Landscape & Community Scale
Wildfire Risk Reduction for
Whistler, BC

Wildfire & Climate Change Webinar Series
Fraser Basin Council
March 7, 2019
Nobody wants to be the next Fort McMurray...

What can we do to reduce wildfire risk in our communities?
Outline

• Background & Context

• Planning:
  ✓ Fire Behaviour Analysis
  ✓ Prescription Development

• RMOW Wildfire Program Components
  ✓ Fuel Thinning Operational Projects
  ✓ FireSmart Public Education & Support Program
  ✓ RMOW Policy: Wildfire DPA

• Planning & Next Steps
RMOW is approaching wildfire management from 3 angles:

- **Wildfire Fuel Thinning Reduction Projects**
  - Wildland Urban Interface (WUI) and Landscape level
- **FireSmart Program for private properties**
  - Public education and support
- **Policy Development**
  - Wildfire Development Permit Area
Wildland Urban Interface (WUI) Planning

• Community Wildfire Protection Plan (CWPP) program
  ✓ Aid communities in developing plans to assist in improving safety
  ✓ Reduce the risk of damage to property.

• Funding available – UBCM Community Resiliency Program

• RMOW community wildfire protection plans
  ✓ 2005 and updated in 2011
CWPPs identified main risk factors in wildland urban interface (WUI)

- Recommendations for:
  - Communication and education strategies
  - Structure protection
  - Emergency response
  - Vegetation management
Landscape Fire Behaviour Analysis

• Landscape scale fire behaviour modeling was completed in 2013 by B.A. Blackwell and Associates

• Purpose:
  ✓ Develop a decision-making tool to guide long-term landscape level wildfire management
  ✓ Identified:
    • Landscape level risks from extreme fire behaviour in hazardous fuels
    • Cost-effective and strategic fuel break locations
    • The impact of various combinations of natural fuel breaks and fuel type conversions on fire behaviour potential
Landscape Fire Behaviour Analysis Findings

- A fire greater than 200ha has the potential to significantly impact the RMOW by threatening homes, infrastructure and public safety.

- The study found that fires that burned through treated landscapes had significantly smaller perimeters than those that burned through untreated stands (modeled over a 24 hr burn period).
Fuel breaks and fuel type conversion areas were designed using the existing road network with consideration for wind direction and probability of ignition.
Goal: Fire-adapted community and fire-resilient ecosystems

• Fuel management prescriptions primary objectives:
  ✓ Reduce wildfire risk to the RMOW and protect wildlife, recreational, ecological and aesthetic values of the sites;
  ✓ Enhance fire suppression opportunities to protect property, infrastructure and adjacent values at risk; and
  ✓ Shift stands from high crown fire potential to low surface fire potential.
Fuel Management Prescription Development

- Stand level plot data collection and layout;
- Fuel type assessment and mapping;
- Identification of site level objectives (e.g. environmental, recreational, and cultural values);
- Data analysis and evaluation of constraints (i.e., range tenures, wildlife habitat, trapline licenses, timber licences, higher-level plans, etc.);
- Stakeholder, First Nations and public information sharing; and
- Prescription development informed by all of the above data.
Prescription Strategies

• Maximizing retention of dominant and co-dominant canopy trees to maintain a cool and moist understory microclimate, where appropriate;

• Thinning from below (i.e., remove suppressed and intermediate trees) to reduce the risk of extreme crown fire behaviour associated with high crown bulk density and fire laddering into crowns;

• Pruning of retained trees to increase crown base height and reduce ladder fuel continuity;

• Reduce fine surface fuels and flammable understory vegetation to reduce the risk and behaviour of surface fire;

• Retain and encourage live deciduous tree and shrub species with a high moisture content to reduce fire behaviour and provide wildlife habitat.
Projects completed

✓ ~100ha of interface fuel treatments completed.
Interface Wildfire Fuel Thinning Projects

Pre treatment

Post treatment
• **2019/20 Planned projects**
  
  ✓ ~61 ha currently under prescription (purple polygons)

  ✓ An additional 21 ha will be prescribed in 2019 (red polygons)

  ✓ Anchor sites to non-fuel features such as talus slopes
Wildfire Fuel Reduction Projects

• RMOW multi-year wildfire management strategy
  ✓ 2018 field reconnaissance of RMOW’s 300 m structure buffer (green polygons).
  ✓ ~260 ha were identified and prioritized for prescription development and operational implementation over the next 5-10 years.
Primary Fuel Break

- **Definition**: A distinct area outside a community (or other values at risk) of strategic size, shape and placement where modifications of forest fuels aid in the protection of the community and resources in the event of a wildfire.

- **Objective**:
  - Modify fire behaviour by reducing fire intensity and rate of spread.
  - Improved fire suppression options (aerial and ground)
Projects completed
  ✓ Callaghan Forest Service Road (~45 ha) – implementation 2014 – 2018 (purple)

Projects underway
  ✓ Cheakamus Lake Road (~115 ha) – implementation 2018 - 2020 (red)

Future projects
  ✓ 16 Mile Forest Service Road (green)
Landscape Fuel Reduction

Callaghan Valley – Linear Fuel Break
Landscape Fuel Reduction

Callaghan Valley – Linear Fuel Break – Aerial View
Landscape Fuel Reduction: Linear Shaded Fuel Break

Spring-Summer Program

Callaghan Valley – Linear Fuel Break – Ground View
Tenure - Stewardship Plan – Cutting Authority – Reporting Requirements

- Area based Community Forest tenure, subject to tabular rate cutting authority, assigned by a unique timber mark to track program costs and volumes.
- Accept all regular tenure obligations referral planning, road mgmt., AAC assignment, Waste depletion, and RESULTS reporting and stand monitoring.
- Apply our First Nation Partner Contract Policy

Method of Treatment:

- Combination of whole tree mechanical thinning and manual saw thinning (80/20 on 20.2 ha).
- **Mechanical Thinning** - feller buncher, grapple skidder, loader. Bunched whole trees brought to roadside.
- Roadside recovered fuels were “hot loaded” to RMOW composter <8km away
- Project divided into 3 separate cost phases:
  - 1) Thinning Phase
  - 2) Log Recovery Phase
  - 3) Fuel Disposal Phase
- **Manual Thinning** – primarily a diameter limit fall to waste, hand buck, pile and burned onsite.

Fuel Reduction Performance Standards:

- Tree Retention Ranges (Mechanical 350 + - 50) (Manual 550 + - 50)
- Ladder fuel pruning height >3m (on >75% of the retained stems)
- Post thinning forest floor fine fuel <7.5cm (<1kg/m3)
Costs of Treatments:

<table>
<thead>
<tr>
<th>Method</th>
<th>Per Ha</th>
<th>Log M3 /Ha</th>
<th>Estimated total M3 removed</th>
<th>Total Fuel Reduction (Green Kg)</th>
<th>Admin and Monitoring / Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical</td>
<td>$10,210</td>
<td>159.5</td>
<td>233.2</td>
<td>1,340,520</td>
<td>$1,022</td>
</tr>
<tr>
<td>Manual</td>
<td>$27,071</td>
<td>0</td>
<td>0</td>
<td>? Less ?</td>
<td>none</td>
</tr>
</tbody>
</table>

Principles applied:
- Higher tree retention levels on manual treatment to reduce costs, lower levels of tree retention on mechanical treatments to increase recovery and increase return to log
- Continuity and experience of machine operator and supervision
- “hot loading” of biomass and logs

Project Output:
- Mechanical Thinning Phase- Cost: $8,920/ha
- Log Recovery Phase- Returned: ($2,301/ha)
- Fuel Disposal Phase- Cost: $3,592/ha

Extent of the Fuel Reduction:
- 50% of the original stand volume was recovered from removal of 75% of the total trees
- The total Fuel/Biomass recovered was 1,334,520 kg or 1,489m3 over the 20.2 ha treatment area.
- And required additional efforts to manually gather, pile and burn 181,151 kg or 202m3 of fine forest fuels to meet the 1kg/m2 standard.
Fuel Reduction – Lessons Learned

Standardised Terminology:
- Landscape vs Interface vs Infrastructure Treatments
- Wildfire Reduction vs Fuel Reduction vs Fuel Modification

Burning vs Recovery:
- Least costs but not without issues
- Delays in project completion and final payments
- Timing of biomass supply and quality

Units of measure and reporting:
- Chips vs Hog vs Biomass
- Green Tonne, vs OD Tonne vs M3 vs Cubic Yards
- Residual stand density, species conversion

FPInnovations Reference Material: Best management practices for Integrated Harvest Operations in BC (Special Publication SP-531)
FireSmart Program

• Focus on private properties

• Priorities
  ✓ Public outreach
    • Highway signs
    • FireSmart Whistler brochure
    • Newspaper feature
    • RMOW Website
  ✓ FireSmart community chipper service
  ✓ Strata FireSmart work days
  ✓ Adopt-a-trail campaign
  ✓ Treating priority municipal land
    • adjacent to assessed private properties
    • WHA rental properties
Wildfire Development Permit Area

- New DPA in Official Community Plan
- [https://www.whistler.ca/ocp/wildfire-protection](https://www.whistler.ca/ocp/wildfire-protection)

- **High Risk Areas**
  - Coniferous vegetation within 10 m should maintain spacing of 3 m
  - Exterior building surfaces should be non-flammable

- **Moderate Risk Areas**
  - No coniferous vegetation within 1.5 m of principal buildings
  - Roof structures should be fire resistant

- **Wildland Areas**
  - Requires a FireSmart Assessment indicating low or moderate
Policy Development – Wildfire DPA
Next Steps

• Complete planning exercise with Blackwell & Associates
• Continue to partner with Cheakamus Community Forest on projects in its tenure
• Seek budget approval for increased resources for FireSmart crew
• Release 3 year Request for Proposal: Fuel Thinning
• Increase support for private homeowners to FireSmart their properties
Thank you.

Questions?