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MISSION AND ORGANIZATION

Mission

To provide a continuing source of high-quality information on the long-term effects of silvicultural treatments and treatment regimes on stand and tree growth and development and on wood and product quality.

Organization

The SMC is composed of forest industry, state, provincial, and federal agencies, suppliers, and universities and other institutions who commit resources and expertise to the mission. The voting Policy Committee, composed of dues-paying members, controls policy with the goal of establishing the highest possible technical standards in carrying out its mission. Technical Advisory Committees (TACs) in Silviculture, Nutrition, Wood Quality, and Modeling, comprised of leading scientists, have been created to develop plans for research projects that are approved by the Policy Committee. The SMC is headquartered at the College of Forest Resources, University of Washington, which provides administration and staffing.
2003 HIGHLIGHTS

1. **Type IV Installations**

   Agreement was reached with the Northwest Tree Improvement Cooperative on the Genetic Gain/Type IV trial design for the Grays Harbor breeding zone. Six installations, each with 22 plots, will be planted; three in early 2005 and three in early 2006. Specifications have been developed for installation sites and candidate area forms have been distributed. Field trips to visit candidate areas and select sites will be conducted in early 2004. The Sylvan Vale Nursery, Black Rock, Vancouver Island, BC, has been contracted to grow the seedlings (“Elite” seedlings in photo).

2. **By-Laws**

   The SMC By-Laws were approved at the spring meeting formalizing the Landowner, Analytic Organization, Supplier, and Institutional membership categories. Work remains to be done with respect to the database and intellectual property.

3. **Membership**

   Lone Rock Timber Company joined the SMC as a Landowner member and Hancock Forest Management rejoined. Jim Flewelling, Forest Technology Group, J.S. Thrower, and Mason, Bruce, and Girard joined as Analytic Organization members. Willamette Industries no longer appears as a member since it was purchased by Weyerhaeuser Company.

4. **Budget**

   Dues received from members declined by $41,000 from 2002 to about $536,000. A large decline in the budget for 2003 was anticipated due to the USFS dropping its membership and the acquisition of Willamette Industries by Weyerhaeuser. There was a further unanticipated loss due to a general decline in acreage owned by members. These losses were partially offset by Lone Rock and Hancock but the net result was the $41,000 decline. The budget year started with a reserve balance from 2002 of $54,000 which was developed to buffer the anticipated dues reductions. During 2003, the budget supported a summer field crew and provided partial support to several graduate students. The year ended with a $35,000 reserve, a drop of $19,000. This is much less than the $41,000 dues loss which was partially offset by special contracts and external grants which paid for some staff expenses.

5. **Research**

   In 2003, the SMC obtained $17,000 in special contract funds from members and $194,000 in new or continuation external grant funds; both were substantial increases over 2002. These funds support graduate students and staff. Brief descriptions and status reports of current projects can be found in the Research Projects section.
6. Personnel

Seven students were supported on a combination of special research contracts with SMC members, external grants, and SMC funds. In addition, 3 undergraduate students were employed as members of the summer field crew or as laboratory assistants.

Dr. A.B. Adams, Research Analyst III, College of Forest Resources, University of Washington continued his collaboration with Rob Harrison on the Carbon Sequestration project that is supported by the Center for Research on Enhancing Carbon Sequestration in Terrestrial Ecosystems, the DOE through the Oak Ridge National Labs.

7. Field Installations

2003/2004 Season

A total of 51 installations (310 plots) were visited for full measurements, treatment trigger checks and to conduct treatments as needed. Six carry-over effects study installations were also measured. The summer field crew, consisting of Randy Collier, Teresa Hirsch, Holly Mounce, Jennifer Leach, and Frithiof Waters visited 9 Type I, 3 Type II, and 8 Type III Installations to measure understory vegetation and gather data on habitat indices using a cover board to assess vertical distribution of vegetation and a probe to measure the depth of the duff.

2004/2005 Season Plan

A total of 81 installations (358 plots) will be visited in the 04/05 season. This includes 5 installations in British Columbia that will be measured by the BC Ministry of Forests, Research Branch. It also includes creating the first three Genetic Gain/Type IV installations (66 plots).

8. Database

The database currently contains data from 443 installations of which 90 are currently active SMC research installations. The updated database was shipped to those members who requested them on a CD-ROM in mid-June.

9. Meetings, Workshops & Conferences, and Publications

The SMC held Spring and Fall Meetings as well as Silviculture and Modeling TAC meetings. Minutes of these meetings can be found at the end of this report.

A field tour for Lone Rock Timber Company personnel was held on July 24 and SMC scientists participated in a variety of symposia, conferences & workshops.

Researchers associated with the SMC produced 6 articles for professional journals and symposium/workshop proceedings. Many of the publications are available at www.standmgt.org.
BY-LAWS OF THE STAND MANAGEMENT COOPERATIVE

First Adopted: April 22, 2003
Most recent amendment: Sept. 22, 2003

ARTICLE I: Name

The name of this organization shall be the Stand Management Cooperative (SMC).

ARTICLE II: Mission

The Mission of the SMC is “To provide a continuing source of high-quality data and information on the long-term effects of silvicultural treatments and treatment regimes on stand and tree growth and development and on wood and product quality.”

ARTICLE III: Scope and Limitations

The territorial coverage of the programs and activities of the SMC consists of forested lands west of the Cascades in Oregon and Washington, northern California, and coastal British Columbia.

ARTICLE IV: Location and Contact

1. The SMC headquarters are located in the College of Forest Resources, University of Washington, Seattle, WA.
2. Contact with the SMC headquarters can be made via
   a. its web site  (www.standmgt.org)
   b. telephone  206-543-9744 or 206-543-1581
   c. FAX  206-685-3091
   d. Email: Director: David Briggs (dbriggs@u.washington.edu)
      Staff: Megan O’Shea (moshea@u.washington.edu)

ARTICLE V: Membership Categories

1. Land Managing Organizations
   a. Public agencies and private companies that manage forest land provide funds to support the mission and provide land and operational support for field research sites.
   b. A Memorandum of Agreement governs the relationship between the Land Managing Organization members and the SMC. Each member agrees to terms presented in the renewable annual Memorandum of Agreement. An example is presented in ANNEX A.
   c. Organizations wishing to join the SMC as a Land Managing Organization member do so through a written request to the Director. The application is presented to the Policy Committee at its next meeting for approval.

2. Analytic Organizations
   a. Organizations that utilize information gathered through SMC research and stored in its database for the purpose of producing and marketing information, products and service.
   b. A Memorandum of Agreement governs the relationship between the Analytic Organiza-
tion members and the SMC. Each member agrees to terms presented in the renewable annual Memorandum of Agreement. An example is presented in ANNEX B.

c. Organizations wishing to join the SMC as an Analytic Organization member do so through a written request to the Director. The application is presented to the Policy Committee at its next meeting for approval.

3. Institutional Organizations
   a. Universities, research laboratories, and trade associations are Institutional members that provide scientist time, laboratory and office space and other services to the SMC. Also research grants from external sources leveraging SMC investments in field sites may be received by these institutions or provided by them.
   b. Organizations wishing to join the SMC as an Institutional member do so through a written request to the Director. The application is presented to the Policy Committee at its next meeting for approval.

4. Supplier Organizations
   a. Organizations that provide materials and supplies to the SMC or its members may become a Supplier member.
   b. Organizations wishing to join the SMC as a Supplier member do so through a written request to the Director. The application is presented to the Policy Committee at its next meeting for approval.

ARTICLE VI: Fees & Continuing Membership

Dues and fees are established by the Policy Committee.

1. Land Managing Organizations
   Annual dues are calculated by a funding formula established by the Policy Committee. Membership is retained through payment of assessed dues.

2. Analytic, Institutional, and Supplier Organizations
   Annual dues are not assessed. Continuing membership is maintained through an annual vote by the Policy Committee based on active participation and contribution to the SMC mission.

ARTICLE VII: Voting and Representation

1. Organizations under ARTICLE V, paragraphs 1, 2 and 3, are voting members of the SMC Policy Committee.
2. Each such voting organization designates one individual as its representative on the Policy Committee and has a single vote.

ARTICLE VIII: Receipt of SMC Database, Research Tools and Services

1. Each Land Managing Organization member receives
   a. an annual updated version of the complete SMC database.
   b. copies of the SMC Annual Report and Quarterly Newsletter.
   c. one free printed copy of research papers and technical reports with a discount for additional printed copies (electronic copies are free from the SMC website).
   d. unlimited access to SMC staff for questions and technical support “as available” in consideration of their institutional obligations.
2. Each Analytical Organization member receives
   a. An annual updated version of the complete SMC database.
   b. copies of the SMC Annual Report and Quarterly Newsletter.
c. one free printed copy of research papers and technical reports with a discount for additional printed copies (electronic copies are free from the SMC website).

d. unlimited access to SMC staff for questions and technical support “as available” in consideration of their institutional obligations.

3. Each Institutional and Supplier Organization member receives
   a. copies of the SMC Annual Report and Quarterly Newsletter.
   b. one free printed copy of research papers and technical reports with a discount for additional printed copies (electronic copies are free from the SMC website).

4. All recipients of any portion of the SMC database must comply with the SMC Database Policy (ANNEX C).

ARTICLE IX: Management

1. The management policies and operations of the SMC shall be vested in a Policy Committee as defined in Article VII.
2. A Director, appointed by the Dean of the College of Forest Resources, University of Washington, and approved by the Policy Committee, will be responsible for operational management of the SMC. A review of the Director’s performance may be initiated by the Dean every 5 years per University of Washington policy or at any time per request from the Chair of the Policy Committee. Enaction of a review and appointment of the review committee membership are at the discretion of the Dean.

ARTICLE X: Election

1. The term of the Chair of the Policy Committee is 2 years. At the end of the term, which is a Fall Meeting, the current Vice-Chair will become Chair effective 30 days after the date of that meeting.
2. At this same Fall Policy Committee meeting, a new Vice-Chair is elected and will serve 2 years as Vice-Chair followed by 2 years as Chair.
3. All elections and resolutions, unless specifically provided for, shall require a majority vote of the members in attendance.
4. Fifty percent of the members shall constitute a quorum at any annual or special meeting of the SMC for the transaction of business. Proxy votes submitted to the Director or Chair of the Policy Committee shall be included in achieving a quorum.

ARTICLE XI: Powers and Duties of the Policy Committee

1. The Policy Committee defines the dues structure of the SMC and approves annual budgets prepared by the Director.
2. The Policy Committee approves all research activities utilizing funds obtained through the dues assessments.
3. The Policy Committee elects a Chair and Vice-Chair.
4. The Policy Committee consults with the Dean of the College of Forest Resources in appointing the Director and any subsequent reviews and consults with the Dean and Director in appointing Technical Advisory Committee leaders and hiring staff.

ARTICLE XII: Meetings

1. The SMC shall have two meetings of the Policy Committee each year; one in April (Spring Meeting) and one in September (Fall Meeting) at a specific date and location determined by the Policy Committee. Special meetings may be called at the discretion of the Policy Committee. Notices of meetings shall be sent to all members at least 2 weeks prior to the meeting. Such notice will be sent to the last known address of the member as it appears in the membership database.
2. Technical Advisory Committees. TAC’s shall meet on dates and places as determined by the appropriate TAC Project Leader. Notices of meetings shall be sent to all members at least 2 weeks prior to the meeting. Such notice will be sent to the last known address of the member as it appears in the membership database.

**ARTICLE XIII: Technical Advisory Committees**

Each Technical Advisory Committee (TAC) is headed by a Project Leader approved by the Policy Committee. TAC’s provide technical review and advice to the Policy Committee on field activities and research projects being conducted by SMC staff or affiliated scientists. The need for, definition of, and effectiveness of TAC’s will be reviewed by the Policy Committee every 2 years.

**ARTICLE XIV: Duties of Officers**

1. The duties of the Chair of the Policy Committee shall be to preside at the regular and special meetings of the SMC.
2. The Vice-Chair shall perform the duties of the Chair in the absence of the Chair and such other duties as may be delegated by the Policy Committee.
3. The Director shall be responsible for all operations of the SMC, supervision of employees and students. He/she reports to both the Chair of the Policy Committee and to the Dean, College of Forest Resources, University of Washington.

**ARTICLE XV: Property**

The real property of the SMC shall be in the custody and at the disposal of the Dean of the College of Forest Resources, University of Washington for reallocation to other uses at the College. Each member of the SMC owns the data collected from its land holdings. The University of Washington acts as an agent for SMC member data for the purposes of collecting and storing said data. The University of Washington shall be the sole licensor for SMC databases, research tools and other SMC services.

**ARTICLE XVI: Conduct of Meetings**

The meetings shall be conducted under the rules of procedure contained in M.A. DeVries (1998) *The New Robert’s Rules of Order, 2nd Ed.* Signet, NY. When a conflict of interest arises, the member will be recused from voting.

**ARTICLE XVII: Vacancies**

1. Any vacancy in the Office of Chair of the Policy Committee shall be filled immediately by the Vice-Chair.
2. Any vacancy in the Office of Vice-Chair shall be filled by nominations and vote at the next regular Policy Committee meeting.

**ARTICLE XVIII: Amendments**

The By-laws of the SMC may be amended by a two-thirds vote of the full membership at any regular or special meeting provided notice of such amendment shall have been sent to all members by the Director at least two weeks prior to such meeting.
ANNEX A

MEMORANDUM OF AGREEMENT BETWEEN LAND MANAGING ORGANIZATION COOPERATORS AND THE UNIVERSITY OF WASHINGTON IN THE STAND MANAGEMENT COOPERATIVE
(cop available upon request)

ANNEX B

MEMORANDUM OF AGREEMENT BETWEEN ANALYTIC ORGANIZATION COOPERATORS AND THE UNIVERSITY OF WASHINGTON IN THE STAND MANAGEMENT COOPERATIVE
(cop available upon request)

ANNEX C

Stand Management Cooperative Data & Publication Policy
As Presented at Spring 2004 Policy Committee Meeting

I. Data & Database

A. Definition

Data are defined as any measurements of stands, trees, or products (a) developed by the SMC research program or (b) shared with the SMC and another organization and for which the SMC has direct responsibility. The Database is defined as all data resulting from efforts of the integrated program, the Regional Forest Nutrition Research Project (RFNRP), and the Stand Management Cooperative; for policy matters no distinction will be made among these three sources of data.

B. Data & Database Rules

1. All organizations, member or non-member, have access to data from installations on their own land at any time.

2. Upon request, each SMC member receives a CD copy of the annually updated database. Updates are generally available at mid-year. Costs of special requests to SMC staff for retrieving, analyzing, reporting, and/or transmitting data will be borne by the Cooperator requesting the data.

3. SMC members have access to all data collected from SMC-supported studies under the condition that the data will not be released to non-member organizations with the exception that a member may temporarily share data with confidentially bound assigns for the sole purpose of having analyses performed for the benefit of the SMC member with the assign allowed to make no further use of the data or analyses.

4. It is recognized that certain individuals and organizations who are not SMC members may desire access to the SMC database for research or other purposes without joining. Requests for data in these situations will be treated on a case-by-case basis. The individual or organization will submit to the SMC Director a written proposal request outlining the analysis planned, plans for use and/or publication of results, and the specific data requested. The proposer must agree to (a) share results of their analyses with the SMC and (b) to provide a review draft of any related publication. The Director will present the request to the Policy Committee for approval. Upon approval, a formal agreement, including a Licensing Agreement and appropriate fees, will be negotiated by the SMC and the proposing entity through the University of Washington Office of Software and Copyright Ventures.
5. Data shared with the SMC by other organizations will not be available to any other member or non-member organization without the express permission of the sharing organization. Data shared with the SMC are to be used for accomplishment of SMC goals, and only results and summaries from analyses are to be published. Shared data will be considered as proprietary information and the designated analyst(s) will take every precaution to ensure confidentiality.

II. Publications, software, models and other works.

1. SMC members are encouraged to share results from their analyses involving use of SMC data. Any publications or products resulting from the use of SMC data must credit that fact.

2. Analyses derived in whole or in part on SMC data may not be shared with non-SMC members except through open publication.

3. Results of analyses, software, or models based on the SMC database produced by UW faculty, staff, students, and designated analysts appearing in peer-reviewed journals, theses, symposium proceedings, and other media are owned by the University of Washington and administered by the Cooperative Director. SMC members will receive copies of these works. These works may be copyrighted by the UW, the authors, or the publishing entity.

4. Non-UW members may also develop and publish analyses, software, or models based on the SMC database. Copyright, if any, established on any such works remains under the ownership and control of their respective authors (or assignees).

5. SMC members and non-members wishing to use or distribute copyrighted materials must obtain appropriate permissions from the copyright owner(s).

6. The SMC data used in the development of any copyrighted or un-copyrighted works remains the property of the University of Washington and subject to the distribution rules in Section I.

Changes and exceptions to this Policy must be approved by the Policy Committee.

Presently under final review for formal adoption.
SMC MEMBERS AND POLICY COMMITTEE REPRESENTATIVES

Land Managing Organizations

Boise Cascade Corporation
Bureau of Land Management
Campbell Group
Cascade Timber Consulting
Forest Systems, Inc.
Hampton Tree Farms
Hancock Forest Management
King County Department of Natural Resources
Lone Rock Timber Consulting
Longview Fibre Company
Olympic Resources Management/Pope Resources
Oregon State Department of Forestry
Pacific Denkman
Plum Creek Timber Company
Port Blakely Tree Farms
Quinault Department of Natural Resources
Rayonier Timberlands
Simpson Timber Company
TimberWest Coast-Timberlands
Washington State Department of Natural Resources
West Fork Timber Company
Weyerhaeuser Company

Steve Kleinschmidt
Larry Larsen
Dave Rumker
Howard Dew
Dan Stransky
Dennis Creel
Dean Stuck
Peggy Leonard
Jake Gibbs
Bob Roth
Scott Holmen
Doug Robin
Duane Weston
Steve Wickham
Mike Mosman
Jim Plampin
Lawrence Raynes
Randall Greggs
Hamish Kerr
Norm Andersen
Gene McCaul/Scott Swanson
David Hyink

Analytic Organizations

Forest Technology Group
Jim Flewelling Biometrics Consultant
J.S. Thrower Consultants
Mason, Bruce & Girard

Kurt Muller
Jim Flewelling
J.S. Thrower
Steve Fairweather

Suppliers

Agrium US INC.
J.R. Simplot
Prodica, LLC

Greg Larson
David Jackson
Rick Gross

Institutions

B.C. Ministry of Forests, Research Branch
Forintek Canada
Oregon State University
University of British Columbia
University of Washington
U.S. Forest Service PNW Research Station
West Coast Lumber Inspection Bureau

Barrie Phillips/Louise DeMontigny
Gerry Middleton
Doug Maguire
Valerie LeMay
David Briggs
Charley Peterson
Brad Shelly
TECHNICAL ADVISORY COMMITTEES

Modeling Project
Project Leader, Greg Johnson,
Weyerhaeuser Company
David Briggs, University of Washington
Jim Flewelling, Biometrics Consultants
Dave Hamlin, Campbell Group
David Hyink, Weyerhaeuser Company
Dave Marshall, USFS PNW Research Station
Fred Martin, Washington Dept. of Natural Resources
Bob Meurisse, USFS Pacific Northwest Region
Bob Monserud, USFS PNW Research Station
Eric Turnblom, University of Washington
Larry Wiechelman, Quinault Dept. of Natural Resources

Nutrition Project
Project Leader, Rob Harrison,
University of Washington
David Briggs, University of Washington
Louise de Montigny, B.C. Ministry of Forests
Bob Edmonds, University of Washington
Barbara Gartner, Oregon State University
Randall Gregg, Simpson Timber Company
David Hann, Oregon State University
Denny Hill, Campbell Group
Greg Johnson, Weyerhaeuser Company
Bob Meurisse, USFS Pacific Northwest Region
Stephen H. Schoenholtz, Oregon State University
William Scott, Weyerhaeuser
John Shumway, USFS PNW Research Station
Tom Terry, Weyerhaeuser Company
Eric Turnblom, University of Washington
Gordon Weetman, University of British Columbia

Silviculture Project
Project Leader, Eric Turnblom,
University of Washington
Norm Andersen, Washington Dept. of Natural Res.
David Briggs, University of Washington
Robert Curtis, USFS PNW Research Station, retired
Louise de Montigny, B.C. Ministry of Forests
Alex Dobkowski, Weyerhaeuser Company
Carri Gaines, Quinault Dept. of Natural Res.
Randall Greggs, Simpson Timber Company
David Hann, Oregon State University
Connie Harrington, USFS PNW Research Station
Rob Harrison, University of Washington
Denny Hill, The Campbell Group
David Hyink, Weyerhaeuser Company
Greg Johnson, Weyerhaeuser Company
Jessica Josephs, Rayonier Timberlands
Eini Lowell, USFS PNW Research Station
Gene McCaul, West Fork Timber Co.
Dave Marshall, USFS PNW Research Station
Peter Marshall, University of British Columbia
Mike Mosman, Port Blakely Tree Farms
Charlie Peterson, USFS PNW Research Station
Jim Plampin, Quinault Department of Natural Res.
Larry Raines, Rayonier Timberlands
Doug Robin, Oregon Department of Forestry
Bill Scott, Weyerhaeuser Company
Nick Smith, Weyerhaeuser Company
Al Waters, TimberWest Forest Corp.
Duane Weston, Pilchuck Tree Farms

Wood Quality Project
Project Leader, Eini Lowell, PNW Research Station
Jamie Barbour, PNW Research Station
David Briggs, University of Washington
Jeff DeBell, Washington Dept. of Natural Resources
Roger Fight, USFS PNW Research Station
Barbara Gartner, Oregon State University
David Hann, Oregon State University
Greg Johnson, Weyerhaeuser Company
Bob Megraw, Weyerhaeuser Company, retired
Gerry Middleton, Forintek Canada
Bob Monserud, USFS PNW Research Station
Dave Rumker, Campbell Group
Brad Shelley, West Coast Lumber Inspection Bureau
Eric Turnblom, University of Washington
The formula for dues calculations remained unchanged; the last dues change occurred in 1997. Member dues decreased from $577,458 in 2002 to $535,805 in 2003 (Table 1, Figure 1), a drop of $41,653. Although Lone Rock Timber Company joined the SMC and Hancock Forest Management rejoined, these were offset by the decision of the USFS to leave the SMC, the acquisition of Willamette Industries by Weyerhaeuser Company, and decreases in landholdings of several other members. Special contracts with members rose from $12,000 in 2002 to $17,000 in 2003 which helped mitigate some of the loss in dues. Institutional members provided the equivalent of $157,648 in the form of salaries of scientists, facilities, administrative support, and in the case of BC Ministry of Forests, field measurements on SMC Installations located in BC. Funding from external grants received by SMC scientists totaled $194,092. These external funds supported several graduate students and we had one project which was a contract to hire SMC staff thereby producing savings in the SMC budget. Total funding from all sources was $904,929. This does not include substantial in-kind time contributed by members participating on SMC Committees nor donations of expertise and materials by supplier members.

2003 began with a positive reserve of $57,857 hence funds available for operations were $611,066 compared to $643,678 in 2002. Table 2 and Figure 2 provides a balance sheet for 2003. Salaries include the permanent SMC staff as well as hiring 4 persons for the summer field crew, hourly helpers and support for graduate research assistants. Most of the salary expense along with a large share of travel and supplies supports field measurement activities and the associated database management. At the end of 2003, the reserve to enter 2004 was $35,004.
### TABLE 1: 2003 FINANCIAL SUPPORT

<table>
<thead>
<tr>
<th>COOPERATOR</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formula dues:</strong></td>
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</tr>
<tr>
<td>Boise Cascade</td>
<td>$17,126</td>
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<tr>
<td>Bureau of Land Management</td>
<td>$73,730</td>
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<tr>
<td>Campbell Group</td>
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<td>Cascade Timber Consulting</td>
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<td>Forest Systems, Inc.</td>
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<td>Hampton Tree Farms</td>
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<tr>
<td>Hancock Forest Management</td>
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<tr>
<td>King County Dept. Natural Res.</td>
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<tr>
<td>Lone Rock Timber Company</td>
<td>$15,808</td>
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<tr>
<td>Longview Fibre</td>
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<tr>
<td>Oregon Dept. Forestry</td>
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<td>Pilchuck Tree Farms</td>
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<td>Plum Creek Timber Co.</td>
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<td>Olympic Resources Mgt/Pope Res.</td>
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<td>Port Blakely Tree Farms</td>
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<td>Quinault Dept. Natural Res.</td>
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<td>TimberWest-Coast Timberlands</td>
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<td>Washington Dept. Natural Res.</td>
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<td>West Fork Timber Co. LLC</td>
<td>$7,625</td>
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<tr>
<td>Weyerhaeuser Company</td>
<td>$75,730</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$535,805</td>
</tr>
<tr>
<td><strong>Member Contracts, Grants, etc.</strong></td>
<td>$17,404</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$553,209</td>
</tr>
<tr>
<td><strong>Less credits for in-kind days</strong></td>
<td>$-</td>
</tr>
<tr>
<td><strong>Net Cash Contributions</strong></td>
<td>$553,209</td>
</tr>
<tr>
<td><strong>Institutional Contributions</strong></td>
<td></td>
</tr>
<tr>
<td>B.C. Ministry of Forests</td>
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<td>Oregon State University</td>
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<td>University of Washington</td>
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<td>USFS PNW Research Station</td>
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<td><strong>Subtotal</strong></td>
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<td><strong>External Research Grants</strong></td>
<td>$194,072</td>
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<td><strong>TOTAL</strong></td>
<td>$904,929</td>
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# TABLE 2: 2003 BUDGET

<table>
<thead>
<tr>
<th>INCOME</th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula Funding</td>
<td>$535,805</td>
<td>87.7%</td>
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<tr>
<td>Contracts</td>
<td>$17,404</td>
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</tr>
<tr>
<td>Subtotal</td>
<td>$553,209</td>
<td>90.5%</td>
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<tr>
<td>In-kind credits</td>
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</tr>
<tr>
<td>Net Cash Contributions</td>
<td>$553,209</td>
<td>90.5%</td>
</tr>
<tr>
<td>2002 Ending Balance Forward</td>
<td>$57,857</td>
<td>9.5%</td>
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<td><strong>Total Funds Available</strong></td>
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FIELD WORK AND DATABASE REPORTS

Bob Gonyea, Field Coordinator, Bert Hasselberg, Field Technician, Randy Collier, Research Forester, John Haukaas, Database Specialist

FIELD WORK

The table summarizes the number of field installations and plots visited during the 02/03 and 03/04 field seasons along with the planned visits for the 04/05 season. This table does not indicate the multitude of activities performed on these installations. A fuller appreciation of the diversity of activities and scope of the workload is detailed in the 2003/2004 summary following the table.

| SMC Field Schedule: 2002-2005; number of installations (number of plots) |
|-----------------------------|-------------|-------------|-------------|
| Installation                | Activity   | 02/03       | 03/04       | 04/05 plan  |
| Type I                      | Full measure | 9 (86)      | 6 (63)      | 8 (91)      |
| RD check                    |             | 3 (6)       | 7 (14)      | 12 (18)     |
| other                       |             | 2 (6)       |             |             |
| Type II                     | Full measure | 5 (25)      | 1 (5)       | 0 (0)       |
| RD check                    |             | 1 (1)       | 2 (2)       | 2 (2)       |
| Type III                    | Full measure | 9 (110)     | 8 (88)      | 8 (88)      |
| Thin check                  |             | 7 (13)      | 5 (4)       | 6 (9)       |
| Thinned                     |             | 7 (13)      | 4 (4)       | To be determined |
| Pruned measured             |             | 1 (6)       | 1 (2)       | 3 (18)      |
| Prune                       |             | 3 (9)       | 3 (9)       | 3 (9)       |
| Carryover                   | Full measure | 7 (20)      | 6 (18)      | 6 (18)      |
| GenGain/Type IV             | Plot layout |             |             | 3 (66)      |
| Contracts                   | Remeasure   | 4 (24)      | 5 (74)      | 4 (24)      |
|                             | New         |             | 2 (21)      |             |
| Foliage Samples             |             | 2(6)        | 2(6)        | 2(6)        |
| Total                       |             | 57 (325)    | 51 (310)    | 81 (358)    |
Type I

- Complete re-measurement of 63 plots. Complete re-measurement includes 100% dbh, 42 height and height to live crown measurements, branch measurements on all height trees, and comments and observations, all per plot.
- Relative density check on 14 plots; 3 plots marked for thinning. Landowners performed the actual thinning
- Fertilized 6 plots on 2 installations

Type II

- Complete re-measurement of 5 plots. Complete re-measurement includes 100% dbh, 42 height and height to live crown measurements, branch measurements on all height trees, and comments and observations, all per plot.
- Relative density check on 2 plots; neither ready to thin. One plot in BC thinned.

Type III

- Complete re-measurement of 88 plots. Complete re-measurement includes 100% dbh,100% heights until average height exceeds 30 feet after which 42 heights are taken, 42 heights to live crown and crown width, branch measurements on all height trees, and comments and observations, all per plot.
- Thinning check on 4 plots; 5 plots thinned
- 2 pruning plots measured; 9 plots pruned

Carry-over study

- Complete re-measurement of 18 plots.

Contracts

- Complete re-measurement of 5 Installations (74) plots. Set up 2 new installations (21 plots) and obtained first measurements.

Summer 2002 field crew

- Understory vegetation and habitat index data collected on 9 Type I, 3 Type II, and 8 Type III installations that were completely re-measured during the 02/03 dormant season.

Other

- Foliage samples collected from 6 plots
- Destructive sampling of 13 trees from 1 plot in 1 installations for stem analysis, wood density, and branch (related rates study) modeling.
Database

The SMC database has 443 installations containing 4,591 plots which have been measured 26,201 times. This represents a total of 259,165 individual trees which, in aggregate, have been measured a total of 1,404,519 times. Of this total, 90 are active SMC research installations with the balance (353 installations) either inactive RFNRP installations or active/inactive installations associated with contract projects.

Of the 90 active SMC installations, 7 are from the RFNRP carry-over effects study and 83 are Type I, II, and III installations. These 84 installations contain 737 plots which have been measured 2948 times and received 565 treatments. These plots contain 101,634 trees which have been measured a total of 382,233 times.

FIELD INSTALLATION DESCRIPTIONS

Nutrition (RFNRP) Project

PHASE I Unthinned natural stands of Douglas-fir and western hemlock. Installations were established in 1969-70, received as many as 4 fertilization treatments, and were measured for 20 years. Completed in 1990. 117 installations, 702 plots.

PHASE II Thinned natural stands of Douglas-fir and western hemlock. Installations were established in 1971-72, received as many as 4 fertilization treatments, and were measured for 20 years. Completed in 1992. 43 installations, 266 plots.

PHASE III Young thinned plantations of Douglas-fir and western hemlock, and low site quality stands of Douglas-fir. Installations were established in 1975, received as many as 4 fertilization treatments, and were measured for 20 years. Completed in 1996. 29 installations, 234 plots.

PHASE IV Pre-commercially thinned (300 trees/acre) plantations of Douglas-fir and western hemlock, and Douglas-fir stands of naturally low stocking. Installations were established in 1980, received as many as 4 fertilization treatments, and were measured for 20 years. Completed in 2000. 34 installations, 306 plots.


CARRY-OVER

Early RFNRP installations established in 1969-1970 that were harvested and re-planted are being measured to identify fertilization effects that carry into the next crop. 7 installations, 17 plots.

Silviculture Project

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 1/2 or 1/4 of initial stems per acre. Except for one control plot, all plots then follow a prescribed thinning regime. In addition, at some installations, additional plots are treated to implement pruning and/or fertilization treatments. 30 Douglas-fir installations, with 322 plots and 8 western hemlock installations, with 56 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. 12 installations, 60 plots.

**TYPE III**  
Areas operationally planted at a wide range of spacings (100, 200, 300, 440, 680, and 1210 stems per acre) to provide experimental material for future research uses. These plantations are established using the best current regeneration practices. Thirty eight total installations planted with Douglas-fir, 6 planted with western hemlock, and 3 planted with 50/50 mix of Douglas-fir and western hemlock.

**TYPE IIIp**  
A subset of the Type III installations, in which permanent tree and vegetation measurement plots have been established. 34 installations, 306 plots.

**TYPE IIIpa**  
A subset of the 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% 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 a late one time. 16 installations, 205 plots.

**GGT/TypeIV**  
A genetic gain trial at 10x10 spacing and an SMC spacing trial with 7x7, 10x10, and 15x15 spacing. Genetics: elite, unimproved and intermediate. Vegetation control complete until crown closure. Six installations, 132 plots of Douglas-fir in Grays Harbor breeding zone to be established in 2005-06.
Progress to Date

Research at the Fall River LTSP has been supported by several different sources in the past. Most funding has continued over the entire life of the project and will likely continue into the future since the Fall River LTSP is now producing interesting and useful results. The Fall River LTSP is also acquiring a reputation as one of the primary projects on the effects of forest management in the Pacific Northwest. Weyerhaeuser Company remains strongly committed to the project, as does the Pacific Northwest Stand Management Cooperative, the U.S. Forest Service PNW Lab and the College of Forest Resources (CFR) at the University of Washington. Funding will continue from these sources.

We are also pursuing funding from additional sources to continue and enhance the project. The project was chosen among the top 10 for full proposal development in the recent USFS Agenda 2020 competition for the PNW region. We won’t know about final funding selections until September. Forest soils students at the CFR have been very successful recently at securing scholarship awards from the Stanley P. Gessel endowment and other CFR sources. Though participation in research at the Fall River Project isn’t specifically a factor in awarding funding from these sources, the possibility of working at Fall River attracts highly capable students who are more competitive for these funding sources. These factors both work together. For instance, funding for the non-summer portion of the Graduate Assistantship for Brian Strahm (who started in Fall, 2002), and Kyle Peterson (who started in Fall, 2003) was found from these CFR scholarship sources last year.

During the period 2003-2004, NCASI funding paid for project expenses including laboratory analysis, supplies, and transportation to and from the field as well as presentation of findings at professional meetings. For 2004, funding from NCASI went primarily to support graduate student Brian Strahm and the cost of his research. Brian has taken over several aspects of the Fall River project, but specifically has extended the “fate of nitrogen” studies, particularly the nitrate mineralization and leaching studies, which have proven to be among the most important and interesting in the Fall River suite of studies so far.

Previous Results

Results have elicited considerable discussion at several scientific and professional meetings, and several prominent scientists have mentioned the nitrogen studies need to continue “at all costs”. A revision of the paper earlier written and submitted to Soil Science Society of America Journal (released due to the short time period of sample collection), will be submitted to Forest Ecology and Management as soon as possible after it clears Weyerhaeuser review, with three years of results instead of the earlier paper’s 6 months. Results show that the mineralization and loss of nitrate has dropped considerably over the last year, and is nearing the levels of the uncut stand. This has happened relatively quickly, and it is important to see whether the decline continues as the new stand is rapidly growing (and accumulating nitrogen in biomass).

The results of this additional work will be presented at the Soil Science Society of America meetings in Seattle this year. The title of the nearly completed manuscript is:


One manuscript has been published:

Additional literature has been reviewed and a table summary prepared showing biomass components for Douglas-fir stands in the PNW where biomass trees were actually felled and processed to determine biomass components directly for the manuscript:


This paper will show the potential overestimation of carbon in trees of plantations >40cm DBH using biomass equations derived earlier from natural stands and clearly demonstrate the need for using biomass equations that are derived from similar stands. Previous presentations have also elicited considerable discussion.

Detailed results of the work above has been given to NCASI and it was asked that this request for continued support not contain too much detail.

**New Work**

New studies and additional work proposed earlier have also been initiated. Brian has installed additional lysimeters, including reactivating lysimeters previously installed at 20 cm, and installing lysimeters in the bole only-no vegetation control plots. Of particular interest is whether nitrate levels at 20 cm exceed those at 100 cm as previously measured. The 20-cm lysimeters had not been monitored for the previous 2 years due to lack of funding to do so.

Brian has progressed a great deal on priority process studies as well, including completing research and preparing a manuscript on anion (nitrate) adsorption. The unexpected results have already elicited some very heated discussion from scientists not familiar with the nature of PNW soils with andic properties.

During the previous year we started monitoring the fate of dissolved organic carbon (DOC) as part of a Department of Energy project on the effects of forest management on C sequestration. The nature and fate of soluble carbon may relate to N chemistry and other nutrients, but we will need to wait until we have adequate data to analyze.

The original Fall River study called for an initial characterization of biomass and the potential for an age-5 Douglas-fir biomass characterization, the funding for which would be found at a later date. Kyle Peterson proposes to work on assessing Douglas-fir biomass and nutrient pools for the 5th year (this year) within selected treatments, most likely the bole-only removal with and without weed control and the total-tree plus all forest floor woody-debris removal treatment. The USFS PNW lab will assess competing vegetation. We will need funding to pay for his travel and sample analysis. Kyle won tuition and personal support during the Fall 2003-Spring 2004 time period, and is working on his own during this summer.

**Presentations.**

Upcoming University of Washington paper and poster presentations on the results from Fall River investigations include the following:

1) Brian Strahm will present a poster “Nitrate Sorption in a Variable Charge Soil of the Pacific Northwest” at the upcoming Soil Science Society of America meeting in Seattle, Washington.


3) Kyle Peterson will present a poster “Fall River Long-term Site Productivity Study: Preharvest
Biomass and Nutrient Estimates” at the upcoming “Productivity of Western Forests: A Forest Products Focus” conference in Kamilche, Washington.


**Additional Studies at Fall River**

Studies not specifically supported by NCASI funding continue to expand. Scott Roberts, Connie Harrington and Tom Terry are responding to reviewers’ comments for a manuscript submitted to Forest Ecology and Management titled, “Harvest residue and competing vegetation affect soil moisture, soil temperature, N availability, and Douglas-fir seedling growth.”

Adrian Ares has submitted a paper abstract for 2004 SSSA meeting titled, “Forest Harvesting Effects on Soil Physical Properties and Douglas-fir Growth in Coastal Washington” based on the soil physical property and tree growth assessment (at age 4) work at Fall River within the compacted, non-compacted, and compacted plus tillage treatments. He is working on the second draft of this manuscript which will be submitted this year to the SSSA Journal. Adrian also has almost finished a first draft USFS Research paper presenting a more detailed report on the soil physical property methods used to determine soil strength, pore space and soil moisture characteristics curves for surface soils within the same three treatments. Adrian will be collaborating with the USFS Olympia Lab and the University of Washington to write a USFS Research Paper publication on the pre- and post-harvest site characterization work at Fall River (soil properties, vegetation, standing crop biomass, post-harvest treatment N and C pools in the forest floor, coarse woody debris and logging slash, etc.).

Kate Piatek is working on a second draft of a paper titled, “Organic matter, carbon, and nitrogen pools remaining after a range of harvesting and organic matter removal treatments in a Douglas-fir stand in western Washington State.” Much of the information in this paper will be presented in the site and treatment-characterization paper described above.

**Field Trips**

Preparations are being made for the American Forests and Paper Association (AF&PA) Forestry School Deans’ tour scheduled for August 12. Other significant tours planned this year to the site include the Oregon State Vegetation Management Coop (August 25) and a pre-conference tour for the Productivity of Western Forests: A Forest Product Focus Symposium (Sept. 20).
Silviculture Project Progress Report

Several SMC Project Items were completed in 2003. Graduate student Luciana Ingaramo completed work on testing both the Bruce & DeMars (used in SMC database work) and the Weyerhaeuser volume equations against stem sectioning data collected from Type I and II installations. Graduate student Yuzhen Li continued work on the analysis of the fertilized plots in Type I installations. Database Specialist John Haukaas completed the general methodology for summarizing Type II installation growth and yield as part of the ongoing project that will eventually provide graphical updates of all installation Types after every measurement season. TreeLab software (SMC version 1.0) was posted to the SMC website. This handy bit of software is calibrated to the Type I and II pure Douglas-fir stands inventoried in the SMC database and includes use of data from thinned and fertilized plots. Pursuant to this, two small “technology transfer” moments were included during the 2003 Fall Policy Committee Meeting. There, the user interface and general operational parameters of the TreeLab software were presented. Similarly, the user interface and general operational parameters for the SMC Tree List Generation Database software (version 1.00) were presented, as well.

Graduate students made steady progress on their thesis projects in 2003, as well. Graduate student Luciana Ingaramo actually completed her Master’s thesis entitled “Effect of Planting Spacing and Design on Growth & Quality of Douglas-fir after 18 Years” using data from a Pilchuck Tree Farm spacing trial. Mariano Amoroso was in the final stages of completing his Master’s thesis entitled “Growth & Yield of Douglas-fir & western hemlock in pure and mixed stands: Results at age 12 from the SMC Type III trials.” Also, graduate student Mark Senger was near completion of his Master’s thesis work looking into the dynamics of understory and groundstory vegetation layers as affected by overstory stand density in pure Douglas-fir Type III plantations.

Work and analyses pertaining to other long-term Silviculture Project studies continued uninterrupted. This included, but was not limited to the SMC mission-driven gathering of high quality data on tree and stand growth and development and product quality. Research year 2003 also saw the resolution of all statistical design issues and many more implementation issues regarding the NWTIC / SMC joint trials known as the GGTIV (Genetic Gains / Type IV) trials. SMC members voted at the 2003 Spring Policy Meeting to proceed with the Grays Harbor replication of this large joint trial.

Accuracy of the Bruce and Demars and Weyerhaeuser Cubic Foot Volume Equations for Douglas-fir

A previous analysis reported in 1994 found that the Bruce and Demars equation slightly over-predicted cubic foot volume. Since 1994 the stem section database has grown significantly and this report updates that analysis, and extends it to include the Weyerhaeuser equation. This analysis is based on 403 Douglas-fir trees from Type I and II installations. “True” total tree volumes, including top and stump (CVTS), were calculated by summing all the individual tree section volumes after assuming specific geometric forms for each portion of the bole. Stump volume was computed using stump diameter and stump height in the formula for a cylinder. The tip section volume was computed using the formula for a cone. Every section in between was computed using Newton’s formula. Cubic foot volumes to a 4 inch top (CV4) were computed by excluding tip volume and stump volume, then interpolating to find the location of the 4-inch top from measured points. Trees with less than an eight foot log were excluded from analysis, leaving a total of 292 trees for CV4 volumes.

The chief results are that both equations tend to overestimate the “true” volume. In trees from Type I installations, the overestimation is generally on the order of 5.4 to 6.7% with the Weyerhaeuser equation overestimating less in CVTS and slightly more in CV4 than the Bruce and Demars equation. For trees from Type II installations, overestimation is greater than for trees in Type I installations, ranging from 7.1 to 10.6% greater than “true,” with the Weyerhaeuser equation overestimating slightly more than the Bruce and Demars equation for both CVTS and CV4.
For more detailed results and further interpretation, please see the article in the SMC Quarterly, vol. 14, No. 2.

Planting Spacing and Design Affects Growth & Quality of Douglas-Fir

The study was located on the Pilchuck Tree Farm on King’s site index 140 ft. land. The study area covers six acres in total, is comprised of 50 plots (about 0.08 acres each) and was planted in 1983 using unimproved 2-yr Douglas-fir seedlings. No thinning has been done at the time of this study. Six different densities were planted: 200 stems per acre (15 x 15 ft), 220 stems per acre (10 x 20 ft), 300 stems per acre (12 x 12 ft), 340 stems per acre (8 x 16 feet), 435 stems per acre (10 x 10 ft), and 680 stems per acre (8 x 8 ft). Though some of the spacings do not match the SMC Type III trials exactly, there is enough overlap that the results of this analysis might give an early look into what is happening on the Type III’s in general. The objective was to examine the effects of initial density and planting design (square vs. rectangular) on growth, yield, and stem quality.

Quadratic Mean Diameter (QMD) was 48% larger at lower stockings (220 stems or less), while individual tree volume was 89% larger at the lower stockings. However, trees at these lower stockings had branches that were 50% larger in diameter than the more highly stocked stands. The proportion of bole surface area at breast height covered by branches was 70% higher in the lower stocked stands as well.

This study also revealed that branch diameter will be greater at lower stocking levels, regardless of individual tree size. For more results and further interpretation, please visit the SMC website at <http://www.cfr.washington.edu/research.smc/meetings/spring%202003/luciana_2003.htm>.

Results from Fertilizing Type I DF Installations

Objectives of this analysis are to assess the effects of fertilization and pre-commercial thinning on growth, yield, and value of stands that have received early and continued density control. The nine Type I installations (63 plots) available for analysis are summarized as follows: Initial TPA ranged from 362 to 700, avg. 500; Initial QMD ranged from 1.9” to 4.6”, avg. 3.0 inches; Initial BA ranged from 2 to 64 sq.ft/ac, avg. 17 sq. ft; Initial Vol. ranged from 16 to 838 ft³/ac, avg. 281; Initial ages ranged from 3 to 8 yr old; plot site index varied from 80 to 100.

Each installation was measured four times: at establishment, and after 4, 8, and 12 years. Growth analysis was conducted at approximate total ages of 8, 12, and 16 years, while yield analysis was conducted at total ages 6, 10, 14, and 18 years.

Preliminary results indicate that fertilization does not impact height of dominant trees. Fertilization does increase quadratic mean DBH (QMD) over unfertilized stands, as it does for basal area (BA) and volume growth and yield. Growth is detectably impacted from the outset, but volume is impacted after eight years (two fertilizations). Change in QMD was nearly 13% greater four years after fertilization than change in QMD in unfertilized stands. The effect of fertilization on QMD seems cumulative at this stage: attained QMD was 5, 6, and 7% greater in fertilized stands than in unfertilized stands 4, 8, and 12 years after study establishment.

Preliminary results for basal area, volume, the effects of pre-commercial thinning, and other more detailed information will be presented at the Spring 2004 Policy Meeting. A newsletter article is planned for early 2005.

Genetic Gains / Type IV Joint Trial Progress (GGTIV)

Work continued on refining the various design options for joint production of the NWTIC Genetic Gain Trial / SMC Type IV Installation in Grays Harbor. Revised study plans were distributed prior to the Spring 2003 Policy Meeting. A Silviculture Project TAC meeting was held jointly with the 2003 Spring Policy Meeting and the membership at large issued the directive to proceed with the Grays Harbor replication of the joint trial.

A tour on 9 Sep 2004 identified one unit for planting in spring 2005 and one unit for planting in Spring 2006 (out of four visited). Two more units are needed for planting in each year, 2005 and 2006 to make a
complete trial in the Grays Harbor area. A call was made for more input from cooperators on potential planting sites.

At the 2003 Fall Policy Committee Meeting, specific site preparation procedures were outlined and reviewed. Units must be clearcut with no dispersed leave trees, but leave trees may be clumped at edges. There should be no detectable evidence of root or other diseases, stump pulling should be avoided, slash should not be piled (except at edges of units as long as all 22 plots can be fit in), and slash burning should also be avoided. Unit should be hand sprayed after plots are laid out and pinned to control re-sprouts and achieve 80% bare ground. Work and analyses pertaining to other long-term Silviculture Project studies continued uninterrupted, such as Type IIIp western hemlock installation establishment and the SMC mission-driven gathering of high quality data on tree and stand growth and development and product quality. Research year 2002 also saw the resolution of further design and implementation issues regarding the so-called TypeIV or next-generation installations.

Field Work and Related Items

The SMC summer field crew continued measurement of understory vegetation plots in summer 2003. This year an effort was made to measure all Type I, II, IIIp, and IIIpa installations that were measured or visited during the 2002/2003 winter measurement season. Thus, the geographic scope, stand ages, and treatment types included in the vegetation database were expanded even further this year.

It is anticipated that a shrinking budget will preclude the possibility of taking vegetation measurements in 2004.
WOOD QUALITY PROJECT PROGRESS REPORT

Project Leader: Eini Lowell, USFS PNW Research Station

The wood quality TAC did not meet in 2003. Continuing projects are briefly discussed in the following paragraphs.

Effect of Treatments on Number and Diameter of Branches in Type I Installations

The SMC branch protocol, established in 1999 for Douglas-fir trees, measures the diameter of the largest branch in the region defined by the 1st whorl above BH and the distance to the next higher and next lower whorls. A count is made of all branches in the defined region that are at least ½ the diameter of the largest branch. This assessment is made on the 42 height trees in each plot. An analysis of data from 19 type I installations (57 plots) is complete. A mix of both tree variables (age, quadratic mean diameter, and crown length) and stand variables (density and site index), were important predictors of number and diameter of branches in the BH region. A journal article is nearly ready for submission.

Related Rates Approach to Modeling Branch diameter Growth

Exploratory research found that field and laboratory procedures for obtaining detailed branch and stem diameter increments for several sample points along a tree stem is straightforward. Analysis of data collected from a small set of sample trees indicates that a related rates model works well. In addition to relating branch diameter growth to that of the stem at the same height in a tree, the related rates model also predicts the time when a branch dies and hence the diameter at the transition from a live (sound) knot to a dead (unsound) knot. Based on these initial findings, sampling has been expanded to develop a more robust data set to work with. A paper was presented at the Fourth IUFRO Workshop on Wood Quality and Modeling in 2002.

Applying Process Capability Analysis (PCA) to Stand Quality Characteristics

PCA is a statistical quality control technique used to measure the degree of conformance of output from a process to specifications. The analogy in forestry is that the process is “growing trees” and the specifications could be limits on knot diameter, rings/inch (RPI), etc. defined by log markets or set as silvicultural objectives by management. This study focuses on assessing the first 16-foot butt log in standing trees using measures that can be rapidly and easily measured at BH. Plots from a replicated spacing trial provided data on periodic dbh measurements, allowing calculation of RPI, and diameter of all branches within a 2-foot region centered on BH, allowing calculation of BH LLAD, average of the largest branch diameter from each quadrant in the plot. A sample of trees from each plot were climbed to the top of the 16 foot log position (17.5 feet) and the largest branch diameter in each quadrant was measured to give log LLAD. Strong relationships were found between the BH branch diameters (either largest or LLAD) and the log branch diameters (either largest or LLAD) providing confidence that one can use the largest BH branch diameter as an index of log quality. The frequency distributions of BH largest branch diameter and RPI of the trees were compared singly and jointly to a set of specifications to determine stand conformance. The conformance measures can have important implications for harvest scheduling and marketing stands and for silviculture. This approach has been presented at 2 conferences and a journal article is in preparation.
MODELING PROJECT PROGRESS REPORT
Project Leader: Greg Johnson, Weyerhaeuser Company

At the Spring Meeting the need for, and future of the Modeling TAC was discussed. The consensus was that the needs for, and opportunities to develop, improved models is growing and that the Modeling TAC should continue. The modeling TAC held a meeting on May 29 to discuss future needs and opportunities; minutes are on pages 41 to 44. The outcome of the TAC meeting was reviewed at the Fall meeting where it was pointed out that the SMC database is ripe for use in developing a young stand (age 0-15) stand model. Such a model could be designed to pass appropriate data to existing models such as SMC-ORGANON for projections to older ages. The group indicated that developing a young model is of strong interest. The group requested that a proposal on such a young stand modeling effort be prepared for discussion at the Spring 2004 meeting.
RESEARCH PROJECTS

EXTERNAL GRANTS & CONTRACTS:

Principal Investigator: Rob Harrison, Associate Professor, University of Washington College of Forest Resources
Title: A Modeling Approach for Enhancing Forest Productivity
Amount: 1998: $20,000 1999: $20,000 2000: $20,000 Total: $60,000
Granting Agency: U.S. Department of Energy
Objectives: To use SMC and other results to develop a model of impacts of nutrition on forest productivity.

Principal Investigator: Rob Harrison, Professor, University of Washington College of Forest Resources, Tom Terry, Weyerhaeuser Corporation
Title: Organic Matter and Management Effects on Forest Productivity
Granting Agency: National Council on Air and Stream Improvement (NCASI)
Objectives: To determine the impacts of organic matter retention and management (fertilization, vegetation control, and tillage) on the long-term productivity of II Douglas-fir stands.

Principal Investigator: Rob Harrison, Professor, University of Washington College of Forest Resources
Title: Effect of Forest Management on Carbon Storage in Managed Forests
Amount: 2000: $45,000 2001: $45,000 2002: $45,000 Total: $135,000
Granting Agency: U.S. Department of Energy
Objective: To estimate the effects of management on C storage.

Principal Investigator: Eric Turnblom, Assistant Professor, University of Washington College of Forest Resources
Title: Carbon Sequestered on King County Forest Land
Amount: 2001: $15,000 2002: $7,159 Total: $22,159
Granting Agency: King County
Objective: To estimate C storage in trees on forested lands in King County.

Principal Investigator: Eric Turnblom, Associate Professor; Andrew Hill MS Student, University of
**Title:**
Using Climate-Related Information to Improve Short-term Growth Projections

**Amount:**
$62,087 1 Jan 2003 to 31 Dec 2004

**Granting Agency:**
USFS Forest Inventory Assessment

**Objective:**
This project will evaluate the availability and quality of supplemental climate information for incorporation into basal area growth models. The project will develop a study plan for examining various methodologies for employing the most suitable climate related information into growth and yield models for basal area, and will then test the methodologies by analyzing the applicability of these methods. Applicability will be judged by comparing methodology outcomes to remeasured FIA forest inventory data. Finally, the project will evaluate possible techniques for incorporation of climate-related information into FIA estimation procedures and recommend further research necessary to improve growth estimation with climate-related information.

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**Principal Investigator:**
David Briggs, Professor, University of Washington College of Forest Resources

**Title:**
Assessing the effect of planting spacing on growth & tree characteristics & stand growth of young Douglas-fir plantations

**Amount:**
Aug 2003-Sept 2004 Total: $29,810

**Granting Agency:**
USDA Forest Service PNW Research Station Focused Science Delivery Program

**Objective:**
Validate applicability of commonly used volume & taper equations to trees in young, new plantations. Develop summary status of growth trajectories of young plantations & relationship to understory vegetation.

**Progress:**
Graduate student L. Ingaramo completed the volume equation tests; results published in 2nd Quarter 2003 SMC Newsletter. Growth trajectory summaries of SMC Installations conducted by J. Haukaas; Type II installations completed & published in 4th Quarter 2003 SMC Newsletter; Type I & III installations underway. M. Senger is analyzing understory vegetation of Type III installations for Masters Thesis.

Expect completion in June 2004.
**SMC STAFF & STUDENT PROJECTS:**

<table>
<thead>
<tr>
<th>Principal Investigator</th>
<th>Luciana Ingaramo, MS student, David Briggs, Eric Turnblom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Accuracy of Bruce &amp; DeMars and Weyerhaeuser Cubic Foot Volume Equations</td>
</tr>
<tr>
<td>Granting Agency</td>
<td>SMC Project List Item N</td>
</tr>
<tr>
<td>Objective</td>
<td>Use the SMC stem sectioning database to test these equations for Douglas-fir.</td>
</tr>
<tr>
<td>Progress</td>
<td>Results published in SMC Newsletter, 2nd Qtr, 2003.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Principal Investigator</th>
<th>Luciana Ingaramo, MS student, David Briggs, Eric Turnblom, Bruce Larson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Effect of Planting Spacing and Design on Growth &amp; Quality of Douglas-fir after 18 Years</td>
</tr>
<tr>
<td>Granting Agency</td>
<td>Pilchuck Tree Farm: 1999-2003</td>
</tr>
<tr>
<td>Objective</td>
<td>Masters Thesis project to summarize and compare status of individual tree and stand growth characteristics plus effects on stem quality, primarily knottiness.</td>
</tr>
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<tr>
<th>Principal Investigator</th>
<th>Mariano Amoroso, MS student, Eric Turnblom</th>
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</thead>
<tbody>
<tr>
<td>Title</td>
<td>Type I Installations: Effect of early spacing control through precommercial thinning in immature Douglas-fir stands</td>
</tr>
<tr>
<td>Granting Agency</td>
<td>SMC Project List Item D</td>
</tr>
<tr>
<td>Objective</td>
<td>The objective of this is to assess the effects of early spacing control on subsequent tree and stand growth and yield in immature Douglas-fir stands.</td>
</tr>
<tr>
<td>Progress</td>
<td>Analysis started during Summer 2002. Analysis &amp; draft report completed in Winter 2003. Summary is being prepared for the SMC Newsletter; journal article is in preparation as well.</td>
</tr>
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<tr>
<th>Principal Investigator</th>
<th>Mark Senger, MS student, Eric Turnblom</th>
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<tbody>
<tr>
<td>Title</td>
<td>Relating Relative Density to Other Stand Measurements</td>
</tr>
<tr>
<td>Granting Agency</td>
<td>SMC Project List Item J</td>
</tr>
<tr>
<td>Objective</td>
<td>It would be desirable to have a simple technique for estimating RD to use as a tool for deciding if a full assessment should be undertaken.</td>
</tr>
<tr>
<td>Progress</td>
<td>Results presented in SMC Newsletter, 1st Quarter, 2003. A journal article is in preparation.</td>
</tr>
</tbody>
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<thead>
<tr>
<th>Principal Investigator</th>
<th>David Briggs, Eric Turnblom, Suzanne Irmen, UW undergraduate student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Using Related Rates to Model the relationship between branch and stem diameter growth</td>
</tr>
<tr>
<td>Granting Agency</td>
<td>SMC, McIntire-Stennis</td>
</tr>
<tr>
<td>Objective</td>
<td>Phase I: Pilot study investigation of feasibility of field and laboratory sampling &amp; measurement techniques. Four trees from ISPA, ISPA/2 and ISPA/4 plots on two Type I Installations felled and sampled.</td>
</tr>
<tr>
<td>Progress</td>
<td>Stand and tree selection and sampling initiated.</td>
</tr>
<tr>
<td>Principal Investigator:</td>
<td>John Haukaas, SMC Research Consultant</td>
</tr>
<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>Title:</td>
<td>Type II Douglas-fir Installation Status Report t</td>
</tr>
<tr>
<td>Granting Agency:</td>
<td>SMC Project List Item B</td>
</tr>
<tr>
<td>Objective:</td>
<td>Development of a standardized summary report procedure on the performance of Type II Installations. Procedure developed will then be adapted to Type I and Type III Installations.</td>
</tr>
<tr>
<td>Progress:</td>
<td>Initial design of report statistics developed; programming underway. Plan to present initial results at SMC Spring 2003 meeting for feedback.</td>
</tr>
</tbody>
</table>

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<tr>
<th>Principal Investigator:</th>
<th>Randy Collier, Eric Turnblom</th>
</tr>
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<tbody>
<tr>
<td>Title:</td>
<td>Form changes of coastal Douglas-fir in response to pruning</td>
</tr>
<tr>
<td>Granting Agency:</td>
<td>SMC Project List Item N</td>
</tr>
<tr>
<td>Objective:</td>
<td>This study will produce a report detailing how pruning affects the form of the first log in a tree that has been pruned. The SMC Type I pruning study provides ample data from plots of differing density and site where trees have been pruned to various intensities.</td>
</tr>
<tr>
<td>Progress:</td>
<td>ANOVA has revealed differences in form and log scale between plots that have been pruned differently. In general, pruning improves form and magnifies log scale. A report detailing these findings is planned for submission in summer 2003.</td>
</tr>
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<tr>
<th>Principal Investigator:</th>
<th>Brian Strahm, Rob Harrison, Tom Terry</th>
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<tbody>
<tr>
<td>Title:</td>
<td>Nitrogen Mobilization as a Function of Organic Matter Retention in a High Productivity Managed Douglas-fir Stand</td>
</tr>
<tr>
<td>Granting Agency:</td>
<td>SMC, Weyerhaeuser Company, National Council on Air and Stream Improvement (NCASI), US Forest Service</td>
</tr>
<tr>
<td>Objective:</td>
<td>To determine the impacts of organic matter retention as a function of harvest intensity on N mobilization and leaching in a high productivity Douglas-fir stand.</td>
</tr>
<tr>
<td>Progress:</td>
<td>Monitoring of soil solution chemistry at 1m depth for various forms of N, and calculation of N leaching rates continued through a second year following replanting. Complimentary 20cm lysimeters installed for future analysis of contrasting N pools with depth.</td>
</tr>
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<tr>
<th>Principal Investigator:</th>
<th>Andrew Hill, PhD student, Eric Turnblom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title:</td>
<td>Growth response to Pruning immature, coastal Douglas-fir</td>
</tr>
<tr>
<td>Granting Agency:</td>
<td>SMC Project List Item R</td>
</tr>
<tr>
<td>Objective:</td>
<td>To determine how green crown removal intensity, stand density and site quality impact individual tree growth in terms of diameter, basal area and total height and how total stand growth is impacted as well.</td>
</tr>
</tbody>
</table>
**Title:** Rating SMC Plots for Swiss Needlecast  
**Granting Agency:** Swiss Needlecast Cooperative, Oregon State University  
**Objective:** To better understand the dynamics and influence of management practices on foliage retention. 14 plots in SMC Type I Installations in Oregon & Southern Washington will be assessed. These plots chosen have various thinning levels and/or fertilization. Two visual measures of foliage retention will be used and compared in the hope of developing a more quantitative index for rating SNC severity.

**Progress:** Field measurements were planned for Fall 2002 as part of an MS Thesis.

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**Title:** Organic Matter and Management Effects on Forest Productivity  
**Granting Agency:** National Council on Air and Stream Improvement (NCASI)  
**Objectives:** Overall support to the University of Washington for work on the Fall River Long-term site productivity project.

**Amount:** 1998: $52,000 1999: $40,000 2000: $40,000 2001: $40,000 2002: $40,000 2003: $40,000  
**Total:** $252,000

**Granting Agency:** Olympic Natural Resources Center  
**Objectives:** Specific support at Fall River LTSP for monitoring the impacts of management on productivity and nutrient loss.

**Amount:** 1998: $10,000 1999: $10,000  
**Total:** $20,000

**Granting Agency:** Weyerhaeuser Company  
**Objectives:** Funding for Fall River Project for additional sample analyses including monitoring fate of nitrogen.

**Amount:** 1998: $15,000 2003: $3009  
**Total:** $18,009

**Granting Agency:** US Forest Service  
**Objectives:** To determine the impacts of organic matter retention and management (fertilization, vegetation control, and tillage) on the long-term productivity of site II Douglas-fir stands.

**Progress:** See Nutrition Progress Report, (Project 2).

**Amount:** 2001: $6,500 2002: $39,000 2003: $42,722  
**Total:** $88,222

**Granting Agency:** University of Washington CFR/Gessel fund/TA  
**Objectives:** Funding for Graduate Assistantships for students working on Fall River LTSP.
TECHNOLOGY TRANSFER

A. MEETINGS, WORKSHOPS, AND CONFERENCES

1. Silviculture TAC Meeting held on March 11 at the USFS Forestry Sciences Lab in Olympia, WA.

2. SMC Spring Policy Committee Meeting held at McMenamin’s in Troutdale, OR. on April 22-23.

3. Modeling TAC Meeting held on May 29, 2003 at the World Forestry Center, Portland, OR.

4. SMC Fall Policy Committee Meeting at Cascade Locks, WA. on September 15-17. Two days of field tours of research on the Wind River Experimental Forest.

5. Field Tours
   ✓ Lone Rock Field Tour of SMC Installations in SW Oregon.

6. Presentations at Professional Meetings


PUBLICATIONS AND REPORTS 1999-2002

Listed are all fact sheets, reports, proceedings, and journal articles produced over the last 4 years associated with SMC projects and resources (data, plots, wood samples, etc.). Many can be copied from the SMC website; for others contact the authors.

2000


2001


SMC. 2001 *What is the Stand Management Cooperative?* Fact Sheet. Stand Management Cooperative, College of Forest Resources, University of Washington, Seattle, WA.

SMC. 2001 *Is Epicormic Branch Formation a Problem After Pruning Douglas-fir?* Fact Sheet. Stand Management Cooperative, College of Forest Resources, University of Washington, Seattle, WA.


2002


2003


west: Accounting for bias introduced from using generalized predictive equations. To be submitted to Western Journal of Applied Forestry.


Software


SMC ORGANON and associated DLL’s are available on the ORGANON web site: http://www.cof.orst.edu/coffr/research/organon/

MINUTES OF MEETINGS

Silviculture Project: Technical Advisory Committee Meeting
11 March 2003 at USFS Forestry Sciences Lab, Olympia, WA

Minutes

Present:

Bill Scott, Rob Harrison, David Marshall, Bob Curtis, Greg Johnson, Norm Andersen, Mike Mosman, Randy Collier, Carrie Gaines, Jim Plampin, Jessica Joesephs, Connie Harrington, Gene McCaul, Randall Greggs, David Briggs, Eric Turnblom.

Agenda

1. Announcements

The proposal entitled “Ecosystem Dynamics in Young, Intensively-Managed Conifer Plantations: Structure, Abundance and Diversity of Vegetation and Habitat” was submitted by co-PI’s Briggs, Harrison, Turnblom, and West to the USDA Cooperative State Research, Education and Extension Service competitive grants program. The proposed research would perform an analysis of the existing Type III vegetation complex (overstory, understory, & habitat indices), extend this to the Type I and II installations, and build a module for implementation in the Landscape Management System. The study will support 2 graduate students and extend understory vegetation and habitat index field data collection to the Type I and II installations. The proposal is in review and we should learn the outcome by late April or early May. Benefits to the SMC are that this project would fund much of the summer field crew activity over the next 4 years and document the remarkable changes in understory vegetation that have been observed in the Type I & II installations according to the treatments they have received.

A small sub-committee of the TAC (Andersen, Briggs, Greggs, Turnblom) met with NWTIC reps (Greggs, Jayawikrama) to discuss the possible joint venture with SMC that would essentially merge the third Genetic Gains Trial replication with the SMC “Type IV” prototype installation. Both the agenda for that meeting on Friday 7 March 2003 and its minutes were entered into the TAC meeting record.

To summarize briefly those minutes, the NWTIC met in Oct 2002 and members voted for a third trial. The trial will be located in the Grays Harbor area, which has seed available for such a trial. There will be three levels of genetic gain, an unimproved level, a moderate gain level, and a high gain level. Thirty to 50 plots are “needed” to achieve statistical significance for the genetic factor. Investigation of other factors such as impacts of silviculture are of lower priority, since the gains trial is not the appropriate mechanism to study them. There is continued interest in collaborating with SMC. NWTIC will sow the Grays Harbor seed in December 2003. NWTIC needs a decision from SMC by 30 June 2003 whether or not it will go ahead with a Type IV trial in the Grays Harbor area in conjunction with them. If yes, the final trial design and funding arrangements must have been finalized. NWTIC is likely to contribute the level of funds it would spend on a stand-alone genetic gain trial toward a joint venture, ~ $60,000 plus staff time.

2. Discussion of Collaborating with NWTIC on hybrid “Type IV” x “Genetic Gains Trial” installations

Discussion opened with a review of each study design: NWTIC Genetic Gains Trial (GGT) and the SMC Type IV. Though a single GGT trial requires at least 30 plots that can be spread across multiple sites, the likely scenario is five plots of each gain level at six (or so) different sites. The 15 plots total at each site will cover roughly 7 acres. The planting spacing most likely will be 10 x 10 ft., the same as the middle level of the three spacings used in the SMC Type IV.

The Type IV uses 3 planting densities (6 x 6 ft, 10 x 10 ft, and 15 x 15 ft), 2 levels of genetic gain (matching the low [unimproved] and high gain levels of the GGT), 2 levels of vegetation management (one common with GGT), and two levels of fertilization (one common with GGT [none] and an additional level of 200...
Having a number of factors and levels in common among the GGT and Type IV studies reduces the total number of plots required. This decreases the required size of a Type IV installation from 10.5 ac. to 8.5 ac., thus the combination of the two studies would require six sites, roughly 15.5 acres each, spread across the Grays Harbor area. This total for the combined study is less than the minimum size of an existing SMC Type III installation.

To illustrate this merger, several schematics beginning with a “straight” GGT and a “straight” Type IV, the proposed merger of the two was presented and discussed.

The discussion that followed revolved mainly around the tradeoffs between using the resulting data from this joint study for answering management decision questions and using the data for modeling purposes. The management questions focus on detecting and estimating both the presence and magnitude of the joint effects of the various factors studied (genetics, spacing, vegetation control and fertilization). The same is true for modeling purposes, as well, but for modeling purposes in general, greater emphasis should be placed on replicating in a way that block variation (variation due to planting site) may be defined more fully. Both purposes for designing a study are valid and are congruent with each other, that is, they are not at cross-purposes with each other. A review of the objectives of the Type IV’s helped to clarify this.

As stated in the SMC Type IV Study Plan (dated March 6, 2003 and distributed at the TAC meeting), the objective of the SMC Type IV trials is to “understand the long-term effects on productivity, quality, and diversity of Douglas-fir and western hemlock trees and stands when the latest advances in genetics, seedling culture, and early vegetation management are deployed in combination.”

Several implications of this broad objective required more detailed explanation.

- Even though the SMC (regional) data set has many thinned and unthinned plots that span a wide range of site classes, there are noticeable gaps. In particular (from oldest cohort to youngest),

Type II installations were established in older stands at or near the stage of stand development conducive to commercial thinning. There are no fertilization treatments. Most stands originated in the 1960’s and early 1970’s, and consequently reflect a different era in terms of genetic improvement, seedling culture, stand culture, etc. There was no experimental control of genetic sources, stock types, planting spacing (some are natural stands), or competing vegetation, differences between installations are likely to be confounded with differences between these and other uncontrolled factors.

Type I installations were established in existing Douglas-fir and western hemlock plantations at a stage of stand development conducive to pre-commercial thinning. They were spaced to produce a suite of plots of varying density in an attempt to mimic planting at those densities. These stands originated in the 1970’s and 1980’s and reflect the genetic improvement, seedling culture, stand culture, etc. prevailing at that time. There was no experimental control with respect to genetic sources, stock types, planting spacing, and control of competing vegetation, so differences between installations are likely to be confounded with differences between these and other uncontrolled factors.

Type III installations were actually planted at different densities since 1986 in a series of six densities: 100, 200, 300, 440, 680 and 1210 stems per acre. They reflect the genetics, seedling stock and early management prevailing at that time. There was no experimental control of genetic gain level, seedling stock types, or competing vegetation so differences between sites are likely to be confounded with these and other uncontrolled factors.

- Type IV installations will control genetic gain level, seedling stock type, planting spacing,
competing vegetation and perhaps fertilization level. They will represent prevailing nursery technology, and early stand management of the new millennium. Since these factors will be experimentally controlled, confounding of these factors across locations (sites) is removed, hence unbiased estimates of responses to genetic gain level, spacing, vegetation control and all possible interactions (if present) will be available.

- It is expected that Type IV installations will provide managers with early data to support decisions regarding the application or use in new stands of any particular level of the factors tested in the study.

- Type IV information will be linked easily to Type III, Type I, and Type II data, the other genetic gains trials, and intensive vegetation management trials, which will assist modeling and/or model calibration efforts.

After discussion, each individual present was asked whether or not the Type IV objectives, design, and expected results were suitably framed for proceeding with a joint venture between SMC and NWTIC. Results with comments are as follows (not counting SMC staff):

Nine were in favor of continuing development of the joint venture (six belonging to organizations with Policy Committee representation). The following reasons/comments were noted:

- It will achieve the stated objectives, perhaps even with fewer replications of the “genetics only” plots
- The long-term nature of this study is excellent
- Works as is, but more emphasis on spacing x genetics interactions is desirable
- Works as is, but dropping fertilization factor to increase other replication, for example, spacing x genetics interaction, is desirable
- Sends message to other cooperatives that joint-venturing is possible
- SMC should maintain an “equal partner” status in the venture
- Since this study is likely to leverage funding from other sources external to SMC, we should make every effort to include as many factors as reasonably possible, since modern research review panels demand this component

Three abstained (two being members of organizations with Policy Committee representation). The following reasons were cited:

- Objectives are not clear
- May not be the best and highest use of resources
- Haven’t followed the Type IV design history, therefore disqualified

One favored discontinuing the joint-venture (a member of an organization with Policy Committee representation) citing the following reason(s):

- Would rather see more single factor studies, such as the GGT, or a study on site prep effects, and more basic research into areas such as nutrient movement through soil profile

Conclusion was to keep working on it for presentation to and vote by membership at the SMC Spring Meeting. A sub-committee meeting to finalize design will be held second week of April.

3. Potential SMC Analysis Project Progress

Progress was reported on several projects appearing in the continuously updated “Potential SMC Analysis Projects” List.

Project J. Relationship between Relative Density (RD) and crown length or crown closure. Status: Analysis completed by Mark Senger, M.S. graduate student working with Eric Turnblom. Report planned for presentation at SMC Spring Meeting.
Project E. Effect of planting spacing on growth of Type III installations. Status: $30K support from USFS Focused Science Delivery Program was lost to the fire budgeting issue.

Project N. Analysis of the stem sectioning database. Status: Graduate student Luciana Ingaramo, working with David Briggs and Eric Turnblom, has been working on this and is preparing an article for the Spring newsletter.

Project B. Type II Douglas-fir Installation Status Report. Status: Database Specialist John Haukaas is working with Randol Collier and Eric Turnblom to produce average stand development summary statistics for all the Type II’s in graphical form to supplement the Installation Summary Reports already being generated after measurement of each individual installation. In the future, we will develop similar summary reporting for the Type I’s and Type III’s.

Project D. Status of Type I plots pre-commercially thinned using two different methods. Status: Graduate student Mariano Amoroso is working with Eric Turnblom to complete this project. Partial results were presented at the TAC meeting, full results are being prepared for presentation at the SMC Spring Meeting.

4. Overview of Type IIIpa Auxiliary Treatment Project Progress

A total of 105 Type IIIpa plots have been established to date. Auxiliary treatments involve thinning the three densest plots (440, 680, 1210 stems per acre) using different regimes and pruning the three least dense plots (100, 200, 300 stems per acre) using different regimes.

Thinning regimes are broadly described as an early entry coupled with either light or heavy thinning, and a late entry coupled with either light or heavy thinning. There is also a “thin late once” regime. To date, 40 plots have been thinned.

Two pruning methods are being compared, caliper or a traditional fixed crown length removal in combination with differing numbers of followers per acre. To date, 22 plots have been pruned.

Of the 62 treated plots, about half have received one two-year re-measurement.

Modeling Project: Technical Advisory Committee Meeting
May 29, 2003 at World Forestry Center, Portland, OR
Minutes

1. Explore the development of a young stand (age 0 to 15) model.
   a. Fenn model is available and covers this age range.
   b. RVMM covers ages 5+. Two versions: tree list and distribution model.
   c. Conifers developed for southern Oregon and N. California – still requires a tree list.
   d. Model specifications:
      i. Project bare ground with treatments to pass-off point to older stand models.
      ii. Genetics
      iii. Vegetation control, site preparation treatment effects
      iv. Apparent site index and LAI might be useful in modeling early growth.
      v. Tree level
         1. species
         2. stocktype
         3. height
4. caliper
5. crown width and/or ratio
6. needle weight – destructive sample of foliage
7. LAI
8. “genetic worth”
9. RGC
10. location (GPS?) – available growing space
11. internode length

vi. Competing vegetation
1. species or life-forms
2. tree centered or area-based estimates?
3. treat all woody plants the same as we do trees
4. percent cover (experiences have been poor with this)
5. height
6. caliper of the largest stem (for woody plants)
7. abundance classes?
8. mini-experiments to test effects of competing vegetation

vii. Plot level
1. location (GPS?) – slope & aspect
2. spacing/growing space/rectangularity

viii. Stand Level
1. site index or productivity measure
2. aspect, slope, elevation
3. site/soil preparation
4. bio-geo-climatic zone

ix. Multiple species
x. Regeneration under alternative harvesting systems/stand structures (variable retention, patch cuts, etc.)

xi. Animal damage (stochastic process – probability of browse) and control

xii. Disease agents (Swiss needle cast)

xiii. Link to physiology – integrate into empirical model framework.

xiv. Need to better characterize site productivity under management.
1. Conifers uses soil depth and water holding capacity
2. Traditional site index probably not appropriate for managed young plantations
3. Climatic and soils data may be useful

xv. Differences between shade tolerant and intolerant species in response to vegetation control

xvi. Potential climate change effects

e. Modeling team:
i. Identify existing modeler (MR) to take lead
ii. Hire someone to do it
iii. “Open-source” paradigm with some program direction

f. Funding:
i. SMC funded project
ii. Subscription basis (with in-kind contributions?)
iii. Grants (maybe especially useful for components of the model dealing with climate, productivity)

Next steps:
i. Identify existing data and models
ii. Set model priorities and data needs
iii. Make incremental improvements to existing frameworks
iv. Make recommendations on future data collection and studies
v. Martin Ritchie to develop a proposal
vi. Hold another meeting to develop recommendations on future data collection and collaboration among cooperatives.

2. Explore the incorporation of young SMC data (Type III’s and Type I’s for example) into existing models

a. Model history / specifications
   i. Small number of Type III’s installed when SMC ORGANON developed and few
      any remeasurements
   ii. Type I’s were also limited
   iii. Site index was a problem – very high estimates of site index from young plantations (seemed unreasonable). Cooperator site index call did not relate to exhibited site index.
   iv. Significantly more data available (re-measurements) available now
   v. More than one site index for a stand – pre- and post-competition (suppression) with competing vegetation
   vi. Can this be done as a part of #1?

b. Modeling team
   i. Hann/ Marshall/ Flewelling/ Hanus/

c. Funding
   i. SMC project
   ii. In-kind

3. Simple program to generate START-UP conditions for ORGANON

a. Flewelling proposal
   i. DBH distribution generator for ORGANON
   ii. Weibull(A, B, C) distribution
   iii. Priority on usable software now with extensions later
   iv. Limited to plantation DF and WH
   v. Products: parameter recovery methods, tree list generator, and software
   vi. Start-up:
      1. 15 years BH
      2. HTOP = 15 to 20 feet
      3. Data from Type III installations with all trees > BH

4. Dq, CV(ba), D10 = f(HTOP, TPA)

   vii. Existing software (Flewelling or Numerical Recipes)
   viii. Multiple methods for partitioning classes
ix. Would write ORGANON tree-list files (no heights or crown ratios)

x. Inputs:
   1. species (DF or WH), HTOP, TPA
   2. or Dq, CV(ba), D10
   3. Other?
   4. Controls

xi. Software:
   1. DLL
   2. Source code available
   3. Batch executable
   4. Windows executable (volunteer?)
   5. Extensible

xii. Report – one-time, on-going?

xiii. Support???

b. Gehringer’s tree list generator
   i. SMC generator is available
   ii. Extensible via updates to base data table
   iii. Handles DF and WH, unthinned and thinned
   iv. Random number seed can be fixed by user

4. Modeling wood quality:
   a. ORGANON wood quality module limited to “Big Six” species, new data on WH to be analyzed soon.
   b. FVS developers being asked to develop similar functionality
   c. Distribution and size of branches, juvenile core
   d. Is it possible to port the functionality from ORGANON to FVS?
   e. New ORGANON variant has new branch diameter equations for DF

5. Set up process for Modeling TAC to review future proposals (such as type IV’s) for modeling benefits.
   a. TAC could act as a reviewer of proposals
   b. GMUG could be another avenue for review
   c. How wide should review function extend? Other cooperatives? Outside scientists?
   d. This approach may fragment the review of proposals and thus may add to problems.
   e. ***Informal review may be the best – participation is hard to get as it is.
   6. New ORGANON beta version is available on the web site.
   a. All new equations for SWO
   b. NWO variant has new western hemlock equations
c. Additional minor species added: RA, RC, Pacific Yew, Dogwood, Willow

d. Operates as a DOS program, a Windows shell is being developed

Stand Management Cooperative Policy Committee Spring Meeting
April 22-23, 2003 at McMenamin’s, Troutdale, Oregon
Minutes

The meeting began at 10:00AM on April 22. Attendees are listed in Appendix A. The 22nd focused reports by TAC leaders, the budget, future meetings, the by-laws and Type IV Installations. The 23rd was devoted to presentations on projects by a variety of speakers as indicated in the Agenda (Appendix B).

BUSINESS MEETING: April 22

Policy Committee Chair Norm Andersen opened the meeting and noted the return of Hancock Forest Management as a member and new member Lone Rock Timber Company. After introductions of attendees, Norm commented on two key items on the agenda: (1) the proposed By-Laws that would formalize operating procedures of the SMC and create a new membership category for Analytical Organizations and (2) the need to decide whether or not to go ahead with the proposed genetic gain trial/type IV collaboration with the NWTIC in the Grays Harbor region.

A. Accomplishments and Plans

Director David Briggs reviewed progress on the list of projects that were presented and prioritized at the Spring 2002 meeting. Two analyses have been completed with summaries appearing in the SMC Newsletter and one has led to submission of a professional journal manuscript. Results of these and progress reports on others underway were presented on the 23rd. There are also research grant proposals pending that, if funded, will provide additional resources to the SMC. He also commented on activities by the Finance Committee to refine the By-Laws and meetings to refine the Type IV/Genetic Gain Trial research proposal, both of which will be discussed in the afternoon. A summer field crew has been hired to conduct vegetation and habitat index surveys. Also, summer is a good time for organizations to request field tours with the SMC staff to showcase the SMC research program to others in their organizations.

B. TAC Leader Reports

Silviculture Project Report: Eric Turnblom noted that work for the 2002/03 field season is nearly finished. The crew will have visited 252 plots for measurements and implementation of treatments where needed. We will soon be preparing the schedule for 03/04 and contacting landowners. Randy Collier commented that the summer field crew hiring is nearly complete; one person had to withdraw so we are seeking a replacement.

Modeling Project Report: Greg Johnson reported that the Modeling TAC had not met since early 2002. It seemed that proposals presented to the Policy Committee in 2002 lacked interest. He asked if the group thought that a Modeling TAC was relevant or needed. In the ensuing discussion, it became apparent that the members favored continuing the Modeling TAC and investigation of how to best utilize the data from the SMC Type I and III installations to devise a “young” stand model that would be valuable. It was noted that most, if not all Type III’s have hit their treatment triggers so that all of the stand development data prior to treatment is available and it would be valuable to model this early development and gain an understanding of how and when they reached their treatment triggers.

Nutrition Project Report: Rob Harrison is on sabbatical. David Briggs reviewed a handout report prepared by Rob summarizing the past year’s activities. Some members indicated a desire to develop new nutrition studies focused on early stages of stand development. Dave indicated that informal discussions had occurred with the Vegetation and Nursery Tech Cooperatives at OSU and that he would convene a meeting to discuss these interests and develop an approach to consider.
Wood Quality Project Report: Eini Lowell reported that the IUFRO Working Party S5.01-04 Workshop “Connection between Forest Resources and Wood Quality: Modeling Approaches and Simulation Software” was held on September 8-15, 2002 in Harrison Hot Springs, British Columbia. This was well attended and there were 3 papers based on SMC research. The proceedings should be appearing any time now. The next workshop will be in New Zealand in 2005.

C. AGENDA 2020 Update

Charlie Peterson summarized last year’s rfp process through the PNW Station that funded several projects. He indicated that this has expanded to other USFS Research Stations in the West and that funds will become available in the future. Since strong industry support is a key to successful proposals, it was decided that the SMC TAC’s should hold meetings to develop proposals to be submitted in the next round.

D. Meetings

D. Briggs reviewed plans for the SMC Fall Meeting to be held at Cascade Locks, OR on September 15, 16, & 17. The plan is to start at 10:00 on the 15th and devote that day to business meeting items and speaker presentations. The 16th and 17th will be a tour of the Wind River Experimental Forest which was agreed upon at the Fall 2002 meeting. It was noted that since this forest is on a low site it is not typical of most industrial land. However, many of the Wind River studies are of such long term and historical significance that many wish to see them. An itinerary developed for the 2002 LOGS tour was discussed and will be modified to reflect interests of WMC members. D. Briggs will work with Dave Marshall and Connie Harrington to refine the itinerary.

E. Hardwood Growth & Yield Modeling Cooperative

Barri Herman was unable to attend so D. Briggs reported on the status of this effort and SMC involvement. At this time the memorandum of understanding has been signed by all organizations planning to contribute data sets. At the request of the hardwood coop group, the SMC submitted a proposal in 2002 to be contractor for organizing the datasets into a coherent database to support a future modeling effort. At this time the Washington Cooperative, Monitoring, Evaluation and Research Committee (CMER) has agreed to provide $15,000 toward this effort and there have been verbal assurances from others to contribute to the estimated total of about $30,000.

F. Genetics and Growth Modeling Workshop

Glenn Howe reviewed a proposal for this workshop and asked if the SMC is willing to be a sponsor. Given the discussion associated with the Modeling TAC, the group agreed that this is a worthy, timely effort and that the SMC would be a sponsor. Glenn will form a planning committee to identify invited speakers and define the budget.

G. Nominating Committee

D. Briggs noted that this fall will be Norm Andersen’s last meeting as Chair of the Policy Committee and that Vice Chair Mike Mosman will become Chair. In the tradition of recent years, the Nominating Committee, consisting of the outgoing and incoming chair plus past-chairs was reactivated to identify candidate(s) for the position of Vice-Chair to be presented at the Fall Meeting for vote.

H. Budget

The 2002 budget began with a reserve from 2001 of $54,220. When combined with member dues and contracts ($589,458), the operating budget was $643,678. A summer field crew was hired for vegetation surveys and to implement a new procedure for gathering habitat index data. Limited support was provided to several graduate students who worked on some of the items on the list of projects from the 2002 meeting. The year ended with a reserve of $57,857.

The 2003 budget shows a drop in member dues and contracts by $40,153 to $549,305. Although there were new members, there is a net loss resulting from the USFS leaving the SMC and Willamette being absorbed by Weyerhaeuser. Including the reserve from 2002 produced an operating budget of $607,162.
Assuming expenditures similar to 2002, a reserve of about $26,000 is projected for the end of 2003.

I. By-Laws

D. Briggs summarized the By-Laws document which contained the Articles of the By-Laws, the Memorandum of Agreement (Annex A) that current members receive and sign along with annual dues invoices, a proposed counterpart Memorandum of Agreement (Annex B) for the proposed Analytic Organization Member category, the existing SMC Database Policy (Annex C), and a proposed Licensing Agreement for use of the Database by Analytic Organization Members (Annex D).

It was noted that the group needed to vote on the articles of the By-Laws since this establishes concurrence with the approach taken to membership for an Analytical Organization; namely that there are no dues, that they may have free use of the database to produce products and services for fee to other SMC members, and that there would be a licensing fee if products and services derived from the database are to be provided to non-members. Agreement on this approach was necessary in order to proceed further with refining Annex B and Annex D.

A motion was made by Randall Greggs to approve the Articles of the By-Laws and the Annex A Memorandum of Understanding, seconded by Howard Dew, and unanimously approved. D. Briggs will immediately contact those who have expressed interest in becoming an Analytical Organization Member. The Finance Committee will ask representatives of this new group to participate in the refinement of the remaining Annexes with the intent that these would be completed and ready for final vote at the Fall Meeting.

J. Genetic Gain Trial-Type IV Collaboration

D. Briggs reviewed the history of the Type IV concept which originated in 1998. Originally, Type IV’s were viewed as a set of long term installations in which the latest advances in genetics, seedling production, and competing vegetation control would be deployed in combination to monitor effects on growth, yield, and quality. In 2001, an opportunity arose to collaborate with the Northwest Tree Improvement Cooperative which was planning a genetic gain trial for Douglas-fir in the Grays Harbor, WA. area. Keith Jayawickrama, Director of the NWTIC, commented that the Grays Harbor trial plans to sow seed this next winter hence it is imperative for planning purposes that the SMC decide whether or not to do the joint study.

D. Briggs and E. Turnblom reviewed a document summarizing 4 potential designs that appeared to fit within constraints of unit size and ability to produce high gain seedlings. It was noted that it would be useful for budgeting and field crew management considerations to spread the development of all 6 units over 2 years.

Subsequent discussion focused on the desirability of including thinning and fertilization as treatments. Including thinning and/or fertilization increases the number of plots and acreage demand. Although there may be sufficient seedlings to include thinning and/or fertilization plots, these would be limited in scope. There was general consensus that specific research questions of interest with respect to thinning and nutrition should be identified and separate experiments designed to address them. The possibility of collaborating with the Vegetation Management and Nursery Technology Cooperatives was discussed. D. Briggs will send an email to identify those interested in participating in meetings to discuss thinning and fertilization issues further. Two other suggestions that were made and accepted were that (1) the 6x6 spacing be changed to 7x7 and (2) “complete vegetation control” (V2) should be the standard in the study with the “current practice vegetation control” (V1) level present only as needed to provide a reference.

After considering all points, discussion focused on Design # 2, originally presented six units or sites, each containing (1) a Genetic Gain Trial of 3 levels of genetic gain (all at 10x10 spacing, no fertilization following planting, and standard vegetation control) each with 5 replications on a site and (2) a complete block Type IV design (2 levels of genetic gain x 3 levels of spacing x 2 levels of vegetation control and no fertilization following planting. Design #2 was revised as follows:
1. “Complete” vegetation control (V2) will be the standard; “current practice” vegetation control (V1) can be handled as an incomplete factor.

2. The tightest spacing will be 7x7 rather than 6x6

3. There will be no thinning and no fertilization regimes (experiments associated with these will be taken up separately in the future)

This revised design reduces acres, demand for high gain seedlings, and costs. In response to a question regarding availability of six units, each capable of handling 13-14 acres of plots, Eric Turnblom indicated that he had made inquiries among some landowners in the Grays Harbor area who indicated they will have units on the order of 40 acres.

The other major concern expressed was related to the cost of conducting the joint study. D. Briggs noted that the cost estimates provided were very rough and would need refinement if we decided to go ahead. Keith indicated that NWTIC will commit approximately $60,000 to this program. One of the large items in the budget estimate is associated with protecting the seedlings from animal damage. Costs to fence have been estimated and are quite large. It was suggested that tubing the seedlings would be a much less expensive alternative and this will be investigated. D. Briggs notes that if the joint design is approved, an important next step will be to more accurately develop the set-up costs and sharing arrangements.

The question was raised as to whether this would be the only Type IV installation and the geographic relevance of a single such installation in Grays Harbor. D. Briggs commented that the original concept called for additional Type IVs for both Douglas-fir and western hemlock to be placed from south to north in both the coastal and Cascade environments. At this time, no plans or contacts had been made with tree improvement programs in other locations since the focus has been on developing an acceptable design and placement of the first one. We will follow up to learn where opportunities to create others may lie.

A motion to accept the modified Design 2 and proceed with this first Type IV was made by Randall Greggs and seconded by Dave Hyink. The motion carried with 13 in favor and 4 opposed. Those who opposed cited concerns over cost (2), the fact that fertilization was excluded (1), and the geographic location (1).

Following this vote discussion focused on next steps to be taken:

1. Produce a finalized design document based on the results of the discussion and vote
2. Revamp the budget estimates to reflect a 2 year implementation and subsequent measurement cycle
3. Intensity contacts with landowners for candidate sites
4. Initiate discussions regarding thinning and fertilization experiments.

The meeting adjourned at 3:45

TECHICAL SESSION: April 23: See the agenda for titles of speakers and titles of presentations. Many can be downloaded from the SMC website. The meeting adjourned at 11:45.
## Appendix A

**STAND MANAGEMENT COOPERATIVE**  
Spring Meeting  
McMenamin’s, Troutdale, OR.  
April 22-23, 2003

### Attendance

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Appendix B

STAND MANAGEMENT COOPERATIVE
Spring Meeting  McMenamin’s, Troutdale, OR.  April 22-23, 2003
AGENDA

April 22  Topic

9:00  Coffee & Rolls

10:00  Welcome: Norm Andersen, Chair SMC Policy Committee
       Introductions: David Briggs, SMC Director

10:10  Accomplishments & Plans for 2003: David Briggs
       Discuss “Analysis Projects” Handout

10:35  Silviculture TAC Report: Eric Turnblom, Silviculture Project Leader
       2002/2003 Field Season & 2003 Summer Field Crew Plan
       Database Update Timetable: Randy Collier, SMC Database Manager

10:50  Modeling TAC Report: - Greg Johnson, Modeling TAC Leader

11:00  Nutrition Project Report – A.B. Adams for Rob Harrison, Nutrition TAC Leader

11:05  Wood Quality Project Report - Eini Lowell, Wood Quality TAC Leader

11:10  Update on Agenda 2020 Collaborations and Studies Funded. Charlie Peterson

11:25  Meeting Announcements

11:35  Alder Cooperative: Barri Hermann
       Sponsorship of Genetics/Growth & Yield Modeling Workshop: Glenn Howe

11:40  Nominating Committee: (to seek Vice Chair candidates; M. Mosman to become Chair in
       Fall 2003)

11:45  **2002/2003 Budget Review & Forecast: David Briggs**

12:00  Lunch

1:00  SMC By-Laws Discussion & Vote

1:45  Grays Harbor Genetic Gain Trial & Type IV Installation Collaboration: Discussion

3:00  Break

3:20  Continued discussion of Type IV & vote

4:30  Adjourn
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<tr>
<td>8:00</td>
<td>Coffee &amp; rolls</td>
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<td>8:10</td>
<td>New Zealand Growth &amp; Yield Modeling: Jim Flewelling</td>
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<td>New Zealand Management Practices: Randall Greggs</td>
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<td>8:50</td>
<td>The Pilchuck Tree Farm Spacing Trial: A Preview of Type III Results? Luciana Ingaramo</td>
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<td>9:10</td>
<td>Modeling Curtis’ Relative Density: Mark Senger</td>
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<td>Growth responses to pruning: Andrew Hill</td>
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<td>10:20</td>
<td>“Type I Installations: Effect of early spacing control through precommercial thinning in immature Douglas-fir stands”: Mariano Amoroso</td>
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<td>10:40</td>
<td>Update on Installation Summary Status Reports: (projects A, B, C on SMC list): John Haukaas</td>
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<td>11:10</td>
<td>Update on Branch Growth Modeling: David Briggs &amp; Eric Turnblom</td>
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<td>11:30</td>
<td>Epicormic Branches following Pruning, Randy Collier</td>
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Stand Management Cooperative Policy Committee Fall Meeting
September 15-17, 2003 at Cascade Locks, Oregon
Minutes

The meeting began at 10:00 on September 15 with 52 attendees from 23 organizations (Appendix A). The full agenda, including presentations on the afternoon of the 15th and itinerary of the Wind River Experimental tour on the 16th and 17th is in Appendix B.

Sept. 15 Business Meeting

Policy Committee Chair Norm Andersen opened the meeting and commented on the progress made on the By-Laws that has led to a number of organizations wishing to join the SMC as Analytic Organization members. He also mentioned additional work needed to be done on the By-Laws and the need to elect a new Vice Chair of the Policy Committee.

Analytic Organization Members: After introductions SMC Director David Briggs started the meeting by reviewing the history of formation of the Analytic Organization member category and the criteria for membership and procedure for voting on new applications as stated in the By-Laws. Four consultants; The Forest Technology Group, JS Thrower, Inc., Jim Flewelling and Mason Bruce & Girard, had requested joining the SMC. A motion to accept all of them as members was made (Hamish Kerr), seconded (Gene McCaul) and approved unanimously.

Election of new Vice-Chair of the Policy Committee: Since the term for Norm Andersen as Chair of the Policy Committee ends after this meeting, Vice Chair Mike Mosman will become Chair for the next 2 years. At the Spring meeting, the Nominating Committee was asked to develop a recommendation for the next Vice-Chair. Norm Andersen reported that the committee had discussed this and recommended that Gene McCaul be the next Vice-Chair. A motion to approve was made (Howard Dew), seconded (Randall Greggs), and unanimously approved.

Budget: David Briggs reviewed the status of the budget for 2003. Based on actual expenses through July and projections to the year end, there should be a budget surplus of approximately $35,000 to carry into 2004. He noted that there was a carry forward of almost $58,000 from 2002 hence even though dues were about $10,600 short of projected basic expenses we were in good shape in 2003. In addition, $194,000 in external grant funds provided opportunities to pay some faculty and staff salaries creating savings sufficient to fund the summer field crew. The external grants were also important in supporting graduate students. The projection for 2004 is for income from dues and basic expenses to be very similar to 2003, hence a similar deficit, about $11,000 is projected. This can be covered by the $35,000 balance expected at the end of 2003 and may be further moderated by opportunities from external grants to cover some costs. It is unclear if there will be funds to support the summer field crew in 2004, especially since there will be some costs associated with the Type IV installations. Dave noted that the SMC funding formula has not been changed since 1997. He also noted that the BLM has indicated that their contribution to the 2005 SMC budget may be reduced by budget cutting in the Federal Government. Dave will be holding meetings with the Finance Committee to discuss this and develop contingency plans. A motion to accept the 2004 dues was made (Norm Andersen), seconded (Larry Raines), and unanimously approved.

By-Laws: Dave Briggs reviewed progress made on the By-Laws. The Finance Committee held a meeting in August and had extensive email correspondence. Suggested changes and discussion points are:

1. Article VIII (Receipt of SMC Database, Research Tools and Services), Item 2 was changed so Analytic Organizations also receive the database and the same access to SMC staff as the Land Managing Organizations. Item 4 was changed to state that all members who receive the SMC database will comply with the terms of the Database Policy. Comments were made that the By-Laws do not appear to permit Institutional or Supplier organizations to receive the database.

2. Article X (Election), Item 1 was changed to clarify when the term of the Policy Committee
Chair terminates.

3. Article XVI (Conduct of Meetings) was amended to add a statement regarding conflict of interest.

4. The Database Policy, which has been substantially revised, was discussed at length. Section I (Data and Database) items 3 and 5 need additional work regarding how members may subcontract with non-members for proprietary work. Some indicated that they would provide wording suggestions for the Committee to consider. Section II (Publications, Software, Models and other Works) appears to be reasonable. The comment was made that the By-Laws and Data Policy should be reviewed with respect to Institutional and Supplier members to be sure that these are correctly handled.

The Committee will review the discussion, make revisions and email them for additional comments.

Field Schedule and Database Reports: Eric Turnblom reviewed the schedule for the 2003/04 field season and a projection of field work through 2010. It was noted that the nature of the field work is shifting from regular to partial measurements as more plots require checks on progress toward treatment triggers and actual treatment. Randy Collier noted that anyone who did not receive a copy of the most recent database update should contact him if they wish a copy.

Future Meetings: Dave Briggs pointed out flyers announcing several upcoming meetings. He asked that anyone with information on others get them to the SMC within the next 2 weeks so they could be included in the next SMC Newsletter. Tentative dates and locations for the 2004 meetings in April (McMenamin’s in Troutdale, OR) and September (at Oregon State University) were reviewed. We will try to finalize dates in the next few weeks and get them on everyone’s calendar. Dave Briggs discussed a renewed effort that will be made this fall to schedule a meeting to discuss member interests and questions regarding fertilization and how the SMC and other cooperatives may be able to respond to these needs.

Modeling TAC Report: Greg Johnson summarized the TAC meeting held on May 29. Three major outcomes of that meeting were

1. The need for and recognition that it is now possible to develop a young-stand (age 0-15) model using SMC and other data. Although some models presently purport to do this, none appear satisfactory in terms of region-wide validation. A proposal is under development and will be presented at the Spring 2004 meeting.

2. The SMC-Organon version was developed without utilizing data from the SMC Type I and III installations which had too few measurements at the time. Today, these contain sufficient re-measurements to permit a revision that includes information from these installations. A team of potential modelers to investigate this was identified for further discussion.

3. The need for an easy method for generating start-up conditions for input to the commonly used growth and yield models was discussed. Most presently rely on tree lists and, for many applications, it would be desirable to be able to generate such lists using a few input parameters rather than require a set of measured trees from existing stands. It was noted that K. Gerhinger’s tree list generator is difficult to use (could be rectified by having a user-friendly interface). Jim Flewelling presented a proposal to develop software for a tree-list generator and reported that he plans to present it at the Spring SMC meeting.

Silviculture TAC Report: Eric Turnblom reviewed the design of the Genetic Gain Trial/Type IV Installations approved at the Spring meeting. A little less than 15 acres is needed to accommodate the 22 total plots that would be created on each of 6 sites in or near the Grays Harbor breeding zone region. Seed will be sown this winter for planting the first 3 sites in January 2005. The remaining 3 sites will be sown in 2005 and planted in 2006. A group visited 4 potential sites on Sept 9; one site for the 2006 planting was
selected and another is a very good possibility for the 2005 planting. Eric asked that members with land in or near the Grays Harbor breeding zone look for potential sites and send in Candidate Area Forms so they can be evaluated. It was noted that the number of seedlings to be planted each year is about 25,000 and that a nursery search is underway. The cost for producing the seedlings has not been determined but is estimated to be about $20,000 which will be shared by the cooperatives. The issue of protecting seedlings by fencing or tubing has been examined. A preliminary break-even analysis using a range of cost estimates suggests that fencing will be the least costly option. Consideration of the field schedule forecast suggests that the tasks of surveying in the plot boundaries and conducting field measurements on the plots can be handled by the existing field crew configuration.

Wood Quality TAC Report: No wood quality TAC meetings were held since the Spring meeting. It was noted that research on branch/knot characteristics related to cultural treatments was progressing. Eini Lowell asked that everyone review and update the Wood Quality TAC membership list. An announcement was made regarding a workshop on wood quality that will be held in Portland, OR., on October 23-24, 2003. The objectives of the workshop are to aid in identifying industry needs in wood quality and discuss methods of carrying out the necessary research.

Nutrition TAC Report Rob Harrison reviewed progress at the Fall River long-term productivity site and other projects and publications. Updates on some of these were presented during the afternoon technical session.

Afternoon Technical Session: The agenda lists the speakers and titles of presentations. Handout copies were provided and the Powerpoint presentations can be found on the SMC web site.

Award to Norm Andersen: At the end of the technical session, Director Dave Briggs presented outgoing Policy Committee Chair Norm Andersen with a gift of appreciation commemorating his service to the SMC. The meeting adjourned at 5:10 pm.

Sept 16-17 Field Tour of the Wind River Experimental Forest: A tour of various studies on the Wind River Experimental Forest, organized by Connie Harrington, Dave Marshall, and Ole Helgerson. The list of stops is provided in the Agenda. We wish to thank them for a very interesting and informative program of stops.
Appendix A

STAND MANAGEMENT COOPERATIVE

Fall Meeting  Cascade Locks OR.  September 15-17, 2003

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AGENDA

Sept 15  Topic

10:00  Welcome: Norm Andersen, Chair SMC Policy Committee Introductions: David Briggs, SMC Director

10:10  Vote on Analytic Organization Member Applications Election of Vice-Chair of Policy Committee Report by SMC Nominating Committee & Vote

10:30  Report on By-Laws: Licensing Agreements, etc.

11:00  SMC Budget for 2004 David Briggs

11:30  2002/2003 Field Schedule: Database Report Future Meeting Announcements

12:00  Lunch

1:00   Silviculture Report: Eric Turnblom (update on type IVs, Modeling Report: Greg Johnson

1:30   Wood Quality Report: Eini Lowell Nutrition Report: Rob Harrison

2:00   Hardwood G & Y Coop Report: Database status (Randy Collier) Type II & III Installation Summary Reports: John Haukaas

2:15   Sustainable Wood Production Initiative: J Barbour, B. Deal

2:30   Using Statistical Process Control to Manage Quality Characteristics in Stands: Dave Briggs

2:50   Break

3:10   TreeLab: Eric Turnblom

3:30   Nitrogen Leaching as a Function of Organic Matter Retention in an Intensively Managed Douglas-fir Stand: Brian Strahm

3:50   Discuss GUI for Tree List Generator: Eric Turnblom

4:10   Preliminary Analyses of Type III Installations: Pure & Mixed Species Plantation Growth & Yield: Mariano Amoroso

4:30   Carbon Sequestration in 4 Soil Types Supporting Managed Douglas-fir Stands: A.B. Adams

4:50   Adjourn
Sept 16  **Wind River Field Tour**

7:45  Depart from Cascade Locks

WKO Mill tour, Carson, WA (1/2 hr)

20-yr old spacing trials Douglas-fir, noble fir, western white pine (plus other species)
Connie Harrington, Tim Harrington

Noon  Lunch/Orientation to Skamania County (Ole Helgerson) Hemlock Lake Picnic Area

Site preparation trial (20-year results) (Connie Harrington)

Planting Creek studies (Dick Miller, Connie Harrington): Alder strip, Fertilization trials, Wide spacing trial

Sept 17  **Young stand management upper-slope stands (PCT in true fir/hemlock): Bob Curtis**

Historic Douglas-fir spacing trial: Dick Miller

RFNRP Wind River installation (SMC) & brief mention of Wind River regeneration transect, Connie Harrington

Noon  Lunch, Hemlock Lake Picnic Area

Canopy Crane: Dave Shaw

Wind River Arboretum (if interest and time permit)

3:00  Return to Cascade Locks and adjourn
### STAND MANAGEMENT COOPERATIVE STAFF

**University of Washington, Seattle:**
- AB Adams, Research Analyst III
- Dave Briggs, SMC Director
- Randy Collier, Senior Computer Specialist
- Bob Gonyea, Field Coordinator
- Rob Harrison, Nutrition Project Leader
- Bert Hasselberg, Field Technician
- John Haukaas, Research Consultant
- Megan O'Shea, Administrative Specialist
- Eric Turnblom, Silviculture Project Leader
- William Bizak, hourly field assistant
- Timothy Scribner, hourly field assistant

**B.C. Ministry of Forests, Victoria:**
- Lisa Meyer, B.C. Field Coordinator
- Louise de Montigny, B.C. Research Forester

**PNW Research Station, Portland:**
- Eini Lowell, Wood Quality Project Leader

**Graduate Students:**
- Mariano Amoroso, MS UW CFR
- Andrew Hill, PhD UW CFR
- Luciana Ingaramo, MS UW CFR
- Mark Senger, MS, UW CFR
- Brian Strahm, MS, UW CFR
- Eric Sucre, MS, UW CFR
- Yuzhen Li, PhD, UW CFR

**Undergraduate Students:**
- Teresa Hirsch (summer crew)
- Holly Mounce (summer crew)
- Jennifer Leach (summer crew)
- Frithiof Waters (summer crew)