COMMUNITY WILDFIRE RESILIENCY PLAN

Village of Radium Hot Springs

August 7, 2023

VILLAGE OF radium hot springs

Nupqu LIMITED PARTNERSHIP

Signature Page

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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.	FOREST PROFESSIONAL SEAL 

1 Contents

Tables and Figures

Acknowledgments

We acknowledge with respect that the land on which this plan takes place, is the traditional unceded territories of the Ktunaxa and Shuswap Nations. Funding for this plan was provided by the Community Resiliency Investment program of British Columbia.

Frequently Used Acronyms

AOI	Area of Interest
BC	British Columbia
BCWS	British Columbia Wildfire Service
BEC	Biogeoclimatic Ecosystem Classification
CFFDRS	Canadian Forest Fire Danger Rating System
CI	Critical infrastructure
CIFFC	Canadian Interagency Forest Fire Centre
CRI	Community Resiliency Investment
CWRP	Community Wildfire Resiliency Plan
EMBC	Emergency Management British Columbia
EKFP	East Kootenay FireSmart Program
FBP	Fire Behavior Prediction System
FESBC	Forest Enhancement Society of British Columbia
FSCCRP	FireSmart Canada Community Recognition Program
FCNRP	FireSmart Canada Neighbourhood Recognition Program
FNESS	First Nations Emergency Services Society
HIZ	Home Ignition Zone (also see Structure Ignition Zone)
IFPO	Interface Fire Protection Officer
LRMP	Land and Resource Management Plan
MOF	Ministry of Forests (used to be called Ministry of Forests, Lands, Natural Resource Operations and Rural Development)
MOTI	Ministry of Transportation and Infrastructure
PSOE	Provincial State of Emergency
PSTA	Provincial Strategic Threat Assessment
OCP	Official Community Plan
RDEK	Regional District of East Kootenay
SOLE	State of Local Emergency
SWPI	Strategic Wildfire Prevention Initiative
UBCM	Union of British Columbia Municipalities
WRR	Wildfire Risk Reduction
WUI	Wildland Urban Interface

1 Introduction

1.1 Overview

The Village of Radium Hot Springs has a distinct atmosphere of a mountain village with a range in its demographic composition, businesses, and housing that can support both a year-round population and recreational property owners. Through its geography and culture, the Village is connected to the environment for local employment, scenery, and tourism. Habitat suitable for wildlife occurs around and within the municipality, from Bighorn Sheep on the mountain, down to the sensitive Columbia River wetlands. This habitat is possible through the native forests, grasslands, and wetlands of the Rocky Mountain Trench. The sought after natural environment that the Village offers to its residents and visitors comes with the risk of wildfire.

With a changing climate, British Columbia has had repeated record setting wildfire seasons since 2003. The unprecedented interface fires of 2003 triggered a provincial review of the disasters and produced the Firestorm 2003 report (Filmon, 2004). One recommendation of this report was the development of strategic plans which would become known as Community Wildfire Protection Plans (CWPP). Since 2004, there have been increases in heat, drought, lightning, and diseased forests across the province. These factors contributed to the 2017 wildfire season setting provincial records on the amount of land burned (1.2 million hectares) total fire suppression cost (over $649 million), and the amount of peopled evacuated (around 65,000) (BC Wildfire Service, 2023). The provincial area burned record was surpassed the following year in 2018 at over 1.35 million hectares. There was widespread impact across the province due to record breaking July temperatures and severe lightning storms. A Provincial State of Emergency was in place for 23 days. 2021 presented another challenging wildfire season due to competing resource requests across western North America, the historical "Heat Dome" with record-breaking temperatures, and an ongoing COVID-19 pandemic. The provincial state of emergency was in effect for 56 days in 2021 (BC Wildfire Service, 2023). This "new normal" of extreme weather put people's homes, communities, and lives at risk.

The Village's leadership took the initiative to produce its first CWPP in 2008 (Burford & Read, 2008). That plan identified the wildfire risk and steps to mitigate the risk at that time. Successfully implemented recommendations include fuel management prescriptions and treatment being completed along the Old Coach Trail, municipal water supply on Forster Road, and parts of north facing slopes on Sinclair Creek using funding from the Strategic Wildfire Prevention Initiative program. The Village of Radium Hot Springs has a Local FireSmart Representative (LFR) on staff that has started spreading the awareness around FireSmart to residents. Fuel management including regular grass mowing and dead material removal is occurring on the municipal properties such as the trails by RiverStone Villas.

A Community Wildfire Resiliency Plan (CWRP) is the next generation of Community Wildfire Protection Plan. This comprehensive plan examines all aspects of the Village's wildfire resiliency based on the seven FireSmart principles: Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Cross-Training, Emergency Planning, and Vegetation Management. Each one of these disciplines will be described, analyzed with consideration of the Village's current situation, and recommendations listed. When these disciplines are implemented through this CWRP, a holistic, science-based approach will address the wildfire risk at all scales

right from the individual home to neighbourhoods to the community. Resiliency is increased specifically through decreased likelihood, frequency, severity, and impact of a wildfire.

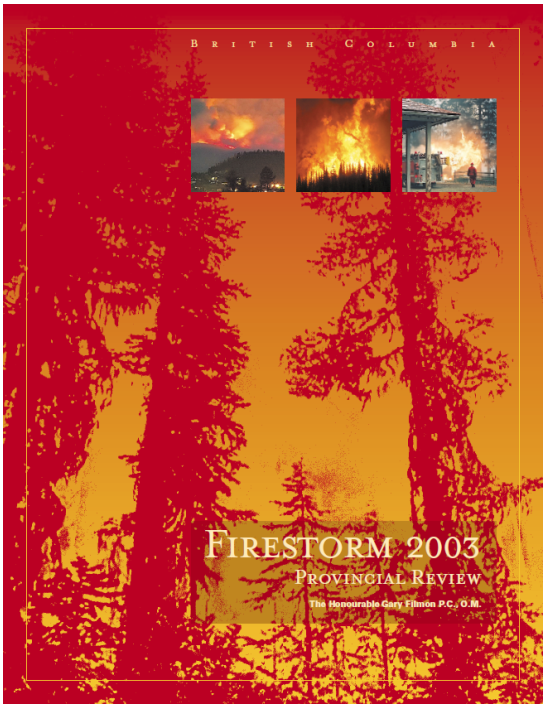

Figure 1: (Filmon, 2004)

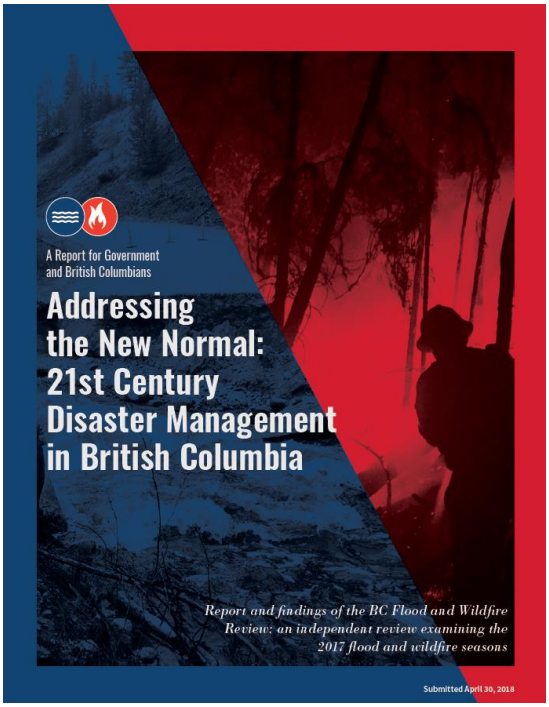

Figure 2: (Abbott & Chapman, 2018)

1.2 Plan Goals

The goals of this Community Wildfire Resiliency Plan include:

- Informing Village of Radium Hot Springs staff, elected officials, contractors and residents of the wildfire risk that exists within the community and Wildland Urban Interface (WUI).
- Set out achievable, measurable recommendations to increase the resiliency of the community against wildfire events within the WUI.
- Provide a strategic level plan that will have to be implemented over five to ten years and can serve as a periodic reference.
- Provide a link to and compliment Village emergency management, bylaws, development, community plans, grant opportunities, an on-the-ground projects.
- Manage areas that are at high or moderate risk to wildfire within the Area of Interest (AOI) by analysing the wildfire threat and prioritize areas that would benefit from wildfire risk reduction treatment.

1.3 Plan Development Summary

As funding for this CWRP was provided by the Community Wildfire Resiliency Program (CRI), the development of this plan was completed using the template and guidance provided by the CRI (Union of BC

Municipalities, 2021). The Association of BC Forest Professional's standards and practice guidelines were used to develop this CWRP as well.

1.3.1 Methodology

Various reports and documents were reviewed to help produce this CWRP. See Section 14 References for a complete list. For the Wildfire Risk Assessment, the 2021 Provincial Strategic Threat Analysis (PSTA) was provided by the Ministry of Forests (MOF) and served as the basis for determining the Wildfire Threat. This layer was verified or updated and data gaps such as those on private land were filled through ground truthing. *Determining Wildfire Threat and Risk at a Local Level,* its accompanying Crosswalk of PSTA Scoring, and the *2020 Wildfire Threat Assessment Guide and Worksheets* (BC Ministry of Forests, 2023) were used to update the PSTA polygons.

2 Relationship to Other Plans

The Village of Radium Hot Springs has developed and implemented internal plans that have influenced its wildfire resiliency to date due to the community being located in a fire dependant ecosystem.

Table 2-1. KEY PLANS AND RELATIONSHIP TO CWRP

Plan Type	Description	Relationship to CWRP	Additional Information
Village of Radium Hot Springs Official Community Plan (OCP) (Village of Radium Hot Springs, 2013)	An Official Community Plan is a bylaw that states the goals, policies and strategies used to guide planning decisions and land use management. This OCP outlines the community's planning principles that were derived from community input received through a comprehensive community survey and through meetings with resident and business stakeholders. The principles that have been established are intended to reflect the long-term vision of the community.	Section 4.6 speaks to wildfire. Strategy: Raise awareness of wildfire hazards and identify high risk areas needing mitigation. Collaborate with the Ministry of Forests, Kootenay National Park and the RDEK to reduce the risks of wildfire on adjacent lands, especially with respect to municipal infrastructure located on crown land. Support local and regional initiatives to restore fire-maintained ecosystems. Develop standards and bylaws to require mitigation to an acceptable standard on all private lands.	Policies: 1. The wildland interface areas that pose the greatest risk to the community are identified. 2. Endeavor to minimize the risk of wildfire in the wildfire interface on both municipal and private lands. 3. Use recognized standards in the assessment of wildfire hazards (currently 'FireSmart' standards based on NFPA documentation). 4. The risk or potential for wildfire shall be considered prior to decisions being made regarding land use allocation, subdivision or development. 5. Prohibit the use of wood shakes as a roofing material and limit the use of fire-retardant treated wood shingles as a siding material other than in areas with a low fire hazard as identified. 6. Develop standards and bylaws to ensure that interface areas will be maintained. 7. Require that access points suitable for evacuation and the movement of emergency response equipment are provided. The number of access points and their capacity should be determined during subdivision design in consultation with the Fire Chief and Approving Officer. 8. Require that fire hazards on forested lands be mitigated to a level deemed acceptable by a qualified professional in a forest fire hazard assessment as a condition of development. 9. Require development to be set back a minimum of 10 metres from the top of ridgelines, cliffs or ravines. Variation of the setback may be considered if a wildfire review can justify a change in the setback.

Table 2-1. KEY PLANS AND RELATIONSHIP TO CWRP			
Plan Type	**Description**	**Relationship to CWRP**	**Additional Information**
Emergency Management Plan	Radium is part of the Regional District of East Kootenay's Emergency Management Plan. This plan is initiated during major emergencies such as fire, floods, and hazardous materials spills.	See Chapter 11 Emergency Planning.	The Village is in the process of updating its Emergency Management Plan.
Housing Needs Report	Local governments are required to collect data, analyze trends, and present a housing needs report under the Government Act.	Provides demographics and current housing description	(Urban Matters CCC, 2022)
Neighbouring CWPP or CWRP	Municipalities and First Nations have developed their own CWPPs or CWRPs for the lands they administer and adjacent provincial crown land.	Potential for overlap with neighbouring CWPPs. Similar recommendations call for urgency.	RDEK CWRP 2023 Shuswap Band CWPP
Bylaws			

3 Community Description

Many homes in the Village have seasonal residents. About 46% of homes are occupied year-round (Urban Matters CCC, 2022). The absent homeowners create unique challenges for the Village of Radium Hot Springs when it comes to engaging homeowners and convincing absent homeowners to implement mitigation actions on their at-risk residence. The Village also has an aging population with its attractive retirement setting. 46% of residents were over 55 in 2016, compared to 36% across the East Kootenay region. Tourism, forestry, and mining are the top industries in the village and the surrounding area (Urban Matters CCC, 2022). The Village's top industries are vulnerable to disturbances by wildfire events and local smoke. Disruptions to traffic, air quality, scenery, and timber supply will hurt the local businesses.

3.1 Area of Interest

Embers from a wildfire can travel great distances and ignite new "spot" fires further downwind. The distance that embers can travel has varied greatly and 2km is an accepted distance to manage for (Bénichou, et al., 2021). Embers can spread over the lakes and rivers. The vulnerability of homes to traveling embers means that homes even in urban or highly developed areas are susceptible to ignition.

The municipal boundary of the Village was buffered by 2000m to generate the AOI. The municipal boundary covers 652 hectares and the entire AOI covers 4256 hectares. This AOI closely matches the provincial Wildfire Risk Class analysis. The structure density within British Columbia was analysed to identify buildings that are within the Wildland Urban Interface (WUI) for the purposes of wildfire and risk management planning. A two-kilometer buffer was applied to areas that have more than six structures per square kilometer. Since it is important to consider how much private land is present in the WUI when completing a risk analysis, the buffer zone of the PSTA was expanded to 2.75 kilometres for areas with a density of more than 25 structures per square kilometer. (BC Wildfire Service, 2022).

3.2 Wildland-Urban Interface

The Wildland Urban Interface occurs where various structures (commonly private homes) and other human developments meet or are intermingled with the forest and other vegetative fuel types (Ministry of Forests and Range, 2008). For the Provincial Strategic Threat Analysis (PSTA), the WUI is the area within 2.75 kilometres of a community with a minimum density of six structures per square kilometre (determined by a GIS spatial analysis). The WUI also contains most of the critical infrastructure. Having a wildfire occur within the WUI could have extreme consequences to human life and property - both tangible and intangible.

Figure 3: Example of Interface WUI in Radium Hot Springs where forest fuels meet urban fuels at an abrupt line.

Figure 4: Example of intermix WUI in Radium Hot Springs where forest fuels are scattered amongst urban development.

4 Wildfire Risk Assessment

4.1 Wildfire history

Figure 5:The Village of Radium Hot Spring is located in the Southeast Fire Centre. Specifically, the Invermere Fire Zone.

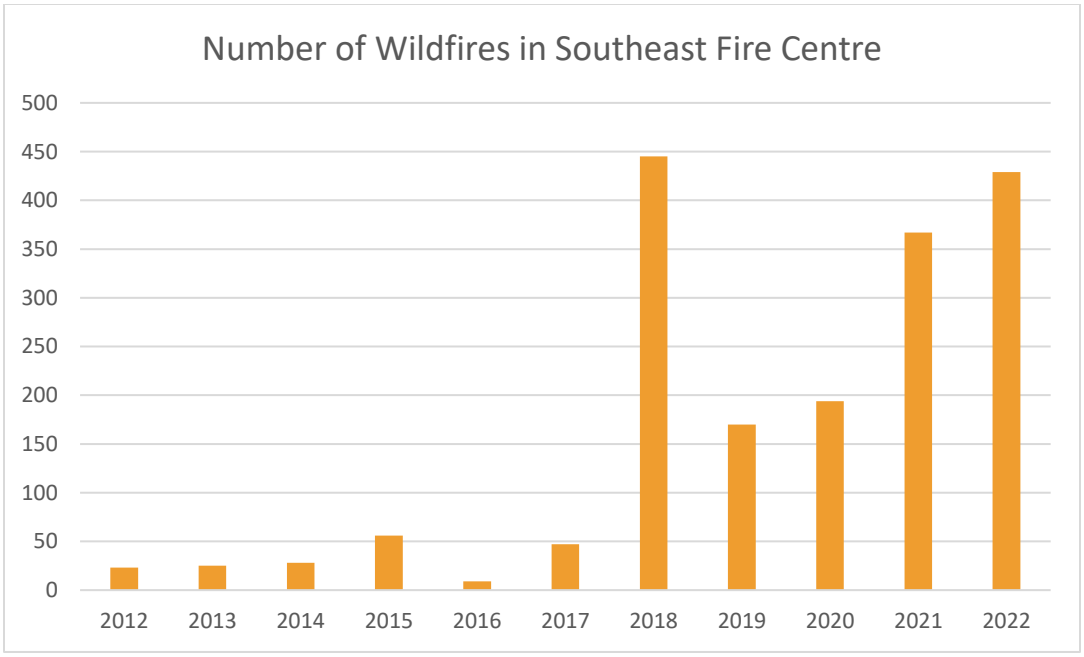

Figure 6: Total number of wildfires in the Southeast Fire Centre in recent past. Only fires >5ha are recorded after 2015.

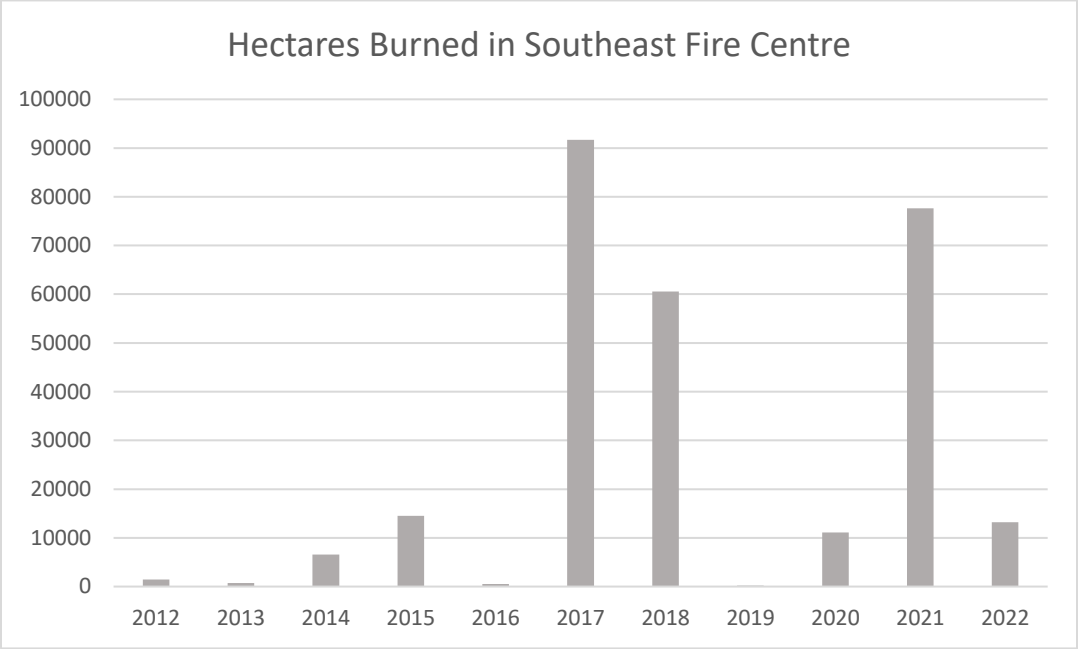

Figure 7: Hectares burned by Wildfire in the Southeast Fire Centre in recent past. Only fires >5ha are recorded after 2015. (BC Wildfire Service, 2023)

4.2 Wildfire Behaviour

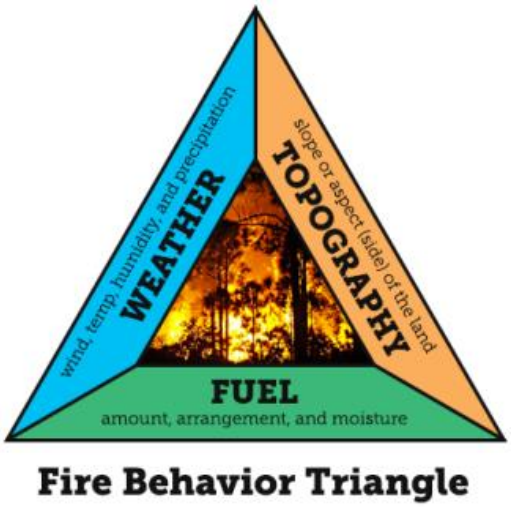

Figure 8: Fire Behaviour Triangle (https://learn.weatherstem.com/modules/learn/lessons/121/12.html)

Wildfire behaviour is the way which fuel ignites, flames develop, and fire spreads (Ministry of Forests and Range, 2008). Weather, topography, and fuel are the three components of the "wildfire behaviour triangle" that influence how a fire acts. Of these three, fuel is most easily influenced by wildfire management. Fuel management is the modification of the vegetation and biomass of a forest or range to reduce the fuel available to burn should a fire occur. A fire with less fuel will burn less intensely and can be controlled more easily. A main objective of

operational fuel treatments is fuel reduction following the principles shown in Table 4-1, in order to gain the desired effect. This focus on fuel is a major component of wildfire management, which calls for an inventory of the types and distribution of fuels on the landscape.

Table 4-1: Principles of fire resistance for dry forests (Agee & Skinner, 2005).

Principle	Effect	Advantage	Concerns
Reduce surface fuels	Reduces potential flame length	Control easier; less torching[a]	Surface disturbance is less with fire than other techniques
Increase height to live crown	Requires longer flame length to begin torching	Less torching	Opens understory; may allow surface wind to increase
Decrease crown density	Makes tree-to-tree crown fire less probable	Reduces crown fire potential	Surface wind may increase, and surface fuels may be drier
Keep big trees of resistant species	Less tree mortality for same fire intensity	Generally, restores historic structure	Less economical; may keep trees at risk of insect attack.

[a] Torching is the initiation of crown fire.

Wildfire is the natural disturbance agent in the Interior Douglas-fir (IDF) and Montane Spruce (MS) biogeoclimatic zones found within the AOI. The natural fire interval ranges from about four to fifty years in the IDF and typically have a stand maintaining fire severity where individual trees survive the low intensity fire. The MS fire return interval is fifteen to seventy-five years of mixed severity burning. The mixed severity burns can cause patches of stand replacing burn severity, low intensity stand maintain areas, and even patches where fire skipped over, allowing that patch to grow closer to an old growth structure. These wildfires were historically started by periodic lightning fires and the Ktunaxa as a cultural practice. These typically low intensity fires can be classified as ground fires with minor candling. This fire behavior resulted in the consumption of woody surface fuels, the survival of mature trees, and revitalization of the grass and shrub communities. This fire behaviour also thinned younger stands, limited the encroachment of trees onto grasslands, and reduced ladder fuels (Rocky Mountain Resource District, 2016).

A century of fire suppression has altered the fire regime of the Rocky Mountain Trench and the effects of this are common within the AOI. Stands now regenerate at densities that are unnaturally high and these stands are currently between 95 to 120 years old. This history and the irregularity of wildfire have created a mosaic of stands and grasslands with varying structure. As a result, the wildfire severity varies as well. A whole range of wildfire behaviour is possible, from low-intensity surface fires to large stand-replacing fires (Hall, 2010).

4.2.1 Fuel Types

The physical characteristics of combustible fuels on the landscape are a major influence on fire behaviour. Fuels can vary in many ways, such as arrangement, load, diameter, species, moisture content, and level of decay. The 2015 Provincial Strategic Threat Analysis (PSTA) fuel types were used as a foundation for the fuel types within the AOI. The accuracy of its output, being a spatial model is dependent on its datasets and assumptions. The PSTA Wildfire Threat Analysis was conducted at a small (coarse) scale, so users need to confirm that the initial wildfire-threat rating assigned to a given area is accurate by having a qualified professional validate that rating at the forest stand level. Fuel types can also change over time. Activities that can change a fuel type include: harvesting, ecosystem restoration, new construction, forest encroachment, or correcting the PSTA model's output through ground truthing.

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Village of Radium 2023 CWRP Canadian Forest Fire Behaviour Prediction Fuel Types

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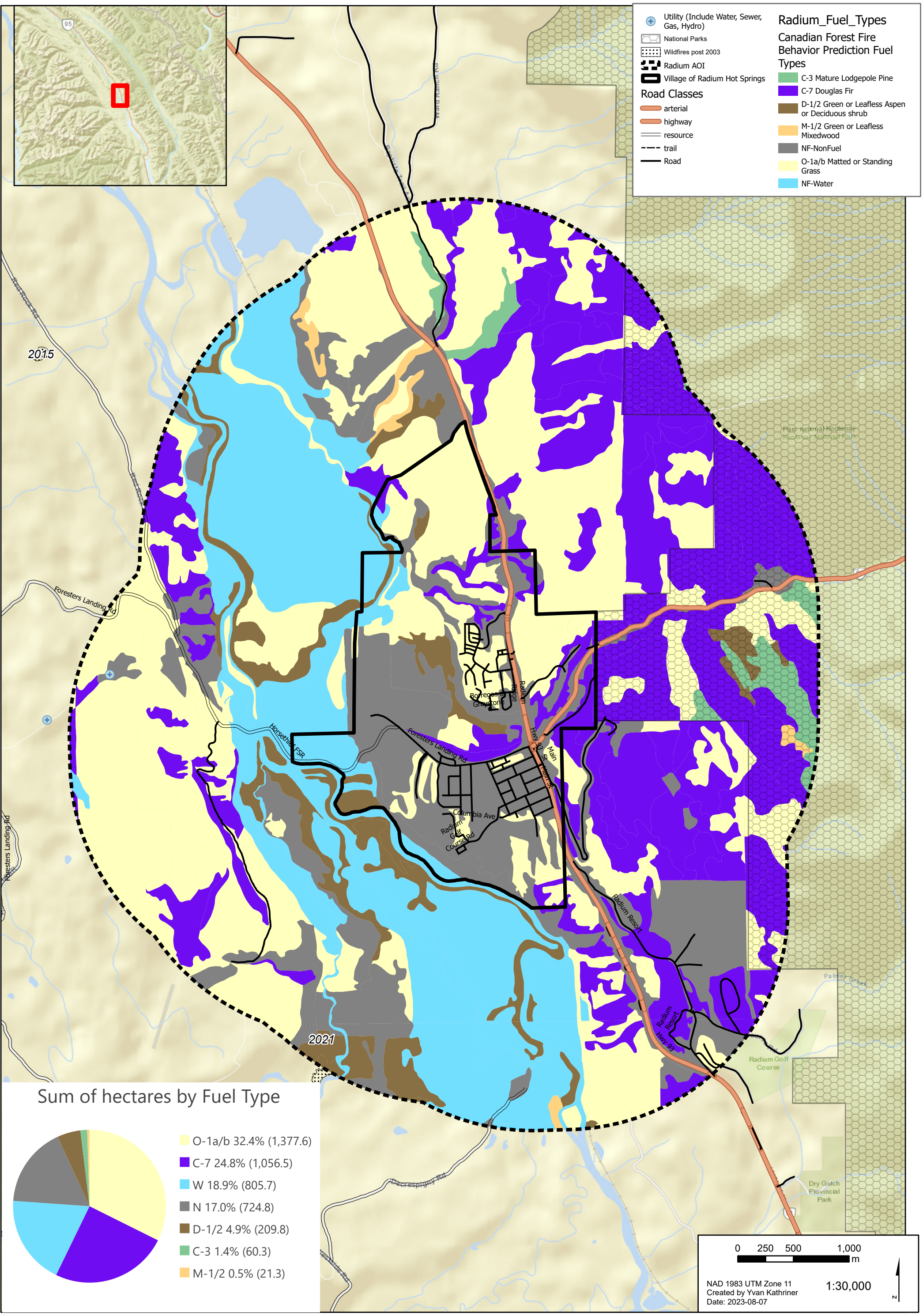

The following are the top two fuel types that occur within the AOI of this CWRP as described by the Canadian Wildland Fire Information System (De Groot, 2016); more information can be found at http://cwfis.cfs.nrcan.gc.ca/background. These fuel types are used across Canada as part of a wildfire behaviour model to help classify and manage wildfires. The third most abundant fuel type is water, including wetlands. This creates a great defensive perimeter along the Columbia Wetlands. ≈

4.2.2 C7 - Ponderosa Pine–Douglas-Fir

This fuel type is characterized by uneven-aged stands of Douglas-fir in various proportions. Stands are open, with occasional thickets of multi-aged Douglas-fir as a discontinuous understory. Canopy closure is generally less than 50%, although thickets are closed and often dense. Woody surface fuel accumulations are light and scattered. Except within Douglas-fir thickets, the forest floor is dominated by perennial grasses, herbs, and scattered shrubs. Within tree thickets, needle litter is the predominant surface fuel. Duff layers are nonexistent to shallow (<3 cm). While Ponderosa Pine and Western Larch are rare within the AOI, the name of this fuel type is part of a widely used system and includes the term Ponderosa Pine.

Figure 10: Unmanaged C7 Fuel type in the AOI. (Yvan Kathriner 2023)

4.2.3 O1 a/b - Grass matted/standing dead.

This fuel type is characterized by continuous grass cover, with no more than occasional trees or shrub clumps that do not appreciably affect fire behavior. Two subtype designations are available for grasslands: one for the matted grass condition common after snowmelt or in the spring (O1-a) and the other for standing dead grass common in late summer to early fall (O1-b). The proportion of cured or dead material in grasslands has a pronounced effect on fire spread there.

Figure 11: O1 fuel type in the AOI. (Yvan Kathriner 2023)

4.3 Provincial Strategic Threat Analysis

The **probability** of a crown fire is represented by the wildfire behaviour threat class. See Table 4-2: Fire Behaviour Threat Classes for a description of each class.

Table 4-2: Fire Behaviour Threat Classes (Strategic Wildfire Prevention Initiative, 2015)

FIRE BEHAVIOUR THREAT CLASS	DESCRIPTION
Very Low	These are lakes and water bodies that do not have any forest or grassland fuels. These areas cannot pose a wildfire threat and are not assessed.
Low	This is developed and undeveloped land that will not support significant wildfire spread. Homes are still vulnerable to structure-to-structure ignition and ember storms.
Moderate	This is developed and undeveloped land that will support surface fires only. Homes and structures could be threatened.
High	Landscapes or stands that: -are forested with continuous surface fuels that will support regular candling, intermittent crown and/or continuous crown fires; -often include steeper slopes, rough or broken terrain with generally southerly and/or westerly aspects; -can include a high incidence of dead and downed conifers; -are areas where fuel modification does not meet an established standard.
Extreme	Consists of forested land with continuous surface fuels that will support intermittent or continuous crown fires. Polygons may also consist of continuous surface and coniferous crown fuels. The area is often one of steep slopes, difficult terrain, and usually a southerly or westerly aspect.

The Provincial Strategic Threat Analysis (PSTA) is a model that spatially displays the wildfire behaviour threat class across British Columbia and was completed first in 2015 (BC Wildfire Service, 2015). The PSTA was designed to aid land managers such as those with the BC Wildfire Service. This CWRP uses the PSTA to plan for and mitigate the impacts of a catastrophic wildfire by identifying areas that have a moderate, high or extreme wildfire threat rating. The broad scale PSTA model is a Geographic Information System (GIS) layer created by combining three key fire behaviour variables:

- **Fire density** - historic fire perimeters and fire start densities since 1950.
- **Headfire intensity** - the energy output of the flaming front of a wildfire, measured in kilowatts per metre (kW/m). Headfire intensity is related to fire spread rate and fuel consumption at the leading edge of a wildfire and has been previously correlated to both fire suppression effort and danger to fire suppression personnel.
- **Spotting impact** - The physical movement of embers from a fire's flaming front to areas outside of the fire perimeter. Spotting is most often associated with high intensity crown fires burning in conifer fuels, and in extreme conditions, spot fires have been detected several kilometres downwind from fire perimeters. The main sources of embers are needles, bark flakes and small branches (BC Wildfire Service, 2015).

The fuel type inventory was used as a component of the headfire intensity and spotting impact. These variables were weighted and combined to produce the wildfire behaviour threat classes across the province (BC Wildfire Service, 2015).

4.3.1 Risk Analysis

Risk is often defined as "**probability** x **consequence** = **risk**" (Kewski, 2016). By using the PSTA as the probability of a catastrophic wildfire occurring and overlaying the WUI to show where the highest consequences because of a wildfire can occur, the areas at highest **risk** to wildfire can be located. Once the areas with the highest risk are known, plans can be made to mitigate the risk, prepare residents and local governments. Fuel reduction treatments have been proposed in the areas at highest risk to wildfire within the AOI.

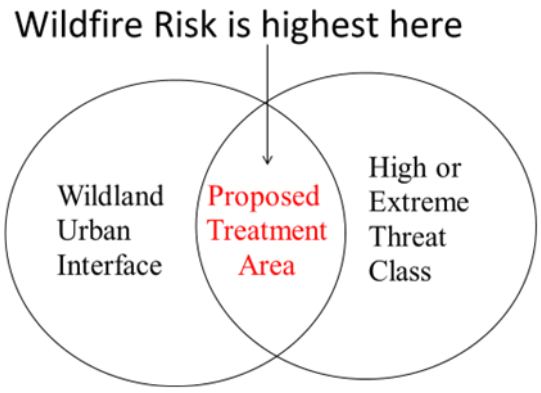

Figure 12: Representation of the Wildfire Risk Assessment.

The 2021 WUI Risk Class Assessment was used to identify the most at-risk areas within the AOI. Revisions for this data set includes the 2021 PSTA updates and the 2020 WUI structure density mapping. A two-kilometer buffer was applied to areas that have more than six structures per square kilometer. Since it is important to consider how

much private land is present in the WUI when completing a risk analysis, the buffer zone was expanded to 2.75 kilometres for areas with a density of more than 25 structures per square kilometer. These areas with more than 25 structures per square kilometer were merged, named, and analysed for their Risk Class. Areas less than 25 structures per square kilometer were not analysed. Annual changes incorporated include recent wildfires, harvesting, fuel treatments, development, updated vegetation resource inventory, and changes to fire weather inputs (BC Wildfire Service, 2022). A Risk Class 1 represents the most at-risk communities and a Risk Class of 5 represents the lowest. The Village of Radium is ranked Risk Class 1; this demonstrates the high level of wildfire preparedness and risk reduction required by residents, homeowners, industries, and government. Identifying the wildfire risk class offers a tool to prioritize mitigation and investment. A question often asked by funding providers is "what is the risk level of a community requesting funding investment?" Initiatives and projects with the answer of Risk Class 1 will be ranked higher provincially during competitive funding applications.

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Village of Radium 2023 CWRP Provincial Risk Class

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Risk Class:1

Risk Class:1

- Utility (Include Water, Sewer, Gas, Hydro)
- National Parks
- Fire Department Protection Zone
- FireSmart Community Funding and Supports
- Wildland urban interface risk class
- WUI (6to25 Structures)
- WUI Risk Class (25+ Structures)
- Radium AOI
- Village of Radium Hot Springs
- arterial
- highway
- resource
- Road

Foresters Landing Rd
Horsethief FSR
Foresters Landing Rd
Columbia Ave
Radium Golf Course Rd
Radium Ridge
Radium Resort
Hwy 93
Radium Resort
Hwy 93
South Red Rock Rd
Canmore
95
93

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Village of Radium 2023 CWRP Wildfire Threat

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FIRE BEHAVIOUR THREAT CLASS	DESCRIPTION
Very Low	These are lakes and water bodies that do not have any forest or grassland fuels. These areas cannot pose a wildfire threat and are not assessed.
Low	This is developed and undeveloped land that will not support significant wildfire spread. Homes are still vulnerable to structure to structure ignition and ember storms.
Moderate	This is developed and undeveloped land that will support surface fires only. Homes and structures could be threatened.
High	Landscapes or stands that: -are forested with continuous surface fuels that will support regular candling, intermittent crown and/or continuous crown fires; -often include steeper slopes, rough or broken terrain with generally southerly and/or westerly aspects; -can include a high incidence of dead and downed conifers; -are areas where fuel modification does not meet an established standard.
Extreme	Consists of forested land with continuous surface fuels that will support intermittent or continuous crown fires. Polygons may also consist of continuous surface and coniferous crown fuels. The area is often one of steep slopes, difficult terrain, and usually a southerly or westerly aspect.

- Utility (Include Water, Sewer, Gas, Hydro)
- National Parks
- Village_of_Radium_Municipal_boundary
- Fuel Treatment Under SWPI or CRI
- RESULTS Wildfire Projects activities
- Indian Reserves
- Wildfires post 2003

PSTA Fire Threat Rating

- Water
- Low
- Moderate
- High
- Extreme

Road Class

- arterial
- highway
- resource
- service
- trail
- Road

2015

2021

Foresters Landing Rd

Horsethief FSR

Foresters Landing Rd

Foresters Landing Rd

Radium Ridge

Borregos at Greystone

Hwy 93 St

Main St

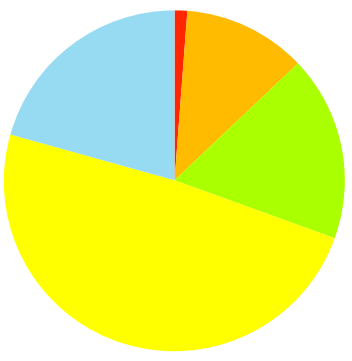
Columbia Ave

Radium Golf Course Rd

Radium Resort

Radium Resort Hwy 93

Area by Fire Threat Class (ha)



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5 Vegetation Management

5.1 Review of 2007 Community Wildfire Protection Plan Vegetation Management.

The 2008 CWPP called for the management of Priority Identified Treatment Areas on crown land. Sites were named R7 & R8. Fuel reduction project have happened around the Old Coach Trail, Sinclair Creek, and the water supply building. All three projects are in need of maintenance treatments. The treatment standards at the time of their implementation would not meet today's targets of 90th percentile Forest Fire Weather Index values set as the targets for wildfire intensity. The Old Coach Trails saw debris being chipped and spread on site, which is no longer an acceptable method for debris management for wildfire risk reduction objectives. Agencies are continuing to conduct research on the efficacy of chipping as a management tool. This shows the progress that is being made by many agencies to protect communities.

Figure 13: Chipping treatment along the Old Coach Trail. Treatment was not contiguous and fuel modification was not intense enough to meet today's heightened standards. An example of a stand requiring maintenance to reduce the wildfire risk to the Village.

5.2 Stocking

Stocking standards describe certain criteria for the trees that exist in a stand after harvesting or treatment for that stand to regenerate. In order to meet wildfire management objectives, these stocking standards must create and maintain the stand in a way often different from those of a commercial timber producing stand. Forest Stewardship Plan (FSP) stocking standards are to be followed when operating with an organization that has an approved FSP. If deviation from the FSP stocking standards is needed to meet wildfire management objectives,

the Fire Management Stocking Standards Guidance Document should be used to develop fire management stocking standards and include a rationale for the deviation (Nicholls & Turner, 2016).

5.3 Forest Health

Extreme weather and climate change stresses established vegetation. The rocky mountain trench has had drought during several of the past growing seasons. Drought affects trees of all ages sometimes to the point where the tree dies. Stressed trees are more susceptible to attack by other forest pathogens such as bark beetles and root disease. These dead and dying trees create an increased fire hazard on properties and within stands. It is recommended that dead and dying trees within 30m of structures are removed and debris cleaned up by an arborist.

5.4 Landscape Level Fuel Breaks

Once the highest risk areas within the WUI are mitigated, landscape level wildfire protection is the next consideration. Due to the large area and the multi-use of forests and grasslands within the Rocky Mountain Trench, it is unrealistic to treat the entire landscape. By identifying strategic fuel breaks across the landscape, it breaks up continuous fuels while reducing the cost of landscape protection and reducing conflicting land management.

A Primary Fuel Break is a naturally or already developed fuel break located in an ideal location to fight wildfires from. These include power lines, pipelines, highways, Forest Service Roads, major rivers, core grassland areas, burned areas, etc. (Rocky Mountain Resource District, 2016). Fuel breaks are most efficient when they are continuous (Moriarty, Okeson, & Pellant, 2015). In order to create continuous fuel breaks, Primary Fuel Breaks are linked up with Landscape Level Fuel Breaks (LLFBs).

LLFBs are treated areas, such as commercial timber harvests, ecosystem restoration projects, and fuel reduction projects. Since LLFBs should provide quick, safer access to defensive positions, they should be linked with road systems. Preferably, LLFBs are located along ridge tops to reduce fire intensity at the end of an uphill run. LLFBs without an associated road system, such as those located along strategic ridgelines, are still useful in fire suppression. When in proximity to critical infrastructure, they can also be effective when established at the base of slopes. Mid-slope LLFBs are least desirable, but under certain circumstances and with improvements can be effective (Bennet et al, 2010). LLFBs will not stop fires on their own, but they will improve the chance that suppression efforts can contain a wildfire.

LLFB widths depend on the fuel type, fuel loading, and terrain slope. While a wider fuel break is always better, they should be a minimum of 60m wide (Bennet et al, 2010). As the percent slope increases, the total LLFB width should increase as well. Widening Primary Fuel Break and LLFBs will increase the distance embers will have to travel to create spot-fires. Combining Primary Fuel Breaks and LLFBs will also create safe access for wildfire suppression, contain the spread of wildfire, and provide options for fireguards and burn-offs ahead of a wildfire front or broadcast burn. LLFBs should be located around communities and the WUI.

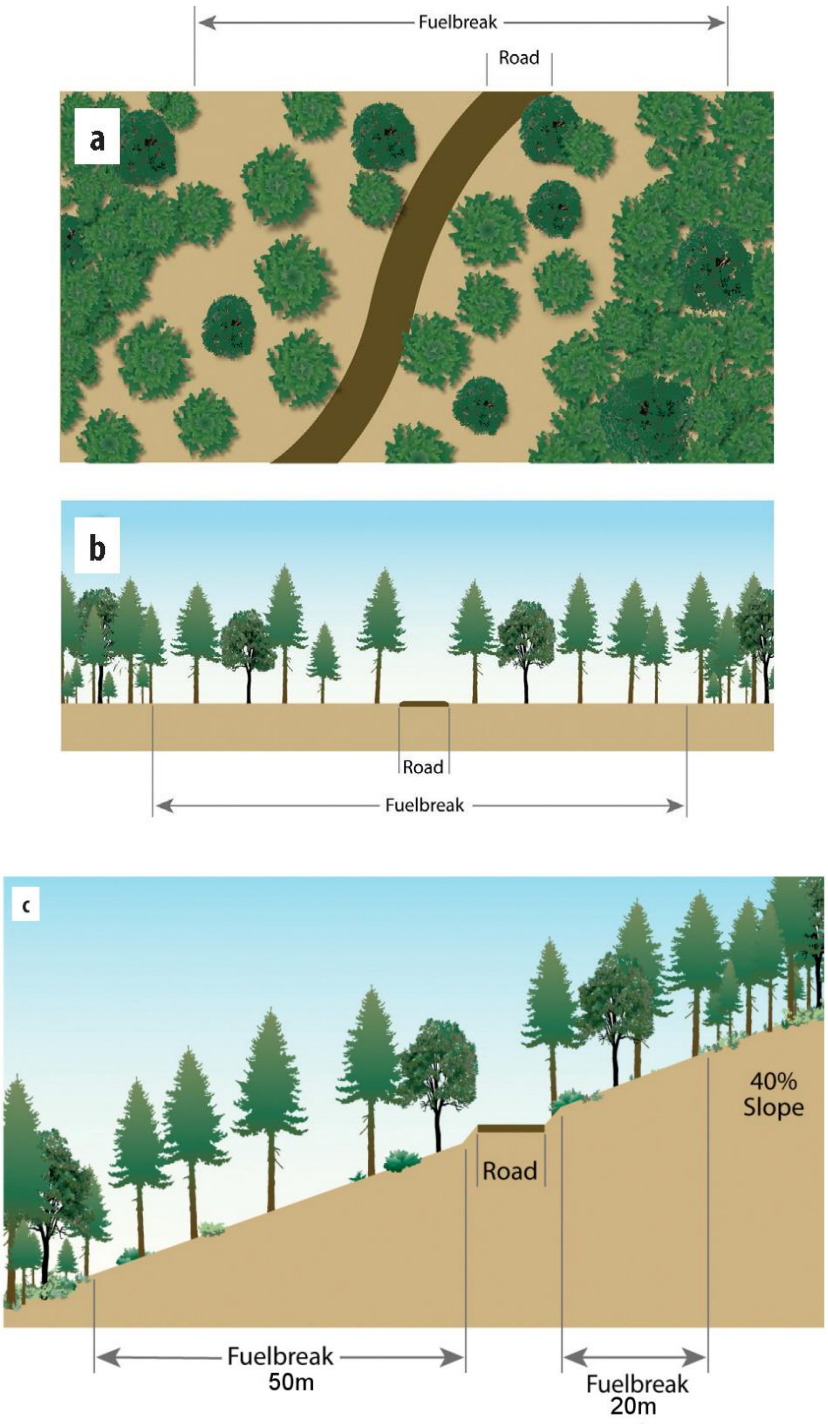

Figure 14: Landscape Level Fuel Break examples a) aerial view, b) profile view, c) slope

The Invermere Fire Zone has planned draft LLFBs as part of the Crown Land Wildfire Risk Reduction (CLWRR) program (see Figure 15). The LLFB's priority is currently undetermined so it is not clear when the CLWRR will treat this strategic strip of the valley bottom that is anchored on the Horsethief and Forster Forest Service Roads. (Mike Morrow, 2023). The CLWRR will only operate on public land, which makes it challenging to plan around at-risk

communities that have private land in strategic, high threat locations. Proposed treatment listed in Table 5-2: Priority Treatment Area List overlap and compliment this LLFB.

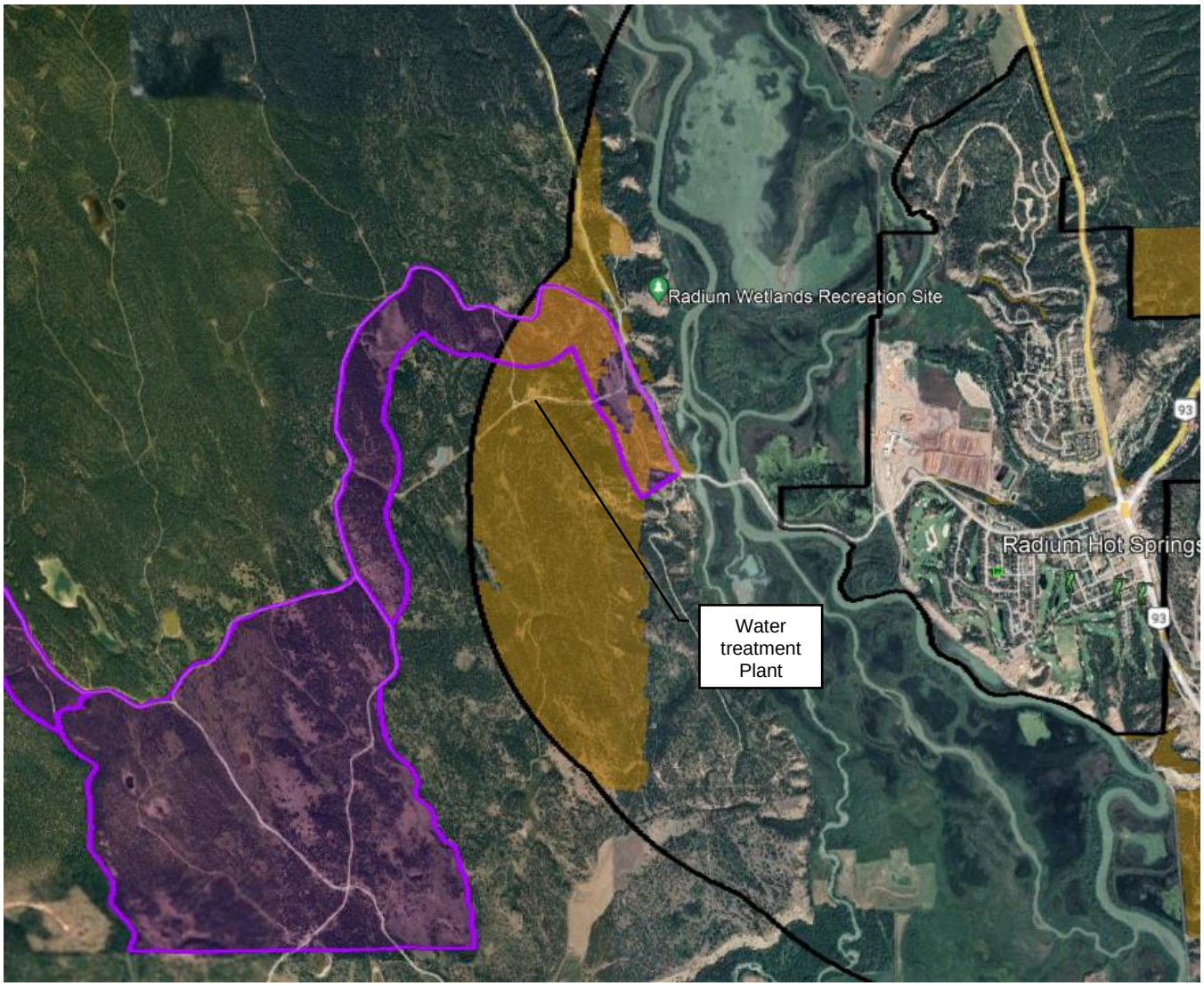

Figure 15: Proposed LLFB in purple. CWRP proposed treatment areas in orange. Located west of Radium Hot Springs.

5.5 Priority Wildfire Fuel Reduction Treatments

5.5.1 Proposed Fuel Treatment Units

Areas with the highest wildfire risk have been identified and prioritized. These areas are candidates for fuel reduction treatments to lower their wildfire behaviour threat rating.

Table 5-1: Map legend for priority treatments

Symbol	Treatment Priority	Definition
	Low	These areas pose a minor risk to the community. While they should still be treated, they should be treated after all the moderate and high areas are complete.
	Moderate	These areas pose a moderate risk to the community and should be treated after all the high priority areas have been treated.
	High	These areas pose the highest risk to the community and should be treated as soon as possible.

The following bullets identify the various factors used in assigning priority levels:

- **Wildfire Urban Interface (WUI)**: The number and types of structures potentially impacted by the polygon. For example, a high wildfire threat polygon adjacent to ten homes may receive a higher priority than an extreme wildfire threat polygon adjacent to one or two buildings (BC Wildfire Service, 2009).
- **Wind**: Initial Spread Index (ISI) roses are completed for each active weather station in the BC Wildfire Service weather station network. The ISI is a numerical rating of a fire's expected rate of spread. It combines the influence of the wind and the Fine Fuel Moisture Code on a fire's rate of spread without the influence of varying fuels. The frequency of counts by wind direction with the frequency of the ISI values during that period is shown in Figure 16. The prevailing winds with the highest ISI in the Rocky Mountain Trench typically come from the south or north. A proposed treatment polygon to the south of values at risk will receive a higher priority than polygons to the east or west of values at risk.

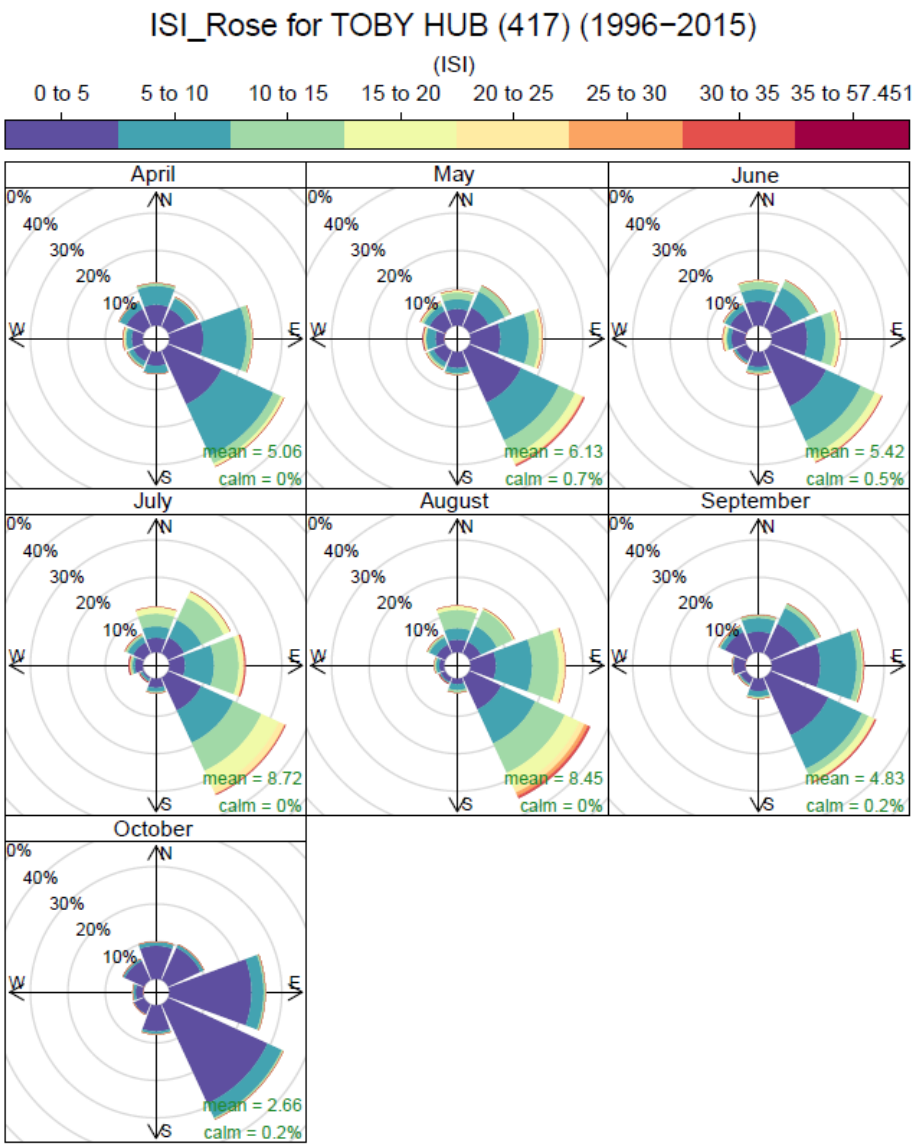

Figure 16: Initial Spread Index (ISI) roses for the Cranbrook weather station. (BC Wildfire Service, 2022)

- **Topography**: Fires spread the fastest uphill (De Groot, 2016). A polygon located downhill of the WUI will receive a higher wildfire behaviour threat class and a higher treatment priority than a polygon located uphill of the WUI. Steep slopes will increase the cost of fuel treatments and lower the treatment priority level if all other factors are the same.
- **Fuel**: the fuel continuity, species, size, crown base height, and forest health influence the wildfire behaviour threat class. Easily treated stands, such as those with fewer stems per hectare or smaller tree piece sizes will have a higher priority.
- **Landscape Level Fuel Breaks**: by treating polygons along primary fuel breaks, the landscape becomes more defensible against wildfire. LLFBs divide up continuous heavy fuels, provide safe access for wildfire suppression, and serve as good areas to burn-off ahead of a wildfire front or broadcast burn. See Figure 15.

- **Land Ownership**: treatment areas are not proposed on private land. Treatment on private land is the responsibility of the land owner.

Many treatment areas follow the PSTA polygons. Since the PSTA model was run at a 50m resolution, these treatment areas are at the same resolution. Field marking should not follow these polygons exactly; instead, a qualified technician should carry out and GPS the treatment field marking, taking into account appropriate stand treatment considerations. This can be completed during the next phase - the prescription phase and will result in areas being changed from the proposed treatment table. Wildfire fuel management typically occurs in stands that have a "Extreme or High" fire threat rating with the goal to reduce the threat to "Moderate or Low". The AOI contains a large amount of "Moderate" fire threat rating close to residents and critical infrastructure. These areas would still benefit from maintenance treatments at this time.

Table 5-2: Priority Treatment Area List

Name	Priority	Area (ha)	Comment
Old Coach Trailhead & Area	1	72.07	Areas needing maintenance and first treatment.
Sinclair Creek Canyon South slope	1	3.64	Areas needing maintenance and first treatment.
Water Treatment Plant Priority 1	1	97.58	Maintenance treatment
Vacant Lot	1	0.15	FireSmart Demonstration lot.
Elk Park Green Belt	2	2.02	First treatment adjacent to homes.
Water Treatment Plant Priority 2	2	211.17	Maintenance treatment
Horse Corral Road	3	48.10	Downwind and uphill of village. Parcel is part of First Nations treaty negotiations.
Base of Redstreak Mountain	3	56.80	Area between houses and this unit has been treated already. Uphill of village.

VILLAGE OF radium hot springs

Village of Radium 2023 CWRP Proposed Treatments

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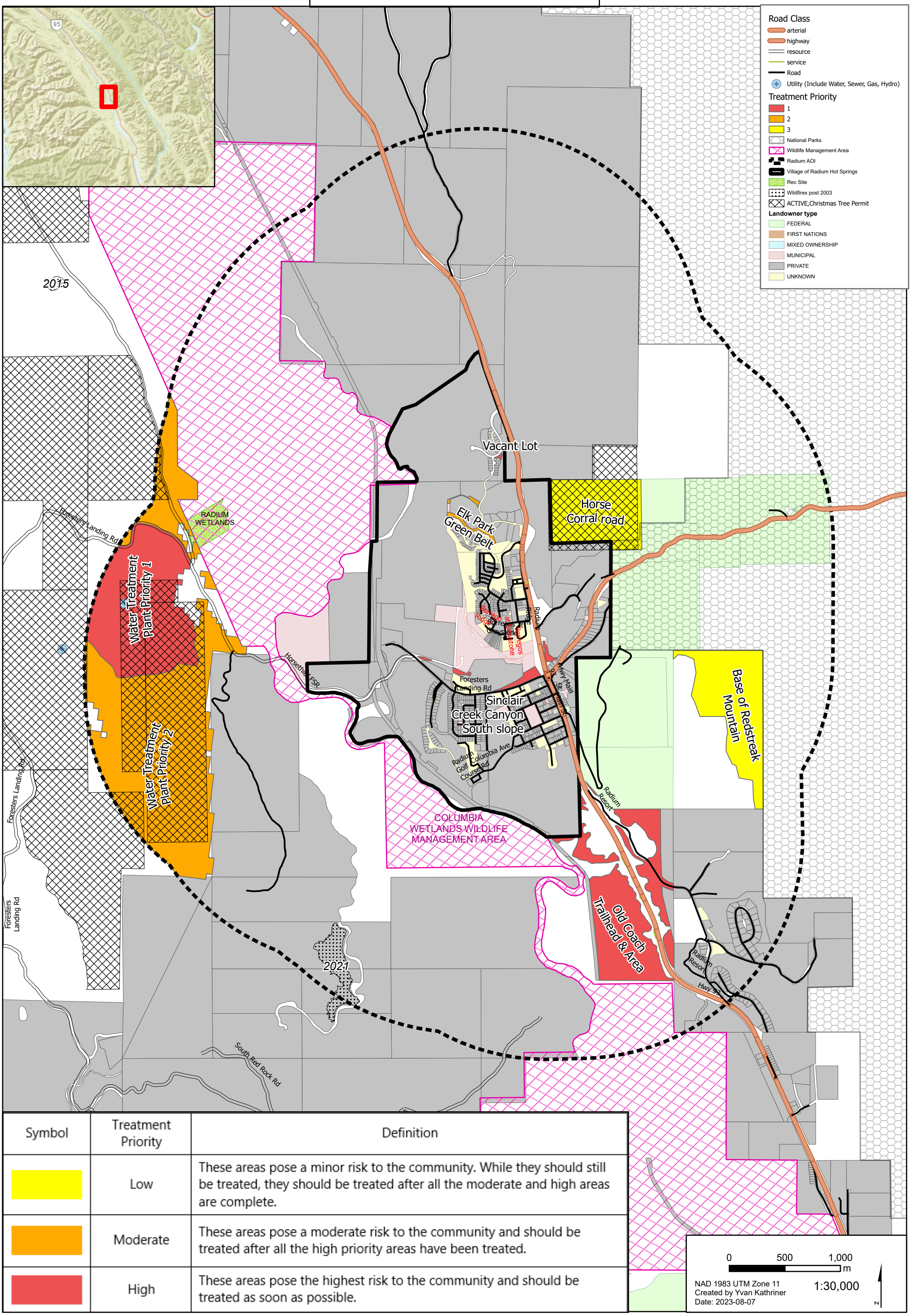

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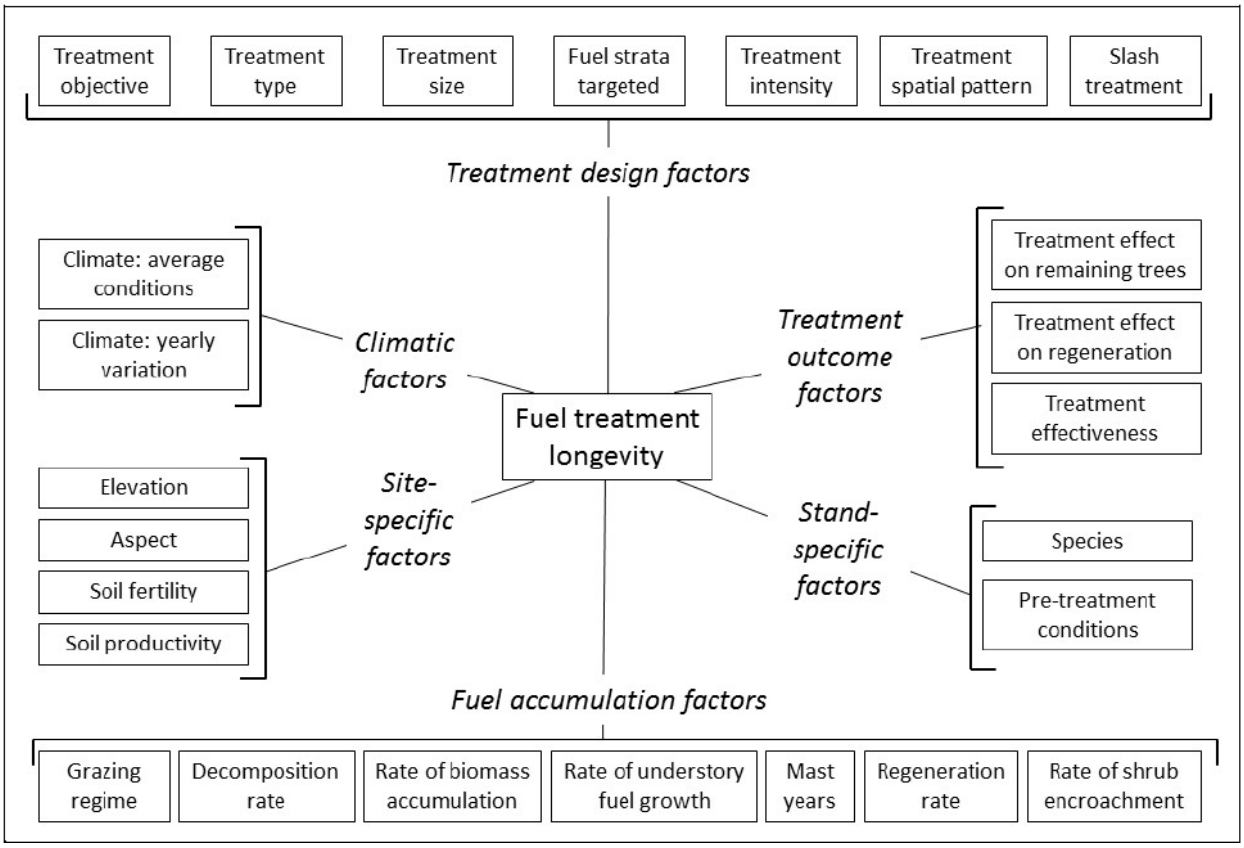
	Moderate	These areas pose a moderate risk to the community and should be treated after all the high priority areas have been treated.
	High	These areas pose the highest risk to the community and should be treated as soon as possible.

5.6 Maintenance

Fuel breaks, such as treatment areas, require ongoing treatment to maintain lowered fire threat ratings. After treatment, tree growth and understory development start the process of fuel accumulation and, if left unchecked, over time the fuel break will degrade back to conditions that existed before treatment. Some form of follow-up treatment is required. Follow-up is dependent on the productivity of the site and the intensity of the original treatment. Maintenance may be required as frequently as every 10 to 15 years to maintain the site in a condition with a low or moderate fire threat rating.



https://www.kootenaywildfire.ca/kelly-osbourne

6 Education

The FireSmart education discipline is designed to disseminate information around wildfire risk, preparedness, and prevention. The Village of Radium Hot springs is a key player in sharing information and resources to help motivate homeowners' action on private land and support communities organizing around wildfire risk reduction. We recognize education plays a key role in bringing the public into the FireSmart conversation and drives the relationship and community building that are so vital to achieving FireSmart communities. As a result, education efforts need to be shared on a range of mediums and with all audiences, including full-time and seasonal residents, businesses, and other stakeholders.

6.1 Objectives

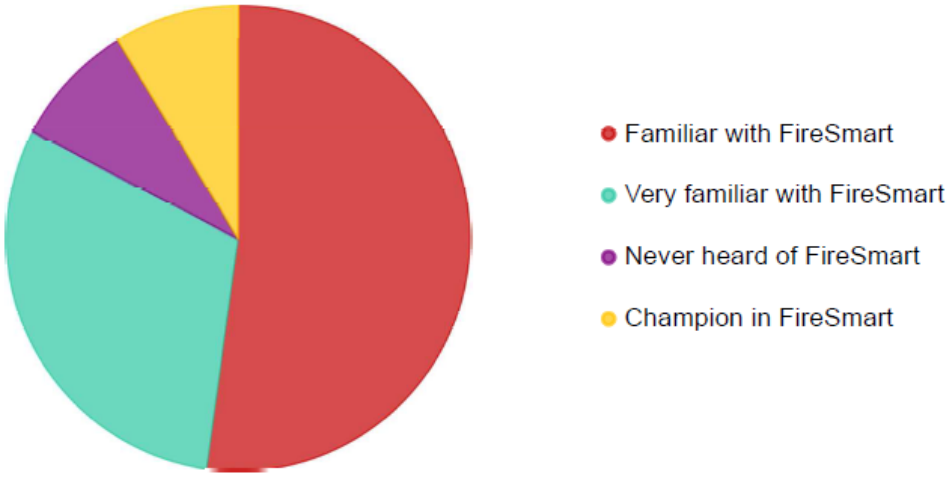
The FireSmart education objectives are:

- To better protect homes and critical infrastructure by improving public awareness of wildfire risk to rural and interface communities and steps the public can take to make their homes and communities more resilient to wildfire.
- To deliver consistent messaging about the shared responsibility between land managers and private property owners to reduce wildfire risk and provide public support to other wildfire risk reduction programs in the Village.
- To educate elected officials around the risks posed by wildfire in the RDEK, and the resources required to mitigate them.
- To garner support and partnerships with private sector, local governments, First Nations, and community organizations in the FireSmart conversation.
- To continue to promote the FireSmart program in the Village or Radium Hot Springs to be a household name, and a highly adopted program.
- To support Provincial agencies and other stakeholders by sharing their information on fire danger ratings, burning regulations, fire prevention and other reporting.
- To improve resident uptake of the Regional Evacuation Notification System.

6.2 Public Survey

In the month of April 2023, a public survey to gather the current knowledge of Radium residents regarding FireSmart was completed. The survey was advertised using the Village's communication streams. A total of 23 participants contributed. Here are the questions and results from this survey.

6.2.1 Question 1 - How familiar are you with FireSmart and its principles to help protect your home from wildfire?

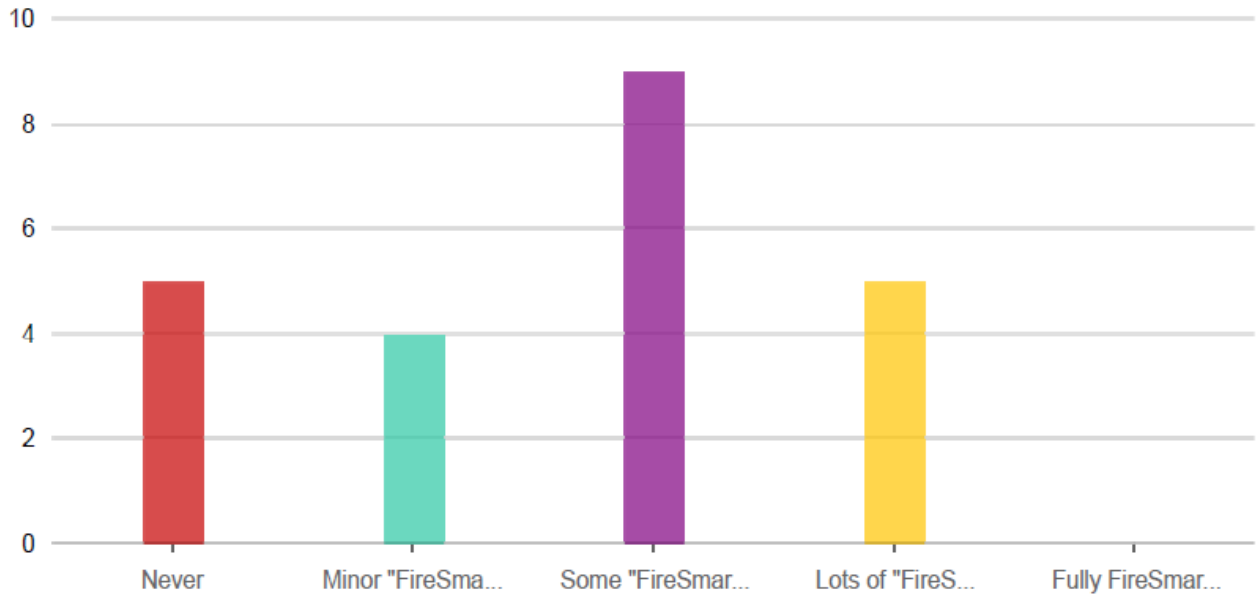


Answers	Count	Percentage
Familiar with FireSmart	12	52.17%
Very familiar with FireSmart	7	30.43%
Never heard of FireSmart	2	8.7%
Champion in FireSmart	2	8.7%

Answered: 23 Skipped: 0

The results to question 1 show that of those surveyed, the FireSmart brand has done its job at reaching residents. Public awareness of FireSmart seems to exist and now is the time for homeowners to implement actions. Neighbourhood champions are needed within the Village to help promote neighbourhood action. The survey responses were anonymous, so those two FireSmart champions remain unknown at this time.

6.2.2 Question 2 - Have you implemented any FireSmart principles on your home, yard, or business?

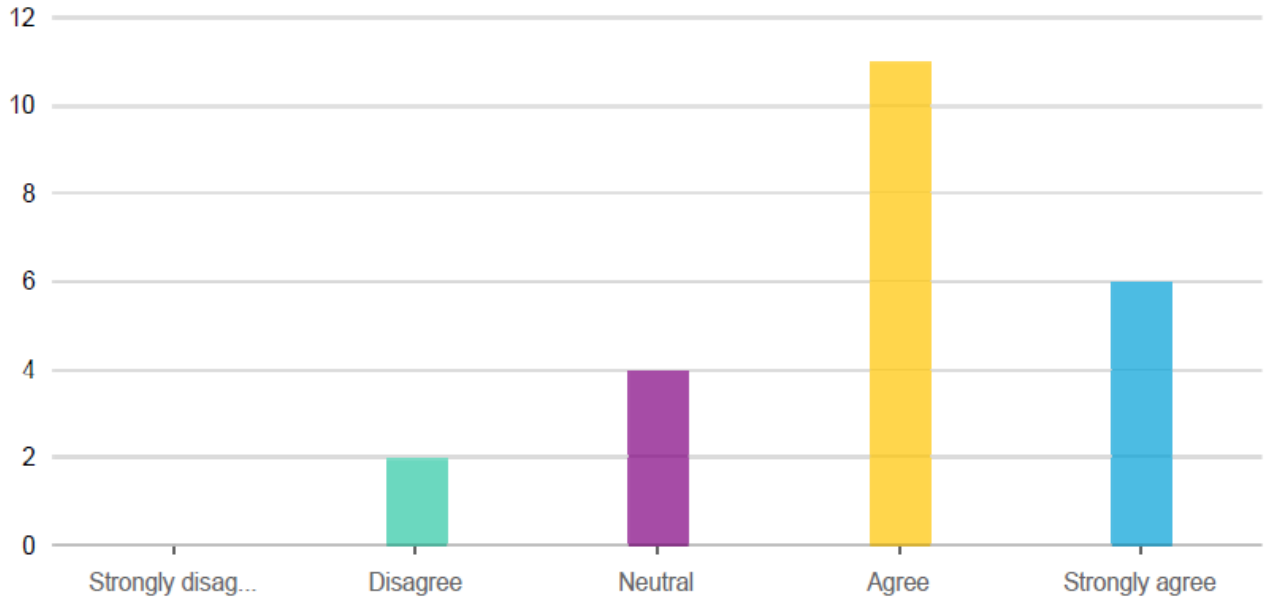


Answers	Count	Percentage
Never	5	21.74%
Minor "FireSmarting" implemented	4	17.39%
Some "FireSmarting" implemented	9	39.13%
Lots of "FireSmarting" implemented	5	21.74%
Fully FireSmart property	0	0%

Answered: 23 Skipped: 0

Question 2 shows that there is still much work to do to by business and home owners to implement FireSmart principles on their properties. Mitigation on and around structures is the best way to reduce ignition during a wildfire event (BC Wildfire Service, 2009). Having the time and money to complete mitigation activities is often a limitation to homeowners. Currently the only funding available to homeowners is a mitigation rebate program of up to $1000 provided by the CRI but requires the local government to apply for grants and then administer a rebate program.

6.2.3 Question 3 - Are you prepared to evacuate your home in under 12 hours in case of an emergency such as a wildfire?



Answers	Count	Percentage
Strongly disagree	0	0%
Disagree	2	8.7%
Neutral	4	17.39%
Agree	11	47.83%
Strongly agree	6	26.09%

Answered: 23 Skipped: 0

Question 3 gives confidence that residents are prepared to leave their homes on short notice in the event of an emergency. Important steps to prepare your home for an evacuation are to make a plan and have supplies ready in a grab-an-go bag that includes personal items, food, water, clothing etc. (Prepared BC, 2023).

6.2.4 Question 4 - What do you consider the greatest threat to your home's ignition due to wildfire.

This question allowed respondents to write their answers. Common concerns raised include:

- Coniferous trees on private property such as a golf course or vacant lot.
- Dead and dying trees.
- Fire at the sawmill log yard.
- Vegetation in Sinclair Canyon.
- Homes that were built without FireSmart in mind that are now at risk of fire. Wooden decks and wooden siding specifically.

Most of the solutions to these public concerns can be found by implementing FireSmart principles. This does require resources and time to maintain yards and retrofit or replace flammable construction material already installed on homes. Sinclair Canyon has been identified as a high priority in Table 5-2 for fuel reduction treatments outside of private land. During the late summer of 2022, the sawmill had two small scale fires in its hog pile (Fire Chief Trevor Carr) when the hog pile was not managed properly and self-combusted. The Radium Fire Department responded to prevent a potential disaster. This problem requires a solution from the sawmill operator following regulation and guidance from WorkSafe BC and the Radium Fire Department.

6.3 FireSmart Canada Neighbourhood Recognition Program

The FireSmart Canada Neighbourhood Recognition Program is about promoting the FireSmart principles; actively engaging and supporting communities; encouraging neighbourhoods to become nationally recognized; building partnerships with organizations and businesses; and raising awareness about wildfire risk, preparedness and prevention. The Village or Radium Hot Springs needs to take advantage of this model and use the resources and community of the British Columbia FireSmart program. The FireSmart program is founded in wildfire and wildfire disaster science, and the findings of post fire incident reviews.

In this programming model, engagement and education opportunities can reach a larger audience than in the one-on-one setting of other FireSmart programs. The program focuses on neighbourhoods acting collectively to reduce wildfire risk on individual private properties and on shared or common land. Individual homeowners can focus on risk mitigation in their Home Ignition Zone (HIZ) which includes their home structure and their yard out to 30m from the home. The local conditions within the HIZ are considered the most important determinant in whether a home will survive a wildfire event. However, in most urban residential settings, properties do not extend 30m from homes. Overlapping HIZs are common and requires cooperation. Individual homeowners in many cases can not treat their whole HIZ without collaboration with their neighbours. Engaging with the FCNRP gives them this opportunity, as well as access to education, funding for events, support from LFRs, and the opportunity to build community connections.

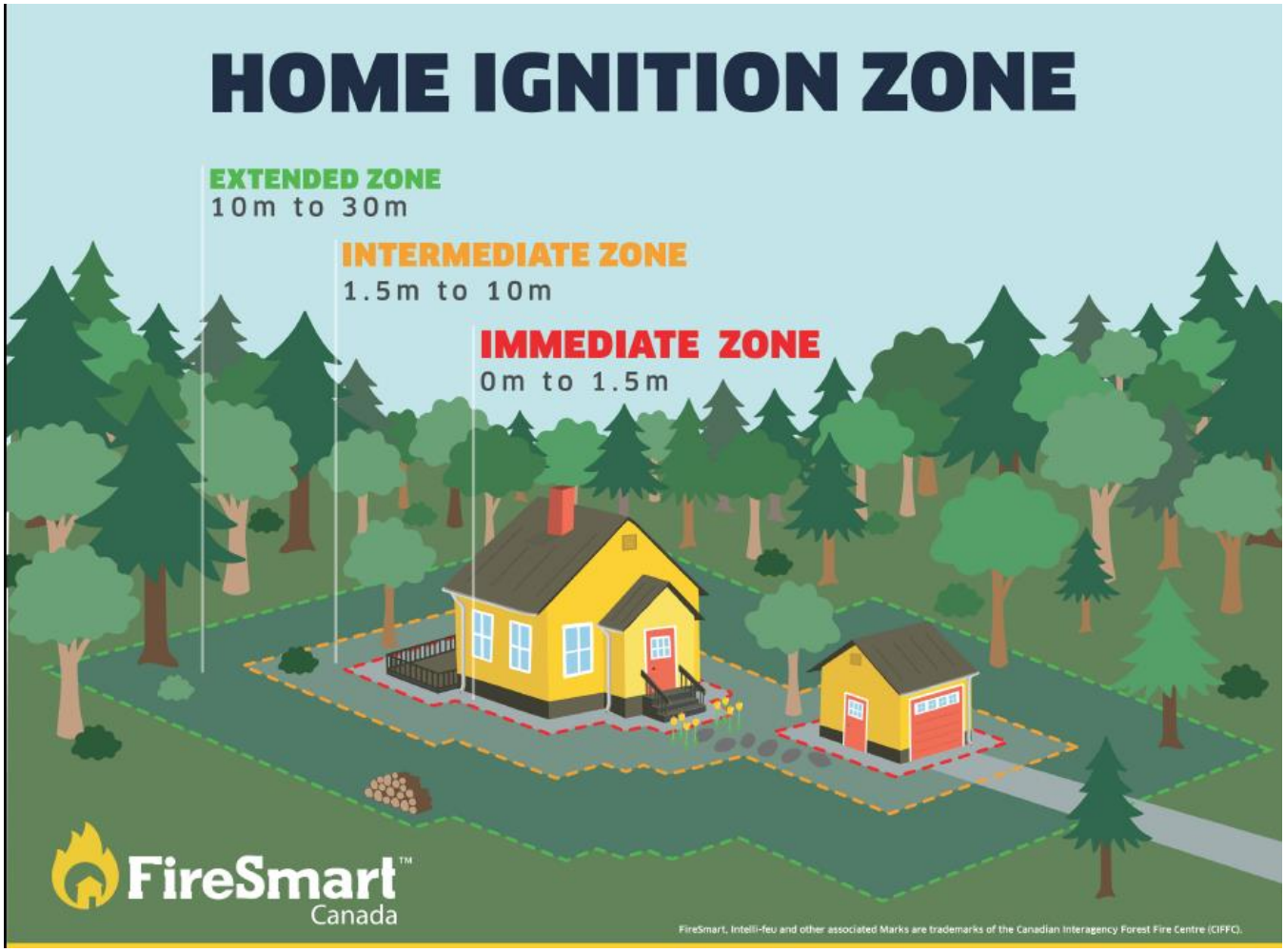


Figure 17: 2023 Revised Home Ignition Zone names with the elimination of "Zone 3" that extended out 30 to 100m from the structure.

6.3.1 Process of Engagement

Engagement under the FCNRP begins with interested individuals engaging with the FireSmart Coordinator about FireSmart and their interest in the program. Generally, these interested individuals serve the role of Neighbourhood Champion (NC) and head up their neighbourhood's FireSmart committee. A LFR will complete a Wildfire Hazard Assessment (WHA) with the support of the NC to identify high risk factors present in the community and provide recommendations for mitigation.

Engagement with the community often begins with an informational meeting or presentation, where the findings of the WHA are presented, and the neighbourhood is called upon to take action and support the NC in organizing around FireSmart. The NC must form a committee to develop a Neighbourhood Plan and organize educational or fuels management events each year. The community must hold one event over the course of the year to be eligible to apply for national recognition through the FCNRP. Once recognized, communities will have additional access to grants or opportunities to further develop their FireSmart program.

6.3.2 Program Uptake

Participation in the FCNRP varies across communities and is often dependent on whether organizational bodies such as strata or community organizations already exist in the neighbourhood. One of the main challenges with program uptake is finding an individual willing to act as the NC. NC have had success when given a platform at pre-organized meetings such as Annual General Meetings (AGMs) or otherwise focused community meetings. Where communities choose not to continue with engagement, the initial conversations and presentations still provide education to community members and kickstart conversations around wildfire risk and safety. In many cases, there are requests for one-on-one support or individual home assessments which the FireSmart Coordinator should provide. Local organizations that the Firesmart Coordinator should engage with include the Radium Golf Group, Subdivisions, and Home Owners Associations.

Figure 18: FireSmart presentation by a LFR in front of keen homeowners looking to become Neighbourhood Champions. (Yvan Kathriner 2020)

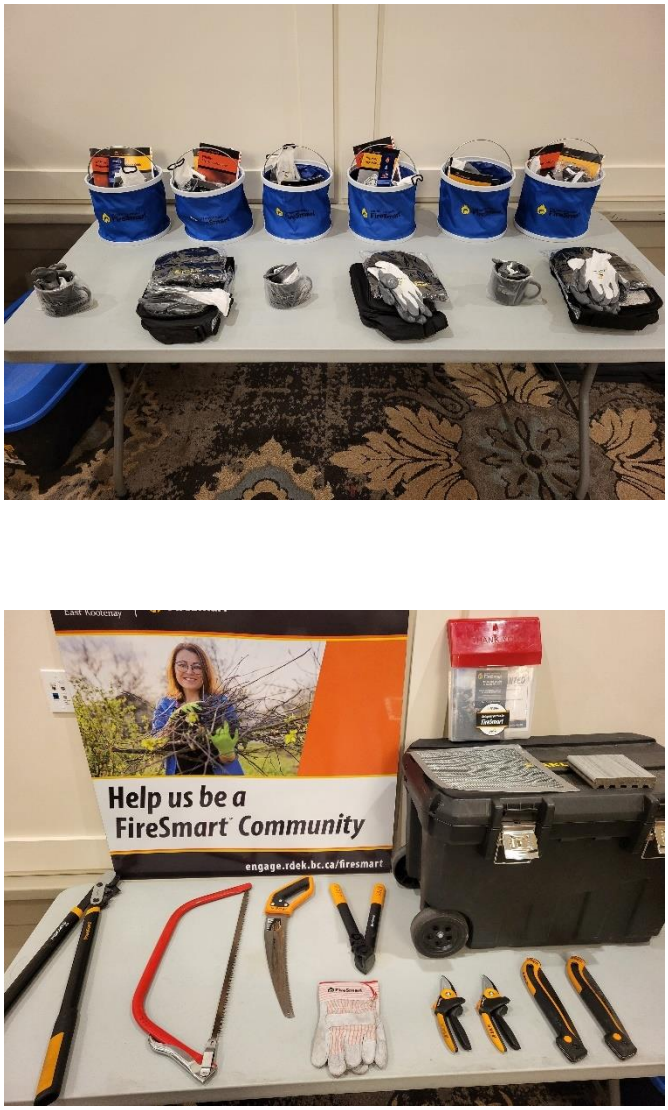


Figure 19: FireSmart information and swag set up at an RDEK event in 2022.

6.3.3 Program Partnerships

Communicating the importance of managing wildfire risk is strengthened when the messaging is coming from multiple channels. Local Fire Departments are a strong program support and often an important starting point for establishing a program in communities. Local businesses connected to the FireSmart program should be engaged in FireSmart Education. This includes greenhouses, landscapers, building centers, and developers.

7 Legislation and Planning

7.1 Kootenay Boundary Higher Level Plan

There are several higher-level plans that influence this CWRP. For example, a higher-level plan that exists in this CWRP's AOI is the Kootenay-Boundary Higher Level Plan Order. This plan is intended to provide environmental, social, and economic stability to the communities within the plan and reduce land use conflicts. Section 8 - Fire-Maintained Ecosystems is particularly relevant to this CWRP and future prescriptions as its goal is "to restore and maintain the ecological integrity of fire-maintained ecosystems, provide for treatments to the areas identified... as shrubland, open range, open forest, and managed forest ecosystem components in NDT 4 so that:

a) treatments will contribute to the creation of a complex, ecologically appropriate mosaic of habitats over the long term.
b) treatments in open range and open forest will remove excess immature and understory trees and emphasize retention of the oldest and/or largest trees.
c) both open forest and managed forest with suitable attributes will contribute to achieving mature and old growth targets as defined in objective 2 (Old and Mature Forest).
d) pursuant to Section 68(4) of the Operational Planning Regulation, green-up height requirements will:

    i. not apply within open forest or open range.
    ii. as identified in objective 4 (Green-up), apply within managed forest outside of Enhanced Resource Development Zones – Timber (ERDZ-T) ... and

e) the relative contribution of open forest towards biodiversity targets is not tree stocking dependent" (Ministry of Forest et al., 2002).

7.2 Forest Stewardship Plans

Forest Stewardship Plans (FSPs) implement government objectives through practices on the ground using measurable results and strategies. FSPs provide the legal default requirements for forest practices and require a government approved variance if operations want to be made outside of an approved FSP. Currently, RDEK does not have an approved FSP and therefore if stand treatment requires a cutting authority application on Crown Land, an applicable FSP would have to be followed. Example FSPs that have their AOI (known as Forest Development Units) overlap with the AOI of this CWPP include the Rocky Mountain Trench Ecosystem Restoration Program FSP (Harris, 2013) and the B.C. Timber Sales FSP (BCTS Kootenay, 2011-2016).

7.3 Forest Landscape Plans

Forest Landscape Plans (FLPs) are now being developed across British Columbia to replace FSPs. A Forest Landscape Plan establishes tactical level objectives and results for forest management under the *Forest and Range Practices Act*. Forest Landscape plans span between the strategic Land use plan (such as the Kootenay-Boundary Land Use Plan) and the operational level Forest Operations Plans. The FLPs aim to be an improvement on FSPs in that they increase public transparency and are government driven. Pilot Project Plans have been completed and communities in the RDEK will have the opportunity to provide input and collaborate during this new planning process (Government of BC, 2023). It is recommended that the RDEK participate in the Forest Landscape Planning process as wildfire management and climate change are topics to be managed for.

7.4 Old Growth Management

Old growth forest are unique and critical forest ecosystems that provide multiple values such as biodiversity, carbon storage, clean watersheds, wildfire refugia, and wildlife habitat. The provincial government is implementing the 2020 Old Growth Strategic Review's recommendations. A technical advisory panel was assembled to define and map at-risk old growth areas. The science-based approach will be used to transform old growth management in BC with collaboration with First Nations to make decisions. The technical advisory panel identified areas for temporary deferral meaning they will not be permitted to be harvested until it the provincial government and First Nations decide how they will be managed. The deferred old growth found within the AOI is located in Kootenay National Park (8.7ha) and on crown land (4.5ha of Priority big-treed older mature forest) beyond the current priority treatment areas. Fuel management treatments will be difficult to get authorizations for, if not impossible, until the areas are released from the deferral stage at an unknown time. The recommendation is to exclude deferred old growth areas from future fuel management prescriptions at this time. These deferred areas are currently uphill and downwind of values at risk.

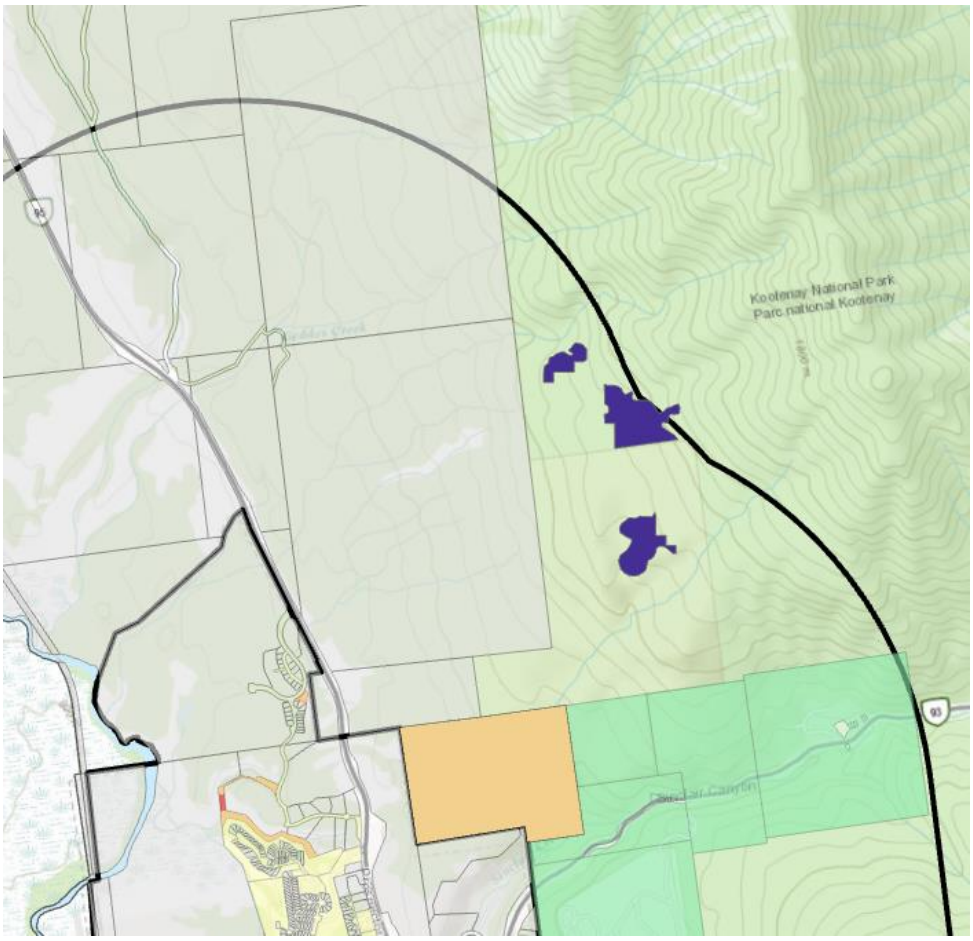


Figure 20: Deferred old growth in the AOI shown in purple.

8 Development Considerations

The local government's role of encouraging appropriate and affordable housing within communities has increased over time ((Mackay & Lovitt, 2021). Local governments have power to regulate, prohibit, set conditions on new housing developments and major renovations. Development decisions made by governments and landowners regarding land use, structure density, egress, terrain, and combustible fuel impacts a neighbourhood's wildfire resiliency. These decisions need to be made before development and construction begins as they will have lasting impacts on fire suppression efforts, wildfire behaviour, home survivability, and public safety should a nearby wildfire occur.

Village of Radium housing is at risk of wildfire by having half of its housing stock be constructed before the age of FireSmart. As concerns about rural development and WUI fires increased, the first FireSmart Committee in Canada was established in 1990. This committee was initiated by the Alberta Forest Service. 50% of homes in the Village were constructed before 2000 (Urban Matters CCC, 2022) (remember the WUI disasters of 2003 in BC). Older homes were less likely to use fire resistant exterior materials and less consideration about combustible fuels surround the structure. Today, construction and landscaping contractors are increasing their awareness and considering the fire rating of the supplies they provide and install.

The OCP already has goals and strategies to increase the Village's wildfire resiliency. The OCP calls for development permits to follow wildfire risk reduction guidelines. The OCP does have lowered standards for areas that have a low wildfire hazard. Embers from a wildfire can travel great distances and ignite new "spot" fires further downwind. The distance that embers can travel has varied greatly and 2km is an accepted distance to manage for (Bénichou, et al., 2021). Embers can spread over the lakes and rivers found in the rocky mountain trench (St. Mary wildfire spotting over Kootenay River in July 2023 for example). The vulnerability of homes to traveling embers means that homes even in urban or highly developed areas are susceptible to ignition. Given the dense building construction, intermixed WUI, and at-risk industrial areas (sawmill) located in the AOI of this CWRP, there are no areas that offer natural protection of embers to homes. **It is recommended that the FireSmart principles apply everywhere and that OCP and its guidelines for development apply everywhere**. Having the possibility for an exemption signed off by a RPF allows for those unique scenarios such as industrialized complexes built out of fireproof material. The following OCP sections should be updated and the same FireSmart standards should be applied throughout.

OCP 4.6.3 Policies to update:

- "1. The wildland interface areas that pose the greatest risk to the community are identified in Schedule D."
- "5. Prohibit the use of wood shakes as a roofing material and limit the use of fire retardant treated wood shingles as a siding material other than in areas with a low fire hazard as identified in Schedule D."

Retroactively enforcing FireSmart principles on private land is difficult after building permits are issued. The best time to implement mitigation is during the subdivision or construction phase. It is recommended that FireSmart wording is written into amendments to Bylaw No. 169, 1997 Subdivision & Development Servicing and Bylaw No. 392, 2013 Building & Plumbing bylaw. Other municipalities in BC already have FireSmart standards in their bylaws and permit approval process and can be emulated.

9 Interagency Cooperation

A wildfire resilient community is possible through the collaboration of multiple stakeholders working together. Stakeholders in creating a resilient Village of Radium include RDEK and municipal fire departments, village staff, First Nations, forest licensees, BC Wildfire Service, MOF, Local FireSmart Representatives, business owners, and homeowners. These are the best groups to prepare for and to react to a wildfire should one break out.

9.1 Crown Land Wildfire Risk Reduction (CLWRR)

The CLWRR funding mechanism is administered through the MOF. This program is available for internal provincial government delivery of priority activities on higher risk areas and not directly accessible by local authorities and First Nations. CLWRR Program highlights include:

• Fuel management planning and treatment activities focusing on provincial Crown land located around communities.

• Prescribed fire (including planning and operational treatments) and the development of a comprehensive provincial prescribed fire program.

• Risk reduction activities targeting provincially identified critical infrastructure, beginning with critical response infrastructure such as government-owned radio repeaters, weather stations and airtanker bases. RCMP infrastructure is not included.

9.2 Regional FireSmart Committee

The Regional District of East Kootenays should lead and maintain an effective regional FireSmart Committee for the Radium FireSmart Coordinator to engage with. The current committee consist of FireSmart engaged stakeholders such as municipalities, First Nation Bands, and fire departments. This committee is a place to share success and challenges, increase awareness of what other communities are doing, and to further spread the FireSmart education to the communities that the committee members represent. Guest should be invited occasionally to provide subject matter expertise and could include representatives from the BC Wildfire Service, the CLWRR, or grant funding agencies. It is recommended that the Village attend and engage with the regional committee whenever possible.

9.3 District Map Meeting

Each winter, the Rocky Mountain Forest District holds a map meeting for two main objectives. The first is to enter upcoming ecosystem restoration, licensee harvesting, habitat enhancement and wildfire risk reduction projects into the First Nations referral process as one package. The second is to try and find synergies or complimentary objectives between land managers and neighbouring land managers. It is recommended that the Village of Radium attends these annual map meetings to increase awareness of projects across the region and to submit its own projects or priority areas.

10 Cross-Training

During emergency events such as an interface fire, multiple agencies can get called to action. First responders, Village staff, BC Wildfire Staff, and contractors may not typically work suppressing interface wildfires. The cross-training of these people in wildfire suppression and response will increase the safety and effectiveness of their work.

Recommended courses include:

- Basics wildland fire training or Wildfire Structural Protection Program Wildland Firefighter Level 1 (WSPP-WFF1)
- Structure protection training
- Incident Command System training I-100
- Local FireSmart Representative training (or FireSmart 101 at the minimum)
- FireSmart Home Partners Mitigation Specialist training
- FireSmart Community Champion training
- Training exercises and scenarios

The following courses are eligible for CRI funding:

- SPP-WFF1 Wildland Firefighter Level 1
- S-100 Basic fire suppression and safety
- S-185 Fire entrapment avoidance and safety
- S-231 Engine Boss • ICS-100 (volunteer fire departments only)

During WUI disasters, the suppression resources of fire departments get overwhelmed. The Village or Radium's fire departments should have a plan in place should wildfires exceed the capabilities of the responding departments.

11 Emergency Planning

The agencies and stakeholders listed for cross-training need to be prepared to respond to emergencies. Planning in advance, before there is smoke on the horizon, is critical in order to mobilize quickly and hand the emergency effectively. Advanced planning includes establishing mutual-aid agreements, acquiring and maintaining equipment, undergoing specialized and cross-training, establishing roles, and testing communication systems. Running drills or exercises test the preparedness of those implementing the emergency plans. Radium is part of the RDEK's Emergency Management Procedures which can guide mitigation, response, and recovery actions for the area in the event of a disaster or incident.

Radium Hot Springs is in the process of updating its Emergency Management Plan in the summer of 2023. This will incorporate the updates to the Emergency Program Act currently in development. The new plan will encompass multiple emergency scenarios including wildfires. The modern plan will incorporate the pillars of emergency planning: Mitigation, preparedness, response, and recovery.

The Evacuation Notification System Voyent Alert is managed by the RDEK Communications department. This notification system is used to inform land and homeowners within the RDEK and municipalities of hazardous events such as wildfires, floods, or hazardous materials incidents. Voyent Alert is used for evacuation alerts and orders related to those three emergencies (RDEK, 2020). Residents are encouraged to sign up to this free and anonymous service. It is available to all residents and property owners in the East Kootenays including

municipalities, First Nation reserves, and second homeowners. Local governments also have broadcast intrusive messaging available to communicate emergencies to residents. RDEK emergency broadcast mediums include TV, Radio, cell phones, RDEK resident email groups, and Facebook.

Three tabletop exercises are completed yearly by the RDEK with stakeholders (for example: BC Ambulance, RCMP, Search and Rescue, utilities, Teck, SPCA, BC Wildfire Service, EMBC, Municipalities, First Nations, RDEK and municipal fire departments). Scenarios change to include emergency events such as wildfire, flooding, hazardous materials spills, and more. EK Emergency management program leads the exercises and invites the stakeholders. The goals of the tabletop exercises are to go through scenarios in a discussion-based format to develop partnerships, have a safe place to go through a drill with low pressure so that people can learn their rolls and responsibilities and carry out the emergency response process. Representation from stakeholders is part of the exercises to provide knowledge and expertise. These tabletop exercises are documented and help improve emergency plans and processes.

Objectives of the tabletop exercise are:

1. Strengthen the understanding of the participant's roles and responsibilities in an Emergency Operations Centre (EOC) during an emergency activation.
2. Strengthen the understanding of the roles and responsibilities of other assisting stakeholder agencies to eliminate duplication of effort between stakeholder agencies during an emergency activation.
3. Provide those participating the opportunity to review their own organisations policy documents, pre-plans, standard operating procedures, memorandums of understanding for example, to ensure they are up to date and response ready.
4. Familiarise and refresh participants with the Incident Action Plan and the Management by Objects approach of the Incident Command System (ICS).

All emergency activations follow the ICS. ICS follows the "Management by Objectives" approach where the objectives are communicated throughout the entire ICS organization through the incident planning process. (RDEK EOC, 2018). It is recommended that the Village of Radium attends a tabletop exercise on a wildfire incident once every spring with key stakeholders to be prepared for the upcoming wildfire season.

An After-Action Review of completed, significant incidents take place on significant events, such as ones including multiple stakeholders or are large in scale. The reviews are led by the East Kootenay Emergency Management Program. The after-action reviews go over what happened, went well, what was challenging, and what will be done next time. This process is like the continuous improvement loop. After Action Reviews are documented and shared with the parties involved. Changes and improvement help to update the emergency response plans of the region.

12 Action Plan & Implementation

The Village of Radium is dependent on grant funding to manage and implement a wildfire resiliency program to serve its residents. Periodic funding is difficult for a local government to manage due to the sporadic funding intakes for varying amounts of funds. At times these intakes are competitive and successful applications are not guaranteed. The ongoing and evolving funding streams that could potentially fund the implementation of this CWRP include:

- Community Resiliency Investment Program

    - FireSmart Community Funding and Supports
- Forest Enhancement Society of BC
- Columbia Basin Trust
- Intact Foundation – Municipal Climate Resiliency Grant
- FireSmart Canada – Community Preparedness Day awards.

13 Recommendations

Recommendations from each section or FireSmart Discipline are listed in the Action Plan table below to help the Village of Radium implement this CWRP.

Table 13-1. COMMUNITY WILDFIRE RESILIENCE PLAN ACTION TABLE						
Action	**Lead(s)**	**Priority**	**Timeframe**	**Resources Required**	**Metric for Success**	**CWRP Section**
Vegetation Management						
1. Develop Prescriptions (may need grant applications) for priority treatment areas	Village administration	High	Ongoing	Budgeted and supplemental funding sources.	Number of treatments completed.	5.5.1
2. Carry out Fuel Management treatments in the identified priority Treatment Units	Village administration	High	Ongoing	Budgeted and supplemental funding sources.	Number of treatments completed.	Table 5-2
Education						
3. Have Neighbourhoods become Nationally recognized by FCNRP.	FireSmart Coordinator (LFR)	High	Annually (December)	Neighbourhood Champions.	Number of nationally recognized neighbourhoods.	6.3
4. Continue to develop and implement targeted and dynamic communications related to emergency and wildfire preparedness and resiliency that utilizes a range of mediums to target a broad-based audience. It is recommended to use the FireSmart branding to provide a unified image to all FireSmart program communications.	Village administration and FireSmart Coordinator (LFR)	Medium	Ongoing	Budget for communication department	Amount of interest generated by communications.	6.3.1
5. Plan publicly accessible events to promote FireSmart, engage with residents, and seek out opportunities to increase its visibility and prominence of the FS messaging, such as events held during Wildfire Preparedness Day and Emergency Preparedness Week.	Village administration and FireSmart Coordinator (LFR)	Medium	Spring and Summer annually	Budget for events	Number of events attended.	6.3.1
6. Communications highlighting community successes and involved residents should support program awareness and uptake. Develop and support Neighbourhood Champions and give them opportunities and incentives to stay involved with the program.	Village administration and FireSmart Coordinator (LFR)	High	Once a year	Event planning and funding.	Annual appreciation event or incentives for neighbourhoods involved.	6.3
7. Educate resort and campsite owners and operators.	Village administration and FireSmart Coordinator (LFR)	Medium	Every Summer.	Budget for coordinator.		6.3.2
Legislation and Planning						
8. It is recommended that the Village participate in any future Forest Landscape Plan development process. Wildfire management and	Village administration	Low	As FLPs get developed in the Rocky Mountain Forest	Competent Wildfire Resiliency Supervisor.	RDEK values incorporated into FLP.	7.3

Table 13-1. COMMUNITY WILDFIRE RESILIENCE PLAN ACTION TABLE						
Action	**Lead(s)**	**Priority**	**Timeframe**	**Resources Required**	**Metric for Success**	**CWRP Section**
climate change are topics to be managed for in this plan.			District.			
Development Considerations						
9. Update OCP to have Development Permit area apply everywhere within the village.	Planning department	Medium	Fall 2023 start.	Budget for Planning department.	OCP Updated.	8
10. Require FireSmart and fuel reduction in advance of Building Construction and Subdividing.	Bylaw department.	Medium	2025	Funding.	Number of Bylaws updated.	8
Interagency Cooperation						
11. It is recommended that the Village attends the annual Regional Map Meetings to increase awareness of projects across the region and to submit its own projects or priority areas.	Village administration	High	Annually (around November)	Minor funding to attend meeting.	Presence and input of proposed projects at meeting.	9.3
12. The Village should continue to develop new and maintain existing partnerships with other agencies, First Nations, RDEK programs, organizations, and businesses.	FireSmart Coordinator (LFR) and Village administration.	Low		Regional FireSmart Committee.	Regional FireSmart committee that meets at least quarterly.	9
Cross-Training						
13. Complete recommended training courses by fire department membership.	Fire Chief	High	Annually (Spring)	Training budget and supplemental funding. Course instructors.	Membership certification in recommended courses.	10
14. Fire departments should have a plan in place should wildfires exceed the capabilities of the responding departments.	Mutual Aid Fire Chiefs	High	August 2023	Mutual Aid Agreements	Are agreements in place?	10
Emergency Planning						
Attend RDEK emergency tabletop exercises on a wildfire incident once every spring with key stakeholders to be prepared for the upcoming wildfire season.	Village Emergency Planning	Medium	As scheduled.	Budgeted funding with funding supplement.	Key stakeholders participate in exercise.	11

14 References

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