Free-Growing Policy and Climate Change

Alex Woods, Regional Pathologist, NIFR, Smithers BC

BC Ministry of Forests and Range

What is Free-growing?

•After logging public forest land in BC, forest companies are required to establish a new crop of trees, and tend them for a number of years to ensure they survive and grow into a healthy new forest.

•To achieve free-growing, the site must have a suitable number of well-spaced trees, ecologically appropriate to the site, of minimum height, and free from brush competition.

Purpose of Free-Growing Policy:

- "free-growing requirements ensure that reforested stands remain successfully reforested." Forest Practices Board Special Report No. 16 (2003),

- The licensee obligation to create free-growing stands is one of the few measurable requirements under the *Forest and Range Practices Act*.

But how well will Free-growing policy uphold the stewardship mandate of the BC Ministry of Forests and Range under a rapidly changing climate?

Timber Supply and the Mountain Pine Beetle Infestation in British Columbia: 2007 Update (Forest Analysis and Inventory Branch)

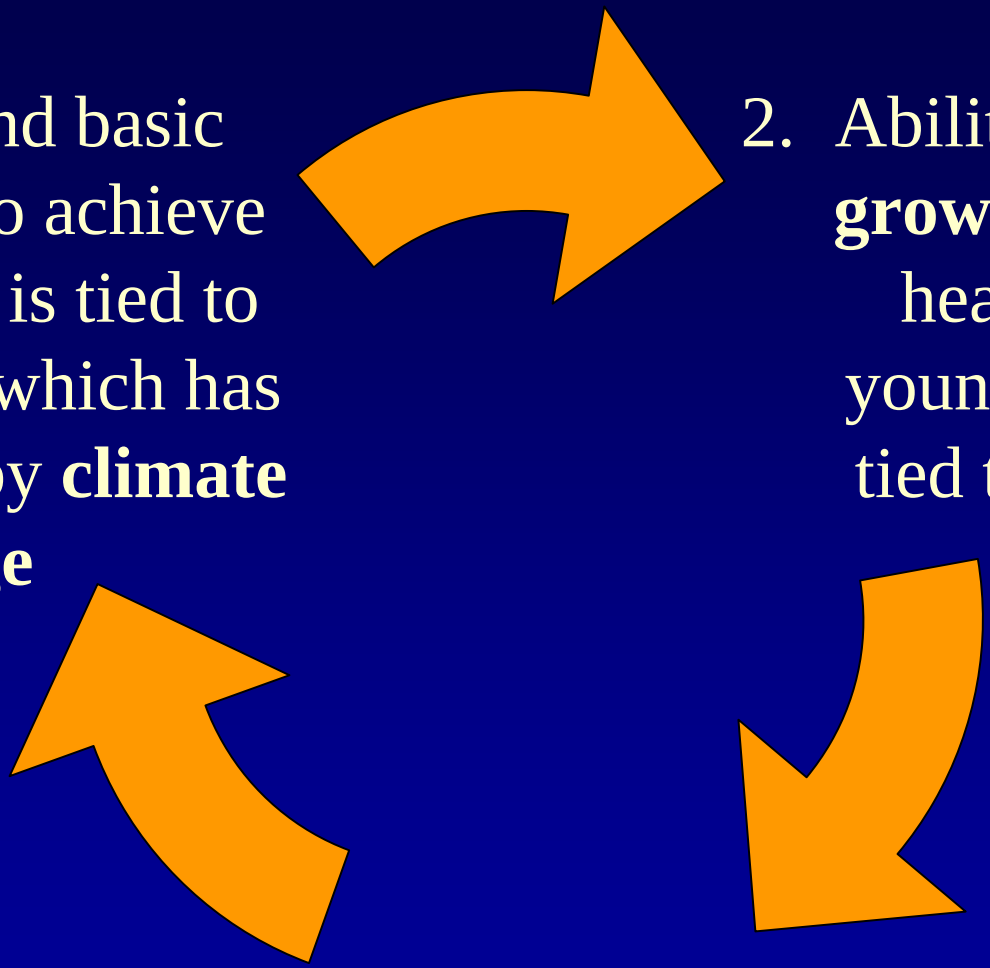
"Given the amount of regeneration that will be needed, the risk of future beetle outbreaks and a warming climate being a possibility, short-term silvicultural practices will have a large influence on forest conditions in the mid and long-term."

Free-growing Policy and Climate Change

1. Ability to fund basic reforestation to achieve **free-growing** is tied to timber supply which has been affected by **climate change**

2. Ability to achieve **Free-growing** is tied to forest health conditions in young stands which are tied to **climate change**

3. Longevity of **Free-growing** condition once attained is being challenged by **climate change**



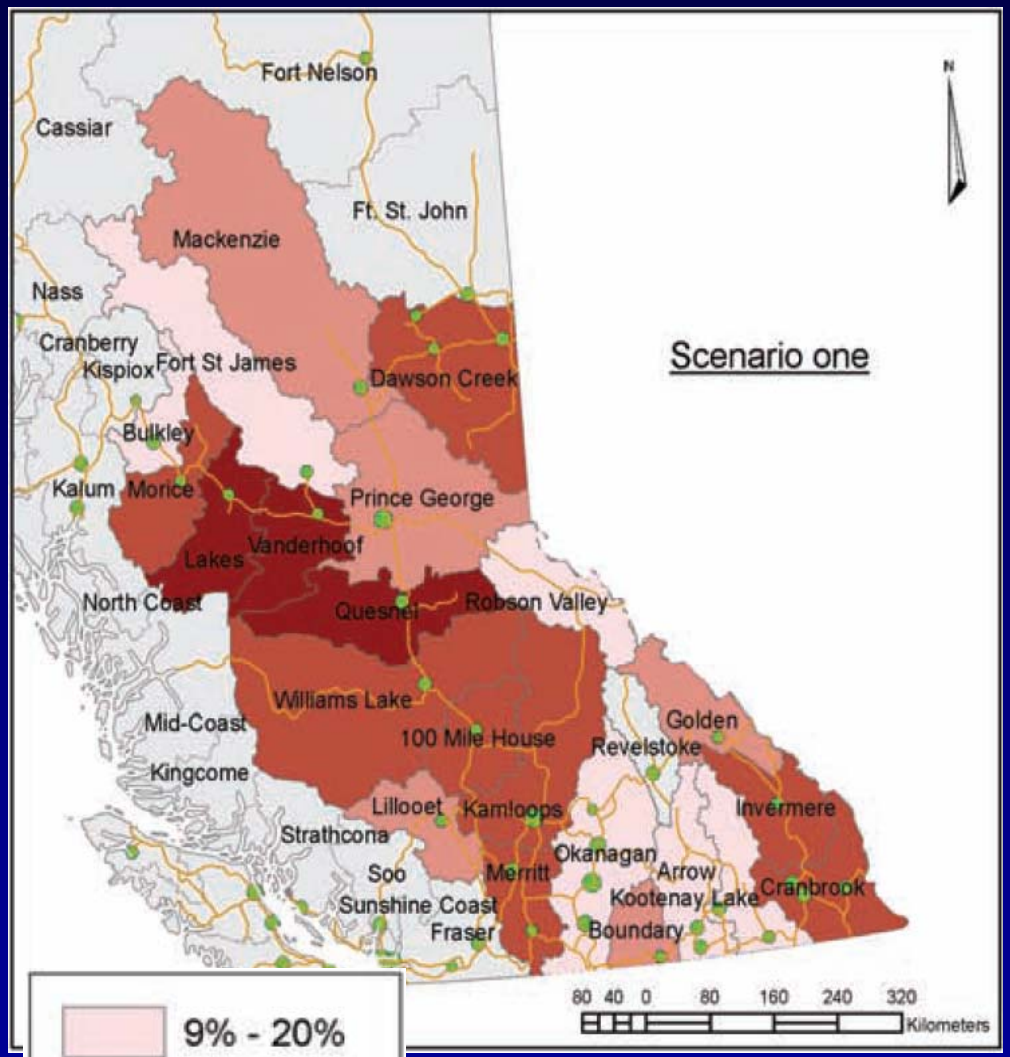
1. Ability to fund achievement of free-growing

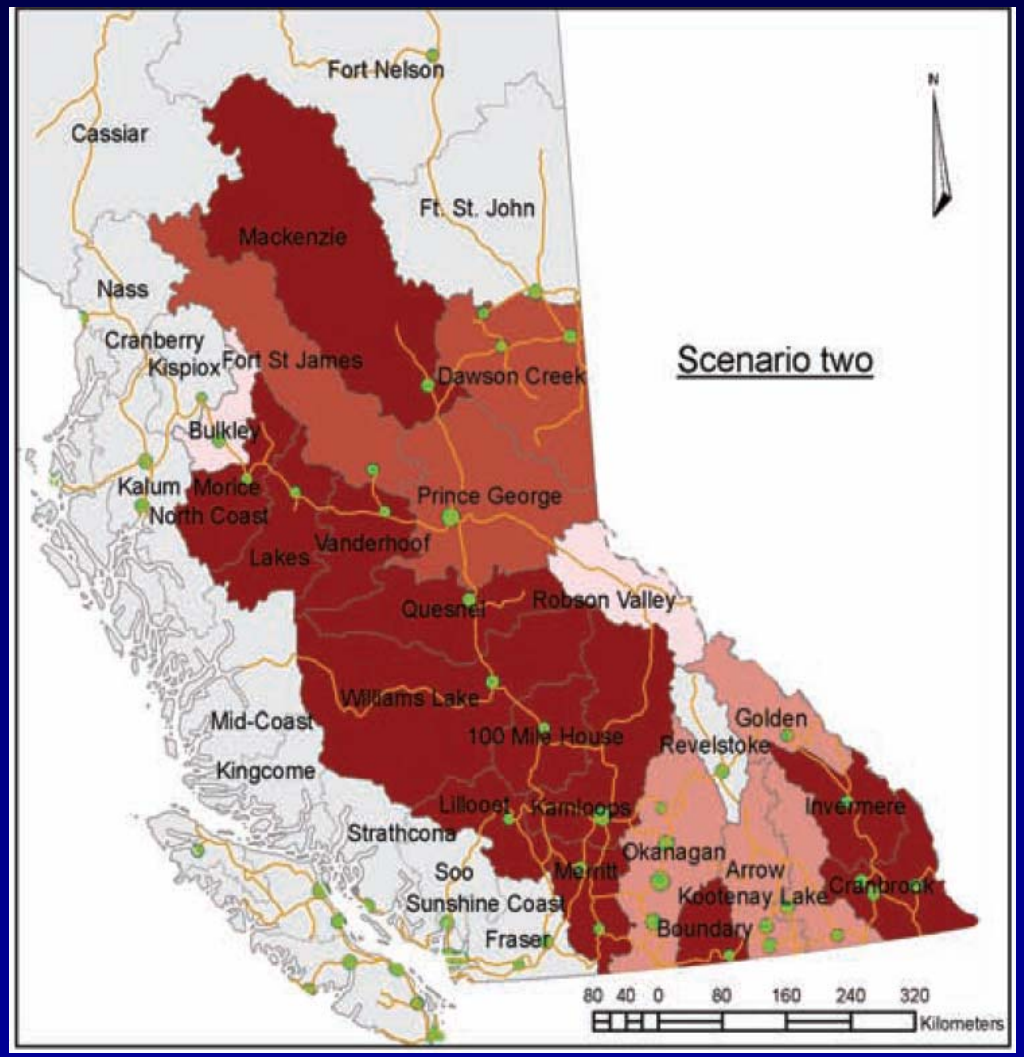
- The ability of licensees to fulfill their basic obligation of reforestation to create free-growing stands is based on a stable timber supply, a competitive industry and a profitable marketplace.

Some TSAs in the Central Interior will experience up to a 72% reduction in mid-term timber supply once the MPB epidemic has run its course

Source:
Timber Supply and the Mountain Pine Beetle Infestation in British Columbia: 2007 Update
(Forest Analysis and Inventory Branch)

1. Ability to fund achievement of free-growing (Timber Supply)





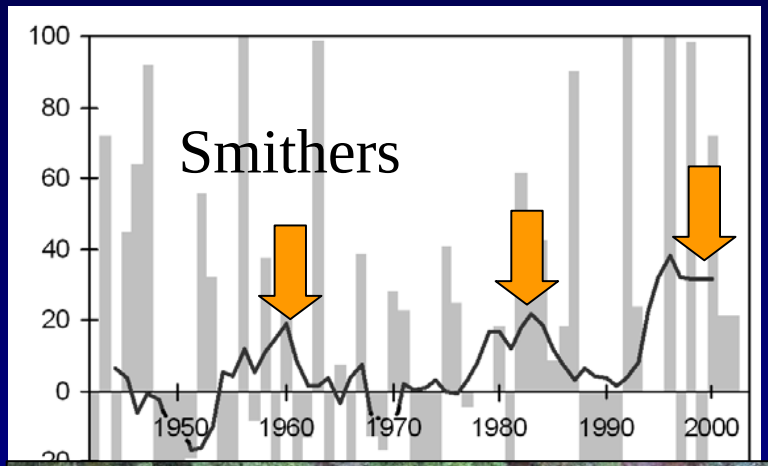
Decline in mid-term Timber Supply

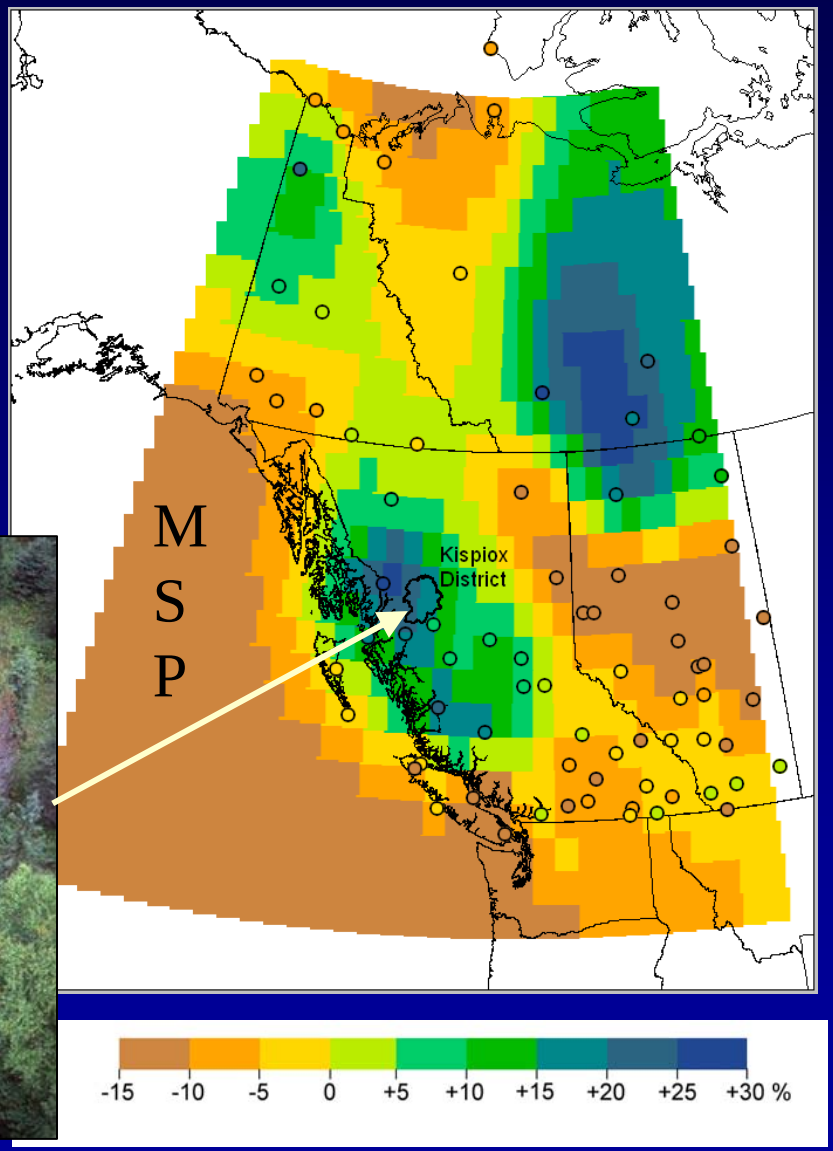
Timber Supply and the Mountain Pine Beetle Infestation in British Columbia: 2007 Update (Forest Analysis and Inventory Branch)

2. Ability to achieve free-growing

The ability of forest managers to tend young stands to the point of achieving **Free-growing** is tied to forest health conditions which are being affected by **climate change.**

Dothistroma & Mean Summer Precipitation





Woods et al 2005

Foliar Diseases of Lodgepole pine

Dothistroma septosporum,

Lophodermium seditsiosum

Lophodermium pinastri

Lophodermella concolor

Davisomycella ampla

Hendersonia pinicola

Phaeoseptoria contortae

Sclerophoma pithyophila

Leptomelaconium cinereum

etc. etc.

Photo: D. Weaver

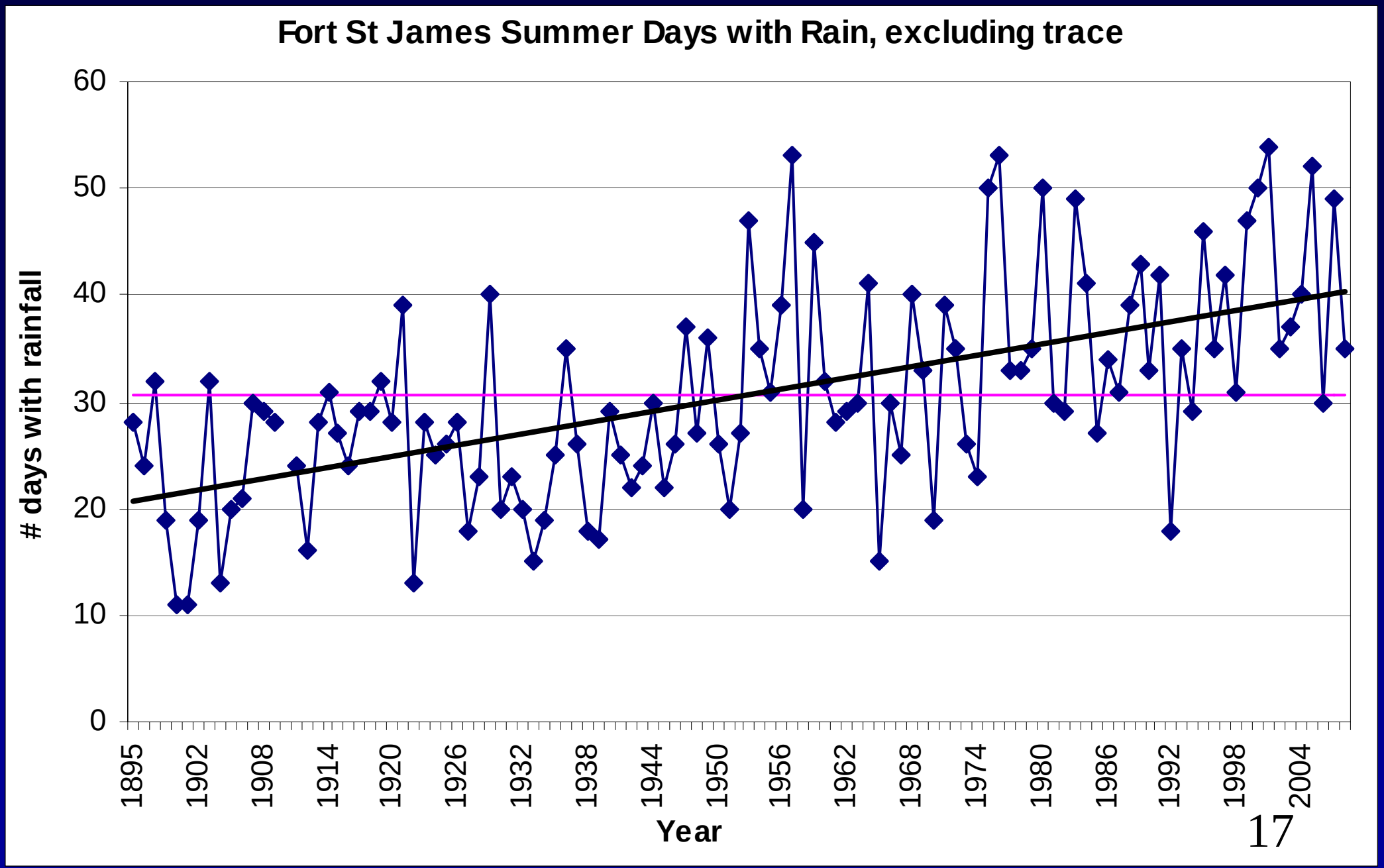
Phaeoseptoria contortae 2008

Rhizosphaera kalkhoffii? *Stigmina lautii?*

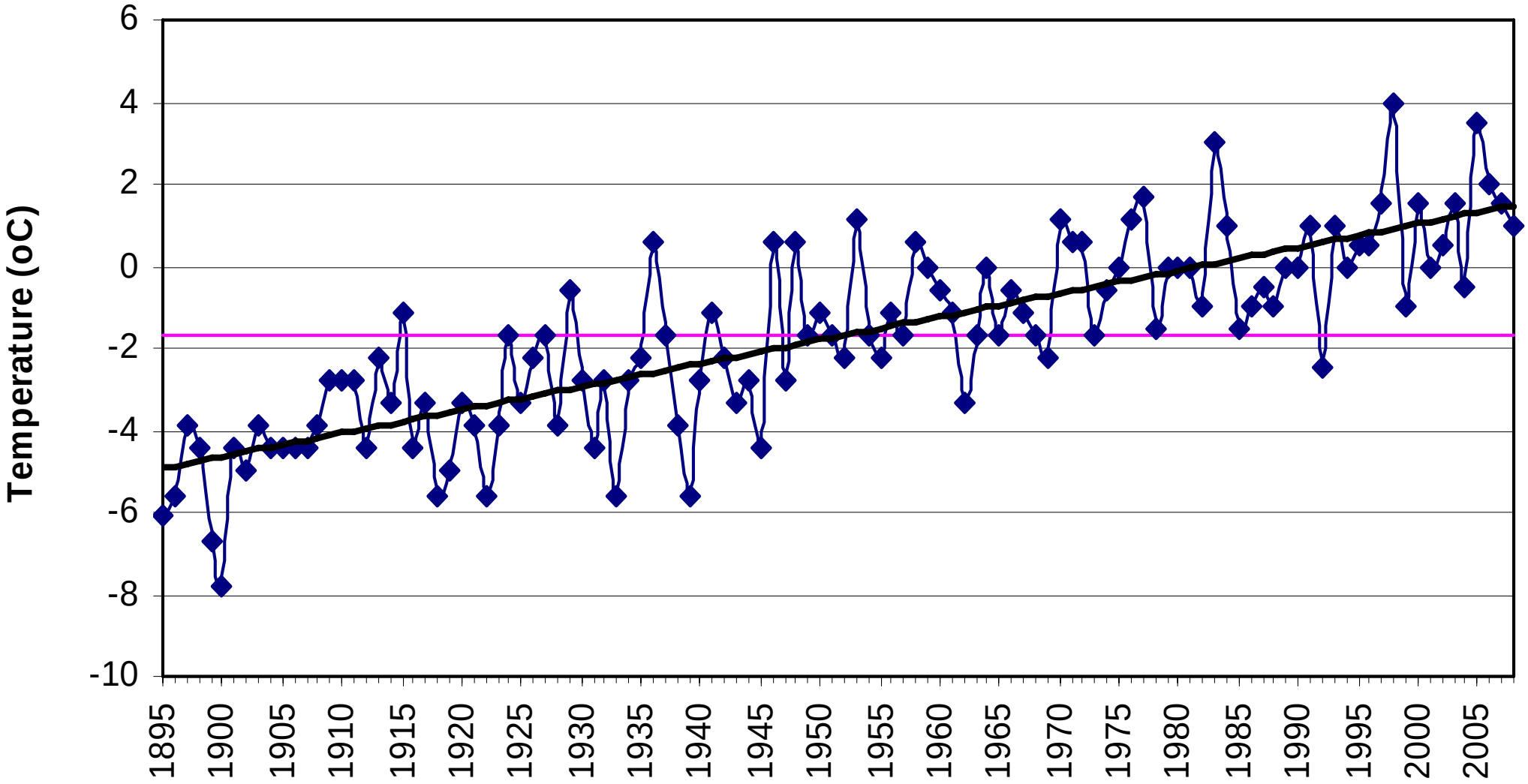
2008

Documented environmental drivers of foliar disease incidence and severity of attack:

- Summer precipitation
  - (Peterson 1973, Gadgil 1977, Harrington and Wingfield 1998, Woods et al. 2005, etc.)
- Overnight minimum temperature
  - (Coakley et al 1999, Harvell et al 2002, etc.)


Fort St James Summer Days with Rain, excluding trace
days with rainfall
60
50
40
30
20
10
0
1895
1902
1908
1914
1920
1926
1932
1938
1944
1950
1956
1962
1968
1974
1980
1986
1992
1998
2004
Year

Fort St. James Summer Min Temperature 1895-2008



V. Egginton

2. Ability to achieve Free-growing…

Foliar diseases are not the only forest pathogens that are increasing in both prevalence and significance in Central BC

Hard pine rusts are too, including:

- Western gall rust (*Endocronartium harknessii*)
- Comandra blister rust *(Cronartium comandrae),* and
- Stalactiform blister rust *(Cronartium coleosporoides)*

Photo: E. Havard

Photo: E. Havard

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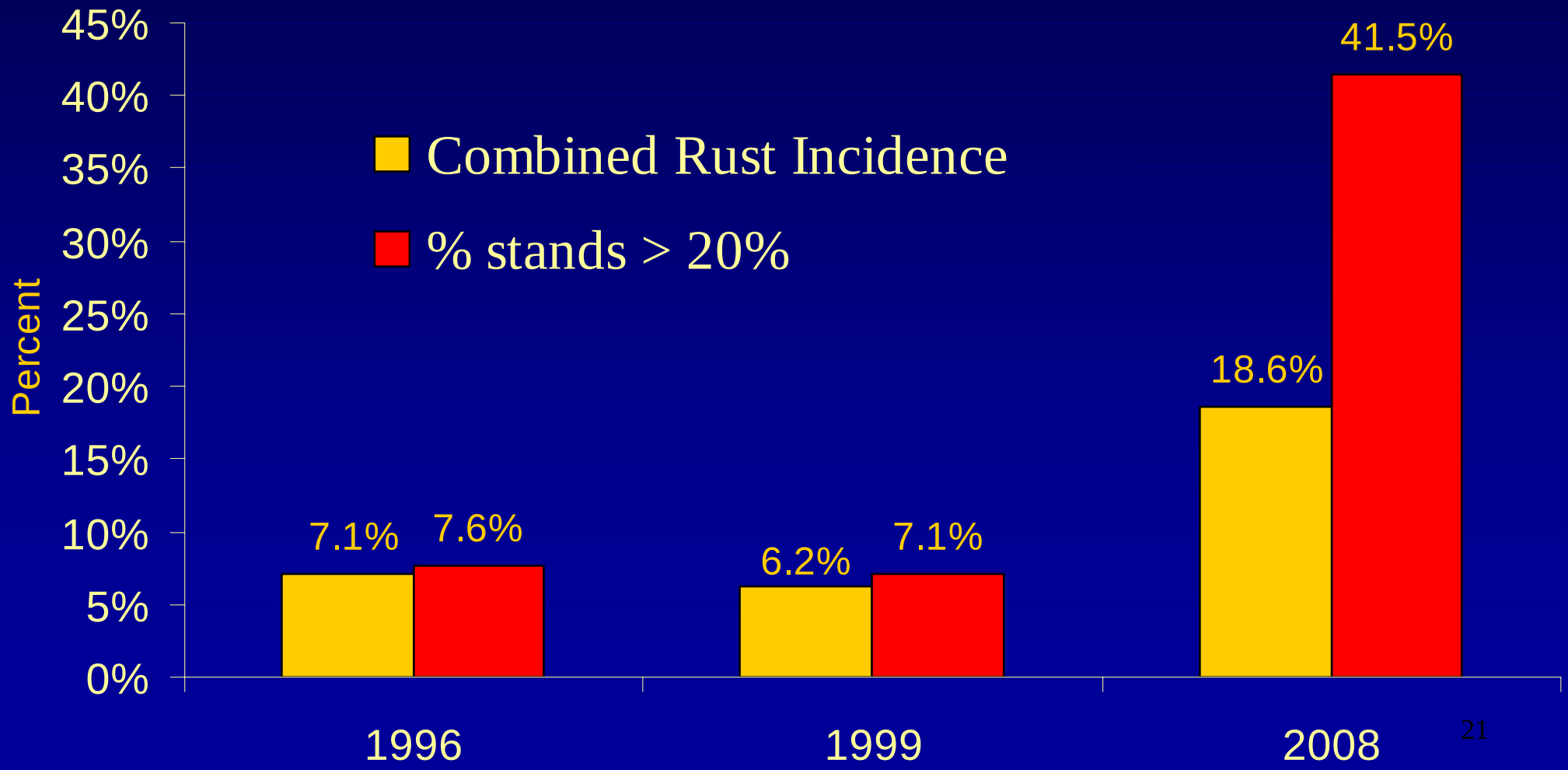
Morice TSA, combined mean rust incidence by stand and percent of stands with >20% incidence in 1996 (n=66), 1999 (n=98) and 2008 (n=82)

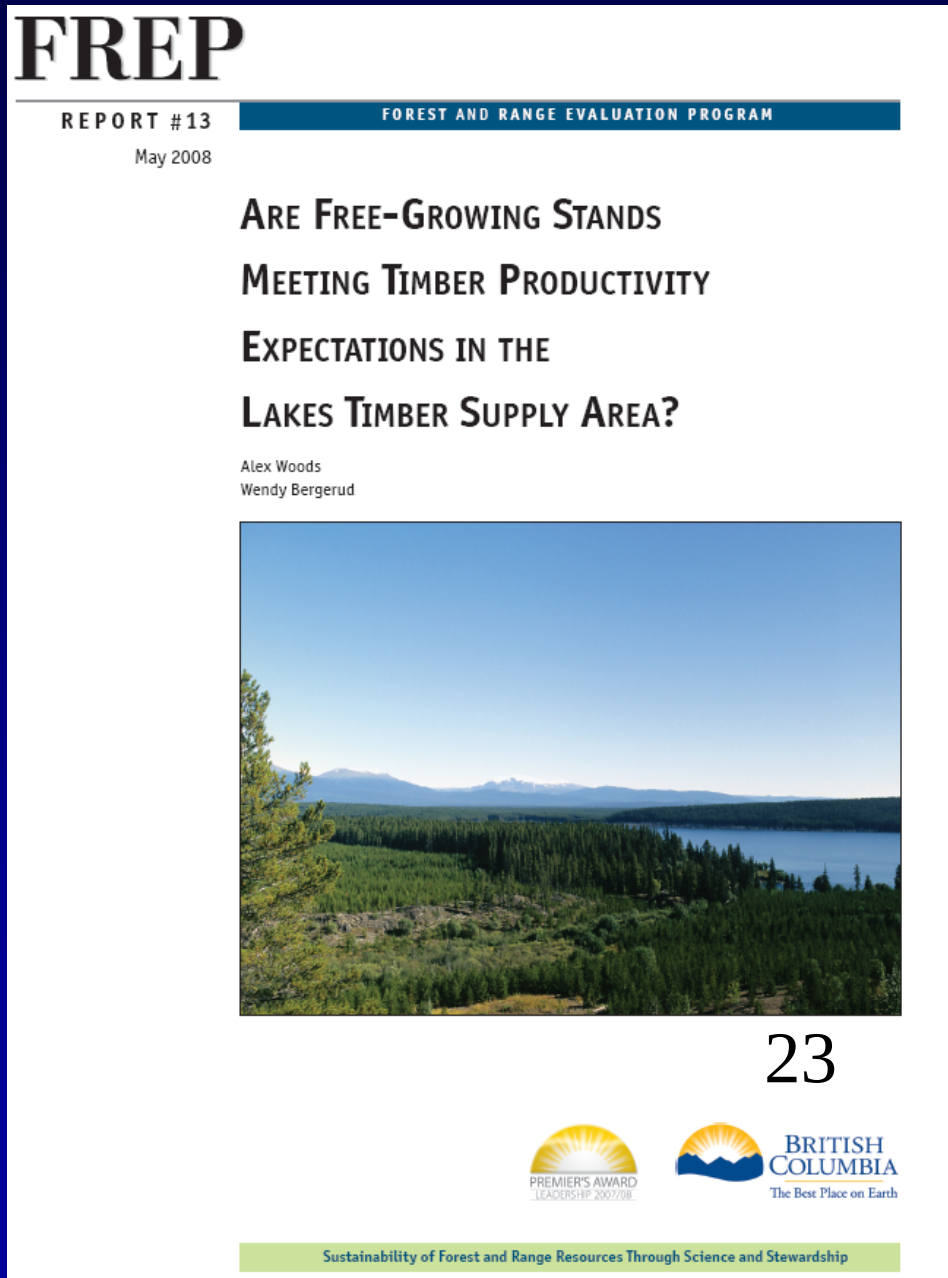


3. Longevity of the free-growing condition

The longevity of the **Free-growing** condition and the productivity of free-growing stands has not been well monitored in the past and is definitely being challenged by **climate change**

3. Longevity of the free-growing condition

A post-free-growing monitoring protocol has been developed under the Forest and Range Evaluation Program (FREP) to determine how well free-growing stands are meeting expectations.



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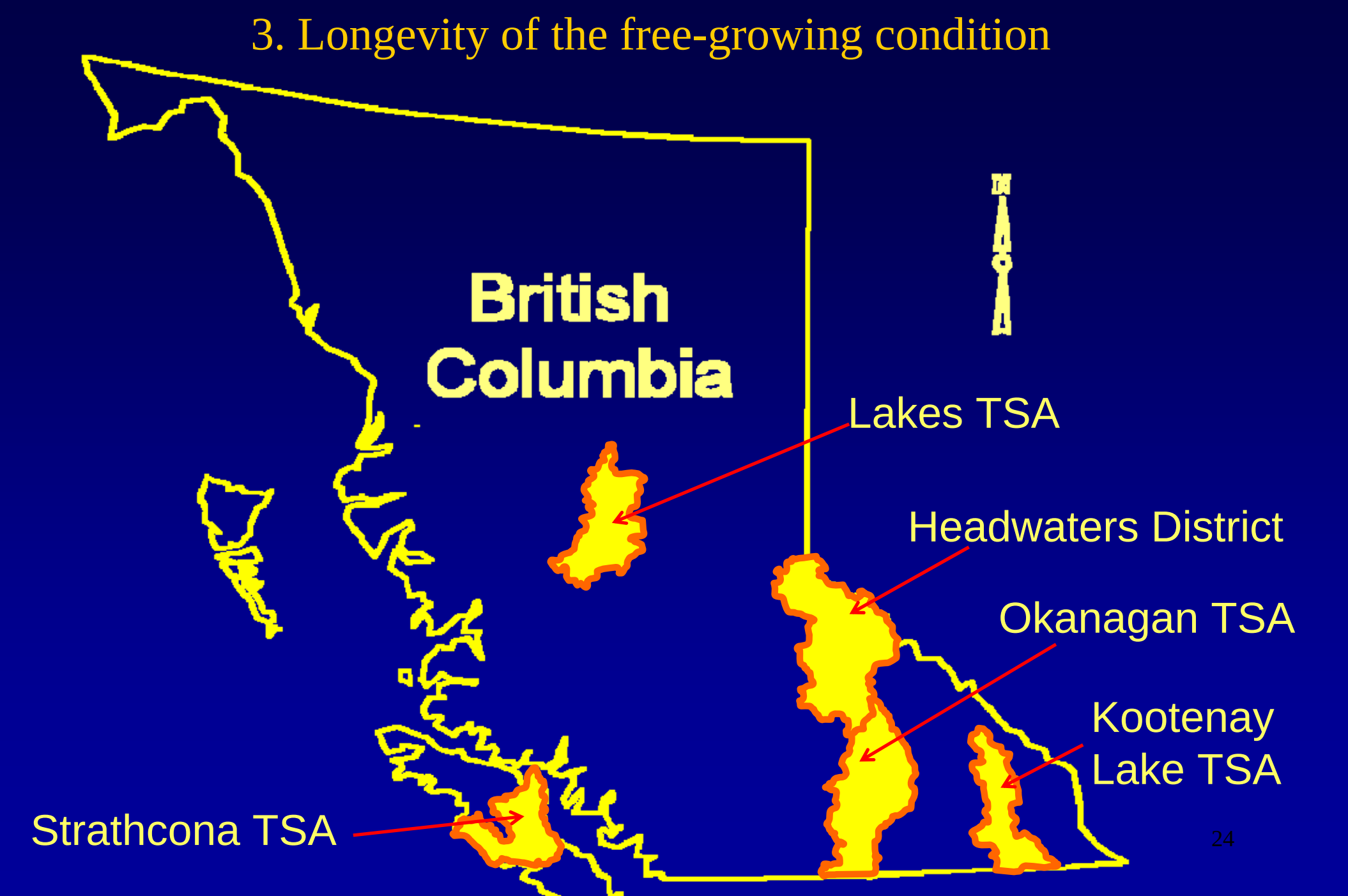


•In 2005, Free-growing stands in the Lakes TSA largely appeared to be meeting expectations and projected volume matched the most recent Timber Supply Review (TSR2) assumptions

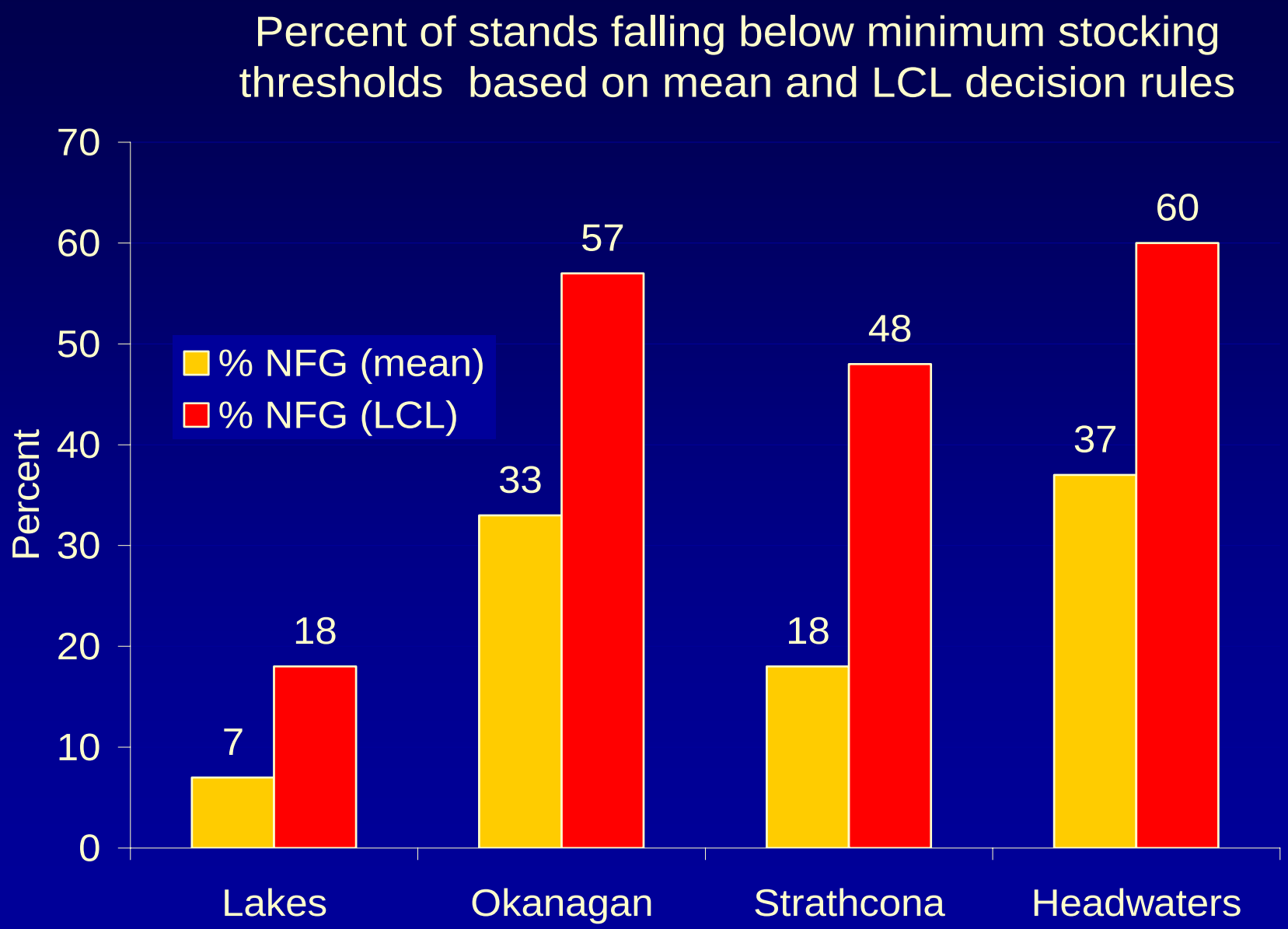
•BUT, both the 2005 assessment and TSR 2 did not capture the effects of the 2006 MPB flight and its impact on young stands

3. Longevity of the free-growing condition

Lakes TSA: Snow press damage result of October 2006 snow storm.

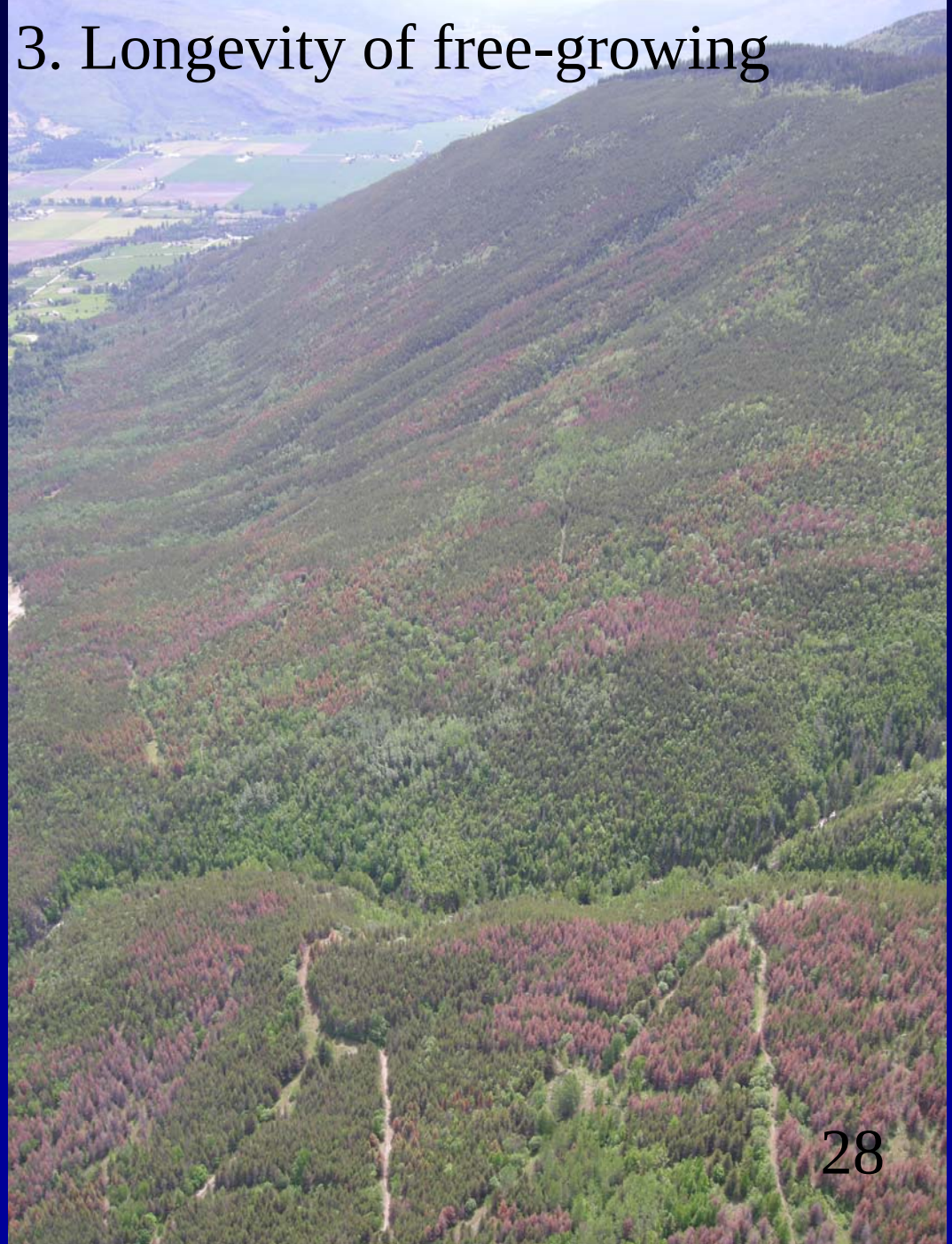
Photo: E. Havard

3. Longevity of the free-growing condition



3. Longevity of free-growing

- The productivity of Free-growing stands in the Okanagan, Headwaters, and Strathcona TSAs appears to be below expectations in many instances.
- This failure to meet expectations is largely due to forest pests.
- Forest pests are just beginning to be influenced by **climate change**.



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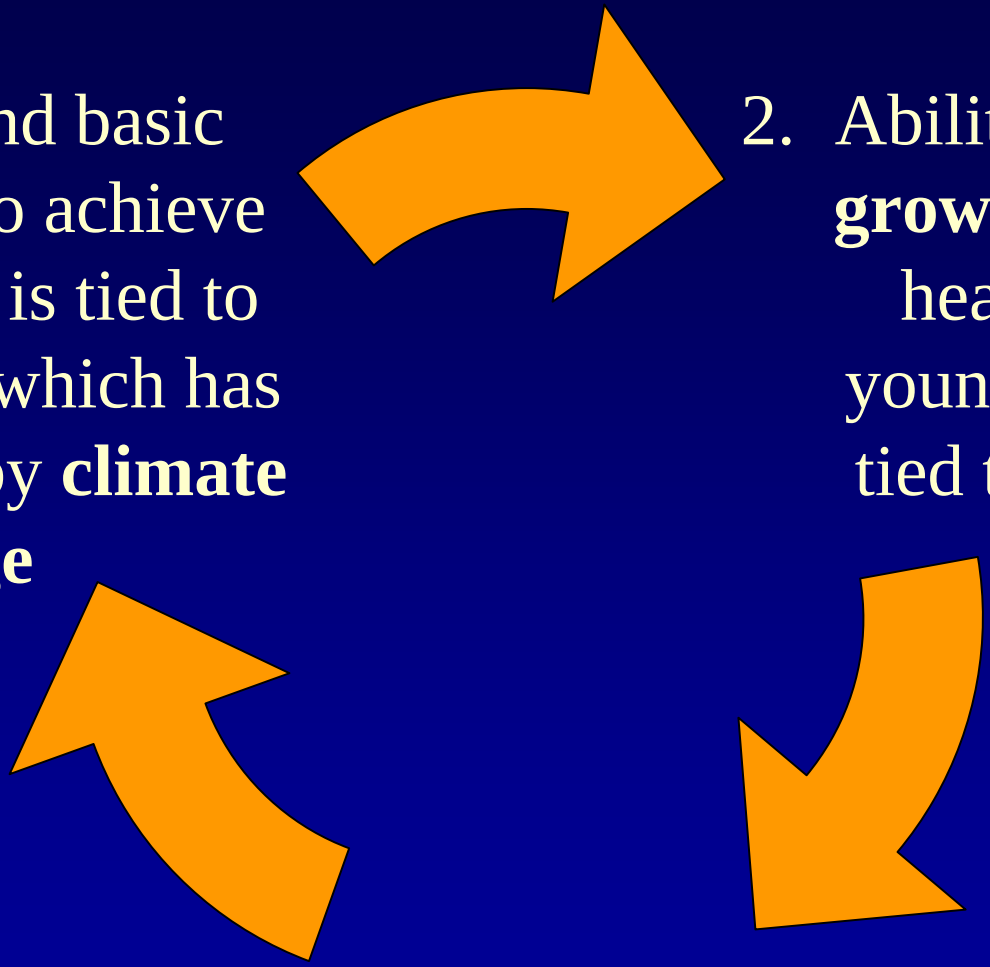
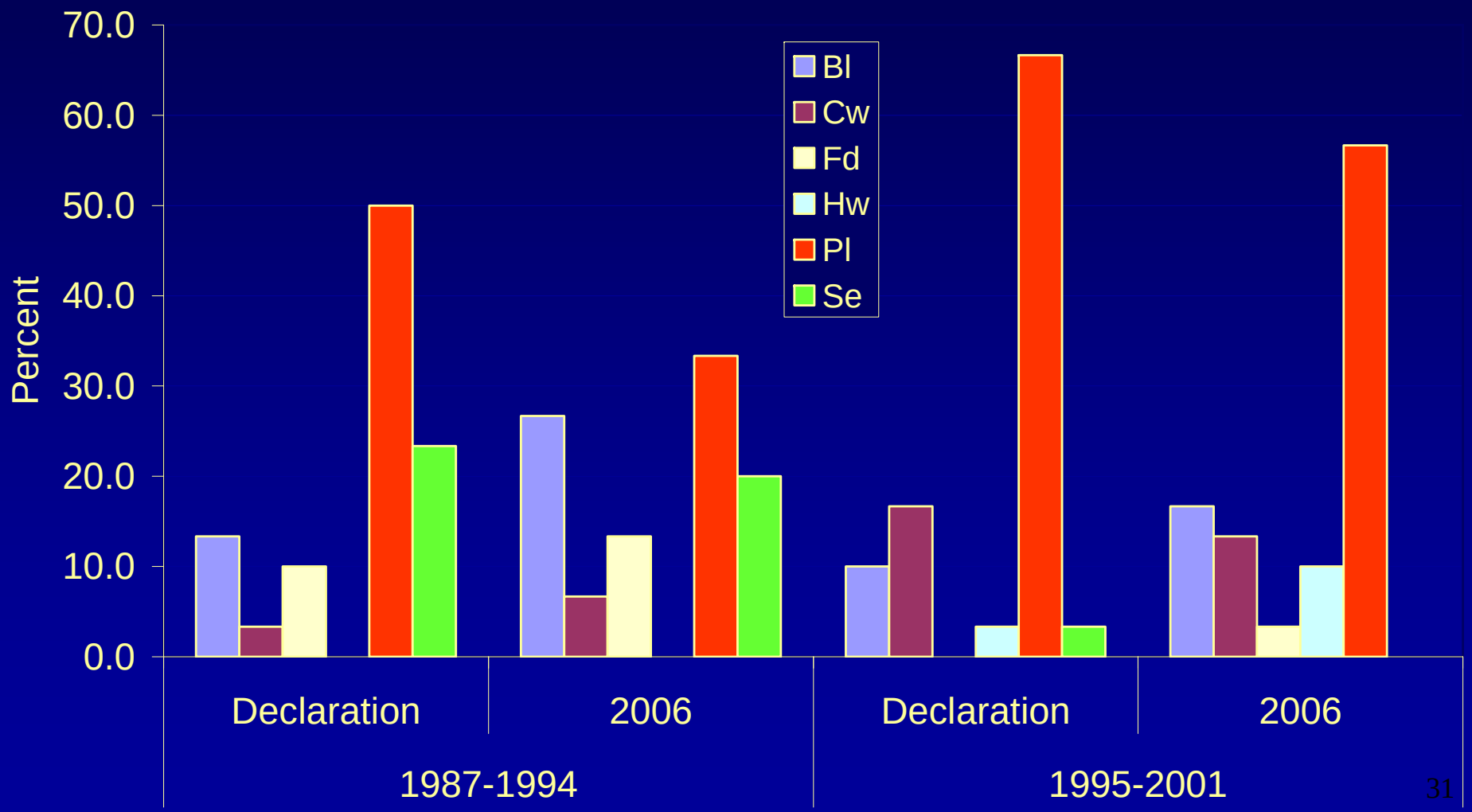


Free Growing = Proactive? = Resiliency?

- Management choices made in order to cost effectively achieve the result of "free-growing" are not necessarily the same choices that would be made in order to make a resilient stand capable of coping with the effects of climate change.

Species composition (leading species, Inventory label) of 60 randomly selected stands declared in the period 1987-1994 and from 1995-2001, both at the time of Free-growing and in 2006 Okanagan TSA



Forest Licence A16831: Skeena Carnaby Sawmill:

Permanent mill closure, bankruptcy declared 2001

- Harvested openings that are still not free growing in 2009: **14,900 ha.**
- Net area of outstanding Lodgepole pine leading plantations: **5,600 ha.**

Future Forests Ecosystems Initiative
Objective #5

Adapt the forest and range management framework to maintain and enhance ecological resilience and ecosystem services, products and benefits under changing ecological conditions

Strategy to Achieve that Objective:

Determine which aspects of forest and range management framework should be adapted, and how, in response to climate change.

Future Forest Ecosystems of BC Symposium

February 2006

Working Group Report: Alternative Management Models (Paradigms)

Leader: Henry Benskin

"Flexibility is paramount in managing our forest resources, to enable us to adapt to climate change impacts and to catastrophic events such as the Mountain Pine Beetle and the 2003/4 wildfires, and to enable us to "move up the value chain" to obtain more value from the wood we harvest.

The separation of logging from manufacturing has merit and is happening in the United States and in some isolated instances in British Columbia—should this be part of the new model?"

Acknowledgements:
Wendy Bergerud, Research Br.
Anthony Britneff, For. Prac. Br.
Tracy Coombes, Nadina FD
Vanessa Egginton, NIFR
Dale Gilbert, Econ. and Trade Br.
Erin Havard, NIFR
Kate Pottinger, Skeena Stikine FD
Lou Tromp, Skeena Stikine FD

Thanks for your attention.

Photo: P. Hanna