Coast BCTS Silviculture Information

Silviculturists simply encourage forest development and applaud nature's fine work.

Mike Desrochers, 2010 Article in the Port McNeill newspaper (used with permission),

The only way to manage birch competition in Fd plantations is through Eternal Vigilance.

Conversation with Brain D'Anjou (sometime in the late 90's or early 2000's

- https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/research/flnrord-research-authors/brian-danjou

Slide 2

Practicing silviculture on the coast requires humility; practicing silviculture in the coast transition zone requires a certain amount of self hatred.

Anonymous, 2007

Slide 3

South Island, Mid Island, North Island, Sunshine Coast, Squamish, Chilliwack

	Rationalize Apportionment	Full Apportionment
Chinook Business Area	**543 433 m^3**	**798 735 m^3**
Seaward-Tlasta	**237 944 m^3**	**483 795 m^3**
Strait of Georgia	**683 690 m^3**	**1 007 656 m^3**
	1 465 076 m^3	**2 290 186 m^3**
	+/-2 200 ha	**+/- 3 500 ha**

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/bc-timber-sales/business-plans-performance-reports/bcts_business_plan_2023-2024_to_2025-2026_final.pdf

2014 Winter Workshop Presentation Topic:

Harvesting Early Good or Bad?

Eleanor McWilliams, MSc, RPF, J&E McWilliams & Associates Ltd.

Associated Strategic Consulting Experts Inc.

February 27, 2014

Harvesting Early Good or Bad?

In 2020s we have sold TSLs at early rotation ages. 2 Examples to follow.

Slide 5

Chehalis River area TSL block example

Logged 1982

Reforestation Regime: Planting, Brushing, Spacing?, Fertilization

Logged 2025 (Sawlog stumpage $49, BCTS VCU cost $24, One block sale)

320 m^3/ha, 43 years old Fd 85, Cw11, Dr 4

CWH dm 01 06 07

76% J grade (gang), 17% Utility grade, 7% pulp and lower

Volume vs Value, in this case the market wanted volume

Hunter Creek area block example

Logged 1965

Reforestation Regime: Planting, Brushing

Sold in 2021, however, November 2021 storm removed access

Stand Attributes at 55 years old

407 m^3/ha, Fd 80, Cw 10, Hw 10 CWH ms1 04 01 03

H grade 1%, I grade 1%, J grade (gang) 70%, 20% Utility grade, 8% pulp and lower

Volume vs value 2021 Market place required J grade logs

Slide 11

Value

Cw gang $240/ cubic metre

Cw poles 40 to 60 feet $300/ cubic metres

Fd gang $100/cubic metres

Do we wait longer for more volume and higher value, when we have timber requirements now?

Hopefully, Eleanor will give us some insite this afternoon.

Slide 12

Slide 13:

Second growth stand 60 years old at 800 metres elevation (Gang Fd)

These 2 examples show us that past silviculture practices can (admittedly not always) result in a timber availability in +/-45 to 60 years.

- **crop establishment soon after harvest**
- **monitoring seedlings for survival**
- **fill planting when necessary to occupy growing sites**
- **monitoring tree growth (sometimes annually) in first three or four years**
- **brushing before trees are overtopped to promote continuous growth**

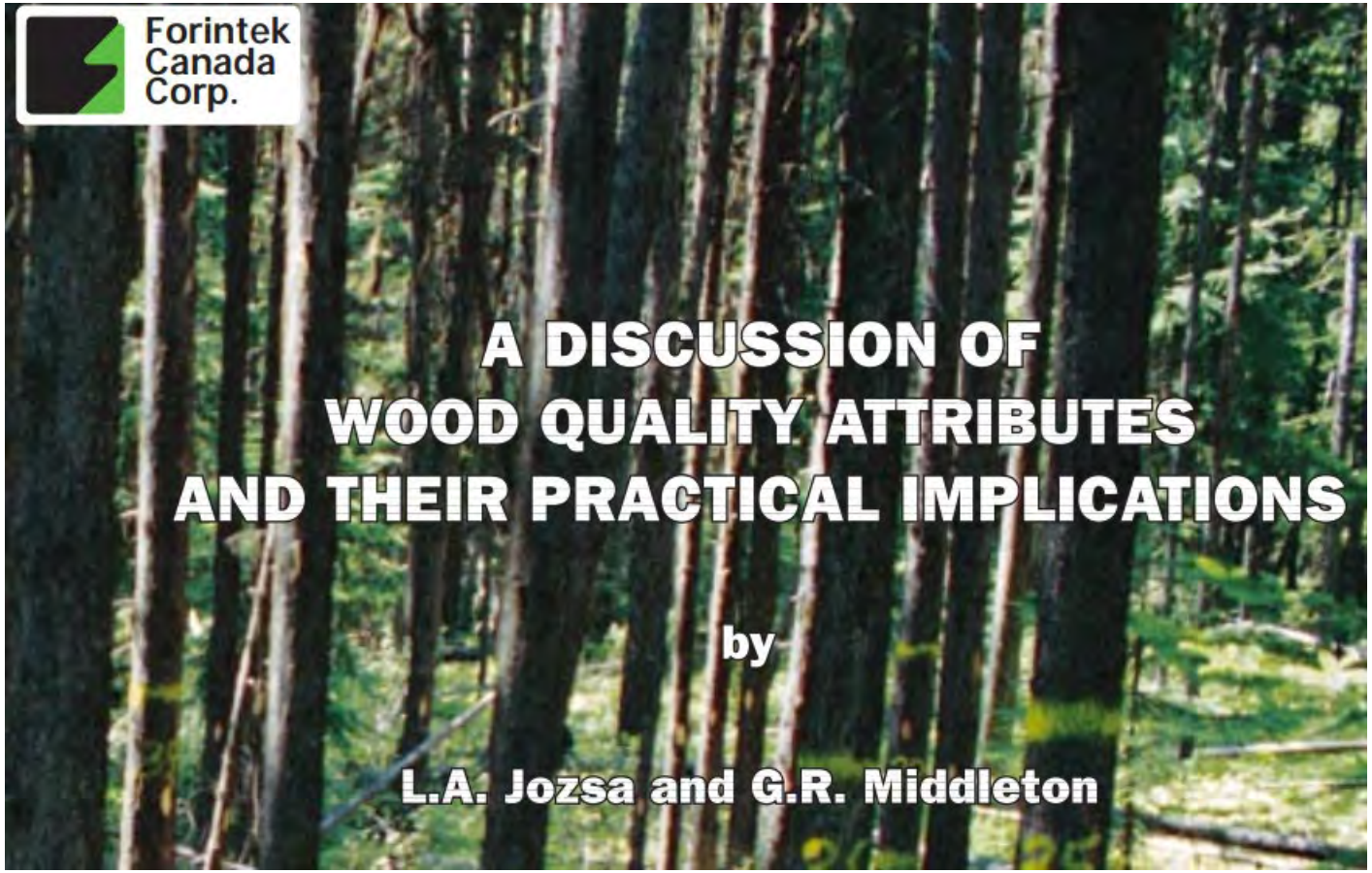
Slide 14

The market place tells us that, at times, 45 to 60 year old reforested stands can support a portion of the forest industry timber requirements. We are looking for new innovative ways of managing our reforestation programs, when we have had the answers for the last 60, 80 years. (perhaps longer if you look at Europe)

Slide 15

Slide 16

Les Jozsa’s work on second growth stands and wood quality



Slide 17 Forest Genetics in BCTS Silviculture Program is based on the Class A Seed Orchard seed sources

BCTS Planting	Class A Seed	Class B Seed
2024	69%	31%
2025	78%	22%
2026	75%	25%

The variability is due to the different bio-zones we are planting in. The climate-based transfer rules due not allow orchard seed in some zones. In these cases we are using wild stand seed to fill the gaps.

Slide 18 GVO Genetic Gain volume: Estimated additional volume gain compared to a wild stand seed (60 to 80 year rotation).

The forest Genetics Council of BC reports out on amount of Class A seed used and the genetic worth.

https://forestgeneticsbc.ca/resources/annual-reports/

Genetic worth (GW) = % improvement for trait compared to natural stand seed
GVO+20 = 20% more volume at rotation DSB+50 = 50% resistant to white pine blister rust

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/tree-seed/cone-collection-workshops/cone_collection_2018_intro_and_regulations.pdf

Slide 19 From BCTS GVO Report

Cw 1 270 000 seedlings 11 to 27% (11, 21, 27)

Genetic Gain based on different seed orchard seed.

Fd 3 377 000 seedlings 16 to 22% (16, 17, 22)

Genetic Gain

Hw 16% Genetic Gain

Yc 21% Genetic Gain

Slide 20 If you need more information to persuade you:

https://forestgeneticsbc.ca/wp-content/uploads/2020/07/Factsheet-2-Seedlot-Genetic-Worth-Values-Verified-for-Coastal-Douglas-fir-at-Age-12-2011.pdf

https://forestgeneticsbc.ca/wp-content/uploads/2020/07/Factsheet-3-Seedlot-Genetic-Worth-Values-Verified-for-Coastal-Douglas-fir-at-Age-20-2017.pdf

Results from this study add confidence to seedlot genetic worth estimates and the application of these values in timber supply analyses. These, and future data from this study will help refine growth models, such as TASS and its interpolation program, TIPSY, and support the ongoing development of genetic selection procedures for tree breeding and seed orchards.

MG Mid Gain, TC Top Cross, WS Wild stand

Slide 21 Site Preparation techniques…….road rehabilitation, skid trail rehabilitation, destumping in root rot areas

Road rehabilitation of temporary access roads:

FPPR 35? Or 36?

Skid Trail decompaction after harvesting.

Destumping in root rot areas.

Goal: to maintain as much forest landbase as possible to support future volume production.

Slide 22 Tree Planting……Tree species, planting densities, stock types, timing of planting

Location	# trees	Density	%Class A	Stock Types
CWK / SQH	532 000	1100 to 1200	74	412, 512, 612
Seaward	228 000	1200	100	412, 410
Campbell RVR	500 000	1200 to 1400	95	412, 410, 512
South Island	314 000	1200	100	412, 410
Sunshine Coast	300 000	1200	100	412

Integrated Silviculture Strategy

Fraser Timber Supply Area

Harvest, Silviculture and Retention Strategy

V 1.8

March 31, 2020

follow current regeneration practices as modeled in the Base Case (forest health incorporated).

Table 15: Species portfolios and regimes for the value strategy; future managed stands

BEC Unit	Sp1/Target Planting (sph)/ Treatments	Sp2/Target Planting (sph)/ Treatments	Sp3/Target Planting (sph)/ Treatments
CWHds1 cool all (RR)	Fd/1600/stump/fert, 80%	Cw/1400/JS900, 20%	
CWHdm cool all (RR, SNC)	Base Case (Fd80Cw20/1,200), fert, 60%	Cw/1400/JS900, 40%	

Slide 24

Location specific comments Seaward:

Seaward 700 seedlings per hectare when “obstacle planting” for protection from Elk browse.

Fertilization at planting: SCHIRP (Salal Cedar Hemlock Integrated Research) – 187,630 seedlings – salal competition

Silva-Pak – 10,535 – fill plants where rapid growth required for established

Slide 25

Location specific comments Campbell River:

800 to 1000 seedlings per hectare for site with natural regeneration, low mortality expected, colluvial, high slash loading

Majority of planting in the spring.

Fall plant occurs mid-September ending no later than Thanksgiving weekend usually.

Species are typically Yc, Cw , Ba, some smaller amounts of Fdc.

Slide 26

Location Specific comments: Sunshine Coast

Minimum spacing of 1.5 metres in colluvial sites

Coning +/- 600/ha for browse protection in specific areas $7 to $9 per cone

Some fertilization at time of planting.

Majority of planting in the spring.

Grizzly Bear Cluster planting.

Slide 27

Location specific comments South Island :

1000 seedlings per hectare in Helicopter harvesting blocks

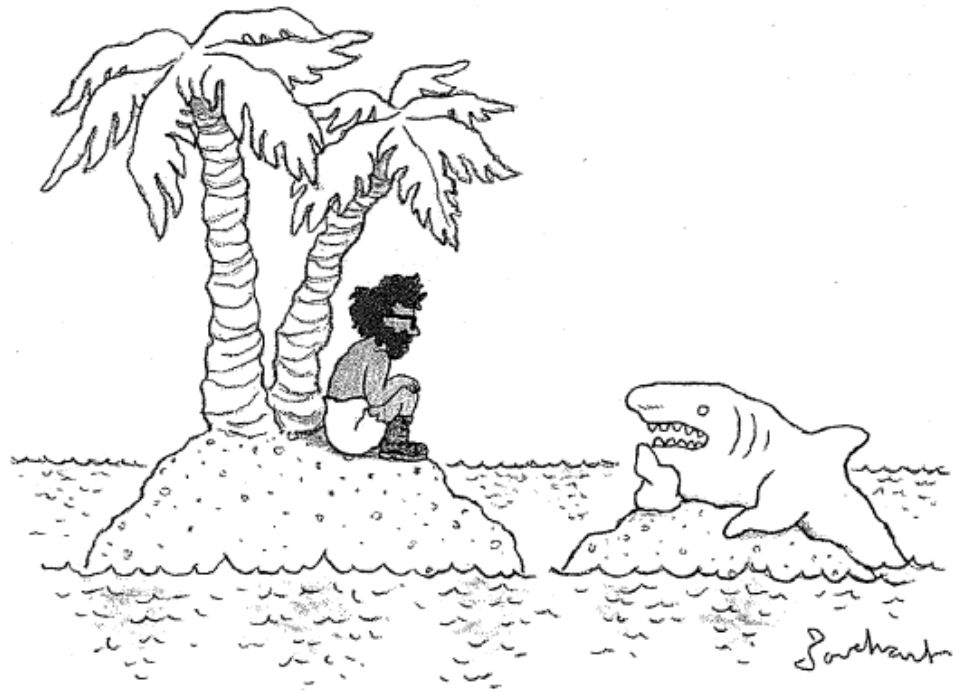
Planting promptly with PSB412As in brush sites

Phasing out browse protection starting in 2022 Minimum spacing of 1.5 metres in colluvial sites

Majority of planting in the spring. Some fall planting (90 000 in fall 2025)

Don’t plant Ba or Hw anymore. No A class Ba seed, and both species come in naturally well on most sites.

THE NEW YORKER



"Speaking of rising sea levels—I'll miss our little chats."

THURSDAY, MAY 8, 2025

Slide 29

Brushing…..Brush species, brushing methods (manual vs herbicide), timing

Chilliwack and Squamish	**532 ha harvest 190 ha brushing**
Campbell River area	**642 ha harvest 90 ha brushing**
Sunshine Coast	**300 ha harvest 100 ha brushing**

Slide 30

Chilliwack and Squamish Manual Brushing July and August

Seaward Manual Girdling May to October, Treat to reach Free Growing. It has a high efficacy rate within the business area. Treatment is primarily used to girdle Alder, but Bitter Cherry has also been included in our prescriptions.

Sunshine Coast Manual Brushing with power saw / brush saws, Girdling with girdling tool

Slide 31

South Island Exclusively Manual Brushing: Alder and Maple -

We target summer treatment, but fire season restrictions have seen us brushing both in spring and fall. Good efficacy with cutting of alder – we delay treatment typically until closer to FG and cut once. Maple has low efficacy and often multiple treatments that end up being more cosmetic than anything. Treating one block next year that was planted in 2023 due to extreme maple competition.

Slide 32

Issues that impact our programs:

Volume vs value

Cw on the landscape

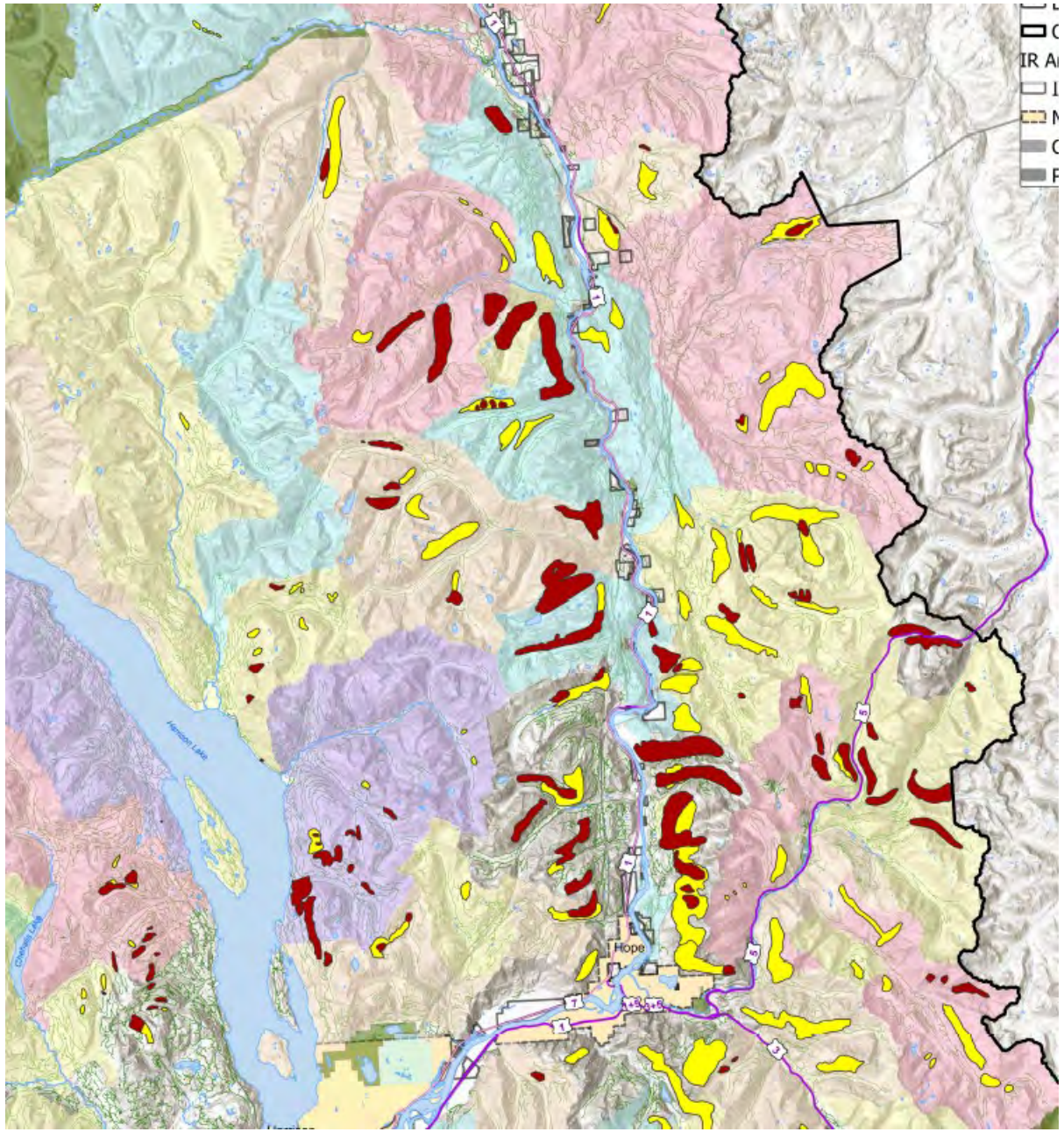
Ground based harvesting and soil disturbance

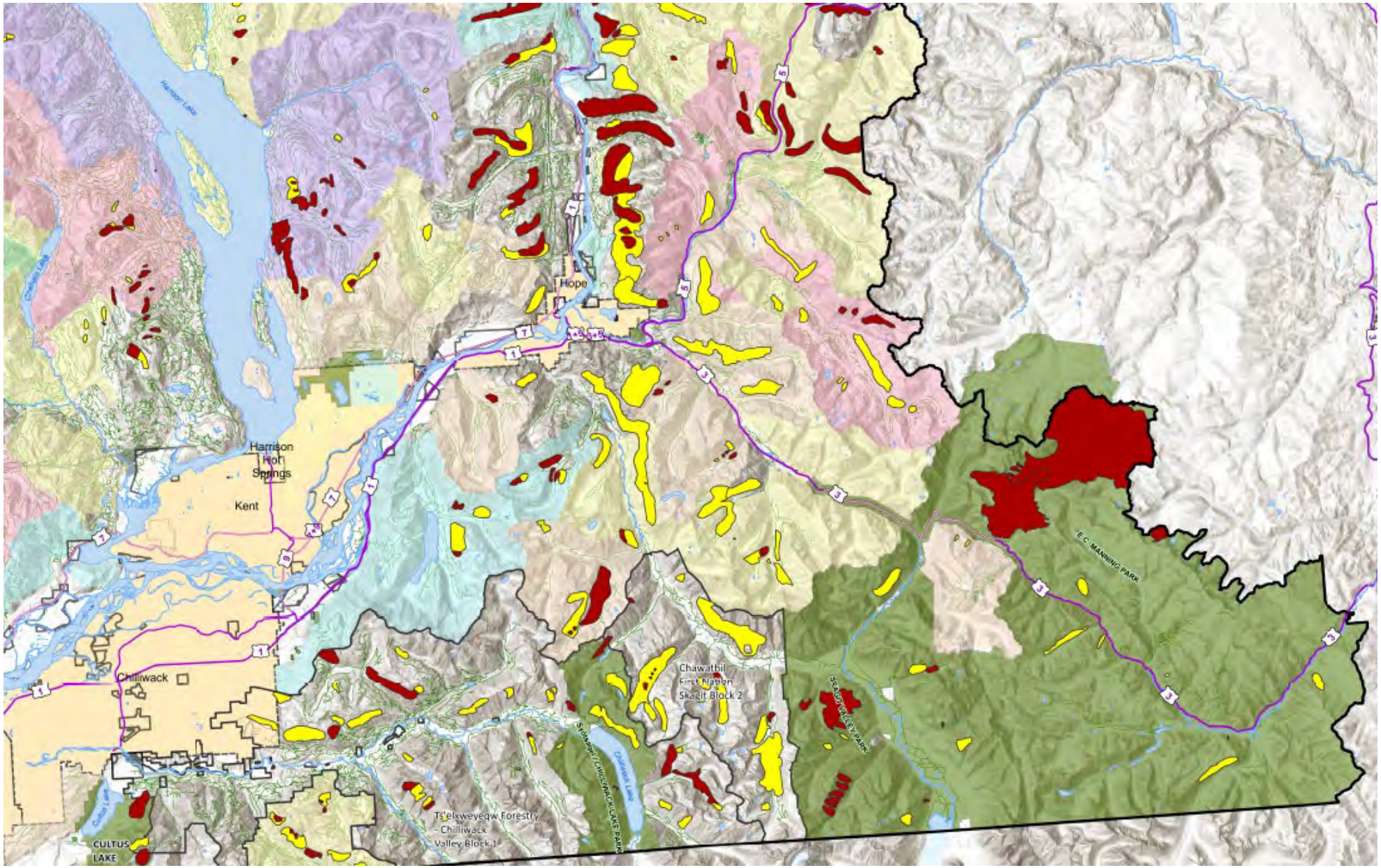
Free growing adjacency for future harvest opportunities

Swiss Needle Cast in Fd plantations

Forest Insects eg Spruce Budworm in Lower Mainland timber supply areas

Forest animals ungulate browse, rodent damage at time of reforestation and tree girdling


Hope


Harrison Lake
Hope
Harrison Hot Springs
Kent
Chilliwack
Chawathil First Nation Skwah Block 2
Ts'elxweyeqw Forestry - Chilliwack Valley Block 1
CULTUS LAKE
E.C. MANNING PARK
SKAGIT VALLEY PARK
SKWAH/CHILLIWACK LAKE PARK

Slide 40

Surveys in Stands 20 to 25 years old:

Loosing Cw from stands where there was mixed planting of Fd and Cw. Cw being overtopped by Fd and Hw. Now trying to plant Cw in clumps to maintain a component of Cw into the next rotation.

Listen to Stepen Zeglan on CBC radio talk about Cw leaving the area

Slide 41 Swiss Needle Cast

Stefan Zeglen 2017 Coastal Silviculture Committee presentation

Field Tour Stop 3:
Swiss Needle Cast, Douglas-fir and You
Stefan Zeglen, MFLNRO

Some interesting facts about Swiss Needle Cast

- Swiss Needle Cast (SNC) is not from Switzerland. It is a native fungus (*Phaeocryptopus gaeumannii*) endemic throughout the range of Douglas-fir in North America.
- Douglas-fir, both coastal and interior, are the only hosts.
- Dendrochronological evidence suggests SNC has affected Fd since the 1500's in Oregon.
- It has been reported in BC since the 1930's but was considered less important than the other common Fd foliar disease *Rhabdocline*. Barely mentioned in the field guides.
- SNC infects only newly flushing foliage in the late spring and early summer. Infection is by ascospores into the needle via the stomata. There is only one cycle per year.
- Infection success appears to be linked to spring leaf wetness and winter temperatures.
- The more occluded stomata, the less foliage retained. Lowest retention in the upper crown, better in lower third.
- If about 25% of stomata blocked, CO_2 uptake is zero.
- There is no host resistance to SNC only variation in the tolerance of the host as measured by the extent and timing of needle retention.
- Since there is no resistance to SNC, there is no host reaction to infection. Hence, the only visible sign is the black 'spots' blocking leaf stomata.
- There appear to be two separate lineages of *P. gaeumannii* in Oregon that vary in their distribution but the incidence of SNC is heaviest where both co-occur.

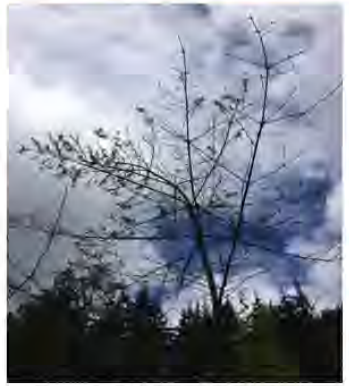
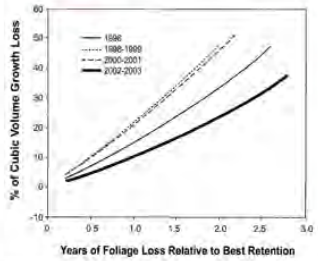


Figure 1. Foliage!?! I don't need no stinkin' foliage!



Impact and Management Implications

- In Oregon, the area affected has gone from 53,000 ha in 1996 to about 250,000 ha in 2016. There was 100,000 ha reported in WA state that year.
- Distribution in Oregon coincides with the Sitka spruce zone.
- Monitoring plots in NW Oregon average 23% growth reductions in epidemic areas. Up to 60% in severely infected stands.
- Estimated volume growth losses of 190 mbf or US$128 million annually in Oregon.
- Disease severity is directly related to pathogen abundance. Pathogen abundance is related to climate.
- Moderate negative correlation between elevation and number of occluded stomates.
- Fertilization does not appear to compensate for loss of needle retention.
- Thinning does not appear to affect needle retention.
- Foliar diseases disproportionately affect genetically maladapted seed sources.
- Moving Fd into areas where it has no history should be done cautiously. Seedlots may vary widely in their response to infection. Using seed from high elevation or from dry site sources on mild sites can increase risk.
- Loss of basal area compensated for by other species.
- It's not the averages that kill trees, it's the extremes.

Slide 42 Swiss Needle Cast planting prescriptions

Identifying SNC in Site Plans

Adjusting planting prescriptions to decease the densities of planted Fd

Acceptance of more Ba and Hw, ...acceptance is difficult for some people.

Stocking Standard changes

Slide 43 Water Management on roads and landslides

Slide 44 Second Growth Fd Hw in Stave River

A WTF moment in a second growth stand in Stave River

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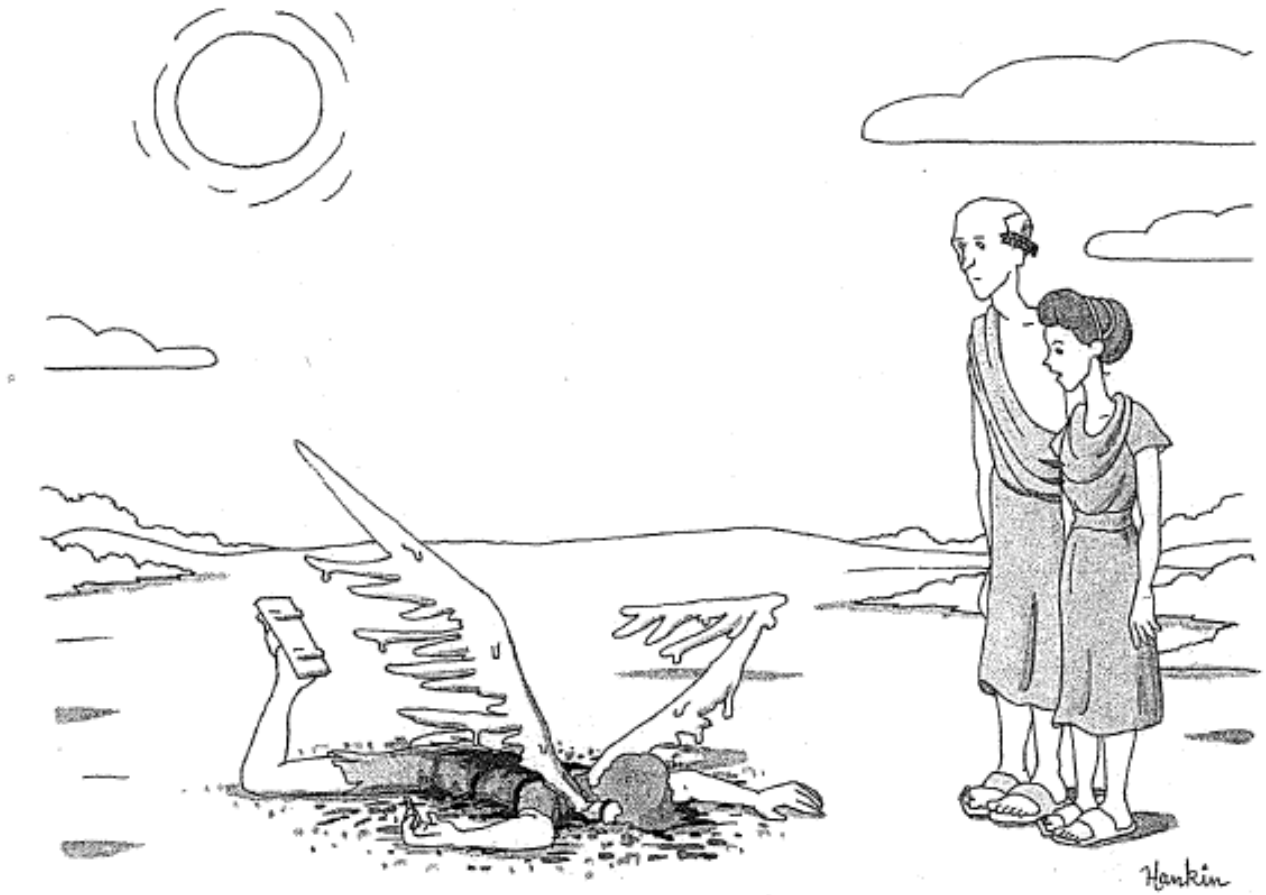

"Really, though, he flew too close to the ground."