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

NEXT ISSUE . . .
Forestry: For the Love of it!

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

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

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

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

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

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 . . .

3 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.
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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You Name It: The Choice of Species Depends Partly on Objectives!

By MIKE NEWTON

My 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. Offset 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.
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 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
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 possi-
bility 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 over-
whelming. 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 com-
petitor. 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 dis-
ease 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 thinn-
ning 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
elder 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 pro-
duced logs of the same value per thou-
sand, 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 mar-
kets 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 occa-
sionally 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 mix-
tures, 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 sec-
ond 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 com-
mercial species are susceptible to vari-
ous 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 choos-
es 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
other short-needled conifers, so having dense stands of these mixtures risks losing everything. If a bug population erupts, as they will periodically when there are lots of hosts, it’s less likely to prosper if only a fraction of a stand is tasty. Contrarily, if one species becomes bug bait, one can salvage it and still have two thirds of a stand of healthy trees that has just been released. Westside forests are far less susceptible to such stand-killing defoliators or bark beetles, but it does occasionally happen. However, it is so rare that it is hardly worth planning for.

In short, wherever you are, there are one or more species that are dominant in the marketplace that are stable, low-risk species. At the moment, these species are relatively few in number, and there are many who advocate trying something else. If the something else is compatible with the locally preferred species, then mixtures are worth a try. There are very few situations where a number two species should be used as a primary crop species unless there is evidence that it has some special value in the foreseeable future. Interesting exceptions can occur.

Western redcedar and incense cedar have some rot-resistant properties that may be of great value when bans on wood preserving products occur. Several such products are being looked at doubtfully because of their arsenic and other metal constituents, yet there is always a need for rot-resistant lumber.

Some sites are simply too harsh for commercial conifer timber production. Establishment of trees for firewood may be feasible in such places.

Madrone, bigleaf maple, Oregon ash and black oak are adaptable to a variety of sites ranging from waterlogged (ash) to rock outcrops (madrone). All are superb fuel and each has its unique attractiveness. All thrive under widely spaced stands, meaning low establishment costs. All need weeding.

In general, go with the tried and true. We family forest owners are mostly not scientists and can expect to encounter risks if we go much beyond traditional culture. For small growers, risk is a big thing. I do not recommend choices that invite bugs or exotic diseases, or any exotic tree species except for ornamentals. And remember, a tree that is worth a lot in the sawmill is also beautiful!

Mike Newton is professor emeritus of Forest Ecology and Silviculture at Oregon State University, where he has been full-time leader in reforestation, vegetation management and long-term silviculture since 1960. His family tree farm is over 300 acres in the Oregon Coast Range, all high-site Douglas-fir ground that was mostly brushland when he bought it between 1961 and 1978. He can be reached at 541-737-6076 or mike.newton@oregonstate.edu.
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.

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 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.

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 (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
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/. The association’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.

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