# Wildfire Risk Reduction on Crown Land – Chilliwack Natural Resource District

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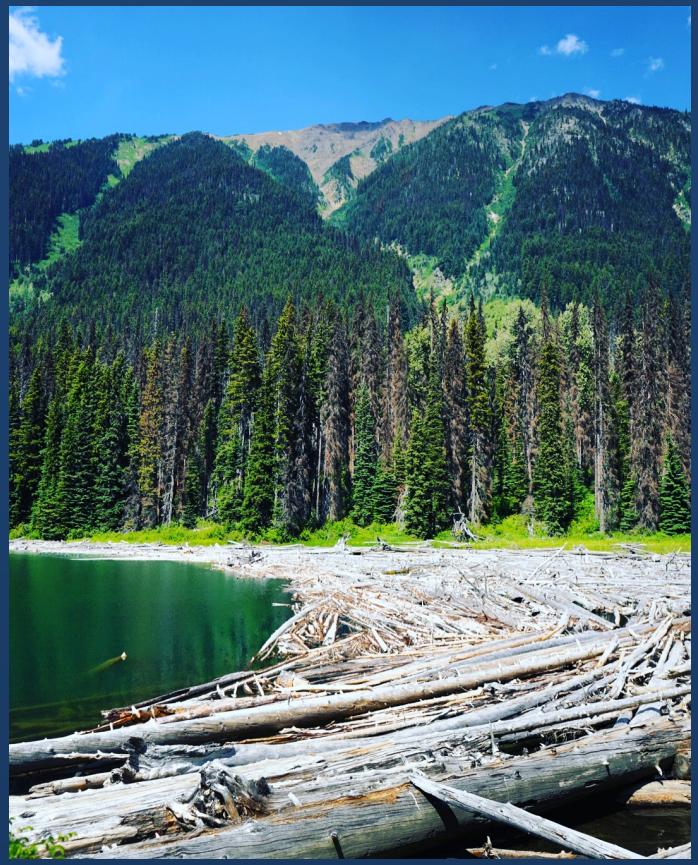
# Agenda

1. Wildfire Risk Reduction Principles

2. Crown Land WRR Program Context

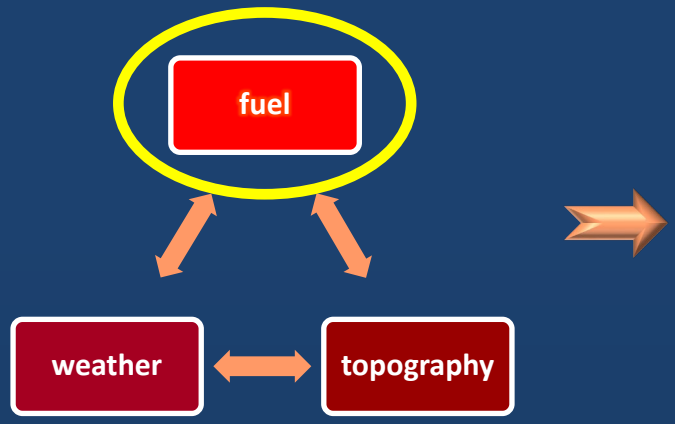
3. Fuel Management Tools

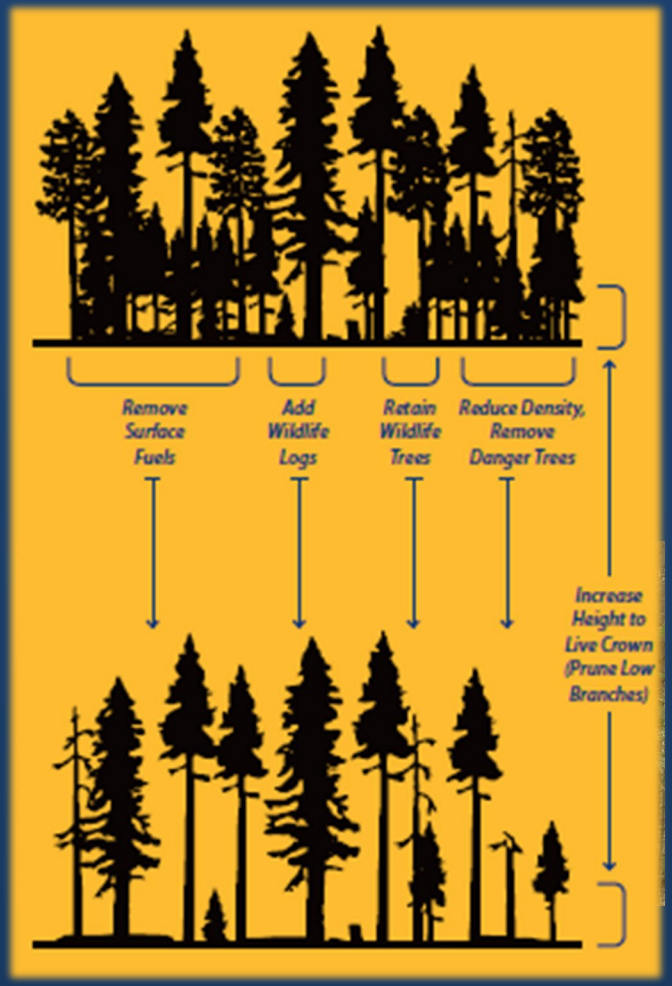
4. PSTA, WUI Risk Class Maps and WRR Polygons in the Chilliwack Natural Resource District



# Section 1: Wildfire Risk Reduction Principles

## Wildfire Risk Reduction = Fuel Management



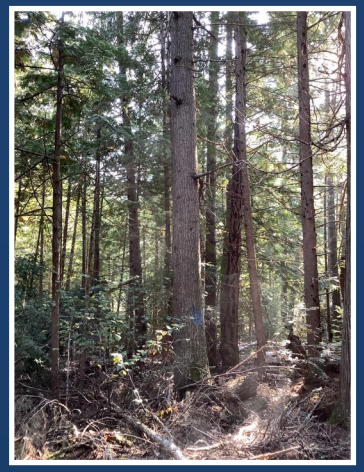




According to the 2017 BC Flood and Wildfire Review, since 2004 approximately 78,000 ha have been treated around BC communities, representing less than 10% of the 800,000 ha identified as moderate to high risk.

Source: BCWS

# Interface and Landscape-Level Fuel Modifications

**Untreated**



Rank 4/5

**Treated**

Rank 2/3

# Why We Conduct Fuel Management

## Multiple Goals:

1. **Protect public health and safety or values at risk**
2. **Fire behaviour reduction**
3. Ecosystem restoration
4. Improve forest health (i.e., treatment of pine beetle killed forests adjacent to communities etc.)
5. Generate revenue to offset costs of treatment (biomass utilization/commercial thinning etc.)

Squamish – Garibaldi Park Road Fuel Management 2020

# Context Informs Wildfire Risk Reduction

| What is Risk? | Who is Responsible? | Where Does $ Come From? |
| --- | --- | --- |
| Likelihood<br>+<br>Consequence | - BCWS?<br>- MFLNRORD?<br>- BC Parks?<br>- Communities?<br>- Licensees?<br>- Tenure holders? | - Where is the liability?<br>- Who benefits? |

# Section 2: Crown Land Wildfire Risk Reduction Context

## Community Resiliency Investment Program

- Operates under the mandate of the Community Resiliency Investment (CRI) program to:
  - reduce wildfire risk and increase community resiliency to wildfires across BC
- The CLWRR component of CRI supports fuel management (prescription development, operational implementation, prescribed burning) on provincial crown land (including BC Parks and Mountain Resorts Branch – Controlled Recreation Areas) for:
  - areas of higher wildfire risk,
  - located near communities; and
  - and critical infrastructure.
- Successful WRR outcomes require collaboration and coordination within joint operations as implementation of these funds will occur in partnership between BCWS, Resource Districts, BC Parks, BC Timber Sales and Mountain Resorts Branch.

# CLWRR 2020/22

## Program Criteria - Prioritization

- **Coarse Filter**
  - PSTA and WUI Risk Class
    - Prioritizing areas with high PSTA and WUI Risk Class 1-2
- **Medium Filter**
  - Fuel Management Projects
  - Critical Infrastructure Projects
  - Prescribed Fire Projects
- **Fine Filter**
  - Project objectives, rationale, threat rating, community resilience and cost effectiveness

# Section 3: Fuel Management Tools

## Tools for Fuel Management Page:

- ABCFP Interim Guidelines – Fire and Fuel Management: ABCFP Interim Guidelines – Fire and Fuel Management
- Wildfire Risk Reduction Planning Standard: 2021 FLNRORD Standard for Developing Tactical Plans for Wildfire Risk
- Fuel Management Prescription Guidance Document: 2020 Fuel Management Prescription Guidance
- Wildfire Risk Reduction Best Management Practices: Coast and Mountains & Georgia Depression Ecoprovinces

Best Management Practices for Fuel Management in the Coast and Mountains & Georgia Depression Ecoprovinces

BC Wildfire Service

Wildfire Risk Reduction

Best Management Practices for Fuel Management in the Coast and Mountains & Georgia Depression Ecoprovinces

ECOPROVINCE OVERVIEW

The Coast and Mountains (green) and Georgia Depression (orange) ecoprovinces encompass all of British Columbia's coast and east to the height of land of the Coast Mountains. Both ecoprovinces are in a temperate rainforest with long growing seasons and cover ground classified as natural disturbance types (NDT) 1 & 2.

In these NDTs, stand-initiating events are rare to infrequent; this can lead to large accumulations of biomass. In droughty conditions or certain stand structures, this can lead to a large amount of fuel available to support high intensity wildfires.

The predominant BEC zones here are Coastal Western Hemlock (CWH) and Coastal Douglas-fir (CDF). When host to mature stands, these ecosystems are typically best represented by C-5 (mature, closed canopy), or C-7 (open canopy) fuel types in the Canadian Forest Fire Behavior Prediction (FBP) System. These both are conifer dominated stands with a high (usually >12m) crown base height (CBH) (tree crowns separated from ground), sparse conifer understory, and sparse down woody fuels. Although stand characteristic may differ than these descriptors the burning characteristics tend to be the best match with the FBP fuel types.

FUEL MANAGEMENT OBJECTIVES

When mitigating wildfire threat, the main objective is to reduce the potential fire behaviour to a manageable level for wildfire suppression activities. In simple terms, modify the stand structure and surface fuel loading to reduce the probability of an active crown fire and significantly lessen the associated fire behaviour.

To change the fire behaviour in a forest stand, at least one of the components of the fire behaviour triangle must be altered; fuel, weather or topography. The only component that can be truly altered is the fuel complex. To begin this process, the structure of the forest stand is examined by stratifying 3 layers;

- Surface fuel – the location that fire is typically ignited and the flaming front is sustained,
- Ladder fuel – the bridge component of the fuel strata that also increases the fire intensity and helps deliver combustion to the crown fuel,
- Crown fuel – the aerial fuel component of a wildfire. This fuel can burn at a faster rate due to the exposure to the wind (more oxygen, and drier). The stratum is also responsible for a high percentage of the spotting potential of a wildfire (ember source).

Following a planning standard for WRR is imperative. Successful fuel treatments will create a forest stand with potential surface fire intensities less than the Critical Surface Intensity (CSI) threshold required to initiate crown fire. A baseline for this is <2,000 kW/m. The treatment objective of each stratum is outlined below:

**Surface fuel** - smaller diameter (<7cm) woody debris that can host an ignition and lead to initial fire spread should be reduced to a level to meet the fire intensity targets based on critical surface intensity. Large accumulations of coarse woody debris that can contribute to sustained high intensity burning should be removed.

**Ladder fuel** - ladder fuels that connect the surface fuels to the crown should be reduced by pruning lower branches and removing suppressed conifers and elevated dead fuels from beneath the canopy.

**Crown Fuel** – The thinning of this layer will reduce the crown bulk density (CBD), thus lowering the fire intensity of a wildfire that reaches the canopy. In dense stands in the Coast and Mountains or Georgia Depression, maintaining a high CBD comprised of dominant and/or co-dominant mature trees can be beneficial to maintaining relative humidity in the understory, reducing in-stand winds and slowing the regeneration of understory surface and ladder fuels.

*Left: this dense canopy can maintain favourable forest floor conditions such as fuel moisture and temperature beneficial for reducing crown fire initiation and may be acceptable in many situations in the Coast and Mountains and Georgia Depression.*

*Right: this thinned overstory represents the extent of overstory thinning that may be appropriate in some treatment areas*

# Other WRR Considerations

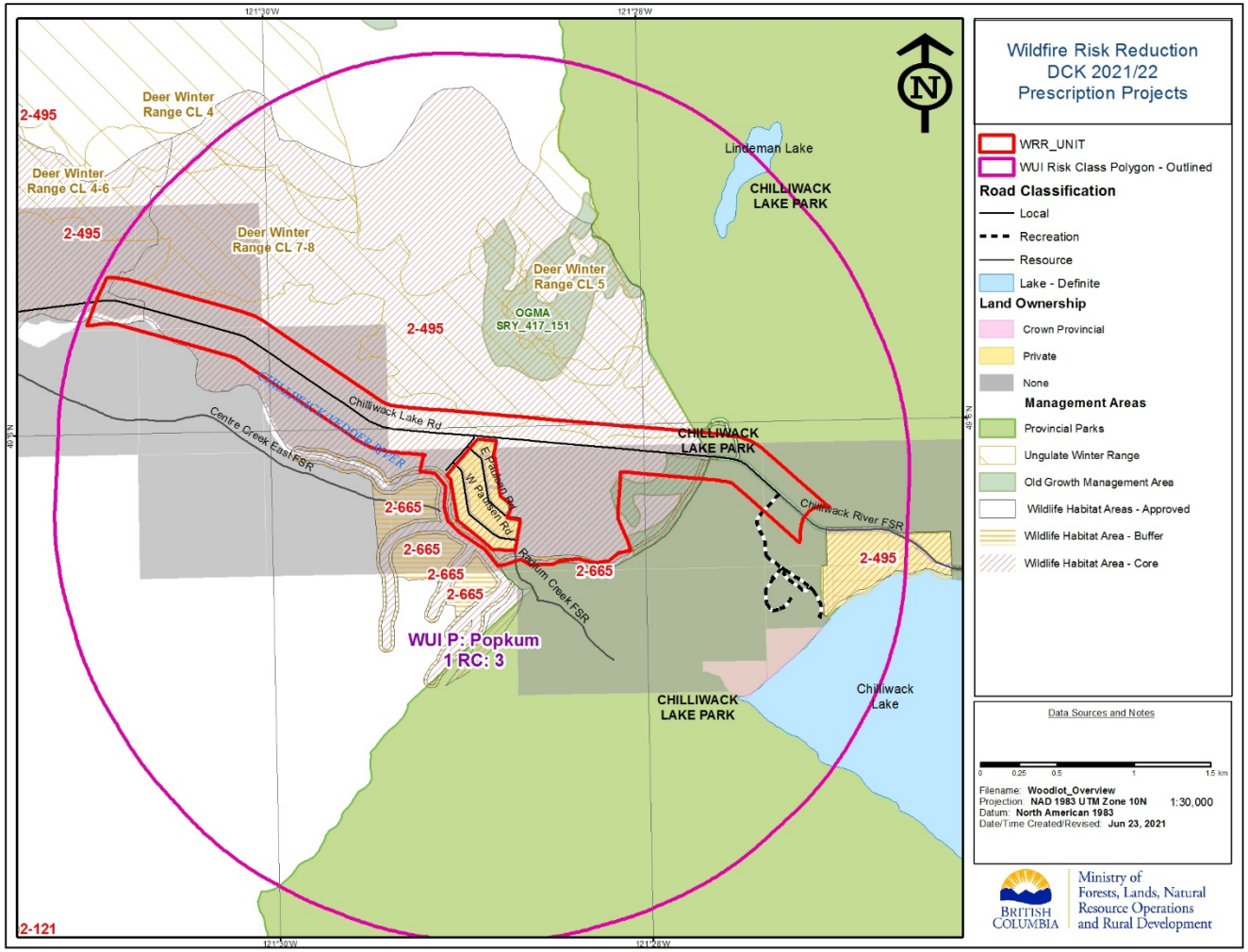
- Latest BCWS guidance: chipping and on-site dispersal is no longer a fundable activity under the CLWRR program
  - Alternative/desirable debris disposal methods:
    1. chip and remove (dispose off-site),
    2. chip and disperse only if treatment is immediately followed by prescribed burning;
    3. bin and remove (i.e., for fibre utilization/composting etc.)
    4. pile burning (OBSCR applies)

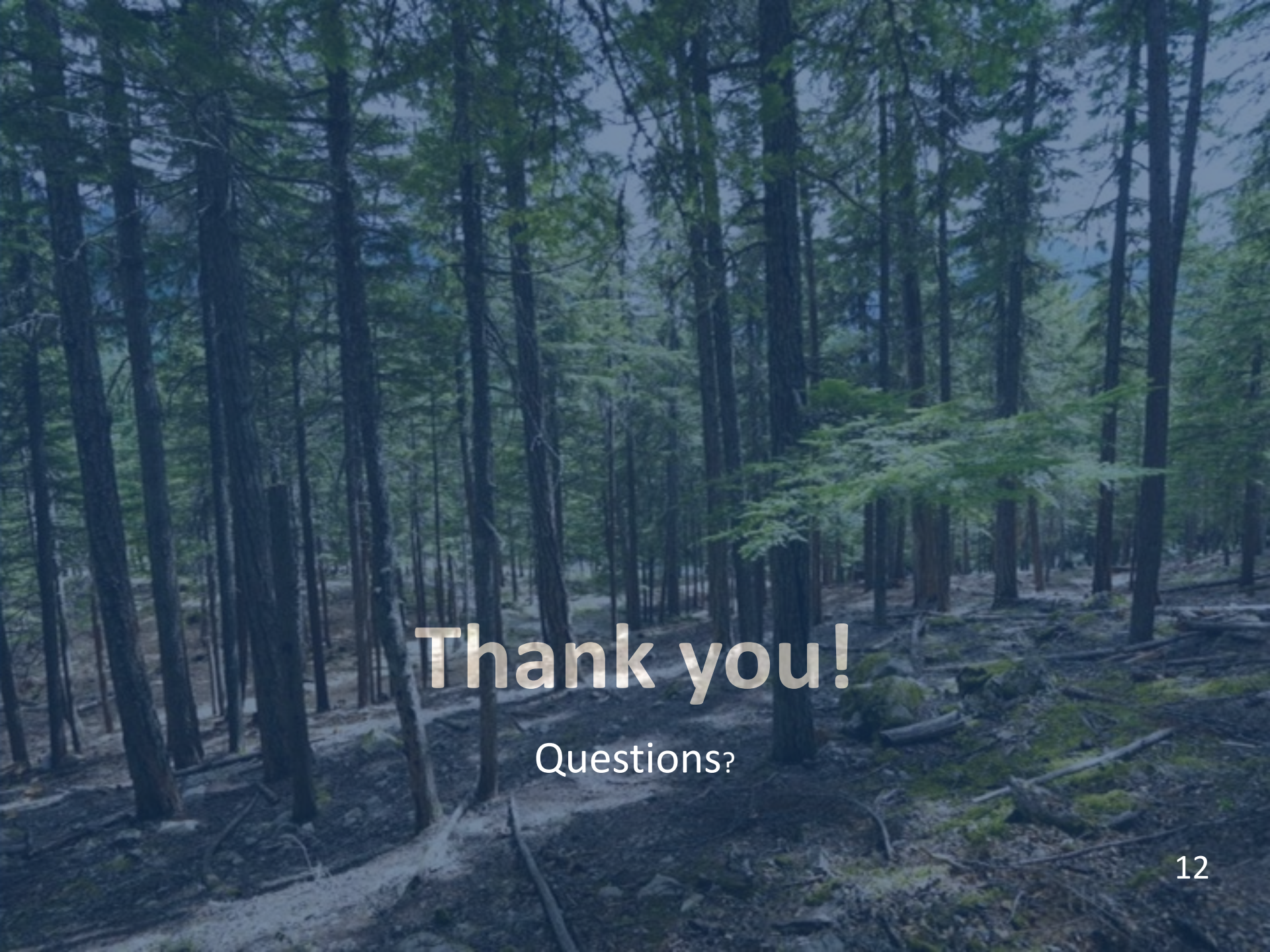
- BMPs for coastal ecosystems depend on BEC/NDT, but generally emphasize:
  - Thin from below, target sph will vary
  - Retain higher crown closure to maintain shade & moisture in the understorey and reduce in stand wind speeds
  - Prune to 3 m to reduce opportunity for a surface fire to ladder up into the overstorey
  - Reduce surface fuel loading and continuity (targeting fines <7 cm in diameter), accumulations of coarser debris and ideally retaining large CWD for biodiversity and ecological function
  - Fuels are more intensively treated closest to the value of concern(<2000kw/m)
  - Large CWD should be discontinuous and should represent a variety of decay classes, diameter classes and species
  - Retain valuable wildlife trees where present and safe

- Fire Management Stocking Standards should be considered in the interface

# Section 4: PSTA, WUI Risk Class Maps and WRR Polygons in the Chilliwack NRD

## WUI Risk Class Mapping




Thank you!
Questions?