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The Stand Management Cooperative: A Source of Information on Cost-effective Reforestation

BY DAVID BRIGGS

The long-term future of the forest industry in the Pacific Northwest depends in part on the productivity of new forests and on the choice of silviculturally sound and cost-effective management regimes. Industry is increasingly dependent on young conifer stands. Large areas of plantations are being established and silvicultural practices such as precommercial thinning, fertilization, vegetation control and use of genetically improved planting stock are now commonly applied. Reliable projections of the outcome of current practices and of the results of possible alternative practices are essential for realistic evaluations of forestry investments and for intelligent choices among stand management regimes.

We need information specifically applicable to the forests of the future. We need relatable estimates of response to silvicultural treatments. We need information on growth rates and yields under a variety of possible management regimes. We need to know how timber quality and value are influenced by silvicultural treatments, and how to design stand management regimes that will produce wood with specified properties.

The preceding statements were written in the 1984 Prospectus that led to the formation of the Stand Management Cooperative (SMC), which began operation in 1985.

PHOTO COURTESY OF DAVID BRIGGS

This Stand Management Cooperative Type III installation shows a variety of planting densities.

Although written more than 20 years ago, these paragraphs could have just as easily been written yesterday. This does not mean that no progress has taken place; rather, it means that so much has changed through advances in research and availability of new technologies that these statements are still true and reflect a continuing need for new information. The prospectus indicated that the scope of the SMC would focus on:

- planted or precommercially thinned stands selected to represent a wide range of site conditions and geographic areas;
- will be confined to forests west of the crest of the Cascade Range in Oregon and Washington, and in the coastal and transition zone in British Columbia; and
- although initial emphasis will be on Douglas-fir, other conifer species and mixed species stands may be studied concurrently if there is sufficient cooperator interest and funding.

The SMC organized around two central research programs: silviculture and wood quality research. This has since expanded to include a modeling program in 1989 and a nutrition program in 1991 when the Regional Forest Nutrition Research Program (RFNRP) merged with the SMC. Program level and policy decisions and advice would be provided by a Policy Committee consisting of one representative from each cooperating organization. A Technical Advisory Committee (TAC) has been formed for each of the

(CONTINUED ON PAGE 2)

SMC

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research programs, composed of a project leader and persons with specific skills and interests who work on developing experimental designs field procedures, implementation tactics, and scientific review of analyses and results.

The sidebar (see opposite page) provides brief descriptions of the existing set of 97 active SMC installations that show its growing emphasis on starting with planted stands in the newer Type III and GGTIV installations. In addition to performing all field plot layout, field measurements, treatment trigger checks and treatments on these installations, the SMC maintains a database on these, all of the former RFNRP installations, and a variety of special study installations located throughout coastal British Columbia, Washington and Oregon. In total, the database consists of 441 installations with 4,566 plots. This represents 258,057 individual trees which, in aggregate, have been measured a total of 1,337,964 times. In addition, soil survey data, vegetation surveys and stem section information is included.

Current SMC membership includes 22 land managing organizations that pay dues, three suppliers and four analytic organizations (consultants) that provide materials and expertise, and institutions that contribute in-kind scientific and technical assistance.

There is active collaboration among the institutional members of the SMC and the SMC collaborates with the New Zealand Douglas-fir Cooperative, other cooperatives and forest research institutions in the region.

Collaboration with the Northwest Tree Improvement Cooperative and PNW Research Station Genetics Team has led to the creation of a new series of genetic gain trial/Type IV installations

PHOTO COURTESY OF DAVID BRIGGS

A pruned plot on an SMC Type I installation.

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Society of American Foresters
4033 S.W. Canyon Rd. • Portland, OR 97221 • 503-224-8046 • FAX 503-226-2515
rasor@safnwo.org • michele@safnwo.org • www.forestry.org

Editor: Lori Rasor • **Assistant:** Michele Docy

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Next Issue: Highlighting our Forestry Experts

(see GGTIV in sidebar). A new project supported by USFS Rocky Mountain Research Station Agenda 2020 funding focuses on wood quality, particularly stiffness, and involves collaboration between the SMC, Pacific Northwest Tree Improvement Research Cooperative, Precision Forestry Cooperative, Rural Technology Initiative and PNW Research Station. There is similar Agenda 2020 collaboration on long-term site productivity studies at two sites in western Washington and one site in western Oregon that involves scientists from industry, PNW Research Station, OSU and UW.

When the SMC formed the first field installations, it established Type I and Type II plots that were created in stands that had been planted before the SMC formed.

Type I plots were established in juvenile plantations before the onset of inter-tree competition. It was assumed that respacing before competition would produce a residual stand that would behave the same as a newly planted stand at the new spacing. This assumption proved to be incorrect due to a phenomenon known as the cross-over effect discussed in a different article in this issue. Type II plots were established in plantations that were reaching commercial thinning age and were assumed to reflect conditions that the Type I plots would eventually achieve.

The SMC's true objective, however, is embodied in the Type III installations that were planted over a wide range of planting spacings using the common reforestation practices of the late 1980s and early 1990s. No attempt was made to standardize or control the landowner's choice of site preparation, planting stock type, genetics, etc. and each landowner applied practices and stock that it believed was best suited to the site and conducted subsequent competing vegetation controls that were typical of the time.

Today, the Type I, II and III installations are providing a wealth of new data that is leading to improved understanding of early intensive management and supporting the development of improved models. The SMC also harvested and reforested a number of installations from the Regional Forest Nutrition Research Program with the objective of determining what influence, if any, fertilization in the former stand may have on the development of the subsequent stand.

It was recognized that the variation in landowner practices used in establishing the Type III installations produced a wide range of initial conditions that may mask some understanding of early stand development. Also, research in genetics, competing vegetation control and nursery practices indicated that great gains may be possible when stands are established with vigorous, improved seedlings that are kept free from weed control.

With this in mind, the SMC, Northwest Tree Improvement Cooperative and PNW Research Station Genetics Team initiated the GGTIV installations that will examine how new plantations develop when reforested using combinations of genetic gain, planting spacing and vegetation control—all with the same seedling stock type. The first three of these installations were planted in March 2005 and three more will be planted in 2006. These new installations are designed with large, well buffered plots and are to be carried to rotation. They are expected to provide valuable short- and long-term information on the effects of deploying these combinations. ◆

Definitions of SMC Installations

TYPE I: Juvenile Douglas-fir and western hemlock plantations with uniform stocking covering a range from 300-680 stems per acre. Installations are established before the onset of substantial inter-tree competition. At establishment some plots were reduced to one-half or one-quarter of initial stems per acre. Except for one control plot, all plots follow a prescribed thinning regime. In addition, at some installations, additional plots are treated to implement pruning and/or fertilization treatments. Of 38 total installations, 30 are Douglas-fir and contain 322 treatment plots, and eight are western hemlock and contain 56 treatment plots.

TYPE II: Existing Douglas-fir plantations now approaching commercial thinning stage and considered to approximate the expected future condition of the Type I installations. Several thinning regimes constitute the treatments on these installations. Twelve total installations contain 60 plots. One installation with five plots has been harvested.

TYPE III: Areas operationally planted at a wide range of spacings (100, 200, 300, 440, 680 and 1,210 stems per acre) to provide experimental material for future research uses. These plantations are established using the current best regeneration practices. Each spacing was planted on a minimum of three acres to permit later establishment of control and treatment plots. There are 34 total installations of which 26 are Douglas-fir, five are western hemlock, and three are planted with a 50/50 mix of Douglas-fir and western hemlock.

TYPE IIIp: Those Type III installations in which permanent tree and vegetation measurement plots have been established.

TYPE IIIpa: Those Type IIIp installations in which additional plots are established in each of the planting densities to evaluate the effects of very early thinning or pruning on growth and development. In the three widest spacings a matrix of pruning density (100 or 200 stems per acre pruned with unpruned "followers") and levels of pruning (50 percent of live crown removed or pruned to 2.5-inch top) is prescribed. In the three dense spacings, a matrix of thinning regimes is scheduled. Thinning treatments include: early/light, early/heavy, late/light, late/heavy and late one time.

Carryover: A set of former RFNRP installations that were harvested and are being monitored for effects of fertilization that carryover into the next stand. There are seven installations and 14 plots.

GGTIV: A genetic gain trial at 10 x 10' spacing and a spacing trial with 7 x 7', 10 x 10' and 15 x 15' spacing. Genetics: elite, unimproved and intermediate. Vegetation control: complete until crown closure. Developed and implemented in collaboration with the Northwest Tree Improvement Cooperative at OSU and the PNW Research Station Genetics Team. Consists of six installations and 132 plots of Douglas-fir in Grays Harbor breeding zone. Three were planted in March 2005 and three more will be planted in 2006.

David Briggs is director, Stand Management and Precision Forestry Cooperatives, College of Forest Resources, University of Washington, Seattle. He can be reached at dbriggs@u.washington.edu.

Fertilization and Pre-Commercial Thinning Effects on Growth and Yield of Douglas-fir Plantations

BY ERIC C. TURNBLOM, YUZHEN LI, AND DAVID G. BRIGGS

Many factors have contributed to the shift from relying on old-growth Douglas-fir forests for timber supply in the Pacific Northwest to reliance upon second- and third-growth forests and intensively managed plantations. This has led to the consideration of using intensive site preparation techniques and intensive stand tending techniques such as weeding, cleaning, pre-commercial thinning, fertilization and commercial thinning as avenues to provide increased levels of nutrients, moisture and sunlight to the residual growing stock. The effects of fertilization and density control on commercial Douglas-fir forests have been studied over the past few decades across the region. The question on the minds of many is whether or not pre-commercial thinning and/or fertilization is a cost-effective way to produce timber of a given size in a given amount of time.

The Stand Management Cooperative (SMC) has established research sites in thrifty, juvenile second-growth plantations ranging in planted density from 300 to 680 trees per acre, with and without later thinning, and some with supplementary treatments across western Washington, Oregon and southwestern British Columbia.

Treatment regimes included two factors: fertilization and density management regime. For fertilization, urea was applied at a rate of 200 pounds/acre in the study establishment year and every fourth year thereafter. Four density management regimes are tested:

1) The stand was not spaced and received no further thinning (i.e., it remained at its Initial Stems Per Acre or ISPA);

2) The stand started at its initial density (ISPA), but was repeatedly thinned[1] later;

3) The stand was spaced to one-half of its initial density (ISPA/2) with minimal thinning[2] later; and

4) The stand was spaced to one-fourth of its initial density (ISPA/4) with no further thinning.

With the exception of the ISPA with no further treatments, the three remaining density levels described above had both a fertilized and unfertilized companion, hence there are seven treatment regimes. The two pre-commercial spacing treatments (ISPA/2 and ISPA/4) were conducted systematically, i.e., with emphasis on spacing uniformity rather than stem quality.

At establishment, after the initial spacings were conducted, there were no significant differences in quadratic mean diameter (QMD), dominant height, age and site index among the seven treatment regimes. QMD averaged 3.0 inches, dominant height averaged 22.7 feet, breast height age averaged 5.4 years, and site index averaged 86 feet at 30-year total age. Due to the different spacing treatments imposed in the establishment year, basal area (BA), volume, trees per acre and relative density did show significant differences and their ratios were 4:2:1 between ISPA, ISPA/2 and ISPA/4, respectively, as would be expected.

ISPA stands averaged 500 stems per acre, ISPA/2 stands averaged 231 stems and ISPA/4 stands averaged 120 to the acre. Within each density level, there were no statistically significant differences in the stand attributes between fertilized and unfertilized treatment pairs—somewhat comforting since the stands hadn't yet been fertilized!

Footnotes

[1]Repeated thinning: first thin when Curtis' RD = 55 and thin to RD = 35; next when RD = 55 again thin to RD = 40; subsequently whenever RD = 60 thin to RD = 40

[2]Minimal thinning: when RD = 55 thin to RD = 35; no further thinning

Figure 1a. DBH Distributions at Study Establishment

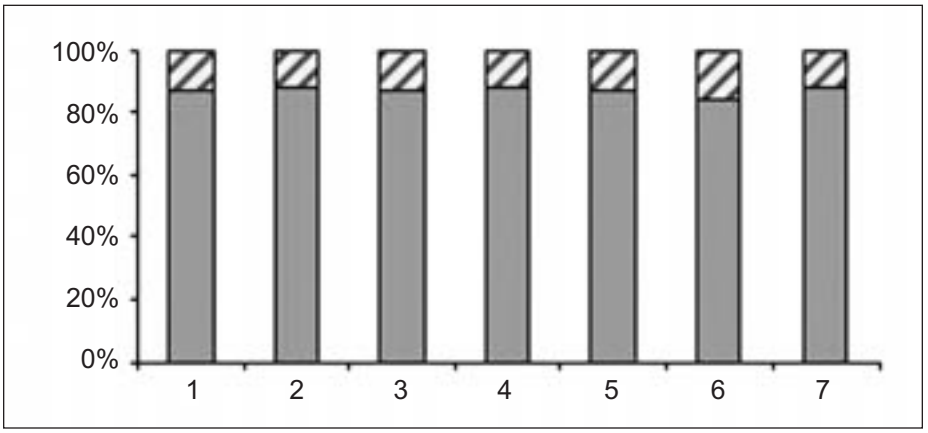
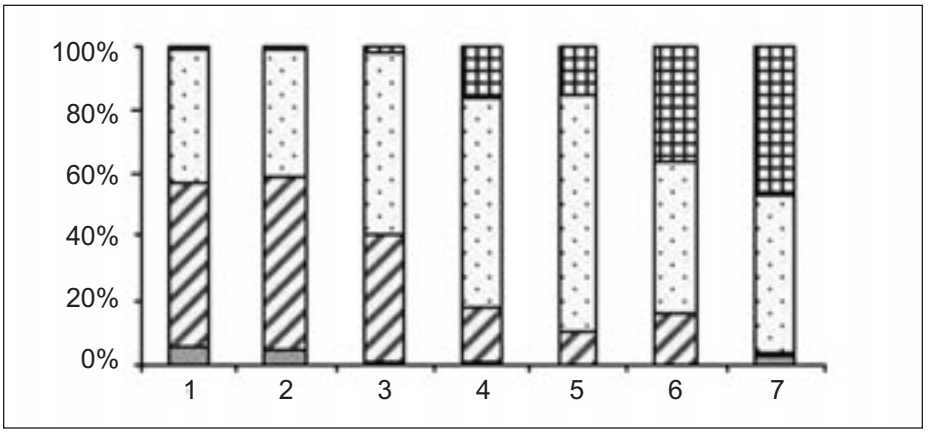


Figure 1b. DBH Distributions after 12 Year by Treatment



1: ISPA No thinning without fertilization
2: ISPA Repeat thinning without fertilization
3: ISPA Repeat thinning with fertilization
4: ISPA/2 Min thinning without fertilization
5: ISPA/2 Min thinning with fertilization
6: ISPA/4 No thinning without fertilization
7: ISPA/4 No thinning with fertilization

1 to 4 inches
5 to 8 inches
9 to 12 inches
13 to 17 inches

Effects of Thinning and Fertilization on Diameter

After 12 years, QMD had significantly increased and was progressively greater from ISPA to ISPA/2 to ISPA/4 since the wider spacings (ISPA/4 and ISPA/2) gave remaining trees more room to grow. In fact, the ISPA/4 spacing exhibited the greatest QMD growth of all. For each density, the fertilized stands have a significantly greater QMD than the unfertilized counterpart.

Not only did the widely spaced treatment regimes exhibit larger QMD, they also had a higher proportion of trees in larger diameter classes. When established, diameter distribution curves (stand tables) were very similar among the treatment regimes (Figure 1a). Twelve years later, the entire stand table for the ISPA/4 treatment shifted to include larger diameter classes than the ISPA/2 treatments, which in turn included larger diameter classes than the ISPAs (Figure 1b).

Looking at the diameter distribution in detail at the start, all seven treatment regimes had about the same proportions in each diameter class (Figure 1a); 86 percent in 1-4 inch trees and 14 percent in 5-8 inch trees. Twelve years later (Figure 1b), about half of the trees in the ISPA/4 stands were 13-17 inches and another half were in the 9-12 inch class. In contrast, the 13-17 inch diameter class in the ISPAs accounted for only 1-2 percent of the trees, while the 5-8 inch diameter class accounted for about 50 percent, after 12 years.

Also, while the stand tables for the fertilized and unfertilized stands were the same at establishment, 12 years later (after three fertilizer applications), the stand table for a fertilized stand included more trees in the larger diameter classes than the unfertilized counterpart for each density level. Thus, the fertilized stands have more large trees than their unfertilized counterparts. This can be visualized in the bar graphs in Figures 1a and 1b.

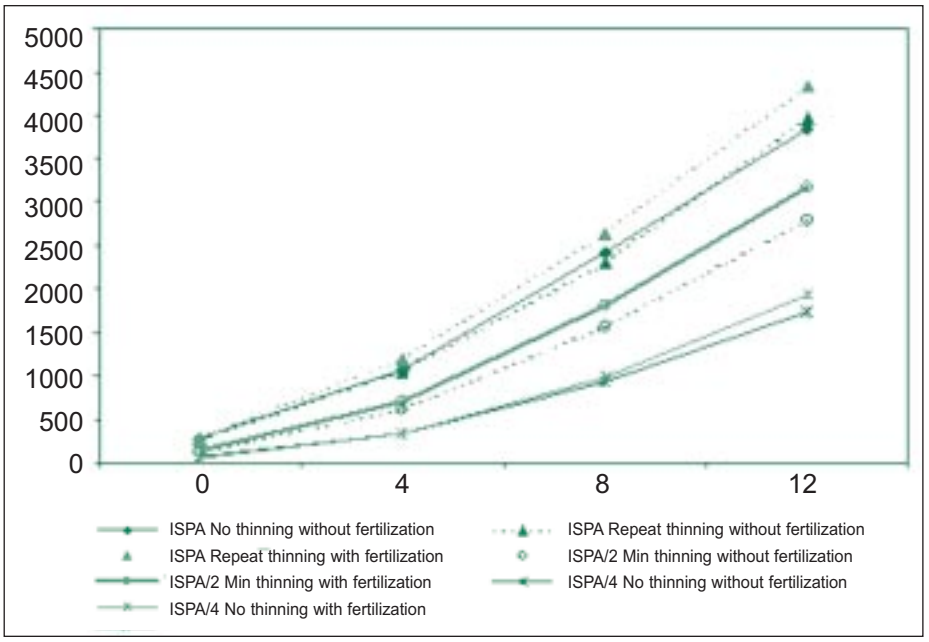
Effects of Thinning and Fertilization on Volume

Figure 2 presents net cubic foot volume per acre at establishment and in the 4th, 8th and 12th year since (including thinnings). The greatest yield in the absence of fertilization is in the ISPA and ISPA Repeated Thinning regimes; the latter has recently caught and slightly surpassed the former. As would be expected from the initial treatments, the ISPA/2 and ISPA/4 densities have lower level trajectories. However, in every case, the curves for fertilized stands are above the unfertilized counterparts. The yield gains due to fertilization during the first growth period were

not statistically significant, but became significant in the second and third growth periods.

This study found significant effects on growth due to fertilization for the period between establishment and four years and between four and eight years into the study, but not from eight to 12 years. However, no significant effect of fertilization on volume yield was found in the first growth period (four-year response to the first fertilizer application), but significant effects did appear in the two subsequent periods (after the second and third fertilizer applications). Either we are observing the cumulative effect of repeated fertilization, a lag between the time a significant growth rate effect develops a sufficient accumulation to make yield significant, or a mix of both.

Figure 2. Net Volume Per Acre Trends Over Time on SMC Sites



Conclusions

Fertilization produced additional growth in QMD and volume under all density regimes; growth rates were significantly increased by the first and second fertilization applications, but not by the third.

Volume per acre and average diameter were not significantly increased in the growth period following the first fertilization, but significant increases were observed in the second and third growth periods (after the second and third fertilizer applications). Possible explanations could be a repeated fertilization effect, a lag between observation of significant change in growth rate and translation into significant yield, or a mix of both phenomena.

The density treatments had a greater effect on QMD and volume growth and yield than did fertilization. Initially, the densest stand had the greatest overall stocking and growth. However, accumulation rate in the dense stands is declining with time and the less dense stands are catching or exceeding the pre-commercially spaced stands in terms of yield.

Is fertilization cost effective? Certainly, we would not fertilize before we pre-commercially thinned, as that would be throwing money away on surplus trees. Much evidence, including that presented here, indicates that on a regionwide basis, fertilization is a cost-effective way to increase final yield or shorten the time needed to reach a particular piece size. These results point to early gains due to fertilization that seem to diminish over time; using a longer re-fertilization cycle probably is more appropriate as stands get older, not less than eight years, for example. The decision to fertilize any particular site is a more difficult question to answer.

What about pre-commercial thinning? The best way to answer this question is to start with expected gain in value at rotation due to the thinning, discount it back to the time pre-commercial thinning is contemplated using an appropriate interest rate, and compare that discounted value to the cost of the operation. If the expected gain in value meets or preferably exceeds the cost of the thinning, then it will be a viable operation. There are, of course, other ways to assess the return on the investment (see article in this issue by John Trobaugh).

A pre-commercial thin may also be more attractive if part of the cost can be recouped by extracting the trees for pulp if markets are up and the cost of felling, extraction, hauling, etc., doesn't tip the scale in favor of leaving the trees where they lay. Other considerations often come into play for a given stand in particular. ◆

Eric C. Turnblom is associate professor and Stand Management Cooperative (SMC) Silviculture Project leader, University of Washington, Seattle. He can be reached at 206-543-2762 or ect@u.washington.edu. Yuzhen Li is a graduate research assistant, College of Forest Resources, UW, and can be reached at yzhli@u.washington.edu. David G. Briggs is professor and SMC director, UW, Seattle. He can be reached at dbriggs@u.washington.edu.

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Financial Analysis of a Treatment

BY JOHN TROBAUGH

Has anyone ever told you, "We can't afford that" or "That's too expensive, we can do this cheaper?" These statements have been a pet peeve of mine for years. Consequently, I learned to respond with: Well, what's the return on the investment? Do you always buy the lowest priced stock without knowing how it has been performing on the market? The lowest cost silviculture is not always the best silviculture. Then you need to back that up with numbers—ultimately it's the numbers that should drive the decision.

Whether you are looking to justify a silvicultural "expense" (really an investment) to the "bean counters" or trying to decide what to cut back on after your silvicultural budget has been slashed, you need to be able to talk the talk: IRR, NPV, BLV, nominal discount rate, real discount rate, hurdle rate, stumpage escalation rate, risk, non-discretionary expenditure and adjacency (see glossary sidebar).

Stock Types

Let's start with looking at a financial analysis of different stock types. In this example we are looking at four seedling stock types:

1. A ***Plug+1*** (P+1) is a small (usually two cubic inches) container (plug) seedling grown in a greenhouse for several months and then transplanted to a bareroot nursery for one year.

2) A ***Styro-8*** (S-8) seedling is grown in an eight cubic inch container in a greenhouse for one year.

3) An ***S-15*** seedling is grown in a 15 cubic inch container in a greenhouse for one year.

4) An ***S-20*** seedling, yes you guessed it, is grown in a 20 cubic inch container in a greenhouse for one year.

Seedling market prices vary, but for this example P+1s are $125 per thousand (M) for the plugs plus $175/M for the year in a transplant bed for a total of $300/M. But wait, don't forget that there is some falldown in the transplant bed and you have already paid for those plugs, so add $22/M, which brings the total cost of plantable P+1s to $322/M; S-8s are $250/M; S-15s are $400/M; and S-20s are $500/M. At this point in the comparison, the lowest cost silviculture is clearly the S-8s at $250/M.

Planting costs also vary, but for this example I am using $230/M for P+1s, $200/M for S-8s, $210/M for S-15s and $215/M for S-20s, bringing total cost of a planted seedling to $552/M, $450/M, $610/M and $715/M for P+1, S-8, S-15 and S-20 seedlings, respectively. The S-8s are still the lowest cost.

Cost of surviving seedlings completes the cost side of this financial analysis. S-8s are the smallest stock type and have the highest mortality rate of these four stock types. P+1 seedlings are bareroot and subject to exposed roots and transplant shock; consequently, they will have the second highest mortality of these stock types. S-15 and S-20 are both fairly large seedlings with the roots protected in a larger plug of soil; consequently, they have the lowest mortality of these stock types. Adding the cost of mortality to the cost of planting and the cost of seedlings, you have $650/M, $563/M, $642/M and $752/M for P+1, S-8, S-15 and S-20 seedlings, respectively (see Figure 1). Hmm, even with higher mortality the S-8s are still the lowest cost per surviving seedlings.

If S-8s have the lowest cost per surviving seedling, why are regional trends moving toward planting fewer S-8s and more large plugs and P+1 seedlings (see Figure 2)?

Seedling Growth

How clear is your crystal ball? Seedling stock type differences are usually reported around age five. Stock type growth differences projected forward to the end of the rotation can be diverging, parallel, converging or no difference from the "control" (see Figure 3).

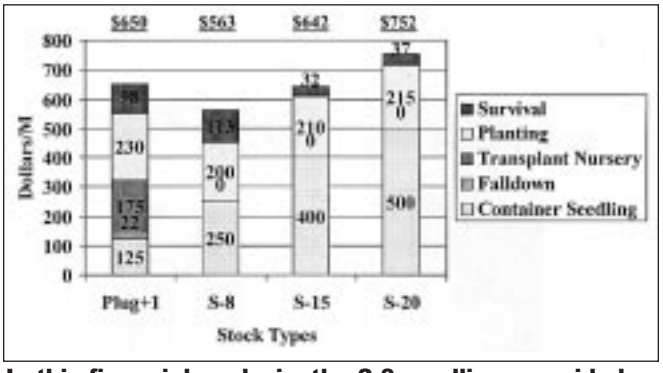
For this analysis I will assume that height differences between stock types have been established and that growth curves will remain parallel through rotation. Assume that percent additional harvest volume equals one half the percent height gain (10 percent height gain = 5 percent additional harvest volume).

Financial Analysis

Now that your crystal ball can clearly see what the future holds for seedling growth trends (yeah right), how about forecasting future economic conditions? The assumptions I used were:

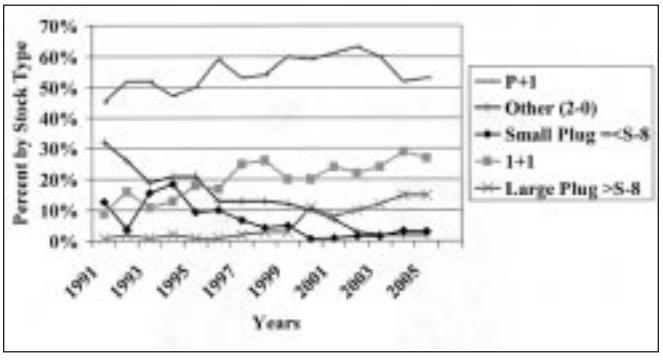
- 32 mbf/acre at 40 years (800 bf/ac/yr) for the baseline treatment (S-8s).
- Douglas-fir stumpage: $500/mbf with no stumpage escalation.
- Investment of $225-$300/acre (S-8s = ($563/M)*400 seedlings per acre = $225/acre).

Figure 1



In this financial analysis, the S-8 seedlings provided the lowest cost of surviving seedlings, followed by S-15s, P+1s and S-20s.

Figure 2



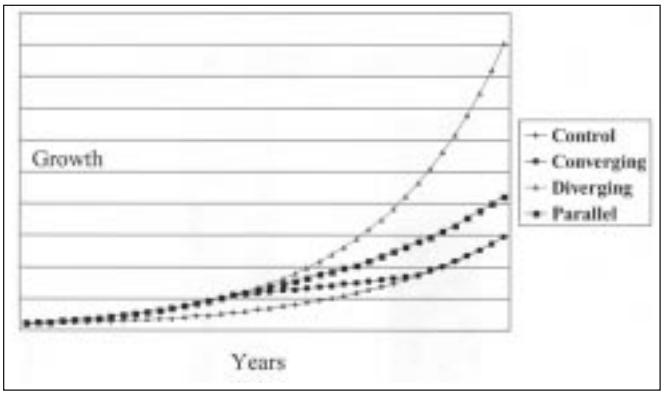
Douglas-fir Stock Type Trends. Briggs, D. and Trobaugh, J. 2001. Management Practices on Pacific Northwest Westside Industrial Forest Lands, 1991-2000: with Projections to 2005. Stand Management Cooperative, Working Paper Number 2.

• Six percent real discount rate (no inflation).

• No taxes and administration costs (T&A).

Since S-8s were the lowest cost surviving seedlings, I used the S-8s as a baseline for comparison with the other three stock types. All three other stock types had greater height growth than the S-8s and also cost more (see Figure 4). Using the assumptions outlined above, the bare land value (BLV) calculation shows that there was virtually no difference between any of the four stock types.

Figure 3



Potential trends for predicting future volume gains.

Figure 4

	S-8	S-15	S-20	P + 1
% Ht. Gain	0%	14%	25%	13%
% Price Increase	0%	38%	73%	21%
% BLV Gain	0%	1%	0%	-4%

Using S-8s as the lowest cost baseline, all three other stock types provide a positive height gain and cost more, but don't have a big increase or decrease in bare land value (BLV).

Hmm, S-8s had the lowest cost surviving seedling and had a comparable BLV to the other stock types based on the assumptions and growth data used in this calculation. So why are regional trends going away from S-8s and toward larger plugs and P+1 transplants? Might there be other economic considerations? Here are some to consider:

1. ***Harvest scheduling:*** Adjacency to harvestable timber might be an issue. S-15s, S-20s and P+1s will achieve green-up quicker than S-8s.

2. ***Scheduling seedling orders:*** All three container stock types are one year seedlings versus a two-year turn around for P+1s.

3. ***Access to seedlings during wet weather:*** Container seedlings are grown in a greenhouse and can be packed and shipped no matter what the weather is like outside, not true of bareroot seedlings.

4. ***Anticipated animal damage:*** P+1 seedlings are a two-year-old seedling; consequently, they have a woodier stem and withstand animal damage better than the three container stock types.

Summary

• S-8s are the least expensive of these four stock types, but during early establishment they are also the slowest growing. Due to the small size of the seedling and small soil plug, they are more susceptible to mortality from environmental stress and animal damage. For some species on some sites they are an excellent choice. Results are highly variable.

• S-15s are slightly less expensive than P+1s with slightly better growth. Consequently, the final decision will depend on other factors such as timing and animal damage.

• S-20s are the most expensive, but they consistently provide the fastest growth. If adjacency is the issue, and you need green-up ASAP, then S-20s will get you there a year sooner.

• P+1s are the preferred stock type of many industrial planting programs, primarily because of the large woody characteristics of the seedling. The primary drawbacks are the bare root exposure to environmental stresses and the two-year production cycle, plus the six months lead time prior to sowing in order to make sure that the nursery has room and is prepared for growing your seedlings. ◆

John Trobaugh is Webster Nursery Program manager, Washington State Department of Natural Resources, in Olympia. He can be reached at 360-664-2884 or john.trobaugh@wadnr.gov.

Glossary

IRR: Internal Rate of Return is a parameter used in financial analysis and is the discount rate at which NPV equals zero.

NPV: Net Present Value is a parameter used in financial analysis in which the net value of all costs (investments) and revenues of a rotation (investment period) are considered after first discounting their values to the present.

BLV: Bare land value is a financial analysis parameter that represents the NPV for an infinite succession of identical rotations. Note that soil expectation value (SEV) and land expectation value (LEV) are BLV synonyms.

Nominal Discount Rate: Annual percentage, including inflation, used to discount costs and revenues.

Real Discount Rate: Annual percentage, NOT including inflation, used to discount costs and revenues.

Hurdle Rate: The discount rate set by the "bean counters" that you have to meet or exceed in order to justify the investment.

Stumpage Escalation Rate: Rate at which stumpage value increases or decreases over time, NOT including inflation.

Risk: The combined probability of failure and the extent of failure.

Non-Discretionary Expenditure: Expenditure required to meet a regulatory or organizational requirement.

Adjacency: Usually refers to a regulatory green-up requirement before harvesting adjacent timber.

Genetic Improvement: Boosting Plantation Productivity in the Pacific Northwest

BY K.J.S. JAYAWICKRAMA

Genetic improvement is now standard practice for forestry programs throughout the world. In a few cases this has progressed to the fourth cycle of improvement. In some parts of the world and for major species, all reforestation is with genetically improved seed.

Industry and agencies started genetic improvement for coastal Douglas-fir in the Pacific Northwest in the 1950s, selecting plus-trees and grafting clonal orchards. Many of them switched to the IFA-PNW "Progressive Tree Improvement System" (a program between the Industrial Forestry Association and the USFS PNW Research Station Genetics group) in the 1960s. This approach emphasized forming local cooperatives to share costs, progeny testing lots of trees using wind-pollinated seed in small testing zones and full-sib seedling orchards. From 1967 until 1993, over 26,000 first-generation Douglas-fir parents were tested in 109 breeding units, with over three million progeny test trees planted. A typical breeding unit was designed for 100,000 acres of commercial timberland and tested 200-300 trees. Cooperative improvement of western hemlock, on a much smaller scale, began in the 1970s.

PHOTO COURTESY OF K.J.S. JAYAWICKRAMA

A high-quality first-generation Douglas-fir progeny test site (genetic evaluation plantation) near Philomath, Ore., at age 32 years.

Predicted and realized genetic gains from cooperative improvement

The Northwest Tree Improvement Cooperative (NWTIC), an umbrella organization serving cooperative tree improvement west of the Cascades, recently began predicting genetic gains for first-generation programs. Gains are predicted for height, dbh and volume (as dbh^2 x height), usually at age 15. Volume gains have been predicted for 36 Douglas-fir programs testing 9,696 parents. Selecting the top one percent of parents and top five percent per program resulted in 54 percent and 40 percent predicted age 15 volume gain on average, respectively. New "1.5-generation" orchards typically combine the best two to five percent of parents from several adjacent first-generation programs.

Gain prediction includes many assumptions and should be validated against realized gains. A realized genetic gain trial in the Oregon Cascades showed 27 percent volume gain at age five. This estimate is for 10 good (but not necessarily the best) crosses from one breeding zone, and is less than the potential gain from a 1.5 generation orchard. Realized genetic gains in volume greater than 25 percent have been shown for other species as well. Internal validation using subsets of data shows the NWTIC gain prediction procedure is working well. We do expect, however, that rotation-age gains will be lower than age 15 gains.

Seed production and gain in operational plantations

A strong breeding and testing program should be linked with an equally effective program deploying gain in operational plantations. There has been a strong emphasis on orchard establishment in the Pacific Northwest. Graft incompatibility was a problem for about 25 years, but has been greatly reduced. There are now over 1,000 acres of grafted Douglas-fir orchards either derived from cooperative programs or from independent first-generation programs now contributing to cooperatives. Seed production was typically rather low in these orchards for the first 5-10 years, but many are now in full production.

Operational gains are being improved in programs associated with NWTIC:

• Roguing orchards eliminating low-gain selections, collecting seed by family and pooling to form high-gain seedlots.

• Establishing new high-gain 1.5 generation orchards (with 20-30 parents chosen from over 1,000 first-generation parents and their progeny).

• Intensive orchard management. Some new orchards include twice as many ramets as needed at full production to boost early seed production.

• Controlled mass pollination (CMP) lets us eliminate contamination by low-gain pollen and "ship in" gain from elite clones in adjacent programs. CMP can be successfully (and relatively inexpensively) applied both for Douglas-fir and western hemlock in productive orchards.

Strengths and successes

The following are some strengths of cooperative testing and seed production in the Pacific Northwest:

• Testing thousands of parents using wind-pollinated, woods-collected seed let tree improvement programs get underway quickly. It also allows very high selection intensities when establishing 1.5-generation orchards. This first generation of improvement has a wealth of opportunities that can and should be "mined" for years.

• Investments in orchards built up a big seed production capacity, more than enough for reforestation needs in most of western Oregon and Washington.

• Some orchards were very well-sited and combined with orchard technology (girdling, fertilizer, gibberellic acid, insect control) have been very productive.

• Cooperators are very interested in, and supportive of, efforts to boost operational gain.

Cooperative second-generation breeding and testing

Second-generation breeding started in the 1990s and test establishment began in 2001. Over 2,600 Douglas-fir crosses are being tested on a total of 90+ test plantations; 508 western hemlock crosses were outplanted in 1997-2001, and the first set of second-generation selections were made in 2005. Computer simulation indicates we may get one-third or more added gain from second-generation breeding and testing (compared to the first generation) at about 10 percent of the testing cost.

A great time to be involved in cooperative tree improvement

Right now tree improvement can boost the productivity of Pacific Northwest plantations at a modest cost since the big dollars (first-generation testing, orchard establishment) have already been spent, and 30 years of experience has been gained in seed production. Gains can be obtained for traits such as volume, stem straightness, reduced number of forks and ramicorn branches, wood density, cold hardiness and tolerance to Swiss needle cast (though not all at the same time). Individual organizations can decide how much to emphasize each trait.

Open-pollinated orchard seed can be produced in productive Douglas-fir or western hemlock orchards for about $4 per reforested acre, only one to two percent of the cost of planting and tending an acre in western Oregon through the first five years. Production costs under less favorable conditions (poor orchard sites or if seed-eating insects cannot be controlled) are higher. On good orchard sites, high-gain CMP seed is likely to cost the equivalent of $10 per reforested acre. Classical tree improvement and the use of orchard seed rarely draws unfavorable attention from the environmental community in the Pacific Northwest, while clonal forestry may be subject to more scrutiny, and the use of genetically engineered native tree species will definitely meet strong opposition. Thus, the time is definitely right to be in cooperative tree improvement in the PNW! ◆

K.J.S. Jayawickrama is director of the Northwest Tree Improvement Cooperative, Department of Forest Science, Oregon State University, Corvallis. He can be reached at keith.jayawickrama@oregonstate.edu.

Planting Density: A Consideration in Cost-Effective Reforestation

BY ERIC C. TURNBLOM

The goal of silviculture may be stated simply as putting the right tree in the right place with the right amount of growing space at each stage of stand development. For the stand initiation stage of development, the most obvious decision to be made regards initial spacing. The decision should be based mainly on the tree and stand conditions that are desired at rotation age if no thinnings are planned, or on the conditions desired at the first pre-commercial or commercial thinning, if planned. Subsequent stages of development are affected by decisions regarding various stand tending techniques, including release operations and intermediate cutting or thinning.

Thinnings have been practiced in the Pacific Northwest in the past and will likely continue to be practiced in the future in order to: 1) increase size of trees at final harvest; 2) remove diseased or poorly formed trees; 3) obtain wood; 4) obtain a positive cash flow; 5) obtain early return on investment; 6) recover anticipated mortality; and/or 7) recover at least a part of fixed costs by keeping a logging crew operating. Economic, ecologic and social factors may also impact or even constrain such decisions.

The majority of past research on initial planting density and other spacing trials has produced a body of conventional wisdom indicating that long-term height growth of the larger trees in the stand is little affected by planting density or pre-commercial thinning (PCT) spacing, although height growth can be reduced by excessively high density, particularly on poor sites. Diameter growth is considered to increase with increasing spacing, which makes sense: The more room there is to grow and expand laterally, the more the trees will do so. However, heavy thinning in dense young stands can produce a so-called "shock effect" of temporary reduction in height and sometimes diameter growth, again particularly on poor sites.

The Cross-over Effect

More recent observations in juvenile stands of Douglas-fir have revealed that both height and diameter growth in closely-spaced stands exceeds that found in widely spaced stands. Since this is contrary to what's generally observed in older stands, the results are "crossed-over" from expectation. Further, a reversal or a "crossing over" must occur at some point in time as juvenile stands mature back to the case of wider stands having the larger diameters and heights. This cross-over effect has not been universally observed for Douglas-fir, however. Red alder exhibits this effect of initial spacing on both juvenile height and diameter too, but the effect has not been observed universally for other species. Lodgepole pine, which stagnates when planted too densely, is an obvious counter example to the cross-over effect.

The Stand Management Cooperative (SMC) has established 26 Douglas-fir "Type III" research sites across western Washington, Oregon and southwestern British Columbia. At each of these Type III sites, Douglas-fir was planted in six, three-acre blocks, each block a different density. The six represented densities in terms of trees per acre are: 100, 200, 300, 440, 680 and 1,210. These densities correspond to square spacings (in feet) of 21 x 21, 15 x 15, 12 x 12, 10 x 10, 8 x 8 and 6 x 6, respectively.

The cross-over effect is quite noticeable in the SMC Type III plots and is displayed in Exhibit 1a and 1b for installations in the seven- to nine-year-old range. Exhibit 1a shows that despite a little variation, average height (adjusted for specific site or location effects) increases as density increases. This in itself is not too surprising, because plants in general are known to "race for the sky," so densely planted stock would be expected to be taller than less densely planted stock, and perhaps thinner, too (the botanical term for this is "etiolation"). The somewhat surprising part of the picture is shown in Exhibit 1b, where quite clearly we see that DBH (adjusted for specific site or location effects) follows the same trend: larger DBH in tighter spacing! At an average age of eight years, the stands with 21 x 21 ft. spacing are 14 percent smaller in DBH and about 11 percent smaller in height than those at the 6 x 6 ft. spacing.

Several explanations for the cause of this cross-over effect have been offered. Some researchers have pointed out that the earlier canopy development in the denser stands leads to increased shading of competing understory vegetation, which may be a major factor in some instances. However, there are other cases reported in which the effect was observed where vegetation had been carefully controlled.

More sophisticated studies provide evidence that when seedlings of certain species were grown in the presence of neighbors, the spectral distribution of light was altered. Although the neighbors did not reduce the quantity of photosynthetic light energy (i.e., the neighbors were not shading each other), a response was triggered that produced elongated internodes. Apparently, the change in the quality of light as measured by the near infra-red:far infra-red ratio served as an early warning of oncoming competition. Still others who have found that top height in Douglas-fir was indeed initially slightly greater at close spacings than at wide spacings suggested that the difference could be attributed to greater opportunity for natural selection among genotypes and microsites provided by the greater initial number of trees. However, some of these studies did not summarize diameters for the top height trees.

Whatever the cause, speculation abounds as to whether or not this apparent juvenile growth acceleration at close spacings can be maintained or

even enhanced by an appropriate thinning regime. There is much evidence in support of benefits being greater from early thinning than when thinning is delayed. In concept, "thinning windows" occur when thinning can be done most effectively. If the stand is not thinned during the time when the window is "open," it may become too dense to respond completely or very well later. Thus, timing of thinnings is important.

Another Experiment

The SMC has designed another study to address the question just posed, among others. The experimental study objectives include the following:

1. Determine the duration of the apparent juvenile growth acceleration at close spacings;
2. Determine if duration of this apparent juvenile acceleration can be prolonged by an appropriate thinning regime; and
3. Determine the magnitude of the gain obtainable (if any).

Of course, knowing the "natural" duration of the cross-over effect is important, as is finding out if and how long the period may be prolonged, which may translate into increased yields within a given time period. Objective 1 will be met by continued measurement and monitoring of the untreated plots. Objectives 2 and 3 require supplemental treatments providing alternative progressions in stand density management. The SMC is currently testing seven different density management regimes in the three denser stands (440, 680 1,200 trees per acre) representing combinations of the timing and intensity of the thinnings.

We may already know most of the answer to objective 1. While we are still seeing patterns of increased height with increased density by age 12, DBH is beginning to cross over to the conventional relationship of tree size with density as can be seen in Exhibit 2. Displayed is average DBH of the dominant tree component (expecting that some number or proportion of the largest trees will become the crop trees) in relation to density. Note that we see an essentially "flat" relationship, that is, the initial advantage in DBH in high density stands is no longer observable.

Exhibit 1a. Mean height Douglas-fir Type III sites–age 8 yrs.

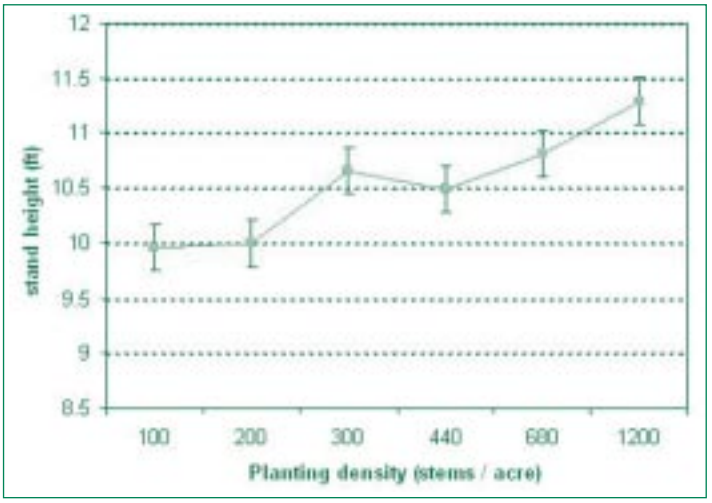


Exhibit 1b. Mean DBH Douglas-fir Type III sites–age 8 yrs.

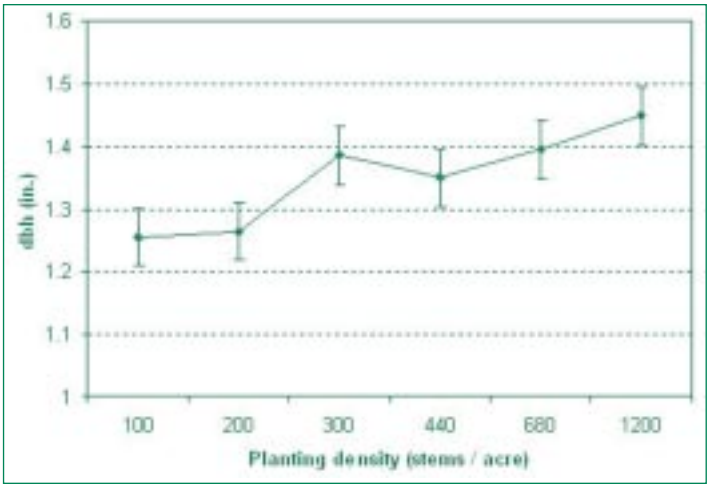
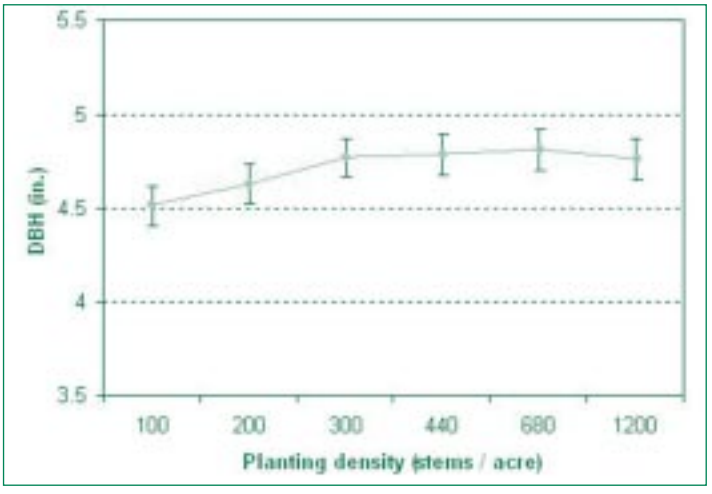


Exhibit 2. Average DBH of 40 of largest trees–age 12 yrs.



Discussion

In general, the cross-over effect is probably linked to the onset of inter-tree competition, clearly operating when the crowns of neighboring trees are interfering with each other and live crown bases begin to recede up the trees. For DBH, this seems to be somewhere between eight and 12 years, giving a very early thinning window of somewhere between two and four years at the most in duration—quite narrow. For height, it may be that the initial advantage may never diminish—this remains to be seen.

The thinning regime trials have not yet been completed. The SMC is still performing thinnings and monitoring the results. Less than half of the research sites have met their thinning triggers so far, meaning most of the sites are still quite young. The real and final answer will not be available until the stands reach rotation age.

Choosing a cost-effective planting density may have to include consideration for the cross-over effect if indeed it impacts benefits at rotation age. Site preparation techniques, genetics, fertilization, and/or other stand-tending techniques may affect the cross-over relationship, as well—it is difficult to say for certain at the time of this writing. ◆

Eric C. Turnblom is associate professor, University of Washington, and Stand Management Co-op (SMC) Silviculture Project leader. He can be reached at 206-543-2762 or ect@u.washington.edu.

Foresters Gather in Lewiston

SAF members from Oregon, Washington State and the Inland Empire Societies met April 13-15 in Lewiston, Idaho. Under the program theme of "Corps of Discovery: Foresters Walking in the Footsteps of Lewis and Clark, attendees participated in indoor general and concurrent sessions, one of four field trip options and myriad other activities, such as the Foresters' Fund.

A special thanks to General Chair Terry Shaw, Program Chair Bob Deal, Finance Chair Charley McKetta, Registration Chair Ellie Lathrop, Posters Chair Jo Ellen force, Sponsorship Chair Bill Lecture, Vendor Chair Roque Nalley and Foresters' Fund Chair Jay Holland, and all the other worker bees too numerous to list here, for their hard work on putting together this successful meeting.

Two-hundred and thirty-nine registered participants attended, plus 20 fully registered guests and spouses, 23 exhibitors, 39 speakers and others who joined the group for select events. A packed house of 300-plus SAFers had an enjoyable time renewing acquaintances and meeting new people from within the region. ◆

PHOTO COURTESY OF HANK KIPP

Lewis and Clark Tour participants view Camas Prairie where Clark and five scouts met a Nez Perce Village and saved the expedition through gifts of Jefferson Medals and Nez Perce food sharing given in return.

PHOTO COURTESY OF CHRIS SCHNEPF

Ron Mahoney and Jim LaTourneax check out a local Foresters' Fund silent auction item.

PHOTO COURTESY OF CHRIS SCHNEPF

Annual meeting Program Chair Bob Deal (right) and a panel speaker.

PHOTO COURTESY OF HANK KIPP

Steve Ricketts, a former Washington State SAF Forester of the Year, visits with one of the Lewis and Clark Expedition "resurrected members."

PHOTO COURTESY OF CHRIS SCHNEPF

Lauren Fins proudly displays her new Fellow ribbon.

PHOTO COURTESY OF HANK KIPP

Michael Goergen, SAF executive vice president (right) with General Chair Terry Shaw following Michael's SAF National Office update presentation.

PHOTO COURTESY OF CHRIS SCHNEPF

Don Hanley (right), Dave Adams (left) and Russ Graham at the icebreaker.

PHOTO COURTESY OF CHRIS SCHNEPF

Foxie Proctor and accompanying sunglasses made the Foresters' Fund a huge success this year, while Deb Scrivner looks on. The Foresters' Fund net proceeds, which will be split between the Foresters' Fund and state society programs, were $5,436.

Bringing Climate into Natural Resource Management

June 28-30, 2005

Portland Hilton, Portland, OR

Sponsored by: PNW and Rocky Mountain Research Stations, USDA Forest Service and Western Forestry and Conservation Association

This conference will present the latest developments in the area of climate change impacts and the management of natural resources. What will be the potential impacts on forest ecosystems? Can western ecosystems adapt to changes in climate? What changes are needed in natural resource management?

Full agenda available at www.westernforestry.org or call 503-226-4562 for more information. Registration fee: $95

$50 Humor Reward Offered!

Moan, groan, giggle, guffaw. Who says foresters don't have a sense of humor?

Now it's time to prove 'em wrong by submitting a forestry joke to the *Western Forester*. A nameless benevolent forester has offered a $50 reward for the best forestry joke selected by the SAF membership.

Here's how it will work: Submit your printable (read clean) joke or jokes (yes, you can submit more than one joke) to the Northwest Office by August 1. Please, no re-worked lawyer, blonde or other Internet jokes. All jokes must include a forester or forestry theme.

Northwest Office staff will review the jokes. Jokes that make at least one member of the staff laugh 'til she cries will qualify for the on-line showdown of best joke.

These qualifying jokes will be posted on the joint OSAF/WSSAF website at www.forestry.org, and all SAF members can vote for their favorite joke during the time period of August 15-September 5. Member votes will be tallied and a $50 check will be mailed to the winning jokester, who will be awarded the coveted title of Funniest Forester of 2005. The winning joke will also be published in a future issue of the *Western Forester*.

Submit your forestry joke to the SAF Northwest Office via mail, fax or email at 4033 SW Canyon Rd., Portland, OR 97221; fax 503-226-2515; rasor@safnwo.org.

Don't forget your name and contact information if you want that check mailed to you.

Tri-Society Awards Banquet Honors Members

Three state societies honored their members at an awards banquet during the Tri-Society Annual Meeting on April 14 in Lewiston. Master of Ceremonies Jim Rombach kept the evening program rolling. The fast-paced evening included a Foresters' Fund oral auction, announcement of Fellow and Golden Members, presentation of state awards, and a keynote presentation by Nez Perce Tribal Member Jaime Pinkham on the evolution of tribal leadership in resource management.

New 2004 Fellows were recognized and honored for their service to SAF: Joe Heller and Donald Hopkins from Washington State; Lauren Fins, Charley McKetta and Ned Pence from Inland Empire; and Norm Michaels from Oregon.

Golden members in 2004 were also recognized for their continued commitment to the Society. These 50-year members include Dewey Almas from Inland Empire; Lee Boeckstiegel, Jim Brady, Wendell Clark, William Coghill, Donald Larsen, Frank Shirley, Doug Stinson and Robert Nitter from Washington State; and Fred Burgess, Magnus Chelstad, Howard Hopkins, Lyle Jack, Lloyd Olson, Gwynne Sharrer, William Shenk, Zane Smith, Lloyd Soule, Richard Spray, Robert Thompson and Jack Winjum from Oregon SAF.

Inland Empire honors four members

The Inland Empire Society presented the Forester of the Year award to William E. Schlosser. Bill is Technical Service Department manager for Northwest Management in Moscow, Idaho. In 2004, Bill was able to pull together the timber industry, county commissioners, school districts and county assessors in full agreement on the Idaho Forestland Taxation Law that was recently signed by the Governor.

PHOTO COURTESY OF CHRIS SCHNEPF

Bill Schlosser (left) receives the Inland Empire Forester of the Year award from IE Chair Russ Graham.

This has been one of the most contentious forest issues in Idaho over the past five years. In addition, Bill served as project leader and developed over 20 community fire mitigation plans in Idaho and Montana in 2004. He also conducted a free GPS training course for family forest owners at the Washington and Idaho Landowners Field Days.

Lynn Kaney, deputy district ranger for the Newport/Sullivan Lake Ranger Districts, Colville National Forest, Wash., was named Inland Empire SAF Communicator of the Year. Lynn has been instrumental in acquiring a broad range of public support for controversial forest, fuels and recreation projects within the Pend Oreille Valley. Within the last year alone, he successfully facilitated contentious and opposing viewpoints at several public meetings organized in response to proposed land management activities.

PHOTO COURTESY OF CHRIS SCHNEPF

Inland Empire's Communicator of the Year Lynn Kaney receives his award from IE Chair Russ Graham.

Receiving the Washington State University Outstanding Senior award

PHOTO COURTESY OF CHRIS SCHNEPF

Beth Ann Stewart receives the Washington State University Outstanding Senior award from Inland Empire Chair Russ Graham.

PHOTO COURTESY OF CHRIS SCHNEPF

Inland Empire Chair Russ Graham congratulates Jonathon Luhnow on receiving the University of Idaho Outstanding SAF Student award.

was Beth Ann Stewart, a senior in Forestry. Upon graduation she plans to begin her professional career with the USDA Forest Service in northern California and would like to return to school for a Master's Degree in Silviculture.

Jonathon Luhnow, a Forest Resources junior, received the University of Idaho Outstanding SAF Student award. During his tenure as chapter chair, he increased student membership, volunteer leadership and club funding to unprecedented levels. He was effective in getting students more involved with local and national SAF meetings, and is currently leading the update of the chapter's website.

Washington State's Forester of the Year

John Bergvall was named WSSAF Forester of the Year for his continuous passion and efforts in public education on forest management issues, plus his tireless promotion of the forestry profession. An active member for over 40 years, he has served in many positions including chair at both the local and state levels. John's most recent effort was spearheading a project to improve the state SAF traveling exhibit. His use of an effective committee, raising funds and developing a new display on forest health and fire are especially noteworthy.

PHOTO COURTESY OF CHRIS SCHNEPF

John Bergvall, center, is congratulated on being named WSSAF Forester of the Year by State Chair Chuck Lorenz and Karen Temen, the 2004 Forester of the Year.

Oregon Society Awards

Eric Geyer of Roseburg was awarded Oregon Society Forester of the Year for the many contributions he has made to the profession. He is currently serving as Umpqua Chapter chair. As chair-elect in 2004, he organized interesting meetings that helped energize the chapter and increase attendance.

PHOTO COURTESY OF CHRIS SCHNEPF

Eric Geyer accepts his Oregon SAF Forester of the Year award, as well as the Chapter Achievement award on behalf of Umpqua Chapter members, from Oregon SAF Chair Sue Bowers.

Eric and a colleague met with the editorial board of the local newspaper to educate them on Ballot Measure 34 (Tillamook State Forest Initiative). Shortly thereafter the newspaper published an editorial, taking a position very similar to the position statement prepared by Oregon SAF for the voter's pamphlet. He has also been involved with the Forestry Expo, Douglas County fair booth and provided leadership to organize a stand density management workshop in March.

The Umpqua Chapter received the Oregon SAF Chapter Achievement award. The chapter has made significant strides to create a viable, healthy chapter that is active in local policy issues as well as providing technical education for members. The chapter initiated a survey to over 100 area professionals in an SAF recruitment effort and gained valuable knowledge about the area's foresters. The chapter distributed nine newsletters, which was redesigned to include local, state and national issues, to members and prospective members. The chapter continues to be active in the policy and legislation area, including holding public meetings on the Biscuit fire salavage and Measure 34 and preparing an op-ed piece that was printed in the local newspaper concerning local Bland Mountain salvage alternative. Several quotes by SAF members were printed in the local paper.

Receiving the Oregon SAF Lifetime Achievement award was Steve Woodard of the Emerald Chapter. He was cited for over 40 years of SAF service at the chapter and state levels and decades of forestry education as an OSU Extension forester and family forest owner (he is currently the Oregon Tree Farmer of the Year). His forestry education efforts have entailed hosting delegations from over 28 countries and leading foresters on multiple trips to five countries. An SAF member since 1963 and awarded Fellow status in 1987, his dedication and demonstrated forestry performance is an inspiration to us all.

Congratulations to all and thanks for your continued efforts in support of professional forestry. ◆

State Society Sponsors Meeting with State Legislators

BY GRETCHEN NICHOLAS

The Washington State Society of American Foresters invited several key legislators to meet with SAF members to discuss current forestry issues and the role of SAF. The event was organized by the state society and hosted by the Southwest Washington SAF Chapter.

The March 29 meeting introduced the SAF to several key legislators, including Senator Mark Doumit, Senator Ken Jacobsen, Representative William "Ike" Eickmeyer, Representative Joel Kretz, and Representative Ed Orcutt.

Despite the range of constituencies, the legislators shared remarkably similar concerns, primarily with forest fragmentation and forest health. With regard to forest fragmentation, some legislators were concerned about the environment and scenic views and others were concerned about maintaining a viable forest products industry.

After an introduction to the SAF by Southwest Washington Chair Tim Harrington, Eric Schroff introduced the issue of forest conversion. Schroff, who is a small forest landowner, covered the Society of American Foresters position statement on the "Loss of Forest Land" (Dec. 2004). The policy states that "much of the permanent loss of forestland occurring today is avoidable, and too often the result of uncontrolled urban expansion, lack of thoughtful land use policies, over regulation and limited economic incentives to own and manage forest lands."

Fire was the hot item on the agenda and was covered from both the suppression and prevention perspectives by Department of Natural Resources foresters Mark Gray and Joe Shramek.

Mark made it very clear the only way to address large fire cost issues is through preventing them in the first place. To do so involves two major elements: preventing the fire from starting, and a combination of preparedness and rapid initial attack. Mark discussed Community Wildfire Protection Plans, an outgrowth of the 2003 Healthy Forests Restoration Act that encourages fire management agencies to coordinate plans with private landowners and tribal, state and local governments.

Joe Shramek, who discussed fire suppression, also emphasized the importance of cross-jurisdictional coordination. He said that wildfire complexity and risk in Washington has increased due to forest health conditions, climatic changes, and greater numbers of people living and recreating in fire-prone forest ecosystems.

Randall Greggs, a forester with Green Diamond Resource Company, then covered the nature of these forest health issues. He described how a tree's defensive mechanisms are strained when tree stocking exceeds the sites' carrying capacity. This creates an accumulation of fuels and thus increased fire risk. Forests whose defense mechanisms are strained are also more vulnerable to a plethora of endemic native diseases and insects that become epidemic when conditions are right. Additionally, forests are now threatened more than ever by invasive species and diseases. He pointed out the best defense is a good offense early in the stand life cycle, with thoughtful species selection, site preparation and well-timed thinning.

The presentations appeared to resonate with the legislators, who asked many good questions. Representatives Kretz and Orcutt lingered for nearly an hour after the end of the formal meeting and engaged in a lively discussion of forestry issues. A special thanks to Washington State SAF Policy Co-Chair John Ehrenreich for organizing the event. ◆

Gretchen Nicholas is Land Management Division manager for the Washington State Department of Natural Resources in Olympia, as well as chair-elect of the Southwest Washington Chapter. She can be reached at 360-902-1360 or gretchen.nicholas@wadnr.gov.

Study Tour Approaches Harvesting with an International Perspective

BY CHAD DAVIS AND LOREN KELLOGG

The topic of forest harvesting in the Pacific Northwest offers a unique perspective for forest managers worldwide. The range of field conditions that exist, along with multi-use forest management objectives, creates a vast array of appropriate forest harvesting techniques from cut-to-length (CTL) systems to small skyline systems to helicopter harvesting.

This variety in methods provides an excellent learning environment for assisting in the management of forestlands and exploring new development of appropriate forest harvesting. Further, issues that arise from complex questions like forest fuels reduction also contribute diversity to the equipment configurations employed in the Pacific Northwest. It is imperative that forest managers and landowners understand the range of options available in order to match desired silvicultural outcomes with specific forest harvesting goals while achieving both in the most environmentally acceptable and cost efficient manner.

With this in mind, the Oregon State University Department of Forest Engineering is offering a two-week Forest Harvesting Study Tour in the Pacific Northwest from July 10-23. The tour will begin in San Francisco, Calif., and travel north to Portland, Ore. Along the way, participants will explore a variety of forest harvesting topics and forest conditions through both technical and field sessions. The two-week tour will also incorporate the Council on Forest Engineering (COFE) 2005 Annual Conference with

(CONTINUED ON PAGE 21)

Calendar of Events

UNIVERSITY-SPONSORED EVENTS

Course	Dates	Sponsor	Location
GPS Workshop	June 13-15	UW	Eatonville, WA
5th International Conference on Forest Vegetation	June 20-24	OSU	Corvallis, OR
Pacific Northwest Forest Harvesting Study Tour	July 10-23	OSU	San Francisco, CA
Western Forest Genetics Association and Northwest Seed Orchard Managers Association Annual Meeting	July 19-21	OSU	Corvallis, OR
International Symposium on Non-Timber Forest Products	Aug. 25-27	UW	Victoria, BC
LMS Training Workshop	Sept. 14-16	UW	Eatonville, WA
Hinkle Creek Watershed Study Conference	Oct. 6-7	OSU	Roseburg, OR
Regeneration of Interior Forests: Principles and Techniques	Oct. 18-20	OSU	Bend, OR
Third Annual Precision Forestry Symposium	Oct. 24-26	UW	SeaTac, WA
ArcGIS Training Workshop	Dec. 4-6	UW	Eatonville, WA

OTHER EVENTS

Tree School South, June 16, Umpqua Community College, Roseburg, OR. Contact: Elissa Wells at 541-672-4461 or elissa.wells@oregonstate.edu.

Westside Advanced Insect and Disease Field Session, June 27-30, Newport, OR. Contact: WFCA.

Bringing Climate into Natural Resource Management, June 28-30, Hilton Hotel, Portland, OR. Contact: WFCA.

Western Forest Mensurationists Meeting, July 4-7, Naniloa Resort, Hilo, HI. Contact: Terry Droessler at 541-753-4702 x102; terryd@duckcreekassociates.com; www.westernforestry.org/wmens.

Soil, Water and Timber Management: Forest Engineering Solutions in Response to Forest Regulation (COFE Conference), July 12-14, Fortuna, CA. Contact: Loren Kellogg at 541-737-2836 or loren.kellogg@oregonstate.edu.

2005 Family Adventure Day/Tree Day, Aug. 19-20, Udell's Happy Valley Tree Farm, Lebanon, OR. Contact: Mary May at 541-967-3871 or mary.may@oregonstate.edu.

National Reunion for U.S. Forest Service People and Friends, Sept. 4-9, Portland, OR. Contact John Marker at 541-352-6154 or www.oldsmokeys.org.

Beginning Forest Road Design Using RoadEng 4, Oct. 7 or Oct. 20-21, Corvallis, OR. Contact: LEI.

PNW Integrated Vegetation Management Association annual meeting, Nov. 8-9, Portland, OR. Contact: WFCA.

Science and Management of Headwater Streams in the PNW, Nov. 17-18, Corvallis, OR. Contact: WFCA.

Western Forestry Conference, Dec. 6-7, World Forestry Center, Portland, OR. Contact: WFCA.

Joint Washington State/Oregon SAF Leadership Conference, Jan. 20-21, 2006, Kelso/Vancouver, WA, area. Contact: Don Hanley at 206-685-4960 or dhanley@u.washington.edu.

Contact Information

LEI: Logging Engineering International, Inc., 1243 West 7th Ave., Eugene, OR 97403; 541-683-8383; www.leiinc.com.

OSU: OSU College of Forestry Outreach Education Office, Peavy Hall 202, Corvallis, OR 97331-5707; 541-737-2329; http://outreach.cof.orst.edu/.

UW: Bob Edmonds, College of Forest Resources, Box 352100, University of Washington, Seattle, WA 98195; 206-685-0953; bobe@u.washington.edu; www.cfr.washington.edu/events.

WFCA: Western Forestry and Conservation Association, 4033 SW Canyon Rd., Portland, OR 97221; 503-226-4562; richard@westernforestry.org; www.westernforestry.org.

Send calendar items to the editor, *Western Forester,* 4033 SW Canyon Rd., Portland, OR 97221; fax 503-226-2515; rasor@safnwo.org. The deadline for the July/August 2005 issue is June 13, 2005.

SAF Council Meets in Bethesda

BY RICK BARNES

As always, there is a great deal going on at the National Office of SAF. Following are just a few examples of SAF in action from our March 12-13 Council meeting in Bethesda, Maryland.

• Michael Goergen prepared and submitted comments on the Draft Environmental Impact Statement for the Phase II Amendment to the Black Hills National Forest.

• President Helms submitted a letter to the U.S. Green Building Council addressing the Leadership in Energy and Environment (LEED) Green Building Rating System. President Helms did an excellent job of pointing out the many environmental values of using wood as a building material. An example is this quote from his letter, "Wood is a renewable resource and if managed properly, timber from sustainably managed forests can be produced in an environmentally friendly manner in perpetuity. Wood is also bio-degradable and can be recycled to make other wood products."

• Lena Tucker, Oregon SAF chair-elect, testified in Washington, D.C. to the House Resource Committee, Subcommittee on Forests and Forest Health. Lena's testimony was on the progress of the Community Wildfire Protection Plan development and implementation in Oregon and the opportunities and challenges for professional foresters this process presents. The following statement is a portion of her testimony: "Community Wildfire Protection planning presents great opportunities for professional foresters to help communities become better prepared to address wildfire threats, and at the same time, help educate communities and private landowners about the need to address other forest management issues through a landscape planning approach."

VOS Report

By now many of you have heard about the Voluntary Organizational Structure (VOS) Task Force Report. This report was prepared by a committee chaired by Past SAF President David Smith. Council is urging members to study this task force report and provide feedback. Council is looking at the report as a document that stimulates thought with an open mind to the possible options that will be considered. The issues raised in the report will be seriously considered, but other options are open for discussion and consideration as well. The report raises the question: Should SAF change our structure, and if so, what should that structure look like?

The House of Society Delegates (HSD), student leadership, Forest Science and Technology Board and others are giving the report a thorough review. The VOS report will be on many, if not all, of these group's agendas at the National Convention October 19-23. Council is taking the comments received from these important bodies, other committees and individual members very seriously. Comments need to be submitted to Council by November 9, 2005, so Council members will be prepared to discuss the input at their December Council meeting. Although members are always welcome to communicate with me or District 1 Council Representative Ann Forest Burns directly, I recommend that chapters discuss the report and the chapter chairs work with their state executive committee to develop input into the process.

Leadership Academy

SAF is once again sponsoring the Leadership Academy June 11-15 in Nebraska City, Nebraska. This Leadership Academy is a tremendous opportunity for leadership training and to get to know many of the up and coming SAF leaders throughout the nation. The Leadership Academy is open to SAF and non-SAF members. The cost is $310 for SAF members and $360 for non members. The academy benefits participants by providing personal professional growth as well as benefiting employers with employees having improved leadership skills. If you are interested in attending or have an employee you would like to send to this leadership conference, contact Louise Murgia at the SAF National office at 301-897-8720 or murgial@safnet.org.

Oregon SAF Chair-elect Lena Tucker (right) and Rita Neznek, associate director, Forest Policy, at the SAF National Office, take a breather in the hearing room after Lena provided testimony for a February 17 hearing on the accomplishments of the Healthy Forests Restoration Act.

National Convention

A great program is planned for the National Convention to be held October 19-23 in Fort Worth, Texas. The theme is *Harnessing the Power of Forestry*. Presentations will be directed at "Driving Changes in Forestry by Sector" and "Driving Changes in Forestry by Subject." I encourage all of you to attend. ◆

Rick Barnes is District II Council Representative for Oregon. He can be reached at rbarnes@barnesinc.com or 541-673-1208. District I Representative Ann Forest Burns can be reached at aforestburns@msn.com. Both are interested in receiving input and suggestions from members and encourage you to contact them directly.

SAF, HSD and VOS

BY ROD BREVIG

This is a brief discussion of SAF, HSD and the VOS report. Much more could be said, but the focus of this article is a request for you, as an SAF member, to let us know what your vision for the future of SAF is in the next decade.

SAF. The Society of American Foresters does some things very well. SAF provides a definition of and a structure for the profession of forestry in America. SAF, through its members, provides expertise in forestry to the citizens of America and the world. SAF provides a place for professional foresters to enhance their careers and share experiences with their friends and colleagues. SAF also provides professional foresters an organization that is solely dedicated to representing their views on forest policy issues at the local, state and federal levels. Every decade SAF commissions a VOS (Volunteer Organizational Structure) task force to determine if our members are being served in the best way possible.

HSD. The acronym HSD stands for the House of Society Delegates. HSD is comprised of 32 members who are the chairs of state or multi-state societies from across the country. Additionally, HSD has a chair, vice-chair, SAF national staff liaison and the chair for the NSA (National Student Assembly).

HSD began in 1966 with the implementation of a brilliant idea—share governance and provide a home within SAF for leaders from across the country. Our primary goal is to facilitate communication between members and their leaders and back. HSD ensures that SAF remains a grassroots organization. HSD will provide a national forum to review the input of members concerning each of the recommendations in the VOS report and other action items, which come from membership over the course of the year.

VOS. What is it about? The forward to the VOS articulates problems that should be the center of a national discussion in SAF. Each year membership is declining; another 600 were lost in 2004.

Schools across the country are changing the names of their schools of forestry to schools of natural resources, producing students whose focus is not on forestry.

This national discussion needs to focus on the future. How can SAF serve its members and students, and deliver vitally needed science that will guide decision makers as they work with the resource? How can we empower our leaders to be informed, dynamic and effectual in working on local, regional and national issues? SAF provides the Eforester, the Leadership Academy and *The Forestry Source* to further these purposes. What more can be done? Science is delivered to our members through the *Journal of Forestry* and regional journals that are peer reviewed and delivered in various public forums throughout the country. The FS&TB (Forest Science and Technology Board) Chair is a nonvoting member of Council and helps organize presentations at SAF's national conferences. Can more be done? The NSA (National Student Assembly) chair is a part of HSD and part of the HSD Convener calls throughout the course of the year. How do we include students in our local chapters and state societies? The VOS suggests a more rigorous delivery of services to students. Is it appropriate? Can more be done?

The VOS report recommends changes that serve some of these needs.

Some have read the VOS and concluded that the underlying motive for the report is to trim budgets. The authors of the report assure me that they didn't even consider budget impacts during their discussions.

What we need from you

As you review the VOS report, let your state society chair know your views of the recommendations. During your chapter and state society meetings take up a rigorous discussion of the VOS recommendations. Make the VOS report the center of discussion during your meeting rather than an auxiliary item that is given five minutes for a cursory review. Form recommendations of your own that your committees have determined better serve the needs of our members.

The questions of "who we are" and "what we want to be" are centered on the opportunity that presents itself in the problems described in the forward to the VOS report.

To download a .pdf version of the task force report, visit the members only page on the joint WSSAF/OSAF website at www.forestry.org. VOS comments should be directed to your council representative or state chair by June 30. ◆

Rod Brevig is the 2005 HSD chair. He can be reached at 208-334-7733 or rbrevig@tax.state.id.us.

Study Tour *(CONTINUED FROM PAGE 18)*

the theme of "Soil, Water, and Timber Management: Forest Engineering Solutions in Response to Forest Regulations."

Forest harvesting topics of the study tour will include pre-harvest planning, implementation, supervision of operations, and post-harvest assessments including sustainable objectives for non-timber resource values and future forest conditions.

The ultimate goal in this study tour is to encourage dialogue on forest harvesting practices with an international voice. Lessons learned in the Pacific Northwest will be applicable in other parts of the globe as well as vice-versa.

For more information about the study tour visit http://ifei.cof.orst.edu/IFEIstudyTour.htm. ◆

Chad Davis is a faculty research assistant in the Department of Forest Engineering at Oregon State University. He can be reached at 541-737-9926 or chad.davis@oregonstate.edu. Loren Kellogg is a professor in the Department of Forest Engineering and director of the OSU International Degree Program. He can be reached at 541-737-2836 or loren.kellogg@oregonstate.edu.

Policy Scoreboard

Editor's Note: To keep SAF members informed of state society policy activities, Policy Scoreboard is a regular feature in the Western Forester. The intent is to provide a brief explanation of the policy activity—you are encouraged to follow up with the listed contact person for detailed information.

OSAF Adopts Updated Riparian Position and Drafts Old-Growth Statement. At an April 13 meeting the OSAF Executive Committee adopted an updated position statement on "Riparian Forest Management and Fish," which replaces a similar statement that expired in December. The updated position discusses the forestry and fish issue in a more current context (e.g., recent population improvements are mentioned) and more pointedly emphasizes the role of active riparian management as well as the need for broader (e.g., beyond forestlands) research studies and policy alternatives.

Work also continues on a draft position titled "Managing Mature and Old-Growth Forests," although the nature and complexity of this issue has extended the process over many months and draft revisions. OSAF's work on this statement has captured the attention of some SAF leaders outside the Pacific Northwest, as the general issue of old-growth is of wide interest and no current national SAF position exists on this topic.

Members are encouraged to use OSAF's position statements to help convey their professional forestry views to key decision makers and the interested public. The updated OSAF riparian position and all other active statements are on our website at www.forestry.org. The draft position on old-growth can be found in the "members only" section of the site. Contact: Paul Adams, OSAF Policy chair, 541-737-2946; paul.adams@oregonstate.edu.

OSAF Active in Salem this Spring. A few bills have caught OSAF's attention during the 2005 Oregon Legislative Session. One result was a letter and email from Chair Sue Bowers to key legislators expressing concerns about SB 345 and SB 530, bills sponsored by a committee whose majority is from the Portland Metro area. SB 345 would establish permanent conservation reserves on some state forestlands and also designate other state lands as permanent reserves, including those within 300 feet of several major rivers. SB 530 would alter some key language of the Forest Practices Act so that the composition and focus of the Board of Forestry could shift from traditional forest products to broader interests. OSAF leaders hosted an information booth at the Capitol on April 6, which included a handout with OSAF's views on these and other bills under consideration.

Another issue that emerged quickly and elicited a prompt OSAF response was Governor Kulongoski's nomination of Les

AuCoin to the Board of Forestry. Chair Sue Bowers sent a letter to the Governor expressing concern about the nomination, particularly given that AuCoin would replace a unique and capable member, Chris Heffernan. AuCoin eventually withdrew himself from consideration following a controversy that confirmed some of OSAF's concerns about his nomination. It is not known if Governor Kulongoski will submit another nomination, but Heffernan is willing and able to serve for another term, which OSAF supports.

Information about the Board of Forestry is available at http://oregon.gov/ODF/BOARD/index.shtml. To check the outcome of bills related to forestry issues, SAF members should visit the Oregon Legislature website at www.leg.state.or.us/bills_laws/. A search engine provides a tool for finding bills using one or more key words. Contact: Paul Adams, OSAF Policy chair, 541-737-2946; paul.adams@oregonstate.edu.

New Lawsuit Challenges Land Use Plan. Skagit County recently filed suit in state Superior Court asking that a recently adopted land-use plan affecting its trust land be overturned. The county alleges the Lake Whatcom Land Use Plan violates the trust land mandate to maximize revenue for trust beneficiaries. The plan, adopted by the Board of Natural Resources last November, was required by legislation that prescribed several parts of the plan. Skagit County believes the requirements exceed DNR's HCP and Washington's Forest Practices requirements.

Skagit County's action is a fascinating departure from the usual process-oriented lawsuit. The county pre-empts the environmental community, which has threatened to file a mandate-based suit of their own to de-emphasize the trust mandate. Skagit County, however, believes the fact pattern favors their interest in trust land management and seeks to strengthen that mandate. A long path awaits the county as it could take three or four years for the suit to reach the state's Supreme Court.

There is precedent for Skagit County's action. Skamania County won a similar suit in 1983, which overturned a state law that reduced impacts on the forest industry from early 1980s disastrous timber market declines. The State Supreme Court, in a unanimous decision, found that the trusts were to be treated as "real, enforceable trusts," managed for the sole benefit of trust beneficiaries. Skagit will be a very big deal before it's over.

Idaho Adopts New Forestland Valuation Formula. Although family forest owners in Idaho may opt for a yield tax that defers payment until the time of harvest, owners of more than 5,000 acres must pay annual property taxes derived by a productivity-based formula. Many landowners feel the current formula is unfair. A committee of county assessors, landowners and an independent economist (SAF member Bill Schlosser of Northwest Management, Inc.) was appointed to derive a new formula, and it was recently signed into law. Contact: Jay O'Laughlin, IESAF Policy chair, 208- 885-5776; jayo@uidaho.edu.

Wildland Fire Policy Update. The 2005 fire season is underway, and the National Fire Plan, instituted following the 2000 fire season, continues to evolve. Check current developments at www.fireplan.gov/index.html. At this writing, the NFP homepage puts the spotlight on the award-winning Idaho State Fire Plan Working Group, and provides a hot link to http://www2.state.id.us/lands/nat_fire_plan/index_nfp.htm. If you are starved for fire policy documents, check http://www.nifc.gov/fire_policy/index.htm, where you will find many new items posted in the past few months, including a concise Q&A sheet. Contact: Jay O'Laughlin, IESAF Policy chair, 208- 885-5776; jayo@ uidaho.edu. ◆

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