INCREMENTAL SILVICULTURE

MIRACLE or MYTH

What works for the coast of BC

Young Spaced and Pruned Stand of Douglas fir
on Southern Vancouver Island

Winter Work Shop
Wednesday February 22nd 2012

Vancouver Island University - Nanaimo

Coastal Silviculture Committee Winter Workshop

February 22, 2012 – 8:35 am to 4:00 pm
Vancouver Island University – Nanaimo Campus

INCREMENTAL SILVICULTURE – MIRACLE or MYTH

What works for the coast of British Columbia

Introduction

With ever increasing budget constraints, a changing climate and the shift from harvesting old growth to managed second growth forest, the CSC felt that it was timely to revisit the role of incremental silviculture on the coast of BC. The intent of the session is to explore the 'miracle or myth' (or likely something in between) of incremental silviculture. The organizing committee has invited a range of speakers – some from south of the border – that will provide both research and operational experience and personal insights into the benefits and limitations of the various treatment options; the workshop will stress the links between treatments and desired outcomes and focus on what works and doesn't in coastal BC forests. The program will also include a moderated question and answer session after all the presentations are made.

Acknowledgements

The Coast Silviculture Committee wishes to thank the following people for contributing their time and efforts in organizing the 2012 Winter Workshop…

- Bryce Bancroft (Chair)
- Paul Barolet
- Cosmin Filipescu
- Lauchlan Glen
- Lisa Meyer
- Don Pigott
- Jack Sweeten
- Michel Vallee
- Dave Weaver
- Craig Wickland

The CSC would also like to thank Vancouver Island University for the venue.

CSC Winter Workshop Agenda
Vancouver Island University
Building 356 Room 109

February 22nd, 2012

Intro and welcome (Chair)	**8:15 – 8:30**
Ralph Winter – incremental silviculture for coastal BC – what, where, when and why	8:30 – 9:05
David H. – *65 years after - a personal perspective on operational incremental silviculture*	9: 05- 9:40
Louise de Montigny –*(with support from Mario Di Lucca and Dominique Lejour) Maximizing benefits from incremental silviculture to address midterm timber supply*	9:40 – 10:15
Coffee	10:15-10:45
Alder Management – **Craig Farnden, Managing red alder with a changing climate – how silvicultural regimes fit in.** **Brian Kyle – Operational implementation – steps and challenges**	10:45-11:40
Business meeting	11:40 to 11:55
Lunch – (Royal Arbutus Room – 2nd floor Building 300)	Noon to 1:15
Kevin Hardy – notes from the field – experience with spacing – what to be aware of when choosing a spacing regime.	1:15 – 1:50
Rob Harrison – Forest nutrition, what can be expected from fertilization, where do we get the best bang for the buck. Does pretreatment density matter?	1:50 – 2:25
Cosmin Filipescu – Wood quality as a result of incremental silviculture treatments – what do we know what are we still learning?	2:25-3:00
Coffee	3:00-3:30
Discussion /wrap up – Bill Beese - Bill has been asked to summarize the main points/issues raised and to chair a panel discussion with all of the presenters to allow participants to ask further questions.	3:30 – 4:15

Presenter Biography and Abstract

Biography:

Name: Ralph Winter
Affiliation: BCFS
Position: Stand Management Officer
Responsibilities: Develop silviculture strategies, policies and procedures. Manage surveys, RESULTS and Stand Tending programs. Administration of Land Based Investment program
Academic training: BSF 81. Dip. Advanced Silv (SIBC)
Previous employment: BCFS

Presentation Abstract:

Topic and/or Title:

Incremental Silviculture – coastal BC an historical overview – what, where, why and when

- Over 100 years of research throughout North America and Europe has shown that when properly done, at the right time and on the right sites, incremental silviculture can be a key tool for improving stand quality and value and habitat conditions in specific areas.
- The decisions for what, when, where and why to treat must be driven by integrated forest level analysis and strategies, not just narrow stand-level financial analysis on individual treatments. To be effective, treatments must be properly timed and sequenced.
- Forest Innovation Investment studies have been done to help provide information and guide stand density decision making
- We now have silviculture strategies for the majority of management units in BC and they will be continued to be updated. They provide context and priority for incremental treatment regimes.
- The question "Does incremental silviculture pay?" is dependent on the management unit inventory, management objectives, assumptions, growth and yield models and the silviculture treatments. We must continually check, validate and refine these.
- The Ministry does not promote incremental silviculture be done everywhere or to the same density. Not all stands require treatment. Well managed basic silviculture may be all that is needed on many stands...especially on second and third growth harvested areas.
- In specific management units, the availability of operable and merchantable sized commercially valuable timber will be a key issue. Spacing in conjunction with other treatments may be a necessary activity in order to achieve desired objectives.

NOTES

Presenter Biography and Abstract

Biography: David H. R.P.F. (retired)

David started his career in 1948 as a Forest Technician with the Research Branch of the South African Forestry Department. One of his responsibilities was measuring the CCT thinning plots – George Warrack later established two reps in Douglas-fir on the Island.

He next attended Edinburgh University and saw spacing and thinning in Britain, France and Switzerland. In 1953 he immigrated to Canada and landing up working for MB in 1954. He assisted in the early spacing trials and in establishing the first fertilizer trials on the island under the direction of Dr T.N. Stoate, a retired Australian forester. By 1968 there were 32 fertilizer experiments totalling 908 plots.

MB initiated its Intensive Forestry Program in 1962, particularly spacing and release. Over the next 20 years over 2000 growth and yield and spaced and control measurement plots were established in all MB tenures, covering most conifer species, a full range of site indices and a wide range of ages. From 1962 onwards his responsibilities included program planning, forest research, and growth and yield. In the 70s and 80s he also coordinated MBs involvement in release, spacing and fertilizing research projects with the USFS, State of Washington, U.W, OSU, Weyerhaeuser and Crown Zellerbach.

Commencing in the 1980s the analysis of all MB growth and yield data started culminating in the first natural and managed stand yield model for Douglas-fir and western hemlock.

He retired in 1992 and was later Module Leader for Module VI of the Silviculture Institute diploma course.

Presentation Abstract:

65 YEARS ON - A PERSONAL PERSPECTIVE ON OPERATIONAL AND INCREMENTAL SILVICULTURE

The Research Branch of the SADF started research on initial spacing and thinning for exotic *Pinus* and *Eucalpytus spp.* in 1935. By 1955, printed results taught me how critical initial spacing and thinning were in reaching target sizes and how results differed between species.

This knowledge, along with exposure to managing Pacific coast conifers as a student at Edinburgh, was valuable when MB started spacing trials in Douglas-fir, western hemlock, Amabilis fir, and western red cedar in the late 1959s and early 1960s. Early results showed significant response in diameter growth which led us to believe that spacing would have a significant impact on yield and piece size.

Early attempts at commercial thinning were derailed by economics but remained a dream.

Fertilizer research projects, mostly in Douglas-fir, commenced in 1954. They were designed to test response to common macro-nutrients and some micro-nutrients, time of application and weight of nutrient. By 1960 it was clear that N was the critical nutrient and response was most evident on poorer sites where, after 5 years, crown density had increased enough to suppress understory vegetation.

Given these positive indications and the incentive to maintain or increase AAC, budgets were increased. Spacing predominated but fill-planting, weed control, and fertilization was completed on thousands of hectares.

By the end of the 80s many forces - economic primarily, changes in the tenure system and pressures from the green movement - brought an end to the forester's dream of intensive management.

My perspective today, based on what I learned from all MB's research and our analyses of growth and yield plots, are essentially negative. I believe the justification for and value of spacing and thinning in particular are questionable. Any return to past levels must be subject to a great deal of study and analysis of much more than wood yield in combination with clear objectives and a good crystal ball.

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Presenter Biography and Abstract

Biography:

Name: Louise de Montigny
Affiliation: Resource Practices Branch, MFLNRO
Position: Silviculture Research Leader
Responsibilities: Conducting research in support of science-based policies
Academic training: BSF UBC, MFS Yale, PhD UBC
Previous employment: Research Silviculturist Stand Tending, Research Branch

Presentation Abstract:

Topic and/or Title: Maximizing growth with incremental silviculture to address midterm timber supply shortfalls

Authors: **Louise de Montigny, Mario Di Lucca and Dominique Lejour**

The Land Based Investment Strategy (2011-14) has suggested juvenile spacing and fertilization of Douglas-fir to mitigate mid-term timber supply shortfalls and maximize timber growth in the provincial forests. These intensive silvicultural treatments can create the stand conditions needed to meet specific management objectives and harvest outputs, but silviculture programs of the past had to rely on simple tools for complex decision making and the results did not always meet the objectives of the day. This presentation discusses the results of an analysis using TASS (Tree and Stand Simulator), the new FAN$IER (Financial Analysis System Including Economic Return) and updated SAWSIM (Sawmill Simulator) models to examine the biological and economic effects of different levels of juvenile spacing with and without fertilization over a range of site indices for coastal Douglas-fir and western hemlock on short rotations. Outputs include log and lumber volume and quality, economics, carbon sequestration and total biomass. The information can be used to identify where and how intensive silvicultural treatments can be applied to achieve the desired Land Based Investment Strategy objectives.

The project is a collaboration between the Resources Practices Branch, Forest Analysis and Inventory Branch, and the Canadian Wood Fibre Center.

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Presenter Biography and Abstract

Name: Craig Farnden PhD RPF
Affiliation: University of BC
Position: Post-Doctoral Fellow
Responsibilities: Project Manager - FFESC Red Alder Climate Change Strategy
Academic training: BCIT (1981), BSF (UBC 1985), PhD (UBC 2010)
Previous employment: Industrial Forestry Service (1985 to 1992), Canadian Forest Service (1992 to 1996), Consulting Forester (1996 to 2005 and beyond)

Presentation Abstract:

A rational context for intensive silviculture of red alder in British Columbia

There are many opinions about red alder, ranging from the continuing view that it is a weed species to the perspective that it is a highly valuable and adaptable crop species. With the latter view becoming increasingly (and justifiably) prevalent, it is important that we a) fully understand its potential as a crop species, b) understand how to appropriately commercialize it and c) ensure that we can develop an appropriate match between timber supply and potential industries that want to use it. Specifically from the silviculture perspective, we need to understand the quality and log profile needs of the hardwood industry, and the inherent timber supply dynamics of the current resource. We can learn a lot about the first factor from the well developed American alder industry, but we've got a long way to go on the fibre supply side of the picture.

Craig Farnden Biography

Craig received a Technical Diploma in Forestry from BCIT in 1981, a BSF degree from UBC in 1985, and a PhD from UBC in 2010 (yes, there's a 25 year gap in there). He spent 19 years working in Prince George first with IFS, then as a research forester for the Canadian Forest Service, and finally as a consultant with his own firm. Amongst other things, he has specialized in the development and application of GY-based decision support tools for silviculturists. He is currently a post-doc at UBC, where he has been the manager of an FFESC project developing a climate change strategy for red alder.

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Presenter Biography and Abstract

Biography:

Name: Brian Kyle
Affiliation: Northwest Hardwoods
Position: Forestry and Engineering Planner
Responsibilities: Full scope license operations coast
Academic training: BCIT Forestry & Business
Previous employment: Weyerhaeuser BC Coastal Coast Mountain Hardwoods, Canfor, BCFP & various contractors & small companies

Presentation Abstract:

Title: The Operational implementation of Alder Spacing

I will touch on Things to look for when considering an alder stand for spacing under an intensive management regime:

Natural vs. Planted, Age, Site, Slope position

The importance of a pre spacing site assessment.

Infrastructure in place now and for the future

Proposed area of treatment vs expected area activity into the future.

I will discuss the site preparation required for Alder management and how that may influence future spacing as a result (e.g., planting densities, the effect of debris , brush & compaction

I will discuss the initial planting densities that have been used for alder intensive management regimes and how they affect or influence opportunities for spacing.

Some of the risk associated with spacing higher density stands as compared to spacing lower density stands.

Consideration of unknown risks to contemplate (e.g., Human disturbance post spacing, wind, snow, pests).

Consideration of density variability in spacing to allow for variability in the final stand and to allow for the best trees to retained as final crop trees.

Planned fiber quality and associated tolerances of tree spacing, tree form, growth rate and ultimate marketability of wood.

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Coast Silviculture Committee

Business Meeting

BUSINESS MEETING AGENDA
FEBRUARY 22, 2012

Coastal Silviculture Committee

Call to order

Additions to the agenda

Adoption of the agenda

1. Discussion on Distribution of Bursaries

    - UBC 2@$ 500.00
    - VIU 2@$ 500.00

    Total $2000.00

2. Bursary Presentation to Vancouver Island University recipients

3. Financial Statement – January 2011 – December 2011

4. Confirmation of Status of Current Directors, and Election of New Directors

5. Discussion about perpetual scholarship

6. Discussion on Summer workshop – fees, location, ideas

7. Adjourn

Financial Report January 1 to December 31 2011
Coastal Silviculture Committee

January 1 2011 BALANCE 20,195.85

CSC BUSINESS COSTS

post office box	151.20		
Society annual fee & By-law fees	36.00		
		(187.20)	(187.20)

BURSARIES

regular bursaries	2,000.00		
perpetual bursary	10,000.00		
		(12,000.00)	(12,000.00)

WINTER WORKSHOP

Income

Registrations	8,304.78		
cash gift	-		
		8,304.78	

Expenses

catering, A/V rental, gratuities	2,995.97		
Printing Costs	498.80		
Extension Services/ MC VISA charges	8.76		
presenters gifts	150.00		
		(3,653.53)	4,651.25

SUMMER WORKSHOP

Income

Registrations	12,141.22		
cash gift	-		
		12,141.22	

Expenses

lunches, snacks, catering, A/V rental, gratuities	6,526.58		
bus + van	2,668.99		
Printing Costs	581.80		
Extension Services/ MC VISA charges	344.00		
Participant gifts	1,103.20		
presenters gifts	300.00		
		(11,524.57)	616.65
	-		

OTHER

Income

transfer from VIU account to CSC account	3,528.32		
bank interest	72.79		
		3,601.11	72.79

Expenses

Bank service charges	14.00		
		-14.00	(14.00)

DECEMBER 31, 2011 BALANCE 13,335.34

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SUMMARY

Bank accounts		
chequing	7613.70	
high interest/no fee	866.68	
short term GIC	4854.96	
TOTAL		13,335.34

Afternoon Sessions

Presenter Biography and Abstract

Biography:

Name: Kevin Hardy, RPF
Affiliation: MFLNRO
Position: Growth and Yield Forester
Responsibilities: Provincial Growth & Yield Program (1994 to present)
Academic training: BSF '83 UBC
Previous employment: Silviculture/Inventory Contractor

Presentation Abstract:

Title: Social Forestry Programs and juvenile spacing – has it been good for our forests?

Since the tough economic times of the early 1980s, a variety of Social Forestry Funds have softened the blow for displaced or unemployed forest workers, I being one of them. Throughout my entire 28 year career, I have watched very large sums of "make-work" funds from a seemingly endless string of short lived forestry funds channeled into a variety of forestry activities e.g. Canada Works 2000, EBAP, FWAP, FRDA 1&2, SMFRA, FRBC, New Forest Opportunities, FIA . Without doubt, one of the most contentious activities was juvenile spacing, which has at times generated intense debate and countless studies aimed at either justifying the practice or quashing it. Road deactivation and alder slaughter programs probably rank up there too, but that's another talk!

While I confess I am guilty of taking a juvenile spacing contract using 1986 year end "silly money" (spacing hemlock on snowshoes in 3 feet of snow), I tried to bend rigid spacing rules to allow for selection of the best trees, and only got threats of payment penalties for my efforts. I have also "choked up" on inter-tree spacing to allow for what I suspected to be incipient stem infections of western gall rust on pine – only to be proven right 10 yrs later when 40% of the leave trees in the first block I worked on had developed stem galls.

It's clear from the many detailed analyses that JS can't generate a return on investment. But for make-work projects it's irrelevant, as it's a political decision to use cash to generate jobs. What's upsetting me as a professional is the collateral damage to these stands– either in lost value due to poor wood quality through to outright mortality due to a myriad of forest health vectors etc. Spacing stands to final crop tree densities does not allow for any losses due to forest health and other vectors that I have seen damage or kill these stands afterwards.

I have taken many opportunities to challenge the spacing dogma that still prevails, but the political weight behind it is difficult to overcome! In essence I have tried to be a "Myth Buster". My advice: "DON'T DO IT!" or "reserve it for sanitation, species conversion, alder plantations, harsh sites, dense pine, or multiple entry treatments" and "FERTILIZATION IS *MUCH* BETTER!".

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Presenter Biography and Abstract

Biography:

Name: Rob Harrison
Affiliation: Stand Management Coop, U Washington
Position: Professor
Responsibilities: teaching, research, extension
Academic training: Ph.D. Auburn Univ**.**
Previous employment: Oak Ridge National Lab

Presentation Abstract:

Topic and/or Title: Forest nutrition, what can be expected from fertilization, where do we get the best bang for the buck.

Forest fertilization, particularly the addition of nitrogen as urea, is widely practiced in the Pacific Northwest due to the typically low N availability of regional soils and the high productivity of forests in the region. Forest managers in the Pacific Northwest (PNW) use fertilization as a means to increase timber yields almost exclusively in intensively-managed stands. Information on the biological basis for nutrient amendments and stand growth responses to fertilization is required to effectively use fertilization as a tool to improve silviculture. Most PNW Douglas-fir forest sites are currently nitrogen deficient. Mineral cycling research over several decades has shown high C/N ratios, low nitrification rates, and tight cycling of N for forests and soils in the region. Research and development projects in the Pacific Northwest have produced an information base that is used to select sites and stands for fertilization and to forecast growth after treatment, but the ability to successfully predict response is limited. Much of the basis for operational fertilization programs in western Oregon and Washington comes from cooperative research programs and current research is largely directed toward improving site-specific response information. Forest fertilization in the Pacific Northwest has become a silvicultural practice of major significance over the past two decades. Forest industry and government organizations managing forest lands in western Oregon and Washington typically apply nitrogen fertilizer to Douglas-fir stands over a range of soil and stand types (operational fertilization of other species is minor). About 50,000 to 55,000 ha are fertilized each year. The key is to be able to focus treatment on the sites most likely to respond, and a major study initiated in 2010 is showing some promise in further improving prescriptions in well-stocked Douglas-fir plantations.

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Presenter Biography and Abstract

Biography:

Name: Cosmin Filipescu
Affiliation: Canadian Wood Fibre Centre, Pacific Forestry Centre, Canadian Forest Service
Position: Research Scientist
Responsibilities: Ecophysiology, Wood quality, Modeling, Silviculture
Academic training: B.Sc. For. (Hons) (Univ. Transilvania), Ph.D. (Univ. of Alberta)
Previous employment: Research, Consulting

Presentation Abstract:

Topic and/or Title:

Wood quality and incremental silviculture: what do we know, what are we still learning?

The Coastal forest sector is currently facing several challenges, including increased globalization and international competition, eroding profit margins, rapid shifts in markets and consumer demands, as well as diverse and sometimes conflicting land uses. As a result, perhaps more than ever before, decisions to invest in incremental silviculture (e.g., juvenile spacing, pruning, thinning, fertilization) should be linked to potential end-use products and value. A comprehensive assessment of relationships between incremental silviculture and wood quality is therefore needed for implementation of viable analysis tools and optimized decision-support systems.

This presentation will briefly summarize current information on fibre attributes in relation to wood quality. The link between attributes that render product value and incremental silviculture will be explored, supported by evidence from long-term research studies in Coastal forests.

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Presenter Biography and Abstract

Name: **W.J. (Bill) Beese**
Affiliation: **Vancouver Island University**
Position: **Univ-College Professor**
Responsibilities: **Forest Ecology & IRM**
Academic training: **Masters of Forest Ecology (UBC)**

Previous employment: Bill has over 30 years of experience in coastal BC in research, ecological consulting and policy development with several forest companies; his research includes silvicultural systems, prescribed fire, regeneration and biodiversity and he is keenly interested in practical implementation of innovative forestry practices. Bill co-authored two chapters in *Forestry and Biodiversity* (UBC Press 2009), and a chapter on variable retention in an upcoming book: *Ecology and Conservation of North Pacific Rainforests* (UW Press 2012). He has served on numerous advisory groups on research, old growth forests and ecosystem-based management. Recent fun gigs include consulting for Forestry Tasmania and a workshop in Sweden on retention forestry.

NOTES

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