Community Wildfire Resiliency Plan

Village of Harrison Hot Springs

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HARRISON HOT SPRINGS
Naturally Refreshed

REGISTERED PROFESSIONAL SIGN AND SEAL

RPF PRINTED NAME	
Debrah Zemanek	5292
DATE SIGNED	
November 19, 2024	
I certify that the work described herein fulfills the standards expected of a member of the Association of British Columbia Forest Professionals and that I did personally supervise the work.	
Registered Professional Forester Signature and Seal	
	

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EXECUTIVE SUMMARY

The Community Wildfire Resiliency Plan (CWRP) process (evolving from the Community Wildfire Protection Plan - CWPP) was created in British Columbia (BC) as a response to the devastating 2003 wildfire season. As an integral part of the Community Resiliency Investment (CRI) Program, managed by the Union of BC Municipalities, CWRPs aim to develop strategic recommendations based on the seven FireSmart principles (Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Emergency Planning, and Vegetation Management) to assist communities in improving safety and reducing the risk of damage to property and critical infrastructure from wildfires.

This CWRP is an update to the Village of Harrison Hot Springs' previous CWPP, developed in 2017 and adopted in 2019. The Village has taken a number of actions since then (summarized in Section 2.2). This CWRP builds on the 2017 recommendations and subsequent activities taken by the Village, and provides Harrison Hot Springs with an updated action plan that can be used to guide the improvement and development of emergency planning, emergency response, evacuation plans, communication and education programs, legislation development, and the management of forest lands for the wildland-urban interface (WUI). The Area of Interest for this CWRP is the entire municipality of Harrison Hot Springs. Few of the residences and businesses in Harrison Hot Springs are intermixed with forested areas; there is a clear boundary between development and the surrounding forest.

The updated local wildfire threat for Harrison Hot Springs is low to moderate (Section 4.4). This contrasts with the previous CWPP, as well as provincial assessments, (Section 4.3) that identified areas of high threat. This discrepancy could, in part, be caused by an overestimation of the fire behaviour potential associated with mixed conifer-deciduous stands that characterize much of the WUI. Understandings of wildfire risk have also shifted on a provincial level over the years, which highlights the importance of an up-to-date CWRP. A thorough analysis of the wildfire environment and wildfire history of the area (Sections 4.1 and 4.2) was completed during plan development, and determined that local wildfires are usually person-caused and occur during periods of seasonal dryness (late summer – fall), or in areas with high loadings of dry fuel (recent cutblocks). Although slope can be an important driving factor, nearby wildfires are usually reported quickly and suppressed while small. This general pattern of fire behaviour is congruent with other coastal communities and with the natural disturbance regime of the area (see Section 4.2.1.)

This being said, Harrison Hot Springs is still at-risk from wildfire. Risk is a measure of the likelihood of an event and its consequence. Although the likelihood of an out-of-control wildfire is relatively low, the consequence of wildfire to the community is high. One of the risk factors that was brought up repeatedly during plan development is the single egress route and the high numbers of summer visitors to destinations further north on Harrison Lake. Therefore, plan recommendations emphasize the importance of the Village's ongoing emergency planning efforts, including the investigation of a secondary egress route from the community in conjunction with the Village's emergency planning partners. Since altering natural forested areas is not expected to affect the Village's risk profile to an appreciable degree, it is

recommended that the Village focus primarily on the other facets of FireSmart, while ensuring that the fire department is well trained and resourced to respond to fires.

Aside from emergency planning, the key to increasing Harrison Hot Springs' community wildfire resiliency is to a) reduce structure ignitability and b) reduce ignition potential. This is equally important to limit the potential for a structure fire to spread from the community into the forest, or to another structure, as it is to limit the potential of a wildfire moving into the community. Since the 2017 CWPP, the Village has 1) implemented a Wildfire Hazard Development Permit Area and 2) hired a Local FireSmart Representative. These are two important steps towards increasing FireSmart uptake in the Village. Continuing to promote FireSmart activities on and surrounding homes and critical infrastructure (with a focus on a values-out approach, i.e., starting with activities on the structure itself and then the surrounding area immediately adjacent and continuing outwards) are the foremost recommendations of this plan. Mitigation should be centered on construction and landscaping regulation through local policies, FireSmart vegetation management around structures, and resident education. Community outreach on the range of available activities and the prioritization of activities should help residents feel empowered to complete simple risk-reduction activities on their properties.

Wildfire management requires a multi-faceted approach for greatest efficacy and risk reduction outcomes. A total of 31 recommendations and action items are presented in a tabularized format (Table 1) in this Executive Summary and are more thoroughly discussed in their appropriate sections within the plan (SECTION 5: FireSmart Principles). Recommendations and action items within this plan should be considered a toolbox of options to help reduce the wildfire threat to neighbourhoods within the plan's wildland-urban interface. Harrison Hot Springs will have to further prioritize implementation based on resources, strengths, constraints, and funding availability, and regularly update the prioritization and course of action as variables change over time.

Table 1. Harrison Hot Springs Community Wildfire Resiliency Plan Action Plan.

Item	Priority	Recommendation	Rationale / Comments	Lead *(involved)*	Timeframe	Success Metric	Funding Opportunities
Education (Section 5.2)							
#1 Host FireSmart Events	High	Continue to host FireSmart events and have Local FireSmart Representative (LFR) presence and FireSmart resources at community events. Consider adding interactive workshops that demonstrate FireSmart practices hands-on, such as community clean-up days.	The inclusion of interactive workshops and community events will complement these resources by offering hands-on experiences. Village staff noted public interest in having Home Ignition Assessments completed but little follow-up on recommendations. An interactive workshop can help empower residents to take action on their own properties.	Village Staff - FireSmart	1 year and ongoing	Conduct at least one interactive workshop or community event annually.	CRI FCFS funding; FireSmart positions, event funding, and resources for Education events (banners, brochures, promo items)
#2 Fuel Treatment Signage	Low	Consider installing public education signage along the Spirit Trail Loop in East Sector Lands once the fuel management prescription is implemented.	Educating the public on wildfire hazard, associated with stand characteristics, and fuel management activities that can be taken will increase understanding.	Village Staff - FireSmart	3-5 years	Signs are installed.	CRI FCFS funding: update signage and social media (e.g. $500 and 5 hrs per sign)
#3 Public Awareness Signage	Low	Install a Fire Danger signboard in strategic locations, e.g., Sandy Beach Cove, Village entrance, and the Village boat launch, to maximize visibility to both community members and visitors. This sign should be accompanied by clear, actionable advice on what to do when fire danger levels are high (e.g., no smoking, no open fires). If regular (i.e., weekly) sign updates are not feasible, opt instead for seasonal signage to avoid desensitization.	The strategic placement of a Fire Danger signboard serves as a constant, visible reminder of the current fire risk level, prompting both residents and visitors to adjust their behaviour accordingly.	Village Staff - FireSmart	1-2 years	Signs are installed and regularly, or seasonally, updated.	CRI FCFS funding: update signage and social media (e.g. $500 and 5 hrs per sign); incremental staff hours to update signs
#4 FireSmart Materials Distribution	Moderate	Continue to ensure availability of FireSmart materials (brochures and manuals) at the Village office and at community events.	Making FireSmart information accessible will enhance visibility and encourage greater community engagement with FireSmart principles.	Village Staff - FireSmart	1 year and ongoing	Resources are available at the Village offices and at community events.	CRI FCFS funding; resources for Education events (banners, brochures, promo items)
#5 Visitor Awareness Materials Distribution	Moderate	Provide resources on FireSmart principles and Leave No Trace practices at the Visitors Centre and on the Tourism page of the Village's website to increase visitors' awareness of wildfire risk. This can help prevent high risk activities, such as abandoning fire pits, parking on dry grass, and improperly disposing of waste.	Visitors and recreators comprise a significant contingent of wildfire risk to Harrison Hot Springs and East Harrison; educating this population can help reduce human-caused ignitions.	Village Staff - FireSmart	1-2 years	Resources are available at the Visitors Centre and added to the Tourism page of the municipal website.	CRI FCFS funding; resources for Education events (banners, brochures, promo items)
#6 Annual FireSmart Progress Report	Moderate	Consider releasing a brief annual FireSmart report to the public to further increase community awareness.	Reporting annually on Village FireSmart initiatives will help bring positive public awareness to community wildfire resiliency.	Village Staff - FireSmart	1-2 years	Annual report is issued.	May be eligible for CRI funding – FireSmart staff time. Estimate 40-80 hours
#7 FireSmart Village Office	High	Complete FireSmart activities on the Village Office, as recommended by the Critical Infrastructure Assessment, to serve as a public demonstration. Consider installing accompanying information signage.	Demonstration and education of simple and effective practices can empower the public to complete FireSmart activities on their own properties.	Village Staff - FireSmart	2-3 years	FireSmart recommendations for the Village Office are completed.	CRI FCFS funding
#8 Initiate FireSmart Canada Neighbourhood Recognition Program	Moderate	Consider promoting the FireSmart Canada Neighbourhood Recognition Program (FCNRP). Local interest in wildfire resiliency could be leveraged to spark interest and agency. Use Home Hazard Assessments to start identifying priority streets and potential neighbourhood leaders. Work with neighbourhoods to complete a Neighbourhood Assessment, Plan, and community event.	The Neighbourhood Recognition Program is an excellent way to enhance wildfire resiliency, by fostering awareness, creating a sense of empowerment, and bringing neighbours together. A local FireSmart event and/or clean-up and BBQ could be completed concurrently with the assessment. In addition, insurance policy discounts with partnering providers are available with FireSmart certification.	Village Staff - FireSmart	2-3 years	At least one recognition is achieved.	CRI FCFS funding and FireSmart staff time. Up to ~$450/assessment and ~$1,100/plan. Up to $5,000 per community event.

Item	Priority	Recommendation	Rationale / Comments	Lead *(involved)*	Timeframe	Success Metric	Funding Opportunities
Legislation and Community Planning (Section 5.3)							
#9 Schedule CWRP Update	Moderate	Apply for funding to update this CWRP in 2029. Reassess and reprioritize proposed and completed fuel treatment units as part of the CWRP update.	A current (i.e., no more than 5 years old) CWRP is a requirement for further funding under the CRI Program.	Village Staff - FireSmart	5 years or ~2029	CWRP update funding obtained	CRI FCFS funding up to $16,000 for an update (2024 program funding); incremental staff hours for project management (40-80)
#10 Legislate FireSmart Landscaping	Moderate	Consider legislating FireSmart landscaping guidelines to residences within the Village outside of the Interface Wildfire Development Permit Area (i.e., the Village core), mandating low flammability plant species and FireSmart landscape maintenance, such a regularly mowing lawns, pruning low hanging conifer branches, and clearing debris from eaves and roofs.	Bylaws can be a successful tool for awareness and education, regardless of enforcement capacity.	Village Staff - Planning *(FireSmart)*	3-5 years	A Wildfire Landscaping Bylaw, or similar, is considered by the Village	Incremental staff hours. CRI FCFS funding for development considerations
#11 Include Immediate Zone in DPA Provisions	Low	Consider updating the Wildfire Development Permit Area (DPA) guidelines to reflect the FireSmart standards for the Immediate Zone – a 1.5 m non-combustible area around the home that is cleared of all vegetation and combustible materials.	The Immediate Zone can be a critical defensible space around homes in ignition prevention and fire suppression efforts.	Village Staff - Planning *(FireSmart)*	3-5 years	A provision is added to the current Wildfire DPA.	Incremental staff hours. CRI FCFS funding for development considerations
#12 OCP Updates with Current Wildfire Hazard	Low	At the time of update for the Official Community Plan (OCP), ensure that language regarding wildfire hazard is up to date and reflects the Village's latest CWRP.	Harrison Hot Springs' current OCP references the 2017 CWPP. Ensuring that the OCP reflects the most current understanding of hazard to the community will create realistic expectations for resiliency efforts.	Village Staff - Planning *(FireSmart)*	10 years (or at the time of OCP update)	The OCP is updated with the most current wildfire threat analysis.	Incremental staff hours. CRI FCFS funding for development considerations
Development (Section 5.4)							
#13 FireSmart Home Ignition Zone Assessments	High	Continue to offer and promote free home hazard assessments for residents (FireSmart Home Ignition Zone assessments or Home Partner Program assessments). See Item #2(Cross-Training) for advice on expanding capacity for assessments by increasing FireSmart roles.	Home hazard assessments encourage action in residential priority zones. Uptake can be incentivized through offerings like a FireSmart rebate program (already in place) or access to free yard waste pick-up. The Home Partner Program is a higher standard of assessment.	Village Staff - FireSmart	1 year	Increased number of homes assessed and improved FireSmart compliance.	CRI FCFS funding
#14 Critical Infrastructure Assessments	High	Review the completed FireSmart assessments for critical infrastructure and community assets and prioritize implementation of recommendations to improve resiliency.	Assessing and safeguarding critical infrastructure is pivotal for ensuring operational continuity during wildfires, significantly contributing to effective response and recovery efforts.	Village Staff - Public Works *(FireSmart)*	1-2 years	Identification and mitigation of wildfire risks in critical infrastructure.	CRI FCFS funding
#15 FireSmart Considerations in Parks and Trails Master Plan	Low	Consider a policy in the under-development Parks and Trails Master Plan to budget and plan for FireSmart vegetation management of new and existing parks as required, especially the maintenance of trail-side fuel loading. See Item #17 (Interagency Cooperation).	Recreational use of forested areas (e.g., East Sector Lands) can increase chance of human-caused ignition. Creating a plan that considers land management through a wildfire lens will increase resiliency.	Village Staff – Public Works Department *(FireSmart)*	3-5 years	A Parks and Trails Master Plan is developed that includes FireSmart language.	Internal funding
Interagency Cooperation (Section 5.5)							

Item	Priority	Recommendation	Rationale / Comments	Lead *(involved)*	Timeframe	Success Metric	Funding Opportunities
#16 FVRD CFRC Participation	High	Maintain active involvement in the Fraser Valley Regional District's (FVRD) Community FireSmart Resiliency Committee (CFRC) to share and integrate Harrison Hot Springs' FireSmart initiatives and experiences.	Proactively contributing Harrison Hot Springs' FireSmart initiatives to CFRC meetings to foster a more cohesive and informed regional response to wildfire risks. Participation in a CFRC is a requirement for accessing CRI 2024 program funding and beyond.	Village Staff - Emergency Planning / FireSmart	Ongoing	Continued participation in CFRC meetings and integration of regional strategies in Harrison Hot Springs' plans.	CFI FCFS and incremental staff hours
#17 Fuel Management Provision in FVRD Partnership Agreement	Low	Ensure that regular trail maintenance and monitoring for fuel build up is a provision of the Partnering Agreement with FVRD that covers the East Sector Lands. See Item #15 (Development).	Addressing fuel-loading (i.e., surface fuels and ladder fuels) of the stand during routine trail maintenance will reduce wildfire hazards.	Village Staff – Public Works Department *(FireSmart)*	1-2 years	Provisions for fuel management are incorporated into the East Sector Lands Partnership Agreement.	Incremental staff hours
#18 Secondary Egress Route	Moderate	In cooperation with the District of Kent, continue to work with relevant Provincial ministries and stakeholders, including BC Parks, Ministry of Emergency Management and Climate Readiness, Ministry of Transportation and Infrastructure, Ministry of Forests, Seabird Island Band, and Fraser Valley Regional District to complete a secondary egress route through Sasquatch Park and provide an alternate evacuation route for residents and visitors along Rockwell Drive.	An alternative egress route for recreators along Rockwell Dr. and Sasquatch Park will alleviate traffic that, at this time, has to funnel through Hot Springs Rd. in the event of an evacuation.	Village Staff - Emergency Planning (*Kent-Harrison Joint Emergency Programs; other stakeholders*)	3-5 years	Funding is secured and a secondary evacuation route is completed.	Internal funding
#19 Public Awareness Signage Along East Harrison	High	Continue to work with the District of Kent and the Fraser Valley Regional District (FVRD) to communicate fire prevention messaging to visitors to the region. Consider increasing wildfire awareness signage along East Harrison and in the vicinity of Sasquatch Park.	Human-caused fire ignitions are a significant source of threat to Harrison Hot Springs; educating the public on best practices for mitigating this risk will reduce hazard.	Village Staff - FireSmart (*Kent Staff; FVRD*)	3-5 years	Signage is posted at strategic points along Rockwell Drive.	Incremental staff hours
#20 Smoke and Heat Exposure Strategy Plan	Low	Consider lobbying the Provincial government or local Medical Health Officer(s) to develop a strategy for communities to draw upon when they are exposed to smoke from wildfire for extended periods of time. This strategy may include smoke exposure risk assessments, exposure reduction measures, and a decision-key for when to evacuate the community due to wildfire smoke.	This was recommended in the 2017 CWPP and Village staff have expressed that smoke and heat exposure are continued concerns.	Village Staff - Emergency Planning	3-5 years	A strategic plan, including recommendations, is developed.	Incremental staff hours; possible UBCM CEPF funding
Cross-Training (Section 5.6)							
#21 Expand FireSmart Team	Low	As Harrison Hot Springs progresses in its FireSmart and resiliency program, consider expanding Harrison Hot Springs' FireSmart team by training and/or hiring for key positions based on community needs. Consider hiring a dedicated FireSmart Coordinator *(duties are currently performed by the Village's Community Services Manager)* and sending a member of the Fire Department to Wildfire Mitigation Specialist (WMS) training.	As of 2024, CRI funding requires at least one FireSmart position. Harrison Hot Springs currently fulfills this by employing a LFR from the Fire Department, however, expanding the FireSmart team will enhance the Village's capacity for conducting assessments, performing mitigation activities, increasing public education, and, overall, bolstering Harrison Hot Springs' wildfire preparedness program.	Village Staff - FireSmart	5-7 years	Positions additional to the LFR are filled	CRI FCFS funding

Item	Priority	Recommendation	Rationale / Comments	Lead *(involved)*	Timeframe	Success Metric	Funding Opportunities
#22 FireSmart Training	High	Ensure that FireSmart staff complete key training programs as required by their role, including Local FireSmart Representative (LFR) Training, Wildfire Mitigation Specialist (WMS) Training, and Wildfire Risk Reduction Training.	These training programs are crucial for equipping FireSmart staff with the comprehensive skills and knowledge needed to implement FireSmart principles, conduct accurate risk assessments, and lead effective wildfire mitigation and community preparedness initiatives.	Village Staff - FireSmart	1-2 years	Completion of specified training programs by all designated FireSmart staff members	CRI FCFS
#23 Emergency Management Training	Low	Applicable Village staff should continue to complete emergency management training in conjunction with local partners (FVRD, District of Kent) as opportunities are made available.	Increasing emergency management personnel will increase response and recovery capacity.	Harrison Hot Springs Fire Department	3-5 years	Number of staff with emergency management training increases	CRI FCFS
#24 FireSmart Wildfire Resiliency and Training Summit	Moderate	Village FireSmart staff should consider attending the Wildfire Resiliency and Training Summit on an annual basis.	Relevant learnings can be shared at CFRC meetings.	Village Staff - FireSmart	Annually	Annual attendance at Wildfire Resiliency and Training Summits (1-2 staff)	CRI FCFS
#25 Maintain Fire Department Training	Moderate	Ensure all Harrison Hot Springs Fire Department members continue to stay up to date on wildland interface training; WSPP-WFF 1 (Wildland Firefighter Level 1) at a minimum. Consider expanding the required annual refresher training program, as resources/budgets allow, to include WSPP-115 (Wildland Structural Protection Program) and S-231 (Engine Boss) training.	SPP-WFF-1 is specific for structural fire fighters who respond to wildland fires in their service area. Harrison Hot Springs Fire Department members are currently well-trained, but expanding and updating training will enhance wildfire suppression capacity.	Harrison Hot Springs Fire Department	1 year and ongoing	All Fire Department members have WSPP-WFF-1, or higher, training	CRI FCFS
Emergency Planning (Section 5.7)							
#26 Complete Emergency Preparedness Plan	High	Prioritize the completion of the Emergency Preparedness Plan update, ensuring it encompasses strategies for wildfire preparation, response, and recovery. Consider seeking traffic modelling services to create an understanding of pinch points, vulnerabilities, and expected timeframe of an evacuation event.	Finalizing updates to the Emergency Preparedness Plan (in development as of July 2024) will significantly bolster Harrison Hot Springs' resiliency by providing the framework for emergency response and recovery.	Village Staff - Emergency Planning (*Regional Partners)*	1 year	Emergency plan is completed and shared with local emergency management partners	CRI FCFS Emergency Planning or UBCM CEPF
#27 Conduct Tabletop Exercises	Moderate	Regularly conduct tabletop exercises to test the updated Emergency Preparedness Plan. Suggest incorporating a wildfire simulation exercise requiring the evacuation of East Harrison and Harrison Hot Springs to identify and address potential challenges. Incorporate traffic modelling if available (see Item #5). Include all relevant emergency management partners (Kent, FVRD, MoF, Seabird Island Band, BC Parks, etc.).	Tabletop exercises are a great way of identifying possible 'pinch points' in an evacuation scenario and testing lines of communication. The East Harrison evacuation scenario was broached by the CFRC as a concern for the community.	Village Staff - Emergency Planning (*Regional Partners)*	Annual	Exercises are conducted annually and plan amendments are made, as necessary.	CRI FCFS Emergency Planning or UBCM CEPF
#28 Visitor Amenities Operators Coordination	Low	As part of Emergency Planning outreach, develop materials to share specifically with the tourism community (accommodations, rentals, guided services, etc.) to advise on the communication of hazard conditions and emergency protocols to visitors. Consider an emergency planning seminar to share preparedness and response strategies.	Visitors comprise a significant portion of the population to consider for emergency management. Ensuring a communication strategy that includes this contingency will enhance Harrison Hot Springs' emergency response.	Village Staff - Emergency Planning (*Business Community)*	3-5 years	A comprehensive communication strategy is developed and shared with tourism businesses.	Internal funding
Vegetation Management (Section 5.8)							
Residential-Scale FireSmart Landscaping							

Item	Priority	Recommendation	Rationale / Comments	Lead *(involved)*	Timeframe	Success Metric	Funding Opportunities
#29 Facilitate Residential-scale Vegetation Management	Moderate	Consider mechanisms to facilitate homeowners undertaking their own FireSmart vegetation management, such as providing tool sharpening services, providing seasonal chipper, dumpster, or other greenwaste collection method, and/or waiving tipping fees.	Removing barriers for residents to conduct FireSmart vegetation management on their properties is the next step along the FireSmart Roadmap. Village and Fire Department staff noted that, while home assessments are being requested, follow-up activities are not being implemented.	Village Staff - FireSmart	1-2 years	5-10 properties participate annually	CRI FCFS
Fuel Treatments							
#30 Fuel Management Treatments	Moderate	Implement fuel management projects as prescriptions are completed and as resources allow.	Prescriptions are in progress for two Village areas.	Village Staff - FireSmart (*Contractors)*	1-2 years	Fuel treatments are completed.	CRI FCFS
#31 FireSmart Green Spaces Program	Moderate	Consider applying for the FireSmart Culturally Significant Sites and Green Spaces (CSSGS) program, which address vegetation on small areas of publicly-owned land (e.g., municipal). Assessments must be conducted by a qualified Local FireSmart Representative or Wildfire Mitigation Specialist.	The CSSGS program is suitable for areas too small to require a fuel management prescription, but would still benefit from fuel treatment. Activities are limited to pruning and brushing of regenerating trees under 2m tall. A secondary assessment is required to be completed after mitigation activities are undertaken.	Harrison Hot Springs LFR	3-5 years	Assessments, recommended mitigation activities, and secondary assessments are completed.	CRI FCFS; up to $25,000 per eligible location for activities, including building materials and labour; up to $850 per location (generally 4-8 hours)

FREQUENTLY USED ACRONYMS

AOI	Area of Interest
BC	British Columbia
BCWS	British Columbia Wildfire Services
BEC	Biogeoclimatic Ecosystem Classification
CFFDRS	Canadian Forest Fire Danger Rating System
CFRC	Community FireSmart Resiliency Committee
CRI	Community Resiliency Investment
CWPP	Community Wildfire Protection Plan
CWRP	Community Wildfire Resiliency Plan
DPA	Development Permit Area
EOC	Emergency Operations Program
FBP	Fire Behaviour Prediction System
FCFS	FireSmart Community Funding and Supports
FOR	Ministry of Forests
FVRD	Fraser Valley Regional District
HHSFD	Harrison Hot Springs Fire Department
HIZ	Home Ignition Zone
ICS	Incident Command System
LFR	Local FireSmart Representative
NDT	Natural Disturbance Type
PSTA	Provincial Strategic Threat Assessment
PTU	Proposed Treatment Unit
UBCM	Union of British Columbia Municipalities
VAR	Values at Risk
WMS	Wildfire Mitigation Specialist
WUI	Wildland-Urban Interface
WWG	Wildfire Working Group

SECTION 1: INTRODUCTION

1.1 OVERVIEW

In April 2024, B.A. Blackwell & Associates Ltd. was retained by the Village of Harrison Hot Springs (the Village; Harrison Hot Springs) to develop a Community Wildfire Resiliency Plan (CWRP) as an update to their previous 2017 Community Wildfire Protection Plan (CWPP). A CWRP is both a localized risk assessment and an action plan to improve wildfire resiliency in a community. The CWRP is the latest evolution in community wildfire planning in British Columbia (BC). A CWRP has its roots in the Community Wildfire Protection Plan (CWPP) framework, which was initially 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 2023 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, capacity, and the unique threats that they face. Despite these differences, the goals of a CWRP remain the same: to improve wildfire prevention, preparedness, response, and recovery in the face of ever-increasing wildfire risk. Implementing recommendations in this CWRP will improve public safety and reduce the risk of damage to values at risk from wildfires.

1.2 PLAN GOALS

This CWRP identifies the level of interface wildfire risk in Harrison Hot Springs by providing a current and accurate understanding of the threats to human life, infrastructure, and values at risk from wildfire. This CWRP is intended to serve as a framework to guide the implementation of specific actions and strategies 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 behaviour threat within the community.

To help guide and accomplish the above strategies, this CWRP will provide Harrison Hot Springs 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 the seven FireSmart disciplines: education, legislation and planning, development considerations, interagency cooperation, cross-training, emergency planning, and vegetation management.

1.3 PLAN DEVELOPMENT SUMMARY

The planning for this CWRP is based on the municipal boundary of Harrison Hot Springs, which is located almost entirely within the wildland-urban interface (WUI). The WUI represents the zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.[1] For the purpose of a CWRP, the WUI is defined as a one-kilometer buffer around a structure density of six or more structures per km^2. Map 1 illustrates the area of interest (AOI) and WUI area. Further information on the WUI and the community details of Harrison Hot Springs is found in Section 3.1 - Area of Interest and Wildland-Urban Interface.

The CWRP process consists of five general phases:

1) Consultation with the Wildfire Working Group (WWG)[2] and project stakeholders.
2) Review of relevant plans and legislation regarding emergency response and wildfire (Section 2 - Relationship to Other Plans and Legislation).
3) Community description and identification of values at risk (Section 3 – Community Description).
4) Assessment of the local wildfire risk (SECTION 4: Wildfire Risk Assessment).
5) Analysis and action plan for each of the seven FireSmart disciplines (SECTION 5: FireSmart Principles).

SECTION 2: RELATIONSHIP TO OTHER PLANS AND LEGISLATION

Wildfire resiliency is influenced by all aspects of community planning, from land use decisions to utilities servicing, development policies, parks and trails planning, bylaw enforcement, and more. As a result, there are many plans that pertain to a CWRP. This section reviews laws, policies, plans, and guidelines to identify linkages and content relevant to wildfire emergency planning and response.

2.1 LOCAL AUTHORITY EMERGENCY PLAN

Emergency preparedness and response planning in BC is guided by the Emergency and Disaster Management Act (EDMA), which replaced the Emergency Program Act in November 2023.[3] This Act defines the various roles and administrative duties of the province and local governments regarding the implementation of higher-level emergency planning; the processes of declaring a state of emergency; and the coordination of post-disaster relief. The Act emphasizes the four phases of emergency management: mitigation, preparation, response, and recovery.

Harrison Hot Springs has a joint emergency management agreement with the District of Kent (Kent) to provide emergency management services to the combined 7500 residents. The Kent-Harrison Joint

[1] FireSmart Canada. 'What is the wildland urban interface?' https://www.firesmartcanada.ca/what-is-firesmart/understanding-firesmart/what-is-the-wui/
[2] For the duration of this project, Harrison Hot Springs 'Wildfire Working Group' functioned like a Community FireSmart Committee (CFRC).
[3] More information can be found at Modernized emergency management legislation - Province of British Columbia (gov.bc.ca)

Emergency Program (KHJEP) covers 174 km^2, extending up the east side of Harrison Lake to Hicks Lake.[4] The Emergency Management team includes a part-time Emergency Program Coordinator, volunteer Deputy Emergency Program Coordinator, volunteer Emergency Social Services Coordinator, and a team of volunteers for Emergency Support Services (ESS). The Program maintains several Emergency Operations Centres (EOC), as well as backup facilities; within Harrison Hot Springs, the upstairs meeting room of the Fire Hall serves as the EOC.

Harrison Hot Springs and Kent are currently in the process of updating the all-hazards emergency plan to include new provisions detailed in EDMA. The KHJEP emergency plan is a living document that is regularly revised when community hazards change, gaps are found within policy or procedures, or the governance structure changes.

2.2 LINKAGES TO OTHER CWPPS/CWRPS

2017 Harrison Hot Springs CWPP

In 2017, B.A. Blackwell & Associates Ltd. developed a CWPP for Harrison Hot Springs that was adopted by the Village in 2019.[5] Twenty-three recommendations were made regarding plans and policies, development, critical infrastructure, vegetation management, public awareness, emergency response, and fire department training. Since the writing of this Plan in 2017, new understandings of FireSmart principles have formed, funding structures have changed, and new standards for reporting have emerged. For the development of this CWRP, the 2017 CWPP was thoroughly reviewed to assess whether recommendations remained relevant and/or could be adapted. Many of the previous recommendations deemed relevant have been, or are in the process of being implemented. These include:

- A Wildfire Development Permit Area (Recommendations #1 & #10) has been designated under the Official Community Plan Bylaw No. 1184, 2022, to guide new development design and FireSmart construction materials within the interface.
- In May 2024, the Village hired a Local FireSmart Representative (LFR) who, as of the time of writing, has completed 33 FireSmart Home Assessments (Recommendation #2), as well as several Village-owned structures, including the Village Offices, Public Works buildings, Ranger Station, and Yacht Club. In addition to this, the LFR has presented FireSmart materials at several Village-hosted public events (Recommendation #13) to promote awareness and engagement. [6]
- Fuel management prescriptions have been developed for two of the proposed treatment units (PTU) identified by the CWPP: Water Tower and Spirit Loop Trail (Recommendation #8). The Village is currently scheduling fuel mitigation work for fall 2024 – winter 2025. See Section 5.8 - Vegetation and Fuels Management for more details.
- The development of this CWRP serves as the recommended 5- to 7-year update of the CWPP (Recommendation #12) to gauge progress and update threat assessment for changes in fuels, forest health, land planning, stand structure, and/or infrastructure within the interface.

[4] Village of Harrison Hot Springs. 2024. *Emergency Management*. Emergency Management | Harrison Hot Springs
[5] B.A. Blackwell & Associates Ltd. 2017. *Village of Harrison Hot Springs Community Wildfire Protection Plan*.
[6] Email communications. July 2024.

- Harrison Hot Springs is engaged with the District of Kent and Seabird Island Band and, in combination, the three parties have submitted a request to BC Parks to support a secondary egress route. (Recommendation #17).
- Harrison Hot Springs has fostered strong working relationships with neighbouring jurisdictions and BC Wildfire Services (BCWS) to identify opportunities for emergency management cooperation (Recommendation #21).
- Harrison Hot Springs Fire Department (HHSFD) has maintained training standards and equipment specific to interface and wildland fires response (Recommendation # 22).

Table 2 below details recommendations that are still relevant and can be adapted to reflect the updated standards and understandings of wildfire threat today.

Table 2. Summary of relevant recommendations from the 2017 CWPP that are updated for this CWRP.

#	Recommendation	Comments
4	Develop a Parks and Trails Master Plan and include consideration for the placement, type, width, and objective of trails. Consideration should also be given to trail building and maintenance as these activities can either increase wildfire risk (through fuels accumulations and unsafe work practices) or decrease wildfire risk (though proper placement, clean-up of combustible fuels trailside and work practices which adhere to Wildfire Act and Regulations). The Master Plan could also include an emergency response plan to deal with the risks of fire within parks.	Harrison Hot Springs is currently seeking to develop a Parks and Trails Plan by 2026. They are focusing on public engagement at this time.
5	Review Village Tree Management and Preservation Bylaw No. 1015, 2012 and revise to allow for homeowners to address wildfire hazards on their property associated with trees immediately adjacent to homes, as determined by a QP.	Harrison Hot Springs is currently updating a number of bylaws.
6	Consider lobbying the Provincial government or local Medical Health Officer(s) to develop a strategy for communities to draw upon when they are exposed to smoke from wildfire for extended periods of time. This strategy may include smoke exposure risk assessments, exposure reduction measures, and a decision-key for when to evacuate the community due to wildfire smoke.	Heat and smoke exposure present serious health and safety concerns and can be exacerbated by the topographical characteristics of a valley. There is currently no cooling facility within the Village. Harrison Hot Springs would benefit from a strategic plan to alleviate this hazard.

Other CWRPs/CWPPs

Understanding the community wildfire plans of neighbouring jurisdictions can help highlight gaps and opportunities for interagency collaboration and create efficiencies. Table 3 below summarizes key points relevant to Harrison Hot Springs from surrounding communities' community wildfire plans.

Table 3. Summary of other local Community Wildfire Plans with relevancy to Harrison Hot Springs.

Plan	Relationship to CWRP
District of Kent CWPP, 2017	Harrison Hot Springs is fully enveloped by the District of Kent. The two municipalities have a strong working relationship that allows both to share resources and address hazards at a landscape level, across jurisdictional boundaries. The 2017 District of Kent CWPP, which is also being updated at time of writing, addresses many of the same considerations as the 2017 Harrison Hot Springs CWPP. These include: Updating the OCP to include language and provisions for wildfire threat through a Wildfire Development Permit Area. • Addressing access/egress issues through bylaws and subdivision development applications, to be reviewed by fire officials. • Embedding FireSmart guidelines in new development planning to address hazard on private land. • Considering the FireSmart Community Recognition Program and Home Partners Program. • Promoting public engagement through workshops, social media, and school programs. • Establishing an Interface Steering Committee that includes Harrison Hot Springs, as well as BCWS, BC Parks, Ministry, industrial operators, and FVRD, to identify wildfire risk and generate collaborative solutions. • Creating an alternate egress route in collaboration with Harrison Hot Springs, and other stakeholders for residents and visitors on Rockwell Drive. *It should be noted that the Kent CWPP is currently being updated, as well.*
Fraser Valley Regional District CWPPs, 2019	Harrison Hot Springs is within the Fraser Valley Regional District (FVRD) and the largest park (East Sector Lands) is managed by the FVRD. Three 2019 CWPPs were developed based on geographic zones. The AOI for 'Zone B' includes the WUI within Electoral Areas C, F, and G, adjacent to the District of Kent. Though none of the CWPPs reference Harrison Hot Spring directly, recommendations from these plans were used to inform the development of this CWRP, to help identify opportunities for synergies and efficiencies on a landscape level.
Sts'ailes First Nation CWRP, 2024	The Sts'ailes First Nation is currently developing its first CWRP.

2.3 LOCAL PLANS AND BYLAWS

Official Community Plan

An Official Community Plan (OCP) outlines the objectives and policies of a local government, as well as a framework to guide, monitor, and evaluate land use and development. Harrison Hot Springs undertook an update to the OCP starting in 2022, leading to the adoption of Official Community Plan Bylaw No. 1184,

2022 in 2024.[7] Table 4 below summarizes the objectives and policies relevant to community wildfire management.

Table 4. Official Community Plan (OCP) and its relationship to the CWRP.

Section	Description & *Relationship to CWRP*
3.7 The East Sector Special Planning Area	This section details land management considerations for this portion of land that hosts several rare plant communities and species at risk. The objectives for this area include balancing environmental protection and recreational use with risk (i.e., flooding) mitigation. *Considerations for species and ecosystems at risk are discussed in further detail in Section 3.3.6 - Environmental Values.*
4.2 Tourist Commercial Development Permit Area	4.2.4 Guideline e. mandates the use of landscape screening for parking clusters and storage and service areas from residential and pedestrian view. *A provision should be added for FireSmart species recommendations to ensure that flammable cedar hedging is not prevalent.*
4.5 Interface Wildfire Development Permit Area	This section outlines the mandates required for development within the designation Interface Wildfire Development Permit Area (DPA). Guidelines and objectives are provided for the protection of development from hazardous conditions. Provisions include: The use of FireSmart building materials and design (e.g., steep roof to prevent debris accumulation and screened vent openings to prevent embers from entering structure). The use of FireSmart vegetation management as standard for intermediate and extended zone (e.g., pruning and debris clean-up). Wildfire Development Permits must include a Fire Mitigation Report, site plan, and landscape plan *The DPA does not include the 'built up' area of the Village. See Map 2 for DPA coverage and Section 5.4 - Development Considerations for further details.*

Local Bylaws

As mentioned above, Harrison Hot Springs is currently in the process of updating a number of bylaws. Table 5 below summarizes the bylaws as available at the time of Plan development.

Table 5. Summary of local bylaws related to emergency management and wildfire resiliency.

Bylaw	Description & Relationship to CWRP
Tree Management and Preservation Bylaw No. 1015, 2012	Tree removal may occur, by permit application to the Village, if undergrowth is inhibited by dense cover; root system or canopy is causing damage; tree is dying; tree presents a danger / hazard to property; or trees are within building envelope of new construction. 'Distinct Trees have additional protection (certain species >80cm dbh).

[7] The Village of Harrison Hot Springs Official Community Plan Bylaw No. 1184, 2022. HHS OCP Bylaw updated (Mar 2023).pdf (harrisonhotsprings.ca)

Bylaw	Description & Relationship to CWRP
	No permit application is required for the removal of trees <30 cm in diameter or <7.5 m tall, which facilitates implementation of *most* FireSmart landscaping recommendations that would be made. Amending this bylaw is not a priority at this time.
Fire Alarm System Bylaw No. 832, 2005	The intent of this bylaw is to prevent the occurrence of false alarms, thereby mitigating the activation of the Fire Department in a non-emergency situation. This requires the property owner to install, maintain, monitor, and properly operate any fire alarm system.
Fireworks Regulation Bylaw No. 871, 2007	This bylaw regulates and restricts the sale and detonation of firecrackers, fireworks, and explosives. Display permits can be obtained through authorization of the Fire Chief.
Open Burning and Outdoor Fire Regulation Bylaw No. 1110, 2017	This bylaw regulates and restricts the open burning of specified materials and the use of unrated Tiki torches, sky lanterns, fireworks, or cooking apparatus. The Fire Chief or any Fire Department Officer has the ability to prohibit all open burning if conditions are deemed high fire hazard (e.g., high winds, air inversion, poor air quality).
Fire Department Regulation Amendment Bylaw No. 1159, 2020"	The bylaw details provisions for firefighting services, including outlining the powers of the Fire Chief.
Property Maintenance Bylaw No. 1072, 2015	This bylaw aims to protect and enhance the quality of properties within the Village. Provisions that pertain to wildfire resiliency include: • Preventing noxious weed and invasive species from amassing; • Banning the accumulation of abandoned vehicles, furniture, appliances, construction materials, and other combustible materials on properties; and • Ensuring the regular brushing of vegetation.

Other Local Plans

Other local plans relevant to the development process of this CWRP are summarized in Table 6 below.

Table 6. Summary of other local plans relevant to the CWRP.

Plan	Description & Relationship to CWRP
2023 Strategic Plan	This plan depicts the Council's objectives and priorities as a resort municipality. Priority actions to address public safety include seeking FireSmart Community Recognition and securing a secondary evacuation route. Recommendations offered in this CWRP are aligned with these goals.
2023 Urban Forests Management Plan	This plan details strategies for the management of urban trees within the Village. This plan acknowledges the contribution of urban trees to the fuel load within the interface and recommends several strategies to mitigate hazard. These include: • Revising the Tree Management and Preservation Bylaw No. 1015 to allow homeowners to address wildfire risks on their property associated with tree immediately adjacent to homes.

Plan	Description & Relationship to CWRP
	• Promoting FireSmart approaches to Village residents. • Engaging with the Ministry of Forests (FOR) and the Fraser Valley Regional District (FVRD) regarding East Sector jurisdiction; specifically, regarding the burden of liability from tree risk and potential wildfire risk within 200 m of residences. • Increasing urban tree diversity to build resiliency to threats associated with climate change, including drought and heat stress. Species selection should consider site suitability, pest resistance, flammability, and climate change adaptation.

2.4 HIGHER-LEVEL PLANS AND LEGISLATION

Table 7 lists higher-level plans and legislation relevant to wildfire planning and risk mitigation. These plans help guide where and how activities like resource extraction and infrastructure development occur, which affects both wildfire threat and consequence.

Table 7. Higher-Level Plans and their relationship to the CWRP.

Issuing Government/Agency	Plan/Legislation	Description	Relationship to CWRP
Province of BC (2013)	Lower Fraser Sustainable Resource Management Plan (SRMP)	This SRMP defines the Fraser Valley South Landscape Unit (LU), and provides an overview of the key resource tenure holders and significant resource values within this LU. The SRMP defined targets for wildlife, fish, and biodiversity within the LU. The plan recognizes that the majority of lower elevation land has been deforested for agricultural and/or urban use, while many lower elevation productive sites have been extensively disturbed by forest fires and timber harvesting.	While it recognizes wildfire as a significant disturbance regime in the area's history, the SRMP does not address wildfire risk reduction or any form of active management for wildfire mitigation.
Province of BC	BC Provincial Open Burning Smoke Control Regulation (OBSCR)	Governs open burning relating to land clearing, forestry operations and silviculture, wildlife habitat enhancement, and community wildfire risk reduction.	Harrison Hot Springs is within a High Sensitivity Smoke Zone. Any open burning must comply with OBSCR, as well as Harrison Hot Springs' Open Burning bylaw.

SECTION 3: COMMUNITY DESCRIPTION

This section discusses the area of focus for this Plan and provides general demographic information about Harrison Hot Springs. Understanding population trends, land use patterns, and values at risk can help direct FireSmart outreach and risk mitigation activities.

3.1 AREA OF INTEREST AND WILDLAND-URBAN INTERFACE

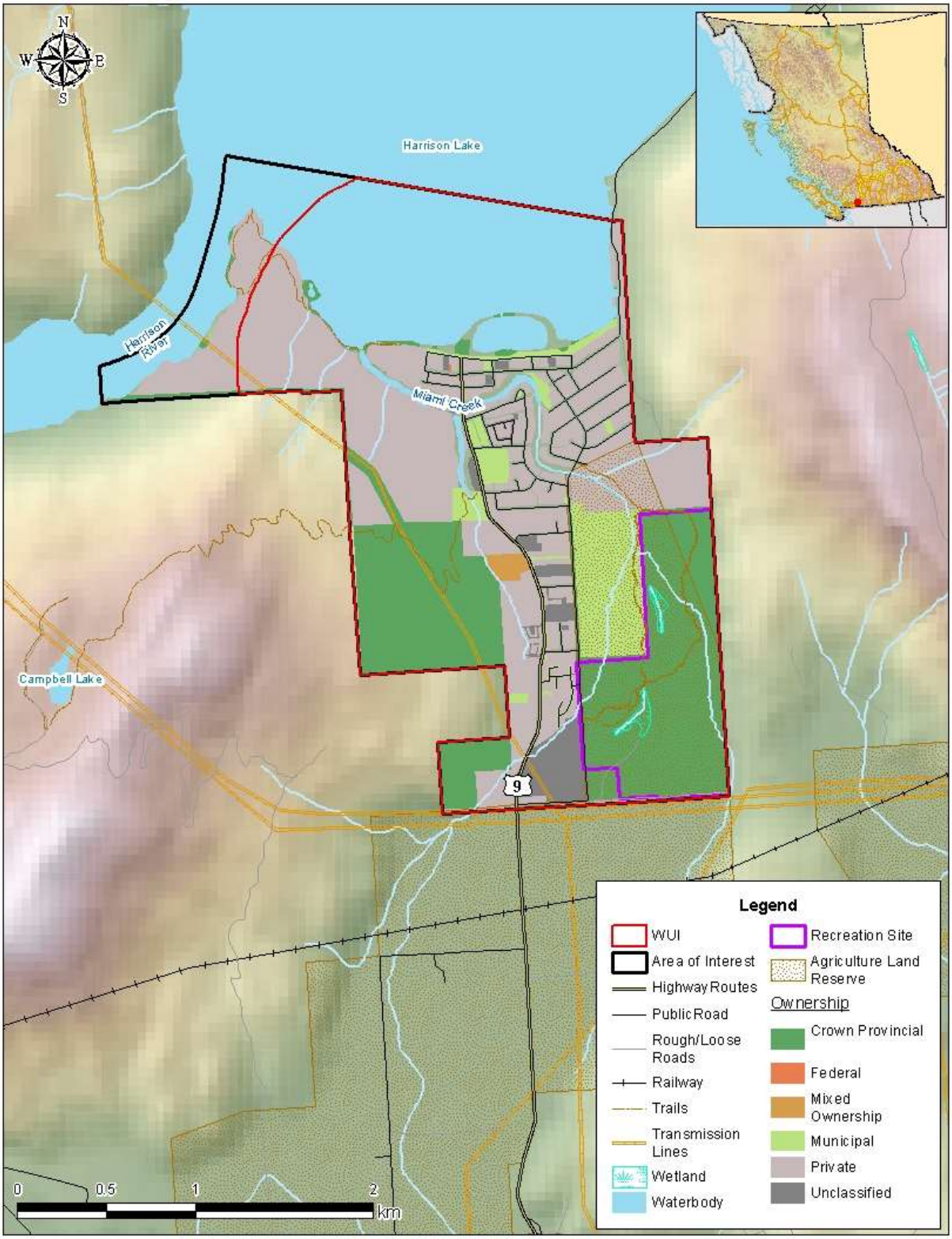
The Area of Interest (AOI) for this CWRP is defined by the municipal boundary of Harrison Hot Springs. This is almost entirely within the eligible wildland urban interface (WUI). The WUI is defined as a 1 km buffer around a structure density greater than 6 structures/km^2 where human development meets or intermingles with undeveloped wildland or vegetative fuels. This area is eligible for funding under the Community Resilience Investment (CRI) FireSmart Community Funding and Supports (FCFS) program.

Harrison Hot Springs is located at the southern tip of Harrison Lake and is fully enveloped by the District of Kent. This is located within the Fraser Valley Regional District, serviced by the BCWS Fraser Fire Zone within the Coastal Fire Centre. Harrison Hot Springs is situated at valley bottom, at the base of the forested slopes of Bear Mountain to the east and Mount Agassiz to the west. The Harrison River defines the northwest tip of the municipality at Sandy Cove Beach. The only two access points to the Village are south, along Hot Springs Road, from Agassiz, and northwest, along Rockwell Drive, which follows the east shoreline of Harrison Lake. This road is mainly used by recreators who, in the event of a wildfire, would need to evacuate south, funneling through Harrison Hot Springs. Considerations for this vulnerability are further discussed in Section 5.7 -

Emergency Planning.

The majority of land within the Village is privately owned (44%), both developed and undeveloped, or Crown Provincial (42%), with Municipal (9%) and Unclassified/Mixed ownership (5%) comprising the remainder. The East Sector Lands (127.8 hectares) in the southwest corner of the Village is Crown-owned but operated by the Fraser Valley Regional District (FVRD) as a Recreation Site. Agricultural Land Reserves (ALR) overlap this area, along with some private and municipal land to the north.

An overview of Harrison Hot Spring's AOI, WUI, and land ownership type is shown below in Map 1. The breakdown of ownership is also shown in Table 8 below.



Map 1. CWRP AOI and Eligible WUI of Harrison Hot Springs.

Table 8. Land ownership in Harrison Hot Springs.[8]

Land Ownership	Area (Ha)	Percent of EWUI (%)
Crown Agency	0	0%
Crown Provincial	228	42%
Federal	0.07	0%
Municipal	47	9%
Private	240	44%
Unclassified/Mixed	26	5%

3.2 COMMUNITY INFORMATION

The Village of Harrison Hot Springs is largely characterized by the waterfront road, Esplanade Avenue, dedicated to tourism. Most businesses and visitor accommodations are situated along this strip between the lakeshore and Miami River. South of this, residential areas comprise the east side of the Village, between Hot Springs Road and the East Sector Lands. Several mobile home parks and RV campgrounds are located south and west of this area. Outside of this concentration of businesses and residences is undeveloped forested land, a mix of private and Crown ownership (see Map 1). Further discussion of these forest types can be found in Section 4.1.3 - Fuel**.**

Key services provided by the municipality include fire protection, emergency management, police services, building and development permits, bylaw enforcement, water, and wastewater, and curbside garbage, recycling, and green waste collection. A recent increase in green waste collection has helped residents appropriately dispose of combustible materials that can otherwise exacerbate fuel loading around homes and structures.[9]

Harrison Hot Springs' permanent resident population totalled 1,905 in 2021. This is a ~30% increase from 2016 and exceeded growth rate projections of 1-12%.[11] Residences consist of 1045 private dwellings, 885 of which are permanently occupied. Most of these are single-detached homes (65%), followed by apartments (15.3%), row housing (11.3%), semi-detached homes (5.1%), moveable dwellings, such as RVs or mobile homes (1.7%), and apartments within a duplex (0.6%). Median income in 2020, at the time of census, was $37,600. The median age of the population is 57.2; the average age is 51.1.[10]

Socioeconomic and demographic data can help highlight priorities and possible barriers for emergency preparedness and response. Considering residential structure types, such as high-density complexes like

[8] ParcelMap BC. Data Catalogue (gov.bc.ca). Retrieved on 24 May 2024.
[9] Personal Communication. July 2024.
[10] Statistics Canada. Profile Table, Census Profile, 2021 Census of Population. Profile table, Census Profile, 2021 Census of Population - Harrison Hot Springs, Village (VL) [Census subdivision], British Columbia (statcan.gc.ca) Retrieved on 18 July 2024.

mobile homes and apartments, can help identify neighbourhood vulnerabilities. Understanding the economic profile of the population can create an understanding of the resources available for FireSmart and other mitigation activities. Population age can highlight obstacles to emergency alerting and evacuation.

Another consideration of the demographic profile is that, as of 2021, 75% of Harrison Hot Springs' employed residents work outside of the Village itself. The main mode of commuting is by vehicle.[11] In the event of an evacuation, consideration for where the bulk of the commuting population is (i.e., time of day) would be important for easing the load on Hot Springs Road.

3.2.1 FIRST RESPONDERS

Fire protection in Harrison Hot Springs is provided by the Harrison Hot Springs Fire Department (HHSFD) within the municipal boundaries, from McPherson Road to Rockwell Drive north of the municipal wharf. Harrison Hot Springs has a Mutual Aid Agreement with the Agassiz Fire Department (AFD); this agreement pertains to fire protection, as well as stand-by units, alarms, and medical aid calls. The HHSFD reported at least six calls a year through this agreement, the majority of which are for medical and other reasons; very few call-outs are for fires.

The Fire Hall building, which also houses the Emergency Operations Centre (EOC), is located on Hot Springs Road. The HHSFD has stated that the residents of Harrison Hot Springs tend to be proactive in reporting early detection of fire and evidence of illegal campfires.[12]

Harrison Hot Springs is located in the BC Wildfire Service (BCWS) Coastal Fire Centre - Fraser Fire Zone. The closest base is in Hope (Haig), roughly 35 minutes outside the Village. BCWS will respond to any wildfires within Village Boundaries that exceed the response capacity of the fire department. The HHSFD reported fewer calls with BCWS than with the AFD, citing just one in 2024.[13]

Table 9 below summarizes the HHSFD's resources.

Table 9. Local fire department capacity, training, and equipment.

Service Area	Fire Department	Personnel	Wildland Training	Wildland Equipment
Harrison Hot Springs	Harrison Hot Springs Fire Department (HHSFD)	• 18 Paid on Call • 1 Administrative Member • 4 Paid on Call Recruits	WSPP-115, WFF-1 (annually), Engine Boss Course, Task Force Leader, Structure Protection Group Supervisor	FireSmart Structure Protection Trailer - Phase 1 (Start Up)

[11] KWC Planning Services. Harrison Hot Springs Village Vision (Official Community Plan 2021) Background Report – Phase 1: Awareness Building. September 2021. 2021.12.13 OCP Awareness Building Report.Final .pdf (harrisonhotsprings.ca)
[12] Email communication. July 2024.
[13] Email communication. August 2024.

3.3 VALUES AT RISK

Values at risk are the human or natural resources that could be negatively impacted by wildfire. Protection of these values during a wildfire event is an important consideration for effective emergency response. Pre-identifying critical infrastructure and values at risk before an emergency event can ensure that essential services can be protected and/or restored quickly. This section describes the values at risk within Harrison Hot Springs.

3.3.1 CRITICAL INFRASTRUCTURE

Critical infrastructure includes any infrastructure essential to the health, safety, security, or economic wellbeing of the community and the effective functioning of government.[14] Table 10 (and displayed on Map 2) lists critical infrastructure and community assets in Harrison Hot Springs, as identified during field work and by the WWG, and highlights some risk and resilience factors for each. FireSmart assessments have been conducted for the village offices, including the Fire Hall and Memorial Hall; public works, including the wastewater treatment plant, and several other village assets.

FireSmart Critical Infrastructure Assessments and hazard mitigation are expanded upon in Section 5.4 - Development Considerations.

Table 10. Critical infrastructure and community assets in Harrison Hot Springs. [15]

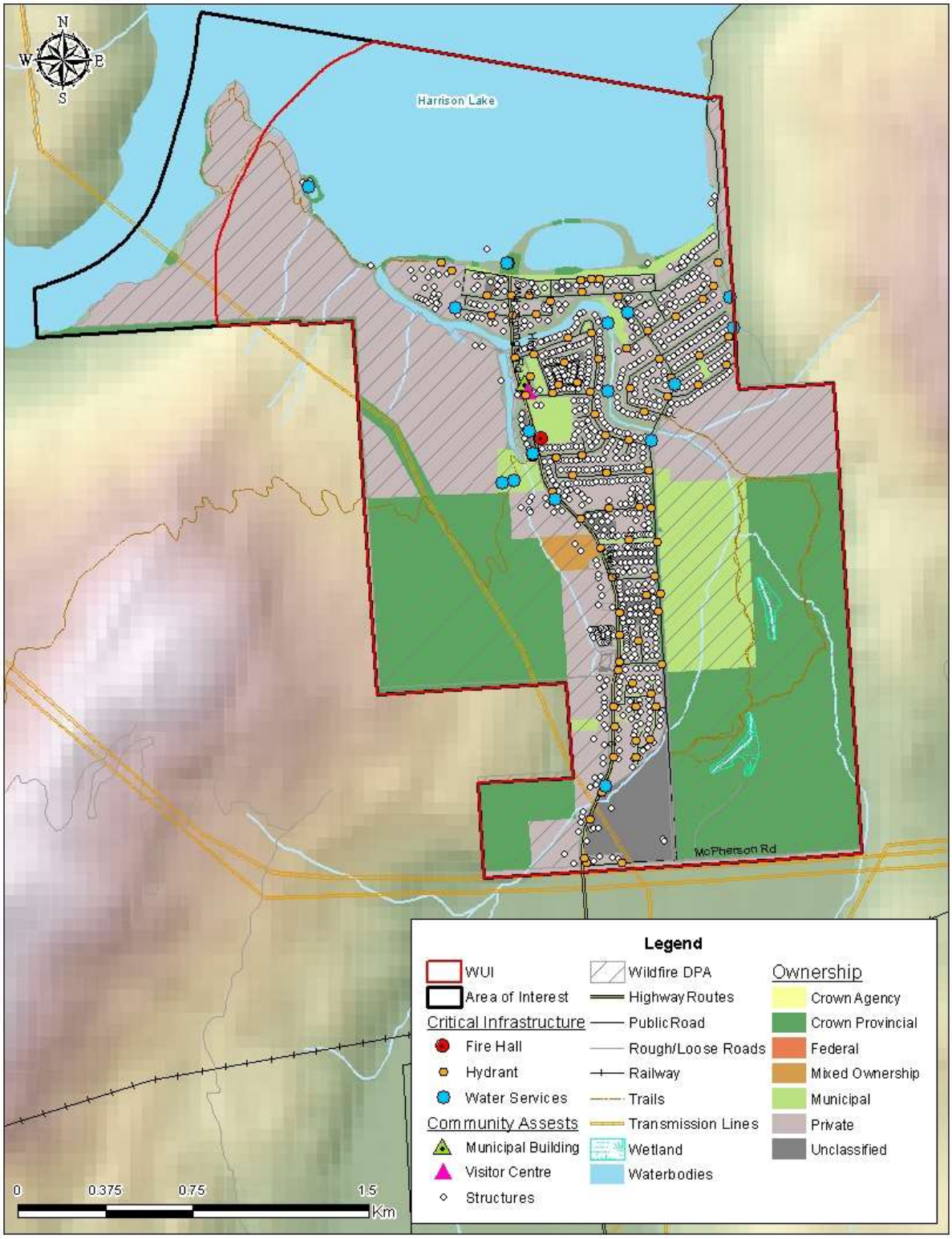
Type	Name	Location	Comment
Critical infrastructure			
Municipal Building - Emergency Operations Centre	Fire Hall	555 Hot Springs Road	Back up generator; lacks a fire hydrant on Fire Hall grounds; surrounded by mixed-wood forest to the north and east
Municipal Building – Emergency Reception Centre	Memorial Hall	290 Esplanade Avenue	Plans to seek funds to install a stand-by generator for this site
Water services	Lake Intake Pump (3)	49.29646 121.78449; 49.30384 121.78532; 49.30385	Stand-by diesel generator

[14] FireSmart BC. Community Wildfire Resiliency Plan Instruction Guide 2023. November 2023. LGPS_CRI_FCFS2023CWRPInstructionGuideV1.pdf (ubcm.ca)

[15] The FireSmart Community Funding and Supports program defines Critical Infrastructure and Community Assets separately – and offers different funding opportunities based on these definitions.

Type	Name	Location	Comment
		121.78528	
Water services	Lake Intake Station	49.30385 121.78530	Controlled by intake station generator
Water services	Sewer Lift Stations (6)	Throughout the Village	Onsite stand by generator at Station #4; Station #1 will have stand-by generator 2025; Trailer generator unit for all other stations
Water services	Reservoir	49.29547 121.78579	Mid-slope position in forested area; FireSmart Critical Infrastructure assessment completed; and fuel management prescription developed. Treatment implementation scheduled for end of September to October 2024
Water services	Wastewater Treatment Plant	49.30746 121.79671	Lakeside, downslope from low hazard stand type (deciduous-dominated); stand-by diesel generator
Water services	Water Treatment Plant	49.29645 121.78451	Stand-by diesel generator
Water services	Drainage Pumping Station	49.30394 121.79325	Stand-by diesel generator
Community Asset			
Municipal Building	Village Offices (Municipal Building)	495 Hot Springs Road	FireSmart Critical Infrastructure assessment completed; fire hazard signage; cedar hedging around works yard
Municipal Building	Tourism Harrison River Valley Visitor Centre & Sasquatch Musem	499 Hot Springs Road	Fibre cement siding; asphalt shingle roofing
Public Building (School District #78)	Harrison Hot Springs Elementary School	501 Hot Springs Road	Some conifer landscaping; FireSmart Critical Infrastructure assessment pending District approval
Public Building	Art Gallery / Cultural Centre	98 Rockwell Drive	Waterfront; downslope of undeveloped forest; wood-siding; asphalt shingle roofing; FireSmart Critical Infrastructure assessment completed
Public Building	Yacht Club	98 Rockwell Drive	Waterfront; downslope of undeveloped forest; wood-siding; metal roofing;

Type	Name	Location	Comment
			FireSmart Critical Infrastructure assessment completed
Transportation / Commercial	Boat Launch	500 Esplanade Avenue	Waterfront; wood-siding; asphalt shingle roofing
Transportation / Commercial	Float Plane Dock	49.30468 121.78739	Waterfront
Transportation / Commercial	Municipal Wharf	102 Rockwell Drive	Waterfront; downslope of undeveloped forest; some combustibles materials stored onsite



Map 2. Values at Risk in Harrison Hot Springs.

3.3.2 ELECTRICAL POWER

A large fire has the potential to impact electrical service by causing disruption in network distribution through direct or indirect processes. For example, heat from flames or fallen trees associated with a fire event may cause power outages. Additionally, vegetation encroachment on power lines can be a wildfire ignition source - a tree branch lying between two conductors can produce high-temperature electrical arcs. BC Hydro provides electrical power to Harrison Hot Springs through a network of below- and above-ground (wooden pole) distribution infrastructure. This system is well-mapped, and BC Hydro will work with local fire departments and BCWS to mitigate impacts to this infrastructure in the event of a wildfire.[16]

A major overheard transmission line runs diagonally across the southwest end of the AOI (see Map 1); part of the right-of-way overlaps with the Campbell Lake Lookout trail. The line connects the Bridge River substation to the Rosedale substation. The right-of-way provides a deciduous shrub break in fuel along the slope. Vegetation in utility rights-of-way is regularly brushed and cleared according to BC Hydro's integrated vegetation management plan.[17]

Secondary power sources for critical infrastructure are important to reduce community vulnerability in the event of an emergency that cuts power for days or even weeks. Vulnerabilities for secondary power sources include mechanical failure, potentially insufficient power sources should a wide-scale outage occur, and diesel fuel shortage in the event of long outages or road closures. Harrison Hot Spring's critical infrastructure has sufficient backup power sources; a new generator was recently purchased for the Fire Hall, which also functions as the Emergency Operations Center (EOC).

3.3.3 DRINKING WATER AND WASTEWATER

Water utility services are provided by the municipality, sourced from Harrison Lake. Village and Fire Department personnel both stated there is good water supply for fire suppression activities.[18] See Section 4.2.3 for a further discussion of water sources available for wildfire suppression activities. The Village's water system infrastructure consists of a water treatment plant, reservoir, intake screen, and pump station. As of 2018, roughly 50% of the Village's residential dwellings, as well as some commercial and recreational properties, were not connected to the municipal water system, using private wells for their potable water source. This is an important consideration for post-emergency event recovery. It should be noted that should the Village require access to more municipal water, for example for firefighting purposes, the water treatment process can be bypassed. This would result in a boil water advisory for residents.

[16] BC Hydro. 2020. *Earthquakes, wildfire, and floods.* Available from: https://www.bchydro.com/safety-outages/emergency-preparation/natural-disasters.html
[17] BC Hydro. Integrated Vegetation Management Plan. 2023. Available from: https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/safety/powerline-ivmp-2022-2027-confirmed-nov.2-2022.pdf
[18] Email communication. July 2024.

The Village's wastewater system includes a treatment facility and six lift stations. A FireSmart Critical Infrastructure assessment was conducted for the wastewater treatment plant, located on the west side of Harrison Lake, in July 2024.

3.3.4 HAZARDOUS VALUES

Hazardous values are defined as values that pose a safety hazard to emergency responders. These can include large propane facilities, landfills, rail yards, storage facilities containing explosives, pipelines, etc. Anywhere combustible materials, explosive chemicals, or gas/oil are stored can be considered a hazardous value. Protecting hazardous values from fires is important to preventing interface fire disasters. The 2017 CWPP identified the wastewater treatment facility as a hazardous value, due to storage of chemicals. Informal field observations for the 2024 CWRP concluded that the site has good FireSmart setback from the surrounding vegetation, which is lower threat, no combustible storage adjacent to structure, and the surrounding stand is low-hazard deciduous forest.

3.3.5 CULTURAL AND HERITAGE VALUES

Cultural values have the potential to be impacted by wildfire, wildfire suppression techniques, or vegetation management activities through physical damage or alteration. Cultural values may include both identified and unidentified archaeological and cultural sites and culturally significant vegetation important to food and medicine gathering traditions. Archaeological sites are recorded by the Archaeology Branch and protected under the Heritage Conservation Act, which applies on both public and private lands. Harrison Hot Springs overlaps the traditional territory of the Sts'ailes First Nation. The Village is committed to working with Sts'ailes in the environmental stewardship of the traditional lands, including promoting sustainable eco-tourism opportunities and ensuring controlled growth in the Village and surrounding areas.[19]

Harrison Hot Springs should continue to consult with Sts'ailes, and other applicable First Nations, well before development and implementation of any proposed fuel prescriptions in the Village to allow for meaningful review and input. Archeological or cultural resource assessments may be required to ensure that known or unknown cultural resources are not inadvertently damaged or destroyed, and that any Sts'ailes' strategies for land management in their traditional territory are addressed.

3.3.6 ENVIRONMENTAL VALUES

Harrison Hot Springs contains numerous environmental values, including documented occurrences of species at risk. Harrison Lake hosts the White Sturgeon (*Acipenser transmontanus,* pop. 4) and the Pygmy Longfin Smelt (*Spirinchus* sp. 1), both BC red-listed species at risk, as identified by the BC Conservation Data Centre (inventoried in Table 11 below). In addition, Miami Creek is home to the Pacific Water Shrew

[19] Village of Harrison Hot Springs. 2022. *Official Community Plan.* HHS OCP Bylaw updated (Mar 2023).pdf (harrisonhotsprings.ca)

(*Sorex bendirii*), also a red-listed species, and the Northern Red-legged Frog (*Rana aurora*), a blue-listed species at risk. Much of Miami Creek and the drainage depressions in the south end of East Sector Lands has been designated as a federally protected critical habitat for the Pacific Water Shrew. Critical habitat is the habitat needed for the survival or recovery of a threatened or endangered species listed on Schedule 1 of the federal Species at Risk Act; it is formally identified in the final recovery strategy that is made for every endangered species. In addition to the above species, a species at risk that is not publicly available (masked) has been identified north of the AOI, along the west shore of Harrison Lake. The East Sector Lands also host two rare ecosystems, the black cottonwood / red-osier dogwood and black cottonwood / sitka willow plant communities, as well as a sphagnum bog (located on private land).[20]

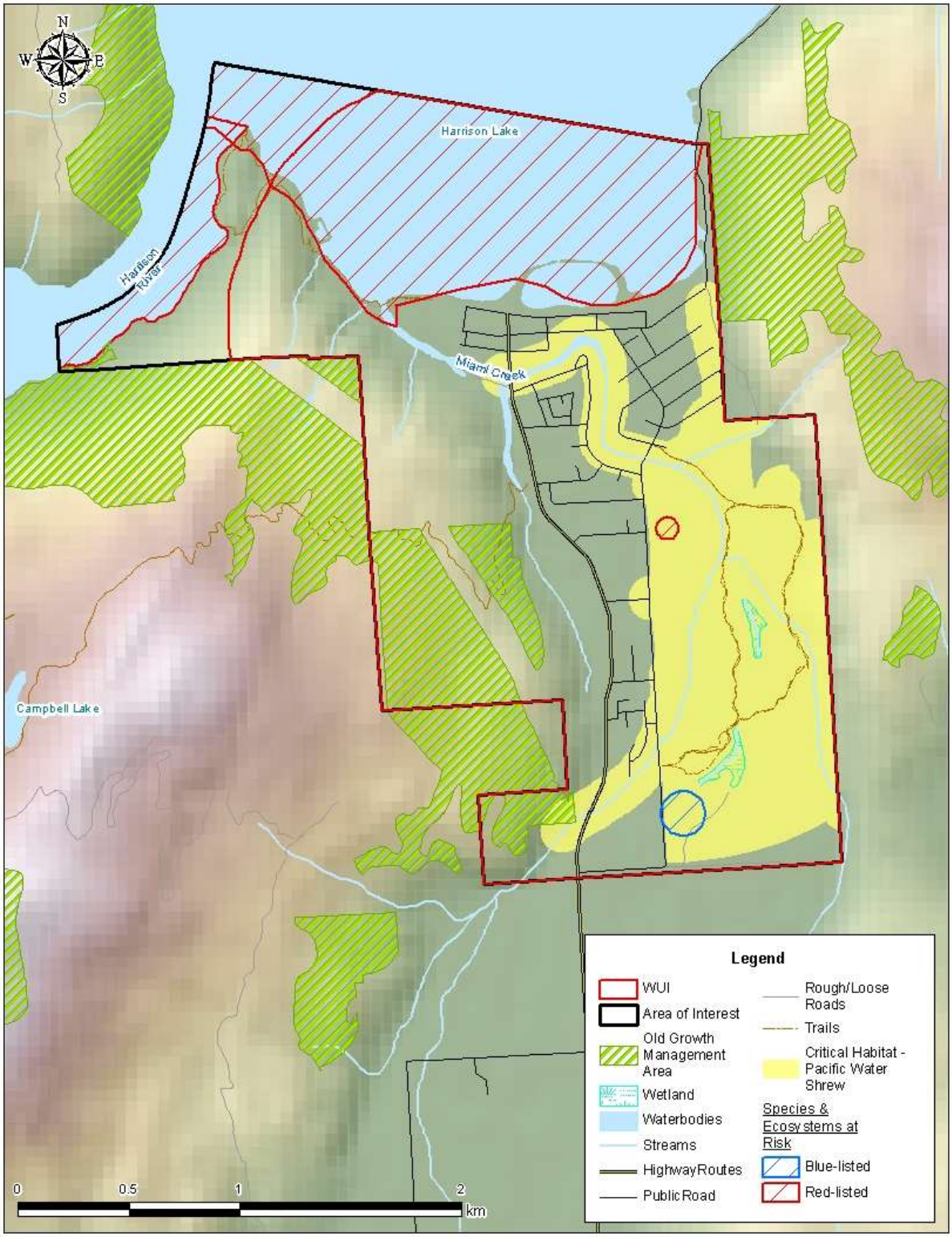
Though no new fuel treatment units are proposed by this plan, it should be noted that there is the possibility for planned fuel management activities to impact the habitat of these populations. Site level operational plans should identify and mitigate potential impacts to species at risk and may require the guidance of a qualified professional. Several legal Old Growth Management Areas (OGMA) overlap the AOI, on the west side of the Village. Forest activities in an OGMA can only occur in consultation with Ministry of Forests.

See Map 3 below for environmental values within Harrison Hot Springs.

Table 11. Species at Risk in the Harrison Hot Springs AOI.

English Name	Scientific Name	Category	BC List	Habitat Type
Pygmy Longfin Smelt	*Spirinchus* sp. 1	Vertebrate Animal	Red	LACUSTRINE; DEEP WATER
Northern Red-legged Frog	*Rana aurora*	Vertebrate Animal	Blue	LACUSTRINE: Shallow Water; PALUSTRINE: Pond; TERRESTRIAL: Marsh, Forest Needleleaf, Forest Mixed
White Sturgeon (Lower Fraser River Population)	*Acipenser transmontanus* pop. 4	Vertebrate Animal	Red	RIVERINE: Big River; High Gradient; Low Gradient; Moderate Gradient; ESTUARINE: River Mouth; Tidal Flat
Pacific Water Shrew	*Sorex bendirii*	Vertebrate Animal	Red	TERRESTRIAL: Forest Mixed, Swamp

[20] Village of Harrison Hot Springs. 2022. *Official Community Plan.* HHS OCP Bylaw updated (Mar 2023).pdf (harrisonhotsprings.ca)



Map 3. Identified environmental values within Harrison Hot Springs.

3.3.7 OTHER RESOURCE VALUES

As a Resort Municipality, tourism and recreation are the most important commercial values in Harrison Hot Springs. The population of Harrison Hot Springs swells significantly in the summer months and shoulder seasons, hosting 550,000 visitors annually.[21] Village staff members noted that they can see as many as 1000 tourists per day in the Village alone. Because of the limited access/egress routes, Harrison Hot Springs must consider the considerable number of recreational users along East Harrison and Sasquatch Provincial Park, especially during peak season.

Most of the visitor accommodations and amenities are concentrated adjacent to the lakeshore, along Esplanade Avenue and along Rockwell Drive up the east shore of Harrison Lake. Notable forested trails include the Spirit Trail Loop and Bear Mountain Flats in the East Sector Lands and the Harrison Grind to the Campbell Lake Lookout, the trailhead of which is located at the site of the Village's water reservoir. Other walking trails exist throughout the Village, including the Miami Creek Greenway.

SECTION 4: WILDFIRE RISK ASSESSMENT

This section summarizes the factors that contribute to local wildfire risk in Harrison Hot Springs. Section 4.1 discusses the wildfire environment, as well as climate change projections affecting the wildfire environment of the area. Section 4.2 - Wildfire History discusses wildfire history in the area and wildfire response data from local fire crews. Section 4.3 and Section 4.4 describes wildfire threat and WUI risk assessments on a provincial and local scale, respectively.

The local wildfire risk assessment helps to identify the parts of the community that are most vulnerable to wildfire so that wildfire risk reduction actions can be implemented effectively. Differing risk levels require tailored risk management to minimize negative impacts from wildfires to communities and high value critical infrastructure. The intent is to enable cost effective wildfire risk reduction strategies that will mitigate wildfire threat to communities and values at risk, at local and provincial scales. Through the identification of risk level, priorities for mitigation and opportunities for increasing community resiliency are both enhanced.[22]

The relationship between wildfire risk and wildfire threat is defined as follows:

Wildfire Risk = Probability X Consequence

Where:

[21] Village of Harrison Hot Springs. 2023. *VHHS Annual Report 2023.* 2023-Annual-Report.pdf (harrisonhotsprings.ca)
[22] Community Resiliency Investment. 2023. *FireSmart Community Funding and Supports Supplemental Instruction Guide.* Retrieved from: https://www.ubcm.ca/funding-programs/local-government-program-services/community-resiliency-investment/firesmart-0

Wildfire risk is the potential losses incurred to human life and values at risk within a community in the event of a wildfire.

Consequences are the repercussions associated with fire occurrence in an area. Higher consequences are associated with densely populated areas, critical infrastructure, areas of high biodiversity, etc.

Probability is the threat of wildfire occurring in an area and is expressed by the ability of wildfire to ignite and consume fuel on the landscape. Wildfire threat is driven by three major components of the wildfire environment:

1) **Topography:** slope and terrain (increases/decreases rate of spread), and aspect (affects fuel dryness).
2) **Fuel:** loading (amount), size and shape, arrangement (horizontal and vertical), compactness, chemical properties, and fuel moisture.
3) **Weather:** temperature, relative humidity, wind speed and direction, and precipitation.

4.1 LOCAL WILDFIRE ENVIRONMENT

There are three environmental components that influence wildfire behaviour: topography, weather, and fuel. These components are generally referred to as the 'fire behaviour triangle' (Figure 1); the ways in which they individually influence the wildfire environment of the WUI are detailed below.

Figure 1. Graphic display of the fire behaviour triangle, and a subset of characteristics within each component.[23]

[23] Province of Alberta. *Wildfire Prevention and Enforcement*. Available from: https://blogs.ubc.ca/firemodel/discussion/

4.1.1 TOPOGRAPHY

Topography has a significant influence on fire behaviour. Slope steepness influences a fire's trajectory and rate of spread; 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 the configuration of features on the landscape that can restrict (e.g., water bodies, rock outcrops) or drive (e.g., valleys, exposed ridges) the movement of a wildfire. South and southwest-facing slopes are typically the most concerning for heating and solar radiation, which can accelerate fuel drying. Topography also impacts the other aspects of the fire environment. Aspect and slope influences vegetation type and continuity, which is discussed in Section 4.1.3. Also, slope length and form can influence both regional and diurnal wind patterns (e.g., anabatic and katabatic slope winds).

Table 12 shows the percent of the WUI by slope steepness class, with corresponding fire behaviour implications. The majority of the Village (71%), including East Sector Lands and the commercial-residential core, is located on flat land and is unlikely to experience accelerated rates of fire spread due to topography alone. This flat terrain means that fires are less likely to gain momentum or exhibit rapid spread, reducing the overall fire risk in these areas. Outside of this valley-bottom area, slopes rise sharply (Figure 2). 23% of the AOI is characterized by steep slopes greater than 40% that would experience accelerated rates of wildfire spread.

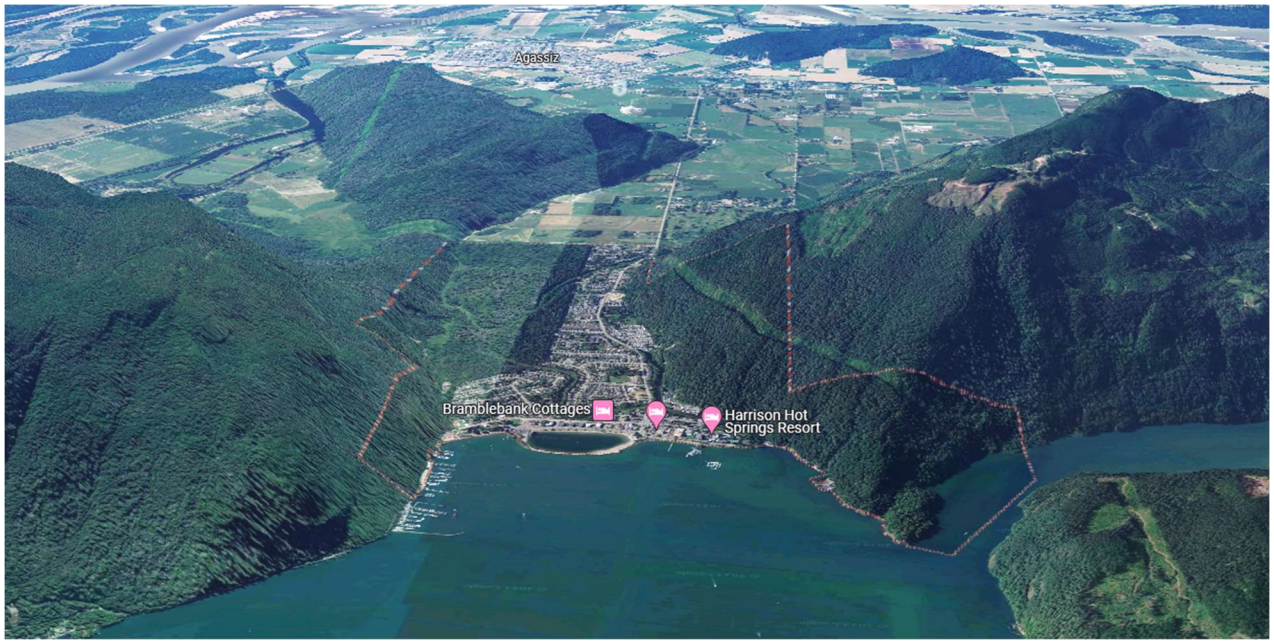


Figure 2. Google Maps image looking south from Harrison Lake towards Agassiz.

Table 12. Slope Percentage and Fire Behaviour Implications.

Slope	Percent of AOI (%)	Fire Behaviour Implications
<20%	71%	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	3%	Flame tilt begins to preheat fuel, increase rate of spread.
31-40%	3%	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
41-60%	7%	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	16%	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

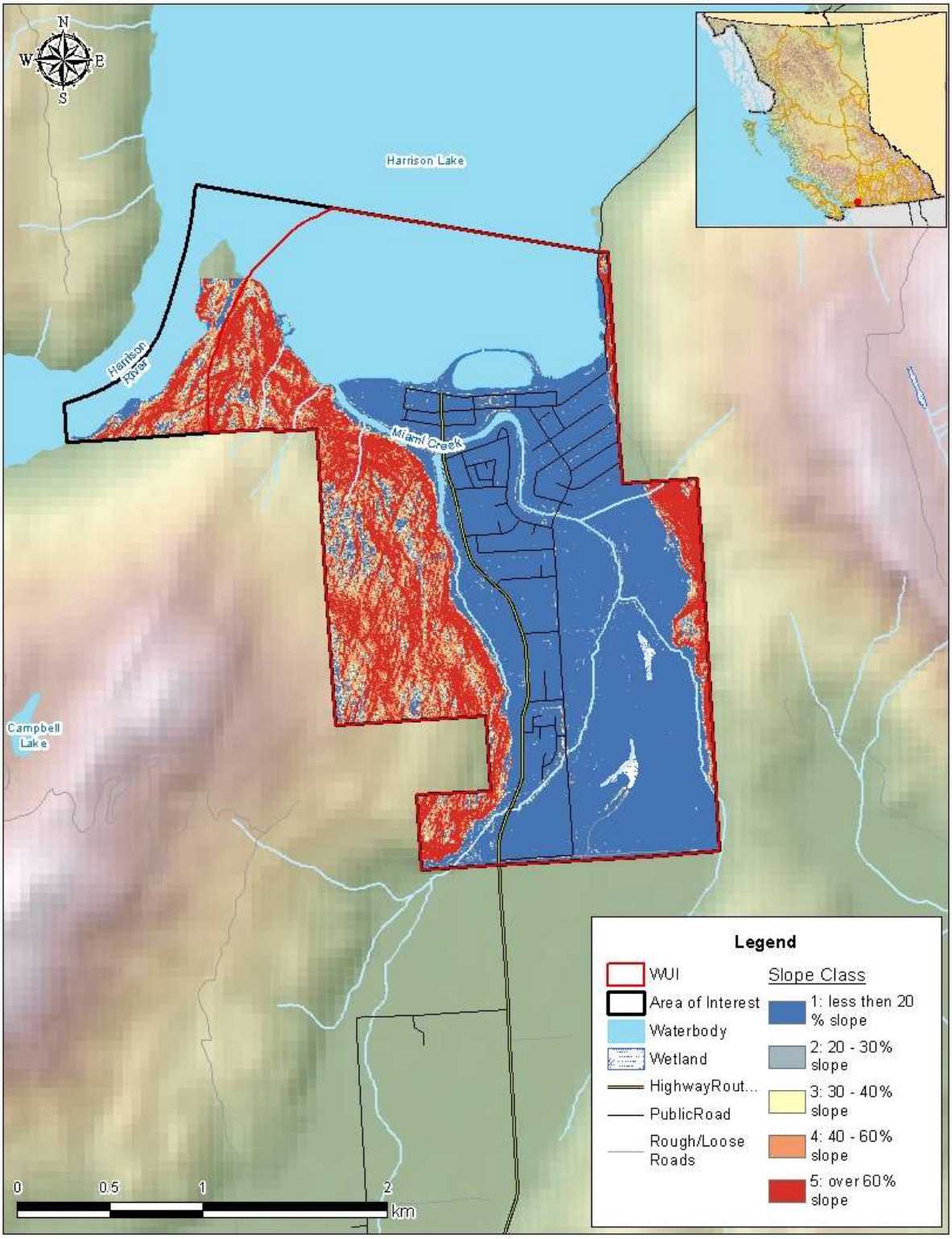
Table 13 shows the fire behaviour implications of the slope position of a value. Values located on the lower slope are at the least risk. Values located mid-slope or at the upper third of a slope are threatened by faster rates of fire spread due to the pre-heating of fuels and longer flame lengths. Harrison Hot Springs has two values at risk that are located at more vulnerable slope positions – the municipal water reservoir and the BC Hydro transmission line are both located mid-slope on the west side of the municipality. However, risk is mitigated by the forest fuel type in this area (see Section 4.1.3).

The overall implications of topography in the WUI are that fire ignitions at valley bottom have an elevated potential of spreading upslope into forested areas, given appropriate fuel and weather conditions. The

steepest slopes in the AOI occur on the undeveloped forested areas above the community. Values at risk are mostly located at valley bottom, where the risk of topographic-driven fires is low.

Table 13. 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 may reduce the preheating near the value. (Value is offset from the slope).
Mid Slope – Continuous	Impacted by fast rates of spread. No break in terrain features 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, preheating and flames bathing into the fuel.



Map 4. Slope steepness classification in Harrison Hot Springs.

4.1.2 WEATHER

Climate-related weather patterns can significantly influence the potential for fire ignition, rate of spread, and burn intensity in a given area. Like much of the Fraser Valley, Harrison Hot Springs has a mild, coastal climate. Summers are warm and dry, and winters are moist with little snowfall.[24] Historical weather data can provide information on the frequency and distributions of days that Harrison Hot Springs is typically subject to high fire danger conditions, which supports an assessment of overall wildfire risk.

The Canadian Forestry Service developed the Canadian Forest Fire Danger Rating System (CFFDRS) to assess fire danger and potential fire behaviour. Danger Class ratings provide a relative index of the ease of wildfire ignition and the difficulty of suppression, and are forecast using four primary inputs: temperature, relative humidity, wind, and precipitation. These inputs can be variable on a small scale based on the specific location of the weather station. 'High fire danger' includes Danger Class ratings of 4 (High) or 5 (Extreme). Note that the CFFDRS is applied differently across Danger Index Regions, as specified in Schedule 2 of the Wildfire Regulation. Therefore, it is more informative to compare data from one station over time (year-over-year or month-to-month) than to compare one station to another.

For this plan, data was summarized from two nearby BCWS weather stations to provide an indication of the historical fire weather patterns in Harrison Hot Springs.[25] The UBC Research weather station is situated within the same BEC zone as Harrison Hot Springs (CWHdm, see Section 4.2.1), in the foothills of Golden Ears. Big Silver 2 weather station is located 45 km north of Harrison Hot Springs, on the east side of the north-south Big Silver Creek drainage. Compared to Harrison Hot Springs, the station is within a drier biogeoclimatic zone (CWHds1,), but also at a higher elevation (570 m). Danger Class days for each weather station are summarized in Figure 3 and Figure 4 below. According to this data, local fire danger peaks in August, although importantly, high danger days can also occur in the late spring and throughout the fall.

[24] Darmarchi, D. 2011. *An Introduction to the Ecoregions of British Columbia*.
[25] Recommended by BCWS Zone staff.

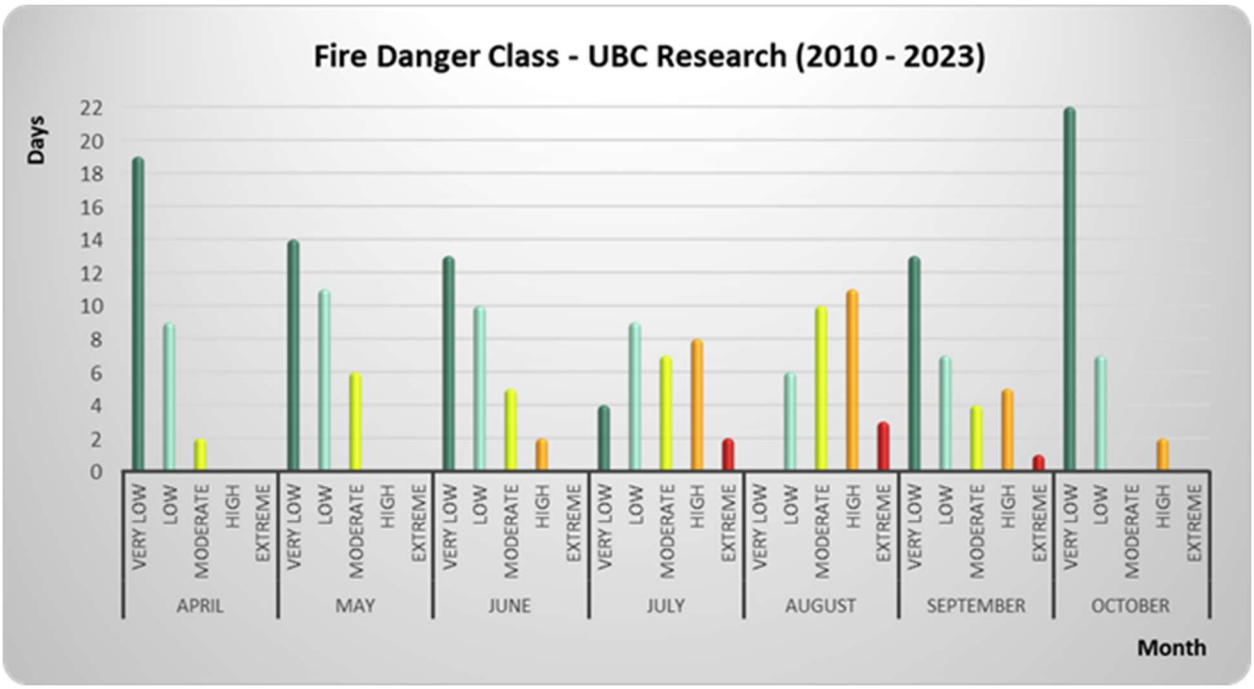


Figure 3. Average number of danger class days during the fire season for the BCWS UBC Research weather station (2010-2023).

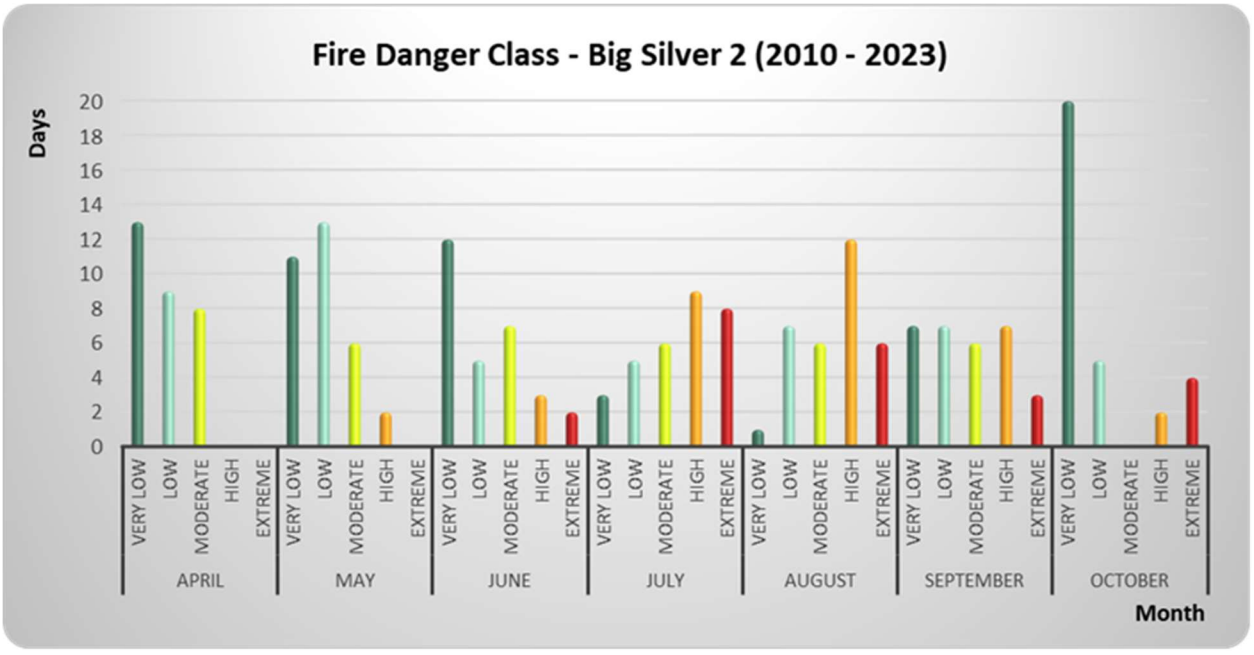


Figure 4. Average number of danger class days during the fire season for the BCWS Big Silver 2 weather station (2010-2023).

Fire Spread Patterns

Hourly wind speed and direction are also recorded at BCWS weather stations, and the data is publicly available in the form of average Initial Spread Index (ISI) roses. The ISI is a numeric rating that combines the effects of wind speed and fine fuel moisture (influenced by temperature and relative humidity) to predict the expected rate of fire spread. Fires upwind of a value pose a more significant threat due to the potential for rapid spread toward the value, compared to fires downwind.

Understanding predominant wind patterns can inform the strategic placement of firebreaks, the prioritization of fuel management activities, and the development of evacuation routes. However, it should be noted that unusual wind patterns can be just as important, as they may be associated with high-risk weather events such as thunderstorms or heat domes.

ISI roses from nearby BCWS weather stations depict prevailing winds from the south (UBC Research), and southwest (Big Silver 2). Historical data from the Agassiz weather station also shows southerly summer winds.[26,27] The length of each segment on the ISI rose indicates the proportion of days where winds occur from that cardinal direction; the color indicates ISI value. Lighter colored bands representing higher ISI values (i.e., >10) indicate strong winds and/or low humidity, so are expected to peak in the summertime, as is seen. Higher ISI values are recorded from the Big Silver 2 station, which is in a drier BEC zone that Harrison Hot Springs and the UBC Research weather station, as discussed above.

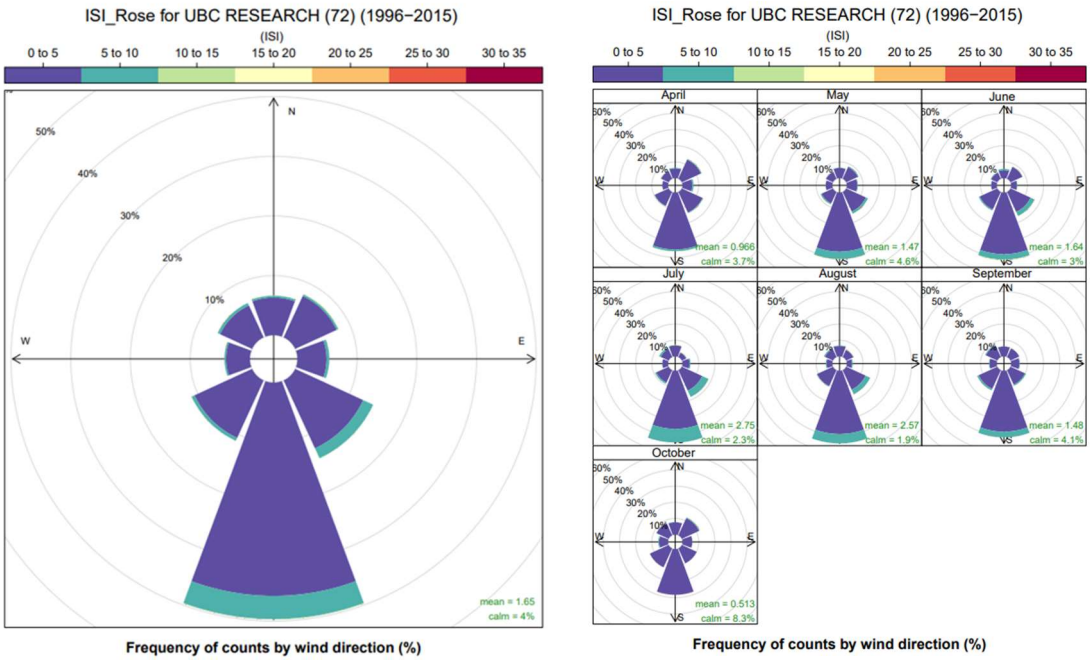


Figure 5. Daily and monthly ISI rose averages for UBC Research weather station.

[26] Windfinder. 2024. *Wind and Weather statistics.* "Agassiz/Harrison Lake." Retrieved on 12 August 2024: https://www.windfinder.com/windstatistics/agassiz_harrison_lake

[27] Harrison Windsports Society. "Lake Info." https://harrisonwindsports.com/

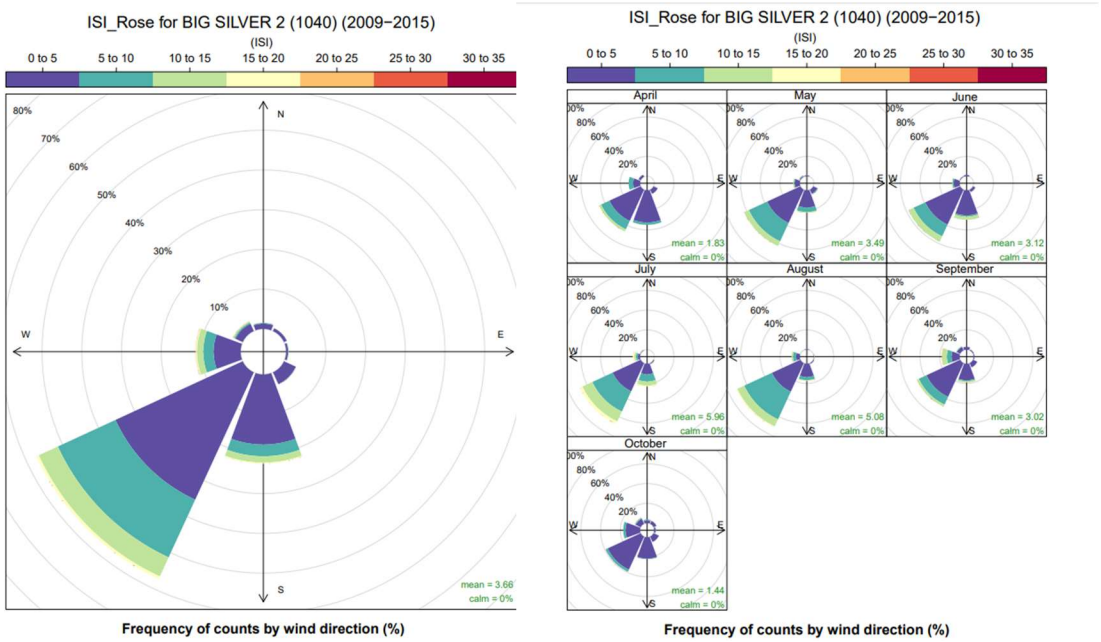


Figure 6. Daily and monthly ISI rose averages for Big Silver 2 weather station.

Climate Change

Climate change is a serious and complex aspect to consider in wildfire management planning. Although there are uncertainties regarding the extent of these impacts on wildfire, the frequency, intensity, severity, duration, and timing of wildfire and other natural disturbances are expected to be altered significantly with the changing climate. Despite the uncertainties, trends within the data are visible.

Projections for the Fraser Valley indicate a 2.2°C to 4.3°C increase in annual average temperatures and 43 to 72 more frost-free days annually by the 2050s. [28] Summer precipitation is expected to decrease by 12%, with a 50% reduction in snowfall. The number of days over 30°C annually is projected to rise significantly, with Abbotsford experiencing 26 days and Chilliwack 29 days over 30°C, up from 7 and 8 days respectively.

The warming global climate is expected to lead to wildfires that are increasingly larger, more intense, and difficult to control. The daily fire severity rating is projected to reach higher peak levels, and head fire intensity is anticipated to increase significantly in western Canada. Additionally, the length of fire seasons is expected to grow, with the most pronounced changes occurring in the northern hemisphere.[29]

[28] Climate Change Adaptation Program. 2023. *BC Climate Change Adaptation Program: Fraser Valley*. Retrieved from: https://www.bcclimatechangeadaptation.ca/regional-adaptation/fraser-valley/

[29] Flannigan, M.D., A.S. Cantin, W.J. de Groot, M. Wotton, A. Newbery, L.M. Gowman. 2013. *Global wildland fire season severity in the 21st century. Forest Ecology and Management*. 294: 54 - 61.

Understanding these projections and their potential impacts is crucial for developing effective wildfire management strategies and ensuring community resilience to climate change. As stated in the 2023 Strategic Plan, Harrison Hot Springs plans to develop a climate action and mitigation plan.[30]

Projected climate change impacts are also expected to increase the vulnerabilities of trees and forests. Observable declines in western redcedar have been observed across the Lower Mainland in recent years due to drought; flooding of lowland areas can also lead to unusually high water tables which can stress or kill trees and make them more susceptible to windthrow events. However, regional climate change extension notes[31] suggest that many tree species in the Coast region appear physiologically resilient to the impacts of climate change. Widespread tree mortality increases potential wildfire risk, and forest health is one aspect that was considered during Plan field work. Scattered mortality of mature coastal Douglas-fir was noted on slopes west of the Village; these pockets were likely related to drought-stress associated with the rocky terrain. Climate change adaptation recommendations specific to forests in the Coast region include planting climatically suited species and genetic stock, increasing species diversity on a stand and landscape scale, monitoring and controlling insect popuations (i.e., sanitation harvest), and increasing overall forest resiliency to fire through fuel breaks and prescribed fire.

4.1.3 FUEL

The type and amount of fuel available for a wildfire is a major driver of the potential fire behaviour in an area. A primary factor in a community's wildfire threat is its proximity to the forest, which is the 'fuel' in a wildfire scenario. The closer values at risk are to the forest, the greater the probability of impact from a forest fire, either due to direct flame contact or ember spotting. Fuel is the only component of the fire triangle that can be realistically managed through human intervention. Further discussion of fuel management activities can be found in Section 5.8 – Vegetation and Fuels Management.

Fuel Type

The Canadian Forest Fire Behaviour Prediction (FBP) System outlines sixteen fuel types based on characteristic fire behaviour under defined conditions.[32] 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, which was almost entirely developed for boreal and sub-boreal forest types which do not occur within the study area. In these cases, the most appropriate fuel type to predict fire behaviour was assigned. This system has been successfully used within BC, with continual improvement and refinement, for 23 years.[33] In some areas, aerial imagery has low spatial resolution and/or ground access was impossible, making fuel type assessment difficult. Where fuel types

[30] Village of Harrison Hot Springs. 2023. *Strategic Plan 2023*. Strategic Plan 2023.pdf (harrisonhotsprings.ca)
[31] Ministry of Forests, Lands, and Natural Resource Operations. *Adapting natural resource management to climate change in the West and South Coast regions: considerations for practitioners and government staff*.
[32] Forestry Canada Fire Danger Group. 1992. *Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3*.
[33] Perrakis, D, G. Eade and D. Hicks. 2018. *Canadian Forest Service Pacific Forestry Centre. British Columbia Wildfire Fuel Typing and Fuel Type Layer Description*.

could not be updated from imagery or field observations with a high level of confidence, the original PSTA fuel type determination was retained.

Table 14 below lists the distribution of fuel types, confirmed or updated by field verification, within the AOI. The most common fuel types in and around Harrison Hot Springs are C-5 and M-1/2, representing mature, multi-layered forests with well-developed herb and shrub layers (conifer-dominated and mixed-wood, respectively). Due to gaps between surface fuels and tree crowns and between trees themselves, these fuel types are associated more frequently with smouldering surface fires than with active crown fires. However, fuel moisture has a big part to play in expected fire behavior, and forest health issues or drought conditions can lead to more intense fire behavior. It should be noted that conifer trees are the greatest influence on fire behaviour in a stand; conifer needle litter, bark, and foliage are all much more flammable that deciduous leaf litter and trees. Therefore, the deciduous component of a stand will reduce the rate of spread and headfire intensity, thereby lowering the wildfire threat rating of a stand. [34] The D-1/2 fuel type – deciduous-dominated forest type – is used to represent riparian vegetation around waterways. Due to the prevalence of species with high leaf moisture content, this fuel type does not support much wildfire behavior.

It is important to note that fuel type on private land cannot be classified under the CWRP funding program and has been left out of this analysis. This is a limitation to the analysis since private land encompasses a large part of the WUI. This fuel type should not be misconstrued as not susceptible to fire, as these areas still often contain combustible materials and flammable landscaping vegetation. Assessing risk on private property near homes is within the scope of FireSmart Home Ignition Zone Assessments, which can be completed by Local FireSmart Representatives. Cleared and developed land, or irrigated land including fields and parks, could be classified as non-fuel. Generally, fuel type on undeveloped private land was similar to fuel type on nearby public land – private properties that extended up the hillsides were forested.

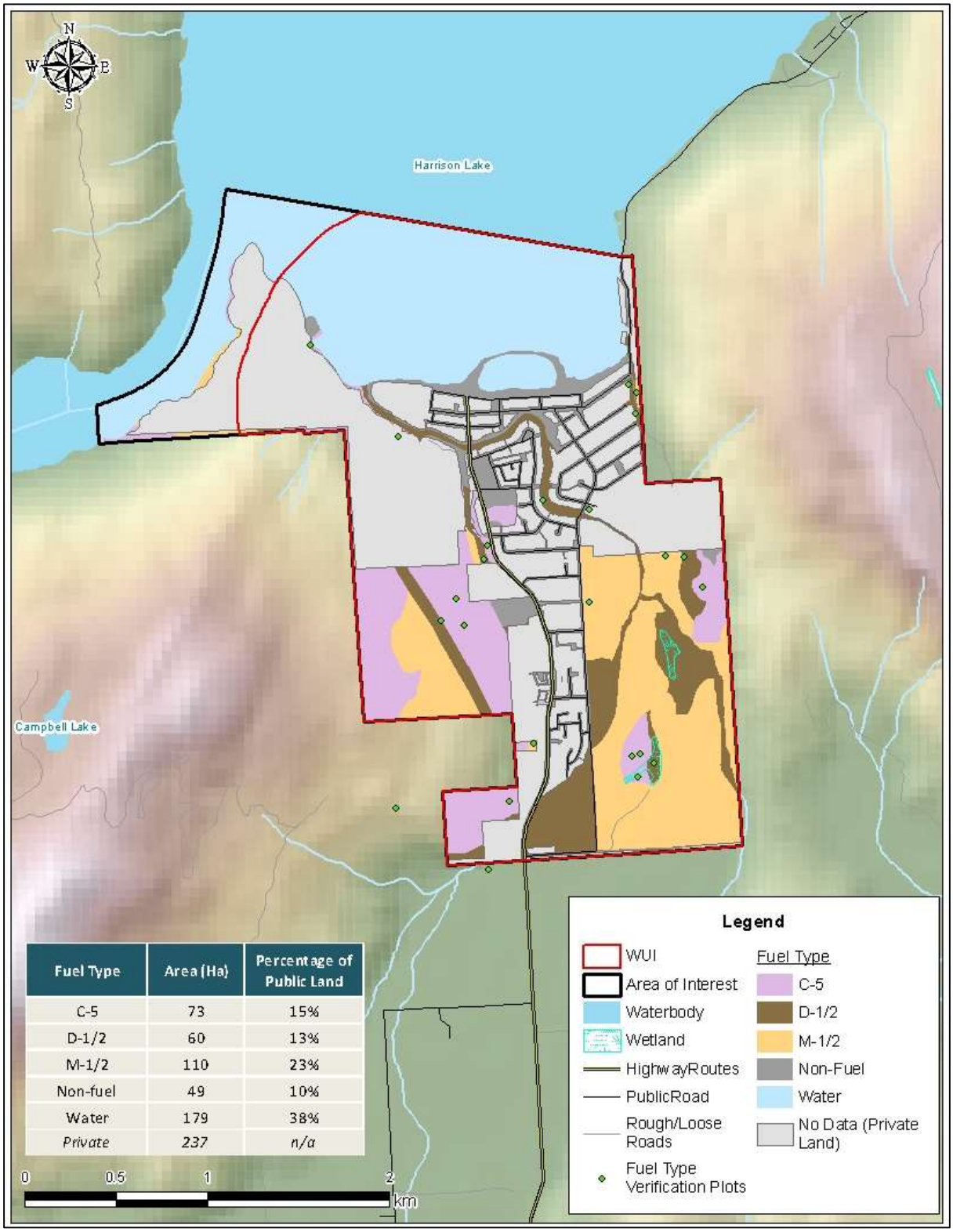
Updated fuel types in Harrison Hot Springs are shown below on Map 5.

Table 14. Fuel types in public land of the Harrison Hot Springs wildland-urban interface (WUI).

Fuel Type	Fuel Type Description Within WUI	Area (ha)	Percent (%) of Public Land
C-5	Lower density and often more mature conifer stands. Natural canopy gaps, low surface fuel accumulations and continuity, and a low flammability (i.e., shrubby) understory. Overstory trees often have high crown base heights. Type was also applied to younger conifer stands that have been brushed and pruned.	73	15%
D-1/2	Deciduous stands/forest. Hazard increases with the amount of deadfall and/or establishment of a flammable shrub layer. Also applied to unmanaged roads / trails in the community.	60	13%
M-1/2	Mixed stands of conifers or deciduous species, low to moderate amounts of dead stems and downed woody fuels. Often	110	23%

[34] 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.*

Fuel Type	Fuel Type Description Within WUI	Area (ha)	Percent (%) of Public Land
	transition to more conifer dominated as pioneer deciduous species die out.		
Non-fuel	This type was applied to irrigated / maintained fields, cleared areas, roadways, exposed rock, shoreline and developed residential properties.	49	10%
Water	Ocean and river. Was not applied to creeks / drainages in the community that were not spatially discernible.	179	38%
Private	*n/a*	*237*	*n/a*



Fuel Type	Area (Ha)	Percentage of Public Land
C-5	73	15%
D-1/2	60	13%
M-1/2	110	23%
Non-fuel	49	10%
Water	179	38%
Private	*237*	*n/a*

Map 5. Updated fuel types in Harrison Hot Springs. Private land is not eligible for classification, so fuel types on private land are not displayed.

4.2 WILDFIRE HISTORY

4.2.1 NATURAL DISTURBANCE REGIME

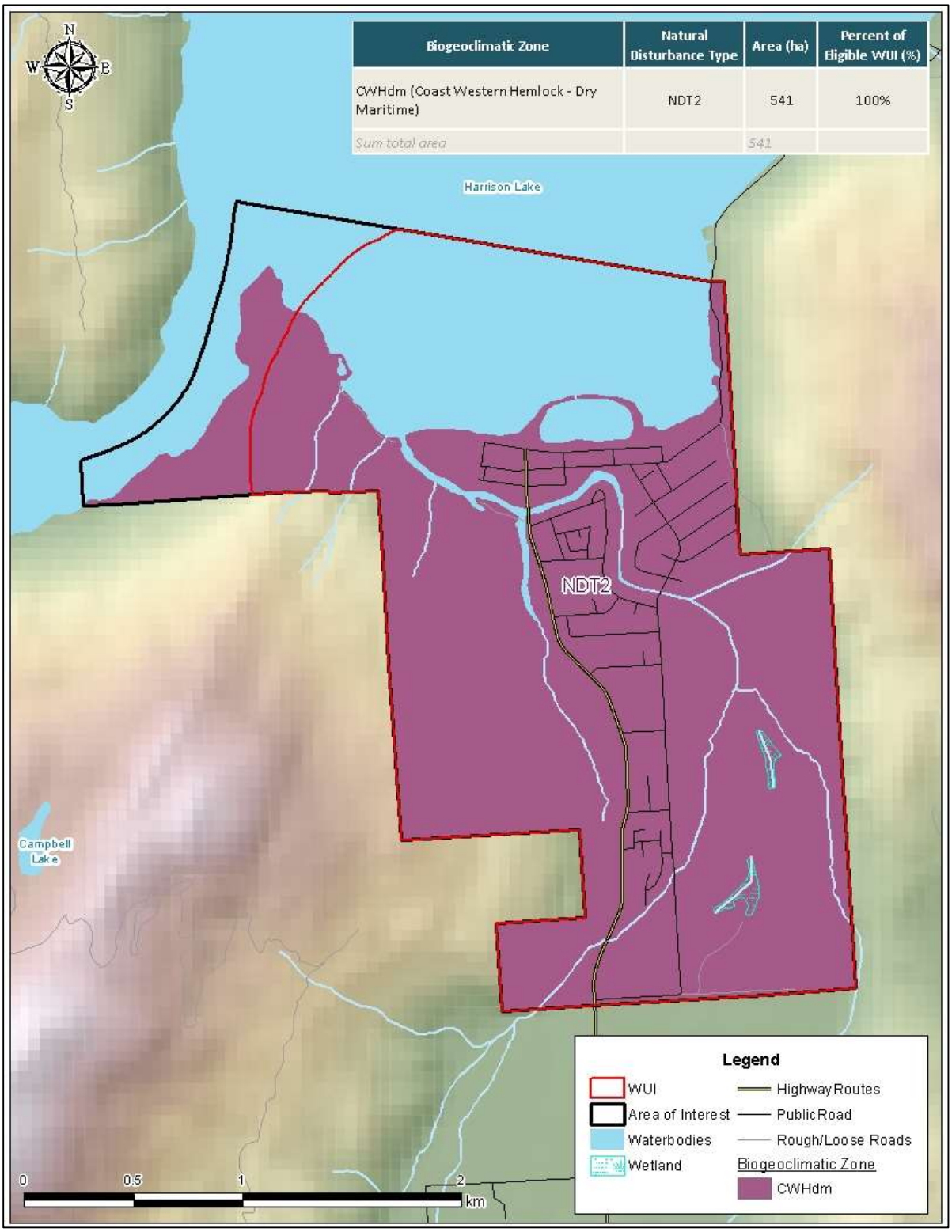
The ecological context of wildfire and the role of fire in the local ecosystem under both current and historical conditions is an important basis for understanding the current and future wildfire threat to a community. Historical natural disturbance regimes have influenced the vegetation dynamics and ecological functions and pathways that determine many of the characteristics of our natural systems. The wildland-urban interface can be classified into 'natural disturbance types' (NDTs) according to biogeoclimatic zone (BEC) and the size and frequency of natural disturbances that historically occur within the area.[35] BEC zones are further classified into 'subzones' based on climatic factors (moisture and temperature) and numerical 'variants' based on subtle geographic differences within a subzone. Harrison Hot Springs is classified as the CWHdm, or dry maritime Coastal Western Hemlock (Table 15 and Map 6).

The CWHdm ecosystem is classified as NDT2: ecosystems that have historically experienced infrequent, stand-initiating events. Occurrences of fire every 250-450 years are likely for this Natural Disturbance Type according to the Biodiversity Guidebook and analyses in similarly 'dry' (relative to other wet coastal forest) ecosystems. Fire regimes in these drier ecosystems were likely mixed severity – a combination of low-, moderate-, and high-severity fires. Low severity fires may kill many small saplings, but only a few large trees; moderate severity fires can cause patchy mortality, while high-severity fires can cause mortality for many large trees. [36] This disturbance cycle resulted in a landscape-level mosaic of even-aged stands with small-scale gap dynamics.[37] Overall, wildfire has historically been recorded as an infrequent, but not rare or undocumented, disturbance in this landscape. While natural disturbance regimes are useful for describing the historic disturbance pattern typical for an area, fire history is complex and highly variable across space and time for many ecosystems.[38] Forest health issues, development patterns, forest harvesting, and natural events contribute to changes in the fire regime, forest attributes, and fuel hazard across landscapes.

Table 15. Biogeoclimatic Zones and Natural Disturbance Types in the Harrison Hot Springs AOI.

Biogeoclimatic Zone	Natural Disturbance Type	Area (ha)	Percent of Eligible WUI (%)
CWHdm (Coast Western Hemlock - Dry Maritime)	NDT2	708	100%

[35] Forest Practices Code of British Columbia. 1995. *BC Biodiversity Guidebook September 1995*. Biodiversity Guidebook (Forest Practices Code of British Columbia, September 1995) (gov.bc.ca)
[36] Droner, B. and Wong, C. 2003. *Prepared for the Coast Information Team, Natural Disturbance Dynamics in Coastal British Columbia*. https://www.for.gov.bc.ca/tasb/slrp/citbc/b-NatDist-DornerWong-May03.pdf
[37] Province of British Columbia. 1995 *Forest Practices Code Biodiversity Guidebook*. Available at: https://www.for.gov.bc.ca/ftp/hfp/external/!publish/FPC%20archive/old%20web%20site%20contents/fpc/fpcguide/BIODIV/chap2a.htm#ntv
[38] Hall, E. 2010. *Maintaining Fire in British Columbia's Ecosystems: An Ecological Perspective.* Available at: https://www.semanticscholar.org/paper/Maintaining-Fire-in-British-Columbia%27s-Ecosystems%3A-Hall/4d4c934dfae93dcb66bae394b08abd00b7c1daea



Map 6. Biogeoclimatic zone classification of Harrison Hot Springs.

4.2.2 HISTORICAL WILDFIRE OCCURENCES

Historical fire ignition and perimeter data for the area encompassing Harrison Hot Springs are depicted below in Map 7 and Map 8.[39] Based on the BCWS historical wildfire datasets, wildfires in the WUI are relatively infrequent, and ignitions rarely result in a wildfire event. Since the 1970's, there have been few significant fires in the area (Map 8). A majority of historic fire activity in the past 50 years in the area is attributed to human-caused ignitions (43%, excluding unknown sources[40]), occurring along the east side of Harrison Lake, along Harrison River west of Harrison Hot Springs, and east of Harrison Hot Springs near Mt. Hicks. BCWS has previously noted that human-caused ignitions in the Fraser Valley are primarily due to recreation, including gunfire and campfires, and residential burning. Poorly abated roadside slash from industrial activities contribute to higher fuel loading.[41] This indicates that a key component of wildfire risk mitigation can be educating the public on safe practices.

In August 2017, a human-caused fire (V11812) on the eastern side of Harrison Lake, approximately 12 km northeast of Harrison Lake, near Slollicum Creek and just north of Sasquatch Provincial Park, burned over 94 ha. This fire produced high volumes of smoke and visibility issues within the municipality. The largest recent fire burned over 400 ha east of Harrison Hot Springs in 2018. This fire burned for several weeks and resulted in the closure of Lougheed Highway.[42] In 2021, the north end of Long Island, in the centre of Harrison Lake, a lightning-caused fire (V12262) burned roughly 223 ha (Figure 7), resulting in an evacuation order issued by the FVRD on 5 August 2021.[43] Coquitlam's Minnekhada Regional Park had a 14 ha fire (V12537) in October 2022 that was actioned by both Coquitlam Fire and Rescue and BCWS (Figure 8).[44]

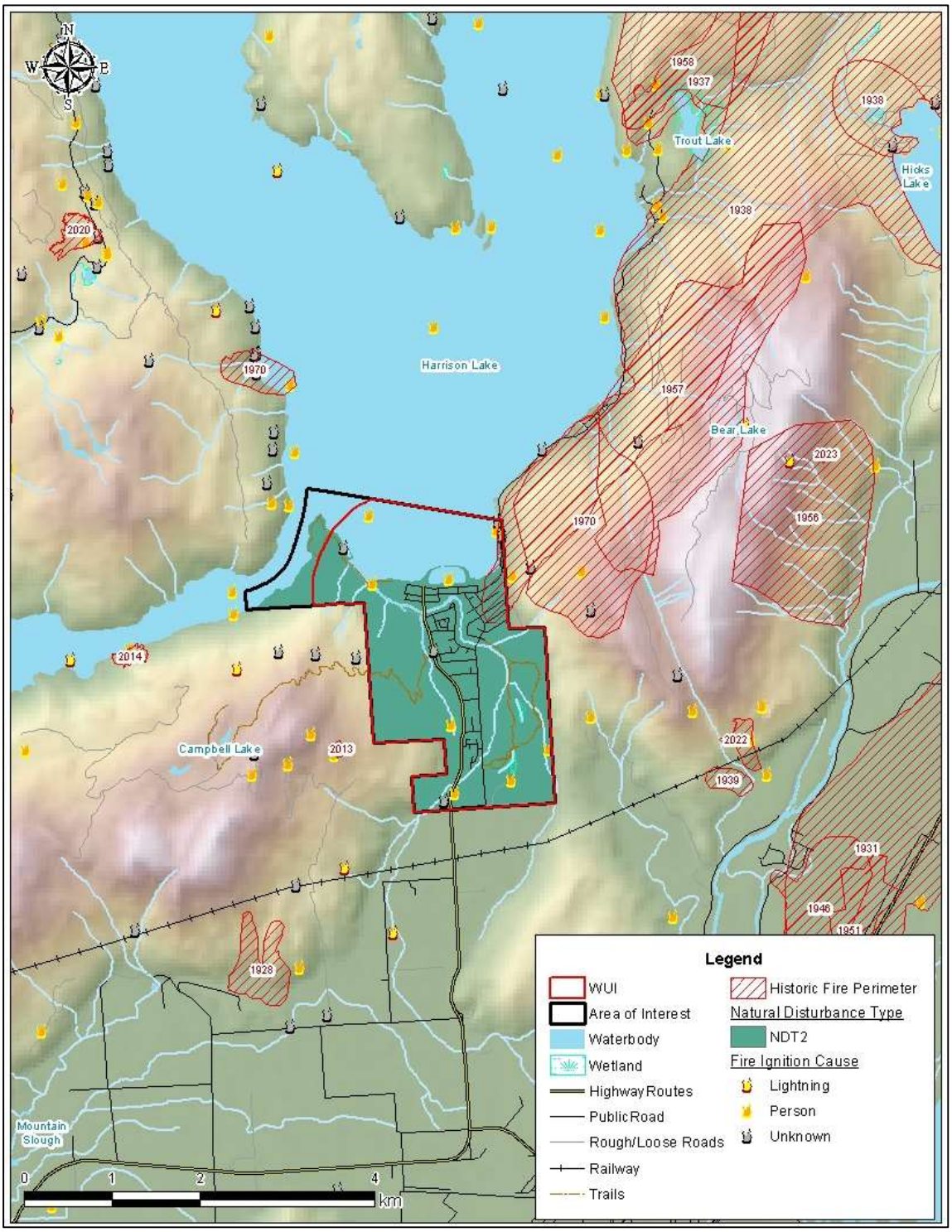
Members of the WWG noted that fires in the surrounding areas are slow to grow, generally due to favourable climatic conditions for fire suppression. The Bear Mountain fire in August 2023 (V13025), which grew to only 1.7 ha in size, was a good example of this.[45]

[39] Fire ignition data is available from 1951-2020 and fire perimeter data is available from 1919-2020.
[40] 21% of ignitions are attributed to lightening strikes and 36% are unknown sources. Source: GIS analysis of BCWS Historical Fire Incident Location data for southwest BC, from Vancouver to Hope, Squamish to the US Border. Retrieved on 8 August 2024 from BC Data Catalogue.
[41] B.A. Blackwell & Associates Ltd. 2019. *Fraser Valley Regional District Zone C 2019 Community Wildfire Protection Plan.* 2019_FVRD_ZoneC_CWPP_FINAL.pdf
[42] B.A. Blackwell & Associates Ltd. 2017. *District of Kent Community Wildfire Protection Plan*. Community Wildfire Protection Plan (kentbc.ca)
[43] BC Wildfire Services. 9 August 2021. [Facebook post.] Fire activity was much quieter... - BC Wildfire Service | Facebook
[44] City News. 1 October 2022. "Wildfire ignites in Coquitlam." Wildfire ignites in Coquitlam | CityNews Vancouver
[45] Personal communication. June 2024.

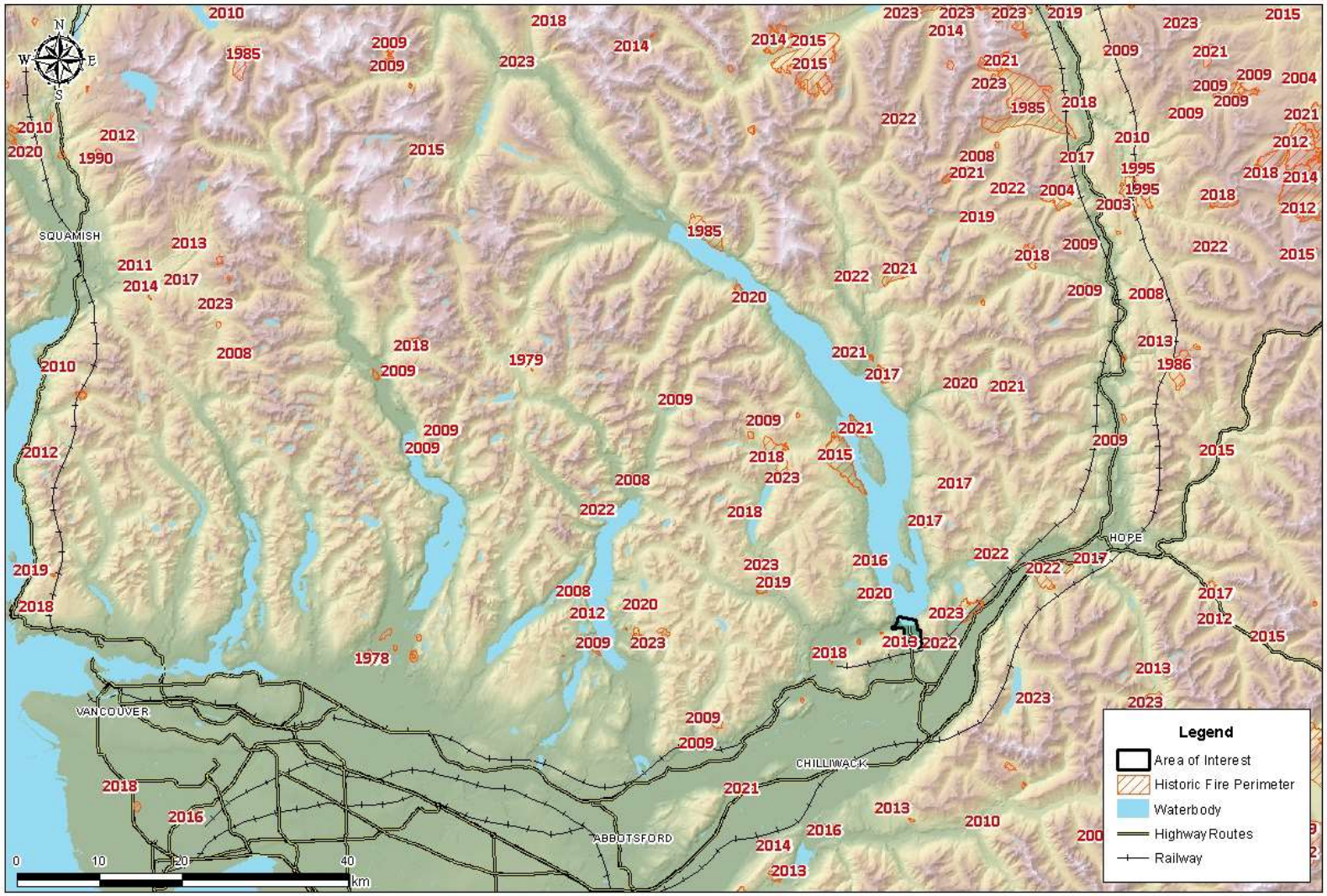
Figure 7. Lightning-caused fire on the north end of Long Island in Harrison Lake, August 2021.[46]

Figure 8. Wildfire in Minnekhada Regional Park, Coquitlam, October 2022.[47]

[46] BC Wildfire Services. 4 August 2021. [Facebook Post.] UPDATE: The BC Wildfire Service... - BC Wildfire Service | Facebook
[47] City News. 1 October 2022. "Wildfire ignites in Coquitlam." Wildfire ignites in Coquitlam | CityNews Vancouver



Map 7. Natural disturbance regime and historical fire ignitions and occurrences around Harrison Hot Springs.



Map 8. Historic wildfire occurrences from the past 50 years (BCWS data).

4.2.3 WILDFIRE RESPONSE

Wildfire response in Harrison Hot Springs is primarily the responsibility of the Harrison Hot Springs Fire Department (HHSFD), with assistance provided from the Agassiz Fire Department and BCWS, if needed. The HHSFD has had very few wildland or structural fire callouts over the past couple of years, reporting just one wildland fire response in 2024, since 2018.

When it comes to wildfire response, Harrison Hot Springs has several notable wildfire resiliency factors. First is fire behavior – as discussed above, local fire response personnel have noted that fires in the area are relatively slow growing due to fuel moisture and weather factors. Using historical 90th percentile fire weather data and the BCWS Red Book, typical rates of spread high fire danger conditions in the Fraser Valley are 2 m/minutes; whereas for the same fuel type and slope, rates of spread in the Fraser Canyon or the Okanagan are twice to three times that.

Second is early detection – a high number of residents and recreationalists in the Harrison area means that there are many 'eyes' on the ground, and that fires get reported quickly. Fires that start roadside or mid-slope (such as in cutblocks) are the most common for the region (due to the prevalence of human ignitions) and are easily visible. The WWG noted that residents are very proactive about reporting abandoned or illegal campfires. Additionally, the Village is finalizing the installation of a SenseNet early detection system[48] around the Village, including the East Sector Lands and near the water reservoir.

The third factor is firefighting resources, particularly water supply. The proximity to and accessibility (both by vehicle and helicopter) of a large and accessible body of freshwater, Harrison Lake, is beneficial to both local fire departments and BCWS, for whom adequate water supply is critical in fire suppression. Additionally, Harrison Hot Springs is geographically proximate to the Haig Fire Base, which has initial attack crews allocated for local response during the fire season. These factors intersect to mean that local firefighting crews can be on a fire quickly while it is still small and controllable, with a high rate of suppression success.

4.3 PROVINCIAL STRATEGIC THREAT ANALYSIS

The Provincial Strategic Threat Analysis (PSTA) is a series of publicly-available spatial layers that are designed to consistently assess and map different aspects of wildfire threat and risk around the province.[49]

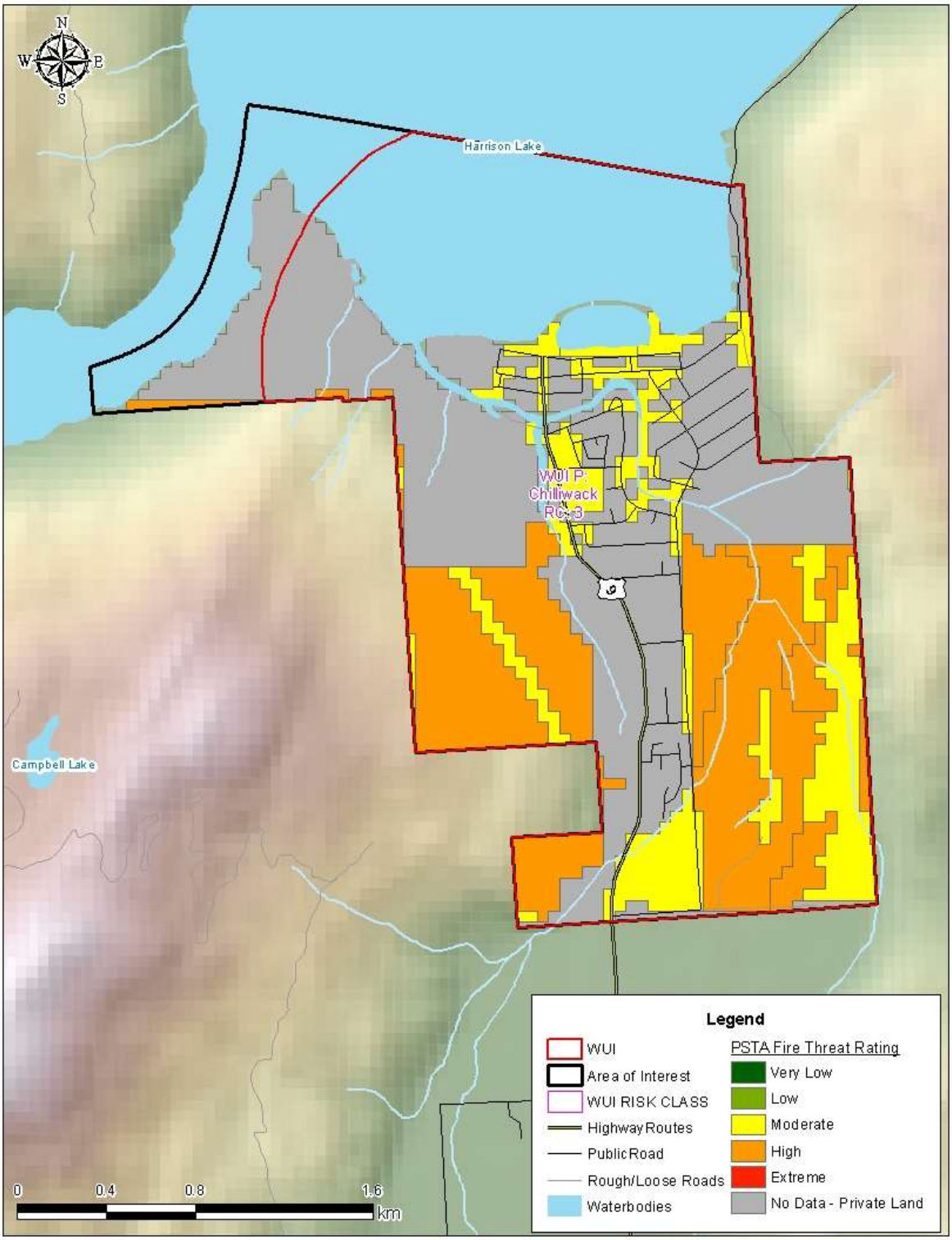
[48] SenseNet Inc. 2023. SenseNet - Rapid Wildfire Detection Solution
[49] Province of BC. 12 May 2023. *2021 Update: Provincial Strategic Threat Analysis (PSTA).* https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/fire-fuel-management/psta

The PSTA is a starting place from which more detailed local risk assessments can be performed (Section 4.4), and to support the development of FireSmart funding applications under the UBCM FCFS program.

The PSTA also forms the basis for the identification of the wildland-urban interface (WUI) in BC. Structure densities are used to define areas of human development. A 2-km buffer is applied on these areas to represent a reasonable maximum distance that embers can travel from a wildfire to ignite a structure. This represents the historic approach to defining the WUI for BC. Harrison Hot Springs' WUI comprises almost the entire municipal boundary due to high structure densities throughout, and adjacent to, the municipality. The only area excluded is the undeveloped northwest corner around Whippoorwill Point. This process doesn't account for non-structural values that may be considered values at risk for a community, highlighting the importance of local community wildfire planning.

Once the WUI is defined, it is combined with the PSTA Fire Threat Rating to delineate discrete 'WUI Risk Class' polygons throughout BC. The PSTA Fire Threat rating integrates coarse-scale, provincially determined wildfire threat components such as fire likelihood (historical fire occurrence), potential fire severity (fire weather conditions and fuel type), and wildfire propagation potential (spotting). Notably, this threat analysis does not extend onto private land.

There are five risk class ratings provided in the resulting provincial WUI Risk Class Map, with 1 being the highest relative risk across the province and 5 being the lowest. The entirety of Harrison Hot Springs is classified as a Risk Class 3. The PSTA Fire Threat Rating and WUI Risk Class Rating of Harrison Hot Springs is shown in Map 9 below. Despite steep slopes surrounding the Village, the PSTA Fire Threat Rating for the Harrison area is much higher than expected for the given fuel typing and historic fire occurrence data. BCWS was contacted to determine the possible cause of the anomaly. It was concluded that incorrect data may be the reason, highlighting the importance of field verification during a CWRP update.



Map 9. Provincial Strategic Threat Analysis (PSTA) Fire Threat Rating and WUI Risk Class Rating for Harrison Hot Springs.

4.4 LOCAL WILDFIRE RISK ASSESSMENT

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

- **Fuel type attribute assessment:** ground truthing/verification and updating as required to develop a local fuel type map.
- **Consideration of the proximity of fuel to the community:** recognizing that fuel closest to the community usually represents the highest hazard.
- **Analysis of predominant summer fire spread patterns:** using wind speed and wind direction during the peak burning period using ISI Rose(s) from BCWS weather station(s) (Section 4.1.2 - Weather). Wind speed, wind direction, and fine fuel moisture condition influence wildfire trajectory and rate of spread.
- **Consideration of topography in relation to values** (Table 12 and Table 13): 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:** according to relative wildfire threat based on the above considerations, other local factors, and field assessment of priority wildfire risk areas.

Wildfire Threat Assessments were completed over several days in June 2024 in conjunction with verification of fuel types (see Appendix B: WUI Risk Assessment - Worksheets and Photos) to support analyses and the development of priority treatment areas. Five site level Wildfire Threat Assessments were completed, and 90 other field stops (e.g., qualitative notes, fuel type verification, and/or photograph documentation) were made throughout the WUI (Appendix A: Local Wildfire Risk Process) to build the most accurate assessment of local fire risk possible.

Field assessment locations were prioritized based upon:

- **Proximity to values at risk:** Field assessments were clustered in the intermix and interface, as well as around critical infrastructure.
- **Local knowledge:** Areas identified as hazardous, potentially hazardous, with limited access/egress, or otherwise of particular concern as vulnerable to wildfire, as communicated by local fire officials and community forest representatives.
- **Observations:** Additional areas potentially not recognized prior to field work were visually identified as hazardous and assessed during the week.

It is important to note that the threat assessment quantifies threat as it relates to forest fuels, and does not include the ignition potential of residential landscaping, structures or other infrastructure. Structure fires and structure-to-structure spread in a wildfire scenario are largely attributable to hazardous

conditions in the Home Ignition Zone of a structure (i.e., the area within 30 meters of the principal building on a property and/or its attachments). However, the analyses do provide relevant information regarding wildfire threat that should be considered for FireSmart and emergency management planning and preparedness.

4.4.1 WILDFIRE THREAT CLASS ANALYSIS

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, depending on the level of risk in the Home Ignition Zone, can pose some threat 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 behaviour threat polygons may include high indices of dead and downed conifers; and
- **Extreme:** Continuous, forested land that will support intermittent or continuous crown fires.

Results of the wildfire threat class analysis for Harrison Hot Springs is shown on Map 10 and in Table 16 below. Much of the AOI (34%) is private land, for which there is no data available. 25% is classified as very low or no threat, representing water or paved/cleared surfaces. 29% is a low threat class and only 13% is classified as moderate threat. Moderate threat areas are associated with steeper slopes (see Map 4) and with undeveloped conifer-dominated or mixed-wood stands. There is no assessable public land classified as high or extreme threat.

Table 16. Fire Behaviour Threat Summary for Harrison Hot Springs' AOI.

Wildfire Behaviour Threat			
Threat Class	**Hectares**	**Percentage (%) of AOI**	**% of Assessable Public Land (excluding water)**
Extreme	0	0%	0%
High	0	0%	0%
Moderate	89	13%	19%
Low	203	29%	43%
Very Low/No Threat (Water)	179	25%	-
No Data (Private Land)	*237*	34%	-

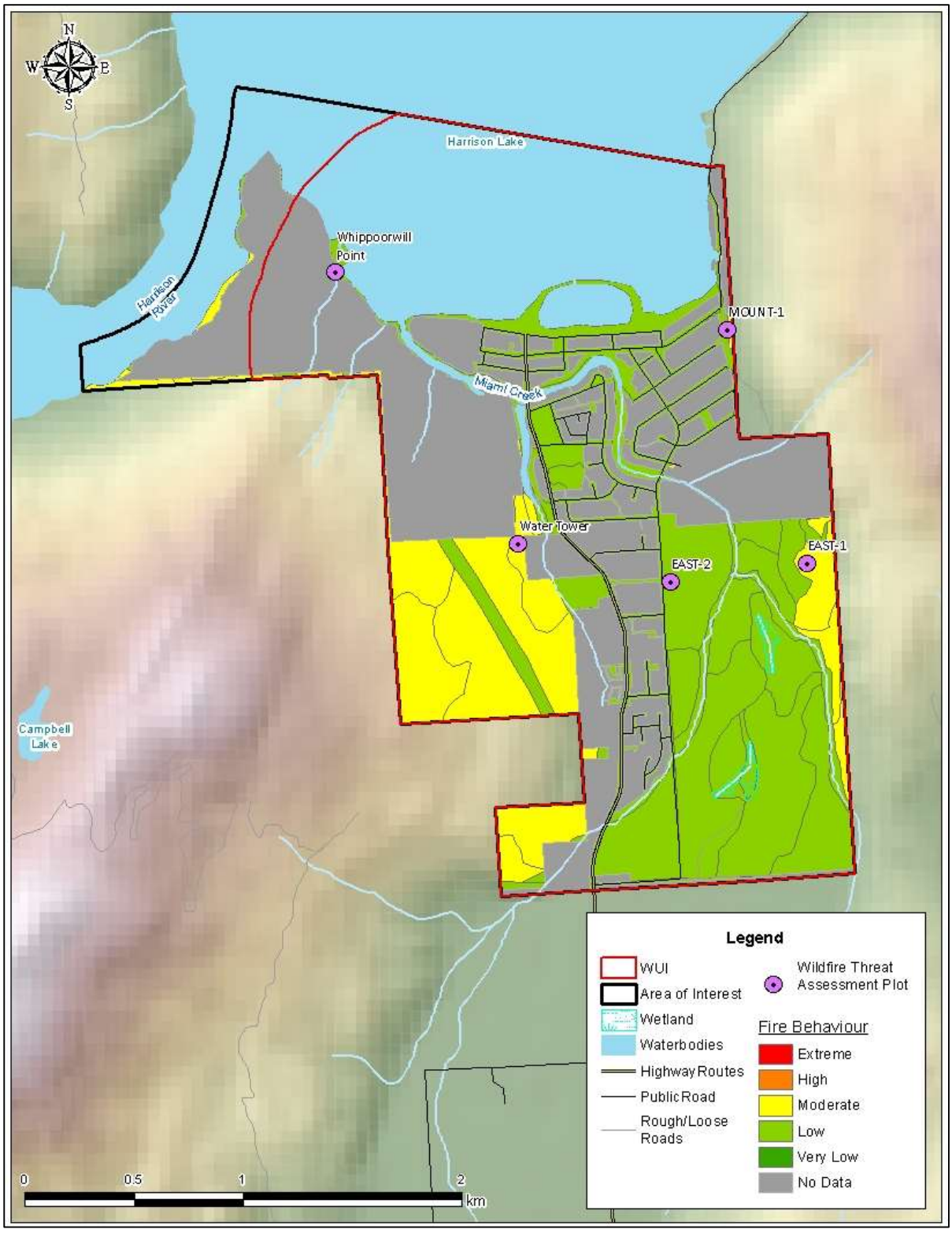
See Appendix A-2: Wildfire Threat Spatial Analysis Methodology for a further discussion on wildfire behaviour threat analysis input data.

4.4.2 WUI RISK CLASS ANALYSIS

In the local risk assessment, WUI risk classes are quantified when the Wildfire Threat is assessed as high or extreme, causing potential unacceptable wildfire threats when near communities and developments. WUI risk classes were not analyzed since wildfire threat does not exceed a moderate threshold anywhere within Harrison Hot Springs (see Table 17 below).

Table 17. WUI Risk Class Summary for Harrison Hot Springs' AOI.

WUI Risk			
Risk Class	**Hectares**	**% of Entire WUI**	**% of Assessable Public Land**
Extreme	0	0%	0%
High	0	0%	0%
N/A (Moderate, Low, Very Low *Wildfire Threat Class*)	471	66%	100%
No Data (Private Land)	*237*	34%	-



Map 10. Local wildfire risk analysis of Harrison Hot Springs.

4.5 HAZARD, RISK, AND VULNERABILITY ASSESSMENT

The BC Emergency and Disaster Management Act requires local authorities to prepare an Emergency Management Plan, addressing all hazards present to and potential impacts on the community.[50] A Hazard, Risk, and Vulnerability Assessment (HVRA) is a tool that local governments can use to fulfill this requirement. The purpose of a HRVA is to help a community make risk-based choices to address vulnerabilities, mitigate hazards, and prepare for response and recovery from hazard events. The process assesses potential harm, their likelihood of occurring, the severity of their possible impacts, and who or what is particularly exposed or vulnerable to these impacts. [51] Part of the HVRA process is the development of a locally-derived inventory of critical infrastructure and community assets. Emergency Management BC provides both a Critical Infrastructure Assessment Tool and an online HVRA tool to assist communities with this process.[52]

Harrison Hot Springs is currently developing an updated emergency management plan. A formal HRVA would help inform this plan and should utilize the most recently completed CWRP for wildfire threat and risk information. Ensuring that these updates reflect the unique considerations of Harrison Hot Springs is important for effective emergency management and resilience building.

[50] Bill 31: *Emergency and Disaster Management Act.* 2023. First Reading, 2023, 42nd Parliament, 4th Session. Bill | Legislative Assembly of BC
[51] Government of BC. 2020. *HRVA Example Report.* https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/local-government/hrva/hrva_forms-step_8-anytown_bc-sample_hrva_report.pdf
[52] More information can be found here: https://www2.gov.bc.ca/gov/content/safety/emergency-management/local-emergency-programs/establishing-an-emergency-program/assessment-analysis

SECTION 5: FIRESMART PRINCIPLES

FireSmart™ is the nationally accepted set of principles, practices, and programs for reducing losses from wildfire.[53] FireSmart concepts, including recommended FireSmart guidelines,[54] have been formally adopted by almost all Canadian provinces and territories, including British Columbia in 2000. FireSmart is founded in standards published by the National Fire Protection Association.

FireSmart includes seven disciplines, which provide a sound framework for reducing wildfire risk to communities:

- Education
- Legislation and Planning
- Development Considerations
- Interagency Cooperation
- Cross-Training
- Emergency Planning
- 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. The following parts of this section provide information on each FireSmart discipline. FireSmart activities that Harrison Hot Springs has already implemented are discussed, as well as any relevant gaps and potential to expand and strengthen this programming. A compilation of recommended action items by FireSmart discipline, Harrison Hot Springs' "FireSmart Action Plan," is detailed in Table 1 - Harrison Hot Springs Community Wildfire Resiliency Plan Action Plan. The FireSmart Roadmap concept, with recommended next steps, is detailed and discussed in Appendix D: FireSmart Roadmap. Most actions are fundable through the UBCM CRI FCFS program.[55] Each recommendation includes a rationale, lead agency, timeline, and estimated resources to complete.

The overarching goal of FireSmart is to empower and encourage communities and citizens to adopt practices to mitigate the negative impacts of wildfire to assets on public and private property. While responsibility for effectively mitigating hazards must be shared between many entities including residents, industry, businesses, and governments,[56] the ultimate root of the WUI problem is the vulnerability of structures and homes to ignition during wildfire events, in particular vulnerability to embers. Embers can

[53] FireSmart is the registered trademark held by the Partners in Protection Association.
[54] FireSmart guidelines first published in the 1999 manual "*FireSmart: Protecting Your Community from Wildfire*", with a second edition published in 2003. The most recent "*FireSmart Begins at Home Manual*" is available at https://firesmartcanada.ca/resources/. The "*British Columbia FireSmart Begins at Home Manual"* provides detailed guidance and is available at BC FireSmart: https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/firesmart
[55] https://www.ubcm.ca/cri/firesmart-community-funding-supports
[56] https://www.firesmartcanada.ca

be transported long distances ahead of the wildfire, across fire guards and fuel breaks, and accumulate in densities that can exceed 600 embers per square meter. Combustible materials found on the exterior of and surrounding homes (the FireSmart Home Ignition Zone) combine to provide fire pathways allowing spot surface fires ignited by embers to spread and carry flames or smoldering fire into contact with structures. As a result, risk mitigation actions on private properties are emphasized.

5.1 FIRESMART COMMUNITY OVERVIEW

During CWRP development, FireSmart vulnerability and resiliency factors were observed for the homes and neighbourhoods of Harrison Hot Springs. These observations include qualitative notes of structural characteristics, as well as landscaping vegetation, detailed below in Table 18.

Table 18. FireSmart vulnerability and resilience factors observed in Harrison Hot Springs.

Vulnerability	Resilience
Village Centre/Lakeshore	
• Egress requires crossing Miami River (2 route options with bridges)	• FireSmart construction principles on newer builds • Little combustibles / vegetation observed in the Home Ignition Zone
Hot Springs Road	
• Higher density mobile home and RV parks • Combustible siding • Metal roofs with some debris accumulated from overtopping trees	• No egress concerns
Eagle Street / NE Village	
• Older builds, more conifer vegetation in the Home Ignition Zone • Egress requires crossing Miami River (2 route options with bridges)	• Deciduous-dominated buffer between residences and forest slope
Miami River Drive / Centre Village	
• Some green waste dumping observed in the Miami greenway • Vinyl and wood siding • Cedar hedges and shrubs commonly used in landscaping	• New developments are FireSmart compliant • Wide boulevards, excellent emergency vehicle access • Multiple egress routes to Hot Springs Road • Fire-rated roofing material (asphalt shingle) • Many properties use xeriscaping
McCombs Drive / South Village	
• Some use of conifer landscaping	• Newer builds with a high proportion of observable FireSmart construction
General	

Vulnerability	Resilience
• Limited egress routes to evacuate village, exacerbated by the influx of visitors and recreators that would be coming from Sasquatch Provincial Park and East Harrison Lake in the event of an evacuation	• Excellent hydrant network throughout neighbourhoods • Few intermixed homes within the AOI • Mostly flat topography, valley bottom • Excellent water source (Harrison Lake) for wildfire suppression • Low to moderate hazard forest type surrounding Village

Most residences throughout the Village exhibit, overall, relatively low flammability landscaping. Several properties use xeriscaping principles, specifically designed to reduce water consumption. However, the presence of ornamental conifer trees and shrubs increases the interaction between structures and vegetation, heightening the risk of fire spread. Cedars are particularly problematic from a wildfire perspective due to their waxy leaves, which are highly flammable, and dry branches that can easily ignite. Additionally, cedars are susceptible to drought, leading to an accumulation of dry, dead material that further increases fire risk. Reducing these continuous cedar shrubs will significantly reduce the potential for wildfire spread within the community.

The sections to follow provide information on each FireSmart discipline. Each section contains a table of recommended actions for Harrison Hot Springs related to the respective discipline. Each recommendation includes a rationale, lead agency, timeline, potential funding avenues, and estimated resources to complete.

Figure 9. Example of wide residential roads and highly visible street addresses, facilitating effective emergency response.

Figure 10. Example of low hanging conifer branches within 30m of homes and wooden structures attached to homes.

5.2 EDUCATION

Description

Public education and outreach are critical components in preparing a community for wildfire prevention and resilience. Engaging in wildfire risk reduction and resiliency activities helps foster a sense of empowerment and shared responsibility among residents. It also supports the successful implementation of various FireSmart disciplines by building awareness and understanding. FireSmart education activities constitute the 'engagement' phase of the FireSmart Roadmap and are the foundation for progress towards resiliency.

Analysis

Since the 2017 CWPP, Harrison Hot Springs has initiated a robust FireSmart Education program. FireSmart education activities are led by Village staff; until recently, capacity has been an issue. In spring 2024, a member of the fire department was hired on contract to the Village as a Local FireSmart Representative (LFR). This additional capacity has allowed the Village's FireSmart education program to expand. Initiatives completed to date include:

- In-person public events that include FireSmart information delivery:
  - Emergency Preparedness Open House in March 2024
  - Annual Boater's Day at the local Yacht Club
  - 75th Anniversary Community Celebration in May 2024
  - Canada Day pancake breakfast at Fire Hall
- FireSmart messaging and resources shared on Village website and social media
  - website provides links for the FireSmart BC website, BCWS app, and Alertable app, used to notify residents of emergency alerts, closures, bans, restrictions, and hazards.
- Promotion of Home Ignition Zone assessments on Village social media, posters, and digital billboard
- Completion of Home Ignition Zone Assessments (33 to date)
- Completion of Critical Infrastructure Assessments

Action Planning

Harrison Hot Springs should continue to implement their multi-media communication strategy to inform residents about wildfire hazards and FireSmart principles, utilizing the municipal website, social media, and print materials to effectively reach a broad audience. Continuing to host interactive workshops or community events that inform on FireSmart practices can be very effective.

Fire danger information and advisories should continue to be regularly updated on all relevant communication channels, including the Harrison Hot Springs website and social media platforms. It is recommended that physical signage continue to be posted in key locations during periods of high fire danger. The FVRD has stated that they will work with local municipalities to post signage, update social media, and close parks as required in response to elevated fire risk. Establishing a protocol for regular

signage and media updates during wildfire season is crucial for maintaining community vigilance and preparedness.

As a designated Resort Municipality, seasonal visitors comprise a large component of Harrison Hot Springs' population; this can consist of thousands of visitors a day.[57] Efforts should be made to extend FireSmart awareness to this contingency, as well as travellers passing through the Village towards destinations on Harrison Lake, via posted signage (i.e., along Rockwell Drive, at the public boat launch, and at Sandy Cove Beach) and providing education materials best practices for campfire safety and Leave No Trace practices at the visitor centre and on the municipal website.

Critical Infrastructure Assessments have been conducted for many municipal buildings. Implementing associated risk mitigation recommendations along with informative signage can be viewed as an opportunity to demonstrate FireSmart best practices to community members.

Harrison Hot Springs could benefit from expanding their FireSmart education program to incentive community uptake. The Home Partners Program (HPP) is a useful tool for empowering the homeowners to take initiative or their own properties. The program is a research-based collaboration between FireSmart BC and the local government. The assessment process is a more thorough approach that that currently taken by the Home Ignition Zone Assessment. It allows opportunities to address hazardous conditions unique to each property. Homeowners can gain FireSmart certified status through the following steps:

1. Have a HPP Assessment conducted by a Wildfire Mitigation Specialist (WMS).
2. Complete mitigation activities recommended in the HPP Assessment.
3. Have an onsite follow-up inspection completed.

With the FireSmart certification, homeowners can be eligible for insurance policy incentives or discounts with partnering providers. As well, FireSmart-certified property signage can be installed to increase neighbourhood awareness.

Like the Home Partners Program, the FireSmart Canada Neighbourhood Recognition Program (FCNRP) can be utilized to increase public awareness and incentive action on a neighbourhood scale. Village staff observed a current lack of interest in the program. Public interest in local hazard, however, has been noted as quite high; the FCNRP could leverage this energy. Steps for initiating and maintaining this program include:

1. Enlist an LFR to conduct a neighbourhood-level assessment and create a Neighbourhood Plan that incorporates local input.
2. Appoint a Neighbourhood Champion and Neighbourhood FireSmart Committee that maintains and track progress of the Neighbourhood Plan.

[57] Personal communication. July 2024.

3. Host annual FireSmart events dedicated to local FireSmart projects.
4. Spend a minimum $2 per capita annually on local FireSmart Neighbourhood efforts.
5. Submit an annual report to FireSmart Canada, documenting progress and compliance with the program.

By following these steps and prioritizing high-impact actions, Harrison Hot Springs can enhance its community education and outreach efforts, improving overall wildfire resilience and safety. Table 1 in the Executive Summary details the full list of recommended actions that Harrison Hot Springs can implement to enhance FireSmart education within its communities.

5.3 LEGISLATION AND PLANNING

Description

Legislation and planning play a significant role in building and maintaining FireSmart neighbourhoods.[58] A summary of planning documents relating to wildfire risk and emergency planning that are relevant to Harrison Hot Springs was provided earlier in SECTION 2: Relationship to Other Plans and Legislation.

The interaction between the built environment (homes, businesses, accessory structures, cultural resource facilities, infrastructure), and the natural environment (landscaping, parks, and natural areas such as grasslands and forests) influence wildfire susceptibility and the effectiveness of responding to it. Key factors that can be planned for (and regulated through the land use planning and development process) affecting public safety during a wildfire include:[59]

- Enforcing the use of FireSmart building materials for new constructions and renovations.
- Ensuring new buildings are adequately set back from forests and slopes.
- Providing adequate access for firefighters and ensuring sufficient water supply for emergency response in new developments.
- Preventing the accumulation of combustible materials or flammable vegetation within a specified distance of homes.
- Restricting the use of highly flammable vegetation in new developments, especially close to homes.

Analysis and Action Planning

While the Village has limited capacity for enforcement, policies, and bylaws can still serve as powerful tools for creating awareness. Several jurisdictions, including the District of Squamish and the City of Nelson, have implemented Wildfire Landscaping Bylaws to prohibit the planting of new flammable conifer shrubs next to residences. Even without much enforcement, such a bylaw can a) educate the public on

[58] FireSmart Canada. 2023. *The Seven FireSmart Disciplines: Legislation and Planning*. Available from: https://firesmartcanada.ca/about-firesmart/the-seven-firesmart-disciplines/
[59] UBCM. 2023. *Community Wildfire Resiliency Plan Instruction Guide 2023.* Available from: https://www.ubcm.ca/sites/default/files/2023-12/LGPS_CRI_FCFS2023CWRPInstructionGuideV1.pdf

FireSmart best practices, b) set the tone for FireSmart recognition at the local government scale, and c) be implemented for public infrastructure.

Opportunities to update or strengthen existing policies, and recommendations to incorporate an interface wildfire risk assessment into future planning, have been identified in Table 1 in the Executive Summary.

5.4 DEVELOPMENT CONSIDERATIONS

Description

Building materials and design, coupled with residential landscaping, have been shown to be the most significant factors influencing home survivability during a wildfire.[60] Development standards influence the potential impact a wildfire may ultimately have on a community. Damage potential is exacerbated when flammable building materials are used throughout the development landscape.[61] As such, strategic decisions regarding FireSmart building materials and design are important to reduce structures' ignitability and protect neighbourhoods from wildfire.

Important factors that can be planned for which affect public safety during a wildfire include:

- Location of development, including hazardous or vulnerable land uses, in relation to high hazard forested vegetation, steep slopes, and other geographical features that contribute to extreme fire behaviour
- Access and circulation patterns
- Availability and adequacy of water supply
- Type of construction materials on structures and attachments (privately and publicly owned)
- Lot size and structure density
- Design guidelines and architectural standards

Analysis

The location and type of development within the Village is regulated by the Official Community Plan (OCP). Land use designations include tourist commercial, residential (low density and medium density), community use, and resources. Most of the forested land east and west of the Village is zoned for 'resource' use. According to the OCP, the intent is to maintain these lands in an undeveloped state. These lands also overlap with Agricultural Land Reserve (ALR) (East Sector) and/or geotechnical hazard areas (slopes). The implications are that any future development is very likely to be concentrated within the existing developed area of the Village, limiting growth of the wildland-urban interface.

[60] Westhaver, A. 2017. *Why some homes survived. Learning from the Fort McMurray wildland/urban interface fire disaster*. A report published by the Institute for Catastrophic Loss Reduction – ICLR research paper series – number 56. https://www.iclr.org/images/Westhaver_Fort_McMurray_Final_2017.pdf

[61] FireSmart Canada. 2023. *The Seven FireSmart Disciplines: Development Considerations*. Available from: https://firesmartcanada.ca/about-firesmart/the-seven-firesmart-disciplines/

While development patterns in the Village are relatively fixed, FireSmart practices and considerations may be factored into future residential construction in Harrison Hot Springs. A DPA is an effective tool, designated under s. 488(1)(b) of the Local Government Act, to ensure the protection of new development from hazardous conditions, such as wildfire. Guidelines for FireSmart construction materials and landscaping species; ember-deflecting design considerations; maintenance practices, such as pruning and clean up, and combustible materials storage ensure that new development is resilient to wildfire hazard.

Since the 2017 CWPP, Harrison Hot Springs has implemented an Interface Wildfire Development Permit Area (DPA). See Map 2 for the coverage. This decision by the Village's Planning Consultants was based on a review of FireSmart resource materials and 2019 CWPP, with input from the public. The current designation utilizes roads as fuel breaks.[62] The DPA sets out guidelines based on the FireSmart Home Ignition Zones (HIZ) (see Figure 11). Guidelines address landscaping choice (i.e., species selection and maintenance (e.g., pruning) within 10m (Intermediate Zone) and 30m (Extended Zone) zones.

Field observations noted that FireSmart compliance of residential properties was reasonably high in Harrison Hot Springs. While combustible materials (i.e., vinyl and wood siding) are the most common construction materials, especially on older buildings, the prevalence of fire-rated roofing (i.e., asphalt shingles) and setbacks between homes and surrounding vegetation was high. Overall, homes are is good condition and properties are well-maintained. There are relatively few wooden deck or other extensions connected to homes and little to no storage of combustibles (e.g., propane tanks, firewood, etc.) noted within the HIZ of most homes. A gap in the current guidelines, however, is that the Immediate Zone, a 1.5 m non-combustible zone around the home itself, is not addressed. It is recommended that a provision be added to the DPA guidelines for this zone's inclusion, to ensure residential homes have a cleared, defensible space.

Action Planning

Another important development consideration is road networks that facilitate both egress and emergency vehicle access. Adequately wide roadways, turnaround points, and/or circulation routes are important to facilitate the entry of first responders into neighbourhoods in the event of an interface wildfire incident, and the exit or evacuation of residents and visitors. Most road networks in Harrison Hot Springs provide excellent access/egress by having multiple entry/exit routes in and out of each residential road. This standard should continue with new development. To prepare for a potential interface evacuation event, access roads and infrastructure should be reviewed for fire suppression accessibility and safety and for the staging of anchor points for firefighting equipment and personnel. Evacuation preparation is discussed in greater detail in Section 5.7 - Emergency Planning.

Recommendations and action items that Harrison Hot Springs can implement to foster resilient development are detailed in Table 1 in the Executive Summary.

[62] Email communication. August 2024.

5.5 INTERAGENCY COOPERATION

Description

Engagement and strong partnerships foster effective FireSmart programs.[63] Interagency cooperation aims to broaden from a singular department- or agency-based approach to a landscape-level, multi-agency approach to wildfire resilience. Bringing organizations together to address wildfire issues that overlap physical, jurisdictional, or organizational boundaries is a good way to help develop interagency mechanisms to reduce wildfire risk. For a small community with limited resources and staff capacity, interagency cooperation is especially crucial to increasing the local government's ability to plan and respond to emergencies effectively. The small land base area of Harrison Hot Springs means that neighbouring land managers' activities strongly influence the Village's wildfire risk profile.

Formal interagency partnerships such as mutual aid agreements and committees allow information and resources to be shared across jurisdictional boundaries, bolstering capabilities in adjacent communities, as needed. A Community FireSmart Resiliency Committee (CFRC) reflects the key planners and responders most involved in local FireSmart, wildfire resiliency planning, and wildfire and emergency response. Committees such as this foster collaborative problem-solving and planning, and delineate required roles and actions during times of emergency response.

Analysis and Action Planning

Harrison Hot Springs and the District of Kent demonstrate the value of interagency partnerships with the existing Kent-Harrison Joint Emergency Program (KHJEP), which WWG members (Table 19) noted has been very successful. This is in addition to the Mutual Aid Agreement between the Harrison Hot Springs Fire Department (HHSFD) and Agassiz Fire Department (AFD). These partnerships bolster Harrison Hot Springs' capacity to deliver emergency preparedness, response, and recovery services within the Village.

Currently, Village staff members also participate in the Fraser Valley Regional District (FVRD) CFRC, which meets quarterly. Maintaining active involvement in the regional CFRC should be a priority for the Village, in conjunction with more local planning with the District of Kent. Continuous participation in the CFRC is highly encouraged as it allows Harrison Hot Springs to share and integrate its FireSmart initiatives and experiences. As noted by Village staff, consistency and timing of messaging across all the municipalities of the FVRD can help foster a more cohesive and informed regional response to wildfire risks. Participation in a CFRC is also currently required to access UBCM CRI FCFS program funding.[64]

Harrison Hot Springs should continue to use the FVRD CFRC platform to work towards cooperative wildfire risk reduction action items. Reviewing high-priority action items identified in this CWRP and discussing

[63] FireSmart Canada. 2023. *The Seven FireSmart Disciplines: Interagency Cooperation*. Available at https://firesmartcanada.ca/about-firesmart/the-seven-firesmart-disciplines/
[64] UBCM. 2023. *Community Wildfire Resiliency Plan Instruction Guide 2023.* Available from: https://www.ubcm.ca/sites/default/files/2023-12/LGPS_CRI_FCFS2023CWRPInstructionGuideV1.pdf

opportunities to incorporate them into regional wildfire risk reduction planning can ensure that its specific needs and concerns are addressed within a broader regional context. For example, Harrison Hot Springs can advocate for regional support in FireSmart education initiatives for tourists and visitors, highlighting the need for strong regional messaging. Sharing materials and expertise can maximize the impact of educational efforts across the region.

To enhance wildfire preparedness and response, relevant Harrison Hot Springs and Kent staff should also conduct regular emergency planning meetings and desktop exercises that incorporate FireSmart and wildfire management topics. These meetings should integrate insights gained from Fraser Valley Regional District CFRC meetings to ensure the community is aligned with regional best practices.

Harrison Hot Springs should also emphasize the need for regular emergency training exercises with key stakeholders, such as the Harrison Hot Springs Fire Department, resort and hospitality staff, RV Park operators, and BCWS. These exercises can enhance interagency coordination and operational readiness during wildfire events, helping to identify response gaps and optimize strategies for efficiency and effectiveness.

Table 19. Harrison Hot Springs' Wildfire Working Group (WWG).

Name	Title
Christy Ovens	Harrison Hot Springs Community Services Manager and acting FireSmart Coordinator
Tyson Koch	Harrison Hot Springs Chief Administrative Officer
Jace Hodgson	Harrison Hot Springs Director of Operations
Ryan Chiarot	Kent-Harrison Joint Emergency Program Coordinator and District of Kent Deputy Fire Chief
Curtis Genest	Harrison Hot Springs Fire Chief
Thomas Redden	Local FireSmart Representative

Recommendations and action items that Harrison Hot Springs can implement to continue growing interagency relationships and increase interagency cooperation are listed in Table 1 in the Executive Summary.

5.6 CROSS-TRAINING AND FIRE DEPARTMENT RESOURCES

Description

Wildfire resiliency planning draws upon various professional disciplines who do not typically work in the wildfire environment. As a result, cross-training of local government staff, structural firefighters, and other key positions will support effective risk reduction activities and emergency response. Educating key stakeholders promotes informed decision-making and helps build local support for adopting FireSmart principles. To expand local capacity and expertise, Harrison Hot Springs should invest in cross-training

opportunities for all individuals involved in potential wildfire emergencies. All staff who are expected to participate in the development and implementation of this plan, or participate in wildfire response and recovery, should be appropriately trained.

Analysis and Action Planning

The Harrison Hot Springs' Fire Department's (HHSFD) current schedule of training includes both standard and specialized wildfire training for members. All fire department members take an annual refresher in Wildland Firefighter Level 1 (WFF-1; includes the S100 [basic fire suppression and safety], S-185 [fire entrapment avoidance and safety], and ICS-100 [Incident Command System training]). Other courses available to members include WSPP-115 (training for structure protection unit crews); Engine Boss Course (S-231) for structure protection program; Structure Protection Group Supervisor (GrpS); and Task Force Leader training. HHSFD also has also purchased a Structure Protection Trailer that is updated, by phase, with equipment and training to support their structure protection program.[65] Currently, the HHSFD is preparing to apply for Stage II of the four-stage CRI FCFS program. [66]

HHSFD's training program as it stands is considered robust, and the focus should be on continuing to provide opportunities for members to take outside courses. As the HHSFD continues to outfit a structural protection unit trailer, they should consider training more members in WSPP-115, which covers sprinkler application and other structural protection techniques using FireSmart principles and is a prerequisite for structural firefighters to be deployed to wildfires on Structure Protection Crews. At a minimum, internal training HHSFD's wildland equipment should be provided to all members. Local fire department staff and equipment is summarized in Table 9 and Section 3.2.1 - First Responders.

Water supply and pressure for fire suppression activities is not a concern to the WWG or HHSFD members. There hydrant system extends throughout most of the communities and, in the case that it is needed, water can be draught from Harrison Lake, for both firefighting and drinking water. In that event, the Agassiz Fire Department (AFD), which would respond as per the Mutual Aid Agreement, has a 5000-gallon water tender. The proximity and access to freshwater for bucketing aircraft or water tenders is a hugely beneficial factor for wildfire response in the area. As such, the HHSFD is well equipped to respond to structural and interface fires within its response area.

Two areas noted as lacking hydrant coverage are the section of the Village from McPherson Road and McCombs Drive north to Hadway Drive, essentially, the southwestern border of the East Sector Lands. This gap is currently being addressed by the Village.[67] It was also noted that no hydrant exists on the Fire Hall grounds.

[65] Email Communication. August 2024.
[66] British Columbia FireSmart. 2022. *Structure Protection Trailer Inventory Form.* FireSmart - Structure Protection Trailer Inventory Form (ubcm.ca)
[67] Email Communication. August 2024.

To effectively implement action items within the CWRP and administer the FireSmart program, Harrison Hot Springs could consider building additional FireSmart capacity. Additional FireSmart positions could also be shared regionally.

The following list summarizes the current status of FireSmart positions within the Village and additional roles that could expand the FireSmart program, if desired:

- **FireSmart Coordinator:** This role manages FireSmart funding/projects and engages with the Fraser Valley Regional District's CFRC. It is crucial for coordinating FireSmart activities and ensuring alignment with regional initiatives. Harrison Hot Springs' Community Services Manager currently fulfills many of the responsibilities of this role.
- **Wildfire Mitigation Specialist:** A trained WMS (2-day course) is a prerequisite of the Homes Partners Program. A WMS executes detailed home hazard assessments and can assist in developing targeted mitigation strategies, as well as other aspects of a community's FireSmart program. Existing LFRs with appropriate experience (i.e. fire department member) are good candidates for WMS training.
- **FireSmart Crew Member:** Undertakes mitigation work, supports community events, and assists with implementing FireSmart recommendations. This position helps with hands-on tasks that reduce wildfire risks on the ground and can be filled by member(s) of a local fire department or maintenance crew as a part-time role, or in addition to regular duties. No specific training.
- **Local FireSmart Representative** (currently filled): LFRs conduct FireSmart assessments, education events, and facilitate the Neighbourhood Recognition Program. LFRs are key to promoting FireSmart principles at the neighbourhood level and ensuring community engagement.

Various FireSmart training programs are available to equip staff with the comprehensive knowledge and practical skills necessary to implement FireSmart principles effectively, conduct detailed risk assessments, and lead community wildfire risk reduction initiatives. In addition to LFR or WMS training, which is fundable under the UBCM CRI FCFS program, the Wildfire Risk Reduction (WRR) course provides a good background on wildfire risk reduction strategies, concepts, and funding opportunities. It is intended for non-forest professionals who are engaged in FireSmart BC programs. Grant funding for training opportunities is also available for emergency management staff. During plan development, it was noted that staff from the Village of Harrison, District of Kent, and FVRD take emergency management courses together.

Recommendations and action items that Harrison Hot Springs can implement to expand training opportunities and enhance firefighting resources are listed in Table 1 in the Executive Summary.

5.7 EMERGENCY PLANNING

Description

Though the Coastal Fire Centre is well-resourced with dedicated local initial attack crews, BC is experiencing record-breaking fire seasons at an almost yearly rate. Deployment of provincial firefighting resources follows the Provincial Coordination Plan for Wildland-Urban Interface Fires,[68] which may lead to a scarcity of BCWS resources, especially aircraft, when several wildfire emergencies are taking place throughout the province. Therefore, local government wildfire preparedness and resource availability are critical components of community wildfire resilience – individuals and agencies need to be ready to act. Plans, mutual aid agreements, resources, training, and emergency communications systems make for effective wildfire response.

Analysis and Action Planning

Harrison Hot Springs has a number of endeavors underway to enhance their emergency preparedness. An update to Harrison Hot Springs' emergency management plan, in partnership with Kent, is in progress at the time of CWRP development. This plan will incorporate the new inclusions to the Emergency and Disaster Management Act (EDMA) and, once finalized, will bolster Harrison Hot Springs' resiliency by providing an up-to-date, comprehensive framework for emergency response and recovery.

Harrison Hot Springs has also received funding, through the UBCM Community Emergency Preparedness Fund - Public Notification and Evacuation Route Planning program, to development an evacuation guide. This will provide residents with specifics of what to expect in the event of an evacuation order. This plan will align with Emergency BC's Evacuation Operational Guidelines.[69]

Additionally, a joint application by Kent, Harrison Hot Springs, and the Sq'éwqel (Seabird Island Band) has been submitted to the Province to pursue an alternate evacuation route for recreators and residents along Rockwell Drive.[70] The goal of this route is to alleviate the traffic load that currently has to funnel through Harrison Hot Springs in the event of an evacuation. Once completed, the evacuation plan will be updated to reflect the new considerations.

A comprehensive communication plan for emergency alerts, information sharing, and coordination among residents and between agencies reduces confusion and enhances coordinated response efforts during emergencies. Currently, Harrison Hot Springs uses the Alertable[71] app, available on the municipal website, to enhance real-time monitoring and efficient communication during emergency situations. This

[68] Province of British Columbia. 2016. *Provincial Coordination Plan for Wildland-Urban Interface Fires*. Available from: British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires (gov.bc.ca)
[69] Emergency Management BC. 2022. *Evacuation Operational Guide for First Nations and Local Authorities in British Columbia."* 17 March 2022. 2nd edition. Evacuation operational guidelines (gov.bc.ca)
[70] Email communication. August 2024.
[71] Alterable: Public Emergency Alerting System

software can improve risk assessment, communication, and resource management during potential emergency events. During plan development, it was noted that the FVRD and the District of Kent also use the Alertable app as their public warning system, which has helped increase user uptake and provided a greater reach for public emergency notifications.[72]

Once the Emergency Preparedness Plan and evacuation guide, are completed, they should be regularly tested and updated with annual exercises. Conducting a wildfire-themed exercise will help identify and address potential hazards, access issues, and response barriers. These exercises could range from walkthroughs and workshops to tabletop exercises and full-scale drills.

As a designated Resort Municipality, Harrison Hot Springs sees a seasonal swell of visitors, and up to 750,000 annually.[73] This population needs to be considered in the event of an emergency. The Village should explore ways to extend the emergency program to include visitor accommodation and amenities operators, to ensure that hazard conditions and emergency notifications can be extended to the visitor population.

Wildfire Preparedness Condition Level

Harrison Hot Springs, possibly in conjunction with local government partners, could also consider developing local daily action guidelines based on expected fire weather conditions (determined by fire danger class for that day – discussed previously in Section 4.1.2 - Weather; see Coastal Fire Centre Danger Class rating webpage[74]). Table 20 below is an example of local daily action guidelines based on expected wildfire conditions.

Table 20. Example of a Wildfire Preparedness Condition Guide.[75]

Prep-Con LEVEL	ACTION GUIDELINES
I LOW	• *All Community staff on normal shifts.* • *Staff will update fire danger signs.*
II MODERATE	• *All Community staff on normal shifts*
III HIGH	• *All Community staff on normal shifts.* • *Daily detection patrols by staff.* • *Regional fire situation evaluated.* • *Daily fire behavior advisory issued.* • *Wildland fire-trained Community staff and EOC staff notified of Prep- Con level.*

[72] Personal communication, June 2024.
[73] Village of Harrison Hot Springs. 2024. "Our Community." https://www.harrisonhotsprings.ca/community/our-community
[74] BC Wildfire Services. 2024. *Fire Weather Danger Class Report.* https://wfapps.nrs.gov.bc.ca/pub/wfwx-danger-summary-war/dangerSummary?fireCentre=Coastal%20Fire%20Centre
[75] FireSmart BC. 2023. *Community Wildfire Resiliency Plan Template.* Available at: FireSmart Community Funding and Supports | Union of BC Municipalities (ubcm.ca)

Prep-Con LEVEL	ACTION GUIDELINES
	• *Establish weekly communications with local wildland fire agency contacts* • *Hourly rain profile for all weather stations after lightning storms.* • *Designated Community staff update fire danger signs.*
IV EXTREME	• *Rain profile (see III).* • *Daily detection patrols by Staff.* • *Daily fire behavior advisory issued.* • *Regional fire situation evaluated.* • *EOC staff considered for stand-by.* • *Wildfire Incident Command Team members considered for stand-by/extended shifts.* • *Designated Community staff: water tender and heavy machinery operators, arborists may be considered for stand-by/extended shifts.* • *Consider initiating Natural Area closures to align with regional situation.* • *Provide regular updates to media Services members/Community staff on fire situation.* • *Update public website as new information changes.*
V FIRE(S) **ONGOING**	• *All conditions apply as for Level IV (regardless of actual fire danger rating).* • *Provide regular updates to media/structural fire departments/park staff on fire situation.* • *Mobilize EOC support if evacuation is possible, or fire event requires additional support.* • *Mobilize Wildfire Incident Command 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.*

Recovery Planning

Recovery plans are a critical part of emergency planning. As mandated by provincial emergency management legislation, Harrison Hot Spring's Emergency Preparedness Plan will address emergency response as well as recovery. In the event of an emergency, the Kent-Harrison Joint Emergency Program (KHJEP) will work to provide Emergency Social Services to affected residents.

Recommendations and action items that Harrison Hot Springs can implement to continue productive and effective emergency planning are listed in Table 1 in the Executive Summary.

5.8 VEGETATION AND FUELS MANAGEMENT

Description

As discussed in Section 4.1 - Local Wildfire Environment, fuel is the only aspect of the fire behaviour triangle that can be modified 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. **FireSmart landscaping:** The removal, reduction, or conversion of flammable plants to create more fire-resistant areas in the FireSmart Home Ignition Zone (see Figure 11 below for zones) around residential structures, critical infrastructure, and designated green spaces.
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.

FireSmart Landscaping

The goal of FireSmart landscaping is to design and maintain yards, green spaces, and spaces around critical infrastructure using FireSmart principles to increase wildfire resiliency. This can involve the removal, reduction, or conversion of flammable plants. FireSmart landscaping within 30 meters of homes and structures throughout Harrison Hot Springs will have the biggest impact on wildfire resiliency. This 30 m radius is further divided into zones of adjacency, and descending priority, see below in Figure 11.

Figure 11. FireSmart Home Ignition Zone.[76]

[76] FireSmart Canada. 2023. "The Home Ignition Zone." Retrieved from: The Home Ignition Zone | FireSmart Canada

Analysis and Action Planning

Harrison Hot Springs' Wildfire Development Permit Area (DPA) mandates that new developments follow guidelines specifying vegetation setbacks from homes, non-flammable species selection, and maintenance activities, such as pruning and deadfall/debris clean-up. The Wildfire DPA sets out guidelines that require residents to opt for FireSmart species, routinely prune low hanging conifer branches adjacent to home, and maintain well-watered, mowed lawns, based on the FireSmart Home Ignition Zones (see Figure 11). The removal of combustible materials and non-vegetative debris from the Home Ignition Zone across residential properties will reduce ignition potential and mitigate fire spread.

When it comes to supporting residential FireSmart landscaping, Harrison Hot Springs has followed two distinct pathways: 1) regulation, through the Interface Wildfire DPA, and 2) community engagement, through home hazard assessments, distributing educational material, and promoting FireSmart at community events. To facilitate implementation of recommendations from home hazard assessments, Harrison Hot Springs should continue to seek opportunities to remove barriers (e.g., financial or mobility issues), such as continuing to offer and promote the FireSmart rebate program and holding community clean-up events.

It is recommended that next steps involve removing barriers for residents who wish to remove forest fuel on their property. Organizing a community clean-up day with the provision of resources such as dumpsters, chippers, or other equipment is a helpful way to engage residents in collective action to reduce wildfire risk while providing an opportunity to educate residents on FireSmart principles. This event can also count towards FireSmart Canada Neighbourhood Recognition. Other ways that FireSmart landscaping activities could be supported by Harrison Hot Springs include further promotion of the FireSmart rebate program and offering more opportunities for residents to dispose of yard waste (e.g., offer a spring or fall chipper program, or community drop-off bin.) Currently, residents are able to dispose of up to 10 paper yard waste bags of yard waste via weekly curbside pick-up.[77] Otherwise, clean wood and yard debris, such as stumps, logs, and trimmings greater than 360mm diameter,[78] can be brought for a free to the Parr Road Green Depot in Chilliwack.

[77] Harrison Hot Springs. 2022. *2022 Curbside Collection Service Improvements.* 2021.12.07 2022 Service Improvements Notice.pdf (harrisonhotsprings.ca)
[78] BioCentral – Green Depot. "Services." Services | BioCentral Green Depot

Figure 12. Conifer landscaping on newly developed property.

Fuel Management Treatments

Description

Fuel management treatments are generally located outside of the Home Ignition Zone and serve to further reduce wildfire risk to communities, as well as to reduce the potential for fire transmission into adjacent forested lands. Fuel management treatments aim to reduce potential fire behaviour to a level that allows for successful fire suppression. While basic FireSmart landscaping can be guided by the recommendations of a Local FireSmart Representative, it is recommended that vegetation management outside of the Home Ignition Zone be directed by a forest professional, with wildfire risk reduction in their scope of practice, to ensure that additional forest values are not being negatively affected.

It should be noted that not all forested areas are suitable candidates for fuel management. Areas that are assessed as having a low or moderate fuel hazard don't usually warrant fuel reduction treatments for the primary purpose of fire risk mitigation. Other factors to consider include the likelihood of fire suppression success, the cost of fuel management, and ecosystem sensitivity to pruning, thinning, or surface fuel removal. Where fuel management treatments are not recommended by a qualified professional,

vegetation management should focus instead on FireSmart landscaping in the Home (or Critical Infrastructure) Ignition Zone.

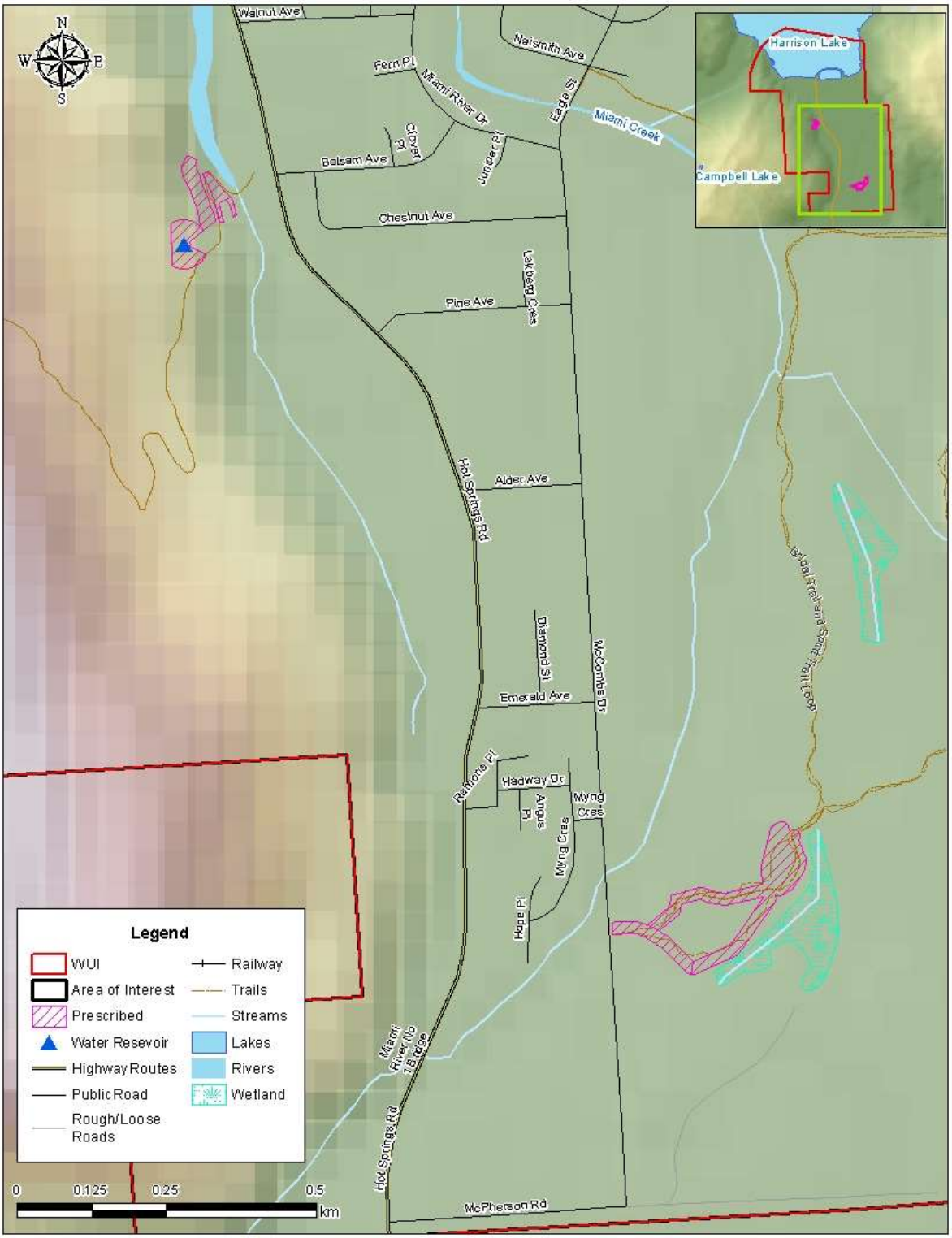
Analysis and Action Planning

The Village has developed fuel management prescriptions (site-level plans) for two Proposed Fuel Treatment Units (PTU) that were identified in the 2017 CWPP – one trailside treatment in East Sector and one treatment around the Village water reservoir. Both areas were identified as areas of concern by the WWG. Since the fire behavior threat in these areas is low to moderate overall (as assessed during CWRP development – see Section 4.4 and Appendix B: WUI Risk Assessment - Worksheets and Photos), and likelihood of successful fire suppression is accordingly high, treatments here would serve as a public demonstration of FireSmart vegetation management techniques, such as pruning and fine woody debris removal. Treatment implementation for the water reservoir is scheduled for fall 2024; Spirit Trail treatment is pending official approval from the Ministry of Forest and the Fraser Valley Regional District and is anticipated to occur in winter 2025. See Map 11 for all treatment unit locations.

It should be noted that assessment methods have evolved since 2017, and a better understanding of fire behaviour associated with specific fuel types has led to a recognition of multilayer conifer stands with a small deciduous component to have lower hazard ratings.[79] This means that the stands that were initially identified as moderate to high hazard are now recognized as lower hazard. See Section 4.1.3 - Fuel for further detail on fuel typing, and refer to Appendix B: WUI Risk Assessment - Worksheets and Photos for detailed descriptions of forested sites in the Village interface.

No other treatment units are being proposed at this time. Instead, FireSmart landscaping is recommended as the primary strategy for vegetation management to mitigate wildfire risk to the community.

[79] 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.*



Map 11. Proposed Treatment Units (PTU) that Harrison Hot Springs is in the process of implementing.

SECTION 6: FIRESMART ROADMAP AND CWRP ACTION PLAN

6.1 FIRESMART ROADMAP

The FireSmart Roadmap (see Figure 13 below and Appendix D: FireSmart Roadmap) is a concept that visually demonstrates how no two communities will follow the same path towards increased community wildfire resiliency, but that actions progress along four sequential phases. Some activities, including education, may appear in multiple phases but should reflect progression in terms of the community's understanding and adoption of FireSmart principles.[80]

1 – Engagement	*Building awareness and growing a local FireSmart program, including staff training and public education campaigns.*
2 – Initiative	*Taking action and implementing local FireSmart activities, such as FireSmart Assessments, a local rebate program, and building a Structural Protection Unit.*
3 – Integration	*Long term changes to support resiliency, focusing on development and collaboration.*
4 – Expansion	*Advanced community activities, such as fuel prescriptions and treatments and the Farm and Ranch Wildfire Preparedness program.*

Figure 13. Graphic representation of the FireSmart Roadmap concept.

Prior to the first phase, FireSmart BC recommends that three foundational elements are in place:

- A FireSmart Position
- A Community Wildfire Resiliency Plan
- A Community FireSmart Resiliency Committee (CFRC), or participation in one

Harrison Hot Springs has all three elements in place, and is progressing through the engagement, initiative, and integration phases of the Roadmap. Despite being a small municipality with limited capacity,

[80] Community Resiliency Investment. 2023. *FireSmart Community Funding and Supports Supplemental Instruction Guide.* Retrieved from: https://www.ubcm.ca/funding-programs/local-government-program-services/community-resiliency-investment/firesmart-0

Harrison Hot Springs has already engaged in the Integration phase despite having a relatively new FireSmart program. An overview of activities Harrison Hot Springs has completed and is ongoing under each phase, with comments and suggested next steps (included in the CWRP Action Plan) is summarized in Table 21.

Table 21. Summary of Harrison Hot Springs' progress along the FireSmart Roadmap.

FireSmart Roadmap Stage	Current Status	Community Response	Recommended Next Steps
1 – Engagement	-A Local FireSmart Representative (LFR) has been engaged since May 2024. -Harrison Hot Springs participates in the FVRD CFRC. -Harrison Hot Springs is actively delivering FireSmart education programming through print resources and in-person events.	Good public response.	Continue efforts and focus on intermix neighborhoods, leveraging existing community groups if possible.
2 – Initiative	-Free Home Partners Program assessments offered. -	Good public interest in assessments (32 residences & 2 strata developments completed), but little follow-up action based on recommendations has been taken.	-Initiate pursuit of Neighbourhood Recognition Program. -Remove barriers to FireSmart upgrades, such as offering a rebate program.
3 – Integration	-New Official Community Plan includes a Wildfire Development Permit Area (DPA).	N/A	Move FireSmart further into the community through the FireSmart BC Plant Program and Library program.
4 – Expansion	-Fuel Management Prescriptions have been developed for 2 Proposed Treatment Units (PTUs) identified by the 2017 CWPP.	n/a	Obtain funding to implement fuel management treatments.

Table 1 in the Executive Summary details the Action Plan for Harrison Hot Springs. Each Action Item is a prioritized recommendation supported with a rationale, suggested lead agency, expected timeframe, resources required (funding, staff capacity), and metric for success.

6.2 TRACKING, REPORTING, AND UPDATES

As Harrison Hot Springs works towards implementation of this plan, consider scheduling an annual review of progress made towards each action item/recommendation. Tracking and reporting will create accountability and also help with future funding applications. Consider reporting accomplishments and successes of the FireSmart program (for example, number of members trained, number of assessments completed) in a brief annual report that can be shared with the public, and serve to further FireSmart engagement.

Harrison Hot Springs should prepare for a five-year comprehensive review/update of the entire plan. A current CWRP (typically 5 years or less) is presently a requirement of the FCFS program. The update should review the entire plan and consider how risk has changed based on any recent wildfires, vegetation management works completed, significant changes to the built environment due to growth and development, economic changes, or other factors that would influence the overall success of the plan. This would also include a detailed analysis of all completed fuel management treatments within the planning area with an updated status and/or a maintenance plan.

APPENDICES

APPENDIX A: LOCAL WILDFIRE RISK PROCESS

Field Data Collection

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

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

1. Update fuel-typing using orthophotography 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 assess site-level threat ratings.
4. Threat assessment analysis using field data collected and rating results of WUI threat plots.

APPENDIX A-1: FUEL TYPING METHODOLOGY AND LIMITATIONS

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.[81] 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.[82] 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 WUI, fuel typing is not updated on private land, fuel types which cannot accurately capture the natural variability within a polygon, and limitations in the data used to create initial fuel types.[82]

There are several implications of the fuel typing limitations, which include: fuel typing further from the developed areas of the study generally has a lower confidence; and, fuel typing should be used as a

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

[82] 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.

starting point for more detailed assessments and as an indicator of overall wildfire risk, not as an operational, or site-level, assessment.

Table 22 summarizes the fuel types by general fire behaviour (crown fire and spotting potential). These fuel types were used to guide the wildfire threat analysis.

Table 22. 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, C-6, S-1, S-2, and S-3 are not summarized below).

Fuel Type	FBP / CFDDRS Description	Description	Wildfire Behaviour Under High Wildfire Danger Level	Fuel Type – Crown Fire / Spotting Potential
C-5	Red and white pine	Well-stocked mature forest, crowns separated from ground. Moderate understory herbs and shrubs; brushed and pruned younger stands	Moderate potential for active crown fire in wind-driven conditions. Under drought conditions, fuel consumption and fire intensity can be higher due to dead woody fuels	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	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
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

The resulting updated fuel types were shown on Map 5 in Section 4.1.3.

APPENDIX A-2: WILDFIRE THREAT SPATIAL ANALYSIS 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 (2 km 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
- Fuel Type

Local 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 23 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 23. Description of variables used in spatial analysis for WUI wildfire risk assessment.

WUI Threat Sheet Attribute	Used in Analysis?	Comment
Fuel Subcomponent		
Duff depth and Moisture Regime	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 continuity	No	
Vegetation Fuel Composition	No	
Fine Woody Debris Continuity	No	
	No	
Live and Dead Coniferous Crown Closure	No	
Live and Dead Conifer Crown Base height	No	
Live and Dead suppressed and Understory Conifers	No	
Forest health	No	
Continuous forest/slash cover within 2 km	No	
Weather Subcomponent		
BEC zone	Yes	Although included, these are broad classifications, meaning most polygons in the Study Area will have the same value
Historical weather fire occurrence	Yes	
Topography Subcomponent		
Aspect	Yes	
Slope	Yes	Elevation model was used to determine slope.

WUI Threat Sheet Attribute	Used in Analysis?	Comment
Terrain	No	
Landscape/ topographic limitations to wildfire spread	No	
Structural Subcomponent		
Position of structure/ community on slope	No	Too difficult to quantify – this is a relative value.
Type of development	No	Too difficult to analyze spatially.
Position of assessment area relative to values	Yes	Only distance to structures is used in this analysis, being above, below or sidehill too difficult to analyze spatially.

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 wildfire threat class. Table 24 below summarizes the components and scores to determine the Fire Threat.

Table 24. Fire Threat Class scoring components.

Attribute	Indicator	Score
Fuel Type	C-1	35
	C-2	
	C-3	
	C-4	
	M-3/4,>50% dead fir	
	C-6	25
	M-1/2, >75% conifer	20
	C-7	
	M-3/4, <50% dead fir	
	M-1/2, 50-75% conifer	15
	M-1/2, 25-50% conifer	10
	C-5	
	O-1a/b	
	S-1	
	S-2	
	S-3	
	M-1/2, <25% conifer	5
	D-1/2	0
	W	0
	N	0
Weather - BEC Zone	AT, irrigated	1
	CWH, CDF, MH	3
	ICH, SBS, ESSF	7
	IDF, MS, SBPS, CWHsds1 & ds2, BWBS, SWB	10

Attribute	Indicator	Score
	PP, BG	15
Historical Fire Occurrence Zone	G5, R1, R2, G6, V5, R9, V9, V3, R5, R8, V7	1
	G3, G8, R3, R4, V6, G1, G9, V8	5
	G7, C5, G4, C4, V1, C1, N6	8
	K1, K5, K3, C2, C3, N5, K6, N4, K7, N2	10
	N7, K4	15
Slope	<16	1
	16-29 (max N slopes)	5
	30-44	10
	45-54	12
	>55	15
Aspect (>15% slope)	North	0
	East	5
	<16% slope, all aspect	10
	West	12
	South	15

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 Wildfire 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. Structures are considered, but there is no consideration for structure type (also not included on threat assessment worksheet). This method uses the best available information to produce accurate and useable threat assessment across the study area in a format which is required by the UBCM CRI FCFS program.

APPENDIX A-3: WILDFIRE THREAT PLOT LOCATIONS

Table 25 displays a summary of all WUI threat plots completed during CWRP field work. The original WUI threat plot forms and photos will be submitted as a separate document. The following ratings are applied to applicable point ranges: Low (0-48); Moderate (49 – 66); High (67 – 80); Extreme (>80).

Table 25. Summary of WUI Threat Assessment Worksheets.

Wildfire Threat Assessment Plot ID	Geographic Location	Wildfire Behaviour Threat Class
Mount-1	East end of Echo Ave.	Low
East-1	East Sector East	Low
East-2	East Sector West End, McCombs	Low
Water Tower	Water Reservoir and Treatment Facility (Water Tower PTU)	Low

Wildfire Threat Assessment Plot ID	Geographic Location	Wildfire Behaviour Threat Class
Whip-1	Whippoorwill Point	Low

APPENDIX A-4: PROXIMITY OF FUEL TO THE COMMUNITY

The correlation between structure loss and wildfire are described below.

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).[83,84] Both the HIZ and CIIZ include the structure itself and three concentric, progressively wider Priority Zones out to 30 m from the structure (Figure 11). More details on priority zones can be found in the FireSmart Manual.[85]

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 in densities that can exceed 600 embers per square meter. Combustible materials found within the HIZ 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 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. Increasing ignition resistance would reduce the number of homes simultaneously on fire; extreme wildfire conditions do not necessarily result in WUI fire disasters.[86] 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.

[83] 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. Retrieved from: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States | Treesearch (usda.gov)

[84] Cohen, J. 2000. *Preventing Disaster Home Ignitability in the Wildland-urban Interface.* Journal of Forestry. p 15 - 21. Retrieved from: https://doi.org/10.1093/jof/98.3.15

[85] Available for download here: FireSmartBC_HomeownersManual_Printable.pdf

[86] 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. Retrieved from: How risk management can prevent future wildfire disasters in the wildland-urban interface (nih.gov)

Table 26. Proximity to the Interface.

Proximity to the Interface	Descriptor*	Explanation
WUI 100 *HIZ/CIIZ and Community Zones*	(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.
WUI 500 *Community and Landscape Zones*	(100-500 m)	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.
WUI 1000 *Landscape Zone*	(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.
Landscape Zone	> 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.*

APPENDIX B: WUI RISK ASSESSMENT - WORKSHEETS AND PHOTOS

Provided separately as PDF package.

APPENDIX C: MAPS

Provided separately as PDF package.

APPENDIX D: FIRESMART ROADMAP

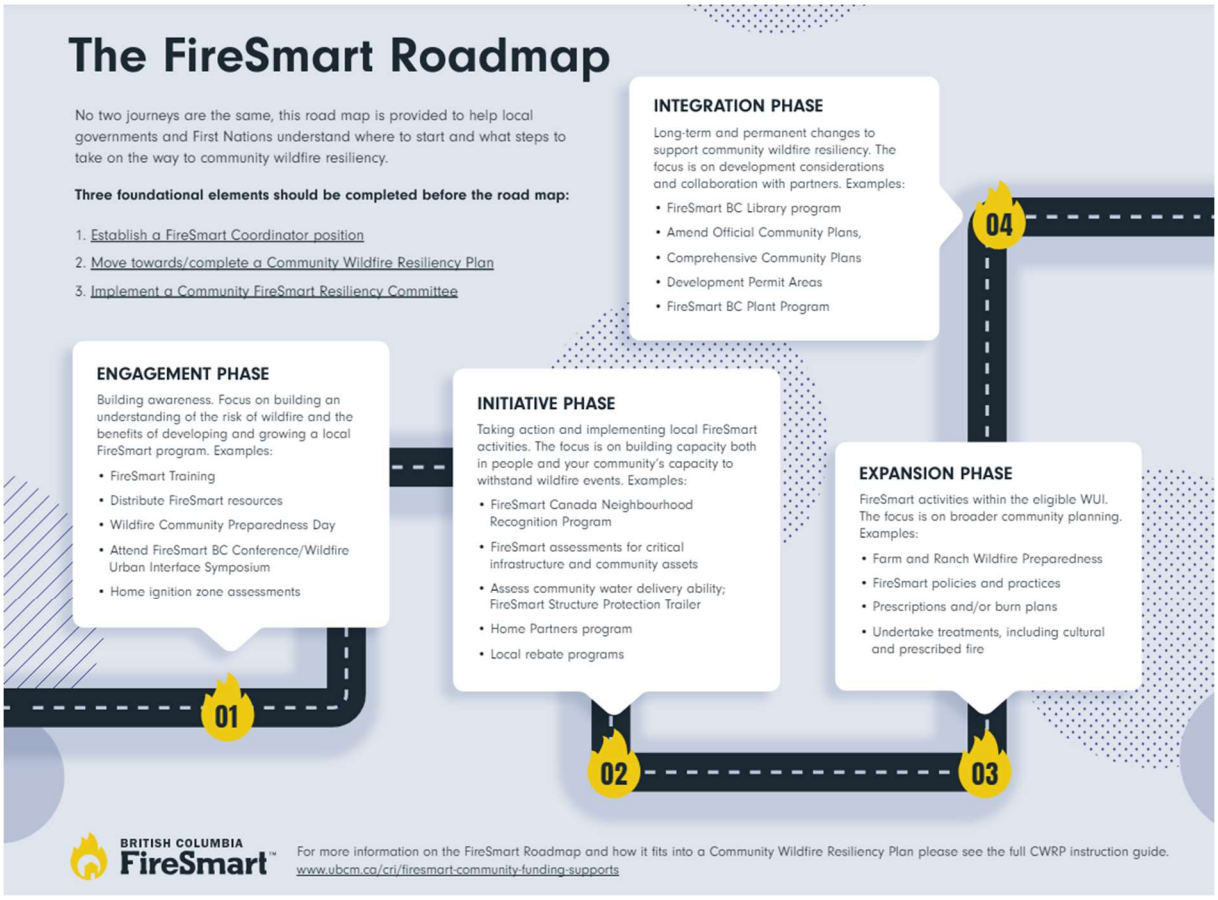


Figure 14. The FireSmart Roadmap is a new focus of community wildfire planning in BC.