

Silviculture Treatments for Ecosystem Management in the Sayward

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BRITISH COLUMBIA

Ministry of Forests
Forest Science Program



Introduction

STEMS is a large-scale, multi-disciplinary experiment that compares forest productivity, economics, and public perception of seven silvicultural regimes replicated at three sites in the Sayward Forest. The STEMS experiment uses silvicultural systems and treatments to create diversity in forest structure that results in a variety of canopy layers (vertical structure) and spatial patchiness (horizontal structure) to enhance biodiversity and wildlife. These silvicultural regimes create a range of gap sizes and frequencies that emulate natural variation in forest structure.

STEMS is part of a larger study called "Silvicultural Options for Harvesting Douglas-fir Young-Growth Production Forests" located in the Capitol Forest near Olympia, Washington. The study was developed jointly by the scientists of the Pacific Northwest Research Station and the Washington State Department of Natural Resources.



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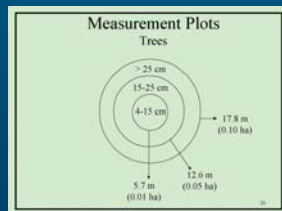
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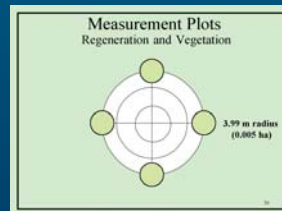
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Objectives

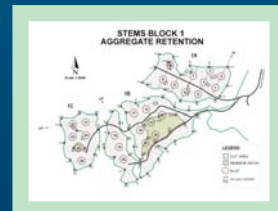
- to create replicated examples of alternative harvest practices and silvicultural regimes that can be used as a demonstration area by foresters and planners in ecosystem management
- to provide quantitative information for evaluation of feasibility and costs of alternative regimes and of their long-term effects on production of timber volumes and values and other non-timber values
- to evaluate the effectiveness of contrasting silvicultural systems in reducing environmental and visual impacts of forestry operations, while supplying high timber outputs over time



Example of a tree measurement plot



Example of a regeneration and vegetation measurement plot



Plot layout in treatment unit 1 – aggregate retention



Key to photos and map

- Location of the STEMS experimental site in the Snowden Demonstration Forest
- Aggregate Retention (25 ha with 10% BA or 120 sph remaining)
- Extended Rotation with Commercial Thinning (18 ha with 50% BA removed)
- Uniform Dispersed Retention (18 ha with 10% or 40 sph BA remaining)
- Clearcut with Reserves (11 ha with 0.3-ha reserve)
- Modified Patch Cuts (35 ha with 13% area removed every 10 years)
- Extended Rotation (non-treatment control)
- Group Selection (21 ha with 13% area removed every 10 years)

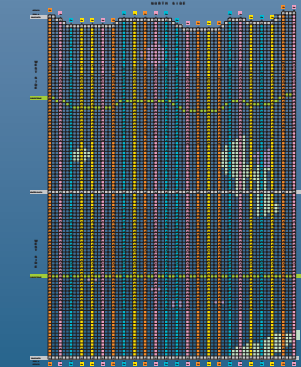
Ongoing studies and associated research partners

- Tree growth and stand development, including understory vegetation
- Regeneration and light availability
- Windthrow, mortality, and coarse woody debris recruitment (Dr. Steve Mitchell, U.B.C.)
- Harvesting production and impacts of residual tree damage and soil disturbance (Eric Phillips and Craig Evans, FERIC)
- Visual quality and public response (Jacques Marc, Forest Practices Branch, B.C. Ministry of Forests)
- Green Tree Retention (Dr. Sue Grayston, U.B.C.)

Continued monitoring of the STEMS experiment will help to determine how best to meet the operational goals and targets set out in the Vancouver Island and Sayward Land Use Plans for multiple-use objectives. The results of this experiment will be used to improve forest management decision-making and policies regarding alternatives to clearcutting.

Regeneration survey results in planted plots after 1 and 2 years

	Treatment Blocks						
	1	2	3	4	5	6	7
Total number of regeneration plots	104	64	84	60	108	68	80
Number of regeneration plots planted	89	0	84	60	17	0	16
% of all regeneration plots planted	86	0	100	100	16	0	20
2nd-year survey results							
Total live planted seedlings/ha	1063	n/a	1205	1263	1150	n/a	1025
% replanted	18	n/a	17	24	13	n/a	25
Browsed lived seedlings/ha	214	n/a	203	392	163	n/a	407
% seedlings browsed	20	n/a	17	31	14	n/a	40
Dead seedlings/ha	134	n/a	76	163	100	n/a	150
% mortality	11	n/a	6	11	8	n/a	13



Map of seedling planting layout for regeneration study in GS10



Seedling planting layout in GS10



Hemispherical photo taken from centre of GS10



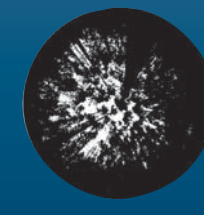
Quantum sensor for light calibration of hemispherical photos



Threshold image of clearcut (open sky)
Original hemispherical photo (below)



Threshold image of aggregate retention (partial canopy)



Threshold image of uncut control (closed canopy)

Acknowledgements

This project was made possible through the support of research partners as noted above and to operational partners including Campbell River Forest District, BC Timber Sales, and International Forest Products. Funding for this research was provided in part by Forest Innovation Investment.

For further information on the status of the STEMS experiment, visit the STEMS website <<http://www.for.gov.bc.ca/hre/stems>>.

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