Climate Resilience Planning for the CCF

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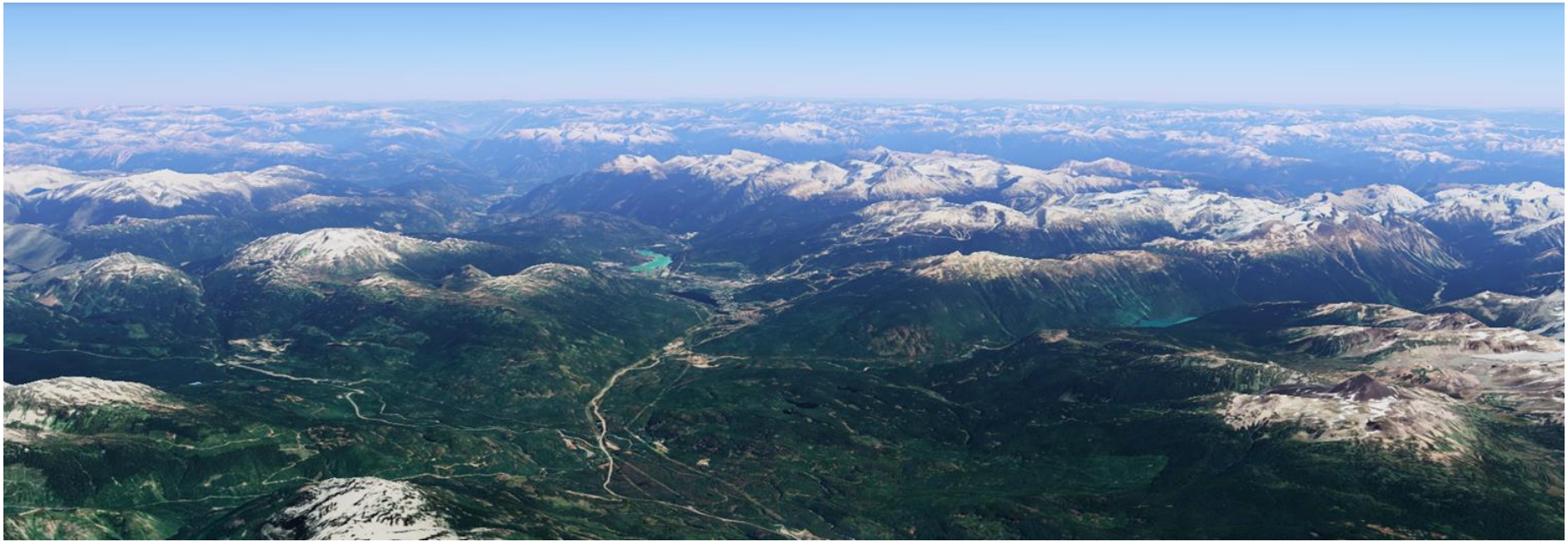
FRONTERA FOREST SOLUTIONS INC.

CHEAKAMUS COMMUNITY FOREST



- Who is seeing impacts to forests from climate change?

- Who is concerned about these impacts?

What can we do?

Build a Climate Resilience Plan!

Climate resilience planning is a decision to be ***proactive about climate change;***

Allows forest managers the ability to ***respond*** to climate change rather than to ***react***.

What are benefits of this type of planning?

Greater Understanding

Gathering Knowledge/Collaboration

Adaptive Management

Climate Resilience Planning: How to Build the Plan

- **Phase 1:** Develop a local forest risk assessment;
- **Phase 2:** Develop a Long-term Operational Strategy - what to do on the landscape;
- **Ongoing:** Monitoring program with adaptive management.

Project Phase 1: Risk Assessment

Key Risk	Expected Changes
Heatwaves	More frequent and intense
Wildfires	More frequent and widespread
Flash flooding	More frequent and intense
Snowpack	More variable; later onset; earlier melt; less consistent; and, decreased accumulation
Cold snaps	Less frequent
Freezing level	More variable and increased altitude
Drought	More frequent, intense, and long lasting

Climate Impacts to Forests

From: *'RMOW General Climate and Climate Change Assessment'* (2022)

Top Ranked Climatic Impacts

- #1: Increases in wildfire activity;
- #2: Forest stress and tree mortality;
- #3: Forest health (insects and diseases).

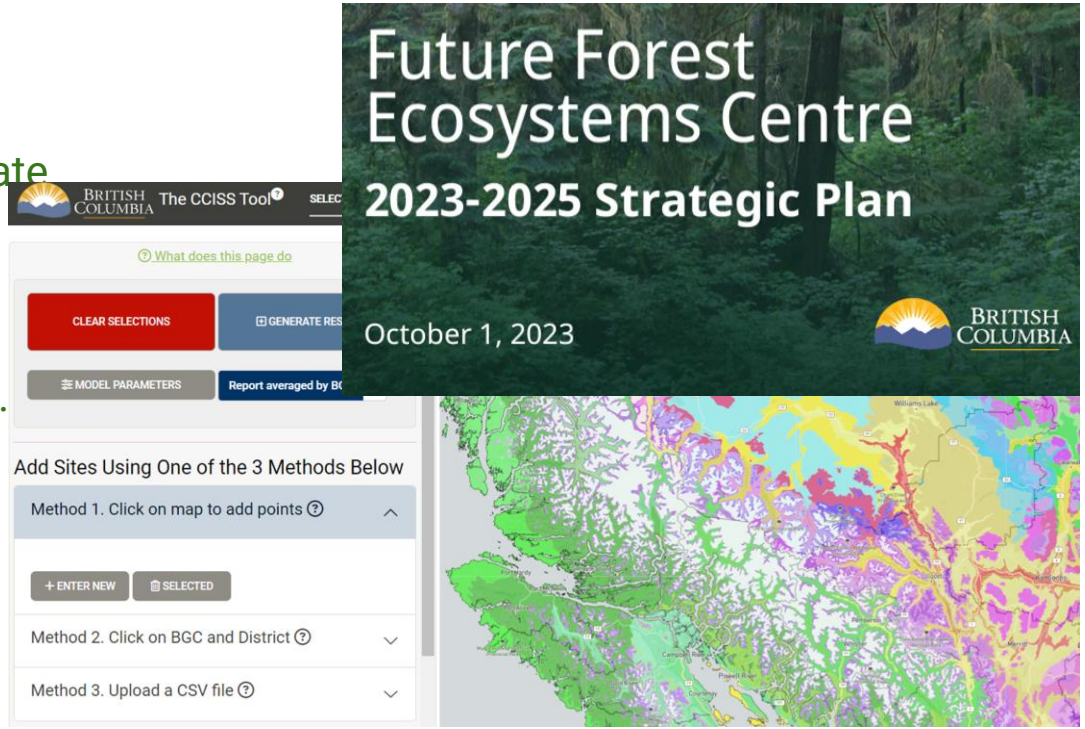
Predicting Wildfire Risk

- Wildfire modelling - across landscape and at site level scale

Predicting Forest Stress and Tree Mortality

1. Identifying regions and site conditions where forests and tree species are at highest risk to climate change stresses;

1. Identifying climate change refugia.

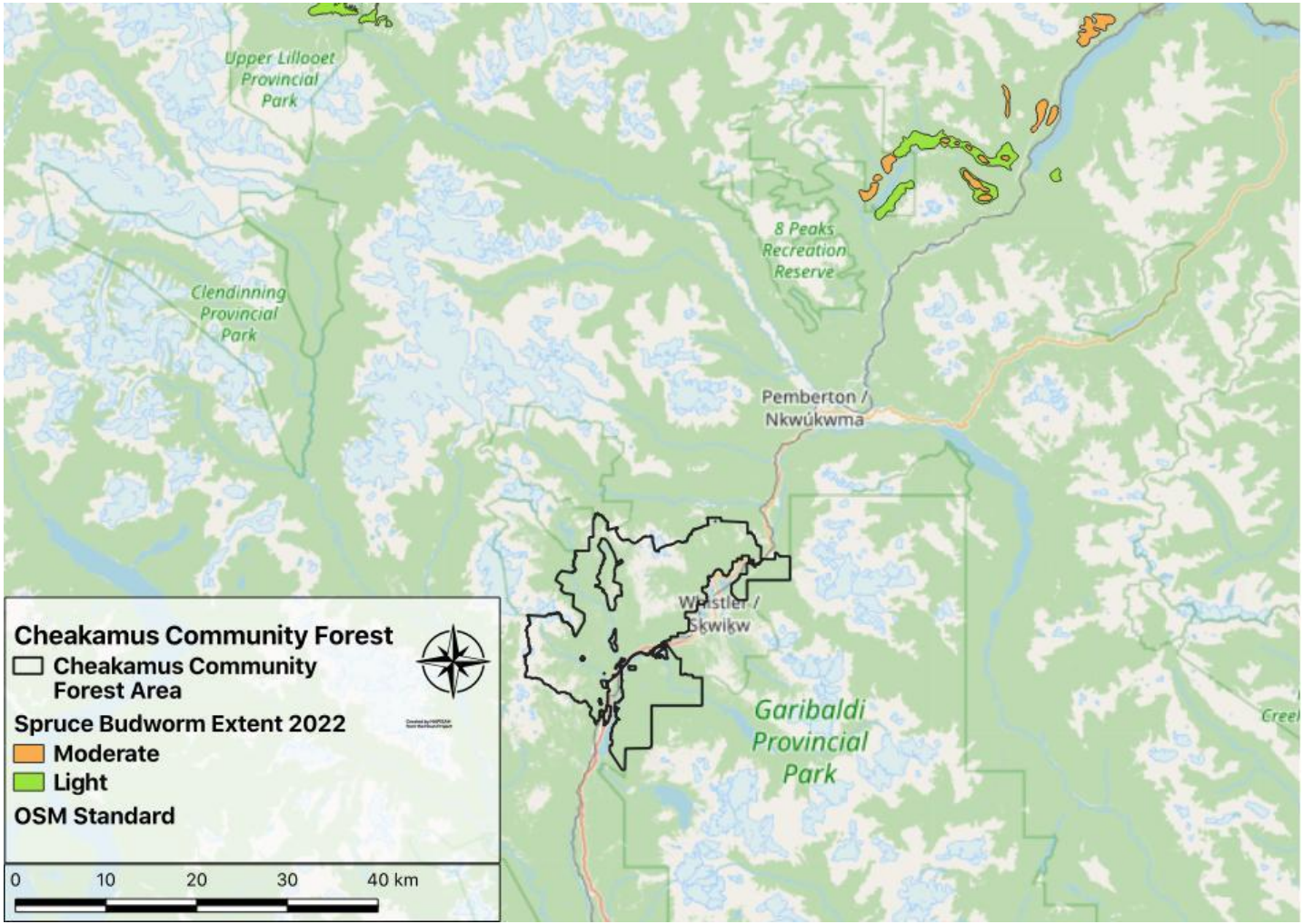


CCISS: Climate change informed species selection tool

Predicting Forest Health Impacts

Working with the BC Ministry of Forests

Current spruce budworm outbreak as a opportunity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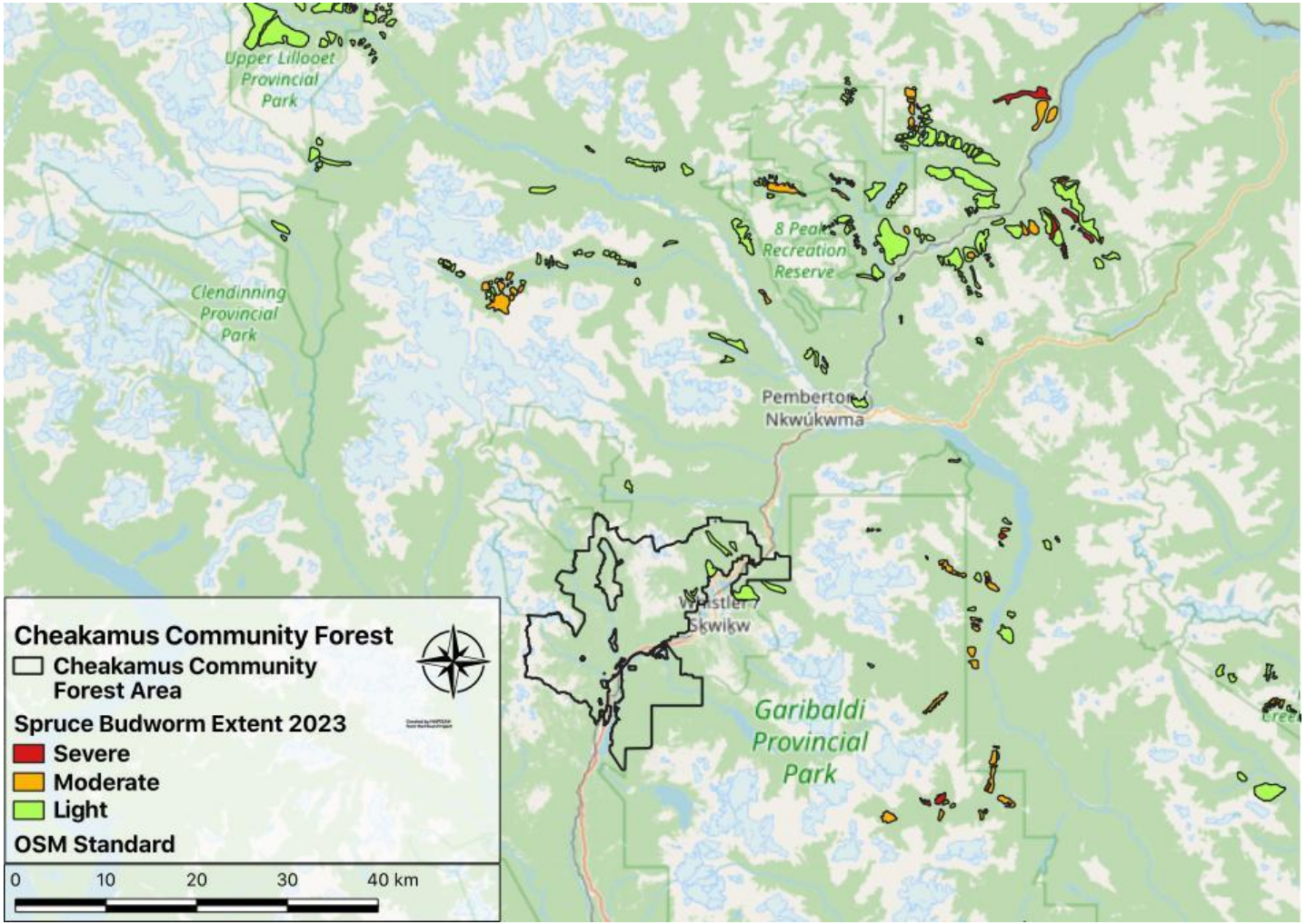
8 Peaks Recreation Reserve
Pemberton / Nkwúkwma
Whistler / Sḵwikw
Garibaldi Provincial Park
Cheakamus Community Forest
Cheakamus Community Forest Area
Spruce Budworm Extent 2022
Moderate
Light
OSM Standard
0
10
20
30
40 km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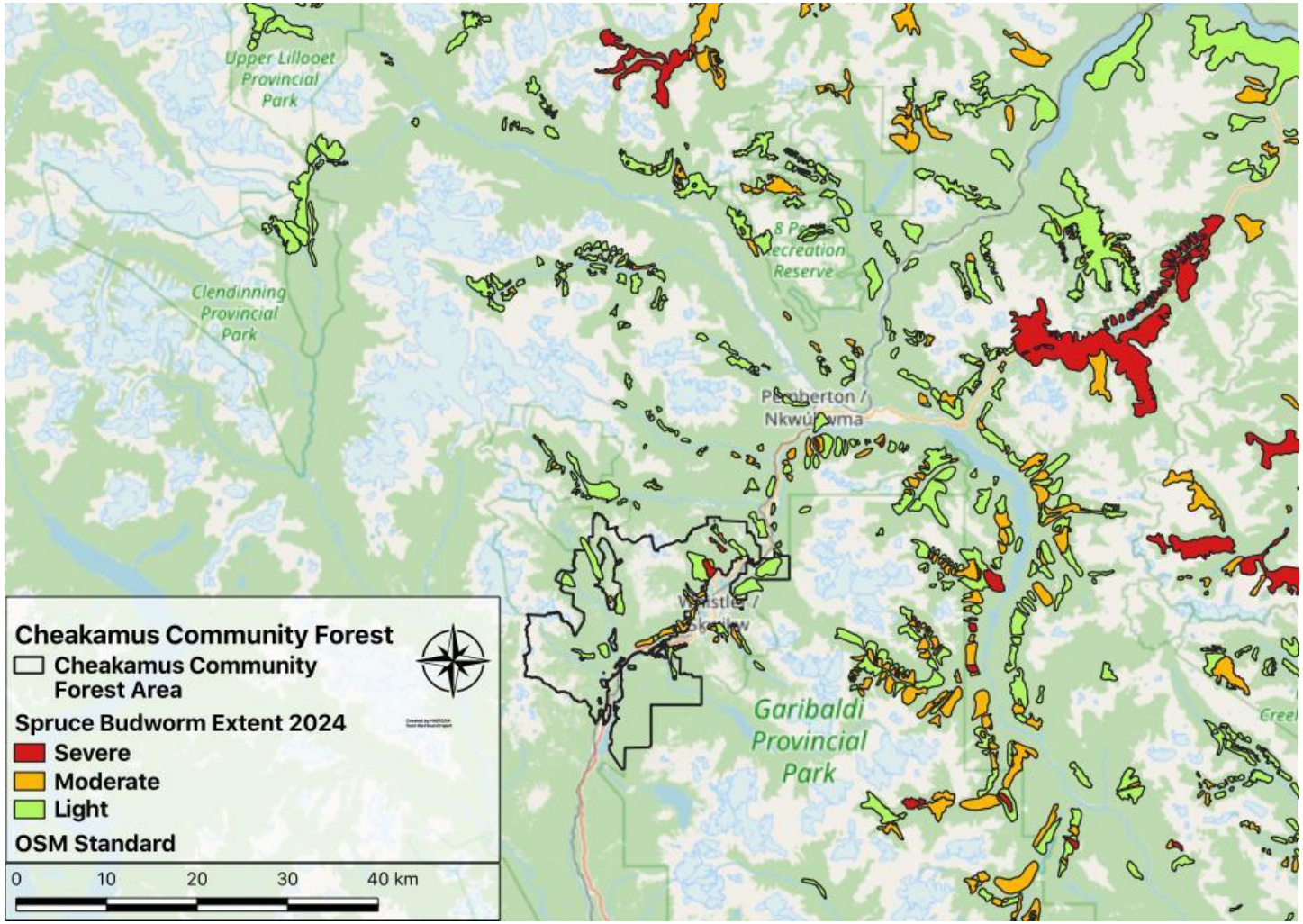
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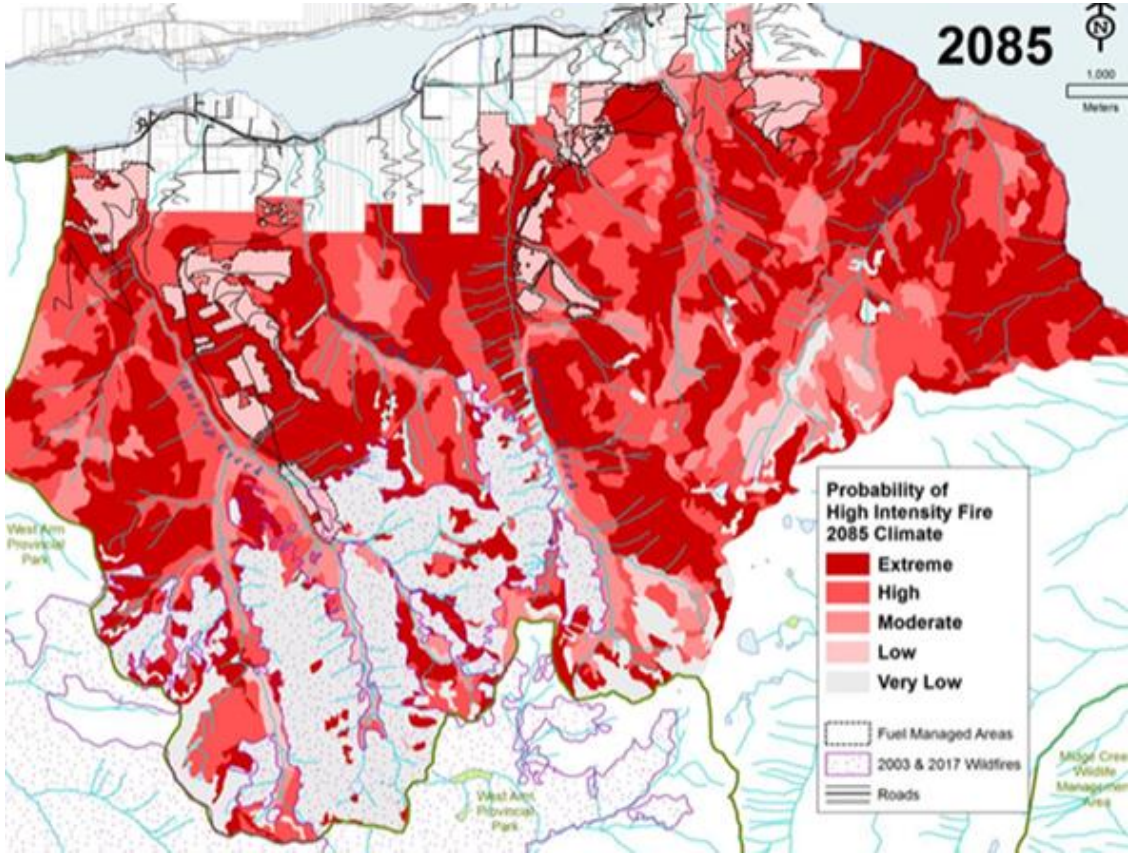
Complete Risk Assessment

- Estimated risk from top ranked climate impacts - gradient of threats and risks;
- A spatial database across the entire CCF - both of individual impacts but all risks combined.



Project Phase 2: Operations Strategy

Management Option Concepts:

Resistance: Maintain relatively unchanged conditions over time.

Resilience: Allow some change in current conditions, but encourage an eventual return to original conditions.

Transition: Actively facilitate change to encourage adaptive responses to changing and new conditions.

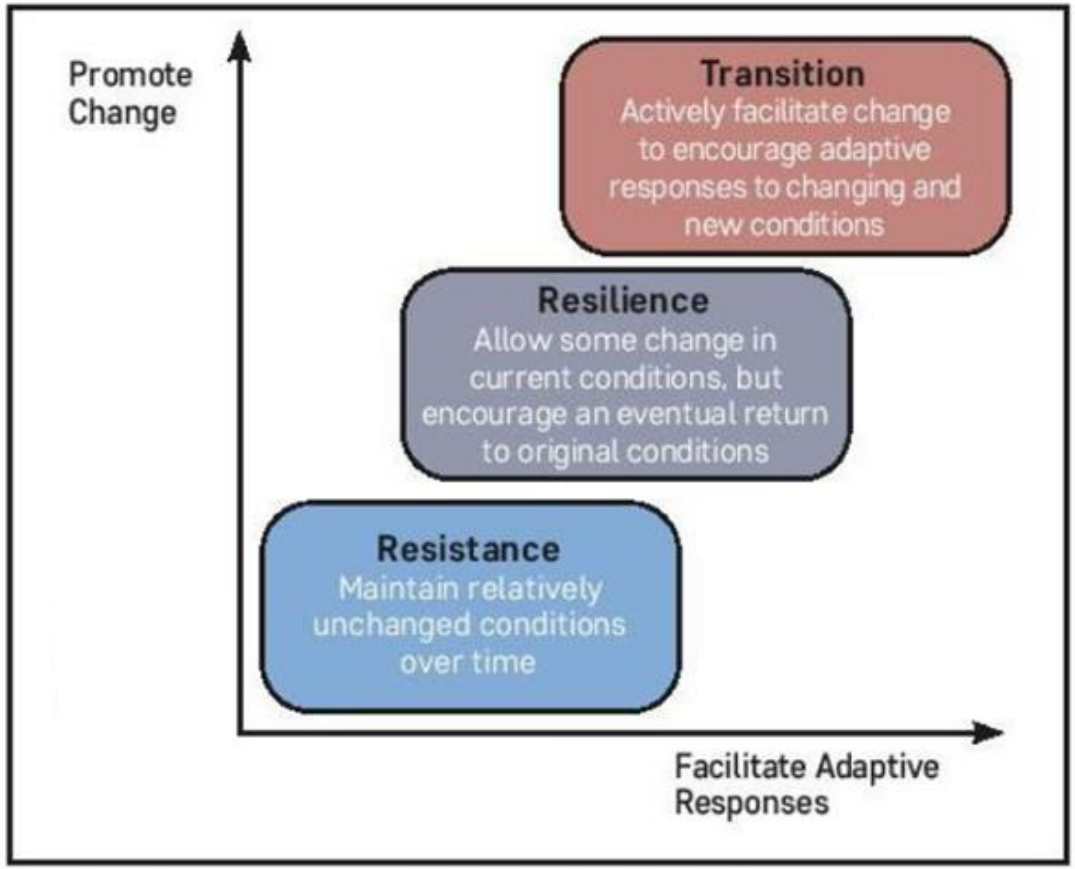


FIGURE 2. *Adaptation options, from Nagel et al 2017.*[7]

Resistance

Forests that are likely to withstand climate change

- Management would be minimal and more protection-focused.

Resilience

Middle ground of intervention - assumes these forests will be moderately or significantly impacted by climate change and would benefit from some management.

Resilience: Example #1

**Ladder fuel removal example*

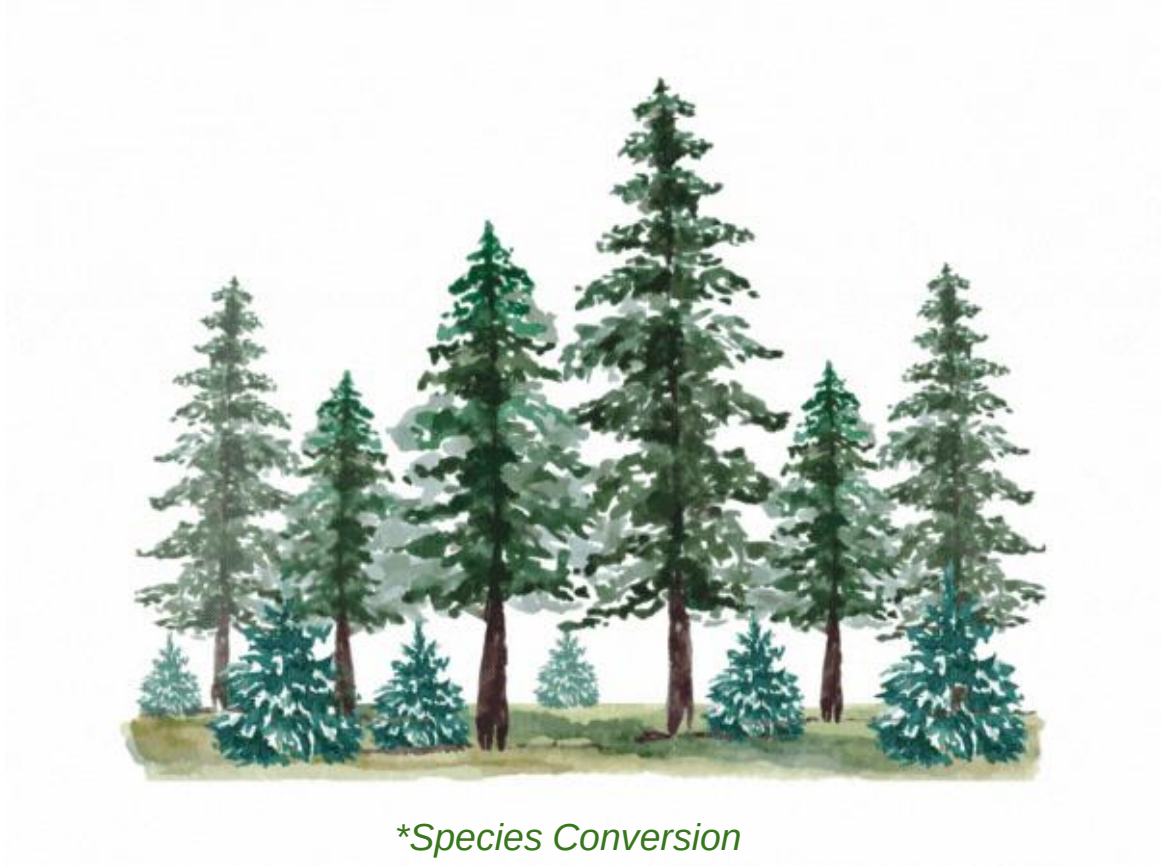
Resilience: Example #2

**Tree thinning with innovative reforestation*

Transition

These approaches anticipate future changes in the climate and facilitate the transformation of the current forest into a new forest type

Transition: Example



*Species Conversion

Climate Resilience Planning: Next Steps

- Develop a Phase 1 Forest Risk Assessment (March, 2025);
- Develop a Phase 2 Long-term Operational Strategy (end of year 2025);
- Monitoring program with adaptive management built in (2026+).

Thank you!

CHEAKAMUS COMMUNITY FOREST

Resort Municipality of WHISTLER

British Columbia Ministry of Forests

Western Spruce Budworm (WSB) Cheakamus Community Forest

Extent:

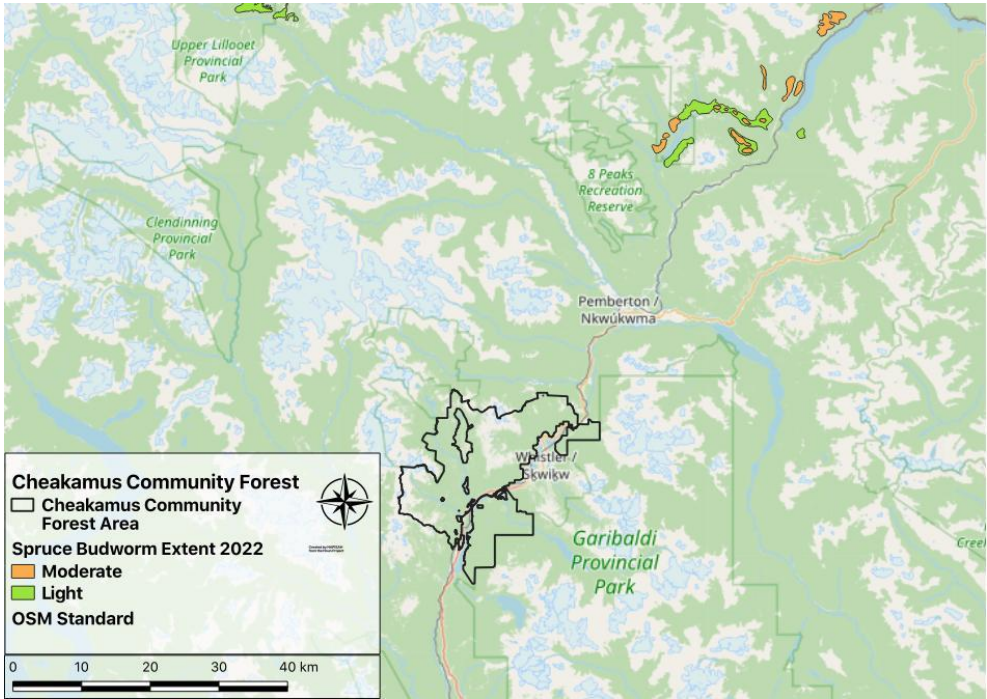
- No WSB seen south of Pemberton since 2009 and no serious outbreaks in the Whistler area since the 1970s

Management Options:

- Short term strategies for managing spruce budworm is primarily biological pesticide b.t.k. with high efficacy and low environmental impact
- Longer term strategies:
  - Increasing crown separation
  - Reducing stand age dynamics/ height structure
  - Increasing landscape age structure
  - Increasing species tree species diversity
  - Promoting stand health (fertilization)

Considerations:

- Western Spruce Budworm (WSB) outbreaks are known to last several years
- Climate can affect outbreak levels year on year due to synchronicity of WSB with Needle Flush.
- Other natural against WSB ineffective during outbreak conditions.



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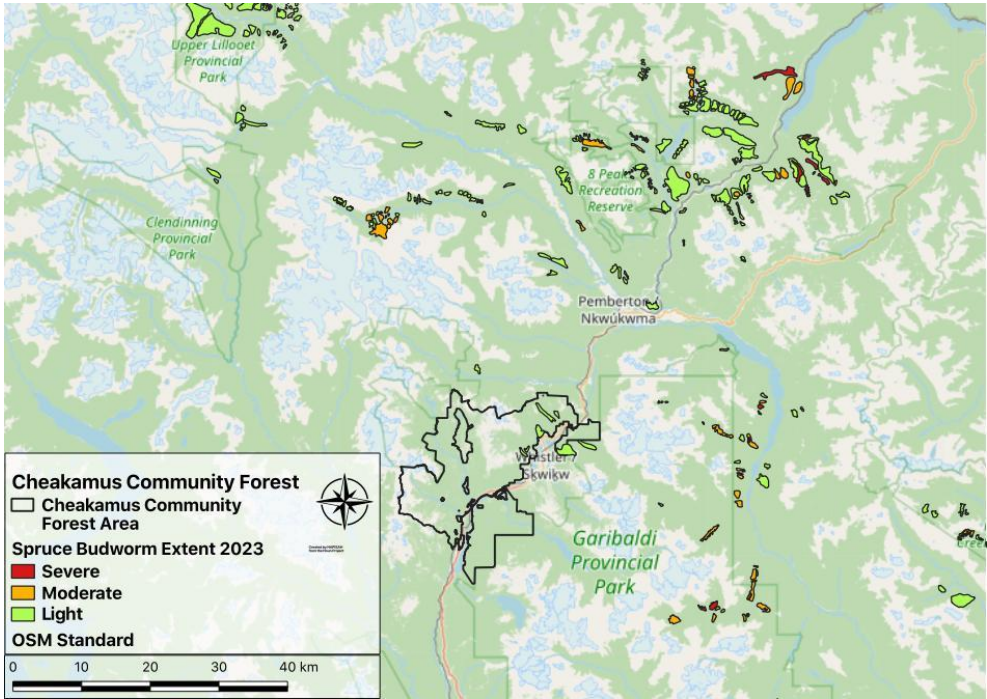

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