Community Wildfire Resiliency Plan

Regional District of Central Kootenay

Electoral Area I

December 20, 2023

Submitted by:

B.A. Blackwell & Associates Ltd.
270 – 18 Gostick Place
North Vancouver, BC, V7M 3G3
Ph: 604-986-8346
Email: bablackwell@bablackwell.com

Submitted to:

Dan Seguin
Manager Community Sustainability
RDCK
Ph: 250-352-1530
Email: DSeguin@rdck.bc.ca

B.A. Blackwell & Associates Ltd.

REGIONAL DISTRICT CENTRAL KOOTENAY

REGISTERED PROFESSIONAL SIGN AND SEAL

RPF PRINTED NAME	
Louis Orieux	RPF #5147
DATE SIGNED	
December 18, 2023	
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	
	

Cover Photo: B. Farrell (B.A. Blackwell & Associates Ltd.)

ACKNOWLEDGEMENTS

The authors would like to thank the following for their direct involvement with planning, reviewing, and contributing to the Electoral Area I Community Wildfire Resiliency Plan (CWRP):

- Andy Davidoff (RDCK Electoral Area I Director)
- Dan Seguin (RDCK Manager Community Sustainability)
- Daniel Klein (BC Wildfire Service – Wildfire Prevention Officer)
- Garrett Fishlock (RDCK FireSmart Program Coordinator)
- Nora Hannon (RDCK Disaster Mitigation and Adaptation Senior Advisor)

These individuals invested their time in meetings, answering questions, and reviewing and commenting on the contents of this document. While this list is incomplete, the authors would also like to thank the following individuals for their helpful information and guidance that they provided during the CWRP's development process: Greg Patterson (Fire Chief, Tarrys Volunteer Fire Department).

This report would not be possible without the Community Resiliency Investment Program and funding from the Union of British Columbia Municipalities.

EXECUTIVE SUMMARY

In June 2023, B.A. Blackwell and Associates Ltd. was retained by the Regional District of Central Kootenay (RDCK) to assist Electoral Area I (EA-I) 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 EA-I's Wildland-Urban Interface (WUI). This plan replaces the previous Community Wildfire Protection Plan (CWPP) completed for EA-I 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).

EA-I has made full or partial progress with six of 34 of the 2016 CWPP recommendations. The recommendations addressed primarily related to delivering public FireSmart and wildfire education and prescribing and treating proposed fuel treatment units. As the Electoral Area's communities (and associated WUI) are spread out over a significant distance surrounding Sentinel Mountain, community wildfire resiliency is strongly tied to the actions of the communities and their residents, the Provincial government, and the relevant stakeholders managing the timber harvest land base. Maintaining meetings of the Castlegar Area FireSmart and Resiliency Committee (and ensuring local volunteer fire department Fire Chiefs are included), which EA-I is part of, will be essential to implementing this plan and achieving effective wildfire risk reduction throughout the electoral area.

EA-I's WUI communities are all in a provincially defined Wildland Urban Interface polygon that has a Risk Class of "1", which reflects the 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 communities. The local analysis determined that, for the assessable area, 32% of EA-I's WUI is classified as a high or extreme fire behavior threat, mostly located on the slopes above (east) of Gibsons Creek, north of Brilliant, and east of Glade – these areas are largely dominated by steeper middle and upper slopes on south and west aspects with conifer-dominated fuel types. The analysis cannot be performed on private land, which covers approximately 55% of EA-I'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.

Rural areas without fire services, or dependent upon small volunteer fire services, rely heavily on the coordination of local resources and the uptake of FireSmart initiatives to be prepared for a wildfire event. 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, with support from Local Government.

EA-I's WUI communities can be considered as largely intermix,[2] with areas/neighbourhoods of interface.[3] Wildfire poses a threat to the communities from either a human ignition (which can happen almost anywhere – forest trail, highway, railway line, backyard), or lightning ignition (most often in the adjacent forests near high points of land), but also from a residential fire that then spreads into surrounding vegetation and landscaping. Because of the rural character, remote or isolated locations, and the observed low adherence to FireSmart residential vegetation management and exterior building materials for many structures within EA-I, 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. Additional emphasis is placed upon the Provincial government and local timber harvest land base stakeholders to manage potentially hazardous fuel conditions within EA-I's WUI – either through fuel treatments recommended as part of this plan, or by using appropriately targeted harvesting and slash management practices.

A total of 47 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 communities with EA-I. RDCK and EA-I 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.

---

[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/.

[2] Homes and structures are largely situated within the vegetated/forested landscape.

[3] Homes and structures are largely situated adjacent to vegetated/forested landscapes surrounding the community/neighbourhood.

Table 1: Electoral Area-I'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							
1	High	Continue to apply for funding and employ an EA-I FireSmart Coordinator/Mitigation Specialist.	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.	RDCK	2 years	EA-I has its own FireSmart program being managed by a local FireSmart Coordinator.	CRI FCFS up to cost maximums.
2	High	RDCK FireSmart Coordinators should plan regular meetings to discuss their successes, failures, and learnings. Consider adding, or having specific meetings with, FireSmart Community Neighbourhood Champions.	So that they can continue to improve the RDCK's FireSmart program and tailor it to their respective communities. Adding in Community Champions will allow them to further support their EA's communities, as well as get FireSmart messaging and opportunities back into the communities faster.	FireSmart Coordinators (RDCK)	ASAP and ongoing	RDCK FireSmart Coordinators are meeting more than once a year.	CRI FCFS funding as part of FireSmart Coordinator salaries.
3	High	Continue to promote FireSmart to EA-I residents at community events, public spaces, and through workshops using FireSmart branded material and printed manuals (Home and Landscaping) and/or a FireSmart Canada Community Preparedness Day. Show a united front by having local government, fire department members, and FireSmart coordinators at events together as much as possible.	Observed adherence and uptake of FireSmart principles on private property and many homes/structures in EA-I is lacking. 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. Tarrys Fire Chief noted the department had not been part of any public education events. Having representatives from all levels of response and government demonstrates the importance of FireSmart to the public.	EA-I / RDCK/ FireSmart Coordinator	Annually	Quantity of resources distributed/number of times used at events.	CRI FCFS up to cost maximums.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
4	High	Update RDCK'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).	RDCK	Annually	Website continuously updated as required.	CRI FCFS up to cost maximums.
5	High	Continue the FireSmart social media campaign, with updated FireSmart graphics and language, through various RDCK/EA-I 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.	EA-I / RDCK	Annually	Ongoing FireSmart social media campaign.	CRI FCFS up to cost maximums.
6	High	Continue to promote FireSmart in School District 8 schools using the FireSmart Education Kit and other resources. Students residing in EA-I attend schools in Castlegar and South Slocan.	Great success has been made through BC schools with FireSmart outreach. Engaging with the community's younger population may increase uptake with all residents.	RDCK / School District 8	Annually	One FireSmart lesson delivered each year (minimum).	CRI FCFS; e.g. FireSmart Magnetic Board for $1,710.
7	High	Continue to promote free FireSmart Home Ignition Zone assessments and/or Home Partners Program assessments to residents.	FireSmart Home Ignition zone and Home Partners Program 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 an educational exercise, and can be funded completely through CRI FCFS. They are a requirement to qualify for the FireSmart rebate program (see Section 5.7).	EA-I / RDCK	2 years	FireSmart Home Ignition Zone assessments are being completed within EA-I.	CRI FCFS up to cost maximums.
8	Moderate	Consider door-to-door knocks in neighbourhoods (such as Pass Creek) that have communication constraints to discuss wildfire risk and FireSmart principles that they can apply to their home and property.	Although wildfire can affect all areas of EA-I's WUI, some communities are more at risk due to risks/constraints not associated to wildfire – such as no cell service and low community turnouts at public FireSmart events. Door to door knocks by Fire Chiefs, fire department personnel, and FireSmart Coordinators have been successful in other communities.	RDCK / EA-I Fire Response Area Departments / FireSmart Coordinators	2 years	Visits to homes in these WUI neighbourhoods from local government/ FireSmart/ fire department members (with FireSmart information left at their door) have started.	In-house personnel time. CRI FCFS for FireSmart materials.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
9	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.	EA-I / 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							
10	High	Install FireSmart educational signage at regional parks.	These signs provide both visitors and residents a quick snapshot of how their actions and activities can inadvertently increase wildfire and ignition risks, as well as introduces visitors to FireSmart – a message they can take home with them.	EA-I / RDCK	5 years (signs installed)	Wildfire risk signs at the highest traffic parks have signs.	Sign cost ~$800 for purchase and installation per sign.
Legislation, Planning and Development - Section 5.3							
11	High	Upon the roll-out of the new BC Building Code in 2024, RDCK should review and assess what FireSmart principles are included and compare them to the draft Wildfire Development Permit Areas (DPAs). Update the draft DPAs as required. Initiate a process to implement the wildfire DPAs, if still required, to manage for risks not addressed in the new Code. Consider the inclusion of EA-I WUI communities.	FireSmart construction and landscaping policies manage for wildland-to-structure fire transfer (and vice versa). Over time, resiliency will be built up at the interface and intermix areas.	EA-I / RDCK (Consultant)	Upon BC Building Code roll out	All new development complies with the policy.	CRI FCFS: up to $10,700 available to apply to incremental staff hours or contract cost.
12	High	Update references to “fire risk” in EA-I’s OCP to include referencing the Local Wildfire Risk Analysis developed as part of this plan, as it more accurately reflects current fire risk for EA-I’s WUI than currently available provincial data.	EA-I should look to the most recent and accurate wildfire risk analysis for its WUI to be used to determine areas of Moderate and High wildfire threat for reducing wildfire threat through community planning and development purposes.	EA-I / RDCK (Consultant)	Upon next OCP review and update	OCP update that includes FireSmart construction/development policies for single home and lot development and major renovations.	CRI FCFS: up to $10,700 available to apply to incremental staff hours or contract cost

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
13	High	Include a policy in EA-I's OCP which supports protection of *designated* accesses to water sources such as hydrants, standpipes, lakes, and streams to remain free of obstructions for fire protection purposes.	Water is the most important resource for fighting wildland and structure fires. As such, policies regarding regular access points for fire trucks to known water sources (such as Kootenay River) should be identified, designated, and protected.	EA-I / RDCK (Consultant)	Upon next OCP review and update	OCP update that protects fire department access to designated water source access points.	CRI FCFS: up to $10,700 available to apply to incremental staff hours or contract cost
14	High	Consider adopting a Wildfire Landscaping Bylaw to restrict flammable landscaping. Example: prohibit conifer vegetation in the Immediate Zone of a residence or structure (0-1.5 m) and prohibit the planting of new conifer vegetation in Priority Zone 1 (1.5-10 m). Highly flammable landscaping plants (ex., cedar hedges) were noted throughout the Township, especially on more densely populated streets. This can be an effective communication tool regardless of enforcement capacity.	Highly flammable landscaping plants (ex., cedar hedges) were noted throughout EA-I, especially on more densely populated streets. Landscaping vegetation can act as a wick, moving fire to homes/structures and throughout communities.	EA-I / RDCK (Consultant)	5 years	A Wildfire Landscaping Bylaw is in effect.	CRI FCFS: up to $10,700 available to apply to incremental staff hours or contract cost
15	High	Continue to 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. Encourage and support privately owned community halls that act as community shelters, and private or community owned critical infrastructure, to do the same.	Protecting water systems, emergency shelters, and community infrastructure is critical to wildfire response and recovery. Assessments have already been completed for EA-I fire halls.	EA-I / RDCK (Local FireSmart Representative; FireSmart Coordinator; and/or Consultant)	Ongoing	Number of assessments completed and mitigation hours/investment	CRI FCFS: up to $800 per assessment and up to $50,000 for mitigation per structure (publicly owned only)

Cross Training & Fire Department Resources - Section 5.4							
Training							
16	High	Continue to provide SPP-WFF1 training in-house to EA-I fire department 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.	This would provide an opportunity to expand in-house wildland specific training, and potentially train adjacent fire departments.	RDCK / Fire Response Area Fire Departments	Annually	Number of firefighters (both paid and on-call volunteer) with wildland training beyond SPP-WFF1 increases.	Staff time; CRI FCFS Training. Columbia Basin Trust funding.
17	High	Support FireSmart specific training to EA-I fire response area fire departments: FireSmart 101, Local FireSmart Representative (LFR), and FireSmart Home Partners Mitigation Specialists.	To build understanding and knowledge of FireSmart principles within local fire departments. To certify EA-I fire department members so they can implement various FireSmart assessments within the community.	RDCK / Fire Response Area Fire Departments	3 years	Number of firefighters (both paid and on-call volunteer) with FireSmart training increases.	Staff time; CRI FCFS Training.
18	High	EA-I fire response area fire departments should continue seeking out (and being supported by RDCK/EA-I in doing so) opportunities to perform wildfire response and structure protection drills - using hydrants, standpipes, and natural water sources, *with* BCWS.	Fast and effective deployment of available Structure Protection Units (two are owned by RDCK) and any additional equipment operated by the BCWS will be crucial in any interface fire scenario. Equipment compatibilities and/or differences between fire departments & BCWS should be identified and addressed ahead of time. Tarrys Fire Department noted that more training opportunities with BCWS would be greatly beneficial.	RDCK / Fire Response Area Fire Departments (BCWS)	Annually	A Drill is performed with BCWS and one EA-I fire department annually.	Staff time as required.

Water							
19	High	Identify and map natural and artificial water sources useable for fire suppression across the entire regional district. Consider standpipe locations along Kootenay River for development. Having a digital map would allow it to be uploaded into response vehicles' CAD systems, shared with BCWS response personnel, as well as included in the pre-planning of emergency community water delivery systems connecting major natural water sources with interface communities, to facilitate deployment of a structural protection system. Include important details such as: estimated water volume and access point notes. Share this information to all mutual aid fire response partners, and update over time.	Most of the firefighting service in EA-I requires water shuttling. This impacts EA-I's wildfire resilience. Shuttling or pumping water from lakes and rivers (and more easily from standpipes) to fill bladders can be pre-planned, including tender access points, traffic control, permanent large-volume pumps, and piping.	Fire Response Area Fire Departments (RDCK GIS department; BCWS; MOTI; MOE)	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 to apply to incremental staff hours or contract cost.
20	High	In coordination with Recommendation #19, create opportunities for BCWS to work with independent water systems to identify assets. Assist those communities in retrofitting their systems to be compatible, if required.	Reducing barriers to BCWS for accessing water sources in the WUI increases opportunities to fight WUI fires.	RDCK / FireSmart Coordinator (BCWS)	Annually	Communities with self-managed water systems are meeting with BCWS	RDCK/EA-I, BCWS, and community time.
21	Moderate	Fire response area fire departments should seek Superior Tanker Shuttle Service accreditation from Fire Underwriters Survey.	This accreditation certifies that the fire department 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 EA-I fire response areas). Note: this does not increase the overall water supply already available under automatic and mutual aid agreements.	Fire Response Area Fire Departments (RDCK)	5 years	Superior Tanker Shuttle Service accreditation achieved.	Fire department staff time as required (and RDCK budget for equipment upgrades and purchases, if needed).

Equipment & Staff							
22	High	In coordination with Recommendations #18 and #19, the EA-I fire departments should continue (or begin, if not done already) annual inspections by BCWS of their wildland firefighting equipment. Any gaps should be addressed, as required.	To ensure proper equipment is available to respond to interface wildfire events, and that equipment is compatible with BCWS's. CRI FCFS funding is available for incremental equipment purchases.	EA-I fire departments (RDCK; BCWS)	Annually	Annual inspection of wildland firefighting equipment from BCWS; gaps filled as practicable.	Fire department and RDCK staff time; CRI FCFS equipment funding up to cost maximums.
Interagency Cooperation - Section 5.5							
23	High	Continue to engage with the established Castlegar Area FireSmart and Resiliency Committee (CFRC) to plan, implement, and coordinate FireSmart initiatives, including fuel management treatments. Look to include EA-I volunteer fire department Fire Chiefs.	To 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 EA-I's WUI.	Castlegar CFRC	Ongoing	CFRC 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.
24	High	As communities self-organize for FireSmart initiatives, and even take up the FireSmart Canada Neighbourhood Recognition Program (see Recommendation #46), RDCK and EA-I should look to support their inclusion in a Community FireSmart Resiliency Committee (CFRC), or develop local sub-committees, as required.	To further community involvement in FireSmart and wildfire risk reduction activities at the community level.	RDCK / EA-I FireSmart Coordinator	Ongoing	Additions to existing CFRCs are made, as required, or new ones are established, as needed.	Cost and time dependent upon level of effort required.
25	High	Work with RDCK, CFRC members, and MOF to develop a fuel treatment/fuel break tracking system to spatially manage proposed and completed fuel management areas both within EA-I'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.	EA-I/Castlegar CFRC / MOF / RDCK	As soon as possible	A regional GIS tracking system is established, or a provincial one is developed that CFRC members can access.	Cost and time dependent upon level of effort required.

26	High	Lobby forest land licensee/managers (e.g., BC Timber Sales) to be aware of where their tenure overlaps EA-I'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.	RDCK / EA-I / Local Government elected officials/ Community members (MOF; Forest Licensees and 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.	RDCK/EA-I staff time for discussions.
27	High	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.	RDCK / EA-I Local Government elected officials (MOTI; Electrical Providers; Railways)	Yearly and ongoing	Right-of-way maintenance discussions are open and ongoing; right-of-ways are kept in low-risk states.	RDCK/EA-I staff time for discussions.
Emergency Planning - Section 5.6							
28	High	Continue tabletop wildfire scenario tabletop exercises with emergency management and CFRC partners. Yearly, pre-fire season is best. Move the "WUI fire" to a different area of EA-I's WUI each time.	Tabletop exercises provide an opportunity to identify weak spots in a plan and collaborate.	RDCK (EA-I/Castlegar CFRC; RCMP; BCWS)	5 years	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

29	High	Consider updating EA-I's OCP with guidelines stating private roads that access forest lands should be of adequate design to allow for the safe movement of logging and fire-fighting equipment. Discuss with the Ministry of Transportation and Infrastructure (MOTI) possible means supporting/enforcing 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 EA-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."	RDCK (MOF; BCWS; Local Fire Response Area Departments)	5 years	OCP updated as required and access roads through private land to the interface forest are maintained.	RDCK/EA-I time for planning and discussions. CRI FCFS: up to $10,700 for incremental staff hours or contract cost.
30	High	RDCK and EA-I 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.	RDCK (FireSmart Coordinator)	Ongoing	Continued update of the Voyent Alert! System (can track downloads from app providers).	RDCK for promotion.
31	High	RDCK should have appropriate signage designating shoreline access routes for secondary boat egress for Glade which relies on ferry or private boat for access/egress.	To expedite egress during an emergency evacuation in a community already significantly constrained.	RDCK / EA-I	5 years	All public shoreline access/egress routes are marked (a series of signs from main roads to access points is best).	RDCK: Cost/time dependent on number of access points and signs required.
32	High	Invest in back-up generators for any critical infrastructure that does not have one (including fire halls). 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 (especially those designated as emergency shelters) would facilitate both emergency response (water supply for suppression) and rapid community return and recovery following a fire.	RDCK / EA-I (Private Industry)	ASAP	A budget and purchase plan for back-up generators is implemented, starting with the most critical infrastructure.	Cost varies - ~$10,000

33	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. Discuss with local Fire Departments and BCWS what mounting/sprinkler types are best. This can be directly led by RDCK, or RDCK can offer support to local fire departments and community organizations to assist doing so.	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.	RDCK / EA-I	1 Year 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
34	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.	RDCK / EA-I	5 years – 2028 update	EA-I always has a current and acceptable CWRP.	~$32,000; CRI FCFS funding
35	Moderate	Pre-plan emergency community water delivery systems to connect major natural water sources with interface communities/neighbourhoods to facilitate deployment of a structural protection system. This can be supported by Recommendation #19. The Argenta Emergency Preparedness Group has been working on this since 2023 (see Section 5.4).	RDCK has many large natural water bodies and streams/creeks to draw from in the event of a wildfire. Shuttling or pumping water from lakes and rivers to fill bladders may be planned in advance, including tender access points, traffic control, permanent large-volume pumps and piping.	RDCK / EA-I (BCWS)	5 Years	Assess community water delivery for each neighbourhood. Develop and test neighbourhood specific plans.	CRI: Assessment of Community Water Delivery Ability - incremental staff hours or contract cost
Vegetation Management - Section 5.7							
Fuel Management Treatments							
37	High	Develop fuel management prescriptions for the identified Potential Fuel Treatment Units (PTUs), starting with those identified as High priority. Continue with treatment implementation when possible.	To reduce wildfire threat and risk to interface and intermix communities within the WUI. Also, to provide FireSmart vegetation management examples to the public that can be implemented on their own properties. See “Rationale” column in Table 25 for more detailed treatment rationales.	EA-I / MOF / BCWS	5 years	Approved FMP(s) for identified High priority areas.	CRI FCFS funding available for prescription and treatments; ~$425/hectare for a ~20 ha prescription

38	High	Lobby Provincial Government (Ministry of Forests) and other potential funding organizations for grant funds to implement landscape level fuel treatment on private land.	Much of EA-I's communities' structures are surrounded by undeveloped, forested private land. Current funding streams for fuel reduction at the landscape level are targeted, and thus limited, to public land. However, the interface wildland does not stop at the public/private land border.	Local Government (Provincial Government)	5 years	Discussions initiated and ongoing	Time and cost dependant upon level of engagement required.
Residential FireSmart							
39	High	In conjunction with provided home FireSmart Assessments (see Recommendation #7), continue offering 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, EA-I, and FireSmart coordinators 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 / EA-I 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).
40	High	Continue providing regional district-led options for the disposal of yard waste. Currently, this includes having tipping fees waived (May and October) for yard waste at the RDCK transfer stations/landfills.	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.	RDCK / EA-I FireSmart Coordinator	Annual	Municipally funded yard waste disposal continues.	CRI FCFS funding is available for tipping fee coverage.
41	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, especially those long distances from RDCK landfills/transfer stations, and to 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.	RDCK / EA-I FireSmart Coordinator	Annual (pre-fire season is best)	Number of properties who elect to have debris disposed.	CRI FCFS funding; ~$100-150 per chipper crew hour.
42	Moderate	Consider releasing an annual RDCK 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 RDCK FireSmart program to track challenges and successes, further promote the program, and tailor outreach methods to achieve the most uptake.	RDCK / EA-I FireSmart Coordinator	Annual	An annual report is published.	Eligible for CRI funding – FireSmart staff time. Estimate 40-80 hours.

43	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 (RDCK; EA-I FireSmart Coordinator)	5 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							
44	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.	RDCK / EA-I FireSmart Coordinator	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).
45	High	As part of fuel treatment implementation, RDCK/EA-I 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.	RDCK / EA-I FireSmart Coordinator	5 years	Signage installed during implementation phases.	Eligible for UBCM CRI funding.
46	High	Continue to support and promote the FireSmart Canada Neighbourhood Recognition Program to communities within EA-I. Identify community champions to spearhead organization for those communities not already organized, and support those communities that have been recognized in the past to continue working towards being so.	There are many small communities throughout EA-I that, by working together, could reduce their community-scale wildfire risk easily and substantially. The program supports a small-scale approach for neighbourhoods consisting of 5-50 homes, with the intent to implement achievable FireSmart goals	RDCK / EA-I FireSmart Coordinator	Ongoing	Increase in number of recognized communities.	FireSmart Canada $500; RDCK FireSmart Champion Grant up to $3000
47	Moderate	As part of the FireSmart Canada Neighbourhood Recognition Program (FCNRP), apply to CRI FCFS for funding to develop Neighbourhood FireSmart Plans.	To help guide FireSmart Canada Neighbourhood Recognition Program communities and their community champions to complete wildfire risk reduction measures.	RDCK / EA-I FireSmart Coordinator	In line with FCNRP Community program uptake.	Communities working towards FCNRP status have a Neighbourhood Plan	Eligible for UBCM CRI funding.

TABLE OF CONTENTS

Registered Professional Sign and Seal I
Acknowledgements II
Executive Summary III
Table of Contents XVII
List of Tables XIX
List of Figures XX
List of Maps XX
Frequently Used Acronyms XXI
SECTION 1: Introduction 22
1.1 Plan Purpose and Goals 22
1.2 Plan Development Summary 23
SECTION 2: Relationship to Other Plans and Legislation 24
2.1 Linkages to CWPPs/CWRPs 24
2.2 Local Plans and Bylaws 24
2.3 Higher-Level Plans and Legislation 28
SECTION 3: Community Description 31
3.1 Wildland-Urban Interface 31
3.2 Community Description 33
3.3 Values at Risk 35
3.3.1 Electrical Power 36
3.3.2 Water and Sewage 36
3.3.3 Hazardous Values 38
3.3.4 Cultural Values 38
3.3.5 High Environmental Values 38
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 49

4.2 Wildfire History 53
4.2.1 Historic Fire Regime 53
4.2.2 Historical Wildfire occurences 54
4.3 Local Wildfire Risk Assessment 57
4.3.1 Wildfire Threat Class Analysis 58
4.3.2 WUI Risk Class Analysis 59
4.4 Hazard, Risk, and Vulnerability Assessment 62
SECTION 5: FireSmart Principles 63
5.1 Community Overview 64
5.2 Education 65
5.3 Legislation, Planning and Development Considerations 70
5.4 Cross-Training and Fire Department Resources 73
5.5 Interagency Cooperation 77
5.6 Emergency Planning 81
5.7 Vegetation Management and Other FireSmart Activities 88
SECTION 6: Appendices c
6.1 Appendix A: Review of 2016 CWPP Recommendations c
6.2 Appendix B: Local Wildfire Risk Process cv
6.2.1 Appendix B-1: Fuel Typing Methodology and Limitations cvii
6.2.2 Appendix B-2: Wildfire Threat Assessment Plots cix
6.2.3 Appendix B-3: Fire Risk Threat Assessment Methodology cx
6.2.4 Appendix B-4: Proximity of Fuel to the Community cxiii
6.3 Appendix C: Wildfire Risk Assessment – Worksheets and Photos cxv
6.4 Appendix D: Maps cxv
6.5 Appendix E: Community FireSmart Resiliency Committee cxvi

LIST OF TABLES

Table 1: Electoral Area-I's Community Wildfire Resiliency Plan V
Table 2: Summary of North Kootenay Lake Electoral Area I's (Kootenay-Columbia Rivers) Official Community Plan and its relationship to this CWRP. 25
Table 3: Summary of local bylaws and their relationship to the CWRP. 26
Table 4: Summary of local plans and policies that are directly relevant to the CWRP. 28
Table 5: Higher level plans and legislation relevant to EA-I's WUI and this Plan. 29
Table 6: Landownership within EA-I's WUI. 31
Table 7: Socio-economic statistics for Electoral Area I, as per the 2021 census. Bolded values have special relevance to the CWRP. 34
Table 8: Critical Infrastructure and community assets within EA I's WUI. 35
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 EA-I's Wildland Urban Interface. 46
Table 13: Natural Disturbance Types (NDTs) of Electoral Area I's WUI. 53
Table 14: Wildfire threat summary for Electoral Area I's eligible WUI. 58
Table 15: WUI risk class ratings within the eligible WUI of the Village of Pemberton 59
Table 16: FireSmart vulnerability and resilience by neighbourhood. 64
Table 17: Education recommendation and action items 67
Table 18: Legislation, planning and development recommendation and action items 71
Table 19: Wildland specific training and resources of the Tarrys VFD. 73
Table 20: Cross-training recommendation and action items 75
Table 21: Interagency cooperation recommendation and action items 79
Table 22: Example of a Wildfire Response Preparedness Condition Guide 83
Table 23: Emergency preparedness recommendation and action items 85
Table 24: Vegetation management action items. 91
Table 25: Summary of Proposed Fuel Treatment Units for EA-I's CWRP (ordered from east to west). 97
Table 26. Fuel Type Categories and Crown Fire Spot Potential encountered within the WUI. cvii
Table 27. Summary of WUI Threat Assessment Worksheets (2020). cix
Table 28: Components of Fire Threat Analysis cxi
Table 29. Initial invitee list (2023) of the Castlegar and Area FireSmart and Resiliency Committee cxvi

LIST OF FIGURES

Figure 1: RDCK EA-I population change statistics - 2006-2016 and projected 2016-2026. 34
Figure 2: Graphic display of the fire behaviour triangle, and a subset of characteristics within each component. 42
Figure 3: Average number of fire danger rating days by month for the Smallwood fire weather station. 50
Figure 4. Daily and monthly average initial spread index rose for Smallwood fire weather station for the fire season (April – October) 52
Figure 5: Summary of fire ignition data by cause within EA-I's WUI (Data from BCWS). 55
Figure 6. A pre-incident planning checklist that can be used to help develop a pre-incident wildfire suppression plan and maps. 82
Figure 7: FireSmart Home Ignition Zone 88
Figure 8. FireSmart Ignition Zone (HIZ) cxiv

LIST OF MAPS

Map 1: Wildland Urban Interface (WUI) for Electoral Area I. The 'eligible WUI' area is the red diagonally lined polygon. 32
Map 2: Hydrant and standpipe locations within EA-I's WUI. 37
Map 3: Values at Risk map for EA-I's WUI. 40
Map 4: Slope, by slope classes, for EA-I's WUI. 44
Map 5. Updated fuel types in EA-I's WUI. 48
Map 6: Natural disturbance regimes and historical fire ignitions and occurrences for EA-I's WUI and a five-kilometer area surrounding. 56
Map 7: Local wildfire threat assessment within EA-I's WUI. 61
Map 8: Overview map of prescribed and proposed fuel treatment units within EA-I's WUI. 94
Map 9: Closer view of the proposed and prescribed treatment areas for EA-I's eastern WUI areas. 95
Map 10: Closer view of the proposed and prescribed treatment areas for EA-I's western WUI areas. 96

FREQUENTLY USED ACRONYMS

AOI	Area of Interest
BC	British Columbia
BCWS	British Columbia Wildfire Service
BEC	Biogeoclimatic Ecosystem Classification
CFFDRS	Canadian Forest Fire Danger Rating System
CRI	Community Resiliency Investment
CWPP	Community Wildfire Protection Plan
CWRP	Community Wildfire Resiliency Plan
DPA	Development Permit Area
EA	Electoral 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 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 develop a new Community Wildfire Resiliency Plan (CWRP) for Electoral Area (EA) I. 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 RDCK Electoral Area I 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).[4] 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 EA-I's last CWPP and takes advantage of the most recent community wildfire planning framework in BC. This CWRP identifies the interface wildfire risk within EA-I's WUI communities, and gives RDCK and EA-I 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 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 RDCK and EA-I with:

- An assessment of wildfire risk to the communities,
- An assessment of values at risk and potential consequences from wildfire,

[4] 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).

- 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) Formation or confirmation/continuation of the Community FireSmart Resiliency Committee (CFRC; see Section 5.5). Consultation with the CFRC 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. The CFRC should continue to meet periodically, as needed to coordinate the fulfillment of this report's recommendations (consider annually or bi-annually, before or during the fire season – per Recommendation #23).
    a. Meetings could include some or all of the parties identified in Section 5.5.
2. The next meeting could be held in Spring-2024. Consider identifying recommendations to allocate resources to, and pursue funding for, from the 2024 UBCM CRI funding intake at this time.
    a. Consider meeting well in advance of the UBCM CRI application deadline (early October 2024), in order to discuss upcoming projects and align activities and initiatives where possible.
    b. RDCK will apply for UBCM CRI funding and compile final reporting.
    c. Continued meetings of the CFRC would be a suitable venue to identify if additional support is needed to fulfill the targeted recommendations.
        i. Additional support might be required in order 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 CFRC 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.

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, numerous RDCK plans and neighbouring jurisdictions 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

Regional District of Central Kootenay Area I Community Wildfire Protection Plan Update - 2016[5]

In 2016, B.A. Blackwell & Associates completed a Community Wildfire Protection Plan update for the Regional District of Central Kootenay Area I. The scope of this plan was a two-kilometer buffer around all residences and critical infrastructure based on WUI density criteria. A tabularized review of the 2016 recommendations and their implementation status is presented in Appendix A. 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 (Castlegar Area FireSmart and Resiliency Committee).

Listed below are jurisdictions adjacent EA-I that have been involved in community wildfire planning. *Strategic opportunities exist between these plans and should be considered.*

- *RDCK Electoral Area E CWRP 2023* – concurrently in development.[6]
- *RDCK Electoral Area I CWRP 2023* – concurrently in development.[6]
- *City of Nelson CWRP 2022* – recently completed.[6]

2.2 LOCAL PLANS AND BYLAWS

The sections and policies of Kootenay-Columbia Rivers Official Community Plan (OCP) listed in Table 2 are directly relevant to proactive wildfire resilience in EA-I. The OCP was reviewed as part of this CWRP to address any gaps or limitations that inadequately address fire hazards or risk mitigation. Due to the last major update of the OCP being from 1996, a major gap is that FireSmart is not mentioned in any policies and Wildfire as a risk has a very limited scope within the Plan. Updating the Plan with a full review of doing so, as well as including management policies specific to single home/lot and subdivision development or renovations is recommended (see Section 5.3).

[5] https://www.rdck.ca/assets/Services/Emergency~Management/Documents/RDCK%20Area%20I%20CWPP%20January%208%202018%20Final%20Draft.pdf

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

Table 2: Summary of North Kootenay Lake Electoral Area I's (Kootenay-Columbia Rivers) Official Community Plan and its relationship to this CWRP.

Section [Kootenay-Columbia Rivers Official Community Plan Bylaw No. 1157, 1996][7]	Policy Description / *Relationship to CWRP*
2.8 Servicing Objective	**2.8.3:** To provide for an adequate level of fire protection within the Plan Area. *This will include appropriate training, tools, and equipment for fire response area fire departments (addressed in Section 5.4)*
3.9 Community Service Policies	**3.9.1:** Community Services permitted on lots designated for Community Service on Schedule 'B' - Land Use Designations, shall include public recreation facilities, community halls, public utility structures and services, schools, universities/colleges, firehalls, greenspace, museums, hospitals and similar uses. *Imbedding policies to upgrade existing, or develop from new, Community Service structures and open/green spaces that are FireSmart will lead to reduced wildfire risk within communities as well as reduced wildfire risk to those assets designated as emergency shelters (addressed in Section 5.3).*
	3.9.4: The Board of the Regional District will continue to maintain and enhance fire protection throughout the Plan Area. *This will include appropriate training, tools, and equipment for fire response area fire departments (addressed in Section 5.4). Wildfire protection can begin/continue by implementing recommendations within this Plan.*
	3.9.6: New and improved domestic water supply systems shall be designed and constructed to provide hydrants and sufficient flows for fire protection and the Regional District recommends to Improvement and Irrigation Districts, the City of Castlegar and the Regional District of Central Kootenay owned water systems that the same utility standards be used so that in case of emergencies, fire equipment can be interchanged and critical repairs made. *Access to reliable, local water sources is paramount for first responder and BCWS firefighting effectiveness. Addressed in Section 5.4)*

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

[7] https://www.rdck.ca/assets/Government/Bylaws/Land~Use-Planning/1157-I_J_OCP_Consolidated_2787.pdf

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

Bylaws	Section	Description and *Relation to CWRP*
Building Bylaw No. 2200 (2010)	18.4	Fire stopping components must be in place before insulation and exterior sheathing are installed. *- Addresses the need for fire protection in new construction to manage room-to-room and structure-to-structure fire transmission.* *- To manage wildland-to-structure fire transfer (and vice versa), FireSmart principles were developed to address this gap. Currently, to mandate exterior construction materials and landscaping beyond the BC Building Code and the building bylaw, a Development Permit Area can be implemented (see Section 5.3). Note: the BC Building Code is currently being updated, with roll out planned for late-2024, and may include FireSmart standards.*
Emergency Management Regulatory Use Bylaw No. 2210 (amended by Bylaw No. 2758 in 2021)	5.1	Outlines administrative structure and roles of Emergency Program *- Provides structure and guidelines in times of emergency.*
	Amended Bylaw No. 2758	Adds "mitigation" into the description of the Emergency Program and Emergency Management Plan *- RDCK to develop, coordinate and manage emergency mitigation, preparedness, response, and recovery. This would include from wildfires.*
Manufactured Home Parks Bylaw No. 1082 (1995)	8.8.3	Fires shall be made only in stoves, incinerators, or other structures designed for that purpose. *- Limits fire ignition and propagation risks in structures made largely from ignitable and combustible materials.*
	8.8.4	If no approved fire hydrant is available to provide protection, a minimum of one (1) stagnant water supply at a minimum of 15,539 litres (6000 Igal) shall be provided on site in order to be accessed in case of emergency for fire protection purposes on properties serviced by Fire Protection. *- Increases assurance of useful water supply systems in the event of a fire to responding fire departments.*
Parks Regulation – Consolidated Bylaw No. 2173	22	No person shall start or maintain a fire in a park, except in facilities provided at a park for that purpose. *- Limits fire ignition and propagation risks.*
	24	No person shall leave a fire in a park unattended. *- Limits fire ignition and propagation risks.*
	25	No person shall burn any unsuitable materials including but not limited to organic yard waste, household waste, plastic, rubber, flammable or combustible liquid, or any treated lumber or construction debris, or toxic waste.

Bylaws	Section	Description and *Relation to CWRP*
		- Limits fire ignition and propagation risks.
	52	No person shall possess or discharge Fireworks, firecrackers or explosive materials of any kind in a park, except for an event authorized by a park use permit. *- Limits fire ignition and propagation risks.*
Resource Recovery Facilities Regulatory Bylaw No. 2905	8 (15)	No person other than the Site Operator or Service Personnel or their representative shall start any fires at any Resource Recovery Facility. *- Limits fire ignition and propagation risks.*
Volunteer Fire Service Regulation Bylaw No. 2769	4.1	Jurisdiction of each Fire Department, and the powers granted to each Fire Department and its Fire Chief and Members under this Bylaw, is restricted to the boundaries of the Fire Department's particular Fire Protection Service Area as set out in its establishment bylaw. A Fire Department shall not respond to any Incident under this Bylaw outside of the boundaries of its Fire Protection Service Area except as specified in Section 4(2)(a) to (f) of this Bylaw. *- Outlines jurisdictional limits of fire departments, which may impact rural communities with no immediate fire service (see Section 5.6).*
	4.2	Apparatus and Fire Department Equipment shall not be taken beyond the geographical limits of the jurisdiction for reasons other than repair, maintenance, or training unless: (a) a written agreement, approved by the Regional District, authorizes the supply of Members, Apparatus, Fire Department Equipment, Fire Protection Services and Associated Services to another jurisdiction; or (b) under the authority of the CAO, the Regional Fire Chief, or the Emergency Operations Center Director; or (c) in connection with a request for assistance by a the Office of the Fire Commissioner, or a Federal or Provincial emergency response Agency; or (d) in connection with an Incident near the boundaries of the Fire Service Protection Area which, if left untended, may threaten the Fire Service Protection Area or other such Service area; or (e) In the event of a Federal or Provincial State of Emergency; or (f) Under the provision of a bylaw for Associated Services. *- Outlines jurisdictional limits of fire departments, which may impact rural communities with no immediate fire service (see Section 5.6).*
	9.4	No person shall grow shrubs, hedges, plants or trees so as to obstruct the visibility or use of a fire hydrant, standpipe or sprinkler connection. *- Provides linkage to FireSmart activities and property preparedness.*
	10.1	Where this bylaw applies within a municipality the Regional District is authorized to enforce municipal open burning regulations. *- Limits fire ignition and propagation risks.*

Bylaws	Section	Description and *Relation to CWRP*
	12.2	The Occupier of a Public Building in which any of the Alarm System, Fire Protection Equipment, or emergency power system is not operating must institute and maintain a Fire Watch until those systems or equipment are operational. *- Limits fire ignition and propagation risks.*
Water Bylaw No. 2894	10.4.1	All fire hydrants and standpipes directly connected to Regional District Water Mains are the property of the Regional District. *- Outlines RDCK ownership and responsibility relating to water sources.*
	11.6.2 (f)	Notwithstanding the prohibitions in this Section, the Manager may authorize in writing the discharge of Regional District supplied water for the purposes of: training programs for fire fighters. *- Supports training opportunities for local fire fighters (see Section 5.4).*

The local plans listed in Table 4 are directly relevant to proactive wildfire resilience in EA-I. 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 and policies that are directly relevant to the CWRP.

Plan	Description and *Relationship to CWRP*
EMERGENCY RESPONSE AND RECOVERY PLAN for the Regional District of Central Kootenay	Outlines structural and organizational requirements for coordinated response and recovery from emergencies in the RDCK, including: decision-making tools for evacuation or shelter in place; EOC levels and activation protocols; hazard and evacuation planning; fire planning including industrial, wildfire and structural fires; and, recovery planning. *Section 3.10 specifically deals with interface fires/wildfires, indicating that interface fires will be managed using unified command with the Ministry of Forests and local fire department(s) and other local fire departments, where applicable.*

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 EA I 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: Higher level plans and legislation relevant to EA-I's WUI and this Plan.

Plan/Legislation	Description and *Relationship to CWRP*
FRPA – Government Action Regulations (GARs)	Multiple GARs are present within EA-I's WUI. These should be considered and managed for appropriately, where present, at the site level through associated site level plans (e.g., Fuel Management Prescriptions). These include: ➢ *Non-legal Old Growth Management Areas* ➢ *Ungulate Winter Range partial-harvest* ➢ *Significant fish streams and rivers* ➢ *Community watersheds* ➢ *Regionally significant visual areas*
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 EA-I is within a High Smoke Sensitivity Zone.* ➢ *All proposed treatment units are within the High Smoke Sensitivity Zone.*
Selkirk Resource District Fire Management Plan	The Selkirk Resource District Kootenay Lake Fire Management Plan (FMP) (MFLNRORD, 2016) identifies values at risk on the landscape and prioritizes broad categories of values as 'themes' for categorizing response through the Resource Strategic Wildfire Allocation Protocol (RSWAP). The four themes are 1) Human Life and Safety, 2) Property and Critical Infrastructure, 3) High Environmental and Cultural Values, and 4) Other resource values (timber, rangelands, etc.). *The organization of values is intended to provide the information needed to make appropriate fire response decisions in complex emergency situations. This CWRP identifies values within the Plan area with the intent of using this information to make appropriate fire response decisions.*
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.[8] *Its key goal is to specify responsibilities and obligations on fire use, wildfire prevention, wildfire control, and rehabilitation.*[8]
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

[8] https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/governance/legislation-regulations

Plan/Legislation	Description and *Relationship to CWRP*
	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 RDCK fire services. RDCK fire departments (including those in EA-I) routinely work 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 EA-I. 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 structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. For the purpose of the FireSmart Community Funding and Supports (FCFS) program, the 'eligible WUI' is considered as the area one kilometer from a structure density class greater than six structures per square kilometer. BC Wildfire Service generates WUI Risk Class maps and associated spatial data to assist with initiatives related to wildfire risk reduction, including the FCFS program.[9]

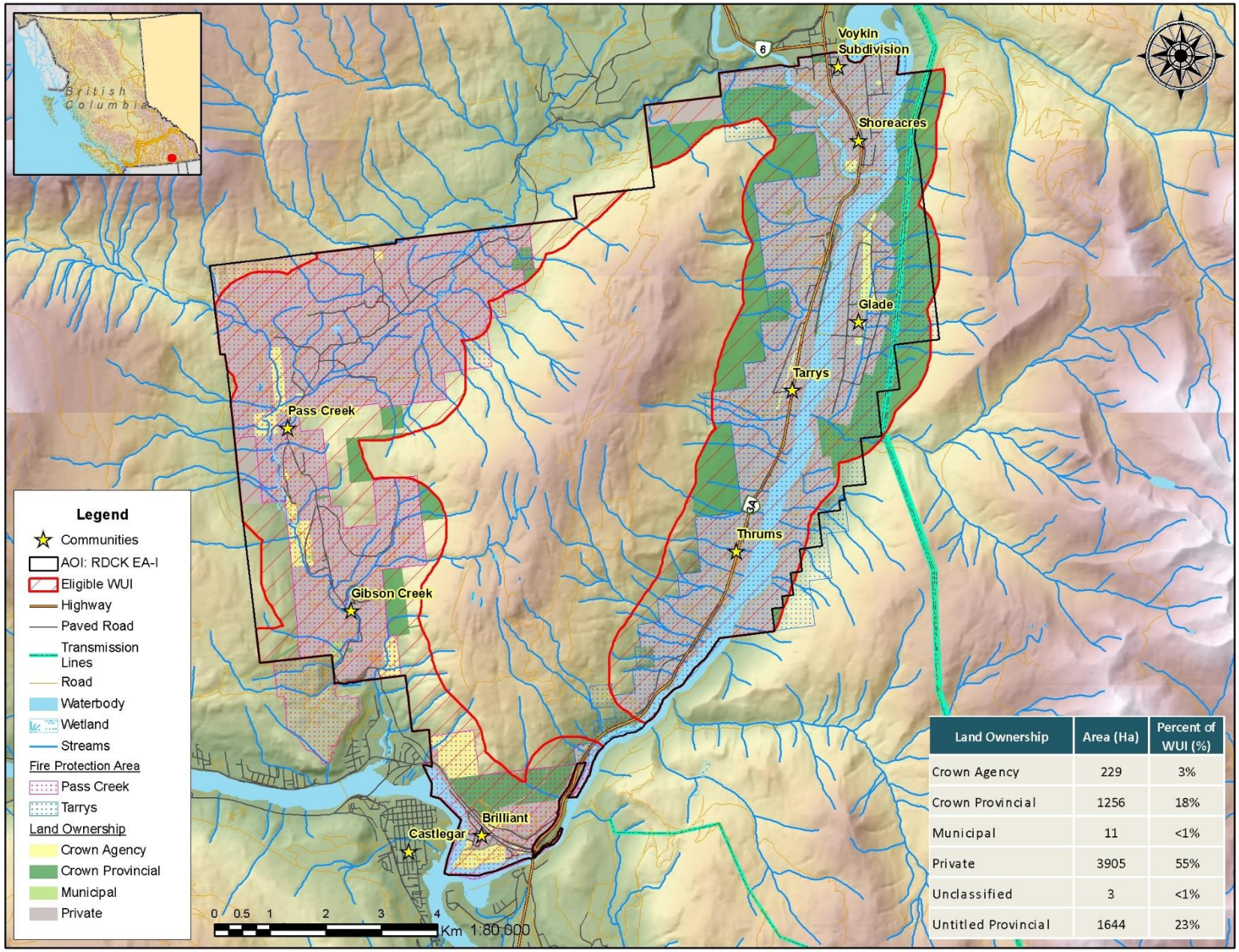
Field work, GIS analysis, and the recommendations for this CWRP cover only this one kilometer 'eligible WUI' which covers a total of 7,048 hectares. The electoral area includes residential, industrial, agricultural, and forested areas. Land use is guided by the Official Community Plan as discussed in Section 2.2. As development occurs, it is possible that the WUI will change.

Map 1 shows an overview of the wildland urban interface (WUI) surrounding communities in EA-I, with an approximate breakdown of land ownership type by area listed in Table 6. A significant portion of EA-I's WUI consists of private land, accounting for approximately 55% of the total land area. This predominance of privately-owned land highlights the importance of proactive FireSmart practices by property owners. The presence of Crown Provincial and Untitled Provincial lands, which collectively make up around 41% of the area, emphasizes the need for collaborative efforts and tailored strategies to address wildfire risk across the jurisdiction.

Table 6: Landownership within EA-I's WUI.

Land Ownership	Area (Ha)	Percent of WUI (%)
Crown Agency	229	3%
Crown Provincial	1256	18%
Municipal	11	<1%
Private	3905	55%
Unclassified	3	<1%
Untitled Provincial	1644	23%
Crown Agency	229	3%
TOTAL	**7048**	-

[9] Wildland Urban Interface Risk Class Maps - Province of British Columbia (gov.bc.ca)



Map 1: Wildland Urban Interface (WUI) for Electoral Area I. The 'eligible WUI' area is the red diagonally lined polygon.

3.2 COMMUNITY DESCRIPTION

EA-I is home to several residential neighborhoods situated along the banks of the Kootenay River and against the foothills of Sentinel Mountain, including Pass Creek, Gibsons Creek, Thrums, Tarrys, Shoreacres, Glade, Brilliant, and the emerging Voykin Subdivision. The electoral area benefits from its location near the convergence of the Columbia and Kootenay Rivers, strategically positioned between the communities of Nelson and Castlegar. This geographical advantage enhances accessibility and connectivity, contributing to the area's appeal. The electoral area is well-connected through a network of highways, including Highway 3, which spans east-west through the region and links it to southern BC. Highway 3A also extends north along the eastern shore of Kootenay Lake, leading to the ferry at Kootenay Bay, while Highway 21 heads south to the US-Canada border. Close proximity to the West Kootenay Regional Airport in Castlegar further enhances transportation options.

Pass Creek and Gibsons Creek are built along the east sides of Sentinel Mountain. Pass Creek and parts of Gibsons Creek have poor cellular service, making them more rural in nature. Brilliant is built along the terrace of the Columbia River, where it meets with the Kootenay River, across from Castlegar. Tarrys, Thrums, Shoreacres, and Voykin Subdivision are built along the main Highway 3A route. Glade stands as a unique neighborhood within EA-I as it is only accessible via a cable ferry that operates daily on-demand. A railway single-track that is operated by Canadian Pacific (CP) Railway runs parallel east of Highway 3A, abutting homes in Shoreacres. A Fortis BC pipeline extends in a north-south direction, traversing the landscape upslope of Tarrys and Thrums neighborhoods.

EA-I resides within the Southeast Fire Region and Arrow Fire Zone; the Arrow Fire Zone base is located in Shoreacres. EA-I receives essential emergency services, community development programs, and land use direction from the RDCK. It overlaps with two fire protection areas (FPA). The Pass Creek Volunteer Fire Department (VFD) provides fire services to Pass Creek, Gibsons Creek, and Brilliant. The Tarrys VFD provides fire services to Tarrys, Thrums, Shoreacres, and Glade. Both fire department fire halls are located on either side of Sentinel Mountain.

Historically, Doukhobor communities and a robust agricultural focus characterized the region. Over time, diversity in the population developed, accompanied by economic shifts toward natural resource sectors, healthcare, tourism, and the service industry. As trades and manufacturing sectors expanded, many residents began commuting to Castlegar or Nelson for employment. Today, the electoral area maintains a primarily residential character, with limited commercial and industrial infrastructure. Prominent among the industrial operations is the Kalesnikoff Lumber mill, located in Tarrys on Highway 3A, across the highway from Tarrys VFD Fire Hall and the Kootenay River.

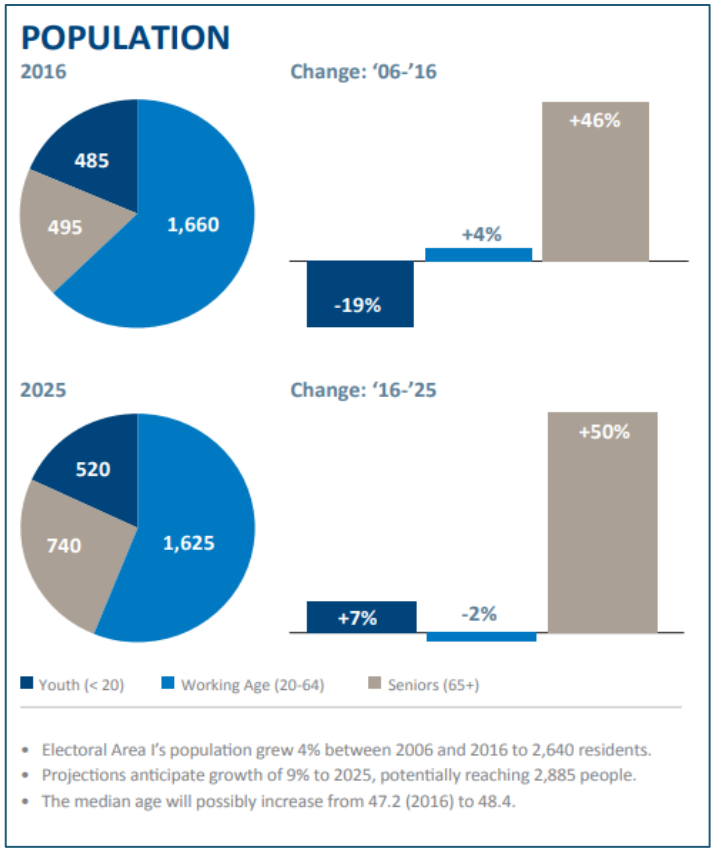


Figure 1: RDCK EA-I population change statistics - 2006-2016 and projected 2016-2026.

EA-I's population has shown steady growth, with the most recent census in 2021 recording a total population of 2,534 residents. This area encompasses a mix of residential neighborhoods and rural communities, and the population density stands at 23.1 people per square kilometer. Notably, there has been a 4.9% population increase between 2016 and 2021. The area encompasses 1,177 total private dwellings, with an impressive permanent occupancy rate of 94.1%. This significant presence of permanent residents presents an ideal opportunity for proactive FireSmart education. This education can have a lasting impact within the community, empowering residents to apply FireSmart principles effectively. Table 7 and Figure 1 provide an overview of relevant census and socio-economic data, offering valuable insights into the demographics and characteristics of the area.

Table 7: Socio-economic statistics for Electoral Area I, as per the 2021 census. Bolded values have special relevance to the CWRP.

Metric	Value
Population[10]	
Total Population	2,534
Population Density (people/km2)	23.1
Population percentage change between 2016 and 2021	4.9
Number of people <14 years old	19
Number of people 15-64 years old	62
Number of people >65 years old	**20**
Median Age (years)	**44.6**
Housing[10]	
Total private dwellings (year)	**1,177**
Private dwellings permanently occupied	**94.1**
Average household size	2.3
Income and Employment[11]	
Median Total Income of Households	$67,797

[10] 2021 Canadian Census Data.
[11] 2020 Canadian Census Data.

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 eligible for funding under the 2024 CRI FCFS Program Guide, which is addressed in Section 5.3. 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 EA-I's WUI as identified by the RDCK,[12] in meetings with EA-I staff, and outlined in the 2023 RDCK Community Risk Assessment. This list should not be considered as whole and complete, but rather a starting point for what should be considered as critical infrastructure. This list should be amended as required to add/remove new/excluded or outdated infrastructure so all are available for Community Asset FireSmart activities. The assets operated by the RDCK are the Tarrys Fire Hall and Pass Creek Fire Hall. Water and electric systems are discussed in more detail in Sections 3.3.1 and 3.3.2. Critical infrastructure FireSmart Assessments were outside the scope of this plan. At the time of writing, FireSmart Critical Infrastructure Assessments have been conducted on all firehalls within EA-I. Map 2 presents a visual display of values at risk throughout the eligible WUI.

Table 8: Critical Infrastructure and community assets within EA I's WUI.

Map ID	Description	Community or Location	Name
Government / Community			
I-30	Community Hall	Pass Creek	Pass Creek Community Hall
I-31	Community Hall	Shoreacres	Shoreacres Community Hall
I-32	Community Hall	Tarrys	Tarrys & District Community Hall
I-33	Community Hall	Glade	Glade Community Hall
I-34	Community Hall	Brilliant	Brilliant Cultural Centre
Utilities			
I-75	Electrical or Generator	Thrums	Brilliant Power Corp.
I-76	Electrical or Generator	Glade	Brilliant Power Corp.
Emergency Response			
I-35	Fire Hall	Tarrys	Tarrys Fire Hall
I-36	Fire Hall	Pass Creek	Pass Creek Fire Hall
I-73	Fire Hall	Shoreacres	BCWS Arrow Fire Zone Office
I-70	Telecommunications	Brilliant	Telecommunications Tower (Telus)

[12] RDCK maintains a comprehensive database of critical infrastructure GIS point data and was provided as part of this Plan's development.

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 that travel north-south, positioned upslope and to the east of the Glade community. 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 EA-I 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 #27 in Section 5.5).

Residential power is provided by a network of wood-pole distribution lines. In general, poles and lines are well-maintained with adequate vegetation setbacks. Nevertheless, some poles are surrounded by tall, unmaintained grass, warranting maintenance considerations to ensure reliable and safe electricity throughout the electoral area.

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. The Voykin Improvement Water District has a backup diesel powered pump, but it is unknown if any Local Government assets (including fire halls) have them. It is recommended that RDCK and EA-I review additional critical infrastructure and invest in back-up generators as required (see Recommendation #32 in Section 5.5).

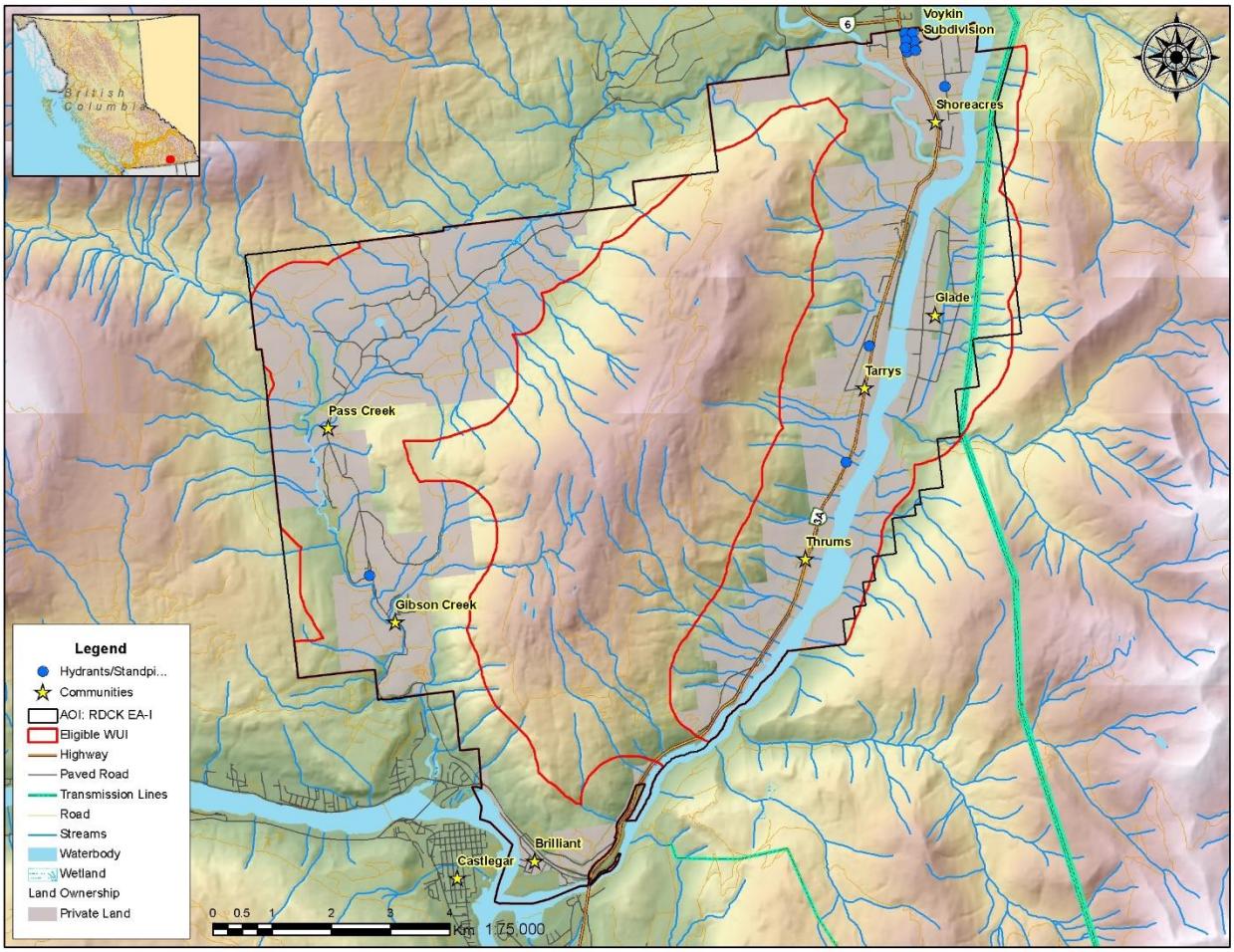
3.3.2 WATER AND SEWAGE

Water supply within EA-I primarily relies on surface water points of diversion and private groundwater resources, except for Glade, Voykin Subdivision and Upper Pass Creek neighbourhoods, which are served by private water systems. A critical aspect of wildfire preparedness is assessing the availability of fire hydrants – of which there are few in EA-I communities. Shown on Map 2, Voykin Sub-division has six rated fire hydrants that are only authorized for fire protection within the sub-division; Shoreacres has one standpipe that feeds a 6,000 gallon underground holding tank; Pass Creek has one fire hydrant; and, Glade has one unrated hydrant (that is not used by the fire department). EA-I Fire Response Area fire departments (Tarrys and Pass Creek) have noted that the supply of water available for fire response within their response areas from available fire hydrants is only able to be used for structures in their immediate vicinity.[13]

[13] Information provided to B.A. Blackwell & Associates from Tarrys Fire Department via information gathering questionnaire.

For the many areas not serviced by hydrants, the Tarrys Fire Department has a 17,000-gallon holding tank at their fire hall and a further 6,000-gallon holding tank in Shoreacres. Kalesnikoff Lumber also has two holding tanks for a total of 403,000 gallons which Tarrys Fire Department is authorized us to use for structure/wildland fires. In the many areas not serviced by hydrants, the department mainly drafts water from the Kootenay River at known access points.

Surface water sources are plentiful throughout the WUI and contribute to water availability for firefighting. The most reliable source of year-round water for firefighting is from the Kootenay River. Other sources (i.e., ponds, creeks, etc.) are known, but not mapped. See Section 5.4 for recommendations related to fire department resources.



Map 2: Hydrant and standpipe locations within EA-I's WUI.

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 is stored can be considered a hazardous value. Protecting hazardous values from fires is important to preventing interface fire disasters.

It was noted in the 2023 RDCK Community Risk Assessment that hazardous materials are transported by truck (Highway 3 and Highway 3A) and train throughout the area. Fire ignition data presented in Section 4.2.2 – Historical Wildfire Occurrences display the concentration of human-caused fire ignitions along the transportation route. As such, it is important for the Ministry of Transportation (MOT) to continue to employ best management practices in maintaining the grass and vegetation along the highway right-of-way. The CP Railway traverses the WUI parallel to the highway and represents another potential ignition source, particularly if vegetation becomes overgrown along the tracks. The risk is heightened where adjacent private properties have coniferous vegetation and/or unmaintained grass.

Additional hazardous infrastructure includes the Kalesnikoff Lumber Mill (in Tarrys along Highway 3A) which may store a substantial amount of wood fibre fuel at any given time, and industrial and hobby farms that likely store gas, oil, and/or fertilizer. Education and associated recommendations regarding FireSmart principles for hazardous materials storage are discussed in Section 5.2. Recommendations associated with industry stakeholders are discussed in Section 5.5.

3.3.4 CULTURAL VALUES

There are documented and registered historic (with a particular focus on the prevalent Doukhobor and mining history of the area) and archeological sites within the WUI and a high potential for additional sites to be found given the long history of use by First Nations (including Syilx Okanagan Nation). Known archeological sites are protected under the Heritage Conservation Act, which applies to both private and public lands.

RDCK 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 First Nations 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

There are multiple high environmental values throughout the RDCK. Specific to EA-I, there are significant proximities to provincial parks and regional parks. Additionally, EA-I's WUI has significant overlaps with species and ecosystems at risk identified through the B.C. Conservation Data Center and by the federal government (), including a significant population of bats. Of these species, three are considered at risk

and include the fringed myotis, northern myotis, and Townsend's big-eared bat.[14] 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.

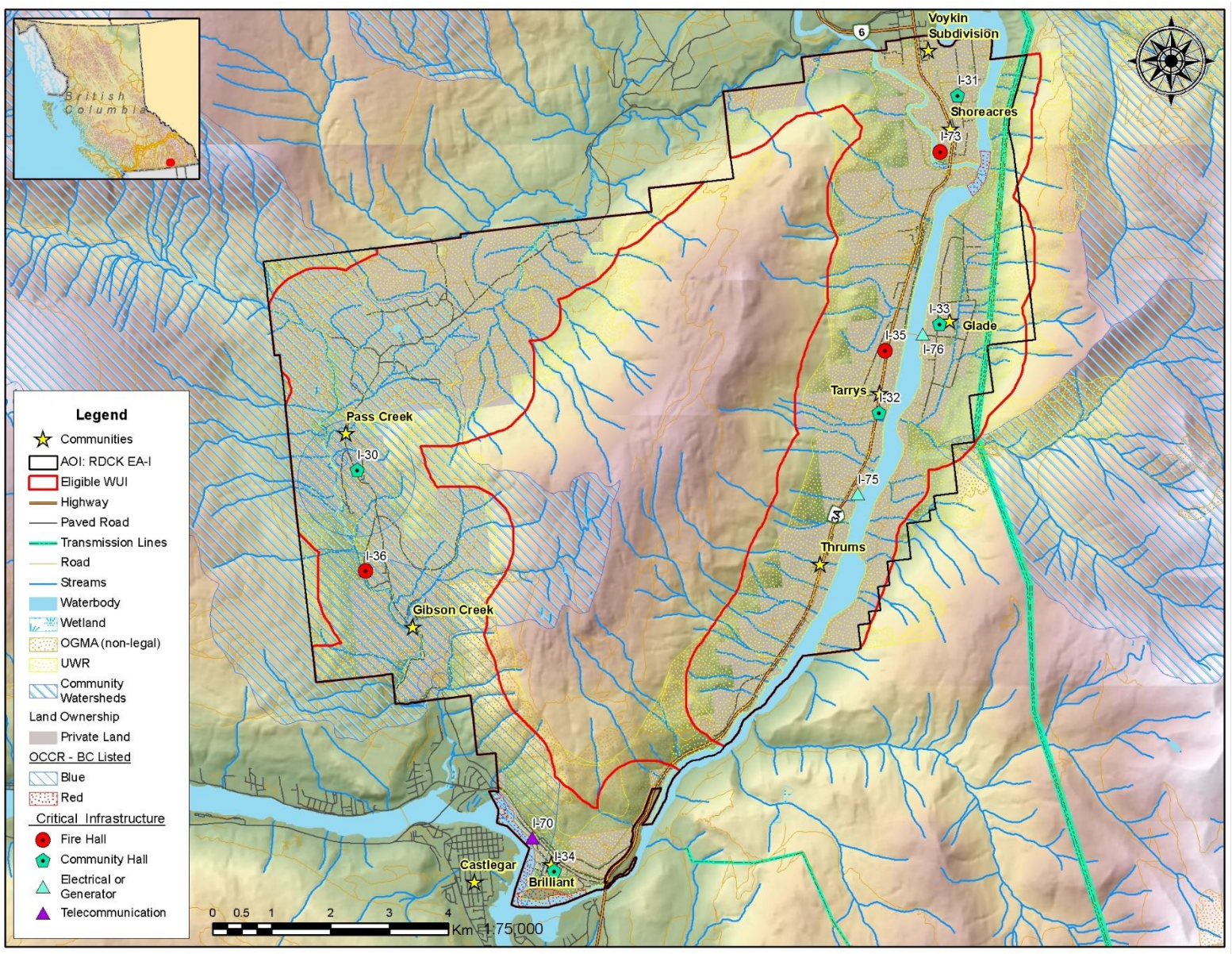
Table 9: Species and Ecosystems at Risk in the WUI – BC Conservation Data Center.

Scientific Name	English Name	Category	BC List	Habitat Type
Acipenser transmontanus pop. 2	White Sturgeon (Upper Columbia River Population)	Vertebrate Animal	Red	RIVERINE: Big River; High Gradient; Moderate Gradient; Pool
Ardea herodias herodias	Great Blue Heron, Herodias Subspecies	Vertebrate Animal	Blue	TERRESTRIAL: Forest needleleaf
Astragalus microcystis	Least Bladdery Milk-vetch	Vascular Plant	Blue	TERRESTRIAL
Chrysemys picta pop. 2	Painted Turtle - Intermountain - Rocky Mountain Population	Vertebrate Animal	Blue	RIVERINE: Slough
Cottus confusus	Shorthead Sculpin	Vertebrate Animal	Blue	RIVERINE; CREEK; MEDIUM RIVER; HIGH GRADIENT; MODERATE GRADIENT
Cottus hubbsi	Columbia Sculpin	Vertebrate Animal	Blue	RIVERINE; BIG RIVER
Dolichonyx oryzivorus	Bobolink	Vertebrate Animal	Blue	TERRESTRIAL; GRASSLAND/HERBACEOUS
Megascops kennicottii macfarlanei	Western Screech-owl, Macfarlanei Subspecies	Vertebrate Animal	Blue	TERRESTRIAL: Forest Mixed; Woodland Mixed, Roadside; RIVERINE: Riparian
Melanerpes lewis	Lewis's Woodpecker	Vertebrate Animal	Blue	RIVERINE: Riparian; TERRESTRIAL: Snag/Hollow Tree; Old Field; Suburban/Orchard; Roadside
Rhinichthys umatilla	Umatilla Dace	Vertebrate Animal	Red	RIVERINE; MEDIUM RIVER; HIGH GRADIENT; MODERATE GRADIENT

3.3.6 OTHER RESOURCE VALUES

There are multiple other important resource values associated with the land base, including forestry, agriculture (commercial and hobby farms), recreation, and tourism. Any fuel management within EA-I's WUI should consider the impact on any of these additional values and consult with appropriate land managers and organized recreation groups in the area. Recommendations associated with industry stakeholders are discussed in Section 5.5.

[14] https://www2.gov.bc.ca/assets/gov/environment/pesticides-and-pest-management/managing-pests/bats/kcbp_bats.pdf



Map 3: Values at Risk map for EA-I's WUI.

SECTION 4: WILDFIRE RISK ASSESSMENT

This section summarizes the factors that contribute to local wildfire risk in EA-I. Section 4.1 discusses the wildfire environment in the WUI: focusing on topography, fuel, and weather. Section 4.2 discusses wildfire history in the area. 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 complements the broader scale RDCK Emergency Response and Recovery 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 2); 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.

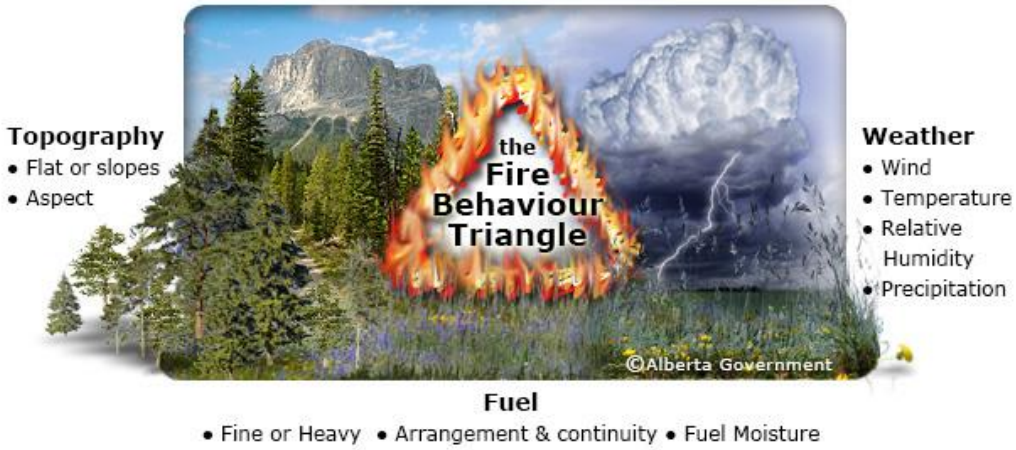


Figure 2: Graphic display of the fire behaviour triangle, and a subset of characteristics within each component.[15]

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.

The topography of EA-I plays a significant role in influencing wildfire behavior and the associated risks to the community. Most communities are situated in the foothills of Sentinel Mountain and near the confluence of the Kootenay and Columbia Rivers. Much of the residential development is positioned along the flat terraces of the Kootenay River, while other neighbourhoods are tucked behind the north face of Sentinel Mountain. Steep, rugged terrain characterizes the mountain which naturally restricts development patterns. As a result, homes are primarily concentrated on the mountain's flat foothills and adjacent river terraces where the topography is more amenable to construction and community growth. This development layout situates homes on flat terrain in the valley bottom, which offers certain advantages in terms of wildfire risk. Notably, homes in these areas would not have their fire rates of spread significantly influenced by topography alone due to their valley-bottom location. The flat terrain of residential development also facilitates water suppression availability for emergency services.

Continuous forested land extends upslope from many residential developments. These forested slopes have the potential to accelerate the rate of fire spread uphill. The steep terrain and access challenges of these slopes can pose challenges for wildfire mitigation and suppression efforts.

Table 10 (and displayed on Map 4) presents a breakdown of the WUI based on slope steepness classes, with implications for fire behaviour. Notably, approximately 42% of the WUI (predominantly on upper south and east sides of Sentinel Mountain, as well as upslope (east) of Glade) features slopes exceeding

[15] Graphic adopted from the Province of Alberta.

30%. These steep slopes can significantly accelerate the rate of fire spread uphill, posing increased fire behavior challenges.

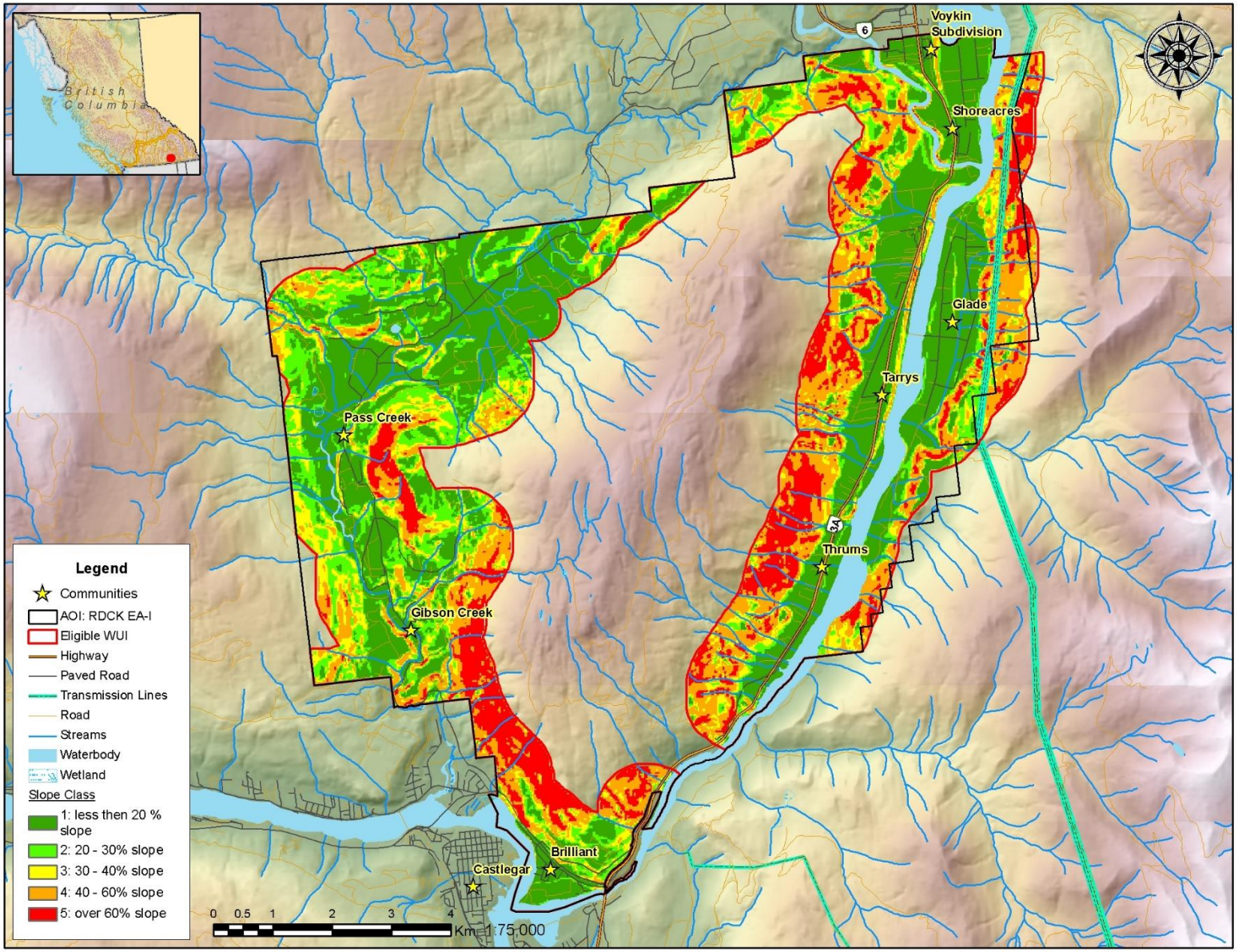
Table 10: Slope Percentage and Fire Behaviour Implications.

Slope	Percent of Eligible WUI	Fire Behaviour Implications
<20%	44%	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	14%	Flame tilt begins to preheat fuel, increase rate of spread.
31-40%	12%	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
41-60%	19%	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	11%	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

Slope-associated *fire risk* is dependent upon the slope position (location) of values, described below in Table 11. Values located in the middle and upper slopes 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 EA-I's communities are located at valley and slope bottoms, on grades <30%, so would not have increased fire behaviour risks influenced by topography and slope position alone. However, there are neighbourhoods, homes, and structures that are middle slope, and these would be threatened by faster rates of slope-driven fire spread. For EA-I, the key topographical feature affecting potential fire behaviour is the presence of continuous forest fuels on all slopes and aspects of Sentinel Mountain. This landscape composition implies that accelerated rates of fire spread are a potential concern, particularly if a fire were to move uphill from structures into the wildland.

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 4: Slope, by slope classes, for EA-I'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, understanding the distribution, type, and management of wildland fuels within Electoral Area I's WUI is vital for developing effective wildfire mitigation and management strategies. 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 EA-I's WUI.

EA-I exhibits a unique mix of vegetative communities that are influenced by human activities and the region's natural geography. Land clearing for agriculture and residential development has significantly shaped the vegetative landscape in the valley bottom. This process has resulted in expansive swaths of cleared and irrigated farmland and lawns. If well-maintained, these clearings effectively reduce the wildfire threat, creating natural firebreaks within the community.

Neighbourhoods built along the Kootenay River watershed, such as Glade and Shoreacres, along Pass Creek and on the Columbia and Kootenay River convergence floodplain (i.e., Brilliant) exhibit a riparian influence. These areas typically feature deciduous vegetation interspersed amongst structures. Deciduous vegetation, with its higher moisture content and characteristics, can reduce fire behaviour dynamics, acting as a mitigating factor in wildfire risk.

The forested slopes both within and outside EA-I's WUI have experienced a significant amount of past, recent, and ongoing logging. Past logging, combined with historically suppressed wildfires throughout the 1900s, has resulted in a relatively continuous distribution of even-aged conifer stands. Importantly, management of reduced slash (harvest debris) in WUI harvested areas is paramount towards further reducing their wildfire behaviour and potential risk to nearby neighbourhoods and adjacent communities. Most homes in the electoral area have adequate forest setbacks, often characterized by long, narrow irrigated properties. However, some homes in Gibsons Creek, Tarry and Thrums have coniferous vegetation within Home Ignition Zones, which requires vigilant maintenance to reduce the wildfire risk.

The Canadian Forest Fire Behaviour Prediction (FBP) System outlines sixteen fuel types based on characteristic fire behaviour under defined conditions.[16] BC Wildfire Service maintains a provincial fuel type layer that was confirmed and updated for this CWRP. It should be noted that mixed conifer stands[17] in the interior wet belt, of which EA-Is WUI is within, are one of the specifically identified areas of uncertainty and knowledge gaps within the FBP system and are considered, at best, a poor match with any fuel type.[18] 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

[16] Forestry Canada Fire Danger Group. 1992. Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.
[17] Species such as western white pine and western larch growing in multi-story canopies, usually associated with Douglas-fir, redcedar, lodgepole pine, or other species.
[18] Natural Resources Canada. 2018. British Columbia Wildfire Fuel Typing and Fuel Type Layer Description. Daniel D.B. Perrakis, George Eade, and Dana Hicks

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.[19] 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 EA-I's eligible WUI. Two of the most hazardous fuel types in the area are C-3 and O-1a/b. C-3 fuel types typically consist of fully stocked, late young forests often with varying crown base heights. Continuous forest land adjacent to residential neighborhoods are often characterized as C-3 fuel types. These areas are susceptible to both surface and crown fires, exhibiting a wide range of fire intensity and rate of spread. Crown fires and spotting potential are high in C-3 fuel types. The rapid rate of fire spread and intense flames pose significant challenges to wildfire management efforts. O-1a/b fuel types are often found on south-facing slopes above Brilliant and scattered throughout residential areas. These areas are characterized by matted and standing grass that can cure, as well as sparse or scattered shrubs, trees, and down woody debris. O-1a/b fuel types can sustain rapidly spreading, high-intensity surface fires, especially when grasses are tall and unmaintained. The potential for active fire behaviour is significant in these areas, making them a focal point for fuel management.

The often drier and rockier steeper middle slopes of Sentinel Mountain (along with south and west facing aspects) are dominated by C-5 and C-7 fuel types. These can support a rapidly spreading surface fire capable of damage or destruction of property and jeopardizing human life, but the fire behaviour potential in these fuel types is recognized as highly variable dependent on the percentage of grass and shrub 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 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[20] (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 B-1: Fuel Typing Methodology.

Table 12: Fuel types in EA-I's Wildland Urban Interface.

Fuel Type	Fuel Type Description within the WUI	Area (ha)	Percent (%) of Public land	% of *assessable* WUI area (waterbodies removed)
C-3	Fully stocked, late young conifer stands with crowns separated from the ground. Moderate to high surface fuel loading from self-pruning and stem exclusion.	123	4%	**4%**

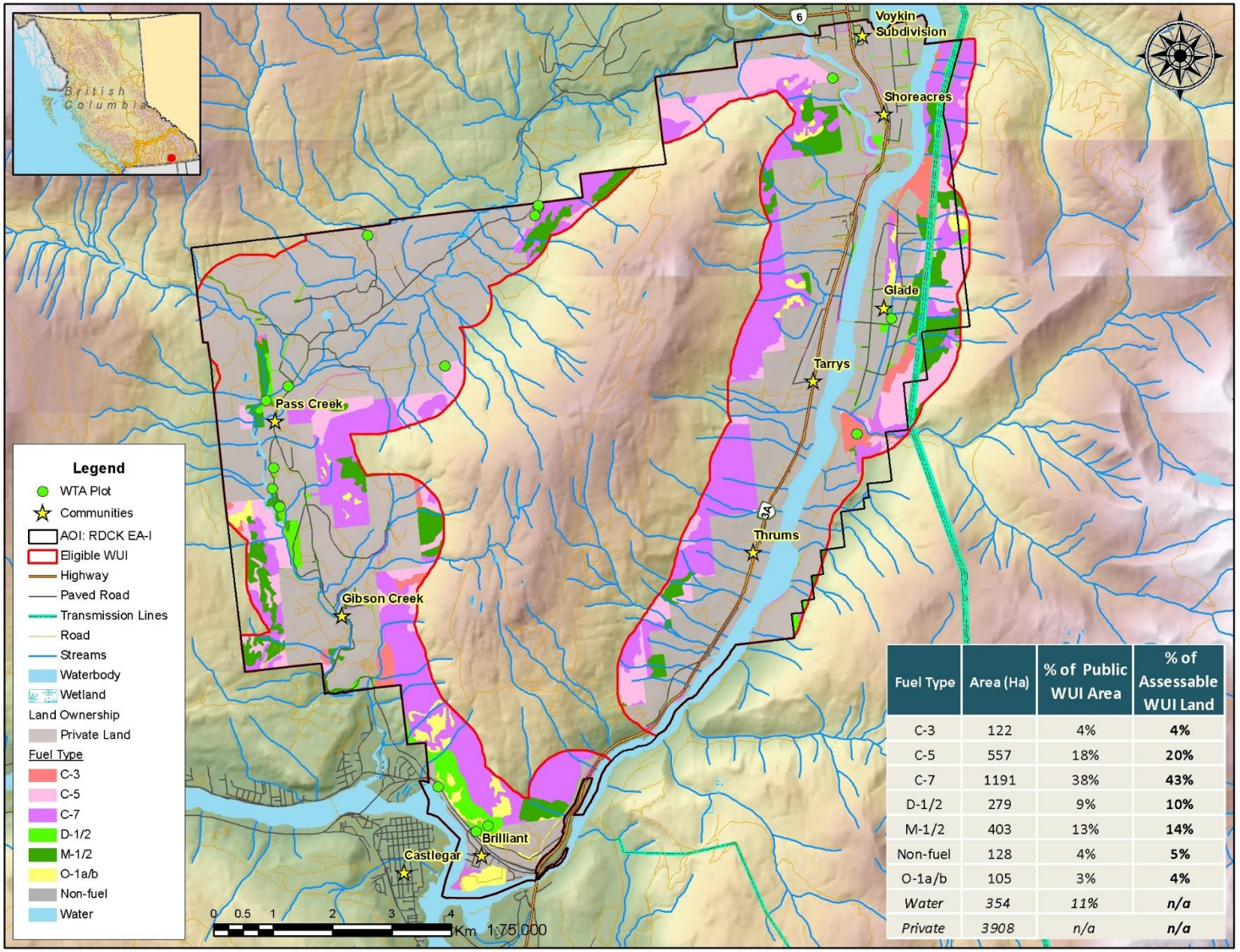
[19] Perrakis, D, G. Eade and D. Hicks. 2018. Canadian Forest Service Pacific Forestry Centre. British Columbia Wildfire Fuel Typing and Fuel Type Layer Description

[20] 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.

Fuel Type	Fuel Type Description within the WUI	Area (ha)	Percent (%) of Public land	% of *assessable* WUI area (waterbodies removed)
C-5	Well-stocked mature forest, crowns separated from ground. Moderate understory herbs and shrubs. Little grass or surface fuel accumulation.	557	18%	**20%**
C-7	Mature and open forest stands with a mix of flashy grass fuels and lower flammability shrubs. Often located on south-facing slopes and throughout the ICHxw.	1191	38%	**43%**
D-1/2	Deciduous stands/forest. Hazard increases with the amount of deadfall and/or establishment of a flammable shrub layer.	279	9%	**10%**
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.[21]	403	13%	**14%**
O-1a/b	Grassland fuels ('a' refers to matted grasses, 'b' refers to standing). The volatility of this fuel type depends on the percentage of grass that is cured.	105	3%	**4%**
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	4%	**5%**
Water	Water and riparian features (e.g., rivers, streams, waterbodies, wetlands	354.	11%	**n/a**

Map 5 below displays the updated fuel types for EA-I's WUI.

[21] Larch was treated as deciduous during fuel typing to account for its high moisture content.



Fuel Type	Area (Ha)	% of Public WUI Area	% of Assessable WUI Land
C-3	122	4%	**4%**
C-5	557	18%	**20%**
C-7	1191	38%	**43%**
D-1/2	279	9%	**10%**
M-1/2	403	13%	**14%**
Non-fuel	128	4%	**5%**
O-1a/b	105	3%	**4%**
Water	*354*	*11%*	***n/a***
Private	*3908*	*n/a*	***n/a***

Map 5. Updated fuel types in EA-I's WUI.

4.1.3 WEATHER

Weather conditions, including relative humidity and wind, along with drought, play pivotal roles in wildfire behaviour. The intricacies of local topography can result in unpredictable and variable weather patterns, further emphasizing the significance of weather as a primary environmental factor influencing fire behaviour. EA-I's weather patterns are considerable variable and are strongly influenced by local topography and other factors. Summers are relatively short, warm and dry, while winters bring freezing temperatures, heavy snowfall, and mostly cloudy conditions. During the summer months, the regional district experiences hot and dry conditions, with occasional periods of extreme heat. Climate change projections suggest intensifying these trends, pointing toward even hotter summers and more pronounced droughts. These conditions create an environment conducive to increased wildfire behaviour, particularly in the context of the region's complex topography.

The local climatic profile of neighbourhoods is influenced by their geographical location in respect to Sentinel Mountain. The varying geographical positions have distinct effects on weather patterns, influencing potential wildfire behaviour respectively. Communities situated on the north side of Sentinel Mountain, such as Pass Creek and Gibsons Creek, experience a climate characterized by more shade and higher precipitation levels. The mountain acts as a natural barrier, intercepting moisture-laden air masses, resulting in relatively cooler and moister conditions. In contrast, south-facing neighborhoods like Tarrys, Thrums, Shoreacres, Glad, and the Voykin Subdivision are more exposed to sunlight, resulting in warmer, sunnier conditions that contribute to lower humidity levels. Forests on south-facing slopes may exhibit drier characteristics which can support more hazardous fire behaviour, as the vegetation in these areas may have lower moisture content making it susceptible to ignition and rapid fire spread.

Historical weather data can provide information on the number and distribution of days when EA-I's WUI communities 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 EA-I can be determined from representative BCWS fire weather stations. Located across from Blewett on the north side of Kootenay Lake, east of Garrity Creek, the Smallwood BCWS fire weather station (997m elevation; Nelson is at 535m elevation); is the most representative for EA-I's WUI. Averages for the past 12 years are presented in below in Figure 3.

Data from the Smallwood fire weather station shows that July and August have the greatest number of High and Extreme fire danger days, with July averaging 8 and August averaging 15. When combined, 38% of days in those two months exhibit High or Extreme fire danger. It is important to note that High fire danger days are present in both June and September within EA-I's WUI.

Overall, it is most likely that fire weather and associated fire danger days blends across EA-I's WUI south to north, from averaging a higher number of High and Extreme fire danger days in its more southern areas, to a lower number of fire danger days in its northern areas. However, the data does show that EA-I's WUI is at risk due to fire season weather.

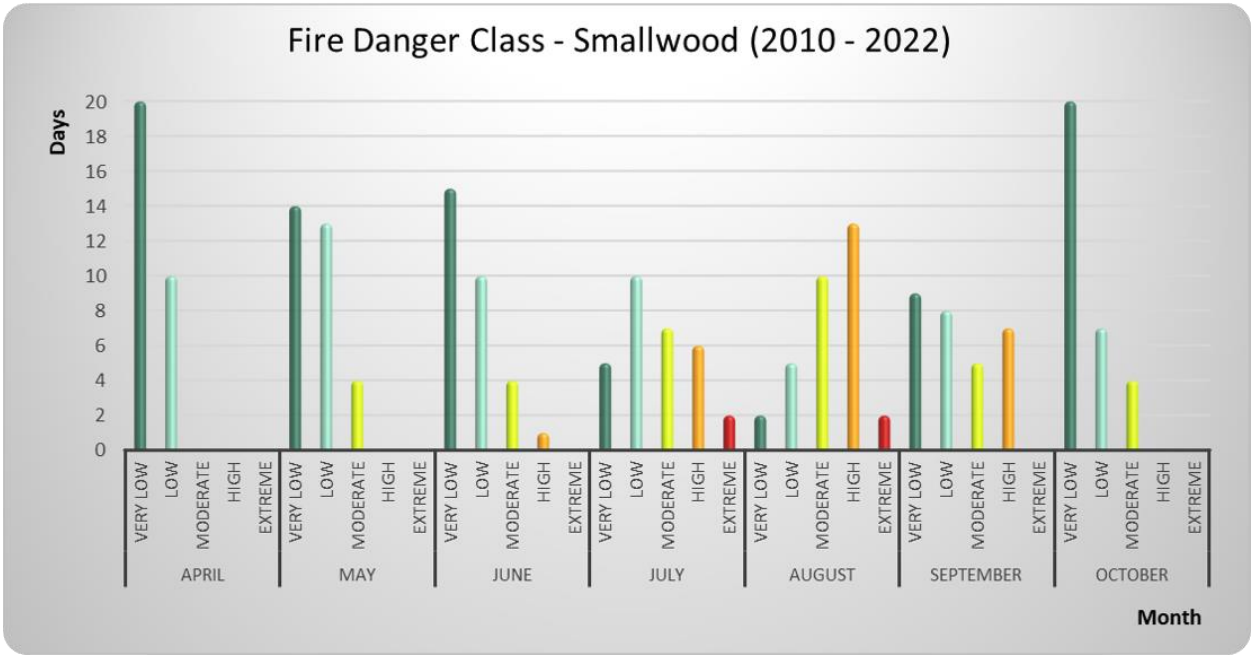


Figure 3: Average number of fire danger rating days by month for the Smallwood fire weather station.

Wind speed and direction are also critical weather components influencing fire behavior, and wind speed and direction are also recorded at BCWS weather stations. Data is publicly available in the form of average Initial Spread Index (ISI) roses.[22] 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.

During the fire season, the Smallwood fire weather station indicates (Figure 4) that EA-I 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 ISI roses, the highest ISI wind directions likely originate from the south, which would drive fire spread in a general northernly direction. July and August are peak wind-driven fire spread months, with strong winds (high ISI values coinciding with the highest temperatures).

The local BCWS Wildfire Prevention Officer noted that high elevation spruce/balsam stands [largely just uphill and outside EA-I's WUI] tend to exhibit the most aggressive and volatile growth in the region. Middle elevation mixed stands of Douglas-fir, larch, and pine species [largely within the upper slopes of EA-I's WUI] can be volatile as well, however, typically less so than the higher spruce/balsam stands. Low elevation western red cedar/western hemlock stands [largely within the lower slopes of EA-I's WUI] exhibit the least volatility, unless certain fuel and weather conditions are met. Importantly, as fuel

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

conditions dry out in the summer and combine with specific weather events (wind, low humidity, hotter temperatures), these fuel types can react with intensity and exhibit aggressive fire behavior. Echoing the sentiments of the firefighting ground crews encountered during Plan development field assessment work, winds are required to create volatility and fire growth in the fuel types in EA-I and are also required to push fire aggressively downslope towards communities.

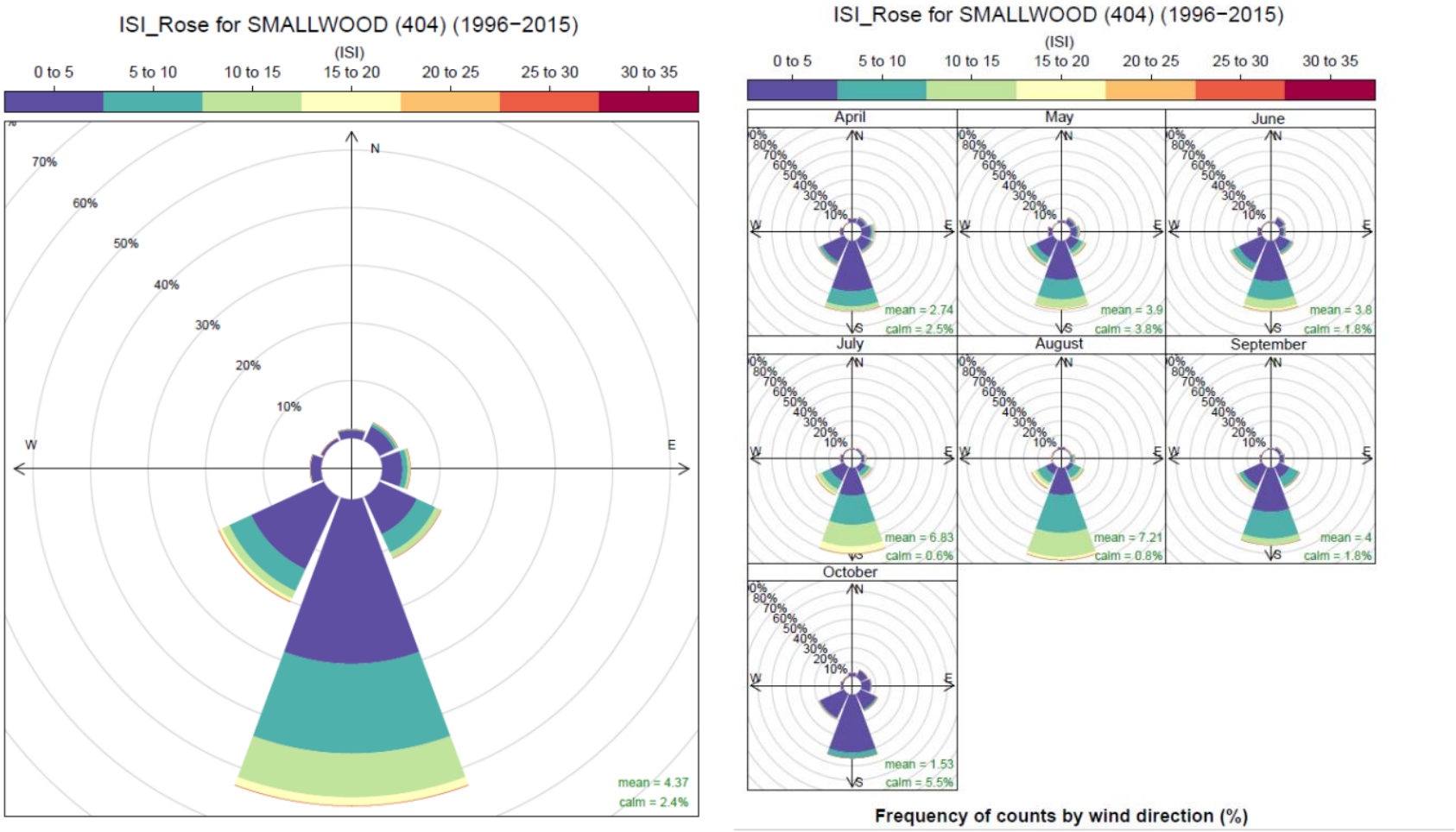


Figure 4. Daily and monthly average initial spread index rose for Smallwood fire weather station for the fire season (April – October)

4.2 WILDFIRE HISTORY

4.2.1 HISTORIC FIRE REGIME

EA-I'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.

Map 6, in Section 4.2.2 below, shows the distribution of Biogeoclimatic zones and associated Natural Disturbance Types (NDTs) in EA-I's WUI. Summarized in Table 13, the middle and lower slopes are predominantly within the Interior Cedar Hemlock, Very Dry Warm (ICHxw) subzone with an associated NDT4 – ecosystems with frequent stand-maintaining fires. 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, sapling size regenerating trees.[23] 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.[23] Larger stand-initiating crown fires may be rarer, but historically occurred at intervals ranging from at least 150 to 250 years.[23]

The upper slopes of EA-I's WUI are dominated by the Interior Cedar Hemlock, Dry Warm (ICHdw1) subzone with an associated NDT3 – ecosystems with frequent stand-initiating events.[23] These ecosystems are characterized by frequent wildfires that range from small spot fires to conflagrations covering tens of thousands of hectares.[23] This results in a landscape mosaic of stands of different ages with individual stands being even-aged.[23] Larger fires often occurred, and could grow to enormous sizes if no topographical-limiting features were present. The mean return interval for fire in the ICH NDT3 is approximately 150 years.[23]

It is important to consider that fire regimes in the region were likely exemplified through pre-settlement cultural burning practices by First Nations. It is also important to consider that, in the future, BEC (and associated NDT) distributions will likely shift and/or change because of climate change.

Table 13: Natural Disturbance Types (NDTs) of Electoral Area I's WUI.

Biogeoclimatic Zone	Natural Disturbance Type	Area (ha)	Percent (%)
Interior Cedar Hemlock, Dry Warm	NDT3	1756	25%
Interior Cedar Hemlock, Very Dry Warm	NDT4	5292	75%

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

4.2.2 HISTORICAL WILDFIRE OCCURENCES

Historic wildfire perimeters, from 1912-2022, are displayed below on on Map 6 for an area within five kilometres of EA-I's WUI. Several large fires have occurred in the area since the 1900s. In the 1960s, a significant human-caused fire scorched approximately 2,777 hectares, burning from Gibsons Creek up Sentinel Mountain. Historical records also indicate several small to medium-sized fires in Pass Creek during the 1910s, 1920s, and 1930s, likely attributed to forestry activities and land-clearing practices. Recent fires in EA-I include a 2015 human-caused fire resulting from a rollover incident in Pass Creek, as well as a smaller fire in 2021 from a similar rollover event in the same area. The majority of reported fire ignitions in the area are human-caused, with many of these ignitions occurring along the highway. Lightning ignitions, although less common, can be a concern, particularly on the tops of slopes where fire behavior can be challenging to control.

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 EA-I's WUI, 764 out of 946 (81%) recorded ignitions have been from people. 180 (24%) of those human caused ignitions were recorded from 2000 onwards. This data, and the fire perimeter data above, both show that humans are historically the leading cause of fire ignition in EA-I's WUI.

Although human ignitions are the dominant source for point ignitions historically, lightning is still a very real ignition threat, and is the leading cause of ignition in higher elevations on slopes and ridges within 5km of EA-I's WUI. Overall, under the right fire weather conditions, fires started from any ignition source in the wildland can grow in size and threaten the WUI.

Figure 5 displays trends with fire ignitions since the 1950's *within EA-I's WUI*. It is not surprising that, due to the much greater presence of people within the WUI than outside of it, humans are the leading cause of ignitions. Of the 284 recorded ignitions within the WUI, 84% were attributed to humans or human-related factors. Furthermore, the data shows that only 19% of these human-caused ignitions occurred from 2000 onwards – this could indicate increased awareness and education among residents about fire prevention. In contrast, lightning-initiated fires constituted only 13% of the recorded ignitions, with 22% of these lightning-related incidents taking place after 2000.

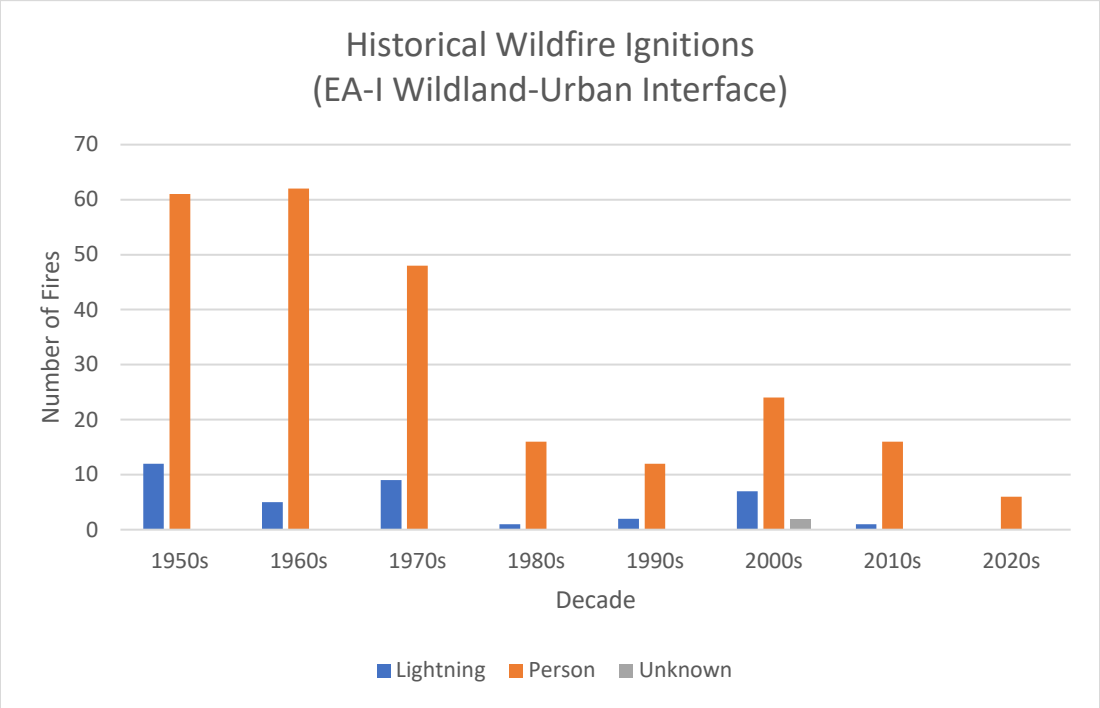
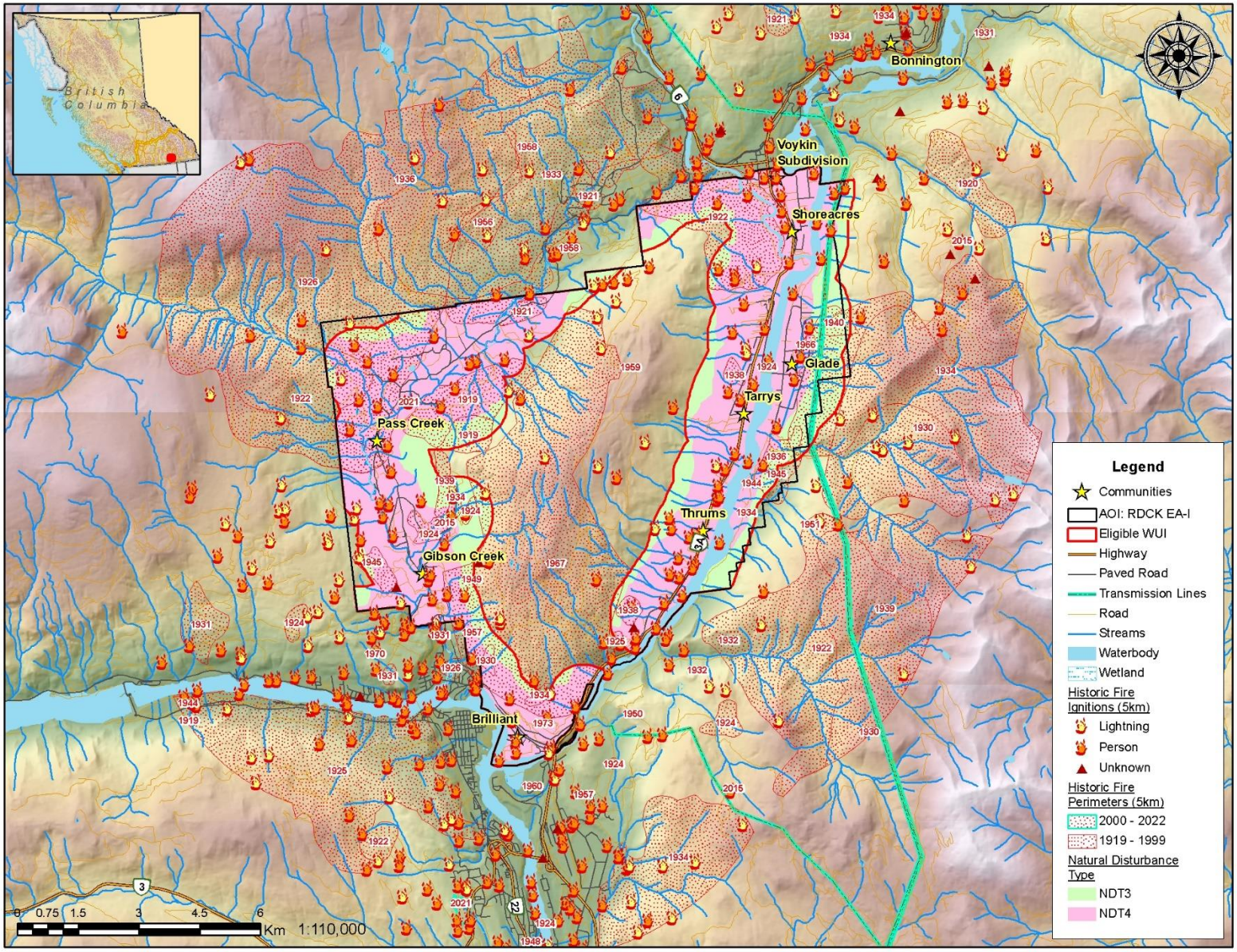


Figure 5: Summary of fire ignition data by cause within EA-I's WUI (Data from BCWS).



Map 6: Natural disturbance regimes and historical fire ignitions and occurrences for EA-I's WUI and a five-kilometer area surrounding.

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 B: 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 B-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 B-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.
- *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 EA-I's WUI was completed in August of 2023. 70 field stops (e.g., qualitative FireSmart notes, fuel type updates/verification, photograph documentation) were made across the WUI (see Appendix B-2: Wildfire Threat Assessment Plots and Map 5), including 10 Wildfire Threat Assessment (WTA) threat plots (see Appendix C: 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, as well as in completed fuel treatment areas to quantify the reduction in site-level wildfire threat. Constraints such as the limited amount of public land within some parts of the WUI available for assessment, and/or limited accessibility into the WUI (e.g., access required through private property; no roads), limited field assessments for some areas.

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 7 and summarized in Table 14 below. The local threat analysis shows that, for the assessable area (i.e., not private land and removing large water bodies like Kootenay River), 32% is represented by High to Extreme wildfire behaviour landscapes. High and Extreme fire wildfire threat areas in EA-I encompass forested slopes of the southern portion of Sentinel Mountain as well as forest land along the west facing eastern slopes of the Glade neighbourhood. Forested slopes with extreme fire threat ratings (4% of public land) are characterized by densely stocked second-growth stands often with moderate to high surface fuel loading on the forest floor, while high wildfire behaviour forests (28%) are typically more open with a mix of grassy fuels and deciduous shrubs dominating the understory. Both often have a drier south or west aspect component. 60% of the landscape is classified as a Moderate wildfire behaviour threat, represented by a mosaic of open-grown forests and grasslands, often on lower and gentler slopes and/or with cooler north and east aspects. Overall, private land totals 55% of EA-I'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 EA-I during field work.

Table 14: Wildfire threat summary for Electoral Area I's eligible WUI

Wildfire Threat			
Threat Class	**Hectares**	**% of WUI**	**% of Assessable Public Land**
Extreme	122	2%	**4%**
High	768	11%	**28%**
Moderate	1660	24%	**60%**
Low	236	3%	**8%**
Very Low/No Threat (Water)	354	5%	-
No Data (Private Land)	3908	**55%**	-

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 15 below (and also displayed on Map 7) summarizes the risk class ratings within the WUI. Of the 890 hectares assigned a High or Extreme wildfire threat class, 297 hectares (32%) have a High or Extreme WUI risk. This analysis provides an initial step towards identifying priority areas/neighbourhoods for directing FireSmart education 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 High to Extreme WUI risk areas is unlikely to be a silver bullet in protecting communities and structures. 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 EA-I's WUI communities and interface/intermix 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 are not a comprehensive list of all areas that qualify for management; they were selected as the highest priority areas that are practicable to implement, present a high risk to their respective communities, and meet required funding program goals and requirements as either fuel breaks or fuel treatment areas.

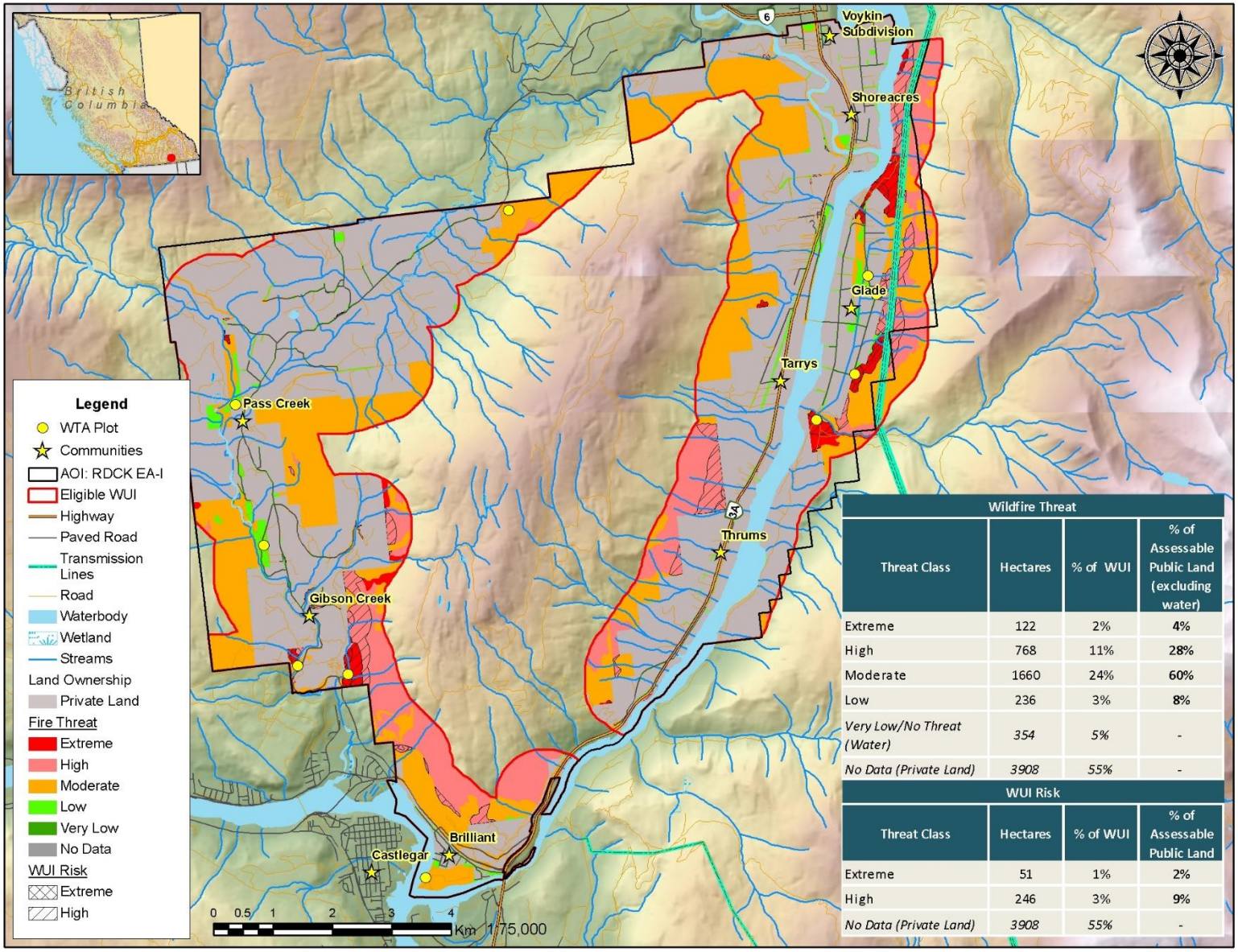
Table 15: WUI risk class ratings within the eligible WUI of the Village of Pemberton

WUI Risk			
Risk Class	**Hectares**	**% of WUI**	**% Assessable Public Land**
Extreme	51	1%	**2%**
High	246	3%	**9%**
N/A (Moderate, Low, or Very Low fire threat)	2249	32%	-
No Data (Private Land)	*3908*	*55%*	-

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.[24] 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. Electoral Area I's WUI is categorized as being in a Risk Class of 1 – highest relative risk.

[24] 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	% of WUI	% of Assessable Public Land (excluding water)
Extreme	122	2%	4%
High	768	11%	28%
Moderate	1660	24%	60%
Low	236	3%	8%
Very Low/No Threat (Water)	*354*	*5%*	-
No Data (Private Land)	*3908*	*55%*	-

WUI Risk			
Threat Class	Hectares	% of WUI	% of Assessable Public Land
Extreme	51	1%	2%
High	246	3%	9%
No Data (Private Land)	*3908*	*55%*	-

Map 7: Local wildfire threat assessment within EA-I's 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.[25] An HRVA was not noted for EA-I, however, the Emergency Response and Recovery Plan for the Regional District of Central Kootenay includes a section on interface wildfire planning (3.10) with listed potential impacts. When an HRVA is completed or updated for EA-I (or RDCK as a whole), RDCK should look to the most recent CWRPs and reference their completed wildfire threat class analyses as well as recommendations.

[25] 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. RDCK and EA-I has an active FireSmart program that is well staffed and funded to complete residential education activities.

Since EA-I's 2016 CWPP was completed, six of 34 of its recommendations have been wholly or partially implemented (previously detailed and discussed in Section 2.1). The recommendations addressed primarily related to delivering public FireSmart and wildfire education and prescribing and implementing proposed treatment units.

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.[26] Increasing ignition resistance would reduce the number of homes simultaneously on fire; extreme wildfire conditions do not necessarily result in WUI fire disasters.[27] Initial assessments of homes/structures damaged versus those not from the recent 2023 Kelowna-area wildfires provides strong evidence supporting these key points.[28] 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

[26] Cohen, J. Preventing Disaster Home Ignitability in the Wildland-urban Interface. Journal of Forestry. p 15 - 21.
[27] 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/.
[28] 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 EA-I were noted (Table 16). This incorporates field observations, the local risk assessment, and information from local government meetings and consultation.

Table 16: FireSmart vulnerability and resilience by neighbourhood.

Community	Vulnerability	Resilience
Gibson Creek	- Intermix neighbourhood. - Steep, broken terrain and continuous forest land abut neighbourhood to the east. - Single-access dead end roads (Lower Gibson Rd, Upper Gibson Rd, Gibson School Rd). - No fire hydrants.	- Within the Pass Creek FPA. - Homes on Pass Creek Rd & Winter Rd have large properties with irrigated lawns. - Bottom slope. - FireSmart vegetation management. completed on some properties. - Suppression waterlines exist on some properties. - Metals roofs are common.
Pass Creek	- Limited cellular service. - Interface to steep forest land to the east. - Narrow, dead-end roads (e.g., Goose Creek Rd, Suncrest Rd). - Retired vehicles and combustibles often abundant throughout rural properties. - No fire hydrants.	- Most homes are located on large, irrigated properties (Sandy Rd, Soukoroff Rd, Pass Creek Rd, Raven Rd etc.). - Within the Pass Creek FPA. - Fuel treatment units have been completed. - New developments generally have FireSmart-compliant building stock. - Wide turn-arounds at dead-end roads.
Brilliant	- Narrow roads. - No fire hydrants.	- Within Pass Creek's FPA. - Flat, fluvial terrace. - Deciduous-dominated vegetation. - Multiple ignition sources: railway, undesignated campsite, highway. - Building stock is generally FireSmart-compliant (stucco, asphalt etc.).
Thrums	- Interface to steep forest land to the west. - Railway and highway are potential ignition sources. - No fire hydrants.	- Within the Tarrys FPA. - Most homes have direct access to main access/egress route (Hwy 3A). - Irrigated lawns with deciduous. landscaping favoured. - Some homes have water access (Kootenay River).
Tarrys	- Interface to steep forest land to the west; some properties are intermixed - Potential ignition sources from railway and highway.	- Within the Tarrys FPA. - Most homes have direct access to main access/egress route (Hwy 3A).

Community	Vulnerability	Resilience
	- Dead-end roads commonly access homes (e.g., Lazeroff Rd, Kooznetsoff Rd). - No fire hydrants.	- Frontier road (Loff Rd) provides secondary access route.
Glade	- Egress challenges posed by ferryboat access. - Interface neighbourhood with hazardous fuel types to the east. - Forested bench (between Glade Rd and Upper Glade Rd). - No fire hydrants.	- Within the Tarrys FPA. - Bottom slope and flat terrain - Irrigated, well-maintained lawns. - Some homes have water access (Kootenay River). - FireSmart activities commonly practiced within HIZ.
Shoreacres	- Single road access/egress, with railway track crossing. - Interface neighbourhood. - Potential ignition source from nearby railway. - No fire hydrants.	- Within the Tarrys FPA. - Flat, fluvial terrace. - Well-maintained, irrigated properties. - Deciduous vegetation is favoured. - Some homes have water access (Kootenay River). - Close access to main egress route (Hwy 3A).
Voykin Subdivision	- Interface to continuous forest land to the west.	- Within Tarrys FPA - Fire hydrants (six). - Well-maintained irrigated lawns. - Adequate firewood storage setbacks.

The sections to follow provide information on each FireSmart discipline as it relates to EA-I. 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 EA-I. 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

Rural areas without fire services, or dependent upon small volunteer fire services, rely heavily on the coordination of local resources and the uptake of FireSmart initiatives to be prepared for a wildfire event. 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, and community level. The education discipline often supports the successful implementation of many other FireSmart disciplines by building awareness and understanding within both residents and visitors.

EA-I (via the RDCK FireSmart program and its own FireSmart Coordinator/Mitigation Specialist) has been actively engaging the community with a FireSmart education program. Despite FireSmart education efforts made by the electoral area Director and Tarrys Fire Chief, uptake has been noted as slow, reflected

in EA-I having one of the lowest rates of completing FireSmart assessments on homes.[29] Other FireSmart education activities that have been completed or are ongoing include:

- Distribution of FireSmart educational materials to residents,
- Social media updates with FireSmart information and fire danger ratings,
- Community FireSmart workshops and presentations, and
- Created FireSmart signage at completed community fuel treatments.

There are currently seven FireSmart Coordinators across multiple RDCK electoral areas. As these positions were all recently created, there could be many initial lessons learned that could be shared between them. RDCK FireSmart coordinators should look to plan regular meetings amongst themselves to share these lessons, as well as success and failures so that the region, as a whole, is working together towards a more wildfire resilient future. Additionally, as FireSmart Neighbourhood Champions (as part of the FireSmart Canada Neighbourhood Recognition Program – see Section 5.7) are identified, consider including them in these meetings so that FireSmart information and programming opportunities are taken back into each community.

To continue furthering FireSmart education initiatives, Table 17 below details recommended actions that EA-I can pursue. Because of the large amount of private property within EA-I's WUI, the observed general lack of adherence to FireSmart construction materials and landscaping, 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 EA-I to continue upon its FireSmart education successes, and to seek out new opportunities to engage with neighbourhoods or demographics not previously done or that have been difficult to so with to date. Not all activities/efforts 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 further into the community – then efforts can be refined and improved moving forwards. This includes tourists, of which there are many to EA-I's communities, recreation areas, and campsites, that may not be knowledgeable on FireSmart and the wildfire risks their actions may carry.

[29] Information from EA-I local government questionnaire. 56 Home Partners Program assessments have been completed in EA-I at the time of this report's writing.

Table 17: 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							
1	High	Continue to apply for funding and employ an EA-I FireSmart Coordinator/Mitigation Specialist.	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.	RDCK	2 years	EA-I has its own FireSmart program being managed by a local FireSmart Coordinator.	CRI FCFS up to cost maximums.
2	High	RDCK FireSmart Coordinators should plan regular meetings to discuss their successes, failures, and learnings. Consider adding, or having specific meetings with, FireSmart Community Neighbourhood Champions.	So that they can continue to improve the RDCK's FireSmart program and tailor it to their respective communities. Adding in Community Champions will allow them to further support their EA's communities, as well as get FireSmart messaging and opportunities back into the communities faster.	FireSmart Coordinators (RDCK)	ASAP and ongoing	RDCK FireSmart Coordinators are meeting more than once a year.	CRI FCFS funding as part of FireSmart Coordinator salaries.
3	High	Continue to promote FireSmart to EA-I residents at community events, public spaces, and through workshops using FireSmart branded material and printed manuals (Home and Landscaping) and/or a FireSmart Canada Community Preparedness Day. Show a united front by having local government, fire department members, and FireSmart coordinators at events together as much as possible.	Observed adherence and uptake of FireSmart principles on private property and many homes/structures in EA-I is lacking. 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. Tarrys Fire Chief noted the department had not been part of any public education events. Having representatives from all levels of response and government demonstrates the importance of FireSmart to the public.	EA-I / RDCK/ FireSmart Coordinator	Annually	Quantity of resources distributed/number of times used at events.	CRI FCFS up to cost maximums.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
4	High	Update RDCK'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).	RDCK	Annually	Website is continuously updated, as required.	CRI FCFS up to cost maximums.
5	High	Continue the FireSmart social media campaign, with updated FireSmart graphics and language, through various RDCK/EA-I 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.	EA-I / RDCK	Annually	FireSmart social media campaign continues.	CRI FCFS up to cost maximums.
6	High	Continue to promote FireSmart in School District 8 schools using the FireSmart Education Kit and other resources. Students residing in EA-I attend schools in Castlegar and South Slocan.	Great success has been made through BC schools with FireSmart outreach. Engaging with the community's younger population may increase uptake with all residents.	RDCK / School District 8	Annually	One FireSmart lesson delivered each year (minimum).	CRI FCFS; e.g. FireSmart Magnetic Board for $1,710.
7	High	Continue to promote free FireSmart Home Ignition Zone assessments and/or Home Partners Program assessments to residents.	FireSmart Home Ignition zone and Home Partners Program 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 an educational exercise, and can be funded completely through CRI FCFS. They are a requirement to qualify for the FireSmart rebate program (see Section 5.7).	EA-I / RDCK	2 years	FireSmart Home Ignition Zone assessments are being completed within EA-I.	CRI FCFS up to cost maximums.
8	Moderate	Consider door-to-door knocks in neighbourhoods (such as Pass Creek) that have communication constraints to discuss wildfire risk and FireSmart principles that they can apply to their home and property.	Although wildfire can affect all areas of EA-I's WUI, some communities are more at risk due to risks/constraints not associated to wildfire – such as no cell service and low community turnouts at public FireSmart events. Door to door knocks by Fire Chiefs, fire department personnel, and	RDCK / EA-I Fire Response Area Departments / FireSmart Coordinators	2 years	Visits to homes in these WUI neighbourhoods from local government/	In-house personnel time. CRI FCFS for FireSmart materials.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
			FireSmart Coordinators have been successful in other communities.			FireSmart/ fire department members (with FireSmart information left at their door) have started.	
9	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.	EA-I / 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							
10	High	Install FireSmart educational signage at regional parks.	These signs provide both visitors and residents a quick snapshot of how their actions and activities can inadvertently increase wildfire and ignition risks, as well as introduces visitors to FireSmart – a message they can take home with them.	EA-I / RDCK	5 years (signs installed)	Wildfire risk signs at the highest traffic parks have signs.	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. One of the most powerful influences that legislation and planning can have on local wildfire risk is through wildfire hazard Development Permit Areas (DPAs).

Section 2.2 provided a comprehensive look at local plans and bylaws that are currently in place and relevant to wildfire resilience. There are currently no policies imbedding FireSmart development principles and considerations within the Kootenay-Columbia Rivers Official Community Plan (OCP).

One of the priorities for recommendations within this Plan is to manage fire risk to structures within their Home Ignition Zones (i.e., within 30m of the structure and the structure itself). As part of the 2022 Wildfire Development Permit Area Study, draft wildfire Development Permit Areas (DPAs) were developed for the RDCK (but have not yet been implemented), however there was little mention of EA-I interface communities. The purpose of a wildfire DPA is to manage wildland-to-structure fire transfer (and vice versa), achieved through the application of FireSmart principles. The BC Building Code, which to date manages room-to-room and structure-to-structure fire transmission, is currently being updated, with roll out planned for late-2024, and may include FireSmart standards. RDCK should review and assess what FireSmart principles are included and compare them to the draft Wildfire Development Permit Areas (DPAs), update the draft DPAs as required, then initiate a process to implement the wildfire DPAs, if still required, to manage for risks not addressed in the new Code – with a strong consideration to include EA-I WUI communities.

Water is the most important resource for fighting wildland and structure fires. As such, policies regarding regular access points for fire trucks to known water sources (such as Kootenay River) should be included in EA-I's OCP – reference can be drawn from RDCK Electoral Area F's Rural OCP Section 17.10 which supports protection of accesses to water sources such as hydrants, standpipes, lakes, and streams to remain free of obstructions for fire protection purposes.

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 regional district 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 RDCK and EA-I can implement are detailed in Table 18.

Table 18: 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							
11	High	Upon the roll-out of the new BC Building Code in 2024, RDCK should review and assess what FireSmart principles are included and compare them to the draft Wildfire Development Permit Areas (DPAs). Update the draft DPAs as required. Initiate a process to implement the wildfire DPAs, if still required, to manage for risks not addressed in the new Code. Consider the inclusion of EA-I WUI communities.	FireSmart construction and landscaping policies manage for wildland-to-structure fire transfer (and vice versa). Over time, resiliency will be built up at the interface and intermix areas.	EA-I / RDCK (Consultant)	Upon BC Building Code roll out	All new development complies with the policy.	CRI FCFS: up to $10,700 available to apply to incremental staff hours or contract cost.
12	High	Update references to “fire risk” in EA-I’s OCP to include referencing the Local Wildfire Risk Analysis developed as part of this plan, as it more accurately reflects current fire risk for EA-I’s WUI than currently available provincial data.	EA-I should look to the most recent and accurate wildfire risk analysis for its WUI to be used to determine areas of Moderate and High wildfire threat for reducing wildfire threat through community planning and development purposes.	EA-I / RDCK (Consultant)	Upon next OCP review and update	OCP update that includes FireSmart construction/development policies for single home and lot development and major renovations.	CRI FCFS: up to $10,700 available to apply to incremental staff hours or contract cost
13	High	Include a policy in EA-I’s OCP which supports protection of *designated* accesses to water sources such as hydrants, standpipes, lakes, and streams to remain free of obstructions for fire protection purposes.	Water is the most important resource for fighting wildland and structure fires. As such, policies regarding regular access points for fire trucks to known water sources (such as Kootenay River) should be identified, designated, and protected.	EA-I / RDCK (Consultant)	Upon next OCP review and update	OCP update that protects fire department access to designated water source access points.	CRI FCFS: up to $10,700 available to apply to incremental staff hours or contract cost
14	High	Consider adopting a Wildfire Landscaping Bylaw to restrict flammable landscaping. Example: prohibit conifer vegetation in the Immediate Zone of a residence or structure (0-1.5 m) and prohibit the planting of new conifer vegetation in Priority Zone 1 (1.5-10 m). Highly flammable landscaping plants (ex., cedar hedges) were noted throughout the Township, especially on more densely populated streets. This can be an effective communication tool regardless of enforcement capacity.	Highly flammable landscaping plants (ex., cedar hedges) were noted throughout EA-I, especially on more densely populated streets. Landscaping vegetation can act as a wick, moving fire to homes/structures and throughout communities.	EA-I / RDCK (Consultant)	5 years	A Wildfire Landscaping Bylaw is in effect.	CRI FCFS: up to $10,700 available to apply to incremental staff hours or contract cost

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
15	High	Continue to 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. Encourage and support privately owned community halls that act as community shelters, and private or community owned critical infrastructure, to do the same.	Protecting water systems, emergency shelters, and community infrastructure is critical to wildfire response and recovery. Assessments have already been completed for EA-I fire halls.	EA-I / RDCK (Local FireSmart Representative; FireSmart Coordinator; and/or Consultant)	Ongoing	Number of assessments completed and mitigation hours/investment	CRI FCFS: up to $800 per assessment and up to $50,000 for mitigation per structure (publicly owned only)

5.4 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 EA-I Fire Response Area Fire Departments. 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)

Regular in-person cross-training between agencies is imperative for familiarization with each other's equipment and to address any incompatibilities. The Tarrys Fire Department and BCWS noted that almost annual cross-training is conducted with BCWS staff, however the Department's wildland specific equipment has not been reviewed by BCWS in a few years.[30,31] Additionally, valuable training through experience can be acquired from being deployed to wildfires. Under the Fire Chiefs' Association of BC and BC Wildfire Service MEMORANDUM OF AGREEMENT for INTER-AGENCY OPERATIONAL PROCEDURES AND REIMBURSEMENT RATES, fire departments (including those in EA-I) routinely work with BCWS in response to incidents within and outside of Fire Protection and Response Areas. Thus, fire departments should maintain a level of wildland-specific training and equipment – wildland training and equipment for the Tarrys VFD is detailed below in Table 19.[32]

Table 19: Wildland specific training and resources of the Tarrys VFD.

Department	Members	Training/Experience	[Wildland] Equipment
Tarrys VFD	22 paid on call	- 17/22 have completed the SPP-WFF1. - Several have SPP-115. - Several firefighters have been deployed to other areas as SPU crews, Crew Leaders, SPS, Engine Boss, etc. - Somewhat annual cross training with BCWS Arrow base.	**Tender 441** - 1500 gals with 1500-gal porta tank. - Forestry equipment on truck: 4" High Volume Pump, Honda forestry pump, various forestry nozzles and adaptor/fittings, 4 - 3 ways, 17 plastic water thieves, 4 forestry gated y's, 21 – 100' 1 ½" supply lines, 4 – 50' 1" forestry lines,

[30] Information gathered from Tarrys VFD questionnaire as part of the development of this Plan.
[31] Information gathered from BCWS questionnaire as part of the development of this Plan.
[32] Wildland training and equipment for the Pass Creek VFD were not provided.

Department	Members	Training/Experience	[Wildland] Equipment
			1 bag of 10 sprinklers, 8 long handle shovels, 4 Pulaski's, and 2 fire axes, 1 Mark 3 pump with tools and equipment. **Rescue 441** (used for wildland and Medical First Response) - Forestry equipment on truck: High pressure skid Honda pump with 100 gals of water, 12 small forestry hoses, 6 – 1 ½" supply lines, 2 Forestry Hose backpacks, 5 long handle shovels, 8 Pulaski's and 2 fire axes, 2 – 50" 1 1 /2" hoses, 2 rubber fire swatters, 6 – fire rakes and 4 water backpacks.

Water is the most important resource for fighting wildland and structure fires. Detailed previously in Section 3.3.2, there are a limited number of hydrants available within EA-I. Natural water sources are thus a valuable source of water that can be used for wildfire fighting (especially during summer drought conditions). The Kootenay River has water available year-round – having this source with access points available to firefighters is strategically important. Recommended by the Tarrys VFD would be to have standpipes installed on the Kootenay River – example locations would be on both sides of the Glade Ferry, one in Shoreacres, and one in Thrums.

An example of community-led water development for wildfire fighting was initiated in 2020 by the Argenta Emergency Preparedness Group (AEPG; in EA-D). They began a water mapping project (with assistance from a Selkirk College student), which received additional support in 2023 from Living Lakes. With a goal of creating quick access to valuable information for fire response (local and BCWS), a focus has been on available water sources:

- Over 30 locations have been GPS'd where a fire pump could be quickly set up, including photos and access information and detailed information about each site.
- Existing standpipes with fire hose fittings were detailed in a similar fashion, noting water pressure and pipe sizes.

Table 20 lists recommendations for the RDCK related to cross-training and fire department resources in EA-I.

Table 20: 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 5.4							
Training							
16	High	Continue to provide SPP-WFF1 training in-house to EA-I fire department 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.	This would provide an opportunity to expand in-house wildland specific training, and potentially train adjacent fire departments.	RDCK / Fire Response Area Fire Departments	Annually	Number of firefighters (both paid and on-call volunteer) with wildland training beyond SPP-WFF1 increases.	Staff time; CRI FCFS Training. Columbia Basin Trust funding.
17	High	Support FireSmart specific training to EA-I fire response area fire departments: FireSmart 101, Local FireSmart Representative (LFR), and FireSmart Home Partners Mitigation Specialists.	To build understanding and knowledge of FireSmart principles within local fire departments. To certify EA-I fire department members so they can implement various FireSmart assessments within the community.	RDCK / Fire Response Area Fire Departments	3 years	Number of firefighters (both paid and on-call volunteer) with FireSmart training increases.	Staff time; CRI FCFS Training.
18	High	EA-I fire response area fire departments should continue seeking out (and being supported by RDCK/EA-I in doing so) opportunities to perform wildfire response and structure protection drills - using hydrants, standpipes, and natural water sources, *with* BCWS.	Fast and effective deployment of available Structure Protection Units (two are owned by RDCK) and any additional equipment operated by the BCWS will be crucial in any interface fire scenario. Equipment compatibilities and/or differences between fire departments & BCWS should be identified and addressed ahead of time. Tarrys Fire Department noted that more training opportunities with BCWS would be greatly beneficial.	RDCK / Fire Response Area Fire Departments (BCWS)	Annually	A Drill is performed with BCWS and one EA-I fire department annually.	Staff time as required.

Water							
19	High	Identify and map natural and artificial water sources useable for fire suppression across the entire regional district. Consider standpipe locations along Kootenay River for development. Having a digital map would allow it to be uploaded into response vehicles' CAD systems, shared with BCWS response personnel, as well as included in the pre-planning of emergency community water delivery systems connecting major natural water sources with interface communities, to facilitate deployment of a structural protection system. Include important details such as: estimated water volume and access point notes. Share this information to all mutual aid fire response partners, and update over time.	Most of the firefighting service in EA-I requires water shuttling. This impacts EA-I's wildfire resilience. Shuttling or pumping water from lakes and rivers (and more easily from standpipes) to fill bladders can be pre-planned, including tender access points, traffic control, permanent large-volume pumps, and piping.	Fire Response Area Fire Departments (RDCK GIS department; BCWS; MOTI; MOE)	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 to apply to incremental staff hours or contract cost.
20	High	In coordination with Recommendation #19, create opportunities for BCWS to work with independent water systems to identify assets. Assist those communities in retrofitting their systems to be compatible, if required.	Reducing barriers to BCWS for accessing water sources in the WUI increases opportunities to fight WUI fires.	RDCK / FireSmart Coordinator (BCWS)	Annually	Communities with self-managed water systems are meeting with BCWS	RDCK/EA-I, BCWS, and community time.
21	Moderate	Fire response area fire departments should seek Superior Tanker Shuttle Service accreditation from Fire Underwriters Survey.	This accreditation certifies that the fire department 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 EA-I fire response areas). Note: this does not increase the overall water supply already available under automatic and mutual aid agreements.	Fire Response Area Fire Departments (RDCK)	5 years	Superior Tanker Shuttle Service accreditation achieved.	Fire department staff time as required (and RDCK budget for equipment upgrades and purchases, if needed).
Equipment and Staff							
22	High	In coordination with Recommendations #18 and #19, the EA-I fire departments should continue (or begin, if not done already) annual inspections by BCWS of their wildland firefighting equipment. Any gaps should be addressed, as required.	To ensure proper equipment is available to respond to interface wildfire events, and that equipment is compatible with BCWS's. CRI FCFS funding is available for incremental equipment purchases.	EA-I fire departments (RDCK; BCWS)	Annually	Annual inspection of wildland firefighting equipment from BCWS; gaps filled as practicable.	Fire department and RDCK staff time; CRI FCFS equipment funding up to cost maximums.

5.5 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 EA-I as there are multiple jurisdictions side-by-side (e.g., RDCK EAs E, H and G, and the City of Castlegar) and multiple land managers currently operating (e.g., BC Timber Sales, Columbia Basin Trust). 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.

Due to its adjacency to the City of Castlegar, EA-I participates in the Castlegar Area FireSmart and Resiliency Committee (CFRC) which began meeting in 2023 to coordinate cross-jurisdictional FireSmart and fuel mitigation planning within Castlegar and surrounding RDCK electoral areas (see Appendix E: Community FireSmart Resiliency Committee). Additionally, EA-I Fire Chiefs also participate in an annual Zone 4 Fire Chiefs meeting that includes BCWS representatives to ensure wildfire emergency pre-organization is in place, policy changes are discussed, and opportunities to improve mutual aid for fire response are capitalized on.[33] Mutual aid agreements exist between BCWS and RDCK fire services. 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.

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 EA-I's WUI is extensive in area, RDCK (via the CFRC) should develop a process for spatially tracking and managing proposed and completed fuel management/fuel break units in the greater regional district area that all members can access. Although RESULTS[34] 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.

BC Timber Sales has tenure overlaps with EA-I's WUI (Sentinel Mountain). 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

[33] Information gathered from BCWS questionnaire as part of the development of this Plan.
[34] 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.

implementing fire management stocking standards as part of reforestation efforts can reduce wildfire behaviour for harvested areas within the WUI.

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 21 details Interagency Cooperation recommendations for EA-I and its jurisdictional and land manager partners.

Table 21: 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 5.5							
23	High	Continue to engage with the established Castlegar Area FireSmart and Resiliency Committee (CFRC) to plan, implement, and coordinate FireSmart initiatives, including fuel management treatments. Look to include EA-I volunteer fire department Fire Chiefs.	To 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 EA-I's WUI.	Castlegar CFRC	Ongoing	CFRC 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.
24	High	As communities self-organize for FireSmart initiatives, and even take up the FireSmart Canada Neighbourhood Recognition Program (see Recommendation #46), RDCK and EA-I should look to support their inclusion in a Community FireSmart Resiliency Committee (CFRC), or develop local sub-committees, as required.	To further community involvement in FireSmart and wildfire risk reduction activities at the community level.	RDCK / EA-I FireSmart Coordinator	Ongoing	Additions to existing CFRCs are made, as required, or new ones are established, as needed.	Cost and time dependent upon level of effort required.
25	High	Work with RDCK, CFRC members, and MOF to develop a fuel treatment/fuel break tracking system to spatially manage proposed and completed fuel management areas both within EA-I'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.	EA-I/Castlegar CFRC / MOF / RDCK	As soon as possible	A regional GIS tracking system is established, or a provincial one is developed that CFRC members can access.	Cost and time dependent upon level of effort required.
26	High	Lobby forest land licensee/managers (e.g., BC Timber Sales) to be aware of where their tenure overlaps EA-I'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.	RDCK / EA-I / Local Government elected officials/ Community members (MOF; Forest Licensees and 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.	RDCK/EA-I staff time for discussions.

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
27	High	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.	RDCK / EA-I Local Government elected officials (MOTI; Electrical Providers; Railways)	Yearly and ongoing	Right-of-way maintenance discussions are open and ongoing; right-of-ways are kept in low-risk states.	RDCK/EA-I staff time for discussions.

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. The RDCK Emergency Plan includes EA-I and the RDCK Emergency Program conducts tabletop exercises yearly with staff (and responds to emergencies involving evacuations almost yearly).

In a wildfire emergency that requires evacuation, Glade has the largest constraint as the community is dependent upon a cable ferry as the primary access route. The small ferry would quickly be overwhelmed by evacuees. As such, there is a specific Evacuation Route Plan for the community, but this has not been shared with the public and is only used in the RDCK EOC for planning purposes. This constraint should be recognized and addressed in EA-I's Official Community Plan (as it has been in Electoral Area E's for Harrop-Proctor) by encouraging the identification and maintenance of public access points to the Kootenay River to facilitate emergency egress via water in the event of forest fire, spills, slides, and other disasters. Consistently applied in communities where egress is an issue (such as Glade) is having Local Government work closely with BCWS when considering trigger points for evacuation alerts and evacuation orders to allow time to evacuate via the ferry. This includes recommending residents evacuate livestock and move large items (such as trailers) across the ferry while they are on *evacuation alert*, thus allowing time for an orderly ferry evacuation during an *evacuation order*. Evacuations via public and private boat launches is a last case, least desirable scenario – considered as part of a tactical evacuation.

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. RDCK and EA-I should promote this notification to residents as much as possible.

Most of EA-I's WUI is only accessible by roads through private property. This is a significant constraint to wildfire first responders as those road conditions are largely unknown. This constraint should also be recognized in EA-I's Community Official Plan by encouraging that private roads that access forest lands 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.

Additionally, it was noted during field assessments, and echoed in meetings with local government and first responders, that there is a pervasive lack of visible, reflective addresses for properties within EA-I. Addresses are one of the most common forms of providing first responders directions of where to respond to. This issue should be made aware to the public with examples and options of proper signage.

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

Figure 6. A pre-incident planning checklist that can be used to help develop a pre-incident wildfire suppression plan and maps.

The RDCK 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 the EA-I, outlining actions staff can take as fire danger levels change throughout the fire season.

Table 22: Example of a Wildfire Response Preparedness Condition Guide[35]

FIRE DANGER LEVEL	ACTION GUIDELINES
LOW	• All District staff on normal shifts.
MODERATE	• All District staff on normal shifts. • Information gathering and dissemination through Nelson's CFRC.
HIGH	• All District staff on normal shifts. • Regional fire situation evaluated. • Daily fire behavior advisory issued. • Wildland fire-trained District staff and EOC staff notified of Fire Danger Level. • Establish weekly communications with CFRC.
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 District 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 / District staff on fire situation. • Update public websites and RDCK 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 EOC/Fire Chiefs. • Implement Evacuation Alerts and Orders based on fire behavior prediction and under the direction of the EOC/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.

Roof top and gutter-mounted sprinklers are a useful tool that can be easily stored and then set up, as needed, by individual homeowners (if they have the required water availability). BCWS can also link their water systems to them to support their firefighting efforts. Three main mounting types exist: temporary mounted sprinklers (fully removable), permanently mounted sprinklers, and permanent sprinkler mounts

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

that sprinklers can then be attached to/removed from. There are benefits and disadvantages to all, especially as structures can differ significantly from one another, however, the benefits to using permanent sprinkler mounts as the preferred choice were noted as such by the Beasley Volunteer Fire Department Fire Chief: permanent rooftop sprinklers are time consuming and difficult to access for troubleshooting; sprinklers on pipes that can be lifted and set onto the permanent mounts from the ground are fast to deploy, easy to lift down when repairs or replacement are needed; and, they reduce sprinkler deterioration rates from not being left in place year-round. Local Government and community organizations can spearhead the acquisition and planning of sprinklers and structure protection units (SPUs) themselves, moving the planning and organization off the individual homeowner and increasing community wildfire resiliency. Additionally, there can be cost savings in bulk orders.

RDCK has two Type 2 SPUs which are regional assets, and firefighters from all 16 RDCK supported fire departments that can be deployed as needed. One SPU is (generally) stationed at the Kaslo and Area Fire Department Hall. It should be noted that under the interagency agreement, when the SPUs are needed, they are requested by the local authority for use within a fire protection area and by BCWS for use outside of the fire protection area. Regardless of the requestor, they are sourced by BCWS. The cost of deployment is reimbursed by the Province. BCWS may or may not opt to use local SPUs to be deployed to a fire.

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

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							
28	High	Continue tabletop wildfire scenario tabletop exercises with emergency management and CFRC partners. Yearly, pre-fire season is best. Move the "WUI fire" to a different area of EA-I's WUI each time.	Tabletop exercises provide an opportunity to identify weak spots in a plan and collaborate.	RDCK (EA-I/Castlegar CFRC; RCMP; BCWS)	5 years	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
29	High	Consider updating EA-I's OCP with guidelines stating private roads that access forest lands should be of adequate design to allow for the safe movement of logging and fire-fighting equipment. Discuss with the Ministry of Transportation and Infrastructure (MOTI) possible means supporting/enforcing 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 EA-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."	RDCK (MOF; BCWS; Local Fire Response Area Departments)	5 years	OCP updated as required and access roads through private land to the interface forest are maintained.	RDCK/EA-I time for planning and discussions. CRI FCFS: up to $10,700 for incremental staff hours or contract cost.
30	High	RDCK and EA-I 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.	RDCK (FireSmart Coordinator)	Ongoing	Continued update of the Voyent Alert! System (can track downloads from app providers).	RDCK for promotion.
31	High	RDCK should have appropriate signage designating shoreline access routes for secondary boat egress for Glade which relies on ferry or private boat for access/egress.	To expedite egress during an emergency evacuation in a community already significantly constrained.	RDCK / EA-I	5 years	All public shoreline access/egress routes are marked (a series of signs	RDCK: Cost/time dependent on number of

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
						from main roads to access points is best).	access points and signs required.
32	High	Invest in back-up generators for any critical infrastructure that does not have one (including fire halls). 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 (especially those designated as emergency shelters) would facilitate both emergency response (water supply for suppression) and rapid community return and recovery following a fire.	RDCK / EA-I (Private Industry)	ASAP	A budget and purchase plan for back-up generators is implemented, starting with the most critical infrastructure.	Cost varies - ~$10,000
33	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. Discuss with local Fire Departments and BCWS what mounting/sprinkler types are best. This can be directly led by RDCK, or RDCK can offer support to local fire departments and community organizations to assist doing so.	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.	RDCK / EA-I	1 Year 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
34	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.	RDCK / EA-I	5 years – 2028 update	EA-I always has a current and acceptable CWRP.	~$32,000; CRI FCFS funding
35	Moderate	Pre-plan emergency community water delivery systems to connect major natural water sources with interface communities/neighbourhoods to facilitate deployment of a structural protection system. This can be supported by Recommendation #19. The Argenta Emergency Preparedness Group has been working on this since 2023 (see Section 5.4).	RDCK has many large natural water bodies and streams/creeks to draw from in the event of a wildfire. Shuttling or pumping water from lakes and rivers to fill bladders may be planned in advance, including tender access points, traffic control, permanent large-volume pumps and piping.	RDCK / EA-I (BCWS)	5 Years	Assess community water delivery for each neighbourhood. Develop and test neighbourhood specific plans.	CRI: Assessment of Community Water Delivery Ability - incremental staff hours or contract cost

Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
36	Moderate	Promote the installation of visible and reflective addresses in EA-I. Consider and explore how to regulate addressing across the District. Note: RDCK has requested a program to support standardized address signage, but stated that if building permits are not applied for then there is no street address. There are no regulations on addressing.	To allow for faster and more direct response to specific properties by first responders during an emergency.	EA-I / RDCK	5 years	Majority of properties have reflective, visible addresses.	Promotion campaign; consider providing discounted signs. 40-60 hours and $40-60 per sign

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 of a structure; see Figure 7 below).

Figure 7: 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,[36] 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 EA-I's WUI is Crown provincial land under forest licenses. Fuel management projects on municipal land are funded and administered through the CRI FCFS program; and those on Crown provincial land (not managed by an area-based tenure) are funded and administered through the BCWS Crown Land Wildfire Risk Reduction (CLWRR) Program. EA-I will need to ensure good planning and collaboration with the Selkirk Resource District CLWRR team, forest tenure holders, local government, community groups, and BCWS to achieve higher quality, more effective, and more efficient fuel treatments.

There are many historical (non-mapped) fuel treatment units (FTUs) completed within EA-I's WUI, as well as tracked prescribed (but not treated) and treated FTUs from the FESBC, CLWRR, and CRI FCFS programs – these are shown on Map 8 - Map 10 below, in conjunction with the proposed fuel treatment units (PTUs) from this Plan.[37] A number of past proposed but not treated FTUs are re-identified within this Plan due to their assessed risk and proximity to interface structures and communities. PTUs proposed as part of this Plan are discussed and described in Table 25.

Priority level for prescription and treatment (High, Moderate, Low) of PTUs is given to each and is based upon a combination of site-level risks and factors 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. The PTUs identified in this Plan are not a comprehensive list of all areas that qualify for management; they were selected as the highest priority areas that are practicable to implement, present a high risk to their respective communities or a strategic opportunity, and meet required funding program goals and requirements as either fuel breaks or fuel

[36] BC Wildfire Service. (2022). 2022 Fuel Management Prescription Guidance.
[37] CLWRR proposed and completed treatments include up to fiscal year-end 2021. CRI FCFS proposed and completed treatments includes up to year end 2022.

treatment areas. Overall, increasing the resilience of EA-I's WUI communities can only be efficiently achieved by performing residential-scale FireSmart activities on private land.

Residential-scale FireSmart Landscaping

Several smaller, community centrally-located PTUs are proposed within this Plan with the additional intention of providing residents with FireSmart vegetation management demonstration projects – showing them what can be done on their properties to reduce similar wildfire risks. A major barrier to implementing FireSmart vegetation management on private property is if there is no easy disposal process for the created vegetative debris. RDCK managed landfills within and adjacent to EA-I (Castlegar and Grohman Narrows) accept yard and garden waste for payment – but, during the months of May and October there is no charge.[38] Unfortunately, for many residents in EA-I's ferry-access or longer-drive communities, transporting material to these stations is too far. Thus, most residents likely rely upon at-home burn piles for garden and yard waste – education around the risks associated with this practice, and how to properly manage them, should be built into EA-I's FireSmart education program.

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

- ***FireSmart Canada Neighbourhood Recognition Program***

  The FireSmart Canada Neighbourhood Recognition Program is a unique approach to collaboratively reduce a neighbourhood's risk to wildfire through education and events. It is run nationally through FireSmart Canada and facilitated locally by the RDCK. It is a grassroots, volunteer run program that is assisted by RDCK Wildfire Mitigation Specialists. It is a small-scale approach for neighbourhoods consisting of 5-50 homes, with the intent to implement achievable FireSmart goals (mitigation projects can be small and simple, or complex and extensive, ranging from individual owners doing around home clean-ups, to community hand treatments on common and private land near critical infrastructure). EA-I has recruited and guided communities into this program, and should continue to do so.

- ***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 $5000.

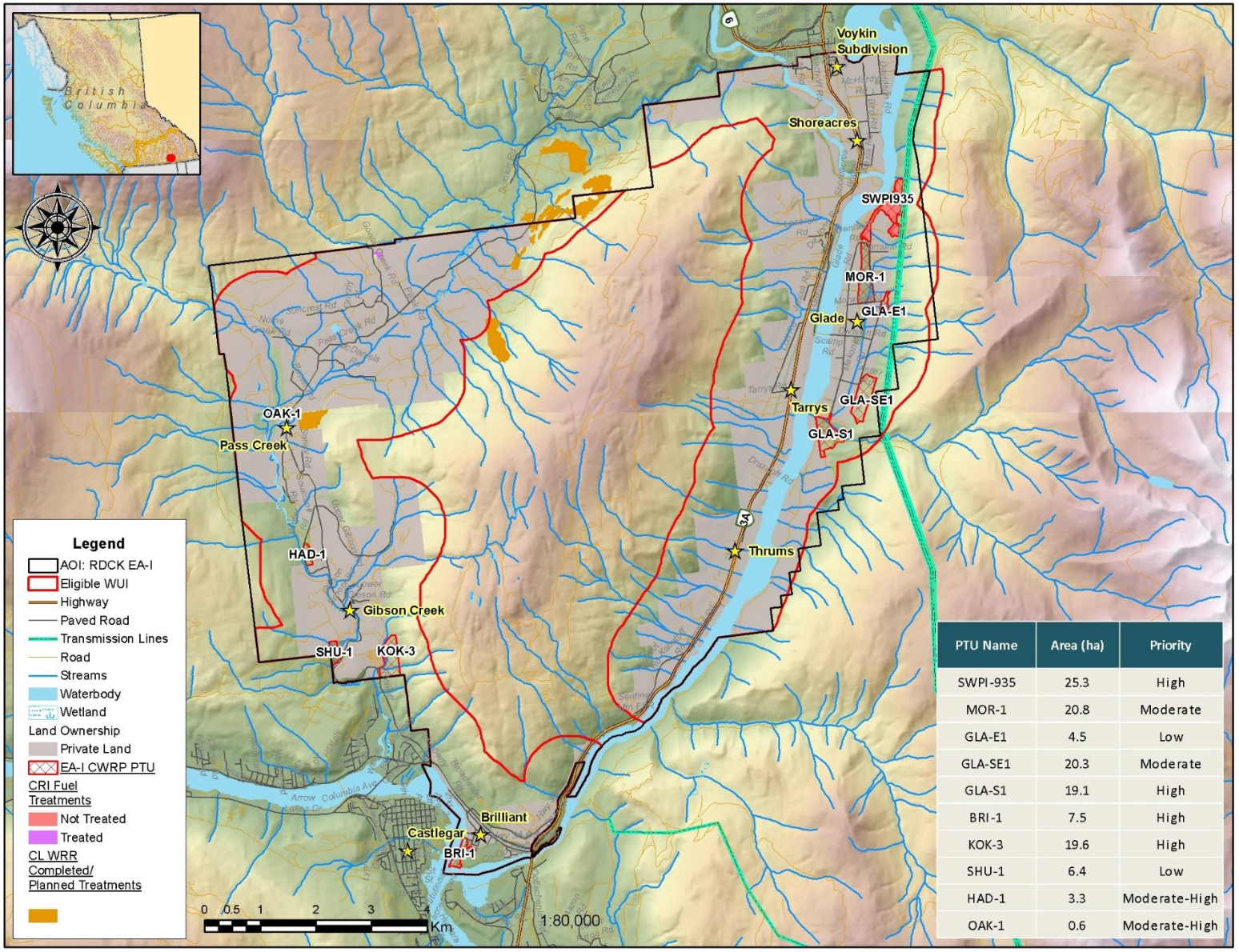
[38] https://www.rdck.ca/EN/main/services/waste-recycling/household-hazardous-waste-round-up/yard-garden-waste-free-tipping.html

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							
37	High	Develop fuel management prescriptions for the identified Potential Fuel Treatment Units (PTUs), starting with those identified as High priority. Continue with treatment implementation when possible.	To reduce wildfire threat and risk to interface and intermix communities within the WUI. Also, to provide FireSmart vegetation management examples to the public that can be implemented on their own properties. See "Rationale" column in Table 25 for more detailed treatment rationales.	EA-I / MOF / BCWS	5 years	Approved FMP(s) for identified High priority areas.	CRI FCFS funding available for prescription and treatments; ~$425/hectare for a ~20 ha prescription
38	High	Lobby Provincial Government (Ministry of Forests) and other potential funding organizations for grant funds to implement landscape level fuel treatment on private land.	Much of EA-I's communities' structures are surrounded by undeveloped, forested private land. Current funding streams for fuel reduction at the landscape level are targeted, and thus limited, to public land. However, the interface wildland does not stop at the public/private land border.	Local Government (Provincial Government)	5 years	Discussions initiated and ongoing	Time and cost dependant upon level of engagement required.
Residential FireSmart							
39	High	In conjunction with provided home FireSmart Assessments (see Recommendation #7), continue offering 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, EA-I, and FireSmart coordinators 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 / EA-I 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).
40	High	Continue providing regional district-led options for the disposal of yard waste. Currently, this includes having tipping fees waived (May and October) for yard waste at the RDCK transfer stations/landfills.	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.	RDCK / EA-I FireSmart Coordinator	Annual	Municipally funded yard waste disposal continues.	CRI FCFS funding is available for

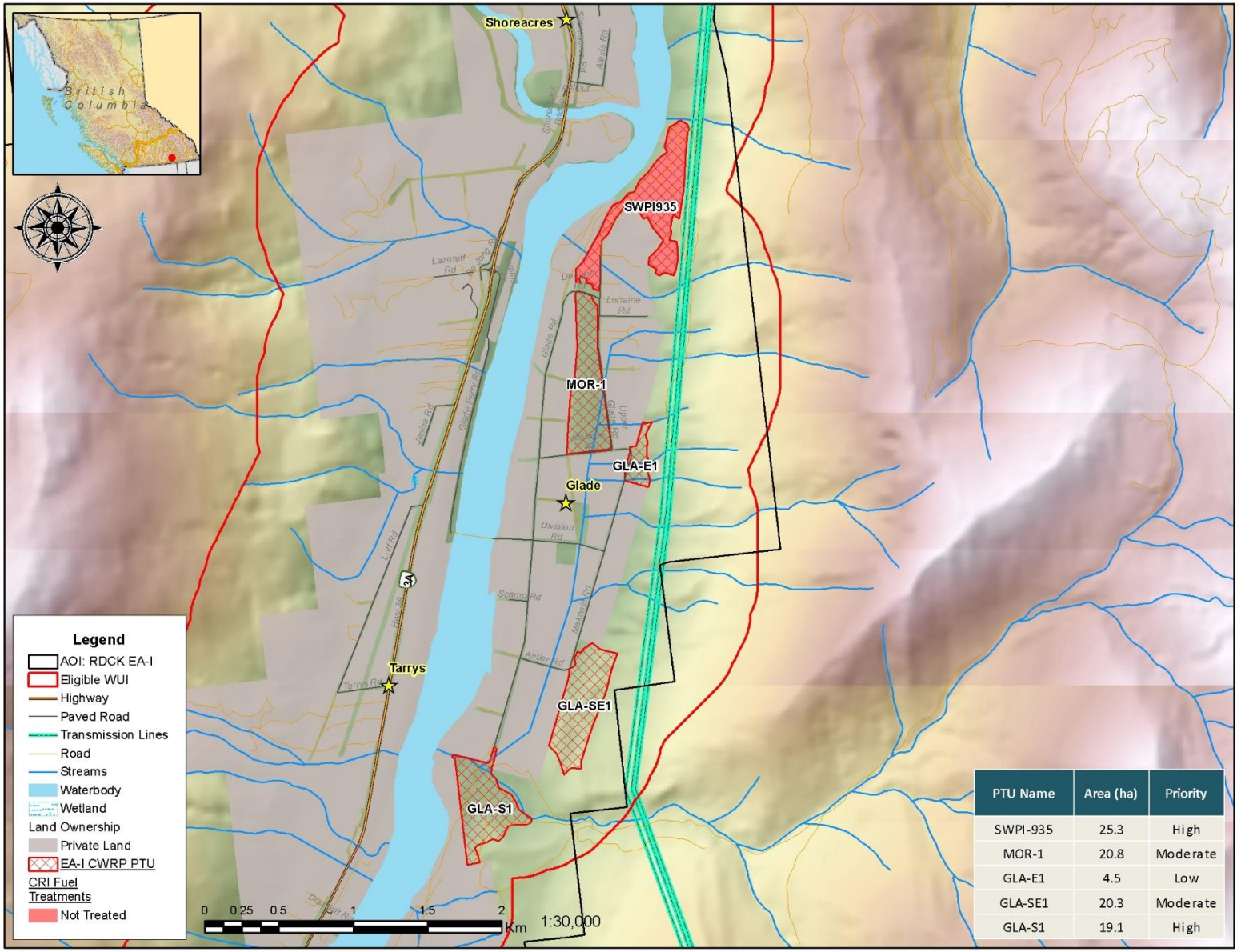
Item	Priority	Recommendation	Rationale	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) / Person Hours
							tipping fee coverage.
41	High	Consider implementing a community chipper program. Education of FireSmart yard and landscaping principles, including chipping specifications, should be incorporated into the program.	To reduce fire and wildfire hazards on private property within the WUI, especially those long distances from RDCK landfills/transfer stations, and to 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.	RDCK / EA-I FireSmart Coordinator	Annual (pre-fire season is best)	Number of properties who elect to have debris disposed.	CRI FCFS funding; ~$100-150 per chipper crew hour.
42	Moderate	Consider releasing an annual RDCK 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 RDCK FireSmart program to track challenges and successes, further promote the program, and tailor outreach methods to achieve the most uptake.	RDCK / EA-I FireSmart Coordinator	Annual	An annual report is published.	Eligible for CRI funding – FireSmart staff time. Estimate 40-80 hours.
43	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 (RDCK; EA-I FireSmart Coordinator)	5 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							
44	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.	RDCK / EA-I FireSmart Coordinator	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
45	High	As part of fuel treatment implementation, RDCK/EA-I 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.	RDCK / EA-I FireSmart Coordinator	5 years	Signage installed during implementation phases.	Eligible for UBCM CRI funding.
46	High	Continue to support and promote the FireSmart Canada Neighbourhood Recognition Program to communities within EA-I. Identify community champions to spearhead organization for those communities not already organized, and support those communities that have been recognized in the past to continue working towards being so.	There are many small communities throughout EA-I that, by working together, could reduce their community-scale wildfire risk easily and substantially. The program supports a small-scale approach for neighbourhoods consisting of 5-50 homes, with the intent to implement achievable FireSmart goals	RDCK / EA-I FireSmart Coordinator	Ongoing	Increase in number of recognized communities.	FireSmart Canada $500; RDCK FireSmart Champion Grant up to $3000
47	Moderate	As part of the FireSmart Canada Neighbourhood Recognition Program (FCNRP), apply to CRI FCFS for funding to develop Neighbourhood FireSmart Plans.	To help guide FireSmart Canada Neighbourhood Recognition Program communities and their community champions to complete wildfire risk reduction measures.	RDCK / EA-I FireSmart Coordinator	In line with FCNRP Community program uptake.	Communities working towards FCNRP status have a Neighbourhood Plan	Eligible for UBCM CRI funding.



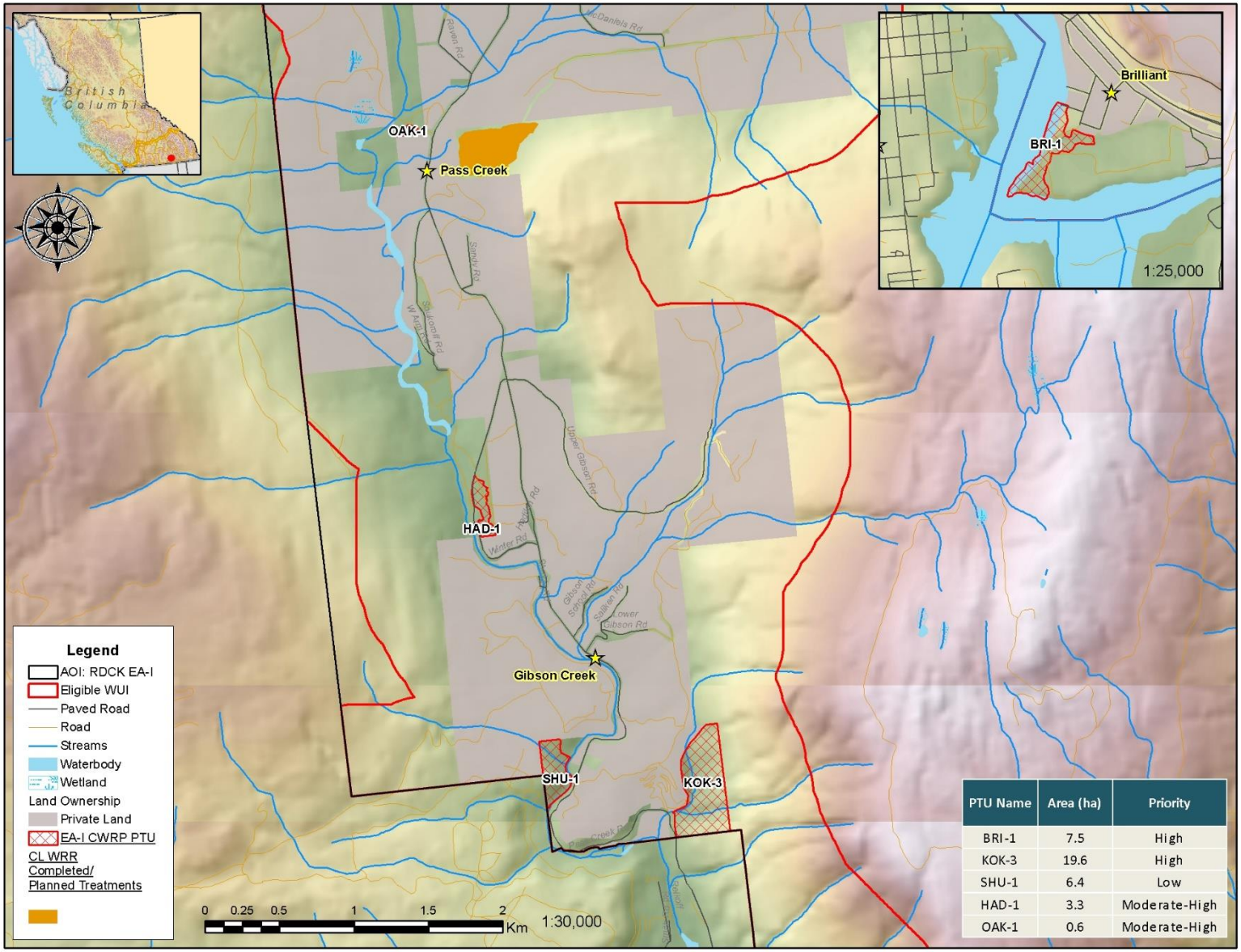
PTU Name	Area (ha)	Priority
SWPI-935	25.3	High
MOR-1	20.8	Moderate
GLA-E1	4.5	Low
GLA-SE1	20.3	Moderate
GLA-S1	19.1	High
BRI-1	7.5	High
KOK-3	19.6	High
SHU-1	6.4	Low
HAD-1	3.3	Moderate-High
OAK-1	0.6	Moderate-High

Map 8: Overview map of prescribed and proposed fuel treatment units within EA-I's WUI.



PTU Name	Area (ha)	Priority
SWPI-935	25.3	High
MOR-1	20.8	Moderate
GLA-E1	4.5	Low
GLA-SE1	20.3	Moderate
GLA-S1	19.1	High

Map 9: Closer view of the proposed and prescribed treatment areas for EA-I's eastern WUI areas.



Map 10: Closer view of the proposed and prescribed treatment areas for EA-I's western WUI areas.

Table 25: Summary of Proposed Fuel Treatment Units for EA-I's CWRP (ordered from east to west).

PTU Name	Nearest Community	Priority	Area (ha)	Overlapping Values / Treatment Constraints	Wildfire Behaviour Threat		Treatment Rationale
					Extreme & High	Moderate	
SWPI-935	Glade	High	25.3	Crown Provincial & Crown Agency land. Entirely in UWR conditional harvest zone. Borders private property. Hydro right of way transmission line on east edge.	23.7	0.5	*Existing CRI prescription.* Treat to reduce wildfire threat within the WUI, interface to homes as well as abutting Hydro right of way transmission line (ignition risk). Treating this unit would also provide a demonstration project of FireSmart vegetation management to the community. In conjunction with PTUs MOR-1 and GLA-E1, treating together would develop a significant fuel break across the northeast edge of Glade.
MOR-1	Glade	Moderate	20.8	Crown Agency land. Borders private property.	0.0	13.2	Treat to reduce wildfire threat within the WUI, interface to homes. Treating this unit would provide a demonstration project of FireSmart vegetation management to the community. In conjunction with PTUs SWPI-935 and GLA-E1, treating together would develop a significant fuel break across the northeast edge of Glade. Lodgepole pine (Pl) leading C-3 stands with open canopy gaps (like C-7). High component of forest health issues among Pl causing mortality. Low crown base heights on most Pl. Treatment would protect homes along Upper Glade Rd including community hall. Treatment would likely include thin from below of understory stems, pruning, and removing dead stems of all sizes. Opportunity to lop-scatter-burn (and to prescribe burn) as well as grazing to manage grass – this is a low cost debris disposal method. WTA GLADE-2 (Moderate)
GLA-E1	Glade	Low	4.5	Crown Provincial land. Entirely in UWR conditional harvest zone. Borders private property. Hydro right of way transmission line on east side.	4.3	0.0	Treat to reduce wildfire threat within the WUI, interface to homes, and adjacent to Hydro right of way transmission line. Treating this unit would provide a demonstration project of FireSmart vegetation management to the community. In conjunction with PTUs SWPI-935 and MOR-1, treating together would develop a significant fuel break across the northeast edge of Glade. Grand fir leading stand with most understory (L3) stems dead or suppressed. Treatment would likely include thin from below of understory stems, pruning, and removing dead stems of all sizes. WTA GLADE-3 (Moderate)
GLA-SE1	Glade	Moderate	20.3	Crown Provincial land. Entirely in UWR conditional harvest zone. Borders private property.	8.8	11.5	Treat to reduce wildfire threat within the WUI, interface to homes, and adjacent to Hydro right of way transmission line. In conjunction with PTU GLA-S1, treating together would develop a significant fuel break across the southeast edge of Glade.

PTU Name	Nearest Community	Priority	Area (ha)	Overlapping Values / Treatment Constraints	Wildfire Behaviour Threat		Treatment Rationale
					Extreme & High	Moderate	
							Treatment would likely include thin from below of understory stems, pruning, and surface fuel reduction. WTA GLADE-4 (High)
GLA-S1	Glade	High	19.1	Crown Provincial land. Water/Electrical critical infrastructure in unit. Entirely in UWR conditional harvest zone. Borders private property.	17.1	1.7	Treat to reduce wildfire threat within the WUI and interface to homes. In conjunction with PTU GLA-SE1, treating together would develop a significant fuel break across the southeast edge of Glade. Hazardous C-3-type stand with C-4 characteristics. Suppressed and dying understory (L3) stems creating future fuel loading hazard. Treatment would likely include thin from below of understory stems, pruning, and surface fuel reduction. Opportunity for commercial selective harvest. WTA GLADE-1 (High)
BRI-1	Brilliant	High	7.5	Crown Provincial and Crown Agency land. Entirely in UWR conditional harvest zone. Borders private property. Gated access from the cemetery – work with Castlegar for access.	0.0	7.2	Treat to reduce wildfire threat within the WUI and interface to homes in a high-use recreation area that includes beach fires and fire pits (ignition risk). C-5/C-7 type stand with some C-3 characteristics. Lodgepole pine leading stand with significant forest health issues. Treatment would likely include thinning of understory stems, pruning, surface fuel removal – targeting forest health affected stems first. Potential for prescribed burning (which could extend into the grass fields to the east). WTA BRI-1 (Moderate)
KOK-3	Pass Creek Falls	High	19.6	Crown Agency land. Existing prescription ribbon on trees. Entirely in UWR conditional harvest zone. Borders private property. Steep slopes. POD water boxes in unit.	19.3	0.3	*Existing CRI prescription.* Treat to reduce wildfire threat within the WUI and interface to homes, to create safe access/egress along main road, and to protect community water sources (PODs). Mixed conifers stand with C-3 characteristics. Treatment would likely include thinning of understory stems, pruning, and surface fuel removal. WTA KOK-1 (Moderate)
SHU-1	Pass Creek Falls	Low	6.4	RDCK Municipal land. Within the Norns Community Watershed. Entirely in UWR conditional harvest zone. Borders private property. Borders Pass Creek riparian area.	3.7	2.7	Treat to reduce wildfire threat within the WUI and interface to homes, and to create safe access/egress along main road. Treating this unit would provide a demonstration project of FireSmart vegetation management to the community. Western red cedar leading C-3-type stand. Dead standing and down supressed understory conifers have created a high surface fuel load. Treatment would likely focus on thinning of understory conifers, pruning, and reduction of surface fuels. WTA SHU-1 (Moderate)

PTU Name	Nearest Community	Priority	Area (ha)	Overlapping Values / Treatment Constraints	Wildfire Behaviour Threat		Treatment Rationale
					Extreme & High	Moderate	
HAD-1	Gibsons Creek	Moderate-High	3.3	Crown Agency and a small area of RDCK municipal land. Within the Norns Community Watershed. Entirely within UWR conditional harvest zone. Borders private property.	0.0	0.0	Treat to reduce wildfire threat within the WUI and interface to homes. Treating this unit would provide a demonstration project of FireSmart vegetation management to the community. Young Lodgepole pine (Pl) leading stand with open patches of low density. Pervasive grass throughout. Little to no existing surface fuel. Treatment would likely focus on removing smaller diameter stems and pruning. Potential grazing or prescribed burning to manage grass would be supported. WTA HAD-1 (Moderate) [Entire polygon fire threat analyses is Low. Site conditions and WTA form indicate that fire behaviour would likely be “flashy” – short but intense.]
OAK-1	Pass Creek	Moderate-High	0.6	Crown Agency land. Within the Norns Community Watershed. Entirely in UWR conditional harvest zone. Borders private property.	0.6	0.0	Treat to reduce wildfire threat within the WUI and interface to homes. Treating this unit would provide a demonstration project of FireSmart vegetation management to the community. Young grand fir leading stand with some forest health induced mortality of overstory conifers. C-3-type stand with C-4 characteristics. Treatment would likely focus on thing from below of understory conifers, pruning, and surface fuel removal. Removal of some co-dominants to reduce overstory crown connectivity could be considered. WTA OAK-1 (High)

SECTION 6: APPENDICES

6.1 APPENDIX A: REVIEW OF 2016 CWPP RECOMMENDATIONS

The 2016 CWPP Recommendations were reviewed and commented on by the Local Government. Comments were edited for clarity.

Item	2016 CWPP Recommendation	2022 CWRP *Follow-Up Discussion*
Communication and Education		
Objective: To improve public understanding of fire risk and personal responsibility by increasing resident awareness of the wildfire threat in their community and to establish a sense of homeowner responsibility.		
1.	Establish a school education program to engage youth in wildfire management. Consult ABCFP, BCWS (the zone) and RDCK Fire Service to facilitate and recruit volunteer teachers and experts to help with curriculum development to be delivered in elementary and/or secondary schools. Educational programming can be done in conjunction with any currently running fire prevention education programs.	***I am not aware of any FireSmart school programs within area I.***
2.	Make summaries of this report and associated maps publicly available through webpage, social media, and public FireSmart meetings. Add fire threat spatial data to the interactive web-mapping tool to allow residents to find their property and the associated threat of wildfire.	***CWRP is available on RDCK website.***
3.	Participate in the National Wildfire Community Preparedness day, typically in May each year.	***We have attended events and FireSmart promotion within area I. Finding an FCNRP within I would be valuable.***
4.	Expand door-to-door FireSmart assessment and/or Home Partner Program within Area I interface in order to educate residents and to quantify the level of risk in the interface.	***Yes, 56 HPP assessments completed so far in area I. [as of September 2023]***
Objective: To enhance the awareness of elected officials and stakeholders regarding the resources required to reduce fire risk.		
5.	Develop regional development permit standards and align local government bylaws.	***Nothing implemented yet, wildfire development permit area study completed in 2022.***
6.	Provide a group voice to the Building and Safety Standards Branch and other provincial entities,	***No communications I am aware of.***

7.	Develop a coordinated approach to fuel management and hazard reduction within and adjacent to the Area I Study Area by coordinating with stakeholders including conservation organizations, communities, forest licensees, Ministry of Transportation and Infrastructure and utility companies, to aid in the establishment of FireSmart activities and large, landscape-level fuel breaks or compliment current or proposed fuel treatment areas.	***Part of area I falls within the Castlegar WRR committee. The majority would be covered off by the Regional round table.***
Structure Protection and Planning		
Objective: Enhance protection of critical infrastructure from wildfire.		
8.	Complete a fire flow / water vulnerability assessment for each water system and identify and map all alternative water sources (reservoirs, streams, lakes, etc.). Identify which areas may have insufficient or unreliable water supplies and provide recommendations to reduce vulnerability in Area I. Explore collaboration with other agencies including Columbia Basin Trust, Ministry of Environment, Ministry of Transportation and Infrastructure and Interior Health Authority.	***[no comment]***
9.	Complete a vulnerability assessment of all critical infrastructure (not only RDCK critical infrastructure) including water infrastructure in interface areas with FireSmart recommendations.	***[no comment]***
10.	Develop alternative, back-up water sources for fire protection and the establishment of standpipes as required.	***[no comment]***
11.	Complete a detailed review of back-up power source options for all critical infrastructure and upgrade as required.	***[no comment]***
12.	Complete more detailed hazard assessments and developing, in collaboration with other available government funding, response plans for stabilization and rehabilitation of burn areas in watersheds that are vulnerable to post-wildfire debris flows and floods.	***[no comment]***
Objective: Encourage private homeowners to voluntarily adopt FireSmart principles on their properties.		
13.	Support homeowners with professionals to provide the Home Partners Program or WUI Site and Structure Hazard Assessments for interface homes and provide information to homeowners on specific steps that they can take to reduce fire hazards on their property. Homeowners should not be charged for these assessments	***Yes, 56 HPP assessments completed so far in area I. [as of September 2023]***
Local Government Policy		
Objective: To reduce wildfire hazard on private land and increase FireSmart compliance.		
14.	Complete OCP review and implement and / or strengthen zoning to expand reach of the existing.	

15.	Develop Wildfire Hazard Development Permit (DP) Areas for major retrofits / renovations or new builds (building permits), collecting bonds to be returned upon evidence of completing development and landscaping according to wildfire hazard assessment. Review District of North Vancouver and Kelowna DP processes, with particular attention to implementation, enforcement, affordability and associated liabilities. Explore proactive incentives, such as tax reductions and reduced building permit fees.	***Not complete.***
16.	Obtain legal advice regarding the Building Act, specifically regarding the temporarily unrestricted matters and local government authority to set exterior building materials requirements. Use local government authority to mandate FireSmart construction materials beyond BC Building Code in wildfire hazard development permit area, as allowed.	***[no comment]***
17.	Develop a landscaping standard to be applied in interface / DP areas. The standard should list flammable non-compliant vegetation, nonflammable drought and pest resistant alternatives, and tips on landscape design to reduce maintenance, watering requirements, and reduce wildfire hazard. Include meeting landscaping standard as a requirement of Development Permit. Review District of North Vancouver and Kelowna DP processes, with particular attention to implementation, enforcement, affordability and associated liabilities. Explore proactive incentives, such as tax reductions and reduced building permit fees.	***Not complete.***
18.	Proactively enforce wildfire covenants requiring owners to maintain their properties hazard free on all properties in Development Permit areas. Enforcement will serve to minimize fuel risks on problematic private properties that have allowed hazardous accumulation of fuels and provide improved protection to adjacent lands.	***Not complete.***
19.	Develop a landscaping standard to be applied in interface / DP areas to ensure that developers leave building set backs on private land so that there is a minimum of 10 m distance between buildings and forest interface.	***Not complete.***
20.	Consider developing an outdoor burning bylaw specifying requirements for and limitations to outdoor burning and, in conjunction with the Fire Chief, implement the bylaw at times of high fire danger when provincial bans are not in place. The bylaw should consider effective and efficient enforcement measures and powers.	***[no comment]***
21.	Work with the Building and Safety Standards Branch to provide input into the Building Code revisions that would apply within the interface to prevent the spread of wildfire	***[no comment]***
Emergency Response and Planning		
Objective: To improve structural and wildfire equipment and training available to RDCK Fire and Rescue.		

22.	Conduct annual mutual aid training with MFLNRORD and BCWS including completion of a mock wildfire simulation in coordination with BCWS and safety training specific to wildland fire and risks inherent with natural areas. As part of the training, conduct annual reviews to ensure PPE and wildland equipment resources are complete, in working order, and the crews are well versed in their set-up and use. Wildfire training should be in compliance with Office of the Fire Commissioner standards.	***[no comment]***
23.	Ensure RDCK Wildfire Mitigation Coordinator act as liaison between the RDCK Collaborative Planning Group and the Emergency Preparedness Committee for Area I. Coordination and information sharing are crucial to the development of a community well prepared for wildfire.	***[no comment]***
24.	Review and clarify SPU request procedures with RDCK fire Chiefs and ensure robust SPP115 training for fire fighters.	***[no comment]***
25.	Develop Regional Service to fund additional SPUs and maintain existing SPUs.	***[no comment]***
26.	Explore opportunities to collaborate with BCWS and within RDCK fire service to coordinate discount volumes of hose for interface fires, reducing costs and logistics to local fire departments	***[no comment]***
27.	Explore opportunities to ensure a duty officer is in place in each Fire Protection Area to provide coverage for periods of high or extreme hazard.	***[no comment]***
28.	Conduct fire preplan assessment for key interface areas in Area I. Other jurisdictions have completed assessments that prioritize fire department-specific variables, such as distance to hydrants, response time from nearest fire station, etc. to produce local risk ratings.	***[no comment]***
Emergency Response Evacuation and Access		
Objective: To improve access and egress to neighbourhoods at risk and natural areas within RDCK.		
29.	Develop a Total Access Plan to create, map and inventory trail and road network in natural areas for suppression planning, identification of areas with insufficient access and to aid in strategic planning. Fire threat mapping from this CWPP should be included. The plan should be updated every five years, or more regularly, as needed to incorporate additions or changes.	***[no comment]***
30.	Require that all new interface developments have access for evacuation and sufficient capacity for emergency vehicles.	***[no comment]***
31.	Facilitate completion of emergency planning zones for interface neighbourhoods with limited access.	***[no comment]***
Fuel Management		

Objective: Reduce wildfire threat on public lands through fuel management.		
32.	Proceed with detailed assessment, prescription development and treatment of hazardous fuel units identified in this CWPP. Collaboration with licensees may facilitate larger projects.	***[no comment; some prescriptions have been developed, and some of those implemented]***
33.	Prioritize Areas of Interest across Electoral Areas with updated CWPPs to ensure effective and objective treatment	***[no comment; some prescriptions have been developed, and some of those implemented]***
Objective: Maintain treated areas under an acceptable level of wildfire fire threat (moderate).		
34.	As treatments are implemented, complete monitoring within 10 years of treatment (subject to site conditions) and maintenance every 15-20 years (subject to prescription and site conditions) on previously treated areas. Treated areas should be assessed by a Registered Professional Forester, specific to actions required in order to maintain treated areas in a moderate or lower hazard.	***[no comment]***

6.2 APPENDIX B: LOCAL WILDFIRE RISK PROCESS

Wildfire Risk Assessment plot worksheets are provided in The correlation between structure loss and wildfire are described below.

Home and Critical Infrastructure Ignition Zones

Multiple studies have shown that the principal factors regarding home and structure loss to wildfire are the structure's characteristics and immediate surroundings. The area that determines the ignition potential of a structure to wildfire is referred to as (for residences) the Home Ignition Zone (HIZ) or (for critical infrastructure) the Critical Infrastructure Ignition Zone (CIIZ). Both the HIZ and CIIZ include the structure itself and three concentric, progressively wider Priority Zones out to 30 m from the structure (Figure 8 below). More details on priority zones can be found in the FireSmart Manual.

Figure 8. FireSmart Ignition Zone (HIZ)

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

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

6.2.1 APPENDIX B-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.[39] 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.[40] 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.[40] 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 by general fire behaviour (crown fire and spotting potential). These fuel types were used to guide the threat assessment.

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

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

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

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

Fuel Type	FBP / CFDDRS Description	AOI Description	Wildfire Behaviour Under High Wildfire Danger Level	Fuel Type – Crown Fire / Spotting Potential
C-5	Red and white pine	*Well-stocked mature forest, crowns separated from ground. Moderate understory herbs and shrubs. Little grass or surface fuel accumulation.*	Moderate potential for active crown fire in wind-driven conditions. Under drought conditions, fuel consumption and fire intensity can be higher due to dead woody fuels.	Low
C-7	Ponderosa pine and Douglas-fir	*Low-density, uneven-aged forest, crowns separated from the ground, understory of discontinuous grasses and shrubs. Exposed bed rock and low surface fuel loading.*	Surface fire spread, torching of individual trees, rarely crowning (usually limited to slopes > 30%), moderate to high intensity and rate of spread.	Moderate
O-1a/b	Grass	*Matted and standing grass that can cure; sparse or scattered shrubs, trees, and down woody debris. Seasonal wetlands that can cure*	Rapidly spreading, high-intensity surface fire when cured.	Low
M-1/2	Boreal mixedwood (leafless and green)	*Moderately well-stocked mixed stand of conifers and deciduous species, low to moderate dead, down woody fuels*	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
N	N/A	*Non-fuel: irrigated 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

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

6.2.2 APPENDIX B-2: 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.[41] 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 (Coast and Mountains Ecoprovince)
  - 0 – 41 Low
  - 42 – 57 Moderate
  - 58 – 69 High
  - 70 – 100 Extreme

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

WTA Plot	Geographic Location	Wildfire Threat Rating
BRI-1	Area I Brilliant Road Cemetery, east of Columbia River	51 (Moderate)
GLADE-1	Adjacent to Glade Rd. at south end of community	74 (High)
GLADE-2	Adjacent to Upper Glade Rd	52 (Moderate)
GLADE-3	Adjacent to north of Makonin Rd.	61 (Moderate)
GLADE-4	Adjacent to south of Makonin Rd.	70 (High)
HAD-1	Area I adjacent to Hadikin Rd.	56 (Moderate)
KOK-1	Area I South of Kokanee Dr.	60 (Moderate)
NSEN-1	Area I north sentinel East of Pass Creek Rd North	56 (Moderate)
OAK-1	Area I South of Oak Rd.	66 (High)
SHU-1	Area I East of Pass Creek Rd	64 (Moderate)

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

6.2.3 APPENDIX B-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.

6.2.4 APPENDIX B-4: PROXIMITY OF FUEL TO THE COMMUNITY

The correlation between structure loss and wildfire are described below.

Home and Critical Infrastructure Ignition Zones

Multiple studies have shown that the principal factors regarding home and structure loss to wildfire are the structure's characteristics and immediate surroundings. The area that determines the ignition potential of a structure to wildfire is referred to as (for residences) the Home Ignition Zone (HIZ) or (for critical infrastructure) the Critical Infrastructure Ignition Zone (CIIZ).[42,43] Both the HIZ and CIIZ include the structure itself and three concentric, progressively wider Priority Zones out to 30 m from the structure (Figure 8 below). More details on priority zones can be found in the FireSmart Manual.[44]

[42] Reinhardt, E., R. Keane, D. Calkin, J. Cohen. 2008. *Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States*. Forest Ecology and Management 256:1997 - 2006. Retrieved from: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States | Treesearch (usda.gov)

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

[44] Available for download here: FireSmartBC_HomeownersManual_Printable.pdf

Figure 8. FireSmart Ignition Zone (HIZ)[45]

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

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

6.3 APPENDIX C: WILDFIRE RISK ASSESSMENT – WORKSHEETS AND PHOTOS

Provided separately as PDF package.

6.4 APPENDIX D: MAPS

Provided separately as PDF package.

6.5 APPENDIX E: COMMUNITY FIRESMART RESILIENCY COMMITTEE

The Castlegar Area FireSmart and Resiliency Committee (CFRC) was formed in 2023, and includes EA-I representation.

Table 29. Initial invitee list (2023) of the Castlegar and Area FireSmart and Resiliency Committee

Agency	Role
EA-I	Unknown (assumed Area Director)
BCWS	Senior Wildfire Prevention Officer
	Prevention Specialist
RDCK	Wildfire Mitigation Specialist
	FireSmart Co-Ordinator
Ministry of Forests	Wildfire Risk Reduction Specialist
	Wildfire Risk Reduction Specialist
City of Castlegar Fire Department	Fire Chief
	Deputy Fire Chief
City of Castlegar	Manger of Planning, Development, and Sustainability
	Manager of Engineering and Infrastructure
Columbia Power Corporation	Environmental Lead
Shuswap Band	Unknown
Yaqan Nukiy	Forester
Lower Kootenay Band	Firesmart Coordinator
Okanagan Nation Alliance	Tmix Technician
Province of BC Government	District Wildfire Coordinator
Selkirk College	Forestry Instructor
Ootischenia Improvement District	Representative