

Community Wildfire Resiliency Plan



Resort Municipality of Whistler

February 3, 2022

Submitted by:

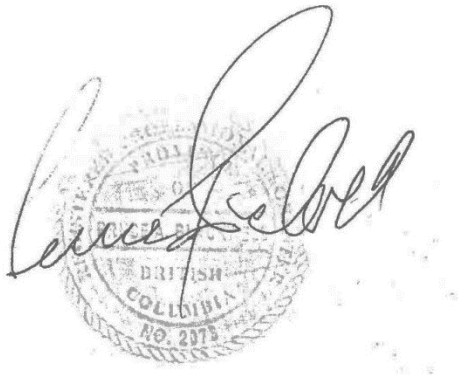
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The Resort Municipality of Whistler is grateful to be on the shared, unceded territory of the Lil'wat People and the Squamish People, known in their respective languages as Łíl'wat7úl and Sk̓wx̓wú7mesh. The municipality respects and commits to a deep consideration of their history, culture, stewardship and voice.

EXECUTIVE SUMMARY

The Community Wildfire Resiliency Plan (CWRP) is the latest evolution in community wildfire planning in British Columbia. A CWRP has its roots in the Community Wildfire Protection Plan (CWPP) framework, which was originally established in BC in response to the series of devastating wildfires in 2003. Since then, many communities in BC have continued to face an ever-increasing threat of wildfire, as the 2017, 2018, and 2021 fire seasons proved to be three of the most historically damaging seasons on record. CWRPs are currently being developed at many jurisdictional and geographic scales, and are individually tailored to address the needs of different communities in response to their size, their capacity, and the unique threats that they face. Despite these differences, the provincial goals of a CWRP remain the same and are founded in the seven FireSmart disciplines: Education, Community Planning, Development Considerations, Interagency Cooperation, FireSmart Training and Cross-Training, Emergency Planning and Vegetation Management.

This CWRP is an update to the Resort Municipality of Whistler's (RMOW) 2011 CWPP, which was predated by the municipality's first in 2005. The RMOW also developed a Wildfire Protection Strategy in 2017, which focused on resources and strategies to implement CWPP recommendations to date. Since the development of these plans, the RMOW has implemented a number of wildfire risk reduction recommendations and continues to exemplify proactive wildfire risk mitigation. The area of interest for this CWRP encompasses a 1-kilometer buffer surrounding Whistler's Urban Development Containment Area, which provides a narrower geographic scope than the previous two CWPPs. This CWRP will provide the RMOW with an updated action plan that can be used to guide their next steps forward to proactively protect the community, infrastructure, and natural landscape of the RMOW from a wildfire event.

To date, the RMOW has worked with forestry contractors and the Cheakamus Community Forest to treat approximately 300 hectares of their wildland-urban interface. The Mountain Resorts Branch has treated approximately 74 hectares to-date on Whistler Blackcomb. The RMOW has also dedicated staff to a comprehensive FireSmart Program that has allowed individual homeowners and neighbourhoods to proactively mitigate their risk to wildfire. The Program has also reduced fuel on portions of municipal land like the Valley Trail.

This CWRP will assess the RMOW's current wildfire risk and resiliency, and provide an action plan to help make the municipality more resilient to an ever-increasing threat of wildfire.

Thirty-two strategic recommendations tied to the seven FireSmart Canada Disciplines¹ are listed in Table 1. This CWRP will focus on the following strategies:

1. Educating residents and visitors to the RMOW about FireSmart principles and wildfire prevention, resulting in behavior change and action on properties.
2. Adapting legislation and community plans as they relate to wildfire preparedness in the RMOW
3. Increasing interagency cooperation within the RMOW and between external stakeholders, and integrating planning for all wildfire resiliency measures throughout the municipality.
4. Increasing cross-training between members of the Whistler Fire Rescue Service (WFRS), BC Wildfire Service (BCWS), RMOW staff, and external emergency management personnel.
5. Enhancing emergency preparedness within the municipality; focusing on major access/egress corridors and neighbourhood level protection.
6. Continuing strategic vegetation management efforts at the community level, while ensuring that multiple forest values continue to be managed for. These principles can be applied to address forest resiliency at the landscape level.

¹ Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Cross-Training, Emergency Planning and Vegetation Management

Table 1: The Resort Municipality of Whistler 2021 Community Wildfire Resiliency Plan

Item #	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding / Est. Cost
Education (Section 5.2)							
<i>Objective(s): 75% of Whistler residents aware of how to FireSmart their property, 50% of high-risk properties have applied FireSmart measures by 2030</i>							
1	Med	<p>Create a strategic communications plan that identifies key goals, objectives and metrics to educate RMOW residents and tourists on wildfire risk and general FireSmart principles.</p> <ul style="list-style-type: none"> - Keep the Whistler FireSmart website up to date; - Promote the FireSmart program via social media; - Continue to host FireSmart workshops; - Continue to present the FireSmart Education Box in local schools; - Continue distribution of the Whistler FireSmart brochure and FireSmart handouts (e.g., Home Owner's Manual, Landscaping Guide, many available as QR Codes); -Continue radio, signage, and in-person patrolling presence regarding wildfire risk and fire bans. 	<p>Public awareness of wildfire risk in Whistler is increasing. Risk is high on private property, and public FireSmart education is one of the best tools to mitigate it. Emergency management staff in the Sea-to-Sky have indicated that compliance with fire bans is low and fires are common in camping spots and along forestry roads.</p>	RMOW (CCF, WFRS, SLRD)	1 Year and Ongoing	<p>Achieve an annual increase with:</p> <ul style="list-style-type: none"> FireSmart Home & Neighbourhood Assessments FireSmart Recognized Neighbourhoods FireSmart Neighbourhood/Strata Work Days Community Chipper Days Adopt-A-Trail Work Days Delivery of KinderSmart, FireSmart Jr. Officer, FireSmart Ambassador & FireSmart Leader courses. <p>Annual investment in tourist education: social media, radio ads, CCF signage.</p> <p>Decrease in WFRS call-outs to campfires.</p>	<p>CRI: FireSmart materials</p> <p>Incremental staff costs</p> <p>Event costs. Signage and media updates.</p>
2	Med	<p>Communicate the steps that the RMOW is taking to mitigate wildfire risk within the municipality.</p> <ul style="list-style-type: none"> - Provide educational signage in historic and current fuel treatment areas (e.g., Lost Lake, Nesters, Cheakamus Road).; - Promote program activities and include maps and statistics on the RMOW website; 	<p>Public awareness increases acceptance and incites reciprocal action on private land.</p> <p>Public feedback informs the Whistler Wildfire/FireSmart Program.</p>	RMOW (WB/MRB)	<p>Post signage ASAP</p> <p>Provide ongoing information updates.</p>	<p>Feedback from fuel treatments feeds into the Whistler Monitoring Program and future fuel management prescriptions.</p> <p>Provide up-to-date information on the Preparedness page, and send broad-scale notifications</p>	<p>CRI: Signage.</p> <p>\$50-500 per sign</p> <p>Incremental staff costs</p>

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		<ul style="list-style-type: none"> - Consider distributing a semi-annual FireSmart newsletter; - Make the CWRP available online. 				of these efforts to the RMOW pre-fire season.	
3	High	Assess and retrofit municipal critical infrastructure (i.e., communications, power, water and sewer infrastructure) to FireSmart standards and provide educational signage. Track assessments, sites and work completed in a database linked to the RMOW GIS. (See Recommendation 8)	<p>Multiple pieces are built with non-FireSmart material and/or surrounded by hazardous vegetation.</p> <p>Displays real-life FireSmart demonstrations to the public and showcases the willingness of the RMOW to proactively protect municipal infrastructure. Many of these structures also double as pieces of critical infrastructure to be used in the event of a wildfire emergency.</p>	RMOW	Begin in 2022, continue to expand as required and/or as funding allows.	Secure funding for the retrofit and/or hazard mitigation of C.I. pieces.	CRI: FireSmart Activities for critical infrastructure (\$25,000 max)
4	Med	Establish and promote a FireSmart rebate program for residents (also see Recommendation 24) prioritized to high-risk neighbourhoods.	<p>Dozens of assessments are performed per year in the RMOW and the Home Partners Program is being integrated as of 2021. Assessments are the first step in a rebate program.</p> <p>Continue to encourage high-risk RMOW residents to have FireSmart Canada Home Partners Assessments completed and incentivize homeowners to perform recommendations from the assessment with (up to) a \$500 rebate, and/or an RMOW-led tree replacement program.</p> <p>Publish and distribute a publicly available FAQ regarding the rebate program.</p>	RMOW	Establish publicly in 2023, continue to expand as funding allows.	<p>Secure funding to be directly allocated to the FireSmart Rebate Program.</p> <p>Formally track the number of rebates applied for and awarded, and categorize by the type of rebate.</p>	CRI: Home Assessments & Rebate Program (50% rebate / homeowner, up to \$500)
5	Low	Work with local nurseries and landscape companies to highlight FireSmart preferred	Conifer vegetation on private properties is a big risk factor. Educating the public and the landscaping industry on aesthetic,	RMOW (Industry)	Engage: 2022 In Place:	Presence of FireSmart information in local garden centers.	CRI: Signage and Interagency Cooperation

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		<p>vegetation, as per the FireSmart Canada Landscaping Guide.</p> <ul style="list-style-type: none"> - Display and promote the Landscaping Guide; - Through the FireSmart BC Plant Tagging Program or internal avenues, display and promote the landscaping guide. Tag preferred and/or high-risk vegetation; investigate discounts on preferred vegetation. 	FireSmart alternatives may increase uptake.		2023	Considerations from local landscape companies and/or development groups regarding FireSmart landscaping.	
Community Planning (Section 5.3) 5.3)							
<i>Objective: Incorporating FireSmart guidance into the RMOW's community planning and policy frameworks.</i>							
6	High	<p>Stay up to date with local, provincial and federal funding sources that support wildfire risk reduction, emergency preparedness, and disaster mitigation work (e.g., Community Resiliency Investment (CRI) program, federal Disaster Mitigation and Adaptation Fund, Intact Fund etc.). Where possible, leverage multiple funding sources and engage with adjacent stakeholders (CCF, SLRD) and First Nations to approach mitigation projects collaboratively.</p>	<p>To fully implement the RMOW CWRP, provincial and federal funding sources are required in addition to municipal funds.</p> <p>Collaborative solutions are essential in areas where stakeholders and land managers overlap.</p>	RMOW (Consultant, CCF, DSQ, CRA/MRB, SLRD)	Annually	<p>Continued funding increases through local/provincial/federal avenues.</p> <p>Continued/expanded collaboration between multiple stakeholders (e.g., RMOW, CCF, DSQ, CRA) through planning and funding applications.</p>	CRI: Up to \$2,000 per meeting for participation in interagency FireSmart/wildfire committee
7	Low	<p>In 2026, initiate an update of this CWRP. The frequency of updates is highly dependent upon major changes which would impact local wildfire risk, or the rate at which wildfire risk reduction efforts are implemented. An evaluation of major changes (including funding program changes that may lead to new opportunities) and the potential need for a</p>	<p>A current (i.e., no more than 5 years old) CWRP is currently a requirement for further funding under the CRI Program.</p>	RMOW (Consultant)	5-6 Years	Ensuring the RMOW has an up-to-date CWRP and action plan.	CRI: \$25,000 (CWRP Update)

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		CWRP update should be initiated every 5 years.					
Development Considerations (5.4)							
<i>Objective: Providing for the resilience of new developments in the RMOW, through community land use and development-related plans and bylaws.</i>							
8	Med	Prepare a database linked to the RMOW GIS that includes the 2014 home assessments and tracks properties and municipal infrastructure that have implemented proactive wildfire protection initiatives including FireSmart thinning and rooftop sprinklers. (See Recommendation 3)	FireSmart work on private land is not comprehensively mapped or tracked in the RMOW.	RMOW	1 Year and Ongoing	Spatial database that can be easily shared and displayed on pdf maps	Internal
9	Med	Adopt a policy to ensure that property owners are notified of and taking actions to mitigate fire hazard on private land, especially on large undeveloped parcels with a high wildfire risk as identified by a professional assessment or judgement.	Municipalities have a duty to warn of hazards on private property. Warning private property owners of fire risk may accelerate action on private land. Review opportunity and prepare a policy and action plan to implement the Fire Chief's authority in the Fire and Life Safety Bylaw.	RMOW (Consultant)	1 Year	All large private land holdings with high hazard receive notification.	CRI: Development Consideration
10	Med	Consider reviewing and amending the Wildfire DPA guidelines to strengthen certain aspects, for example, rated shake roofing.	Current Wildfire DPA guidelines do not specify the standard to which shake roofs must be rated – for example, Class A or Class B under ASTM/UL standards. There are also concerns with the durability of fire retardant coatings.	RMOW	5 years	The Wildfire DPA is amended as required to improve community resilience to wildfire.	Internal
Interagency Cooperation (Section 5.5)							
<i>Objective: Seek the collaborative effort of multiple stakeholders within the RMOW to undertake wildfire risk reduction/resiliency tasks.</i>							
11	High	Reinstate the RMOW Wildfire Working Group as the Community Firesmart and Resiliency Committee (CFRC) and hold regular meetings. The internal RMOW committee could meet e.g. bi-monthly and include other groups as required. The CFRC should be chaired by the head of the	The RMOW WUI is a mix of municipal, private, Crown, and CCF forested land with multiple land managers in play. Planning fuel management and implementing CWRP actions, including seeking funding, will be facilitated by communication across all jurisdictions.	RMOW (CCF, WFRS, WB, BCWS, etc.)	1 Year and Ongoing	Participation by all parties. Tracking of CWRP actions and spatial database of all fuel management.	CRI: Up to \$2,000 per meeting for participation in interagency FireSmart/wildfire committee

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		Whistler Wildfire Program and integrate the CCF, WFRS, Whistler Blackcomb, BCWS, RMOW departments, and local First Nations as needed (see Table 22).	The purpose of the CFRC is to coordinate CWRP implementation and develop collaborative solutions.				
12	High	Through the RMOW CFRC and/or a separate planning table, continue to partner with the CCF to manage fuel on the landscape and integrate harvest planning with other fuel management tracking. Integrate resilience planning with planning for old growth, sensitive ecosystems, and other non-timber forest values.	The CCF comprises much of the RMOW WUI.	CCF RMOW (FWAC)	1 Year and Ongoing	CCF harvest planning integrated in RMOW fuel management mapping. A continued discussion and actions regarding landscape-level resilience planning.	CRI: Up to \$2,000 per meeting for participation in interagency FireSmart/wildfire committee
13	Med	Continue to participate in the SLRD CFRC to improve interagency efforts and Sea-to-Sky community connections.	Representative(s) from the RMOW should also sit on the SLRD CFRC.	SLRD (RMOW)	Ongoing	Continue attending SLRD meetings and developing cooperative solutions between communities.	CRI: Up to \$2,000 per meeting for participation in interagency FireSmart/wildfire committee
FireSmart Training & Cross-Training (5.6)							
<i>Objective: Further training relevant individuals in the RMOW to better understand wildfire disciplines and wildfire management planning objectives, to achieve a safe and effective wildfire response.</i>							
14	High	Continue and expand on cross-training between WFRS, BCWS and mutual aid partners. Crews: Host spring-time clinics to reintroduce WFRS/BCWS crews to each other's suppression equipment; identify and source solutions where incompatibilities may exist. Host mutual aid drills multiple times a year throughout fire season. Management: Hold meetings between potential incident command personnel,	In a wildfire event, structural crews may use BCWS equipment and vice-versa. Smoothing issues out and raising awareness for risk-reduction initiatives will provide for a more easily coordinated and effective wildfire response.	WFRS BCWS (RMOW)	Annually	Annual introduction of crews - showcasing proficiencies in setting up SPU's and assessing wildfire behaviour. Annual ICS/planning meetings.	CRI: Up to \$2,000 per interagency meeting

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		potentially through the RMOW CFRC to demonstrate where RMOW risk-reduction measures have been implemented, including but not limited to fuel treatments and secondary access roads.					
15	Med	Continue to expand internal wildfire-specific training in the WFRS. Work toward having all career and paid-on-call members of the WFRS being certified in the SPP-WFF1, SPP-115, S-190 (Fire Behavior) and S-215. Work towards having all career members of the WFRS being certified as Strike Team Leaders, Task Force Leaders and/or Engine Bosses.	The majority of WFRS has SPP-WFF1 (Wildland Firefighter Level 1). WFF-1 and S-231 (Engine Boss) is required for a BCWS deployment which can provide staff with valuable experience.	WFRS (BCWS)	Ongoing	Tracking certification of WFRS personnel and ensuring retention of wildfire-trained members.	CRI: SPP-WFF1
16	Low	Continue to expand FireSmart training and certification among RMOW staff and engaged residents. Continue hosting and/or funding attendance for the FireSmart BC Conference.	More Local FireSmart Representatives (LFR) and Home Partners Wildfire Mitigation Specialists (WMS) increases capacity for FireSmart Assessments, Neighbourhood Champion Workshops and Neighbourhood Recognition Program.	RMOW WFRS	Ongoing	Tracking certification of WFRS/RMOW personnel.	CRI: LFR training, Pro. Development to Increase Capacity for FireSmart Activities, FireSmart BC Conference.
Emergency Planning (5.7)							
<i>Objective: Preparing the RMOW to holistically respond to a wildfire emergency and/or the threat of wildfire.</i>							
17	High	Initiate a roof-top sprinkler program for residential properties. Investigate bulk orders from wildfire protection or irrigation companies. Priority should be given to high-risk neighbourhoods that are lacking in perimeter fuel management treatments.	Pre-installed rooftop sprinklers reduce the time and resources needed to set up a structural protection system in a neighbourhood threatened by a wildfire. Sprinkler installation can be paired with a free FireSmart Assessment. Consider including as part of an incentive program for high priority homes.	RMOW WFRS	1 Year and Ongoing	Establish an efficient and effective system. Track the number and location of sprinklers purchased and installed annually	Sprinklers \$40 - \$100 each 2 hours per installation/assessment
18	Med	Pre-plan emergency community water delivery systems to connect major natural water sources with interface	Whistler has five large lakes (Alta, Nita, Alpha, Green, Lost) to draw from in the event of a wildfire. Shuttling or pumping	WFRS (RMOW)	1-2 Years	Assess community water delivery (municipal and natural) for each	CRI: Assessment of Community Water Delivery

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		neighbourhoods, to facilitate deployment of a structural protection system.	water from these lakes to fill bladders may be planned in advance, including tender access points, traffic control, permanent large-volume pumps and piping.			neighbourhood. Develop and test neighbourhood specific plans.	Ability - incremental staff hours or contract cost
19	Med	Evaluate whether current WFRS wildfire/structure protection equipment is adequate to protect an entire interface neighbourhood (e.g., up to 100 homes) during a wildfire event	Provincial resources and resources from other fire departments may be limited during the fire season. The more internal capacity WFRS has, the better.	WFRS	1-2 Years	Inventory of structure protection equipment	CRI: Structure Protection Inventory - incremental staff hours or contract cost
20	Med	Assess and mitigate wildfire hazard along primary neighbourhood access routes, Alta Lake Road, and the Highway 99 corridor, including all highway exits. Thin ('daylight') to increase public safety during a potential evacuation.	Evacuation of the municipality may take over 12 hours (Sea to Sky Multimodal Evacuation Plan 2019). Action may be limited on private land, so threat should be reduced where possible.	RMOW (Consultant)	1-5 Years	Primary access routes are thinned to decrease wildfire risk	CRI: Fuel Management
21	Med	Assess secondary first-responder vehicle access throughout RMOW neighbourhoods, categorizing access features by the type of vehicle appropriate for the road/trail. Upgrade and thin ('daylight') as required to serve WFRS 4x4 vehicles and provide a safe point to anchor suppression efforts to.	Work within RMOW CFRC, integrating existing OCP (Schedule E2, Recreation Trails Plan), WFRS, and CCF mapping (2018 Road-Based Access Management Plan).	RMOW (CCF) (WFRS)	5 Years	Comprehensive map with CCF, WFRS input. Existing secondary egress routes are upgraded and thinned for WFRS	CRI: Fuel Management, Interagency Cooperation
22	Low	Undergo road upgrades and/or thinning projects along the Flank trail and Green Lake Loop to provide safe and reliable vehicle access for fire crews and potential anchoring lines.	The Flank Trail and Green Lake Loop are old roads that have grown over to singletrack in many places. The Flank Trail is the only access to the hillside above Alta Lake (northwest); Green Lake Loop is the only access on the hillside behind Green Lake (southeast). Roads could be gated to maintain recreational nature of trails.	RMOW (CCF) (WFRS)	10 years	Assessments complete by 2025. Access improved on priority routes	CRI: Fuel Management, Interagency Cooperation
23	Low	Develop a post-fire rehabilitation plan for RMOW forested areas and for the Cheakamus Community Forest.	Under the Wildfire Act, MFLNRORD is only responsible for rehabilitation related to fire suppression – i.e., fire guards. Although	RMOW, CCF, WB	10 years	A post-fire rehabilitation plan is developed with costed	Internal: \$15,000

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			provincial funds may be allocated to assist licensees with post-fire reforestation, a post-fire rehabilitation plan will help the RMOW prepare to assess fire impacts and mitigate any potential hazards related to slope stability etc., both on municipal land and in the CCF.			actions; contingency budget is allocated	
Vegetation Management (Section 5.8)							
<i>Objective: Continue to remove hazardous vegetation and create resilient forests within the community, at the forest interface, and at the landscape level.</i>							
24	High	Create a strategic FireSmart plan and incentive program focusing on sequentially treating high priority neighbourhoods or zones.	Currently the RMOW treats private properties as they approach the FireSmart team but the program needs to be delivered strategically in areas of highest risk. Review the 2014 FireSmart Assessment, identify neighbourhoods with most at risk homes and create a prioritized timeline for mitigation in those neighbourhood zones. Link to WUI thinning and develop an incentive program to support homeowners.	RMOW	1 Year and Ongoing	Increase in FireSmart work on private land in a prioritized, strategic manner.	Internal funding; fuel management work ~\$35,000/hectare
25	High	Continue to implement the high-priority interface treatment areas that are already covered by fuel management prescriptions (see Table 30) and plan/implement a maintenance program for areas treated in the past.	Prescriptions have already been developed and approved for these areas; they are high-risk interface areas.	RMOW (Consultant)	1-3 Years	Successful completion of individual treatment areas.	CRI: Fuel Management, internal funding ~\$35,000/hectare
26	High	Continue to implement pre-identified fuel break treatment areas to provide strategic low-hazard anchor points throughout the RMOW and CCF, and prescribe additional areas for treatment to expand these areas (see Recommendation #26 and subject to outcomes of Recommendation #29).	Wedge: Continued harvesting and/or fuel management treatments through the CCF and Sea-to-Sky District. 16 Mile: Prescription to be finalized and treatment-ready in 2022.	CCF (RMOW) (Consultant)	Completed as soon as logistics and funding allow.	Successful completion of individual treatment areas and approved FMPs.	CRI WRR program ~\$20,000/hectare

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27	Med	Continue to develop fuel management prescriptions for high-priority polygons, accounting for multiple ecological values in addition to risk reduction, subject to outcomes of Recommendation #29 (see Recommendation #26, Table 31 & Map 9)	These areas have been identified in the CWRP; they are high priority interface areas that look to protect immediate neighbourhoods, watersheds, and provide for landscape resiliency.	RMOW Consultant	3-6 years	Approved FMPs ready to be implemented	~\$400/hectare for a ~20 ha unit
28	Low	Explore local markets and/or design home-grown solutions to biomass utilization (e.g., combined heat and power) in order to make local fuel management projects more affordable and appealing.	Biomass utilization will bring down the cost per hectare of fuel treatments, enabling RMOW and the CCF to complete more area annually, and help RMOW meet sustainability targets.	RMOW, CCF (SLRD, DOS, VoP)	Ongoing	Non-merchantable or small volumes of wood have a viable market other than the RMOW composter	Internal
29	High	Conduct trials and undertake research including incorporation of Traditional Ecological Knowledge to test the assumptions that underpin the wildfire thinning rationale. Collaborate with researchers where possible (e.g., UBC Tree Ring Lab).	There is a lack of research in coastal forests on the effects of fuel reduction in an actual fire scenario and the effects on broader ecological values. Emerging research is indicating that current approaches may need some modification for coastal forests in the face of climate change.	RMOW	1 Year and Ongoing	Evidence from trials and research indicates that modelling assumptions regarding the outcomes of fuel thinning are accurate	Internal; \$20,000 annually for monitoring plan implementation
30	High	Conduct analysis to determine the return on investment for investing in fuel reduction thinning, the FireSmart program, or alternatives and develop a strategic plan identifying where to spend funds.	Fuel reduction thinning is very costly. Understanding the levels of protection provided by it, alternative methods such as green fire breaks, and through the FireSmart program will help the RMOW determine where to spend limited resources between fuel management and FireSmart	RMOW FireSmart Coordinator WFRS	1 Year	Strategic plan identifying expenditures in fuel thinning, alternatives and FireSmart program to provide maximum protection to the RMOW	Internal
31	High	Ensure prescription templates more explicitly incorporate consideration of other forest and natural area values.	Wildfire fuel reduction must minimize negative effects on other forest values such as species at risk habitat, riparian area values, old growth trees and enhance forest resiliency to climate change.	RMOW (Consultant)	Ongoing	Ensure acceptance of fuel management prescriptions by all relevant user groups.	Internal

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32	Med	Develop standards for fuel treatments in riparian areas that meet the provincial Riparian Area Protection Regulation.	More requests are being made to thin in riparian areas. The preference would be to avoid thinning in riparian areas but if necessary, the RMOW requires clear guidance on how it can be done while meeting RAPR.	RMOW	2 Year	Have a standard developed regarding fuel treatments in riparian areas.	Internal

TABLE OF CONTENTS

Registered Professional Sign and Seal	i
Acknowledgements.....	ii
Executive Summary.....	iii
Table of Contents.....	xv
List of Tables	xvii
List of Figures	xviii
List of Maps.....	xx
Frequently Used Acronyms.....	xxi
SECTION 1: Introduction	1
1.1 Plan Purpose and Goals	2
1.2 CWRP Development Summary	2
SECTION 2: Relationship to Other Plans and Legislation	4
2.1 Local Authority Emergency Plan	4
2.2 Linkages to Other CWPPs/CWRPs.....	5
2.3 Official Community Plan	7
2.4 Local Bylaws	10
2.5 Other Local Plans	11
2.6 Linkages to Higher Level Plans and Legislation.....	13
SECTION 3: Community Description	14
Territory Acknowledgement.....	15
3.1 Area of Interest and Wildland-Urban Interface	16
3.2 Values at Risk	18
3.2.1 Emergency Response, Public Services, Electrical & Communications	18
3.2.2 Water and Sewage	19
3.2.3 Cultural Values	25
3.2.4 High Environmental Values & Other Resource values.....	25
SECTION 4: Wildfire Risk Assessment	27
4.1 Wildfire Environment.....	27
4.1.1 Topography	28
4.1.2 Fuel.....	29

4.1.3	Weather	33
4.2	Wildfire History	37
4.3	Provincial Strategic Threat Analysis	40
4.4	Local Wildfire Threat Assessment	43
SECTION 5: FireSmart Principles		47
5.1	Neighbourhood Overview.....	52
5.2	Education	58
5.3	Community Planning.....	62
5.4	Development Considerations	64
5.5	Interagency Cooperation	69
5.6	FireSmart Training & Cross-Training	73
5.7	Emergency Planning.....	76
5.8	Vegetation Management.....	83
5.8.1	Residential FireSmart Vegetation Managmeent.....	84
5.8.2	Landscape Vegetation Management	86
5.8.3	Vegetation Management Summary.....	95
SECTION 6: Appendices.....		i
6.1	Appendix A: Review of CWPP Recommendations	i
6.2	Appendix B: Local Wildfire Risk Process	i
6.2.1	Appendix B-1: Fire Risk Threat Assessment Methodology	i
6.2.2	Appendix B-2: Proximity of Fuel to the Community	iii
6.3	Appendix C: Wildfire Risk Assessment – FBP Fuel Type Change Rationale	i
6.4	Appendix D: Wildfire Risk Assessment – Worksheets and Photos	ii
6.5	Appendix E: Maps	iii
6.6	Appendix F: WUI Threat Plot Locations	iv
6.7	Appendix G: Fuel Typing Methodology and Limitations.....	v
6.8	Appendix H: Fire Risk Threat Assessment Methodology	vi

LIST OF TABLES

Table 1: The Resort Municipality of Whistler 2021 Community Wildfire Resiliency Plan	v
Table 2: Paraphrased goals, objectives and policies from the RMOW's Official Community Plan with direct implications to emergency and wildfire management.	7
Table 3: Summary of RMOW Bylaws with direct implications to wildfire and emergency management..	10
Table 4: Summary of other Local Plans relating to the CWRP, often paired with informal suggestions for the various user groups and/or plans to consider with respect to wildfire resilience.	11
Table 5: Higher Level Plans and Relevant Legislation	13
Table 6: Various growth and economic statistics from the RMOW	14
Table 7: Summary of land ownership within the RMOW Area of Interest	16
Table 8: Summary list of Critical Infrastructure pieces within the AOI.....	20
Table 9: Slope percentage within the AOI (exclusive of major waterbodies) and fire behaviour implications.	28
Table 10: Slope Position of Value and Fire Behaviour Implications.....	29
Table 11: Representative fuel-types/forest-types within the RMOW.....	30
Table 12: BEC zones, subzones and variants within the AOI. (Photo at right: Historic fire photo [estimated 1940's], looking north from Rainbow Lodge towards what is now the Alpine neighbourhood)	33
Table 13: Recent wildfires in the CWHms1/NDT2. (Photo at left: Boulder fire west of Pemberton in 2015)	33
Table 14: Fire threat ratings as per the 2021 Provincial Strategic Threat Analysis dataset.	41
Table 15: Wildfire threat class summary across the AOI.	44
Table 16: WUI threat class ratings	45
Table 17: FireSmart activities funded through the 2021 UBCM CRI program and their level of implementation in the AOI.	48
Table 18: Assessment of FireSmart vulnerabilities and potential mitigation measures by neighbourhood within the RMOW AOI.	53
Table 19. FireSmart Education recommendations in the RMOW	59
Table 20. Community Planning Recommendations for the RMOW	63
Table 21. Development Consideration recommendations for the RMOW	67
Table 22: Recommended members of the RMOW's Community FireSmart Resiliency Committee (CFRC)	70
Table 23. Interagency Cooperation recommendations for the RMOW	71
Table 24. FireSmart Training and Cross-Training recommendations for the RMOW	74
Table 25: Example of a Wildfire Response Preparedness Condition Guide	77
Table 26: WFRS firefighting resources, and key mutual aid resources relevant to wildfire response.	78
Table 27. Emergency Planning recommendations in the RMOW.....	79
Table 28. Details on the three main initiatives of the Whistler FireSmart Program	84
Table 29. Residential FireSmart Vegetation Management recommendations	85
Table 30. Landscape Vegetation Management recommendations	89

Table 31: Summary of Proposed Treatment Units that are recommended to have fuel management prescriptions developed.	92
Table 32. Fuel Type Categories and Crown Fire Spot Potential. Only summaries of fuel types encountered within the WUI are provided (as such, other fuel types, i.e., C-1, C-2, C-4, S-2, and S-3 are not summarized below).	i
Table 33. Proximity to the Interface.	iii
Table 34. Summary of WUI Threat Assessment Worksheets.	iv
Table 35. Description of variables used in spatial analysis for WUI wildfire risk assessment.	vii

LIST OF FIGURES

Figure 1: View from Whistler Creekside looking south toward the Tantalus Range (left), with the same view covered by wildfire smoke in 2015 (right). (Photo credit: Summit Lodge online blog, 10 Photos of Whistler Before and During the Wildfire Smoke).	1
Figure 2: Key focal points and stages of progression for the development of the RMOW CWRP.	3
Figure 3: Cover pages of the RMOW's Hazard, Risk & Vulnerability Assessment (HRVA), Comprehensive Emergency Management Plan (CEMP), and the Sea-to-Sky Multimodal Evacuation Plan.....	4
Figure 4: Cover page of the 2005 CWPP.	5
Figure 5: Inside the Squamish-Lil'wat Cultural Center in Whistler (Photo Credit: Tourism Whistler). Above: Logos of the Lil'wat Nation and Squamish Nation.	15
Figure 6: Left; 21 Mile Creek pumphouse and treatment station on Alta Lake Road with poor vegetation setbacks. Right: Taluswood pumphouse roofed in cedar shakes.	19
Figure 7: Adapted from the 2020 RMOW OCP. The Community Vision shows the importance of nature to the community.	26
Figure 8: Framework to understanding wildfire risk. Adapted from "Wildfire Risk to Communities - USFS".	27
Figure 9: Graphic display of the fire behaviour triangle, and a subset of characteristics within each component.	27
Figure 10. Average number of danger class days during the core fire season for the Cheakamus weather station. Presents a smaller sample size than Callaghan but in a more representative location (595m) for the developed portion of the RMOW.	35
Figure 11. : Average number of danger class days during the core fire season for the Callaghan weather station. Presents a longer-term average than Cheakamus but in a less comparable location (869m elevation).	35
Figure 12 Frequency of wind counts by direction for Whistler (714m). (Source: Meteoblue weather)	36
Figure 13: Structure fire from January 2021 at a construction site on Sunridge Drive in Whistler, with potential to spread into the surrounding interface. (Photo credit: Whistler Fire Fighters IAFF Local #3944, from https://globalnews.ca/news/7581052/whistler-large-fire/)	37
Figure 14. RMOW FireSmart Program graphic	47
Figure 15: The RMOW's FireSmart brochure - detailing the risk of wildfire in Whistler, and various preventative measures for homeowners.	51

Figure 16: View of Alpha Lake looking north up the valley. Photo credit: Whistler Content Hub, Destination BC/ Heath Moffatt.	52
Figure 17: Results from community engagement polling from the RMOW's 2020 OCP.....	58
Figure 18: Areas in red and orange are included In the RMOW Wildfire Protection Development Permit Area.....	65
Figure 19: Cross-training exercise between structural and wildland departments	73
Figure 20: Potential pre-incident planning considerations that the WFRS/RMOW can review and discuss pre-fire season.	76
Figure 21: Overview of fuel management basics and initiatives throughout the RMOW in the Home, Community, and Landscape Zones.	83
Figure 22: Pre- and post-treatment examples from the Nesters operational fuel treatment in the spring/summer of 2021.	86
Figure 23: Generalized relationship between proactive fuel management activities (left) and the resulting burn severity (Red: very high, Orange: high, Yellow: medium) from a small portion of the Kenow wildfire in 2017. No structures within the townsite were destroyed by the fire.	96
Figure 24: Difficulties, issues, and potential remedies for vegetation management programs in the RMOW.	97

LIST OF MAPS

Map 1: Area of Interest for the RMOW CWRP showing an overview of different land ownership types throughout the municipality.....	17
Map 2: Critical Infrastructure within the AOI, as recognized by RMOW staff.....	24
Map 3: Fuel types present within the AOI, displaying field points for fuel type changes and verifications.	32
Map 4: Distribution of Biogeoclimatic (BEC) zones throughout the AOI.....	34
Map 5: Distribution of historic wildfires within the AOI. Fire perimeters greater than 1.0ha since 1920 are displayed along with reported point ignitions between 1950 and 2019.....	39
Map 6: Fire threat map of the AOI. Source: Provincial Strategic Threat Analysis data.	42
Map 7: Local fire behaviour	46
Map 8: Overview of completed fuel treatments within the RMOW, and areas where treatment is currently ongoing and/or where a completed prescription exists.....	87
Map 9: Proposed treatment units (PTUs) for future fuel management within the CWRP AOI.....	91

FREQUENTLY USED ACRONYMS

AOI	Area of Interest
BC	British Columbia
BCWS	British Columbia Wildfire Service
BEC	Biogeoclimatic Ecosystem Classification
CCF	Cheakamus Community Forest
CEMP	Comprehensive Emergency Management Plan
CFFDRS	Canadian Forest Fire Danger Rating System
CFRC	Community FireSmart Resiliency Committee
CI	Critical infrastructure
CRA	Controlled Recreation Area
CRI	Community Resiliency Investment
CWPP	Community Wildfire Protection Plan
CWRP	Community Wildfire Resiliency Plan
DP	Development Permit
DPA	Development Permit Area
DSQ	District of Squamish
EMBC	Emergency Management British Columbia
FBP	Fire Behavior Prediction System
FSCNRP	FireSmart Canada Neighbourhood Recognition Program
HRVA	Hazard Risk and Vulnerability Analysis
LRMP	Land and Resource Management Plan
MFLNRORD	Ministry of Forests, Lands, Natural Resource Operations and Rural Development
MOTI	Ministry of Transportation and Infrastructure
PSTA	Provincial Strategic Threat Assessment
OCP	Official Community Plan
SLRD	Squamish-Lillooet Regional District
UBCM	Union of British Columbia Municipalities
WFRS	Whistler Fire Rescue Service
WRR	Wildfire Risk Reduction
WUDCA	Whistler Urban Development Containment Area
WUI	Wildland Urban Interface
WWG	Whistler Wildfire Group

SECTION 1: INTRODUCTION

In 2021, B.A. Blackwell and Associates Ltd. (Blackwell) was retained to assist the Resort Municipality of Whistler (RMOW) in developing a Community Wildfire Resiliency Plan (CWRP). This CWRP is an evolution of the 2011 and 2005 Community Wildfire Protection Plans (CWPP) that were developed for the municipality. It will assess the successes and challenges that the RMOW has realized in implementing recommendations from the previous two plans, and pave the road ahead for a proactive approach towards protecting and promoting the resiliency of Whistler.

Wildfire disasters continue to be experienced across British Columbia and throughout the Pacific Northwest. Recent wildfires burning in the Nahatlatch and Elaho valleys demonstrated the potential for large and severe wildfires even on the coast, and the 2021 wildfire season was a reminder of the devastating effects that these wildfires can have on communities and the economy of entire regions. On top of this, leading experts are projecting lengthier fire seasons and more severe fire behaviour in the years to come. This threat combines with important advances in loss prevention programs to spur the need for greater consideration and due diligence with respect to reducing fire risk in the wildland-urban interface (WUI). CWRPs are an invaluable opportunity to proactively manage wildfire risk and increase community resilience to wildfire.



Figure 1: View from Whistler Creekside looking south toward the Tantalus Range (left), with the same view covered by wildfire smoke in 2015 (right). (Photo credit: Summit Lodge online blog, [10 Photos of Whistler Before and During the Wildfire Smoke](#)).

1.1 PLAN PURPOSE AND GOALS

The purpose of this CWRP is to provide a tailored suite of recommendations to the RMOW to guide effective wildfire risk reduction planning for a minimum of the next five years. Using this CWRP as a framework, the RMOW can prioritize decisions in order to:

- 1) Increase the efficacy of fire suppression and emergency response,
- 2) Reduce potential impacts and losses to property and critical infrastructure from wildfire, and
- 3) Reduce wildfire behavior threat within the community.

To help guide and accomplish the above strategies, this CWRP will provide the RMOW with:

- 1) An assessment of wildfire risk to the community,
- 2) An assessment of values at risk and potential consequences from wildfire,
- 3) Maps of fuel types and recommended areas for fuel treatments,
- 4) An assessment of emergency response capacity, and
- 5) Options and strategies to reduce wildfire risk in seven FireSmart disciplines: education, legislation and planning, development considerations, interagency cooperation, cross-training, emergency planning, and vegetation management.

This CWRP was funded internally through the RMOW, and completed with guidance from the Community Resiliency Investment (CRI) FireSmart Community Funding and Supports (FCFS) Program. The 2021 CRI template for CWRPs was used as a basic document outline.

1.2 CWRP DEVELOPMENT SUMMARY

The area of interest for this CWRP is the wildland-urban interface (WUI) of the RMOW. The WUI is traditionally understood as the zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. For the purpose of a CWRP, the WUI is defined as a one-kilometer buffer around the Whistler Urban Development Containment Area (WUDCA). Map 1 in Section 3.1 shows the RMOW WUI.

The CWRP process consists of five general phases:

- 1) Consultation and information sharing with local government and stakeholders
- 2) Review of relevant plans and legislation regarding emergency response and wildfire (SECTION 2:)
- 3) Community description and identification of values at risk (SECTION 3:)
- 4) Assessment of the local wildfire risk including field assessment (SECTION 4:)
- 5) Analysis and action plan for each of the seven FireSmart disciplines including identification of future fuel treatment areas (SECTION 5:)

Figure 2 illustrates a summary of actions taken during each of the five key development phases for this CWRP.

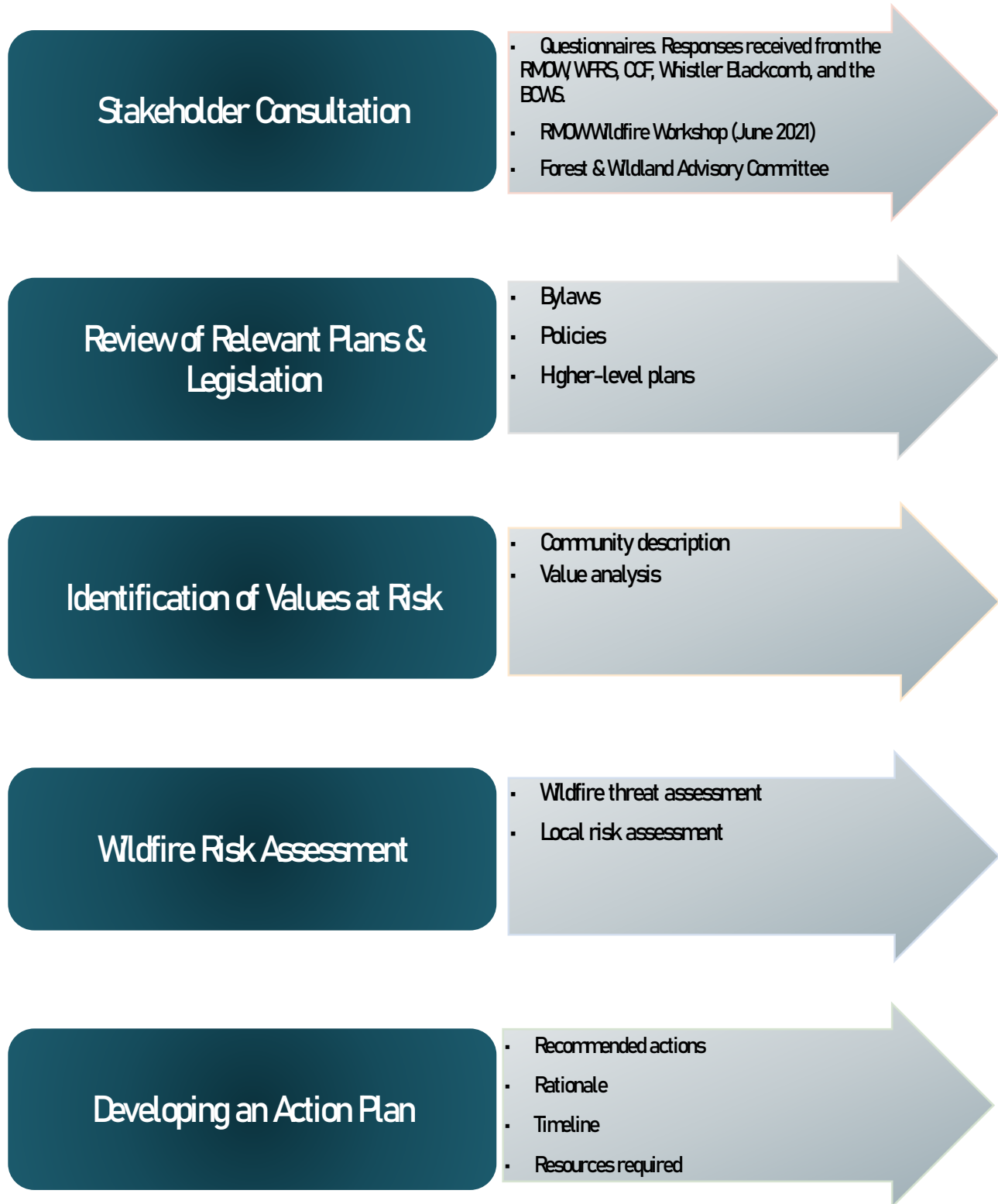


Figure 2: Key focal points and stages of progression for the development of the RMOW CWRP.

SECTION 2: RELATIONSHIP TO OTHER PLANS AND LEGISLATION

This section reviews local and provincial plans and legislation that are relevant to wildfire resiliency in the RMOW.

2.1 LOCAL AUTHORITY EMERGENCY PLAN

The RMOW has partnered with neighboring jurisdictions to develop a number of official plans related to emergency situations. While the RMOW is exposed to a number of potential natural hazards, it is well-recognized that an interface fire is the most threatening to the community, and in a worst-case scenario would require a mass evacuation of the entire community. In response to the 2012 Hazard, Risk & Vulnerability Assessment Report developed for the RMOW, the municipality developed a Comprehensive Emergency Management Plan² (CEMP, 2015) to guide emergency response. The CEMP outlines Incident Command Post (ICP) locations, Emergency Operations Center (EOC) organization and locations, resource requests, partnerships with the BCWS, recovery efforts post-emergency, and much more. Due to the CEMP's completeness and the unpredictability and complexity of wildfire emergencies, further details of the CEMP will not be discussed in this CWRP.

The RMOW partnered with the District of Squamish (DOS) to fund the Sea to Sky Multimodal Evacuation Plan (2019)³ in order to assess the potential reality of a mass evacuation event for the Sea-to-Sky corridor. This plan identifies current challenges with an evacuation scenario, and allows the RMOW to proactively develop solutions to mitigate these challenges. Recommendations made in this CWRP will reference key takeaways of the evacuation plan.

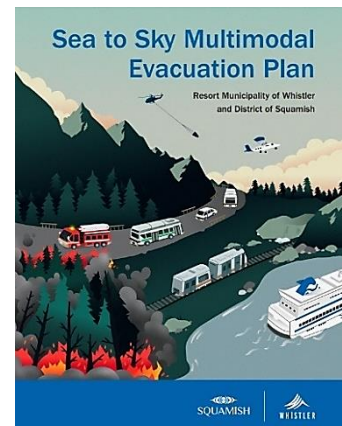
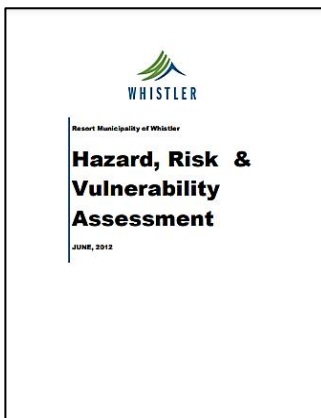


Figure 3: Cover pages of the RMOW's Hazard, Risk & Vulnerability Assessment (HRVA), Comprehensive Emergency Management Plan (CEMP), and the Sea-to-Sky Multimodal Evacuation Plan.

²RMOW Comprehensive Emergency Management Plan, RMOW, (2015):

https://www.whistler.ca/sites/default/files/related/comprehensive_emergency_management_plan_digital.pdf

³ Sea to Sky Multimodal Evacuation Plan, RMOW, DOS, ISL Engineering & Land Services, 2019:

<https://whistlercreative.ca/wp-content/uploads/2020/07/RMOW-EvacuationPlan.pdf>

2.2 LINKAGES TO OTHER CWPPS/CWRPS

2005 Community Wildfire Protection Plan

The 2005 CWPP (B.A. Blackwell & Associates) performed a risk assessment within the entire boundary of the RMOW to demonstrate the probability and potential consequence of a wildfire event in and around the municipality. The 2005 CWPP focused on the following issues, which continue to be themes in this 2021 CWRP.

1. **Access Management:** addressing issues with emergency access/egress for neighbourhoods with strict one way in and out
2. **Engagement & Education:** developing more robust communications with respect to wildfire risk and prevention
3. **Building Codes & Bylaws:** addressing pre-existing risks with residential, commercial and municipal buildings, and incorporating FireSmart principles in these regulations
4. **Fire Department Training:** continuing to expand wildfire response training within the WFRS and looking at equipment deficiencies
5. **Emergency Response**
6. **Fuel Management:** developing a network of landscape-level fuel breaks and a thinning program around trail networks and interface areas
7. **Post-Fire Rehabilitation:** needing to develop a seeding, slope stabilization, and infrastructure protection rehabilitation plan

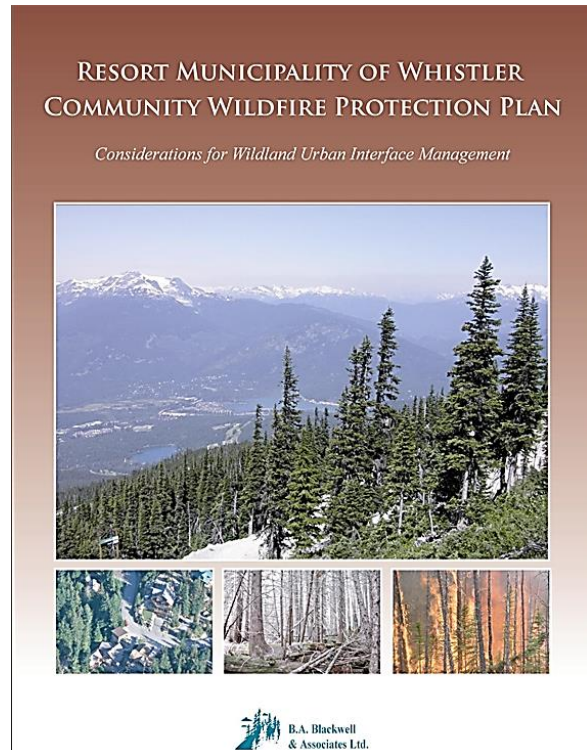


Figure 4: Cover page of the 2005 CWPP.

2005 CWPP recommendations formed the foundation of community wildfire planning in the RMOW. A number of these recommendations have been addressed since 2005. See 6.1 A for a complete list.

2011 Community Wildfire Protection Plan

A 2011 CWPP Update was produced to address significant development within the RMOW. The 2011 CWPP assessed the entire municipality, and included the interface area around the new Wedgewoods development, which falls within Electoral Area C of the Squamish-Lillooet Regional District. A more comprehensive risk analysis was completed in this plan, which reinforced the high risk of a wildfire to the RMOW as a result of surrounding forest types, topography, climate, and the intermixed nature of many neighbourhoods. In response to this ever-present risk and a growing probability of fire, the 2011 plan focused on a need to manage for the following issues in addition to the 2005 recommendations:

1. Communication & Education: Expanding this program and distributing physical FireSmart materials to residents and developers.
2. Structure Protection: Needing to develop a wildfire-specific development permit area (DPA).
3. Emergency Response
4. Fuel Management: Expanding the thinning program surrounding the community and in the Cheakamus Community Forest (CCF) and establishing a monitoring regime for treated areas.

Responses to recommendations from the 2005 CWPP, as well as additional recommendations from this 2011 update are detailed in Appendix A: Review of CWPP Recommendations

2021 Squamish-Lillooet Regional District (SLRD) CWRP

In 2021 the SLRD updated their CWRP for both Electoral Area C and D, which abut the RMOW. Representatives from the RMOW participated in the SLRD Community FireSmart Resiliency Committee (CFRC). The SLRD intends to hold ongoing CFRC meetings for future collaboration and interjurisdictional planning.

2.3 OFFICIAL COMMUNITY PLAN

The RMOW's Official Community Plan⁴ (OCP) has many goals and objectives that are directly relevant to wildfire risk. Adopted in 2020, this OCP establishes policies that guide community planning and land use management. The RMOW aims to continue protecting the natural lands surrounding Whistler by continuing to fund fuel management and public education. Objectives and policies from the OCP that are directly relevant to the CWRP are summarized in Table 2 below. The RMOW's Community Vision forms a foundational piece for this CWRP.

Table 2: Paraphrased goals, objectives and policies from the RMOW's Official Community Plan with direct implications to emergency and wildfire management.⁵

Goal; Objective; Policy;	Description and Relationship to the CWRP
<ul style="list-style-type: none"> Policy 4.1.1.3(k) 	<ul style="list-style-type: none"> Within the WUDCA, recognize the need for WRR measures within and adjacent to developed areas that may require tree removal, tree thinning and landscape alterations. <p>CWRP: Paves the way for fuel management and FireSmart initiatives.</p>
Objective 4.1.5 <ul style="list-style-type: none"> Policy .1, .3, .4, .5 	Objective: Protect human safety and property from natural hazards <ul style="list-style-type: none"> Proactively implement initiatives for effective prevention of wildfires and structure fires including Whistler's CWPP and CEMP. <p>CWRP: Outlines potential requirements for wildfire hazard assessments and FireSmart considerations for rezoning, development, and subdivision development – detailed in depth in the wildfire protection DPA.</p>
<ul style="list-style-type: none"> Policy 4.1.6.4 (a, b, d) 	<ul style="list-style-type: none"> Proposed developments must be serviceable by fire protection services, accessible via the local road system, and evaluated to assess the impacts on wildfire hazard.
<ul style="list-style-type: none"> Policy 5.5.2.12 	<ul style="list-style-type: none"> Requires visitor accommodations developments to meet municipal wildfire mitigation guidelines.
<ul style="list-style-type: none"> Policy 4.1.1.3 Policy 5.6.2.3 Policy 5.6.7.6 Multiple DPAs 	<ul style="list-style-type: none"> Requires the preservation of a 20m wide vegetation buffer along the Highway 99 corridor, to protect and enhance visual quality. <p>CWRP: May conflict with the recommendation to mitigate wildfire risk along the Highway 99 corridor. Consult with Planning Department and focus on ladder fuel, not overstorey reduction. Revisited in Table 27 and Table 31 (Highway Egress).</p>
Goal 7.2 Objective 7.2.1 <ul style="list-style-type: none"> Policies .1 through .6 	<p>Goal: Proactively manage natural areas to be resilient to climate change.</p> Objective: Ensure municipal wildfire management programs reduce risk to natural areas and private properties. <ul style="list-style-type: none"> Update the CWPP and related wildfire plans periodically and implement the recommendations. Reduce wildfire risk in the WUI areas. Partner with provincial agencies and Whistler Blackcomb regarding wildfire fuel management and evacuation planning. Support residents in reducing wildfire risk on private property in alignment with FireSmart Canada guidelines and consistent with other municipal priorities. Develop landscape level fuel breaks to provide defensible space to fight wildfires.

⁴ Whistler's Vision and Official Community Plan, RMOW, 2020: <https://www.whistler.ca/ocp>

⁵ This table is being used to show relevance of the OCP to the CWRP, and includes paraphrased information. The OCP itself should be referenced for legally binding language regarding goals, objectives, policies and DPAs.

Goal; Objective; Policy;	Description and Relationship to the CWRP
	<ul style="list-style-type: none"> Continue to seek provincial support and funding from Whistler's wildfire management programs. <p>CWRP: Details multiple high-level initiatives spurred and funded since the 2005/2011 CWPPs, that are being carried forward and expanded on in 2021.</p>
<p>Goal 8.7</p> <p>Objective 8.7.2</p> <ul style="list-style-type: none"> Public Safety 	<p>Goal: Ensure Whistler is a safe and secure resort community.</p> <p>Objective: Maintain a safe community through the provision of sufficient fire, rescue and emergency services.</p> <ul style="list-style-type: none"> Review and maintain WFRS facilities, equipment and training. Provide effective response and develop innovative approaches to provide for safety in a cost-effective manner. Provide core services including fire prevention, deliver effective education, and promote WRR initiatives and programs. Recommending two paved access/egress routes in new subdivisions and ensuring Valley Trail upgrades can accommodate emergency vehicles. <p>CWRP: Details multiple WFRS, emergency preparedness, and cross-training initiatives that are being carried forward and expanded on in 2021.</p>
<ul style="list-style-type: none"> Policy 9.3.1.6 Policy 9.5.7.7 Policy 9.5.8.8 	<ul style="list-style-type: none"> Manage natural areas and recreation assets for long-term wildfire fuel management impacts and the mitigation of fuel-load hazards. Apply WRR principles to the Valley Trail network [at off-road trailheads and congregation areas] to protect the network's emergency capabilities in a prioritized manner.
<p>Goal 10.3</p>	<p>Involves objectives and policies regarding clean energy generation ideas</p> <p>CWRP: Debris created from fuel management is generally not of a "merchantable" size to be delivered to a mill, and debris disposal is an exceedingly costly and limiting factor in fuel treatments throughout the RMOW, especially where pile burning is avoided.</p>
<p>Objective 11.1.1</p> <ul style="list-style-type: none"> Policy 11.1.1.1 	<p>Objective: Maintain and improve safety on Highway 99 and on all roads in Whistler.</p> <ul style="list-style-type: none"> Collaborate with the provincial government to maintain and enhance the safety and reliability of Highway 99. <p>CWRP: Many areas of the Highway 99 corridor have a continuous coniferous fuel load with a high likelihood of human caused ignitions. Revisited in Table 27 and Table 31 (Highway Egress).</p>
<p>Objective 12.1.1</p> <ul style="list-style-type: none"> Policy 12.1.1.8 	<p>Objective: Maintaining a dependable water supply for personal, commercial and fire protection needs.</p> <ul style="list-style-type: none"> Investigate the resiliency of the water supply and distribution systems with respect to the impact of climate change and natural disasters. <p>CWRP: Connects to the importance of the 21-Mile watershed (outlined in the Source Water Protection Plan) and reinforces the need for fuel management on the west side of the valley, as well as critical infrastructure assessments and mitigation around all water infrastructure.</p>
<p>Chapter 13</p> <p>Wildfire Protection DPA</p>	<p>Designates different portions of the RMOW as either "High Risk", "Moderate Risk" or "Wildland", and applies different development guidelines to each.</p> <ul style="list-style-type: none"> Provides exemptions from needing a DP for roof replacements with Class A or B materials, and for "Moderate Risk" developments that will not contain conifers within three meters of a principal building. Recommends removing coniferous vegetation in favor of deciduous. Recommends spacing, pruning, topping, and debris cleanup in analogous areas to the FireSmart Home Ignition Zones. Recommends fire-resistant building materials.

<u>Goal; Objective; Policy;</u>	Description and Relationship to the CWRP
	<ul style="list-style-type: none"> • Recommends proactive FireSmart assessments of developments, and follow-up consideration of vegetation-free areas, preferred landscaping, building features and structure locations. <p>CWRP: The DPA forms the basis of proactive resilience in development for the future in Whistler. The implementation and enforcement of this DPA needs to be monitored.</p>

2.4 LOCAL BYLAWS

Alongside the OCP, the RMOW has a number of local bylaws that have implications for wildfire risk reduction and emergency management (Table 3).

Table 3: Summary of RMOW Bylaws with direct implications to wildfire and emergency management.

RMOW Bylaw	Description and Relationship to the CWRP
Fire and Life Safety Bylaw No. 2020, 2020	<ul style="list-style-type: none"> Permits the Fire Chief to require a property owner or occupier to undertake necessary actions to remove or reduce a Fire Hazard Regulates fire protection services and fireworks use. Sets restrictions on high-risk construction activity during periods of High and Extreme fire danger, unless approved under an Interface Construction Restriction Exemption. Authorizes the Fire Chief to permit open air burning as part of a wildfire fuel management project, in accordance with OBSCR.
Outdoor Potable Water Usage Bylaw No. 2179, 2018	<ul style="list-style-type: none"> Restrictions on Interface Construction Restriction Exemptions; not being issued or valid during Water Conservation Stages 3 or 4.
Emergency Measures Bylaw No. 1592, 2002	<ul style="list-style-type: none"> Provides the authority to the RMOW to establish the CEMP.
Landscape Modification Prescription Reports – Fuel Management	<ul style="list-style-type: none"> Outlines measurable recommendations and the involvement of a qualified tree professional for fuel management activities on private lands.

With reference to the RMOW's Fire and Life Safety Bylaw, there is currently no defined policy or process for the WFRS Fire Chief to enforce the mitigation of identified fire hazards on private land. Fire hazard is defined in this bylaw as *"a condition, arrangement or act which increases the likelihood of fire or which may provide a ready fuel supply to augment the spread or intensity of a fire, or which may obstruct, delay, hinder or interfere with the operations of the Fire Rescue Service or the egress of occupants in the event of a fire."* Often times, hazard levels and conditions on the property can reflect absent ownership, considerable degradation, or neglect.

In response to the authority granted to the Fire Chief, there is a need for a consistent, transparent policy with which to contact landowners of a fire hazard. This is especially relevant on large undeveloped parcels of private land with high-risk vegetation, and revisited in Table 21.

2.5 OTHER LOCAL PLANS

In addition to the OCP and local bylaws, multiple user groups within the RMOW have developed plans that have direct or indirect implications for wildfire management. Certain plans were funded to directly organize risk reduction efforts (i.e., Whistler Fire Strategy, 2017), while other plans provide insight toward the many values that need to be incorporated into all forest management activities within the municipality. These plans are summarized in Table 4 below.

Table 4: Summary of other Local Plans relating to the CWRP, often paired with informal suggestions for the various user groups and/or plans to consider with respect to wildfire resilience.

Plan type	Description and Relationship to CWRP
Whistler Fire Strategy <i>B.A. Blackwell & Associates (2017)</i>	<ul style="list-style-type: none"> Identified the continued values at risk, achievements to date, key stakeholders, and funding programs the RMOW has utilized. Identified key barriers to success (i.e., funding, available resources, private land risks, stakeholder silos, new developments). Offered solutions regarding funding, education, stakeholder coordination, planning, DPAs, stand-alone projects and budget scenarios.
Whistler Smoke Management Plan <i>B.A. Blackwell & Associates (2019)</i>	<ul style="list-style-type: none"> Provides an overview of the regulatory framework for open air burning for fuel management projects within the RMOW – under the guidance of Division 2 of OBSCR. This Creates a significantly more realistic framework for debris disposal via pile burning in WRR projects.
Twenty-One Mile Creek Watershed Source Water Protection Plan <i>RMOW (2018)</i>	<ul style="list-style-type: none"> Identifies the high risk that a catastrophic wildfire within the 21 Mile Watershed would pose to the clean drinking water supply for the RMOW. <p><u>Resilience:</u> Strengthens the need for additional fuel treatments on the West side of the valley, upslope of Alta Lake Road.</p>
CCF Annual Harvesting Plan	<ul style="list-style-type: none"> Outlines the active harvest plans of the CCF, the majority of which are under a wildfire thinning framework. There is a desire from the CCF to continue these projects, but to focus on stands in the direct interface due to high treatment costs. <p><u>Resilience:</u> Significant tracts of the CCF contain dense second-growth stands that have been historically logged and/or disturbed. Continuing to manage forest stands at the landscape level for wildfire resilience is key to the long-term preservation and protection of these forest resources.</p>
WORCA Strategic Plan <i>(2021-2024)</i>	<ul style="list-style-type: none"> Outlines a desire and vision to develop and maintain a sustainable mountain bike trail network throughout the RMOW. The RMOW is currently developing a Recreation Trail Strategy to complement this plan, and build on WORCA's vision. <p><u>Resilience:</u> This trail network is often directly integrated with fuel management projects in the RMOW, and can provide key access points and strategic fuel breaks for future activities. WORCA should communicate the impact of "cut and chuck" trail building to its members to avoid trailside debris accumulations that pose a fire hazard, and investigate opportunities to partner for fuel removal (e.g., planning and partnering with FireSmart Whistler, transitioning "Adopt-a-Trail" to the WORCA trail network.</p>

Plan type	Description and Relationship to CWRP
Climate Action Big Moves Strategy Community Energy Climate Action Plan <i>RMOW (2020, 2016)</i>	<p>Big Move #6: Close the loop and shift toward lower carbon consumption.</p> <ul style="list-style-type: none"> Takeaways: Improve organic waste reduction. Demonstrate RMOW leadership by embedding GHG emissions considerations into municipal procurement practices. Continue to develop the wildfire program and Whistler FireSmart as key climate adaptation strategies. <p><u>Resilience:</u> Demonstrates a desire and a need to establish a more permanent and economically feasible solution to debris disposal or usage from fuel management projects (See Recommendation 28).</p>
Recreation and Leisure Master Plan Report <i>RMOW (2015)</i>	<ul style="list-style-type: none"> Provides planning direction for RMOW natural assets, with respect to the continued use of parks, trails and other recreation services. A key strategy of the plan outlines the need to expand communication of “Fire Safe practices” in all areas.
Comprehensive Water Conservation and Supply Plan <i>RMOW (2015)</i>	<ul style="list-style-type: none"> Outlines the seasonal water supply in the RMOW, and reviews the maximum daily water demands and potential peak-season water shortages within the municipality. <p><u>Resilience:</u> While the WFRS does have protocols in place to have RMOW Utilities divert water and/or increase available pressure, this plan reinforces a need to pre-establish a reliable mass water-delivery system from natural water sources in the municipality, as opposed to strictly relying on traditional hydrant systems to provide for neighbourhood protection (see Recommendation 18).</p>
RMOW FireSmart Assessment Report (2014)	<ul style="list-style-type: none"> Provided home assessments to 2,556 single family homes in Whistler. 26% of assessed homes had a rating of extreme, while 50% of assessed homes had a rating of high. The assessment established neighbourhood-wide hazard ratings based off of structure and site hazards. <p><u>Resilience:</u> While the RMOW’s FireSmart Program has not used this information to date, the assessment reinforces the idea of focusing local FireSmart initiatives on prioritized neighbourhoods based on exposure to fire hazards (see Recommendation 24).</p>

2.6 LINKAGES TO HIGHER LEVEL PLANS AND LEGISLATION

A number of relevant land use plans, ministerial orders, forest stewardship plans, and non-legal planning objectives apply to lands within the RMOW. These plans display how the forests within the municipality provide a breadth of values that are relevant to multiple stakeholders and land managers (see Table 5 below). These values are addressed by forest professionals when preparing site-specific plans for fuel management, and should also be considered in any local policies for forest management.

Table 5: Higher Level Plans and Relevant Legislation

Plan/Legislation	Description and Relationship to CWRP
Sea-to-Sky Land and Resource Management Plan (LRMP)	<p>Legal and Non-Legal Objectives</p> <ul style="list-style-type: none"> <i>Old Growth Management Areas (Legal): Five minor overlaps within the AOI.</i> <i>Cultural Places & Cultural Management Area (Legal) & Squamish Nation Wild Spirit Place: Upper Cheakamus River.</i> <i>Wildland Areas (Legal): Miniscule overlap, Rainbow Mountain/Stsatcswam.</i> <i>Front-Country Area (Non-Legal): Entire AOI exclusive of the Upper Cheakamus River cultural management area.</i>
FRPA Values & Government Action Regulations (GARs)	<ul style="list-style-type: none"> <i>Ungulate-Winter Ranges: Two occurrences in the AOI, no overlaps with any PTUs.</i> <i>Wildlife Habitat Areas: Two overlaps with conditional harvest zones for spotted owl in the CCF (Cheakamus & Wedge areas).</i> <i>Species & Ecosystems at Risk: Individual overlaps with Northern Goshawk (Accipiter gentilis laingi).</i> <i>Community Watersheds: Six overlaps (21 Mile, Agnew, Rideau, Blackcomb, Whistler, Alpha).</i> <i>Visual Quality Objectives: A mix of Partial Retention (East side of the valley, primarily) and Retention (West side).</i>
Forest Stewardship Plans (FSP) Community Forest (CF) Timber Management Operating Plan (2019)	<p>FSP's illustrate Forest Development Units within which forest licensee's activities are planned for. FSP's describe strategies to address government objectives that are reflected in higher level plans.</p> <ul style="list-style-type: none"> <i>The Cheakamus Community Forest (CCF) (CFA K3V FSP) overlaps a significant portion of the AOI, and is jointly managed by the RMOW, Squamish Nation and Lil'wat Nation.</i> <i>CCF 2021 Annual Operating Plan outlines harvesting proposals in Wedge Creek and 16 Mile.</i> <i>2020 Proposed Harvesting and Wildfire Management Plans saw the completion of the Cheakamus Lake Road wildfire thinning project.</i>
BC Provincial Open Burning Smoke Control Regulation (OBSCR)	Summarized by the RMOW's 2019 Smoke Management Plan as it relates to wildfire risk reduction fuel treatments in the municipality.

In addition to these higher-level plans and legislation, the RMOW's Forest and Wildland Advisory Committee (FWAC) often seeks additional environmental considerations when planning and implementing wildfire risk reduction initiatives to ensure all values of the forest are considered, that they are not being compromised by the wildfire fuel reduction projects, and that overall climate resiliency of the forest is being enhanced. See Recommendation #29 and Recommendation #30 for more detail.

SECTION 3: COMMUNITY DESCRIPTION

Nestled in the Coast Mountains between the District of Squamish and the Village of Pemberton, Whistler is known worldwide as an outdoor recreation destination. With an ever-growing demand for tourism, recreation, and an immersion in nature comes a growing need to protect the magnificent landscapes that Whistler is known for. Table 6 displays a few choice socioeconomic statistics that demonstrate the population growth and economic growth of the RMOW, which have important implications for wildfire resilience.

Table 6: Various growth and economic statistics from the RMOW

Metric	Value	Summary Relevance to the CWRP	Data Source
Permanent Population	2011: 10,223 2020: 13,948	More development; More residents to inform about FireSmart; More active voices in the community.	BC Stats, Whistler Housing Authority, Tourism Whistler
Total Population Equivalent	2011: 26,350 2019: 36,426 Peak: 55,000	Equivalent with the effects of a growing permanent population; More recreational traffic on the land-base; A need to inform non-permanent residents of FireSmart principles; Potential evacuation/emergency complications.	BC Stats, Whistler Housing Authority, Tourism Whistler
Age Distribution	20-39: 44% 40-64: 26%	A major proportion of permanent residents are young adults-seniors, which can be roughly correlated with an able-bodied age-range to perform preventative FireSmart actions.	2016 Census
Occupied Dwellings (Total Number)	2011: 3,900 2016: 4,610	More development; More residents to inform about FireSmart; More active voices in the community.	2016 Census
Occupied Dwellings (% of Residential Dwellings)	2016: 44%	Displays the percentage of residential dwellings (all dwelling types) that are occupied by permanent residents. A lack of occupancy can make preventative actions difficult to accomplish.	2016 Census
Median Home Purchase Price (Single Family)	2011: \$1.11M 2018: \$2.45M	An incredible increase in property values, displaying the extreme value-at-risk of property. Comparable increases have also been seen in condos and townhouses.	Whistler Listing System
Summer Visitation	2017/18: Over 1,500,000	Displays a need to showcase preventative measures to tourists.	Tourism Whistler
Tourism	Annual BC GDP: \$1,530,000,000 % Share of BC Tourism Export Revenue: 25%	The major contribution of tourism in Whistler to the provincial economy.	2015 RMOW EPI Key Findings

TERRITORY ACKNOWLEDGEMENT

The RMOW recognizes that the lands held by the municipality are located on the unceded traditional territories of the Lil'wat Nation and Squamish Nation, and the RMOW is taking steps to advance reconciliation and promote a working relationship between the three governments. Listed are some examples of this relationship that will contribute to cooperative and holistic land management decisions:

- The RMOW, Squamish Nation, and Lil'wat Nation entered into a Memorandum of Understanding (MOU) in 2017, to cooperatively explore opportunities for development, Crown land management and community planning.
- Expanded on the 2017 MOU with a Protocol Agreement in 2018, to continue addressing areas of mutual interest and fostering a local commitment to the Truth and Reconciliation Commission of Canada.
- Established the Cheakamus Community Forest in 2009, jointly managed by the three governments and actively employing Ecosystem Based Management.
- Squamish Nation and Lil'wat Nation have ratified land use planning agreements with the Province, included in the Sea-to-Sky LRMP.



**Skwxwú7mesh
Úxwumixw**

Squamish Nation



Figure 5: Inside the Squamish-Lil'wat Cultural Center in Whistler (Photo Credit: Tourism Whistler). Above: Logos of the Lil'wat Nation and Squamish Nation.

3.1 AREA OF INTEREST AND WILDLAND-URBAN INTERFACE

The Area of Interest (AOI) for this CWRP is a 1-kilometer buffer around the Whistler Urban Development Containment Area (WUDCA) as defined in Schedule A of the OCP, which is consistent with Whistler's Settlement Area Map in the Squamish-Lillooet Regional District's (SLRD) Regional Growth Strategy (RGS). The WUDCA defines the primary area within the municipality in which development (residential, visitor, commercial, industrial, and institutional) will be focused, and also contains lands with natural designations as protected areas, non-urban, parks, and recreation areas. Schedule A also identifies seven "Option Sites" that are located outside the WUDCA, where base area developments (i.e., lift staging, day skier, commercial facilities, or accommodation) may be considered.

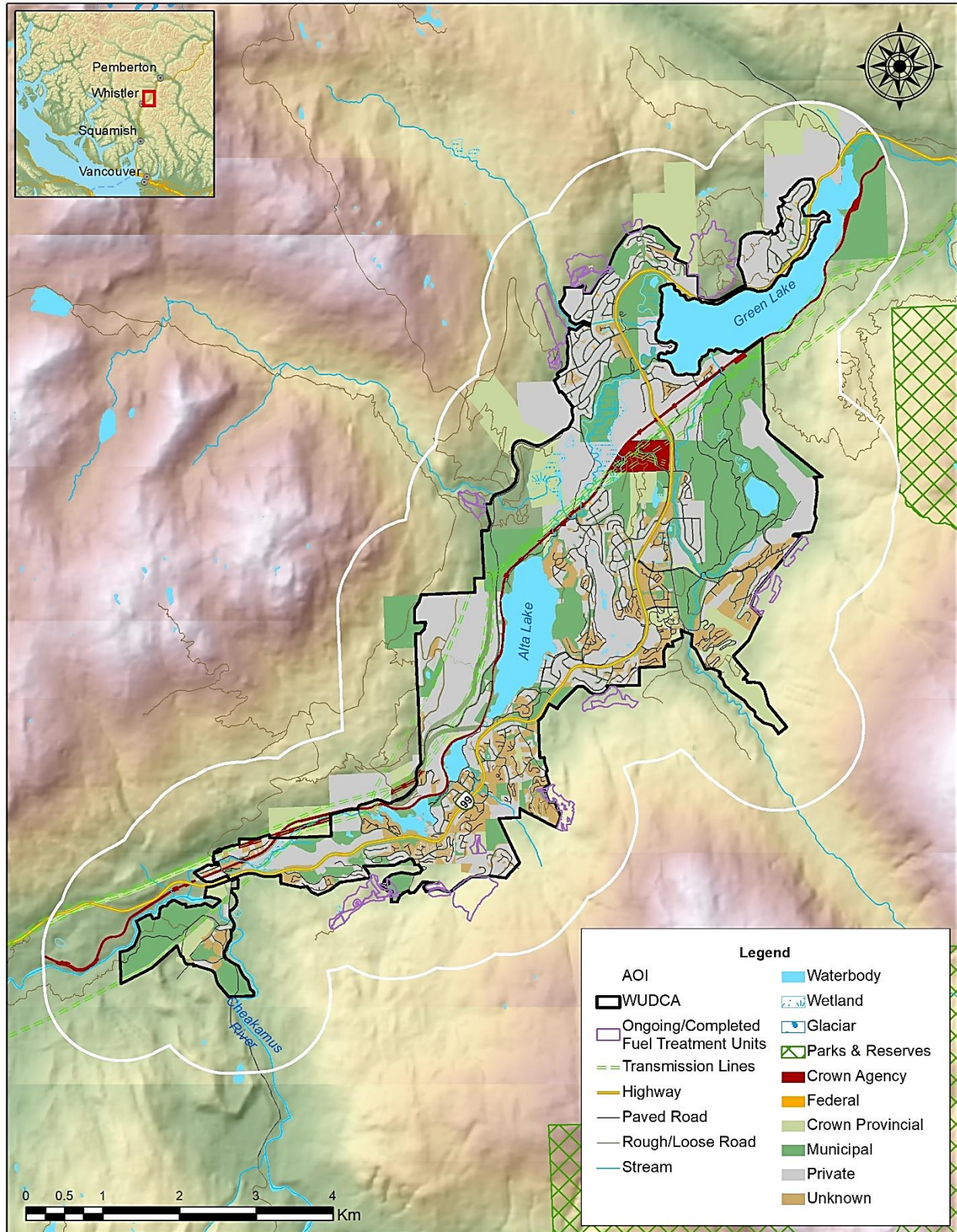
Focusing on this 6,977-hectare area allows for a significant portion of forestland surrounding the RMOW's urban areas to be prescribed for wildfire mitigation activity. Multiple areas outside of the WUDCA are still eligible for commercial and tourism-related development, and a number of different land managers are actively pursuing wildfire risk reduction initiatives adjacent to the WUDCA (i.e., the Mountain Resorts Branch for forests within the Controlled Recreation Area [CRA] and MFLNRORD for provincial Crown land, both through the WRR program). The entirety of the AOI is within RMOW municipal boundaries. See Map 1 on the following page.

Table 7: Summary of land ownership within the RMOW Area of Interest

Land Ownership	Area (Hectares)	% of AOI
Crown Provincial	4,786	69
Private	1,062	15
Municipal	747	11
Unknown	289	4
Crown Agency	92	1
Federal	1	Nil
Total	6,977	100

Much of the Crown land within the AOI is either managed as part of the Cheakamus Community Forest or the CRA,⁶ which clearly demonstrates the need for a collaborative approach to wildfire risk reduction initiatives (see 5.5 for a focused look at interagency cooperation). Private and municipal land together cover 26% of the AOI, and generally represent areas where the forest meets an identified value. Mitigation activities on municipal and private land require a teamwork-driven approach between the RMOW and private landholders which is often facilitated by Whistler's FireSmart Program. Efforts of the program are detailed in SECTION 5: FireSmart Principles.

⁶ See Schedule C of the RMOW OCP:
<https://www.whistler.ca/sites/default/files/ocp-schedules/Schedule-C-Cheakamus-Community-Forest-Provincial-Parks-and-Whistler-Olympic-Park.pdf>



Map 1: Area of Interest for the RMOW CWRP showing an overview of different land ownership types throughout the municipality.

3.2 VALUES AT RISK

Within the RMOW there are a breadth of different values at risk that could be negatively impacted by a wildfire, or by suppression efforts related to a wildfire. It is outside the scope of this CWRP to review and assess all of the individual values that are held by the community; in result this section will focus on many key pieces of infrastructure and key cultural and environmental services that should be considered when planning proactive risk reduction measures, or communicated in a wildfire response scenario. The values at risk outlined in this section are shown on Map 2 below.

3.2.1 EMERGENCY RESPONSE, PUBLIC SERVICES, ELECTRICAL & COMMUNICATIONS

As outlined in the RMOW's Comprehensive Emergency Management Plan (CEMP), there are multiple pieces of municipal and publicly owned infrastructure that are crucial for wildfire preparedness and for emergency response. Many of these pieces of 'critical infrastructure' were noted to be constructed of building materials that are susceptible to fire, or directly surrounded by hazardous forest types. Assessing infrastructure for its exposure to fire hazards and mitigating these hazards proactively will allow the RMOW to be more resilient to an interface fire (see Recommendation 3). Critical infrastructure in the RMOW is listed in Table 8 below.

BC Hydro transmission lines bisect both the north and south slopes of the AOI and may serve as fuel-breaks to wildfire spreading upslope or downslope in the valley. While often discontinuous at the landscape scale due to topographic breaks and/or rocky, exposed ground, some sections of these transmission line right-of-ways were noted to contain continuous mixedwood fuel that could carry a surface fire. While BC Hydro does follow an integrated vegetation management plan for controlling vegetation on their right-of-ways,⁷ the RMOW should consider lobbying BC Hydro to be compliant with their legislated obligations of maintaining these corridors in a manner that prevents any fire from spreading.

The RMOW has developed a reliable emergency communication system for inside and outside the Emergency Operations Center (EOC), which is described in depth in Section 7.3 of the RMOW's CEMP. For day-to-day resident and visitor communications in the RMOW including the successful operation of the Whistler Alert⁸ emergency notification tool, a dense series of communications infrastructure services the valley. Wildfires can and do disrupt these systems through power outages and/or physical damage, which can very quickly complicate an emergency situation in an area as densely populated as Whistler.⁹ Ideas regarding the resilience of these pieces of infrastructure are introduced in Table 8 under "Communications."

⁷ BC Hydro Integrated Vegetation Management Plan for Control of Vegetation Within Transmission Rights of Way (2016):

<https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/safety/Corridor-PMP-May-2016.pdf>

⁸ Whistler Alert, a mass community-notification tool for residents and visitors:

<https://www.whistler.ca/media/news/rmow-launches-whistler-alert-emergency-notification-system>

⁹ Scott Anderson, Carol Barford, and Paul Barford. 2020. Five Alarms: Assessing the Vulnerability of US Cellular Communication Infrastructure to Wildfires. In Proceedings of the ACM Internet Measurement Conference (IMC '20). Association for Computing Machinery, New York, NY, USA, 162–175. DOI: <https://doi.org/10.1145/3419394.3423663>

3.2.2 WATER AND SEWAGE

Whistler obtains its water through natural alpine sources, largely relying on two surface water intakes (i.e., 21 Mile Creek & Blackcomb Creek) while having the capability to switch to purely groundwater sources during periods of high turbidity. Water is distributed through a complex system of reservoirs, well sites, booster pump stations, and fire hydrants. Water supply and potential water shortages and mitigation measures are outlined in depth in the RMOW's Comprehensive Water Conservation and Supply Plan.¹⁰ The 21 Mile Creek watershed and associated infrastructure has a crucial importance to the RMOW, as 45-55% of the municipality's water supply is sourced from here. The 21 Mile Creek Watershed Source Protection Plan¹¹ acknowledges that a catastrophic wildfire within this watershed would greatly increase the risk of major turbidity events; events that automatically shut down the water supply treatment system which could jeopardize water supply throughout the RMOW. While no formal evaluation of wildfire risk and/or mitigation measures specific to the 21 Mile Creek watershed has been undertaken, ongoing efforts to mitigate wildfire hazard to this watershed and its associated infrastructure are being prioritized by the RMOW (see "Water and Sewage" in Table 8 and various proposed treatment units in Table 31).

The RMOW provided a database of critical water and sewage infrastructure within the municipality, which are detailed in a general priority order in Table 8. Efforts to mitigate the wildfire risk to these pieces of infrastructure have been underway since the 2005 CWPP, and it is imperative to the long-term resilience of the municipality that these efforts are sustained. During field work for this CWRP, it was noted that multiple individual pieces of infrastructure (mainly booster and pump stations) still exhibited non-FireSmart building materials that would be susceptible to combustion through an ember shower and/or direct flame exposure. This vulnerability is reviewed in Recommendation #3.



Figure 6: Left; 21 Mile Creek pumphouse and treatment station on Alta Lake Road with poor vegetation setbacks. Right: Taluswood pumphouse roofed in cedar shakes.

¹⁰ Comprehensive Water Conservation and Supply Plan (2015):

https://www.whistler.ca/sites/default/files/related/comprehensive_water_conservation_and_supply_plan_update_2015.pdf

¹¹ Twenty One mile creek Watershed Source Water Protection Plan (2020):

https://www.whistler.ca/sites/default/files/2018/Nov/related/25045/twenty-one_mile_creek_watershed_source_water_protection_plan_sept.pdf

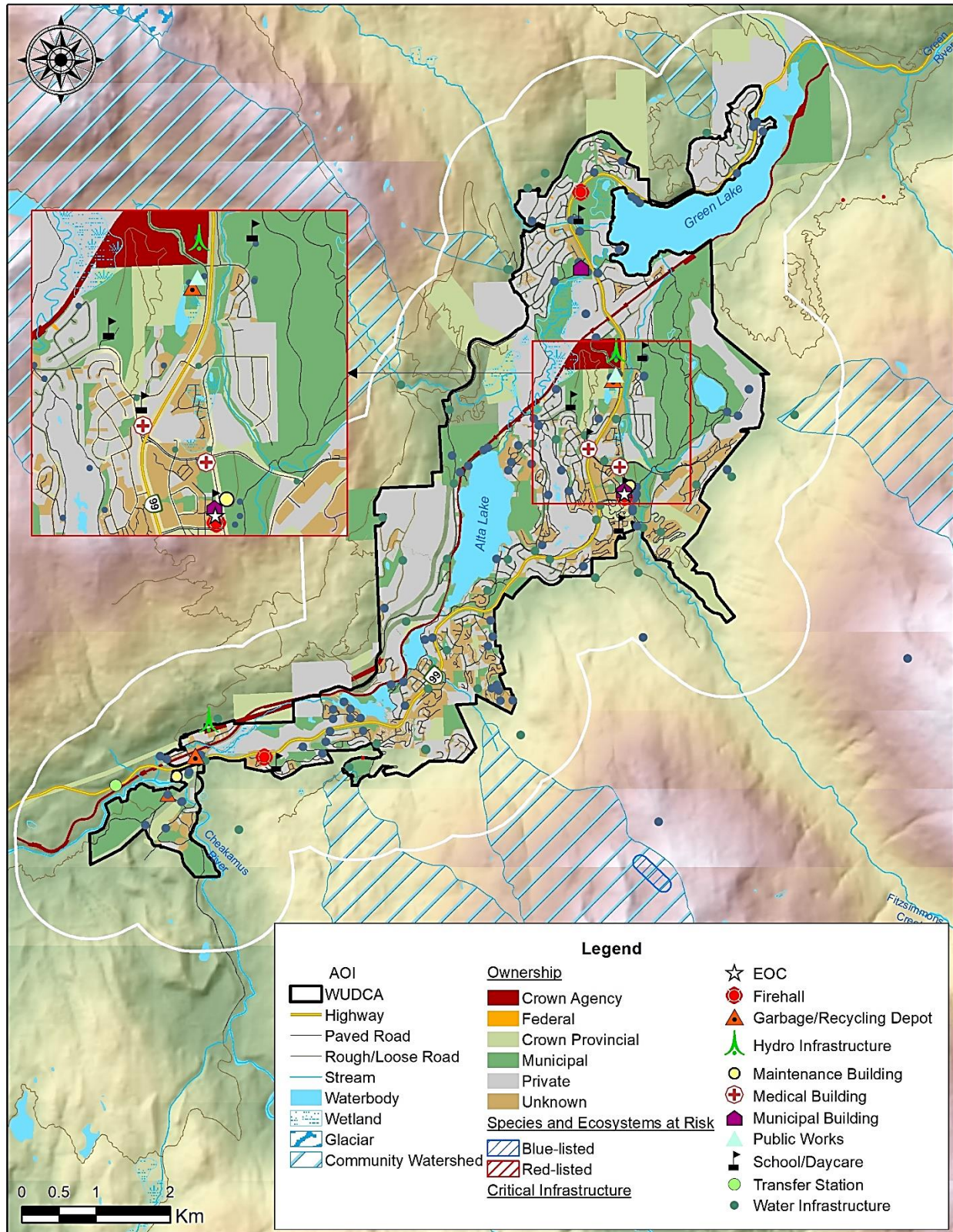
Table 8: Summary list of Critical Infrastructure pieces within the AOI.

Critical Infrastructure Type	Critical Infrastructure Name	Location / Relevant Notes
Emergency Response, Public Services, Electrical, Gas, and Communications		
Fire Department	Fire Hall #1	4315 Blackcomb Way.
	Fire Hall #2	8900 Highway 99. 2021 High School fuel management treatment surrounds this fire hall.
	Fire Hall #3	1505 Spring Creek Drive.
Hospital / Medical Center	Whistler Health Care Center / Medical Clinic	4380 Lorimer Road
	BC Ambulance Service	7192 Lorimer Road
RCMP	Public Safety Building/Police Services	4315 Blackcomb Way
Schools	Whistler Waldorf School	7324 Kirkpatrick Way
	Myrtle Philip Community School	6195 Lorimer Road. School is adjacent to the original prescription boundary for the Nesters fuel treatment unit, but the area nearest the school was not implemented due to a possible school expansion.
	Whistler Secondary School	8000 Alpine Way. School is adjacent to the 2021 High School fuel management treatment.
	Spring Creek Community School	1509 Spring Creek Drive. Valley Trail and municipal land surround the school to the East and North, with the Highway 99 PTU along the highway ROW.
BC Hydro Transmission Lines	Bisecting the RMOW. See CI Map.	
Communications	There are four RCMP radio towers operating within the AOI (Alpine, Pan Pacific & Whistler Detachment), and 439 individual Industry Canada towers (TELUS, Rogers, Bell, Fido, Wind & Inukshuk) operating in the AOI. These will not be individually noted here but a prioritized assessment of these structures for exposure to fire hazards should be communicated with the relevant parties, as well as the need for the installation of backup power sources to ensure the 72-hour operation of key facilities in the event of a power outage.	
Public Works Building	Municipal Public Works Yard	8020 Nesters Road. 2021 Nesters fuel treatment unit treated the forest to the west of this area. Functions as the secondary EOC.
Sub-Station	Function Hydro Sub-Station	Alpha Lake Road. No mitigation projects directly surrounding, but surrounded by Hydro ROWs.
	Rainbow Hydro Sub-Station	Across Nesters Road to the north from the public works yard. 2021 Nesters fuel treatment unit treated the forest to the SW of this area. Proposed mitigation along the Rainbow-Sproatt Flank trail would aid in first responder access to the forests upslope.
Transfer Station/Recycling	Garbage/Recycling Center @ Function Junction	Alpha Lake Road/Lynham Road. Municipal forest parcels surrounding. Unimplemented Riverside treatment unit is across Highway 99
	Transfer Station	Outside the AOI.

Critical Infrastructure Type	Critical Infrastructure Name	Location / Relevant Notes
	Garbage/Recycle Center @ Nesters	South of the public works yard.
Other Public Buildings	Meadow Park Arena/Pool	8625 BC-99. Surrounded by natural/developed openings, Valley Trail and Highway 99 PTU directly to the west.
	Village Maintenance Shop	4365 Blackcomb Way. Surrounded by municipal forested parcels, Valley Trail and access roads.
	Conference Center Parking Lot	Concrete parking lot. Surrounded by the village.
	Whistler Children's Center	7146 Nesters Road. 2021 Nesters fuel treatment was across Nesters Road to the north.
	Mark Warner Day Care	4293 Mountain Square. Within the Village.
	Teddy Bear Day Care	4335 Blackcomb Way. Middle of the Village, small forested municipal parcels surrounding.
	Municipal Hall	4325 Blackcomb Way. Middle of the Village, small forested municipal parcels surrounding.
	Landfill Gas Flare	Jane Lakes Road. Surrounded by municipal forest parcels.
Water and Sewage		
Intakes	21 Mile Creek (R231) (P281 and P280 below are top priority)	Top of the 21 Mile Creek access road. Cemetery FMP implemented in 2017 – treated a 6.2hectare area downslope.
	Blackcomb Creek	Top of Lost Lake Road – Blackcomb Community Watershed. Within the CRA – current FMP developed surrounding the adjacent reservoir (Cabin Resource Works).
UV Treatment Facility	21 Mile UV Facility (P281)	5825 Alta Lake Road. Adjacent to the Cemetery FMP, treated in 2017, and adjacent to the Alta Lake Road North PTU.
Reservoirs	Rainbow (R227) & Alpine North (R237) Reservoir	Service road from the top of Valley Drive. Surrounded by an unimplemented Rainbow FMP TU.
	Cheakamus Crossing Reservoir (R226)	Access road to the East of Cheakamus Lake Road. Cheakamus CCF fuel break is located ~150 meters downslope to the west.
	Alpha Creek Reservoir (R224)	Millar's Pond Crescent. Surrounded by the Millar's Pond FMP, treated in 2014.
	Gondola Way Reservoir Cell 1 & 2 (R228)	Service road between Gondola Way and Heritage Peaks.
	Taluswood 2 Reservoir (R236)	Service road under the Creekside Gondola.
	Taluswood Reservoir (R235)	Taluswood Place. 2021 Taluswood fuel management treatment is adjacent, but not directly abutting.
	Sunridge Plateau Reservoir (R239)	Service road east of Sunridge Drive. Contained within the Brio Extension PTU.
	Blackcomb & Lost Lake Reservoir (R233)	Off of 4701 Blackcomb Way. Both are adjacent to the Horstman fuel management areas, treated in 2013.
	Stonebridge Reservoir (R240)	Off the north end of Stonebridge Place.

Critical Infrastructure Type	Critical Infrastructure Name	Location / Relevant Notes
	Emerald Estates Reservoir (R238)	Service roads N/W of Emerald Drive. Contained within the Emerald West PTU.
	Singing Pass Reservoir (R229)	Singing Pass Trail, Whistler Mountain.
	R13 VWWU Reservoir	1374 Alpha Lake Road, upslope from Function Junction.
	R222A & R222B	8340 Alpine Way. Adjacent to the Alpine fuel treatment, treated in 2017.
Well Sites & Associated Buildings	Rainbow Park Irrigation Well (PW401) Valley Trail b/w Rainbow/Lorimer (W218) Rainbow Trail Valley Trail (W219)	NW corner of Alta Lake
	Function Junction Well #1 & #2 (W212)	1005 Lynham Road, Function Junction turnoff.
	Emerald Well #1, 2 & 3 (W201)	9225 Highway 99 (East and West sides). Adjacent to portions of the Highway 99 PTU.
	Alpine Well #1 (W202)	Highway 99 – Parkwood Drive. Within/adjacent to the Highway 99 PTU.
	Alpine Well #2 (W210)	8010 Alpine Way. Adjacent to the Highway 99 PTU.
	Alpine Well #3 (W213)	8625 Highway 99 – Meadow Park. Adjacent to the Highway 99 PTU.
	Village Well (W211)	4330 Blackcomb Way.
	Community Well #1, 2 & 3 (W205)	4490 Blackcomb Way.
	Cheakamus Crossing Well (W217)	North of treatment plant.
	W9 VWWU Well	1099 Millar Creek Road.
Booster Pump Buildings	21 Mile Pump Station (P280)	5785 Alta Lake Road. The Stonebridge PTU surrounds this pump station.
	Cheakamus Crossing Pump Station (P279)	1135 Cheakamus Lake Road, adjacent to the wastewater treatment plant.
	Reservoir Valve Station (P288)	Fitzsimmons Valve Station/Gondola Transit Exchange.
	Mountain View Pump Station (P245)	8319 Mountain View Drive (Alpine North).
	Community Booster Pump & PRV (P247)	4290 Blackcomb Way.
	Whistler Road PRV & Booster Pump (P264)	Whistler Road at Nordic Drive.
	Sunridge PRV & Booster Pump (P265)	3840 Sunridge Drive.
	Taluswood 2 PRV & Pump (P270)	2400 Taluswood Place. 2021 Taluswood fuel management treatment is adjacent, but not directly abutting.
	Stonebridge PRV & Pumps (P274)	5406 Stonebridge Drive
	Lost Lake Pump (P286)	4701 Blackcomb Way. Adjacent to the Horstman fuel management areas, treated in 2013.

Critical Infrastructure Type	Critical Infrastructure Name	Location / Relevant Notes
Pressure Reducing Valves	There are 41 individual PRV's in the RMOW. These will not be individually noted here but they should be assessed for FireSmart compliance and any required retrofitting and/or fuel mitigation.	
Wastewater Treatment Facility	Cheakamus Lake Road/Highway 99	Unimplemented Riverside TU is across Cheakamus Lake Road from the facility, as is the completed Cheakamus fuel break.
Sanitary Lift Stations	There are 69 individual sanitary lift stations in the RMOW. These will not be individually noted here but they should be assessed for FireSmart compliance and any required retrofitting and/or fuel mitigation.	



Map 2. Critical Infrastructure within the AOI, as recognized by RMOW staff

3.2.3 CULTURAL VALUES

The RMOW has established close ties with the Squamish Nation and the Lil'wat Nation and is strongly motivated to strengthen this relationship through ongoing joint land management decisions. Within the AOI, the Sea-to-Sky LRMP legally defines one Cultural Place and one Cultural Management Area, which span the Upper Cheakamus area. In the spring of 2021, the Cheakamus Community Forest (a joint partnership between the RMOW, Squamish Nation and Lil'wat Nation) successfully finished their selective harvest of 113 hectares as part of the Cheakamus Lake Road Wildfire Project, which is fully within the Cheakamus Cultural Management Area.

Due to site sensitivity, the locations of archaeological sites may not be made publicly available, however, data provided by the MFLNRORD Archaeology Branch confirms that there are six known archeological sites within the AOI. Any future initiatives to mitigate the fire hazard within 50 meters of a known archaeological site should be planned in coordination with an Eligible Consulting Archaeologist. With reference to vegetation management programs in the RMOW (detailed in Section 5.7 Vegetation Management), any fuel thinning activities must continue to include consultation with all identified First Nations at the site level and with sufficient time for review and input regarding their rights and interests prior to prescription finalization or implementation.

3.2.4 HIGH ENVIRONMENTAL VALUES & OTHER RESOURCE VALUES

While the BC Conservation Data Center lists only one publicly available occurrence of a blue or red listed ecosystem and/or species within the AOI,¹² the preservation and protection of Whistler's natural surroundings is at the core of the RMOW's Official Community Plan. Defined through the RMOW's Community Vision, the "vision characteristics" in Figure 7 demonstrate the high value that is placed on nature and its recreational and tourism related offerings.¹³

¹² A nesting site for *Accipiter gentilis laingi* (Northern Goshawk) noted near Millar's Pond.

¹³ Adapted from Chapter 2 of the RMOW's 2020 OCP (pages 2-2 through 2-4).

Vision Characteristic: Sense of Place

- **Landscape**

- Natural areas are never far from sight and reach; they are the predominant component of our mountain landscape, core to our mountain culture and the basis of our outstanding recreation offerings.

Vision Characteristic: Environment

- **Respect**

- We understand, respect and steward natural areas as the foundation of our community, our tourism-based economy and overall human health.

- **Protection**

- Our development footprint is limited: *sensitive ecosystems*, wildlife habitat and indigenous biodiversity are healthy, protected and where necessary restored. We support the protection of regional ecosystems, wildlife habitat and agricultural land.

- **Access**

- Where natural areas are accessed and enjoyed for recreation and overall well-being, we do so in a responsible way.

- **Resources**

- Natural resources and energy are conserved and we have achieved zero waste. Water sources are protected. Natural materials are selected and synthetic substances and emissions are managed to protect human well-being and ecosystem health.

- **Climate**

- GHG emissions are being systematically eliminated, all energy is derived from renewable sources and we are increasing our resilience to a changing climate.

Vision Characteristic: Tourism-based Economy

- **Dependence**

- Economic activity depends on and respects the natural environment, our unique mountain culture and the people of our community.

Figure 7: Adapted from the 2020 RMOW OCP. The Community Vision shows the importance of nature to the community.

These ideals and values are largely reflected in the goals and management principles of the Cheakamus Community Forest (CCF), which covers roughly **35%** of this CWRP's area of interest. The CCF is guided by an Ecosystem Based Management Plan (2013)¹⁴ under which the highest priority for timber harvest is to be compatible with the RMOW's OCP, as well as First Nations cultural objectives. The CCF strives to generate employment (especially for First Nations) and revenue, while managing the forest in an economically sustainable manner.¹⁵ The harvest volume within the CCF is small when compared to adjacent forest tenure holders, and the majority of harvest in previous years has been allocated to wildfire risk reduction projects.

¹⁴ CCF EBM Plan: https://www.cheakamuscommunityforest.com/wp-content/uploads/dlm_uploads/2019/03/EBM-Plan-FINAL-March-2013.pdf

¹⁵ Adapted from the CCF's "What & Why": <https://www.cheakamuscommunityforest.com/what-why/>

SECTION 4: WILDFIRE RISK ASSESSMENT

When assessing wildfire risk for the RMOW, it is important to note that risk is the product of hazard and vulnerability. Using a simplified framework from the US Forest Service (Figure 8), it is crucial to analyze the likelihood of fire, potential wildfire intensity, and the exposure and susceptibility of the community in a wildfire event. This section will overview the unique wildfire environment and history within the RMOW and demonstrate Whistler's wildfire risk through various threat analyses.

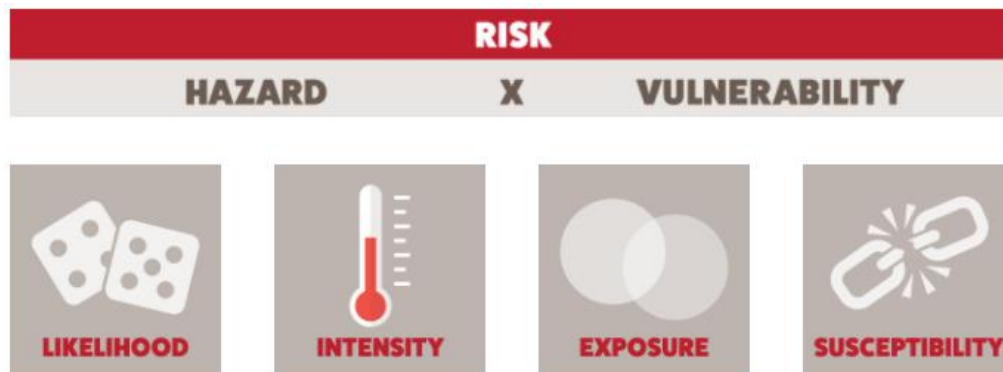


Figure 8: Framework to understanding wildfire risk. Adapted from "Wildfire Risk to Communities - USFS".¹⁶

4.1 WILDFIRE ENVIRONMENT

There are three components that influence wildfire behavior: topography, weather, and fuel. These three components are widely recognized as the 'fire behaviour triangle' (Figure 9); the ways in which they individually influence the wildfire environment throughout the RMOW will be detailed below. Fuel is the only component of the fire behavior triangle that can be directly managed.



Figure 9: Graphic display of the fire behaviour triangle, and a subset of characteristics within each component.

¹⁶ Wildfire Risk to Communities Info Sheet (2020):
<https://wildfirerisk.org/wp-content/uploads/2020/04/WRC-Info-Sheet-2020-04.pdf>

4.1.1 TOPOGRAPHY

Slope steepness influences the fire's trajectory and rate of spread and slope position relates to the ability of a fire to gain momentum uphill. Other factors of topography that influence fire behaviour include aspect, elevation, and configuration of features on the landscape that can restrict (i.e., water bodies, rock outcrops) or drive (i.e., valleys, exposed ridges) the movement of a wildfire.

Whistler's mountainous topography defines both its position as an outdoor recreation destination and its wildfire environment. The municipality is located in a mid-elevation valley at the divide between the Green River and Cheakamus River drainages. The high point of the valley is Alta Lake at ~640 m elevation with mountains on both sides. The majority of the community is positioned at valley bottom. Newer neighbourhoods and water infrastructure are located on lower mid-slopes (e.g., Kadenwood, Taluswood, Stonebridge). Many of the topographic features commonly found throughout the municipality (i.e., steep slopes and creek draws) provide positive conditions for wildfire spread, whereas other features (rocky bluffs, valley-bottom wetlands, abrupt slope and aspect changes) hinder spread. Overall, Whistler's terrain introduces logistic difficulties for both fire suppression and vegetation management.

In general, the Whistler valley runs in a southwest – northeast direction, with prominent cross-drainages feeding into this valley from various cardinal directions. Each of these valleys provides the potential for a funneling of wind and a convective draw for fire. Local BCWS staff¹⁷ commented that wildfires on steep south and west slopes that have shallow surface fuels (moss and lichens) are particularly receptive to growth, but that wildfires in the region occur at all aspects, fuel types, and elevations. Table 9 and Table 10 show the percent of the AOI by slope steepness class and slope position, with corresponding fire behavior implications. A value on the upper 1/3 of a steep slope would be impacted by preheating and faster rates of spread. Slope effect increases the likelihood that a structure fire in an interface neighbourhood would spread into the adjacent forest.

Table 9: Slope percentage within the AOI (exclusive of major waterbodies) and fire behaviour implications.

Slope	Percent of WUI	Fire Behaviour Implications
<20%	38	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	17	Flame tilt begins to preheat fuel, upslope wind increases, higher rate of spread.
31-45%	16	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
46-60%	19	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	9	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

¹⁷ Pemberton Fire Zone

Table 10: Slope Position of Value and Fire Behaviour Implications.

Slope Position of Value	Fire Behaviour Implications
Bottom of Slope / Valley Bottom	Impacted by normal rates of spread.
Mid Slope - Bench	Impacted by increased rates of spread. Position on a bench can reduce the preheating near the value if the value is far enough offset from the slope.
Mid slope – Continuous	Impacted by fast rates of spread. No break in terrain features allows consistent growth, while fuels are affected by preheating and flames bathing into the fuel ahead of the fire.
Upper 1/3 of slope	Impacted by extreme rates of spread. At risk to large continuous fire run.

4.1.2 FUEL

Although fuel structure varies throughout the AOI, the major risk factor that is common to almost the entire area is the continuity of conifer forest cover, at least on the valley slopes. Fuels on the valley bottom are lower risk with the built-up Whistler Village area, multiple large lakes, riparian areas, and golf courses.

Forests throughout the RMOW have an extensive disturbance history from both natural and anthropogenic sources. Most of the bottom two-thirds of the valley were logged in the 1900s, especially on the flanks of Whistler and Blackcomb. The edges of these old cutblocks are still apparent today and create homogenous areas of hazardous second-growth conifers. In other areas, inaccessible slopes, rocky terrain, logging, and fires have left pockets of older, younger, or more sparse trees, which break up the continuity of hazardous fuels. Transmission lines and ski runs provide long and narrow fuel breaks throughout the AOI. Transmission lines run mostly cross-slope in the lower part of the valley.

The current fuel environment has been very subtly altered since these initial intrusions, as the tourism and ecosystem-based economy of Whistler results in little industrial activity besides residential and commercial development, and some aggregate mining. Forest harvesting is limited and occurs mainly southeast of Cheakamus Crossing and north near Wedge Creek, or in small FireSmart areas in the interface.


The Canadian Forest Fire Behaviour Prediction (FBP) System outlines sixteen fuel types based on characteristic fire behaviour under defined conditions. BC Wildfire Service maintains a provincial fuel type layer that was confirmed and updated for this CWRP. It should be noted that a locally observed fuel type may have no exact analog within the FBP system. Although a subjective process, the most appropriate fuel type was assigned based on research, experience, and practical knowledge; this system has been successfully used within BC, with continual improvement and refinement, for 20 years.¹⁸ The following hazardous forest types are common throughout the valley, as shown in Table 11 and Map 3. This map was



¹⁸ Perrakis, D., G. Eade, and D. Hicks. 2018. BC Wildfire Service. Ministry of Forests, Lands, and Natural Resource Operations. British Columbia Wildfire Fuel Typing and Fuel Type Layer Description

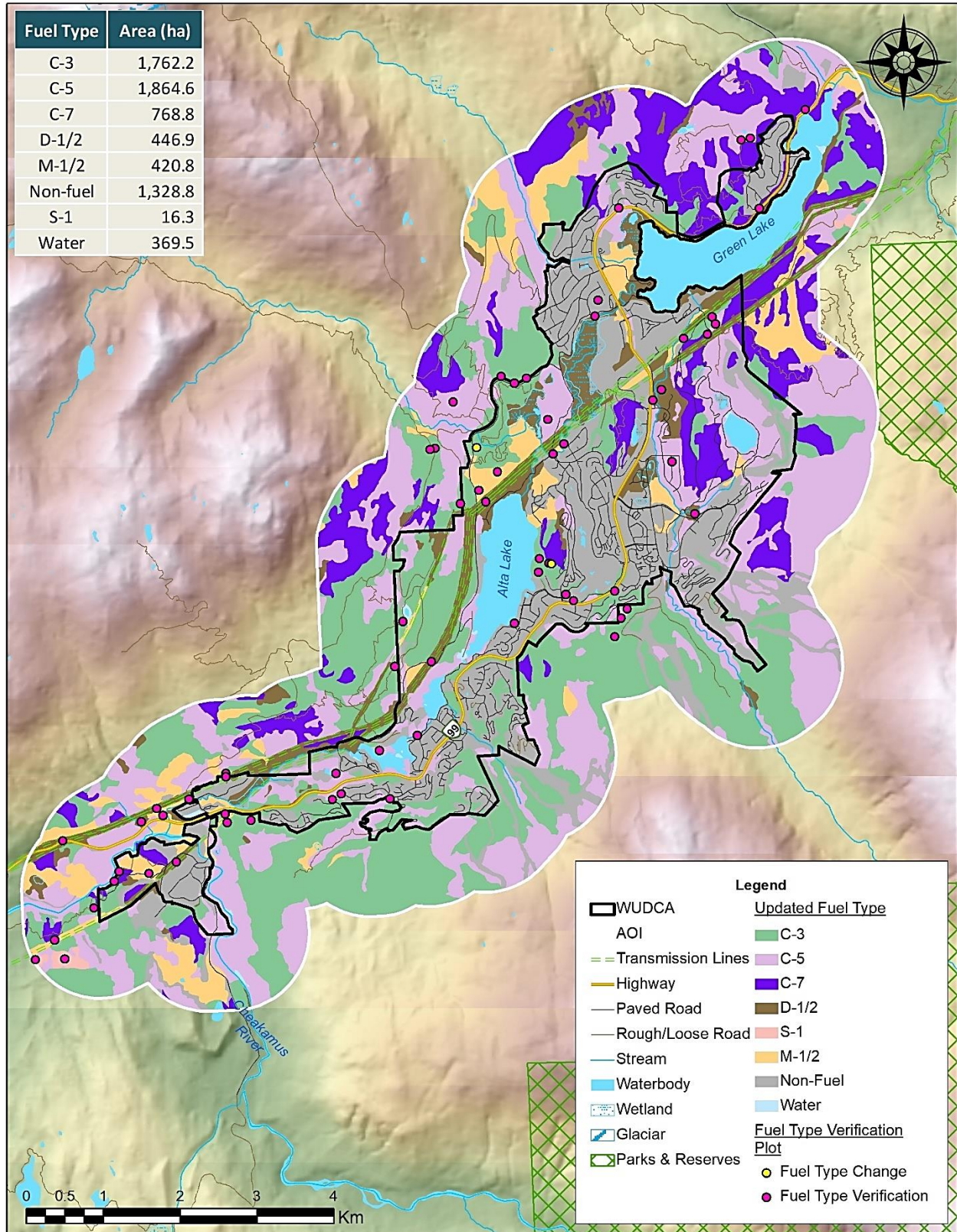
created through a comprehensive assessment of the BCWS' fuel type dataset, as updated through a verification and change process in the field.

It should be noted that fuel types on private residential land are typed as D-1/2 or 'non-fuel'. Other areas in the AOI classified as D-1/2 include deciduous dominated riparian areas (e.g., between Alta Lake and Green Lake). M-1/2 'mixed wood' fuel types were assigned to planted cutblocks (5 - 25 years old), some shrubby slopes, and transmission line right-of-ways. C-5 and C-7 were assigned to more mature and open forest stands, respectively. C-3 was assigned to immature conifer-dominated stands. S-1 and S-2 are 'slash' fuel types and O-1a/b is a sparse 'grassland' fuel type. Where fuel types could not be updated from imagery with a high level of confidence, the original PSTA fuel type call was retained.

Table 11: Representative fuel-types/forest-types within the RMOW.

Common Fuel Type	Representative Photo
<p>C-3: Dense (greater than 60% crown closure) to moderately open stands of coniferous trees (>80%). Often assigned to younger, smaller-diameter regenerating stands that are denser than a mature C-5 stand. The amount and distribution of surface fuels and ladder fuels changes through succession of the forest. Also assigned to plantations entering stem exclusion.</p>	

Common Fuel Type	Representative Photo
<p>C-4: Young coniferous stands with greater than 4000 stems per hectare (very dense). Not commonly found in large continuous areas throughout the study area, but many pockets exhibiting this structure within a C-3, C-5 or C-7 stand exist.</p>	
<p>C-5: Mature stands with large, old trees, a high crown base height, and a deciduous/low flammability shrub component. Generally associated with low to moderate fire behaviour. In Whistler C-5 characterizes old-growth and some mature second growth.</p>	
<p>C-7: Lower density conifer stands with lower canopy closures, either due to recent mortality or rocky, thin soils. Generally associated with low to moderate fire behavior with surface fire carried in grass (or moss, fine surface fuel). In Whistler, C-7 types occur on south-facing slopes above Emerald, Alpine, and Stonebridge, and drier slopes south of Green Lake.</p>	



Map 3. Fuel types present within the AOI, displaying field points for fuel type changes and verifications.

4.1.3 WEATHER

The climate in Whistler is largely characterized as a transitional zone between the coast and interior with warm and dry summers. The vast majority of the AOI is in the Coastal Western Hemlock Moist Submaritime (CWHms1) Biogeoclimatic (BEC) zone – the result of a broad-scale classification system for different ecosystems based on regional climate (Table 12). At higher elevation, very small portions of the AOI fall into the Mountain Hemlock and Engelmann Spruce Subalpine Fir BEC zones, which are characterized by much more wet and cool ecosystems receiving significantly more annual snowfall.

Biogeoclimatic Zone	Area (ha)	Percent of AOI (%)
CWHms1	6887	99
MHmm2	84	1
ESSFmw2	8	Nil

Table 12: BEC zones, subzones and variants within the AOI.
(Photo at right: Historic fire photo [estimated 1940's], looking north from Rainbow Lodge towards what is now the Alpine neighbourhood)¹⁹



Wildfire	Year	Size (ha)
V30160 (Elaho)	2015	12,495
V10237 (Nahatlatch)	2015	2912
V10247 (Nahatlatch)	2014	793

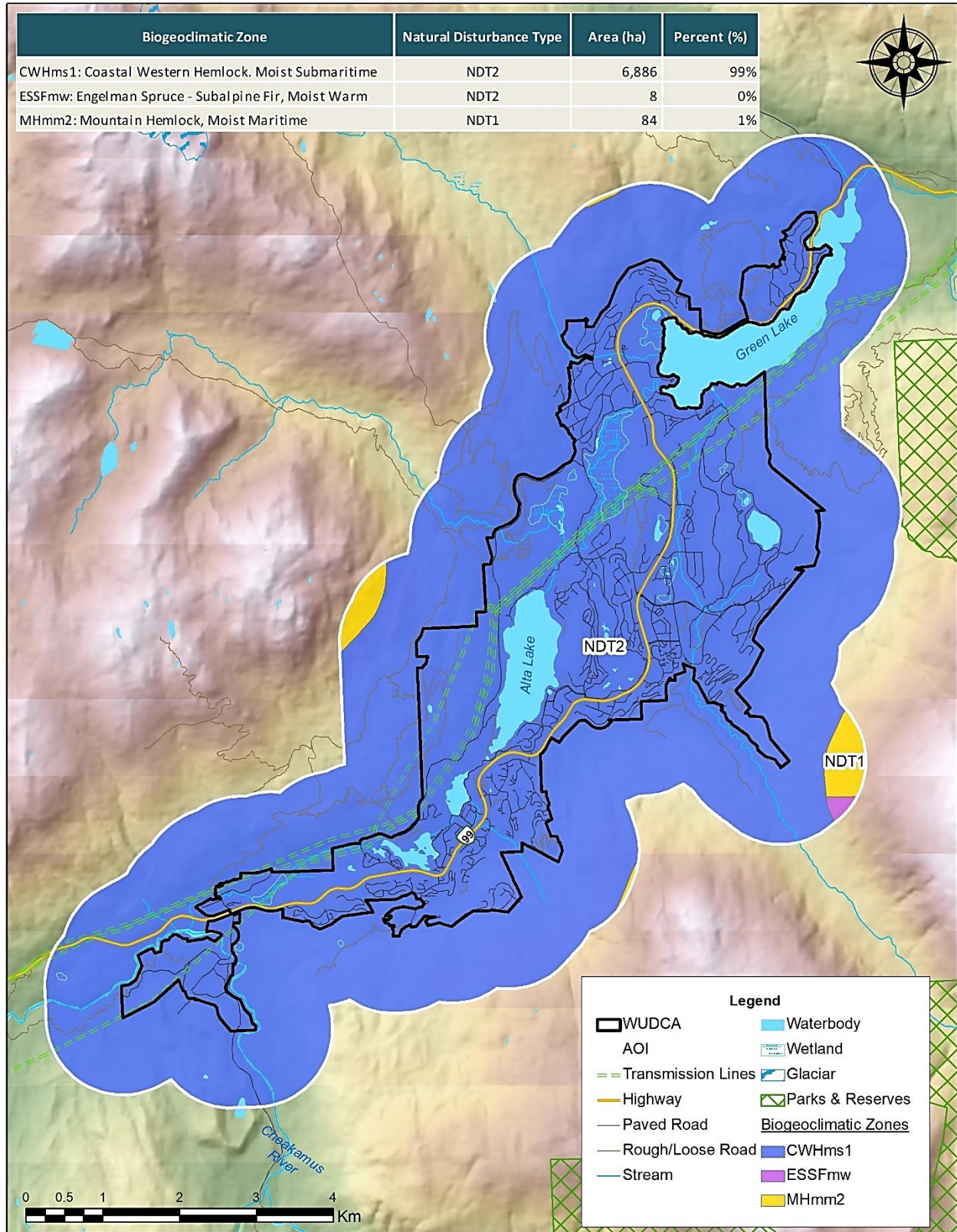
Table 13: Recent wildfires in the CWHms1/NDT2. (Photo at left: Boulder fire west of Pemberton in 2015)²⁰

The CWHms1 subzone is also defined as an ecosystem that naturally experiences infrequent stand-initiating wildfires, on a mean return interval of 200 years (Natural Disturbance Type [NDT] 2). Wildfires were often of moderate size (20 – 1000 ha), with larger fires occurring after long droughts. Historic ecosystems were mature with patches of younger forest resulting from disturbance. There were two notable large fires in NDT2 ecosystems in 2015 (Table 13). Both of these fires were found to have been ignited by lightning during a period of low rain after a winter with low snow pack, and were influenced by strong, dry outflow winds from the interior.²¹

¹⁹ Retrieved from the Whistler Museum Blog: <https://blog.whistlermuseum.org/2013/06/15/whistlers-wildfire-past-alpine-meadows-is-burning/>

²⁰ Retrieved from the Pique News Magazine via the BC Wildfire Service: <https://www.piquenewsmagazine.com/whistler-news/whistler-left-in-smoke-as-fire-crews-work-through-tough-conditions-to-battle-blazes-2498710>

²¹ MFLNRORD. 2016. Sea to Sky Natural Resource District Fire Management Plan.



Map 4: Distribution of Biogeoclimatic (BEC) zones throughout the AOI.

The BC Wildfire Service operates two weather stations within the RMOW, which capture important fire weather data throughout the fire season. The Callaghan station is over 6-kilometers from the AOI and at a significantly higher elevation than much of the developed valley (869m), while the Cheakamus station is within the AOI and at a valley-bottom elevation (595m). As the Cheakamus station was only established in 2017, Callaghan can be used to show longer-term trends in fire weather (Figure 10) while Cheakamus provides a representative look at present-day fire weather indices in the WUDCA (Figure 11).

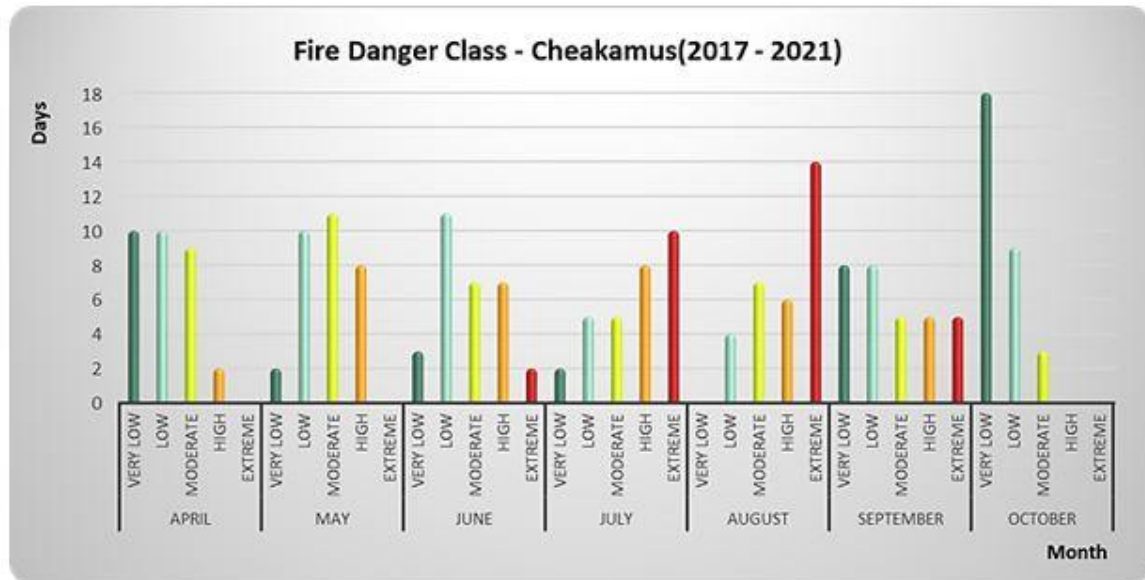


Figure 10. Average number of danger class days during the core fire season for the Cheakamus weather station. Presents a smaller sample size than Callaghan but in a more representative location (595m) for the developed portion of the RMOW.

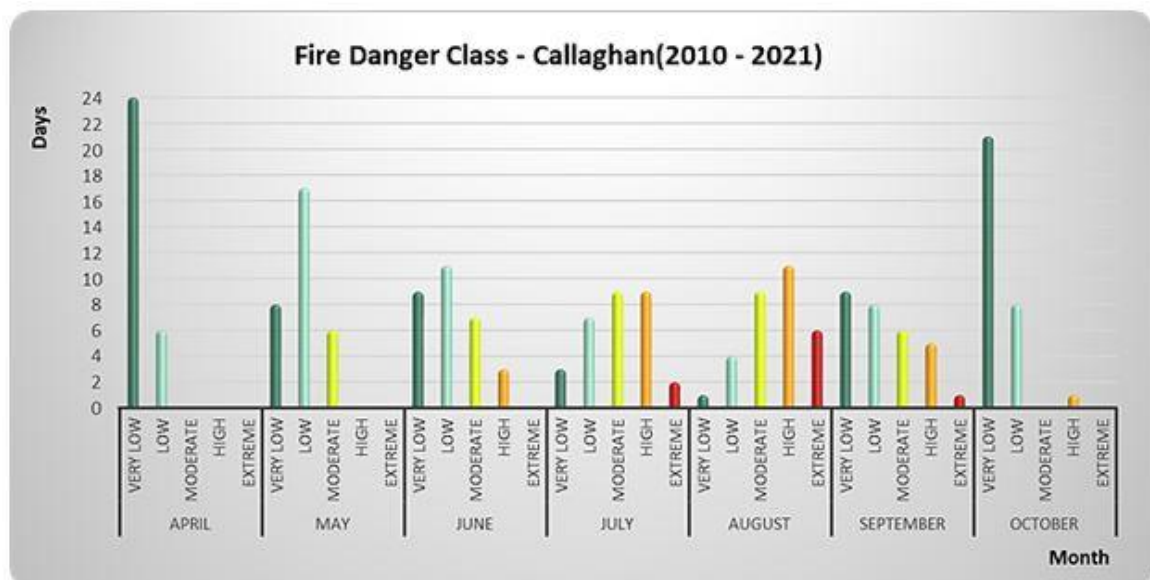


Figure 11. Average number of danger class days during the core fire season for the Callaghan weather station. Presents a longer-term average than Cheakamus but in a less comparable location (869m elevation).

In addition to annual fire weather conditions, arguably the most significant factor for wildfire growth is the prevailing wind direction. While the mountainous topography surrounding Whistler can locally influence wind conditions, weather models do show a consistent prevailing wind from the south-southwest. This aligns with the broad-scale topography of the valley, and has implications for wildfires that start upwind and spread toward any value at risk.

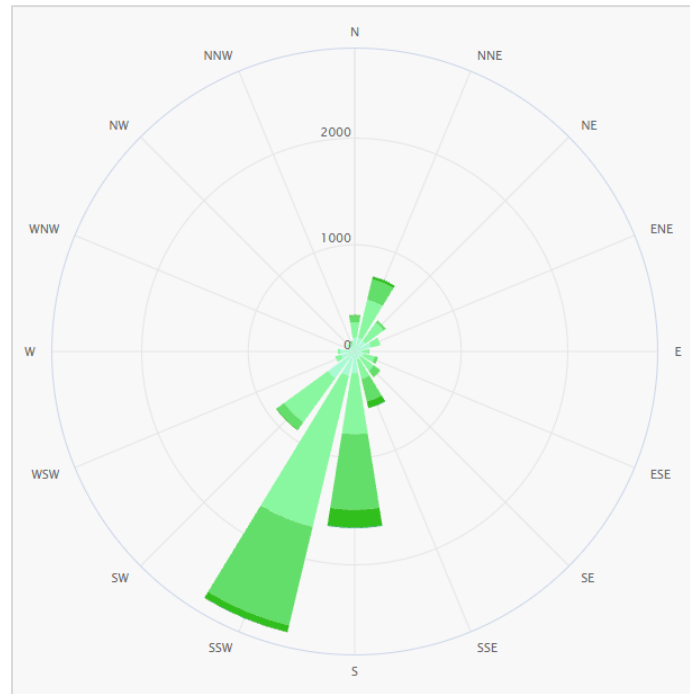


Figure 12 Frequency of wind counts by direction for Whistler (714m). (Source: Meteoblue weather)

Climate Projections

Through the RMOW's 2020 Climate Action Big Moves Strategy (preceded by the Community Energy Climate Action Plan [CECAP]), Whistler acknowledges the predicted effects that climate change will have on the municipality. Climate modelling within the CECAP shows that the Sea-to-Sky corridor will experience longer, hotter, and drier summers in coming years. The following statistics are from the Pacific Climate Impacts Consortium regarding climate projections for Whistler, through 2050²²:

- Milder winters, with 60-70% reductions in snowpack at low elevations;
- A 171% increase in the total number of summer days over 25°C;
- Decrease in summer precipitation by an average of 17%;
- Longer dry spells by an average of 15%;

²² Retrieved from: https://www.pacificclimate.org/sites/default/files/publications/WhistlerMemo_Final.pdf

While the forest types and BEC zones within the RMOW suggest a low-frequency yet high-severity fire regime, these climate projections may provide for an increase in fire frequency and severity within the RMOW. Halofsky, J.E., Peterson, D.L. & Harvey, B.J (2020) discuss how there may be only a small increase in fire frequency and severity in moist coniferous forests in the Pacific Northwest (PNW), but confidently project a large increase in frequency, extent, and severity in dry coniferous forests²³. This provides important information for the transitional climate of the RMOW as it shifts more and more away from coastal conditions and toward interior conditions. Halofsky also discusses how increased concentrations of carbon dioxide in the atmosphere may lead to more persistent high pressure blocking ridges across the PNW, which exacerbate drought conditions and the potential for fire.

Pritchard et al. (2021)²⁴ discuss how across multiple forest types in western North America, the frequency and extent of high-severity fire over the past few decades is outside the historic range of variability. These high-severity fires often accelerate vegetation change and forest conversion, and leave irreplaceable native habitats vulnerable to disturbance. Through the OCP, the RMOW has made clear that they understand the growing risk of wildfire as a result of a lengthier and more pronounced fire season.

4.2 WILDFIRE HISTORY

The forests within the RMOW have not experienced a significant wildfire event in the past 50 years. In order to be mapped and tracked provincially, a wildfire must exceed 1.0 hectare. Since 1920 there have only been 16 wildfires >1.0 ha, affecting 9.2% of the AOI (Map 5). Notable ignitions that garnered concern within recent years include a 31-hectare fire caused by lightning up at elevation on Blackcomb Mountain (2009) and a human-caused fire on the Blackcomb Benchlands (2017). Using ignition data from 1950 through 2019, there have been 120 ignitions within the AOI. Of the 120, 81% of these fires have been



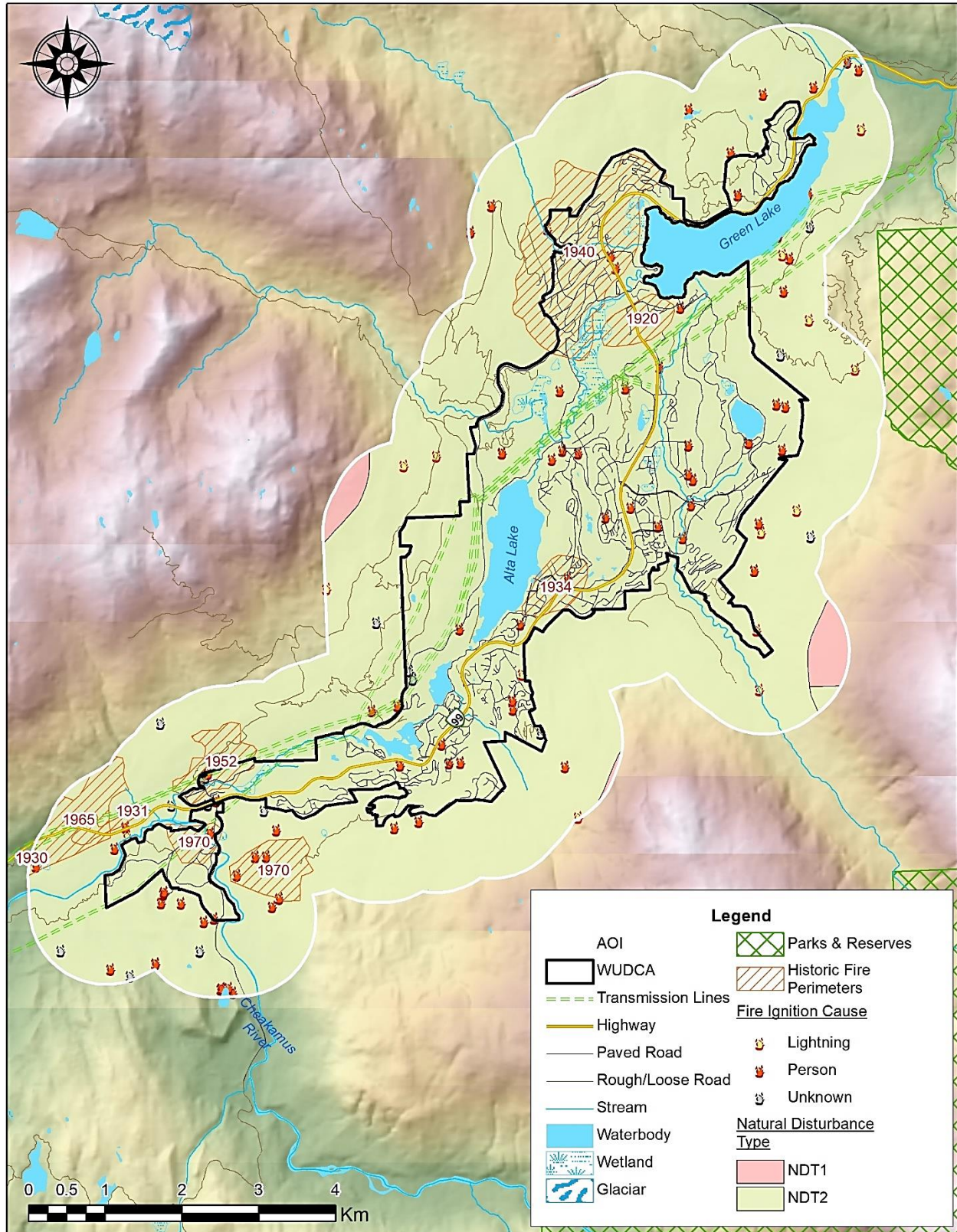
Figure 13: Structure fire from January 2021 at a construction site on Sunridge Drive in Whistler, with potential to spread into the surrounding interface. (Photo credit: Whistler Fire Fighters IAFF Local #3944, from <https://globalnews.ca/news/7581052/whistler-large-fire/>)

²³ Halofsky, J.E., Peterson, D.L. & Harvey, B.J. Changing wildfire, changing forests: the effects of climate change on fire regimes and vegetation in the Pacific Northwest, USA. *fire ecol* 16, 4 (2020). <https://doi.org/10.1186/s42408-019-0062-8>

²⁴ Prichard, S. J., et al. 2021. Adapting western North American forests to climate change and wildfires: 10 common questions. *Ecological Applications* 31(8):e02433. [10.1002/eap.2433](https://doi.org/10.1002/eap.2433)

human-caused, commonly from either an abandoned campfire, smoking, equipment-use, open-burning, or railroads. The four largest fires from this ignition database (1940/302 ha, 1965/178 ha, 1952 and 1970/61 ha) were all human-caused. Due to a historic lack of FireSmart compliance at the structure and neighbourhood level throughout the RMOW, human-caused or negligent structure fires spreading into the surrounding forest and adjacent structures is an ever-growing concern for the WFRS.

Significant wildfires have occurred near Whistler. Located roughly 35 kilometers to the west, the 2015 Elaho Valley wildfire was ignited by lightning and consumed approximately 12,500 hectares of forest from valley bottom to tree line, across forest types and topography that are directly comparable to those of the RMOW. This fire demonstrated the potential for severe wildfire behavior even in coastal old growth ecosystems given extreme fire weather conditions.



Map 5: Distribution of historic wildfires within the AOI. Fire perimeters greater than 1.0ha since 1920 are displayed along with reported point ignitions between 1950 and 2019.

4.3 PROVINCIAL STRATEGIC THREAT ANALYSIS

The BC Wildfire Service provides a spatially explicit overview of relative wildfire risk in the province through the Provincial Strategic Threat Analysis (PSTA). This spatial dataset provides a starting point to assess the wildfire risk within the RMOW, which is refined using a local wildfire risk assessment process in Section 4.4 Local Wildfire Threat Assessment. Three inputs are combined to create the PSTA wildfire risk analysis component:²⁵

- 1) **Historic fire density** represents the ignition and fire spread potential based upon historic patterns and fire density, weighted by fire size (larger fire perimeters were given a higher weight in order to reflect the greater cost and damage usually associated with larger fires).
- 2) **Spotting impact** represents the ability of embers or firebrands to be sent aloft and ignite additional fires outside of the main fire perimeter. Spotting is mostly associated with high intensity crown fires in coniferous fuels and frequently results in structure losses. In a review of the Fort McMurray wildfire, it was determined that the majority of home ignitions occurring at the outer edges of urban neighbourhoods were most likely caused by embers of the forest fire that attacked vulnerabilities in structures themselves and in fuels surrounding the homes²⁶. For this wildfire risk analysis, the spotting analysis is based on estimating the threat to a given point on the landscape from the fuels surrounding it, up to two kilometers. Spotting distances greater than two kilometers are rare and unpredictable.
- 3) **Head fire intensity (HFI)** represents the predicted intensity (measured in kW/m) of the fire front, and is correlated with flame length and fire behaviour. The greater the fire intensity (kW/m) and higher the fire intensity class, the more extreme the fire behaviour is likely to be and the more difficult the fire will be to suppress. The HFI used in the wildfire risk analysis was developed using 90th percentile fire weather index values.

The final wildfire risk analysis value is developed through an average weighting process of the three layers.²⁷ Values are then separated into 10 classes which represent increasing levels of overall fire threat (the higher the number, the greater the fire threat), with threat class 7 considered the threshold for conditions severe enough to potentially cause catastrophic losses in any given fire season, when overlapping with values at risk.

²⁵ MFLNRORD, BCWS. 2021. BC Wildfire PSTA Fire Threat Rating. Retrieved from: <https://catalogue.data.gov.bc.ca/dataset/bc-wildfire-psta-fire-threat-rating>

²⁶ Westhaver, Alan. 2017. Why some homes survived: Learning from the Fort McMurray wildland/urban interface fire disaster. Institute for Catastrophic Loss Reduction. Retrieved from: <https://www.iclr.org/wp-content/uploads/PDFS/why-some-homes-survived-learning-from-the-fort-mcmurray-wildland-urban-interface-fire-disaster.pdf>

²⁷ Weighting of the three PSTA wildfire threat analysis components: Fire density 30%; HFI 60%; spotting impact 10% (water bodies were automatically given a value of 'no threat' [-1])

The fire threat ratings for the AOI from the 2021 PSTA are summarized in Table 14 and spatially illustrated in Map 6. While 14% of the AOI is on private land and is not assigned a PSTA threat class, the threat of wildfire to values on private land and lands adjacent should not be neglected. In the 2021 PSTA, 53% of the AOI is classified as high threat.

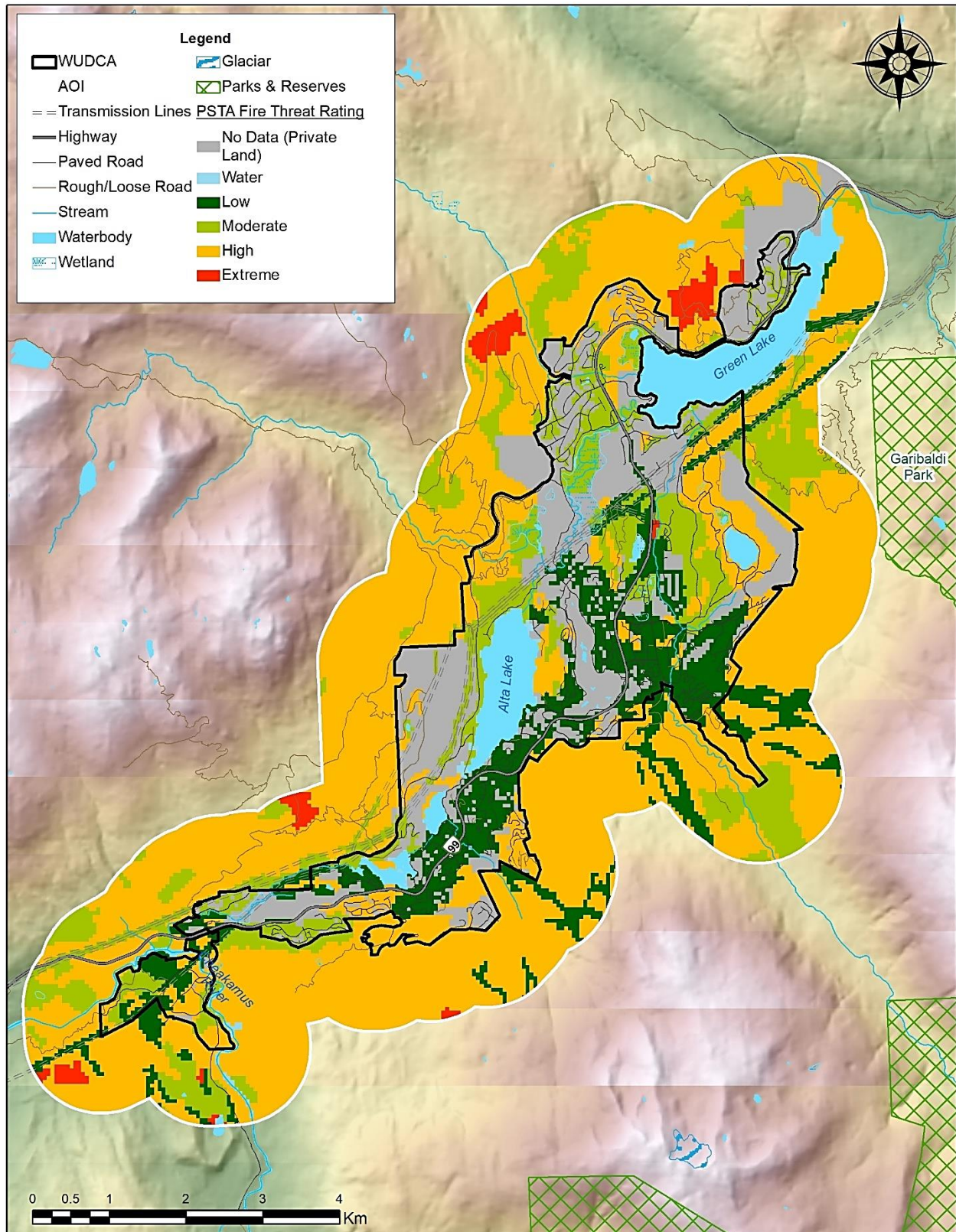
Table 14: Fire threat ratings as per the 2021 Provincial Strategic Threat Analysis dataset.

Threat Class	Area (ha)	Threat Class Description	Percent of AOI
-3	963	No Data (Private Land)	14%
-1	382	Water	5%
1 / 2 / 3	778	Low	11%
4 / 5 / 6	1041	Moderate	15%
7 / 8	3714	High	53%
9 / 10	99	Extreme	1%

While the results of the PSTA analysis do provide an excellent coarse-grained assessment of the wildfire threat throughout the AOI, there are considerable limitations associated with the PSTA wildfire risk analysis component. Based upon the accuracy of the source data and the modelling tools, the most notable limitations are:

- Limited accuracy and variability of the fire history point data;
- Sensitivity to an often inappropriate and/or unverified fuel type and the associated limitations of using fuel type approximations for fire behaviour modelling;
- 90th percentile rating for HFI, which represents a near worst-case scenario which may be artificial in some circumstances.

Consequently, the PSTA is complemented by a finer scale local wildfire risk analysis considering local factors to improve the wildfire risk assessment. The key steps to completing the local wildfire risk analysis and a detailed assessment of the local wildfire risk are described in Section 4.4 Local Wildfire Threat Assessment and in Appendix B: Local Wildfire Risk Process.



Map 6: Fire threat map of the AOI. Source: Provincial Strategic Threat Analysis data.

4.4 LOCAL WILDFIRE THREAT ASSESSMENT

There are two main components of this local threat assessment: the wildfire behaviour threat class (fuels, weather, and topography sub-components) and the WUI risk class (structural sub-component). The local wildfire threat assessment process includes several key steps as outlined in Appendix B: Local Wildfire Risk Process and summarized as follows:

- *Fuel type attribute assessment* – ground truthing and verification to produce an updated local fuel type map;
- *Proximity of fuel to the community* – recognizing that the fuel complex closest to a value usually represents the highest hazard;
- *Analysis of predominant summer fire spread patterns* – using frequent wind direction in combination with the Initial Spread Index²⁸ (ISI) from representative weather stations to assess weather-specific considerations of predicted fire spread;
- *Topography in relation to values* – slope percentage and slope position of the value are considered, where slope percentage influences the fire's trajectory and rate of spread and slope position relates to the ability of a fire to gain momentum uphill;
- *Stratification of the WUI* – with regards to wildfire threat given the above considerations, other local factors and field assessment of priority wildfire risk areas.

Wildfire Threat Assessment (WTA) plots were completed over a number of field days in May 2021 according to the 2020 WTA Guide²⁹ (See Appendix D: Wildfire Risk Assessment – Worksheets and Photos).

WTAs were completed in interface (i.e., abrupt change from forest to residential development) and intermix (i.e., where forest and structures are intermingled) areas of the AOI to support the development of priority treatment areas. A total of 13 WTA plots were completed and 688 other field stops (e.g., qualitative notes, fuel type verification, and/or photograph documentation) were made across the AOI in order to build the most accurate assessment of local fire risk possible (see Appendix F: WUI Threat Plot Locations and Map 7). For detailed field data collection and spatial analysis methodology for the local threat assessment and classification, see Appendix H: Fire Risk Threat Assessment Methodology.

²⁸ An intermediate input from the Canadian Forest Fire Behaviour Prediction (FBP) system; displaying the result of prevailing wind speeds and fine fuel moisture codes.

²⁹ 2020 Wildfire Threat Assessment Guide and Worksheets, Retrieved from:
<https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/fuels-management/2020-wildfire-threat-assessment-guide-final.pdf>

Field assessment locations were prioritized based upon:

- *Proximity to values at risk:* Focusing on structures in the intermix and interface, and around critical infrastructure;
- *Local knowledge:* Areas identified as hazardous, potentially hazardous, with limited access/egress, or otherwise of particular concern as vulnerable to wildfire;
- *Future treatment potential:* Areas that are logistically feasible for future fuel management projects, often containing dense second growth conifer stands and/or linking to pre-existing fuel breaks or access features;
- *Verifying provincial classification:* Areas classified as high or extreme threat in the provincial PSTA dataset or with an uncommon fuel type were ground-truthed to assess the fuel type and threat, even if they were relatively far from values;
- *Observations:* Additional areas potentially not recognized prior to field work that were visually identified as hazardous were assessed during the week.

Wildfire Behavior Threat Class Analysis

Combining the verified and updated fuel types throughout the AOI with WTAs and office-based analysis, the local wildfire threat was updated. Classes of the wildfire behaviour threat class analysis are as follows:

- Very Low: Waterbodies with no forest or grassland fuels, posing no wildfire threat;
- Low: Developed and undeveloped land that will not support significant wildfire spread;
- Moderate: Developed and undeveloped land that will support surface fires that are unthreatening to homes and structures;
- High: Landscapes or stands that are continuous forested fuels that will support candling, intermittent crown fires, or continuous crown fires. These landscapes are often steeper slopes, rough or broken terrain and/or south or west aspects. High polygons may include high indices of dead and downed conifers; and
- Extreme: Continuous forested land that will support intermittent or continuous crown fires.

The results of the wildfire behaviour threat class analysis are shown on Map 7 and in Table 15.

Table 15: Wildfire threat class summary across the AOI.

Wildfire Behaviour Threat Class	2021 CWRP Data Update	
	% of AOI	Hectares
Extreme	<1%	30
High	13%	748
Moderate	40%	2,377
Low	40%	2,390
Very Low/ No Threat (Water)	6%	370
No Data (Private Land and Private Managed Forest Land)	18%	1,062

WUI Threat Class Analysis

WUI Threat classes are quantified when the Wildfire Behaviour Threat (the above) is assessed as high or extreme, causing potential of unacceptable wildfire threats when near communities and developments.

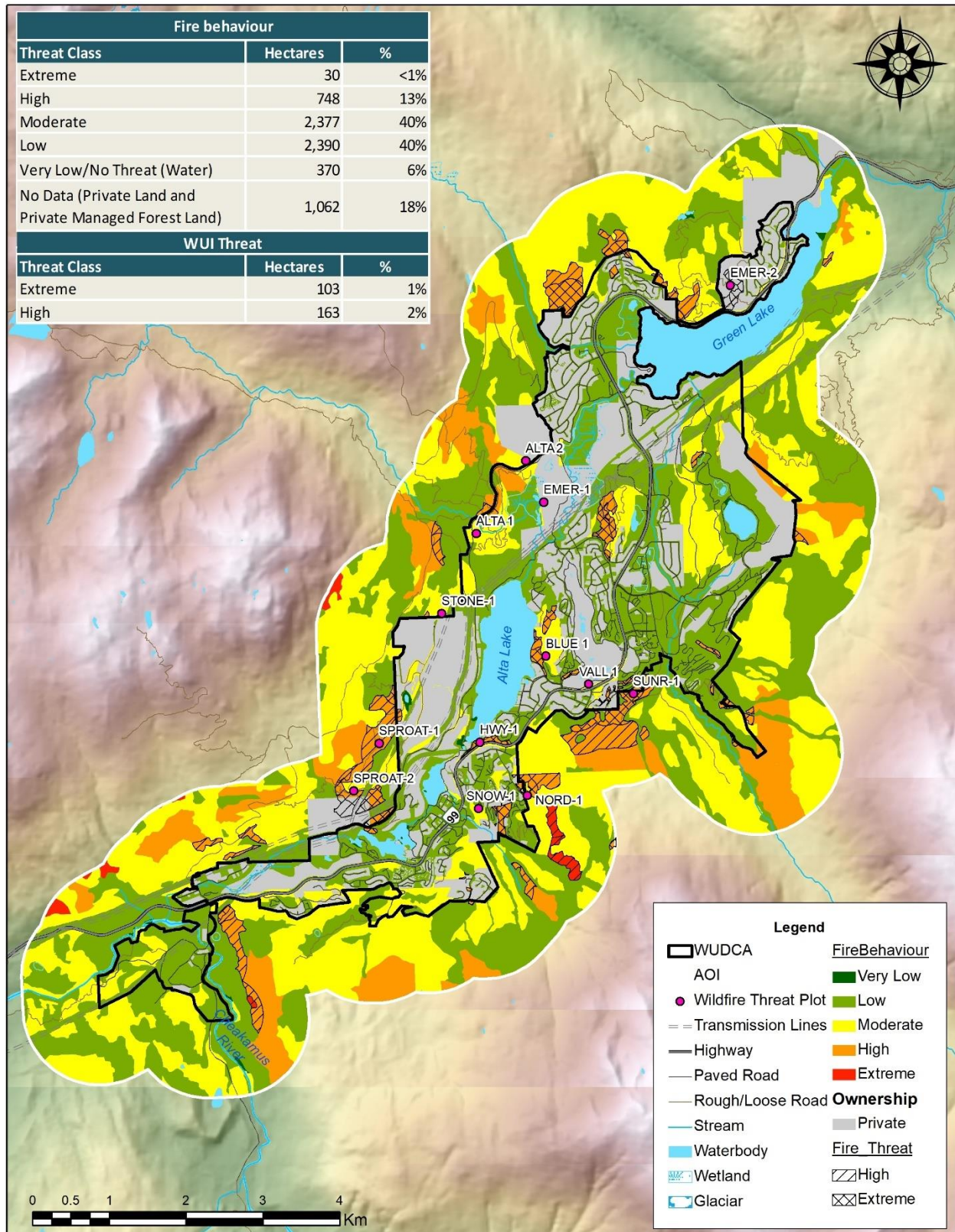
WUI Threat Classes are described below:

- Low: The high or extreme threat is sufficiently distant from developments, having no direct impact of the community and is located over 2 km from structures;
- Moderate: The high or extreme threat is sufficiently distant from developments, having no direct impact of the community and is located 500 m to 2 km distance from structures;
- High: The high or extreme threat has potential to directly impact a community or development and is located 200 m to 500 m from structures; and
- Extreme: The high or extreme threat has potential to directly impact a community or development and is located within 200 m from structures.

Table 16 (and also displayed on Map 7) summarizes the WUI threat class ratings within the AOI.

Table 16: WUI threat class ratings

WUI Threat		
Threat Class	Area (ha)	% of AOI
Extreme	103	1
High	163	2
Moderate	476	7
Low	-	-
N/A	5,226	75
No Data (Private Land and Private Managed Forest Land)	1,031	15



Map 7: Local fire behaviour

SECTION 5: FIRESMART PRINCIPLES

FireSmart Canada is the leading program in the country aimed at empowering the public and increasing neighbourhood resilience through wildfire mitigation measures. The FireSmart program covers a breadth of preventative measures which are founded in the seven FireSmart disciplines: Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Cross-Training, Emergency Planning, and Vegetation Management. These seven disciplines and the guiding principles behind FireSmart can be applied at a number of spatial scales, and are not restricted to any type of land ownership, forest type or property type. A summary evaluation of the current level of FireSmart implementation within the AOI of this CWRP is presented below in Figure 14 and Table 17, while many of these FireSmart activities will be looked at in detail in the following subsections. All the activities listed in Table 17 are eligible for funding under the 2021 CRI FireSmart Community Funding and Supports program.

The RMOW has been actively performing FireSmart measures since the development of the 2005 CWPP, and has established a leading FireSmart Program within the province. Both FireSmart BC and Shaw Spotlight filmed videos in 2021 to highlight the efforts of the FireSmart program in Whistler, showcasing successes with the FireSmart Canada Neighbourhood Recognition Program (FCNRP), Home Partners Program (HPP) and development considerations.³⁰ The RMOW has consistently secured funding through the provincial CRI program and its previous successors (i.e., Forest Enhancement Society of BC [FESBC] and the Strategic Wildfire Prevention Initiative [SWPI]), while prioritizing resilience efforts through internal funding. Proposed project budgets for 2021 through 2025 earmark \$148,000 for wildfire protection through the WFRS, and \$8,800,000 for community wildfire protection through the environmental stewardship division.³¹



Figure 14. RMOW FireSmart Program graphic³²

³⁰ Shaw Community Link: <https://www.youtube.com/watch?v=qaFrmxXsih8>

FireSmart BC: <https://firesmartbc.ca/whistler-shows-how-wildfire-prevention-should-be-done-today-and-tomorrow/>

³¹ RMOW Proposed 2021-2025 Project Budgets:

https://www.whistler.ca/sites/default/files/2021/Feb/related/4347/rmow_2021-2025_proposed_project_budgets.pdf

³² <https://www.whistler.ca/services/emergency/fire/firesmart-whistler>

Table 17: FireSmart activities funded through the 2021 UBCM CRI program and their level of implementation in the AOI.

FireSmart Discipline	FireSmart Activities	Current Status
Education³³	Update public signage, social media, websites and/or newsletters	<ul style="list-style-type: none"> Considerable amount of information available online on the RMOW FireSmart page. FireSmart Program and fire hazard is frequently advertised through social media.
	Distribute FireSmart educational materials and resources	<ul style="list-style-type: none"> Distributed online and through local workshops and events.
	Develop education for the reduction of local human-caused fires	<ul style="list-style-type: none"> Fire hazard and campfire bans are aggressively promoted.
	Encourage community participation in Wildfire Community Preparedness Days, organize and/or host FireSmart events and workshops	<ul style="list-style-type: none"> Events actively being hosted.
	Support neighbourhoods to apply for FireSmart Canada Neighbourhood Recognition Program	<ul style="list-style-type: none"> Currently 15 FireSmart Canada recognized neighbourhoods in the RMOW, and looking to expand.
	Offer FireSmart rebate program	<ul style="list-style-type: none"> Yet to be established.
Legislation and Planning	Develop or amend a CWRP/CWPP	<ul style="list-style-type: none"> CWPPs completed in 2005 and 2011. RMOW-funded Wildfire Strategy completed in 2017.
	Develop FireSmart policies for the design and maintenance of public land, such as regional parks, or buildings	<ul style="list-style-type: none"> Plan in place for 2022 to develop public building practices and policies.
	Conduct FireSmart Assessments for publicly owned buildings	<ul style="list-style-type: none"> CRI application for 2022 specifies 50 planned and identified pieces of RMOW critical infrastructure.
Development Considerations	Amend OCPs or bylaws to incorporate FireSmart principles	<ul style="list-style-type: none"> Already pursued multiple changes, see Sections 2.3 and 0.
	Revise zoning and development permit documents to include FireSmart considerations	<ul style="list-style-type: none"> Developed a Wildfire Protection DPA as part of the 2020 OCP.
	Establish Development Permit Areas for Wildfire Hazard	<ul style="list-style-type: none"> Developed as part of the 2020 OCP.
	Include wildfire prevention and suppression considerations in the design of subdivisions	<ul style="list-style-type: none"> Included in the Wildfire Protection DPA.
	Replace building materials (home and critical infrastructure) with fire-resistant materials	<ul style="list-style-type: none"> Required as part of the Wildfire DPA. No rebate program currently established.

³³ The results were unavailable at the time of writing, but the RMOW was currently conducting a public survey to assess the public's awareness of the FireSmart Program.

FireSmart Discipline	FireSmart Activities	Current Status
		<ul style="list-style-type: none"> A high proportion of structures within the RMOW still exhibit hazardous building materials.
	Amend referral processes for new developments to ensure multiple departments, including the fire department and/or emergency management personnel, are included	<ul style="list-style-type: none"> Included in the Wildfire Protection DPA.
	Develop plans for residential areas: - Conduct HIZ assessments for individual properties - Develop FireSmart Neighbourhood Plans - Undertake Neighbourhood Wildfire Risk Assessments for neighbourhoods pursuing FCNRP status	<ul style="list-style-type: none"> Ongoing as part of the FireSmart Program.
Interagency Cooperation	Develop, coordinate, and/or participate in a Community FireSmart Resiliency Committee or multi-agency fire and/or fuel management planning table	<ul style="list-style-type: none"> “Wildfire Working Group” had convened from 2016-2018, representing multiple levels of RMOW staff and multiple land managers. No comparable program currently established.
	Provide Indigenous cultural safety and humility training to emergency management personnel	<ul style="list-style-type: none"> Unknown at the time of writing. FireSmart Supervisor is seeking to include a Traditional Ecological Knowledge (TEK) workshop for the FireSmart team.
	Attend 2021 FireSmart BC Conference, to be hosted by the BC FireSmart Committee	<ul style="list-style-type: none"> 2022 FireSmart BC Conference to be attended by the FireSmart Supervisor +1.
Cross-Training	Provide or attend training for Local FireSmart Representatives (LFR)	<ul style="list-style-type: none"> Current FireSmart Supervisor is a qualified LFR Facilitator. 2021 FireSmart crew (6 individuals) and FireSmart Coordinators (2) are LFRs. Emergency Program Coordinator and Dpt. Fire Chief are LFRs. See Recommendation #15.
	Support LFRs to attend facilitator training	<ul style="list-style-type: none"> Current FireSmart Supervisor is a qualified LFR Facilitator, facilitator for the HPP, and a Wildfire Mitigation Specialist (WMS). Two FireSmart crew and FireSmart Coordinators are WMSs.
	Cross-train fire department members SPP-WFF1 Wildland Firefighter Level 1 ICS-100	<ul style="list-style-type: none"> Majority of WFRS firefighters (career and POC) have these certifications. See Recommendation #14.
	Professional development to increase capacity for FireSmart activities	<ul style="list-style-type: none"> FireSmart Supervisor is an ISA certified arborist, with crew being developed annually as arborists with ongoing and progressive training.

FireSmart Discipline	FireSmart Activities	Current Status
Emergency Planning	Develop and/or participate in cross-jurisdictional meetings and tabletop exercises focused on wildfire preparedness	<ul style="list-style-type: none"> Annual cross-training between the WFRS and BCWS crews.
	Assess structural protection capacity	<ul style="list-style-type: none"> Share SPU with District of Squamish
	Use and/or promote EMBC Wildfire Preparedness Guide for community emergency preparedness events focused on wildfire	<ul style="list-style-type: none"> Adequately promoted by the FireSmart Program.
Vegetation Management	Undertake fuel management on publicly owned land (fuel management prescriptions, treatments, maintenance, or prescribed burns)	<ul style="list-style-type: none"> Actively engaged in both prescription development, implementation, and FireSmart works.
	Remove or reduce flammable vegetation up to 100 m from critical infrastructure	<ul style="list-style-type: none"> Planned assessments are in place for 2022, with follow up mitigation measures.
	Provide vegetative debris disposal for homeowners Provide a dumpster or chipper Waive tipping fees	<ul style="list-style-type: none"> Community Chipper Days program established. Debris disposal bins provided to neighbourhoods.





**FireSmart
WHISTLER**

**WILDFIRES
HAPPEN HERE**






**Whistler residents are
working together to
reduce the impact
of wildfires.**

EMBERS BURN HOMES

HOW WILDFIRES SPREAD



SPARKS/EMBERS
This is the burning debris that can be thrown up to two kilometres ahead of a wildfire. Sparks and embers can ignite materials on or near your home, causing severe damage.



EXTREME HEAT
Radiant heat from a wildfire can melt vinyl siding, ignite your home and even break windows. Extreme heat can come from flames within 30 metres of your home.



DIRECT FLAME
As wildfires spread towards homes, they ignite other flammable objects in their path. Breaks in this path, especially close to your home, can help reduce this threat.

WHAT YOU CAN DO!

HOUSE OWNER

- FireSmart your property, visit whistler.ca/firesmart
- Plan a neighbourhood FireSmart Community Chipper Day
- Request a free FireSmart home assessment: whistler.ca/fire

STRATA PROPERTY OWNER

- Ask your Strata Council to request a FireSmart assessment
- Plan a strata based FireSmart Community Chipper Day

RENTER

- Share the FireSmart information with your landlord

CHECK YOUR STRUCTURE

ROOFS: ensure they are fire resistant or fire retardant
CHIMNEYS: install a spark arrestor
DOOR: ensure they are fire rated and have a good seal

REMOVE THE FUEL

Begin at the structure and work outward to 10 metres
 Make this a fire-resistant zone, free of all materials that could easily ignite from a wildfire including conifers, surface fuels, firewood, recreational vehicles.
 Prune all tree branches with 2 meters of the ground.

HOW WILDFIRES GROW

EMBERS IGNITE FUELS CLOSE TO STRUCTURES
Coniferous trees, firewood, dried garden debris, recreational vehicles.

EMBERS IGNITE STRUCTURES
Wood shakes, wood or vinyl siding, doors and chimneys.



YARD SPACING
Changes within 10 meters of your home will have the biggest impact



PRUNE TREES
Prune all tree branches within 2 meters of the ground



For more information consult the home owners FireSmart Manual whistler.ca/firesmart

**HELP MAKE WHISTLER
A WILDFIRE RESILIENT COMMUNITY**
For more information visit whistler.ca/firesmart

Resort Municipality of Whistler
whistler.ca/firesmart





Figure 15: The RMOW's FireSmart brochure - detailing the risk of wildfire in Whistler, and various preventative measures for homeowners.³⁴

³⁴ https://www.whistler.ca/sites/default/files/2018/May/related/23731/2018_whistlerfiresmartbrochure.pdf

5.1 NEIGHBOURHOOD OVERVIEW

The RMOW has distinct neighbourhoods that are exposed to different levels of wildfire risk depending on their location, the fuel that surrounds them, and the materials they are constructed from. While some of the older valley-bottom neighbourhoods are surrounded by less hazardous fuel types or fuel breaks (e.g., water bodies, golf courses, and built-up areas), construction materials and landscaping styles are generally not FireSmart compliant. Some newer developments have been built with more FireSmart principles in mind, but are generally located in more hazardous locations – on slopes and in the intermix, rather than the interface. Residential neighbourhoods in Whistler are frequently sub-divided into strata corporations, with up to 80% of permanent residents in the RMOW living in strata developments.³⁵

As a municipality, the RMOW has been the recipient of a FireSmart Community Protection Achievement Award, while up to 15 individual stratas and/or neighbourhoods have achieved recognition as FireSmart Neighbourhoods.³⁶ For this CWRP, all of the unique neighbourhoods in the RMOW were assessed for relevant fire risk and general FireSmart risk and resilience factors (Table 18). Neighbourhoods were clumped together where they are close geographically and/or exposed to similar hazards. The mitigation actions recommended will be explored in further detail through the recommendations of this CWRP.



Figure 16: View of Alpha Lake looking north up the valley. Photo credit: Whistler Content Hub, Destination BC/ Heath Moffatt.

³⁵ Personal communication with RMOW FireSmart Supervisor, Scott Rogers (May 13, 2021).

³⁶ Data via personal communications with RMOW FireSmart Supervisor, Scott Rogers (May 13, 2021). Individual neighbourhoods are highlighted in Table 18 below. Recognition is based off of FireSmart Canada Recognition criteria, found here: <https://www.firesmartcanada.ca/programs-and-education/neighbourhood-recognition-program/>

Table 18: Assessment of FireSmart vulnerabilities and potential mitigation measures by neighbourhood within the RMOW AOI.

Municipal Neighbourhood ³⁷	General Location	Profile	Risk Factors	Mitigation Measures
Alpha Lake Village	Immediately North of Hwy99 East end of Alpha Lake	<ul style="list-style-type: none"> Valley bottom. Valley Trail runs along the Highway and then intersects neighbourhood. 	<ul style="list-style-type: none"> Surrounded by private forested land surrounding, other than the Highway right-of-way. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level, continue Valley Trail mitigation measures
Alpine Meadows <i>19 Mile Creek (2020)</i> <i>Fissile Lane (2019)</i>	North end of Alta Lake Road West of Hwy99 & Green Lake South	<ul style="list-style-type: none"> "Alpine Meadows" fuel management block completed (2017). North end under prescription (Rainbow TU-01, Rainbow RMOW 6). East side of Highway 99 being implemented (High School). 	<ul style="list-style-type: none"> Direct interface with coniferous slopes. Intermix neighbourhood with old coniferous vegetation and landscaping throughout. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level, continue Valley Trail mitigation measures. Implement the CCF Rainbow TU-01 block.
Alta Lake (Rainbow Lodge)	West shore of Alta Lake, East of Alta Lake Road.	<ul style="list-style-type: none"> Lakeshore, long access/egress along Alta Lake Road back to Highway 99. 	<ul style="list-style-type: none"> Private forested slope on the high-side of Alta Lake Road, below BC Hydro right-of-way 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level.
Bayshores, Kadenwood, Millar's Pond & Spring Creek <i>The Glades (2019)</i> <i>Bear Ridge (2020)</i>	Whistler Creek South: South of Hwy99, west of Creekside Village.	<ul style="list-style-type: none"> Private land parcels intermixed with municipal land Valley Trail running throughout the neighbourhoods Millar's Pond (2014) and Kadenwood (2008/09, 2015), Big Timber (2015) fuel management blocks completed. 	<ul style="list-style-type: none"> Steep, rocky, broken topography. Intermix neighbourhood with old coniferous vegetation and landscaping throughout. Some old cedar shake roofs noted Considerable coniferous growth along the Hwy99 corridor, downslope of private land parcels. Most areas are single access/egress. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level, continue to perform mitigation measures along the Valley Trail and adjacent municipal parcels. Assess access and mitigation along Millar's Pond Path and the Bear Creek/Bayshores Ski Out. Look at prescribing the Kadenwood Gondola block, and implementing adjacent WRR-identified blocks.
Blueberry & Alta Vista	East of Alta Lake,	<ul style="list-style-type: none"> Private land throughout the neighbourhood, 	<ul style="list-style-type: none"> In the immediate interface with Blueberry Park. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level

³⁷ Individual neighbourhoods and/or stratas within each area are italicized if they have received Neighbourhood Recognition under the FCNRP. Criteria for recognition under this program can be found at: <https://www.firesmartcanada.ca/programs-and-education/neighbourhood-recognition-program/>

Municipal Neighbourhood ³⁷	General Location	Profile	Risk Factors	Mitigation Measures
<i>Alta Vista II</i>	surrounding Blueberry Park, and west of Whistler Golf Club.	<ul style="list-style-type: none"> Evidence of strata/homeowner FireSmart thinning. Valley Trail runs throughout the neighbourhood; select municipal portions treated. 	<ul style="list-style-type: none"> Considerable cedar-shake roofing throughout 	<ul style="list-style-type: none"> Continue Valley Trail mitigation measures. Prescribe and implement fuel treatment in for Blueberry Park.
Brio <i>Suncrest (2020)</i>	South of Hwy99, immediately West of Whistler Village.	<ul style="list-style-type: none"> Private land throughout the neighbourhood, Brio fuel management block completed (2015) with additional area under prescription and proposed for prescription 	<ul style="list-style-type: none"> Coniferous vegetation and Valley Trail running between Highway 99 and private land. Untreated conifer slopes east of the community, between roads/ski-runs/A-Line. Cedar shake roofing common along Tantalus Drive. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level, and along the Valley Trail. Implement remainder of the Brio FMP, and/or prescribe immediate interface above Sunridge/Tantalus Drive (within the CRA).
Cheakamus Crossing <i>Whitewater (2020)</i>	South of Hwy99 and the Cheakamus River.	<ul style="list-style-type: none"> Considerable areas of non-fuel (deciduous, gravel pits, hydro right-of-ways), mixed in with development for employee-restricted housing. 	<ul style="list-style-type: none"> Ongoing development for high-density employee housing. Spans into the interface. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level Implement the Riverside prescribed treatments. Continue mitigation treatments along the Valley Trail east of the neighbourhood.
Emerald Estates	West of Hwy99 at the north end of the valley, adjacent to Green Lake.	<ul style="list-style-type: none"> Emerald West PTU is being prescribed for a fuel management prescription, as the RMOW has recently acquired an adjacent parcel of land. 	<ul style="list-style-type: none"> Surrounded by large parcels of private land and the Rideau Community Watershed. Intermix neighbourhood with old coniferous vegetation and landscaping throughout. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level Implement the Rainbow CCF4 (TU03 & 04) fuel management blocks. Discuss/incentivize the treatment of forested private land, and investigate alternative risk-mitigation methods (neighbourhood sprinkler programs).

Municipal Neighbourhood ³⁷	General Location	Profile	Risk Factors	Mitigation Measures
Function Junction	North of Hwy99, across from Cheakamus Crossing.	<ul style="list-style-type: none"> Largely industrial and commercial property, with hydro right-of-ways immediately upslope and considerable deciduous fuel types at valley bottom. There is an ability to investigate future harvest opportunities within the CCF upslope of the Rainbow-Sproatt Flank, but polygons are not being proposed through the scope of this CWRP. 	<ul style="list-style-type: none"> Dense coniferous forest upslope of the transmission line right-of-ways. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner/commercial level.
Nesters & Whistler Cay Estates <i>Sunrise (2020)</i> <i>Eagle Ridge (2019)</i> <i>Smoketree Village</i>	West of Hwy99, between the Whistler Golf Club and the Rainbow Substation.	<ul style="list-style-type: none"> Nesters Hill fuel management treatment completed with additional area under prescription. 	<ul style="list-style-type: none"> Intermix neighbourhood with old coniferous vegetation and landscaping throughout. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level. Continue implementation of municipal portions of the Nesters FMP after expansion of the Myrtle Philip Community School is decided on
Nicklaus North	East of Hwy99, surrounding Nicklaus North Golf Course and south of Green Lake.	<ul style="list-style-type: none"> Surrounded by the lake and golf course, no hazardous interface. Evidence of some pruning/FireSmart treatment throughout the neighbourhood. 	<ul style="list-style-type: none"> Series of new shake roofs installed (unaware if Class A or B). 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level.
Nordic Estates & Highlands <i>Castle Estates (2020)</i> <i>The Heights (2019)</i>	Whistler Creek North: South of Hwy99, Nordic Drive & Taluswood.	<ul style="list-style-type: none"> Multiple small municipal parcels scattered amongst private parcels. 	<ul style="list-style-type: none"> Mid slope neighbourhood surrounded by rocky, broken topography and coniferous fuel types. Single access/egress. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level, finish implementing the Taluswood FMP, assess natural municipal parcels for small-scale FireSmart mitigation treatments, and assess access, hazard and preparedness along the NW Passage ski-

Municipal Neighbourhood ³⁷	General Location	Profile	Risk Factors	Mitigation Measures
				out/trail. Assess along the highway for treatment potential.
Rainbow Estates	North of Hwy99 and Green Lake, between Alpine Estates and Emerald Estates.	<ul style="list-style-type: none"> Newly developed neighbourhood with effective FireSmart considerations put into development (landscaping, setbacks, building materials, access and turnarounds). Interface (north) almost exclusively under prescription. 	<ul style="list-style-type: none"> Direct interface with conifer forest to the north 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level. Implement all CCF and RMOW Rainbow fuel management blocks. Continue to mitigate along Highway99 and the Valley Trail.
Stonebridge	North of Alta Lake Road off of Stonebridge Drive.	<ul style="list-style-type: none"> Large lots, many still under development. Evidence of basic FireSmart fuel management within the development (roadside, surrounding lots, and along the Lower Sproatt Trail). 	<ul style="list-style-type: none"> Highly intermixed neighbourhood, positioned mid-slope. Largely rocky, broken topography and fuel types surrounding. Single access/egress along Stonebridge Drive. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level. Prescribe the Sproatt and Stonebridge fuel management prescriptions. Investigate sprinkler protection throughout the neighbourhood due to the large private land lots.
Twin Lakes <i>Tamarisk (2020)</i>	West of Alpha & Nita Lakes East of Alta Lake Road Along Old Gravel Road & Nita Lake Drive	<ul style="list-style-type: none"> Spaced coniferous vegetation and FireSmart qualities in Nita Lake. Ongoing construction for a new development west of Alta Lake Road in the Twin Lakes area. 	<ul style="list-style-type: none"> Private land surrounding, other than the Alta Lake Road right-of-way. Old Gravel Road lots are very intermixed and surrounded by old coniferous vegetation. Access issues: Old Gravel Road – gravel, narrow, turnaround issues. Dirt road connecting Nita Lake Drive to the North, but blocked by landowner. 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level, investigate hazard mitigation along Alta Lake Road.
Whistler Village/Blackcomb Benchlands <i>The Woods (2020)</i>	Within the Village, up Glacier Lane and the lower slopes	<ul style="list-style-type: none"> Fully private land throughout the neighbourhoods. Horstman fuel management blocks completed (2013), with 	<ul style="list-style-type: none"> Benchlands are in direct interface with coniferous forest. Intermixed neighbourhood with considerable coniferous vegetation throughout 	<ul style="list-style-type: none"> Promote FireSmart at the homeowner level. Assess the Blackcomb access roads for mitigation measures and access potential.

Municipal Neighbourhood ³⁷	General Location	Profile	Risk Factors	Mitigation Measures
<i>The Gables (2020)</i>	of Blackcomb Mountain.	additional area under prescription.		
White Gold	East of Highway 99, north of the Village, and west of Lost Lake Park.	<ul style="list-style-type: none"> • Older, intermixed neighbourhood in direct interface with Lost Lake Park. • Spruce Grove fuel management block implemented in 2020, with trail thinning throughout Lost Lake Park in 2006/08. 	<ul style="list-style-type: none"> • Considerable coniferous vegetation throughout the neighbourhood, with frequent evidence of homeowners storing firewood directly against their walls. 	<ul style="list-style-type: none"> • Promote FireSmart at the homeowner level.

5.2 EDUCATION

Public education and outreach play a critical role in helping a community prepare for and prevent a wildfire. Participating in wildfire risk reduction and resiliency activities also promotes a sense of empowerment and shared responsibility. This discipline often supports the successful implementation of many other FireSmart disciplines by building awareness and understanding within both residents and visitors.

Many of the goals of FireSmart go hand-in-hand with some of the most pertinent community goals of the RMOW, as demonstrated through community engagement polling for the RMOW's 2020 OCP (Figure 17). Continuing to protect the environment, infrastructure and community from wildfire threat while encouraging sustainable land management will not only make the RMOW more FireSmart, but will also provide the framework for a stronger and more connected community.



Figure 17: Results from community engagement polling from the RMOW's 2020 OCP.

As a result of the previous CWPPs and considerable effort by municipal staff and Whistler Fire Rescue Service, there are already many FireSmart education initiatives within the municipality. The RMOW has an [online page](#) dedicated to FireSmart, which includes a number of available resources for residents – detailing the FireSmart Home Partners Program, Work Days, Community Chipper Service, RMOW initiatives and much more. These programs as well as fire hazard and fire prevention are regularly and adequately communicated to the public through the RMOW website, news outlets, social media, and physical displays.

To improve FireSmart education in the RMOW, recommendations in this CWRP will focus on continuing general education measures, displaying RMOW initiatives and seeking strategic feedback, establishing incentive programs for homeowners, and reinforcing a desire to promote FireSmart landscaping. These recommendations will aim to increase the awareness for FireSmart within the

RMOW, and foster motive and desire among residents to make a meaningful difference (Table 19).

It should be noted that although educating tourists is a priority, RMOW's FireSmart education activities have primarily targeted residents. Tourists to the RMOW come from all over the Sea-to-Sky but mainly from the Lower Mainland. Tourist education may be most successful through regional initiatives coordinated in the Squamish-Lillooet Regional District Community FireSmart Resiliency Committee and should focus on safe forest recreation and evacuation information.

Table 19. FireSmart Education recommendations in the RMOW

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
Education (Section 5.2)							
Objective(s): 75% of Whistler residents aware of how to FireSmart their property, 50% of high-risk properties have applied FireSmart measures by 2030							
1	Med	<p>Create a strategic communications plan that identifies key goals, objectives and metrics to educate RMOW residents and tourists on wildfire risk and general FireSmart principles.</p> <p>- Keep the Whistler FireSmart website up to date; - Promote the FireSmart program via social media; - Continue to host FireSmart workshops; - Continue to present the FireSmart Education Box in local schools; - Continue distribution of the Whistler FireSmart brochure and FireSmart handouts (e.g., Home Owner's Manual, Landscaping Guide, many available as QR Codes); - Continue radio, signage, and in-person patrolling presence regarding wildfire risk and fire bans.</p>	<p>Public awareness of wildfire risk in Whistler is increasing. Risk is high on private property, and public FireSmart education is one of the best tools to mitigate it. Emergency management staff in the Sea-to-Sky have indicated that compliance with fire bans is low and fires are common in camping spots and along forestry roads.</p>	<p>RMOW (CCF, WFRS, SLRD)</p>	<p>1 Year and Ongoing</p>	<p>Achieve an annual increase with: FireSmart Home & Neighbourhood Assessments FireSmart Recognized Neighbourhoods FireSmart Neighbourhood/Strata Work Days Community Chipper Days Adopt-A-Trail Work Days Delivery of KinderSmart, FireSmart Jr. Officer, FireSmart Ambassador & FireSmart Leader courses.</p> <p>Annual investment in tourist education: social media, radio ads, CCF signage.</p> <p>Decrease in WFRS call-outs to campfires.</p>	<p>CRI: FireSmart materials Incremental staff costs Event costs. Signage and media updates.</p>

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
2	Med	<p>Communicate the steps that the RMOW is taking to mitigate wildfire risk within the municipality.</p> <ul style="list-style-type: none"> - Provide educational signage in historic and current fuel treatment areas (e.g., Lost Lake, Nesters, Cheakamus Road).; - Promote program activities and include maps and statistics on the RMOW website; - Consider distributing a semi-annual FireSmart newsletter; - Make the CWRP available online. 	<p>Public awareness increases acceptance and incites reciprocal action on private land.</p> <p>Public feedback informs the Whistler Wildfire/FireSmart Program.</p>	RMOW (WB/MRB)	<p>Post signage ASAP</p> <p>Provide ongoing information updates.</p>	<p>Feedback from fuel treatments feeds into the Whistler Monitoring Program and future fuel management prescriptions.</p> <p>Provide up-to-date information on the Preparedness page, and send broad-scale notifications of these efforts to the RMOW pre-fire season.</p>	<p>CRI: Signage. \$50-500 per sign Incremental staff costs</p>
3	High	<p>Assess and retrofit municipal critical infrastructure (i.e., communications, power, water and sewer infrastructure) to FireSmart standards and provide educational signage. Track assessments, sites and work completed in a database linked to the RMOW GIS. (See Recommendation 8)</p>	<p>Multiple critical infrastructure buildings are built with non-FireSmart material and/or surrounded by hazardous vegetation.</p> <p>Displays real-life FireSmart demonstrations to the public and showcases the willingness of the RMOW to proactively protect municipal infrastructure. Many of these structures also double as pieces of critical infrastructure to be used in the event of a wildfire emergency.</p>	RMOW	<p>Begin in 2022, continue to expand as required and/or as funding allows.</p>	<p>Secure funding for the retrofit and/or hazard mitigation of critical infrastructure</p>	<p>CRI: FireSmart Activities for critical infrastructure (\$25,000 max)</p>
4	Med	<p>Establish and promote a FireSmart rebate program for residents (also see Recommendation 22) prioritized to high-risk neighbourhoods.</p>	<p>Dozens of assessments are performed per year in the RMOW and the Home Partners Program is being integrated as of 2021. Assessments are the first step in a rebate program.</p> <p>Continue to encourage high-risk RMOW residents to have FireSmart Canada Home Partners Assessments completed and incentivize homeowners to perform recommendations from the assessment with (up to) a \$500 rebate, and/or an RMOW-led tree replacement program.</p>	RMOW	<p>Establish publicly in 2023, continue to expand as funding allows.</p>	<p>Secure funding to be directly allocated to the FireSmart Rebate Program.</p> <p>Formally track the number of rebates applied for and awarded, and categorize by the type of rebate.</p>	<p>CRI: Home Assessments & Rebate Program (50% rebate/homeowner, up to \$500)</p>

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
			Publish and distribute a publicly available FAQ regarding the rebate program.				
5	Low	<p>Work with local nurseries and landscape companies to highlight FireSmart preferred vegetation, as per the FireSmart Canada Landscaping Guide.</p> <ul style="list-style-type: none"> - Display and promote the Landscaping Guide; - Through the FireSmart BC Plant Tagging Program or internal avenues, display and promote the landscaping guide. Tag preferred and/or high-risk vegetation; investigate discounts on preferred vegetation. 	Conifer vegetation on private properties is a big risk factor. Educating the public and the landscaping industry on aesthetic, FireSmart alternatives may increase uptake.	RMOW (Industry)	<p>Engage: 2022</p> <p>In place: 2023</p>	<p>Presence of FireSmart information in local garden centers.</p> <p>Considerations from local landscape companies and/or development groups regarding FireSmart landscaping.</p>	CRI: Signage and Interagency Cooperation

5.3 COMMUNITY PLANNING

Legislative tools can have a profound impact on FireSmart requirements and initiatives throughout a municipality, and the RMOW has done a great job in aligning local bylaws and policies to best support community wildfire resilience. While the existence of wildfire-specific bylaws, policies, and a wildfire protection DPA is a great place to start, the intent behind these legislative pieces needs to be clearly communicated to the residents of Whistler, and their implementation needs to be supervised and tracked. Local bylaws, policies and plans, as well as higher level plans and legislation that relate to this CWRP were reviewed in SECTION 2: Relationship to Other Plans and Legislation. Two additional recommendations relating to legislation and planning are being proposed through this CWRP.

Table 20. Community Planning Recommendations for the RMOW

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
Community Planning (Section 5.3)							
Objective: Incorporating FireSmart guidance into the RMOW’s community planning and policy frameworks.							
6	High	Stay up to date with local, provincial and federal funding sources that support wildfire risk reduction, emergency preparedness, and disaster mitigation work (e.g., Community Resiliency Investment (CRI) program, federal Disaster Mitigation and Adaptation Fund, Intact Fund etc.). Where possible, leverage multiple funding sources and engage with adjacent stakeholders (CCF, SLRD) and First Nations to approach mitigation projects collaboratively.	<p>To fully implement the RMOW CWRP, provincial and federal funding sources are required in addition to municipal funds.</p> <p>Collaborative solutions are essential in areas where stakeholders and land managers overlap.</p>	RMOW (Consultant, CCF, DSQ, CRA/MRB, SLRD)	Annually	<p>Continued funding increases through local/provincial/federal avenues.</p> <p>Continued/expanded collaboration between multiple stakeholders (e.g., RMOW, CCF, DSQ, CRA) through planning and funding applications.</p>	CRI: Up to \$2,000 per meeting for participation in interagency FireSmart/wildfire committee
7	Low	In 2026, initiate an update of this CWRP. The frequency of updates is highly dependent upon major changes which would impact local wildfire risk, or the rate at which wildfire risk reduction efforts are implemented. An evaluation of major changes (including funding program changes that may lead to new opportunities) and the potential need for a CWRP update should be initiated every 5 years.	A current (i.e., no more than 5 years old) CWRP is currently a requirement for further funding under the CRI Program.	RMOW (Consultant)	5-6 Years	Ensuring the RMOW has an up-to-date CWRP and action plan.	CRI: \$25,000 (CWRP Update)

5.4 DEVELOPMENT CONSIDERATIONS

Concerns regarding wildfire risk in new developments in the RMOW were first raised in the 2005 CWPP, and have since been well addressed through legislative avenues. As part of the 2020 OCP, the RMOW has enacted a Wildfire Protection Development Permit Area (DPA), which functions to protect development from wildfire.^{38,39} This is a significant step forward in proactively building wildfire resilience, especially in a growing interface community like Whistler. Wildfire DPA compliance and guideline enforcement will ultimately determine its effectiveness. The following points highlight components of the Wildfire DPA:

- No requirement for a DP when replacing a roof with anything other than untreated wood shakes (i.e., Class A/B fire retardant rating);
- Spacing coniferous vegetation set distances away from principal structures and from other conifers;
- Highlights preferred landscaping, and preferred trees to retain where vegetation is being altered;
- Recommends particular building materials and features;
- Requires a FireSmart Assessment and consideration of recommendations when developing in an area designated as “Wildland”.

Figure 18 shows the portions of the RMOW to which the Wildfire DPA applies. It should be noted that although rated shake roofs are currently allowed under DPA guidelines, this has been brought up as a concern due to the durability of fire-retardant coatings. The RMOW could investigate the possibility of banning shakes altogether in a future Wildfire DPA amendment.

³⁸ The wildfire protection DPA defines “development” as any of the following: alteration of land; disruption or destruction of vegetation; construction of, addition to, or alteration of a building or structure; subdivision of land.

³⁹ Chapter 13 / Schedule S of the 2020 OCP: <https://www.whistler.ca/ocp/wildfire-protection>

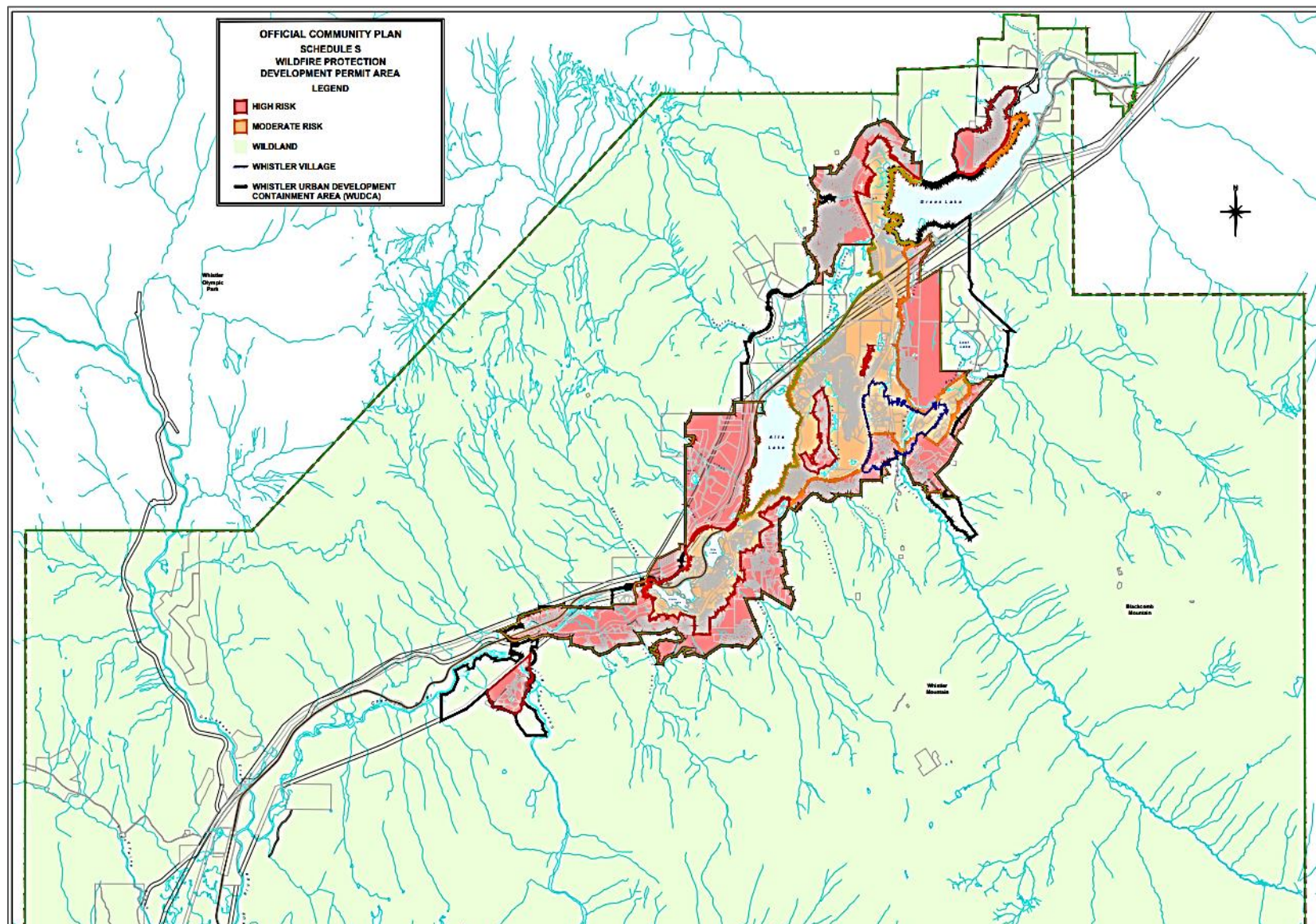


Figure 18: Areas in red and orange are included in the RMOW Wildfire Protection Development Permit Area

On top of the wildfire protection DPA, Policy 4.1.6.4 in Chapter 4 (Growth Management) of the RMOW's OCP states that any proposed developments that require an OCP or zoning amendment must be serviceable by fire protection services, accessible via the local road system, and evaluated to assess the impacts on wildfire hazard. The following two recommendations are being made with respect to incorporating wildfire resiliency in future development considerations.

Table 21. Development Consideration recommendations for the RMOW

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
Development Considerations (Section 5.4)							
Objective: Providing for the resilience of new developments in the RMOW, through community land use and development-related plans and bylaws.							
8	Med	Prepare a database linked to the RMOW GIS that includes the 2014 home assessments and tracks properties and municipal infrastructure that have implemented proactive wildfire protection initiatives including FireSmart thinning and rooftop sprinklers. (See Recommendation 3)	FireSmart work on private land is not comprehensively mapped or tracked in the RMOW.	RMOW	1 Year and Ongoing	Spatial database that can be easily shared and displayed on pdf maps	Internal
9	Med	Adopt a policy to ensure that property owners are notified of and taking actions to mitigate fire hazard on private land, especially on large undeveloped parcels with a high wildfire risk as identified by a professional assessment or judgement.	Municipalities have a duty to warn of hazards on private property. Warning private property owners of fire risk may accelerate action on private land. Review opportunity and prepare a policy and action plan to implement the Fire Chief’s authority in the Fire and Life Safety Bylaw.	RMOW (Consultant)	1 Year	All large private land holdings with high hazard receive notification.	CRI: Development Considerations

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
10	Med	Consider reviewing and amending the Wildfire DPA guidelines to strengthen certain aspects, for example, rated shake roofing.	Current Wildfire DPA guidelines do not specify the standard to which shake roofs must be rated – for example, Class A or Class B under ASTM/UL standards. There are also concerns with the durability of fire retardant coatings.	RMOW	5 years	The Wildfire DPA is amended as required to improve community resilience to wildfire	Internal

5.5 INTERAGENCY COOPERATION

The 2017 Whistler Wildfire Strategy identified that “stakeholder silos” have been a key barrier to success for wildfire mitigation initiatives throughout the RMOW. This issue still exists today as multiple land managers and emergency personnel in the RMOW are delivering FireSmart and fuel management programs independently of one another with overlap and without a coordinated approach. It is important to recognize that any amount of mitigation work whether organized or not is better than none, but the following basic issues were noticed through field work and background research for this CWRP:

- A lack of organization regarding what portions of forestland have received fuel management treatments;
- Portions of municipal fuel management blocks having been treated without RMOW knowledge (often inadequately to fuel management prescription specifications);
- Interface portions of Crown/CRA land being tendered for treatment, despite sharing boundaries with hazardous municipal parcels;
- Fuel management efforts being performed in new subdivisions and pre-existing stratas with a lack of oversight and management from the FireSmart Program or qualified forest professionals.
- Pushback and/or a lack of understanding from local advisory committees regarding fuel management efforts.

As an active wildfire will not stop at the point where the Cheakamus Community Forest meets a parcel of municipal forest or the Controlled Recreation Area meets privately held land, wildfire mitigation efforts need to be developed collaboratively between multiple agencies. The diversity in issues addressed through the seven FireSmart principles illustrates how complex of an issue wildfire resiliency and preparedness is; an issue that can only be effectively addressed if stakeholders at all jurisdictional and spatial scales are brought to one planning table.

Convened from 2018 through 2020, the Wildfire Working Group was a RMOW-led initiative to address this issue of stakeholder silos. The Wildfire Working Group came up with holistic management decisions that were based on feedback and advocacy from multiple user groups and land managers. The 2021 CRI Program Guide for CWRPs defines this equivalent group as a Community FireSmart Resiliency Committee (CFRC). The reestablishment of this group is recommended in this CWRP (Recommendation 11).

Table 22 outlines many of the key individuals and stakeholders that should be considered for participation in the RMOW’s new Wildfire Working Group/CFRC. Input from these parties has helped to form the action plan for this CWRP, and it should be recognized that this list is not exhaustive or permanent.

Table 22: Recommended members of the RMOW's Community FireSmart Resiliency Committee (CFRC)

Agency	Title	Role/Comments
RMOW	Environmental Stewardship Manager	Recommended lead of the CFRC. Should oversee and coordinate all FireSmart related programs in the RMOW.
	FireSmart Supervisor/Coordinator	Oversee and continue to expand the FireSmart Program.
	WFRS Chief WFRS Deputy Chief	Continue to provide emergency services – work internally and with the BCWS to increase wildfire preparedness.
	Emergency Program Coordinator	Continue to address the emergency program and identify deficiencies.
	Forest and Wildland Advisory Committee	Provide non-wildfire focused input regarding environmental management practices.
Whistler Blackcomb	Senior Manager of Planning and Environment	Continue to coordinate WRR efforts on WB properties, and coordinate cross-training of WB staff.
BCWS Coastal Fire Center Pemberton Fire Zone	Wildfire Officer – Prevention	Oversee, approve, and recommend fuel management initiatives within the RMOW.
	Wildfire Officer Wildfire Technician	Coordinate cross-training with the WFRS, discuss the involvement of BCWS crews in FireSmart initiatives.
MFLNRD Crown Land WRR	Stewardship Officer	Oversee the planning and coordination of WRR efforts on Crown land. Seek collaboration with adjacent land managers.
	Mountain Resorts Branch	Oversee the planning and coordination of WRR efforts in the CRA. Seek collaboration with adjacent land managers.
Cheakamus Community Forest	Manager	Oversee the planning and coordination of WRR efforts in the CCF.
Squamish Nation	Emergency Coordinator	Provide oversight and input regarding wildfire resiliency initiatives in the RMOW, including the incorporation of traditional ecological knowledge (TEK) and traditional land management practices.
Lil'wat Nation	Safety Officer	

This CWRP provides the following three recommendations related to interagency cooperation, aimed to achieve a more collaborative multi-jurisdictional approach for wildfire resiliency in the RMOW.

Table 23. Interagency Cooperation recommendations for the RMOW

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
Interagency Cooperation (Section 5.5)							
Objective: Seek the collaborative effort of multiple stakeholders within the RMOW to undertake wildfire risk reduction/resiliency tasks.							
11	High	Reinstate the RMOW Wildfire Working Group as the Community FireSmart and Resiliency Committee (CFRC) and hold regular meetings. The internal RMOW committee could meet e.g. bi-monthly and include other groups as required. The CFRC should be chaired by the head of the Whistler Wildfire Program and integrate the CCF, WFRS, Whistler Blackcomb, BCWS, RMOW departments, and local First Nations as needed. (see Table 22).	<p>The RMOW WUI is a mix of municipal, private, Crown, and CCF forested land with multiple land managers in play. Planning fuel management and implementing CWRP actions, including seeking funding, will be facilitated by communication across all jurisdictions.</p> <p>The purpose of the CFRC is to coordinate CWRP implementation and develop collaborative solutions.</p>	RMOW (CCF, WFRS, WB, BCWS, etc.)	1 Year and Ongoing	<p>Participation by all parties.</p> <p>Tracking of CWRP actions and spatial database of all fuel management.</p>	CRI: Up to \$2,000 per meeting for participation in interagency FireSmart/wildfire committee
12	High	Through the RMOW CFRC and/or a separate planning table, continue to partner with the CCF to manage fuel on the landscape and integrate harvest planning with other fuel management tracking. Integrate resilience planning with planning for old growth, sensitive ecosystems, and other non-timber forest values.	The CCF comprises much of the RMOW WUI.	CCF RMOW (FWAC)	1 Year and Ongoing	<p>CCF harvest planning integrated in RMOW fuel management mapping.</p> <p>A continued discussion and actions regarding landscape-level resilience planning.</p>	CRI: Up to \$2,000 per meeting for participation in interagency FireSmart/wildfire committee

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
13	Med	Continue to participate in the SLRD CFRC to improve interagency efforts and Sea-to-Sky community connections.	Representative(s) from RMOW should also sit on the RMOW CFRC.	SLRD (RMOW)	Ongoing	Continue attending SLRD meetings and developing cooperative solutions between communities.	CRI: Up to \$2,000 per meeting for participation in interagency FireSmart/wildfire committee

5.6 FIRESMART TRAINING & CROSS-TRAINING

Building wildfire resilience within a community requires the deployment of many specialized roles and responsibilities. Regarding both wildfire prevention initiatives and wildfire response, there is an ever-growing need for the individuals and organizations who hold these various roles to share their knowledge with other groups who may be involved. Not all the residents, tourists, land use planners, municipal staff, and structural firefighters in the RMOW are trained and experienced with wildfire prevention and/or wildfire response, but each and every person can make a meaningful difference in a safe and successful response if they are more in-tune with wildfire management planning objectives. This CWRP will focus on the following three recommendations to ensure that meaningful cross-training is implemented throughout various RMOW departments.



*Figure 19: Cross-training exercise between structural and wildland departments
(Photo credit: FireSmart BC, "Cross-Training")*

Table 24. FireSmart Training and Cross-Training recommendations for the RMOW

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
FireSmart Training & Cross-Training (Section 5.6)							
Objective: Further training relevant individuals in the RMOW to better understand wildfire disciplines and wildfire management planning objectives, to achieve a safe and effective wildfire response.							
14	High	Continue and expand on cross-training between WFRS, BCWS and mutual aid partners. Crews: Host spring-time clinics to reintroduce WFRS/BCWS crews to each other’s suppression equipment; identify and source solutions where incompatibilities may exist. Host mutual aid drills multiple times a year throughout fire season. Management: Hold meetings between potential incident command personnel, potentially through the RMOW CFRC to demonstrate where RMOW risk-reduction measures have been implemented, including but not limited to fuel treatments and secondary access roads.	In a wildfire event, structural crews may use BCWS equipment and vice-versa. Smoothing issues out and raising awareness for risk-reduction initiatives will provide for a more easily coordinated and effective wildfire response.	WFRS BCWS (RMOW)	Annually	Annual introduction of crews - showcasing proficiencies in setting up SPU’s and assessing wildfire behaviour. Annual ICS/planning meetings.	CRI: Up to \$2,000 per interagency meeting
15	Med	Continue to expand internal wildfire-specific training in the WFRS. Work towards having all career and paid-on-call members of the WFRS being certified in the SPP-WFF1, SPP-115, S-190 (Fire Behavior) and S-215. Work towards having all career members of the WFRS being certified as Strike Team Leaders, Task Force Leaders and/or Engine Bosses.	The majority of WFRS has SPP-WFF1 (Wildland Firefighter Level 1). WFF-1 and S-231 (Engine Boss) is required for BCWS deployment.	WFRS (BCWS)	Ongoing	Tracking certification of WFRS personnel, ensuring retention of wildfire-trained members.	CRI: SPP-WFF1

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
16	Low	Continue to expand FireSmart training and certification among RMOW staff and engaged residents. Continue hosting and/or funding attendance for FireSmart BC Conference.	More Local FireSmart Representatives (LFR) and Home Partners Wildfire Mitigation Specialists (WMS) increases capacity for FireSmart Assessments, Neighbourhood Champion Workshops and Neighbourhood Recognition Program.	RMOW WFRS	Ongoing	Tracking certification of WFRS/RMOW personnel.	CRI: LFR Training, Professional Development to Increase Capacity for FireSmart Activities, FireSmart BC Conference.

5.7 EMERGENCY PLANNING

Pre-emptive emergency planning is a crucial step in assessing a municipality's ability to respond to an interface fire, to direct emergency response during the event, and to follow steps to recovery in order to stabilize the community after the fact. The RMOW has created a Comprehensive Emergency Management Plan (CEMP) that contains a hazard specific guide to interface fires, as this type of disturbance was assigned a high-hazard rating due to both likelihood and potential consequence.⁴⁰ The interface fire hazard specific guide was not available for viewing at the time of writing, but the RMOW and WFRS should make sure that the guide includes the considerations in Figure 20 as an equivalent type of pre-incident planning checklist.⁴¹

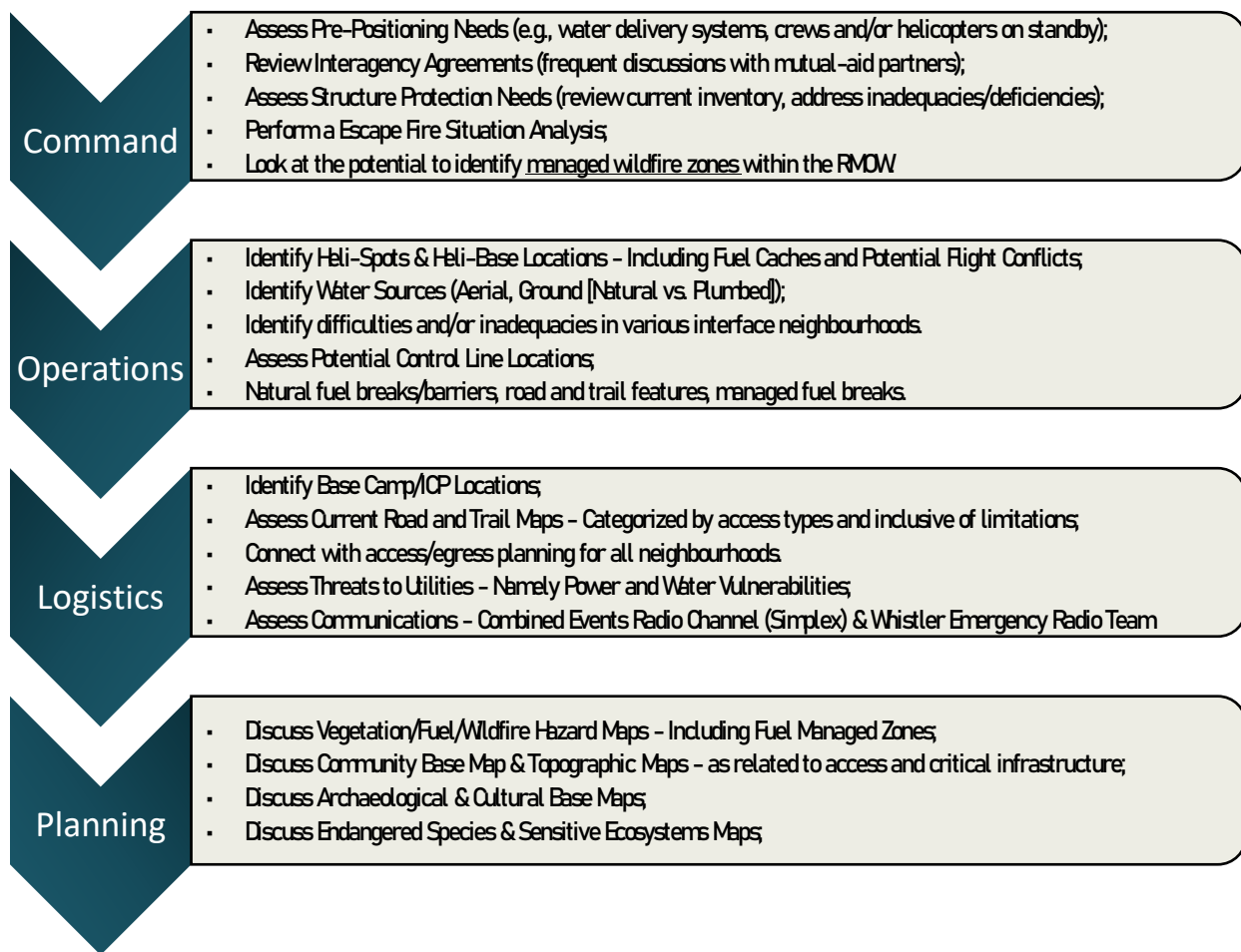


Figure 20: Potential pre-incident planning considerations that the WFRS/RMOW can review and discuss pre-fire season.

⁴⁰ Interface fires as identified through the RMOW's 2012 Hazard, Risk & Vulnerability Assessment.

https://www.whistler.ca/sites/default/files/related/rmow_hazards_risk_vulnerability_assessment_june2012.pdf

⁴¹ Adapted from the CRI's CWRP supplemental instruction guide (2021). <https://www.ubcm.ca/sites/default/files/2021-05/2021%20CWRP%20Supplemental%20Instruction%20Guide.pdf>

The pre-incident planning checklist in Figure 20 should be reviewed, tested, and practiced annually by the WFRS and any mutual aid partners through tabletop and live simulation exercises. As well, the FireSmart Community Funding and Supports program provides an example of a wildfire-specific response and preparedness guide – adapted to the RMOW in Table 25 – which can be considered alongside the RMOW’s interface fire hazard specific guide.

Table 25: Example of a Wildfire Response Preparedness Condition Guide

FIRE DANGER RATING	ACTION GUIDELINES
LOW	<ul style="list-style-type: none"> Have all RMOW & WFRS staff on normal shifts.
MODERATE	<ul style="list-style-type: none"> Have all RMOW & WFRS staff on normal shifts Gather relevant fire information (e.g., expected weather trends, local and regional wildfire picture etc.) and disseminate through the CFRC
HIGH	<ul style="list-style-type: none"> Have all RMOW & WFRS staff on normal shifts. Perform daily detection patrols by WFRS staff. Evaluate the regional fire situation daily. Issue a daily fire behavior advisory through online, social media, radio, and news outlets. Advocate MOTI to include the advisory on electronic highway signs. Formally notify wildfire-trained RMOW and Whistler-Blackcomb staff and EOC staff of Fire Danger Level and expected weather trends. Establish weekly communications with the CFRC
EXTREME	<ul style="list-style-type: none"> Same conditions as per “High”. Have EOC staff considered for stand-by. Have wildfire Incident Management Team members considered for stand-by/extended shifts. Designate Community and/or Community Forest staff as preparedness requires (e.g., water tender, heavy machinery operators, arborists may be considered for stand-by/extended shifts. Consider initiating Natural Area closures to align with regional situation.
FIRE(S) ONGOING	<ul style="list-style-type: none"> Same conditions as per “Extreme”. Provide regular updates to media/structural fire departments/staff on fire situation. Mobilize EOC support if evacuation is possible, or fire event requires additional support. Mobilize an Incident Management Team under the direction of the Fire Chief. Implement Evacuation Alerts and Orders based on fire behavior prediction and under the direction of the Fire Chief.

Though the WFRS does have mutual aid agreements in place with multiple departments (e.g., Squamish, Pemberton, and Black Tusk Fire Departments, Whistler SAR, Whistler-Blackcomb Mountain Patrol, BCWS etc.), local and provincial resources can often become scarce through a heightened wildfire season – as was witnessed in the summer months of 2021. The capacity for assistance from these partners cannot exclusively be relied on, which bolsters the importance of WFRS becoming increasingly prepared through equipment, training, and planning avenues. Table 26 lists the current inventory of personnel and apparatus that the WFRS has, and identifies key resources to be called on within the RMOW and through

external agencies with respect to an interface fire. Additionally, Table 27 presents six recommendations relevant to emergency planning to create resiliency to interface fires.

Table 26: WFRS firefighting resources, and key mutual aid resources relevant to wildfire response.

Fire Department	Resource Overview	Apparatus Type (Quantity)	Description / Comment
WFRS ⁴²	Fire Chief Deputy Fire Chief 22 Career FFs 54 PoC FFs	Fire Engines (3)	Limited to paved access roads with adequate turnarounds. Can be used in shuttling water.
		Quint Trucks (3)	Drafting capabilities from natural water sources should be determined. Temporary bladders (2500/5000gal) should be acquired.
		Utility/Forestry Trucks (3)	Chevy 3500s. Small pump and water supply. Can be used effectively as initial attack trucks in areas with reliable pickup access.
		Side-by-Side (1)	Pump and water available on a trailer. Limited to small smoldering initial attack, but can provide reconnaissance along quad-trail access points.
		Structure Protection Unit	Details of the SPU were unavailable at the time of writing. The WFRS should assess the capabilities of this SPU and consider if another SPU is required.
Whistler-Blackcomb ⁴³	Water. Equipment. ORVs. Personnel.	Reservoir Water / Snowmaking Lines	Over 52 million gallons available via large pumping systems.
		On-Mountain Fire Boxes (9)	Pumps, fuel, tools, intake hoses, shovels, pulaskis, helmets, forestry hose, snowmaking-forestry couplings, three-way/back-check valves, nozzles, hydrant keys, piss cans etc.
		Operations Staff	Basic fire suppression training.
		ATVs (Large Fleet)	Provides quick response mobility throughout the RMOW.
BCWS	Initial Attack & Unit Crews ⁴⁴	Initial Attack & Unit Crews Incident Command Personnel.	Resources are not committed to the RMOW.

⁴² This list was generated via communications with the WFRS Fire Chief, and through Fire Fandom (while recognized as unofficial): https://fire.fandom.com/wiki/Whistler_Fire_Rescue_Service. This list is not exhaustive.

⁴³ Via communications with Arthur Dejong (May 21, 2021)

⁴⁴ Referencing available crews in the Pemberton Fire Zone. Unit Crews are a provincial resource and can often be deployed out of zone and unavailable to support local fire events.

Table 27. Emergency Planning recommendations in the RMOW

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
Emergency Planning (Section 5.7)							
Objective: Preparing the RMOW to holistically respond to a wildfire emergency and/or the threat of wildfire.							
17	High	Initiate a roof-top sprinkler program for residential properties. Investigate bulk orders from wildfire protection or irrigation companies. Priority should be given to high-risk neighbourhoods that are lacking in perimeter fuel management treatments.	Pre-installed rooftop sprinklers reduce the time and resources needed to set up a structural protection system in a neighbourhood threatened by a wildfire. Sprinkler installation can be paired with a free FireSmart Assessment. Consider including as part of an incentive program for high priority homes.	RMOW WFRS	1 Year and Ongoing	Establish an efficient and effective system. Track the number and location of sprinklers purchased and installed annually	Sprinklers \$40 - \$100 each 2 hours per installation/assessment
18	Med	Pre-plan emergency community water delivery systems to connect major natural water sources with interface neighbourhoods, to facilitate deployment of a structural protection system.	Whistler has five large lakes (Alta, Nita, Alpha, Green, Lost) to draw from in the event of a wildfire. Shuttling or pumping water from these lakes to fill bladders may be planned in advance, including tender access points, traffic control, permanent large-volume pumps and piping.	WFRS (RMOW)	1-2 Years	Assess community water delivery (municipal and natural) for each neighbourhood. Develop and test neighbourhood specific plans.	CRI: Assessment of Community Water Delivery Ability - incremental staff hours or contract cost

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
19	Med	Evaluate whether current WFRS wildfire/structure protection equipment is adequate to protect an entire interface neighbourhood (e.g. up to 100 homes) during a wildfire event	Provincial resources and resources from other fire departments may be limited during the fire season. The more internal capacity WFRS has, the better.	WFRS	1-2 Years	Inventory of structure protection equipment	CRI: Structure Protection Inventory - incremental staff hours or contract cost
20	Med	Assess and mitigate wildfire hazard along primary neighbourhood access routes, Alta Lake Road, and the Highway 99 corridor, including all highway exits. Thin ('daylight') to increase public safety during a potential evacuation.	Evacuation of the municipality may take over 12 hours (Sea to Sky Multimodal Evacuation Plan 2019) Action may be limited on private land, so threat should be reduced where possible.	RMOW (Consultant)	1-5 Years	Primary access routes are thinned to decrease wildfire risk	CRI: Fuel Management

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
21	Med	Assess secondary first-responder vehicle access throughout RMOW neighbourhoods, categorizing access features by the type of vehicle appropriate for the road/trail. Upgrade and thin ('daylight') as required to serve WFRS 4x4 vehicles and provide a safe point to anchor suppression efforts to.	Work within RMOW CFRC, integrating existing OCP (Schedule E2, Recreation Trails Plan), WFRS, and CCF mapping (2018 Road-Based Access Management Plan)	RMOW (CCF) (WFRS)	5 Years	Comprehensive map with CCF, WFRS input. Existing secondary egress routes are upgraded and thinned for WFRS	CRI: Fuel Management, Interagency Cooperation
22	Low	Undergo road upgrades and/or thinning projects along the Flank trail and Green Lake Loop to provide safe and reliable vehicle access for fire crews and potential anchoring lines.	The Flank Trail and Green Lake Loop are old roads that have grown over to singletrack in many places. The Flank Trail is the only access to the hillside above Alta Lake (northwest); Green Lake Loop is the only access on the hillside behind Green Lake (southeast). Roads could be gated to maintain recreational nature of trails.	RMOW (CCF) (WFRS)	10 years	Assessments complete by 2025. Access improved on priority routes.	CRI: Fuel Management, Interagency Cooperation

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
23	Low	Develop a post-fire rehabilitation plan for RMOW forested areas and for the Cheakamus Community Forest.	Under the Wildfire Act, MFLNRORD is only responsible for rehabilitation related to fire suppression – i.e., fire guards. Although provincial funds may be allocated to assist licensees with post-fire reforestation, a post-fire rehabilitation plan will help the RMOW prepare to assess fire impacts and mitigate any potential hazards related to slope stability etc., both on municipal land and in the CCF	RMOW, CCF, WB	10 years	A post-fire rehabilitation plan is developed with costed actions; contingency budget is allocated	Internal; \$15,000

5.8 VEGETATION MANAGEMENT

As discussed in Section 4.1.2, fuel is the only aspect of the fire behavior triangle that can be directly managed to reduce wildfire threat. Fuel or vegetation management reduces potential wildfire intensity and ember exposure to people, structures, and other values through manipulation of both natural and cultivated vegetation within or adjacent to a community. A well-planned vegetation management strategy can greatly increase fire suppression effectiveness and reduce damage to property and to values.

Vegetation management can largely be accomplished through two different activities:

1. Residential-scale FireSmart landscaping: The removal, reduction, or conversion of flammable [landscaping] plants to create more fire-resistant areas in the FireSmart Noncombustible Zone and Priority Zones 1, 2 and 3.
2. Fuel management treatments: The manipulation or reduction of living or dead forest and grassland fuels to reduce the rate of spread and head fire intensity and enhance likelihood of successful suppression.

The RMOW has been proactive with both residential and landscape-scale vegetation management initiatives since the 2005 CWPP. What began as a trail-side thinning and debris-removal program in Lost Lake has developed into a comprehensive fuel management program across three spatial levels (Figure 21).

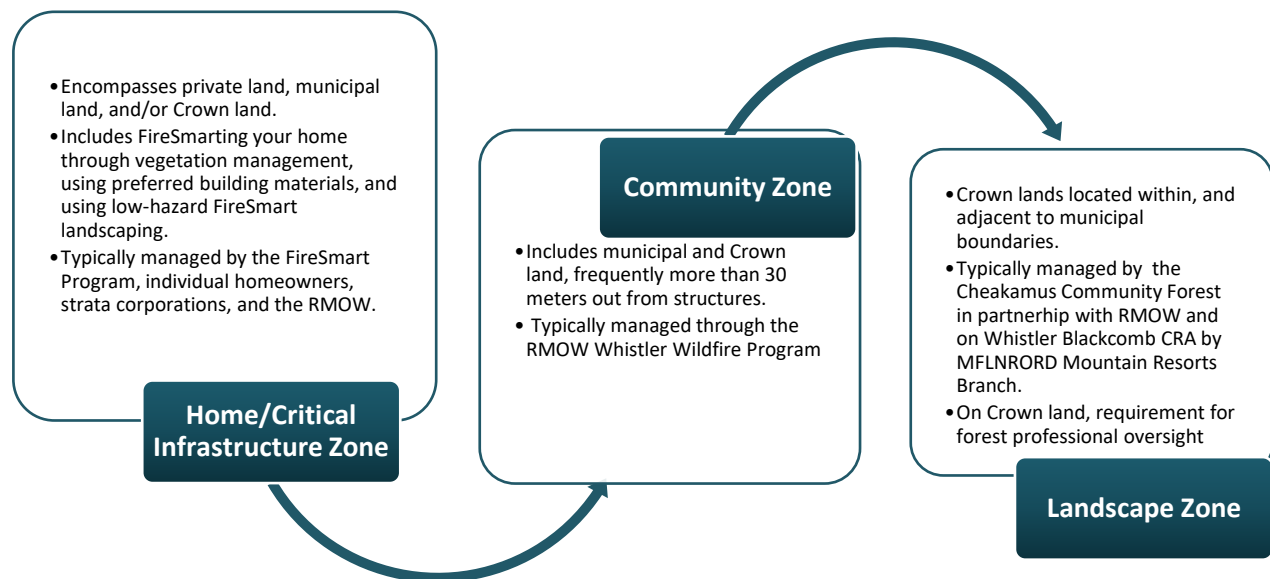


Figure 21: Overview of fuel management basics and initiatives throughout the RMOW in the Home, Community, and Landscape Zones.

5.8.1 RESIDENTIAL FIRESMART VEGETATION MANAGEMENT

The RMOW has largely addressed residential vegetation management through the Whistler FireSmart Program. This program is currently staffed by two permanent staff that work administratively for half of the year and operationally for the remainder, accompanied by five additional seasonal laborers. This program is aimed to educate residents regarding FireSmart principles, bridge the gap within and between neighbourhoods through FireSmart activities, and continue to keep the RMOW community receptive, active, and appreciative of the program. The program attempts to split their efforts between reducing individual structure hazard, and reducing hazard in the Community Zone.

The following initiatives have been spurred by the FireSmart Program in order to achieve these objectives:

Table 28. Details on the three main initiatives of the Whistler FireSmart Program

Whistler FireSmart Program Initiative	Summary
FireSmart Work Days	<ul style="list-style-type: none"> Organized for individual stratas and/or neighbourhoods. Provides FireSmart education for attendees, and provides tools to perform simple fuel management activities. Activities are based off pre-established plans that conform to FireSmart Canada standards. Have hosted 84 in the last three years (as of June 5, 2021).
Community Chipper Days	<ul style="list-style-type: none"> First-Come-First-Serve program, providing free unlimited use of a chipper for portions of municipal land adjacent to private property. Debris bins often remain in the neighbourhood for further homeowner cutting on private lands - bin is then removed by the RMOW. Estimated more than 600 properties having used the service in 2019 and 2020.
Adopt-a-Trail	<ul style="list-style-type: none"> Identifies hazardous forest stands adjacent to trail networks in the RMOW (often the Valley Trail), and coordinates fuel management cutting/debris disposal alongside. No measurable standard or plan is used, and treatment inadequacies were often noted (as per professional opinion).

To expand on the early successes that the FireSmart Program has had in Whistler, they aim to continue to secure funding in order to expand the reach of the program. As topography, cost, operational logistics, and other forest values make fuel management increasingly difficult in many portions of the RMOW, reducing fire hazard in the Home Zone will become more and more critical. While many of the recommendations in Section 5.2: Education are achievable by this program, an additional recommendation is being made with reference to residential vegetation management.

Table 29. Residential FireSmart Vegetation Management recommendations

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
Vegetation Management (Section 5.8)							
Objective: Continue to remove hazardous vegetation and create resilient forests within the community.							
24	High	Create a strategic FireSmart plan and incentive program focusing on sequentially treating high priority neighbourhoods or zones.	Currently the RMOW treats private properties as they approach the FireSmart team but the program needs to be delivered strategically in areas of highest risk. Review the 2014 FireSmart Assessment, identify neighbourhoods with most at risk homes and create a prioritized timeline for mitigation in those neighbourhood zones. Link to WUI thinning and develop an incentive program to support homeowners.	RMOW	1 Year and Ongoing	Increase in FireSmart work on private land in a prioritized, strategic manner.	Internal funding; fuel management work ~\$35,000/hectare

5.8.2 LANDSCAPE VEGETATION MANAGEMENT

Vegetation management on a landscape scale (Community and Landscape Zones) has been accomplished through the Whistler Wildfire Program and Cheakamus Community Forest operations. The Whistler Wildfire Program, led by the RMOW Environmental Stewardship department, plays a lead role in planning, funding, and implementing the majority of fuel thinning and fuel-break projects in the municipality, in collaboration with the Cheakamus Community Forest (CCF) where appropriate. An estimated 131 hectares have been treated in the WUI through fuel thinning programs from 2005 to 2020 (71% of which has been since 2015), with an additional 168 hectares treated through landscape-level fuel breaks in the CCF.

Map 8 displays a visual representation of these treated areas, alongside additional areas that are currently under prescription for future treatment.

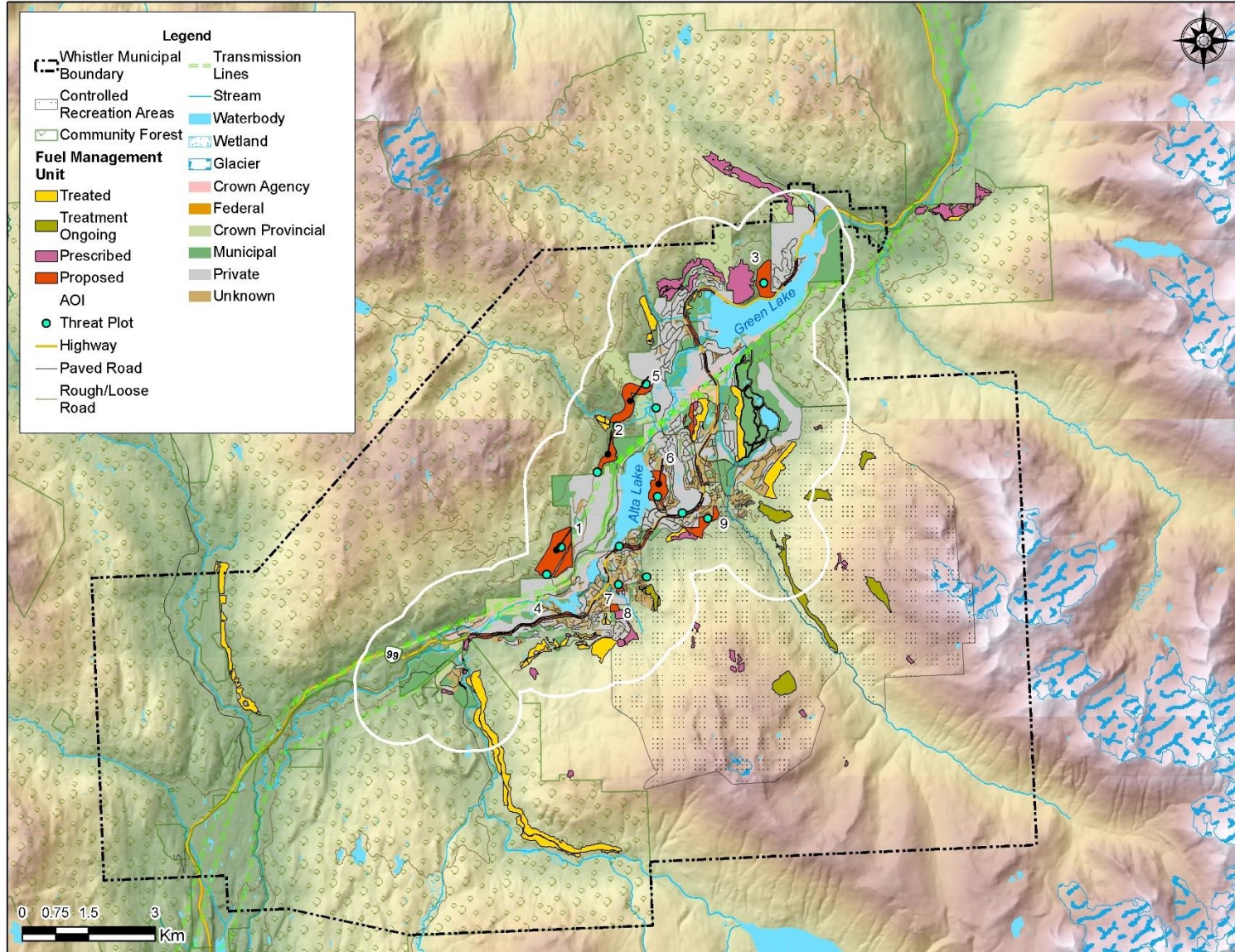


Figure 22: Pre- and post-treatment examples from the Nesters operational fuel treatment in the spring/summer of 2021.⁴⁵

The Mountain Resorts Branch (MRB) has led efforts on risk reduction projects within the controlled recreation area (CRA), having treated an estimated 74 hectares by the time of writing, with plans to continue treating high-priority polygons.⁴⁶ Having multiple land managers responsible for funding and implementing fuel treatments has led to some uncertainty and overlap on fuel management projects in Whistler and the Sea to Sky region. The re-establishment of a Whistler Wildfire Working Group/Community FireSmart Resiliency Committee will help coordinate vegetation management.

⁴⁵ Photos B.A. Blackwell & Associates

⁴⁶ At the time of writing, FMPs are currently being developed by Cabin Resource Management for 31.6 hectares within the CRA.



Map 8: Overview of completed fuel treatments within the RMOW, and areas where treatment is currently ongoing and/or where a completed prescription exists.

Fuel management treatments on municipal and Crown lands should continue to be planned and supervised by a professional forester or forest technologist registered with the Association of BC Forest Professionals (ABCFP) that is operating within their scope-of-practice, as there are multiple forest values that need to be managed for. The polygons prescribed for treatment in this CWRP are intended to provide a realistic framework for fuel thinning projects through the active life of this CWRP (five years from adoption) and support previous planning work in the RMOW.⁴⁷

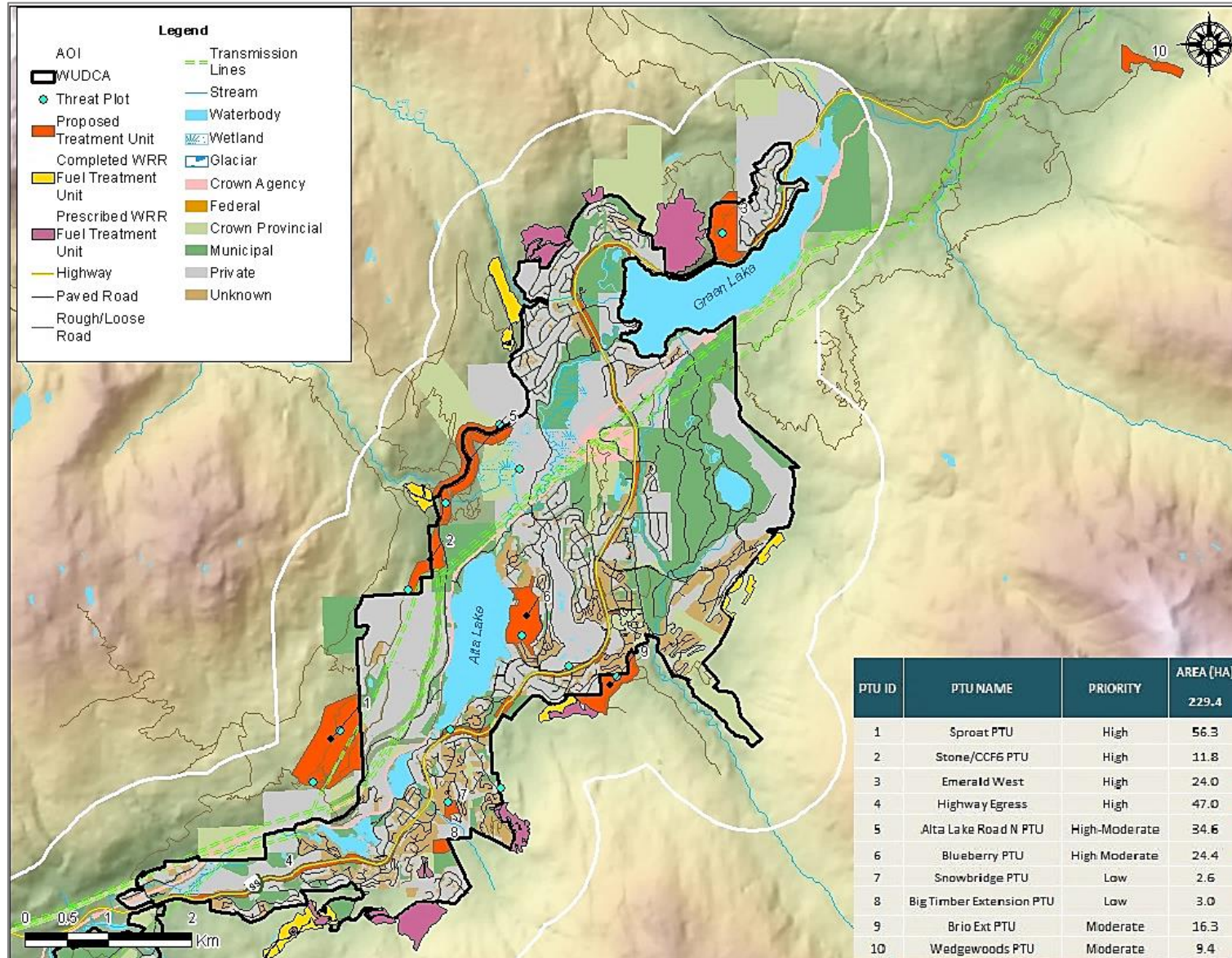
The following three recommendations relate to landscape vegetation management in the RMOW:

⁴⁷ Publicly accessible at the time of writing: https://www.whistler.ca/sites/default/files/2020/Apr/related/24385/wildfire_planning_2019-2027_program_final.pdf

Table 30. Landscape Vegetation Management recommendations

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
Vegetation Management (Section 5.8)							
Objective: Continue to remove hazardous vegetation and create resilient forests at the landscape level.							
25	High	Continue to implement the high-priority interface treatment areas that are already covered by fuel management prescriptions (see Table 30) and plan/implement a maintenance program for areas treated in the past.	Prescriptions have already been developed and approved for these areas; they are high-risk interface areas.	RMOW (Consultant)	1-3 Years	Successful completion of individual treatment areas.	CRI: Fuel Management, internal funding ~\$35,000/hectare

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
26	High	Continue to implement pre-identified fuel break treatment areas to provide strategic low-hazard anchor points throughout the RMOW and CCF, and prescribe additional areas for treatment to expand these areas (see Recommendation #26 and subject to outcomes of Recommendation #29).	Wedgemount: Continued harvesting and/or fuel management treatments through the CCF and Sea-to-Sky District. 16 Mile: Prescription to be finalized and treatment-ready in 2022.	CCF (RMOW) (Consultant)	Completed as soon as logistics and funding allow.	Successful completion of individual treatment areas and approved FMPs.	CRI WRR program ~\$20,000/hectare
27	Med	Continue to develop fuel management prescriptions for high-priority polygons, accounting for multiple ecological values in addition to risk reduction, subject to outcomes of Recommendation 28 (see Recommendation 24, Table 30 & Map 9)	These areas have been identified in the CWRP; they are high priority interface areas that look to protect immediate neighbourhoods, watersheds, and provide for landscape resiliency.	RMOW Consultant	3-6 years	Approved FMPs ready to be implemented	~\$400/hectare for a ~20 ha unit



Map 9: Proposed treatment units (PTUs) for future fuel management within the CWRP AOI.

Table 31: Summary of Proposed Treatment Units that are recommended to have fuel management prescriptions developed.

PTU Name	Total Area (ha) ⁴⁸	Treatment Unit Location	Wildfire Behaviour Threat (Hectares)			Treatment Rationale	Overlapping Values / Treatment Constraints
			High	Mod	Low		
Sproatt	56.3	South of Stonebridge; b/w Lower Sproatt Road, Hydro ROWs & Alta Lake Road (CCF)	31	17.1	8.2	<p>-Few fuel treatments exist to-date on the west side of the valley. Treatment would add to protection for the Stonebridge community, the Hydro ROWs and the broader hillside, including the 21 Mile Creek drainage.</p> <p>-Considerable coverage of second growth conifer stands with merchantable thinning potential. Pockets of younger pole/sapling forest with high hazard and zonal mature stands with lower hazard.</p> <p>-Good pre-established access along the Lower Sproatt Road, where fuel mitigation treatments are being performed in the Stonebridge development.</p>	Mountain bike trail network throughout: “Danimal Middle” bisects the unit, “Three Birds”, “AC/DC”, “Piece of Cake”, “A La Mode”, “Whipped Cream”, “Bush Doctor” within.
Stone/CCF6	11.8	West of Alta Lake Road; South of the Cemetery. Wraps the Hydro ROW to the west (CCF/Municipal)	0	10.3	1.5	<p>-Treatment would add protection/resiliency to the Alta Lake Road corridor (for residents and emergency access/egress), and from a roadside fire progressing into the 21 Mile Creek drainage.</p> <p>-A mix of dense larger diameter second growth stands with merchantable thinning potential, with thick pole/sapling C4 pockets.</p> <p>-Connects to the Alta Lake Road N PTU.</p>	Mountain bike trail network throughout: “Whip Me Snip Me”, “A Cut Above”, “Beaver Pass”
Emerald West	24.0	West of Emerald Estates; East of the Rainbow TUs (Municipal)	6.3	14.9	2.8	<p>-Private-land parcel recently acquired by the RMOW. Fuel loading amounts vary widely throughout the PTU as there has been a significant influence from dead pine.</p> <p>-Remainder of Emerald Estates is surrounded by private land holdings, and this will provide continuity with the Rainbow treatments to the west. Can also provide protection for the Rideau Community Watershed and the Emerald reservoir from an approaching fire from the south.</p>	Broken topography, consistent machine access may be difficult. Multiple mountain bike trails throughout.

⁴⁸ These are suggested areas based off of initial reconnaissance and interpretation of ortho photos. Actual required/feasible treatment area may include more or less area.

PTU Name	Total Area (ha) ⁴⁸	Treatment Unit Location	Wildfire Behaviour Threat (Hectares)			Treatment Rationale	Overlapping Values / Treatment Constraints
			High	Mod	Low		
Highway Egress	47.0	Various portions adjacent to Highway 99	2.1	14.9	30	-Dense conifer stands of differing structure frequently line Highway 99, which are all very susceptible of fire spread and/or spotting. Vehicle fires/human ignitions are very possible along the corridor, and this is the main corridor for emergency evacuation.	OCP Policies require the maintenance of a 20m vegetated buffer along Highway 99 – variances/compromises to coniferous shielding will need to be sought. Can investigate planting/revegetating with deciduous/FireSmart vegetation, or building non-combustible structures / fencing that can be adorned to appear as naturally complimenting and aesthetically pleasing.
Alta Lake Road North	34.6	Alta Lake Road; North of the Cemetery/21 Mile Creek Access Road. (CCF/Municipal)	12.1	14.4	8.1	-Equivalent first comment to Stonebridge. -Mature second-growth stand on the west side of the road (roughly 1000SPH overstory) with considerable (roughly 1400SPH) understory conifer, which would be the priority side for treatment. Lower density on the east side of the road but has significant vertical continuity of fuels. -Ties into undeveloped private land south of Alpine Estates. -Opportunity to recuperate costs through some merchantable timber.	Mountain bike trail network throughout: “Bob’s Rebob”, “Get Over It”
Blueberry	24.4	Blueberry Hill Park (Municipal)	7.5	15.8	1.1	-Direct interface forest with the surrounding community, in which poor FireSmart compliance was frequently noted. -Mix of stem-exclusion stands with considerable dead material on the western slopes, with dry/rocky forested areas with considerable inputs of dead pine in the east/height of land. Hazard fluctuates considerably throughout. -Exposure to wind off of Alta Lake can combine with slope to create a hazardous spotting environment.	Trail throughout: “Blueberry”. Operability constraints at the height of land and in eastern portions due to rocky/broken ground.
Sunridge / Brio Extension	16.4	Sunridge Plateau; Above Sunridge Drive, Tantalus Drive, Whistler Way. Tie into ski/bike access road. (CRA)	13.3	0.2	2.8	-Direct interface forest with the community and the Sunridge plateau reservoir, in which FireSmart projects have notably been completed. -A mix of dense second growth conifer stands and more sparsely forested/shorter Ba/Cw stands on rocky outcroppings. -Good pre-existing road access throughout the PTU. New prescribed area would tie into the NW Passage Road/trail and the un-implemented portion of the “Brio” treatment.	Within the CRA: Treatment will be in/around “A-Line” and “Easy Does It”

PTU Name	Total Area (ha) ⁴⁸	Treatment Unit Location	Wildfire Behaviour Threat (Hectares)			Treatment Rationale	Overlapping Values / Treatment Constraints
			High	Mod	Low		
Kadenwood Gondola/Big Timber Extension ⁴⁹	3.0	South of First Tracks Lodge. (RMOW)				-Direct interface to Creekside Village, Gondola Way and Kadenwood Drive. Hazardous and treatable forest types, with various pre-existing road features and quad/machine trails throughout. -Small portions of forest in the adjacent Big Timber area have been treated. Opportunity to tie into currently funded CRA treatments.	Steep, rocky ground.
Snowridge	2.6	Nordic; West of Snowridge Crescent (Crown)	0	2.6	0	-Steep forested Crown land parcel with thick pockets of conifer sapling and regen. Trees are short and small diameter with low drooping crowns. -Low treatment priority due to its isolation	Steep ground.

⁴⁹ This area is adjacent to a pre-identified treatment area named “Kadenwood Gondola”, as well as a treatment area that is currently having a prescription developed within the CRA. At the time of writing there has been a lack of clarity regarding previously funded efforts in this area.

5.8.3 VEGETATION MANAGEMENT SUMMARY

Rationale for Vegetation Management

Prichard et al. (2021) examined common questions regarding the adaptation of western North American forests to climate change and wildfire,⁵⁰ discussing the continued need for landscape level resilience planning and fuel treatments. In response to fire suppression success, the authors discuss how if an insufficient amount of forestland is treated on a landscape, the unexpected behaviour of large fires will likely overwhelm the ability of small fuel treatments to facilitate effective suppression.

In 2017, the Kenow Wildfire in Waterton Lakes National Park clearly demonstrated the effects of wildfire on a tourism-driven town, as over 80% of the hiking trail network along with campgrounds, the visitor center, staff housing, and key water and electrical infrastructure were destroyed by the fire.⁵¹ Parks Canada had deployed years of fuel management activities around the Waterton townsite itself, which allowed first responders to perform their jobs much more safely and effectively within the town (Figure 23). The protective results of fuel management were witnessed again in 2021 in the town of Logan Lake – where decades of proactive fuel management surrounding the community played an invaluable role in protecting the town from the Tremont Creek wildfire.

⁵⁰ Prichard, S. J., et al. 2021. Adapting western North American forests to climate change and wildfires: 10 common questions. *Ecological Applications* 00(00):e02433. [10.1002/eap.2433](https://doi.org/10.1002/eap.2433)

⁵¹ Parks Canada, Kenow Wildfire: <https://www.pc.gc.ca/en/pn-np/ab/waterton/nature/environment/feu-fire/feu-fire-kenow>.

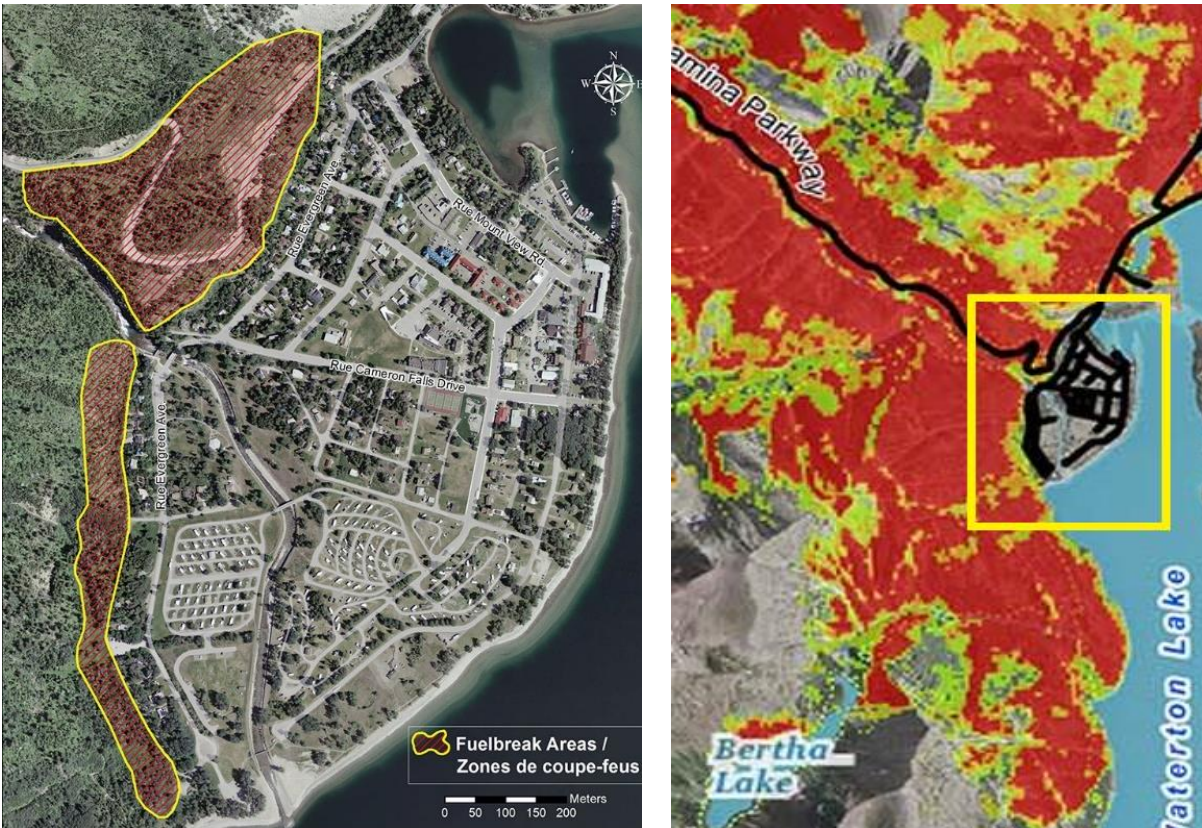


Figure 23: Generalized relationship between proactive fuel management activities (left) and the resulting burn severity (Red: very high, Orange: high, Yellow: medium) from a small portion of the Kenow wildfire in 2017. No structures within the townsite were destroyed by the fire.

Successes and Challenges in the RMOW

Having been involved in fuel management initiatives for the better part of 15 years, the RMOW has experienced many achievements as well as growing pains. Many of the logistic issues that made fuel management difficult in the RMOW back in 2005 and again in 2011 are still extremely relevant today, while some new difficulties have been realized as programs have evolved (Figure 24).

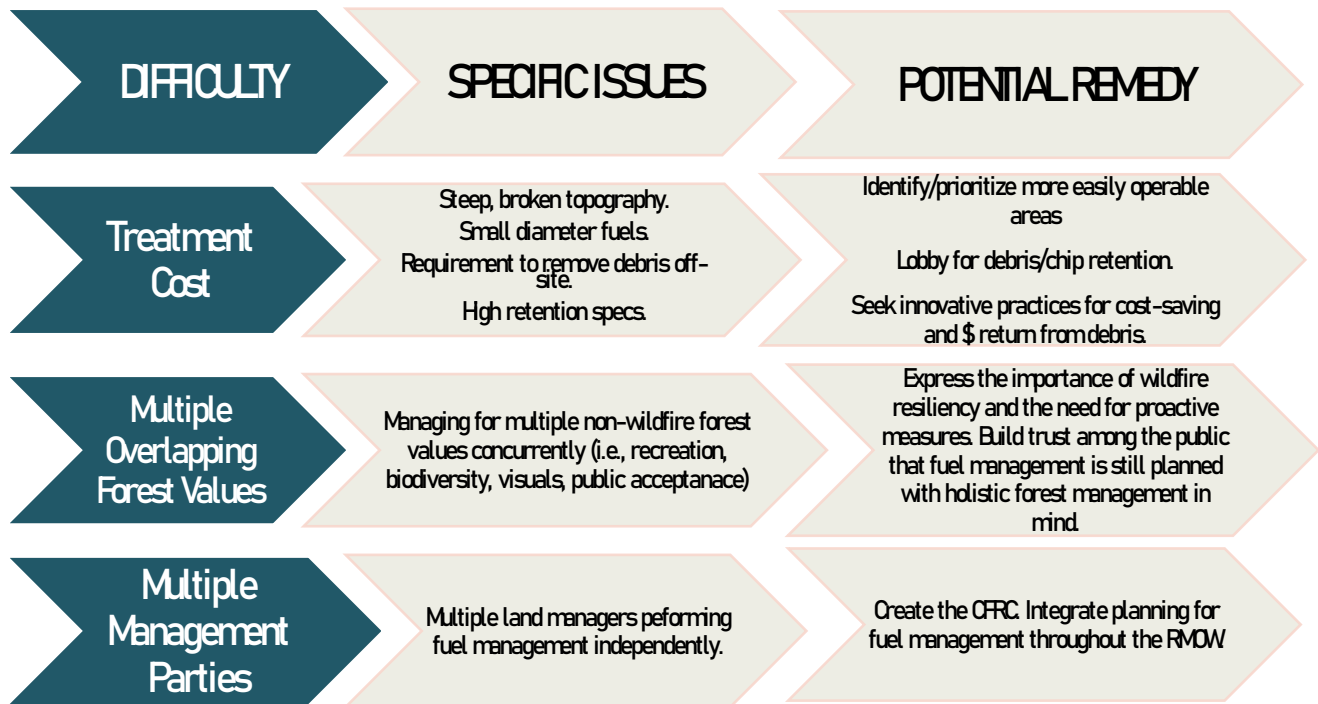


Figure 24: Difficulties, issues, and potential remedies for vegetation management programs in the RMOW.

While fuel management treatments may often seem prohibitively expensive and are sometimes viewed as unnecessary incursions into the forest, taking away proactive forest management within the RMOW can leave Whistler with an unnecessary exposure to wildfire. This combines with the fact that the RMOW has pushed the idea of managing natural areas to be resilient to climate change (OCP Goal 7.2), and has a desire for clean energy generation ideas (OCP Goal 10.3) in order to *close the loop and shift toward lower carbon consumption* (Climate Action Big Moves Strategy, Big Move #6). Not only can vegetation management make the RMOW more resilient to the growing threat of wildfire, these initiatives can pave the way for a sustainable land management framework. The following five recommendations relate to future vegetation management initiatives in the RMOW, and conclude the recommendations of this CWRP.

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
Vegetation Management (Section 5.8)							
Objective: Assess and improve upon the vegetation management program in the RMOW							
28	Low	Explore local markets and/or design home-grown solutions to biomass utilization (e.g. combined heat and power) in order to make local fuel management projects more affordable and appealing.	Biomass utilization will bring down the cost per hectare of fuel treatments, enabling RMOW and the CCF to complete more area annually, and help RMOW meet sustainability targets.	RMOW, CCF (SLRD, DOS, VoP)	Ongoing	Non-merchantable or small volumes of wood have a viable market other than the RMOW composter	Internal
29	High	Conduct trials and undertake research including incorporation of Traditional Ecological Knowledge to test the assumptions that underpin the wildfire thinning rationale.	There is a lack of research in coastal forests on the effects of fuel reduction in an actual fire scenario and the effects on broader ecological values. Emerging research is indicating that current approaches may need some modification for coastal forests in the face of climate change.	RMOW	1 Year and Ongoing	Evidence from trials and research indicates that modelling assumptions regarding the outcomes of fuel thinning are accurate	Internal; \$20,000 annually for monitoring plan implementation

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
30	High	Conduct analysis to determine the return on investment for investing in fuel reduction thinning, the FireSmart program, and alternatives and develop a strategic plan identifying where to spend funds.	Fuel reduction thinning is very costly. Understanding the levels of protection provided by it and through the FireSmart program or alternatives such as green fuel breaks will help the RMOW determine where to spend limited resources between fuel management and FireSmart.	RMOW FireSmart Coordinator WFRS	1 Year	Strategic plan identifying expenditures in fuel thinning and FireSmart program to provide maximum protection to the RMOW	Internal
31	High	Ensure prescription templates more explicitly incorporate consideration of other forest and natural area values	Wildfire fuel reduction must minimize negative effects on other forest values such as species at risk habitat, riparian area values, old growth trees and enhance forest resiliency to climate change.	RMOW (Consultant)	Ongoing	Ensure acceptance of fuel management prescriptions by all relevant user groups.	Internal

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)			
32	Med	Develop standards for fuel treatments in riparian areas that meet the provincial Riparian Area Protection Regulation.	More requests are being made to thin in riparian areas. The preference would be to avoid thinning in riparian areas but if necessary, the RMOW requires clear guidance on how it can be done while meeting RAPR.	RMOW	2 Year	Have a standard developed regarding fuel treatments in riparian areas.	Internal

SECTION 6: APPENDICES

6.1 APPENDIX A: REVIEW OF CWPP RECOMMENDATIONS

Successfully Addressed		In Progress		Inadequately Addressed or Unrealistic
Item	Issue Identified	Recommendation & Year	Response (2011 CWPP or Alternative)	Relation to 2021 CWRP
1	Access Management Issues with one way in/out neighborhoods. Creates potential issues for evacuation and emergency crew access.	Improve access to isolated areas (2005)	Continued issue with reference to secondary access/egress in multiple neighbourhoods. Logistics of fixing this prove to be too costly and/or not realistic.	Still identified as an issue in older neighbourhoods, while new developments (Rainbow/Crazy Canuck) have thoughtfully employed this idea. Now shifting the focus to creating a low fire hazard along the pre-existing access corridors.
2		Develop an evacuation plan for the community and outlying road/trail networks (2005)	2011: Whistler Emergency Plan & Emergency Preparedness Program Since: Comprehensive Emergency Management Plan & Sea-to-Sky Multimodal Evacuation Plan	Yet to address whether or not the WFRS has detailed neighbourhood by neighbourhood evacuation plans.
3	Engagement & Education Limited number of programs and communication with respect to wildfire risk and prevention.	Construct a FireSmart show-home/demo (2005)	Yet to happen.	Recommending retrofits to pieces of municipal infrastructure (pump houses etc.), paired with informational signage.
4		Relay FireSmart and fire danger information to the community online (2005)	Fire risk, reduction and preparedness is communicated on the RMOW website during fire season.	Pushing a social media presence of the FireSmart program, as well as continued delivery of educational materials in local schools.
5		Educate the local business community on FireSmart prep and planning (2005)	2011: WFRS has run extensive education programs on FireSmart principles for residents, business owners and children. Since: FireSmart Supervisor has developed a very informative program regarding fire risk.	Continue on the same trajectory.
6		Provide FireSmart information along with development permit application papers (2011)	Addressed through the wildfire DPA.	
7	Building Codes & Bylaws Pre-existing issues with fire risk of residential/commercial buildings. No consideration for FireSmart properties.	Create (minimum) 10m setbacks from forest interface (2005)	Addressed through the wildfire DPA.	

Item	Issue Identified	Recommendation & Year	Response (2011 CWPP or Alternative)	Relation to 2021 CWRP
8		Review/revise bylaws to be consistent with a FireSmart community (2005)	Bylaws have been amended and OCP policies capture wildfire prevention very well.	Recommending amendments or consideration of the 20m vegetation buffer along the Highway corridor.
9		For new subdivisions, require fire retardant roofing (Class A/B rating) (2005)	Addressed through the wildfire DPA.	
10		Establish Wildfire Hazard DPA guidelines (2011)	Addressed through the wildfire DPA.	
11		Require a landscaping standard for FireSmart vegetation (2011)	No mention of landscaping-FireSmart (other than DPA rules) in the OCP, or in local garden centers.	Pushing for FireSmart language with reference to landscaping in the OCP. Advocating for an awareness of the FireSmart guidelines and/or incentives from local garden centers and local landscape companies for preferred vegetation.
12		Require FireSmart principles to be applied to new developments, and for retrofitted/re-roofed homes (2011)	Addressed through the wildfire DPA.	
13		Have subdivision plans and hazard assessments reviewed by the Fire Chief prior to approval (2011)	Addressed through the wildfire DPA.	
14	Fire Department Training Adequate to date, but a need for continued wildfire response training. Emergency infrastructure (fire halls and hospital) both at valley bottom, posing a smoke-out issue.	Purchase a sprinkler setup for protection of 30-50 homes (minimum), ensure WFRS crews are adequately trained in its use (2005)	2011: Covenants require sprinklers on some subdivisions (?), unclear on changes to WFRS capabilities. Since: WFRS has a shared SPU with Squamish (?), and performs annual recurrency training with it.	Continue to pursue annual training opportunities with BCWS. Continue to push wildland-specific training within the WFRS. Recommending that a large-scale residential sprinkler program be investigated.
15	Emergency Response Water delivery system to the RMOW is reliant on one-way electrical service.	Identify and establish a secondary ICP/EOC (2005)	EOC plans developed through the CEMP.	No further comment.
16		FireSmart fuel storage facilities on the ski hill (2005)	Nothing official noted.	Not reviewed during field data collection, but conversations with Vail/MRB identified that many of these priority areas are being identified and treated.
17		Work with BCWS to have a helicopter/bucket on standby during periods of High fire danger (2005)	Nothing official noted.	This is an operational decision that the BCWS will make.
18		Create backup solutions to the failure of the water delivery system (2005).	Portable generators available to power the system. Alarms installed to notify when water levels are nearing minimum firefighting requirements.	Recommending mass-water-delivery plans be established and practiced from natural water sources to protect individual neighbourhoods.
19	Fuel Management No activities completed to date.	Maintain BC Hydro transmission corridors to a fuel break standard (2005)	BC Hydro has implemented vegetation management standards (unaware of the specifics)	Continuing to use right-of-ways as strategic fuel break boundaries. Lobby BC Hydro to effectively follow their legislated responsibilities for R/W management.

Item	Issue Identified	Recommendation & Year	Response (2011 CWPP or Alternative)	Relation to 2021 CWRP
20		Develop a fuel break network to expand on pre-existing breaks (landscape level) (2005)	Since: Cheakamus & Callaghan breaks have been completed (168 hectares total).	Continuing to push the landscape-level fuel break programs (focusing on Wedge & 16 Mile drainages). Advocating to the CCF to continue focusing on wildfire resilience at the landscape level, (i.e., planning to manage for a mosaic of hazard levels throughout the CCF).
21		Develop a thinning program around trails and forested areas in/around the community (2005)	2011: 27.4 hectares treated, with significant public support. 12 new polygons identified for treatment. 2021: 131 hectares treated to date.	Continuing to push the interface thinning and landscape-level fuel break programs. The RMOW has dedicated money to the program on top of what can be funded through CRI. Still encountering logistic hurdles and topographic challenges that make treatments costly and slow.
22		Work with UBCM to continue the program given the high cost of treatment (2011)	Program is still going, and contractors have now been guaranteed, but the costs are still very high.	
23		Develop a MOU with the CCF to continue and expand the program (2011)	Program is still going, but the costs are still very high.	
24		Fund and implement a monitoring/maintenance schedule to treatments (2011)	Funded. Beginning in 2021/22, but to address many values in addition to risk reduction.	
25	Post-Fire Rehabilitation	Develop a plan - seeding, slope stabilization, infrastructure protection (2005)	No mention.	Is addressed vaguely through the Recovery section (6.16) of the CEMP. Will likely be a reactive initiative spurred by the environmental management program, given the diversity of wildfire effects.

6.2 APPENDIX B: LOCAL WILDFIRE RISK PROCESS

Wildfire Risk Assessment plot worksheets are provided in Appendix D: Wildfire Risk Assessment – Worksheets and Photos, plot locations are summarized in Appendix F: WUI Threat Plot Locations, and the field data collection and spatial analysis methodology is detailed in Appendix H: Fire Risk Threat Assessment Methodology.

6.2.1 APPENDIX B-1: FIRE RISK THREAT ASSESSMENT METHODOLOGY

The Canadian Forest Fire Behaviour Prediction (FBP) System outlines five major fuel groups and sixteen fuel types based on characteristic fire behaviour under defined conditions.⁵² Fuel typing is recognized as a blend of art and science. Although a subjective process, the most appropriate fuel type was assigned based on research, experience, and practical knowledge; this system has been used within BC, with continual improvement and refinement, for 20 years.⁵³ It should be noted that there are significant limitations with the fuel typing system which should be recognized. Major limitations include: a fuel typing system designed to describe fuels which sometimes do not occur within the AOI, fuel types which cannot accurately capture the natural variability within a polygon, and limitations in the data used to create initial fuel types.⁵³ Details regarding fuel typing methodology and limitations are found in Appendix G: Fuel Typing Methodology and Limitations. There are several implications of the aforementioned limitations, which include: fuel typing further from the developed areas of the study has a lower confidence, generally; and, fuel typing should be used as a starting point for more detailed assessments and as an indicator of overall wildfire risk, not as an operational, or site-level, assessment. Forested ecosystems are dynamic and change over time: fuels accumulate, stands fill in with regeneration, and forest health outbreaks occur. Regular monitoring of fuel types and wildfire risk assessment should occur every 5 – 10 years to determine the need for threat assessment updates and the timing for their implementation.

Table 32 summarizes the fuel types by general fire behaviour (crown fire and spotting potential). These fuel types were used to guide the threat assessment.

Table 32. Fuel Type Categories and Crown Fire Spot Potential. Only summaries of fuel types encountered within the WUI are provided (as such, other fuel types, i.e., C-1, C-2, C-4, S-2, and S-3 are not summarized below).

Fuel Type	FBP / CFDDRS Description	AOI Description	Wildfire Behaviour Under High Wildfire Danger Level	Fuel Type – Crown Fire / Spotting Potential
C-3	Mature jack or lodgepole pine	Fully stocked, late young forest (Douglas fir, hemlock, cedar), with crowns separated from the ground	Surface and crown fire, low to very high fire intensity and rate of spread	High*

⁵² Forestry Canada Fire Danger Group. 1992. Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.

⁵³ Perrakis, D.B., Eade G., and Hicks, D. 2018. Natural Resources Canada. Canadian Forest Service. *British Columbia Wildfire Fuel Typing and Fuel Type Layer Description* 2018 Version.

Fuel Type	FBP / CFDDRS Description	AOI Description	Wildfire Behaviour Under High Wildfire Danger Level	Fuel Type – Crown Fire / Spotting Potential
C-7	Ponderosa pine and Douglas-fir	Low-density, uneven-aged forest, crowns separated from the ground, understory of discontinuous grasses and shrubs. Exposed bed rock and low surface fuel loading.	Surface fire spread, torching of individual trees, rarely crowning (usually limited to slopes > 30%), moderate to high intensity and rate of spread	Moderate
O-1a/b	Grass	Matted and standing grass communities; sparse or scattered shrubs, trees and down woody debris. Seasonal wetlands that have the potential to cure.	Rapidly spreading, high- intensity surface fire when cured	Low
M-1/2	Boreal mixedwood (leafless and green)	Moderately well-stocked mixed stand of conifers and deciduous species, low to moderate dead, down woody fuels; areas harvested 10-20 years ago	Surface fire spread, torching of individual trees and intermittent crowning, (depending on slope and percent conifer)	<26% conifer (Very Low); 26-49% Conifer (Low); >50% Conifer (Moderate)
D-1/2	Aspen (leafless and green)	Deciduous stands	Always a surface fire, low to moderate rate of spread and fire intensity	Low
S-1	Slash (jack / lodgepole pine, white spruce)	Any conifer slash	Moderate to high rate of spread and high to very high intensity surface fire	Low
W	N/A	Water	N/A	N/A
N	N/A	Non-fuel: irrigated agricultural fields, golf courses, alpine areas void or nearly void of vegetation, urban or developed areas void or nearly void of forested vegetation	N/A	N/A

*C-3 fuel type is considered to have a high crown fire and spotting potential within the WUI due to the presence of moderate to high fuel loading (dead standing and partially or fully down woody material), and continuous conifer ladder fuels.

6.2.2 APPENDIX B-2: PROXIMITY OF FUEL TO THE COMMUNITY

Home and Critical Infrastructure Ignition Zones

Multiple studies have shown that the principal factors regarding home and structure loss to wildfire are the structure's characteristics and immediate surroundings. The area that determines the ignition potential of a structure to wildfire is referred to as (for residences) the Home Ignition Zone (HIZ) or (for critical infrastructure) the Critical Infrastructure Ignition Zone (CIIZ).^{54,55} Both the HIZ and CIIZ include the structure itself and four concentric, progressively wider Priority Zones out to 100 m from the structure (Table 33 below). More details on priority zones can be found in the FireSmart Manual.⁵⁶

It has been found that during extreme wildfire events, most home destruction has been a result of low-intensity surface fire flame exposures, usually ignited by embers. Firebrands can be transported long distances ahead of the wildfire, across fire guards and fuel breaks, and accumulate within the HIZ/CIIZ in densities that can exceed 600 embers per square meter. Combustible materials found within the HIZ/CIIZ combine to provide fire pathways allowing spot surface fires ignited by embers to spread and carry flames or smoldering fire into contact with structures.

Because ignitability of the HIZ/CIIZ is the main factor driving structure loss, the intensity and rate of spread of wildland fires beyond the community has not been found to necessarily correspond to loss potential. For example, FireSmart homes with low ignitability may survive high-intensity fires, whereas highly ignitable homes may be destroyed during lower intensity surface fire events.⁵⁵ Increasing ignition resistance would reduce the number of homes simultaneously on fire; extreme wildfire conditions do not necessarily result in WUI fire disasters.⁵⁷ It is for this reason that the key to reducing WUI fire structure loss is to reduce structure ignitability. Mitigation responsibility must be centered on structure owners. Risk communication, education on the range of available activities, and prioritization of activities should help homeowners to feel empowered to complete simple risk reduction activities on their property.

Table 33. Proximity to the Interface.

Proximity to the Interface	Descriptor*	Explanation
WUI 100	(0-100 m)	This Zone is always located adjacent to the value at risk. Treatment would modify the wildfire behaviour near or adjacent to the value. Treatment effectiveness would be increased when the value is FireSmart.
HIZ/CIIZ and Community Zones		
WUI 500	(100-500m)	Treatment would affect wildfire behaviour approaching a value, as well as the wildfire's ability to impact the value with short- to medium- range spotting; should also provide suppression opportunities near a value.

⁵⁴ Reinhardt, E., R. Keane, D. Calkin, J. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. *Forest Ecology and Management* 256:1997 - 2006.

⁵⁵ Cohen, J. Preventing Disaster Home Ignitability in the Wildland-urban Interface. *Journal of Forestry*. p 15 - 21.

⁵⁶ <https://firesmartcanada.ca/> and <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/firesmart>

⁵⁷ Calkin, D., J. Cohen, M. Finney, M. Thompson. 2014. *How risk management can prevent future wildfire disasters in the wildland-urban interface*. *Proc Natl Acad Sci U.S.A.* Jan 14; 111(2): 746-751. Accessed online 1 June, 2016 at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3896199/>.

Proximity to the Interface	Descriptor*	Explanation
<i>Community and Landscape Zones</i>		
WUI 1000		
<i>Landscape Zone</i>	(500-1000 m)	Treatment would be effective in limiting long - range spotting but short- range spotting may fall short of the value and cause a new ignition that could affect a value.
<i>Landscape Zone</i>	>1000 m	This should form part of a landscape assessment and is generally not part of the zoning process. Treatment is relatively ineffective for threat mitigation to a value, unless used to form a part of a larger fuel break / treatment.

**Distances are based on spotting distances of high and moderate fuel type spotting potential and threshold to break crown fire potential (100m). These distances can be varied with appropriate rationale, to address areas with low or extreme fuel hazards.*

6.3 APPENDIX C: WILDFIRE RISK ASSESSMENT – FBP FUEL TYPE CHANGE RATIONALE

Provided separately as PDF package.

6.4 APPENDIX D: WILDFIRE RISK ASSESSMENT – WORKSHEETS AND PHOTOS

Provided separately as PDF package.

6.5 APPENDIX E: MAPS

Provided separately as PDF package.

6.6 APPENDIX F: WUI THREAT PLOT LOCATIONS

Table 34 displays a summary of all Wildfire Threat Assessments completed during CWRP field work. The original WTA forms and photos will be submitted as a separate document. The following ratings are applied to applicable point ranges:

- Wildfire Threat Assessment Rating (Based off of 2020 WTA Worksheets)
 - Low (0-41); Moderate (42 – 57); High (58 – 69); Extreme (>70);

Table 34. Summary of WUI Threat Assessment Worksheets.

WTA Plot ID	Geographic Location	WTA Rating	Fuel Type in Area
ALTA-1	East side of Alta Lake Road, across from the Cemetery.	56 (Moderate)	C3
ALTA-2	Upslope of Alta Lake Road, immediately South of undeveloped private property in the CCF. Mel's Dilemma biking trail further upslope.	56 (Moderate)	C3
BLUE-1	Blueberry Park - SW portion. Plot is representative of much of the West half of the Park. Rocky/sparse in the East.	53 (Moderate)	C3
EMER-1	Emerald Forest Conservation Area.	54 (Moderate)	C5
EMER-2	West of Emerald Estates.	46 (Moderate)	C7
HWY-1	North side of Highway 99 by Alta Lake (Hillcrest).	62 (High)	C3
NORD-1	Nordic Drive, 200m N of Taluswood FMP.	47 (Moderate)	C5
SNOW-1	West of Snowridge Crescent, 2.5ha forested parcel.	51 (Moderate)	C3
SPROAT-1	South of Stonebridge, off of the Lower Sproatt Road and adjacent to the Hydro RoW.	62 (High)	C3
SPROAT-2	South of Stonebridge, near the Lower Sproatt Road and adjacent to the Hydro RoW. Danimal Middle bisecting the area.	42 (Moderate)	C5
STONE-1	North end of Stonebridge Drive.	50 (Moderate)	C3
SUNR-1	Downslope of the Sunridge Plateau reservoir, 50m from private property (with evidence of thinning/FireSmarting). Controlled Rec Area.	69 (High)	C3
VALL-1	Between the Valley Trail & Highway 99 beside the Whistler Golf Club. ***AREA HAS BEEN TREATED under a fuel management framework (Adopt-a-Trail).	49 (Moderate)	C-5

6.7 APPENDIX G: FUEL TYPING METHODOLOGY AND LIMITATIONS

The initial starting point for fuel typing for the WUI was the 2020 provincial fuel typing layer provided by BCWS as part of the *2020 Provincial Strategic Threat Analysis* (PSTA) data package. This fuel type layer is based on the FBP fuel typing system. PSTA data is limited by the accuracy and availability of information within the Vegetation Resource Inventory (VRI) provincial data; confidence in provincial fuel type data is very low on private land. The PSTA threat class for all private land within the WUI was not available. Fuel types within the WUI have been updated using ortho imagery of the area with representative fuel type calls confirmed by field fuel type verification. Polygons not field-verified were assigned fuel types based upon similarities visible in orthophotography to areas that were field verified. Where polygons were available from the provincial fuel typing layer, they were utilized and updated as necessary for recent harvesting, development, etc.

It should be noted that fuel typing is intended to represent a fire behaviour pattern; a locally observed fuel type may have no exact analog within the FBP system. The FBP system was almost entirely developed for boreal and sub-boreal forest types, which do not occur within the WUI. As a result, the local fuel typing is a best approximation of the Canadian Forest Fire Danger Rating System (CFFDRS) classification, based on the fire behaviour potential of the fuel type during periods of high and extreme fire danger within the local MFLNRORD region. Additionally, provincial fuel typing depends heavily on VRI data, which is gathered and maintained in order to inform timber management objectives, not fire behaviour prediction. For this reason, VRI data often does not include important attributes which impact fuel type and hazard, but which are not integral to timber management objectives. Examples include: surface fuels and understory vegetation.

In some cases, fuel type polygons may not adequately describe the variation in the fuels present within a given polygon due to errors within the PSTA and VRI data, necessitating adjustments required to the PSTA data. In some areas, aerial imagery is not of sufficiently high resolution to make a fuel type call. Where fuel types could not be updated from imagery with a high level of confidence, the original PSTA fuel type polygon and call were retained.

For information on the provincial fuel typing process used for PSTA data as well as aiding in fuel type updates made in this document, please refer to Perrakis, Eade, and Hicks, 2018.⁵⁸

⁵⁸ Perrakis, D.B., Eade G., and Hicks, D. 2018. Natural Resources Canada. Canadian Forest Service. *British Columbia Wildfire Fuel Typing and Fuel Type Layer Description* 2018 Version

6.8 APPENDIX H: FIRE RISK THREAT ASSESSMENT METHODOLOGY

As part of the CWRP process, spatial data submissions are required to meet the defined standards in the Program and Application Guide. Proponents completing a CWRP can obtain open-source BC Wildfire datasets, including Provincial Strategic Threat Analysis (PSTA) datasets from the British Columbia Data Catalogue. Wildfire spatial datasets obtained through the BC Open Data Catalogue used in the development of the CWRP include, but are not limited to:

- PSTA Spotting Impact
- PSTA Fire Density
- PSTA Fire Threat Rating
- PSTA Lighting Fire Density
- PSTA Human Fire Density
- Head Fire Intensity
- WUI Human Interface Buffer (1436m buffer from structure point data)
- Wildland Urban Interface Risk Class
- Current Fire Polygons
- Current Fire Locations
- Historical Fire Perimeters
- Historical Fire Incident Locations
- Historical Fire Burn Severity

As part of the program, proponents completing a CWRP are provided with a supplementary PSTA dataset from BC Wildfire Services. This dataset includes:

- Fuel Type
- Structures
- Structure Density
- Eligible WUI (2Km buffer of structure density classes >6).

The required components for the spatial data submission are detailed in the Program and Application Guide Spatial Appendix – these include:

- AOI
- Proposed Treatment
- WUI (1Km buffer of structure density classes >6)

The provided PSTA data does not transfer directly into the geodatabase for submission, and several PSTA feature classes require extensive updating or correction. In addition, the Fire Threat determined in the PSTA is fundamentally different than the localized Fire Threat feature class that is included in the Local Fire Risk map required for project submission. The Fire Threat in the PSTA is based on provincial scale inputs - fire density; spotting impact; and head fire intensity, while the spatial submission Fire Threat is

based on the components of the Wildland Urban Interface Threat Assessment Worksheet. For the scope of this project, completion of WUI Threat Assessment plots on the entire AOI is not possible, and therefore an analytical model has been built to assume Fire Threat based on spatially explicit variables that correspond to the WUI Threat Assessment worksheet.

Field Data Collection

The primary goals of field data collection are to confirm or correct the provincial fuel type, complete Wildfire Threat Assessment Plots, and assess other features of interest to the development of the CWRP. This is accomplished by traversing as much of the AOI and surrounding Eligible WUI as possible (within time, budget and access constraints). Threat Assessment plots are completed on the 2020 WTA form, and as per the 2020 Wildland Urban Interface Threat Assessment Guide.

For clarity, the final threat ratings for the AOI were determined through the completion of the following methodological steps:

1. Update fuel-typing using orthophotography provided by the client and field verification.
2. Update structural data using critical infrastructure information provided by the client, field visits to confirm structure additions or deletions, and orthophotography
3. Complete field work to ground-truth fuel typing and threat ratings (completed 13 WUI threat plots on a variety of fuel types, aspects, and slopes and an additional 688 field stops with qualitative notes, fuel type verification, and/or photographs)
4. Threat assessment analysis using field data collected and rating results of WUI threat plots – see next section.

Spatial Analysis

Not all attributes on the WUI Threat Assessment form can be determined using a GIS analysis on a landscape/polygon level. To emulate as closely as possible the threat categorization that would be determined using the Threat Assessment form, the variables in Table 35 were used as the basis for building the analytical model. The features chosen are those that are spatially explicit, available from existing and reliable spatial data or field data, and able to be confidently extrapolated to large polygons.

Table 35. Description of variables used in spatial analysis for WUI wildfire risk assessment.

WUI Threat Sheet Attribute	Used in Analysis?	Comment
FUEL SUBCOMPONENT		
Depth of organic layer	No	Many of these attributes assumed by using ‘fuel type’ as a component of the Fire Threat analysis. Most of these components are not easily extrapolated to a landscape or polygon scale, or the data available to estimate over large areas (VRI) is unreliable.
Surface Fuel composition	No	
Dead and down material continuity	No	
Ladder fuel composition	No	
Ladder fuel horizontal continuity	No	
Stem/ha (understory)	No	
Overstory composition/CBH	No	
Crown Closure	No	
Fuel strata gap	No	
Stems/ha (overstory)	No	
WEATHER SUBCOMPONENT (From original 2012 WTA forms)		
BEC zone	Yes	
Historical weather fire occurrence	Yes	

WUI Threat Sheet Attribute	Used in Analysis?	Comment
TOPOGRAPHY SUBCOMPONENT (From original 2012 WTA forms)		
Aspect	Yes	
Slope	Yes	Elevation model was used to determine slope.
Terrain	No	
Landscape/ topographic limitations to wildfire spread	No	
STRUCTURAL SUBCOMPONENT (From original 2012 WTA forms)		
Position of structure/ community on slope	No	
Type of development	No	
Position of assessment area relative to values	Yes	Distance to structure is used in analysis; position on slope relative to values at risk is too difficult to analyze spatially.

The field data is used to correct the fuel type polygon attributes provided in the PSTA. The corrected fuel type layer is then used as part of the initial spatial analysis process. The other components are developed using spatial data (BEC zone, fire history zone) or spatial analysis (aspect, slope). A scoring system was developed to categorize resultant polygons as having relatively low, moderate, high, or extreme Fire Threat, or Low, Moderate, High, or Extreme WUI Threat.

These attributes are combined to produce polygons with a final Fire Behaviour Threat Score. To determine the Wildland Urban Interface Score, only the distance to structures is used. Buffer distances are established as per the WUI Threat Assessment worksheet (<200, 200-500 and >500) for polygons that have a 'high' or 'extreme' Fire Behaviour Threat score. Polygons with structures within 200m are rated as 'extreme', within 500m are rated as 'high', within 2km are 'moderate', and distances over that are rated 'low'.

Limitations

There are obvious limitations in this method, most notably that not all components of the threat assessment worksheet are scalable to a GIS model, generalizing the Fire Behaviour Threat score. The WUI Threat Score is greatly simplified, as determining the position of structures on a slope, the type of development and the relative position are difficult in an automated GIS process. This method uses the best available information to produce the initial threat assessment across the AOI in a format which is required by the UBCM CRI program.

The threat class ratings are based initially upon (geographic information systems) GIS analysis that best represents the WUI wildfire risk assessment worksheet and are updated with ground-truthing WUI threat plots. WUI threat plots were completed in a variety of fuel types, slopes, and aspects in order to be able to confidently refine the GIS analysis. It should be noted that there are subcomponents in the worksheet which are not able to be analyzed using spatial analysis; these are factors that do not exist in the GIS environment.

The threat assessment is based largely on fuel typing, therefore the limitations with fuel typing accuracy (as detailed in Appendix G: Fuel Typing Methodology and Limitations. Wildfire Risk Assessment plot worksheets are provided in Appendix D: Wildfire Risk Assessment – Worksheets and Photos, plot locations are summarized in Appendix F: WUI Threat Plot Locations, and the field data collection and spatial analysis methodology is detailed in Appendix H: Fire Risk Threat Assessment Methodology. Appendix B-1: Fire Risk Threat Assessment Methodology and Appendix G: Fuel Typing Methodology and Limitations) impacts the threat assessment, as well.