATE LANDS WETLANDS PROGRAM
775 Summer Street NE, Suite 100, Salem, OR 97301-1279 (503) 378-3805

DIVISION OF STATE LANDS RECEIVED
2004 JUN 25 P 1:26

1. County: Lane
   City:
   Responsible Jurisdiction: ☐ City ☑ County
   Local Case File No: PA 02-5838
   DSL File No.: WN 2004-0211 (JK)
   proj.# 42307

2. APPLICANT: Mark & Cindi Childs (name)
   3101 Timberline Dr. (mailing address)
   Eugene OR 97405 (city, state, zip)
   (541) (phone)

   LANDOWNER: same (name)
   (mailing address)
   (city, state, zip)
   ( ) (phone)

3. LOCATION
   T 18 R 04 S 11 ¼ Tax Lot(s) 303 & 304 (73 ac. out of 113.7 total ac.)
   Address (street/city) 3101 Timberline Dr.
   NWI quad map name Eugene West 4 **(attach copy with site indicated)**
   Attached: ☑ LWI/NWI Map ☑ Parcel Map ☐ Site Plan ☑ Other Zoning Map

4. SITE INFORMATION
   LWI/NWI Wetland Classification Codes(s) R4SBC
   Adjacent Waterway (if any) – In Flood Plain? ☐ Yes ☐ No
   Current Land Use Exclusive Farm Use Zoning E-40/RCP

5. PROPOSED ACTIVITY
   - ☐ site plan approval
   - ☐ grading permit
   - ☐ conditional use permit
   - ☐ subdivision
   - ☐ planned unit development
   - ☐ building permit (new structures)
   - ☑ Other
   Project Description Propose to amend the Rural Comprehensive Plan from an Agricultural land designation to Marginal Land
   Completed by/Contact Sharon Joiner Date 6-23-04
   Address LMD 125 E 8th Av Phone (541) 682-3108
   Eugene, OR 97401

DSL RESPONSE *

- ☐ A removal-fill permit is required from the Division of State Lands
- ☐ A removal-fill permit will be required when the development project proceeds
- ☐ A removal-fill permit may be required
- ☐ A permit may be required by the Corps of Engineers (503-808-4373)
- ☐ Information needed includes:
  - ☐ A wetland determination/delineation report (Consultants list enclosed)
  - ☐ _____

  } may be needed prior to earthwork

- ☐ State Permit _____ ☐ was issued ☐ has been applied for
- ☒ No removal-fill permit is required for the described project if because: Based on the information provided, no removal or fill is currently proposed.

Comments Based on the information provided, it appears the site may have wetlands/waterways.

☐ On-Site Visit: By _____ Date _____

Response completed by Melinda Wood Date _____

* If the project is changed to involve fill or removal from the wetlands area, a state removal

#4 – 1p.

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Michael E. Farthing
Attorney at Law

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July 28, 2004

Lane County Board of Commissioners
%Jerry Kendall
Land Management Division
Lane County Courthouse/PSB
125 East 8th Avenue
Eugene, OR 97401

Re: Plan Amendment/Zone Change Applications
Agriculture (E-40) to Marginal Lands (ML)
Ogle-Child (PA 02-5838)

Chair Green and Commissioners:

This is the final submittal of new information by the Applicants for the above referenced applications. Enclosed is a supplemental response prepared by the Applicant's forester, Marc Setchko, which responds to new (and old) allegations and arguments fact that were submitted in the July 14, 2004 letter from the Goal One Coalition and directed at the timber productivity of the Subject Property.

With the exception of new productivity tables regarding the Subject Property's potential for growing Ponderosa pine, most of Mr. Setchko's information is further explanation and support for findings and conclusions he has previously provided regarding the site's timber growing capacity. For example, on page 1 of the enclosed statement, Mr. Setchko provides great details as to what KMX is and why there is no market for it. Similarly, Mr. Setchko repeats his review of tree species other than Douglas fir with regard to their growth rate and suitability for this site.

After reviewing, one more time, why Douglas fir is the most merchantable of the tree species that can be grown on the site, beginning in the middle of page 2 of the attached statement, Mr. Setchko provides a detailed description of "Valley Ponderosa pine" and how it is different from Eastern Oregon Ponderosa pine. He then describes the results of his analysis of the Subject Property's growth and productivity capabilities for Ponderosa pine growth in the form of projected tables for both tax lots (303 and 304) which comprise the Subject Property. Mr. Setchko is quick to note that he used tables based on growth of Eastern Oregon Ponderosa pine which is not applicable to pine grown in the Willamette Valley. Also, his estimate of growth potential might be inflated because it does not account for the dry conditions on the Subject Property.

#5 – 1/pp.

Mr. Setchko concludes his statement with a comprehensive response to Mr. Just's arguments and assertions of fact that are primarily a rehash of previous allegations. Most of Mr. Just's assertions are not based on facts or supported by expert opinion. In contrast, Mr. Setchko has conducted a detailed analysis of the Subject Property's ability to grow a variety of hardwood and conifer species. Mr. Setchko's primary conclusion regarding the Subject Property timber productivity capability is this:

> Douglas fir is by far the most valuable tree species that can be grown on this site and , among the "merchantable" trees that can be grown, and including Ponderosa pine[1], their growth rate is no greater than and, in most cases, less than that of Douglas fir.

Mr. Just, Goal One and the neighbors have not provided any evidence that refutes or contradicts this conclusion.

We will reserve other comments and arguments for our final rebuttal.

Sincerely,

Michael E. Farthing

MEF/bk

Enclosures

cc: Lane County Board of Commissioners
Brad Ogle
Marc Setchko

[1]Applicants do not concede that Ponderosa pine that is grown in Lane County is "merchantable" as that term is used in ORS 197.247(1)(b)(C). Mr. Setchko testified there is no present mill that purchases pines in the area.

Marc E. Setchko
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Phone: (541) 344-0473
FAX: (541) 344-7791

July 26, 2004

Lane County Board of Commissioners

RE: Lane County File #PA 02-5838, Ogle; Response to Goal One Coalition Letter dated July 14, 2004

Members of the Board of Commissioners:

In conjunction with my testimony, which I presented on Wednesday afternoon, July 14, 2004, I have enclosed the following written reponse to the Goal One letter written by Jim Just. I have addressed each issue as presented in the letters, most of which I also addressed with my testimony. I am answering these questions as a qualified, Society of American Foresters Certified Professional Forester (#2953), with 27 years of experience including 17 years as a consultant, with Bachelor of Science (Cal Poly, SLO) and Master of Forestry (Oregon State) Degrees.

Responses to questions raised in July 14, 2004, letter from Goal One.

Page 3: Goal One states that "merchantable" species other than Douglas-fir must be considered.

The productivity and income tests must consider all merchantable timber species capable of growing on the site. Douglas-fir was used because it is the highest value merchantable tree species. Other species may be better suited for the site and/or faster growing. Hardwood species include black cottonwood, Oregon ash, Oregon white oak, red alder, bigleaf maple and hybrid poplar. From a merchantable standpoint there is no market for cottonwood, ash and poplar. Oregon white oak is extremely slow growing and worth very little from a commercial standpoint, particularly the small scrub oak, which is worth nothing. Maple does not produce much merchantable wood per acre and red alder will not grow well on this site, due to moisture constraints. Alder grows primarily in the wet coastal areas or down in draws along creeks. On rare occassions a lone alder or two can be found on dry slopes, usually short and stunted. Merchantable conifer species include grand fir, western hemlock, incense and western red cedar. Red cedar and grand fir will not grow well on this site, due to moisture constraints. Hemlock is extremely sensitive to moisture stress and will not do well on this site. Incense cedar is well suited to the site but is very slow growing. All of these species, except for the cedars and alder, are worth considerably less money than Douglas-fir and have approximately the same, or slower growth rates. The cedar species are close in value to the Douglas-fir, but much slower growing. While an alder tree might grow in a spot where there is moisture, the site will not support a stand of alder. Therefore, Douglas-fir was used for the calculations.

Another frequently mentioned conifer species is KMX. While this species may grow faster than Douglas-fir on this site, it is not a merchantable species (see ORS 197.247(1)(b)(C)). KMX is a hybrid cross between knobcone pine and Monterey pine. However, knobcone pine is small and slow growing, it is valuable as a ground cover to shelter more valuable trees after a forest fire. It has no commercial value. Monterey pine is a taller tree used as ornamentals or for windbreaks. It has no commercial value. The cross between the two is used primarily to grow trees on marginal sites where trees are desired for ornamental, aesthetic or other reasons. There is no current commercial market for this species. There are several reasons KMX is not a merchantable species. First, while it will grow almost anywhere, it will not grow into a straight well-formed tree; it tends to grow into a big bush. It is difficult to harvest, generates a lot of slash and will not produce a straight merchantable log. From a chip/pulp standpoint it cannot be used due to its extremely high resin content; it gums up machinery and its fiber will not blend well with other species. Mills **will not** buy this wood, and they will stop buying from you if it is found mixed into any pulp

loads sent in. A final note on KMX; it is not recognized by the State of Oregon as species which can be used for reforestation.

Hybrid poplar has also been mentioned as a "merchantable" species. There currently is no market for poplar and the best growth rates (including those used by Mr. Just) are in irrigated plantations, not natural stands. In the past there was a market for the chips; that has ceased to exist. The other argument which could be raised is that you can buy "poplar" boards at several locations in the area. The poplar being sold is called yellow poplar and comes from the tulip tree grown in the southeast portion of the country.

The other species which is suited to this particular site, within certain parameters, is ponderosa pine. Ponderosa pine will outcompete Douglas-fir on marginal sites, which this site is. However, studies of valley ponderosa pine, as it is called west of the Cascades, are not complete enough to produce any growth tables or site index tables. Currently there are no site index tables for pines west of the Cascades. The Willamette Valley Ponderosa Pine Association is collecting data, however most of the studies are only 20 years old, with the oldest data collected on some 30 year old trees. The biggest problem is finding an entire stand of ponderosa pine; very few exist at the present time. In twenty more years there will be 40-45 year stands which were planted 15-20 years ago; currently there is not enough data for any growth tables to be published on ponderosa pine stands. This is confirmed by the Willamette Valley Ponderosa Pine Association.

In order to address the issue of ponderosa pine on the site I used the only Site Index tables available. From a forestry standpoint site index tables cannot be accurately used outside of their geographical areas. However, in order to obtain a figure for use in a table I have used an eastern Oregon site index table. For this site specific analysis I bored trees in existing stands. I have also typed out the acres which are actually growing stands and/or scattered ponderosa pine, as well as areas which have such a thin layer of soil over rock that they have never supported trees. These areas have been grassland with scattered shrubs as long as any record keeping has been conducted.

I typed only the areas underlying the Philomath 107C and 108F soils, as these are the areas Mr. Just uses to show the cubic foot growth for ponderosa pine. In Mr. Just's table of growth presented on Page 8 he has used cubic foot growth figures (141 cu.ft./ac./yr.) from the 100-year ponderosa pine tables written by Meyer in 1938 (see Exhibit 1). Therefore, I have used the 100-year site table (see Exhibit 2). Trees bored on site show a 100-year site index of 104. Mr. Just shows a 100-year site index of 120. He obtained this by converting a 50-year site index of 107 (with no documentation as to where the 107 comes from), then converts this to 100-year site index number using the Douglas-fir conversion table exhibit from my original analysis. This cannot be done. The table included in my report is for converting a site index from the 100-year McArdle table for Douglas-fir to a site index number on the 50-year King table for Douglas-fir. These tables are for Douglas-fir **only**, they cannot be used for other species. Site Index tables are for specific species in specific geographical areas, developed over years, through an entire growth rotation. This is the problem with valley ponderosa pine, the oldest studies are 30 years old, most are only 20 years old. Site index tables for eastern Oregon ponderosa pine cannot be used in the valley. Eastern Oregon ponderosa pine planted in the valley grows well for 20 to 30 years, then the growth slows down dramatically and the trees do not do well from that point on. The trees in the valley are eastern Oregon pines which adapted to the area and have become their own variety of ponderosa pine, called valley pine. This can be verified by the Willamette Valley Ponderosa Pine Association. Site index figures quoted by Mr. Just for ponderosa pine came from the publication "Establishing & Managing Ponderosa Pine" (Goal One, Exhibit 2). This publication is careful to note that **no studies of volume growth per acre have been done. Currently, large stands of ponderosa are few, but they appear to have volumes simiar to local Douglas-fir stands of similar to local Douglas-fir stands of similarr ages. The exception may be on the very severe (either wet or dry) sites, where volumes per acre will be less.** The site in question is a dry site.

Page 8: Goal One growth tables.

From my site analysis and photo delineation of the soil types in question I have created the following tables, with the knowledge that the eastern Oregon tables are not the correct ones for this area. However, they are the only source available, for at least presenting an idea of the potential growth.

In Tax Lot 303 there are 8.766 acres within the 107C soil type and 4.715 acres within the 108F soil type which are thin soils over rock; in Tax Lot 304 there are 2.575 acres within the 107C soil type and 1.897 acres within the 108F soil type which are thin soils over rock. These areas have not grown trees for as long as records have been kept. I have shown these acres on the bottom of each table. I have also changed the 102C Panther soil number from 50 cu.ft./ac./yr. to 45 cu.ft./ac./yr. since this is the number shown on the SCS tables (see Exhibit 3).

Tax Lot 303	Acres	Growth/Year	Total Growth
81D McDuff clay loam	5.600	158 Cu.Ft./Ac.	884.80 Cu.Ft.
102C Panther silty clay loam	1.747	45 Cu.Ft./Ac.	78.615 Cu.Ft.
107C Philomath silty clay*	9.510	110 Cu.Ft./Ac.	1,046.10 Cu.Ft.
108F Philomath cobbly silty clay*	2.327	110 Cu.Ft./Ac.	255.97 Cu.Ft.
113G Ritner cobbly silty clay loam	6.914	149 Cu.Ft./Ac.	1,030.186 Cu.Ft.
Grassland with exposed rock	13.481	0 Cu.Ft./Ac.	0 Cu.Ft.
Totals	39.579		3,295.671 Cu.Ft.

Average Growth Potential -- 39.579 Acres ÷ 3,295.671 Cu.Ft. = 83.268 Cu.Ft./Ac./Yr.

Tax Lot 304	Acres	Growth/Year	Total Growth
102C Panther silty clay loam	12.936	45 Cu.Ft./Ac.	582.120 Cu.Ft.
107C Philomath silty clay*	10.278	110 Cu.Ft./Ac.	1,130.580 Cu.Ft.
108F Philomath cobbly silty clay*	3.731	110 Cu.Ft./Ac.	410.410 Cu.Ft.
113G Ritner cobbly silty clay loam	2.741	149 Cu.Ft./Ac.	408.409 Cu.Ft.
Grassland with exposed rock	4.472	0 Cu.Ft./Ac.	0 Cu.Ft.
Totals	34.158		2,531.519 Cu.Ft.

Average Growth Potential -- 34.158 Acres ÷ 2,531.519 Cu.Ft. = 74.112 Cu.Ft./Ac./Yr.

*These growth figures are for ponderosa pine for Site Index 104 (see Exhibit 4). All other growth figures are for Douglas-fir.

A portion of the acres delineated as grassland with exposed rock are underneath the two powerlines crossing the property. These areas will never grow trees due to the power companies continually cutting them down to keep their corridors clear. The productivity tables shown below deduct the remaining powerline acreage, which have no trees at the present time and will not have trees in the future.

Tax Lot 303	Acres	Growth/Year	Total Growth
81D McDuff clay loam	5.600	158 Cu.Ft./Ac.	884.80 Cu.Ft.
102C Panther silty clay loam	0.287	45 Cu.Ft./Ac.	12.915 Cu.Ft.
107C Philomath silty clay*	7.915	110 Cu.Ft./Ac.	870.650 Cu.Ft.
108F Philomath cobbly silty clay*	2.327	110 Cu.Ft./Ac.	255.970 Cu.Ft.
113G Ritner cobbly silty clay loam	6.914	149 Cu.Ft./Ac.	1,030.186 Cu.Ft.
Powerline	3.055	0 Cu.Ft./Ac.	0 Cu.Ft.
Grassland with exposed rock	13.481	0 Cu.Ft./Ac.	0 Cu.Ft.
Totals	39.579		3,054.521 Cu.Ft.

Average Growth Potential -- 39.579 Acres ÷ 3,054.521 Cu.Ft. = 77.175 Cu.Ft./Ac./Yr.

Tax Lot 304	Acres	Growth/Year	Total Growth
102C Panther silty clay loam	12.326	45 Cu.Ft./Ac.	554.670 Cu.Ft.
107C Philomath silty clay*	9.329	110 Cu.Ft./Ac.	1,026.190 Cu.Ft.
108F Philomath cobbly silty clay*	2.782	110 Cu.Ft./Ac.	306.020 Cu.Ft.
113G Ritner cobbly silty clay loam	2.741	149 Cu.Ft./Ac.	408.409 Cu.Ft.
Powerline	2.508	0 Cu.Ft./Ac.	0 Cu.Ft.
Grassland with exposed rock	4.472	0 Cu.Ft./Ac.	0 Cu.Ft.
Totals	34.158		2,295.289 Cu.Ft.

Average Growth Potential -- 34.158 Acres ÷ 2,295.289 Cu.Ft. = 67.196 Cu.Ft./Ac./Yr.

*These growth figures are for ponderosa pine for Site Index 104 (see Exhibit 4). All other growth figures are for Douglas-fir.

These tables are presented using the only data available; it remains to be seen if the ponderosa pine can maintain these growth rates over a rotation. Until Willamette Valley stands can be tracked through an entire rotation the true growth rates of pine in the valley will not be known.

All of these tables presented show the subject property produces less than 85 cu. ft./ac./yr. of "merchantable" timber volume. This has been determined by Lane County, and the State of Oregon, to be the measuring parameter for marginal soils.

Clarifications on statements made by Mr. Just of Goal One Coalition in the July 14, 2004 letter.

Page 7: Mr. Just states that poplar plantations supporting 350-500 cubic feet per acre per year are found west of the Cascades. These figures are from irrigated plantations in the Columbia Gorge. He then states that I have dismissed several hardwood species from consideration because "there is not enough moisture on this parcel to support these trees." He summarizes this statement as conclusory. Mr. Just then proceeds to describe the Panther soil as a soil found in areas receiving an average of 45 inches of rain per year. From this information Mr. Just makes the conclusory statement that the Panther soil will support hybrid poplar. Mr. Just further writes that my letter states cedar will not grow on this site and I then contradict myself by saying cedar is found on the site. I stated that **red** cedar will not grow well, due to moisture constraints, and **incense** cedar, which is well suited to dry sites, is scattered throughout the property.

Page 9: Mr. Just states that Department of Forestry records indicate that the Breeden Bros. logged 400,000 board feet. This is the number put on the application for a permit to log; the applicant can fill in any number they chose. The number is rarely verified by the state, in fact it is confidential information that the applicant is not required to give out. It is simply a ballpark figure to give the state an idea of the scope of logging activity. The other statement concerning Derek Jaros logging 175,000 is erroneous; Mr. Jaros never owned the timber or the land and no logging even took place in 1997.

Page 10: Mr. Just states the use of a 50-year growth cycle does not reflect the use of reasonable management practices. I used a 50-year growth cycle after Mr. Just stated that a 60-year growth cycle was inappropriate to use becauses it did not reflect the use of a reasonable management practices. He also stated that a 50-year cycle should be used because it has been determined by Lane County to be the parameter used for the income test.

Page 11: Without getting into a discussion of what year's timber prices should be used for the income test, I must point out the following point concerning ponderosa pine prices quoted by Mr. Just on Page 11 of his letter. He states that 2S ponderosa pine was selling for $1,250 per thousand board feet in 1994 and $850 per thousand board feet today. These prices are for 250-350 year old "yellow belly" old growth pine, primarily from central and eastern Oregon. This wood is hard to find on today's market, as most of it has already been cut. West of the Cascades it is very rare to find this age of ponderosa pine in the Willamette Valley stands. The ponderosa pine equivalent to Douglas-fir 2S is the 4S grade, which has the same grading specs.

I hope this answers all of the questions brought up by Mr. Just of Goal One coalition. I have followed all of the guidelines specified by Lane County to determine if the parcel in question meets the criteria for Marginal Lands. In summary, I find from the specific site conditions present, empirical yield tables, SCS data, Lane County Data and experience with similar lands, that this property is ill suited to the production of timber and use as land for forestry purposes. It is my opinion that this parcel should be classified as marginal land.

Sincerely,

Marc E Settachko

	CMAI FOR PONDEROSA PINE							CMAI FOR LODGEPOLE PINE		
	100 YR. TABLE (PIPO) 600-MEYER							100 YR. TABLE (PICO) 520-ALEXANDER		
				SCRIBNER		INTER.1/8"				
SITE INDEX	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE	BD.FT./ AC./YR.	TOTAL AGE	BD.FT./ AC./YR.	TOTAL AGE	CU.FT./ AC./YR.	CU.M./ HA./YR.	TOTAL AGE
110	122	8.5	40	462	110	626	80	99	6.9	90
111	124	8.7	40	473	110	641	80	100	7.0	90
112	126	8.8	40	484	110	657	80	101	7.1	90
113	128	9.0	40	495	110	672	80	102	7.1	90
114	130	9.1	40	506	110	687	80	103	7.2	90
115	132	9.2	40	517	110	702	80	104	7.3	90
116	134	9.4	40	528	110	717	80	105	7.3	90
117	136	9.5	40	539	110	732	80	106	7.4	90
118	137	9.6	40	550	110	747	80	107	7.5	90
119	139	9.7	40	561	110	762	80	108	7.6	90
* 120	141	9.9	40	572	110	776	70	109	7.6	90
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			

EXHIBIT 1

Appendix B.—*Site index and site class for Douglas-fir, western Oregon, 50-year basis.*

b.h. age (years)	Total height (feet)									
10	16	18	20	22	24	27	29	32	34	37
20	30	35	40	44	49	54	59	63	68	73
30	42	49	56	63	70	76	83	90	97	103
40	53	61	69	78	86	95	103	112	120	129
50	60	70	80	90	100	110	120	130	140	150
Site index	60	70	80	90	100	110	120	130	140	150
Site class	V		IV		III		II		I	
ODR* site class	FG		FF		FE	FD	FC		FB	FA

*Oregon Department of Revenue.

Appendix C.—*Site index and site class for ponderosa pine, 100-year basis.*

Total age (years)	Total height (feet)												
20	6	9	12	16	20	25	30	35	40	45	50	55	60
30	11	15	20	26	32	38	44	51	57	64	70	77	84
40	16	22	28	35	42	49	55	63	70	77	85	93	100
50	21	28	35	43	51	58	65	73	80	89	97	105	113
60	26	34	42	50	58	66	73	81	90	99	107	115	124
70	30	39	47	56	64	73	80	89	98	108	116	125	134
80	34	43	52	61	70	79	88	97	106	116	124	133	143
90	37	47	57	66	75	85	94	104	113	123	132	142	152
100	40	50	60	70	80	90	100	110	120	130	140	150	160
Site index	40	50	60	70	80	90	100	110	120	130	140	150	160
Site class	VI		V		IV	III	II		I				

Appendix D.—*Site index and site class for Sitka spruce and western hemlock, 100-year basis.*

Total age (years)	Total height (feet)							
20	13	17	21	25	30	34	38	43
30	23	30	37	45	52	60	67	75
40	31	41	51	62	72	82	92	103
50	38	51	63	76	88	101	114	126
60	44	58	73	87	102	117	131	146
70	49	64	81	97	114	130	146	162
80	53	70	88	105	123	140	158	176
90	56	75	94	113	132	151	169	188
100	60	80	100	120	140	160	180	200
Site index	60	80	100	120	140	160	180	200
Site class		V		IV	III		II	I

Appendix E.—*Site index and site class for alder, 50-year basis.*

Total age (years)	Total height (feet)						
10	23	27	31	35	39	42	46
20	37	44	50	56	63	69	75
30	47	55	63	71	79	87	95
40	54	63	72	81	91	100	109
50	60	70	80	90	100	110	120
Site index	60	70	80	90	100	110	120
Site class	IV		III		II		I

EXHIBIT 2

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

2-7-90

LANE COUNTY - FOREST SOILS RATINGS

SCS #	SCS Name	(Site Index) Rating	SCS Acreage	Cuft/Ac per yr
004G	Atring-Rock Outcrop Complex, 30-60%	Med 120	1140	86
005	Awbrig sicl	3	9890	est 40
006	Awbrig Urban Land complex	3	350	est 20
008	Bashaw c	3	9650	est 30
009	Bashaw-Urban Land complex	3	350	est 20
010	Beaches	3	1000	
017	Brallier muck, drained	3	1160	
018	Brallier muck, tidal	3	930	
019	Brenner sicl	3	860	
021B	Bullards-Ferrelo loams, 0-7%	Med 144	510	est 80
021C	Bullards-Ferrelo loams, 7-12%	Med 144	1560	est 80
021E	Bullards-Ferrelo loams, 12-30%	Med 144	1210	est 80
021G	Bullards-Ferrelo loams, 30-60%	Med 144	850	est 80
022	Camas gr si, occ flooded	3	6370	est 40
023	Camas-Urban land complex	3	600	est 20
028C	Chehulpum sil, 3-12%	3	1970	est 40
028E	Chehulpum sil, 12-40%	3	440	est 40
033	Conser sicl	3	4200	est 45
034	Courtney gr sicl	3	2920	est 40
038	Dayton, sil, clay sub	3	4280	est 40
042E	Dixonville-Hazelair-Urban Land, 12-35%	Low	640	est 35
043C	Dixonville-Philomath-Hazelair, 3-12%	Med	11480	est 45
043E	Dixonville-Philomath-Hazelair, 12-35%	Med	22990	est 45
044	Dune Land	3	5870	
045C	Dupee sil, 3-20%	Med	20190	est70 *
048	Fluvents, Nearly Level	3	9550	
052B	Hazelair sicl, 2-7%	Low	5680	est 40
052D	Hazelair, 7-20%	Low	41510	est 40
053	Heceta fs	3	2010	est 20
073	Linslaw l	2	5700	est 80
075	Malabon sicl	2	15350	est 65
076	Malabon-Urban Land complex	2	6420	est 50
077B	Marcola cob sicl, 2-7%	Med	690	est 70
085	Natroy sicl	3	15170	est 60
086	Natroy sic	3	2100	est 60
087	Natroy-Urban Land Complex	3	610	est 40
094C	Netarts fs, 3-12%	Med 80	1060	58
094E	Netarts fs, 12-30%	Med 80	420	58
098	Noti l	3	3860	est 30
100	Oxley gr sil	2	2010	est 80
101	Oxley-Urban land complex	2	870	est 60
102C	Panther sicl, 2-12%	3	8400	est 45 *
103C	Panther-Urban Land complex, 2-12%	3	440	est 40
105A	Pengra sil, 1-4%	3	5070	est 45
106A	Pengra-Urban land complex, 1-4%	3	780	est 30
107C	Philomath sic, 3-12%	Low	2280	est 45
108C	Philomath cob sic, 3-12%	Low	2280	est 45
108F	Philomath cob sic, 12-45%	Low	7090	est 45
109F	Philomath-Urban land complex, 12-45%	Low	270	est 20

SITE INDEX	CMAI FOR PONDEROSA PINE 100 YR. TABLE (PIPO) 600-MEYER								CMAI FOR LODGEPOLE PINE 100 YR. TABLE (PICO) 520-ALEXANDER			CMAI FOR WESTERN LARCH 50 YR. TABLE (LAOC) 265-SCHMIDT		
	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
70	55	3.8	50	172	160	232	130		59	4.1	90	101	7.1	70
71	56	3.9	50	177	160	240	130		60	4.2	90	103	7.2	70
72	58	4.1	50	182	160	247	130		61	4.3	90	105	7.3	70
73	59	4.1	50	188	160	255	130		62	4.3	90	107	7.5	70
74	60	4.2	50	193	160	263	130		63	4.4	90	109	7.6	70
75	62	4.3	50	198	160	270	130		64	4.5	90	111	7.8	70
76	63	4.4	50	203	160	278	130		65	4.5	90	113	7.9	70
77	64	4.5	50	209	160	285	130		66	4.6	90	116	8.1	70
78	65	4.5	50	214	160	293	130		67	4.7	90	118	8.3	70
79	67	4.7	50	219	160	300	130		68	4.8	90	120	8.4	70
80	69	4.8	40	225	150	313	110		69	4.8	90	122	8.5	70
81	70	4.9	40	232	150	321	110		70	4.9	90			
82	72	5.0	40	238	150	330	110		71	5.0	90			
83	74	5.2	40	245	150	339	110		72	5.0	90			
84	75	5.2	40	252	150	347	110		73	5.1	90			
85	77	5.4	40	258	150	356	110		74	5.2	90			
86	78	5.5	40	265	150	365	110		75	5.2	90			
87	80	5.6	40	271	150	373	110		76	5.3	90			
88	82	5.7	40	278	150	382	110		77	5.4	90			
89	83	5.8	40	284	150	391	110		78	5.5	90			
90	85	5.9	40	292	130	403	100		79	5.5	90			
91	87	6.1	40	300	130	413	100		80	5.6	90			
92	88	6.2	40	308	130	423	100		81	5.7	90			
93	90	6.3	40	316	130	433	100		82	5.7	90			
94	92	6.4	40	324	130	443	100		83	5.8	90			
95	94	6.6	40	332	130	453	100		84	5.9	90			
96	96	6.7	40	340	130	463	100		85	5.9	90			
97	97	6.8	40	348	130	473	100		86	6.0	90			
98	99	6.9	40	356	130	483	100		87	6.1	90			
99	101	7.1	40	364	130	493	100		88	6.2	90			
100	102	7.1	40	372	120	507	90		89	6.2	90			
101	104	7.3	40	381	120	519	90		90	6.3	90			
102	106	7.4	40	390	120	530	90		91	6.4	90			
103	108	7.6	40	399	120	542	90		92	6.4	90			
104	110	7.7	40	408	120	554	90		93	6.5	90			
105	112	7.8	40	417	120	566	90		94	6.6	90			
106	114	8.0	40	426	120	578	90		95	6.6	90			
107	116	8.1	40	435	120	590	90		96	6.7	90			
108	118	8.3	40	444	120	602	90		97	6.8	90			
109	120	8.4	40	453	120	614	90		98	6.9	90			

EXHIBIT 4

ATTACHMENT DIVIDER

GOAL ONE COALITION

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August 6, 2004

Lane County Board of Commissioners
125 East 8th Avenue
Eugene, Oregon 97401

RE: PA 02-5838, Ogle marginal lands application: response to applicant's supplemental information

Dear Commissioners:

The Goal One Coalition (Coalition) is a nonprofit organization whose mission is to provide assistance and support to Oregonians in matters affecting their communities. The Coalition is appearing in these proceedings at the request of and on behalf of its membership residing in Lane County. Mr. Just is appearing in these proceedings on behalf of the Coalition, LandWatch Lane County, and himself.

The purpose of this letter is to respond to additional information provided by the applicant in a submittal dated July 28, 2004, and in particular that provided in a letter from Marc E. Setchko, Consulting Forester, in a letter dated July 26, 2004. For convenience of reference, the July 26, 2004 Setchko letter will be cited hereafter as "Setchko."

1. Productivity for ponderosa pine

Stechko provides calculations for productivity of the proposed marginal lands for ponderosa pine. Those calculations and the resulting estimates of productivity for ponderosa pine do not meet applicable standards. Soils on the subject lands have been remapped in a manner not supported by any evidence in the record or consistent with administrative rule; the site surveys have not been adequately documented; and an inapplicable site table has been used.

According to LCOG, soils on the proposed marginal land portion of TL 303 are as follows:

102C	Panther silty clay loam, 2-12% slopes	12.936 ac.	37.871%
107C	Philomath silty clay, 3-12% slopes	12.853 ac.	37.629%
108F	Philomath cobbly silty clay, 12-45% slopes	5.628 ac.	16.477%
113G	Rittner cobbly silty clay loam, 30-60% slopes	2.741 ac.	08.023%
		34.158 ac.	100%

#6 – 51 pg.

LCOG reports that the soils on the proposed marginal land portion of TL 304 are as follows:

81D	McDuff clay loam, 3-25% slopes	5.600 ac.	14.149%
102C	Panther silty clay loam, 2-12% slopes	1.747 ac.	04.414%
107C	Philomath silty clay, 3-12% slopes	18.276 ac.	46.176%
108F	Philomath cobbly silty clay, 12-45% slopes	17.792 ac.	17.792%
113E	Ritner cobbly silty clay loam, 12-30% slopes	6.914 ac.	17.469%
		39.579 ac.	100%

Secthko provides the following soils information for TL 303[1]:

102C	Panther silty clay loam, 2-12% slopes	12.936 ac.	37.871%
107C	Philomath silty clay, 3-12% slopes	10.278 ac.	30.090%
108F	Philomath cobbly silty clay, 12-45% slopes	3.731 ac.	10.923%
113G	Rittner cobbly silty clay loam, 30-60% slopes	2.741 ac.	08.023%
Grassland with exposed rock		4.472 ac.	13.092%
		34.158 ac.	100%

Setchko provides the following soils information for TL 304[2]:

81D	McDuff clay loam, 3-25% slopes	5.600 ac.	14.149%
102C	Panther silty clay loam, 2-12% slopes	1.747 ac.	04.414%
107C	Philomath silty clay, 3-12% slopes	9.510 ac.	24.028%
108F	Philomath cobbly silty clay, 12-45% slopes	2.327 ac.	05.879%
113E	Ritner cobbly silty clay loam, 12-30% slopes	6.914 ac.	17.469%
Grassland with exposed rock		13.481 ac.	34.061%
		39.579 ac.	100%

Thus Setchko reclassifies a substantial portion of the NRCS-identified 107 and 108 Philomath units to "Grassland with exposed rock." This is not a soil unit recognized in the NRCS Soil Survey of Lane County Area, Oregon; or in any other NRCS Soil Survey. No maps or any other data are provided to illustrate, describe, delineate, or otherwise support the revised soil mapping. Setchko reports the forest capability of the "Grassland with exposed rock" soil unit as "0 cf/ac/yr."

OAR 660-006-0003(1) provides:

> "OAR Chapter 660, Division 006 applies to all forest lands as defined by Goal 4."

OAR 660-006-0010 provides, in relevant part:

> "Governing bodies shall include an inventory of 'forest lands' as defined by Goal 4[.] * * * If site information is not available then an equivalent method of determining forest site suitability must be used."

[1] Setchko erroneously indicates that this data pertains to TL 304.
[2] Setchko erroneously indicates that this data pertains to TL 303.

OAR 660-006-0005(2) provides:

> "'Cubic Foot Per Acre' means the average annual increase in cubic foot volume of wood fiber per acre for fully stocked stands at the culmination of mean annual increment as reported by the USDA Natural Resources Conservation Service (NRCS). Where NRCS data *are not available or are shown to be inaccurate*, an alternative method for determining productivity may be used. *An alternative method must provide equivalent data and be approved by the Department of Forestry.*" (Emphasis added.)

LUBA has, in the context of a plan amendment and zone change to allow rural residential uses, explained:

> It is capability or potential for production, measured as cf/ac/yr of commercial tree species, that is at issue in determining a property's suitability for commercial forest uses. *Potts v. Clackamas County,* 42 Or LUBA 1 (2002).

LUBA has explained what "equivalent data" means:

> NRCS data are expressed directly in terms of the ultimate legal standard, *i.e.*, cubic feet per acre per year. * * * The rule's [OAR 660-006-0005(2) requirement for "equivalent data" requires that any alternative methodology must be capable of expressing that data as "cubic feet per acre per year," as NRCS does, or as equivalent data." *Carlson v. Benton County,* 37 Or LUBA 897, 910 (2000).

The Oregon Department of Forestry has, in Land Use Planning Notes Number 3, April 1998, set forth the methodology it finds acceptable to provide equivalent data. The Department of Forestry has stated that the methodology it approves to determine the productivity of an area is contained in the *Field instructions for forest surveys in Washington, Oregon, and Northern California. USDA Forest Service, PNE Range and Experiment Station.*[3] That methodology can be summarized as follows:[4]

> 1. Plots must be taken to measure the productivity of each different soil type and aspect on the property.
>
> 2. Selection of site-trees (trees selected to determine site index) is a critical part of accurately determining the productivity of the land. Site-trees must have remained in a dominant or co-dominant position throughout their life. If insufficient dominant trees exist on the property to determine the site index, site-trees may be selected from adjacent properties with the same aspect, elevation, and soil type.
>
> 3. Use the appropriate table to determine site index. For example, King's Douglas-fir table is used for Douglas-fir and grand fir; Barnes western hemlock table is used for western hemlock and Sitka spruce; Meyer's ponderosa pine table is used for ponderosa pine and Jeffrey pine (except in the Willamette Valley).

[3] "Land Use Planning Notes," Number 3, April 1, 1998, p. 4. See Exhibit 1.
[4] ODF's own summary is found in "Land Use Planning Notes," Number 3, April 1, 1998, p. 4-7. See Exhibit 1.

> 4. "If . . . no trees are available for site index calculations, or if the site index cannot be determined accurately from the existing timber in the area, then soil survey methodology will be required to accurately assess the site productivity. To map the area and provide site specific data that is more accurate than the USDA Soil Survey will require the landowner to employ a soil scientist to do a higher intensity soil survey. The qualifications and procedures for conducting such a survey are contained in OAR 603-80-0040(3). This survey must provide detailed information on the soil types represented on the property."[5]

Setchko does not provide any productivity data for the "Grassland with exposed rock" soil type that is equivalent to NRCS data, using methodology accepted by ODF. Setchko concedes that site trees were not measured. Therefore, a more detailed soil survey is required. Mr. Setchko is not a soil scientist certified as a soils classifier by the ARCPACS (A Federation of Certifying Boards in Agronomy, Biology, Earth and Environmental Sciences). Mr. Setchko did not submit a soils report. Mr. Setchko did not describe the methodologies used for the preparation of a soils report. Mr. Setchko did not indicate the level of order of survey used in the field survey, the scale and type of maps used for field investigations, or the number of sample locations and observation points. Mr. Setchko did not provide the date of the field investigation. Mr. Setchko did not describe the methods used for observations (backhoe, auger, shovel etc.) and methods used for documentation (for slope, color, pH etc.). Mr. Setchko did not note any limitations encountered during the field investigation such as soil depth, drainage, slope or inaccessibility. Mr. Setchko did not describe how the level of order of survey used on his investigation differs from that used by NRCS in the original soil survey. Mr. Setchko did not provide an overview of the geology or geologic setting, describing sources of parent material, bedrock and related factors; did not describe the landforms and topography, confirming the relationship of landforms to soil mapping units; did not describe on-site and adjacent hydrology, including surface and subsurface features, intermittent versus perennial, flood plain and floodways and other related information; and did not describe the revised soil mapping units with their range of characteristics, explaining how and why they differ from NRCS soil mapping. Mr. Setchko did not provide a summary of soil characteristic variabilities incorporating significance of preceding weather (above or below average) and crops and natural vegetation present.

Setchko states that the Philomath 107C and 108F soils on the subject properties were "typed." That report has not been reviewed by ODF to confirm that ODF-approved methodology was followed.[6] It is not explained how adequately stocked plots were identified and delineated. It has not been that a sufficient number of appropriate dominant or co-dominant site trees selected and sampled for each plot.[7] No data on plot and tariff trees is included in the record. Therefore evidence in the record does not establish that Setchko accurately measures site productivity.

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[5] "Land Use Planning Notes," Number 3, April 1, 1998, p. 5. See Exhibit 1. *See also* The Woodland Workbook: Forest Measurement, EC 1190, Oregon State University Extension Service, May 2004, Exhibit 3.

[6] See Exhibit 1-4.

[7] Height from 15-20 dominant and co-dominant trees, and age counts on about 10 trees, should be sufficient to determine site index if the area is homogeneous. Additional plots will need to be to be taken to represent different soil types and aspects across the property. See Exhibit 1-5.

Virtually all of the Valley ponderosa pine was harvested in the years following settlement; current plantations result from restocking from remnant stands in a project conducted by the Willamette Valley Ponderosa Pine Association and the Linn County Small Woodlands Association.[8] The earliest replantings are now approaching 30 years in age. Setchko states that there are currently no site index tables for ponderosa pine west of the Cascades. Setchko therefore uses a site index table for eastern Oregon, while acknowledging that "site index tables for eastern Oregon ponderosa pine cannot be used in the valley." OSU researcher Max Bennett has stated that it would be more appropriate to use data compiled from studies in northern California and southwestern Oregon.[9] Setchko concludes without explanation that the productivity of the Philomath units is 110 cf/ac/yr.

In its letter of July 14, 2004 the Coalition produced a table in which the Philomath units were assigned a productivity of 141 cf/ac/yr. Setchko assails that figure as the result of a 50 year site index that was not explained and of calculations that "cannot be done." The 50-year site index of 104 is found in Fletcher, *Establishing and Managing Ponderosa Pine in the Willamette Valley,* EM 8805, Appendix 2-3 of the Coalition's letter of July 14, 2004. Consulting the site tables utilized by Setchko in its Exhibit 2, the 100-year site index would be 150, and the productivity 210 cf/ac/yr.[10]

Setchko has further subtracted land underneath a powerline from consideration, and assigned that land a productivity of 0 cf/ac/yr. The area purported to be impacted by the powerline is not indicated on a map, nor is it shown how the total area was calculated. ORS 197.247(1)(b)(C) requires that the inquiry address whether "the proposed marginal land . . . is not capable . . . of producing eighty-five cubic feet of merchantable timber per acre per year." The presence of powerlines does not affect the capability of the land. Setchko errs in assigning land under the powerlines a cf/ac/yr rating of zero.

Setchko uses a cf/ac/yr rating of 45 for the 102C Panther soil unit. Data provided by ODF states that productivity for Douglas-fir of the 102C Panther soil unit is an estimated 50 cf./ac/yr.[11] Setchko errs in using a rating of 45 rather than 50 for the Panther soil unit.

Setchko apparently challenges the capability of the Panther unit to support hybrid poplar, stating that productivity figures referenced by the Coalition are for irrigated plantations and that statements regarding the Panther unit are conclusory. The Coalition in its letter of July 14 referred to "Hybrid Poplar in the Pacific Northwest," published in the Journal of Forestry, June 2002, p. 28. That article at p. 29 states that hybrid poplar plantations are concentrated on the western side of the Cascades, where ample rainfall supports growth rates of 350 to 500 cf/ac/yr; and on the eastern side of the Cascades in irrigated plantations. Setchko misstates that the 350-500 cf/ac/yr growth rates pertain to irrigated sites east of the Cascades. The Coalition pointed out that the Panther soils are found in areas of ample rainfall, and that the soil units characteristics match those of soils supporting hybrid poplar.

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[8] Mr. Just was treasurer of Linn County Small Woodlands Association from 1996 - 2000.
[9] See Exhibit 2-1.
[10] See Exhibit 2.
[11] See Exhibit 4.

Setchko states that there is currently no market for hybrid poplar or KMX and therefore they do not constitute "merchantable timber." This is incorrect, and applies an incorrect standard. OAR 629-610-0050 addresses species suitable for reforestation. OAR 629-610-0050(1)(c) requires only that "[t]he species must be marketable in the foreseeable future." For forest tree species that may have growth cycles measured in many decades, the foreseeable future could be as long as fifty or a hundred years.

Markets fluctuate; while the market for a particular species may be momentarily weak or nonexistent, conditions change over time. As demand for pulp rises and falls, paper manufacturers may be able to rely on their own plantations, or may begin to purchase chip logs on the open market. For forest tree species, markets are a function of availability. If no pine species are available in a particular area, it is not feasible for mills to set up to utilize such species. As plantations mature and logs become available, it becomes feasible for mills to begin to utilize the resource. Logs that are not suitable for milling into lumber may still be merchantable as firewood.

Hybrid poplar is highly suited for pulp. Pulp logs are currently $25-$35/ton in the Willamette Valley. While not as readily marketable as Douglas-fir, hybrid poplar is also purchased by specialty mills for moldings, cabinets, plywood, engineered wood products and furniture.[12] Hybrid poplar is also suitable as firewood.[13]

Setchko states that KMX is not a merchantable species. Setchko concedes that "it will grow almost anywhere," but states that "it will not grow into a straight well-formed tree . . . and will not produce a straight merchantable log." Setchko is not correct.

Mr. Just operates a tree farm, and has reforested portions with KMX. ODF assisted with reforestation planning, and Mr. Just received cost-share assistance and tax credits for the reforestation. The KMX, planted in 1996 on Hazelair soils not suited for Douglas-fir, are now straight, well-formed trees.[14]

Jim Monroe is another tree farmer who has reforested with KMX, with ODF approval. His planting was done in 1991 in cooperation with OSU. Those trees have thrived where Douglas-fir would not. The trees are now large, straight and well-formed. Survival and growth rates have been extremely satisfactory.[15]

Setchko is incorrect in stating that KMX is not suitable for pulp or lumber. OSU research reports:

> "Tests of the characteristics of KMX showed that it produces high quality pulp and is suitable for studs and dimension lumber. In limited testing, it was second only to western hemlock in pulping characteristics. Tests of the wood showed that it is similar to the other western pines in its strength characteristics. * * * The wood produced . . .

[12] See Exhibit 5; also see Appendix 1 of Coalition letter of July 14, 2004.
[13] The Woodland Workbook: Forest Measurement, EC 1127, OSU Extension Service, June 2003, p. 16. See Exhibit 6.
[14] See Exhibit 7-5.
[15] See Exhibit 7-1 – 7-4.

is similar to that of ponderosa and other pines grown in the southeastern United States. These species have been managed for high quality lumber.

"In New Zealand and Australia, Monterey pine (the timber species most like KMX) is used for paper, and it's pruned and thinned to produce high quality lumber and plywood. There's no reason to expect that KMX would not be suitable for use in fiber or strand boards."[16]

Setchko concludes by stating that is not accepted by ODF as a species which can be used for reforestation. Setchko is not correct. ODF administrative rules allow for reforestation with KMX, or with other non-native species such as hybrid poplar, if a written plan is submitted and approved.[17]

Setchko errs in dismissing without explanation potential productivity for KMX on the subject site.

The Setchko discussion of the use of a 50-year growth cycle does not explain why that cycle was selected. Information provided by earlier Setchko calculations reveal that reasonable management practices would favor the selection of a 60-year cycle because the 60-year cycle results in a substantially greater average income over the growth cycle.

An OSU Extension Service publication states:

"From analysis and long experience, foresters have derived the general rule that when PAI [periodic annual increment] falls below MAI [mean annual increment], the timber stand is 'mature' – that is, it has passed its peak of wood growth production in the

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[16] The Woodland Workbook: Stand Management, Using Knobcone x Monterey Hybrid Pine (KMX in Western Oregon, Extension Circular 1193, January 1993. See Exhibit 8-6.

[17] OAR 629-610-0060 provides:

"Written Plans for the Use of Non-native Tree Species

"(1) When an operation will result in a reforestation requirement, and the landowner intends to plant or seed a tree species not native to the operation area, the landowner shall obtain prior approval from the State Forester of a written plan which describes the tree species and how it will be used to meet the reforestation requirements. Information in the plan shall include:

"(a) The tree species that will be used;

"(b) Evidence that the species is ecologically suited to the planting site;

"(c) Evidence that the species is capable of producing commercial forest products that will be marketable in the foreseeable future; and

"(d) Available research or field test findings which demonstrate the tree species has been successfully used in reforesting sites similar to the operation area.

"(2) Written plans for the use of non-native tree species must be submitted for approval no later than twelve months after tree stocking is reduced and prior to planting. Written plans for the use of non-native tree species shall be approved by the State Forester if a determination is made that the information provided indicates there is a high probability the purpose of the reforestation rules will be achieved.

"(3) For the purpose of this rule, any tree species that the State Forester determines has naturally existed and reproduced in the operation area or on similar sites shall be considered a native species.

biological sense. Thus, the stand might be harvested if growth rate is the overriding factor in the harvest decision."[18]

Research indicates that, for Douglas-fir on a typical site, culmination of mean annual increment, or the growth cycle that would maximize average increase in volume of wood fiber over the growth cycle, would occur at about 80 years. The choice of a 50-year or even a 60-year growth cycle for purposes of estimating average income over the growth cycle is arbitrary, fails to maximize average income over the growth cycle, and therefore does not constitute reasonable management practices.[19]

Testimony from Jesse and Jo Ann Ulloa in a letter dated July 26, 2004 confirms that substantial amounts of western red cedar and ponderosa pine were logged from the subject properties, contradicting the Setchko statement that "red cedar . . . will not grow on this site."

Setchko is incorrect in stating that the prices for ponderosa pine provided in the Coalition's letter dated July 22, 2004 were "for 250-350 year old 'yellow belly' old growth pine, primarily from central and eastern Oregon." The prices quoted were from the Grants Pass Unit, for southwestern Oregon pine, and for ponderosa pine peelers.

CONCLUSION: Evidence in the record demonstrates the portions of both TL 303 and TL 304 proposed to be redesignated marginal land are capable of producing in excess of 85 cf/ac/yr of merchantable timber. Setchko tables asserting the contrary are not based on evidence in the record establishing that the methodology used meets acceptible standards and is accepted by ODF. Setchko has improperly failed to consider the productivity potential of areas of the property asserted to be "grassland with exposed rock" and areas beneath power lines. Setchko has inappropriately used eastern Oregon site tables to calculate the productivity for ponderosa pine. Setchko has inappropriately dismissed potential productivity for hybrid poplar and KMX. Therefore neither area of proposed marginal land can be approved as marginal land.

The Coalition asks that it be sent notice and a copy of any decision in this matter.

Respectfully submitted,

Jim Just
as an individual and as Executive Director, Goal One Coalition

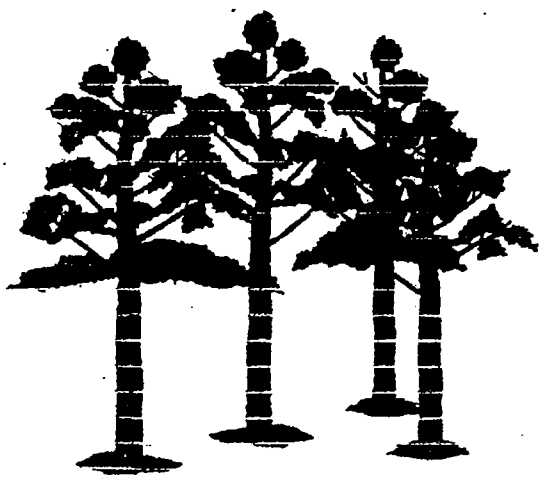
[18] The Woodland Workbook: Forest Measurement, EC 1190, Oregon State University Extension Service, May 2004, Exhibit 3-13.
[19] See Exhibit 3-13.

LAND USE PLANNING NOTES <<<<

NUMBER 3 X APRIL 1998

"STEWARDSHIP IN FORESTRY"

PURPOSE: This technical bulletin has been developed to help landowners and local governments when they must use an alternative to the USDA Soil Survey to determine the productivity of forestland. Under OAR 660-06-005 "where SCS data are not available or are shown to be inaccurate, an alternative method for determining productivity may be used. An alternative method must provide equivalent data and be approved by the Department of Forestry." This paper describes the methodology that the Department approves and provides guidance and other information necessary to use that methodology. We have also included some background information to answer some commonly asked questions about the cubic foot productivity class system.



Why use the average annual cubic foot production in land use decisions?

The Department of Forestry advises using the USDA Cubic Foot Productivity Class[1] system, as opposed to other systems of measure, when making land use planning decisions because it measures the relative productivity of the soil, it is not dependent upon the condition of the forest or the species of trees currently growing on the site, and it is more consistent than other measures.

The cubic foot productivity class system ranks soils based upon the mean annual increment measured in cubic feet at the point in time where the culmination of mean annual increment (maximum average annual growth) occurs. This is the average growth rate of the timber over the life of the stand measured at the peak of that average growth rate. The table below shows the potential timber yields of productivity classes 1 - 5 in cubic feet per acre per year (cuf:/ac/yr).

[1]Field instructions for forest surveys in Washington, Oregon, and Northern California. USDA Forest Service, PNW Range and Experiment Station.

Exhibit 1-1

CUBIC FOOT PRODUCTIVITY CLASSES

CODE	POTENTIAL YIELD-MEAN ANNUAL INCREMENT
1	225 or more cuft/ac/yr
2	165 to 224 cuft/ac/yr
3	120 to 164 cuft/ac/yr
4	85 to 119 cuft/ac/yr
5	50 to 84 cuft/ac/yr

Cubic foot productivity class was developed to compare the relative productivity of different soils. Other measures which might be used to compare different parcels, such as site class or site index, are not consistent between species and authors. Site class is commonly used on the west side to describe the productivity of Douglas-fir forests, but site class is only used for Douglas-fir and not for other species. Site index is calculated as tree height divided by tree age at a base age of 100 or 50. Since on the same area, in the same length of time, different species grow to different heights, site index is not consistent between species.

For example cubic foot productivity class III can produce between 120 and 164 cubic feet per acre per year from a fully stocked natural stand. In the next column is a comparison with several species and site indexes.

CUBIC FOOT PRODUCTIVITY CLASS 3
(120 - 164 cuf:/ac/yr)

Site Index Equal to Productivity Class III

Douglas-fir	
(100 yr Site Index)	130 - 160
Western Hemlock	
(100 yr Site Index)	100 - 110
Ponderosa Pine	
(100 yr Site Index)	120 - 130
White Fir	
(50 yr Site Index)	60 - 70
Engelmann Spruce	
(50 year Site Index)	80 - 90

Another advantage of using cubic foot productivity class is that the ratings are available for most forestland without professional assistance. The published soil surveys contain a rating which can be used by county planners or private landowners to rate productivity and using the information does not require visiting the site or taking measurements.

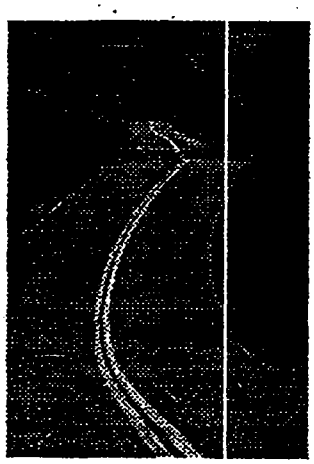


Exhibit 1-2

Why don't we use board feet instead of cubic feet?

Cubic foot volume is a form of measurement commonly used in forestry research and forest management planning. It is a physical measurement based upon the actual volume of wood. On the other hand, board foot volume is based upon a series of rules. The board foot rules were developed to try to determine the amount of lumber which could be sawed (at that time) from a range of different diameter logs. Although its predictive abilities are out of date (1 board foot of log now produces from 1.7 - 2 board feet of lumber), board foot rules continue to be the most common measure used to buy and sell logs in the Northwest. The problem with converting cubic feet to board feet is that the conversion factor is not a constant. Because board foot volume is determined by a rule, one cubic foot of wood from a log with a scaling diameter (small end diameter) of 6 inches contains 3.32 board feet, while one cubic foot of wood from a log with a scaling diameter (small end diameter) of 30 inches contains 6.86 board feet. Therefore as the average diameter of a stand increases in size, the board foot/cubic foot ratio of the stand also increases. To complicate matters further, the length of the logs cut from the tree effects the conversion from cubic feet to board feet. Since trees are tapered and board foot is measured from the small end of the log, cutting the tree into different length logs changes the number of board feet contained in the tree. Because of this difference, the exact number of board feet contained in a stand of timber cannot be determined without knowing how the trees will be bucked into logs.

Because the board feet contained in a stand of timber depends on the average diameter of the stand and the way the trees are bucked into logs, the ratio of board feet to cubic feet is not constant. Comparisons such as soil productivity are much easier to make based upon a constant volume measure such as cubic feet. That is why it is more commonly used in the more technical forestry applications.

General Procedures to Challenge the Site Productivity Listed in the Soil Survey

Before deciding to use an alternative method of measuring the productivity of forestland documentation should be produced showing that an attempt has been made to use the soil survey and either the soil(s) in question have no rating, or reasons exist indicating that the soil survey may be inaccurate. Where either of these two circumstances exist, a soil scientist from the USDA Natural Resource Conservation Service (NRCS, formerly SCS) should be contacted.

In many cases soils that are primarily used for agriculture were not given ratings for forestry. However, this does not mean they are not capable of growing trees. On the contrary, they may be highly productive, and a NRCS soil scientist may be able to provide a rating of that soil's forest capability. An NRCS soil scientist should also be able to advise you about the procedures used to conduct the soil survey and the accuracy of that survey as it relates to the property and soils in question. The advice received may save both the land owner and local official time and money.

Exhibit 1-3

Because the soil survey is not site specific information, The Department of Forestry has agreed to approve methods that would allow a land owner to use site specific information to determine the productivity of the land when applying for a dwelling or other land use decision.

The process should work something like this:

1. The Department of Forestry has approved a methodology for calculating site productivity (the details are described below in this document). When the landowner contacts the county with concerns about the productivity rating of their property, they are provided with information about the required methodology.

2. The landowner must have an independent, knowledgeable person, like a consulting forester, measure the trees on the property and calculate the cubic foot site class using the approved methods. Plots must be taken to measure the productivity of each different soil type and aspect on the property. The consultant must use care when selecting site trees to obtain an accurate measurement, and the consultant's report must provide adequate detail to determine whether the approved methods were followed.

3. The consultant shall provide a copy of the report to the county to use in making land use decisions. If the county has questions about whether the consultant followed the methodology, the Department of Forestry may need to review the report. However, because this is a land use decision, the county must make the final decision to accept or reject the work of the consultant.

Methodology Approved by the Department of Forestry for Calculating Site Productivity

The Department of Forestry does not measure sites for landowners. The landowner needs to have an independent qualified person, such as a consulting forester, take the measurements and calculate the cubic foot site class. The methodology the Department of Forestry approves to determine the productivity of an area is contained in the *Field instructions for forest surveys in Washington, Oregon, and Northern California. USDA Forest Service, PNW Range and Experiment Station.* Equivalent published methodology is more widely available from a Weyerhaeuser research paper, by King[2]. These papers describe how to select site-trees and calculate site index. A second paper, from the US Department of Agriculture[3], uses site index information

[2]King, James E. 1966. Site index curves for Douglas-fir in the Pacific Northwest. Weyerhaeuser Forestry Paper No. 8. Weyerhaeuser Forestry Research Center, Centralia, WA.

[3]USDA. 1986. Culmination of mean annual increment for commercial forest trees of Oregon.

(continued on next page)

Exhibit 1-4

as determined from on-site measurements to reference a set of cubic foot productivity tables. We approve this method because it is based on site specific measurements and it will produce results that are consistent with the Soil Survey.

A summary of the methodology and the necessary tables to calculate site class for the three most common forest types are included below. The methods listed in this paper can be used in combination with other published site index and yield tables if the site is not suited to one of these species. However, the use of other tables or the use of other species to determine site index must be approved by the Department of Forestry on a case by case basis.

Plots must be taken to measure the productivity of each different soil type and aspect on the property. Selection of site-trees (trees selected to determine site index) is a critical part of accurately determining the productivity of the land. To be used, site-trees must have remained in a dominant or co-dominant position throughout their life. If the land has been selectively harvested in the past, most or all of the dominant trees in the stand may have been removed. Basing site index calculations on the remaining trees, grown in lower crown positions, will not accurately measure site productivity. In some cases it may be difficult to find enough site trees on the property to accurately determine productivity. If insufficient dominant trees exist on the property to determine the site index, site-trees may be selected from adjacent properties with the same aspect, elevation, and soil type.

If the parcel is a forest site and no trees are available for site index calculations, or if the site index cannot be determined accurately from the existing timber in the area, then soil survey methodology will be required to accurately assess the site productivity. To map the area and provide site specific data that is more accurate than the USDA Soil Survey will require the landowner to employ a soil scientist to do a higher intensity soil survey. The qualifications and procedures for conducting such a survey are contained in OAR 603-80-0040 (3). This survey must provide detailed information on the soil types represented on the property.

General Rules for Selecting Site Trees

1. If possible, use the species that dominates the area. Height from 15 to 20 dominant and co-dominant trees and age counts on about 10 trees should be sufficient to determine site index if the area is homogeneous. Additional plots will need to be taken to represent different soil types and aspects across the property.

2. You may select site trees of different species as long as they use the same site table.

Technical Note No. 2. USDA, Soil Conservation Service, Portland, OR. (Note: the SCS - Soil Conservation Service is now the NRCS - Natural Resource Conservation Service)

Exhibit 1-5

3. Site index should not vary by more than 20 or 30 between site trees (as indicated on each site table), unless the difference can be explained by actual site variation. Use the site index tables below to compare site measurements.

4. If you select Douglas-fir or grand fir site trees use the site tree selection method for King's Douglas-fir table, outlined below. For other site tree species, use the site tree selection criteria for other species.

Method for Selecting Site Trees for King's Site Index Table
(Use for Douglas-fir and grand fir)

1. Within the plot area, locate an approximately circular area that encompasses 25 trees (the "site index clump") and that is representative of the site being sampled. When there is a choice, favor well-stocked areas over sparse areas. When counting trees, include only Douglas-fir with normally-formed tops; do not include understory trees that are both younger and shorter than the general crown canopy.

2. Of these 25 trees, select the 5 with the largest dbh as site trees.

3. Any site tree with a clear history of suppression should be rejected, and the next largest tree selected if it is suitable. However, you may select a suppressed tree over a shorter, suppression-free tree of the same age.

4. If a 25-tree clump is not available, a smaller clump may be used. You should still limit the site tree subsample to the 1/5 of the trees in the clump with the largest dbh **unless** this gives you less than three site trees.

Method for Selecting Site Trees for Other Site Index Tables

1. Select trees that are or have been free from suppression for their entire lives. A tree that has been suppressed will have closely-spaced annual growth rings on all or part of its increment core.

2. Select dominant trees.

3. Trees less than 50 years old are undesirable if older trees are available. For ponderosa pine, trees 60 to 120 years old are most desirable.

4. Site trees should be evenly distributed across the plot area.

5. Select trees that show no signs of top-out, such as crooks or forks, **unless** these trees are taller than normally-formed trees of the same dbh.

6. If no suitable site trees are available from the property, select dominant trees from a nearby area with the same general aspect, elevation, and soil type. Note the location of the site trees in your report.

Exhibit 1-6