

# Northwest Woodlands

A Publication of the Oregon Small Woodlands, Washington Farm Forestry, Idaho Forest Owners & Montana Forest Owners Associations

## ALTERNATIVE SPECIES SILVICULTURE

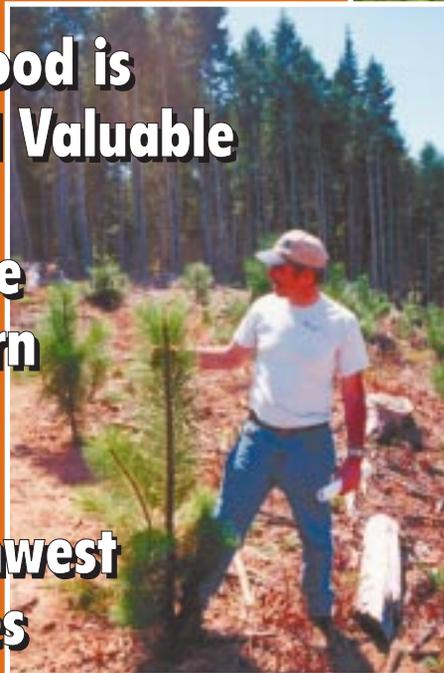
**The Choice of Species Depends Partly on Objectives**

**Coast Redwood is Tolerant and Valuable**

**Return of the King: Western White Pine**

**Inland Northwest Opportunities and Challenges**

**Willamette Valley Ponderosa Pine Making a Comeback**



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**NEXT ISSUE . . .**

**Forestry: For the Love of it!**

**This magazine is a benefit of membership in your family forestry association**

# TABLE OF CONTENTS

Spring 2005

## DEPARTMENTS

**3 PRESIDENTS' MESSAGES**

**6 DOWN ON THE TREE FARM**

**27 LETTERS TO THE EDITOR**

**28 CALENDAR**

**30 TREEMAN TIPS**

### ON THE COVER:



*This aerial photo shows a mixture of Douglas-fir and hemlock, with a few cedars along a stream. Note that alder has been left along the stream, and the dead hardwoods are visible more than 30 feet back from the stream where Douglas-fir and hemlock are growing for future harvest. Photo courtesy of Mike Newton*

*Inset caption: Rick Fletcher with two-year-old planted and fertilized pines at George Fenn's property near Elkton, Ore. Photo courtesy of Howard Dew*

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## FEATURES

**8**

### YOU NAME IT: THE CHOICE OF SPECIES DEPENDS PARTLY ON OBJECTIVES

*The options are plentiful and the risks are many when deciding which species to plant, but the tried and true is usually the best decision.*

BY MIKE NEWTON

**12**

### TOLERANT AND VALUABLE: A GOOD COAST REDWOOD COMBINATION

*Coast redwood...love it or hate it as a Pacific Northwest species. But read on, there are many good reasons to make it part of your silvicultural mix.*

BY STEVE BOWERS

**14**

### RETURN OF THE KING: WESTERN WHITE PINE

*The time may be right to bring back a species with excellent growth, root disease resistance, frost resistance, ability to grow in a wide range of sites and good markets. Is it time for western white pine?*

BY CONSTANCE HARRINGTON

**16**

### OPPORTUNITIES AND CHALLENGES FOR CONVENTIONAL AND EXOTIC TREE SPECIES IN THE INLAND NORTHWEST

*It is easy to say just grow what grows best on your site, but Inland Northwest sites present challenging and complex situations. A diverse approach to forestry may be best.*

BY RONALD L. MAHONEY

**20**

### WILLAMETTE VALLEY PONDEROSA PINE MAKING A COMEBACK

*Fifteen years of effort to bring back a native Willamette Valley species is beginning to pay off.*

BY RICK FLETCHER

**22**

### WESTERN BLACK WALNUT: AN UNDERAPPRECIATED OPPORTUNITY

*Beauty, wildlife habitat and high commercial value...all in one highly prized and underappreciated tree species.*

BY GARY GOBY

## ALSO IN THIS ISSUE . . .

**24 IMPROVING ACCESS TO CERTIFIED WOOD MARKETS**

**26 WORLD FORESTRY CENTER IN THE MIDST OF MANY CHANGES**

# You Name It: The Choice of Species Depends *Partly* on Objectives!

By MIKE NEWTON

**M**y family has a tree farm. Say we just cut some timber, had a big storm or some voracious bug has eaten our fastest-growing trees. How do we decide what to replace the missing trees with? Or, if we have some bare ground, what should we put there if we want it green? The answers have some what-ifs, but there are a few common questions that will help in deciding, and a few simple answers.

In the Inland Empire, figure on white pine, Douglas-fir, larch, ponderosa pine or even grand fir to be viable in the marketplace and decent choices, depending on site conditions. In this area, the moisture regime and market prices are big ticket items. What has grown there for a long time will tell us a lot, including whether an

introduced disease threatens an otherwise valuable species. This is one place where mixtures may work reasonably well if matched to the site.

On the Oregon and Washington westside, a number of species grow extremely well, but the site specificity is less clear and differences in value are huge. Then someone tells us we have to watch out for Swiss needle cast, *Phellinus* root rot, or some such pestilence. Now what do we do? If we live on the dry eastside, everyone tells us that the forests all around are in poor health and are gonna burn. Well, what *are* the safe and attractive species choices?

I have tried a number of westside species and all the natives can be made to grow well in places they have grown before. I would not recommend exotics or exotic seed sources of local species for fear they will lack tolerance of whatever pestilence threatens. Since I will likely not live long enough to see what I establish reach maturity, I have to think about what I hand off to my successors. Eventually, someone who owns this property will be interested in values other than the view. So the timber value is a crucial long-term factor. Offsetting this are the risk factors—

bugs, disease, fire, wind, ice storm, wet ground, market collapse and so on.

Let's discuss some factors that are fairly consistent among species to help you understand what choices you *can* make with reasonable prospects of having a nice stand of something if everything else goes well.

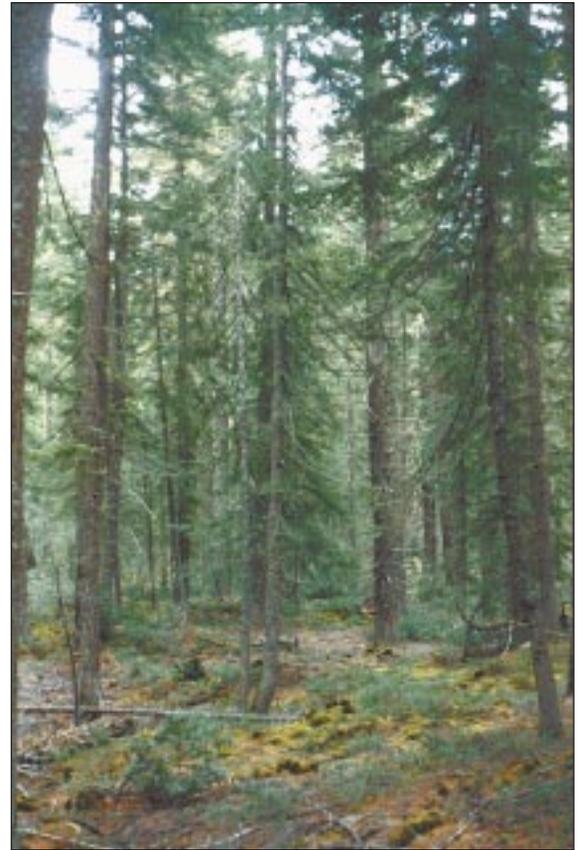


PHOTO COURTESY OF MIKE NEWTON

*Mature Douglas-fir and hemlock, and some true fir, on below-average site at 4,000 feet in the Cascades. At this age, Douglas-fir lives longer than hemlock, but will not replace itself naturally, leading to pure hemlock.*

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First, all commercial species thrive best if they have little competition for the first three years. On harsh sites, such as southwestern Oregon, weeding may be required for three or four years, whether growing Douglas-fir, ponderosa pine or sugar pine. If the weeds are controlled and large-diameter planting stock with big root systems is used, most species will grow on a range of sites if they have occurred there before. Once established, they need space. In generally dry country, somewhat less hardy species can be used on north slopes, and the toughest species (think ponderosa pine) on south slopes. Level ground is often not good for conifers or hardwoods (except alder or poplars) if there is any chance of bogginess.

Lots of folks like to plant a *lot* of trees to ensure survival. The most desirable conifers are not capable of surviving to small sawtimber size at densities of more than 300 trees per acre on the westside, and fewer trees on the eastside. There is no point in planting closer than 12 feet x 12 feet unless one decides not to use chemical weed control, in which case mortality needs to be allowed for in a major way. It is generally observed that investment in a relatively small number of very large, healthy seedlings will bring better returns than buying a large number of trees for the same ground and not tending them. So a well-weeded, low-density plantation will provide better growth and fewer subsequent precommercial thinning costs than other choices of equal per-acre cost.

It is usually preferable to plant whatever species is selected in pure stands. If more than one species is desired, plant them in blocks of a half-acre or more so the one that initially grows taller won't suppress its desirable neighbors. It is especially important to plant hardwoods separate from conifers since their weeding requirements, growth patterns and space requirements are different. It takes great expertise to make them compatible in mixed stands.

Having remarked that timber value



PHOTO COURTESY OF MIKE NEWTON

*Hemlock, left, and Douglas-fir growing compatibly at age four. As long as these species are at least 10 feet apart, they will co-exist satisfactorily. Douglas-fir value is at least twice that of hemlock, but stand growth is about equal up to 50 years on good sites.*

might be important someday, which species will have the greatest value in the long run? One principle of this question is how to figure it. Large alder logs, for instance, are competitive in per-thousand board feet log scale price with Douglas-fir. But if figured by the acre, and deducting logging costs, an acre of good-site Douglas-fir will add a great deal more value per acre per year than alder, perhaps by a factor of five to 10. Not even alder grows really well on sites that are waterlogged for much of the winter (an often misunderstood fact). Unless one *can't* grow Douglas-

fir because of wet ground or disease, it is worthwhile to note that Douglas-fir has the most consistent market value of any species in the Northwest.

One may remark that western red-cedar has the highest log values. When taking into account the slower growth and tasty foliage of cedar, and great loss of scale in taper, the volume *per acre per year* translates into fewer dollars and a high cost of protecting from animals.

Does a westsider always grow Douglas-fir? Maybe yes, probably no. There is some merit to having Douglas-fir grow where it will grow well. It is



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lovely to look at, pleasant to smell and great in the sawmill. As a lawn tree, don't put it upwind from your house. When they blow over houses suffer!

Establishment costs are as low as for any western tree species, and the possibility of obtaining the proper Douglas-fir seed is probably the best of all species. However, there *are* places where it encounters risks, mostly where disease such as Swiss Needle Cast or *Phellinus* are not just present, but overwhelming. Bear in mind that the stumpage value (harvest revenue after logging and hauling costs) per acre of Douglas-fir is likely to be twice as much (or more) than its nearest competitor. But if I were to make a choice in a major needle cast spot, I might well choose a mixture of Douglas-fir and another conifer of almost identical growth potential for the first 30 years. Hemlock is a good grower, meets this criterion and does not succumb to this particular disease. Note here that I

would not veto Douglas-fir altogether because the needle cast is more or less native, and this tree has hosted the disease for centuries. But if the hemlock should pan out as more compatible with local diseases, it will grow a heck of a stand of timber with half a stand of seedlings.

Planting 150 trees of each species per acre will make a great pure stand if either one dies, or alternatively, if one begins to outshine the other, a thinning will release the better species and still yield a profit. If we move a bit further from the coast, this particular disease will probably not justify selection away from the tried and true.

The question of hardwoods comes up frequently. A big alder will bring a nice log price, but the prices are dependent on size. One can grow a sawlog-sized alder on a moist site on the westside in 30 years, but the logs will not be large enough to bring a premium price today. By the time alder produces a butt log

32-feet long with a 12-inch scaling diameter, it will be 40-50 years. In this same time, Douglas-fir will have produced logs of the same value per thousand, but far more thousands per acre. However, alder will grow places that Douglas-fir does not, such as margins of wetlands (cottonwood will too, but markets are now terrible most places).

Remember to answer the questions: Can I log on that wet ground? What are my logging costs going to be with smallish logs and low volume per acre and wettish ground? Get some local advice to help with this decision.

For forest plantings east of the mountains, Douglas-fir is only occasionally ideal in pure stands. Larch is a great grower and is competitive in the market. It doesn't get the same bugs as Douglas-fir. Grand fir is good in mixtures, but it attracts some of the same bugs as Doug-fir. Its price is fairly good, so don't knock it until you have compared prices of second-growth white and ponderosa pines, grand fir and lodgepole. The big pines in Idaho are beautiful, but second-growth logs are not at a premium. The lowly second growth grand fir is a consistent seller in the stud market, and it is likely that it will always sell because there is a lot of it to maintain the market.

On dry eastside sites, nearly all commercial species are susceptible to various defoliators and bark beetles. Managing stands economically depends on having relatively low densities of whatever mixtures one chooses so crowns are always full and vigorous. Mixtures of species of compatible growth habits will work. If one chooses a mix of several species together, then the choice might well be dictated by presence of pests so that no pest nails more than one species. Bugs like the tussock moth or budworm will defoliate Douglas-fir, grand fir and



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# Willamette Valley Ponderosa Pine Making a Comeback

By RICK FLETCHER

The year was 1852 and white settlement of the Willamette Valley was well underway. The town of Monroe, Ore., was just getting its start with a new water-powered sawmill. Records of the mill indicate that it cut ponderosa pine exclusively for several years until the supply ran out.

track a presence of pines for the last 7,000-10,000 years. Although pine pollen is difficult to distinguish between, it is hypothesized that lodgepole pines were the dominant pines until about 7,000 years ago when a major climate shift removed the lodgepole and brought in ponderosa pine. Ponderosas have been prevalent ever since.

(ponderosas) surrounded by grass prairie that confronted early settlers.

If Willamette Valley ponderosa was genetically similar to ponderosa from east of the Cascades, one might not worry a lot about this unclear picture of heritage. A pine race study put in place in 1928 clearly shows that east-side ponderosa sources will not survive long term on the westside.

Concern about the dwindling supply of native Willamette Valley ponderosa pines and the realization that the local source could not be replaced with east-side sources led to the formation of the Willamette Valley Ponderosa Pine Conservation Association in 1996. A group of local foresters, landowners and scientists have been studying the local pines for the past 15 years and recently started propagating local parent sources.

The association seeks to further this work in restoring ponderosa pine to the Willamette Valley through research, education and increased availability of seed from the local race of pines. To date, over 600 native stands have been mapped, and about 150 parents have been grafted into a seed orchard near St. Paul, Ore., which should begin producing seed in the next couple of years. In the meantime, seed collections from existing Willamette Valley wild ponderosa stands have been used to produce seedlings, which now account for more than one million planted each year in the Willamette Valley.

Valley ponderosa pine is currently being planted mostly on very dry or wet sites where Douglas-fir does not do well, but it seems to reach its maximum growth potential on the deep, well-drained farm sites near the Willamette Valley floor. Generally, it is found natively only at elevations below 1,000 feet. Ponderosa pine is commonly associated with oaks on drier sites and is common along rivers and sloughs on some fairly wet sites. Like other conifers, it responds well to



PHOTO COURTESY OF IRENE MCPHERSON

Old-growth ponderosa pine logging operation in Sodaville, Ore., in the central Willamette Valley in 1912.

Other reports and studies done on ponderosa pine in the Willamette Valley paint a similar picture with ponderosa in scattered stands or mixed in with groves of Douglas-fir, ash and oak. Two different studies using pollen count frequency found in deep cores from Willamette Valley bogs

Many people are surprised to find out that ponderosa pine (*Pinus ponderosa*), a common tree east of the Cascade Mountains, is also native to the Willamette Valley in western Oregon. Although no one seems to be quite sure how ponderosa got into the Willamette Valley, the local source is genetically different from that east of the Cascade Mountains.

Undoubtedly there is some connection between indigenous peoples' burning and the distribution of pine in the valley at time of white settlement. Ponderosa pine is very common in other fire-impacted landscapes and is quite tolerant of ground fires, especially when the trees are mature. The frequent ground fires set by native peoples very likely resulted in the widely spaced groves of yellow pines

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PHOTO COURTESY OF RICK FLETCHER

*Bob Mealey in a six-year-old planting of Willamette Valley ponderosa pine on his place near Albany, Ore.*

weeding and fertilization, but it is not tolerant of certain common herbicides, so care needs to be taken in applying chemicals around new plantings.

There is still much to learn about its silviculture, but young plantations seem to be capable of densities similar to its Douglas-fir counterparts. It mixes well with grazing and has been very successful as a component of agroforestry plantings. As with any plant, there are any number of insects and diseases that can cause problems, but the most severe include Ips bark beetle, sequoia pitch moth and western gall rust.

Because pine wood is used for visual products, pruning makes more sense than on structural wood species like Douglas-fir. OSU Wood Products Laboratory tests on the pine found it to be of good quality, but both heavier and faster growing than its eastside cousin, which is an unexpected combination.

One current challenge is where to market ponderosa pine logs. With little current supply available, no mills in the area cut ponderosa, so landowners must ship their logs to the eastside or to southern Oregon. As the millions of currently planted trees come on line in 30-40 years, this new raw material

should stimulate a better market.

If you would like more information about the reestablishment of Willamette Valley ponderosa pine, the Willamette Valley Ponderosa Pine Conservation Association or for a copy of the recently completed publication, *Establishing and Managing Ponderosa Pine in the Willamette Valley*, contact Bob McNitt at 503-769-2520 or visit [www.western-forestry.org/wvppca/](http://www.western-forestry.org/wvppca/). The associa-

tion's work will be complete when landowners can readily purchase native planting stock, and research-based information exists about how to plant and grow this tree. ■

**RICK FLETCHER** is an Oregon State University Extension forester for Benton County. Located in Corvallis, he can be reached at 541-766-3554 or [rick.fletcher@oregonstate.edu](mailto:rick.fletcher@oregonstate.edu).

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