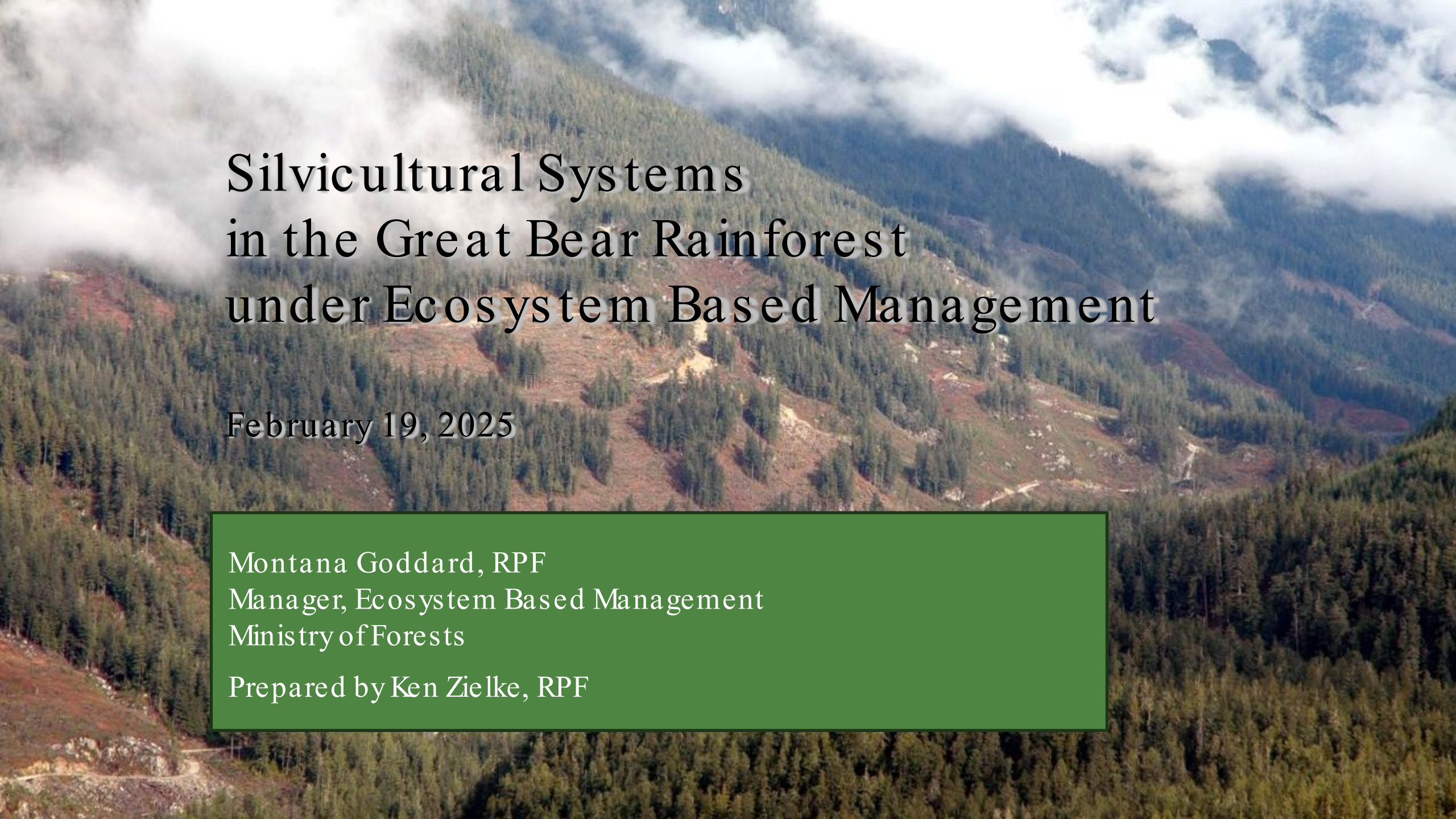


An aerial photograph of a mountain landscape. The foreground and middle ground show a steep, forested slope. A significant portion of the forest has been cleared, revealing a reddish-brown soil surface. The cleared area is irregular in shape, following the contours of the mountain. The remaining forest consists of dense evergreen trees. In the background, more mountain peaks are visible, partially obscured by white, fluffy clouds. The sky is bright, and the overall scene suggests a managed forest environment.

Silvicultural Systems in the Great Bear Rainforest under Ecosystem Based Management

February 19, 2025

Montana Goddard, RPF
Manager, Ecosystem Based Management
Ministry of Forests

Prepared by Ken Zielke, RPF

Outline – Where we will go today...

1. Objectives for silvicultural systems in the GBR Land Use Order (LUO).
2. The importance of the retention system.
3. Landscape level context for the retention system.
4. Landscape level windthrow considerations.
5. Stand level windthrow considerations.
6. Summary – Take-home messages.



The key sources of direction in the GBR...

Great Bear Rainforest Land Use Objectives Order

DIVISION 1 - General

1. Relationship with Forest and Range Practices Act objectives

- (1) Pursuant to section 93.4 of the *Land Act*, the following Part 1 objectives are established as land use objectives for the purposes of the *Forest and Range Practices Act*, and apply as specified in each section to the area shown in Schedule A (order area).
- (2) A person required to prepare a woodlot licence plan is not required to specify results or strategies for the objectives established in this order for land that is subject to a woodlot licence.
- (3) A person required to prepare a forest stewardship plan is not required to specify results or strategies for the objectives established in this order for land that is subject to a community forest agreement.
- (4) Results or strategies specified in a forest stewardship plan may apply to more than one objective contained in this order.
- (5) This order establishes land use objectives in accordance with section 93.4 of the *Land Act*, and nothing in, under or arising out of this order abrogates or derogates from any Indigenous rights, Indigenous title or treaty rights of any applicable First Nations and does not relieve the Province of any obligation to consult with any applicable First Nation.

2. Definitions

- (1) In this order:

"**applicable First Nation**" means any First Nation with an asserted or established Indigenous right, Indigenous title, or treaty right to the area under consideration;

"**blue-listed plant community**" means a plant community listed in Schedule O that is sufficiently established;

"**contemporary culturally modified tree**" means a tree that was modified less than eighty years ago by First Nations people as part of their cultural use of the tree;

"**First Nation engagement**" means reasonable efforts to communicate, share information, engage in dialogue, and identify and work to resolve issues and concerns brought forward by applicable First Nations;

"**historical culturally modified tree**" means a tree that was modified more than eighty years ago by First Nations people as part of their cultural use of the tree;

"**Indigenous forest resource**" means a forest plant resource listed in Schedule J, or other forest plant resource identified by First Nations during First Nation engagement, that is utilized for food, social, medicinal or ceremonial purposes;

"**Indigenous forest values**" means Indigenous forest resources, Indigenous heritage features, historical culturally modified trees, contemporary culturally modified trees, monumental

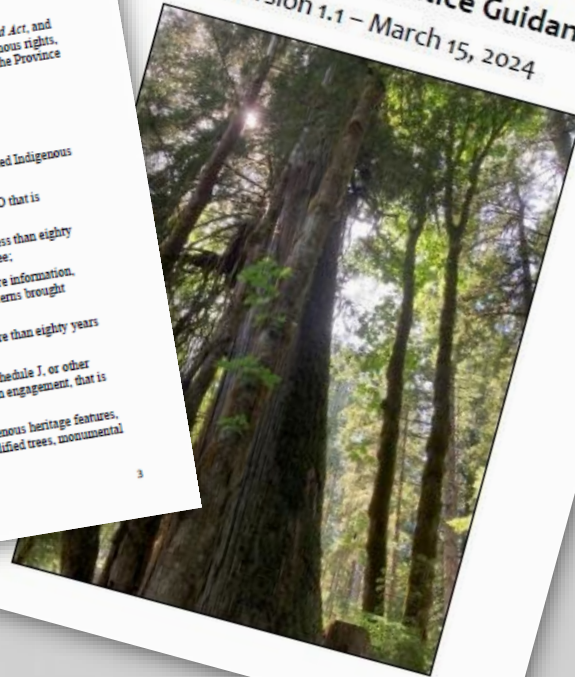
June 2023

1 - Great Bear Rainforest

Implementing the 2023 Great Bear Rainforest Land Use Order

Ecosystem-Based Management Planning and Practice Guidance

Version 1.1 – March 15, 2024



Implementing the 2023 Great Bear Rainforest Land Use Order

Ecosystem-Based Management Supplemental Technical Guidance

Version 1.1 – March 15, 2024



LUO objectives for silvicultural systems...

1. **Maintain forest structure and diversity at the stand level by:**
 - a) maintaining a minimum of 15% of the Cutblock area as Stand Retention;
 - b) **distributing** stand retention **throughout** the cutblock;
 - c) maintaining **greater than 15%** retention as **necessary, considering** cutblock size, landscape unit context and immediate landscape context; and,
 - d) managing windthrow.



LUO definition...

- **"stand retention"** means small patches of trees and understory vegetation that are located in a Cutblock or contiguous to a Cutblock.



Further LUO objectives...

2. To the extent practicable, include the following within Stand Retention:
- a) Indigenous features and values;
 - b) habitat elements important for restoration of old forest; and
 - c) habitat elements important for wildlife.



Why is Stand-level Retention Important?

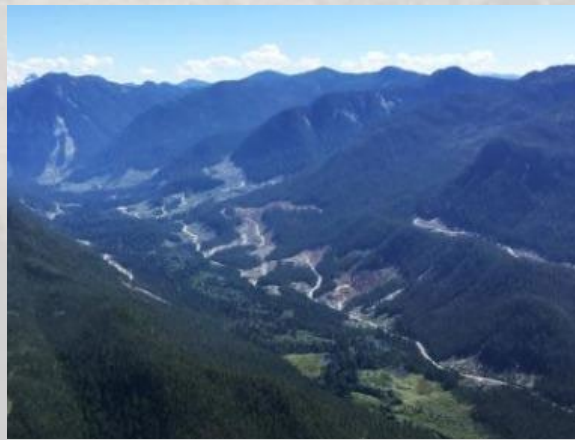
- Sustains older stand structure, function for conservation of biodiversity at stand level.
- Helps stand provide attributes of older stands more quickly.
- Provides key habitats for some life stages of species and highly specialized habitats for others.
- Necessary complement to landscape level – e.g. connectivity across the managed forest.



Some Supplemental guidance definitions...

Variable retention –

- Is an overarching approach to silvicultural systems, not a silvicultural system itself.
- Follows a **natural disturbance-based** management paradigm.
- Recognizes the importance of **structural complexity**.
- Requires **long-term retention** of trees and associated habitat.



Beese et. al.
Ecological Process (2019) 8:33

Some EBM Supplemental Technical Guidance definitions...

The retention silvicultural system:

- A silvicultural system designed to meet the goals of variable retention.
- Retains individual trees or groups of trees for at least one rotation, maintaining **more than half the total harvested area** of the cutblock within a **‘zone of forest influence’** from **other trees**.

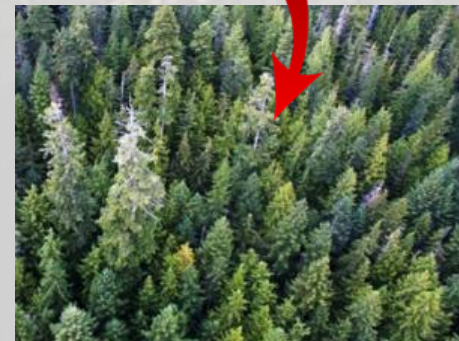
*Mitchell, S.J. and W.J. Beese.
Forestry Chronicle Vol. 78,
No. 397-403 (2002)*



GBR direction for use of the retention silvicultural system:

Three scales to consider:

1. Landscape Unit context
2. Immediate landscape context of cutblock
3. The stand/cutblock itself

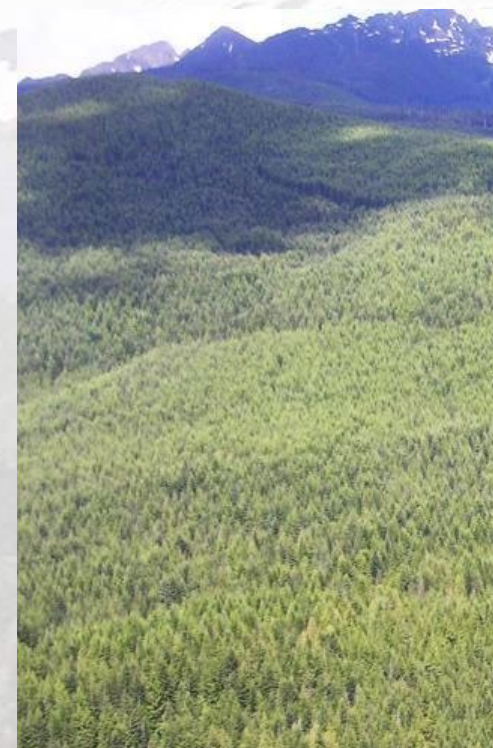


Scale 1 – Landscape Unit Context:

Consider **mature and old forest context** within your landscape unit :

- At **higher levels** (> 60% mature and old forest for the **dominant SSGs**) use any silvi system.
- At **moderate levels** (40 to 60% mature and old forest for the dominant SSGs) use retention system on $\geq 50\%$ of area harvested.
- At **low levels** (<40% old and mature forest for dominant SSGs) use retention system on $\geq 70\%$ of area harvested

Note: The usage of the retention system will be based on a 5-year rolling average.



Scale 2 – Immediate landscape context around the cutblock:

- a) Where < 70% old or mature within 2 km :
 - Use the retention system
- b) Where $\leq$ 50% old or mature within 2 km :
 - Also use higher levels of retention
- c) Where < 30% mature or old forest within 2 km:
 - Also prioritize trees with old attributes for retention
- d) Where >70% mature or old forest within 2 km:
 - Use the other criteria found in Sec 2.1

PRINCIPLE - retention is more important where immediate landscape has less old and mature.

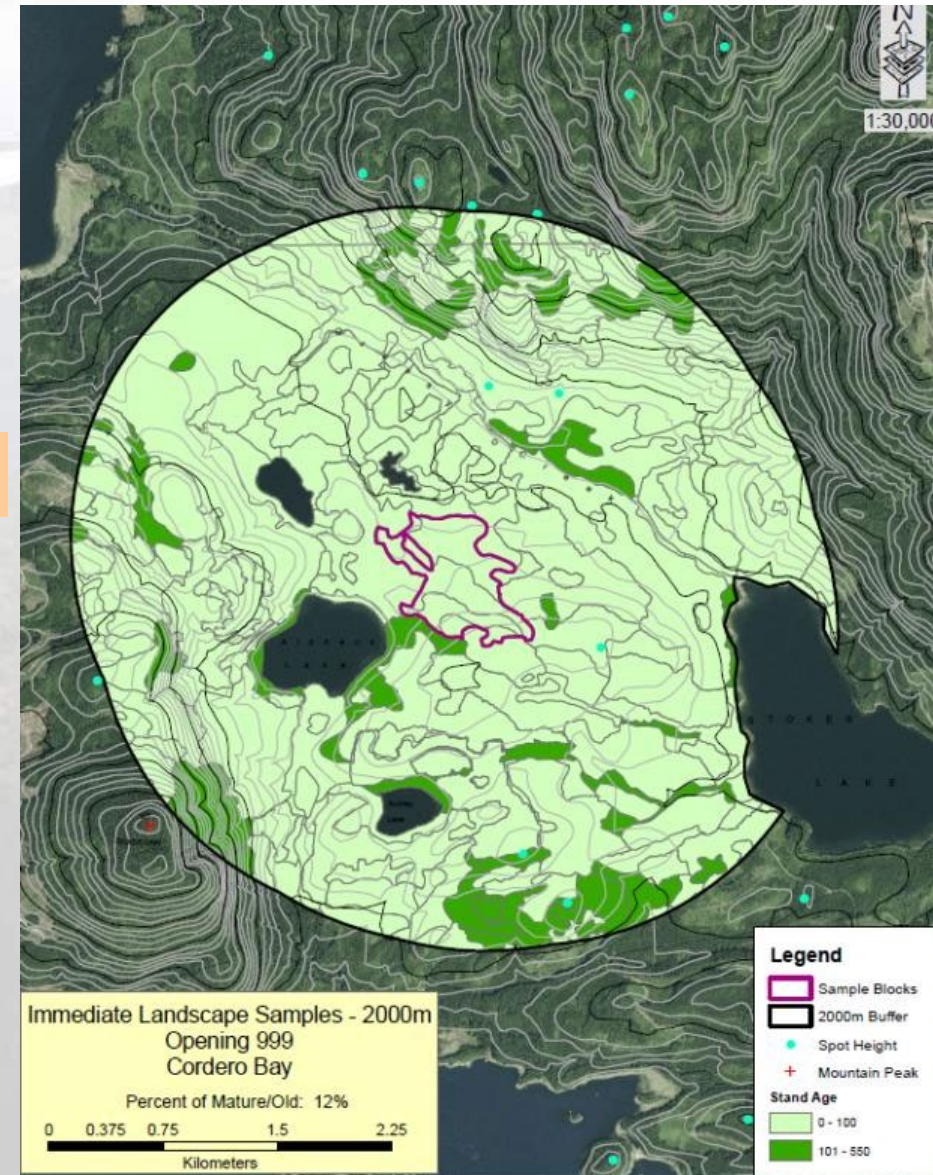


Scale 2 - Measurement Example:

Dark green – mature and old

% old and mature within 2 km is 12%

NOTE - Measures of mature and old are outside the Total Area Under Prescription in the cutblock (TAUP)



Scale 3 – Consider the Cutblock Itself:

- **Consider Windthrow biophysical hazard**

If a retention system is intended:

- Design of forest influence
 - Over 50% of block
 - For at least one rotation
- Biological anchors and design



Landscape Windthrow Consideration

Where *biophysical hazard for windthrow* is:

- HIGH OR VERY HIGH 'on most' of the proposed cutblock – **can use any silvicultural system.**
- NIL TO MODERATE - **Use all the other guidance** (landscape level) about when to use a retention silvicultural system.



High or Very High Biophysical Hazard

- *across most of the cutblock area*



High or Very High Biophysical Hazard

- *across most of the cutblock area*



Stand Level Windthrow Best Mgmt Practices

Unless other values are present, try to design cutblock and silvicultural system for:

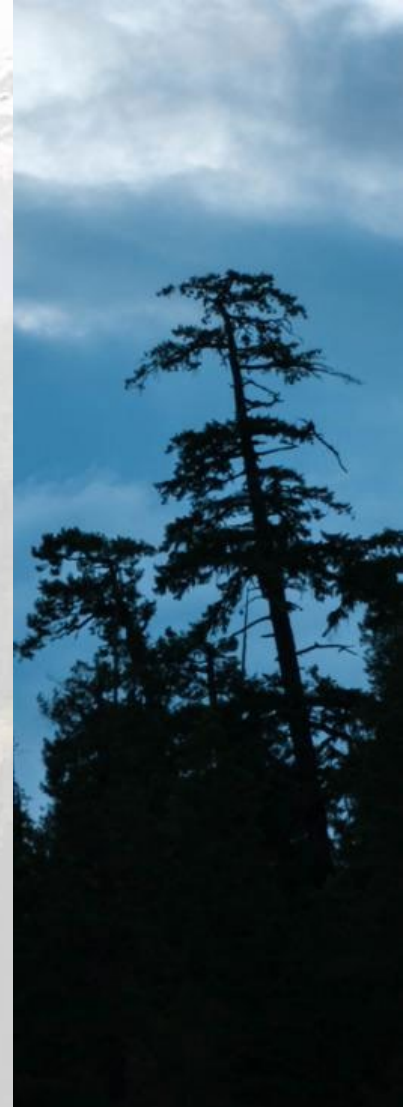
- no more than 15 m penetration into edges, OR
- less than 30% windthrow throughout patches and strips.

(Whichever constitutes greater wind damage)



Summary – Take-home Messages

1. **The retention silvicultural system will play a more prominent role in the GBR.**
 - a) Distribution of retention in a cutblock is seen as important for managing biodiversity.
2. **Important to consider the landscape context.**
 - a) We believe two spatial scales are important – the landscape unit scale and the immediate landscape scale (within 2 kms).
3. **Important to control windthrow within reasonable limits.**
 - a) Set some goals, which will be monitored.



A serene landscape photograph of a forest. In the foreground, a dense stand of tall, dark evergreen trees is visible. The middle ground features a valley filled with a thick, white mist or fog, which partially obscures the trees below. In the background, a steep hillside covered in a dense forest of tall, thin evergreen trees rises up. The overall atmosphere is calm and ethereal, with soft lighting and a cool color palette dominated by greens, blues, and whites.

Thank you!