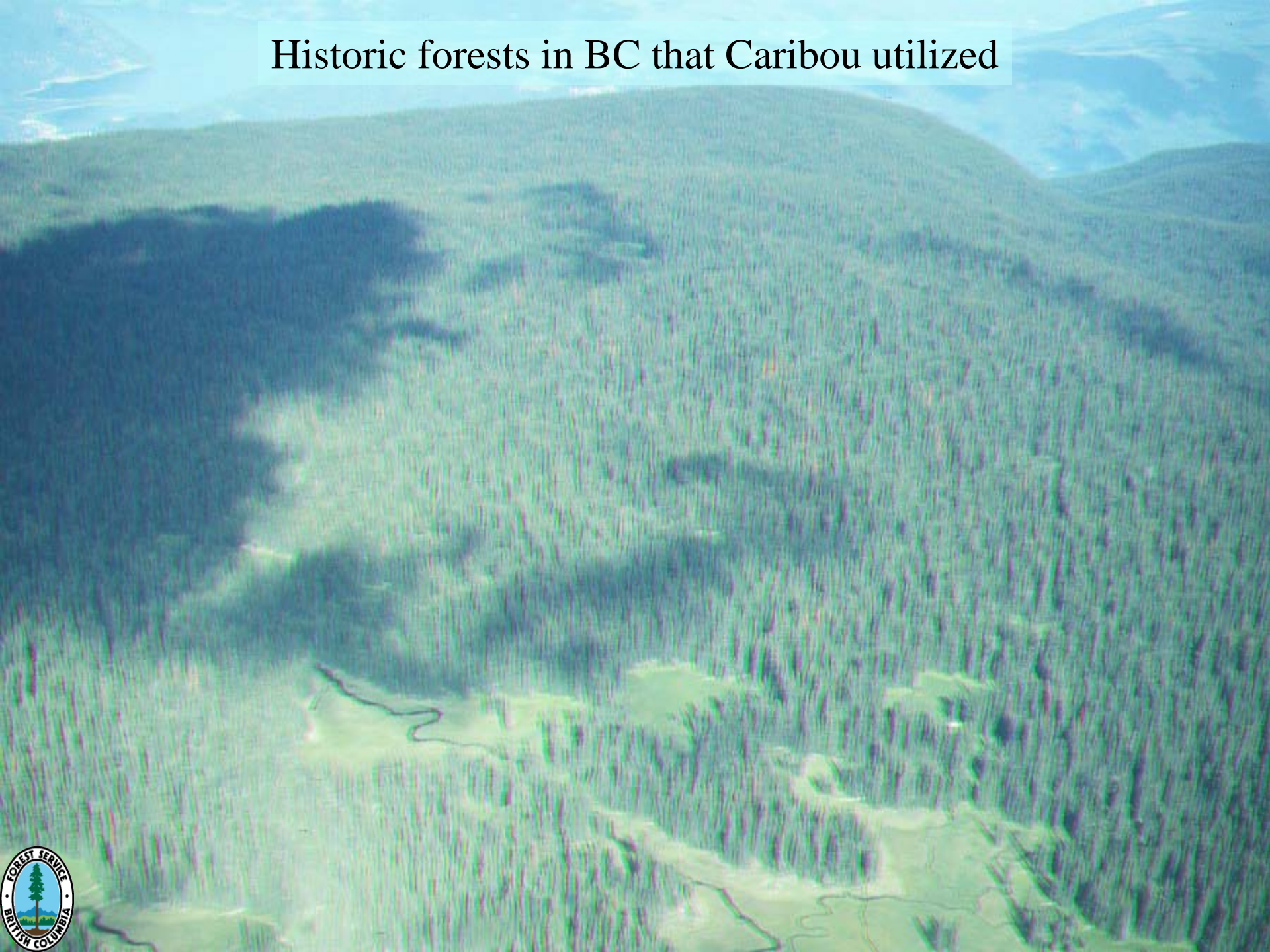


# Case study: unique simulations and model-assisted field installation design

## Caribou habitat modeling

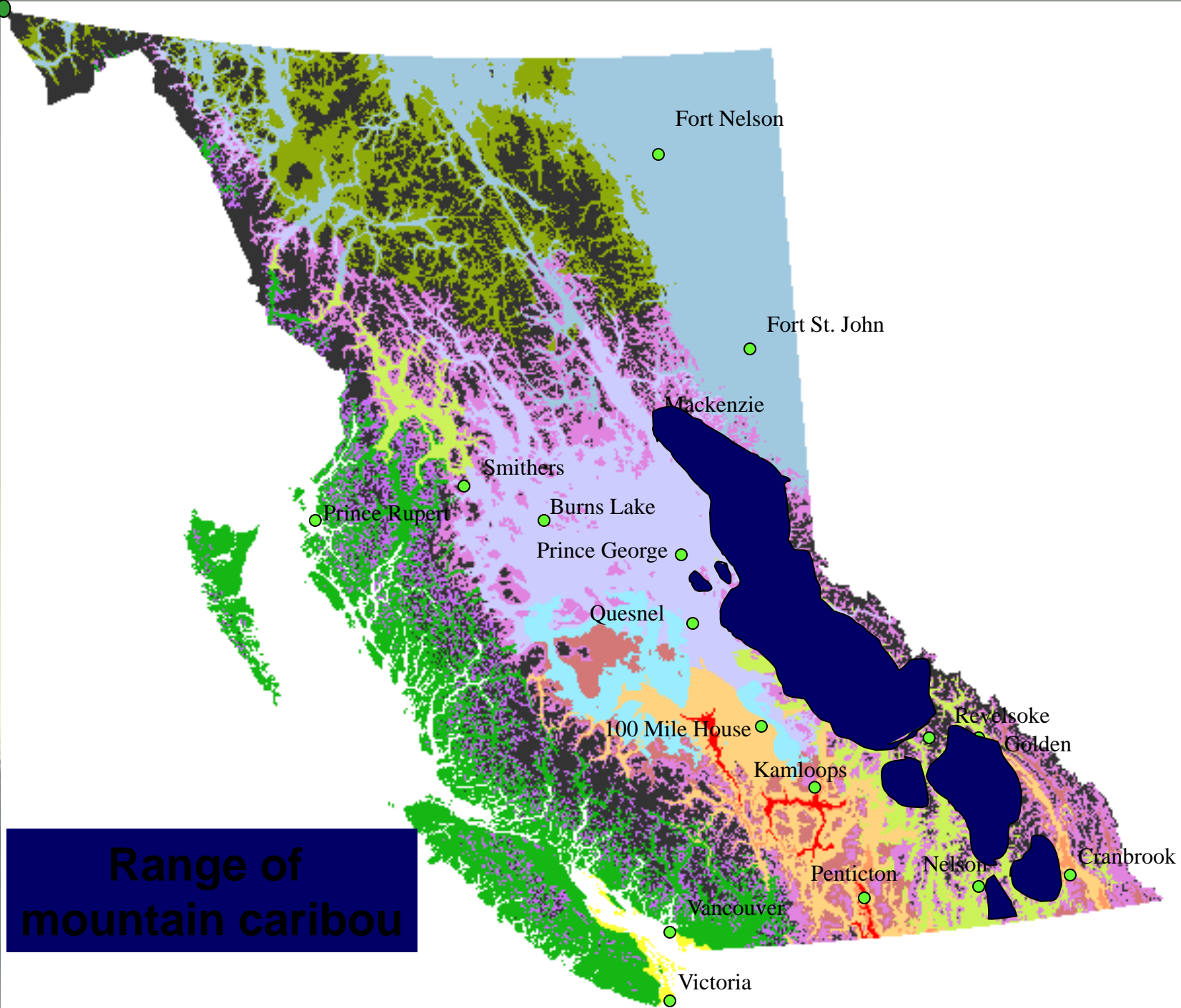
# Historic forests in BC that Caribou utilized



# Modern, timber-oriented forests in BC







**Range of  
mountain caribou**



# Mountain Caribou - Early Winter Habitat Requirements

- low to moderate snowpack
- relatively gentle topography
- mature and old forest structures
- abundant arboreal lichens

## Early Winter Habitat Issues

- loss of late mature and old forests
- roads: harassment and predation
- fine or large scale habitat
  - interspersed: alternative prey



Ministry of  
Forests and Range

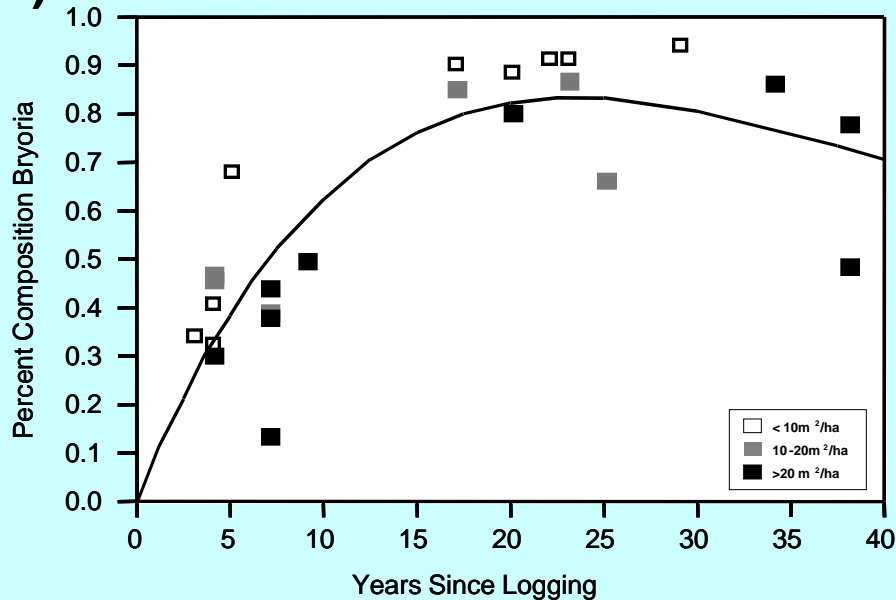
Forest Science  
Program



# The Problem:

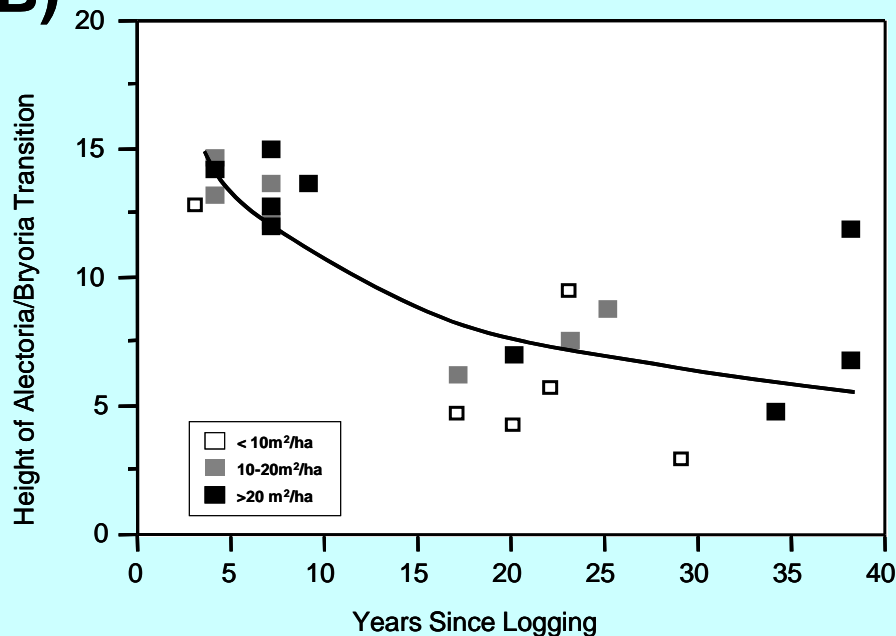
- Mountain caribou (*Rangifer tarandus caribou*) is a red listed (endangered) species
- Availability of arboreal lichen species associated with old growth is very important to winter survival
- Mountain caribou strongly prefers lichen in the genus *Bryoria* over *Alectoria*.
- The two genus occupy different parts of the crown
  - *Bryoria* occupies upper, more open, wind-blown portions of the canopy
  - *Alectoria* the lower, more humid and protected regions

A)



- Transition from *Bryoria* to *Alectoria* lowers in the tree after partial cutting

B)



From Lewis (2004)  
 Masters thesis,  
 Simon Fraser U.



# The Question:

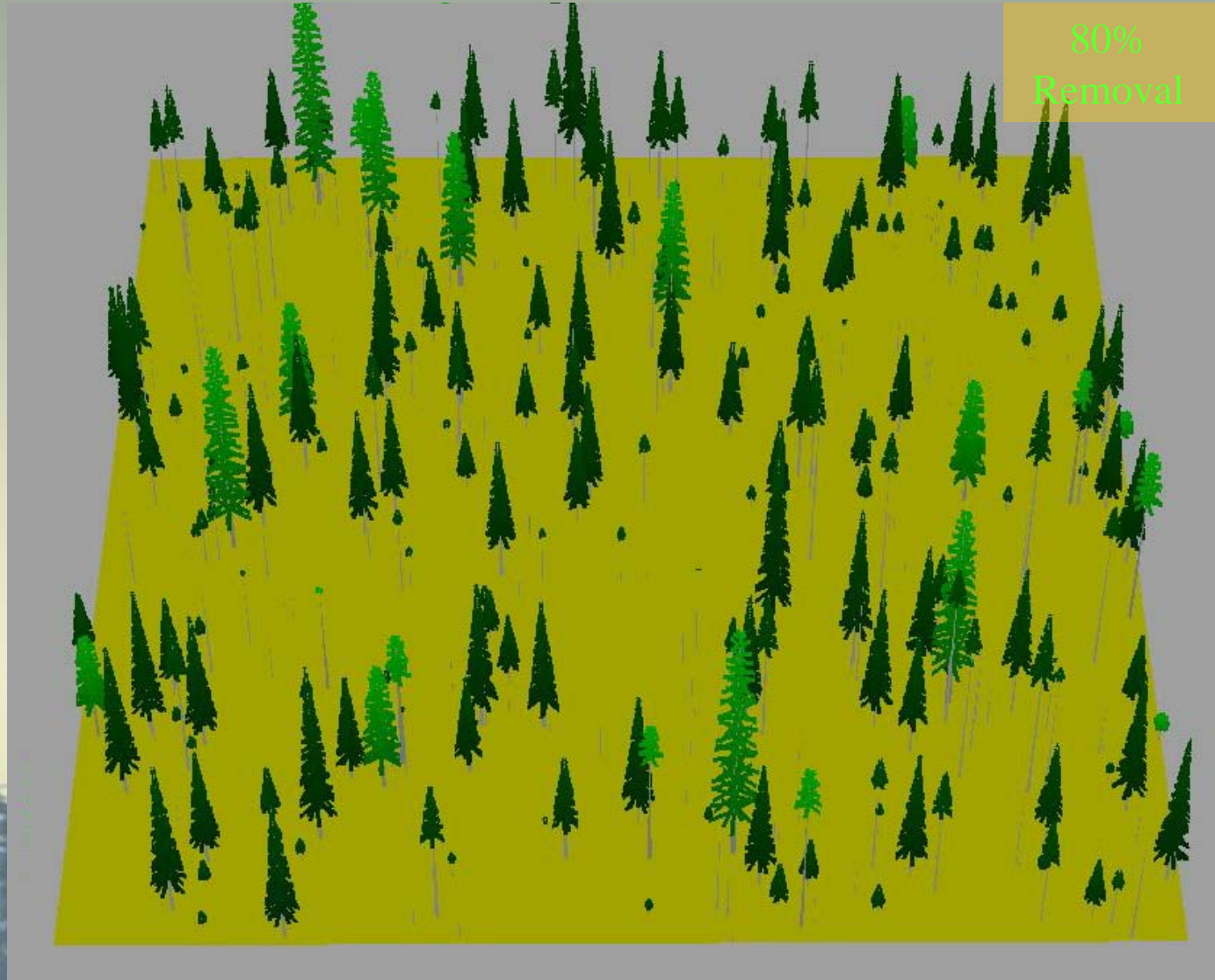
- If this hypothesis is true, what partial cutting regimes would best promote the abundance and availability of *Bryoria* spp.?
- TASS models crown well so it was used to provide some insight to this question.





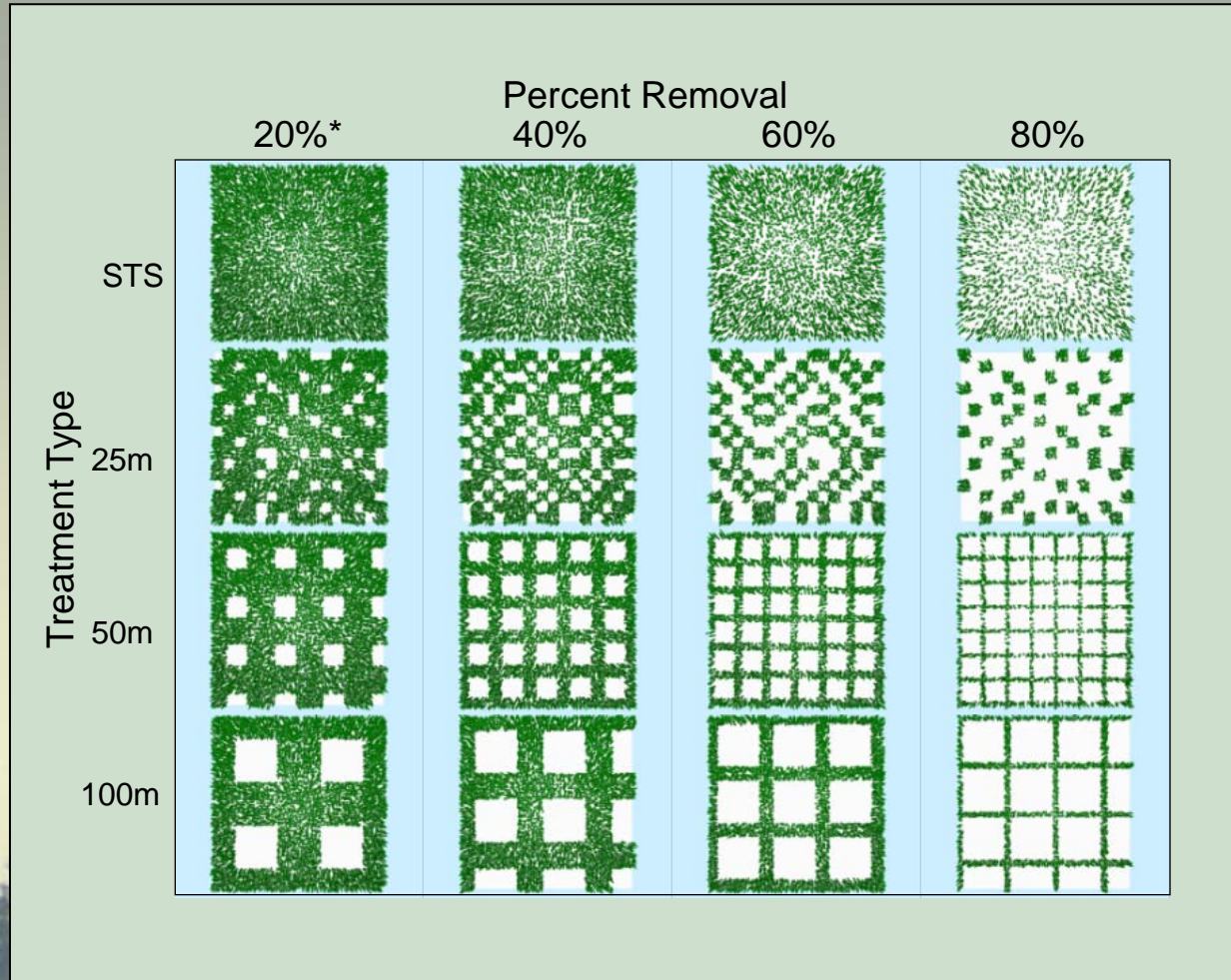
Thanks again you for  
your attention

# VISTASS representation of partial cutting regimes (Single tree selection)





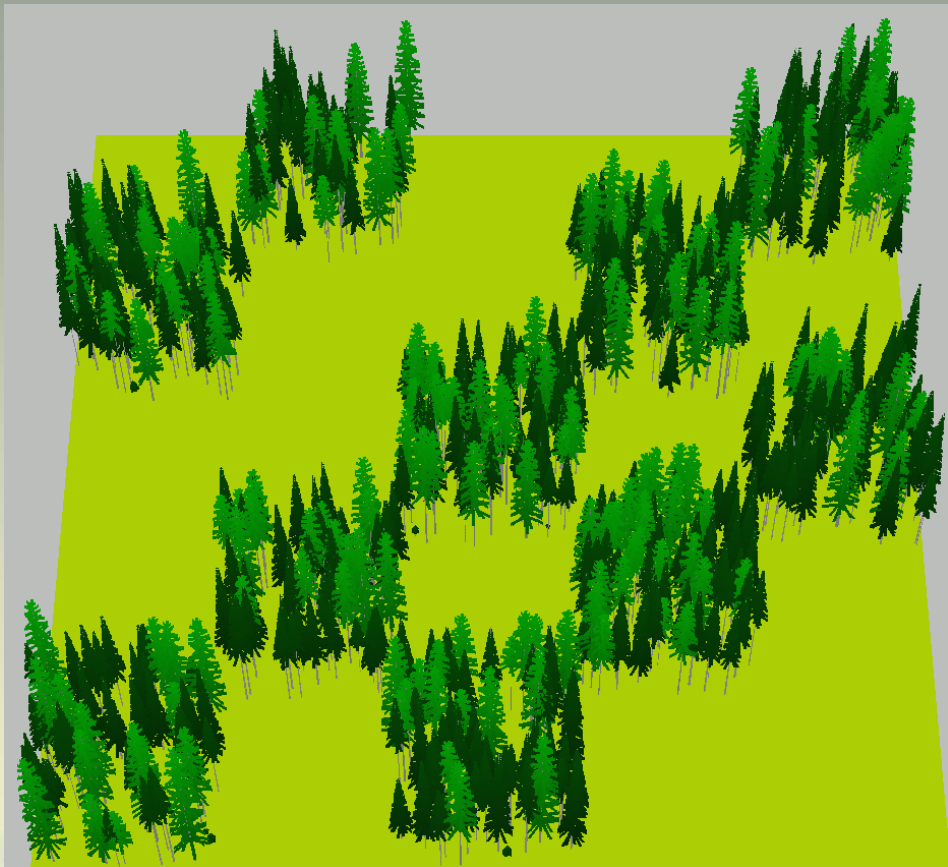
# Factorial design of TASS simulation experiment



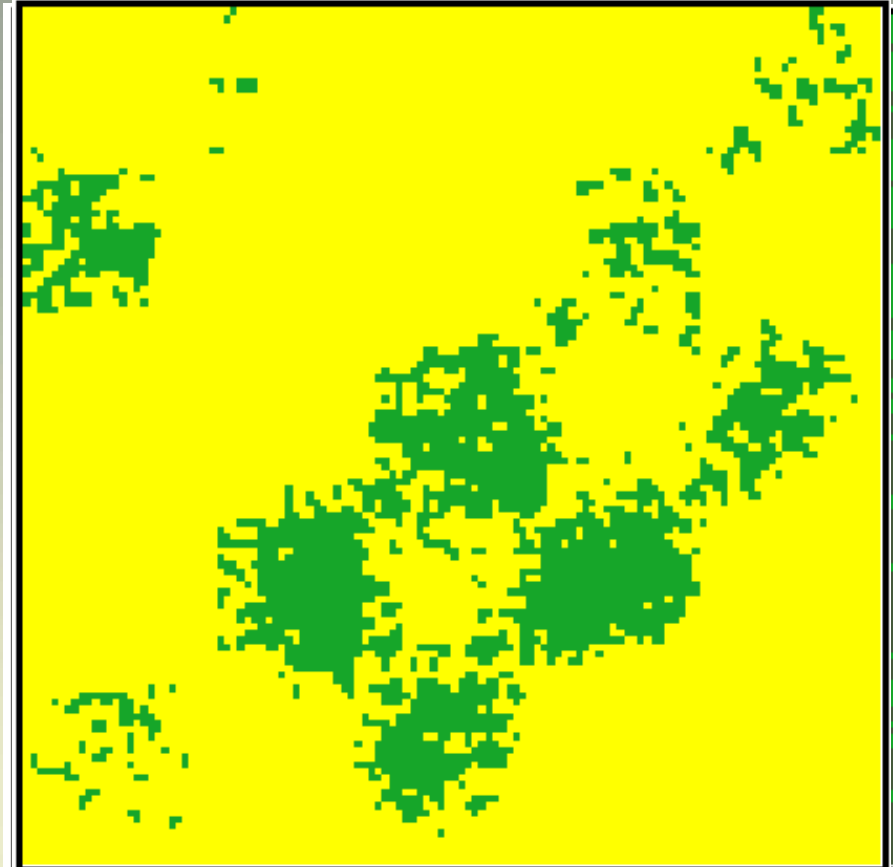


# ESSF Simulations

60% removal – 25m x 25m Patches



VISTASS representation



PACL at 0.5m above ground level

Engelmann Spruce  
Subalpine Fir

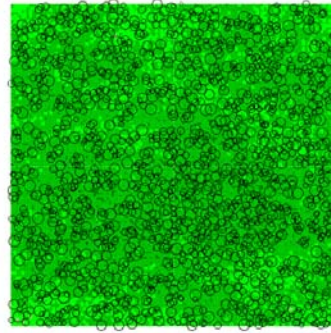


PACL\_CLASS

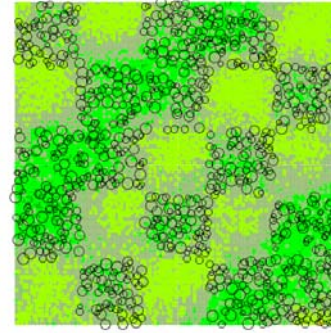
0.00 - 0.25	0.25 - 0.50
0.50 - 0.75	0.75 - 1.00



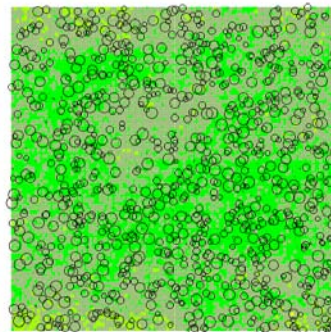
Un-Logged Control



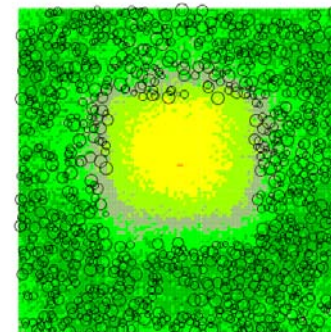
25 Meter openings 40% Removal



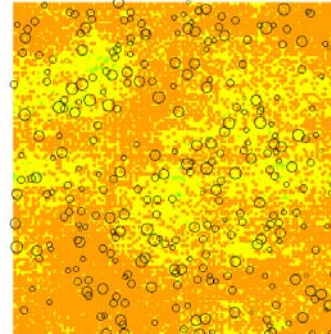
STS 40% Removal



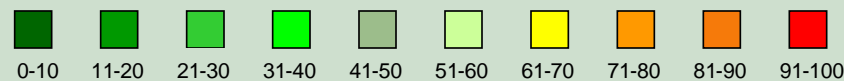
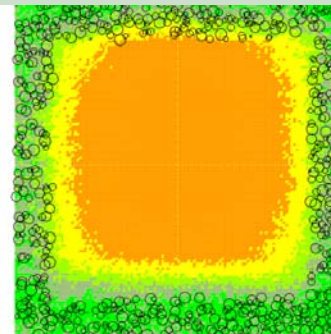
50 Meter opening 40% Removal



STS 80% Removal



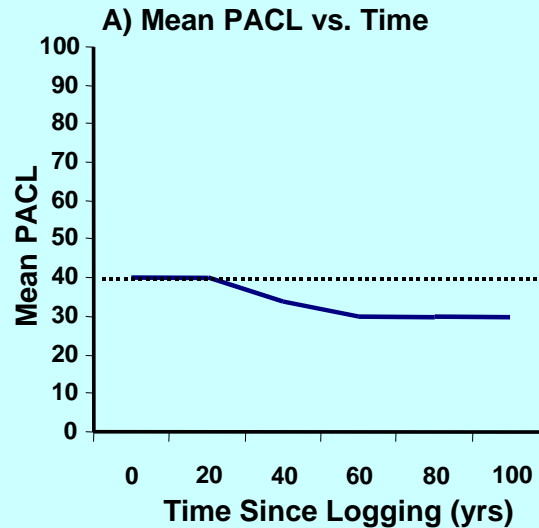
100 Meter opening 40% removal



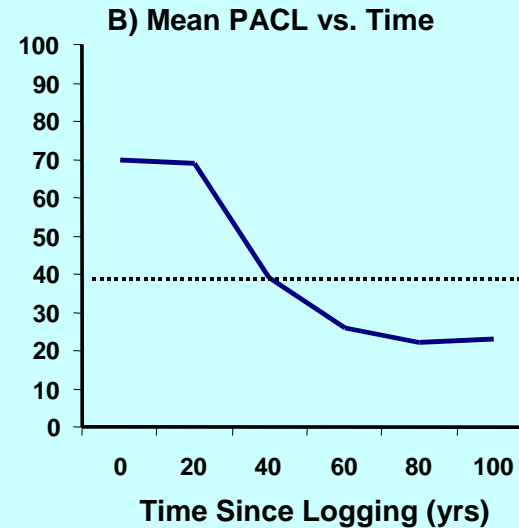
**PACL Classes**

## 2.5 Metres Above Ground

### STS 40



### STS 80



The light regime at 2.5m above ground line darkens with time.

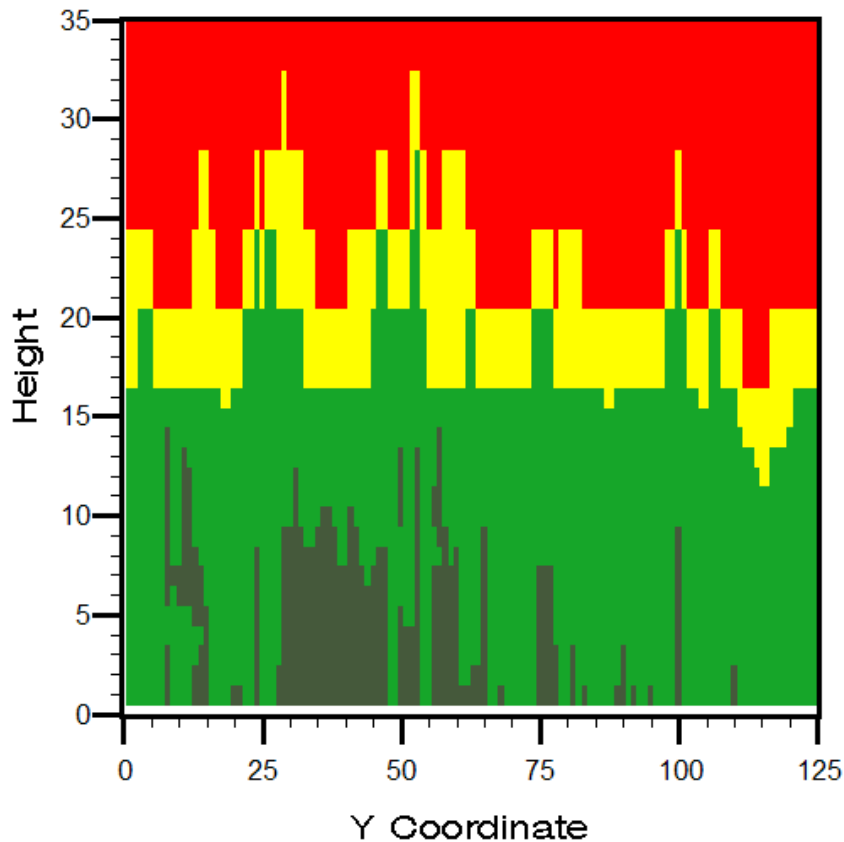
(From Lewis (2004) Master's thesis, Simon Fraser U.)



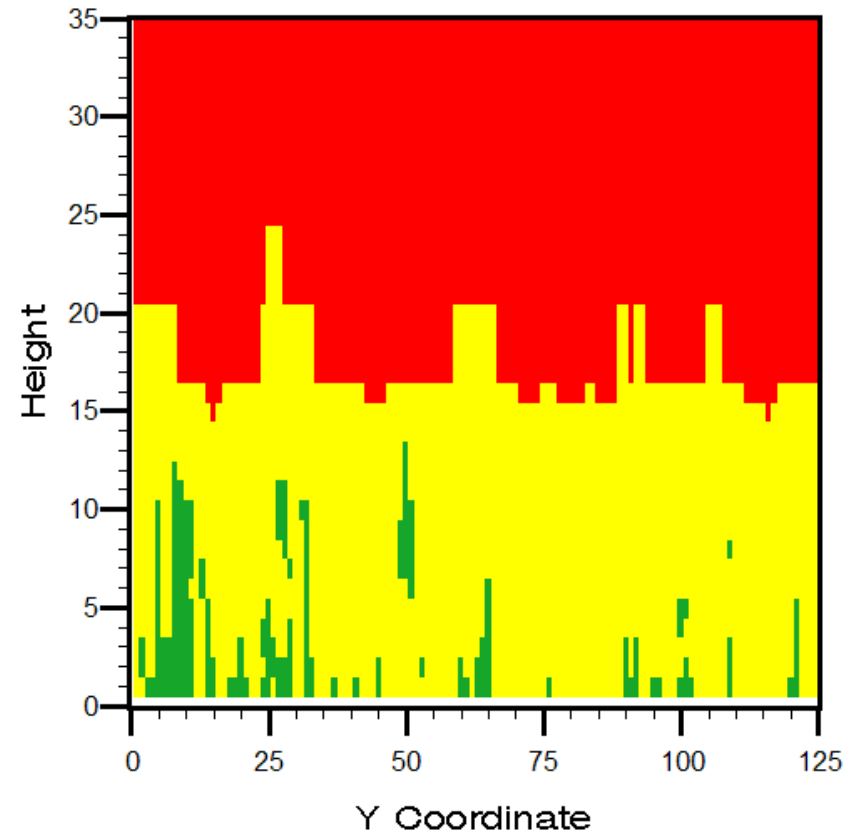
# ESSF Simulations

## Vertical PACL profiles

Pre-Cut Conditions



60% Removal STS



South → North

South → North

PACL\_CLASS

0.00 - 0.25	0.25 - 0.50
0.50 - 0.75	0.75 - 1.00

Ministry of  
Forests and Range

Forest Science  
Program



# ESSF Simulations

## Hypothetical live/dead branch zones

