Community Wildfire Resiliency Plan

Town of Creston

December 20, 2023

Submitted by:

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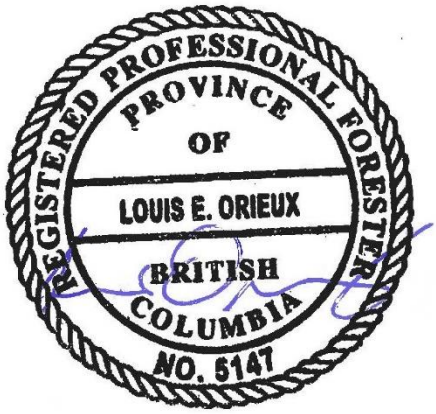
I certify that the work described herein fulfills the standards expected of a member of the Association of British Columbia Forest Professionals and that I did personally supervise the work.	
Registered Professional Forester Signature and Seal	
	

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- Jared Riel (Town of Creston Fire Chief)
- Daniel Klein (BC Wildfire Service)
- Nora Hannon (RDCK Disaster Mitigation and Adaptation Senior Advisor)

These individuals invested substantial time in meetings, answering questions, and reviewing and commenting on the contents of this Plan. While this list is incomplete, the authors would also like to thank the members of the Creston Valley FireSmart Resiliency Committee (CVFRC).

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EXECUTIVE SUMMARY

In June 2023, B.A. Blackwell and Associates Ltd. was retained by the Regional District of Central Kootenay (RDCK) to assist the Town of Creston (Creston; Town) in developing a new Community Wildfire Resiliency Plan (CWRP). A CWRP is both a localized risk assessment and an action plan to improve wildfire resiliency within the municipality's Wildland-Urban Interface (WUI). This plan replaces the previous Community Wildfire Protection Plan (CWPP) completed for Creston in 2016, accounting for changes that have occurred in the last seven years and taking advantage of the newest community wildfire planning framework in BC. The CWRP is founded on the application of the seven FireSmart™ disciplines (Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Cross-training, Emergency Planning, and Vegetation Management).

Creston has made full or partial progress on a few of the 2016 CWPP recommendations. The recommendations not addressed related to updating specific plans, delivering public FireSmart and wildfire education, building code risks, and private landowner vegetation management issues. As the Town shares borders with RDCK Electoral Areas B and C, and Yaqan Nukiy (Lower Kootenay Indian Band) reservation lands, community wildfire resiliency is strongly tied to the actions of these neighbouring jurisdictions and the Provincial government. Maintaining meetings of the newly formed Creston Valley FireSmart Resiliency Committee will be essential to implementing this plan and achieving effective wildfire risk reduction throughout Creston and the upper Kootenay River Valley area.

Creston is in a provincially defined Wildland Urban Interface polygon that has a Risk Class of "2", which reflects the second-highest wildfire risk rating. The Provincial Strategic Threat Analysis assigns a "High" or "Extreme" threat rating to much of the surrounding area. Fieldwork for this CWRP allowed for verified and updated fuel types and wildfire threat assessments to be combined with an office-based analysis to provide a local wildfire risk assessment for the Town. The local analysis determined that, for the assessable area, the steep southerly-facing forested slopes in the northeast of the community's WUI pose the most significant wildland fire risk to the community, dominated by both High and Extreme wildfire threat rating polygons. The analysis cannot be performed on private land which covers approximately 73% of Creston's WUI. This highlights the need to implement risk mitigation programs on private land if community resilience is to be achieved. Conditions on private land can often result in the fire hazard being much higher than in the forest adjacent if there is low compliance with FireSmart principles – which is an issue that was frequently observed through field work. It is important to recognize that in WUI fires, wildland fuels (trees, shrubs, branches, etc.) are not the only fuel available to the fire – houses and their exterior construction materials and landscaping vegetation, cars, barbeque propane tanks, and more (anything that is flammable or combustible) is available fuel.

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 flying embers (firebrands). Firebrands can be transported long distances ahead of the wildfire, across fire guards and fuel breaks, and accumulate in densities that can exceed 600 embers per square meter. Combustible materials found on the exterior of and surrounding homes (the FireSmart Home Ignition Zone) combine to provide fire pathways allowing

spot surface fires ignited by embers to spread and carry flames or smoldering fire into contact with structures.

Because ignitability of structures and landscaping vegetation is the main factor driving structure loss, the intensity and rate of spread of wildland fires beyond the community has not been found to necessarily correspond to loss potential. For example, FireSmart homes with low ignitability may survive high-intensity fires, whereas highly ignitable homes may be destroyed during lower intensity surface fire events. Increasing ignition resistance would reduce the number of homes simultaneously on fire; extreme wildfire conditions do not necessarily result in WUI fire disasters.[1] 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, supported by Local Government.

Creston can be considered an interface community – the homes and structures are largely situated adjacent to vegetated/forested landscapes surrounding. Wildfire poses a threat to the community from either a human or lightning ignition in the adjacent forests, but also from a residential fire that then spreads into surrounding vegetation and landscaping. Located in the upper Kootenay River floodplain and on a series of terraces on the east side of the Kootenay River, Creston is a relatively static community with limited recent subdivision and population growth and an aging population of which 40% is over the age of 65. Because of the amount of private land within Creston's WUI, and the observed low adherence to FireSmart residential vegetation management and exterior building materials, there is an emphasis on FireSmart education and FireSmart residential risk reduction policies is made within this Plan. 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.

A total of 46 recommendation and action items are presented in Table 1 within this Executive Summary and are more thoroughly discussed in their appropriate sections within this Plan. Ultimately, the recommendation and action items within this Plan should be considered as a toolbox of options to help reduce the wildfire risk and consequence to Creston. Creston will have to further prioritize implementation based on resources, strengths, constraints, and availability of funding, and regularly update the prioritization and course of actions as variables change over time. Importantly, as Creston is now moving emergency management and planning services in-house (out of RDCK management), it could be time to move the community's FireSmart program in-house as well. This could provide Creston and Creston Fire Rescue the greatest opportunity to provide a local FireSmart program to residents delivered by local professionals with local knowledge and community connections.

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

Table 1: Town of Creston's Community Wildfire Resiliency Plan

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
Education - Section 5.2							
Residents							
1a 1b	High High	Move the FireSmart program "in-house" by having Town of Creston apply to UBCM CRI FCFS for FireSmart program funding. Apply for funding to hire a FireSmart Coordinator. This position can be added to a current employee's role, be made a new position, or contracted out.	To provide a continuous, local FireSmart program, delivered by local professionals with local knowledge and connections, to their community. Having a FireSmart Coordinator will provide a lead person with dedicated time to coordinate, manage, and implement the program, especially as it grows.	Creston (RDCK)	2 years	Creston has its own FireSmart program being managed by a local FireSmart Coordinator.	CRI FCFS up to cost maximums.
2	High	Continue to promote FireSmart to Creston residents at community events, public spaces, and through workshops using FireSmart branded material and printed manuals (Home and Landscaping).	Most residences in Creston are not FireSmart. Landscaping (conifer hedges), firewood and combustible materials storage, and external building materials are the biggest issues. FireSmart BC resources help present a unified message. Print resources are popular and easy to distribute. FireSmart branded tents, banners, and t-shirts can be purchased with CRI FCFS funding.	Creston (RDCK)	Annually	Quantity of resources distributed/number of times used at events.	CRI FCFS up to cost maximums.
3	High	Update Creston's FireSmart webpage with the most recent FireSmart graphics and language. Provide links to the current fire danger rating, or better yet, have that posted on the front of this page (making sure to keep it updated during the fire season).	To continue to provide to most recent and up to date FireSmart information, language, and principles to residents (and visitors).	Creston (RDCK)			CRI FCFS up to cost maximums.
4	High	Implement a FireSmart social media campaign through various Creston social media platforms (i.e., Facebook, Twitter, Instagram).	To promote FireSmart information to residents (and visitors). Include links to graphics, videos, pdf information/pamphlet downloads, etc.	Creston (RDCK)			CRI FCFS up to cost maximums.
5	High	Promote FireSmart in Creston schools using the FireSmart Education Kit and other resources.	Great success has been made through BC schools with FireSmart outreach. Engaging with the community's younger population may increase uptake with all residents.	Creston (RDCK)	Annually	One FireSmart lesson delivered each year (minimum).	CRI FCFS; e.g. FireSmart Magnetic Board for $1,710.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
6	High	Consider door-to-door knocks in identified high-risk, priority neighbourhoods in the WUI interface northeast and east areas of Creston to discuss wildfire risk and FireSmart principles that they can apply to their home and property.	Although wildfire can affect all areas of Creston, analyses have identified the neighbourhoods in the northeast and east as being the most at risk in relation to potential wildfire behavior. Door to door knocks by Fire Chiefs, fire department personnel, and FireSmart Coordinators have been successful in other communities.	Creston (CFR)	2 years	All homes in these WUI neighbourhoods have had at least one visit from a CFR member (with FireSmart information left at their door).	Town of Creston for personnel time. CRI FCFS for FireSmart materials.
7	High	Provide (through Creston's own FireSmart program) or promote (through RDCK's FireSmart program), free FireSmart Home Ignition Zone assessments.	FireSmart Home Ignition zone assessments introduce residents to FireSmart, its principles, fire and wildfire risks associated with their home and property, and how they can be mitigated. These assessments are primarily and education exercise, and can be funded completely through CRI FCFS.	Creston / RDCK	2 years	FireSmart Home Ignition Zone assessments are being completed within Creston.	CRI FCFS up to cost maximums.
8	Moderate	Increase public awareness of this Community Wildfire Resiliency Plan.	Increasing awareness of wildfire risk also increases community resiliency through household emergency planning, and support for FireSmart.	Creston (RDCK)	1 year from CWRP completion	Awareness by residents - consider a survey.	Staff time to update website, and media posts. Newspaper ads ~$300 each.
Visitors							
9	High	Purchase and install new Fire Danger Rating signs. Have them posted at major roads entering Creston and keep them updated (especially during fire season).	Creston Fire Rescue identified the current signs as outdated. These signs provide both visitors and residents a quick snapshot of the current local wildfire conditions as well as a reminder of being FireSmart.	Creston	5 years (signs installed)	Old Fire Danger Rating Signs have been replaced.	Sign cost ~$800 for purchase and installation per sign.

Legislation, Planning and Development - Section 5.3							
10	High	Enact a Wildfire Landscaping Bylaw to restrict flammable landscaping. Example: prohibit conifer vegetation in the Immediate Zone of a residence or structure (1.5 m) and prohibit the planting of new conifer vegetation in the Intermediate Zone (10 m). The bylaw should apply throughout Creston.	Cedar and juniper hedges and ornamentals are popular in Creston and have been planted around new builds. As new developments are built, Creston has a great opportunity to prevent flammable vegetation from being established.	Creston (Development Services)	Approved within 3 years.	All new development complies with the policy.	CRI FCFS: up to $10,700 with estimated incremental staff hours or contract cost
11	High	Consider amending Creston's Official Community Plan Wildfire Hazard DPA boundary to include all of Creston. At the very least, it should include all structures within two kilometres of the wildland-urban interface.	Existing development in Creston does not (generally) meet FireSmart principles are a much greater portion of the community is at risk from ember shower ignition than just the current area mapped (which largely reflects managing ignition from direct flame contact at the WUI boundary).	Creston (Development Services; CFR)	As soon as possible.	Expanded DPA boundary is developed.	CRI FCFS: up to $10,700 with estimated incremental staff hours or contract cost
12	High	Consider amending Creston's Official Community Plan Wildfire Hazard DPA exemption policies as *recommended:* 1.1.3 Replacement or repair of existing exterior cladding. *- To meet FireSmart policies, this should mandate the use of non-combustible materials.* 1.1.4 Replacement of existing doors, windows or building trim. *- To meet FireSmart policies, this should mandate the use of non-combustible materials and double-paned tempered glass.* 1.1.9 Restoration planting of vegetation, provided native non-invasive vegetation is used to enhance the natural environment or provide habitat. *- To meet FireSmart principles, this should mandate the use of native fire-resistant plant species.*	Roofing and siding materials are the top two FireSmart policies for risk reduction to structures and should not be exempt from renovations within the DPA area.	Creston (Development Services; CFR)	As soon as possible.	Exemption policies are updated.	CRI FCFS: up to $10,700 with estimated incremental staff hours or contract cost

13	High	Consider amending Creston's Official Community Plan Section 5 Land Use Policies (F. Recreational Parks and Open Spaces, 1 and 2), and Section 9 Future Harvests (Community Enhancement Projects, G) as recommended in Table 2.	To imbed FireSmart vegetation management into existing and proposed plans and policies to increase wildfire resilience in the community through planning and development in the future.	Creston (Development Services; CFR)	As soon as possible.	Updates made as recommended.	CRI FCFS: up to $10,700 with estimated incremental staff hours or contract cost
14	High	Meet with the RDCK and Yaqan Nukiy to develop a joint fire ban enforcement policy. The goal is to make local burning regulations or provincial fire bans enforceable by Creston Fire Rescue throughout its service area, which includes adjacent Yaqan Nukiy reservation land and RDCK communities.	Creston Fire Rescue needs the authority to enforce fire bans in its response area is it a) understands the current local fire threat, and b) knows its current response capabilities and if they are sufficient for the current or forecasted fire weather.	Creston, RDCK, Yaqan Nukiy	As soon as possible	Creston Fire Rescue has the authority to enforce fire bans throughout its service area.	Staff time: 40-80 hours
15	High	Conduct FireSmart Critical Infrastructure Assessments for public works and community/government buildings. Conduct FireSmart mitigation as soon as possible (vegetation management, material upgrades). Set a priority sequence for assessment based on wildfire response and post-wildfire recovery.	Protecting water systems, emergency shelters, and community infrastructure is critical to wildfire response and recovery.	Creston (Local FireSmart Representative, FireSmart Coordinator, and/or Consultant)	2 years (assessments completed)	Number of assessments completed and mitigation hours/investment.	CRI FCFS: up to $800 per assessment
16	High	Include a policy in Creston's OCP to 1) require all government-owned critical infrastructure to adhere to FireSmart principles, including the prohibition of cedar shakes; and 2) require all newly constructed critical infrastructure to be built and landscaped to FireSmart standards.	Using non-FireSmart construction materials sets a bad example to residents and can leave adjacent vegetation and/or residences exposed to a risk.	Creston (Consultant)	As soon as possible	Priority Creston critical infrastructure have had FireSmart updates completed.	CRI FCFS: up to $50,000 for mitigation per structure (publicly owned only)
Interagency Cooperation - Section 5.4							
17	High	Continue to engage with Yaqan Nukiy, BCWS, local forest tenure licensees (and include RDCK and MOF as needed) on FireSmart initiatives through the established Creston Valley FireSmart Resiliency Committee (CVFRC).	Even once-annual meetings are valuable and provide a platform for information sharing. All parties have indicated a willingness for collaboration, which will allow for greater management of wildfire risk both within and surrounding Creston's WUI.	Creston CVFRC	Ongoing	CVFRC FireSmart meeting takes place at least once annually.	At least 8 hours per meeting to prepare, participate and debrief. CRI FCFS up to $2,000 per meeting.

18	High	Work with CVFRC members and MOF to develop a fuel treatment/fuel break tracking system to spatially manage proposed and completed fuel management areas both within Creston's WUI and outside it at the regional level.	It is imperative that all land managers know what adjacent or overlapping jurisdictions have identified as fuel breaks, so that time and money is not wasted reassessing or re-prescribing an area.	Creston CVFRC, MOF, RDCK	As soon as possible	A regional GIS tracking system is established, or a provincial one is developed that CVFRC members can access.	Cost and time dependent upon level of effort required.
19	High	Continue maintaining mutual aid agreements and fire protection contracts with surrounding fire protection areas, as well as a response agreement with Yaqan Nukiy.	To allow for greater access to firefighting resources within the regional area, and to manage firefighting within Creston's WUI.	Creston (CFR) (Adjacent fire departments) (Yaqan Nukiy)	Ongoing	Contracts and agreements remain in place; new ones developed, as needed.	Staff time for planning and contract development.
20	High	Lobby forest land licensee/managers (e.g., Woodlots, Creston Community Forest) to be aware of where their tenure overlaps Creston's WUI and to develop and implement (or continue implementing) forest planning, harvesting, slash management, and reforestation plans that reduce wildfire behaviour in these areas.	Cutblock placement can break up the forest continuity across the landscape – with proper slash and reforestation management, they can remain as areas of low wildfire behaviour for many years. However, if not managed properly, they can increase wildfire behaviour.	Creston (MOF; Forest Licensees/ Managers)	Ongoing	Forest licensees/ managers are aware of their tenure overlaps with the WUI and are actively working towards forest management plans to reduce wildfire behaviour in those areas.	Creston staff time for discussions.
21	High	Creston and RDCK should lobby and work with the electrical power providers in and influencing the community's WUI, MOTI for Provincial highways, and rail line owners/operators to regularly maintain their right-of-way's vegetation.	Transmission lines can provide excellent fuel breaks and access for first responders in the event of a wildfire – if the vegetation on them is regularly managed and kept in a low-hazard state. They can also be the source of fire ignitions - trees and other vegetation intruding into power lines can cause fires in multiple ways. Highways can also provide excellent fuel breaks if the vegetation on them is regularly managed and kept in a low-hazard state. If not, they can act as wicks moving fire along them, or ignition sources for fires from burning cars, cigarette butts, sparks, etc. Additionally, highways are a main access/egress route during an emergency – these routes should be kept at as low risk of state as possible.	Creston (MOTI; (Electrical providers; Rail line operators)	Yearly and ongoing	Right-of-way maintenance discussions are open and ongoing; right-of-ways are kept in low-risk states.	Creston staff time for discussions.

Cross Training & Fire Department Resources - Section 5.5							
Training							
22	High	Continue to provide SPP-WFF1 training in-house to CFR members and consider having some members take 'train-the-trainer' courses so that more courses (e.g., S-231, WSPP-115) can be delivered in-house to members.	This would provide an opportunity to expand in-house wildland specific training, and potentially train adjacent fire departments.	CFR	3 years	Number of CFR members with wildland training beyond SPP-WFF1 increases.	Staff time; CRI FCFS Training.
23	High	Consider providing FireSmart specific training to CFR members: FireSmart 101, Local FireSmart Representative (LFR), and FireSmart Home Partners Mitigation Specialists.	To build understanding and knowledge of FireSmart principles within CFR. To certify CFR members so they can implement various FireSmart assessments within the community.	CFR	3 years	Number of CFR members with FireSmart training increases.	Staff time; CRI FCFS Training.
24	High	CFR should continue seeking out opportunities to perform wildfire response and structure protection drills - using hydrants and/or natural water sources, *with* BCWS.	Fast and effective deployment of the CFRs Structure Protection Units and any additional equipment operated by the BCWS will be crucial in any interface fire scenario. Equipment compatibilities and/or differences between CFR & BCWS should be identified and addressed ahead of time.	CFR (BCWS)	Annually	Drills performed at least once annually in different neighbourhoods (prioritizing WUI interface neighbourhoods in the northeast and east of Town), with different water sources.	Staff time as required.
25	High	CFR should seek opportunities to assist Yaqan Nukiy (and potentially BCWS) with prescribed/cultural burning projects.	Cultural burning has played a role in both fire and ecosystem management for Yaqan Nukiy. Exposing CFR members to live-fire scenarios in different fuel types under controlled conditions will increase its capacity and ability to lead and/or assist in wildfire scenarios. Doing so with Yaqan Nukiy will build upon their already existing relationship, and further cultural awareness.	CFR (BCWS; Yaqan Nukiy)	Annually	CFR is involved in local cultural and ecosystem restoration burning implementation.	Staff time as required.
26	Moderate	Consider training Creston Emergency Management staff/Emergency Operations Centre (EOC) members in Incident Command System courses (ICS).	ICS-100 is an online course that introduces effective control of an emergency site; other levels of ICS provide more detailed training. BCWS uses the ICS system.	Creston (CFR)	3 years	Number of Creston Emergency Management staff that receive some level of ICS training.	CRI FCFS: staff time and course cost (ICS-100 $25 online).

Water							
27	High	CFR should continue to identify natural and artificial water sources useable for fire suppression but should develop a map (or better - digital map that can be uploaded into response vehicles' CAD systems) of their location and important details (est. water volume; access point notes; etc.) Share this information and update over time. This can double as a pre-plan of emergency community water delivery systems to connect major natural water sources with interface neighbourhoods, to facilitate deployment of a structural protection system.	Outside of Creston municipal boundaries, but within the CFR response area, there are no hydrants – water shuttling is required. Response to these areas impacts CFR's wildfire resilience. Shuttling or pumping water from lakes and rivers to fill bladders can be pre-planned, including tender access points, traffic control, permanent large-volume pumps, and piping.	CFR (Creston or RDCK GIS department; BCWS)	5 years and ongoing	A fire suppression water source plan and map are produced and shared.	CRI FCFS Community Water Delivery Assessment – Up to $10,700 for incremental staff hours or contract cost.
28	Low	CFR should seek Superior Tanker Shuttle Service accreditation from Fire Underwriters Survey.	This accreditation certifies that the CFR can supply enough water to have some areas without fire hydrants within a certain distance of their structures qualify as having a fire hydrant within 300m of it (this can also potentially lower insurance rates for property owners within the CFR's fire response area).	CFR (Creston)	5 years	Superior Tanker Shuttle Service accreditation achieved by CFR.	CFR staff time as required (and Creston budget for equipment upgrades and purchases, if needed).
Equipment & Staff							
29	High	CFR should continue annual inspections by BCWS of its wildland firefighting equipment. Any gaps should be addressed, as required.	To ensure CFR is appropriately equipped to respond to interface wildfire events, and that their equipment is compatible with that of BCWS. CRI FCFS funding is available for incremental equipment purchases.	CFR (BCWS)	Annually	Annual inspection of wildland firefighting equipment from BCWS; gaps filled as practicable.	CFR staff time; CRI FCFS equipment funding up to cost maximums.
30	Moderate	Continue to develop and implement plans to replace CFR apparatus as it ages out.	Suitable apparatus is critical for response to interface wildfires.	CFR (Creston)	Ongoing as required	CFR's fleet is adequate to meet demands.	Staff time and Creston budget requirements.

Emergency Planning - Section 5.6							
31	High	Conduct tabletop wildfire scenario tabletop exercises with emergency management and CVFRC partners. Yearly, pre-fire season is best. Move the "WUI fire" to a different area of Creston's WUI each time.	Tabletop exercises provide an opportunity to identify weak spots in a plan and collaborate.	Creston (CVFRC; RDCK; RCMP; BCWS; Yaqan Nukiy)	1 year and ongoing	Knowledge of 'pinch points' in an evacuation scenario and understanding of roles and responsibilities.	CRI FCFS Emergency Planning: up to $2,000 per meeting. Possibly CRI / CEPF / Columbia Basin Trust
32	High	Consider updating Creston's OCP mandating (with embedded enforcement mechanisms) that private roads that access forest lands should be of adequate design to allow for the safe movement of logging and fire-fighting equipment.	Access by emergency responders to the WUI is paramount towards both defending communities from WUI fire events, but also for aiding in fuel treatment practicability. This constraint is recognized in RDCK Electoral Area F's Rural Community Official Plan in section 18.3.8 which, "Encourages that private roads that access forest lands should be of adequate design to allow for the safe movement of logging and fire-fighting equipment."	Creston (MOF; BCWS; CFR)	5 years	Access roads through private land to the interface forest are maintained.	Creston time for planning and discussions. CRI FCFS: up to $10,700 with estimated incremental staff hours or contract cost.
33	High	RDCK and Creston should continue to promote the Voyent Alert! System to residents and visitors.	Clear, consistent, concise, and quick communication during an emergency event and evacuation are integral to the prevention of loss of life. A lack of this was identified as an issue during recent WUI fire disasters, such as that in Lahaina, Maui, USA and Fort McMurray, Alberta.	Creston/RDCK (FireSmart Coordinator)	Ongoing	Continued update of the Voyent Alert! System (can track downloads from app providers).	Creston/RDCK time for promotion.
34	High	Invest in back-up generators for any critical infrastructure that does not have one. Encourage private businesses that provide critical services, like gas stations and grocery stores, to follow suit.	Back-up generators for pumphouses, treatment plants, and community buildings would facilitate both emergency response (water supply for suppression) and rapid community return and recovery following a fire.	Creston	ASAP	A budget and purchase plan for back-up generators is implemented, starting with the most critical infrastructure.	Cost varies - ~$10,000

35	High	Initiate a roof-top sprinkler program for residential properties. Investigate bulk orders from wildfire protection or irrigation companies or commercial gutter-mount kits. Consider sprinkler kits as an incentive to communities/neighbourhoods for FireSmart participation.	Pre-installed rooftop sprinklers reduce the time and resources needed to set up a structural protection system in a community threatened by wildfire. Sprinkler installation could be paired with a free FireSmart Assessment.	Creston	3 years and ongoing	Establish an efficient and effective system. Track the number and location of sprinklers purchased and installed annually.	Bulk sprinklers $40 - $100 each; gutter mount kits ~$100-200 for one home
36	High	Update Creston's specific Hazard, Risk, and Vulnerability Assessment (HRVA) with relevant information from this, and subsequent updated, CWRPs.	To incorporate the most up to date wildfire risk analysis and information into the assessment.	Creston (Consultant)	Upon each HRVA update	HRVA is updated with the most recent information from Creston's CWRP.	Consultant costs.
37	High	Schedule regular updates of this Community Wildfire Resiliency Plan: target every 5 years.	A current and acceptable CWRP is required for funding under the CRI FCFS program. Update the wildfire threat for areas with completed fuel treatments and identify additional areas for treatment.	Creston	5 years – 2028 update	Creston always has a current and acceptable CWRP.	~$30,000; CRI FCFS funding
Vegetation Management - Section 5.7							
Fuel Management Treatments							
38	High	Develop fuel management prescriptions for the identified Fuel Treatment Unit and Fuel Treatment Areas. Prioritize in the following order: 1) Fuel Break 2) Northeast 3) Wetlands	*See "Rationale" column in Table 25 for more detailed treatment rationales. 1) Fuel Break – to develop a cohesive cross-WUI fuel break in a direct interface area that would provide safe access for fire fighters and firefighting opportunities. 2) Northeast – to address High and Extreme fire behaviour threat areas in the WUI that are directly interface to structures and properties. 3) Wetlands – to address High and Moderate fire behaviour threat in a forested stand within the community adjacent to water infrastructure. Also a great FireSmart public demonstration project.	Creston Creston Community Forest MOF BCWS	5 years	Approved FMP(s) for identified High priority areas.	~$425/hectare for a ~20 ha prescription

39	Moderate	Work with the Creston Community Forest and neighbouring jurisdictions (RDCK, Yaqan Nukiy) to explore alternative disposal methods for debris from fuel treatments or other forest harvesting activities (e.g., combined heat and power, biochar, secondary forest products, etc.).	Policies on slash burning are expected to become more restrictive in recent years, and pile burning can also prove to be logistically difficult and often be viewed negatively from the community. Strategies to reduce industrial wood waste may soon be required, and they will also fit into climate action plans and economic development strategies.	Creston / Forest Licensees / RDCK / Yaqan Nukiy	3 years (discussion underway)	Alternatives considered and documented	Staff time
Residential FireSmart							
40	High	In conjunction with provided home FireSmart Assessments (see Recommendation #7), offer a local rebate program to property owners that have completed a FireSmart home assessment (Home Ignition Zone assessment or Home Partners Program Mitigation assessment. RDCK, Creston, and the FireSmart coordinator should advertise that the amount eligible for rebate has increased to $5000 for the CRI FCFS 2024 application program.	FireSmart home assessments encourage action in the FireSmart Home Ignition Zone of a community. Offer a rebate program (funded through CRI FCFS) to residents who have a pre- and post-work FireSmart assessment conducted. Focus on removal of conifer hedges and upgrading exterior structure materials.	RDCK / Creston (FireSmart Coordinator)	Annually	Number of properties participating annually.	50% of costs per property up to $5,000, plus 2 hours administration time per property (CRI FCFS).
41	High	Continue providing municipally-led options for the disposal of yard waste. Currently, these include having tipping fees waived (May and October) for yard waste at the Creston Landfill and having curb-side yard waste pick-up three times a year	Yard waste burning restrictions limit options for debris disposal. Free debris disposal may be used as an incentive to participate in other FireSmart activities, like assessments or workshops.	Creston	Annual	Municipally funded yard waste disposal continues.	CRI FCFS funding is available for tipping fee coverage.
42	High	Consider implementing a community chipper program. Education of FireSmart yard and landscaping principles, including chipping specifications, should be incorporated into the program.	To reduce fire and wildfire hazards on private property within the WUI and promote FireSmart vegetation management knowledge and education. The intent is for landscaping/yard vegetation to be included, not farm or agriculture vegetation. This could assist with more uptake of residential FireSmart landscaping principles as the disposal method is brought to the resident, especially for those older and less mobile.	Creston	Annual (pre-fire season is best)	Number of properties who elect to have debris disposed.	CRI FCFS funding; ~$100-150 per chipper crew hour.
43	Moderate	Consider releasing an annual Creston FireSmart report to the public that tracks community-specific uptake in various FireSmart initiatives, as well as tracks fuel management at all scales.	As the program grows, reporting allows the Creston FireSmart program to track challenges and successes, further promote the program, and tailor outreach methods to achieve the most uptake.	Creston	Annual	An annual report is published.	Eligible for CRI funding – FireSmart staff time. Estimate 40-80 hours.

44	Moderate	Engage with local garden centers to implement the FireSmart BC Plant [Tagging] Program.	FireSmart BC introduced a plant tagging program in 2021 that has been implemented with great success by over 34 nurseries and garden centres to date. The Plant Program is an easy way to provide information at the point of purchase for homeowners and landscapers. See: https://firesmartbc.ca/landscaping-hub/plant-program/	Local Garden Centres (Creston)	3 years	Local garden centres have been notified of the program.	Staff time for engagement (2-4 hours per garden centre).
Community and Critical Infrastructure FireSmart							
45	High	Implement recommended vegetation management recommendations from FireSmart Critical Infrastructure Ignition Zone Assessments (see Recommendation #15), when completed, on a priority basis.	To reduce fire behavior and risks to critical infrastructure most important to fire and wildfire fighting and post-wildfire recovery.	Creston	5 years	High priority critical infrastructure has had FireSmart vegetation management completed.	CRI FCFS funding up to $53,500 per municipal infrastructure (vegetation management included).
46	High	As part of fuel treatment implementation, Creston should develop interpretive signage to demonstrate pre- and post-fuel treatment forest stands conditions.	Interpretive signage could include text explaining the purpose of the fuel management treatment, connection to the CWRP, and FireSmart practices residents nearby can take to reduce wildfire hazards around their yards and homes.	Creston	5 years	Signage installed during implementation phases.	Eligible for UBCM CRI funding.

TABLE OF CONTENTS

Registered Professional Sign and Seal I
Acknowledgements II
Executive Summary III
Table of Contents XVI
List of Tables XVIII
List of Figures XIX
List of Maps XIX
Frequently Used Acronyms XX
SECTION 1: Introduction 21
1.1 Plan Purpose and Goals 21
1.2 Plan Development Summary 22
SECTION 2: Relationship to Other Plans and Legislation 23
2.1 Linkages to CWPPs/CWRPs 23
2.2 Local Plans and Bylaws 23
2.3 Higher-Level Plans and Legislation 28
SECTION 3: Community Description 29
3.1 Wildland-Urban Interface 29
3.2 Community Description 34
3.3 Values at Risk 35
3.3.1 Electrical Power 36
3.3.2 Water and Sewage 37
3.3.3 Hazardous Values 38
3.3.4 Cultural Values 39
3.3.5 High Environmental Values 39
3.3.6 Other Resource Values 39
SECTION 4: Wildfire Risk Assessment 41
4.1 Wildfire Environment 41
4.1.1 Topography 42
4.1.2 Fuel 45
4.1.3 Weather 48

4.2 Wildfire History 51
4.2.1 Historic Fire Regime 51
4.2.2 Historical Wildfire occurences 51
4.2.3 Wildfire Response 54
4.3 Local Wildfire Risk Assessment 54
4.3.1 Wildfire Threat Class Analysis 55
4.3.2 WUI Risk Class Analysis 56
4.4 Hazard, Risk, and Vulnerability Assessment 59
SECTION 5: FireSmart Principles 60
5.1 Community Overview 61
5.2 Education 61
5.3 Legislation, Planning and Development Considerations 65
5.4 Interagency Cooperation 68
5.5 Cross-Training and Fire Department Resources 72
5.6 Emergency Planning 77
5.7 Vegetation Management and Other FireSmart Activities 82
SECTION 6: Appendices xciii
6.1 Appendix A: Local Wildfire Risk Process xciii
6.1.1 Appendix A-1: Fuel Typing Methodology and Limitations xciii
6.1.2 Appendix A-2: Wildfire Threat Assessment Plots xcv
6.1.3 Appendix A-3: Fire Risk Threat Assessment Methodology xcvi
6.1.4 Appendix A-4: Proximity of Fuel to the Community xcix
6.2 Appendix B: Wildfire Risk Assessment – Worksheets and Photos ci
6.3 Appendix C: Maps ci
6.4 Appendix D: Creston Valley FireSmart Resiliency Committee cii

LIST OF TABLES

Table 1: Town of Creston's Community Wildfire Resiliency Plan V
Table 2: Summary of Creston's Official Community Plan emergency and wildfire-related objectives and policies and their relationship to this CWRP 24
Table 3: Summary of local bylaws and their relationship to the CWRP. 25
Table 4: Summary of local plans that are directly relevant to the CWRP. 28
Table 5: Description of higher-level plans and legislation and their relationship to the CWRP. 28
Table 6: Land Ownership within the eligible WUI of Creston. 32
Table 7: Socio-economic statistics for the Town of Creston, as per the 2021 census. Bolded values will be discussed below as they have special relevance to the CWRP. 34
Table 8: Critical Infrastructure within the Town of Creston and its WUI. 36
Table 9. Species and Ecosystems at Risk in the WUI – BC Conservation Data Center. 39
Table 10. Slope Percentage and Fire Behaviour Implications. 43
Table 11. Slope Position of Value and Fire Behaviour Implications. 43
Table 12. Fuel types in Creston's Wildland Urban Interface 46
Table 13. Natural Disturbance Types (NDTs) of Creston's WUI. 51
Table 14: Creston Fire Rescue fire callout record 2013-2022 54
Table 15: Wildfire threat summary for Creston's eligible WUI 56
Table 16: WUI risk class ratings within Creston's WUI. 57
Table 17: FireSmart vulnerability and resilience by neighbourhood. 61
Table 18: Education recommendation and action items 63
Table 19: Legislation, planning and development recommendation and action items 66
Table 20: Interagency cooperation recommendation and action items 70
Table 21: Cross-training recommendation and action items 74
Table 22: Example of a Wildfire Response Preparedness Condition Guide 79
Table 23: Emergency preparedness recommendation and action items 80
Table 24: Vegetation management action items 85
Table 25: Summary of Proposed Fuel Treatment Units and Proposed Treatment Areas for the Town of Creston's CWRP. 90
Table 26. Fuel Type Categories and Crown Fire Spot Potential encountered within the WUI. xciv
Table 27. Summary of WUI Threat Assessment Worksheets (2020). xcv
Table 28: Components of Fire Threat Analysis xcvii
Table 29. Proximity to the Interface. ci

LIST OF FIGURES

Figure 1: Graphic display of the fire behaviour triangle, and a subset of characteristics within each component. 42
Figure 2: Average number of fire danger rating days by month for the Akokli Creek fire weather station. 49
Figure 3. Daily and monthly average initial spread index rose for Akokli Creek fire weather station for the fire season (April – October) 50
Figure 4: Summary of fire ignition data by cause within Creston's WUI (Data from the BC Wildfire Service). 52
Figure 5. A pre-incident planning checklist that can be used to help develop a pre-incident wildfire suppression plan and associated maps. 78
Figure 6: FireSmart Home Ignition Zone 82
Figure 7: FireSmart Home and Critical Infrastructure Ignition Zone (HIZ, CIIZ) c

LIST OF MAPS

Map 1: Wildland Urban Interface overview map. 31
Map 2. Wildland Urban Interface (WUI) for the Town of Creston. The 'eligible WUI' area is the red outlined polygon. 33
Map 3: Creston fire hydrants. 38
Map 4: Values at Risk map for the Town of Creston's WUI. 40
Map 5: Slope, by slope classes, for Creston's WUI 44
Map 6. Updated fuel types in the eligible WUI of the Town of Creston 47
Map 7: Natural disturbance regimes and historical fire ignitions and occurrences for Creston's WUI and a five-kilometer area surrounding. 53
Map 8: Local wildfire threat assessment within the Town of Creston's eligible WUI 58
Map 9: Overview map of Proposed Treatment Units and Areas within Creston's WUI. 88
Map 10: Closer view of the Fuel Break (FB) Proposed Treatment Area. 89
Map 11: Closer view of the Northeast (NE) Proposed Treatment Area. 89
Map 12: Closer view of the Wetland Park Proposed Treatment Unit. 89

FREQUENTLY USED ACRONYMS

AOI	Area of Interest
BC	British Columbia
BCWS	British Columbia Wildfire Service
BEC	Biogeoclimatic Ecosystem Classification
CFR	Creston Fire Rescue
CFFDRS	Canadian Forest Fire Danger Rating System
CRI	Community Resiliency Investment
CWPP	Community Wildfire Protection Plan
CWRP	Community Wildfire Resiliency Plan
DPA	Development Permit Area
FBP	Fire Behavior Prediction System
FCFS	FireSmart Community Funding and Supports: Stream 1 of the UBCM CRI Program
HIZ	Home Ignition Zone
MOF	Ministry of Forests
MOTI	Ministry of Transportation and Infrastructure
NDT	Natural Disturbance Type
PSTA	Provincial Strategic Threat Assessment
PTU	Proposed Treatment Unit
RDCK	Regional District of Central Kootenay
UBCM	Union of British Columbia Municipalities
WRR	Wildfire Risk Reduction: Stream 2 of the UBCM Community Resiliency Investment Program, administered by the Ministry of Forests
WTA	Wildfire Threat Assessment
WUI	Wildland Urban Interface

SECTION 1: INTRODUCTION

In June 2023, B.A. Blackwell and Associates Ltd. was retained by the Regional District Central Kootenay (RDCK) to assist the Town of Creston (Creston) in developing a new Community Wildfire Resiliency Plan (CWRP). A CWRP has its roots in the Community Wildfire Protection Plan (CWPP) framework, which was originally established in BC in response to the series of devastating wildfires in 2003. This plan replaces the previous 2016 Town of Creston CWPP. Recent wildfire disasters like those experienced in Oregon State (2020), Washington State (2014, 2015, 2020, 2023), Fort McMurray, Alberta (2016), BC (2017, 2018, 2021, 2023), and California (2017, 2018, 2020) continue to 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 concerning fire risk in the wildland-urban interface (WUI).[2] CWRPs are an invaluable opportunity to proactively manage wildfire risk and increase community resilience to wildfire.

CWRPs are currently being developed at many jurisdictional and geographic scales, and are individually tailored to address the needs of different communities in response to their size, their capacity, and the unique threats that they face. Despite these differences, the goals of a CWRP remain the same and are founded in the seven FireSmart disciplines: Education, Legislation & 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 (FCFS) Program. As per funding requirements, this CWRP is completed according to the 2022 CRI template.

1.1 PLAN PURPOSE AND GOALS

This plan accounts for changes that have occurred since Creston's last CWPP and takes advantage of the most recent community wildfire planning framework in BC. This CWRP identifies the interface wildfire risk within the municipality, and gives the Town a current and accurate understanding of the threats to human life, infrastructure, and values at risk from wildfire. This CWRP is intended to serve as a framework to guide the implementation of specific actions and strategies to:

- Increase the efficacy and of fire suppression and safety of emergency responders,
- Reduce potential impacts and losses to property and critical infrastructure from wildfire, and
- Reduce potential wildfire behavior and threat within the community.

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

- An assessment of wildfire risk to the community,

[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).

- An assessment of values at risk and potential consequences from wildfire,
- Maps of fuel types and recommended areas for fuel treatments,
- An assessment of emergency response capacity, and
- Options and strategies to reduce wildfire risk through the seven FireSmart disciplines.

1.2 PLAN DEVELOPMENT SUMMARY

The CWRP development process consisted of five general phases:

1) Engagement with the Creston Valley FireSmart Resiliency Committee (CVFRC – see Appendix D; via Creston Fire Rescue). Consultation with the CVFRC and information sharing with stakeholders and First Nations occurred throughout.
2) Review of relevant plans and legislation regarding emergency response and wildfire (Section 2).
3) Description of the community and identification of values at risk (Section 3).
4) Assessment of the local wildfire risk (Section 4).
5) Analysis and action plan for each of the seven FireSmart disciplines (Section 5).

The following next steps are a suggested route towards operationalizing the recommendations detailed in this CWRP:

1. CVFRC should continue to meet periodically, as needed to coordinate the fulfillment of this Plan's recommendations (consider annually or bi-annually, before or during the fire season – per Recommendation #17).
    a. Meetings could include some or all the parties identified in Section 5.4.
2. The next meeting could be held in early 2024. Consider identifying recommendations to allocate resources to, and pursue funding for, the 2024 UBCM CRI funding intake at this time.
    a. Consider meeting well in advance of the UBCM CRI application deadline (early October 2024), to discuss upcoming projects and align activities and initiatives where possible.
    b. As per Recommendation #1a, Creston will apply for separate UBCM CRI funding, and compile final reporting, unless specific joint regional initiatives are occurring.
    c. Continued meetings of the CVFRC would be a suitable venue to identify if additional support is needed to fulfill the targeted recommendations.
        i. Additional support might be required to coordinate activities that will bridge more than one funding year (i.e., prioritizing, prescribing and supervising implementation of vegetation management; coordinating plan and policy review), or that require more time and resources currently available to any one CVFRC member (e.g., potentially some FireSmart education recommendations).
        ii. Consultant support or a term contract salary could be incorporated into the UBCM CRI application accordingly.
3. In subsequent meetings, members from different agencies could share information about actions taken to fulfill recommendations.
    a. Documentation of the status of CWRP recommendations could be compiled and maintained alongside these meetings.

SECTION 2: RELATIONSHIP TO OTHER PLANS AND LEGISLATION

Wildfires can affect all aspects of a community. As a result, there are many plans specific to or including Creston that relate to this CWRP. This section reviews all relevant plans, policies, bylaws, guidelines, and provincial legislation to identify sections within that are relevant to community wildfire planning and response.

2.1 LINKAGES TO CWPPS/CWRPS

2016 Town of Creston CWPP

In 2016, B.A. Blackwell & Associates completed a Community Wildfire Protection Plan update for the Creston. The scope of this plan was a two-kilometer buffer around all residences and critical infrastructure based on WUI density criteria. Overall, completed activities have primarily fallen within the FireSmart Education discipline, but some recommended fuel treatments have been prescribed and/or treated, and there is now an active Community FireSmart Resiliency Committee.

Listed below are jurisdictions within the RDCK near Creston that have been recently involved in community wildfire planning. *Strategic opportunities exist between these plans and should be considered.*

- *RDCK Electoral Area D CWRP 2023* – concurrently in development.[3]
- *RDCK Electoral Area E CWRP 2023* – concurrently in development.[3]
- *RDCK Electoral Area F CWRP 2023* – concurrently in development.[3]
- *City of Nelson CWRP 2022* – recently completed.[3]

2.2 LOCAL PLANS AND BYLAWS

The sections and policies of the Town of Creston's Official Community Plan (OCP) listed in Table 2 are directly relevant to proactive wildfire resilience in the community. The OCP was reviewed as part of this CWRP to address any gaps or limitations that inadequately address fire hazards or risk mitigation. A major gap that was identified in the OCP as it relates to wildfire is the lack of FireSmart vegetation considerations within greenspace policies.

[3] By B.A. Blackwell & Associates Ltd and Cathro Consulting Ltd.

Table 2: Summary of Creston's Official Community Plan emergency and wildfire-related objectives and policies and their relationship to this CWRP.

Section [Creston Official Community Plan Bylaw No. 1854, 2017[4]]	Policy Description / *Relationship to CWRP*
1.0 Purpose and Vision	"This Official Community Plan (OCP) is intended to provide a framework to guide growth and development in Creston towards the community's vision for the future. The Plan offers policy direction on: land use; housing; circulation and mobility; infrastructure and servicing; Connectivity and green space; and, to some extent, social and economic development." – *- Land use policies should look to have FireSmart and wildfire risk reduction principles imbedded into them. Identified below and discussed in Section 5.3.*
5 Land Use Policies	**F. Recreational Parks and Open Spaces** 1. General Policies: Develop a Parks Master Plan to create cohesiveness and diversity between recreational spaces. *- The Master Plan should imbed FireSmart vegetation management principles into its policies to develop green spaces with low wildfire risk (see Section 5.3).* 2. Parkland Dedication Policies: Parkland dedication not exceeding 5% of gross developable site area shall be required with all new subdivisions where 3 or more new lots are created, and may be in a form and shape as determined by the Town for best meeting the particular requirements of the area, including but not limited to: linear parks or trails, creek-front parks, neighbourhood tot lots, irregularly shaped conservation and/or habitat enhancement areas, etc. *- Land returned to Creston under this policy should be returned in a low-risk wildfire level so that the Town does not inherit the liability if not done so.* **G. Development and the Natural Environment** 1. General Policies: Work with Ministry of Transportation and Infrastructure regarding the use of the Arrow Mountain Highway Bypass as a Wildfire Fuel Mitigation area and to allow for municipally managed access. *- The Arrow Mountain Highway Bypass is proposed as a fuel treatment area within this plan to be developed into a landscape-level fuel break (see Section 5.7).*
6 Development Permit Areas	**DPA 1 – Wildfire Protection Development Permit Area** 1. Exceptions: 1.1.3 Replacement or repair of existing exterior cladding. *- To meet FireSmart policies, this should mandate the use of non-combustible materials.* 1.1.4 Replacement of existing doors, windows or building trim. *- To meet FireSmart policies, this should mandate the use of non-combustible materials and double-paned tempered glass.*

[4] https://www.creston.ca/sites/default/files/2023-07/Official%20Community%20Plan-1854_0.pdf

	1.1.9 Restoration planting of vegetation, provided native non-invasive vegetation is used to enhance the natural environment or provide habitat. *- To meet FireSmart principles, this should mandate the use of native fire-resistant plant species.* 2. DPA 1 - Wildfire Protection Development Permit Area 2.2 Area Designation (Schedule B – Map) *- DPA area is limited in scope compared to the threat associated with ember showers created in a wildfire event (Discussed in Section 5 lead in; see Section 5.3 for associated recommendations).* 2.3 Guidelines *- All proposed guidelines sufficiently meet current FireSmart standards.*
9 Future Harvests	**Community Enhancement Projects** G) Arrow Mountain Highway Bypass Lands Make application to the Ministry of Transportation and Infrastructure (MOTI) for public and local government access to the Arrow Mountain Highway Bypass Lands for wildfire mitigation projects and recreation. *- The Arrow Mountain Highway Bypass is proposed as a fuel treatment area within this plan to be developed into a landscape-level fuel break (see Section 5.7).* **Municipal Homework – Plans, Strategies, Partnerships and Incentive Programs** B. Establish a community wide Tree Planting Program for greening of public and private lands. *- The Program should imbed FireSmart vegetation management principles into its policies to develop green spaces with low wildfire risk (see Section 5.3).* I. Finalize the Town of Creston Community Wildfire Management Plan. *- Accomplished through the development of this Plan.*

The local bylaws listed in Table 3 are directly relevant to proactive wildfire resilience in Creston. These bylaws were reviewed as part of the CWRP to address any gaps or limitations that inadequately address fire hazards or risk mitigation.

Table 3: Summary of local bylaws and their relationship to the CWRP.

Bylaws	Section	Description and *Relation to CWRP*
Building Bylaw No. 1394	18.1	Where 1A flammable liquids in quantities greater than four (4) Liters are stored in the shipping container then provisions shall be made to withstand internal explosion as per the BC Fire Code and BC Building Code. *- Addresses the storage of hazardous materials and ignition risks.*
	15.1	During the construction, alteration, repair, maintenance or demolition of any building or structure, safety measures for fire safety and protection of the public shall be carried out according to the requirements of the Building Code. *-Fire safety is a consideration during construction or repair of any building or structure. Limits ignition risks and fire risks.*

Bylaws	Section	Description and *Relation to CWRP*
Emergency Management Bylaw No. 1960	8.3	Implementation of the Town's Emergency Management Plans, including activating the Emergency Operations Centre, may be initiated by the Chief Administrative Officer, Director of Emergency Management or the Fire Chief if, in their opinion, an Emergency exists or appears imminent, or a Disaster has occurred or threatens the Town. *- Fire Chiefs have the authority to activate the EOC, which could be required during a wildfire emergency.*
Fire Prevention & Hazard Control Bylaw No. 1931	4.3	The Fire Chief may require the Owner or Occupier of a Hotel or Public Building, to provide or make alterations to the Building's Fire Protection Equipment, including heat and smoke detection, Fire Alarm Systems, exit signs, fire separations, and means of egress, to provide adequate life safety to occupants. These requirements must not exceed those established by the regulations contained in the current BC Building Code or BC Fire Code and may include equivalencies as determined by the Fire Chief. *- Limits fire ignition and propagation risks associated from building materials.*
	4.10	No person or Owner or Occupier of a Premises shall allow combustible waste materials or garbage to remain longer than twenty-four (24) hours in any street, lane, alley, or sidewalk located within five (5) meters of the Building. *- Limits fire ignition and propagation risks associated from hazardous materials.*
	4.15	Owners and Occupiers of Buildings must not allow or cause combustible materials in and around the Buildings to accumulate in quantities or locations that will constitute a fire hazard. *- Limits fire ignition and propagation risks associated from hazardous materials*
	4.24 4.25	Public buildings and hotels must have proper management of egress. *- Increases safe exit points in the case of a fire and ensures fire responder accessibility to buildings.*
	4.38	An Owner or Occupier of real property must ensure the maintenance, inspection and testing of water supply systems and hydrants for Fire Protection *- Increases assurance of useful water supply systems in the event of a fire.*
	4.42	An Owner or Occupier of a Premises shall not permit combustible materials, other than those for which the location is designed, to accumulate in quantities or locations that will constitute an undue fire hazard. *- Limits fire ignition and propagation risks associated from hazardous materials.*
	4.46	The Owner or Occupant of an occupied Hotel or Public Building in which any Fire Alarm System, automatic sprinkler system or emergency power system is not operating must institute and maintain in that Building a fire watch *- Increases assurance of emergency response in a timely manner.*
Fire Service Bylaw No. 1928	6	The Fire Chief has the authority to administer this bylaw; exercise the powers of Fire Commissioner; provide advice and recommendations to Council; and, enter on properties to inspect conditions that may cause a fire. *- Allows the Fire Chief to manage and mitigate fire risks on private property.*

Bylaws	Section	Description and *Relation to CWRP*
	7.1	The Fire Chief, in consultation with the Chief Administrative Officer, shall determine which of the Fire Protection and Assistance Response Services the Fire Department shall provide, and the level to which such Services shall be provided. *- Requires communication and good relationship between Fire Chief at CAO*
Fireworks Regulation Bylaw No. 1778	3.7	No person may hold, possess, store, discharge, or otherwise use fireworks in a manner that increases the risk of physical injury to any person or damage to any public or private property. *- Limits fire ignition and propagation risks associated from inappropriate usage of fireworks.*
Inspection & Testing of Fire Protection Equipment Bylaw No. 1930	4.1	The Owner and Occupier of each Hotel and Public Building in the Municipality must ensure that all Fire Protection Equipment in their Buildings are inspected and tested by a Fire Protection Technician in accordance with the requirements of the British Colombia Fire Code and the regulations made under it. *- Increases assurance of emergency response in a timely manner*
Open Burning Bylaw No. 1929	4.1	No person shall, except as expressly permitted by This Bylaw, start, light, ignite, or maintain any open air fire or allow any outdoor fire to burn on property owned or occupied by that person or on property owned or occupied by any other person or business. *- Limits fire ignition and propagation risks associated open burning on private land.*
	4.2	No person shall light, start or maintain a fire on public lands without submitting a written fire safety plan and obtaining a valid Permit approved by the Fire Chief prior to commencement of the fire *- Limits fire ignition and propagation risks associated from open burning on public land.*
	4.3	Yard Waste burning is prohibited at all times. *- Limits fire ignition and propagation risks associated from yard waste disposal.*
	4.6	The Fire Chief may, at his or her sole discretion, allow open air burning and may issue a Permit for open air burning for a) fire training exercise; b) municipal purposes and trail or forest maintenance in undeveloped lands where it enhances community protection through fuels mitigation; c) fires on special occasions for celebratory or religious ceremonial purposes; and d) land clearing for developments where burning would be considered an increased risk to the community due to fire hazard risks, forest proximity, lack of available firefighting water, or environmental reasons. *- Enables community protection via safe and managed fuel reduction.*
Property Maintenance Bylaw No. 1813	6.5	The Owner or Occupier of Property fronting onto a Boulevard, at their own expense, must keep the Boulevard free from garbage or other matter, debris and objects that might create a health, fire or accident hazard. *- Limits fire ignition and propagation risks associated from hazardous materials.*

The local plans listed in Table 4 are directly relevant to proactive wildfire resilience in Creston. These plans were reviewed as part of the CWRP to address any gaps or limitations that inadequately address fire hazards or risk mitigation.

Table 4: Summary of local plans that are directly relevant to the CWRP.

Local Plan	Description and Relation to CWRP
Creston Disaster Response Plan 2023	Outlines structural and organizational requirements for coordinated response and recovery from emergencies in Creston, including: decision-making tools for evacuation or shelter in place; EOC levels and communications protocols; describes the stages of evacuation; summarizes staffing requirements; identifies critical infrastructure and significant buildings to the community. *- Fire/Rescue section outlines Pre-Event, Event and Post-Event actions and requirements. See Section 5.6 for proposed wildfire-specific recommendations.*

2.3 HIGHER-LEVEL PLANS AND LEGISLATION

Table 5 lists higher-level plans and legislation that are relevant to wildfire planning and risk mitigation within Creston and the surrounding area. These plans help guide where and how activities like resource extraction occur on the landscape, which can affect both wildfire threat and consequence. Depending on the location of any proposed fuel management treatments, fuel management prescriptions and prescribed / cultural burn plans may need to address these plans as they relate to on-the-ground restrictions and policies for forest modification.

Table 5: Description of higher-level plans and legislation and their relationship to the CWRP.

Plan	Description and *Relationship to CWRP*
BC Provincial Open Burning Smoke Control Regulation	The Open Burning Smoke Control Regulation came into effect in September 2019 and governs open burning relating to land clearing, forestry operations and silviculture, wildlife habitat enhancement, and community wildfire risk reduction. *- The entire wildland-urban interface of Creston is within a High Smoke Sensitivity Zone.* *- All proposed treatment units are within the High Smoke Sensitivity Zone.*
Kootenay Boundary Higher Level Plan	The Kootenay Boundary Land Use Plan Implementation Strategy was completed in 1997, and was discussed in the previous CWPP. *- Legal, spatially defined objectives for 'Connectivity Corridors', and 'Water Intakes Used for Human Consumption' apply within the AOI. A non-legal objective for fire-maintained ecosystem restoration also applies - however, this provision targets NDT4 ecosystems, which are not present in the AOI.*
Selkirk Resource District Fire Management Plan	This plan was published in 2015 and was discussed in the previous CWPP. *- It identifies values within the plan area with the intent of using this information to make appropriate fire response decisions.*

Plan	Description and *Relationship to CWRP*
BC Wildfire Act and Wildfire Regulation	The Wildfire Act and Wildfire Regulation define the legal responsibilities and obligations to which everyone in British Columbia is subject. When the BCWS places bans or restrictions in an area, the Wildfire Act and Regulation make them enforceable. [5] *Its key goal is to specify responsibilities and obligations on fire use, wildfire prevention, wildfire control, and rehabilitation.*[5]
Fire Chiefs' Association of BC and BC Wildfire Service MEMORANDUM OF AGREEMENT for INTER-AGENCY OPERATIONAL PROCEDURES AND REIMBURSEMENT RATES	Guides and facilitates the collaboration between the Province and fire departments or by outlining key information regarding resource requests, deployment and response procedures, remuneration guidelines, and other necessary details to effectively manage the partnership. The intent of this Agreement is to further improve the operating procedure, strengthening capacity while providing increased flexibility to share resources in British Columbia, with clear rules of engagement and reimbursement requirements. *Mutual aid agreements exist between BCWS and Creston Fire Rescue. Creston Fire Rescue has worked with BCWS in response to incidents within and outside of Fire Protection and Response Areas.*

SECTION 3: COMMUNITY DESCRIPTION

This section defines the planning area for this CWRP and provides general demographic information about Creston. An understanding of population trends, land use patterns, and values at risk can help effectively direct FireSmart outreach and risk mitigation activities.

3.1 WILDLAND-URBAN INTERFACE

The Wildland-Urban Interface (WUI) is defined by FireSmart Canada as the zone where human development meets or intermingles with the natural environment. BC Wildfire Service generates WUI Risk Class maps and associated spatial data to assist with initiatives related to wildfire risk reduction, including the Funding and Supports (FCFS) program.[6] For the purpose of the FCFS program, the 'eligible WUI' is considered as the area one kilometer from a structure density class greater than six structures per square kilometer.

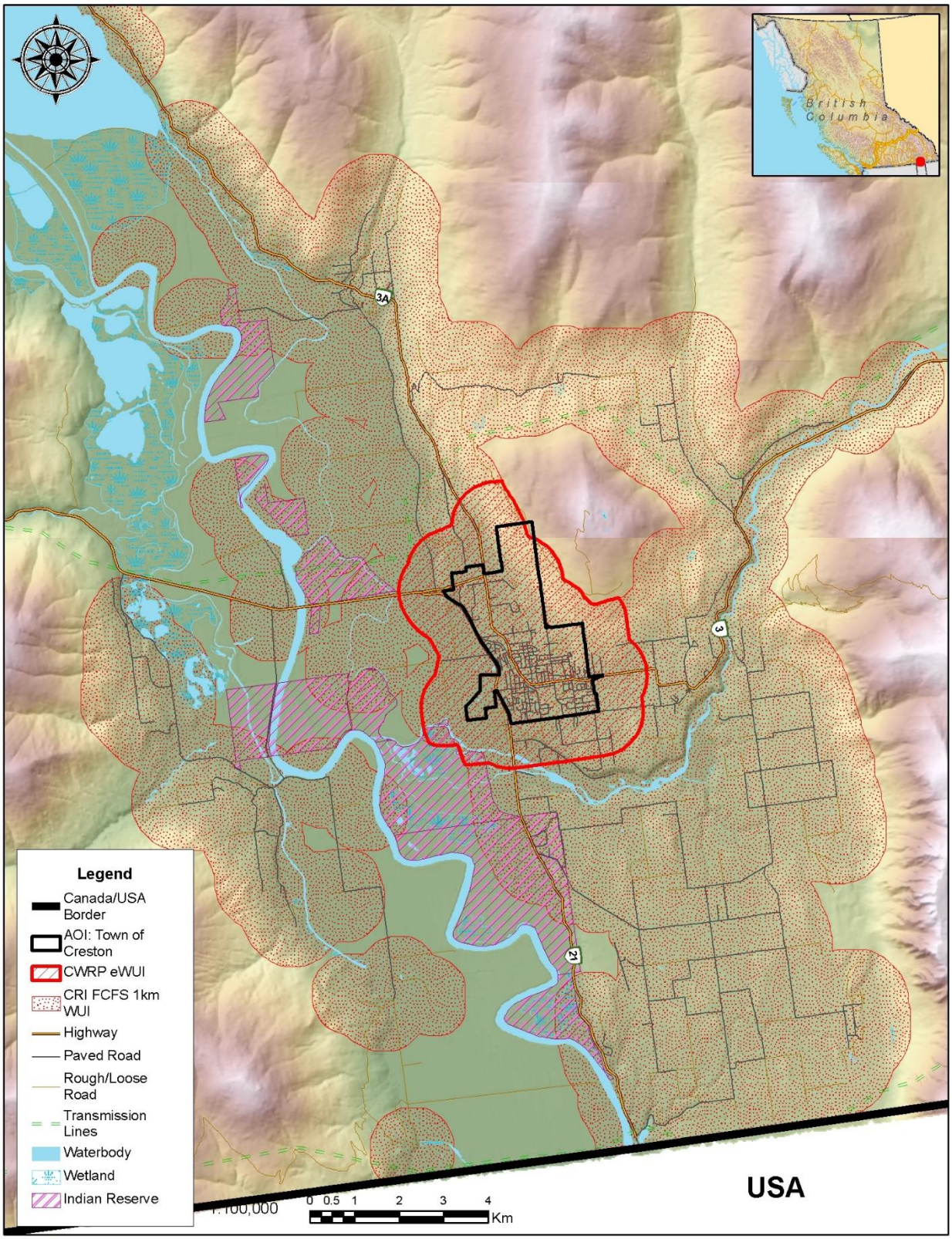
Map 1 shows the FCFS eligible WUI for CWRPs in the greater area surrounding Creston. Due to the structure density of the unincorporated communities outside Creston's municipal boundary, the WUI effectively extends from the southern tip of Kootenay Lake in the north, to the Canada/United States border in the south; the Kootenay River (and Yaqan Nukiy reservation land) in the west, to east of Erickson in the east. Applying this entire WUI area for this Plan is not practical as:

- RDCK will be updating CWRPs for Electoral Areas A, B, and C in 2024, which includes the entire FCFS eligible WUI surrounding Creston;

[5] https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/governance/legislation-regulations
[6] Wildland Urban Interface Risk Class Maps - Province of British Columbia (gov.bc.ca)

- There is a much greater weighting towards wildfire risk and resiliency planning for Creston closer to Creston's values at risk (which includes municipal infrastructure as well as residences within the community); and,
- As Creston may be moving its FireSmart program in-house, the CRI FCFS funding for eligible activities applies to those within Creston's municipal boundary.

This does not mean FireSmart and fuel management activities will not be planned and completed outside of Creston's municipal boundary – RDCK (in conjunction with BCWS) will actively be planning and implementing this work. Thus, a one-kilometre buffer of Creston's municipal boundary was used to clip the FCFS eligible WUI, creating the eligible WUI for Creston's CWRP. Field work, GIS analysis, and the recommendations for this CWRP cover only this one-kilometer eligible WUI (hereafter referred to as WUI) which totals 2,359 hectares and covers all of Creston as well as some areas outside of the municipal boundary. The WUI includes residential, industrial, agricultural, and forested areas. Land use within Creston is guided by the Official Community Plan as discussed in Section 2.2. As development occurs, it is possible that both the municipal boundary and the WUI will change.

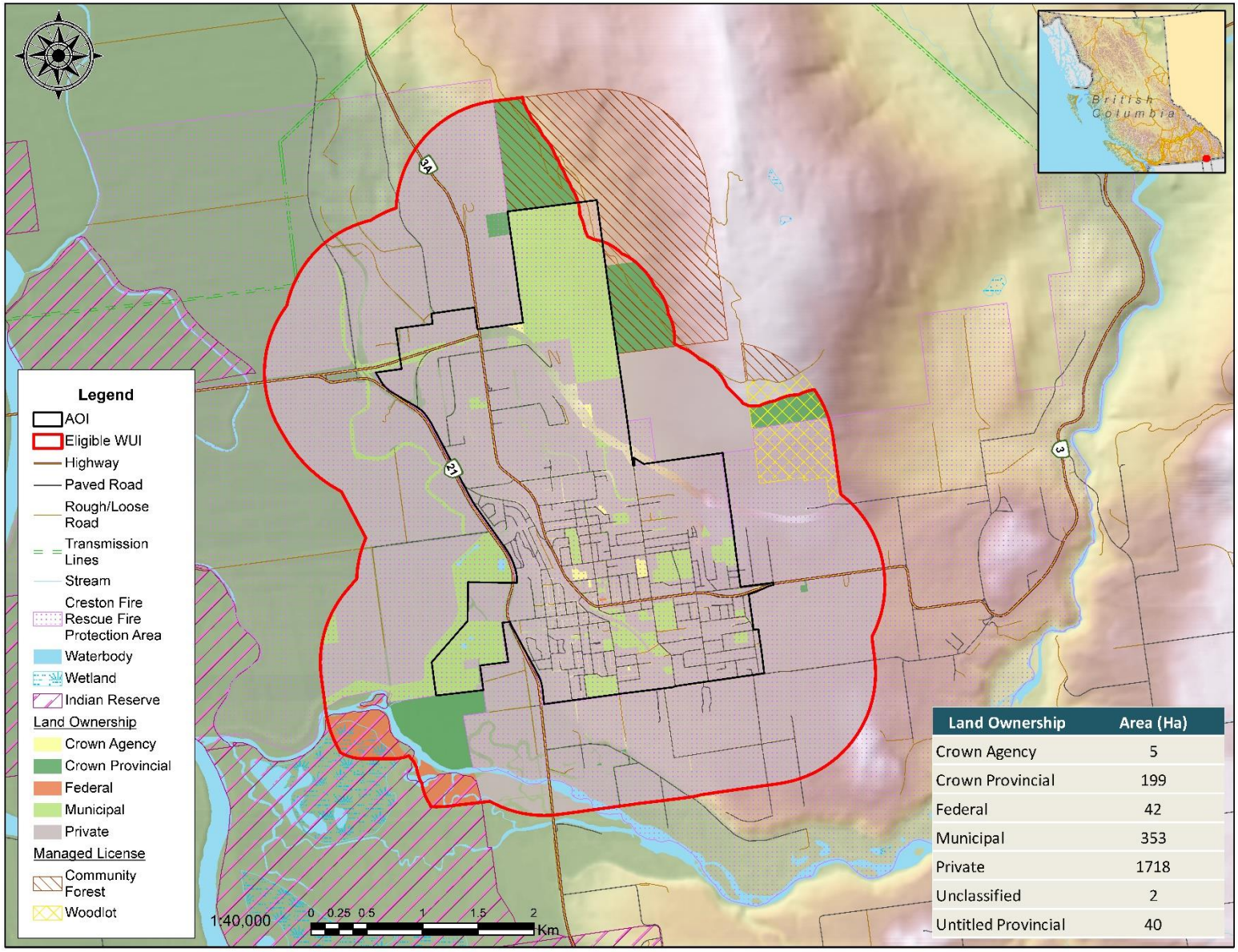


Map 1: Wildland Urban Interface overview map.

Map 2 shows a detailed overview of Creston's WUI, with an approximate breakdown of land ownership type by area listed in Table 6. The map shows how continuous the WUI is onto RDCK electoral area and Yaqan Nukiy (Lower Kootenay Band) lands. Successful wildfire resilience efforts will need to cross these jurisdictional boundaries. Most of the forested Crown land, situated on the north and east sides of Creston, is managed through the Creston Community Forest and local Woodlot licenses. Three-quarters of Creston's WUI is private land, while municipal and Crown Provincial land make up almost all the rest of the WUI's area.

Table 6: Land Ownership within the eligible WUI of Creston.

Land Ownership	Area (Ha)	Percent of WUI (%)
Crown Agency	5	<1%
Crown Provincial	199	8%
Federal	42	2%
Municipal	353	15%
Private	1718	73%
Unclassified	2	<1%
Untitled Provincial	40	2%
TOTAL	2,359	-



Map 2. Wildland Urban Interface (WUI) for the Town of Creston. The 'eligible WUI' area is the red outlined polygon.

3.2 COMMUNITY DESCRIPTION

The population of Creston increased a modest 4.1% from 2016 to 2021, to 5,583. However, the residential, agricultural, and industrial community expands beyond the Town's municipal boundary – as such, the number of people reliant upon Creston as its central point of commerce is far greater. The municipal boundary also abuts Yaqan Nukiy reservation lands, with a main residential village, on its west edge. Relevant socio-economic statistics on population, employment, housing, and education for Creston are summarized in Table 7.

Table 7: Socio-economic statistics for the Town of Creston, as per the 2021 census. Bolded values will be discussed below as they have special relevance to the CWRP.

Metric	Value
Population[7]	
Total Population	5,583
Population Density (people/km2)	664.2
Population percentage change between 2016 and 2021	4.1
Number of people <14 years old	1,330
Number of people 15-64 years old	2,770
Number of people >65 years old	**2,150**
Median Age (years)	**57.6**
Housing[7]	
Total private dwellings (year)	**2,810**
Private dwellings permanently occupied	**2,670**
Average household size	2
Income and Employment[8]	
Median Total Income of Households	58,800

As shown in Table 7 the median household age is 57.6 and number of residents aged over 65 is almost 40%. This indicates there could be a higher percentage of the population that could face mobility or transportation constraints when dealing with an evacuation scenario, as well as complications from smoke inhalation during local or regional wildfire events. Of the 2,810 total private dwellings, 90% are permanently occupied. This indicates Creston is a community dominated by permanent residents – this provides an opportunity for proactive FireSmart education as those being educated through a Creston FireSmart program can keep and apply that education within the community itself.

Creston is built within the flood plain and on a series of glacial-fluvial terraces on the east side of the upper Kootenay River. Agriculture has long been the main industry in town with most agricultural fields located to the west of the municipality in the Kootenay River flood plain (but many properties run hobby farms and orchards). And although the last sawmill in Creston closed in the early 1980's, commercial forestry is

[7] 2021 Canadian Census Data.
[8] 2020 Canadian Census Data.

still active within the forests to the east and northeast in and outside the municipal boundary (through both a community forest tenure and a woodlot tenure).

Most residences in Creston are located on the terraces above the floodplain, and there has been recent subdivision expansion into the forested hillsides in the northeast. Most of the central developed community is dominated by cleared land re-vegetated with grass and scattered deciduous and coniferous trees. Residences on the east side of town are considered interface as they, in varying degrees, meet the forest there as a hard line instead of intermixing within it.

Creston lies at the junction of three main Provincial highways: Highway 3, which travels east-west through Creston and across southern BC; Highway 3A, which travels north out of Creston up the east side of Kootenay Lake to the ferry at Kootenay Bay; and Highway 21, which travels south out of Creston to the US-Canada border. Creston is served by the Creston Valley Regional Airport, which lies to the south (and outside) of the municipality.

Fire response services are provided to the municipality by Creston Fire Rescue (CFR), which operates with three full time staff and 43 paid on call firefighters.[9] The Creston Valley Hospital & Health Centre, located in Creston, is a Level 1 Community Hospital in the East Kootenay health service area managed by Interior Health.[10]

3.3 VALUES AT RISK

Values at risk are the human, natural, or cultural resources that could be negatively impacted by wildfire. Protection of these values during a wildfire event is an important consideration for effective emergency response. Pre-identifying critical infrastructure and values at risk before an emergency event can ensure that essential services can be protected and/or restored quickly. As well, many activities that proactively assess and mitigate fire hazards around critical infrastructure and "Community Assets" are currently eligible for funding under the 2024 CRI FCFS Program Guides, which is addressed through Recommendation 15. Critical infrastructure includes buildings and structures that are essential to the health, safety, security, or economic wellbeing of the community and the effective functioning of government.

Table 8 lists critical infrastructure in Creston as identified through RDCK GIS data and field assessments. This list should not be considered as full and complete – Creston and RDCK should update it, as required, to ensure all critical infrastructure are eligible for FireSmart assessments. The RDCK maintains a comprehensive database of critical infrastructure that also includes cell phone towers. Water and electric systems are discussed in more detail in Sections 3.3.1 and 3.3.2. At the time of writing, FireSmart Critical Infrastructure Assessments have not been conducted on any of the Town's critical infrastructure. Map 4 presents a visual display of values at risk throughout the eligible WUI.

[9] Data provided to B.A. Blackwell & Associates from CFR via information gathering questionnaire.
[10] https://www.interiorhealth.ca/search?type=All&search_api_fulltext=creston&f%5B0%5D=content_type%3Alocation

Table 8: Critical Infrastructure within the Town of Creston and its WUI.

Map ID	Classification	Name	Agency	Address
Community and Government				
CR-10	Town Hall	Creston Town Hall	Creston	238 10th Ave N, Creston
CR-3	Health Centre/Hospital	Creston Valley Hospital and Health Centre	Interior Health	312 15 Ave N, Creston
CR-9	Seniors Residential Care Facility	Swan Valley Lodge	Interior Health	818 Vancouver St, Creston
CR-5	School	Adam Robertson Elementary	School District #8	421 9 Ave N, Creston
CR-7	School	Kootenay River Secondary School	School District #8	223 18 Ave S, Creston
CR-4	School	Homelinks Centre	School District #8	4 Ash St, Creston
CR-1	Community Complex	Creston & District Community Complex	Creston	312 19 Ave N, Creston
CR-38	Community Hall	Creston Valley Seniors Association	Unknown	810 Canyon St, Creston
CR-44	Local Government	RDCK Office	RDCK	531 16 Ave S, Creston
CR-45,46	Works Yard	Public Works Yard	Creston	600 Helen St, Creston
Utilities				
CR-50	Sewage - Treatment	Wastewater Treatment Plant	Creston	238 - 10th Avenue North, Box 1339, Creston
CR-51	Water – Reservoir/Well	Reservoir Cistern	Creston	unknown
Transportation				
n/a	Highways	3, 3A, 21	MOTI	n/a
n/a	Railway	Canadian National Railway	CN Rail	n/a
Emergency Response				
CR-6	Fire Hall	Creston Emergency Services Building	Creston	1505 Cook St, Creston

3.3.1 ELECTRICAL POWER

A large fire has the potential to impact electrical service by causing disruption in network distribution through direct or indirect processes. Direct heat from flames or damage from fallen trees associated with a fire event may cause power outages. There are two major transmission lines right-of-ways near Creston (one south, and one north), but both are outside the Town's WUI. Transmission lines can provide excellent fuel breaks and access for first responders in the event of a wildfire – if the vegetation on them is regularly managed and kept in a low-hazard state. They can also be the source of fire ignitions - trees and other vegetation intruding into power lines can cause fires in multiple ways. A tree falling across a line can tear the line down and result in a downed line. A branch spanning two line conductors for a sufficient period of time may ignite the branch and also may produce high-energy, high-temperature arcs multiple feet in length. If the branch remains in contact and arcing, it can cause progressive damage that eventually breaks the line. It is important that both Creston and RDCK lobby the electrical power providers in and influencing

the community's WUI to regularly maintain their right-of-way's vegetation (see Recommendation #21 in Section 5.4).

Residential and commercial power throughout Creston is provided by a network of wood-pole distribution lines. Although the majority of the community's vegetation profile (limited treed areas) poses low risk for ignition risk with these power lines, there is still instances where both the municipality and landowners have highly flammable vegetation and/or unmaintained conifer trees growing in close proximity to power poles or distribution lines.

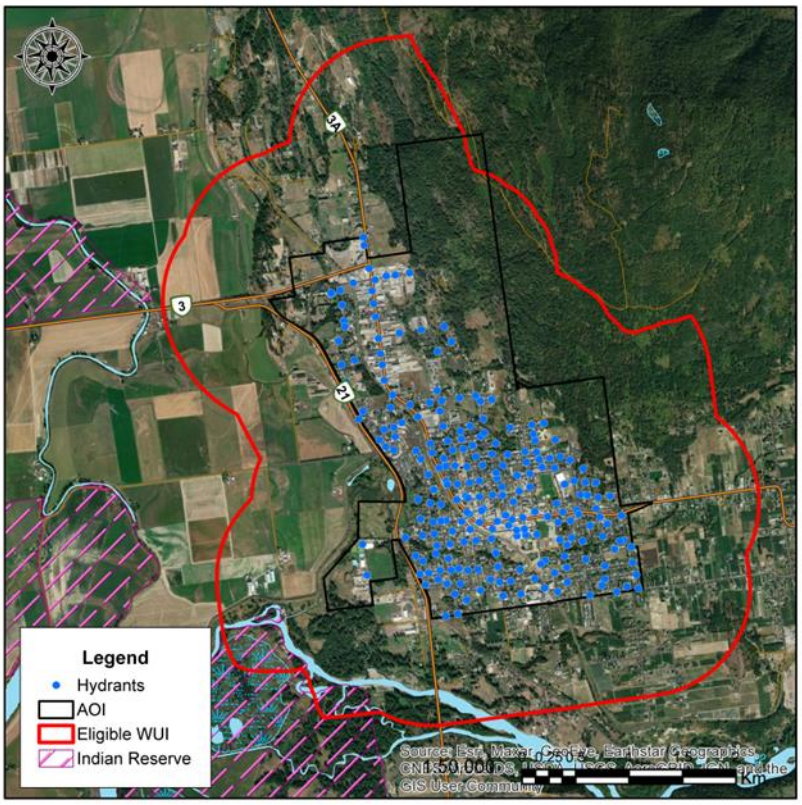
Having secondary power sources for critical infrastructure is important to reduce community vulnerability in the event of an emergency that cuts power for days, or even weeks. Creston Town Hall and the Wastewater Treatment Plant both have back up diesel generators. Creston is currently in the process of applying for grant funding to install a generator at the Creston Emergency Services Building. Creston review additional critical infrastructure and invest in back-up generators as required (see Recommendation #34 in Section 5.6).

3.3.2 WATER AND SEWAGE

Water for Creston is supplied via the Erikson Water System, located in Erikson just outside the eastern border of Town (crossing the boundary of RDCK Electoral Areas B and C).[11] It utilizes Arrow Creek, which is susceptible to low flows during drought years that could impact drinking water supply during high water demands.[11] The system services 655 active connections and is the largest of the water systems managed by RDCK.[11] The system also services a network of approximately 240 fire hydrants within Creston's municipal boundaries (see Map 3 below).

Creston Fire Rescue (CFR) has noted that the supply of water available for fire response within the Town via fire hydrants is sufficient (although there is a lack of pressure along Scott Street).[12] However, in some areas outside of Town, but within CFR's Fire Protection Area (and areas directly influencing Creston's WUI), there are either no hydrants, unrated hydrants, or minimal water supplies.[12]

[11] https://www.rdck.ca/EN/main/services/water/rdck-water-systems/erickson-water-system.html
[12] Information provided to B.A. Blackwell & Associates from CFR via information gathering questionnaire.



Map 3: Creston fire hydrants.

The most reliable source of year-round water for firefighting is the Kootenay River, and other sources (i.e., ponds, creeks, etc.) are known, but not mapped (see Recommendation #27 in Section 5.5).[12] See Section 5.5 for recommendations related to fire department resources.

No concerns or vulnerabilities from fire hazards were noted with the sewage system for Creston, although it is unknown whether the system has backup power sources or not.

3.3.3 HAZARDOUS VALUES

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

Hazardous values on private land in the WUI are likely concentrated around the industrial park, east of downtown. It is also very likely that both industrial and hobby farms store gas, oil, and/or fertilizer. Education regarding FireSmart principles for hazardous materials storage should be included in Creston's FireSmart education messaging.

Hazardous materials are also transported by truck (highways) and train (CN Rail) through the WUI. Accidental ignitions from train tracks and equipment are also a fire risk. Vegetation management practices along the rail lines and highway right of ways has the ability to exacerbate a fire hazard if deciduous and/or coniferous vegetation and cured grasses are being brushed and left in accumulations beside the tracks. This presents more of a concern where the vegetation on private properties adjacent to the tracks has a coniferous component or cured grass which are able to support fast spreading fires. Recommendations associated with industry stakeholders are discussed in Section 5.4.

3.3.4 CULTURAL VALUES

There are documented and registered 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 Yaqan Nukiy (Lower Kootenay Band) of the Ktunaxa Nation. Known archeological sites are protected under the Heritage Conservation Act, which applies to both private and public lands.

Creston should continue to consult with applicable First Nations well before development and implementation of any proposed fuel prescriptions to allow for meaningful review and input, as well as collaborative opportunities – cultural burning by Yaqan Nukiy has a long documented and orally spoken history in the area. 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.

3.3.5 HIGH ENVIRONMENTAL VALUES

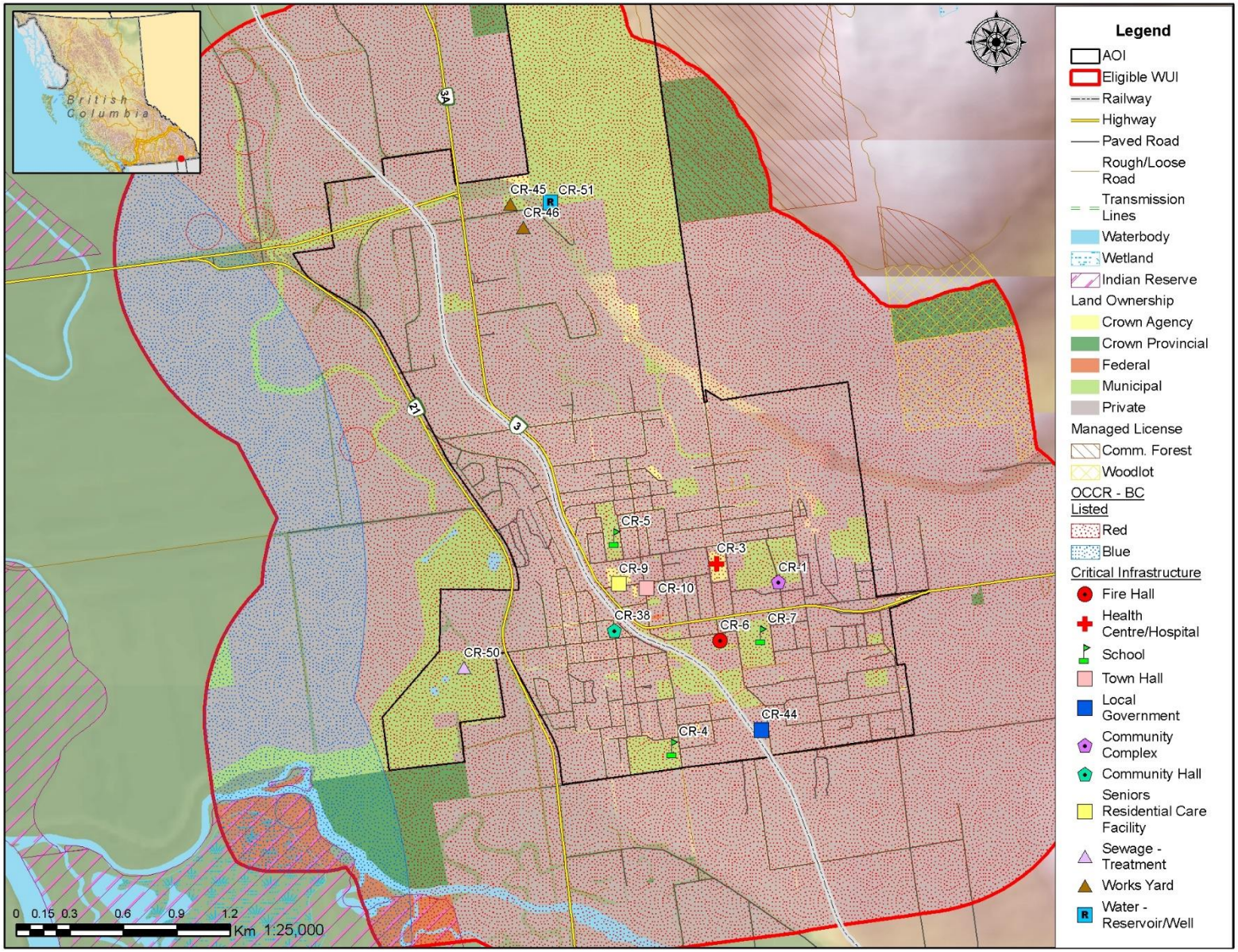
The Kootenay Boundary Higher Level Plan and Creston Community Forest Management Plan identify many important environmental areas throughout the WUI. Additionally, Creston's WUI has significant overlaps with species and ecosystems at risk identified through the B.C. Conservation Data Center and by the federal government (Table 9; Map 4). All fuel management prescriptions must identify and mitigate potential impacts to ecosystems or species at risk and may require rationales and/or mitigation measures for tree removal in some areas.

Table 9. Species and Ecosystems at Risk in the WUI – BC Conservation Data Center.

Common Name	Scientific Name	Category	BC List	Habitat Type
Alkali-marsh Butterweed	Senecio hydrophilus	Vascular Plant	Red	Terrestrial
Bobolink	Dolichonyx oryzivorus	Vertebrate Animal	Blue	Terrestrial; Grassland/Herbaceous
Great Blue Heron, Herodias Subspecies	Ardea herodias herodias	Vertebrate Animal	Blue	Terrestrial; Forest Broadleaf

3.3.6 OTHER RESOURCE VALUES

There are multiple other important resource values associated with the land base, including agriculture (commercial and hobby farms), recreation, and tourism. Additionally, the Creston Community Forest and woodlots have significant tenure overlaps with Creston's WUI. Any fuel management, forestry work, and industrial work within Creston's WUI should consider the impact of wildfire risk to the community. Recommendations associated with industry stakeholders are discussed in Section 5.4.



Map 4: Values at Risk map for the Town of Creston's WUI.

SECTION 4: WILDFIRE RISK ASSESSMENT

This section summarizes the factors that contribute to local wildfire risk in Creston. Section 4.1 discusses the wildfire environment in the WUI: focusing on topography, fuel, and weather. Section 4.2 and 4.2.3 discuss wildfire history in the area and wildfire response data from local fire crews. Section 4.3 uses updated fuel types combined with wildfire threat assessments and an office-based analysis to update the local wildfire risk for the eligible WUI.

The local wildfire risk assessment helps to identify the parts of the eligible WUI that are most vulnerable to wildfire. The CWRP risk assessment will complement the Town of Creston Emergency Management Plan.

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

Wildfire Risk = Probability X Consequence

Where:

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

Probability is the threat of wildfire occurring in an area and is expressed by the ability of a wildfire to ignite and then consume fuel on the landscape. An area's *wildfire threat* is controlled primarily by:

- Topography: Slope and terrain features can influence rate of spread; aspect can affect pre-heating and other fuel properties
- Fuel: Amount, vertical and horizontal arrangement, type, and dryness
- Weather: Temperature, relative humidity, wind speed and direction, precipitation

Consequences refer to the repercussions associated with fire occurrence in a given area. Higher consequences are associated with densely populated areas, presence of values at risk, etc.

4.1 WILDFIRE ENVIRONMENT

There are three environmental components that influence wildfire behavior: topography, weather, and fuel. These components are generally referred to as the 'fire behaviour triangle' (Figure 1); the ways in which they individually influence the wildfire environment of the area will be detailed below. Fuel is the only component of the fire triangle that can be reasonably managed through human intervention. It is important to recognize that in WUI fires, wildland fuels (trees, shrubs, branches, etc.) are not the only fuel available to the fire – houses and their exterior construction materials and landscaping vegetation, cars, barbeque propane tanks, and more (anything that is flammable or combustible) is available fuel.

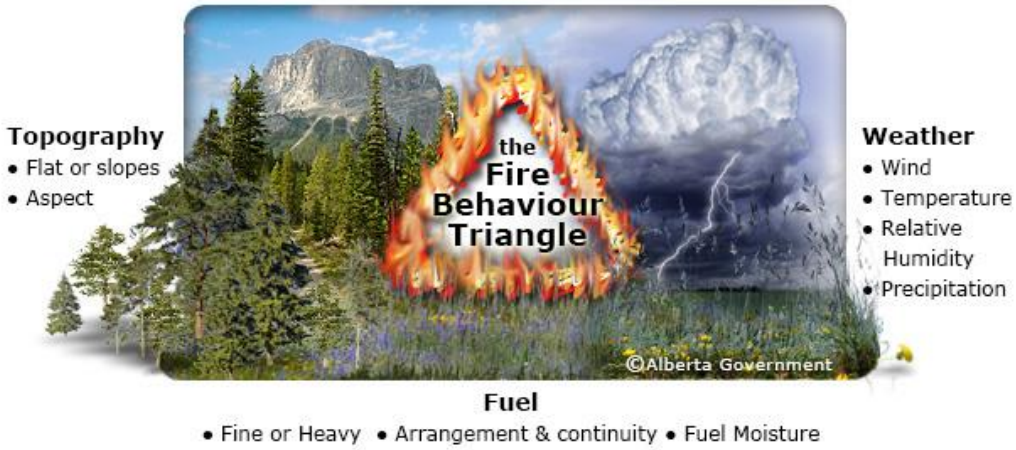


Figure 1: Graphic display of the fire behaviour triangle, and a subset of characteristics within each component.[13]

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. As the majority of Creston occupies flat terraces, topography presents a limited local natural risk factor within the Town's WUI. However, on a larger scale, the broad Kootenay River Valley that Creston is in can funnel winds to drive a fire both up (north) and down (south) the valley. Additionally, smaller rivers, tributaries, and creek draws (often running up/down the valley slopes of the side drainages) provide additional convective features that can drive the upslope spread of fire.

Shown below on Map 5, the majority of Creston Village and associated infrastructure are located in the valley bottom, which is naturally advantageous from a fire spread standpoint. However, some older and newer developments in the northeast of town (10th Avenue North; Helen Street) are into the lower part of steeper slopes, placing more structures and infrastructure at a topographical risk to fire. Developments uphill of water infrastructure can make water delivery more difficult as natural local water sources typically become scarcer and pumping against gravity requires additional pressure. Additionally, these developments are located on exposed south/southwest facing slopes, which receive nearly constant insolation throughout the summer. While this aspect provides the most challenging weather conditions in fire season, vegetation growth is typically more limited due to more pronounced growing season water deficits.

Table 10 shows the percent of the WUI by slope steepness class, with corresponding fire behavior implications. Nearly one-fifth of the WUI (18%), almost all in the Town's northeast area, is on >30% slope and would experience accelerated rates of fire spread *uphill* due to slope class.

[13] Graphic adopted from the Province of Alberta.

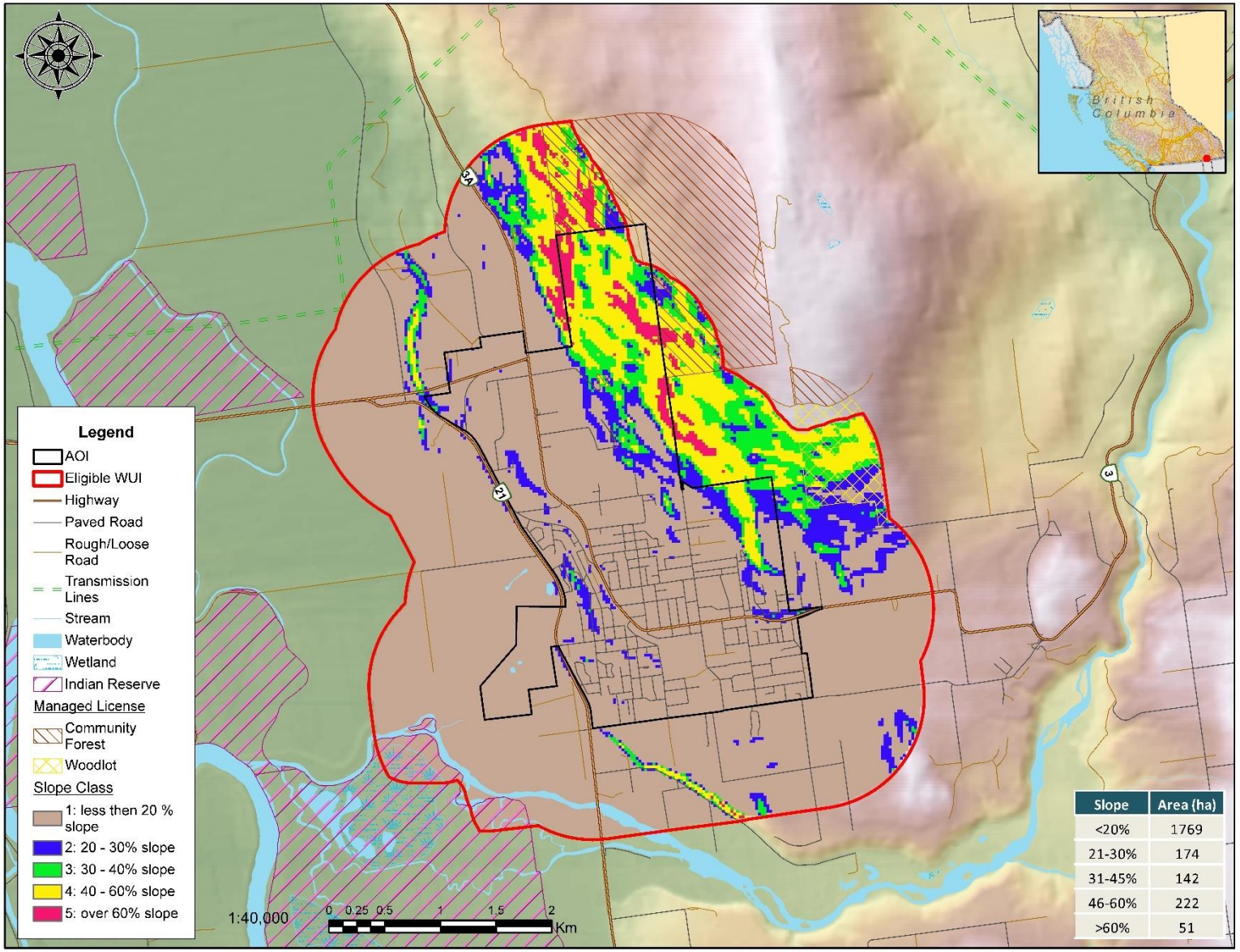
Table 10. Slope Percentage and Fire Behaviour Implications.

Slope	Percent of Eligible WUI	Fire Behaviour Implications
<20%	75%	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	7%	Flame tilt begins to preheat fuel, increase rate of spread.
31-40%	6%	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
41-60%	10%	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	2%	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

Table 11 shows the fire behavior implications of slope position of a value. Values located in the mid-slope are threatened by faster rates of fire spread due to the pre-heating of fuels from fire below and longer flame lengths reaching uphill. As discussed above, most of Creston is situated at valley bottom on flat terraces so would not have fire rates of spread influenced by topography alone. However, structures at the base of slopes in the northeast of Creston are more at risk from fires spreading uphill.

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.



Map 5: Slope, by slope classes, for Creston's WUI

4.1.2 FUEL

The ecological context of wildfire and the role of fire in the local ecosystem under both current and historical conditions is an important basis for understanding the current and future wildfire threat to a community. Also, the type and amount of fuel available for a wildfire is a major driver of the potential fire behaviour in an area. Fuel is the only component of the fire triangle that can be realistically managed through human intervention. This section analyses and discusses available *wildland* vegetative fuels within Creston's WUI.

Land clearing and diking for agriculture and land clearing for development have removed native forest, shrub, and grass vegetative communities from the majority of Creston's WUI. These swaths of cleared and irrigated farm and orchard land at valley bottom and adjacent terraces reduce wildfire threat. In the hillsides northeast and east of town (both within and outside Creston's WUI) past logging has combined with historically suppressed wildfires throughout the 1900s to result in a continuous distribution of relatively even-aged conifer stands. Within Creston's WUI (primarily in the Community Forest), these forested stands have seen new logging that has now started breaking up the even-aged continuity, something that can reduce wildfire behaviour by forcing fire 'to the ground'. However, management of reduced slash (harvest debris) in these WUI harvested areas is paramount towards further reducing their wildfire behaviour and potential risk to nearby neighbourhoods and the greater community.

The Canadian Forest Fire Behaviour Prediction (FBP) System outlines sixteen fuel types based on characteristic fire behaviour under defined conditions.[14] BC Wildfire Service maintains a provincial fuel type layer that was confirmed and updated for this CWRP. It should be noted that a locally observed fuel type may have no exact analog within the FBP system. In these cases, the most appropriate fuel type to predict fire behaviour was assigned; the FBP system was almost entirely developed for boreal and sub-boreal forest types, which do not occur within the study areas. Furthermore, fuel types depend heavily on Vegetation Resource Inventory (VRI) data, which is gathered and maintained to inform timber management objectives, not fire behaviour prediction. Although a subjective process, the most appropriate fuel type was assigned based on research, experience, and practical knowledge; this system has been successfully used within BC, with continual improvement and refinement, for 25 years.[15] In some areas, aerial imagery is of low spatial resolution and/or ground access was impossible, making fuel type assessment difficult.

Table 12 lists the percentage of fuel types in Creston's eligible WUI. The fuel types present that are considered most hazardous in terms of fire behaviour (almost all located in the forested slopes in the northeast of Creston's WUI) are S-1, O-1a/b, and C-7 (under certain conditions). Extensive areas of S-1, O-1a/b, or C-7 can support a rapidly spreading surface fire capable of damage or destruction of property and jeopardizing human life. The fire behaviour potential in these fuel types is recognized as highly variable

[14] Forestry Canada Fire Danger Group. 1992. Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.
[15] Perrakis, D, G. Eade and D. Hicks. 2018. Canadian Forest Service Pacific Forestry Centre. British Columbia Wildfire Fuel Typing and Fuel Type Layer Description

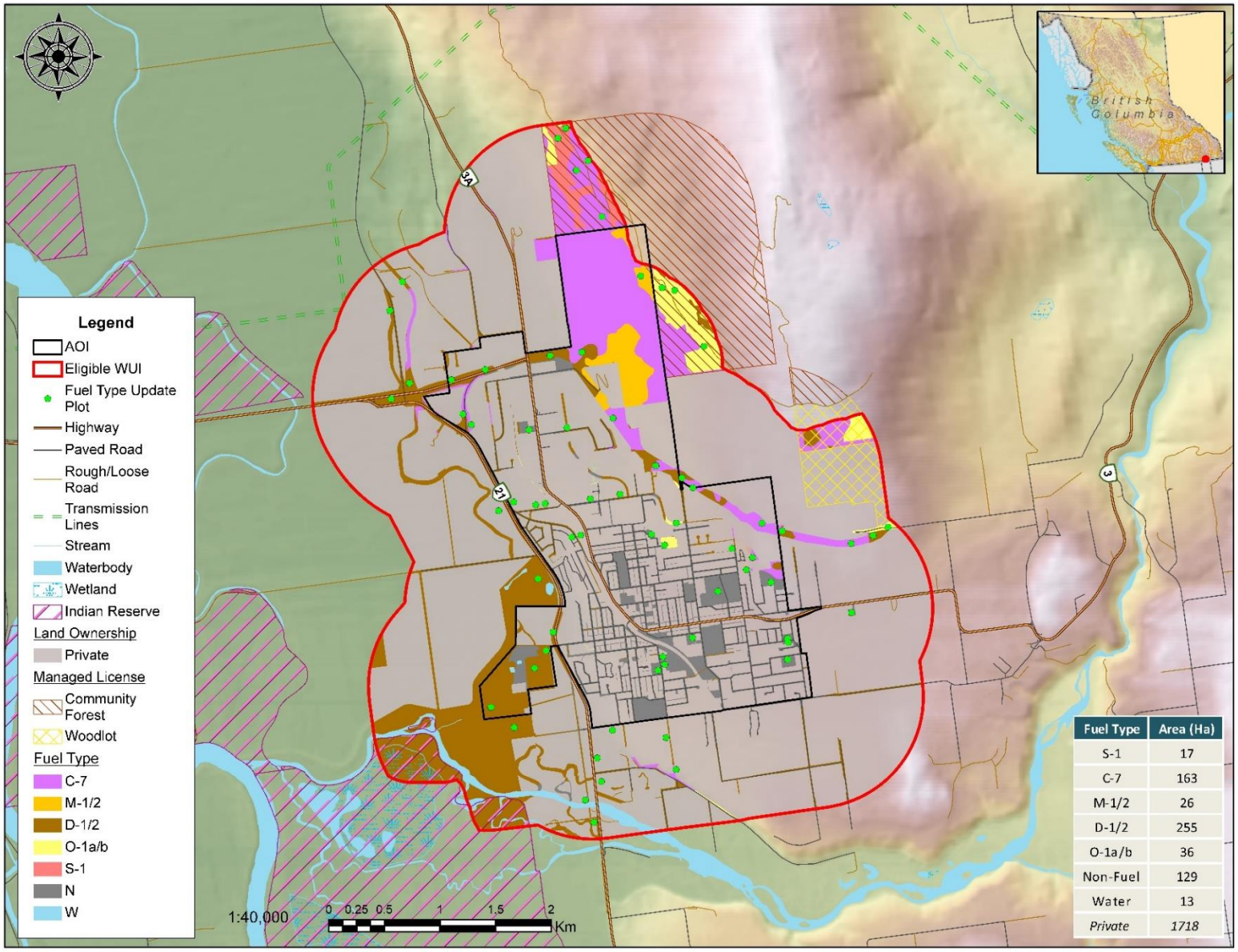
dependent on the percentage of grass or slash that is cured and the wind speed. An M-1/2 fuel type can be considered hazardous depending on the proportion of conifers within the forest stand, and/or the amount of dead and downed material. D-1/2 stands (for Creston, mostly located in the west and southwest of its WUI in the floodplain) are dominated by deciduous species, and are generally considered the least hazardous forest type because of their higher moisture content and lack of flammable ladder fuels. The hazard of a D-1/2 stand can greatly increase if there is an accumulation of surface fuels, cured grasses, or flammable shrubs. Recent spring cross-over conditions[16] (called the 'spring dip') have allowed for destructive forest fires in deciduous-dominated stands. Detailed fuel type descriptions and their associated wildfire risk can be found in Appendix A-1: Fuel Typing Methodology.

Table 12. Fuel types in Creston's Wildland Urban Interface

Fuel Type	Fuel Type Description within the WUI	Area (ha) of WUI	Percent (%) of WUI
S-1	Any conifer slash as the result of harvesting practices. Slash is typically one to two seasons old, continuous, with no post-logging treatment applied. Tops and branches left on site result in moderate fuel load depths.	17	**3%**
C-7	Low-density, uneven-aged conifer-dominated forest, crowns separated from the ground, understory of discontinuous grasses and shrubs. Exposed bed rock and low surface fuel loading. Often located on south-facing slopes and throughout the ICHxw.	163	**25%**
D-1/2	Deciduous stands/forest. Hazard increases with the amount of deadfall and/or establishment of a flammable shrub layer.	26	**4%**
M-1/2	Moderately well-stocked mixed stands of conifer and deciduous, low to moderate dead stems and down woody fuels. Often transition to become more conifer dominated as pioneer deciduous species die out if disturbance is excluded.	255	**40%**
O-1a/b	Grassland fuels ('a' refers to matted grasses, 'b' refers to standing). Matted and standing grass that can cure; sparse or scattered shrubs, trees, and down woody debris. Cutblocks >2 seasons old that do not meet S-type descriptions, as well as young regenerating cutblocks that have not reached any horizontal continuity.	36	**6%**
Non-fuel	Areas with no available forest or grass fuels (e.g., roadways, gravel clearings, irrigated and/or mowed fields). These areas may (and often do) contain combustible materials, infrastructure, flammable landscaping, and homes.	129	**20%**
Water	-	13	**2%**
Private Land	-	*1720*	***73%***

Map 6 below displays the updated fuel types for the eligible WUI surrounding Creston.

[16] Cross-over conditions refer to a point where air temperature drops below the relative humidity (e.g., 20°C/15% humidity), providing conditions for potentially severe fire behaviour.



Map 6. Updated fuel types in the eligible WUI of the Town of Creston

4.1.3 WEATHER

Creston is located at ~600m elevation in the broad Kootenay River Valley with moderate to large mountain ranges running parallel to the valley. Fire season conditions are generally warm to hot (July and August daily temperature means average 19.7°C, with maximums averaging 27.3°C), and dry in the valley, with climate change projections trending toward even hotter summers and more pronounced droughts.[17] Local BC Wildfire Service (BCWS) staff working actively on wildfires in the Central Kootenays during 2023 commented that in this region, weather (i.e., relative humidity and wind), slope, and aspect are far more important factors in fire growth than fuel types.[18]

Historical weather data can provide information on the number and distribution of days when Creston's WUI and surrounding areas experience high fire danger conditions. 'High fire danger' is considered with a Canadian Forest Fire Danger Rating System (CFFDRS) Danger Class rating of 4 (High) or 5 (Extreme). Average danger class data for Creston is determined from the [nearest and most representative] Akokli Creek fire weather station, located on the east side of Kootenay Lake, ~40km north of Creston and 200m higher in elevation.[19] Averages for the past 10 years is presented below in Figure 2. The data from this station may underestimate fire danger due to the moderating effect of the adjacent Kootenay Lake. This is problematic for Creston and its WUI, as residents and industrial operators would most likely be referencing the Akokli Creek fire weather station for the daily fire danger rating.

[17] Environment and Climate Change Canada

[18] From verbal conversations between the Plan's developers and wildfire crews encountered during field work for the Plan's development.

[19] There are two other BCWS fire weather stations within ~40km of Creston: Goatfell and Darkwoods. These are less representative as they are both at significantly different elevations than Creston (Goatfell: +500m; Darkwoods: +1000m) and they are both located outside the main Kootenay River/Lake Valley which has the largest affect on Creston's wind patterns.

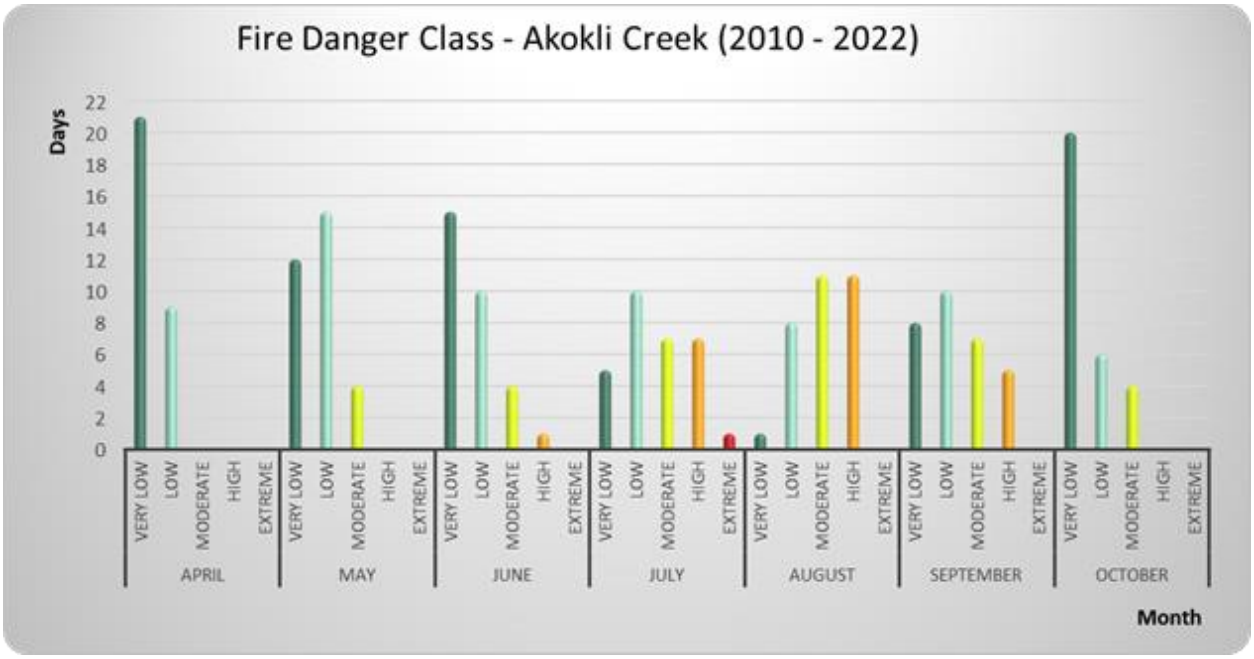


Figure 2: Average number of fire danger rating days by month for the Akokli Creek fire weather station.

Hourly wind speed and direction is also recorded at BCWS weather stations. Data is publicly available in the form of average Initial Spread Index (ISI) roses.[20] The ISI is a numeric rating of the expected rate of fire spread that combines the effects of wind speed and fine fuel moisture (which is controlled by temperature and relative humidity). ISI roses can be used to help plan the location of 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.

Wind and ISI data assessed from the Akokli Creek fire weather during the fire season, indicates that Creston primarily experiences strong diurnal winds – up-valley from the southeast and south during the day, and down-valley from the northeast at night. As per the ISI rose, the highest ISI wind directions are from the southeast and south which is for the most part consistent throughout the fire season from April to October.

[20] https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/vegetation-and-fuel-management/fire-fuel-management/fuel-management

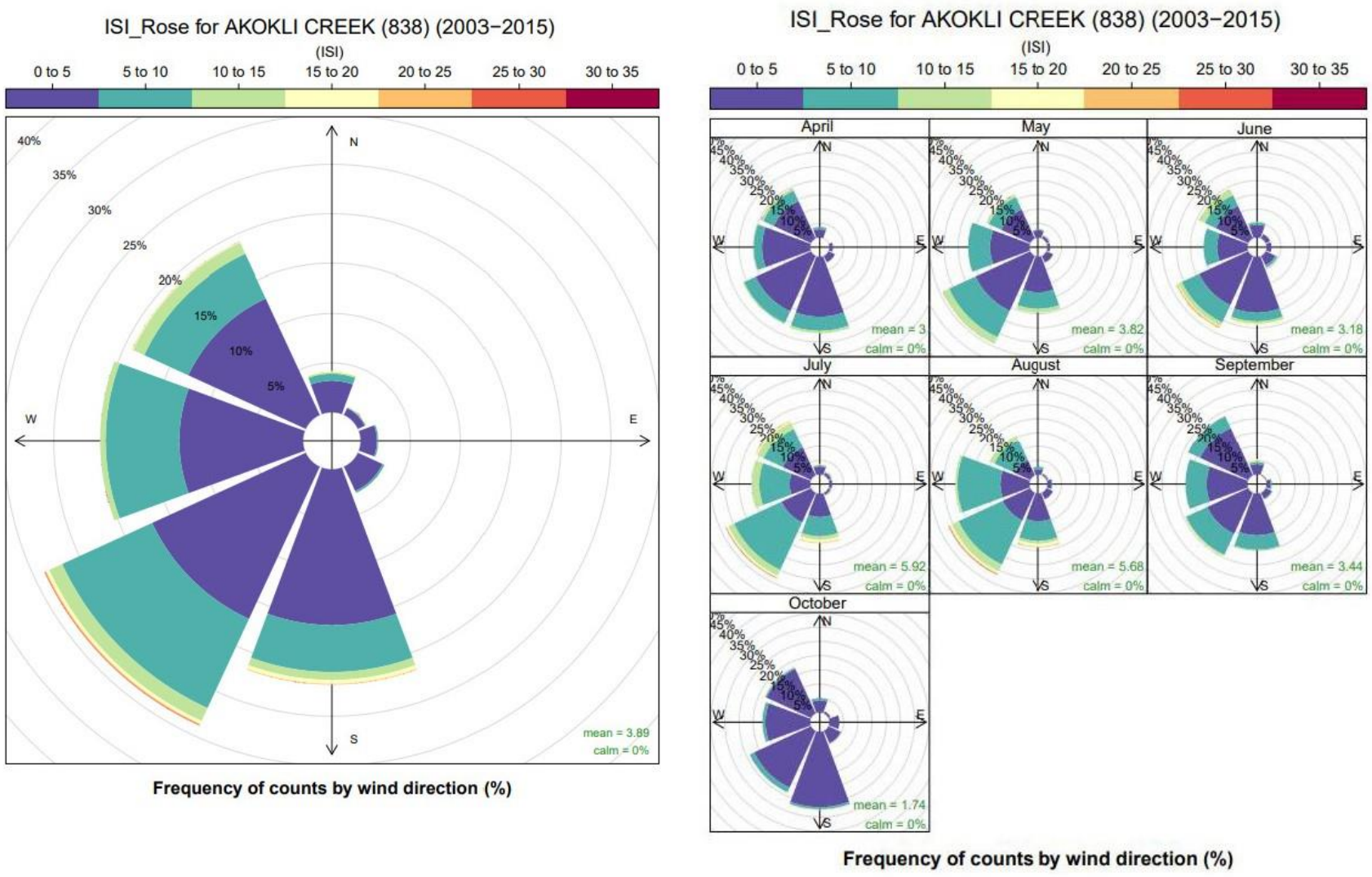


Figure 3. Daily and monthly average initial spread index rose for Akokli Creek fire weather station for the fire season (April – October)

4.2 WILDFIRE HISTORY

4.2.1 HISTORIC FIRE REGIME

Creston's WUI can be categorized using the Biogeoclimatic Ecosystem Classification (BEC) system, which classifies the province into zones by vegetation, soils, and climate. Regional subzones are derived from relative precipitation and temperature. Shown in Table 13, nearly all of Creston's WUI falls into the Interior Cedar Hemlock, Very Dry Warm (ICHxw) subzone, which is the driest of the ICH. Forests in the (ICHxw) are characterized by a natural disturbance regime of ecosystems with frequent, stand-maintaining fires (referred to as a Natural Disturbance Type [NDT] 4).[21] These frequent fires would maintain the existing forest stand structure through frequent, low-intensity fires that would normally regulate the amount of surface fuel build-up and reduce the number of small, sampling size regenerating trees.[21] This regime was likely exemplified through pre-settlement cultural burning practices by the Yaqan Nukiy. A higher frequency and a variable intensity of these types of fires across the landscape would create mosaics of uneven-aged forests and grassy or shrubby openings which naturally restricted the spread of large, severe fires.[21]

Map 7, in Section 4.2.2 below, shows the distribution of Biogeoclimatic zones and associated NDTs in Creston's wildland-urban interface. It is important to consider that BEC distributions will likely shift and/or change because of climate change.

Table 13. Natural Disturbance Types (NDTs) of Creston's WUI.

Biogeoclimatic Zone	Natural Disturbance Type	Area (ha)	Percent (%)
Interior Cedar Hemlock, *Dry Warm*	NDT3	81	3%
Interior Cedar Hemlock, *Very Dry Warm*	NDT4	2278	97%

4.2.2 HISTORICAL WILDFIRE OCCURENCES

Displayed below on Map 7, within five kilometres of Creston's WUI wildfires occurred very frequently in the 1920s-1930s, with humans being the most common cause of those fires' ignitions (90%; 35/39). However, since 1940 (when there were two lightning-initiated fires; one burning just over 14,000 ha – by far the largest in the records) there have been only four BCWS recorded wildfires within the same five-kilometer area of Creston's WUI: 2008 – human; 2010 – lightning; 2014 – human; 2017 – human; with none of those burning more than 6.6 ha. Overall, only six fires within the last 100 years grew over 500 ha in size. Interestingly, the map shows that almost no fires crossed through the Kootenay River riparian area and flood plain, which indicates how much of a fire barrier that natural feature is, protecting Creston's western edge from advancing ground fires.

[21] BC Biodiversity Guidebook. https://www.for.gov.bc.ca/hfd/library/documents/bib19715.pdf

BCWS fire ignition data (which records point ignitions that may or may not have developed into a wildfire with a recorded perimeter area) is only available from 1950 onwards. Looking at the same five-kilometre area surrounding Creston's WUI, 260 out of 309 (84%) recorded ignitions have been from humans or human activity. Nearly half of those (43%) were recorded from 2000 onwards. Of the 40 recorded lightning ignitions, 10 (25%) were recorded from 2000 onwards.

Figure 4 displays trends with fire ignitions since the 1950's *within Creston's WUI*. As with the data discussed above for the larger five-kilometer buffer area of the town's WUI, the overwhelming majority (88%) of these ignitions have been human-caused.

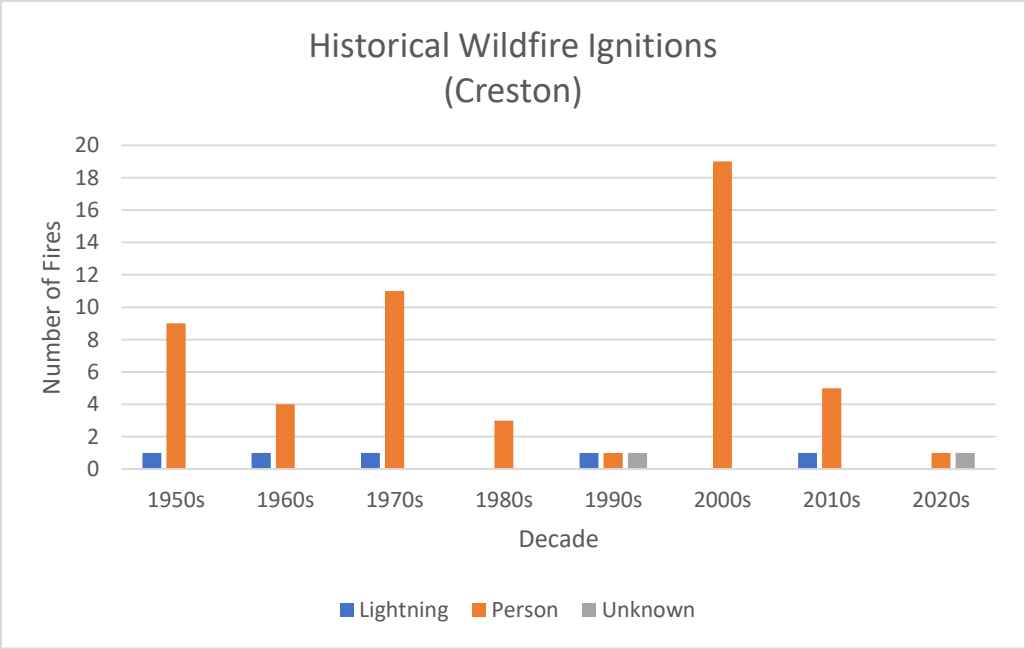
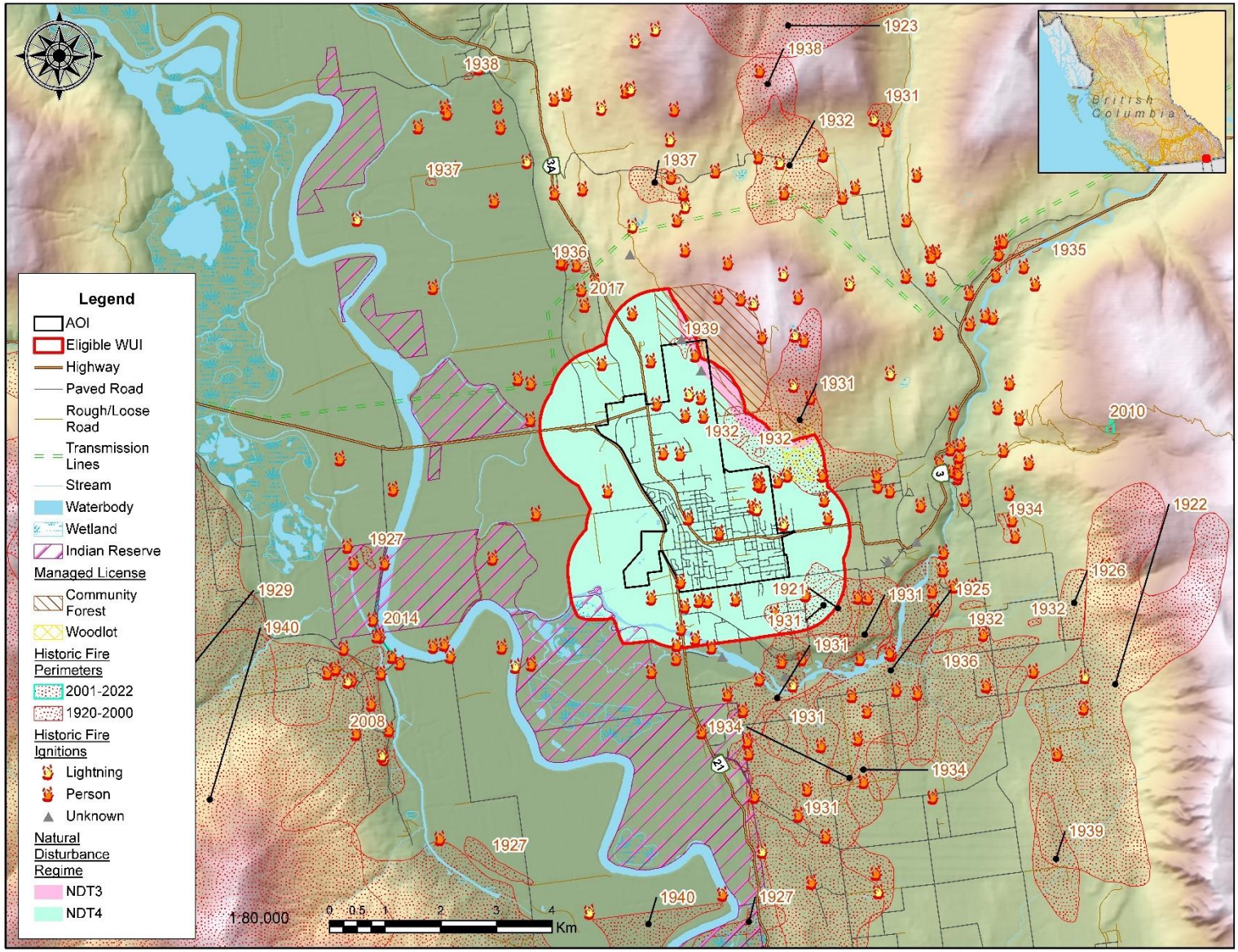


Figure 4: Summary of fire ignition data by cause within Creston's WUI (Data from the BC Wildfire Service).

The historical fire perimeter and ignition data discussed shows that historically, fire ignitions and fire development were frequent, but they were most likely low-intensity, stand-maintaining, and rarely grew to a substantial size. Importantly, most fire ignitions were human caused, which can be addressed through FireSmart education.



Map 7: Natural disturbance regimes and historical fire ignitions and occurrences for Creston's WUI and a five-kilometer area surrounding.

4.2.3 WILDFIRE RESPONSE

Creston Fire Rescue (CFR) fire response data[22] (Table 14) shows that it responded to an average of 24 fire calls per year between 2013 and 2022, of which 38% were non-structural fires (identified as 'wildland' fires). The data shows a marked increase in total callouts per year starting in 2019, with the last two years on record (2021 and 2022) showing the greatest number of callouts within the last 10 years. 2021 also had the highest number of wildland fire callouts during that same 10-year period (23). This response data from CFR demonstrates the importance of wildfire specific training and equipment and public fire education -wildfires can just as easily begin from a house fire igniting the adjacent forest and wildland fuels. See Section 5 for related recommendations.

Table 14: Creston Fire Rescue fire callout record 2013-2022

Year	Wildland Callout	Structure Callout	Total	*% Wildland Callout*
2013	5	12	17	*29%*
2014	1	12	13	*8%*
2015	3	12	15	*20%*
2016	10	14	24	*42%*
2017	8	16	24	*33%*
2018	8	10	18	*44%*
2019	13	14	27	*48%*
2020	10	14	24	*42%*
2021	23	22	45	*51%*
2022	12	25	37	*32%*
Total	***93***	***151***	***244***	***38%***

4.3 LOCAL WILDFIRE RISK ASSESSMENT

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

- *Fuel type attribute assessment* – ground truthing/verification and updating as required to develop a local fuel type map (Appendix A-1: Fuel Typing Methodology).
- *Consideration of the proximity of fuel to the community* – recognizing that fuel closest to the community usually represents the highest hazard (Appendix A-4: 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). Wind speed, wind direction, and fine fuel moisture condition influence wildfire trajectory and rate of spread.

[22] Data provided to B.A. Blackwell & Associates from CFR via information gathering questionnaire

- *Consideration of topography in relation to values* (Table 10 and Table 11) – slope percentage and slope position of the value are considered, where slope percentage influences the fire's trajectory and rate of spread and slope position relates to the ability of a fire to gain momentum uphill.
- *Stratification of the WUI* – according to relative wildfire threat based on the above considerations, other local factors, and field assessment of priority wildfire risk areas.

Wildfire threat assessment field work in Creston's WUI was completed in August of 2023. 105 field stops (e.g., qualitative FireSmart notes, fuel type updates/verification, photograph documentation) were made across the WUI (see Appendix A-2: and Map 8), including four Wildfire Threat Assessment (WTA) threat plots (see Appendix B: Wildfire Risk Assessment – Worksheets and Photos). WTA plots were completed in interface (i.e., abrupt change from forest to residential development) and intermix (i.e., where forest and structures are intermingled) areas of the WUI to support wildfire risk analyses and development of priority treatment areas. The limited number of WTA's completed within the WUI reflects: 1) the limited amount of public land within the WUI available for assessment; 2) accessibility constraints of the forested areas in the northeast of the WUI (e.g., access required through private property); and 3) the limited amount of that assessable area with wildfire threat attributes to quantify (i.e., municipal land that are playing fields do not need wildfire threat assessments completed for them – qualitative risk assessments are sufficient).

It is important to note that the local WTA analysis does not apply to private land parcels nor any areas outside of the eligible WUI for this CWRP. As well, the threat assessments quantify threat as it relates to forest fuels, but do not include the ignition potential of residential landscaping, structures, or other infrastructure. Structure fires and structure-to-structure spread in a wildfire scenario are largely attributable to hazardous conditions in the FireSmart Home Ignition Zone of a structure (i.e., the area within 30m of the principal building and/or its attachments).

4.3.1 WILDFIRE THREAT CLASS ANALYSIS

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 can be unthreatening to homes and structures;
- High: Landscapes or stands with continuous forested or grassland fuels that will support candling, intermittent crown fires, or continuous crown fires. These landscapes often contain 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 8 and in Table 15 below. The local threat analysis shows that, for the assessable area (i.e., not private land), 34% of Creston's eligible WUI is classified as a high or extreme fire behavior threat and 16% is classified as a moderate threat – almost all

located in the northeast and east areas of the WUI due to conifer-dominated forest fuel types on steeper slopes. 51% of the WUI is classified as a low or no threat (water) – almost all located in the Town's centre and west/southwest areas of the WUI due to deciduous-dominated or managed grass dominated fuel types and low slope grades (flood plain and terraces). Overall, private land totals 73% of Creston's WUI – this area was not allocated fire threat data. Conditions on private land can often result in the fire hazard being much higher than in the forest adjacent if there is low compliance with FireSmart vegetation and structure principles – issues that were frequently observed throughout Creston during field work.

Table 15: Wildfire threat summary for Creston's eligible WUI

Wildfire Threat			
Threat Class	**Hectares**	**% of WUI**	**% of Assessable Public Land**
Extreme	112	5%	**18%**
High	103	4%	**16%**
Moderate	100	4%	**16%**
Low	310	13%	**49%**
Very Low/No Threat (Water)	13	1%	**2%**
No Data (Private Land)	*1720*	*73%*	***n/a***

4.3.2 WUI RISK CLASS ANALYSIS

WUI risk classes are quantified when the Wildfire Threat (the above) is assessed as high or extreme, potentially causing unacceptable wildfire risk 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 2 km from structures;
- **Moderate**: The high or extreme threat is sufficiently distant from developments, having no direct impact of the community and is located 500m to 2 km 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 16 below (and displayed on Map 8) summarizes the risk class ratings within the WUI. Of the 215 hectares assigned a High or Extreme wildfire threat class, 107 hectares (50%) have a high or extreme WUI risk. This indicates priority areas/neighbourhoods for directing FireSmart and vegetative/fuel management efforts, if practicable.

It is important to note that reducing the risk (i.e., performing wildland fuel management) in any of the moderate to extreme WUI risk areas is unlikely to be a silver bullet in protecting neighbourhoods. In

extreme wildfire scenarios, firebrands (embers) can travel many kilometers ahead of the active fire front, land in densities of up to 600/m^2, and ignite combustible building materials and landscaping vegetation. In combination with wildland fuel management, increasing the resilience of Creston and its interface neighbourhoods can only be efficiently achieved by performing residential-scale FireSmart activities on private land. The proposed fuel treatment units identified in Section 5.7 were selected for as the highest priority areas that are practicable to implement and present a high risk to the community.

Table 16: WUI risk class ratings within Creston's WUI.

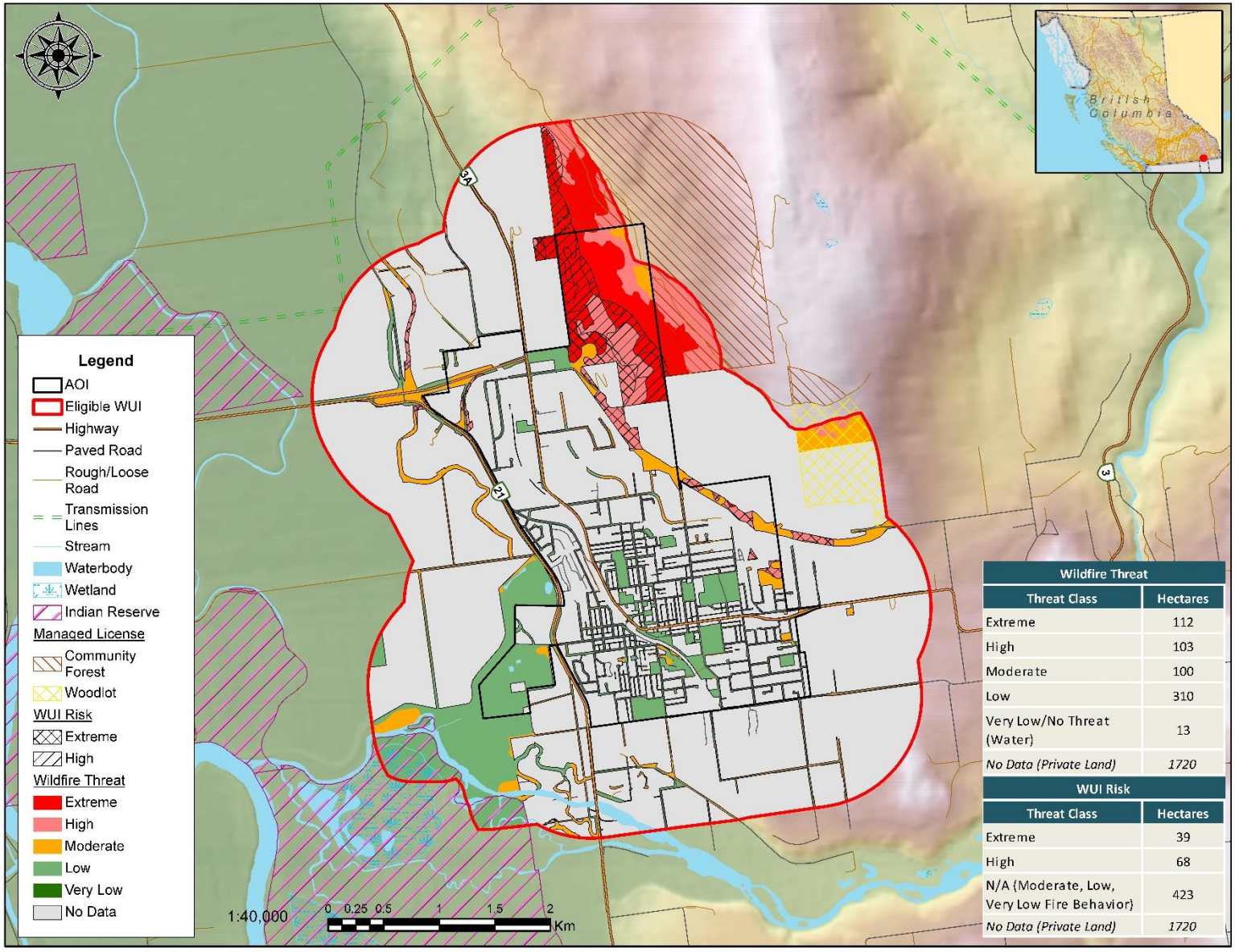
WUI Risk			
Risk Class	**Hectares**	**% of WUI**	**% Assessable Public Land**
Extreme	39	2%	**6%**
High	68	3%	**11%**
N/A (Moderate, Low, or Very Low fire threat)	423	18%	-
No Data (Private Land)	*1720*	*73%*	-

For detailed field data collection and spatial analysis methodology for the local threat assessment and classification, see Section 6.1.

The Province of BC produces a Provincial Strategic Threat Analysis (PSTA, updated in 2021) for all non-private land parcels in BC. This high-level assessment of relative wildfire threat throughout the province is largely based on data from the Vegetation Resource Inventory (VRI) that has not been ground truthed, fire occurrence patterns, potential fire intensity, and spotting potential.[23] The PSTA ranks threat on a scale of 1 (lowest) through 10 (extreme). Complementing the above local wildfire risk analyses, the PSTA is a high-level, geographic information system (GIS) raster analysis that is suitable for wildfire threat information across the land base, while appropriate land management activities need to be determined at the local level using site-specific stand-level information.

Additionally, the Province has developed a WUI Risk Class Framework to prioritize risk reduction initiatives, categorizing WUI polygons by a risk class of 1 (highest) through 5 (lowest). The application of relative risk does not imply "no risk" since the goal is to identify areas where there is higher risk. Creston's WUI is categorized as being in a Risk Class of 2.

[23] MFLNRORD. (2017). Provincial Strategic Threat Analysis. Accessed from: https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/fuels-management/provincial_strategic_threat_analysis_2017_update.pdf



Wildfire Threat	
Threat Class	**Hectares**
Extreme	112
High	103
Moderate	100
Low	310
Very Low/No Threat (Water)	13
No Data (Private Land)	*1720*

WUI Risk	
Threat Class	**Hectares**
Extreme	39
High	68
N/A (Moderate, Low, Very Low Fire Behavior)	423
No Data (Private Land)	*1720*

Map 8: Local wildfire threat assessment within the Town of Creston's eligible WUI

4.4 HAZARD, RISK, AND VULNERABILITY ASSESSMENT

The purpose of a Hazard, Risk and Vulnerability Assessment (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.[24] As part of Creston moving its emergency planning and management in house an HRVA was recently completed, but a final report has not been published at the time of this Plan's writing. Any updates of Creston's HRVA should look and refer to the most recent CWRP for the most up to date wildfire risk analyses and vulnerabilities to the community, as well as key recommendations to focus on.

[24] Government of BC. 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 ownership, forest type or property type. Creston's FireSmart program has been managed and delivered for over 10 years by RDCK, including local delivery of FireSmart education.

Since the 2016 CWPP was completed, a few of its recommendations have been wholly or partially implemented (previously detailed and discussed in Section 2.1). The recommendations not addressed related to updating specific plans, delivering public FireSmart and wildfire education, building code risks, and private landowner vegetation management issues.

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

Because ignitability of structures and landscaping vegetation 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.[25] Increasing ignition resistance would reduce the number of homes simultaneously on fire; extreme wildfire conditions do not necessarily result in WUI fire disasters.[26] Initial assessments of homes/structures damaged versus those not from the recent 2023 Kelowna-area wildfires provides strong evidence supporting these key points.[27] 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

[25] Cohen, J. Preventing Disaster Home Ignitability in the Wildland-urban Interface. Journal of Forestry. p 15 - 21.
[26] Calkin, D., J. Cohen, M. Finney, M. Thompson. 2014. *How risk management can prevent future wildfire disasters in the wildland-urban interface*. Proc Natl Acad Sci U.S.A. Jan 14; 111(2): 746-751. Accessed online 1 June, 2016 at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3896199/.
[27] Presentation by BCWS to the Wildland Fire and Fuels Community of Practice group via Forest Professionals of BC Webinar, November 2023.

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.

5.1 COMMUNITY OVERVIEW

During CWRP development, FireSmart risk and resiliency factors for different general areas or specific neighbourhoods throughout Creston were noted (Table 17). This incorporates field observations, the local risk assessment, information from meetings with the CFR Fire Chief, and Community Emergency Plans.

Table 17: FireSmart vulnerability and resilience by neighbourhood.

	Vulnerability	Resilience
Downtown, South, and West municipal neighbourhoods	- Higher density of structures, many with non-FireSmart compliant exterior structure materials and landscaping vegetation.	- Within Fire Response Area. - Located on large, flat terraces. - Largely cleared of vegetation. - Fuel treatments were completed on municipal lands. - Fire Hydrants.
Helen Street Mobile Home Park	- Interface to steeper forest land and intermix within. - Steep road grades and narrow roads. - Non-FireSmart compliant exterior structure materials and landscaping vegetation. - No fire hydrants.	- Within Fire Response Area. - None noted.
CrestGlen Mobile Home Park	- Tight switchback roads. - Non-FireSmart compliant exterior structure materials.	- Within Fire Response Area. - Fire hydrants (but only in one section).
Subdivisions at the top of 16th and 20th Avenues	- Interface to steeper forest land and intermix within. - Narrow roads. - No fire hydrants.	- Within Fire Response Area. - None noted.
Subdivision at the top of 10th Avenue	- Interface to steeper forest land and intermix within.	- Within Fire Response Area. - Fire hydrants.

The sections to follow provide information on each FireSmart discipline as it relates to Creston. An analysis of actions that have been implemented are noted, as well as any relevant gaps identified. Each section contains a table of recommended actions for Creston. Most actions are fundable through the CRI FireSmart Community Funding and Supports program. Each recommendation includes a rationale, lead agency, timeline, and estimated resources to complete.

5.2 EDUCATION

Public education and outreach play a critical role in helping a community prepare for and prevent a wildfire emergency. Awareness of wildfire risk is important, but this needs to be paired with an awareness of potential mitigation actions and available FireSmart programs for residents to implement on their properties and within the community. Participating in wildfire risk reduction and resiliency activities can also promote a sense of empowerment and shared responsibility at the home, street, neighbourhood,

and municipal level. The education discipline often supports the successful implementation of many other FireSmart disciplines by building awareness and understanding within both residents and visitors.

Creston (via the RDCK FireSmart program) began actively engaging the community through educational FireSmart events in spring/summer 2023, hosted at the newly constructed Creston Emergency Services Building. CFR noted that while the public's response and awareness of wildfire risk has increased, awareness and uptake of FireSmart and its principles on private property has been slow – attributed to a lack of education opportunities. Creston keeps an up-to-date FireSmart webpage that introduces FireSmart to residents and provides (with links) information on how residents can FireSmart their own homes and properties.[28] Additionally, Creston has fire weather signs posted, but CFR noted these are outdated and could be replaced.

CFR noted difficulties in providing a local FireSmart program that is being managed through the greater regional district's program. Moving the FireSmart program in house (i.e., Town of Creston applies for its own FireSmart grant funding through UBCM CRI FCSFS), and having it managed by a local FireSmart Coordinator, could provide Creston and CFR the greatest opportunity to provide a local program to residents delivered by local professionals with local knowledge and community connections.

To continue furthering FireSmart education initiatives, Table 18 below details recommended actions that Creston can pursue. Because of the large amount of private property within Creston's WUI, the observed general lack of adherence to FireSmart construction materials and landscaping throughout the municipality, and the understanding that homes, landscaping vegetation, and all other manner of flammable and combustible materials are considered fuel in the WUI wildfire triangle, a large emphasis should be placed by Creston to pursue all manner of FireSmart education opportunities. Not all will be successfully received by the public, but it is equally important to know what does not work as what does in getting the FireSmart message into the community – then efforts can be refined and improved moving forwards. Also, it is important to recognize the demographics of the community and provide FireSmart education opportunities that can be accessed by all. With 40% of residents over the age of 65, social media and online messaging may not be as accessible to them as the younger residents. Providing a mix of education mediums (in person events, social media campaigns, webpage information) may be what is required to spread FireSmart education as broadly as possible within the community.

[28] https://www.creston.ca/2368/FireSmart

Table 18: Education recommendation and action items

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
Education - Section 5.2							
Residents							
1a 1b	High High	Move the FireSmart program "in-house" by having Town of Creston apply to UBCM CRI FCFS for FireSmart program funding. Apply for funding to hire a FireSmart Coordinator. This position can be added to a current employee's role, be made a new position, or contracted out.	To provide a continuous, local FireSmart program, delivered by local professionals with local knowledge and connections, to their community. Having a FireSmart Coordinator will provide a lead person with dedicated time to coordinate, manage, and implement the program, especially as it grows.	Creston (RDCK)	2 years	Creston has its own FireSmart program being managed by a local FireSmart Coordinator.	CRI FCFS up to cost maximums.
2	High	Continue to promote FireSmart to Creston residents at community events, public spaces, and through workshops using FireSmart branded material and printed manuals (Home and Landscaping).	Most residences in Creston are not FireSmart. Landscaping (conifer hedges), firewood and combustible materials storage, and external building materials are the biggest issues. FireSmart BC resources help present a unified message. Print resources are popular and easy to distribute. FireSmart branded tents, banners, and t-shirts can be purchased with CRI FCFS funding.	Creston (RDCK)	Annually	Quantity of resources distributed/number of times used at events.	CRI FCFS up to cost maximums.
3	High	Update Creston's FireSmart webpage with the most recent FireSmart graphics and language. Provide links to the current fire danger rating, or better yet, have that posted on the front of this page (making sure to keep it updated during the fire season).	To continue to provide to most recent and up to date FireSmart information, language, and principles to residents (and visitors).	Creston (RDCK)			CRI FCFS up to cost maximums.
4	High	Implement a FireSmart social media campaign through various Creston social media platforms (i.e., Facebook, Twitter, Instagram).	To promote FireSmart information to residents (and visitors). Include links to graphics, videos, pdf information/pamphlet downloads, etc.	Creston (RDCK)			CRI FCFS up to cost maximums.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
5	High	Promote FireSmart in Creston schools using the FireSmart Education Kit and other resources.	Great success has been made through BC schools with FireSmart outreach. Engaging with the community's younger population may increase uptake with all residents.	Creston (RDCK)	Annually	One FireSmart lesson delivered each year (minimum).	CRI FCFS; e.g. FireSmart Magnetic Board for $1,710.
6	High	Consider door-to-door knocks in identified high-risk, priority neighbourhoods in the WUI interface northeast and east areas of Creston to discuss wildfire risk and FireSmart principles that they can apply to their home and property.	Although wildfire can affect all areas of Creston, analyses have identified the neighbourhoods in the northeast and east as being the most at risk in relation to potential wildfire behavior. Door to door knocks by Fire Chiefs, fire department personnel, and FireSmart Coordinators have been successful in other communities.	Creston (CFR)	2 years	All homes in these WUI neighbourhoods have had at least one visit from a CFR member (with FireSmart information left at their door).	Town of Creston for personnel time. CRI FCFS for FireSmart materials.
7	High	Provide (through Creston's own FireSmart program) or promote (through RDCK's FireSmart program), free FireSmart Home Ignition Zone assessments.	FireSmart Home Ignition zone assessments introduce residents to FireSmart, its principles, fire and wildfire risks associated with their home and property, and how they can be mitigated. These assessments are primarily and education exercise, and can be funded completely through CRI FCFS.	Creston / RDCK	2 years	FireSmart Home Ignition Zone assessments are being completed within Creston.	CRI FCFS up to cost maximums.
8	Moderate	Increase public awareness of this Community Wildfire Resiliency Plan.	Increasing awareness of wildfire risk also increases community resiliency through household emergency planning, and support for FireSmart.	Creston (RDCK)	1 year from CWRP completion	Awareness by residents - consider a survey.	Staff time to update website, and media posts. Newspaper ads ~$300 each.
Visitors							
9	High	Purchase and install new Fire Danger Rating signs. Have them posted at major roads entering Creston and keep them updated (especially during fire season).	Creston Fire Rescue identified the current signs as outdated. These signs provide both visitors and residents a quick snapshot of the current local wildfire conditions as well as a reminder of being FireSmart.	Creston	5 years (signs installed)	Old Fire Danger Rating Signs have been replaced.	Sign cost ~$800 for purchase and installation per sign.

5.3 LEGISLATION, PLANNING AND DEVELOPMENT CONSIDERATIONS

Legislation and planning regulation are effective tools for proactively reducing wildfire risk, although they can be less effective in large, rural regional districts like RDCK than in dense municipalities due to difficulties in enforcement. However, private property FireSmart Home Ignition Zone and structure risk reduction is the most effective avenue towards homes and structures surviving a wildfire event. Two of the most powerful influences that legislation and planning can have on local wildfire risk is through wildfire hazard Development Permit Areas (DPAs) and open burning bylaws.

Section 2.2 provided a comprehensive look at local plans and bylaws that are currently in place and relevant to wildfire resilience in Creston. Creston has an established Wildfire DPA that includes all wanted FireSmart policies. However, as displayed on the OCP Schedule B Wildfire DPA Map, it applies to a very limited interface area on the northeast side of the municipality. This leaves the majority of Creston at risk to ignitions from ember showers, as described in the opening paragraphs of this FireSmart Principles section. Additionally, it is recommended that the OCP update policies relating to land use, specifically parks, recreation parks, open and green spaces, and the development of the natural environment to include FireSmart vegetation management policies as a means to proactively manage wildfire risk within the community.

Creston's bylaws pertaining to the fire department, powers granted to the Fire Chief to assess and manage risk on private property, and open burning on both public and private land are robust and no recommendations are proposed within this plan.

Part of development considerations is ensuring that all critical infrastructure (described in Section 3.3 and listed in Table 8) are constructed or brought up to a high FireSmart standard. Performing FireSmart Critical Infrastructure Assessments on those infrastructure that have not had one completed yet (in priority sequence) will detail which are most at risk to wildfire, and what mitigation activities should be performed to reduce those risks. Additionally, including a policy in the OCP stating that all municipal structures are built and landscaped to FireSmart standards would ensure these structures are wildfire resilient from the start as well as provide examples of FireSmart construction and landscaping to the public.

Recommended changes to planning and development in Creston are detailed in Table 19.

Table 19: Legislation, planning and development recommendation and action items

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
Legislation, Planning and Development - Section 5.3							
10	High	Enact a Wildfire Landscaping Bylaw to restrict flammable landscaping. Example: prohibit conifer vegetation in the Immediate Zone of a residence or structure (1.5 m) and prohibit the planting of new conifer vegetation in the Intermediate Zone (10 m). The bylaw should apply throughout Creston.	Cedar and juniper hedges and ornamentals are popular in Creston and have been planted around new builds. As new developments are built, Creston has a great opportunity to prevent flammable vegetation from being established.	Creston (Development Services)	Approved within 3 years.	All new development complies with the policy.	CRI FCFS: up to $10,700 with estimated incremental staff hours or contract cost
11	High	Consider amending Creston's Official Community Plan Wildfire Hazard DPA boundary to include all of Creston. At the very least, it should include all structures within two kilometres of the wildland-urban interface.	Existing development in Creston does not (generally) meet FireSmart principles are a much greater portion of the community is at risk from ember shower ignition than just the current area mapped (which largely reflects managing ignition from direct flame contact at the WUI boundary).	Creston (Development Services; CFR)	As soon as possible.	Expanded DPA boundary is developed.	CRI FCFS: up to $10,700 with estimated incremental staff hours or contract cost
12	High	Consider amending Creston's Official Community Plan Wildfire Hazard DPA exemption policies as *recommended:* 1.1.3 Replacement or repair of existing exterior cladding. *- To meet FireSmart policies, this should mandate the use of non-combustible materials.* 1.1.4 Replacement of existing doors, windows or building trim. *- To meet FireSmart policies, this should mandate the use of non-combustible materials and double-paned tempered glass.* 1.1.9 Restoration planting of vegetation, provided native non-invasive vegetation is used to enhance the natural environment or provide habitat. *- To meet FireSmart principles, this should mandate the use of native fire-resistant plant species.*	Roofing and siding materials are the top two FireSmart policies for risk reduction to structures and should not be exempt from renovations within the DPA area.	Creston (Development Services; CFR)	As soon as possible.	Exemption policies are updated.	CRI FCFS: up to $10,700 with estimated incremental staff hours or contract cost

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
13	High	Consider amending Creston's Official Community Plan Section 5 Land Use Policies (F. Recreational Parks and Open Spaces, 1 and 2), and Section 9 Future Harvests (Community Enhancement Projects, G) as recommended in Table 2.	To imbed FireSmart vegetation management into existing and proposed plans and policies to increase wildfire resilience in the community through planning and development in the future.	Creston (Development Services; CFR)	As soon as possible.	Updates made as recommended.	CRI FCFS: up to $10,700 with estimated incremental staff hours or contract cost
14	High	Meet with the RDCK and Yaqan Nukiy to develop a joint fire ban enforcement policy. The goal is to make local burning regulations or provincial fire bans enforceable by Creston Fire Rescue throughout its service area, which includes adjacent Yaqan Nukiy reservation land and RDCK communities.	Creston Fire Rescue needs the authority to enforce fire bans in its response area is it a) understands the current local fire threat, and b) knows its current response capabilities and if they are sufficient for the current or forecasted fire weather.	Creston, RDCK, Yaqan Nukiy	As soon as possible	Creston Fire Rescue has the authority to enforce fire bans throughout its service area.	Staff time: 40-80 hours
15	High	Conduct FireSmart Critical Infrastructure Assessments for public works and community/government buildings. Conduct FireSmart mitigation as soon as possible (vegetation management, material upgrades). Set a priority sequence for assessment based on wildfire response and post-wildfire recovery.	Protecting water systems, emergency shelters, and community infrastructure is critical to wildfire response and recovery.	Creston (Local FireSmart Representative, FireSmart Coordinator, and/or Consultant)	2 years (assessments completed)	Number of assessments completed and mitigation hours/investment.	CRI FCFS: up to $800 per assessment
16	High	Include a policy in Creston's OCP to 1) require all government-owned critical infrastructure to adhere to FireSmart principles, including the prohibition of cedar shakes; and 2) require all newly constructed critical infrastructure to be built and landscaped to FireSmart standards.	Using non-FireSmart construction materials sets a bad example to residents and can leave adjacent vegetation and/or residences exposed to a risk.	Creston (Consultant)	As soon as possible	Priority Creston critical infrastructure have had FireSmart updates completed.	CRI FCFS: up to $50,000 for mitigation per structure (publicly owned only)

5.4 INTERAGENCY COOPERATION

The goal of interagency cooperation is to approach wildfire resilience through a collaborative, multi-agency approach. This increases the ability of local governments to plan and respond to emergencies effectively. Cooperation and communication are especially critical for Creston as there are multiple jurisdictions side-by-side (Town of Creston, Yaqan Nukiy, RDCK Electoral Areas B and C) and multiple land managers currently operating (e.g., Creston Community Forest, Woodlot 1461). Landscape-level fire resilience cannot effectively be achieved without planning for resilience across jurisdictional boundaries. Engagement can be formal or informal and can take place through existing communication channels or stand-alone committees. Prior to the development of this CWRP, the Creston Valley FireSmart Resiliency Committee (CVFRC) was formed in May 2023, and includes membership from Town of Creston (via Creston Fire Rescue), Yaqan Nukiy, BCWS, and three local forest licensees (see Appendix D: Creston Valley FireSmart Resiliency Committee for further CVFRC information). CFR also participates in an annual Zone 4 Fire Chiefs meeting that includes BCWS representatives.

When planning and implementing forest harvesting and fuel management treatments in the community and in adjacent forest tenures, a high-level tracking and communication of fuel treatments needs to occur. It is imperative that all land managers know what adjacent or overlapping jurisdictions have identified as fuel breaks, so that time and money is not wasted reassessing or re-prescribing an area. As Creston's eWUI is limited in area, and the surrounding communities and wildland directly affect Creston's wildfire risk profile, the CVFRC should develop a process for spatially tracking and managing proposed and completed fuel management/fuel break units in the greater Creston area that all members can access. Although RESULTS[29] is a powerful spatial tool to keep track of forest activities on the Provincial land base, it does not include activities on municipal and First Nations land. A separate spatial layer should be maintained by Ministry of Forests (MOF) as a public service using inputs from municipalities, First Nations, and forest licensees. Changes to the MOF Wildfire Risk Reduction program (which manages wildland fuel treatments on the Provincial land base) in the coming years may solve some of these problems.

The Creston Community Forest and some woodlots have significant tenure within Creston's WUI. Forest activities can both increase and decrease wildfire risk in WUI areas and BCWS stated that Category 3 industry burning has led to fire starts and continues to be a concern every spring. Forest harvesting practices such as strategic cutblock placement, reducing post-harvest slash, providing loads of firewood to the public, and implementing fire management stocking standards as part of reforestation efforts can reduce wildfire behaviour for harvested areas within the WUI.

Mutual aid agreements exist between BCWS and Creston Fire Rescue. This is captured in the MEMORANDUM OF AGREEMENT for INTER-AGENCY OPERATIONAL PROCEDURES AND REIMBURSEMENT RATES between the Fire Chief's Association of BC and the BC Wildfire Service. Additionally, Creston has fire protection contracts with RDCK for the operation of fire service in West Creston, Arrow Creek,

[29] Government application that tracks silviculture information by managing the submission of openings, disturbances, silviculture activities and obligation declarations as required by the Forest and Range Practices Act.

Wynndel Lakeview, and Canyon Lister. At the time of this Plan's writing, a new fire protection contract is being considered with Yaqan Nukiy. CFR noted that mutual aid is rarely considered (due to lack of need) with other fire departments. BCWS will be called during a wildfire incident within Creston's fire protection area, but this only happens around one to two times a fire season. Overall, CFR stated that there is excellent communication and working relationships with other fire departments within their zone, and that training opportunities are shared and firefighters are sent out when available to participate.

Discussed in Section 3.3, transmission lines can provide excellent fuel breaks and access for first responders in the event of a wildfire – if the vegetation on them is regularly managed and kept in a low-hazard state. They can also be the source of fire ignitions - trees and other vegetation intruding into power lines can cause fires in multiple ways. Highways and rail lines can also provide excellent fuel breaks if the vegetation on them is regularly managed and kept in a low-hazard state. If not, they can act as wicks moving fire along them, or ignition sources for fires from burning cars, cigarette butts, sparks, etc. Additionally, highways are a main access/egress route during an emergency – these routes should be kept at as low risk of state as possible.

Table 20 details Interagency Cooperation recommendations for the Creston.

Table 20: Interagency cooperation recommendation and action items

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
Interagency Cooperation - Section 5.4							
17	High	Continue to engage with Yaqan Nukiy, BCWS, local forest tenure licensees (and include RDCK and MOF as needed) on FireSmart initiatives through the established Creston Valley FireSmart Resiliency Committee (CVFRC).	Even once-annual meetings are valuable and provide a platform for information sharing. All parties have indicated a willingness for collaboration, which will allow for greater management of wildfire risk both within and surrounding Creston's WUI.	Creston CVFRC	Ongoing	CVFRC FireSmart meeting takes place at least once annually.	At least 8 hours per meeting to prepare, participate and debrief. CRI FCFS up to $2,000 per meeting.
18	High	Work with CVFRC members and MOF to develop a fuel treatment/fuel break tracking system to spatially manage proposed and completed fuel management areas both within Creston's WUI and outside it at the regional level.	It is imperative that all land managers know what adjacent or overlapping jurisdictions have identified as fuel breaks, so that time and money is not wasted reassessing or re-prescribing an area.	Creston CVFRC, MOF, RDCK	As soon as possible	A regional GIS tracking system is established, or a provincial one is developed that CVFRC members can access.	Cost and time dependent upon level of effort required.
19	High	Continue maintaining mutual aid agreements and fire protection contracts with surrounding fire protection areas, as well as a response agreement with Yaqan Nukiy.	To allow for greater access to firefighting resources within the regional area, and to manage firefighting within Creston's WUI.	Creston (CFR) (Adjacent fire departments) (Yaqan Nukiy)	Ongoing	Contracts and agreements remain in place; new ones developed, as needed.	Staff time for planning and contract development.
20	High	Lobby forest land licensee/managers (e.g., Woodlots, Creston Community Forest) to be aware of where their tenure overlaps Creston's WUI and to develop and implement (or continue implementing) forest planning, harvesting, slash management, and reforestation plans that reduce wildfire behaviour in these areas.	Cutblock placement can break up the forest continuity across the landscape – with proper slash and reforestation management, they can remain as areas of low wildfire behaviour for many years. However, if not managed properly, they can increase wildfire behaviour.	Creston (MOF; Forest Licensees/ Managers)	Ongoing	Forest licensees/ managers are aware of their tenure overlaps with the WUI and are actively working towards forest management plans to reduce wildfire behaviour in those areas.	Creston staff time for discussions.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
21	High	Creston and RDCK should lobby and work with the electrical power providers in and influencing the community's WUI, MOTI for Provincial highways, and rail line owners/operators to regularly maintain their right-of-way's vegetation.	Transmission lines can provide excellent fuel breaks and access for first responders in the event of a wildfire – if the vegetation on them is regularly managed and kept in a low-hazard state. They can also be the source of fire ignitions - trees and other vegetation intruding into power lines can cause fires in multiple ways. Highways can also provide excellent fuel breaks if the vegetation on them is regularly managed and kept in a low-hazard state. If not, they can act as wicks moving fire along them, or ignition sources for fires from burning cars, cigarette butts, sparks, etc. Additionally, highways are a main access/egress route during an emergency – these routes should be kept at as low risk of state as possible.	Creston (MOTI; (Electrical providers; Rail line operators)	Yearly and ongoing	Right-of-way maintenance discussions are open and ongoing; right-of-ways are kept in low-risk states.	Creston staff time for discussions.

5.5 CROSS-TRAINING AND FIRE DEPARTMENT RESOURCES

All staff and agency partners who are expected to participate in the development and implementation of this plan, or participate in a wildfire response and recovery, should be appropriately trained. This includes municipal Emergency Management staff, other municipal staff that could play a role in an Emergency Operations Center (EOC), and Creston Fire Rescue (CFR) / FireSmart. Training opportunities include:

- Basic Wildland Fire Suppression and Safety
- Incident Command System
- FireSmart 101
- FireSmart Local FireSmart Representative (LFR)
- FireSmart Community Champion
- FireSmart Home Partners Wildfire Mitigation Specialist (WMS)
- Post-wildfire reclamation and recovery
- Post-wildfire structure damage assessment
- BC Structure Protection Program (WSPP-115)

Despite being a relatively small department, CFR has wildland fire training and experience, all housed in the newly constructed Creston Emergency Services Building. CFR has three paid staff and an additional 43 paid-on-call members. Despite this large number of paid-on-call members, the number responding to incidents was noted by CFR as being a deficiency. Another noted deficiency was the recruitment of new paid-on-call members. CFR does provide a work experience program, requiring a 12-month commitment, that includes participation in fire suppression, technical rescue, medical response, fire prevention, public education, company fire inspections, preplanning, and maintenance duties of equipment and the fire station, as well as community events. New hires are provided exterior firefighting training, with a full-service training program offered every two to three years.

Members from CFR have been deployed to local area wildfire incidents as mutual aid partners, and CFR participates in the annual Zone 4 Fire Chiefs meeting that includes BCWS representatives. Specific wildfire cross-training opportunities with BCWS are also sought out – such as in March 2021 when CFR provided water tender support and ground crews to a controlled burn. Regular in-person cross-training between agencies is imperative for familiarization with each other's equipment and to address any incompatibilities. The following list highlights wildland-specific training levels in CFR:

- WSPP-115: all persons
- SPP-WFF1: 1 person
- Engine Boss (S-230): 8 persons
- Structural Protection Systems: 3 persons

CFR is fully equipped to handle local structural fire response and has ample wildland capable equipment (one Rescue truck with CFAS, two Command vehicles, hand tools, hose lays, pumps, one Type 2 and one Type 3 Structural Protection Units, and more). In addition, Creston has at its availability additional structural and wildland equipment from adjacent communities that it is contracted to provide fire services for through those communities' fire halls (West Creston, Wynndel Lakeview, and Canyon Lister). CFR's

wildland firefighting equipment is surveyed by BCWS annually, and all other equipment is checked prior to fire season.

Water is the most important resource for fighting wildland and structure fires. Creston's water supply and fire hydrant system (both discussed in Section 3.3.2) were noted as being sufficient, but the hydrants on Scott Street lack water pressure. Water availability in Creston during the fire season can become strained by drought conditions in the Arrow Creek watershed – water restrictions are put in place at the start of almost every summer for mitigation. However, there is a secondary well water source that can supplement Creston's water supply, as needed. Natural water sources are another valuable source of water that can be used for wildfire fighting. The Kootenay River has water available year-round, and other local sources (ponds, lakes, etc.) are known of, but not mapped.

Table 21 lists recommendations for the Creston related to cross-training and fire department resources.

Table 21: Cross-training recommendation and action items

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
Cross Training & Fire Department Resources - Section 5.5							
Training							
22	High	Continue to provide SPP-WFF1 training in-house to CFR members and consider having some members take 'train-the-trainer' courses so that more courses (e.g., S-231, WSPP-115) can be delivered in-house to members.	This would provide an opportunity to expand in-house wildland specific training, and potentially train adjacent fire departments.	CFR	3 years	Number of CFR members with wildland training beyond SPP-WFF1 increases.	Staff time; CRI FCFS Training.
23	High	Consider providing FireSmart specific training to CFR members: FireSmart 101, Local FireSmart Representative (LFR), and FireSmart Home Partners Mitigation Specialists.	To build understanding and knowledge of FireSmart principles within CFR. To certify CFR members so they can implement various FireSmart assessments within the community.	CFR	3 years	Number of CFR members with FireSmart training increases.	Staff time; CRI FCFS Training.
24	High	CFR should continue seeking out opportunities to perform wildfire response and structure protection drills - using hydrants and/or natural water sources, *with* BCWS.	Fast and effective deployment of the CFRs Structure Protection Units and any additional equipment operated by the BCWS will be crucial in any interface fire scenario. Equipment compatibilities and/or differences between CFR & BCWS should be identified and addressed ahead of time.	CFR (BCWS)	Annually	Drills performed at least once annually in different neighbourhoods (prioritizing WUI interface neighbourhoods in the northeast and east of Town), with different water sources.	Staff time as required.
25	High	CFR should seek opportunities to assist Yaqan Nukiy (and potentially BCWS) with prescribed/cultural burning projects.	Cultural burning has played a role in both fire and ecosystem management for Yaqan Nukiy. Exposing CFR members to live-fire scenarios in different fuel types under controlled conditions will increase its capacity and ability to lead and/or assist in wildfire scenarios. Doing so with Yaqan Nukiy will build upon their already existing relationship, and further cultural awareness.	CFR (BCWS; Yaqan Nukiy)	Annually	CFR is involved in local cultural and ecosystem restoration burning implementation.	Staff time as required.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
26	Moderate	Consider training Creston Emergency Management staff/Emergency Operations Centre (EOC) members in Incident Command System courses (ICS).	ICS-100 is an online course that introduces effective control of an emergency site; other levels of ICS provide more detailed training. BCWS uses the ICS system.	Creston (CFR)	3 years	Number of Creston Emergency Management staff that receive some level of ICS training.	CRI FCFS: staff time and course cost (ICS-100 $25 online).
Water							
27	High	CFR should continue to identify natural and artificial water sources useable for fire suppression but should develop a map (or better - digital map that can be uploaded into response vehicles' CAD systems) of their location and important details (est. water volume; access point notes; etc.) Share this information and update over time. This can double as a pre-plan of emergency community water delivery systems to connect major natural water sources with interface neighbourhoods, to facilitate deployment of a structural protection system.	Outside of Creston municipal boundaries, but within the CFR response area, there are no hydrants – water shuttling is required. Response to these areas impacts CFR's wildfire resilience. Shuttling or pumping water from lakes and rivers to fill bladders can be pre-planned, including tender access points, traffic control, permanent large-volume pumps, and piping.	CFR (Creston or RDCK GIS department; BCWS)	5 years and ongoing	A fire suppression water source plan and map are produced and shared.	CRI FCFS Community Water Delivery Assessment – Up to $10,700 for incremental staff hours or contract cost.
28	Low	CFR should seek Superior Tanker Shuttle Service accreditation from Fire Underwriters Survey.	This accreditation certifies that the CFR can supply enough water to have some areas without fire hydrants within a certain distance of their structures qualify as having a fire hydrant within 300m of it (this can also potentially lower insurance rates for property owners within the CFR's fire response area).	CFR (Creston)	5 years	Superior Tanker Shuttle Service accreditation achieved by CFR.	CFR staff time as required (and Creston budget for equipment upgrades and purchases, if needed).
Equipment and Staff							
29	High	CFR should continue annual inspections by BCWS of its wildland firefighting equipment. Any gaps should be addressed, as required.	To ensure CFR is appropriately equipped to respond to interface wildfire events, and that their equipment is compatible with that of BCWS. CRI FCFS funding is available for incremental equipment purchases.	CFR (BCWS)	Annually	Annual inspection of wildland firefighting equipment from BCWS; gaps filled as practicable.	CFR staff time; CRI FCFS equipment funding up to cost maximums.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
30	Moderate	Continue to develop and implement plans to replace CFR apparatus as it ages out.	Suitable apparatus is critical for response to interface wildfires.	CFR (Creston)	Ongoing as required	CFR's fleet is adequate to meet demands.	Staff time and Creston budget requirements.

5.6 EMERGENCY PLANNING

Local government and community preparations for a wildfire emergency are very important. Plans, mutual aid agreements, resources, training, and emergency communications systems make for effective wildfire response. Up until 2023, emergency planning for Creston has been managed by RDCK. Now emergency planning is managed by the municipality under a newly completed Emergency Management Plan.

Clear, consistent, concise, and quick communication during an emergency event and evacuation are integral to the prevention of loss of life. The RDCK has upgraded to a new notification system for emergency alerts and water advisories powered by “Voyent Alert!”. Downloadable as an app to a smart phone, the user can receive a detailed map of the affected area. The system also supports text messaging, emails, or landline calls. Creston should promote this notification to residents as much as possible.

Portions of Creston’s northeast forested slopes within its WUI are only accessible by roads through private property. This is a significant constraint to wildfire first responders as those road conditions are largely unknown. Consider updating Creston’s OCP mandating (with embedded enforcement mechanisms) that private roads that access forest lands should be of adequate design to allow for the safe movement of logging and fire-fighting equipment. Access by emergency responders to the WUI is paramount towards both defending communities from WUI fire events, but also for aiding in fuel treatment practicability.

A pre-incident plan is a compilation of essential fire management information needed to save valuable time during fire suppression operations. During a busy wildfire season, Provincial resources are often stretched thin, and any information that local governments can provide to BCWS crews is helpful. A pre-incident plan should be developed and tested using tabletop simulations, and if necessary, revised prior to every fire season. BCWS should be involved in this process to ensure that any mapping done as part of the pre-incident plan or Fire Management Planning process is not unnecessarily duplicated.

Figure 5 contains a checklist of discussion points and considerations during pre-incident plan development.

Figure 5. A pre-incident planning checklist that can be used to help develop a pre-incident wildfire suppression plan and associated maps.

Creston could also consider developing local daily action guidelines based on expected wildfire conditions. Table 22 below provides a template that can be tailored specifically to Creston, outlining actions staff can take as fire danger levels change throughout the fire season.

Table 22: Example of a Wildfire Response Preparedness Condition Guide[30]

FIRE DANGER LEVEL	ACTION GUIDELINES
LOW	• All Community staff on normal shifts.
MODERATE	• All Community staff on normal shifts. • Information gathering and dissemination through the CVFRC.
HIGH	• All Community staff on normal shifts. • Regional fire situation evaluated. • Daily fire behavior advisory issued. • Wildland fire-trained Municipal staff and EOC staff notified of Fire Danger Level. • Establish weekly communications with the CVFRC.
EXTREME	• 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 / Municipal staff on fire situation. • Update public websites and Creston social media as new information changes.
FIRE(S) ONGOING	• All conditions apply as for 'Extreme' (regardless of actual fire danger rating). • 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.

Emergency planning also includes the recovery from an emergency. As discussed in Section 3.3.1, having secondary power sources for critical infrastructure is important to reduce community vulnerability in the event of an emergency that cuts power for days, or even weeks.

Recommendations and action items that Creston can implement to continue productive and effective emergency planning are detailed below in Table 23.

[30] From FireSmart Community Funding and Supports 2022 CWRP Supplemental Instruction Guide

Table 23: Emergency preparedness recommendation and action items

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
Emergency Planning - Section 5.6							
31	High	Conduct tabletop wildfire scenario tabletop exercises with emergency management and CVFRC partners. Yearly, pre-fire season is best. Move the "WUI fire" to a different area of Creston's WUI each time.	Tabletop exercises provide an opportunity to identify weak spots in a plan and collaborate.	Creston (CVFRC; RDCK; RCMP; BCWS; Yaqan Nukiy)	1 year and ongoing	Knowledge of 'pinch points' in an evacuation scenario and understanding of roles and responsibilities.	CRI FCFS Emergency Planning: up to $2,000 per meeting. Possibly CRI / CEPF / Columbia Basin Trust
32	High	Consider updating Creston's OCP mandating (with embedded enforcement mechanisms) that private roads that access forest lands should be of adequate design to allow for the safe movement of logging and fire-fighting equipment.	Access by emergency responders to the WUI is paramount towards both defending communities from WUI fire events, but also for aiding in fuel treatment practicability. This constraint is recognized in RDCK Electoral Area F's Rural Community Official Plan in section 18.3.8 which, "Encourages that private roads that access forest lands should be of adequate design to allow for the safe movement of logging and fire-fighting equipment."	Creston (MOF; BCWS; CFR)	5 years	Access roads through private land to the interface forest are maintained.	Creston time for planning and discussions. CRI FCFS: up to $10,700 with estimated incremental staff hours or contract cost.
33	High	RDCK and Creston should continue to promote the Voyent Alert! System to residents and visitors.	Clear, consistent, concise, and quick communication during an emergency event and evacuation are integral to the prevention of loss of life. A lack of this was identified as an issue during recent WUI fire disasters, such as that in Lahaina, Maui, USA and Fort McMurray, Alberta.	Creston/RDCK (FireSmart Coordinator)	Ongoing	Continued update of the Voyent Alert! System (can track downloads from app providers).	Creston/RDCK time for promotion.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
34	High	Invest in back-up generators for any critical infrastructure that does not have one. Encourage private businesses that provide critical services, like gas stations and grocery stores, to follow suit.	Back-up generators for pumphouses, treatment plants, and community buildings would facilitate both emergency response (water supply for suppression) and rapid community return and recovery following a fire.	Creston	ASAP	A budget and purchase plan for back-up generators is implemented, starting with the most critical infrastructure.	Cost varies - ~$10,000
35	High	Initiate a roof-top sprinkler program for residential properties. Investigate bulk orders from wildfire protection or irrigation companies or commercial gutter-mount kits. Consider sprinkler kits as an incentive to communities/neighbourhoods for FireSmart participation.	Pre-installed rooftop sprinklers reduce the time and resources needed to set up a structural protection system in a community threatened by wildfire. Sprinkler installation could be paired with a free FireSmart Assessment.	Creston	3 years and ongoing	Establish an efficient and effective system. Track the number and location of sprinklers purchased and installed annually.	Bulk sprinklers $40 - $100 each; gutter mount kits ~$100-200 for one home
36	High	Update Creston's specific Hazard, Risk, and Vulnerability Assessment (HRVA) with relevant information from this, and subsequent updated, CWRPs.	To incorporate the most up to date wildfire risk analysis and information into the assessment.	Creston (Consultant)	Upon each HRVA update	HRVA is updated with the most recent information from Creston's CWRP.	Consultant costs.
37	High	Schedule regular updates of this Community Wildfire Resiliency Plan: target every 5 years.	A current and acceptable CWRP is required for funding under the CRI FCFS program. Update the wildfire threat for areas with completed fuel treatments and identify additional areas for treatment.	Creston	5 years – 2028 update	Creston always has a current and acceptable CWRP.	~$30,000; CRI FCFS funding

5.7 VEGETATION MANAGEMENT AND OTHER FIRESMART ACTIVITIES

As discussed in Section 4.1, fuel is the only aspect of the fire behavior triangle that can be realistically modified to reduce wildfire threat. Fuel or vegetation management reduces potential wildfire intensity and ember, flame, and radiant heat 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 first responder safety, fire suppression effectiveness, and reduce damage to property and to values.

Vegetation management can largely be accomplished through two different activities:

1. **Residential-scale FireSmart landscaping**: The removal, reduction, or conversion of flammable [landscaping] plants to create more fire-resistant areas in the FireSmart Immediate, Intermediate, and Extended Zones (i.e., the area within 30m from a structure).

Figure 6: FireSmart Home Ignition Zone

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.

Fuel Management Units

Fuel management treatments may function as fuel breaks (linear features, at least 1 km in length) or polygon treatments for discrete areas. The intent of establishing fuel treatments is to modify fire behaviour and should be designed to keep surface fires on the ground to avoid the establishment of more

dangerous and uncontrollable crown fires. Fuel treatments can also provide anchor points to fire-fighting crews for suppression activities,[31] yet the application of appropriate suppression tactics in a timely manner with sufficient resources is essential for fuel treatments to be effective – fuel treatments adjacent to a home or property should not be considered a "fire break". Thus, to increase the efficacy of fuel treatments, FireSmart standards should be applied on nearby private properties to structures and vegetation to reduce the risk of structure ignition. Fuel treatment units will also require periodic maintenance (e.g., brushing, prescribed burning, surface fuel cleanup) to retain their effectiveness.

Implementing fuel management treatments often requires the successful collaboration of various land managers, as these treatment areas can span across multiple types of land ownership. Often, this is required for the fuel treatment to effectively connect areas of low hazard, or to be a cohesively effective area. A significant amount of public land within Creston's WUI is under the ownership of Creston or is Crown Provincial land managed by the Creston Community Forest. Fuel management projects in community forests are currently funded and administered through the Forest Enhancement Society of BC (FESBC), while those on municipal land are funded and administered through the CRI FCFS program.

Priority level for prescription and treatment (High, Moderate, Low) of proposed PTUs is given to each and is based upon a combination of site-level risks that include, wildfire behaviour threat, strategic location, proximity to structures and critical infrastructure, location relative to dominant fire-season wind directions, and overall practicability of treatment implementation. Importantly, increasing the wildfire resilience of Creston can only be efficiently achieved by performing residential-scale FireSmart activities on private land.

Newly identified (proposed) Fuel Treatment Units and Fuel Treatment Areas within Creston's WUI are described and discussed in Table 25 and are shown on Map 9 (overview), and Map 10 - Map 12 (individually).

Residential-scale FireSmart Landscaping

A major barrier to implementing FireSmart vegetation management on private property is if there is no easy disposal process for the created vegetative debris. This can be further exacerbated when the demographics of the community are older (such as with Creston – 40% of residents are over the age of 65). Creston provides municipal yard waste pick-up three times a year (one in the Spring and twice in the Fall).[32] Additionally, the Creston Landfill accepts yard and garden waste for payment – however, there is no charge during the months of May and October.[33]

Other Residential-scale FireSmart Activities that Creston should apply through CRI FCFS and implement include:

[31] BC Wildfire Service. (2022). 2022 Fuel Management Prescription Guidance.
[32] https://letstalk.creston.ca/curbside-organic-waste-collection
[33] https://www.rdck.ca/EN/main/services/waste-recycling/household-hazardous-waste-round-up/yard-garden-waste-free-tipping.html

- ***FireSmart Rebate Program***

  To aid in residential-scale vegetation management and structure improvements, this program allows for residents that have had a completed FireSmart assessment (Home Ignition Zone or Home Partners Program) receive a rebate (using recorded expenses) for work completed to lower risk identified in their assessment. Starting in the 2024 CRI FCFS program, the eligible amount of rebate per property is now $5,000. RDCK has implemented the rebate program in previous years – Creston should continue to do so.

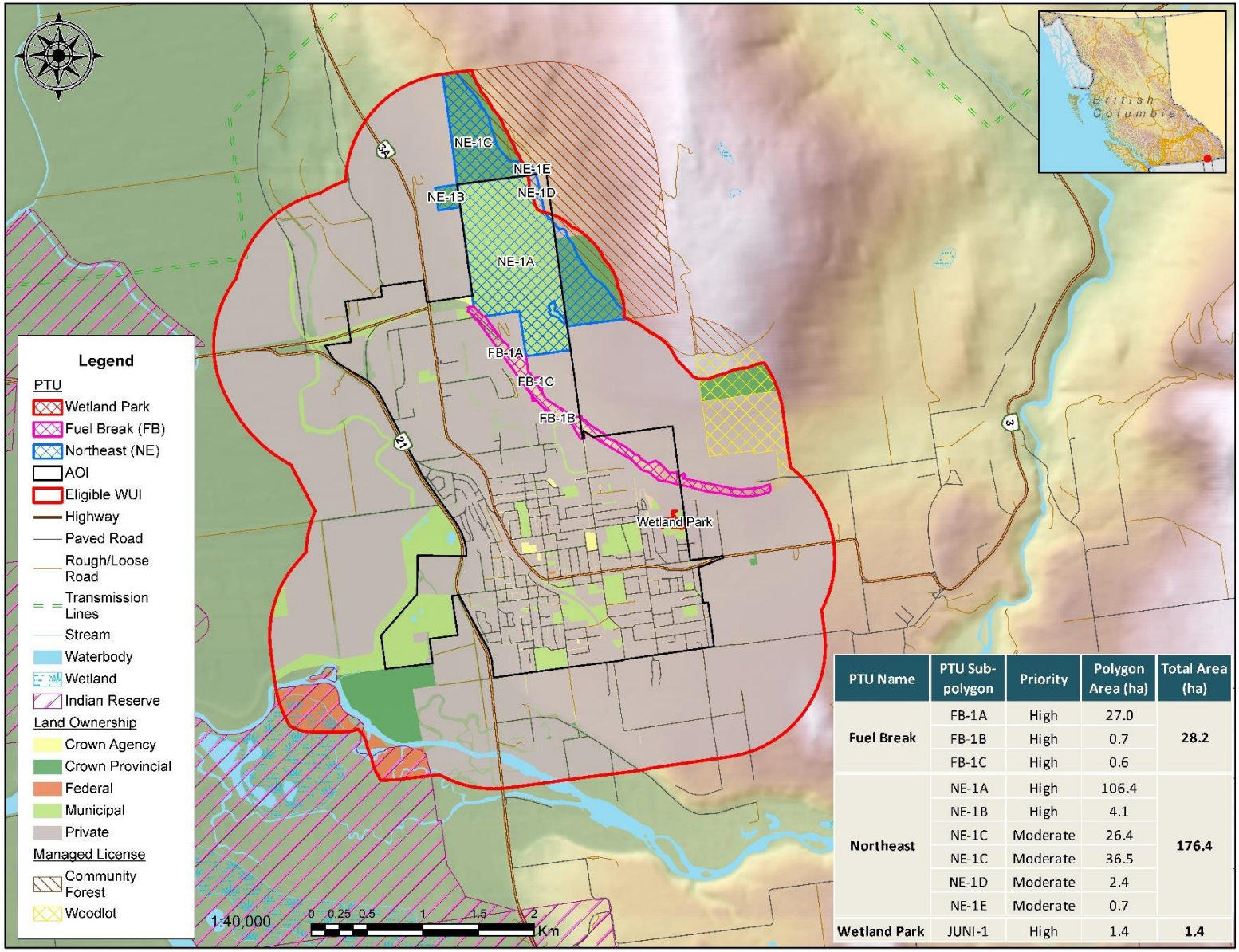
Associated vegetation management recommendations and action items are listed in Table 24.

Table 24: Vegetation management action items

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
Vegetation Management - Section 5.7							
Fuel Management Treatments							
38	High	Develop fuel management prescriptions for the identified Fuel Treatment Unit and Fuel Treatment Areas. Prioritize in the following order: 1) Fuel Break 2) Northeast 3) Wetlands	*See "Rationale" column in Table 25 for more detailed treatment rationales. 1) Fuel Break – to develop a cohesive cross-WUI fuel break in a direct interface area that would provide safe access for fire fighters and firefighting opportunities. 2) Northeast – to address High and Extreme fire behaviour threat areas in the WUI that are directly interface to structures and properties. 3) Wetlands – to address High and Moderate fire behaviour threat in a forested stand within the community adjacent to water infrastructure. Also a great FireSmart public demonstration project.	Creston Creston Community Forest MOF BCWS	5 years	Approved FMP(s) for identified High priority areas.	~$425/hectare for a ~20 ha prescription
39	Moderate	Work with the Creston Community Forest and neighbouring jurisdictions (RDCK, Yaqan Nukiy) to explore alternative disposal methods for debris from fuel treatments or other forest harvesting activities (e.g., combined heat and power, biochar, secondary forest products, etc.).	Policies on slash burning are expected to become more restrictive in recent years, and pile burning can also prove to be logistically difficult and often be viewed negatively from the community. Strategies to reduce industrial wood waste may soon be required, and they will also fit into climate action plans and economic development strategies.	Creston / Forest Licensees / RDCK / Yaqan Nukiy	3 years (discussion underway)	Alternatives considered and documented	Staff time
Residential FireSmart							
40	High	In conjunction with provided home FireSmart Assessments (see Recommendation #7), offer a local rebate program to property owners that have completed a FireSmart home assessment (Home Ignition Zone assessment or Home Partners Program Mitigation assessment. RDCK, Creston, and the FireSmart coordinator should advertise that the amount eligible for rebate has increased to $5000 for the CRI FCFS 2024 application program.	FireSmart home assessments encourage action in the FireSmart Home Ignition Zone of a community. Offer a rebate program (funded through CRI FCFS) to residents who have a pre- and post-work FireSmart assessment conducted. Focus on removal of conifer hedges and upgrading exterior structure materials.	RDCK / Creston (FireSmart Coordinator)	Annually	Number of properties participating annually.	50% of costs per property up to $5,000, plus 2 hours administration time per property (CRI FCFS).

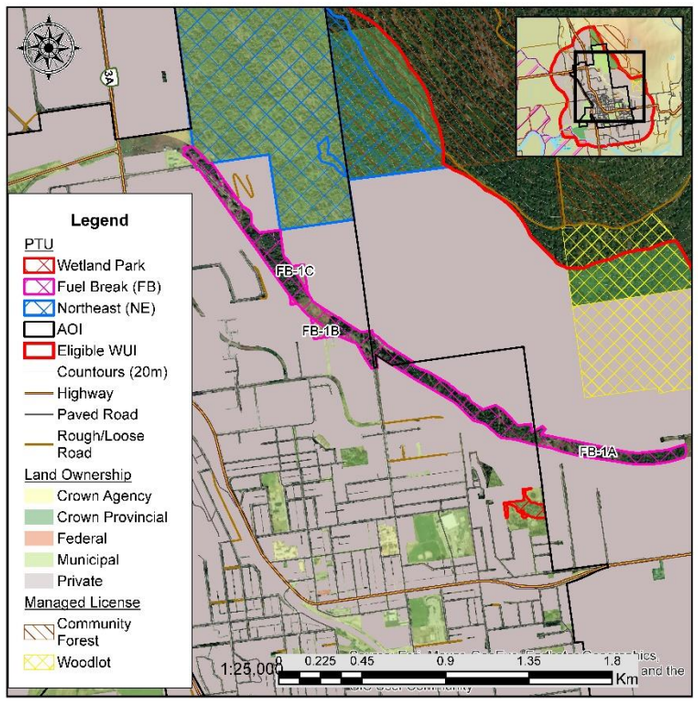
Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
41	High	Continue providing municipally-led options for the disposal of yard waste. Currently, these include having tipping fees waived (May and October) for yard waste at the Creston Landfill and having curb-side yard waste pick-up three times a year	Yard waste burning restrictions limit options for debris disposal. Free debris disposal may be used as an incentive to participate in other FireSmart activities, like assessments or workshops.	Creston	Annual	Municipally funded yard waste disposal continues.	CRI FCFS funding is available for tipping fee coverage.
42	High	Consider implementing a community chipper program. Education of FireSmart yard and landscaping principles, including chipping specifications, should be incorporated into the program.	To reduce fire and wildfire hazards on private property within the WUI and promote FireSmart vegetation management knowledge and education. The intent is for landscaping/yard vegetation to be included, not farm or agriculture vegetation. This could assist with more uptake of residential FireSmart landscaping principles as the disposal method is brought to the resident, especially for those older and less mobile.	Creston	Annual (pre-fire season is best)	Number of properties who elect to have debris disposed.	CRI FCFS funding; ~$100-150 per chipper crew hour.
43	Moderate	Consider releasing an annual Creston FireSmart report to the public that tracks community-specific uptake in various FireSmart initiatives, as well as tracks fuel management at all scales.	As the program grows, reporting allows the Creston FireSmart program to track challenges and successes, further promote the program, and tailor outreach methods to achieve the most uptake.	Creston	Annual	An annual report is published.	Eligible for CRI funding – FireSmart staff time. Estimate 40-80 hours.
44	Moderate	Engage with local garden centers to implement the FireSmart BC Plant [Tagging] Program.	FireSmart BC introduced a plant tagging program in 2021 that has been implemented with great success by over 34 nurseries and garden centres to date. The Plant Program is an easy way to provide information at the point of purchase for homeowners and landscapers. See: https://firesmartbc.ca/landscaping-hub/plant-program/	Local Garden Centres (Creston)	3 years	Local garden centres have been notified of the program.	Staff time for engagement (2-4 hours per garden centre).
Community and Critical Infrastructure FireSmart							
45	High	Implement recommended vegetation management recommendations from FireSmart Critical Infrastructure Ignition Zone Assessments (see Recommendation #15), when completed, on a priority basis.	To reduce fire behavior and risks to critical infrastructure most important to fire and wildfire fighting and post-wildfire recovery.	Creston	5 years	High priority critical infrastructure has had FireSmart vegetation management completed.	CRI FCFS funding up to $53,500 per municipal infrastructure (vegetation management included).

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
46	High	As part of fuel treatment implementation, Creston should develop interpretive signage to demonstrate pre- and post-fuel treatment forest stands conditions.	Interpretive signage could include text explaining the purpose of the fuel management treatment, connection to the CWRP, and FireSmart practices residents nearby can take to reduce wildfire hazards around their yards and homes.	Creston	5 years	Signage installed during implementation phases.	Eligible for UBCM CRI funding.

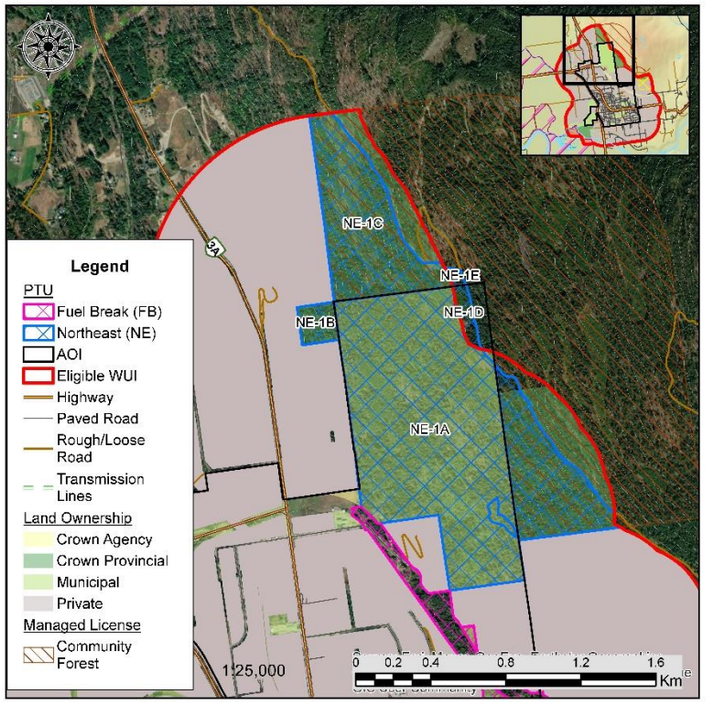


PTU Name	PTU Sub-polygon	Priority	Polygon Area (ha)	Total Area (ha)
Fuel Break	FB-1A	High	27.0	28.2
	FB-1B	High	0.7	
	FB-1C	High	0.6	
Northeast	NE-1A	High	106.4	176.4
	NE-1B	High	4.1	
	NE-1C	Moderate	26.4	
	NE-1C	Moderate	36.5	
	NE-1D	Moderate	2.4	
	NE-1E	Moderate	0.7	
Wetland Park	JUNI-1	High	1.4	1.4

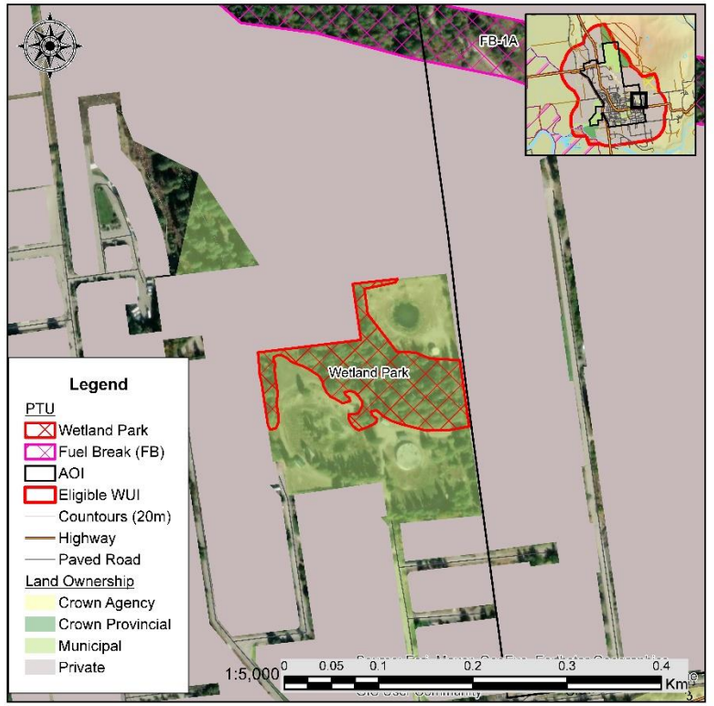
Map 9: Overview map of Proposed Treatment Units and Areas within Creston's WUI.



Map 10: Closer view of the Fuel Break (FB) Proposed Treatment Area.



Map 11: Closer view of the Northeast (NE) Proposed Treatment Area.



Map 12: Closer view of the Wetland Park Proposed Treatment Unit.

Table 25: Summary of Proposed Fuel Treatment Units and Proposed Treatment Areas for the Town of Creston's CWRP.

PTU/PTA Name	PTU Sub-polygon	Priority	Polygon Area (ha)	Total Area (ha)	Overlapping Values / Treatment Constraints	Wildfire Behaviour Threat			Treatment Rationale
						Extreme & High	Mod	No Data[34]	
Fuel Break *(Proposed Treatment Area)*	FB-1A	High	27.0	**28.2**	Crown Provincial land portion; both within and outside Creston municipal boundary. Adjacent to private property. Limited road access through area.	13.8	14.2	0.0	Creston has a unique opportunity with this corridor of Crown Provincial land that bisects the northeast part of its WUI as it is almost directly in the Town's interface. Originally planned as a highway bypass, converting it into a linear fuel break feature would create an interface-wide zone of low wildfire behaviour that would provide safe access points by firefighters to Creston's forested northeast WUI. All manner of wildland firefighting tactics could be implemented, if needed, to fight a fire moving down or across-slope into the community. Alternatively, this would also provide a fuel break limiting the opportunity of a fire that starts in the community from moving northwest, with prevailing fire season winds, uphill into a slope of High and Extreme wildfire behaviour threat. Given its location within the municipality, the Fuel Break will also provide an important public FireSmart vegetation management education opportunity. To achieve the intent of a landscape-level fuel break, almost all areas of the Fuel Break area will likely have some form of fuel management risk reduction completed in them – the type and amount will vary throughout the Treatment Area due to the differing fuel types present within it (predominantly C-7). The finer-scale process of prescription development field work will identify Treatment Units and should then prioritize them for implementation by assessed risk and strategic importance. Overall, the fuel management treatments anticipated will include the reduction of ladder fuels through thinning understory conifers, crown separation of overstory conifers through spacing,
	FB-1B	High	0.7		Municipal land portion. Adjacent to private property.				
	FB-1C	High	0.6		Crown Agency land portion; within Creston municipal				

[34] Two portions of the Northeast PTU area (sub-polygons NE-1D and NE-1E) are outside the eWUI. However, they are identified as part of the larger treatment unit as including them would make a practicable area bound by an access road across the entire top edge of the unit.

					boundary. Adjacent to private property.				raising of the effective crown base heights of retained overstory conifers through pruning, and the reduction of surface fuels through pile and burning (prescribed burning may be difficult due to the narrow confines of the Treatment Area, but should be considered if and where practicable).
Northeast *(Proposed Treatment Area)*	NE-1A	High	106.4	**176.4**	Municipal land portion and entirely within Creston's eWUI. Adjacent to private property on its south and west edges. Limited road access. Steep slopes.	166.5	6.8	3.1	The Northeast treatment area encompasses the forested northeast of Creston's WUI. This area is dominated by C-7 fuel types with some M-1/2 in the lower slope (likely moisture receiving sites). The entire northeast WUI area is almost all High and Extreme wildfire behaviour threat due to the presence of conifer-dominated fuel types on steep, south and southwest facing slopes. Although all structure values are at the bottom of the slope and prevailing fire season winds are from the southwest (moving a fire uphill away from the community), the potential wildfire behaviour if a fire is in this slope should not be ignored. At the edge of the WUI, the Creston Community Forest has completed recent harvesting – this breaks up the continuity of the fuel environment, but reduced slash management should be considered. With the harvesting, a forest road conveniently runs practically across the entire northeast edge of the WUI. This road can be used as a backstop for possible prescribed/cultural burning, if assessed as practicable (hence the inclusion of a small area outside of the WUI). The identified sub-polygons are to describe differing land ownership/land managers within this treatment area, which may equate to differing funding sources for prescription development and treatment implementation. High priority was given to those land ownership areas that directly interface with properties and structures. This area is identified as a Proposed Treatment Area. To achieve the intent of a landscape-level area of reduced wildfire behaviour threat, many areas of the Northeast Treatment Area will likely have some form of fuel management risk reduction completed in
	NE-1B	High	4.1		Crown Provincial land portion, within the eWUI but outside of Creston's municipal boundary. Private property on its north, south, and west sides.				
	NE-1C	Moderate	62.9		[two polygons] Crown Provincial land portions, within Creston's eWUI but outside the municipal boundary. Within the Creston Community Forest.				

	NE-1D	Moderate	2.4		Municipal land portion but outside Creston's eWUI.				them – the type and amount will vary throughout the Treatment Area due to the differing fuel types present and treatment constraints within it. The finer-scale process of prescription development field work will identify Treatment Units and should then prioritize them for implementation by assessed risk and strategic importance. As mentioned previously, the road across the top of the entire Treatment Area makes it possible to support prescribed/cultural burning. Overall, the fuel management treatments anticipated will include the reduction of ladder fuels through thinning understory conifers, crown separation of overstory conifers through spacing, raising of the effective crown base heights of retained overstory conifers through pruning, and the reduction of surface fuels (can be through both/either pile and burning and prescribed/cultural burning).
	NE-1E	Moderate	0.7		Crown Provincial land portion but outside of Creston's eWUI. Within the Creston Community Forest.				
Wetland Park *(Proposed Treatment Unit)*	JUNI-1	High	1.4	**1.4**	Entirely on municipal land with water infrastructure. Bounded by private property	1.1	0.3	0.0	Wildfire behaviour threat almost all High. Interface to private property with structures as well as municipal water infrastructure. Identified ignition risk area from overnight homeless campers as well as public trails. This PTU provides an excellent opportunity for a FireSmart demonstration project to the community. Treatment will likely focus on a combination of understory conifer removal, retained conifer pruning, and surface fuel reduction where needed. Posting signs after the treatment is completed displaying before/after pictures and FireSmart information is recommended.

SECTION 6: APPENDICES

6.1 APPENDIX A: LOCAL WILDFIRE RISK PROCESS

Wildfire Risk Assessment plot worksheets are provided in Appendix B: Wildfire Risk Assessment – Worksheets and Photos, plot locations are summarized in Appendix A-2: , and the field data collection and spatial analysis methodology is detailed in Appendix B-2 and B-3.

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.[35] Fuel typing is recognized as a blend of art and science. Although a subjective process, the most appropriate fuel type was assigned based on research, experience, and practical knowledge; this system has been used within BC, with continual improvement and refinement, for 20 years.[36] It should be noted that there are significant limitations with the fuel typing system which should be recognized. Major limitations include: a fuel typing system designed to describe fuels which sometimes do not occur within the WUI, fuel types which cannot accurately capture the natural variability within a polygon, and limitations in the data used to create initial fuel types.[36] There are several implications of these limitations, which include: fuel typing further from the developed areas of the study has a lower confidence, generally; and, fuel typing should be used as a starting point for more detailed assessments and as an indicator of overall wildfire risk, not as an operational, or site-level, assessment. Forested ecosystems are dynamic and change over time: fuels accumulate, stands fill in with regeneration, and forest health outbreaks occur. Regular monitoring of fuel types and wildfire risk assessment should occur every 5 – 10 years to determine the need for threat assessment updates and the timing for their implementation.

Table 26 summarizes the fuel types observed in Creston's WUI by general fire behaviour (crown fire and spotting potential). These fuel types were used to guide the threat assessment.

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

[36] 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.

Table 26. Fuel Type Categories and Crown Fire Spot Potential encountered within the WUI.

Fuel Type	FBP / CFDDRS Description	*WUI Description*	Wildfire Behaviour Under High Wildfire Danger Level	Fuel Type – Crown Fire / Spotting Potential
C-7	Ponderosa pine and Douglas-fir	*Low-density, uneven-aged conifer-dominated forest, crowns separated from the ground, understory of discontinuous grasses and shrubs. Exposed bed rock and low surface fuel loading.*	Surface fire spread, torching of individual trees, rarely crowning (usually limited to slopes > 30%), moderate to high intensity and rate of spread.	Moderate
O-1a/b	Grass	*Matted and standing grass that can cure; sparse or scattered shrubs, trees, and down woody debris. Cutblocks >2 seasons old that do not meet S-type descriptions, as well as young regenerating cutblocks that have not reached any horizontal continuity.*	Rapidly spreading, high-intensity surface fire when cured.	Low
M-1/2	Boreal mixedwood (leafless and green)	*Moderately well-stocked mixed stands of conifers and deciduous species, low to moderate dead, down woody fuels.*	Surface fire spread, torching of individual trees and intermittent crowning, (depending on slope and percent conifer).	<26% conifer (Very Low); 26-49% Conifer (Low); >50% Conifer (Moderate)
D-1/2	Aspen or birch (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 as the result of harvesting practices.*	Moderate to high rate of spread and high to very high intensity surface fire.	Low
N	N/A	*Non-fuel: irrigated/mowed agricultural fields, urban or developed areas void or nearly void of vegetation and forests.*	N/A	N/A
W	N/A	*Water*	N/A	N/A

6.1.2 APPENDIX A-2: WILDFIRE THREAT ASSESSMENT PLOTS

Table 27 displays a summary of all Wildfire Threat Assessment (WTA) plots completed during CWRP field work. The most recent 2020 WTA threat plot worksheets and methodology were used.[37] The plot forms and photos will be submitted as a separate document. The following ratings are applied to applicable point ranges:

- Wildfire Behaviour Threat Score (Southern Interior Mountains)
  - 0 – 47 Low
  - 48 – 65 Moderate
  - 66 – 79 High
  - 80 + Extreme

Table 27. Summary of WUI Threat Assessment Worksheets (2020).

WTA Plot	Geographic Location	Wildfire Threat Rating
CF-1	East of Helen St. near Billy Goat Bluff Trail	33 (Low)
JUNI-2	West of 26th Ave. in Creston Wetland Park	46 (Low)
SIXTEENTH-1	East of 16th Ave. N	48 (Moderate)
TWELVTH-1	Between 16th Ave. N and 10 Ave. N	48 (Moderate)

[37] MFLNRORD.2020 Wildfire Threat Assessment Guide and Worksheets

6.1.3 APPENDIX A-3: FIRE RISK THREAT ASSESSMENT METHODOLOGY

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

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

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

- Fuel Type
- Structures
- Structure Density
- Eligible WUI (1 km buffer of structure density classes >6).

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

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

The provided PSTA data does not transfer directly into the geodatabase for submission, and several PSTA feature classes require extensive updating or correction. In addition, the Fire Threat determined in the PSTA is fundamentally different than the localized Fire Threat feature class that is included in the Local Fire Risk map required for project submission. The Fire Threat in the PSTA is based on provincial scale inputs - fire density; spotting impact; and head fire intensity, while the spatial submission Fire Threat is based on the components of the Wildland Urban Interface Threat Assessment Worksheet. For the scope of this project, completion of WUI Threat Assessment plots on the entire AOI is not possible, and therefore an analytical model has been built to assume Fire Threat based on spatially explicit variables that correspond to the WUI Threat Assessment worksheet.

Field Data Collection

The primary goals of field data collection are to confirm or correct the provincial fuel type, complete 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 Eligible WUI as possible (within time, budget and access constraints). Threat Assessment plots are completed on the 2020 form, and as per the Wildland Urban Interface Threat Assessment Guide.

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

1. Update fuel-typing using orthophotography provided by the client and field verification.
2. Update structural data using critical infrastructure information provided by the client, field visits to confirm structure additions or deletions, BC Assessment, and orthophotography.
3. Complete field work to ground-truth fuel typing and threat ratings (completed 8 WUI threat plots on a variety of fuel types, aspects, and slopes and an additional 250 field stops with qualitative notes, fuel type verification, and/or photographs).
4. Threat assessment analysis using field data collected and rating results of WUI threat plots – see next section.

Spatial Analysis

The field data is used to correct the fuel type polygon attributes provided in the PSTA. This corrected fuel type layer is then used as part of the spatial analysis process. The other components are developed using spatial data (BEC zone, fire history zone) or spatial analysis (aspect, slope). A scoring system was developed to categorize resultant polygons as having relatively low, moderate, high or extreme Fire Threat, or Low, Moderate, High or Extreme WUI Threat. Table 28 below summarizes the components and scores to determine the Fire Behaviour Threat.

Table 28: Components of Fire Threat Analysis

Attribute	Indicator	Score
Fuel Type	C-1	35
	C-2	
	C-3	
	C-4	
	M-3/4,>50% dead fir	
	C-6	25
	M-1/2, >75% conifer	20
	C-7	
	M-3/4, <50% dead fir	
	M-1/2, 50-75% conifer	15
	M-1/2, 25-50% conifer	10
	C-5	
	O-1a/b	
	S-1	
	S-2	
	S-3	
	M-1/2, <25% conifer	5

	D-1/2	0
	W	0
	N	0
Weather - BEC Zone	AT, irrigated	1
	CWH, CDF, MH	3
	ICH, SBS, ESSF	7
	IDF, MS, SBPS, CWHsds1 & ds2, BWBS, SWB	10
	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

WUI Risk Classes and their associated summed scores

Very Low	0
Low	0-35
Moderate	35-55
High	55-65
Extreme	>65

These attributes are summed to produce polygons with a final WUI Risk Score. To determine the Fire Threat 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'.

Limitations

There are obvious limitations in this method, most notably that not all components of the threat assessment worksheet are scalable to a GIS model, generalizing the Fire Behaviour Threat score. The WUI Risk 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 FCFS program.

6.1.4 APPENDIX A-4: PROXIMITY OF FUEL TO THE COMMUNITY

Home and Critical Infrastructure Ignition Zones

Multiple studies have shown that the principal factors regarding home and structure loss to wildfire are the structure's characteristics and immediate surroundings. The area that determines the ignition potential of a structure to wildfire is referred to as (for residences) the Home Ignition Zone (HIZ) or (for critical infrastructure) the Critical Infrastructure Ignition Zone (CIIZ).[38,39]Both the HIZ and CIIZ include the structure itself and three concentric, progressively wider Priority Zones out to 30 m from the structure (Figure 7 below). More details on priority zones can be found in the FireSmart Manual.[40]

[38] 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.
[39] Cohen, J. Preventing Disaster Home Ignitability in the Wildland-urban Interface. Journal of Forestry. p 15 - 21.
[40] https://firesmartcanada.ca/ and https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/firesmart

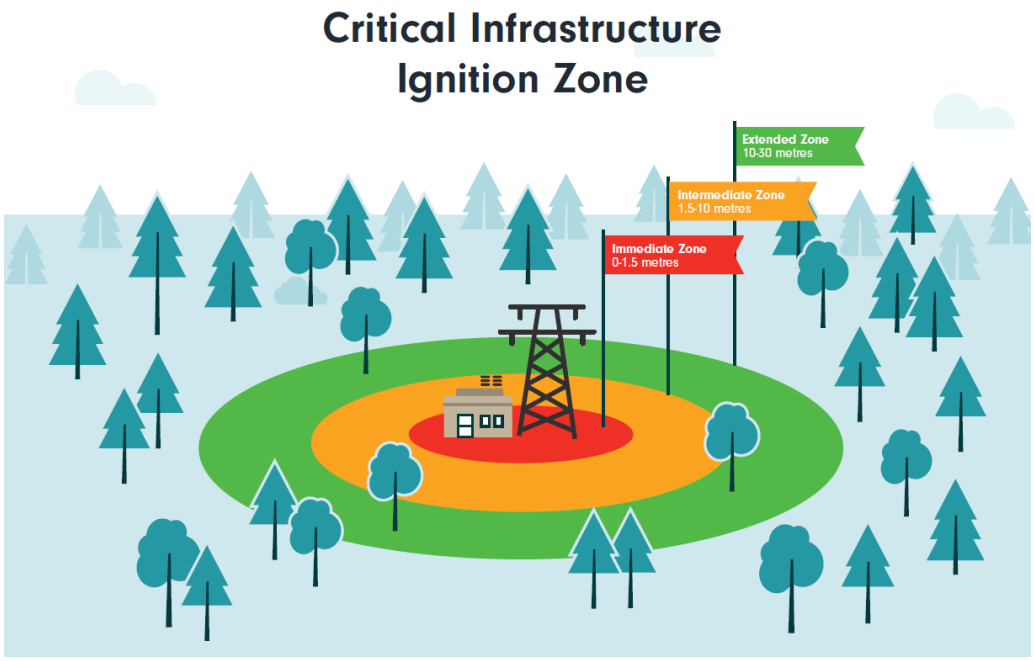


Figure 7: FireSmart Home and Critical Infrastructure Ignition Zone (HIZ, CIIZ)

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). Firebrands can be transported long distances ahead of the wildfire, across fire guards and fuel breaks, and accumulate within the HIZ/CIIZ in densities that can exceed 600 embers per square meter. Combustible materials found within the HIZ/CIIZ combine to provide fire pathways allowing spot surface fires ignited by embers to spread and carry flames or smoldering fire into contact with structures.

Because ignitability of the HIZ/CIIZ is the main factor driving structure loss, the intensity and rate of spread of wildland fires beyond the community has not been found to necessarily correspond to loss potential. For example, FireSmart homes with low ignitability may survive high-intensity fires, whereas highly ignitable homes may be destroyed during lower intensity surface fire events.[39] Increasing ignition resistance would reduce the number of homes simultaneously on fire; extreme wildfire conditions do not necessarily result in WUI fire disasters.[41] 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.

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

Table 29. 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	(100-500m)	Treatment would affect wildfire behaviour approaching a value, as well as the wildfire's ability to impact the value with short- to medium- range spotting; should also provide suppression opportunities near a value.
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.

**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: WILDFIRE RISK ASSESSMENT – WORKSHEETS AND PHOTOS

Provided separately as PDF package.

6.3 APPENDIX C: MAPS

Provided separately as PDF package.

6.4 APPENDIX D: CRESTON VALLEY FIRESMART RESILIENCY COMMITTEE

The Creston Valley FireSmart Resiliency Committee (CVFRC) was formed in May 2023. Its Terms of Reference are as follows:

This CVFRC fills a key level of collaboration and organization on the sub-regional level. The FireSmart and wildfire resiliency programs in BC require coordination of all levels of government, industry and local community and stakeholders to promote and deliver impactful, efficient, and cost-effective wildfire resiliency initiatives. The CVFRC will use provincial and federal resources to provide FireSmart and community wildfire resiliency leadership within the Creston Valley.

1. **WORKING GROUP OBJECTIVES**

   The key objectives of the CVFRC are to:

   1. Coordinate activities across agencies related to the 7 disciplines of FireSmart, including information sharing, co-development, and delivery of projects as appropriate, while maintaining each agency's independence to deliver its mandate;
   2. Strengthen relationships with residents and organizations within the Creston Valley to engage in wildfire resiliency;
   3. Develop and implement education plans to support all agency initiatives; and
   4. Collaborate across agencies on activities that increase community wildfire resilience, including but not limited to community / stakeholder engagement, sharing of resources, and accessing funding.