

## Background

Throughout British Columbia, social, legislative, and stewardship issues have instigated the establishment of studies that evaluate alternatives to clearcutting for harvesting and management of forests. Prioritization of areas for these studies within the Vancouver Forest Region (VFR) of the Ministry of Forests (MoF) identified the lower elevation, Douglas-fir dominated ecosystems along the south coast as a priority area. Forests above Roberts Creek on the Sunshine Coast, northwest of Vancouver, were selected as being suitable both for large-scale silvicultural systems research, while introducing management issues related to forestry in close proximity to urban centres.

The Roberts Creek Study Forest (RCSF) demonstrates alternative silvicultural systems within an area administered by the Sunshine Coast Forest District Small Business Forest Enterprise Program. Designed as a set of adaptive management case studies, research and monitoring within the study blocks provides information to assist the development of methods to harvest and manage these Douglas-fir-dominated ecosystems to meet a range of biological, social, and economic objectives.

## Local forests

The RCSF lies within the Dry Maritime Coastal Western Hemlock subzone which occurs at low elevations on the mainland and adjacent islands. Climate is characterized by warm, relatively dry summers, and moist, mild winters with little snowfall.

Blocks within the RCSF range from 350 to 590 metres above sea level, and are gently sloped with southerly aspect. Charcoal within the soil profile and on trees and snags throughout the study area suggests that fire initiated the current forests, which are typically in excess of 120 years of age. Douglas-fir typically represents the majority of stand volume while shade-tolerant western hemlock and western redcedar represent the majority of smaller diameter trees. Salal dominates the sparse understory vegetation. The predominant soils have loamy sand or sandy loam texture (humoferric podzols), a thin humus layer, tend to be nutrient-poor to medium and submesic in moisture, and subseric to submesic in moisture.

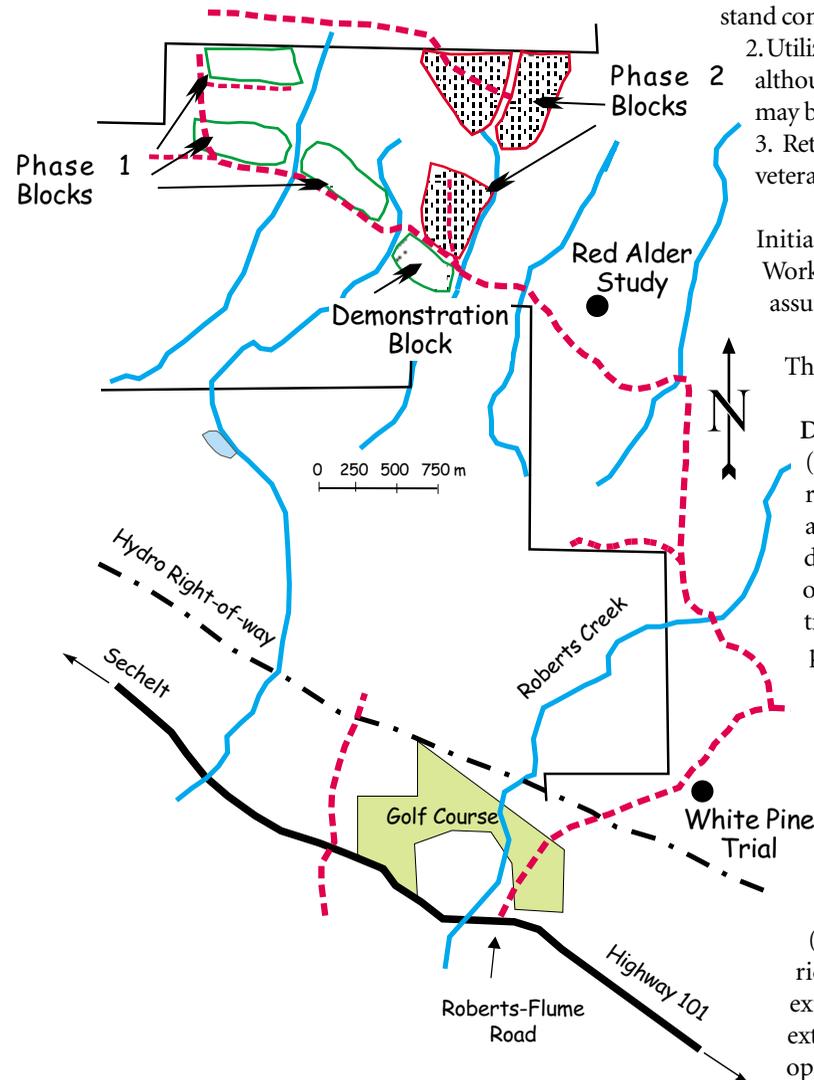
Initial logging, possibly during the 1870s, was confined to the harvest of fallen and standing western redcedar for

shingles. Subsequent harvesting during the 1950s and 1960s removed dead redcedar for shakes and shingles.

## Overall objectives

The overall objective of the RCSF is to demonstrate a range of alternative silvicultural systems and through research and monitoring, improve our understanding and implications of the alternatives. More specific objectives include:

- Evaluate harvesting economics, and refine skills related to development and layout of alternatives. (Conducted by Forest Engineering Institute of Canada)
- Monitor planted and natural regeneration growth and development



- Monitor windthrow
- Measure effects of alternative harvesting systems on local hydrology including water chemistry, and water quality (chemistry, turbidity and temperature) and water quantity

## Silvicultural systems

Three general principles were incorporated into all silvicultural systems selected for inclusion in the RCSF:

1. Practice even-aged forest management and aim for similar species composition to current forests, with Douglas-fir as the primary species, western redcedar as a secondary species, and western hemlock a minor stand component.
2. Utilize cable-yarding to minimize soil disturbance although other yarding systems (e.g., helicopter) may be considered.
3. Retain all centuries-old Douglas-fir and redcedar veteran trees, if safe to do so.

Initial harvesting operations were reviewed by Workers' Compensation Board representatives to assure safe working practices.

The RCSF developed in stages:

**Demonstration Block:** First harvest entry (1993) retained dispersed Douglas-fir and redcedar at 57 trees per hectare (ha). Second and final entry (1999) reduced residual stand density to 24 trees per ha. This block developed operational skills associated with partial cutting and currently assists with project promotion.

**Phase 1:** Three systems were established in neighbouring blocks, harvested between March 1996 and April 1997, and spring planted in 1997. Systems included 1) clearcut with reserves (1 tree per ha), 2) dispersed retention of Douglas-fir and redcedar (95 per ha), and 3) removal of trees (11% of stand volume) in narrow parallel corridors; this was the first initial entry of an extended rotation prescription designed to extend rotation length, and to accelerate development of old growth characteristics.

**Phase 2:** Three systems were established in neighbouring blocks, harvested between fall of 1998 and summer of 1999, and spring planted in 2000. Systems included 1) variable retention, retaining trees both in groups and individually, 2) strip shelterwood removing trees in strips between 50 and 100 metres in width, and 3) removal of trees (18% of stand volume) in narrow parallel corridors, the initial entry designed as a variation on the Phase 1 extended rotation treatment.

## Research initiatives summary

More than 11 research projects have been initiated by researchers from MoF, Federal Government, and universities (Simon Fraser, UBC, Royal Roads). Research initiatives can be divided into primary topics (continuous measurements since harvest) and secondary topics where funding has limited measurement frequency since harvesting.

### Research initiatives

#### Primary

- Conifer regeneration
- Windthrow
- Harvesting economics (first four blocks)
- Hydrology

#### Secondary

- Mycology
- Coarse woody debris
- Vegetation
- Salamanders
- Soil nematodes
- Bird habitat

## For more information

Research findings are published through peer reviewed Technical Reports, Extension Notes, and Journal Articles. Field tours also provide for extension of research results to a broad audience. Reports are accessible at the following Internet address:

<http://www.for.gov.bc.ca/vancouver/research/projects/RCSF/RCSF.htm>

## Visiting the RCSF

The road to Phase 1 and the Demonstration Block is drivable by car and bus. Contact the MoF Research Section of Vancouver Regional Office (Nanaimo) or Sunshine Coast Forest District for additional information.



# Roberts Creek Study Forest

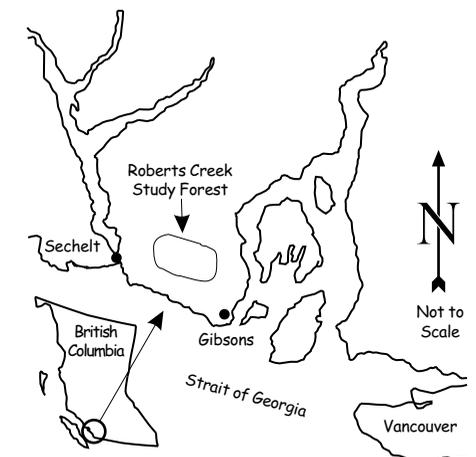
A co-operative project demonstrating & studying different methods for harvesting & managing the forested ecosystems along the Sunshine Coast

B.C. Ministry of Forests  
Vancouver Forest Region  
Forest Research Section

Small Business Forest  
Enterprise Program

Sunshine Coast  
Forest District

December 2001



### Phase 1: Dispersed Retention

Harvested: 1996/97  
95 trees per hectare retained.  
Next entry: 2002/03  
Final harvest (2002/03) will retain approximately 25 trees per ha.



### Phase 2: Strip Shelterwood

(to the left in photo)  
Harvested: 1998/99  
50% area harvested in strips.  
Next Entry: 2002 (earliest)  
**Variable retention block**  
(to the right in photo)  
Harvested: 1998/99  
Retained trees in groups and dispersed.

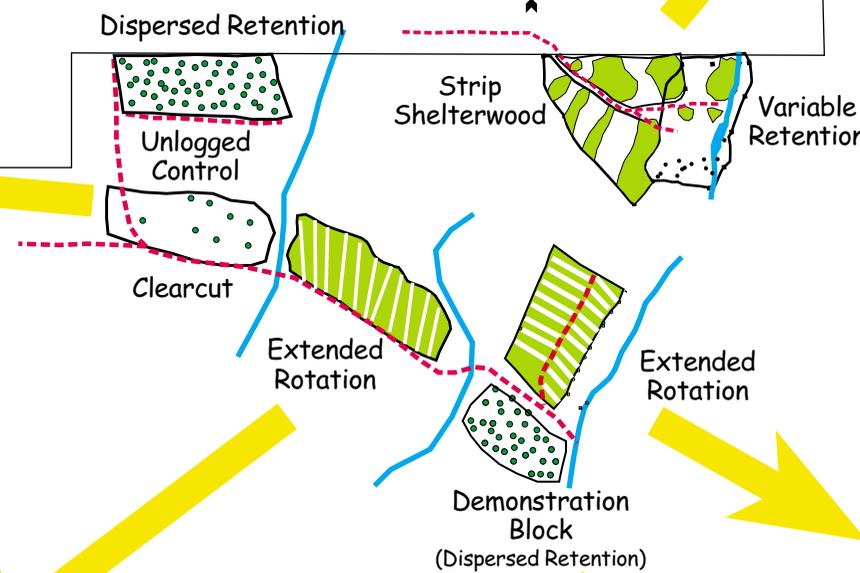
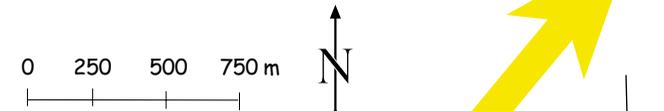


### Phase 1: Clearcut with reserves

Harvested: 1996  
Douglas-fir veteran trees retained plus additional trees to a density of 1 tree per ha.

### Phase 1: Extended Rotation.

Harvested: 1996  
Eleven 4-metre-wide corridors oriented north-south removed 11% stand volume.  
Next entry: 2011 (15% Volume removal)



### Phase 2: Extended Rotation.

Harvested: 1999/2000  
Yarding corridors 6-8 metres wide and oriented roughly northwest-southeast removed 18% stand volume.  
Next entry: 2015 (15% Volume removal)



### Demonstration Block: Dispersed Retention

Harvested: 1993  
First harvest retained 57 trees per hectare. The 2nd and final harvest (1999) retained 24 trees per ha.

