Columbia Shuswap Regional District Electoral Area A

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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.	
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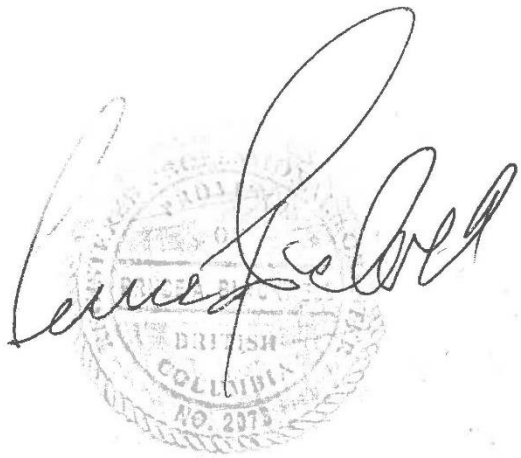	

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EXECUTIVE SUMMARY

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 in Kelowna. 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.

The area of interest (AOI) for this plan is within the Columbia Shuswap Regional District (CSRD) Electoral Area A, and encompasses the rural communities of Donald, Blaeberry, and Moberly Hospital Creek. The CWRP provides the CSRD with an action plan that can be used to guide the improvement and/or development of emergency plans, emergency response, evacuation plans, communication and education programs, bylaw development in areas of fire risk, and the management of potentially hazardous forest lands for the AOI's eligible WUI (WUI).

Wildfire management requires a multi-faceted approach for greatest efficacy and risk reduction outcomes. A total of 44 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 document. Because the WUI extends outside of the CSRD Electoral Area A boundary and overlaps with other jurisdictions, the CSRD's role may be limited to one of influencer in some instances, while other action items can be implemented directly.

Ultimately, the recommendations and action items within this plan should be considered a toolbox of options to help reduce the wildfire threat to communities within the plan's WUI. The CSRD will have to further prioritize implementation based on resources, strengths, constraints, and availability of funding, and regularly update the prioritization and course of action as variables change through time.

FireSmart activities on private property is the number one recommendation in this plan. The key to reducing WUI fire structure loss is to reduce structure ignitability. Mitigation should be centered on construction practices and regulations, vegetation management around structures, and continued resident education. Public outreach on the range of available activities and the prioritization of activities should help residents to feel empowered to complete simple risk reduction activities on their property.

Field work allowed for verified and updated fuel types and wildfire threat assessments to be combined with an office-based analysis to update the local wildfire threat for the WUI (SECTION 4: Wildfire Risk Assessment, Appendix A: Local Wildfire Risk Process). A key subcomponent of this analysis is the *wildfire threat class* (analyzing fuels, weather, and topography sub-components), which has the following classes:

- 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;
- High: Landscapes or stands that are continuous forested fuels that will support candling, intermittent crown or continuous crown fires. These landscapes are often steeper slopes, rough or broken terrain and/or south or west aspects. High polygons may include high indices of dead and downed conifers; and
- Extreme: Continuous forested land that will support intermittent or continuous crown fires.

The result of the analysis shows that 74% of the public land in the WUI has a moderate wildfire behavior threat or higher. This, along with other analyses presented and discussed throughout the document, show that wildfire is a real threat to Electoral Area A's WUI. The CSRD has begun planning and preparing for a wildfire emergency in this area through available FireSmart resources but should look to this CWRP on how to continue this process effectively.

Table 1: CSRD's Electoral Area A Community Wildfire Resiliency Plan. 2021

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timefra me	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Education (Section 5.1)							
Objective: provide information to communities and citizens empowering them to adopt and conduct FireSmart practices to mitigate the negative impacts of wildfire to their homes/businesses, properties, and neighbourhoods.							
1	High	This CWRP report and associated maps should be made publicly available on the CSRD website and social media platforms.	The CWRP may also be directly shared with local stakeholders and land managers who may be interested in collaborating on FireSmart and wildfire risk reduction activities.	CSRD (FireSmart Coordinator, Communication s)	1 year	Available for download or viewing on the CSRD website	UBCM CRI funding available. (~8 hours in house)
2	High	Continue to deploy a FireSmart education program within Electoral Area A. Build a strong level of resident engagement through FireSmart workshops and events tailored to specific community wildfire risk factors.	Workshops and presentations should include FireSmart education particular to the area, such as best practices for FireSmart priority zones, preferred materials for use when conducting home renovations, and safe debris removal methods.	CSRD (FireSmart Coordinator)	Annually	Two or more FireSmart events held per year; number of people who attend.	Eligible for UBCM CRI funding
3	High	Consider employing additional staff (e.g., Local FireSmart Representative) to support fulfillment of these recommendations and increase local FireSmart engagement.	Benefits of a local LFR is a frequency and regularity of touch-points and local-specific knowledge.	CSRD	1 year then ongoing	Contracting/em ploying an LFR in 2023 funding year	Eligible for UBCM CRI funding UBCM CRI funding available for LFR training and employment

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
4	High	Continue making Home Ignition Zone assessments by the FireSmart Coordinator available for residents	HIZ assessments encourage action in the Priority Zones of a community. CSRD has had good uptake in previous years.	CSRD (FireSmart Coordinator)	Annually - spring - fall	~10 - 30 assessments are completed annually	~$6,000 - $10,000: 4 hour @ $50/hour including organization, travel, assessment, reporting per property for 30 properties, plus expenses
5	Moderate	Continue making a FireSmart rebate program available for residents who have a pre- and post-work FireSmart assessments conducted.	FireSmart rebate programs are an incentive to complete FireSmart work. CSRD has had good uptake in previous years.	CSRD (FireSmart Coordinator)	Annually - spring - fall	~10 - 20 properties participate annually	~$10,000 in rebates: 20 properties at up to $500 rebate per property, plus 2 hours administration time per property
6	High	Educate residents of off-site debris disposal opportunities, such as local hog fuel opportunities and potential future chipping services (Recommendation 42).	This would assist residents in reducing green waste accumulation on properties.	CSRD (FireSmart Coordinator)	1 year	Increased public awareness of debris removal methods	UBCM CRI funding available for public education materials, FireSmart events/ presentations/ workshops and Wildfire Community Preparedness Day

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timefra me	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
7	High	Educate farmers of flashy spring wildfire conditions that are typical to the area to discourage high risk activities, such as field burning, from occurring during hazardous conditions.	Volatile cured grasses and high winds prior to spring green-up are common in the region, which is when field burning typically occurs.	CSRD (FireSmart Coordinator)	1 year	Increased awareness of hazardous field burning conditions	UBCM CRI funding available for public education materials, FireSmart events/ presentations/ workshops
8	Moderate	Support and facilitate priority neighborhoods to self-organize to attain FireSmart Canada Neighbourhood Recognition Program (FSCNRP) status.	Consider utilizing the local FireSmart rebate program or chipping services as incentives for participation.	CSRD (FireSmart Coordinator/LFR)	5 years	Completed for priority neighbourhoods 1, 2, and 3	UBCM CRI funding available. ($5000/ neighbourhood; 40 hours/ initiative)
9	Moderate	Educate homeowners of the importance of clear and accurate house numbering for safe and effective emergency evacuation.	Many addresses within the WUI are not adequately visible from the road. Consider adopting a local bylaw to help achieve sufficient address visibility as needed/if required.	CSRD (FireSmart Coordinator/LFR)	2 years then ongoing	Addresses are clearly visible from the road in all levels of light	UBCM CRI funding available for FireSmart education (~8 hours in-house)
10	Moderate	Make FireSmart province-specific landscaping guidelines available on the CSRD FireSmart webpage and hand out pamphlets/literature to residents to increase FireSmart	Landscaping guidelines list flammable non-compliant vegetation/landscaping materials, non-flammable drought- and pest-resistant alternatives, and tips on landscape design to	CSRD (FireSmart Coordinator, Communications)	1 year	Posted on CSRD's FireSmart webpage and hardcopies	UBCM CRI funding available (~20 hours in-house)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timefra me	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		management knowledge amongst residents.[1]	reduce wildfire hazard on private property.			handed out to residents	
11	Moderate	Educate residents of risk factors associated with residing outside of a Fire Protection Area.	It is common, especially in the case of renters and visitors, to be unaware of the lack of fire services in their areas (in the event they call 911).	CSRD (FireSmart Coordinator)	1 year	All residents in WUI notified of inherent risk.	CSRD (in-house, cost dependent on method of communication/ time and effort invested, low cost overall)
12	Moderate	Encourage the installation of exterior residential sprinklers as one measure (in conjunction with FireSmart retrofitting and landscaping) to comprehensively reduce wildfire risk on properties.	Use FireSmart presentations and workshops as opportunities to provide information on water supply system requirements, manufacturers, component parts and cost of exterior sprinklers as one tool to increase structure resiliency.	CSRD (FireSmart Coordinator)	1 year	Increased public awareness of residential sprinklers and 5-10 sprinklers installed each year in the WUI.	UBCM CRI funding available for public education materials, FireSmart events/ presentations/ workshops
13	Moderate	Seek opportunities to remove barriers to FireSmart uptake for residents with mobility issues through community support and engagement.	This can be incorporated into the FSCNRP, or tackled as a stand-alone initiative.	CSRD (FireSmart Coordinator/LFR)	3 years then ongoing	FireSmart opportunities support residents with mobility issues	CSRD (in-house, cost dependent on)

[1] Available for download here: FireSmartBC_LandscapingGuide_Web_v2.pdf

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timefra me	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Legislation and Planning (Section 5.2)							
Objective: provide the means for the CSRD to implement wildfire risk reduction actions through bylaws and legislation by outlining local government responsibilities regarding wildfire							
14	High	Complete or schedule periodic updates of the CWRP. The frequency of updates is dependent upon major changes which would impact local wildfire risk, funding changing that may lead to new opportunities or the rate at which wildfire risk reduction efforts are implemented.	A current (i.e., no more than 5 years old) CWRP is a requirement for further funding under the CRI Program. Reassess and reprioritize proposed and completed fuel treatment units as part of a CWRP update.	CSRD (Consultant)	5 years from adopting this CWRP document	The WUI always has an up-to-date CWRP and action plan	UBCM CRI funding available (~3 hours in-house to review need for update, ~16 hours for CRI application, $25,000 for full document/$10,000 for update)
15	Moderate	Consider extending future wildfire risk reduction activities and projects throughout the entire Electoral Area A Eligible WUI.	Increase wildfire resiliency across all communities in the Electoral Area A Eligible WUI through FireSmart and risk reduction programs.	CSRD	1 year then ongoing	FireSmart and wildfire risk reduction administered to all communities in the Eligible WUI	UBCM CRI funding available for FireSmart planning and activities in the Eligible WUI
16	High	The Local Fire Services Advisory Committee should assess the feasibility of extending local fire suppression services to residents within the WUI.	The WUI is not included within a Fire Protection Area. A 2020 residential survey conducted in Blaeberry highlighted a shared concern of the lack of fire protection in the community.	Local Fire Services Committee (CSRD)	5 years	A Fire Protection Area is established for the WUI	UBCM CRI funding available for FireSmart policies (~20 hours in-house for reviewal, additional time and cost for adaptation)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timefra me	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
17	Moderate	Consider enacting a local bylaw to require the removal or mitigation of hazardous yard conditions on private property that can pose a safety risk in the event of a fire. The bylaw should also regulate storage of combustible materials 10 m away from homes during the wildfire season.	Reduce wildfire risk on private property through provisions of combustibles and hazardous yard conditions.	CSRD	5 years	The adoption of a bylaw to require mandate property maintenance	UBCM CRI funding available for FireSmart policies (~20 hours in-house)
Development Considerations (Section 5.3)							
Objective: embed FireSmart practices and considerations into all development within the WUI							
18	High	The FireSmart Coordinator should complete FireSmart assessments of CSRD critical infrastructure.	Critical infrastructure are identified in Table 7.	CSRD (FireSmart Coordinator)	2 years	Assessments completed and action items being planned for	UBCM CRI funding available (¬1,000/ assessment)
19	High	Use fire-resistant construction materials, building design and landscaping for all critical infrastructure when completing upgrades or establishing new infrastructure.	Plan and implement action items in the sequence of critical infrastructure importance.	CSRD	Ongoing	New critical infrastructure and all critical infrastructure renovations are FireSmart	Local government funding ($ Variable: CI specific)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timefra me	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
20	High	Assess community water delivery ability as required for suppression activities. The assessment should include an analysis of the vulnerability of natural water sources to wildfire, mass wasting, and/or drought, and the duration and quality of supply during sustained pumping effort.	There is no municipal water system in the WUI; water uptake is through private wells. Determine potential supply issues in the event of a large interface wildfire event (See Recommendation 20).	CSRD (Consultant)	2-3 years	Assessment completed	UBCM CRI funding available (~$25,000 for assessment – contracted service)
21	High	If and when a water availability assessment is completed (Recommendation 19), implement action items to improve water availability for fire suppression as prioritized within the assessment.	Consider installing water infrastructure (e.g., water cisterns) in areas identified in assessment without sufficient water supply for firefighting.	CSRD	5 years	Assessment completed and action items being planned for	Local government funding ($ Variable: action item specific, ~$2000-$5000/water cistern)
22	High	Conduct a review of fire suppression accessibility, safety, and staging of anchor points for firefighting equipment and personnel on all dead-end roads.	Areas of difficult access should be identified and improved (e.g., Hospital Creek Road, Ottoson Road, Johnson etc.)	CSRD (Consultant)	3 years	Assessment completed	Local government funding (~20 hours in-house including meetings with BCWS and Golden Fire Fighting Department)
23	Moderate	When an Official Community Plan (OCP) is established for Electoral Area A, community initiatives to reduce wildfire risk (e.g., FireSmart, fuel reduction etc.) should be	There is currently no OCP for Electoral Area A. Embed FireSmart values into all aspects of community development and planning.	CSRD	5 years	OCP established with wildfire initiatives and long-term	UBCM CRI funding available

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timefra me	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		defined to guide future development.				community goals.	
24	Moderate	When an OCP is established for Electoral Area A, a wildfire hazard DPA should be developed for the protection of development from hazardous wildfire conditions in wildfire hazard areas. Update Bylaw 510 - Zoning Bylaw with respect to it when enacted.	New interface and intermix development are common throughout the Blaeberry, Moberly and Hospital Creek. The DPA can speak to building materials, set-backs, vegetation/landscaping, etc., or to one or a combination of those elements. Engagement with residents and the building community is recommended during the DPA development process.	CSRD (Consultant)	5 years	Interface wildfire DPA created and adopted	UBCM CRI funding available (~25,000 and 40 hours in-house)
25	Moderate	All new developments should have a water system that meets or exceeds the minimum standards of NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting.	The Golden Fire Department and/or BCWS should also review the planned water supply to ensure it provides sufficient placement, flow, and reliability for suppression needs.	CSRD (Developers, BCWS, Golden Fire Department)	Ongoing	New development water standards meet NFPA 1142 Standard	Local government funding /developers (~4 hours in house for water system review, $ variable for water system bared by developers)
Interagency Cooperation (Section 5.4)							

Objective: Broaden from department or agency siloes and single jurisdiction-based approach to a risk driven, multi-agency and multi-scalable approach.

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
26	High	Formally establish a Community FireSmart Resilience Committee and host meetings semi-annually to review and act upon FireSmart and wildfire risk reduction actions identified in this plan.	Increase collaborative wildfire resilience efforts across stakeholders.	CFRC	Ongoing	The CSRD, local land managers, BCWS and other stakeholders participate in 2-6 meetings annually	~4-8 in-house hours/meeting to prepare, host and debrief
27	High	Schedule a meeting with MFLNRORD to share information about this CWRP and the overlapping WRR Tactical Plan. Look for synergies and opportunities to collaborate on shared initiatives through a multi-agency approach.	Ongoing engagement is recommended after this meeting. Multi-agency coordinated action can be more effective at reducing wildfire risk.	CSRD/MFLNRORD	Ideally spring of 2022	A meeting is held between the CSRD and MFLNRORD to share project findings	~4-8 in-house hours/meeting to prepare, host and debrief
28	High	Work with Recreation Sites and Trails B.C. to advocate that a defensible space between flammable vegetation and campfire pits in the Waitabit Recreation Site be augmented.	Encroachment of junipers towards campfire pits was observed by consultants during fieldwork.	CSRD (Recreation Sites and Trails B.C.)	Ongoing	Junipers removed from non-combustible zones of campfire pits	~3 hours prior to fire season
29	Moderate	Work with BCWS to install and regularly maintain signage of danger class ratings, fire bans, and general fire safety related warnings at key locations in the WUI. Signage should be updated with current fire danger ratings during the peak wildfire season (May to October)	Currently, there is no Fire Danger Rating sign in the WUI. Highly visible locations could include Tans-Canada Highway 1 turnoffs and Upper Donald-Golden Road.	CSRD (FireSmart Coordinator, Community Champions)	2 years (Then ongoing)	At least one sign installed and current and accurate fire danger ratings posted.	~1 hour/week during wildfire season (in house)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timefra me	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
30	Moderate	Work with the Ministry of Transportation and Infrastructure (MOTI) to encourage maintaining the Trans-Canada Highway grassy right-of-way in a low hazard state.	This is to reduce ignition potential and improve emergency access in the event of an evacuation or wildfire event. Ignition of O-1a/b fuels adjacent to the Trans-Canada Highway was expressed as a concern by the CFRC.	CSRD (MOTI)	Ongoing	Grassy ROW is maintained in a low-hazard state	~3 hours prior to fire season
31	Moderate	Work with utility stakeholders to encourage regular brushing and clearing of woody debris and shrubs to help reduce fire risk, utility pole damage, and subsequent outages.	Encroachment of understory vegetation and overhanging trees were noted by consultants during fieldwork.	CSRD (BC Hydro, Fortis BC)	Ongoing	BMPs in use for the region	~3 hours prior to fire season
32	Moderate	Communicate with railways prior to each wildfire season to ensure that best-management-practices to reduce fire ignition are continued.	This is to reduce ignition potential of railways in the WUI.	CSRD (CP Rail, CN Rail)	Ongoing	BMPs in use for the region	~3 hours prior to fire season
Cross-Training (Section 5.5)							
Objective: Support the development of comprehensive and effective wildfire risk reduction planning and activities, as well as safe and effective response							
33	High	If an LFR is employed in the WUI (Recommendation 3), regular communication and coordination should be maintained between the FireSmart Coordinator and LFR.	Local FireSmart uptake should be pursued collectively by CSRD FireSmart staff.	CSRD (FireSmart Coordinator/LFR)	Ongoing	Training and communication between FireSmart Coordinator and LFR	Eligible for UBCM CRI funding
34	High	CSRD Emergency and FireSmart staff should participate in exercises pertaining to the Golden and Area Emergency Program.	Exercises could be walkthroughs, workshops, table top exercises, functional exercises or full-scale exercises	CSRD/Town of Golden/Golden Fire Department	Annually /Ongoing	Participation in training exercises	CSRD (~12 hours in-house per test exercise)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timefra me	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
35	Moderate	Pursue funding to enable the FireSmart Coordinator to attend the annual FireSmart symposium.	Relevant learnings should be shared at CFRC meetings.	CSRD (FireSmart Coordinator)	1 year	Attendance at 2023 FireSmart Conference	Eligible for UBCM CRI funding
36	Moderate	CSRD emergency management personnel should be trained in ICS-100, WRR Basics, and Local FireSmart Representative training.	ICS-100 and WRR Basics will help the CSRD work with BCWS and MFLNRORD respectively.	CSRD	2 years	Emergency Management personal are all trained in ICS-100, and some have WRR Basics and LFR training	LFR training is eligible for UBCM CRI funding (~32 hours in-house/staff member)
Emergency Planning (Section 5.6)							
Objective: create specific wildfire response pre-incident plans so those responding to a wildfire emergency know who is available to help with what and when, and to improve response and recovery from a wildfire emergency.							
37	High	Host community tabletop exercises or workshops focused on community emergency preparedness and wildfire readiness.	Workshops and/or exercises should review emergency and evacuation protocols, community access/egress and personal emergency preparation resources.	FireSmart Coordinator (Golden Emergency Program Coordinator)	1 year	~20-30 participants per year	UBCM CRI funding available

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timefra me	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
38	High	Promote emergency planning and preparedness of private farmland by hosting a Farm and Ranch Wildfire Preparedness Workshop and through the distribution of the Farm/Ranch Wildfire Plan Guide and Workbook.	Discuss wildfire action planning specifically for farm land through a mix of in-person events and promotional materials.	FireSmart Coordinator (Golden Emergency Program Coordinator)	1 year	~5-10 participants per year	UBCM CRI funding available
39	High	The CSRD and the Town of Golden should continue to review the Golden and Area Emergency Program annually or as needed.	Maintain an up-to-date emergency program in the WUI.	CSRD/City of Golden	Annually	Annual review and renewal of GAEMP Agreement	~12 hours annually in-house
40	High	Promote the Alertable notification software to inform residents of critical-level and advisory-level alerts issued within the area.	Continue to provide information and sign-up capabilities through the CSRD website.	CSRD	1 year then ongoing	Increased knowledge and registration of the Alertable software	$ variable dependent on promotional method
41	Moderate	Develop local daily action guidelines based on expected wildfire conditions.	See Table 24 as an example.	CSRD (Golden Emergency staff)	1 year then ongoing	Daily action guidelines are developed and followed as fire conditions change	~12 hours annually in-house
Vegetation Management (Section 5.7)							
Objective: Reduce the potential wildfire intensity and ember exposure to people, infrastructure, structures, and other values through manipulation of both the natural and cultivated vegetation that is within or adjacent to a community.							
42	High	Host a community yard waste clean-up day. Provide free chipping services and off-site debris removal	This is to remove cost barriers for wildfire fuel reduction on private property. Potential to incorporate clean-up day into the FSCNRP.	CSRD (FLNRORD -	Annual (avoiding the	Prescriptions for high priority units developed	UBCM CRI funding available

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		as incentives to encourage yard waste removal.		Selkirk Forest District)	wildfire season)		~16 hours/year in-house
43	High	Advocate for the inclusion of fuel treatment units proposed in this CWRP in the Wildfire Risk Reduction Program.	Wildfire Risk Reduction projects are completed through the Resource District. Local governments and engaged communities can advocate or submit high priority areas for consideration to the Resource District to be planned and implemented through the WRR program.	CSRD (FLNRORD - Selkirk Forest District)	3 years	CWRP proposed treatment units included in WRR program	Crown Land Wildfire Risk Reduction funding
44	Moderate	As part of implementation of the high-traffic WAIT fuel treatment unit, the CSRD should develop interpretive signage to demonstrate the removal of ladder fuels, surface fuels, and understory conifers, and educate visitors about wildfire risk within the wildland urban interface.	Increase public awareness and support of fuel management practices.	CSRD (FLNRORD - Selkirk Forest District)	3-5 years	Trail-side signs placed in high-public use area, post treatment	Crown Land Wildfire Risk Reduction funding and UBCM CRI funding opportunities

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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
CFS	Community Funding and Support
CI	Critical infrastructure
CRI	Community Resiliency Investment
CSRD	Columbia Shuswap Regional District
CWPP	Community Wildfire Protection Planning
CWRP	Community Wildfire Resiliency Planning
DPA	Development Permit Area
EMBC	Emergency Management British Columbia
FBP	Fire Behavior Prediction System
FCCRP	FireSmart Canada Community Recognition Program
FCNRP	FireSmart Canada Neighbourhood Recognition Program
FCFS	FireSmart Community Funding and Supports
HIZ	Home Ignition Zone
HRVA	Hazard Risk and Vulnerability Analysis
MFLNRORD	Ministry of Forests, Lands, Natural Resource Operations and Rural Development
MOTI	Ministry of Transportation and Infrastructure
PSTA	Provincial Strategic Threat Assessment
PTU	Proposed Treatment Unit
OCP	Official Community Plan
UBCM	Union of British Columbia Municipalities
VAR	Values at Risk
WRR	Wildfire Risk Reduction
WUI	Wildland Urban Interface

SECTION 1: INTRODUCTION

1.1 OVERVIEW

In August 2021, B.A. Blackwell and Associates Ltd. was retained to assist the Columbia Shuswap Regional District (CSRD) in developing a Community Wildfire Resiliency Plan, hereinafter referred to as the CWRP, for an area of interest identified by the CSRD within Electoral Area A. This CWRP assesses that area of interest's eligible wildland-urban interface (WUI) with a focus on integrating the updated Provincial Strategic Threat Analysis (PSTA), updated BC Wildfire Service (BCWS) fuel type mapping, and an improved wildfire threat analysis methodology, all with a focus on the seven FireSmart principles.

Recent wildfire disasters like those experienced in BC (2017, 2018, 2021), California (2017, 2018, 2020), Oregon (2020, 2021), Washington State (2014, 2015, 2016, 2021) and, Fort McMurray, Alberta (2016) all display the vulnerability of communities and the potential toll of wildfires on families, neighbourhoods, public health, and the economy of entire regions. These events, along with important advances in loss prevention programs, have spurred the need for greater consideration and due diligence with respect to fire risk in the WUI.[2] CWRPs are an invaluable opportunity to proactively manage wildfire risk and increase community resilience to wildfire.

1.2 PLAN GOALS

The purpose of this CWRP is to identify and update wildfire risk specific to the WUI, to describe the potential consequences of wildfire to the communities within it, and to examine options and strategies to reduce wildfire risk. This CWRP provides an assessment of the level of wildfire risk to the WUI and frames the current threat to human life, property, and critical infrastructure faced from wildfire. The goal of this CWRP is for it to serve as a framework to inform 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 behavior threat within the communities.

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

1) an assessment of wildfire risk to the communities,
2) an assessment of values at risk and potential consequences from wildfire,

[2] Wildland urban interface is defined as the presence of structures in locations in which conditions result in the potential for their ignition from flames and firebrands/embers of a wildland fire (National Fire Protection Association). More details are in Section 3.1 - Wildland Urban Interface.

3) maps of fuel types and recommended areas for fuel treatments,
4) an assessment of emergency response capacity and community FireSmart status, and
5) options and strategies to reduce wildfire risk in seven FireSmart disciplines: education, legislation and planning, development considerations, interagency cooperation, cross-training, emergency planning, and vegetation management.

CWRPs are funded in BC by the Union of BC Municipalities (UBCM) under the Community Resiliency Investment (CRI) FireSmart Community Funding and Supports Program. As per funding requirements, this CWRP is completed according to the 2021 CRI template.

1.3 CWRP DEVELOPMENT SUMMARY

The CWRP development process consisted of five general phases:

1) Consultation involving key local government representatives, structural and wildfire specialists, and stakeholders, and the formation of the informal Community FireSmart Resiliency Committee (CFRC).
2) Information sharing with First Nations.
3) Review of relevant plans and legislation regarding emergency response and wildfire.
4) Identification of the values at risk and assessment of the local wildfire threat.
5) Developing a Community Wildfire Resiliency Plan with a focus on the seven FireSmart principles.

SECTION 2: RELATIONSHIP TO OTHER PLANS AND LEGISLATION

Wildfire can affect all aspects of a community. As a result, there are many plans that relate to this CWRP. The intent of this section is to review all municipal, regional, and provincial bylaws, policies, plans, and guidelines and identify any sections that are relevant to wildfire emergency planning and response.

2.1 LOCAL AUTHORITY EMERGENCY PLAN

Emergency preparedness and response is guided by higher level emergency management legislation such as the provincial Emergency Program Act.[3] The Emergency Program Act describes the various roles and administrative duties of the province and local governments with regards to emergency, the implementation of higher-level emergency plans, the processes of declaring a state of emergency, and coordinating post disaster relief programs and assistance.

Emergency management within the WUI is provided as a sub-regional service by the Town of Golden (via contract with the CSRD) through the Golden and Area Emergency Management Program Agreement. The emergency program guides emergency planning, response and recovery for the WUI. The agreement is broad in scope, and is supplemented by additional emergency plans. Local emergency management is discussed in further detail in Section 5.6 - Emergency Planning.5.4

2.2 LINKAGES TO CWRPS

CSRD Electoral Area F CWRP 2021

A Community Wildfire Resilience Plan was simultaneously developed for Electoral Area F of the CSRD in 2021 to assist the regional district in identifying wildland fire risks and recommending mitigation actions particular to Electoral Area F. Synergies among the two CWRPs should be reviewed and opportunities for the CSRD to utilize resources to concurrently reduce risk across both Electoral Areas should be identified.

[3] British Columbia Provincial Government. 2020. *Emergency Program Act.* Retrieved from: Emergency Program Act (gov.bc.ca)

2.3 LOCAL BYLAWS

Table 2 contains local policies which are relevant to wildfire risk reduction and emergency response.

Table 2. Summary of CSRD Electoral Area A wildfire and emergency related bylaws

CSRD Electoral Area A Bylaw and Section	Description	Relationship to CWRP
Bylaw 5061: Regional District's Emergency Programs Extended Service Bylaw	Permits emergency management of Electoral Area A to be provided as a sub-regional service.	This bylaw steers how the CSRD delegates CSRD emergency powers and duties for the WUI
Bylaw 5434: Golden and Area Emergency Management Program (GAEMP) Regulatory Bylaw	Permits the CSRD to contract with the Town of Golden for the provision of the Golden and Area Emergency Management Program.	The annual agreement enacts the Town of Golden to extend emergency their emergency management program to service Electoral Area A of the CSRD (including the WUI).
Bylaw 5556: CSRD Community Parks Regulation Bylaw – Section 2 - #3	Mandates fires in Regional Parks; prohibits personal fires in parks except designated park facilities; bans littering flammable material.	Tom Kelley Memorial Park is a regional park in Electoral Area A mandated by this bylaw, this bylaw reduces ignition potential in high-traffic areas in CSRD public land.
Bylaw 5260: Nicholson Suppression Local Service Bylaw	Enacts the Fire Nicolson Volunteer Fire Fighting Department to provide fire suppression and emergency services a Fire Protection Area in Electoral Area A.	The WUI is not included within the Fire Protection Area.
Bylaw 5763: Nicholson Suppression Local Service Bylaw Amendment	A bylaw to extend the Electoral Area A Fire Protection Area.	The WUI is not included within the Fire Protection Area.
Bylaw 5688: CSRD Local Fire Services Advisory Committee	Establishes a Local Fire Services Advisory Committee for CSRD Electoral Areas A, D and E to provide advice on policies related to fire service, promotes fire service opportunities and liaise fire community suppression concerns with the CSRD.	Community members in the WUI can raise suppression issues to the Advisory Committee.

CSRD Electoral Area A Bylaw and Section	Description	Relationship to CWRP
Bylaw 5615: Illegal Dumping Regulations	Regulates public refuse; designates authorized refuse facilities and containers for the disposal and deposit of refuse.	The Golden Resource Recovery & Residual Management Facilities collects waste, and has a resource recovery program that accepts wood waste.
Bylaw 510: Zoning Bylaw	Regulates the zoning and development of property within the municipality.	DPA zones are delineated in the Zoning Bylaw to protect development from hazards. This bylaw is to be updated if a Wildfire Hazard DPA is established within the WUI.

2.4 OTHER LOCAL PLANS

Table 3 contains other local plans and policies which are relevant to the CWRP.

Table 3. Summary of other Local Plans relating to the CWRP

Plan Type	Description	Relationship to CWRP
Wildfire Risk Reduction Tactical Plan for the Golden Area (2021)	A plan administered by MFLNRORD to identify Crown land with hazardous forest stands for potential fuel management planning, treatment and risk reduction activities on provincial crown land.	A significant amount of Crown land within the WUI has been identified for wildfire risk reduction as a result of this plan. Potential fuel treatment units proposed in this CWRP can be lobbied to be included in the wildfire risk reduction program (Section 5.7 - Vegetation Management).
FCCRP Community Wildfire Hazard Assessment (Blaeberry North, Blaeberry South, Donald, Hospital Creek, Moberly)	Community Wildfire Hazard Assessments were completed for the CSRD to evaluate wildfire hazards to communities within Electoral Area A. FireSmart recommendations were made as a result of the assessments.	The Community Wildfire Hazard Assessments informs the CWRP of the level of FireSmart compliance among communities in the WUI and identifies hazardous factors that increase community risk to wildfire.
Golden and Area Emergency Management Program Agreement	Provides emergency planning, mitigation, preparedness and recovery for the Town of Golden and the CSRD Electoral Area A.	The Agreement establishes emergency management and plans to help communities prepare, response and recovery from emergency events such as wildfire.

2.5 LINKAGES TO HIGHER LEVEL PLANS AND LEGISLATION

Table 4 below lists higher-level plans and legislation relevant to wildfire planning and risk mitigation within the CSRD. Fuel management prescriptions and burn plans must also address these plans as they relate to on-the-ground restrictions and policies for forest modification.

Table 4. Higher Level Plans and Relevant Legislation

Issuing Government	Plan/Legislation	Description	Relationship to CWRP
Province of BC	Woodlot License Planning and Practices Regulation	Regulates woodlot licenses and defines mandates of woodlot managers in regards to cutting specifications and environmental disturbance.	11 woodlot licenses are within the WUI.
Province of BC	Selkirk Resource District Wildland Urban Interface Default Stocking Standards	Provides default reduced stocking standards to the WUI to reduce wildfire risk. Woodlot License Plans within the WUI can adopt these standards to achieve fire management objectives.	Since a recent amendment in 2021, these stocking standards now apply to BEC units in this WUI.
Province of BC	Golden Backcountry Recreation Access Plan	Establishes backcountry recreation management guidelines to provide recreation features, facilities and opportunities of provincial public land.	Waitabit Creek Recreation site is within the WUI. A fuel treatment opportunity has been proposed adjacent to the recreation site (Section 5.7 - Vegetation Management).
Province of BC	BC Provincial Open Burning Smoke Control Regulation	Governs open burning relating to land clearing, forestry operations and silviculture, wildlife habitat enhancement, and community wildfire risk reduction.	Approximately three-quarters of the WUI is within high Smoke Sensitivity Zone and one-quarter is within a medium Smoke Sensitivity Zone. Fuel reduction operations must abide by burning regulations during debris disposal.
Province of BC	BC Building Code (2018)	Governs how new construction, building alterations, repairs and demolitions are completed; establishes minimum requirements for safety, health, accessibility, fire/structural protection of buildings and water/energy efficiency.	Applies to the construction and development of residential housing and other community infrastructure within WUI. The Code does not include FireSmart standards, which must be defined at a local level.

SECTION 3: COMMUNITY DESCRIPTION

The area of interest's WUI is within CSRD's Electoral Area A and includes the rural, unincorporated communities of Donald, Blaeberry, Moberly and Hospital Creek north of the Town of Golden. These communities are built along the Golden-Donald Upper Road frontage, which runs parallel to the Trans-Canada Highway. The WUI is characterized by a mix of rural properties, residential neighborhoods and forest tenure, including several woodlots.

The WUI is situated in the Rocky Mountain Trench of the Kootenay Rockies region of BC, resting in the flats of Willowbank Mountain and Moberly Peak. Blaeberry River flows east to west, feeding into the Columbia River. Communities are located on the leeward side of the Kootenay Mountains and experience warm summers with lots of sunshine.

The area has been inhabited by the Ktunaxa Aboriginal Peoples, Secwepemc Shuswap Nations and the Metis Nation since time immemorial. The Tk'emlups te Secwepemc, Splatsin First Nation, Skeetchestn Indian Band, Shuswap Indian Band, Simpcw First Nation, Little Shuswap Lake Band, Adams Lake Indian Band, Ktunaxa Nation Council and Neskonlith Indian Band are among the First Nation governments whose traditional areas include the WUI. No First Nation reserves overlap with the WUI.

The economy of the region was historically driven by logging and trading through the Canadian Pacific Railway. Population spikes accompanied the establishment of the Canadian Pacific Rail route through the Selkirk and Rocky Mountains, now referred to as Rogers Pass. Today, the economy is still heavily influenced by forestry and rail, but development of the Kicking Horse Mountain Resort, along with other outdoor adventure companies, has helped grow the tourism industry. The majority of residents within the WUI work beyond it.

Population and economic trends for the WUI are difficult to accurately quantify as it encompasses a small portion of the large electoral area. However, population and economic trends for the entire electoral area can help predict tendencies. Electoral Area A's population has had very little change in recent years, with a 2.7% increase between 2011 and 2016. New development and subdivision of private property, particularly in the Moberly community, is currently in progress, but the population is expected to experience a continued slow growth. Relevant socio-economic statistics for CSRD Electoral Area A are shown below in Table 5.

Table 5. CSRD Electoral Area A Socio-Economic Statistics

Metric	Value
Total Population	3,148
Population Density (people/km^2)	0.2

Median Age (years)	46
Housing Units	1,075 Single Detached
	215 movable dwelling
	45 apartments
	15 semi-detached houses
	5 row houses
Median Home Value ($)	348,808
Median Household Income ($)	68,448
Unemployment Rate	13.4
Employment Rate	62.9

Services to residents are provided both at the regional and the local level through the municipality of Golden. The regional government provides land use planning, weed control, building regulation and inspection, recycling, bylaw enforcement, mosquito control, noxious weed control, mapping, street lighting, and recreation services. The WUI is within the Interior Health Authority. Golden and District Hospital, a Level 1 Community Hospital offering inpatient, obstetrics and 24/7 emergency care[4] and located in Golden, is the closest hospital to the WUI.

[4] Interior Health. 2021. *Golden & District Hospital*. Retrieved from: Information Page (interiorhealth.ca)

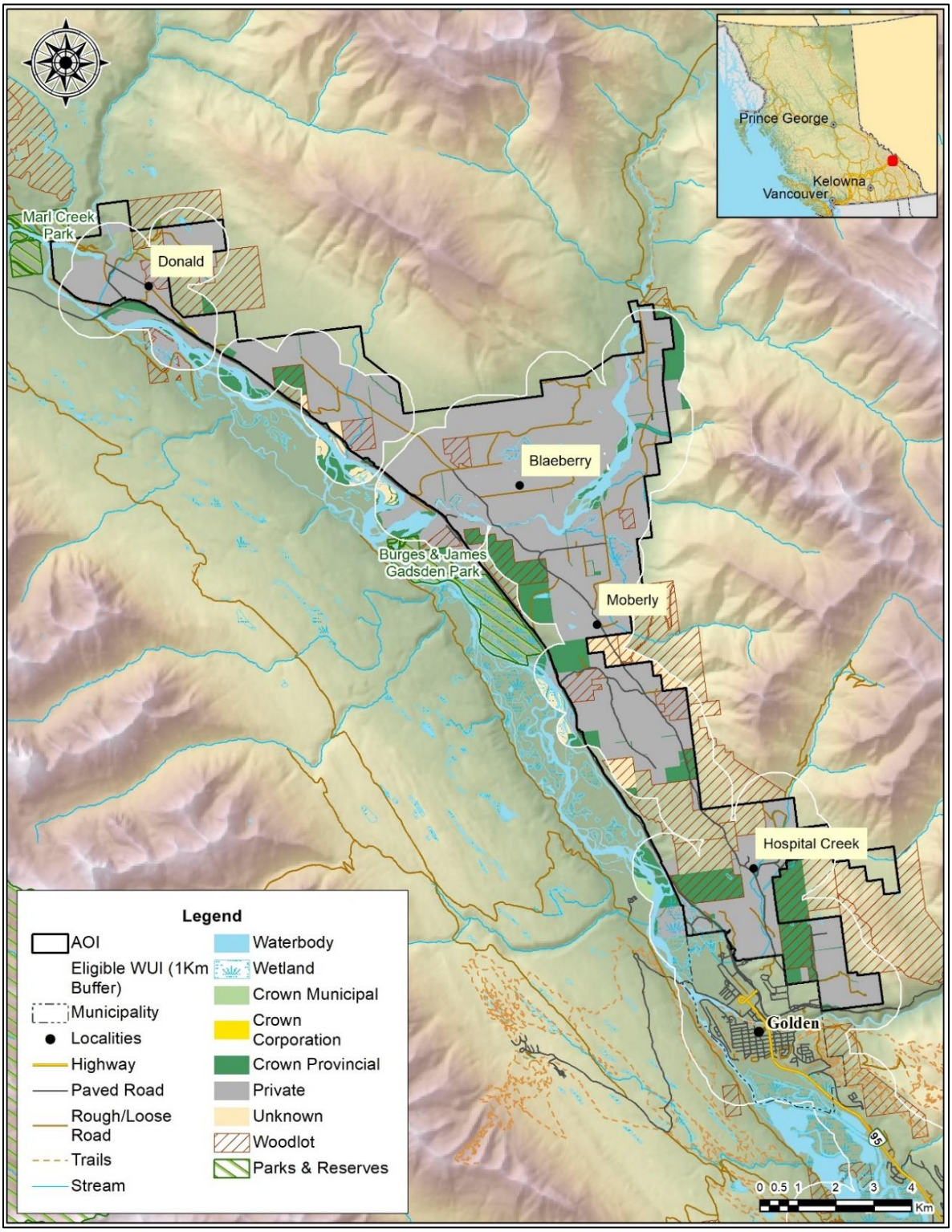
3.1 WILDLAND URBAN INTERFACE

The wildland urban interface (WUI) is defined by FireSmart Canada as the zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. The 'eligible WUI' represents a one-kilometer buffer around a structure density of 6+ structures/km^2 within the area of interest and defines the focus of this CWRP – a total of 10,702 hectares.

A breakdown of the area by ownership type is provided in Table 6. More than half of the land is private (66%), consisting mostly of large, forested acreages. Approximately one third of the land area is Crown Provincial. The AOI, WUI, land ownership types and managed licenses are illustrated in Map 1.

Table 6. Land Ownership within the WUI

Land Ownership	Area (Ha)	Percentage of WUI
Crown Corporation	1.4	<1%
Municipal	38.5	<1%
Crown Provincial	3,227.1	30%
Private	7,101.5	66%
Unknown	293.8	3%
Crown Corporation	1.4	<1%



Map 1. CSRD Electoral Area A CWRP AOI and WUI

3.2 VALUES AT RISK

Values at risk are human and natural resources that may be impacted by wildfire and include human life and property, critical infrastructure, high environmental and cultural values, and other resource values. Protection of values at risk during a wildfire event is an important consideration for emergency response effectiveness, ensuring that coordinated evacuation can occur if necessary and that essential services can be maintained and/or restored quickly in the case of an emergency. This section outlines critical infrastructure and resource values in the WUI.

3.2.1 CRITICAL INFRASTRUCTURE

Critical infrastructure are assets essential for the functioning of government and society, namely, water, food, transportation, health, energy and utilities, safety, telecommunications and information technology, government, finance, and manufacturing.[5]

Many cellular communication, OPS repeaters and broadcasting towers are owned and operated by different telecommunication providers throughout the WUI. Of note, due to their location at the very edge of the WUI or within forested areas are a hot box tower operated by the Railway Association of Canada, a safety repeater owned by a private adventure company and two CSRD-owned communication towers.

Hot box detectors are railway safety features that detect overheating wheel bearings. They alert railway traffic control and train crews of unsafe travel temperatures, helping to prevent accidental fire ignitions. Since railroads are potential ignition sources affecting the WUI, this communication infrastructure is a particularly important wildfire safeguard.

Other critical infrastructure in the WUI include bridges, rail crossings and a CSRD operated landfill and transfer station. The only critical assets operated by the CSRD are the aforementioned communication towers and landfill and transfer station. Critical infrastructure within the WUI are listed in Table 7 and shown in Map 2. See Section 5.3 - Development Considerations for recommendations regarding the protection critical infrastructure from wildfire.

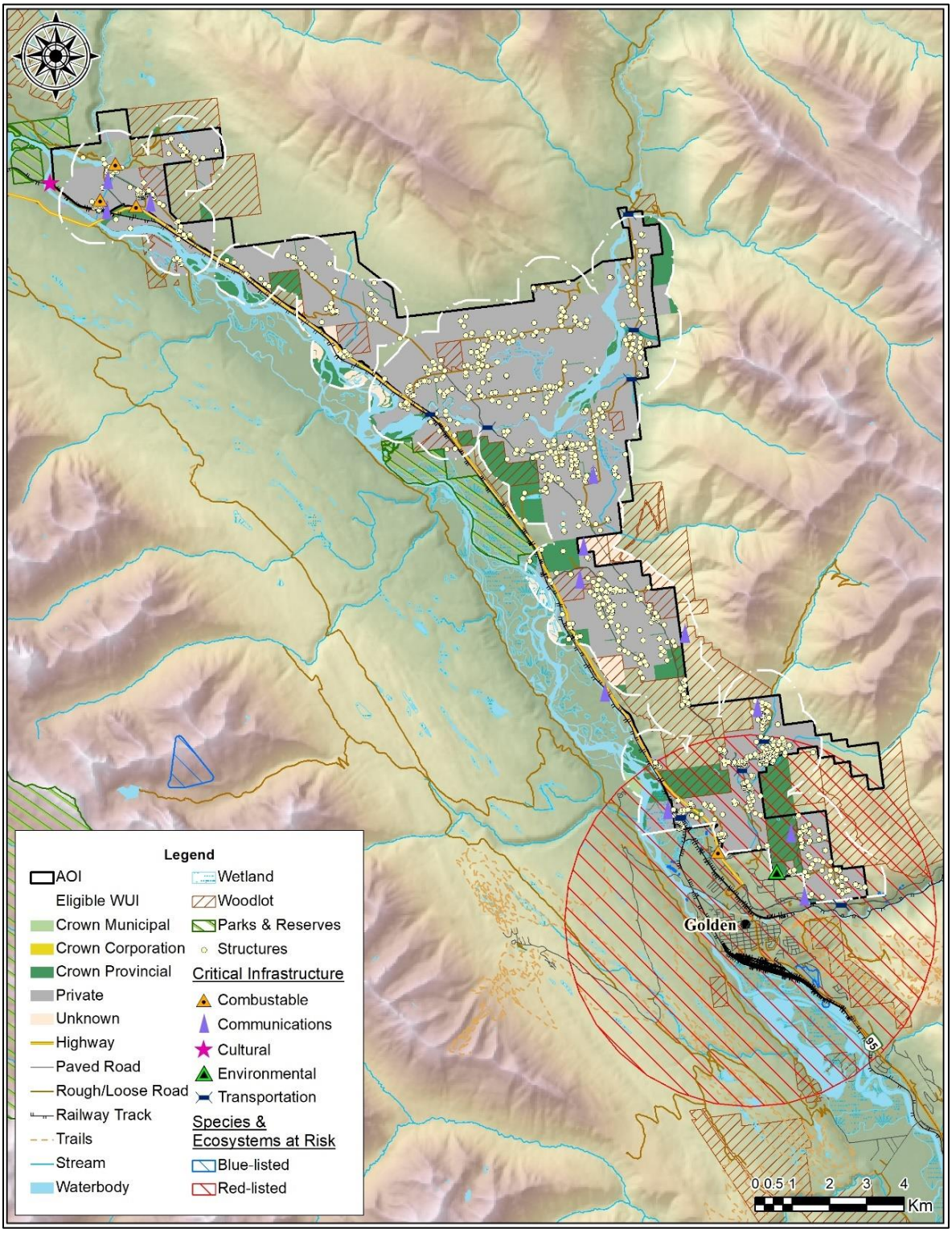
[5] Government of Canada. 2021. *National Strategy for Critical Infrastructure*. Retrieved from: National Strategy for Critical Infrastructure (publicsafety.gc.ca)

Table 7. Critical Infrastructure in the WUI

Type	Name	Jurisdiction	Address	Risk & Resilience Factors[6]
Tower	Golden East BC (Hot Box Detector)	The Railway Association of Canada	Highway 1, V0A 1H1	Forest Intermix
Tower	Donald Station	Columbia Electoral Area 'A' Television Rebroadcasting Society	Donald Road, V0A 1H0	Surrounded by non-fuel (built up), but within wood mill perimeter
Tower	Donald Communications Tower	TELUS Communications Inc.	Big Bend Highway, V0A 1H1	Forest Interface
Tower	Safety/OPS Repeater	Mistaya Alpine Tours	1740 Sward Front Road	Forest Interface
Tower	Safety/OPS Repeater	Bradley McLaren Wet N' Wild Adventures	1509 Lafontaine Road	Forest Intermix
Tower	Safety/OPS Repeater	Kicking Horse Mountain Resort	Oster Road, V0A 1H1	Forest Interface
Tower	Safety/OPS Repeater	Campbell Icefield Chalet	1360 Adolph Johnson Road	Forest Interface
Tower	Safety/OPS Repeater	Purcell Helicopter Skiing	438 Lafontain Road	Forest Interface
Tower	Broadcasting Tower	CBC/ Radio-Canada	Highway 1, V0A 1H1	Forest interface, wood mill perimeter
Tower	Broadcasting Tower	CSRD Electoral Area A Television Rebroadcasting Society	V0A 1H0	Forest Intermix
Tower	Broadcasting/Analog TV Tower	Columbia Electoral Area 'A' Television Rebroadcasting Society	V0A 1H0	Forest Intermix
Cultural	Donald Cemetery	N/A	Donald Cemetery Road, V0A 1H1	Forest Intermix
Landfill and Transfer station	Golden Resource Recovery & Residual Management Facility	CSRD	350 Golden Donald Upper Rd	Forest Interface
Bridge	Hospital Creek/Golden Bridge	Provincial	Upper Donald Road, V0A 1H1	Surrounded by non-fuel
Bridge	Hedgeberg Creek Bridge	Provincial	Blaeberry Road, V0A 1H1	Forest Intermix
Bridge	Oster Bridge	Provincial	Oster Road, V0A 1H1	Surrounded by non-fuel
Bridge	Widene Creek Bridge	Provincial	Blaeberry Road, V0A 1H1	Surrounded by non-fuel
Bridge	Redburn Bridge	Provincial	Blaeberry Road, V0A 1H1	Forest Intermix
Bridge	Blaeberry Upper Bridge	Provincial	350 Golden Donald Upper Rd	Forest Intermix

[6] Critical infrastructure FireSmart Assessments were outside of the scope of this plan; factors are based on general location or community function

Bridge	Anderson Road Bridge	Provincial	Anderson Road, V0A 1H1	Surrounded by non-fuel
Rail Crossing	Blaeberry River Bridge	Provincial	Highway 1, V0A 1H1	Surrounded by non-fuel
Bridge	Golden Hill Wildlife Bridge	Provincial	Highway 1, V0A 1H1	Forest Interface
Rail Crossing	Anderson Rail Crossing	The Railway Association of Canada	Anderson Road, V0A 1H1	Surrounded by non-fuel



Map 2. Values at risk in the WUI

3.2.2 ELECTRICAL POWER

A large fire has the potential to disrupt electrical service distribution through direct or indirect processes. For example, heat from flames or fallen trees associated with a fire event may cause power outages. BC Hydro serves electrical power to the WUI through a network of street-side wooden pole distribution lines sourced from the GDN Substation located in Golden. This system is well-mapped, and in the event of a wildfire BC Hydro will work with local and provincial emergency responders and employ their emergency response protocols.[7]

BC Hydro controls vegetation ingress along powerlines to maintain reliable electricity distribution and to reduce the risk of fire ignition from vegetation contact.[8] Side-street wooden poles that connect to homes are particularly vulnerable to fire. Encroachment of vegetation along distribution lines and wooden-poles was observed during CWRP fieldwork, notably along Upper Golden- Donald Road. See Section 5.4 - Interagency Cooperation for recommendations for safeguarding power lines from fire ignition and to help prevent power-outages across the WUI.

3.2.3 WATER AND SEWAGE

The functionality of critical water and sewage infrastructure can be impacted by an interface wildfire event as a result of emergency power cuts or physical damage. Infrastructure may be located in forested or interface areas near water sources, which increases their vulnerability. There is no CSRD water nor sewage systems in the WUI. Residents have private groundwater wells, some surface water intakes and employ private, on-site septic tank systems to store and treat sewage.

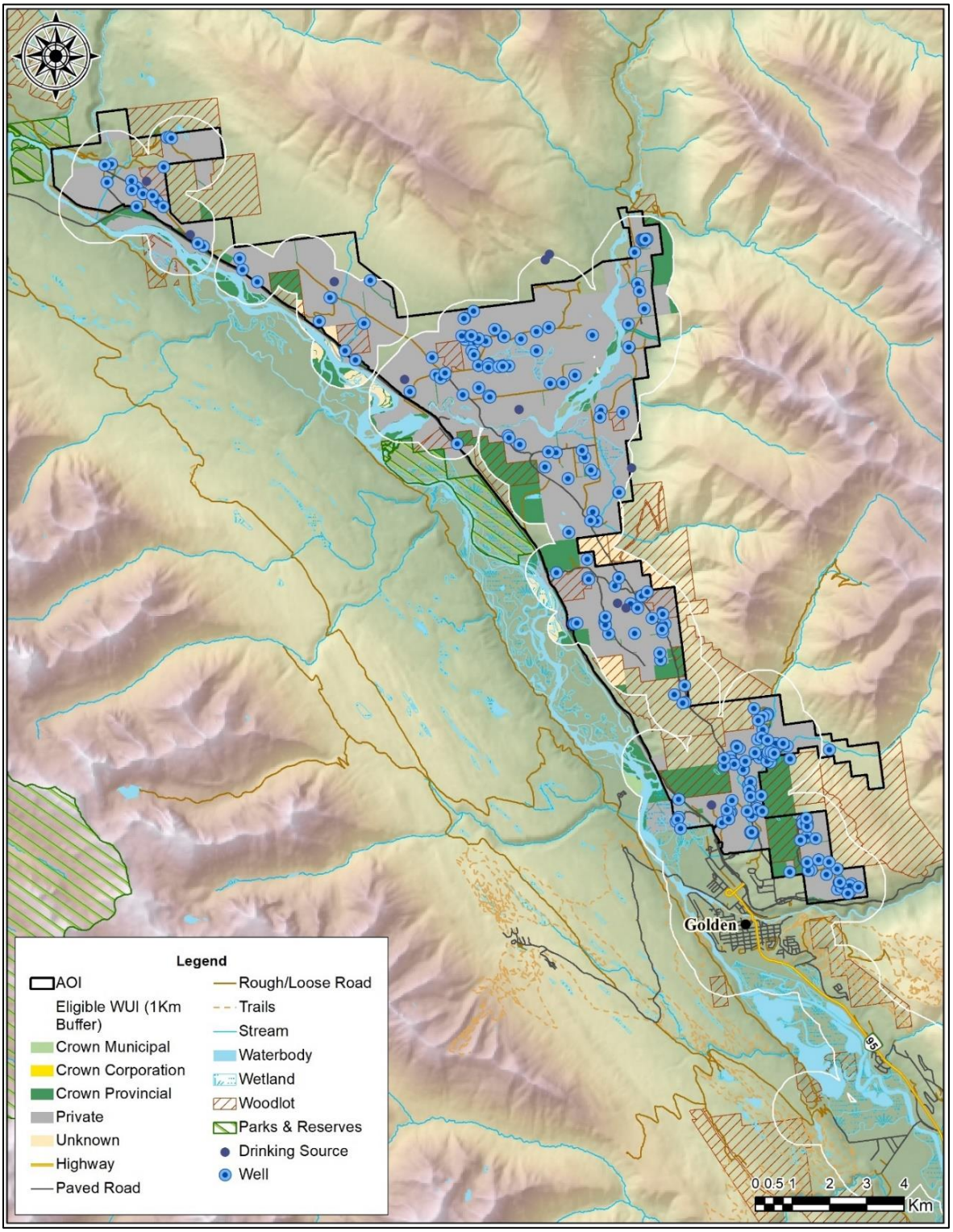
Natural surface water sources are present throughout the WUI and are the only available water sources, other than shuttling water from outside of the WUI, for fire suppression. The largest and most reliable water supply in the WUI is the Blaeberry River. Waitabit Creek and Hospital Creek as well as many smaller creeks and ponds are also present, but seasonal water deficits typically result in low water levels during the wildfire season. Water supply sources are listed in Table 8 and shown below in Map 3. See Section 5.3 - Development Considerations for recommended actions to improve water availability for fire suppression purposes.

[7] BC Hydro. 2020. *Earthquakes, wildfire, and floods.* Retrieved from: Earthquakes, wildfires, and floods (bchydro.com)

[8] BC Hydro. 2016. *Integrated Vegetation management Plan for BC Hydro transmission and Distribution Power Line Corridors*. Retrieved from: Integrated Vegetation Management Plan for Control of Vegetation Within Transmission Rights of Way (bchydro.com)

Table 8. Drinking sources in the WUI

Name	Location
Sorensen Spring	51°29'36.6"N, 117°09'39.9"W
Milum Spring	51°28'50.2"N, 117°08'55.3"W
Wyssen Brook	51°27'42.6"N, 117°00'12.8"W
Jones Creek	51°27'46.9"N, 117°05'38.4"W
Berglind Spring	51°26'16.5"N, 117°04'15.0"W
Skyberg Creek	51°24'44.0"N, 116°59'20.8"W
Moberly Creek	51°22'39.8"N, 117°00'03.8"W
Moberly Creek	51°22'35.4"N, 116°59'50.1"W
Whipple Creek	51°22'30.1"N, 116°58'57.3"W
Limekiln Creek	51°19'35.2"N, 116°58'24.0"W
Polecabin Creek	51°27'32.2"N, 117°00'28.0"W
Lander Brook	51°25'38.9"N, 117°01'42.8"W



Map 3. Water infrastructure in the WUI

3.2.4 HAZARDOUS VALUES

Hazardous values are infrastructure that pose a safety hazard to emergency responders and include large propane facilities, landfills, rail yards, storage facilities containing explosives, pipelines, etc. Anywhere combustible materials, explosive chemicals, gas, or oil is stored can be considered a hazardous value. Protecting hazardous values from fires is important to preventing interface fire disasters.

Several forestry infrastructures are present in the Donald. These hold large amount of fuel that can be ignited in a wildfire event. WR Wood Products operates a large lumber mill with associated log and lumber storage, and wood waste storage facilities. A retired lumber mill is also present, with neglected facilities, log stacks and wood waste remaining on the property.

Railroads running through the WUI are possible sources of accidental fire ignition. In addition to temperature monitoring, CP Pacific employs wildfire mitigation strategies through vegetation management, track soaking and increased track patrols during the wildfire season.[9]

The only hazardous infrastructure under the jurisdiction of the CSRD is the Golden Resource Recovery & Residual Management Facility. Residential refuse for the WUI is collected at the landfill. Hazardous and combustible materials accepted at the transfer station include propane tanks, household hazardous waste, yard trimming and batteries.

Table 9. Hazardous Infrastructure within the WUI

Type	Name	Jurisdiction	Location	Risk & Resiliency Factors
Wood mill	WR Wood Products Mill	WR Wood Products	2986 Golden Donald Upper Road	Forest Interface
Log Dump	N/A	N/A	Big Bend Highway	Forest Intermix
Retired Wood Mill	N/A	N/A	Reeves Road	Forest Interface
Landfill and Transfer station	Golden Resource Recovery & Residual Management Facility	CSRD	350 Golden Donald Upper Rd	Forest Interface
Railroad	Railway Tracks	CP Rail	Adjacent to the Trans-Canada Highway (Highway 1)	Forest Interface and intermix

[9] Canadian Pacific. 2021. *CP statement on TSB investigation update concerning fire in Lytton, B.C.* Retrieved from: CP statement on TSB investigation update concerning fire in Lytton, B.C. (cpr.ca)

3.2.5 CULTURAL VALUES

Cultural values have the potential to be impacted by wildfire or wildfire suppression activities through physical damage or alteration. There are many documented historic and archeological sites within the WUI and a high potential for additional sites to be found given the long history of use by the Ktunaxa Aboriginal Peoples, Secwepemc Shuswap Nations and the Metis Nation. Known archeological sites are protected under the Heritage Conservation Act, which applies on both private and public lands.

Prior to stand modification for fire hazard reduction, archeological assessments may be required to ensure that known or unknown cultural resources are not inadvertently damaged or destroyed, and that First Nations strategies for land management in their traditional territory are complied with. Fuel treatment activities must include consultation with all identified First Nations at the site level and with sufficient time for meaningful review and input regarding their rights and interests prior to prescription finalization or implementation.

3.2.6 HIGH ENVIRONMENTAL VALUES

The Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*) is a red-listed species at risk identified through the B.C. Conservation Data Center that has been specifically observed and recorded within the WUI (shown on Map 2). Through consultation with the Conservation Data Center and a biologist or qualified professional, all site-level operational plans must identify and mitigate potential impacts to overlapping species at risk and may require rationales and/or mitigation measures for harvesting in some areas.

3.2.7 OTHER RESOURCE VALUES

There are multiple resource values associated with the WUI, including forestry, recreation, and tourism. Any fuel management activity within the WUI should consider the impact on future timber supply and consult with licensees and land managers operating in the area.

The Waitabit Creek Recreation Site is a popular summer camping site in the WUI. Campfires in the recreation site present an increased risk of accidental wildfire ignition and six human-caused fire ignitions have been recorded at the recreation site since 2012. Juniper (*Juniperus communis)* is scattered throughout, often within a few meters of campfire pits. Juniper is among the most volatile shrubs, with highly flammable aromatic and oily foliage.[10] The recreation site follows provincial campfire regulations, fire bans and restrictions and has fire information signage posted at the entrance and throughout the site. Other recreation opportunities available in the WUI include the Northern Lights Wolf Centre, the Golden

[10] FireSmart BC. *FireSmart BC Landscaping Guide*. Retrieved from: FireSmartBC_LandscapingGuide_Web_v2.pdf

Skybridge and numerous short-term rental cabins. Section 5.4 - Interagency Cooperation and Fuel management activities to 5.7 - Vegetation Management contain recommendations related to the Waitabit Creek Recreation Site.

SECTION 4: WILDFIRE RISK ASSESSMENT

This section summarizes the factors that contribute to local wildfire risk in the WUI. Section 0 discusses the wildfire environment: topography, fuel, and weather and includes climate change projections affecting the wildfire environment of the area. Section 4.2 discusses wildfire history of the region. Section 4.3 describes the analysis used to classify the local wildfire threat and WUI risk for the WUI. Section 4.4 overviews how wildfire risk can be incorporated in Hazard, Risk and Vulnerability Assessments.

The local wildfire risk assessment helps to identify the parts of the WUI that are most vulnerable to wildfire so that wildfire risk reduction actions can be implemented effectively.

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

Wildfire Risk = Consequence X Probability

Where:

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, 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 then consume fuel on the landscape – its *wildfire threat*. Wildfire threat is driven by three major components of the wildfire environment:

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

These components are generally referred to as the 'fire behaviour triangle' (the ways in which they individually influence the wildfire environment of the WUI will be detailed below). Fuel is the only component of the fire triangle that can be managed.

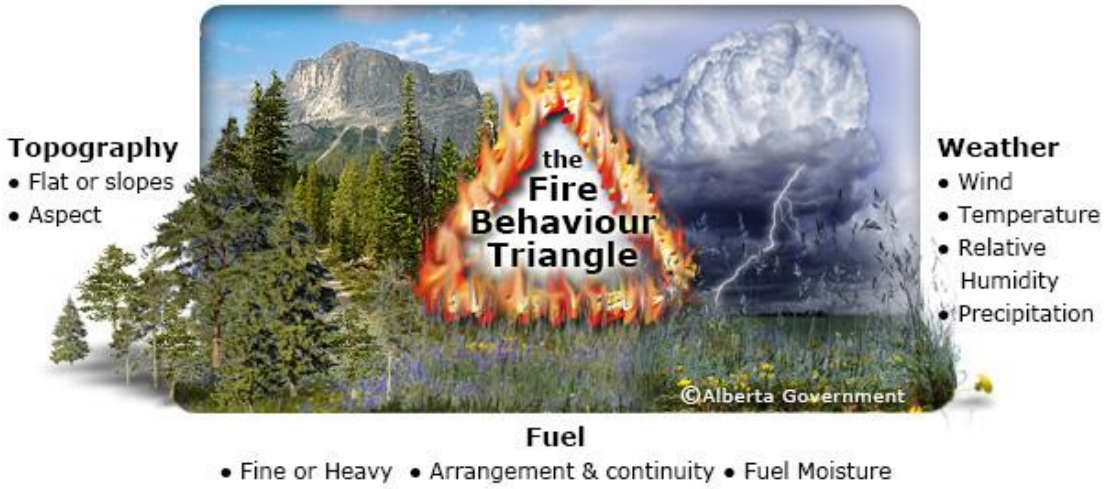


Figure 1. Graphic display of the fire behviour triangle, and a subset of characteristics of each component[11]

[11] Province of Alberta. *The Fire Behvaiour Triangle*. Retrieved from: Discussion | Forest Fire Model (ubc.ca)

4.1 WILDFIRE ENVIRONMENT

4.1.1 TOPOGRAPHY

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

Communities in the WUI are generally situated on flat or gently rolling terrain at valley bottom which reduces the threat of fire spreading from below into the community. An exception to this is the Trans-Canada Highway and railway, both potential ignition sources, and both are downslope of communities. Local BCWS staff commented that the steep-sided right-of-way of the highway provides convective features for fast-spreading fire upslope from it. BCWS also expressed concern that the grassy surface fuels present along the sloped right-of-way are highly volatile (when dry) and can accelerate fire spread rates.

Table 10 shows the percent of the WUI by slope percent class and those classes fire behaviour implications. The majority of the WUI (76%) is on less than 20% slope and will likely not experience accelerated rates of spread due to slope class. 17% of the WUI is likely to experience an increased or high rate of spread, and 7% is likely to experience a very high or extreme rate of spread.

Table 10. Slope Percentage and Fire Behaviour Implications.

Slope	Percent of WUI	Fire Behaviour Implications
<20%	76%	Very little flame and fuel interaction caused by slope, normal rate of spread.
20-30%	11%	Flame tilt begins to preheat fuel, increase rate of spread.
30-40%	6%	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
40-60%	4%	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	3%	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

When slope percentage is considered in context with a value's slope position (summarized below in Table 11), that value's risk to increased fire behaviour can change dramatically. For instance, a value located in the upper 1/3 of a steep slope (>40% inclination) will be exposed to fires downslope travelling very quickly uphill towards it and be impacted by preheating and thus faster rates of fire spread. Managing fuel

downslope of homes and structures would typically reduce wildfire risk to those values more so than managing fuel upslope of them.

Table 11. 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 increase 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.

4.1.1 FUEL

Although fuel structure varies throughout the WUI, forest cover continuity does not. This is a major risk factor. An exception to this is cleared, irrigated lawns and farmland of some large properties (typically in Blaeberry and Donald), where threat is the attributed to cured grass. Values at risk are generally surrounded by conifer forest on three or four sides.

The Canadian Forest Fire Behaviour Prediction (FBP) System outlines sixteen fuel types based on characteristic fire behaviour under defined conditions.[12] BCWS maintains a provincial fuel type layer that was confirmed and updated for this CWRP. This system has been successfully used within BC, with continual improvement and refinement, for 20 years.[13] Detailed fuel type descriptions and their associated wildfire risk can be found in Appendix A: Local Wildfire Risk Process.

The fuel types present that are considered most hazardous in terms of fire behaviour are C-2 and C-3 (C-2 and C-3 were assigned to immature conifer-dominated stands). An M-1/2 fuel type can sometimes be considered hazardous, depending on the proportion of conifers within the forest stand. A C-7 (assigned to more mature and open forest stands) or O-1b (grasslands) fuel type often can support a rapidly

[12] Forestry Canada Fire Danger Group. 1992. *Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.* Retrieved from: Development and structure of the Canadian Forest Fire Behavior Prediction System | Canadian Forest Service Publications | Natural Resources Canada (nrcan.gc.ca)

[13] Perrakis, D, G. Eade and D. Hicks. 2018. *Canadian Forest Service Pacific Forestry Centre. British Columbia Wildfire Fuel Typing and Fuel Type Layer Description.* Retrieved from: British Columbia Wildfire Fuel Typing and Fuel Type Layer Description. | Canadian Forest Service Publications | Natural Resources Canada (nrcan.gc.ca)

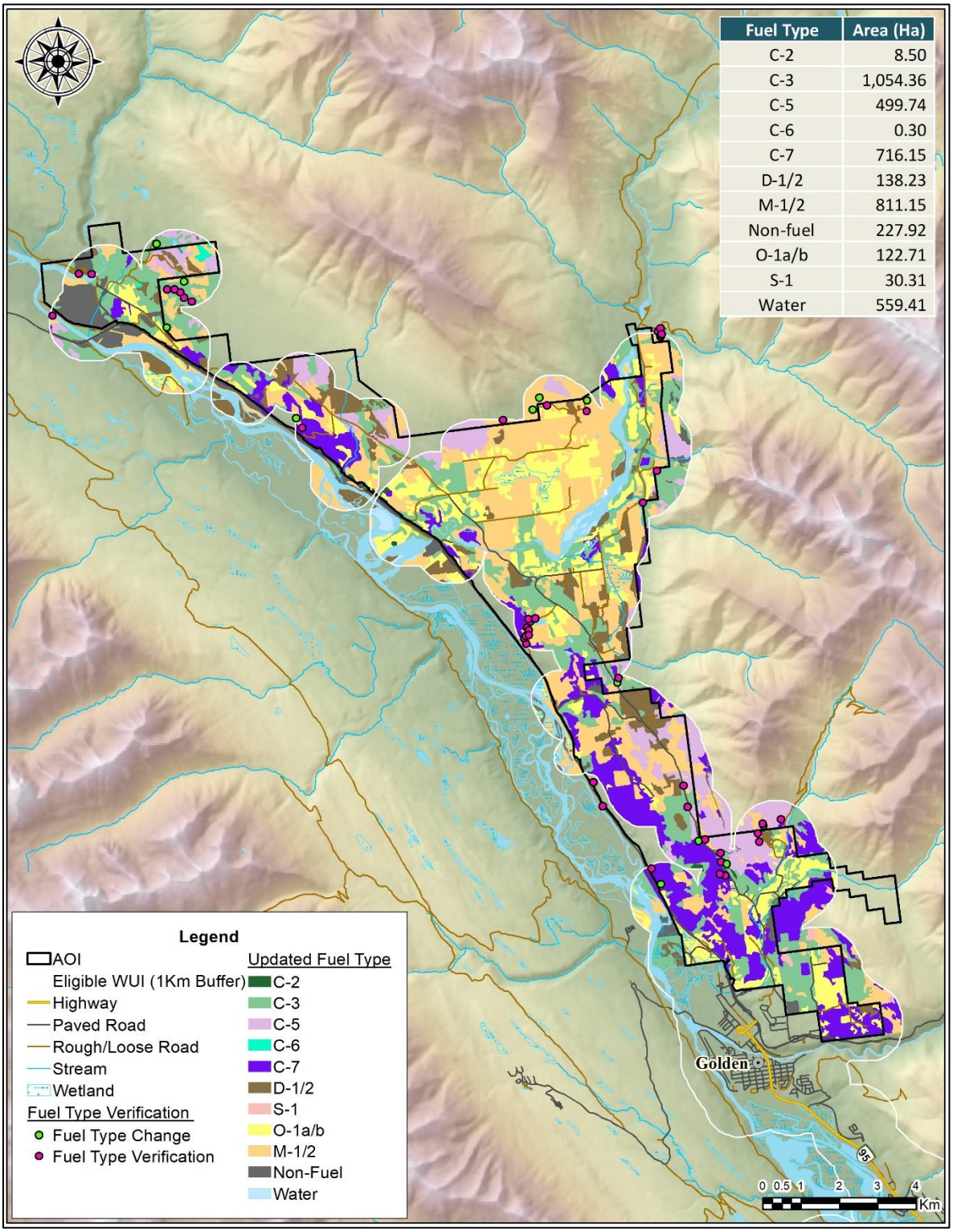
spreading grass or surface fire capable of damage or destruction of property, and jeopardizing human life, although it is recognized as a highly variable fuel type dependent upon the level of curing.[14] Riparian areas (e.g., Blaeberry River) are dominated by D-1/2 fuel types. M-1/2 'mixedwood' fuel types were assigned to planted cutblocks (5 - 25 years old). Where fuel types could not be updated from imagery with a high level of confidence, the original PSTA fuel type call was retained. Table 12 lists the percentage of fuel types in the WUI and updated fuel types are shown on Map 4. Detailed fuel type descriptions and their associated wildfire risk can be found in Appendix A-1: Fuel Typing Methodology and Limitations.

It is important to note is that fuel type on private land cannot be classified and has been left out of this analysis. This is a major limitation to the analysis since private land encompasses a large part (66%) of the WUI and is mainly grassland or continuous forest cover.

Table 12. Fuel types in the Wildland Urban Interface

Fuel Type	Provincial Fuel Type 2021: % of Public Land	CWRP 2021: % of Public Land
C-2	1%	<1%
C-3	18%	25%
C-5	14%	12%
C-6	1%	1%
C-7	19%	17%
D-1/2	10%	3%
M-1/2	13%	20%
Non-fuel	3%	5%
O-1a/b	8%	3%
S-1	1%	1%
S-3	1%	0%
Water	12%	13%

[14] Regional BCWS representatives indicated that the most volatile fuel type in the WUI O1b (cured grass) in the spring.



Map 4. Updated fuel types in the WUI

4.1.2 WEATHER

It is important for the development of appropriate prevention programs that the average exposure to periods of high fire danger is determined. 'High Fire Danger' is considered as Canadian Forest Fire Danger Rating System (CFFDRS) Danger Class ratings of 4 (High) and 5 (Extreme). Danger class days were summarized to indicate the fire weather for the WUI. Considering that fire danger varies from year to year, historical weather data can provide information on the number and distribution of days when the WUI is typically subject to high fire danger conditions, which is useful information in assessing fire risk.

Figure 2 below displays the average frequency of danger class days summarized from the Blaeberry BCWS weather station, located within the WUI, 300 m south of Blaeberry School Road at an elevation of 861 m. The weather station provides a 10-year fire weather data collection interval between the months of April and October. Historically, fire weather in the WUI is highest from July to August. 25 of the 62 days (40%) over those two months are either 'moderate' or 'high' danger class days. August has the most severe fire weather with 10 'moderate' and four 'high' fire weather days. There are historically one to six 'moderate' or 'high' danger class days in April, May, June, and September respectively, demonstrating the potential for ignitions during warm and dry periods during those months.

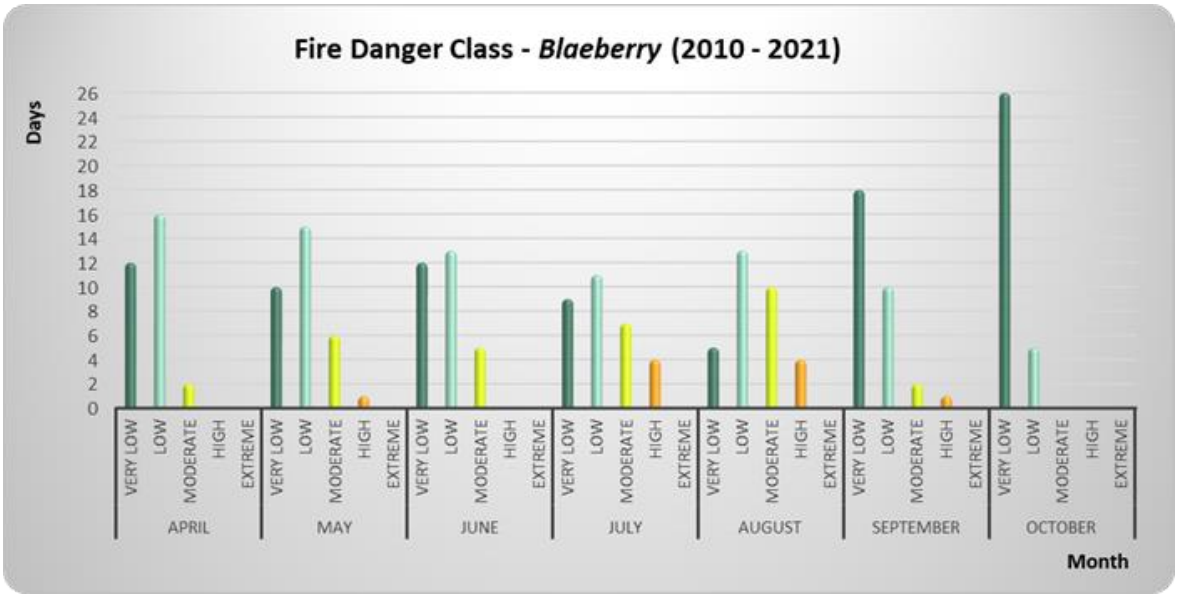


Figure 2. Average number of danger class days for the Blaeberry fire weather station. Summary of fire weather data for the years 2010-2020

Hourly wind speed and direction is also recorded at BCWS stations and made publicly available in the form of average Initial Spread Index (ISI) roses.[15] The Initial Spread Index (ISI) is a numeric rating of the expected rate of fire spread that combines the effects of wind speed and fine fuel moisture (controlled by temperature and relative humidity). ISI roses were used to help plan the location of proposed fuel treatments on the landscape to protect values at risk based on the predominant wind direction and frequency of higher ISI values. Wildfire that occurs upwind of a value poses a more significant threat to that value than one which occurs downwind.

During the fire season (April – October), prevailing winds originate from multiple directions, but seldom from the north (Figure 3). Winds are generally strongest in the south and west. Monthly data shows that July and August are peak months with strong winds (high ISI values) occurring 12% of the time (Figure 4Figure 4). Predominant winds appear to slightly ease in October. Hourly data (not displayed) shows that wind speeds peak from around noon to six pm, remaining strong into the evening and tapering off after midnight.

[15]Province of British Columbia. *Tools for Fuel Management*. Retrieved from: https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/vegetation-and-fuel-management/fire-fuel-management/fuel-management

Local BCWS staff noted that high winds in April and volatile grassy fuels pose a wildfire risk within the WUI. Open burning generally occurs during this month, increasing ignition risk factors until green-up occurs.

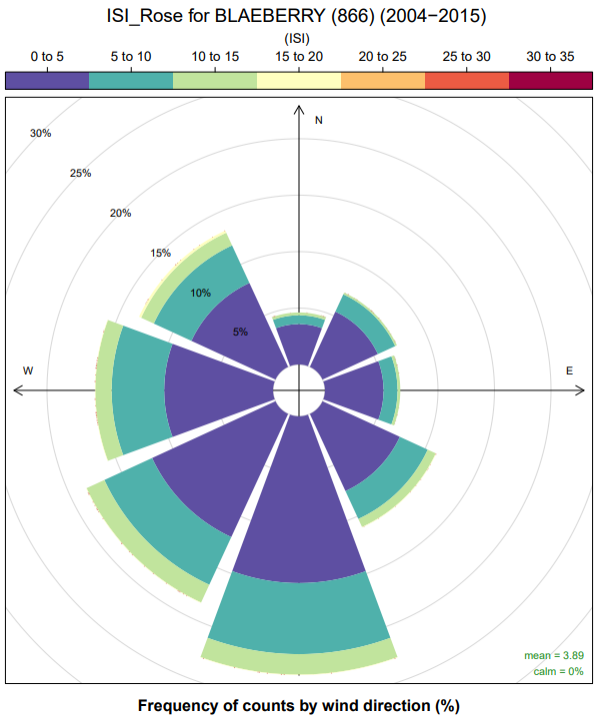


Figure 3. Average daily ISI Rose tendencies during wildfire season

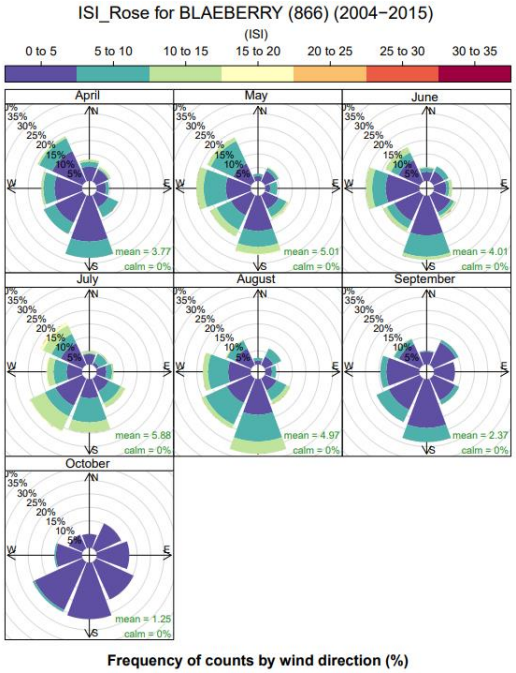


Figure 4. ISI Roses depicting average daily wind speed and direction for each month during the fire season (April – October). Data taken from the Blaeberry fire weather station 1996 – 2015

Climate Change

Climate change is a serious and complex aspect to consider in wildfire management planning. Numerous studies outline the nature of climate change impacts on wildland fire across Canada, and globally.[16] 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 is expected to be altered significantly with the changing climate.[17] Despite the uncertainties, trends within the data are visible.

The following climate predictions are made for the Kootenay Boundary Region[18] (2050s projected values, compared to a 2016 baseline average):

- Increased average temperature potential (1.9°C increase),
- Increased average summer temperature potential (2.4°C increase),
- Longer growing seasons (increase of 24 frost-free days, increase of 295 growing degree days),
- Variability in precipitation (10-25% increase in spring, fall and winter months, 30% decrease in summer months),

Climate scientists expect that the changing global climate will trend towards wildfires that are increasingly larger, more intense, and difficult to control; it is likely that these fires will be more threatening to the communities within the WUI due to increased potential fire behaviour, fire season length, and fire severity. An increased frequency of wildfire disturbance events is expected to occur in the region because of climate change projections. These include:

- Longer wildfire seasons and more frequent and severe wildfires,
- Increase of catastrophic fires in moist ecosystems with dense forest types and high fuel loading,
- Increased heat and moisture stress on vegetation,
- Earlier melt and reduced snowpack resulting in increased drought and fire probability and,
- Frequent and severe storms which will increase blowdown.[18]

[16] Flannigan, M.D et al. 2009. *Implications of changing climate for global wildland fire.* International Journal of Wildland Fire 18, 483-507

[17] Dale, V., L. Joyce. S. McNulty, R. Neilson, M. Ayres, M. Flannigan, P. Hanson, L. Irland, A. Lugo. C. Peterson, D. Simberloff, F. Swanson, B. Stocks, B. Wotton. 2001. *Climate Change and Forest Disturbances*. BioScience 2001 51 (9), 723-734

[18] Government of BC. 2016. *Adapting natural resource management to climate change in the Kootenay Boundary Region: Considerations for practitioners and Government Staff*. Retrieved from: kbren160222.pdf (gov.bc.ca)

4.2 WILDFIRE HISTORY

4.2.1 HISTORIC FIRE REGIME

Biogeoclimatic (BEC) zones have been used to classify BC into five Natural Disturbance Types (NDTs). The NDT classification is based on the frequency and severity of pre-European disturbance events (including, but limited to, wildfires) and indicates historical fire regimes.[19]

While natural disturbance regimes are useful for describing the historical disturbance pattern typical for an area, fire history is complex and highly variable across space and time for many ecosystems.[20] Forest health issues, development patterns, and natural events contribute to changes in the fire regime, forest attributes, and fuel hazard around the community. Table 13 below details the NDTs (and their associated BEC Zones) present in the WUI.

Table 13. Natural disturbance types biogeoclimatic zones and in the WUI

Natural Disturbance Type	Biogeoclimatic Zone	Area (ha)	Percent
NDT3	ESSFdk2: Engelmann Spruce - Subalpine Fir, Dry Cool, ICHmk4: Interior Cedar - Hemlock, Moist Cool, MSdk2: Montane Spruce, Dry Cool	8,437.9	81%
NDT2	ICHmw1: Interior Cedar - Hemlock, Moist Warm	402.9	4%
NDT4	IDFdk5: Interior Douglas-fir, Dry Cool	1,527.7	15%

81% of the WUI is characterized as NDT3, attributed to forest ecosystems with frequent stand-initiating events. Historically, wildfires occurring in these areas ranged in size from small spot fires to conflagrations covering tens of thousands of hectares and resulted in a landscape mosaic of stands of different ages with individual stands being even-aged. The mean return interval for fires and disturbances in the NDT3 has generally been 150 years.

15% of the WUI is represented by NDT4; grasslands, shrubland and forest ecosystems that frequently experience low intensity fires creating uneven-aged forest stands that are interspersed with shrubs and grass openings. Occasional surface fires (4-50 years) consume woody fuel, thin young stands and raise the crown base height larger trees. Stand-initiating crown fire disturbances have historically occurred in intervals of 150-250 years in the NDT4.

[19] Province of British Columbia. 1995. *Biodiversity Guidebook*. Retrieved from: Biodiversity Guidebook (Forest Practices Code of British Columbia, September 1995) (gov.bc.ca)

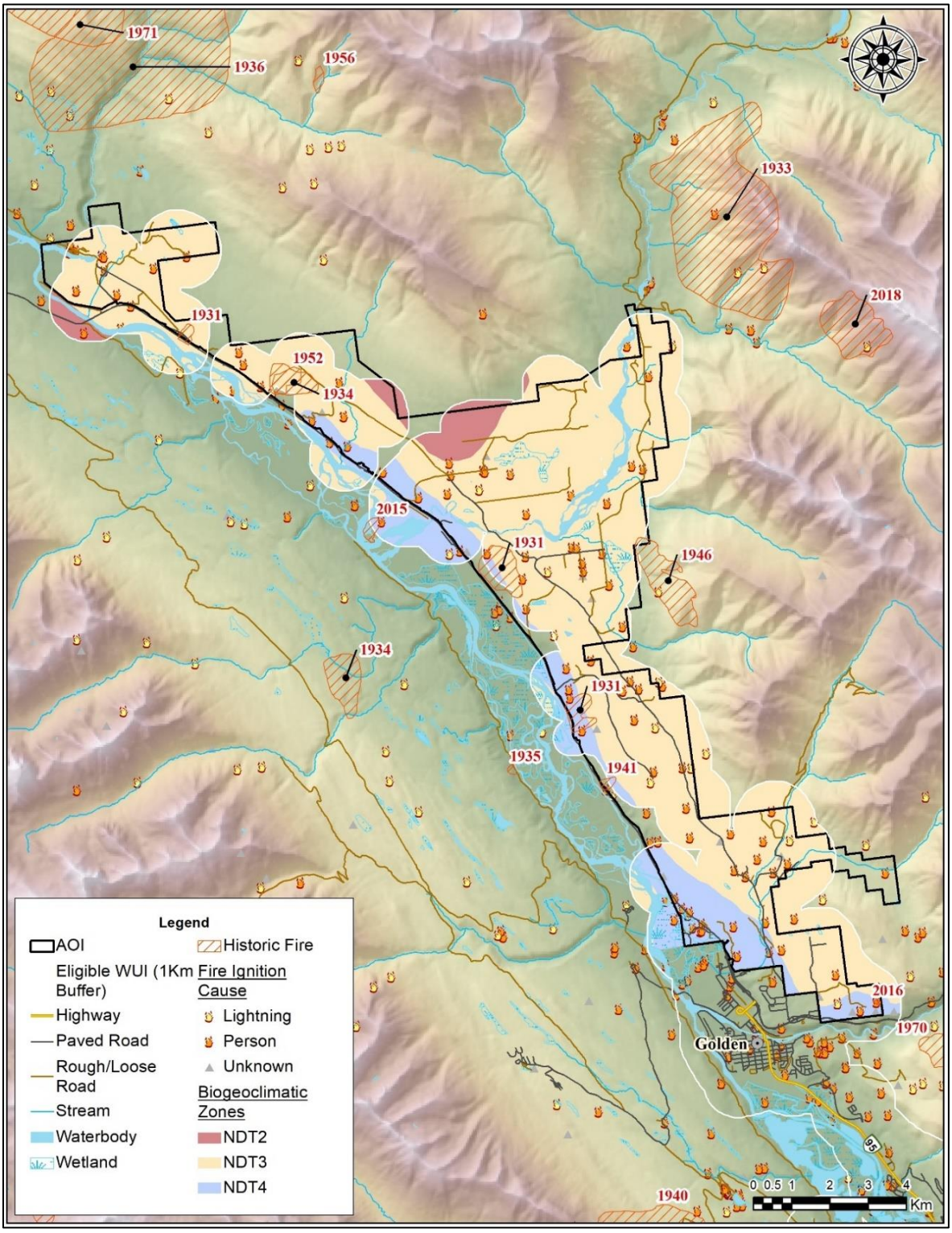
[20] Hall, E. 2010. *Maintaining Fire in British Columbia's Ecosystems: An Ecological Perspective.* Retrieved from: https://sernbc.ca/uploads/75/Maintaining_Fire_in_BC_Ecosystems.pdf

The remaining 4% of the WUI is classified as NDT 2; forest ecosystems with rare stand-initiating events, with a mean return interval of 250 years for large fire events.

4.2.2 HISTORICAL WILDFIRE OCCURRENCES

Wildfires in the region occur frequently and have the potential to be large. Historical fire ignition and perimeter data for the WUI (from the BCWS historical wildfire dataset) are depicted in Map 5. Fire ignition data is available from 1950-2020 and fire perimeter data is available from 1919-2020.

Humans are the most common cause of ignitions in the WUI, accounting for 88% fire ignitions, with the majority of ignitions occurring on private land. Historic fires within the WUI have been relatively small in size. Lightening ignitions do also occur, especially along water courses. The surrounding area has experienced much more large-scale fire activity, with prominent historic fires attributed to lightning ignitions. Most notably, a wildfire occurring nearly 6 km west of the WUI grew to approximately 21,000 hectares in the 1970's (not shown on map). Other large-scale fire events have occurred within kilometers of the WUI in the 1930's and 1940's. These fires occurred in similar fuels and are within the same regional climate, suggesting that in the absence of active fire suppression, the WUI is capable of supporting similar fires during prolonged periods of high to extreme fire danger.



Map 5. Natural disturbance regimes and historical fire ignitions and occurrences

4.3 LOCAL WILDFIRE RISK ANALYSIS

There are two main components of this local risk assessment: the *wildfire threat class* (fuels, weather, and topography sub-components) and the *WUI risk class* (structural sub-component). The local wildfire risk analysis 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 (Section 4.1.1 - Fuel and Appendix A-1: Fuel Typing Methodology and Limitations).
- *Consideration of the proximity of fuel to the community* – recognizing that fuel closest to the community usually represents the highest hazard (Appendix A-5: Proximity of Fuel to the Community).
- *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, Figure 3). Wind speed, wind direction, and fine fuel moisture condition influence wildfire trajectory and rate of spread.
- *Consideration of topography in relation to values*– slope percentage and slope position of the value are considered, where slope percentage influences the fire's trajectory and rate of spread and slope position relates to the ability of a fire to gain momentum uphill (Section 4.1.1 - Topography.
- *Stratification of the WUI* – according to relative wildfire threat based on the above considerations, field assessment of priority wildfire risk areas (based upon the Provincial Strategic Threat Analysis) from and other local factors.

4.3.1 WILDFIRE THREAT CLASS ANALYSIS

Using the verified and updated fuel types (Section 4.1.1 - Fuel, Appendix A-1: Fuel Typing Methodology and Limitations) and office-based analysis (Appendix A-2: Wildfire Fire Threat Spatial Analysis Methodology, Appendix A-3: WUI Risk Spatial Analysis Methodology), local wildfire threat for the WUI was built.

Classes of the wildfire threat class analysis are as follows:

- Very Low: Waterbodies with no forest or grassland fuels, posing no wildfire threat;
- Low: Developed and undeveloped land that will not support significant wildfire spread;
- Moderate: Developed and undeveloped land that will support surface fires that are less threatening to homes and structures;

- High: Landscapes or stands that are continuous forested fuels that will support candling, intermittent crown or continuous crown fires. These landscapes are often steeper slopes, rough or broken terrain and/or south or west aspects. High polygons may include high indices of dead and downed conifers; and
- Extreme: Continuous forested land that will support intermittent or continuous crown fires.

The results of the wildfire threat class analysis are shown on Map 6 and in Table 14 below. It should be noted that wildfire threat was only analyzed on public land, and does not capture the fire threat associated with private land. As private land makes up more than half of the WUI's land base (6,199.5 ha), this serves as a major limitation in capturing fire threat. Other limitations are outlined in Appendix A-2: Wildfire Fire Threat Spatial Analysis Methodology.

The updated analysis shows that approximately 28% of public land in the WUI is extreme threat. 25% represents a high fire threat and approximately 22% constitutes a moderate threat rating. The remaining 10% of public land have low or very low threat ratings, typically attributed to deciduous stands along water courses and areas with urban development.

Table 14. Fire threat summary the WUI

Wildfire Behaviour Threat Class	Hectares	Percentage of Public Land
Extreme	1,150.0	28%
High	981.0	24%
Moderate	937.1	22%
Low	538.9	13%
Very Low/ No Threat (Water)	561.7	13%

4.3.2 WUI RISK CLASS ANALYSIS

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

- **Low**: The high or extreme threat is sufficiently distant from developments, having no direct impact of the community and is located over 2Km from structures;
- **Moderate**: The high or extreme threat is sufficiently distant from developments, having no direct impact of the community and is located 500m to 2Km distance from structures;

- **High**: The high or extreme threat has potential to directly impact a community or development and is located 200m to 500m from structures; and
- **Extreme**: The high or extreme threat has potential to directly impact a community or development and is located within 200m from structures.

Table 15 summarizes the WUI Risk class ratings within the WUI. 258 hectares have extreme threat class ratings, 1,055 hectares have high threat class ratings, and 817 hectares have a moderate threat class rating. The WUI Risk spatial analysis process is described in Appendix A-3: WUI Risk Spatial Analysis Methodology.

Table 15. WUI Risk class ratings of the WUI

WUI Threat		
Threat Class	**Hectares**	**%**
Extreme	258.3	2%
High	1,055.0	10%
Moderate	817.6	8%
Low	-	0%
N/A	2,037.7	20%
No Data (Private Land and Private Managed Forest Land)	6,199.5	60%

4.3.3 WUI THREAT ASSESSMENTS

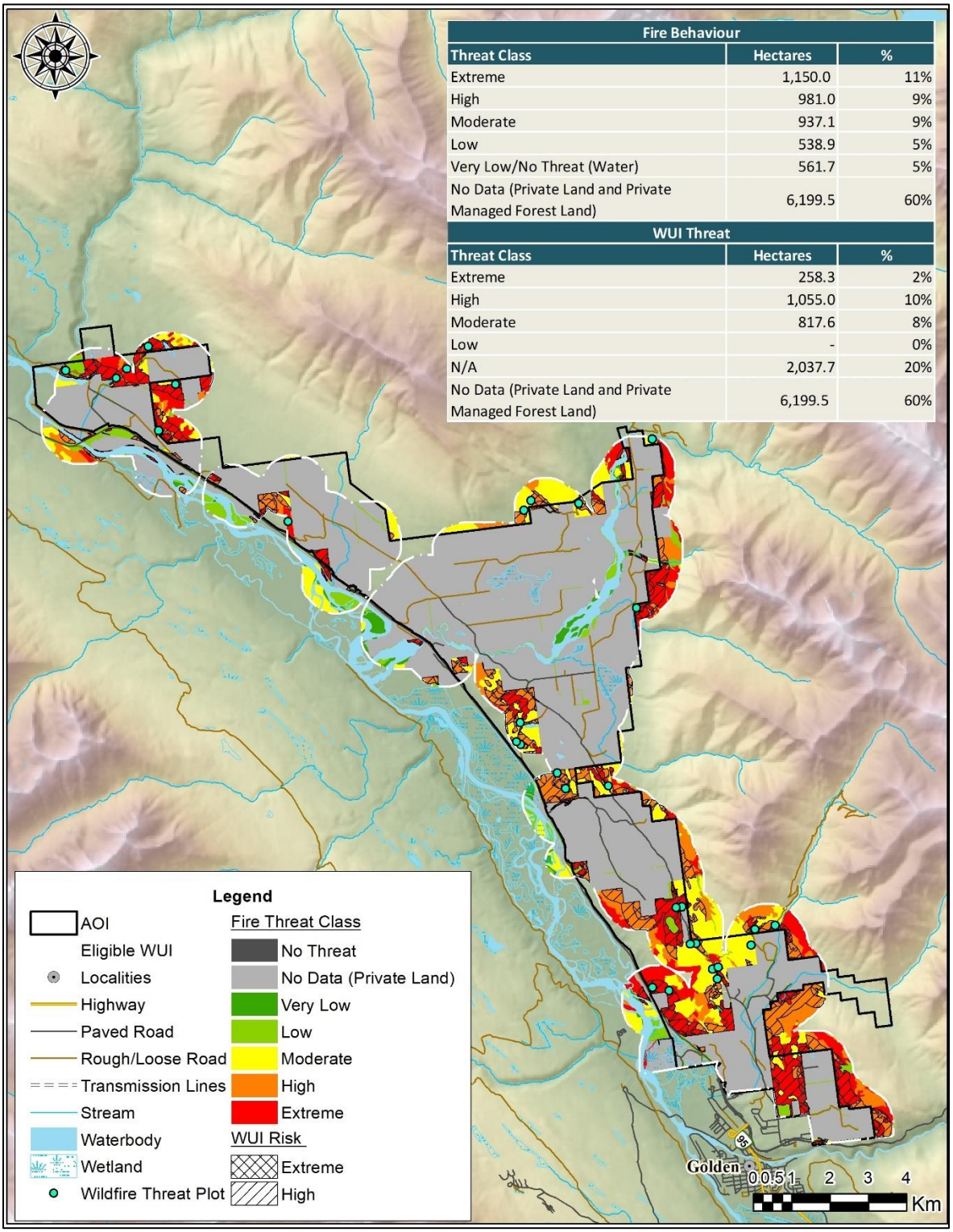
In accordance to the provincial standard, WUI Threat Assessments were completed over a number of field days in October of 2021 in conjunction with verification of fuel types (Appendix A-4: Wildfire Threat Plot Locations, Appendix B: WUI Risk Assessment - Worksheets and Photos). Assessments were completed in interface and intermix areas of the WUI to ascribe a threat of stand attributes based on fuel structure components and to support development of priority treatment areas.

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.
- *Prevailing fire season winds*: More field time was spent assessing areas upwind of values at risk, especially in potential locations for landscape-level fuel breaks.
- *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.

- *Verifying provincial classification*: areas classified as high threat in the Provincial Strategic Threat Analysis dataset, or with an uncommon fuel type, were assessed to ground-truth the fuel type and threat, even if they were relatively far from values

A total of 29 WUI threat plots were completed and 104 other field stops (e.g., qualitative notes, fuel type verification, and/or photograph documentation) were made across the WUI (Map 6) in areas that had road or trail access in order to build the most accurate assessment of local fire risk.



Map 6: Local wildfire risk

4.4 HAZARD, RISK, AND VULNERABILITY ASSESSMENT

The Hazard, Risk and Vulnerability Analysis (HRVA) that local governments undertake as part of the legislative requirements to develop a local Emergency Management Plan inventories and provides locally derived information about critical infrastructure important to the community.[21] Emergency Management BC supports this by providing the Critical Infrastructure Assessment Tool.[22]

The purpose of a HRVA is to help a community make risk-based choices to address vulnerabilities, mitigate hazards, and prepare for responding to and recovering from hazard events. The HRVA process assesses sources of potential harm, their likelihood of occurring, the severity of their possible impacts, and who or what is particularly exposed or vulnerable to these impacts.[23]

As values at risk within the WUI change significantly, this analysis should be updated concurrently with a CWRP update. Wildfire threat and risk, noted above in Section 4.3 - Local Wildfire Risk Analysis, should also be considered when updated emergency planning documents.

[21] UBCM. 2020. *Community Wildfire Resiliency Plan Instruction Guide*. Retrieved from: https://www.ubcm.ca/sites/default/files/2021-09/LGPS_CRI-FCFS_2022ApplGuide_2021-09-03_0.pdf

[22] More information on the instruction guide can be found here: https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/local-emergency-programs/critical-infrastructure-assessment

[23] 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

SECTION 5: FIRESMART PRINCIPLES

FireSmart™ is the leading program in Canada aimed at empowering the public and increasing neighbourhood resilience through wildfire mitigation measures. It has been formally adopted by almost all Canadian provinces and territories, including British Columbia in 2000. The FireSmart program covers a wide breadth of preventative measures, which are founded in the seven FireSmart disciplines: Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Cross-Training, and Vegetation Management. These seven disciplines and the guiding principles behind FireSmart can be applied at a number of spatial scales, and are not restricted to any type of land

The overarching goal of FireSmart is to 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,[24] the ultimate root of the WUI interface problem is the vulnerability of structures and homes to ignition during wildfire events, in particular vulnerability to embers. As a result, risk mitigation actions on private properties are emphasized.

FireSmart Implementation in the WUI

An evaluation of the current level of FireSmart implementation within the WUI is presented below in Table 16. All the activities listed are eligible for funding under the 2022 CRI FireSmart Community Funding and Supports program.

Table 16. Select FireSmart activities funded under the 2022 UBCM CRI program and their level of implementation in the WUI

FireSmart Discipline / CRI Funding Category	FireSmart Activity Type[25]	Current Status
Education	*Update public signage, social media, websites and/or newsletters*	Achieved. The CSRD has an established public communications strategy to provide seasonal print and web content along with media releases, regarding wildfire risk.

[24] FireSmart Canada. 2021. Retrieved from: https://www.firesmartcanada.ca

[25] Union of BC Municipalities. 2021. *Community Resiliency Investment Program 2022 FireSmart Community Funding & Supports Program & Application Guide.* Retrieved from: LGPS_CRI-FCFS_2022ApplGuide_2021-09-03_0.pdf (ubcm.ca)

FireSmart Discipline / CRI Funding Category	FireSmart Activity Type[25]	Current Status
	Distribute FireSmart educational materials and resources	Not yet achieved.
	Support the organization of a Neighbourhood Champion workshop, community FireSmart day, FireSmart events and workshops, and/or wildfire season open houses.	Not yet achieved.
	Organize and host public information meetings related to a proposed activity in other CRI funding categories.	Ongoing. The CSRD has hosted a FireSmart community meetings in the WUI.
	Support neighbourhoods to apply for FireSmart Canada Neighbourhood Recognition Program.	Not yet achieved.
Legislation and Planning	*Develop or amend a CWRP/CWPP.*	Ongoing. A 2021 CWRP for a portion of Electoral Area A's WUI.
	Develop FireSmart polices for the design and maintenance of public land, such as regional parks, or buildings.	Not yet achieved.
	Conduct FireSmart Assessments for publicly owned buildings.	Not yet achieved.
Development Considerations	*Amend Citywide OCP or bylaws to incorporate FireSmart principles.*	Not yet achieved. An OCP has not been developed for Electoral Area A.
	Revise zoning and development permit documents to include FireSmart considerations (landscaping and exterior design and finish).	Not yet achieved.
	Establish Development Permit Areas for Wildfire Hazard.	Not yet achieved.
	Include wildfire prevention and suppression considerations in the design of subdivisions as well as neighbourhood and area plan policies.	Not yet achieved.
	Complete recommended mitigation activities for critical infrastructure (based on FireSmart Critical Infrastructure assessment).	Not yet achieved.
	Amend referral processes for new developments to ensure multiple departments, including the fire department	Not yet achieved.

FireSmart Discipline / CRI Funding Category	FireSmart Activity Type[25]	Current Status
	and/or emergency management personnel, are included.	
	Develop plans for residential areas: *1) Conduct Home Ignition Zone assessments for individual properties.* *2) Offer a rebate program to property owners that complete eligible FireSmart activities.* *3) Develop FireSmart Neighbourhood Plans.* *4) Undertake Neighbourhood Wildfire Risk Assessments for neighbourhoods pursuing FireSmart Canada Neighborhood Recognition.* *5) Conduct Home Partners Program wildfire mitigation assessments.*	Ongoing. The CSRD offers free Home Ignition Assessments and administer a rebate program for residents who complete eligible FireSmart retrofits to their homes/properties. Neighbourhood Wildfire Risk Assessments were completed for communities in the WUI. Other actions to develop plans for residential areas have not yet been achieved. The Home Partners Program is a different program than FireSmart. It can be evaluated by the CSRD to determine its effectiveness as an additional or alternate wildfire risk assessment tool.
Interagency Cooperation	*Develop, coordinate, and / or participate in a Community FireSmart Resiliency Committee or multi-agency fire and/or fuel management planning table.*	A CFRC was formed as part of the development for this CWRP.
	Provide Indigenous cultural safety and humility training to emergency management personnel.	Not yet achieved.
	Attend 2022 FireSmart BC Conference, to be hosted by the BC FireSmart Committee.	Not yet achieved.
Cross-Training	*Provide or attend training for Local FireSmart Representatives (LFR).*	Partially achieved. 15 CSRD staff and the contracted FireSmart Coordinator have been trained as LFRs. No LFR's reside in the WUI.
	Support LFRs to qualify as LFR training facilitator.	Not yet achieved.
	Cross-train fire department members: • *SPP-WFF1 Wildland Firefighter Level 1* • *S-231 Engine Boss* • *ICS-100*	Not applicable. The WUI is outside of a Fire Protection Area.
	Cross-train emergency management personnel: • *ICS-100* • *WRR Basics Course*	Achieved. 4 CSRD Protective Services staff and numerous staff in varying department have ICS-100 and emergency recovery training.

FireSmart Discipline / CRI Funding Category	FireSmart Activity Type[25]	Current Status
	Complete Wildfire Mitigation Specialist training, and support local government staff that have completed this to qualify as facilitators.	Not yet achieved.
Emergency Planning	*Develop and/or participate in cross-jurisdictional meetings and tabletop exercises focused on wildfire preparedness.*	Achieved. Multi-jurisdictional exercises with the Town of Golden have been done in the past as part of the GAEMP.
	Assess structural protection capacity.	Not yet achieved. The WUI is outside of a Fire Protection Area.
	Assess community water delivery ability as required for suppression activities (limited to current water system evaluation and available flow analysis).	Not yet achieved.
	Use and/or promote EMBC Wildfire Preparedness Guide for community emergency preparedness events focused on wildfire.	Not yet achieved.
Vegetation Management	*Undertake fuel management on publicly owned land (fuel management prescriptions, treatments, maintenance, or prescribed burns, including off-site debris disposal and professional assessments).*	Not yet achieved.
	Remove or reduce flammable vegetation up to 100 m from critical infrastructure.	Not yet achieved.
	Provide vegetative debris disposal for homeowners: • *Provide a dumpster or chipper.* • *Waive tipping fees.*	Partially achieved. Yard waste, garden waste, and wood waste are free for disposal throughout the year at the Golden Transfer and Refuse Disposal Site (administered by the CSRD). Site-specific initiatives for rural homes have not been achieved.
	Undertake fuel management demonstration projects.	Not yet achieved.

Priority Neighbourhoods for FireSmart Initiatives

There is variation in neighborhood characteristics throughout the WUI, including variation in the extent to which FireSmart attributes are present. Neighborhoods that are in *intermix* areas are more hazardous, overall, than neighborhoods in *interface* areas. An intermix area is a part of the WUI in which forested inclusions separate or surround structures. In comparison, an interface area is part of the WUI

in which a developed area meets non-developed, open or forested area along a defined boundary. The WUI features a mix of both interface and intermix properties that all interact with dense wildland vegetation. As such, FireSmart principals are critical to reducing interface fire risks.

During CWRP development, FireSmart risk and resiliency factors for each community were observed (Table 17). This incorporates field observations, the WUI Risk analysis, information from the Community FireSmart Resiliency Committee and Community Wildfire Hazard Assessments.

Table 17. Priority neighbourhoods for FireSmart actions, and their vulnerabilities and resiliencies to wildfire

Priority	Community	FireSmart Vulnerabilities	FireSmart Resiliencies
1	Donald	• Highly intermixed • Long, unmaintained grass • Combustibles (e.g., propane tanks, retired vehicles) stored in Priority Zone 1 • Large piles of wood materials in Priority Zones 1 & 2 • Firewood storage in non-combustible zone • Older building stock (vinyl, wood cladding) • Some decaying roofs; gaps present • Wood extensions present (e.g., decks, porches) in varying condition • Outside Fire Protection Area • No community water system	• Fair forestland setbacks; large lots • Most homes have Class A tin roofs • Flat terrain
2	Blaeberry	• Intermixed community • Singe-access route to Blaeberry North (Neville Road) • Large private forested acreages; fuel continuity • Frequent poor forest setback • Livestock and hobby farms present; hay stacks located in Priority Zones 1 &2 • Some debris and log piles in Priority Zone 1 • Long driveways with poor address visibility • Outside Fire Protection Area • No community water system	• Well-manicured, irrigated lawns • Outbuilds typically set back from forest • Most homes have Class A tin roofs • Flat terrain • Large and close natural water source (Blaeberry River) • New development (more likely to be FireSmart in comparison to older homes) • Generally tidy yards, free of combustibles in the Non-combustible zone and Priority Zone 1
3	Moberly/Hospital Creek	• Interface and Intermix community • One way access/egress • Top of ridge • No hydrants • Frequent poor forest setback • Long driveways with poor address visibility • Many short-term rental units • Outside Fire Protection Area • No community water system	• Well-manicured, irrigated lawns • Deciduous trees and shrubs are typically favoured for landscaping • New development (more likely to be FireSmart in comparison to older homes) • Vegetation management (pruning, thinning from below) implemented Priority Zones 1 & 2 of private property in Hospital Creek

The sections to follow provide information on each FireSmart discipline, including an analysis of implementation and relevant gaps identified by the Community FireSmart Resiliency Committee. Each section contains a table of recommended actions for the CSRD relating to that FireSmart discipline. Most actions are fundable through the CRI FireSmart Community Funding and Supports program. Each recommendation includes a rationale, lead and support agencies, a recommended timeline for completion and estimated resources to complete it.

5.1 EDUCATION

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

The CSRD has an established FireSmart education strategy that uses several platforms, including the CSRD website, webinars, social media, print materials and radio broadcasting. Permanent pages are located on the CSRD website and publications are released on local media outlets during the fire season to provide information about wildfire ignition hazards, actions prohibited under local bylaws and water restriction and fire danger rating changes. Additionally, in 2019, a public workshop was held in the Blaeberry community to provide information to homeowners about adopting FireSmart principles. The FireSmart Coordinator reported that the event was well-attended, however, little action has resulted from the workshop.

One of the most successful FireSmart programs that the CSRD administers is providing free FireSmart homes assessments and offering a rebate program to homeowners who complete recommended eligible FireSmart activities on their home and property.[26] Maintaining this program will continue to educate and engage homeowners to take FireSmart actions on their private property.

As a FireSmart education strategy for wildfire safety messaging has been established, more targeted engagement for communities in the WUI should be a priority for the CSRD. The Community FireSmart Resilience Committee expressed a shared concern that outreach is difficult due to the rural geography of the WUI. To increase residential engagement, FireSmart education should target fire risks and wildfire mitigation opportunities specific to the communities within it.

One priority recommendation to boost FireSmart engagement is for the CSRD to employ a Local FireSmart Representative (LFR) to assist the CSRD FireSmart Coordinator in the delivery of a local FireSmart program

[26] Columbia Shuswap Regional District. 2021. *FireSmart in the CSRD*. Retrieved from: FireSmart in the CSRD | Columbia Shuswap Regional District

targeted for the WUI. An LFR can provide local knowledge and increase touch-points as a liaison between the regional district and residents.

Table 18 below details recommended FireSmart Education actions that the CSRD can implement in the WUI.

Table 18: Education recommendation and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: provide information to communities and citizens empowering them to adopt and conduct FireSmart practices to mitigate the negative impacts of wildfire to their homes/businesses, properties, and neighbourhoods.							
1	High	This CWRP report and associated maps should be made publicly available on the CSRD website and social media platforms.	The CWRP may also be directly shared with local stakeholders and land managers who may be interested in collaborating on FireSmart and wildfire risk reduction activities.	CSRD (FireSmart Coordinator, Communications)	1 year	Available for download or viewing on the CSRD website	UBCM CRI funding available. (~8 hours in house)
2	High	Continue to deploy a FireSmart education program within Electoral Area A. Build a strong level of resident engagement through FireSmart workshops and events tailored to specific community wildfire risk factors.	Workshops and presentations should include FireSmart education particular to the area, such as best practices for FireSmart priority zones, preferred materials for use when conducting home renovations, and safe debris removal methods.	CSRD (FireSmart Coordinator)	Annually	Two or more FireSmart events held per year; number of people who attend.	Eligible for UBCM CRI funding
3	High	Consider employing additional staff (e.g., Local FireSmart Representative) to support fulfillment of these recommendations and increase local FireSmart engagement.	Benefits of a local LFR is a frequency and regularity of touch-points and local-specific knowledge.	CSRD	1 year then ongoing	Contracting/employing an LFR in 2023 funding year	Eligible for UBCM CRI funding UBCM CRI funding available for LFR training and employment

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
4	High	Continue making Home Ignition Zone (HIZ) assessments by the FireSmart Coordinator available for residents	HIZ assessments encourage action in the Priority Zones of a community. CSRD has had good uptake in previous years.	CSRD (FireSmart Coordinator)	Annually - spring - fall	~10 - 30 assessments are completed annually	~$6,000 - $10,000: 4 hour @ $50/hour including organization, travel, assessment, reporting per property for 30 properties, plus expenses
5	High	Continue making a FireSmart rebate program available for residents who have a pre- and post-work FireSmart assessments conducted.	FireSmart rebate programs are an incentive to complete FireSmart work. CSRD has had good uptake in previous years.	CSRD (FireSmart Coordinator)	Annually - spring - fall	~10 - 20 properties participate annually	~$10,000 in rebates: 20 properties at up to $500 rebate per property, plus 2 hours administration time per property
6	High	Educate residents of off-site debris disposal opportunities, such as local hog fuel opportunities and potential future chipping services (Recommendation 42).	This would assist residents in reducing green waste accumulation on properties.	CSRD (FireSmart Coordinator)	1 year	Increased public awareness of debris removal methods	UBCM CRI funding available for public education materials, FireSmart events/ presentations/ workshops and Wildfire Community Preparedness Day

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
7	High	Educate farmers of flashy spring wildfire conditions that are typical to the area to discourage high risk activities, such as field burning, from occurring during hazardous conditions.	Volatile cured grasses and high winds prior to spring green-up are common in the region, which is when field burning typically occurs.	CSRD (FireSmart Coordinator)	1 year	Increased awareness of hazardous field burning conditions	UBCM CRI funding available for public education materials, FireSmart events/ presentations/ workshops
8	Moderate	Support and facilitate priority neighborhoods to self-organize to attain FireSmart Canada Neighbourhood Recognition Program (FSCNRP) status.	Consider utilizing the local FireSmart rebate program or chipping services as incentives for participation.	CSRD (FireSmart Coordinator/LFR)	5 years	Completed for priority neighbourhoods 1, 2, and 3	UBCM CRI funding available. ($5000/ neighbourhood; 40 hours/ initiative)
9	Moderate	Educate homeowners of the importance of clear and accurate house numbering for safe and effective emergency evacuation.	Many addresses within the WUI are not adequately visible from the road. Consider adopting a local bylaw to help achieve sufficient address visibility as needed/if required.	CSRD (FireSmart Coordinator/LFR)	2 years then ongoing	Addresses are clearly visible from the road in all levels of light	UBCM CRI funding available for FireSmart education (~8 hours in-house)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
10	Moderate	Make FireSmart province-specific landscaping guidelines available on the CSRD FireSmart webpage and hand out pamphlets/literature to residents to increase FireSmart management knowledge amongst residents.[27]	Landscaping guidelines list flammable non-compliant vegetation/landscaping materials, non-flammable drought- and pest-resistant alternatives, and tips on landscape design to reduce wildfire hazard on private property.	CSRD (FireSmart Coordinator, Communications)	1 year	Posted on CSRD's FireSmart webpage and hardcopies handed out to residents	UBCM CRI funding available (~20 hours in-house)
11	Moderate	Educate residents of risk factors associated with residing outside of a Fire Protection Area.	It is common, especially in the case of renters and visitors, to be unaware of the lack of fire services in their areas (in the event they call 911).	CSRD (FireSmart Coordinator)	1 year	All residents in WUI notified of inherent risk.	CSRD (in-house, cost dependent on method of communication/ time and effort invested, low cost overall)
12	Moderate	Encourage the installation of exterior residential sprinklers as one measure (in conjunction with FireSmart retrofitting and landscaping) to comprehensively reduce wildfire risk on properties.	Use FireSmart presentations and workshops as opportunities to provide information on water supply system requirements, manufacturers, component parts and cost of exterior sprinklers as one tool to increase structure resiliency.	CSRD (FireSmart Coordinator)	1 year	Increased public awareness of residential sprinklers and 5-10 sprinklers installed each year in the WUI.	UBCM CRI funding available for public education materials, FireSmart events/ presentations/ workshops

[27] Available for download here: https://firesmartbc.ca/wp-content/uploads/2021/04/FireSmartBC_LandscapingGuide_Web_v2.pdf

Item #	Priority	Recommendation / Next Steps	Comments	Lead (involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
13	Moderate	Seek opportunities to remove barriers to FireSmart uptake for residents with mobility issues through community support and engagement.	This can be incorporated into the FSCNRP, or tackled as a stand-alone initiative.	CSRD (FireSmart Coordinator/LFR)	3 years then ongoing	FireSmart opportunities support residents with mobility issues	CSRD (in-house, cost dependent on)

5.2 LEGISLATION AND PLANNING

Legislation and regulation are effective tools for reducing wildfire threat in the WUI, although they can be less effective in large, rural regional districts like the due to difficulties in enforcement. A summary of CSRD current bylaws, policies, and plans relevant to wildfire risk and emergency planning was provided earlier in Section 2.3 - Local Bylaws. Reviewing zoning bylaws *through a wildfire lens* to assess where they inadvertently promote conditions that may contribute to fire spread (*e.g.,* landscaping, fencing), and determining where bylaws can be updated or strengthened to reduce wildfire risk to development (such as adopting bylaws tied to wildfire hazard levels and requiring minimum standards for construction materials and techniques, and vegetation management) can help accomplish the goal of more wildfire resilient communities.

Opportunities to update or strengthen existing policies, and recommendations to incorporate an interface wildfire risk assessment into future plans, have been identified in Table 19.

Table 19: Legislation and planning recommendation and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: provide the means for the CSRD to implement wildfire risk reduction actions through bylaws and legislation by outlining local government responsibilities regarding wildfire							
14	High	Complete or schedule periodic updates of the CWRP. The frequency of updates is dependent upon major changes which would impact local wildfire risk, funding changing that may lead to new opportunities or the rate at which wildfire risk reduction efforts are implemented.	A current (i.e., no more than 5 years old) CWRP is a requirement for further funding under the CRI Program. Reassess and reprioritize proposed and completed fuel treatment units as part of a CWRP update.	CSRD (Consultant)	5 years from adopting this CWRP document	The WUI always has an up-to-date CWRP and action plan	UBCM CRI funding available (~3 hours in-house to review need for update, ~16 hours for CRI application, $25,000 for full document/$10,000 for update)
15	Moderate	Consider extending future wildfire risk reduction activities and projects throughout the entire Electoral Area A Eligible WUI.	Increase wildfire resiliency across all communities in the Electoral Area A Eligible WUI through FireSmart and risk reduction programs.	CSRD	1 year then ongoing	FireSmart and wildfire risk reduction administered to all communities in the Eligible WUI	UBCM CRI funding available for FireSmart planning and activities in the Eligible WUI
16	High	The Local Fire Services Advisory Committee should assess the feasibility of extending local fire suppression services to residents within the WUI.	The WUI is not included within a Fire Protection Area. A 2020 residential survey conducted in Blaeberry highlighted a shared concern for the lack of fire protection in the community.	Local Fire Services Committee (CSRD)	5 years	A Fire Protection Area is established for the WUI	UBCM CRI funding available for FireSmart policies (~20 hours in-house for reviewal, additional time and cost for adaptation)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
17	Moderate	Consider enacting a local bylaw to require the removal or mitigation of hazardous yard conditions on private property that can pose a safety risk in the event of a fire. The bylaw should also regulate storage of combustible materials 10 m away from homes during the wildfire season.	Reduce wildfire risk on private property through provisions of combustibles and hazardous yard conditions.	CSRD	5 years	The adoption of a bylaw to require mandate property maintenance	UBCM CRI funding available for FireSmart policies (~20 hours in-house)

5.3 DEVELOPMENT CONSIDERATIONS

The relationship 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) influences susceptibility to wildfire and the effectiveness to respond to it. Factors that can be planned for (and regulated through the land use planning and development process) affecting public safety during a wildfire include:[28]

- 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 behavior (Appendix A-5: Proximity of Fuel to the Community).
- Access and circulation patterns.
- Availability and adequacy of water supply.
- Type of construction materials on structures and attachments.
- Lot size and structure density.
- Design guidelines and architectural standards.

Since there is no regionally supplied water system in the WUI, it is crucial that water availability from a fire suppression standpoint is understood, areas of vulnerability are identified and mitigation measures are sufficiently implemented. Potential supply issues can be determined through a water supply vulnerability analysis. Within the assessment, natural water sources, the duration and quality of water supply during sustained pumping efforts and water availability and distribution should be assessed. Water supply for fire suppression can be further improved in the WUI by requiring new developments (both commercial and residential) to meet or exceed the minimum NFPA 1142 minimum Standard on Water Supplies for Suburban and Rural Firefighting.[29]

Ensuring adequate access/egress is important to facilitate entry and exit of first responders and residents to and from neighborhoods in the event of an interface wildfire incident. A shared concern of the FireSmart Resiliency Committee is a lack of alternate routes in and out of WUI communities. To prepare for a potential interface wildfire or evacuation event, dead-end roads should be reviewed for fire suppression accessibility, safety and for the staging of anchor points for firefighting equipment and personnel.

[28] UBCM 2020. *Community Wildfire Resiliency Plan Instruction Guide.* Retrieved from: Community Wildfire Resiliency Plan Instruction Guide (ubcm.ca)

[29] NFPA. 2021. *NFPA 1142 Standard on Water Supplies for Suburban and Rural Firefighting*. Retrieved from: NFPA 1142: Standard on Water Supplies for Suburban and Rural Firefighting

Official Community Plan

An Official Community Plan (OCP) is a general statement of the objectives and policies of the local government that provides long-range framework to guide, monitor and evaluate future land use and development throughout a municipality or electoral area. An OCP does not yet exist for CSRD Electoral Area A. Wildfire preparedness and risk reduction community goals should be embedded within a future OCP to instill FireSmart principles in future development.

Moreover, one of the most powerful tools that the CSRD can employ to foster wildfire resiliency of future development is through the enactment of a Wildfire Hazard Development Permit Area (DPA). DPAs identify locations that need special treatment for certain purposes, including the protection of development from hazards.[30] Upon the establishment of an OCP, the CSRD should consider allocating areas (of moderate, high, and extreme hazard threat rating, or along significant access routes) as a wildfire hazard DPA for the protection of development from hazardous conditions.

A summary of recommendations that CSRD can implement to embed FireSmart practices and considerations into development are detailed below in Table 20

[30] Province of British Columbia. 2021. *Development Permit Areas.* Retrieved from: Development Permit Areas - Province of British Columbia (gov.bc.ca)

Table 20: Development considerations recommendation and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: embed FireSmart practices and considerations into all development within the WUI							
18	High	The FireSmart Coordinator should complete FireSmart assessments of CSRD critical infrastructure.	Critical infrastructure are identified in Table 7.	CSRD (FireSmart Coordinator)	2 years	Assessments completed and action items being planned for	UBCM CRI funding available (¬1,000/ assessment)
19	High	Use fire-resistant construction materials, building design and landscaping for all critical infrastructure when completing upgrades or establishing new infrastructure.	Plan and implement action items in the sequence of critical infrastructure importance.	CSRD	Ongoing	New critical infrastructure and all critical infrastructure renovations are FireSmart	Local government funding ($ Variable: CI specific)
20	High	Assess community water delivery ability as required for suppression activities. The assessment should include an analysis of the vulnerability of natural water sources to wildfire, mass wasting, and/or drought, and the duration and quality of supply during sustained pumping effort.	There is no municipal water system in the WUI; water uptake is through private wells. Determine potential supply issues in the event of a large interface wildfire event (See Recommendation 20).	CSRD (Consultant)	2-3 years	Assessment completed	UBCM CRI funding available (~$25,000 for assessment – contracted service)
21	High	If and when a water availability assessment is completed (Recommendation 19), implement action items to improve water availability for fire suppression as prioritized within the assessment.	Consider installing water infrastructure (e.g., water cisterns) in areas identified in assessment without sufficient water supply for firefighting.	CSRD	5 years	Assessment completed and action items being planned for	Local government funding ($ Variable: action item specific, ~$2000-$5000/water cistern)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
22	High	Conduct a review of fire suppression accessibility, safety, and staging of anchor points for firefighting equipment and personnel on all dead-end roads.	Areas of difficult access should be identified and improved (e.g., Hospital Creek Road, Ottoson Road, Johnson etc.)	CSRD (Consultant)	3 years	Assessment completed	Local government funding (~20 hours in-house including meetings with BCWS and Golden Fire Fighting Department)
23	Moderate	When an Official Community Plan (OCP) is established for Electoral Area A, community initiatives to reduce wildfire risk (e.g., FireSmart, fuel reduction etc.) should be defined to guide future development.	There is currently no OCP for Electoral Area A. Embed FireSmart values into all aspects of community development and planning.	CSRD	5 years	OCP established with wildfire initiatives and long-term community goals.	UBCM CRI funding available
24	Moderate	When an OCP is established for Electoral Area A, a wildfire hazard DPA should be developed for the protection of development from hazardous wildfire conditions in wildfire hazard areas. Update Bylaw 510 - Zoning Bylaw with respect to it when enacted.	New interface and intermix development are common throughout the Blaeberry, Moberly and Hospital Creek. The DPA can speak to building materials, set-backs, vegetation/landscaping, etc., or to one or a combination of those elements. Engagement with residents and the building community is recommended during the DPA development process.	CSRD (Consultant)	5 years	Interface wildfire DPA created and adopted	UBCM CRI funding available (~25,000 and 40 hours in-house)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
25	Moderate	All new developments should have a water system that meets or exceeds the minimum standards of NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting.	The Golden Fire Department and/or BCWS should also review the planned water supply to ensure it provides sufficient placement, flow, and reliability for suppression needs.	CSRD (Developers, BCWS, Golden Fire Department)	Ongoing	New development water standards meet NFPA 1142 Standard	Local government funding /developers (~4 hours in house for water system review, $ variable for water system bared by developers)

5.4 INTERAGENCY COOPERATION

The goal of interagency cooperation is to broaden from a single department- or agency-based siloes approach to a risk driven, multi-agency and multi-scalable approach.[31] This increases the ability of local governments to plan and respond to emergencies effectively. For a large regional district like the CSRD, interagency cooperation is especially crucial. Regional district residents in the WUI may identify more with the Town of Golden than they do with the regional district. The small amount of regional district-owned land also means that the activities of other land managers may have a stronger influence on the risk profile of communities than CSRD actions. Examples include fuel treatments under the MFLNRORD Wildfire Risk Reduction program and vegetation management undertaken by utility and transportation stakeholders.

Community FireSmart Resiliency Committee

A Community FireSmart Resiliency Committee is a mechanism for coordinating collaboration between local FireSmart Community Funding and Supports (FCFS) funded activities and Crown Wildfire Risk Reduction (WRR) funded activities, and for collaborating on new plans and projects for the future.[31] A Community FireSmart Resiliency Committee of local stakeholders was formed at the onset of plan development in September 2021. The Committee should aim to meet at least semi-annually to discuss FireSmart disciplines and to collaboratively implement wildfire risk reduction. A template Terms of Reference (Appendix D: Community FireSmart Resiliency Committee Terms of Reference Template) has been developed to define the scope of the committee and details potential responsibilities for it.[32,33]

Table 21 below details current agencies involved, their current representatives and titles, and their role within the Community FireSmart Resiliency Committee.

Table 21: CSRD Electoral Area A Community FireSmart Resiliency Committee

Organization/ Government	Contact Title	Person	Role in CWRP Development	Future Opportunities
CSRD	Emergency Program Coordinator	Tom Hansen	Provided data, information, and other relevant plan content; work to determine CWRP actions; conducted outreach with other stakeholders to discuss the plan and receive additional input.	Spearhead the implementation of CWRP recommendations. Provide outreach to and communicate with applicable stakeholders.

[31] UBCM 2020. *Community Wildfire Resiliency Plan Instruction Guide*. Retrieved from: Community Wildfire Resiliency Plan Instruction Guide (ubcm.ca)

[32] B.C. FireSmart. 2021. *Community FireSmart Resiliency Committee Terms of Reference Template*. Retrieved from: Community-FireSmart-and-Resiliency-Committee-Terms-of-Reference.pdf (firesmartbc.ca)

[33] Columbia Shuswap Regional District. 2021. *Electoral Area F Community FireSmart Resiliency Committee Mandate and Purpose*

Organization/ Government	Contact Title	Person	Role in CWRP Development	Future Opportunities
CSRD	FireSmart Coordinator	Len Youden	Provided local level FireSmart knowledge and history relevant to plan content; helped determine CWRP actions; conducted outreach with other stakeholders; engaged in fieldwork and provided input and plan review.	Support implementation of FireSmart education recommendations through public outreach, education and expertise.
MFLNRORD: Selkirk Forest District	Land and Resource Coordinator	Amber Cooke	Assisted in a support capacity by providing WRR program information and data; identified WRR areas of concern; provided plan review.	Continual engagement with the CSRD to implement priority fuel treatments identified in the WRR tactical plan and CWRP.
BCWS: Columbia Fire Zone – Revelstoke	Wildfire Technician	Stefan Hood	Assisted in a support capacity by providing local-level fire response knowledge and history; answered operational questions; provided plan review	Zone staff are considered the local wildfire experts. Zone staff do not approve plans or funding applications nor are they available to manage CRI and WRR programs.

Recommended action items the CSRD can implement to continue growing interagency relationships and increase interagency cooperation are listed below in Table 22.

Table 22. Interagency Cooperation recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: Broaden from department or agency siloes and single jurisdiction-based approach to a risk driven, multi-agency and multi-scalable approach.							
26	High	Formally establish a Community FireSmart Resilience Committee and host meetings semi-annually to review and act upon FireSmart and wildfire risk reduction actions identified in this plan.	Increase collaborative wildfire resilience efforts across stakeholders.	CFRC	Ongoing	The CSRD, local land managers, BCWS and other stakeholders participate in 2-6 meetings annually	~4-8 in-house hours/meeting to prepare, host and debrief
27	High	Schedule a meeting with MFLNRORD to share information about this CWRP and the overlapping WRR Tactical Plan. Look for synergies and opportunities to collaborate on shared initiatives through a multi-agency approach.	Ongoing engagement is recommended after this meeting. Multi-agency coordinated action can be more effective at reducing wildfire risk.	CSRD/MFLNRORD	Ideally spring of 2022	A meeting is held between the CSRD and MFLNRORD to share project findings	~4-8 in-house hours/meeting to prepare, host and debrief
28	High	Work with Recreation Sites and Trails B.C. to advocate that a defensible space between flammable vegetation and campfire pits in the Waitabit Recreation Site be augmented.	Encroachment of junipers towards campfire pits was observed by consultants during fieldwork.	CSRD (Recreation Sites and Trails B.C.)	Ongoing	Junipers removed from non-combustible zones of campfire pits	~3 hours prior to fire season

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
29	Moderate	Work with BCWS to install and regularly maintain signage of danger class ratings, fire bans, and general fire safety related warnings at key locations in the WUI. Signage should be updated with current fire danger ratings during the peak wildfire season (May to October)	Currently, there is no Fire Danger Rating sign in the WUI. Highly visible locations could include Tans-Canada Highway 1 turnoffs and Upper Donald-Golden Road.	CSRD (FireSmart Coordinator, Community Champions)	2 years (Then ongoing)	At least one sign installed and current and accurate fire danger ratings posted.	~1 hour/week during wildfire season (in house)
30	Moderate	Work with the Ministry of Transportation and Infrastructure (MOTI) to encourage maintaining the Trans-Canada Highway grassy right-of-way in a low hazard state.	This is to reduce ignition potential and improve emergency access in the event of an evacuation or wildfire event. Ignition of O-1a/b fuels adjacent to the Trans-Canada Highway was expressed as a concern by the CFRC.	CSRD (MOTI)	Ongoing	Grassy ROW is maintained in a low-hazard state	~3 hours prior to fire season
31	Moderate	Work with utility stakeholders to encourage regular brushing and clearing of woody debris and shrubs to help reduce fire risk, utility pole damage, and subsequent outages.	Encroachment of understory vegetation and overhanging trees were noted by consultants during fieldwork.	CSRD (BC Hydro, Fortis BC)	Ongoing	BMPs in use for the region	~3 hours prior to fire season
32	Moderate	Communicate with railways prior to each wildfire season to ensure that best-management-practices to reduce fire ignition are continued.	This is to reduce ignition potential of railways in the WUI.	CSRD (CP Rail, CN Rail)	Ongoing	BMPs in use for the region	~3 hours prior to fire season

5.5 CROSS-TRAINING

All staff and agency partners who are expected to participate in the implementation of this plan, or participate in a wildfire response and recovery, should be appropriately trained. Because communities in the WUI are relatively independent, they may already have engaged community leaders. These leaders are good candidates for participation in wildfire training, in addition to CSRD staff.

Training opportunities for emergency staff and community leaders include:

- Basic Wildland Fire Suppression and Safety
- Incident Command System (ICS-100)
- FireSmart 101
- FireSmart Local FireSmart Representative
- FireSmart Community Champion
- FireSmart Home Partners Wildfire Mitigation Specialist
- FireSmart Annual Symposium
- Post wildfire reclamation and recovery
- Post wildfire structure damage assessment
- BC Structure Protection Program - S115

If a community leader has been trained and employed as an LFR, regular cross-training and coordination between the FireSmart Coordinator and the LFR should occur to share learnings and collaboratively achieve FireSmart objectives.

The joint partnership between the CSRD and Town of Golden to deliver the Golden and Area Emergency Management Plan presents cross-training opportunities. The agreement administers the Town of Golden to develop and maintain emergency exercise and training programs through consultation with the regional district, and delegates the regional district to support in the development of these exercises. The CSRD should continue to support and participate in all training exercises pertaining to the joint emergency plan. Emergency exercises can be walkthroughs, workshops, tabletop exercises or full-scale exercises.

Recommended action items that CSRD can implement to create and continue to develop opportunities for cross-training are listed below in Table 23.

Table 23. Cross-training recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: Support the development of comprehensive and effective wildfire risk reduction planning and activities, as well as safe and effective response							
33	High	If an LFR is employed in the WUI (Recommendation 3), regular communication and coordination should be maintained between the FireSmart Coordinator and LFR.	Local FireSmart uptake should be pursued collectively by CSRD FireSmart staff.	CSRD (FireSmart Coordinator/LFR)	Ongoing	Training and communication between FireSmart Coordinator and LFR	Eligible for UBCM CRI funding
34	High	CSRD Emergency and FireSmart staff should participate in exercises pertaining to the Golden and Area Emergency Program.	Exercises could be walkthroughs, workshops, table top exercises, functional exercises or full-scale exercises	CSRD/Town of Golden/Golden Fire Department	Annually/ Ongoing	Participation in training exercises	CSRD (~12 hours in-house per test exercise)
35	Moderate	CSRD emergency management personnel should be trained in ICS-100, WRR Basics, and Local FireSmart Representative training.	ICS-100 and WRR Basics will help the CSRD work with BCWS and MFLNRORD respectively.	CSRD	2 years	Emergency Management personal are all trained in ICS-100, and some have WRR Basics and LFR training	LFR training is eligible for UBCM CRI funding (~32 hours in-house/staff member)
36	Moderate	Pursue funding to enable the FireSmart Coordinator to attend the annual FireSmart symposium.	Relevant learnings should be shared at CFRC meetings.	CSRD (FireSmart Coordinator)	1 year	Attendance at 2023 FireSmart Conference	Eligible for UBCM CRI funding

5.6 EMERGENCY PLANNING

When several wildfire emergencies are taking place throughout the province, BCWS resource availability may become scarce. Deployment of provincial resources occurs based on the Provincial Coordination Plan for Wildland Urban Interface Fires.[34] Therefore, local government and community 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. As a result of this and general rural living situations, residents are likely more prepared to deal with an emergency in the CSRD than in many jurisdictions.

Some of the complexities of interface wildfires in the WUI include:

- Evacuation of livestock from agricultural areas;
- Lack of BC Hydro electrical service;
- Long distances between homes;
- Poor cellular service;
- Single access communities, some on rough forest service roads; and
- Possible compounding natural hazards (i.e., landslide blocking roads).

Pre-Incident Planning

The Golden and Area Emergency Plan Agreement is a document that provides guiding principles for emergency planning, response and preparedness for the Town of Golden and extending within the WUI. The mutual covenant among the two jurisdictions authorizes emergency management services to be provided as a sub-regional service through the Town of Golden. Through the agreement, the Town of Golden is responsible for the direction and control of emergency planning response and recovery, the operation and maintenance of an Emergency Operations Centre, the coordination of disaster recovery programs, the provision of an Emergency Response Coordinator and the declaration of a state of local emergency within the Town of Golden jurisdictional boundaries. The declaration of a state of local emergency in Electoral Area A is the responsibility of the regional district, as well as development support and assistance of emergency preparedness and response plans and programs.

The CSRD should look for opportunities to support the Town of Golden in facilitating emergency preparedness through hosting wildfire readiness community education events. Emergency planning education may include tabletop exercises and workshops focused on evacuation protocols, community egress, personal emergency preparation and emergency planning of private farmland. Furthermore, the

[34] Province of British Columbia. 2016. *Provincial Coordination Plan for Wildland Urban Interface Fires.* 2016. Retrieved from: https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf

emergency planning communication strategy should promote increased uptake of the Alertable application, a valuable communication software that notifies residents of local-critical and advisory-level alters issued within the area. Current uptake in the Town of Golden and across the CSRD Electoral Area A is approximately 20%.

A pre-incident plan is a compilation of essential fire management information needed to save valuable time during fire suppression operations. The development of pre-incident wildfire suppression and response plans and maps to support emergency management can be considered a tool for increasing wildfire response readiness. Although the Town of Golden is responsible for the direction of emergency planning for the WUI, the CSRD can support the emergency planning process by advocating for wildfire-specific emergency planning to be incorporated in the Golden and Area Emergency Management Plan. To optimize preparedness, the wildfire response plan should be reviewed annually and tested and practiced periodically. These plans and maps, developed in consultation with wildfire response professionals (*e.g.,* Revelstoke Fire Zone staff, wildfire and emergency planning consultants), should consider at a minimum:

- **Command:** Authority, constraints, structural protection needs, management constraints, etc.
- **Operations:** Helicopter base locations, flight routes, restrictions, and water intakes, fire control line locations and natural barriers, crew/personnel safety zones and staging locations, fuel caches, etc.
- **Logistics:** Base camp locations, roads and trails, utilities and communications (critical infrastructure).
- **Planning:** Maps (neighbourhoods, vegetation and fuel, hazards, critical infrastructure, archaeology and environmentally sensitive areas, water sources, access/egress, etc.

Wildfire Preparedness Condition Level

The CSRD could also consider developing local daily action guidelines based on expected wildfire conditions. Table 24 below provides a template that can be tailored specifically to the WUI, outlining actions staff can take as fire danger levels change throughout the year (but mostly through the fire season).

Table 24. Example of a Wildfire Response Preparedness Condition Guide[35]

Fire Danger Level	Action Guidelines
Low	• All Community staff on normal shifts.

[35] UBCM. 2020. *FireSmart Community Funding and Supports 2021 CWRP Supplemental Instruction Guide.* Retrieved from Community Wildfire Resiliency Plan Instruction Guide (ubcm.ca)

Fire Danger Level	Action Guidelines
Moderate	• All Community staff on normal shifts • Information gathering and dissemination through the CFRC
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 Fire Danger Level. • Establish weekly communications with CFRC • Hourly rain profile for all weather stations after lightning storms.
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.
Fires(s) **Ongoing**	• All conditions apply as for Level IV (regardless of actual fire danger rating). • Provide regular updates to media/structural fire departments/staff on fire situation. • Mobilize EOC support if evacuation is possible, or fire event requires additional support. • Mobilize 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.

Firefighting Resources

No fire protection areas overlap with the WUI; however, mutual aid agreements allow the Golden Fire Department to respond to wildfires or structural fires threatening wildland within the WUI under a BCWS task number, if resources permit. The Golden Fire Department is a 24-hour volunteer fire service that provides emergency fire, rescue and medical services to the Town of Golden.[36]

The Nicholson Volunteer Fire Rescue is a CSRD Volunteer Fire Department that services a portion of Electoral Area A, south of the Town of Golden, but does not extend into the WUI. In 2020, a community survey was conducted in Blaeberry regarding community issues and priorities.[37] Results indicated a shared concern of the lack of fire protection in the community with 21% of respondents citing the absence of fire protection one of the biggest issues affecting the Blaeberry community. The CSRD Local Fire Services Committee should consider assessing the feasibility of extending local fire suppression services to residents in the WUI.

Recommended action items that the CSRD can implement to continue productive and effective emergency planning for the WUI are detailed below in Table 25.

[36] Town of Golden. Fire Rescue. Retrieved from: Town of Golden - Golden Fire Department: a 24 hour-a-day service

[37] CSRD. 2020. Responses to the Blaebery Survey – September 2020. Retrieved from: Responses to the Blaeberry Survey.pdf (csrd.bc.ca)

Table 25. Emergency preparedness recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: create specific wildfire response pre-incident plans so those responding to a wildfire emergency know who is available to help with what and when, and to improve response and recovery from a wildfire emergency.							
37	High	Host community tabletop exercises or workshops focused on community emergency preparedness and wildfire readiness.	Workshops and/or exercises should review emergency and evacuation protocols, community access/egress and personal emergency preparation resources.	FireSmart Coordinator (Golden Emergency Program Coordinator)	1 year	~20-30 participants per year	UBCM CRI funding available
38	High	Promote emergency planning and preparedness of private farmland by hosting a Farm and Ranch Wildfire Preparedness Workshop and through the distribution of the Farm/Ranch Wildfire Plan Guide and Workbook.	Discuss wildfire action planning specifically for farm land through a mix of in-person events and promotional materials.	FireSmart Coordinator (Golden Emergency Program Coordinator)	1 year	~5-10 participants per year	UBCM CRI funding available
39	High	The CSRD and the Town of Golden should continue to review the Golden and Area Emergency Program annually or as needed.	Maintain an up-to-date emergency program in the WUI.	CSRD/City of Golden	Annually	Annual review and renewal of GAEMP Agreement	~12 hours annually in-house
40	High	Promote the Alertable notification software to inform residents of critical-level and advisory-level alerts issued within the area.	Continue to provide information and sign-up capabilities through the CSRD website.	CSRD	1 year then ongoing	Increased knowledge and registration of the Alertable software	$ variable dependent on promotional method

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
41	Moderate	Develop local daily action guidelines based on expected wildfire conditions.	See Table 24 as an example.	CSRD (Golden Emergency staff)	1 year then ongoing	Daily action guidelines are developed and followed as fire conditions change	~12 hours annually in-house

5.7 VEGETATION MANAGEMENT

As discussed in Section 4.1.1, fuel is the only aspect of the fire behavior 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 and losses to structures and community resources.

Vegetation management can largely be accomplished through two different activities:

1. *Residential-scale FireSmart landscaping*: The removal, reduction, or conversion of flammable [landscaping] plants to create more fire-resistant areas in the FireSmart Non-combustible Zone and Priority Zones 1, 2 and 3.

2. *Fuel management treatments*: The manipulation or reduction of living or dead forest and grassland fuels to reduce the rate of spread and head fire intensity and enhance likelihood of successful suppression. The intent is to modify fire behaviour and fuel treatment should be designed to keep surface fires on the ground and avoid becoming more dangerous crown fires. Fuel treatment units require periodic maintenance to retain their effectiveness.

Since private land makes up most of the WUI, and most fire ignitions occur on private land, residential-scale FireSmart landscaping is one of the most effective actions that can be taken to reduce wildfire risk in the WUI. Debris-disposal opportunities exist for residents managing vegetation on their properties. The refuse station accepts yard trimmings and the wood mill purchases wood waste for hog fuel, providing that collection and transportation costs are covered by the person removing the debris off-site. The CSRD should look for opportunities to remove barriers to fuel reduction on private property (e.g., cost barriers, mobility issues etc.). Providing chipping services and/or off-site debris disposal programs can incentivize property owners to conduct FireSmart vegetation management. To build engagement, a community yard waste clean-up day can be incorporated into the residential landscaping program.

In 2018, reduced stocking standards for the WUI were adopted for certain biogeoclimatic zones (ICHdw1, ICHdm, ICHmw2, ICHmw4 and ICHxw) in the Selkirk Resource District to reduce interface wildfire risk throughout managed lands close to structures.[38] In November, 20201, the reduced stocking standards were extended to include previously non-conforming biogeoclimatic zones (MSdk, IDKdk5, ICKmw1) in

[38] Leslie, E., Christianson, D., Hodgkinson, T., Cathro, J. 2018. Fire management/Wildland Urban Interface (WUI) stocking standards for Selkirk Resource District South Columbia. Retrieved from: WUIStockingStandardsDSEFinalV1.0.pdf (gov.bc.ca)

the Golden WUI.[39] The reduced stocking standards can now be adopted by woodlots in the WUI, to align wildfire risk reduction and timber harvesting objectives.

A Wildfire Risk Reduction (WRR) Tactical Plan was developed in February 2021 for the Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (MFLNRORD) (discussed in Section 2.4 – Other Local Plans).[40] The Tactical Plan largely overlaps with the WUI and numerous areas of Crown land were prioritized for potential fuel management activities. A fuel management treatment unit on the west side of Lafountain Road has been implemented (2021) and a unit to the north has been prescribed for future implementation (2023) as a result of the Tactical Plan (shown on Map 7). Additional fuel management treatment units outside of the area of interest of this report have also been prescribed for treatment as part of the WRR program for this area. Queued fuel management areas in the WUI were revisited as part of fieldwork for the CWRP to confirm wildfire risk. Additional Crown land within the WUI that could benefit from fuel management has been proposed in Table 26.

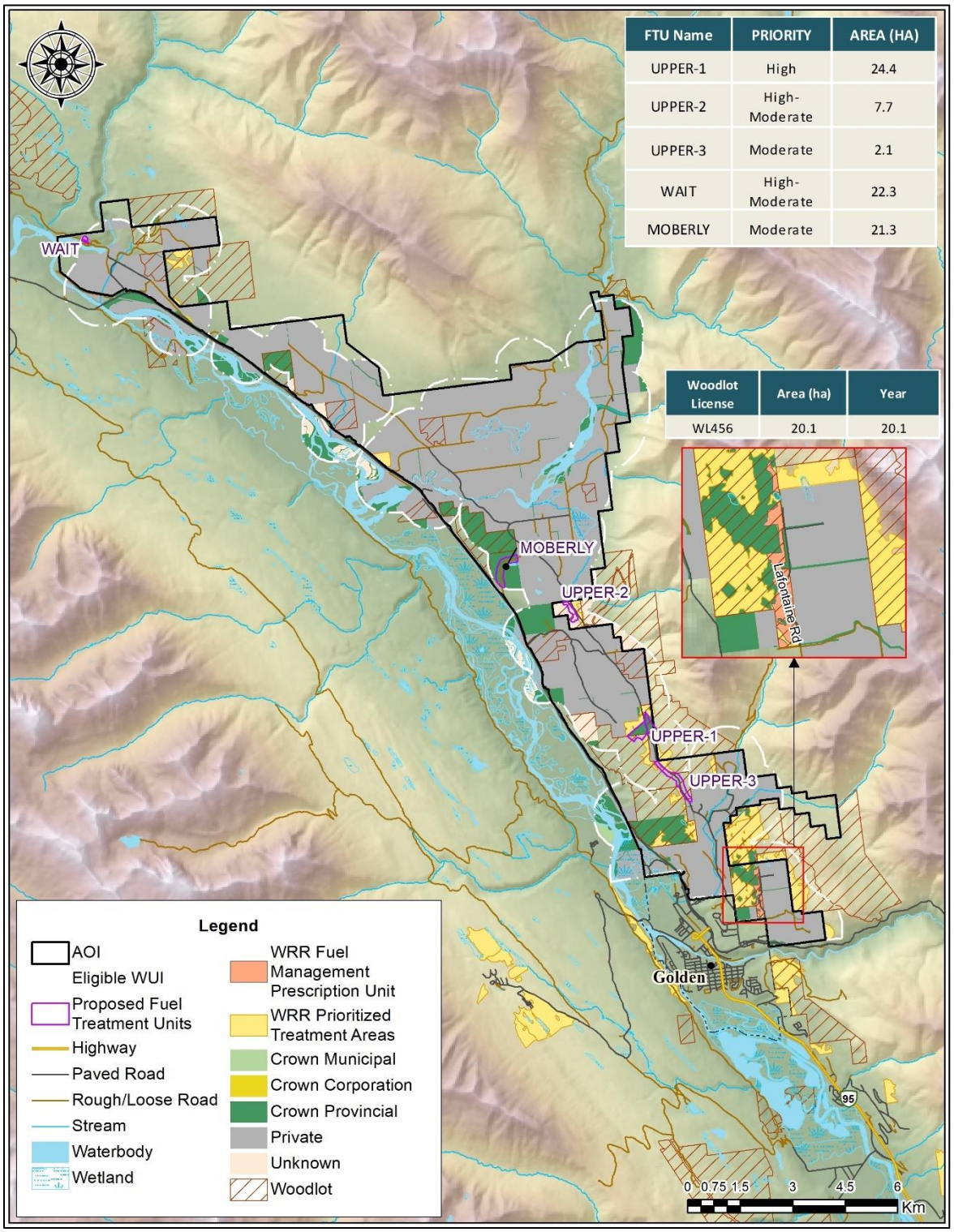
Funding opportunities for fuel treatments on public land exist through the UBCM CRI program and through the Crown Land WRR program (administered by MFLNRORD). The CSRD can independently pursue UBCM CRI funding support for the implementation of recommended fuel treatment units, or advocate for the inclusion of proposed treatment units in the current WRR program. It is acknowledged that cooperation with land managers and forest licensees will be necessary to complete treatments.

In addition to maintaining a defensible between flammable vegetation and campfire pits in the Waitabit Recreation Site, a fuel treatment unit has been proposed adjacent to the site (discussed in Table 26 and shown in Map 10). Due to the high recreational traffic of this unit, there is an opportunity to incorporate interpretive signage to demonstrate the removal of ladder fuels, surface fuels, and understory conifers, and educate community members and tourists about wildfire risk within the WUI.

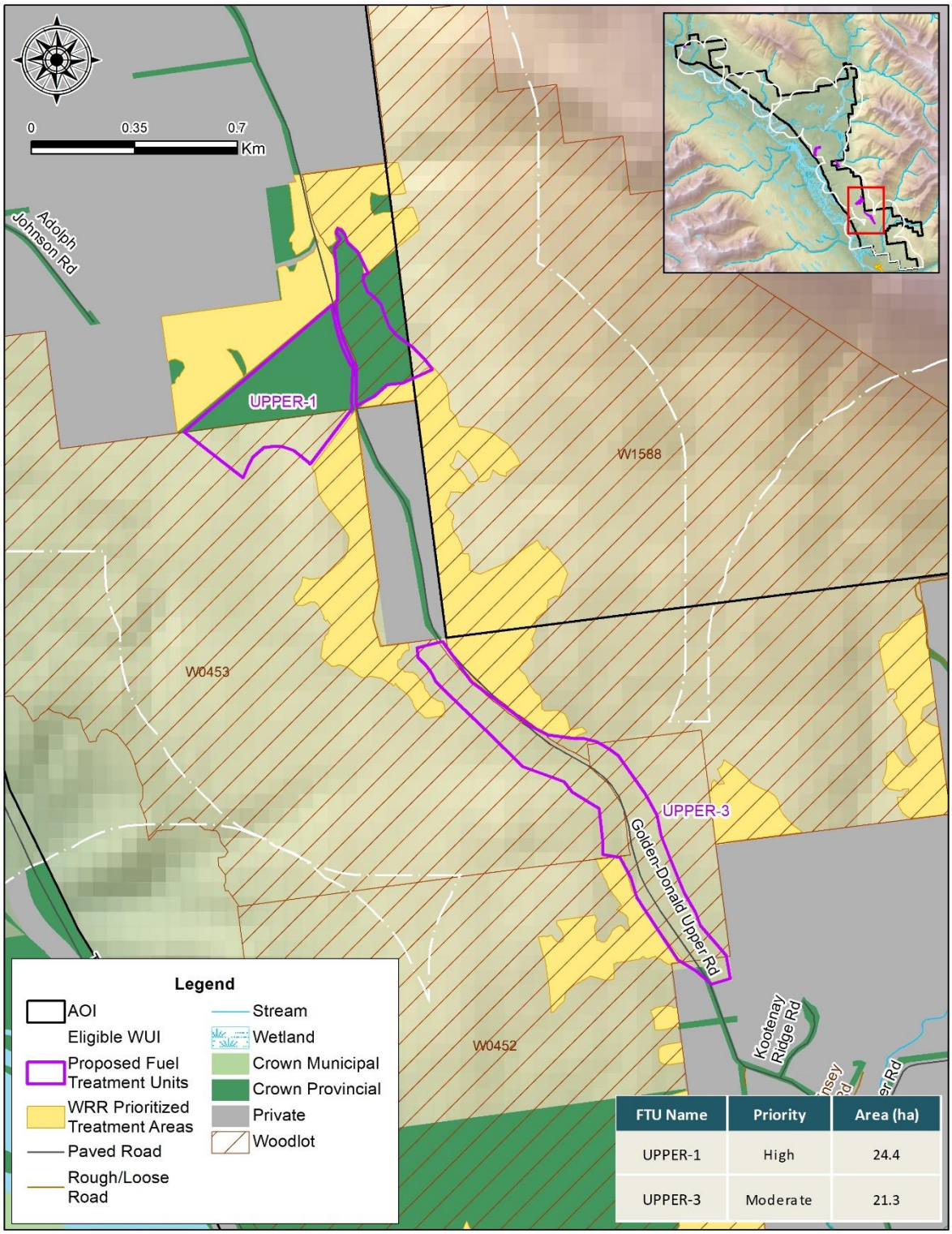
Map 7 through Map 11 show proposed fuel treatments units, areas prioritized as part of the WRR Tactical Plan and ongoing fuel management projects in the WUI. Associated vegetation management recommendations and action items to reduce wildfire hazard of forest land within the WUI are listed in Table 27.

[39] Christianson, D. 2021. Fire management stocking standards for Selkirk Resource District – Amendment for Golden Wildland Urban Interface Area

[40] Schweizer, C. – Pioneer Consultants. 2021. Wildfire Risk Reduction Tactical Plan for the Golden Area

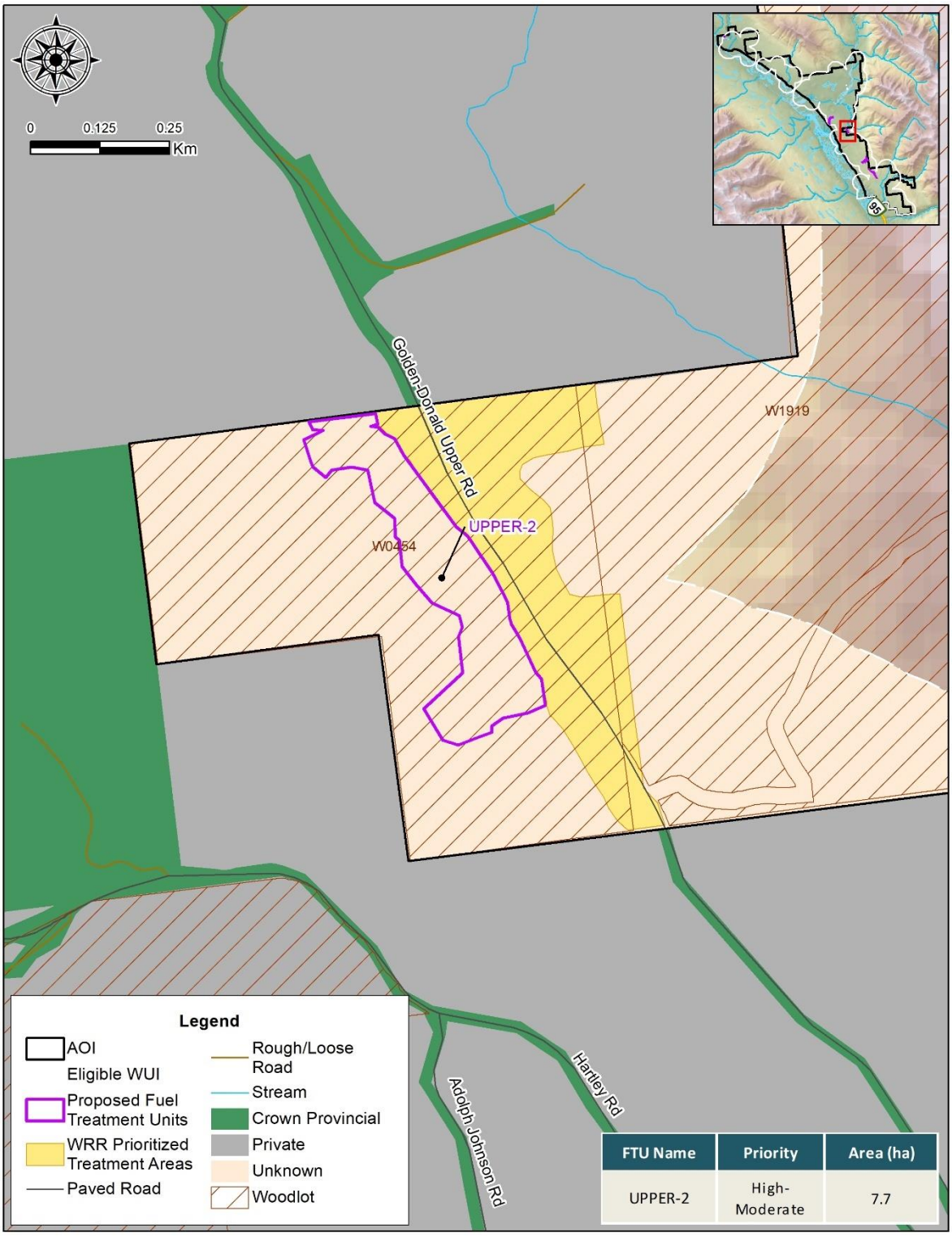


Map 7. Proposed and ongoing fuel treatment units

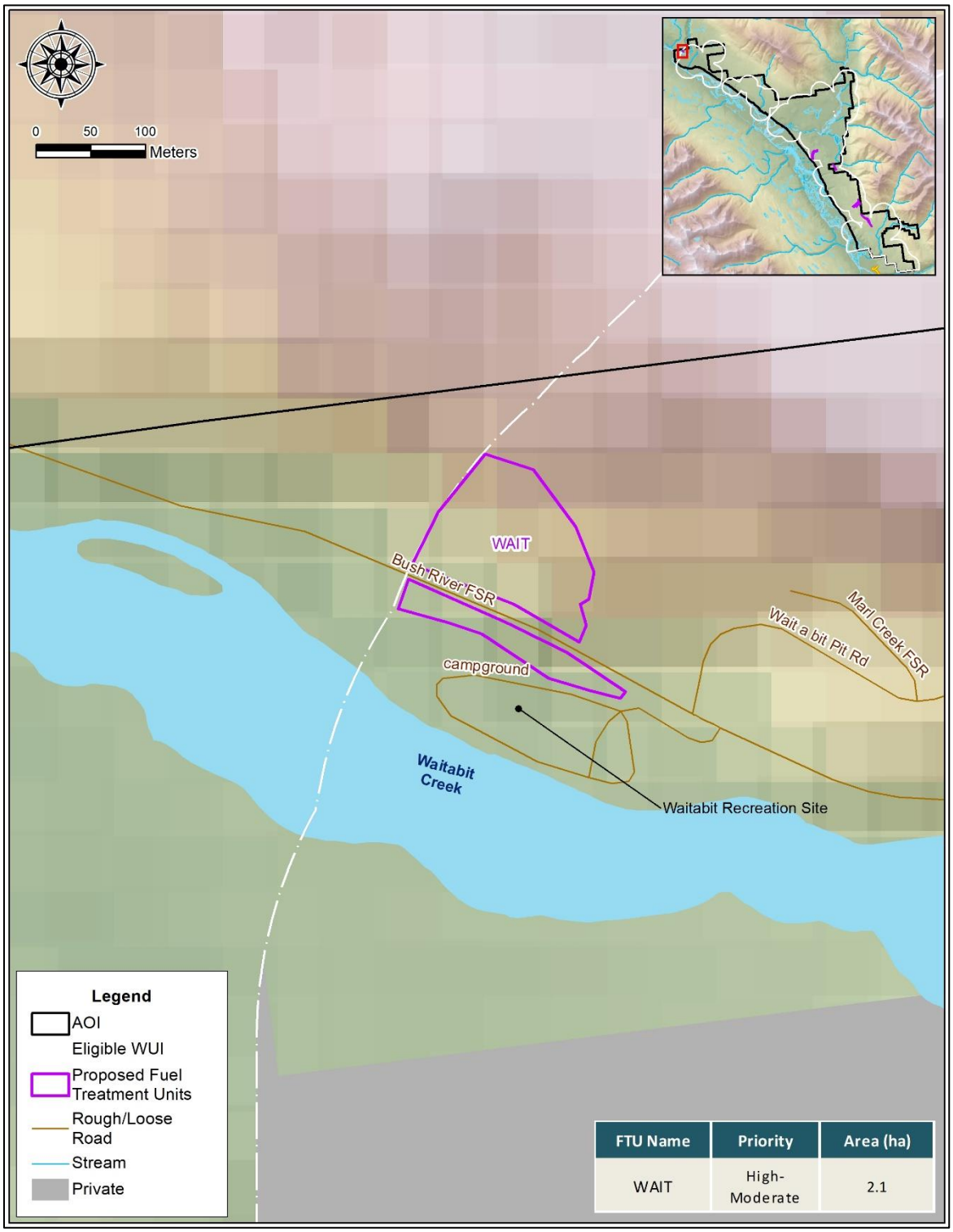


FTU Name	Priority	Area (ha)
UPPER-1	High	24.4
UPPER-3	Moderate	21.3

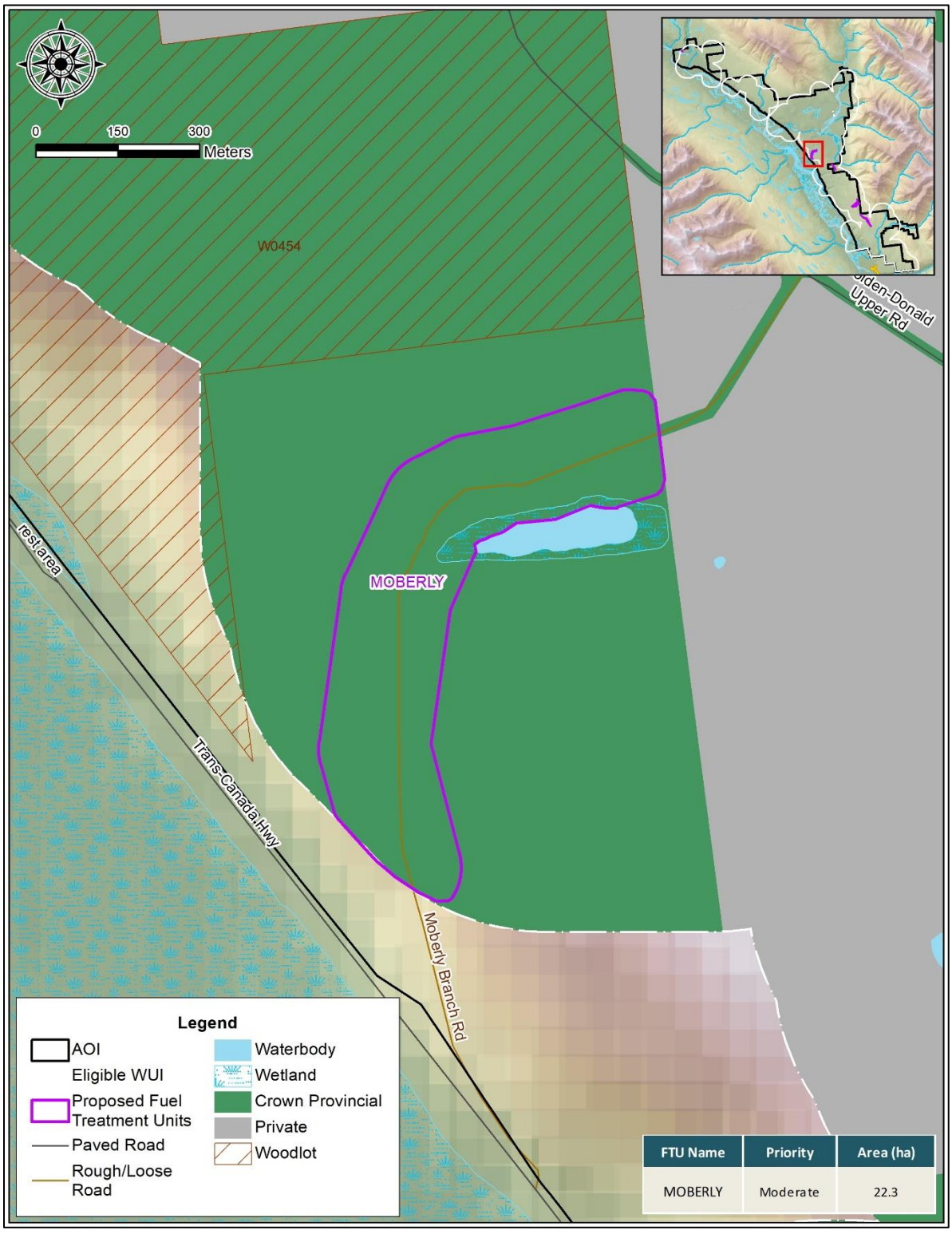
Map 8. UPPER-1 and UPPER 3 proposed fuel treatment units



Map 9. UPPER-2 proposed fuel treatment unit



Map 10. WAIT proposed fuel treatment unit



Map 11. MOBERLY proposed fuel treatment uni

Table 26. Summary of Proposed Fuel Treatment Units

PTU Name	Total Area (ha)	Priority	Wildfire Behavior Threat (ha)			Overlapping Values / Treatment Constraints[41]	Treatment Rationale
			Extreme + High	Moderate	Low		
UPPER-1	24.4	High	22.7	1.7	0.0	Crown land designation of the treatment unit. Golden-Donald Upper Road and BC Hydro overhead powerlines transect the unit north to south. Woodlots 1588 and 0453 overlap the PTU. Land management and treatment implementation of the overlapping areas is under the determination of respective woodlot managers. WRR proposed prescriptions bound the unit to the north and south. The PTU can be included in future implementation of adjacent queued priority areas.	This unit is located on either side of the primary access/egress road of the WUI. Adjacent crown land with similar stand characteristics were prioritized for WRR fuel management. Egress was identified by the CFRC as a community vulnerability to wildfire. The unit is almost entirely a C-3 fuel type, with a small portion of M-1/2 (75% conifer). The unit is densely stocked and L1 and L2 trees have relatively low crown-base heights. Suppressed saplings are present throughout the understory. Moderate surface fuel loading of scattered fine and coarse fuels is present. Treat to reduce vertical and horizontal fuels and to reduce debris accumulation to improve the safety of Golden-Donald Upper Road.

[41] Archeological assessments will be required during the prescription development of proposed treatment units as identified through First Nation consultation. See Appendix E: Communications for communication records with local First Nation Governments.

PTU Name	Total Area (ha)	Priority	Wildfire Behavior Threat (ha)			Overlapping Values / Treatment Constraints[41]	Treatment Rationale
			Extreme + High	Moderate	Low		
UPPER-2	7.7	High-Moderate	7.7	0.0	0.0	Crown land designation of the treatment unit. Abutting private land north of the unit. Golden-Donald Upper Road and BC Hydro overhead powerlines are east of the unit. Complete overlap with woodlot 0453, thus, treatment implementation is under the determination of the respective woodlot manager. Recent cutblocks tie into the unit on the west (part of W0453). WRR proposed prescriptions bound the unit to the west. The PTU can be included in future implementation of adjacent queued priority areas.	This unit is located west of the primary access/egress route for the WUI. The unit is entirely a C-3 fuel type. Dense crown closure (~75%). Both horizontal and vertical fuel continuity are continuous. Cedar saplings compose the understory at approximately 2,500 stems per hectare. Surface fuels are scattered, with some dead, elevated coarse woody debris. Treat to reduce stem density and remove ladder fuel continuity.
UPPER-3	21.3	Moderate	8.7	10.9	1.7	Crown land designation of the treatment unit. Private land boarders the unit on the north. Golden-Donald Upper Road and BC Hydro overhead powerlines transect the unit north to south. Woodlots 1588, 0452 and 0453 overlap the PTU. Land management and treatment implementation of the overlapping areas is under the determination of respective woodlot managers. WRR proposed prescriptions bound the unit to the east and west. The PTU can be included in future implementation of adjacent queued priority areas.	This unit is located on either side of the primary access/egress road of the WUI and approximately 60m south of homes. The unit is a mosaic of C-3 and C-7 fuel types. L1 and L2 trees have not begun self-pruning resulting in low crown base heights. Multi-layered stand with spruce sapling and intermediate cedar ingress in the understory. Patches of forest health instances contributing to moderate-high surface fuel loading (some suspended fuel). Treat to protect the homes from a fire moving from the south and to improve Golden-Donald Upper Road a primary access/egress route.

PTU Name	Total Area (ha)	Priority	Wildfire Behavior Threat (ha)			Overlapping Values / Treatment Constraints[41]	Treatment Rationale
			Extreme + High	Moderate	Low		
WAIT	2.1	High-Moderate	2.0	0.0	0.1	Crown land designation of the treatment unit. Partial overlap with the Waitabit Recreation Site. Cooperation with Recreation Sites and Trails B.C will be necessary to complete treatment of this unit. The Bush River forest service road transects the unit and a small quarry pit is directly adjacent to the north. The PTU can be included in future implementation of adjacent queued priority areas.	This unit is upslope of the Waitabit Recreation Site. The unit is entirely a C-3 fuel type. Scattered juniper present in the understory. Mature trees have high crown base heights (9m), however there is moderate ladder fuel continuity due to intermediate and understorey conifer ingress. Moderate surface fuel loading of fine fuel. Campfire pits present an increased risk of accidental wildfire ignition. Treatment would improve wildfire resiliency of the Recreation Site. This is a high-traffic unit that can use interpretive signage to demonstrate the removal of ladder fuels, surface fuels, and understory conifers, and educate site visitors about wildfire risk within the wildland urban interface.
MOBERLY	22.3	Moderate	9.3	13.0	0.0	Crown land designation of the treatment unit. Moberly Branch Road transects the unit. A wetland bounds the unit on the east thus appropriate riparian buffers will have to be considered when treating the unit. The PTU can be included in future implementation of adjacent queued priority areas.	This unit is a northwest road buffer along Moberly Branch Road, which is one of the primary routes to and from the Trans-Canada Highway. The unit is comprised primarily of C-5, M-1/2 (50-75% conifer) and C-3 fuel types, with a small sliver of O-1a/b surrounding a wetland. The unit is downslope of the Blaeberry community. Terrain is sloped gently towards the northwest and is broken up with benches. The overstorey is much denser along the road right-of-way with a small fringe of C-3 fuel type. The understory is relatively sparse, with scattered deciduous shrubs, however, continuous pinegrass increases surface fire threat. Treat to remove surface fuels and to increase access/egress safety of Moberly Branch Road.

Recommendations and action items to increase FireSmart vegetation management and practices within the WUI and associated Home and Structure Ignition Zones are provided below in Table 27.

Table 27. Vegetation management recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: Reduce the potential wildfire intensity and ember exposure to people, infrastructure, structures, and other values through manipulation of both the natural and cultivated vegetation that is within or adjacent to a community.							
42	High	Host a community yard waste clean-up day. Provide free chipping services and off-site debris removal as incentives to encourage yard waste removal.	This is to remove cost barriers for wildfire fuel reduction on private property. Potential to incorporate clean-up day into the FSCNRP.	CSRD (FLNRORD - Selkirk Forest District)	Annual (avoiding the wildfire season)	Prescriptions for high priority units developed	UBCM CRI funding available ~16 hours/year in-house
43	High	Advocate for the inclusion of fuel treatment units proposed in this CWRP in the Wildfire Risk Reduction Program.	Wildfire Risk Reduction projects are completed through the Resource District. Local governments and engaged communities can advocate or submit high priority areas for consideration to the Resource District to be planned and implemented through the WRR program.	CSRD (FLNRORD - Selkirk Forest District)	3 years	CWRP proposed treatment units included in WRR program	Crown Land Wildfire Risk Reduction funding
44	Moderate	As part of implementation of the high-traffic WAIT fuel treatment unit, the CSRD should develop interpretive signage to demonstrate the removal of ladder fuels, surface fuels, and understory conifers, and	Increase public awareness and support of fuel management practices.	CSRD (FLNRORD - Selkirk Forest District)	3-5 years	Trail-side signs placed in high-public use area, post treatment	Crown Land Wildfire Risk Reduction funding and UBCM CRI funding opportunities

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		educate visitors about wildfire risk within the wildland urban interface.					

SECTION 6: APPENDICES

6.1 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 AOI and surrounding WUI as possible (within time, budget and access constraints). Threat Assessment plots are completed on the 2020 and 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 provided by the client and field verification.
2. Update structural data using critical infrastructure information provided by the client, field visits to confirm structure additions or deletions, and orthophotography
3. Complete field work to ground-truth fuel typing and assess site-level threat ratings
4. Threat assessment analysis using field data collected and rating results of WUI threat plots.

6.1.1 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.[42] 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.[43] It should be noted that there are significant limitations with the fuel typing system which should be recognized.

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 in 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.[43]

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

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

[43] 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 28 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 28. 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-4, C-6, S-2, and S-3 are not summarized below)

Fuel Type	FBP / CFDDRS Description	WUI Description	Wildfire Behaviour Under High Wildfire Danger Level	Fuel Type – Crown Fire / Spotting Potential
C-2	Boreal Spruce	Moderately stocked, late young forest (spruce), with crowns extending to the ground	Surface and crown fire, high fire intensity and rate of spread	
C-3	Mature jack or lodgepole pine	Fully stocked, late young forest (Douglas fir, hemlock, cedar), with crowns separated from the ground	Surface and crown fire, low to very high fire intensity and rate of spread	High*
C-7	Ponderosa pine and Douglas-fir	Low-density, uneven-aged forest, crowns separated from the ground, understory of discontinuous grasses and shrubs. Exposed bed rock and low surface fuel loading.	Surface fire spread, torching of individual trees, rarely crowning (usually limited to slopes > 30%), moderate to high intensity and rate of spread	Moderate
C-5	Red and white pine	Well-stocked mature forest, crowns separated from ground. Moderate understory herbs and shrubs. Often accompanied by dead woody fuel accumulations.	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; areas harvested 10-20 years ago	Surface fire spread, torching of individual trees and intermittent crowning, (depending on slope and percent conifer)	<26% conifer (Very Low); 26-49% Conifer (Low); >50% Conifer (Moderate)
O1a/b	Grass	Matted and standing grass communities; sparse or scattered shrubs, trees and down woody debris. Seasonal wetlands that have the potential to cure.	Rapidly spreading, high-intensity surface fire when cured	Low
D-1/2	Aspen (leafless and green)	Deciduous stands	Always a surface fire, low to moderate rate of spread and fire intensity	Low
S-1	Slash (jack / lodgepole pine, white spruce)	Any conifer slash	Moderate to high rate of spread and high to very high intensity surface fire	Low

Fuel Type	FBP / CFDDRS Description	WUI Description	Wildfire Behaviour Under High Wildfire Danger Level	Fuel Type – Crown Fire / Spotting Potential
W	N/A	Water	N/A	N/A
N	N/A	Non-fuel: irrigated agricultural fields, golf courses, alpine areas void or nearly void of vegetation, urban or developed areas void or nearly void of forested vegetation	N/A	N/A

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

During field visits, recurring patterns of fuel type errors were found in the provincial dataset. They were:

- C-3 fuel types being incorrectly identified by the PSTA as C-5,
- C-3 fuel types being incorrectly identified by the PSTA as C-7,
- C-7 fuel types being incorrectly identified by the PSTA as C-3,
- C-7 fuel types being incorrectly identified by the PSTA as O-1a/b,
- M-1/2 fuel types being incorrectly identified by the PSTA as D-1/2 and,
- M-1/2 fuel types being incorrectly identified by the PSTA as C-7.

The resulting updated fuel types were shown on Map 4 in Section 4.1.1 - Fuel.

6.1.2 APPENDIX A-2: WILDFIRE FIRE 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 (1436m buffer from structure point data)
- Wildland Urban Interface Risk Class
- Current Fire Polygons
- Current Fire Locations

- Historical Fire Perimeters
- Historical Fire Incident Locations
- Historical Fire Burn Severity

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

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

The required components for the spatial data submission are detailed in the CRI 2021 FCFS Program and Application Guide Spatial Appendix[44] – these include:

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

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

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 29 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.

[44] UBCM. 2021. *Community Resiliency Investment Program 2021 FireSmart Community Funding & Supports Program & Application guide*. Retrieved from: cri-fcfs-2021-program-guide_0.pdf (ubcm.ca)

Table 29. 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.
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 30 below summarizes the components and scores to determine the Fire Threat.

Table 30. Fire Threat Class scoring components

Attribute	Indicator	Score
Fuel Type	C-1	35
	C-2	

Attribute	Indicator	Score
	C-3	
	C-4	
	M-3/4,>50% dead fir	
	C-6	25
	M-1/2, >75% conifer	
	C-7	20
	M-3/4, <50% dead fir	
	M-1/2, 50-75% conifer	15
	M-1/2, 25-50% conifer	
	C-5	
	O-1a/b	10
	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
	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 program.

6.1.3 APPENDIX A-3: WUI RISK SPATIAL ANALYSIS METHODOLOGY

To determine the WUI Risk score, only the distance to structures is used. Buffer distance classes are determined; <200m, 200m-500m and >500m) but only for polygons that had a 'high' or 'extreme' Fire Threat score from previous assessment. In order to determine WUI Risk; those aforementioned polygons within 200m are rated as 'extreme', within 500m are rated as 'high', within 2km are 'moderate', and distances over that are rated 'low'. WUI Risk Classes and associated assumed scores are summer below in Table 31.

Table 31. WUI Risk Classes and their associated summed scores

WUI Risk Class	Score
Very Low	0
Low	0-35
Moderate	35-55
High[45]	55-65
Extreme	>65

6.1.4 APPENDIX A-4: WILDFIRE THREAT PLOT LOCATIONS

Table 32 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).

[45] WUI risk is only assessed for polygons with wildfire threat ratings of high or extreme.

Table 32: Summary of WUI Threat Assessment Worksheets

Wildfire Threat Assessment Plot ID	Geographic Location	Wildfire Behaviour Threat Class
BEND-1	East of Big Bend Highway - Donald	Moderate
BERG-1	West of the end of Bergenham Road - Moberly	Moderate
BERG-2	West of Bergenham Road - Moberly	High
BRIDGE-1	South Redburn Creek FSR – Blaeberry North	Low
FORDE-1	North of Forde Station Road – Blaeberry South	Moderate
HWY-1	East of Trans-Canada Highway – Hospital Creek	Moderate
HWY-2	East of quarry – Hospital Creek	Low
JOHN-1	South of Johnson Road – Blaeberry North	Low
JOHN-2	South of Johnson Road – Blaeberry North	Moderate
JOHN-3	North of Johnson Road – Blaeberry North	Low
KOOTENAY-1	West of Upper Donald-Golden Road – Hospital Creek	Moderate
KOOTENAY-2	West of Upper Donald-Golden Road – Hospital Creek	Moderate
KOOTENAY-3	East of Upper Donald-Golden Road – Hospital Creek	Moderate
MOB-1	East of Moberly Branch Road - Moberly	Low
MOB-2	West of Moberly Branch Road - Moberly	Low
MOB-3	West of Moberly Branch Road - Moberly	High
OBERG-1	South of Blaeberry Road – Blaeberry North	Moderate
OSTER-1	West of Hospital Creek Road – Hospital Creek	Moderate
OSTER-2	North of Hospital Creek Road – Hospital Creek	High
OSTER-3	West of West Oster Road – Hospital Creek	Moderate
REEVES-1	North of Reeves Road - Donald	Moderate
REEVES-2	East of Abetibie FSR - Donald	Moderate
REEVES-3	South of the end of Reeves Road - Donald	Moderate
UPPER-1	East of Upper Donald-Golden Road - Moberly	High
UPPER-2	East of Upper Donald-Golden Road - Moberly	Moderate
UPPER-3	West pf Upper Donald-Golden Road - Moberly	Moderate
UPPER-4	East of Upper Donald-Golden Road – Hospital Creek	Moderate
UPPER-5	West of Upper Donald-Golden Road – Hospital Creek	Moderate
WAIT-1	North of Waitabit Recreation Site - Donald	Moderate

6.1.5 APPENDIX A-5: 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).[46,47] Both the HIZ and CIIZ include the structure itself and four concentric, progressively wider Priority Zones out to 100 m from the structure (Figure 5 below). More details on priority zones can be found in the FireSmart Manual.[48]

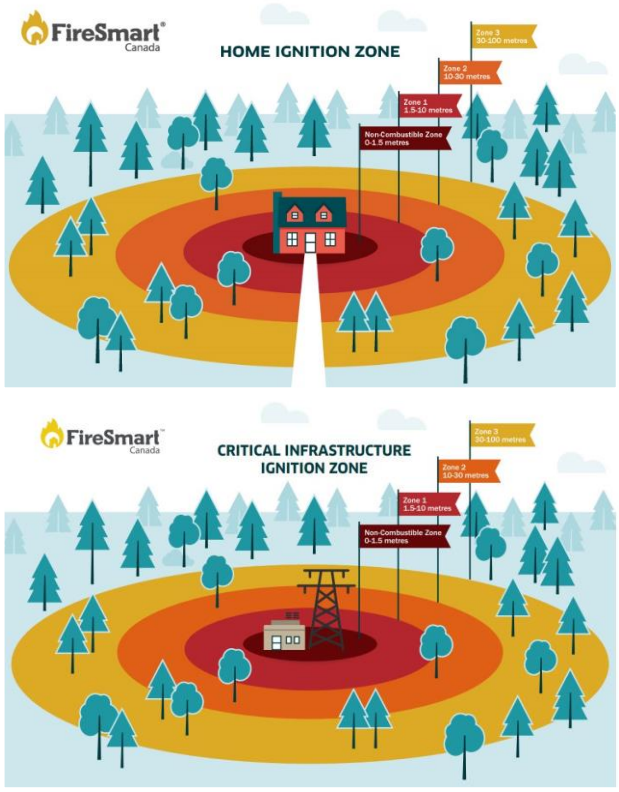


Figure 5. FireSmart Home and Critical Infrastructure Ignition Zone (HIZ, CIZ)

[46] 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)

[47] Cohen, J. *Preventing Disaster Home Ignitability in the Wildland-urban Interface.* Journal of Forestry. p 15 - 21. Retrieved from: Preventing Disaster: Home Ignitability in the Wildland-Urban Interface | Journal of Forestry | Oxford Academic (oup.com)

[48] Available for download here: FireSmartBC_HomeownersManual_Printable.pdf

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

Because ignitability of the HIZ/CIZ 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.[47] Increasing ignition resistance would reduce the number of homes simultaneously on fire; extreme wildfire conditions do not necessarily result in WUI fire disasters.[49] It is for this reason that the key to reducing WUI fire structure loss is to reduce structure ignitability. Mitigation responsibility must be centered on structure owners. Risk communication, education on the range of available activities, and prioritization of activities should help homeowners to feel empowered to complete simple risk reduction activities on their property.

Table 33. Proximity to the Interface.

Proximity to the Interface	Descriptor*	Explanation
WUI 100 *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 2000 *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.

[49] 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)

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

6.2 APPENDIX B: WUI RISK ASSESSMENT - WORKSHEETS AND PHOTOS

Provided separately as PDF package.

6.3 APPENDIX C: MAPS

Provided separately as PDF package.

6.4 APPENDIX D: COMMUNITY FIRESMART RESILIENCY COMMITTEE TERMS OF REFERENCE TEMPLATE

Columbia Shuswap Regional District Electoral Area A

Community FireSmart Resiliency Committee

Background Information

The Community FireSmart® and Resiliency Committee (CFRC) fills a key level of collaboration and organization across B.C. It takes the collaborative efforts of multiple stakeholders working together to achieve wildfire resilient communities. This may include local fire departments, First Nation and/or local government staff and elected officials, provincial government such as Emergency Management BC (EMBC) and BC Wildfire Service (BCWS), Land Mangers (e.g., Natural Resource District/BC Parks), industry representatives and other community stakeholders. The CFRC will provide the missing link, bringing partners together under a common vision connected to the seven FireSmart disciplines.

Purpose

The FireSmart Resiliency Committee's mandate is to act in an advisory and advocacy capacity to support the CSRD's objective of reducing the risks of wildfire to Electoral Area A. The purpose of the committee is to strengthen collaboration between key partners including residents, provincial agency staff, local government staff, and other stakeholders to coordinate, plan, and share information on how to successfully implement the seven principles of FireSmart at a regional level.

Scope

This CSRD Electoral Area A Community FireSmart and Resiliency Committee will focus on growing the seven FireSmart disciplines within the geographic boundaries of the WUI of Electoral Area A and in partnership with First Nations, member municipalities, and other government agencies. CFRCs work collaboratively with FireSmart BC and be considered a member in good standing with FireSmart Canada. The committee will evaluate, review and/or develop procedures, guidelines, best practices and promote the FireSmart program resources and information through education and public relations. The CFRC may be a contact point within the region for public that are interested in taking advantage of the seven FireSmart disciplines to increase their wildfire resiliency.

Membership

The structure of the Electoral Area A CFRC is similar to other CFRCs in BC and will include both land managers, elected officials, and emergency management staff from across the CSRD. As the CFRC evolves over time, membership may also change. The CFRC will be made up of a maximum of 12

members plus a Committee Chair (CSRD FireSmart Coordinator for up to three years) with representation from:

- Local Fire Departments
- CSRD staff
- Provincial government staff
- Elected officials
- The natural resources and forestry sector
- Utility Companies
- The farming and agricultural sector
- Tourism representative
- The Building, Development and Construction Industry
- Chamber of Commerce
- Recreation groups
- First Nations
- Other stakeholder and resident groups and associations

Creation of Committees

Stakeholders from the above list (not exhaustive or exclusive) will be encouraged to apply for membership on the committee. Members will be appointed for a three-year term on the committee. The committee chair will make the final decision on successful membership applications, with the option to renew membership as the Committee Chair or as a member of the Committee.

The CFRC may create standing, ad hoc (special project) or advisory (related to another board, committee or project) committees as required. Each sub-committee that is created by the CFRC will be governed by a document that clearly defines its purpose, goals and deliverables. Sub-committees would make recommendations to the CFRC as a whole.

Deliverables

- Collaborate on a communication and public education strategy with multiple local governments
- Coordinate applications to the Community Resiliency Investment program and other funding opportunities
- Identify and review fuel management opportunities in collaboration with MFLNRORD
- Develop/update, implement and monitor the success of Community Wildfire Resiliency Plans

Other Suggested Deliverables

- Develop a network of Local FireSmart Representatives in areas within the Electoral Area and coordinate their activities within the region

- Create an advocacy program for participation in the FireSmart Canada Neighbourhood Recognition Program and work towards increasing the number of recognized neighbourhoods and communities in the region each year
- Coordinate applications to the Community Resiliency Investment program and other funding opportunities
- Identify FireSmart activities that should be undertaken by communities to best build wildfire resiliency in higher risk areas

Meetings

The FireSmart Coordinator (appointment Committee Chair) will chair CSRD Electoral Area A CFRC meetings. Meetings will be held regularly. Frequency depends on the activity of the committee, but the CSRD will endeavor to hold between 2 – 12 meetings annually. Conference call meetings may be held. The Chair will propose and/or solicit the Committee for agenda topics and is responsible for administrative duties. Administrative duties include preparing the agenda, recording the minutes, sharing the draft minutes for correction, sending out meeting minutes and properly filing the minutes.

Member organizations are expected to provide a representative, however when extenuating circumstances arise preventing attendance, an alternate representative will be designated and briefed prior to the meeting. A meeting may be cancelled at the decision of the Chair.

Committee Protocol

The Committee will work toward consensus, using an interest-based approach rather than a position-based approach. If a vote on a matter is necessary, the vote will be taken with a simple majority of Committee members present and voting required to pass a motion.

- A Vice-Chair and Secretary will be elected by the Committee at the first meeting for the first term. A Chair and Secretary will be elected by the Committee at the first meeting of each subsequent term. The names of these positions will be forwarded to the CSRD.
- The Chair will act as the liaison between the Committee and the CSRD Emergency Services Coordinator (or designate).
- Meetings will be open meetings and will be run by the Chair or Vice-Chair in the absence of the Chair.
- The Secretary will record minutes of the meeting and forward those minutes to the CSRD. The minutes will be distributed electronically to the Committee members. Meeting minutes will be posted on the Committee web page only if taken and approved by CSRD staff.
- The quorum of the meeting will be comprised of not less than half of appointed committee members.
- The CSRD may add or remove members from the Committee at any time at its discretion.

- The Committee may invite other persons to participate in making presentations to the Committee in order to benefit from additional expertise pertaining to subjects being discussed.
- Dates for the next meeting should be determined by the Committee during the first current meeting.
- The Emergency Program Coordinator (or designate) may attend meetings. The Emergency Program Coordinator (or designate) will attend a minimum of one meeting per year to discuss budget recommendations and approvals.
- The Committee will adhere to all statutes, legislation, acts, bylaws and all other responsibilities as a committee of the CSRD.
- Committee members may choose to express their personal views to others outside the Committee but may not speak on behalf of or in any way create the impression that they are speaking for the Committee as a whole. In order to ensure open and honest dialogue; Committee members should not discuss comments or opinions expressed by other Committee members without their knowledge and consent.
- A conflict of interest arises when a committee member speaks or votes on a motion that could be the cause of some direct significant benefit - monetary or otherwise - to that member. If such a situation arises, the member involved should excuse themselves from proceedings that relate to the conflict unless explicitly requested to speak, only after a majority vote to do so. Any subsequent information provided by the individual will clearly be identified in the meeting minutes as coming from a source perceived to be in a conflict of interest.
- Members of the public may observe meetings but will not have voting rights and will only have speaking rights through invitation by the Chair.

Resources

The Regional District will provide such administrative and other support as may reasonably be requested by the Committee to facilitate the operation of the Committee. Any Committee budget requirements will be included within the Community Resiliency Initiative (or similar) grant submission subject to the CSRD's normal annual review and approval process. Committee participation is voluntary with no remuneration provided for members' time.

Terms of Reference Approved

Name of Member	Date	Name of Member	Date
Name of Member	Date	Name of Member	Date
Name of Member	Date	Name of Member	Date
Name of Member	Date	Name of Member	Date
Name of Member	Date	Name of Member	Date
Name of Member	Date	Name of Member	Date
Name of Member	Date	Name of Member	Date

6.5 APPENDIX E: COMMUNICATIONS

Provided separately as PDF package.