From the SMC Director, David Briggs

Meetings and Events

The SMC held its Fall Meeting on September 16-18 at Campbell River, British Columbia with 44 attendees representing 18 organizations. The SMC has received numerous requests from a variety of non-landowner organizations interested in access to the database. A committee has been working with the University of Washington Office of Intellectual Property and Technology Transfer to develop an appropriate membership category and database licensing agreement for these organizations. The business meeting on the 16th focused on drafts of by-laws and database licensing agreements and on a revised design for Type IV installations. Minutes of the Fall meeting are available on the SMC website www.standmgt.org. The 17th and 18th were field trips to a variety of research sites. It was particularly interesting to see managed plantations of western red and yellow cedar including pruning trials and to discuss some of the management issues associated with the soils and forest types of the Campbell River region.

Director David Briggs and Silviculture Project Leader Eric Turnblom participated in a tour of SMC installations sponsored by the Washington Department of Natural Resources. The objective was to acquaint program managers of DNR with the mission and field programs of the SMC and explore ways that SMC research could be used by DNR.

Research conducted by SMC scientists and Visiting Scholars was featured in 3 papers presented at the IUFRO Working Party S5.01-04 Conference “Connection between Forest Resources and Wood Quality: modelling Approaches and Simulation Software. David Briggs, Eric Turnblom, and Olav Hoibo, former Visiting Scholar from the Agricultural University of Norway collaborated on 2 papers on the profile of branches and on branch growth in Douglas-fir. Eric Turnblom and Gero Becker, former Visiting Scholar from the University of Freiburg, Germany collaborated on a paper crossvalidating Douglas-fir branch models for Douglas-fir in the US and Europe.

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Field Season and Database

During the dormant season of 2001/02, the field crew (Bob Gonyea and Bert Hasselberg) measured 332 plots on 53 installations, performed thinning checks and marked those ready for thinning, fertilized 6 plots and pruned 6 plots. They also surveyed in plots and obtained first measurements on one new hemlock installation. A 3-person summer crew was hired to accompany Randy Collier, SMC research forester and database manager, to perform understory vegetation surveys on 15 installations. With advice from Prof. Steve West, the summer crew also gathered data on wildlife habitat indicators on these installations. A brief description of procedures for measuring the wildlife habitat indicators is presented in this issue. The SMC database was fully updated with new data and distributed to members on CD-ROM. At present, the database contains data on more than a quarter-million trees located on 440 installations with 4503 plots; the typical tree has been measured 6 times.

Congratulations to Associate Professor Eric Turnblom

We all congratulate Silviculture Project Leader Eric Turnblom, who was promoted to Associate Professor in the UW College of Forest Resources effective September 15, 2002.

Rating SMC Plots for Swiss Needle Cast

Aaron Weiskittel and Doug Maguire; Department of Forest Resources, Oregon State University

The emergence of Swiss needle cast (SNC) in the Oregon Coast Range has led to many questions regarding current forest management practices, the role of this native pathogen, and the natural dynamics of Douglas-fir foliage. One of the biggest questions, however, has been the most appropriate method for quantifying and classifying forest health in this region. To date, needle retention ratings are the primary means for assessing SNC severity in stands. Currently, there is little understanding of foliage retention patterns and the factors that influence it for Douglas-fir in this region. Research in Europe indicates that average needle age, genetics, crown position, altitude, and latitude significantly influence needle retention. To help better understand the natural dynamics and the influence of management practices on foliage retention, fourteen SMC plots in Oregon and southern Washington will be assessed for needle retention in the fall of 2002. The plots are all type I installations and only the stands with various thinning levels (1, 4, 7) and fertilization (13, 14, 15) treatments will be assessed. Foliage retention will be visually measured in two ways, namely the standard retention of each crown third as well as the percentage of needles retained for the last five years on a branch on the fifth whorl from the top. The work is part of an MS thesis that is working to develop a more quantitative index for rating SNC severity and the findings will be shared with the SMC cooperative.
Members of the National Council for Air and Stream Improvement (NCASI) descended upon western Washington last month to attend two days of meetings regarding the Fall River Long-Term Site Productivity Study. The first of the two-day affair was held at the US Forest Service Pacific Northwest Research Station in Olympia, WA. Rob Harrison of the University of Washington and the SMC discussed the culmination of three years worth of pre-harvest biomass data for the stand, inclusive of total understory vegetation and coarse woody debris. Graduate student Christopher Licata presented the results of his thesis project illustrating the relationship between the pre-harvest biomass data and its compatibility with regional estimates. The culmination of these two areas of research will allow for the generation of nutrient pool estimates for the pre-harvested site. In addition, Licata discussed the effects of different levels of organic matter removal on the mineralization rates, and consequently, nutrient availability within the various treatments addressed by the study. Of particular interest, nitrogen mineralization and leaching as a function of organic matter removal, a focus of former graduate student Barry Flaming’s thesis, will be further investigated by incoming graduate student Brian Strahm in order to determine the potential mechanisms driving these observations.

The US Forest Service’s Connie Harrington presented the results of continued work by the Forest Service on the effects of microsite condition on microclimate and seedling growth.

Day two found the group headed down to Pacific County, WA for a visit to the field site. Tom Terry of Weyerhaeuser gave a detailed overview of the site, from the general geologic formations that predominate the area, down to the site-specific soil characteristics, and on to cover the methods of harvest and management controls implemented during the installation of the study. At this point, the NCASI team was led through a number of the sample plots which exemplify the various treatment regimes that exist within the site. Then, demonstrations by the likes of the US Forest Service’s Leslie Brodie, and other collaborators, exhibited numerous sampling methods and instruments responsible for data collection. A special thanks to the PI’s on this project, Tom Terry, Connie Harrington and Rob Harrison, NCASI for their research funding, and Leslie Brodie for her contributions on the field tour.
The New Vegetation Sampling Procedure – 2002

Randy Collier, SMC Database Manager/Analyst

It has long been recognized that silvicultural prescriptions have significant impacts upon far more than just the growth of the trees in a forest stand. Different silvicultural practices can radically affect tree growth, stand structure, understory vegetation and of course wildlife.

However very few quantitative measures of stand structure are routinely made of estimators of wildlife habitat. During the summer of 2002 the Stand Management Cooperative’s summer crew enhanced the standard vegetation survey with the inclusion of habitat measures into the vegetation sampling protocol and by expanding the sampling from the type III installations in an attempt to assess every plot in every installation that received a complete measurement over the previous winter season. The vegetation sampling season begins in mid June and depending upon the season ends in early to mid August.

We found that the best crew configuration for this task is a four-person team; two people to locate the center points of the subplots and assess habitat and two persons following to assess the vegetation and the coarse woody debris load of each of the four quadrats of the subplots.

The first step in the procedure is to locate or relocate the centers of each subplot. To do this the northeastern corner and depending on the plot size the relevant distance is measured off from the corner 45° from the plot boundary bearing. Table 1 contains the original distances for the type III installations.

<table>
<thead>
<tr>
<th>Trees Per Acre</th>
<th>Distance to subplot center from MSP corner on the diagonal</th>
<th>% Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>63.8</td>
<td>8.1</td>
</tr>
<tr>
<td>200</td>
<td>51.0</td>
<td>12.1</td>
</tr>
<tr>
<td>300</td>
<td>45.4</td>
<td>14.9</td>
</tr>
<tr>
<td>440</td>
<td>41.6</td>
<td>17.4</td>
</tr>
<tr>
<td>680</td>
<td>43.5</td>
<td>16.1</td>
</tr>
<tr>
<td>1210</td>
<td>39.7</td>
<td>18.9</td>
</tr>
</tbody>
</table>

However with the addition of treatments to the type III installations and acceptance of rectangular treatment plots necessitated an adjustment. So if a plot is not the conventional shape but in a type III installation the distance is 42 feet.

In the type I and II installations if the plot size is 0.5 acres then the distance is 66 feet. If the plot size is 0.2 acres, i.e., pruned plots, then the distance is 33 feet.

Once the subplot centre is located it is marked with a 2 foot PVC pipe and when weather permits the plot and subplot number are marked on the pipe with a sharpie pen. The centre is also marked with flagging ribbon to facilitate locating the point by the following botanists. This procedure is repeated in a clockwise manner for the remaining subplots in the measurement sample plot.
The botany crew follows the location crew and does the four quadrats of the first 3.6 metre radius subplot together. This allows the botany people to calibrate their visual estimates of percentage cover of each species and coarse woody debris by size and decay class present in each of the four quadrats. After the first subplot has been assessed for vegetation, the botany team splits up with each person assessing a subplot alone in a ‘ leap-frog’ sequence.

Once the location crew has completed locating and marking all of the subplots, they then commence to assess each quadrant for cover and depth of duff.

The cover assessment is done with a cover board that consists of a window shade 3.2 m long by 0.7 m wide. This window shade is mounted on a pruning pole and has a 3 by 0.5 m grid of 10 by 10 cm cells that are color coded in 1 m high segments. See Figure 4.

To assess cover, the person who handles the cover board sets it up at the subplot centre facing north. The observer moves to a position 7.2 m from the subplot centre and crouches down to an observation height of 0.5 m and counts the number of visible squares lower than 1 m. The observer then stands to an observation height of 1.5 m and counts the number of visible squares between 1 and 2 m as well as the number of visible squares above 2 m.

The observer also uses a steel stake to probe the duff level down to mineral soil and records that depth to the closest centimeter.

The observer then moves to a point 7.2 m to the east of the centre point and repeats the process. This continues on at the southern and western observation points and is repeated at subsequent subplot centers throughout the installation.

The assessment rates vary depending upon the density and complexity of the stand understory. Our experience shows that on average a four person survey crew can reasonably be expected to average a complete assessment of six plots per day. Figures 5 and 6 show the probing procedures.

Figure 3: Marked Subplot Center

Figure 4: Cover board

Figure 6: Measuring Duff Depth
Luciana Ingaramo
Graduate Student
University of Washington, College of Forest Resources

My interest in Forestry started while I was in 3rd year of the School of Agronomy at University of Buenos Aires, Argentina. When the professor at that time showed us some pictures of people measuring trees in a big range of different environments: on the snow, in tropical forests, in beautiful and neat plantations and all around the world, I realized that forestry was something very diverse and exciting. The idea of traveling to remote and beautiful places while working really trapped me.

Before entering the School of Agronomy I studied Biology, but that is a very broad science, and I had the feeling that it was too theoretical, and that I would never be able to apply the huge amount of concepts that I was learning. The need for solving problems, and in a natural environment, on the ground, really got me.

While finishing my last year, and doing my undergraduate thesis, I started to work in the Forestry Department as a teacher and research assistant. The project consisted in the evaluation and management of the natural regeneration of slash pine, an exotic species that has been planted for many years, in Northern Argentina.

After finishing school I started to work for the Argentinean government, with the Agency that regulates subsides the government gives to landowners for reforestation. My job consisted of evaluating the forestry projects that the landowners presented, both in the office, through remote sensing, and in the field, by checking the success of the implantation and the covered surface. This gave me the opportunity to learn about the use of satellite images and GIS in the natural resources field and also, and very important to me, to travel all over the country and have the chance to see the necessities of forest landowners that usually are isolated in the countryside, especially with the very small landowners, that are a big proportion in my country.

After a couple of years of finishing school, I wanted to go back and continue my studies. Still there was a lot to learn, and a master's degree outside the country sounded like an irresistible opportunity, especially in the Pacific Northwest, the region of the biggest trees. I started my program at University of Washington in Silviculture, and the relationship between planting spacing and wood quality is the subject of my research. I still have that necessity of doing research in aspects that can be used directly to give answers to forest landowners.

In my free time, (which is not very much being a graduate student), I like to play tennis, sail and be outdoors, especially when it is sunny.
The objective of this study is to link radiata pine tree characteristics to the quality and value of boards in New Zealand (NZ) Cuttings, NZ Visual Framing, and Australian Machine Stress Grades (MSG) from both clonal and standing tree perspectives. Specifically, this paper presents an analysis of clonal variation in the quality and value of 2 x 4s, establishing the relationships between the tree and products characteristics, and documents the broad sense heritability of the tree variables associated with product value.

Ten clones were selected to cover a broad range of radiata pine representative of the forest being harvested in New Zealand in the coming years. Two trees were harvested for each clone. The trees were pruned up to 4 m. The stems were cut into logs, and four logs were cross-cut to be sawn: the pruned butt log and three unpruned. The yield analysis was performed separately for pruned and unpruned logs. Tree quality assessed included DBH, Branch Index, Intemode Index, bulk density, outer wood density (from increment cores), ring width, microfibril angle, spiral grain, tracheid length, and compression wood. On the lumber pieces, knot area ratio was also assessed. The value of boards in NZ Cuttings from pruned butt logs averaged 333 $/m\text{3}$ as compared to 204 $/m\text{3}$ for unpruned upper logs. There was no significant difference between clones for boards from the pruned butt logs (P = 0.12), but there were highly significant differences between boards from unpruned upper logs. Regression analysis showed that best performing clones among the unpruned upper logs were the ones with small branches. Regression analysis showed that best performing clones among the unpruned upper logs were the ones with small branches.


For decades, initial spacing of 2 m x 2 m has been used for black spruce reforestation in eastern Canada. In recent years, however, wider spacings for black spruce are being advocated to reduce establishment costs and accelerate tree growth. Wider spacings will affect not only return on investment but also the quality of products from the plantations, both of which are critical to the success of reforestation programs. As part of a multidisciplinary project, this study evaluated and quantified the impact of initial spacing on lumber grade yield, bending properties, and MSR yield in this species. Furthermore, visual grades of the plantation-grown lumber were compared for their bending properties and their compliance to the current grade requirements for bending stiffness. A total of 139 sample trees were collected from 4 different spacings (3,086, 2,500, 2,066, 1,372 trees/ha) in a 48-year-old initial spacing trial, and 849 pieces of 2-in. thick lumber from the 4 spacings were graded visually and tested for bending strength and stiffness.

With decreasing initial stand density from 3,086 to 2,066 trees/ha, branch diameter showed a steady increase. However, the 3 higher stand densities (3,086, 2,500, and 2,066 trees/ha) had a comparable Select Structural (SS) grade yield thanks to the relatively small branches in these species. Lumber strength and stiffness in those 3 spacings were also quite comparable. When the initial stand density was further reduced to 1,372 trees/ha, however, a remarkable decrease in the SS grade yield due to knots occurred, and lumber strength and stiffness also decreased significantly. The real concern occurred when the plantation-grown lumber was compared to that from natural stands currently being processed in eastern Canada. On average, the plantation-grown black spruce lumber stiffness was 28.9% lower than that of lumber from the natural stands. As a result, a high percentage of the plantation-grown lumber did not meet the bending design values. However, the percentage of the compliance to the design values tended to increase with increasing initial stand density. This article discusses the possible causes for the significantly lower bending properties of the plantation-grown lumber, and potential solutions for increasing lumber properties and the percentage of the compliance.


In recent years, eastern redcedar has been the most rapidly expanding tree resource in the Great Plains from Oklahoma to South Dakota, primarily in rangelands and pastures. Based on these increases and potential management-related problems, eastern redcedar is perceived as a threat to the rangeland resource. Pruning eastern redcedar can allow for increased herbaceous growth under the eastern redcedar’s crown, improve livestock handling, maintain the species for diversity and habitat contributions, and improve wood quality for potential future utilization by forest industries. To determine the effect of pruning at different heights on tree growth, we compared unpruned trees’ total height and diameter to trees pruned from ground level to heights of 60, 90, 120, and 150 cm. No significant differences in the total height were found for all pruning treatments over all time periods. After more than 10 yr, trees pruned to 60, 90, and 120 cm had smaller diameters at ground level than unpruned trees. There were no differences in ground diameters for trees pruned to 150 cm compared to unpruned trees after 4 yr of growth. There were no significant differences in dbh for eastern redcedar trees pruned to all heights. Management of eastern redcedar, including pruning, is recommended as an alternative to control measures.
Upcoming Meetings and Events

The SMC Spring meeting will be held at McMenamin's in Troutdale, OR on April 23/24, 2003. Log onto the SMC web site for more information: http://www.standmg.org.

The Levels of Growing Stock meeting and tour will be on July 8-9, 2003. Those interested should contact Norm Andersen at: norm.andersen@wadnr.gov for further information and to get on the mailing list.

The second International Precision Forestry Symposium on June 15-18, 2003 on the UW campus. Those interested should contact Megan O'Shea at moshea@u.washington.edu, or log onto the PFC Symposium site for more details: http://www.cfr.washington.edu/Outreach/PreFor/index.html