Community Wildfire Resiliency Plan

Strathcona Regional District
Electoral Area D

February 25, 2022

Submitted by:

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DATE SIGNED	
February 25, 2022	
I certify that the work described herein fulfills the standards expected of a member of the Association of British Columbia Forest Professionals and that I did personally supervise the work.	
Registered Professional Forester Signature and Seal	
	

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EXECUTIVE SUMMARY

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

This CWRP will replace Strathcona Regional District (SRD) Electoral Area D's (EA D) 2012 CWPP and provides SRD with an updated action plan that can be used to guide the improvement and/or development of emergency plans, emergency response, evacuation plans, communication and education programs, bylaw and policy development in areas of fire risk, and the management of potentially hazardous forest stands in the Wildland Urban Interface (WUI).

Fieldwork allowed for verified and updated fuel types and wildfire threat assessments to be combined with an office-based analysis to update the local wildfire threat for the WUI. UBCM CRI grant funding does not allow for assessments on private land, which constitutes 85% of EA D's WUI. Classes of the wildfire threat class analysis are as follows:

- Very Low: Areas no forest or grassland fuels, posing no wildfire threat;
- Low: Developed and undeveloped land that will not support significant wildfire spread;
- Moderate: Developed and undeveloped land that will support surface fires that are unthreatening to homes and structures;
- High: Landscapes or stands that provide continuous forested fuels that will support candling, intermittent crown or continuous crown fires. These landscapes are often steeper slopes, rough or broken terrain and/or south or west aspects. High polygons may include high indices of dead and downed conifers; and
- Extreme: Continuous forested land that will support intermittent or continuous crown fires.

The result of the analysis show that of the remaining assessable area within the WUI (and also removing area covered by large waterbodies), 82% is either very low threat, or low threat. The remaining ~18% of the WUI is almost all moderate threat, with high and extreme threat classes together totaling less than 1% total.

Most homes in the WUI are part of either intermix or interface communities – the homes and structures are largely situated within the vegetated/forested landscape or border against a forest edge. With 93% of historical fire ignitions being directly from humans or associated human activity, the most likely threat of wildfire ignition and spread within these communities is from a structure or industrial fire spreading via vegetation to other homes and structures and then into the surrounding forested landscape. The key to reducing WUI fire structure loss is to reduce structure ignitability. Thus, FireSmart activities on and surrounding homes and critical infrastructure (with a focus on a values-out approach, *i.e.,* starting with activities on the structure itself and then the surrounding area immediately adjacent and continuing

outwards) is the number one recommendation in this plan. Using the 2022 UBCM CRI FireSmart Community Funding and Supports program application guide as a gauge on how FireSmart EA D's WUI communities are, of the 37 applicable mitigation activities, 35% have already been achieved, 8% partially achieved, and 57% not achieved. Continued mitigation should be focused on development considerations (construction practices and regulations), FireSmart assessments and vegetation management on homes, neighbourhoods, and critical infrastructure, and continued resident education. Public outreach on the range of available activities and the prioritization of activities should help residents to feel empowered to complete simple risk reduction activities on their property.

A total of 36 recommendation and action items are presented in Table 1 within this Executive Summary and are more thoroughly discussed in their appropriate sections within the document. Because the WUI overlaps multiple land titles and license holders, SRD's role may be limited to an advocate or influencer in some instances, while other action items can be implemented directly. Ultimately, the recommendation and action items within this plan should be considered a toolbox of options to help reduce the wildfire threat to Electoral Area D.

Table 1: Strathcona Regional District Electoral Area D's CWRP Action Plan

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Education (Section 5.1)							
Objective: To provide information to residents empowering them to adopt and conduct FireSmart practices to mitigate the negative impacts of wildfire to their homes/businesses, properties, and neighbourhoods.							
1	High	This CWRP report and associated maps should be made publicly available by SRD through its website, Campbell River FD's website, Oyster River FD's website, and on social media. In addition, this CWRP should be shared with local industry partners who may be interested in collaborating on FireSmart and wildfire risk reduction activities.	Include all members of the Community FireSmart Resiliency Committee, as well as other relevant industries and businesses in the WUI ((*i.e.,* woodlots, Mosaic Forest Management and other private forest land managers, BC Parks, and local First Nations).	SRD; City of Campbell River	1 year from document completion	Available for download or viewing on SRD's and FDs' webpages	SRD; City of Campbell River (~5 hours to update one website)
2	High	SRD, Campbell River FD, and Oyster River FD should continue to promote FireSmart education through FireSmart workshops (*i.e.,* SRD EA D's 'Safety Day'), open houses, presentations, and information mailouts. Supply FireSmart resources during these engagement campaigns and promote the FireSmart Begins at Home mobile app as a method of conducting home assessments. Promote overall home fire safety by providing information on fire extinguishers, fireplace maintenance, chimney maintenance, etc.	Educate homeowners of FireSmart principles and encourage residents to FireSmart their homes. Aim to conduct the engagement and promotion campaign before and during the fire season. The SRD should consider FireSmart workshops for each of the priority neighbourhoods separately hosted in/near their community to attract as many residents as possible. Consider providing fire extinguisher maintenance and re-certification at these workshops.	SRD (Campbell River FD, Oyster River FD, Local FireSmart Representatives)	Yearly (pre-fire season)	1 workshop per neighbourhood per year	UBCM CRI funding is available (~40 hours for planning and 1 day for each workshop)
3	High	SRD and Oyster River FD should, where missing, develop FireSmart/Wildfire Preparedness pages on their websites with links to FireSmart BC information, local updates, etc.	Websites are effective platforms to distribute information. SRD should consider creating a fire weather decal on its front page displaying the current fire weather (that could double as a button to its FireSmart page).	SRD (Oyster River FD, Consultant)	1 year	Webpages updated	UBCM CRI funding is available (~$3000 contracted service. ~40 hours for set-up. Additional

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							hours for updates as required)
4	High	SRD should apply for funding to complete Home Ignition Zone Assessments (HIZ) or Home Partners Program (HPP)Wildfire Mitigation Assessments on residential properties. Inform residents (through mail-outs, social media, etc.) of the program and provide online and mail-in sign-up options for a set of potential assessment dates.	HIZ assessments can be completed by a Local FireSmart Representative and assess the home and property's risk from wildfire. HPP Wildfire Mitigation Assessments[1] area more detailed and comprehensive assessment completed by fire professionals (*ex.* firefighter) that have completed FireSmart Wildfire Mitigation Specialist training. The assessment process accurately evaluates a home and property for wildfire exposure, while engaging the homeowner in their unique risk and ways to reduce it.	SRD (LFR or HPP Mitigation Specialists – may be a consultant)	5 years	Interface homes in each priority neighbourhood (Table 15) have been assessed.	UBCM CRI funding is available for both HIZ and HPP assessments. (~$250/structure)
5	High	In conjunction with recommendation #4, SRD should offer a local rebate program to residential property/homeowners that have completed eligible FireSmart assessments and activities. (Rebates are limited to 50% of the total cost of eligible activities, up to $500/property)	Rebate programs can be difficult to incentivize owners to participate in. Currently underway in the Squamish-Lillooet Regional District[2], inform residents (through mail-outs, social media, etc.) that those who have had a HIZ or HPP assessment completed automatically qualify for the rebate program. Provide online and mail-in registration options.	SRD (Consultant)	5 years	Rebate program implemented in EA D.	UBCM CRI funding is available (cost/time dependent on number of registered properties)
6	High	SRD should apply for funding to complete Neighbourhood Wildfire Assessments for each of the priority neighbourhoods listed	Neighbourhood Wildfire Assessments provide a written evaluation of the overall neighbourhood wildfire hazard	SRD (Local FireSmart	5 years	Assessments completed for neighbourhood.	UBCM CRI funding is available

[1] More information on HPP assessments can be found here: https://www.firesmartcanada.ca/programs-and-education/firesmart-home-partners-program/
[2] Contact the SLRD for more information on how they have implemented this program. Additional information located here: https://www.slrd.bc.ca/emergency-program/preparedness/firesmart-program

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		in Table 15.	and should be completed by a certified Local FireSmart Representative to be recognized by FireSmart Canada. This could be contracted out in conjunction with recommendation #4.	Representative, Consultant)			(~$400-1000/neighbourhood depending on location and size)
7	High	Links to the Campbell River FireSmart Guide to Landscaping should be created on SRD's, Campbell River FDs, and Oyster River FD's webpages. SRD should continue to include it, or reference to it, in annual FireSmart education mail-outs.	Increase FireSmart vegetation management knowledge amongst EA D's residents. Consider a social media 'blast' relating to it.	SRD (Campbell River FD, Oyster River FD)	1 year	Posted on SRD's and FDs' FireSmart webpages	UBCM CRI funding is available (~ 20 hours in-house)
8	Moderate	SRD should support and facilitate priority neighbourhoods to self-organize to attain FireSmart Canada Neighbourhood Recognition Program (FSCNRP) status. Once completed, support the development of FireSmart Neighbourhood Plans.	Neighbourhood Wildfire Assessments are a steppingstone towards FSCNRP status. Leverage the leadership of a Local FireSmart Representative.	SRD (Local FireSmart Representatives)	5 years	Completed for priority neighbourhoods	UBCM CRI funding is available ($5000/ neighbourhood; 40 hours/ initiative)
9	Moderate	SRD should encourage School District 72 to adopt and deploy existing wildfire education programs. Other options/value-added activities include consulting with the Association of BC Forest Professionals (ABCFP) and BCWS (North Island Mid Coast Fire Zone) as well as the SRD EA D FD and regional FireSmart representatives to facilitate and recruit volunteer teachers and experts to help with curriculum development to be delivered in the schools (field trips, guest speakers, etc.).	Emergency preparedness curriculum is available provincially, which includes preparedness for a variety of natural hazards, including wildfire (Master of Disaster, FireSmart BC Education box).	SRD	Yearly (pre-fire season)	One FireSmart education day per school year	UBCM CRI funding available (FireSmart BC Education box - $800 Junior K-Grade 12. Field trips, guest speakers, etc. ~$2500 per school)
Legislation and Planning (Section 5.2)							
Objective: To provide the means for Strathcona Regional District to implement wildfire risk reduction actions through by-laws and legislation by outlining local government responsibilities regarding wildfire.							
10	High	Complete or schedule periodic updates of the CWRP. The frequency of updates is highly dependent upon major changes	A current (i.e., no more than 5 years old) CWRP isa requirement for further funding under the UBCM CRI Program.	SRD (Consultant)	5 years from adopting this CWRP	EA D always has an up-to-date CWRP and	UBCM CRI funding is available

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		which would impact local wildfire risk or the rate at which wildfire risk reduction efforts are implemented. An evaluation of major changes (including funding program changes that may lead to new opportunities) and the potential need for a CWRP update should be initiated every 5 years.			document	action plan	(~$25,000 for full document / $10,000 for update)
11	High	Update/Amend the Black Creek – Oyster Bay Fire Protection Service Regulation Bylaw (or create separate legislation applicable to Campbell River FD's response area in EA D) that extends fire bans and other associated wildfire risk bans enacted to cover both FD's fire protection areas.	One bylaw, or two equal bylaws should cover both fire response areas to eliminate confusion on what regulations apply where, and to reduce wildfire risk across the WUI.	SRD (Consultant/Lawyers)	5 years	Legislation updated/created	UBCM CRI funding is available ($3000 contracted service)
Development Considerations (Section 5.3)							
Objective: To embed FireSmart practices and considerations into all development within SRD Electoral Area D.							
12	High	Develop a Wildfire Hazard DPA and update the Oyster Bay – Buttle Lake Official Community Plan (OCP) when completed. To meet objectives, consider including the following elements: • minimum setbacks from forested edges based on FireSmart, • fuel management based upon qualified professional recommendations, • landscaping to FireSmart guidelines, • building materials and design based on NFPA 1144 and FireSmart standards, • underground servicing, • prompt removal of combustible	To embed FireSmart values into all aspects of community development and planning, especially to those communities within the WUI. Variations of a Wildfire DPA, with differing levels of FireSmart adherence required, are being developed/employed by municipalities and regional districts across BC.[3]	SRD (Consultant)	5 years	Interface wildfire DPA created and adopted	UBCM CRI funding is available (~$20,000 contracted service and 40 hours in-house)

[3] Example municipalities and regional districts include District of West Vancouver and the Regional District Okanagan-Similkameen.

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		construction materials or thinning/fuel management waste, and a minimum of two access/evacuation routes for all neighbourhoods.					
13	High	Explore opportunities to enhance water access/drafting sites across the WUI for EA D fire response area fire departments and wildland firefighters. Opportunities include building permanent cisterns/reservoirs adjacent to/within communities that can be filled during the winter, or are on the edge/near known accessible drafting sites and are gravity fed and covered to reduce evaporation during fire season.	This will likely involve multiple jurisdictions and entities including SRD, EA D fire response area fire departments, BCWS, FLNRORD and multiple professional assessments (engineering, riparian, biology). Example cistern locations would be half-way up York Road and adjacent to the small housing communities along Upper Campbell Lake.	SRD (BCWS, EA D FD's, FLNRORD, Consultant)	5 years (for siting and planning)	Locations for cisterns / reservoirs identified in priority neighbourhoods .	SRD (unknown)
14	High	SRD EA D's functional infrastructure (*i.e.,* Firehalls, Emergency Reception Centres, Emergency Housing Locations, water lift/pump stations, etc.) should have backup gas- or diesel-powered generators. SRD and EA D fire response area fire departments should invest in secondary power sources, as/if required, to continue these services in the case of a prolonged or extensive power outage because of a wildfire. Upgrade or realign resources, as prioritized.	Ensure that generators have sufficient fuel supply for extensive power outages (3 + days) so that they can function as required in the event of an emergency.	SRD (SRD EA D FDs)	5 years	All functional critical infrastructure have backup power sources	SRD SRD EA D FD (~$30,000 per site - depending on requirements)
15	High	Engage a qualified professional (such as a Local FireSmart Representative) to complete formal FireSmart assessments of all critical infrastructure. Plan and implement action items in the sequence of importance. Additionally, SRD should request that Telus Communications Inc, FortisBC and BC Hydro conduct FireSmart assessments their key infrastructure and implement	Critical infrastructure, such as fire halls and emergency shelters, are identified in Table 7.	SRD (Local FireSmart Representative or Consultant)	3 years	Assessments completed and action items being planned for	UBCM CRI funding is available (~$1000 per location – contracted service)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		mitigation work as required.					
16	High	Use fire-resistant construction materials, building design, and landscaping for all critical infrastructure when completing upgrades or establishing new infrastructure.	Vegetation setbacks around critical infrastructure should be compliant with FireSmart principles (*e.g.,* no combustible material within 10 m of structures).	SRD	Ongoing	New and upgraded critical infrastructure are FireSmart	SRD ($ variable: CI specific)
17	High	The Campbell River FireSmart Guide to Gardening should be set as a standard and applied to SRD EA D zoning and development permit documents.	Consider including the landscaping standard as part of the wildfire hazard DPA.	SRD	5 years	Landscaping standard built into zoning and/or an interface wildfire DPA	UBCM CRI funding is available ($/time dependent on actions taken)
18	High	Conduct a full review and updating of the Oyster Bay – Buttle Lake Official Community Plan to imbed FireSmart principles within the stated objectives and policies and to guide future land use and development decisions. Examples include updating: • Rural design guidelines and development principles. Existing designated development permit areas: (401) Neighbourhood Commercial, (402) Tourist Commercia Development, (403) Cottage Industry, (404) Protection of the Natural Environment, Its Ecosystems and Biological Diversity, (405) Industrial, and (406) Upland Habitat Greenways.	The OCP sections recommended for updating should not be considered the complete list of sections that should be reviewed and updated, but rather a guide to how FireSmart principles can be viewed and actioned in it. See the Fraser Valley Regional District Electoral Area D OCP Update, the Cariboo Regional District Electoral Area G OCP, and other regional district electoral areas as examples.	SRD (Consultant)	5 years	Required OCP sections updated	UBCM CRI funding is available (~20 in-house hours and ~$10,000 including $1,500 for administration (SRD) and $8,500 for consultant costs (100 hrs @ $85/hr).
19	Moderate	Existing single access/egress neighbourhoods should be reassessed for potential secondary access/evacuation routes. There could be opportunities for an easement or agreement-on-use on the edge of an individual's private property, routes through private managed forest land, or using BC Hydro right-of-way corridors (to be used only in emergency evacuation situations).	It is recognized that landscape geography and private property can make this difficult. Start by contacting land managers and owners and discuss using resource roads as emergency evacuation routes. An example is constructing a connection from the end of York Road west to Highway 19, or from the end of York	SRD	5 years	Where determined possible, secondary egress routes are being planned for development	SRD (Cost/time dependent on level of discussions and planning)

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			Road south to existing forest resource roads creating access to Duncan Bay Road.				
Interagency Cooperation (Section 5.4)							
Objective: To broaden from a department or agency single jurisdiction-based approach to a risk driven, multi-agency and multi-scalable approach.							
20	High	Engage with forest licensees and private managed forest landowners/operators within the WUI to: 1) Identify parts of the license/operations area that are in the WUI and what goals would be for this zone regarding harvesting, post-harvest debris disposal, and reforestation prescriptions so that both harvesting operations and the future forest stand maintain or enhance wildfire resiliency, especially at interface edges. 2) Gauge interest in facilitating a forest licensee – BCWS specific wildfire education and training day/workshop.	1) Reduce interface wildfire risk throughout managed forest lands that are closest to structures in the WUI. Consider involving BCWS North Island Mid-Coast Zone and FLNRORD personnel in discussions and planning. Slash management is a priority for wildfire risk reduction. 2) Promote wildfire management and wildfire mitigation tools/tactics to those managing the wildland forest land base. Consider adding the S-100 course/training to those who attend.	1/2) SRD (FLNRORD, Stakeholders, BCWS, Consultant)	5 years	1) Forest landowners and managers know where their tenure area overlaps with the WUI 2) Licensee – BCWS specific workshop/training day completed.	1) SRD (time/cost dependent) 2) UBCM CRI funding is available – education (~40 hours for planning and 1 day for each workshop)
21	High	Plan SRD EA D CFRC scheduled meetings, especially before and during the fire season.	Forward relevant information to forest landowners and managers within the WUI, including BC Parks.	SRD (Stakeholders)	Ongoing	1 meeting each year prior to fire season	SRD (~$300/yr)
22	High	Continue to have relevant SRD members attend annual FireSmart BC conferences, hosted by the BC FireSmart Committee.	Participation will continue to foster a strong relationship between SRD and FireSmart BC/Canada. Notify the EA D fire response area FDs of the conference and encourage attendance.	SRD (EA D fire response area FDs)	Ongoing – yearly	SRD rep. and EA D fire response area FDs' Fire Chiefs attend yearly	UBCM CRI funding is available (cost/time dependent on conference location)
23	Moderate	Encourage BC Parks to apply FireSmart vegetation management principles at campsites and that no hazardous fuel accumulations are left in campsite locations (whether accumulated naturally or by human activities).	Reduce wildfire risks at BC Park campsites within the WUI.	SRD (BC Parks)	5 years	Consultation with BC Parks completed	SRD (~2 hours)

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24	Moderate	Continue to promote right-of-way best management practices (BMPs) for regular brushing and clearing of woody debris and shrubs in coordination with FortisBC and BC Hydro to help reduce fire risk, utility pole damage, and subsequent outages.	Tree failures adjacent to power lines (transmission and distribution) are common occurrences and represent significant risks to ignition within the WUI. Encroachment of understory vegetation and overhanging trees were noted by consultants in various locations.	SRD (BC Hydro, FortisBC)	5 years	BMPs in use for the district.	UBCM CRI funding is available (~30 hours in-house)
Cross-Training (Section 5.5)							
Objective: To support the development of comprehensive and effective wildfire risk reduction planning and activities, as well as a safe and effective response.							
25	High	Complete and participate in regular testing of, and updates to, the Evacuation Plan for SRD EA D. Include yearly (pre-fire season is best) wildfire emergency simulation exercises. Identify hazards, barriers to access (i.e., locked gates, tight or no turnarounds), and other response issues and develop measures to address them.	Include SRD emergency response staff, BCWS, RCMP, and mutual aid partner fire departments.	SRD (see comments)	Yearly (pre-fire season)	Table-top response exercises conducted at least once every two years	UBCM CRI funding is available (12 planning hours; 60 person-hours per exercise)
26	High	SRD should facilitate: 1)additional Local FireSmart Representative (LFR) training for SRD EA D residents and District staff. EA D fire response area FDs should facilitate: 2) FireSmart Home Partners Mitigation Specialist Training opportunities for EA D fire response area fire department staff.	Increase SRD's and EA D fire response area FDs' capabilities to provide FireSmart programs and resources to the community.	SRD/SRD EA D fire response area FDs	2 years	1+ additional LFR in SRD staff 1+ Mitigation Specialist on both Campbell River and Oyster River FDs' staff	UBCM CRI funding is available (~$2000/16 hrs per person)
27	Moderate	SRD should leverage Local FireSmart Representatives (LFR) to: 1) conduct outreach into priority FireSmart Neighbourhoods to identify potential community champions, and 2) schedule and conduct FireSmart Community Champion Training.	Increase EA D's FireSmart priority neighbourhoods' capabilities to assume FireSmart planning and mitigation activities themselves.	SRD (LFRs)	1) 2-3 years 2) 2-4 years	Community champion identified for each high-risk FireSmart neighbourhood.	1) SRD: ~80 hours 2) UBCM CRI funding is available
Emergency Planning (Section 5.6)							

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To create specific wildfire response pre-incident plans so those responding to a wildfire emergency know who is available to help with what and when, and to improve SRD's ability to respond to (during and after) a wildfire emergency.							
28	High	Campbell River and Oyster River FDs should continue engaging BCWS to conduct annual reviews ensuring PPE and wildland equipment resources are complete, in working order, and the crews are well-versed in their set-up and use. Identify equipment deficiencies and plans to fill them.	Maintain an annual structural and interface training and equipment review program and maintain a strong relationship between SRD EA D FDs and BCWS.	EA D fire response area FDs	Yearly (pre-fire season)	Wildland firefighting equipment resources are complete	EA D fire response area FDs (~20 hours in-house)
29	High	Oyster River FD should digitize important fire and emergency response information, such as water drafting sites and have the information available on units within response vehicles.	To ensure prompt and effective response to fire emergencies within their fire response area. Oyster River FD should reach out to the SRD to see if the District's GIS department can provide this service. The data should be made available on the NI911 Fire Dispatch mapping service so it is available on all mobile CAD units on emergency response vehicles.	Oyster River FD	2 years	Required information is digitized and available electronically	Oyster River FD
30	High	SRD should apply for UBCM CRI funding to hire a FireSmart coordinator (full-time basis).	To manage the planning and implementation of recommendations and action items in this report. Note: funding is guaranteed only on a year-by-year basis. For continuity of multi-year and ongoing FireSmart projects, SRD should explore creating a position not reliant on grant funding. Potential option to collaborate with City of Campbell River and other municipalities to create a joint position.	SRD (Local municipalities)	2 years	FireSmart coordinator hired	UBCM CRI funding is available ($59,000 contract pay)

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31	Moderate	Develop an Evacuation Plan pamphlet that summarizes key components of the Evacuation Plan, specific to resident roles during an evacuation event. The pamphlet should be made available online and could be available as a hard copy at general stores.	Consider adding a section for "what we need for prompt response on your property"[4] that details key information/items/locations first responders and emergency responders require when responding to incidents.	SRD (EA D fire response area FDs)	5 years	Pamphlets created and available to the public	SRD (Cost to develop: 40 hours total and $5.00/ pamphlet)
32	Moderate	Update SRD EA D's HRVA and/or emergency management plans with information and data from this CWRP. Develop wildfire-specific incident plans and associated maps. Incorporate items listed in the Pre-Incident Planning subsection above. Local Fire Threat and stakeholders'/tenure holder's contact information should be incorporated within the map. The map should be included in the SRD EA D Evacuation Plan and shared with EA D Fire Departments, the City of Campbell River, BCWS, and industrial operators (Woodlots, private managed forest landowners) to support emergency response in the event of a wildfire. The map should be reviewed as needed to incorporate additions and/or changes.	Wildfire incident plans and maps will support emergency response in the event of a wildfire and/or evacuation event. These plans help target emergency planning and effort in meaningful and effective ways, such as knowing where fire guards can/can't be built, as well as minimizing the need for using machinery to build cat guards in sensitive areas. Overall, all emergency and evacuation plans should be shared with those persons and entities responsible for local emergency response.	SRD (Consultant, BCWS)	5 years	Wildfire incident plans and associated maps were created and made available	SRD (Cost to EOC/EPC; 12 planning hours and ~$6,000 contracted service)
Vegetation Management (Section 5.7)							
Objective: To reduce the potential wildfire intensity and ember exposure to people, infrastructure, structures, and other values through manipulation of both the natural and cultivated vegetation that is within or adjacent to a community.							
33	High	Continue implementing the yearly community/neighbourhood chipping program. Education of FireSmart yard and landscaping principles, including chipping specifications should be incorporated into	To reduce wildfire hazards on private property within the WUI and promote FireSmart vegetation management knowledge and education.	SRD	Yearly	Continued high amount of participation byEA D residents	UBCM CRI funding is available (Costs/time in

[4] Recently conducted on Thetis Island.

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		the program.					line with previous year)
34	High	1) In conjunction with recommendation #15, initiate detailed assessment, prescription development, and treatment of forest stands on Crown or municipal land within FireSmart Structure Ignition Zones 1-3 of functional critical infrastructure. 2) Contact private landowners within FireSmart Structure Ignition Zones 1-3 of noted critical infrastructure and lobby for either them to plan and implement similar wildfire risk reduction activities on their land, or have SRD do that on their behalf.	To reduce wildfire risk to functional critical infrastructure in the WUI. Plan to complete FireSmart critical infrastructure assessments first. If hazardous fuels are noted within FireSmart Structure Ignition Zones 1-3, a prescription may be required for treatment implementation.	SRD (Consultant)	5 years	Prescriptions for high priority units developed. Treatment completed on one TU.	UBCM CRI funding is available (~$500/ha prescription; ~$8000/ha treatment)
35	High	When fuel treatments are conducted (on critical infrastructure), treatment monitoring 10 years out should be completed by a qualified professional. This can be completed with a CWRP update or as a stand-alone exercise.	Assess the efficacy of the treatment and schedule maintenance activities. It is cheaper to perform maintenance early when regeneration is small.	SRD (Consultant)	10 years	All completed fuel treatments are reassessed within 10 years, and ongoing, post-treatment	UBCM CRI funding is available (~100/ha for assessment)
36	High	In line with recommendation #20, SRD should emphasize the importance of post-harvest slash management to those forest license holders and private forest landowners within the WUI.	Consider involving BCWS and promoting tools such as the Critical Surface Intensity Worksheet[5,6] – developed to assess if the surface fuel loading prescribed/present will limit the chances of crown fire ignition, based on the retained height to live crown (or	SRD (BCWS, WUI forest license holders)	5 years	Post-harvest slash management in the WUI is considering wildfire risk reduction	SRD (~40 hours consultation with BCWS and outreach to forest license

[5] Worksheet located here: https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/critical_surface_intensity_worksheet_v4.xlsx
[6] Additional information and tools located here: https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/vegetation-and-fuel-management/fire-fuel-management/fuel-management

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
			prescribed pruning height) of the treated/harvested stands.				holders)

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FREQUENTLY USED ACRONYMS

AOI	Area of Interest
BC	British Columbia
BCWS	British Columbia Wildfire Service
BEC	Biogeoclimatic Ecosystem Classification
CDC	Conservation Data Centre
CFFDRS	Canadian Forest Fire Danger Rating System
CFS	Community Funding and Support
CI	Critical Infrastructure
CIIZ	Critical Infrastructure Ignition Zone (also see Structure Ignition Zone)
CRI	Community Resiliency Investment
CWPP	Community Wildfire Protection Plan
CWRP	Community Wildfire Resiliency Planning
DPA	Development Permit Area
EAD	Electoral Area D
EMBC	Emergency Management British Columbia
FBP	Fire Behavior Prediction System
FD	Fire Department
FESBC	Forest Enhancement Society of British Columbia
FSCCRP	FireSmart Canada Community Recognition Program
HIZ	Home Ignition Zone (also see Structure Ignition Zone)
HRVA	Hazard Risk and Vulnerability Analysis
LRMP	Land and Resource Management Plan
MFLNRORD	Ministry of Forests, Lands, Natural Resource Operations and Rural Development
MOTI	Ministry of Transportation and Infrastructure
NDT	Natural Disturbance Type
PSTA	Provincial Strategic Threat Assessment
OCP	Official Community Plan
SRD	Strathcona Regional District
SWPI	Strategic Wildfire Prevention Initiative
UBCM	Union of British Columbia Municipalities
VAR	Values at Risk
WRR	Wildfire Risk Reduction
WUI	Wildland Urban Interface

SECTION 1: INTRODUCTION

In April 2021, B.A. Blackwell and Associates Ltd. was retained to assist the Strathcona Regional District (SRD) in developing an updated Community Wildfire Resiliency Plan for Electoral Area D (EA D), hereinafter referred to as the CWRP. This CWRP revisits areas assessed in SRD EA D's 2012 Community Wildfire Protection Plan (CWPP), but with a focus on integrating the updated Provincial Strategic Threat Analysis (PSTA), updated BC Wildfire Service (BCWS) fuel type mapping, and an improved wildfire threat analysis methodology, all with a focus on the seven FireSmart principles.

Recent wildfire disasters like those experienced in Slave Lake, Alberta (2011), Washington State (2014, 2015), Fort McMurray, Alberta (2016), BC (2017, 2018, 2021), and California (2017, 2018, 2020) all display the vulnerability of communities and the potential toll of wildfires on families, neighbourhoods, public health, and the economy of entire regions. These events, along with important advances in loss prevention programs, have spurred the need for greater consideration and due diligence concerning fire risk in the wildland-urban interface (WUI).[7] CWRPs are an invaluable opportunity to proactively manage wildfire risk and increase community resilience to wildfire.

1.1 PLAN PURPOSE AND GOALS

The purpose of this CWRP is to identify and update the wildfire risk specific to SRD EA D and the surrounding eligible WUI, to describe the potential consequences of wildfire to SRD EA D's communities, and to examine options and strategies to reduce the wildfire risks. This CWRP provides a reassessment of the level of wildfire risk to SRD EA D and gives all stakeholders a current and accurate understanding of the wildfire threats to human life, property, and critical infrastructure in EA D. The goal of this CWRP is for it to be used as an action plan to:

1) Increase the effectiveness of fire suppression and emergency response,
2) Reduce potential impacts and losses to lives, property, and critical infrastructure from wildfire, and
3) Reduce wildfire behaviour threats within the community.

To help guide and accomplish the above strategies, this CWRP will provide SRD and local fire departments that provide fire service protection to areas within EA D with:

1) an updated assessment of wildfire risk to the community,
2) an updated assessment of values at risk and potential consequences in the event of a wildfire,
3) updated mapping of fuel types and recommended areas for fuel treatments and forest modifications,
4) an updated assessment of emergency response capacity and community FireSmart status, and

[7] 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).

5) options and strategies to reduce wildfire risk in seven FireSmart disciplines: education, legislation and planning, development considerations, interagency cooperation, cross-training, emergency planning, and vegetation management.

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

1.2 CWRP DEVELOPMENT SUMMARY

The CWRP development process consisted of five general phases:

1) Consultation involving key SRD representatives, structural and wildfire specialists, and stakeholders. This included:
    a. SRD staff:
        i. Protective Services Coordinator (Shaun Koopman)
        ii. Parks & Facilities Technician (Jacob Blanchard)
        iii. Coordinator, Engineering Services (Jesse Humphreys)
        iv. Manager, Engineering Services (Wolfgang Parada).
    b. Campbell River Fire Department (FD) Fire Chief (Thomas Doherty).
    c. Oyster River Volunteer Fire Rescue Association (FD) Fire Chief (Bruce Green).
    d. BCWS North Island Mid Coast Fire Zone (Kate McLean, Todd Flanagan, Dan Harris).
    e. Stakeholders: Woodlot 1641, BC Parks
2) Information sharing with First Nations (see Appendix G: List of First Nations and Associated Governments Consulted).
3) Review of relevant plans and legislation regarding emergency response and wildfire (Section 2).
4) Identification of the values at risk and assessment of the local wildfire threat (Sections 3 and 4).
5) Developing an action plan with a focus on the seven FireSmart principles (Section 5).

SECTION 2: RELATIONSHIP TO OTHER PLANS AND LEGISLATION

Wildfires can affect all aspects of a community. As a result, there are many plans that relate to this CWRP. The intent of this section is to review all laws, policies, plans, and guidelines and identify sections within that are relevant to wildfire emergency planning and response.

2.1 LOCAL AUTHORITY EMERGENCY PLAN

Emergency preparedness and response in Electoral Area D is managed by the SRD and is guided by higher-level emergency management legislation such as the provincial Emergency Program Act.[8] The Emergency Program Act describes the various roles and administrative duties of the province and local governments with regards to emergency organization, the implementation of higher-level emergency plans, the processes of declaring a state of emergency, and coordinating post-disaster relief programs and assistance. EA D's evacuation planning and management documents are discussed further in Section 3.2.1.

2.2 LINKAGES TO OTHER CWPPS/CWRPS

Strathcona Regional District Electoral Area D2012Community Wildfire Protection Plan (CWPP)

EA D's 2012 CWPP was reviewed, and the recommendations were discussed with the CFRC. Recommendations that were partially or wholly addressed or completed include[9]:

- **Recommendation 3:** *Coordinate fire department spring mailing of information, reminders, FireSmart brochures, etc with the Strathcona Regional District to reach all residents of Area D.*
- **Recommendation 5:** *The Oyster River FD should commit key individuals to receive more advanced wildfire specific suppression and knowledge training, such as: S-185 Fire Entrapment Avoidance, S-290 Principles of Fire Behaviour, and - S-390 Intermediate Fire Behaviour.*
- **Recommendation 6:** *Establish wildfire simulation exercises, carried out at least once per year, involving BCWS, emergency management agencies, local stakeholders, and residents.*
- **Recommendation 7:** *Improve knowledge about access (including constraints to) and water sources through effective collaboration between agencies and stakeholders. Access issues, which should be mapped and shared on a regular basis and be up to date, can comprise the following: ownership, barriers to access (i.e. gates, bollards), bridge load limitations/removals/installations, and road deactivation and condition.*
- **Recommendation 11:** *The Comox Valley Regional District should review and simplify the Black Creek/Oyster Bay Fire Protection Local Service Area boundary. It should be expanded to include a logical part of Hwy 19 and all the residential areas of York Road, including the BC Hydro substation.*
- **Recommendation 14:** *Bylaws pertaining to Fire Department local service/protection areas should be revised to include details of the departments' ability to legally respond outside of their area, at the request of the Wildfire Management Branch or not. Currently, the Campbell River*

[8] British Columbia Provincial Government, 2020. Emergency Program Act. Retrieved From: https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/00_96111_01

[9] Paraphrased for brevity. See the actual SRD EA D 2021 CWPP for as-written recommendations

Fire Department has this written into a Memorandum of Understanding but legal authority does not exist within the city's bylaws.

2020 Community Wildfire Protection Plan for the City of Campbell River, BC

Prepared by Strategic, the 2020 Campbell River CWPP addresses the structural and wildland firefighting capability of the Campbell River FD, which is contracted by SRD to provide firefighting and response services to a northern section of EA D.

2.3 OYSTER BAY – BUTTLE LAKE OFFICIAL COMMUNITY PLAN 1996

An Official Community Plan (OCP) documents objectives and policies of the local government and provides it with a long-range framework to guide future land use and development decisions. Table 2 below summarizes the objectives and policies within the Oyster Bay – Buttle Lake OCP 1996 (representing EA D) that are directly relevant to community wildfire resilience. The current OCP includes amending bylaws up to SRD 364 (November 6, 2020).

Table 2: Summary of Oyster Bay – Buttle Lake's1996 OCP emergency and wildfire-related objectives and policies and their relationship to this CWRP

Section, Sub-section, Goal	Description and Relationship to CWRP
Part 301 Agriculture - Objectives	1. Preserve arable land for food production; 4. To reduce the potential for land use conflicts, new developments on non-agricultural lands adjacent to the Agricultural Land Reserve shall be designed with appropriate subdivisional sizes and dimensions, building setbacks, stormwater arrangements and appropriate buffering along property lines in the form of berms, landscaped buffer areas, and fencing in accordance with the Landscaped Buffer Specifications of the Land Reserve Commission. • *Appropriate setbacks based on FireSmart building principles of structures from vegetation and steep slopes reduces wildfire risk to that structure, and from the structure to the vegetation.* • *Landscaping vegetation can increase or decrease wildfire resiliency to adjacent structures and vegetation.* 5. Encourage environmentally sound agricultural practices that protect surface water, ground water and soil integrity. • *Water availability is integral to fire fighting and stopping a wildfire in the WUI from either entering the wildland from homes and properties, or vice versa.*
Part 303 Commercial - Policies - Tourist Commercial	6. New campgrounds and other tourist facilities may be permitted in any portion of the planning area without amending this OCP including Map 3. Siting of new facilities shall be in accordance with the conditions noted in Policy 10. • *Development planned 'through a wildfire lens' can increase health and safety concerning wildfire. Appropriate setbacks based on FireSmart building principles of structures from vegetation and steep slopes reduces wildfire risk to that structure, and from the structure to the vegetation.*
Part 306 Environmentally Sensitive Areas - Protection and Management	4. Where environmentally sensitive areas are identified, the landowners shall be encouraged to place these areas into a public trust or return them to a public domain through the use of legislative mechanisms such as Section 215 covenants, transfer of development rights, density bonusing, tax credit donations, return to Crown designations, and community land trusts.

Section, Sub-section, Goal	Description and Relationship to CWRP
	• *Local government has a responsibility to manage wildfire hazards and risks associated with government-owned or adopted parks, trails, and greenbelts. The BC Wildfire Act gives local governments authority to prevent and control fires, but liability rests with whomever causes the fire.* 6. Environmental studies and monitoring completed by qualified professionals, to terms of reference set by the Regional District and appropriate agencies and paid for by the property owner(s) may be required prior to permitting development which may have an impact on known or suspected environmentally sensitive areas. The required studies may include hydrogeological reports, stormwater management plans, environmental impact studies, flora and fauna inventories and mitigation plans. • *Water availability is integral to fire fighting and stopping a wildfire in the WUI from either entering the wildland from homes and properties, or vice versa.* 8. The retention and planting of native ground cover and trees in all developments shall be encouraged. • *Landscaping vegetation can increase or decrease wildfire resiliency to adjacent structures and vegetation.*
Part 307 Forested Areas - Other Forested Areas - Policies	1. The preservation of forest cover on non-reserve lands shall be encouraged by use of rural design guidelines, clustering, density bonus, transfer of development rights and other similar mechanisms. • *WUI vegetation, especially in interface or intermix communities, can increase or decrease wildfire resiliency to adjacent structures and vegetation.*
Part 308 Hazard Lands - Policies	1. Lands susceptible to flooding, high fire risk, instability, high rates of erosion or steep slopes that would pose a threat to property if developed, shall be considered hazard lands. • *Known high fire risk areas should be managed appropriately for that risk.*
Part 309 Housing - General Housing - Objectives	7. Establish containment boundaries around the circumference of settled areas to prevent further suburban sprawl and coastal strip development. • *Vegetated containment boundaries create WUI interface areas - WUI vegetation can increase or decrease wildfire resiliency to adjacent structures and vegetation.*
Part 309 Housing - General Housing - Policies - Retaining Rural Character	16. Use of the following guidelines shall be encouraged for designing housing developments: e) Clearing of vegetation at the edge of roads and driveways should be kept to a minimum, and roads and driveways curved. • *Unmanaged vegetated road edges create a fire risk and can act as a wick, aiding fire spread.*
Part 310 Industrial - Policies	4. All lands, except those lands identified for park purposes and those designated "Residential" or "Country Residential" shall be designated as being eligible for consideration for the issuance of Temporary Industrial Use permits. The issuance of such a permit shall be conditional on the applicant providing: b) plans for mitigation of potentially harmful impact on the environment and the local community • *Plans should include fire suppression and protection from wildfire.*
Part 311 Parks and Recreation - Acquisition	1. Generally, the residents want the Regional District to obtain additional parkland of the following types: (listed in order of preference): • *Local government has a responsibility to manage wildfire hazards and*

Section, Sub-section, Goal	Description and Relationship to CWRP
	risks associated with government-owned or adopted parks, trails, and greenbelts.
Part 311 Parks and Recreation - Multi- Use Trails	9. The creation of a network of walking, bicycling and bridle trails along Georgia Strait and connecting parks and natural areas, schools, and residential neighbourhoods and commercial nodes is encouraged. • *Local government is has a responsibility to manage wildfire hazards and risks associated with government-owned or adopted parks, trails, greenbelts, schools, etc.*
Part 316 Water Supply and Sewage Treatment Systems - Water Supply and Conservation	14. To reduce stress on septic systems and to reduce water consumption, the implementation of a water conservation program including public education and installation of water saving devices in all buildings will be considered. • *Water infrastructure and availability is integral to fire fighting and stopping a wildfire in the WUI from either entering the wildland from homes and properties, or vice versa.*

2.4 LOCAL BYLAWS

Table 3 below contains local policies which are directly relevant to community wildfire resilience.

Table 3: Summary of local wildfire and emergency-related bylaws and relationship to the CWRP

Bylaw	Description and clauses relevant to the CWRP
2733 Strathcona Emergency Program Service Establishment Bylaw 275 Amendment to Bylaw 2733	Establishes a service to provide emergency preparedness plans and operations, including EA D (Oyster River – Buttle Lake). • *Regulates all aspects of the "Strathcona Emergency Program" to be reviewed every 5 years.*
1964 Black Creek – Oyster River fire protection service area bylaw	Establishes a specified area for the purpose of providing fire protection to the community of Black Creek/Oyster Bay. *Local services established:* • *Fire prevention; fire suppression; and assistance in response to:* *- Requests from the Provincial Ambulance Service for extrication of persons from damaged motor vehicles;* *- Requests for assistance in the extrication of persons from damaged buildings, structures or natural hazards;* *- Emergencies, where the equipment and personnel of the Department is required, and police or ambulance personnel are unavailable or are unable to respond adequately; and* *- The above provisions are subject to a determination by the Fire Chief that the personnel and equipment resources of the Fire Department can respond to the emergency.*

Bylaw	Description and clauses relevant to the CWRP
375 Black Creek – Oyster Bay Fire Protection Service Regulation Bylaw	Establishes a service for the purpose of providing fire protection to the communities of Black Creek and Oyster Bay ("the Black Creek-Oyster Bay fire protection service area"). The Regional District board may, by bylaw, regulate the activities under the service, including establishing regulations for the lighting of fires in the service area. The bylaw applies to outdoor fires, beach fires, and campfires on all privately-owned and publicly owned properties. General Conditions (important excerpts): • *Outlines general conditions for persons to start or maintain an outdoor fire, beach fire, or camp fire.* • *Fire Chief an enact a fire ban even if Provincial or Federal Governments have not.* Outdoor fires – permits: • *A fire permit must be acquired from the Fire Chief to lite/maintain an outdoor fire (the permit may be withdrawn at any time).* • *Exception: No permits required for burning domestic waste, during the day, from November 1st to March 31st, providing fire size requirements are met (and no published notice of required permits has been issued).* Beach fires: • *Must use only wood, be for warmth or cooking, be below the high-tide line, less than 50cm diameter, extinguished by 11:00pm.* Campfires: • *Campfires must be setback from all combustible materials (including trees), be less than 50cm diameter, have on site an effective means of extinguishing the fire, be extinguished by 11:00pm.* High risk activities: • *Fire Chief, at any time, can order High Risk Activities be prohibited for a specific period.* Cost recover fees and charges for extraordinary fires and scene security costs: • *The owner of property on which an extraordinary fire occurs shall be liable for a charge for extraordinary fire costs.* • *The regional government may recover all costs and expenses incurred incidentally to taking any measures pursuant to an extraordinary fire jointly and severally from any person who at the time had the charge, management or control of the building or property that is the subject of the charge.*
2052 Maintenance Bylaw	Grants authority to the SRD (under the Nuisance and Unsightly Premises function in accordance with Section 725(1)(a), (b), (c), (d), and (e) of the Municipal Act) to: • *Prohibit persons from causing or permitting water, rubbish, or noxious, offensive or unwholesome matter to collect or accumulate around their premises, or from depositing or throwing bottles, broken glass or other rubbish in any open space.* • *Require the owners or occupiers of real property, or their agents, to remove from it any accumulations of filth, discarded material or rubbish.*
2027 Park Rules and Regulations Bylaw	Gives authority to the SRD to make rules and regulations governing the use, management, improvement, operation, control and use of Regional District Parks. Appendix A - Section 7. Fires • *This section outlines fire regulations within parklands throughout the SRD, including prohibiting the ignition of fire outside of fire circles/rectangles without the permission of the Regional District, limiting fire sizes to 1m x 1m,*

Bylaw	Description and clauses relevant to the CWRP
	extinguishing fires by 11:00pm and the requirement of a 10L water pail at each fire.
158 Building Regulation Bylaw	To regulate construction within EA D to serve the public interest and the activities undertaken by or on behalf of the Regional District pursuant to it are intended to provide a limited and interim spot-checking function for health, safety, and the protection of persons and property. • *All residential construction must abide by the BC Building Code.*
1404SRD Campbell River Area Zoning Bylaw	To regulate the location and use of buildings and structures and the use and subdivision of land, including the surface of water in Regional District areas, including EA D. • *Any forestry management activity relating to the production and harvesting of timber on any land that is classified as managed forest land pursuant to the Assessment Act or any land within a license area under the Forest Act shall not be restricted by any terms or conditions of this bylaw so long as the land continues only to be classified for that purpose.* • *Where land is classified as "Agricultural Land Reserve" pursuant to the Agricultural Land Commission Act, the provisions of those regulations shall take precedence over this bylaw.*
64 Minimum Standards for Subdivision of Land	Provides minimum standards for subdivision of land to all land within an electoral area of the Regional District speaking to: • *Water, sewage disposal, roads, lot area requirements and exemptions, minimum frontage.*

2.5 OTHER LOCAL PLANS

Table 4 below contains other local plans and policies which are directly relevant to the CWRP.

Table 4: Summary of other Local Plans and Policies relating to the CWRP

Plan type	Description and Relationship to CWRP
Strathcona Regional District Strategic Plan 2020 - 2024	The strategic plan outlines that supporting adaptation of climate change through sub-regional initiatives and increasing understanding and capabilities to respond to wildfire are key District strategic priorities. • *Recommendations made within the CWRP are aimed to increase public understanding of wildfire hazards and FireSmart principles, while increasing EA D's wildfire resiliency.*

2.6 LINKAGES TO HIGHER LEVEL PLANS AND LEGISLATION

Table 5 below lists higher-level plans and legislation relevant to wildfire planning and risk mitigation. Fuel management prescriptions and burn plans must address these plans as they relate to on-the-ground restrictions and regulations.

Table 5: Higher Level Plans and Relevant Legislation and their relationship to the CWRP

Plan/Legislation	Description and Relationship to CWRP
Vancouver Island Land Use Plan	The VILUP is a comprehensive land use plan on a regional scale that was

Plan/Legislation	Description and Relationship to CWRP
(2000)	developed to guide sustainable resource stewardship and management of crown land and water. • *Establishes land use objectives for Special Management Zones and Resource Management Zones, which guides Crown land license holders planning and development documents, and subsequently CWRP recommendations pertaining to Crown land.*
FRPA – Government Action Regulations (GARs)	Visual Quality Objective (VQO) polygons guide forest management activities on a landscape in a manner so that timber harvesting does not compromise the designated objective. • *Multiple VQO polygons are within the WUI that should be accounted and planned for if overlapping fuel treatment prescriptions.* Designated Community Watersheds are defined under FRPA. To protect the water that is diverted for human consumption, such areas require special management to: 1. Conserve the quality, quantity, and timing of water flow. 2. Prevent cumulative hydrological effects having a material adverse effect on water. • *The Oyster Community Watershed overlaps the WUI.*
Woodlot Management Plans	The primary purpose of a Woodlot Management Plan is to propose an allowable annual cut (AAC) for the woodlot license taking into account inventory information and resource management considerations. • *One woodlot's (W1641) schedule B (Crown land portion) license area overlaps with the WUI.*
BC Provincial Open Burning Smoke Control Regulation (OBSCR)	The OBSCR 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. • *All communities along the east coast within the WUI from are within a High Smoke Sensitivity Zone. The remaining WUI communities east of Campbell River near Campbell and Upper Campbell Lakes are within a Medium Smoke Sensitivity Zone.*
Strathcona-Westmin Park Master Plan	The Master Plan identifies the following: • *The goal of the Master Plan is to accommodate the [Myra Falls] mine and, at the same time, protect the natural resources and provide recreation opportunities within the Park.* • *Overall direction for the management will be to protect the Park's recreation and conservation values while not imposing undue restrictions on the mine's operation.*

SECTION 3: COMMUNITY DESCRIPTION

Electoral Area D (EA D) of the Strathcona Regional District (SRD) is located south and west of Campbell River on the east side of Vancouver Island. Covering 1,850 square kilometers,[10] it stretches from the eastern shoreline inland along the south shores of Campbell Lake to the south end of Buttle Lake. EA D is characterized by a mix of isolated rural properties, small residential neighbourhoods, resort destinations (hotel, condo, cabin, RV, and marina), parkland, and forest tenure (including large tracts of private managed forest land). The main population is clustered along or close to Highway 19A (north-south along the east coast) in the communities of Shelter Point, Stories Beach, Oyster Bay and Oyster River. Additional residents occupy stretches along Highway 28 which travels southwest from Campbell River towards Buttle Lake and Gold River.

The region has been inhabited by the Coast Salish and Kwakwaka'wakw Aboriginal Peoples since time immemorial.[11] We Wai Kai (Cape Mudge, Quinsam), Klahoose, Xwemalhkwu (Homalco), Wei Wau Kum (Campbell River) First Nations, and Tla'amin Nation are among the First Nation governments whose traditional territory includes EA D.

EA D is mostly comprised of low-lying forested hills including rocky outcrops, karst geologic features, large and small freshwater lakes (including Upper and Lower Campbell Lakes and Buttle Lake), and small valleys throughout the landscape. There are also the alpine mountain peaks within the Strathcona Regional Park and the coastal shoreline with estuaries and tidal flats. Lying on the leeside of Vancouver Island, EA D is in a rain shadow; summers are warm and dry and winters are mild and wet.

The economy of the region was historically driven by commercial fishing, mining, and logging, the latter two of which have endured as main economies, joined by tourism. Statistics Canada states a 2020 population estimate for EA D as 4,883, an increase of approximately 11% from the 2002 estimate.[12] The median age of the population is 56.3 years old (considerably higher than the provincial median age), of which approximately 29% are categorized as seniors.[12] Overall, EAD's population has stayed relatively constant over the last decade. Important to note and consider, however, is that the population varies significantly based on the season due to visitors and part-time residents; the population increases during the summer due to the influx of seasonal second-property owners, tourists to the resorts and marinas, and campers and adventurists to the Strathcona Provincial Park and associated campgrounds.

Residents of EA D are attracted to the low density, rural and suburban settlement of the region which offers an alternative to city life.[13] This is reflected in that 1,535 of the 1,875 occupied private dwellings are single-detached homes.12

[10] https://srd.ca/srd-communities/electoral-areas/electoral-area D/
[11] Quadrisland.ca
[12] Statistics Canada (web): Strathcona D (Oyster Bay – Buttle Lake)
[13] Oyster River – Buttle Lake Official Community Plan

The regional government provides land use planning, emergency management, building and development permits, bylaw enforcement, and administration. Water and sewage are provided to some residents.

Fire protection services within EA D for those properties east of Highway 19 are split between Campbell River Fire Department (Campbell River FD) and Oyster River Fire Rescue (Oyster FD), shown below on Map 1. Properties outside their fire response areas (*i.e.,* generally west of Highway 19) must rely upon their own suppression equipment and capabilities. BC Wildfire Service (BCWS) will respond to all fires on Crown land and is contracted (through Working Rule Agreements) to provide wildfire service to areas of private managed forest land. EA D is within the BCWS North-Island Mid Coast Fire Zone which is part of the Coastal Fire Centre.

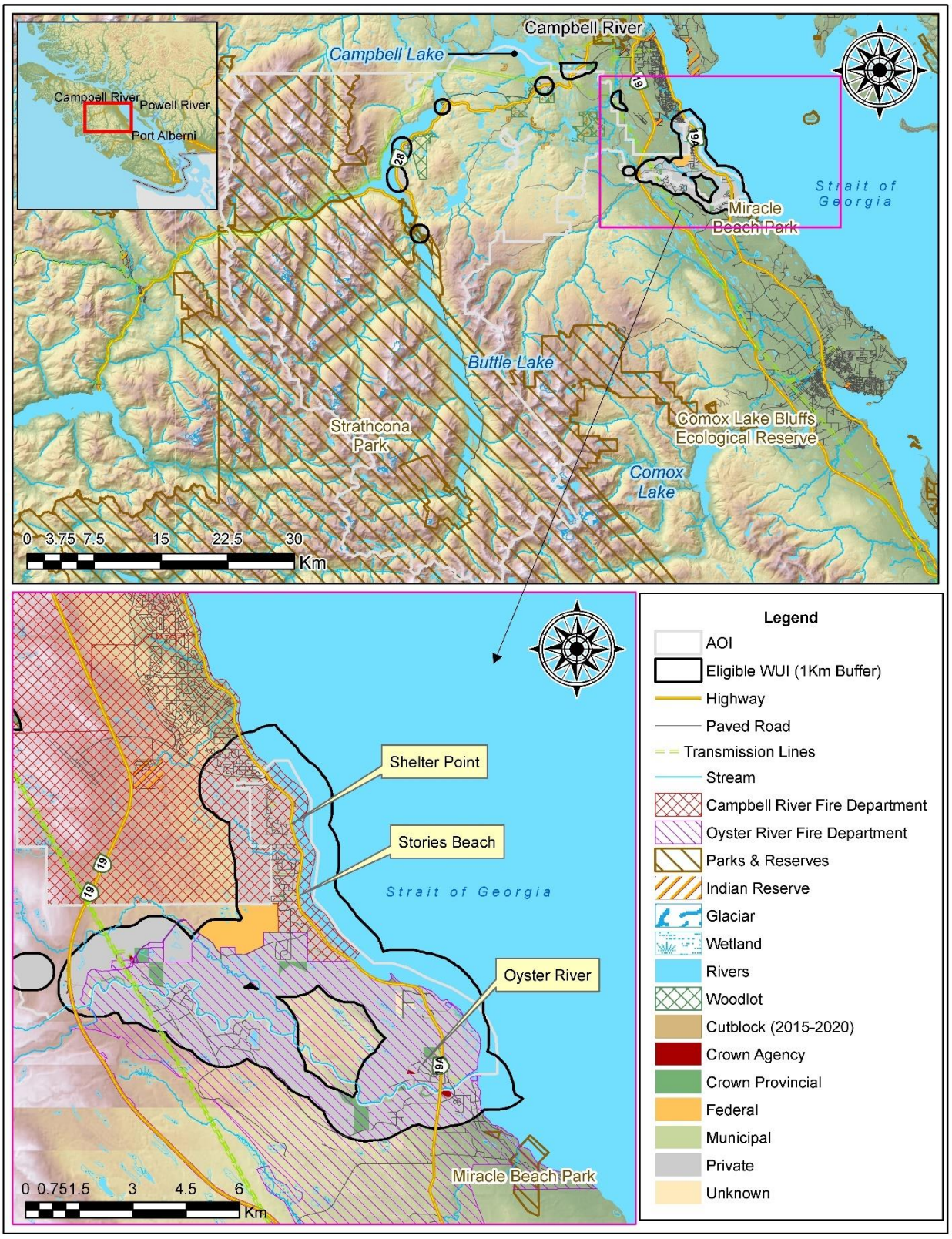
The main concerns relating to EA D's wildfire preparedness that were expressed by the Community FireSmart Resiliency Committee[14] were:

- Effective fire response to residential areas with no hydrants (largely in the Oyster FD fire response area)
- Single-access neighbourhoods, narrow streets, and limited turn around areas affecting access/egress for residents and firefighting equipment (especially York Road).
- The unaligned legislation implementing fire bans/restrictions between Oyster FD fire protection area and the Campbell River FD fire protection area.
- Lack of FireSmart construction materials and vegetation management practices on private property.

3.1 AREA OF INTERESTAND WILDLAND-URBAN INTERFACE

The Area of Interest (AOI) for the CWRP is the entirety of EA D. The associated eligible Wildland-Urban Interface (WUI) represents a one-kilometer buffer around a structure density of 6+ structures/km^2 within the AOI and defines the focus of this CWRP – EA D's WUI encompasses a total of 8,815 hectares. Approximately 2,000 hectares of the WUI overlaps large waterbodies (lakes or ocean). A breakdown of the area by ownership type, excluding large waterbody overlaps, is listed in Table 6. The AOI, WUI, and land ownership types are shown below on Map 1.

[14] The role and members of EA D's Community FireSmart Resiliency Committee are explainedin detail in Section 5.4



Map 1: Electoral Area D Wildland-Urban Interface and Fire Response Areas

The majority of the land base in the WUI is private (85%), of which large areas are classified as private managed forest land. Crown land covers 10% of the WUI.

Table 6: Land Ownership within the Wildland-Urban Interface

Land Ownership[15]	Area (ha) on Land Base	Percent Area on Land Base
Crown Agency	27	0.4%
Crown Provincial	618	9.7%
Federal	205	3.2%
Municipal	44	0.7%
Private	5418	85.4%
Unknown	33	0.5%
Total	**6,345**	**100%**

[15] The land ownership source is ParcelMap BC, provided by the Land Title and Survey Authority (LTSA). This dataset does not differentiate Indian Reserves from Federal Crown parcels.

3.2 VALUES AT RISK

Protection of critical infrastructure and values at risk during a wildfire event is an important consideration for emergency response effectiveness ensuring that coordinated evacuation can occur if necessary and that essential services can be maintained and/or restored quickly in the case of an emergency. Critical infrastructure includes emergency and medical services, electrical and natural gas services, transportation, water and sewer services, social services, evacuation reception centres, and communications infrastructure. Critical infrastructure is shown on Map 2, and Table 7 details the inventory of critical infrastructure identified in the WUI.

3.2.1 EMERGENCY RESPONSE AND COMMUNICATIONS

The current evacuation plan highlights seven evacuation zones with evacuation routes assigned to each. In the event of an evacuation order, the SRD is responsible for offering support services, including reception centres and emergency housing. The Evacuation Plan is to be used in conjunction with the Regional Master Emergency Plan, which provides additional overreaching procedures to be used in any emergency, such as: BC Emergency Management System (BCEMS) overview, roles and responsibilities, EOC activation and management, and guidelines for declaring a State of Local Emergency (SOLE).[16]

Rogers Communications operates and maintains one cellular communication transceiver tower within the WUI. Three other towers (one operated by Telus Communications; two operated by Rogers Communications) are located just outside the WUI but provide service to those within it.

3.2.2 ELECTRICAL POWER

A large fire has the potential to impact electrical service by disrupting the network power distribution through both direct and indirect processes. For example, heat from flames or fallen trees associated with a fire event may cause power outages. Electrical power is provided to residents of EA D by BC Hydro via the Oyster River Substation by a network of overhead pole distribution lines. This system is well-mapped, and in the event of a wildfire, BC Hydro will work with local and provincial emergency responders and employ their emergency response protocols.[17] Neighbourhoods with small, street-side wooden poles that connect to homes are particularly vulnerable to fire. Utility right-of-way best management practices such as regular brushing and clearing of woody debris and shrubs are employed by BC Hydro to help reduce fire risk, utility pole damage, and subsequent outages.

Secondary power sources are important to reduce critical infrastructure vulnerability in the event of an emergency that cuts power for days, or even weeks. Vulnerabilities for secondary power sources include mechanical failure, potentially insufficient power sources should a wide-scale outage occur, and fuel shortage in the event of long outages. The CFRC identified that secondary power sources are in place for some, but not all, of the critical infrastructure within the WUI.

[16] SRD EA D Island Evacuation Plan (Draft)
[17] https://www.bchydro.com/safety-outages/emergency-preparation.html

3.2.3 WATER AND SEWAGE

Water is provided to most properties along the coastline of EA D. The northern portion is serviced via the Campbell River municipal water system, while the southern portion is serviced via the Black Creek – Oyster Bay Water Local Service Area, part of the Comox Valley Water System and Regional District. Those not connected to the water systems must use private wells or surface water intakes.

There is no sewer system in EA D – residents rely on private septic systems. Curbside garbage, recycling, and yard waste pick-up are also not a service provided by the Strathcona Regional District. Residents are responsible for setting up their own curbside pick-up privately or taking their garbage and recyclables to a Comox Strathcona Waste Management facility.

3.2.4 HAZARDOUS VALUES

Hazardous values are defined as values that pose a safety hazard to emergency responders and include large propane facilities, landfills/refuse sites, storage facilities containing explosives, 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.

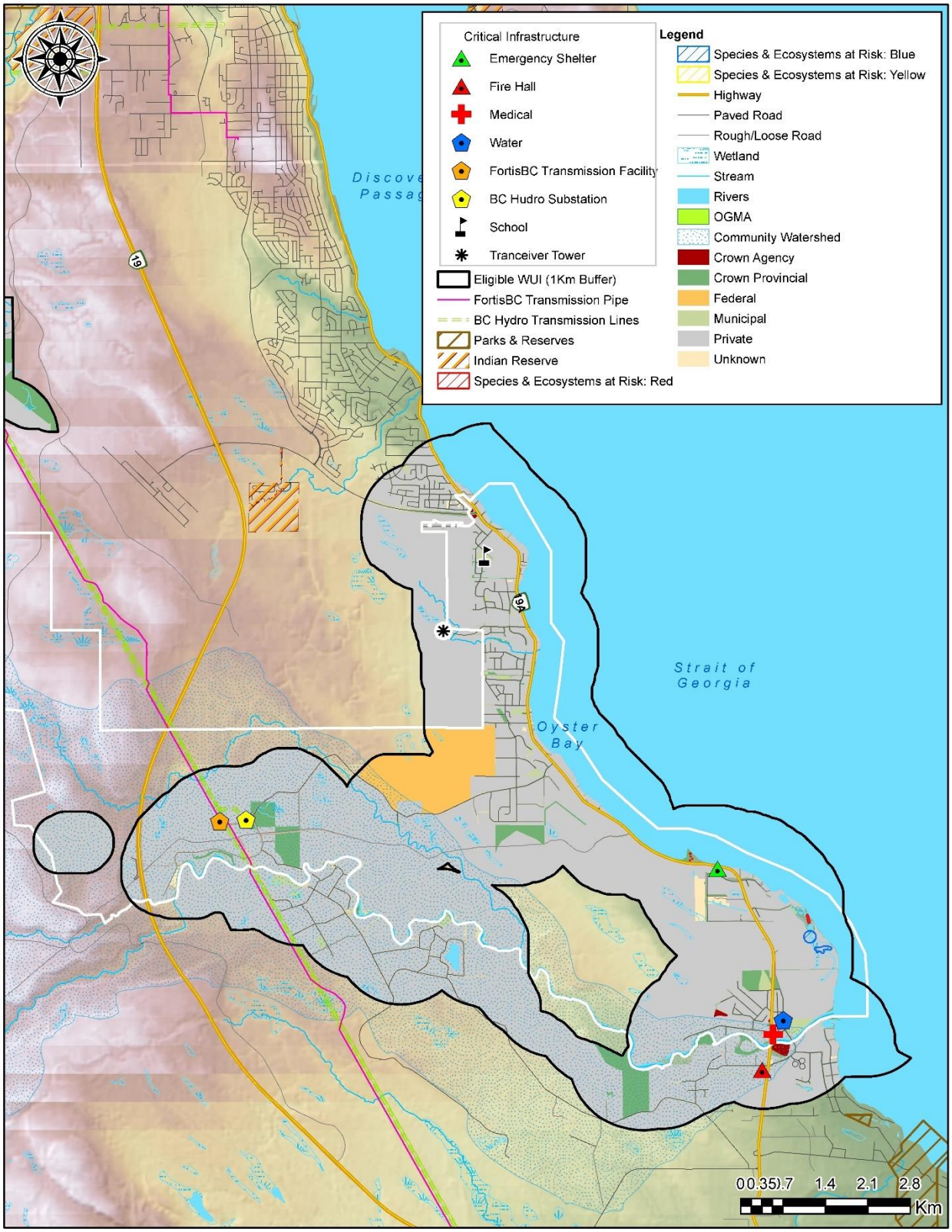
FortisBC provides natural gas to properties along the east coast of EA D via a network of underground distribution pipes and valves connected to the main Vancouver Island north-south transmission pipeline which terminates in Campbell River. From a wildfire hazard and suppression point of view, buried gas and oil pipelines are low risk. However, caution should be taken if driving heavy fire apparatus over buried gas lines. Before travelling over or along any gas right-of-way, FortisBC should be contacted.

The management and treatment of fuels in proximity to hazardous infrastructure is critical in reducing the risks associated with both structural fire and wildfire. Specifically, best management practices recommended for the management of hazardous values include:

1) Incorporating FireSmart planning and setback requirements for all infrastructure in this category;
2) Maintaining emergency fuel/propane emergency shut off procedures to be enacted immediately and efficiently in the event of an approaching wildfire or ember shower; and
3) Installing sprinkler systems to keep wood accumulations/stacks (branches, logs, lumber, firewood, etc.) damp, especially during the fire season (this is specifically applicable to wood fibre industrial sites).

Table 7: Critical Infrastructure within the Wildland-Urban Interface

Critical Infrastructure Type	Critical Infrastructure Name	Address/Intersection/Location
Emergency Response, Public Services, Electrical, Gas, and Communications		
Emergency Shelter	Oyster Bay Resort	4357 South Island Highway, Campbell River
Fire Department	Oyster River Fire Hall	2241 Catherwood Road, Black Creek
Health	Bridge Medical Clinic	2207F Glenmore Rd, Campbell River
School	Ocean Grove Elementary School	3773 Mclelan Rd, Campbell River
Communications (Civic Infrastructure)	Telus Communications Transceiver Tower	McGimpsey Road (north edge), just east of Storey Creek Golf Club.
Electrical	Oyster River Substation (BC Hydro)	Start of Deer Field Road, just west of the junction with York Road
Gas	Oyster River Transmission Facility (FortisBC)	End of Deer Field Road, 400m west of the BC Hydro substation
Water and Sewage		
Water	Oyster River Water Treatment Plant	Regent Rd (east side); northwest corner of the Oyster River Nature Park
Hazardous Materials		
n/a	-	-



Map 2: Critical Infrastructure and Species/Ecosystems at Risk within the Wildland-Urban Interface

3.2.5 CULTURAL VALUES

There are many documented historic and archeological sites within the WUI and a high potential for additional sites to be found given the long history of use by the Coast Salish and Kwakwaka'wakw Aboriginal Peoples. Known archeological sites are protected under the Heritage Conservation Act, which applies on both private and public lands. In addition, there are resource and cultural values presently held that should be known and managed for.

First Nations with overlapping interests should be involved well before any fuel management projects are initiated to allow for meaningful review and input. 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.

3.2.6 HIGH ENVIRONMENTAL VALUES

Table 8 below lists the ecosystem or species at risk occurrences that have been identified through the B.C. Conservation Data Center (CDC) or have been specifically observed and recorded within the WUI boundary. Through consultation with the CDC and a biologist or qualified professional, all site-level operational plans must identify and mitigate potential impacts to ecosystems or species at risk. Blue and Red listed occurrences are shown above on Map 2.

Table 8: Publicly available occurrences of Red and Blue-listed species recorded in the Wildland-Urban Interface

Scientific Name	Common Name	Category	BC List	Habitat Type
Bidens amplissima	Vancouver Island beggarticks	Vascular Plant	Blue	Palustrine: Herbaceous Wetland; Old Field
Cercyonis pegala incana	Common Wood-nymph, incana subspecies	Invertebrate Animal	Red	Terrestrial: Shrubland, Grassland/Herbaceous; ESTUARINE: Herbaceous Wetland
Balsamorhiza deltoidea	deltoid balsamroot	Vascular Plant	Red	Terrestrial: Grassland/Herbaceous

SECTION 4: WILDFIRE RISK ASSESSMENT

This section summarizes the factors that contribute to local wildfire risk in EA D's WUI. Using verified and updated fuel types (Appendix A: Local Wildfire Risk Process) combined with field wildfire threat assessments and office-based analysis (Appendix A: Local Wildfire Risk Process), local wildfire risk for the WUI was updated. There are two main components of this local risk assessment: the *wildfire threat class* (fuels, weather, and topography sub-components) and the *WUI risk class* (structural sub-component). The local wildfire risk assessment helps to identify the parts of the WUI that are most vulnerable to wildfire.

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

Wildfire Risk = Consequence X Probability

Where:

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

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

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

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

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

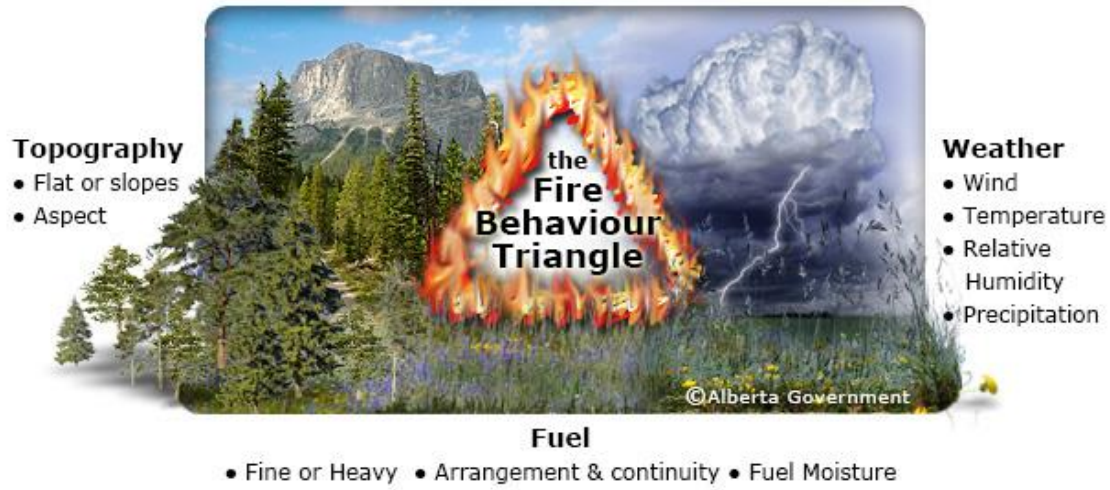


Figure 1. Graphic display of the fire behavior triangle, and a subset of characteristics of each component[18]

4.1 WILDFIRE ENVIRONMENT

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.

The Biogeoclimatic Ecosystem Classification (BEC) system classifies the province into zones by vegetation, soils, and climate. Regional subzones are derived from relative precipitation and temperature. EA D's WUI is entirely within the CWHxm subzone, comprising of two variants – eastern and western. Historically, because of major yet infrequent fires that occurred in this disturbance type, the landscape would have consisted of extensive areas of even-aged stands with snags and veteran trees that had survived previous fires.[19] Extensive logging over the last 100 years within the WUI and the surrounding area outside of Provincial parks has further created large expanses of mostly even-aged forest stands.

Fuel

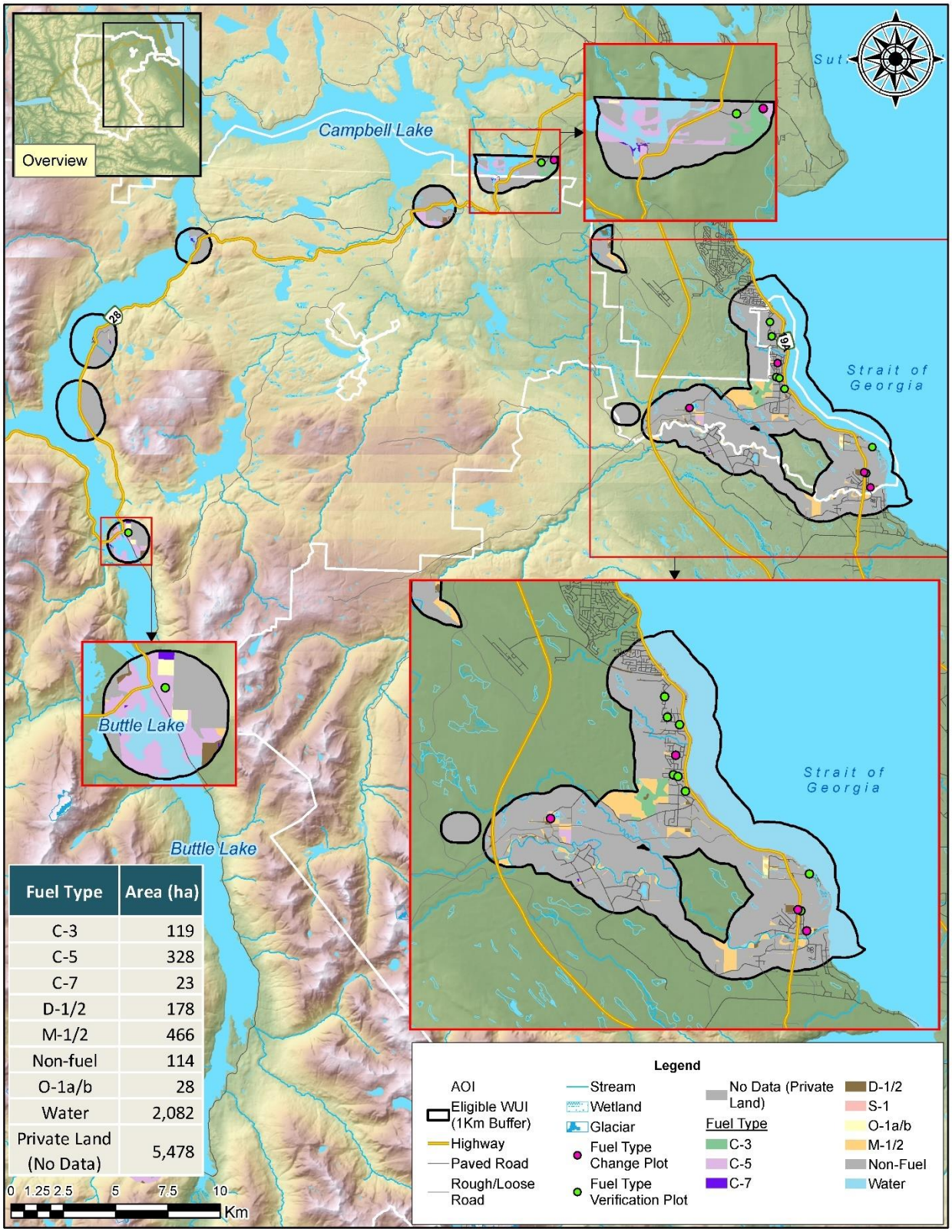
The Canadian Forest Fire Behaviour Prediction (FBP) System outlines sixteen fuel types based on characteristic fire behaviour under defined conditions.[20] Fuel types (confirmed or updated by fieldwork verification) for EA D's WUI are detailed below in Table 9 and shown on Map 3. The fuel type present that may be considered most hazardous in terms of fire behaviour and firebrand spotting potential in the WUI is C-3, particularly if there are large amounts of woody fuel accumulations or denser understory ingrowth, and S-3. No S-3 types were mapped in the WUI, however as they result from forest harvest

[18] Province of Alberta
[19] Province of British Columbia, 1995. Biodiversity Guidebook.
[20] Forestry Canada Fire Danger Group. 1992. Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.

operations, they will exist in the future and should be recognized. C-5 fuel types have a moderate potential for active crown fire when wind-driven. An M-1/2 fuel type can sometimes be considered hazardous, depending on the proportion of conifers within the forest stand; conifer fuels include those in the overstory, as well as those in the understory. An O-1b fuel type often can support a rapidly spreading grass or surface fire capable of damage or destruction of property, and jeopardizing human life, although it is recognized as a highly variable fuel type dependent upon the level of curing. Private land, accounting for more than 80% of the WUI, is not attributed any fuel type. Detailed fuel type descriptions and their associated wildfire risk can be found in Appendix A-1: Fire Risk Threat Assessment Methodology.

Table 9: Updated fuel types (by area and percent of WUI, excluding water) within the Wildland-Urban Interface

Fuel Type	Fuel Type Description within WUI	Area (ha) of WUI	Percent (%) of WUI (excluding water)
C-3	Fully stocked, late-young conifer forest with crowns separated from the ground. Often the result of clear-cut logging.	119	1.8%
C-5	Well-stocked mature forest, crowns separated from ground. Moderate understory herbs and shrubs. Little grass or surface fuel accumulation. Typically, undisturbed, or selectively harvested forests.	328	4.9%
C-7	Open, sparsely populated conifer stands with grass and low-lying shrubs underneath. Often on dry, rocky ridges and outcrops. Tree crowns usually close to or at the ground.	23	0.3%
D-1/2	Deciduous stands/forest.	178	2.6%
M-1/2	Moderately well-stocked mixed stand of conifers and deciduous species, low to moderate dead, down woody fuels. Typically, areas harvested 10-20 years ago or mature wet/floodplain forests.	466	6.9%
O1-a/b	Matted and standing grass communities; sparse or scattered shrubs; trees and down woody debris; areas harvested <7 years ago *with good slash management*.	28	0.4%
S-3	Areas recently logged with slash where the cedar component is retaining all its foliage in a cured condition on the branches, but the hemlock and Douglas-fir components have dropped up to 50% of their foliage. Slash fuels tend to be continuous and uncompacted.	0	n/a
N (non-fuel)	Areas with no available fuel, such as gravel dumps, beaches, etc.	114	1.7%
W (water)	Large waterbodies.	2,082	n/a



Fuel Type	Area (ha)
C-3	119
C-5	328
C-7	23
D-1/2	178
M-1/2	466
Non-fuel	114
O-1a/b	28
Water	2,082
Private Land (No Data)	5,478

Map 3: Updated fuel types in the Wildland-Urban Interface

Weather

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

Figure 2 below displays the average frequency of danger class days summarized from the Quinsam Base BCWS weather station, located on the west side of Campbell River, 20 km north of Oyster River and 28 km east of central Upper Campbell Lake. The weather station provides an 11-year fire weather data collection interval for the WUI between the months of April and October. When looking at the peak fire season, June – September, the data shows that 36% (44/122) of days are High Fire Danger.

Overall, July and August are by far the two months with the most fire danger, having 12 and 18 High Fire Danger days each, respectively.

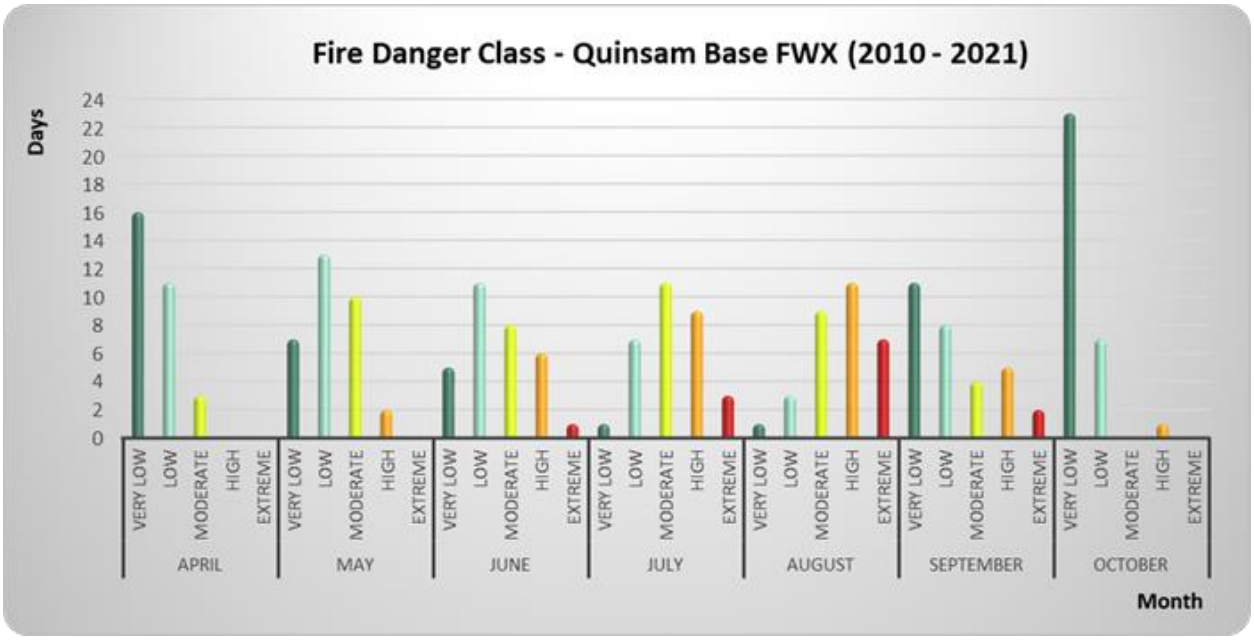


Figure 2: Average number of danger class days for the Quinsam Base fire weather station. Summary of fire weather data for the years 2010-2021.

Climate change is projected to contribute to changes in the fire regime, forest attributes, and fuel hazard across BC. Climate scientists expect that the warming global climate will trend towards wildfires that are increasingly larger, more intense, and more difficult to control. Furthermore, these fires will likely threaten WUI communities more often due to increased potential for intense fire behaviour, fire

season length, and fire severity.[21] As outlined the *Climate Summary for the West Coast*[22] the following climate predictions for the West Coast of BC are made, including EA D:

- Year-round moderate increases in temperature (an increase in mean temperature of 1.4° C by the 2050s)
- Decline in summer precipitation by approximately 10% by the 2050s. This trend is associated with drier fuels and soils, increasing fire behaviour potential.
- Increase in precipitation in other seasons - annual average of +6% by 2050s.
- A decrease in snowfall of 28% in the winter and 51% in the spring by the 2050s. Maritime watersheds that shift from rain/snow-driven to rain-driven hydrological regime will likely experience the greatest shift in flow patterns, and resultant soil and groundwater storage.[23]
- An additional 22 frost-free days and +327 growing degree days by the 2050s.

Wind speed and direction are also critical components of fire behavior. Information on local wind conditions is found in Appendix A-3: Fire Spread Patterns. Summarized in an Initial Spread Index (ISI) Rose(s) from representative BCWS weather stations, the Initial Spread Index (ISI) is a numeric rating of the expected rate of fire spread that combines the effects of wind speed and fine fuel moisture. A wildfire that occurs upwind of a value poses a more significant threat to that value than one which occurs downwind. During the fire season (April – October), the Quinsam Base BCWS fire station indicates predominant winds originate from the north, northeast, and east. This is consistent for July and August (peak 'High Fire Danger' weather months). Thus, fires north and east (upwind) of structures and values pose the largest threat in the area.

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.

Table 10 shows the percent of the WUI by slope percent class and those classes fire behaviour implications. 90% of the WUI is on less than 20% slope and will likely not experience accelerated rates of spread. 2% of the WUI is likely to experience an increased rate of spread, 2% a high rate of spread, and 2% is likely to experience a very high or extreme rate of spread.

[21] BC Provincial Government. 2020. Preliminary Strategic Climate Risk Assessment. Retrieved from: https://www2.gov.bc.ca/gov/content/environment/climate-change/adaptation/risk-assessment
[22] Pacific Climate Impacts Consortium. Climate Summary- West Coast. 2013. https://pacificclimate.org/sites/default/files/publications/Climate_Summary-West_Coast.pdf
[23] MFLNRO, 2016. BC Provincial Government extension note 'Adapting natural resource management to climate change in the West and South Coast Regions'. Accessed online at: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nrs-climate-change/regional-extension-notes/coasten160222.pdf

Table 10. Slope Percentage and Fire Behaviour Implications.

Slope	Percent of WUI	Fire Behaviour Implications
<20%	90%	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	4%	Flame tilt begins to preheat fuel, increase rate of spread.
31-40%	2%	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
41-60%	2%	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	2%	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

When slope percentage is considered in context with a value's slope position (summarized below in Table 11), that value's risk to increased fire behaviour can change dramatically. For instance, a value located in the upper 1/3 of a steep slope (>40%) will be exposed to fires downslope travelling very quickly uphill towards it and be impacted by preheating and thus faster rates of fire spread. Managing fuel downslope of homes and structures would typically reduce wildfire risk to those values more so than managing fuel upslope of them. Homes and critical infrastructure in the WUI vary in slope position at the microsite level, but on a landscape level most are in the east coast portion of the WUI where the slope is <20%, except for stream banks.

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 increasing 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 terrain break features affecting preheating and flames rolling over 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 rolling over into the fuel.

4.2 WILDFIRE HISTORY

Historic Fire Regime

BEC zones have been used to classify BC into five Natural Disturbance Types (NDTs). The NDT classification is based on the frequency and severity of pre-European disturbance events (including, but limited to, wildfires) and indicates historical fire regimes.[24]

The WUI is entirely classified as NDT 2 – ecosystems with infrequent stand-initiating events. Wildfires in these ecosystems were often of moderate size (20 to 1000 ha), with unburned areas resulting from

[24] Province of British Columbia, 1995. Biodiversity Guidebook.

sheltering terrain features, higher site moisture, or chance. Many larger fires occurred after periods of extended drought, but the landscape was dominated by extensive areas of mature forest surrounding patches of younger forest.[25] The mean fire return interval for disturbances in the NDT2 historically was about every 200 years.[25] While natural disturbance regimes are useful for describing the historical disturbance pattern typical for an area, fire history is complex and highly variable across space and time for many ecosystems.[26]

Historical Wildfire Occurrences

Historical fire ignition and perimeter data for the WUI are depicted below in Map 4. Fire ignition data is available from 1950-2020 and fire perimeter data is available from 1917-2020.

Based on the BCWS historical fire ignition dataset, most ignitions within EA D were human-caused, but lightning ignitions still occur – out of 427 total ignitions since 1950, 66% were from human or human activity and 26% were from lightning (7% unknown). The provincial average for human-caused wildfires is 40%.[27]

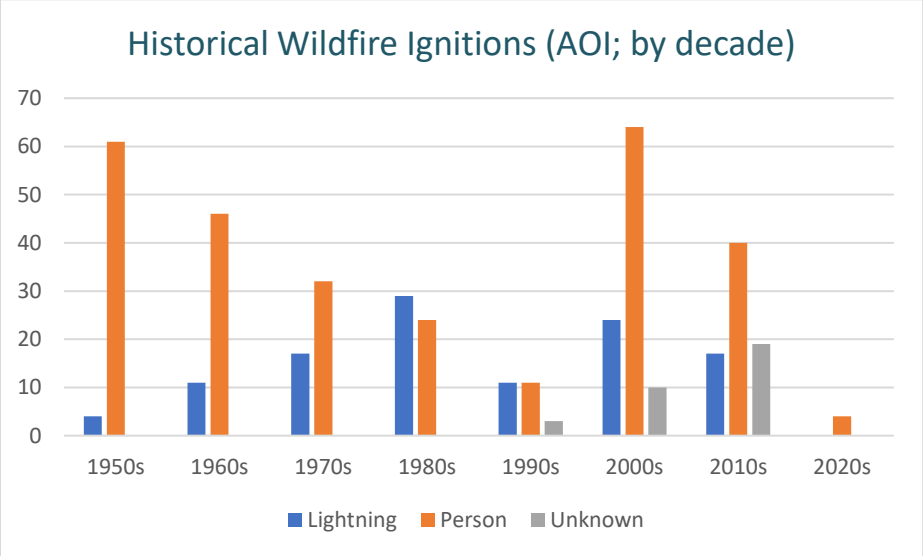


Figure 3: Historical wildfire ignition data (EA D; by decade)

When focusing on just the WUI (Figure 4), most ignitions were human-caused– out of 94 total ignitions ranging from 1950 to present, 93% were from human or human activity and only 2% were from lightning (5% unknown). When analyzing the last 30 years of data for recent ignition trends, from 1990 to present there were 58 ignitions of which 53 were from human or human activity (91%). This shows that human-

[25] Pogue, L. A., and L. Daniels. 2017. Three Centuries of Fire at Vaseux Lake. MASC Executive Summary for the BC Community Forests Association.
[26] Hall, E. 2010. Maintaining Fire in British Columbia's Ecosystems: An Ecological Perspective. Report submitted to the Wildfire Management Branch, Ministry of Forests and Range.
[27] https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-response/fire-characteristics/causes

caused fires present the greatest risk to EA D. However, it should be noted that lightning ignitions can occur in the region, indicated by 26% of ignitions in the AOI attributed to lightning strikes.

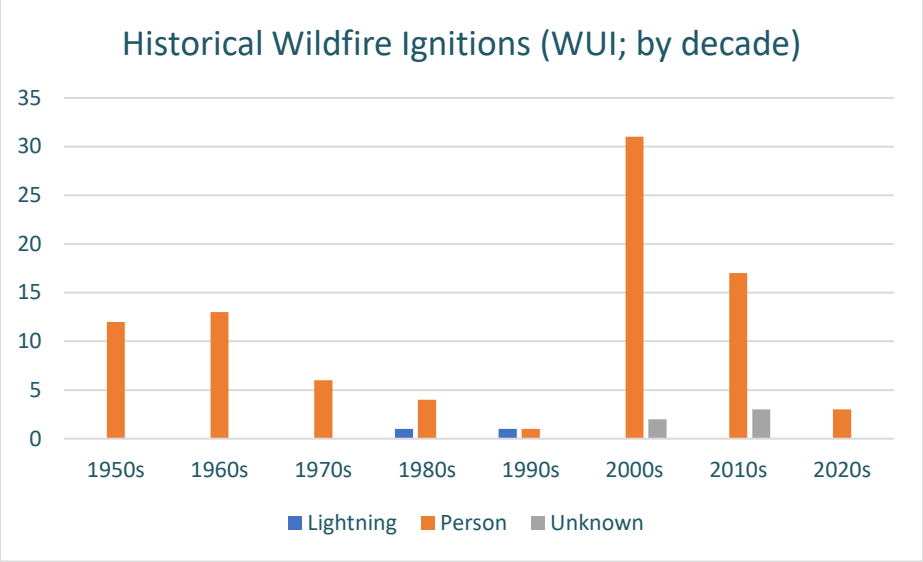
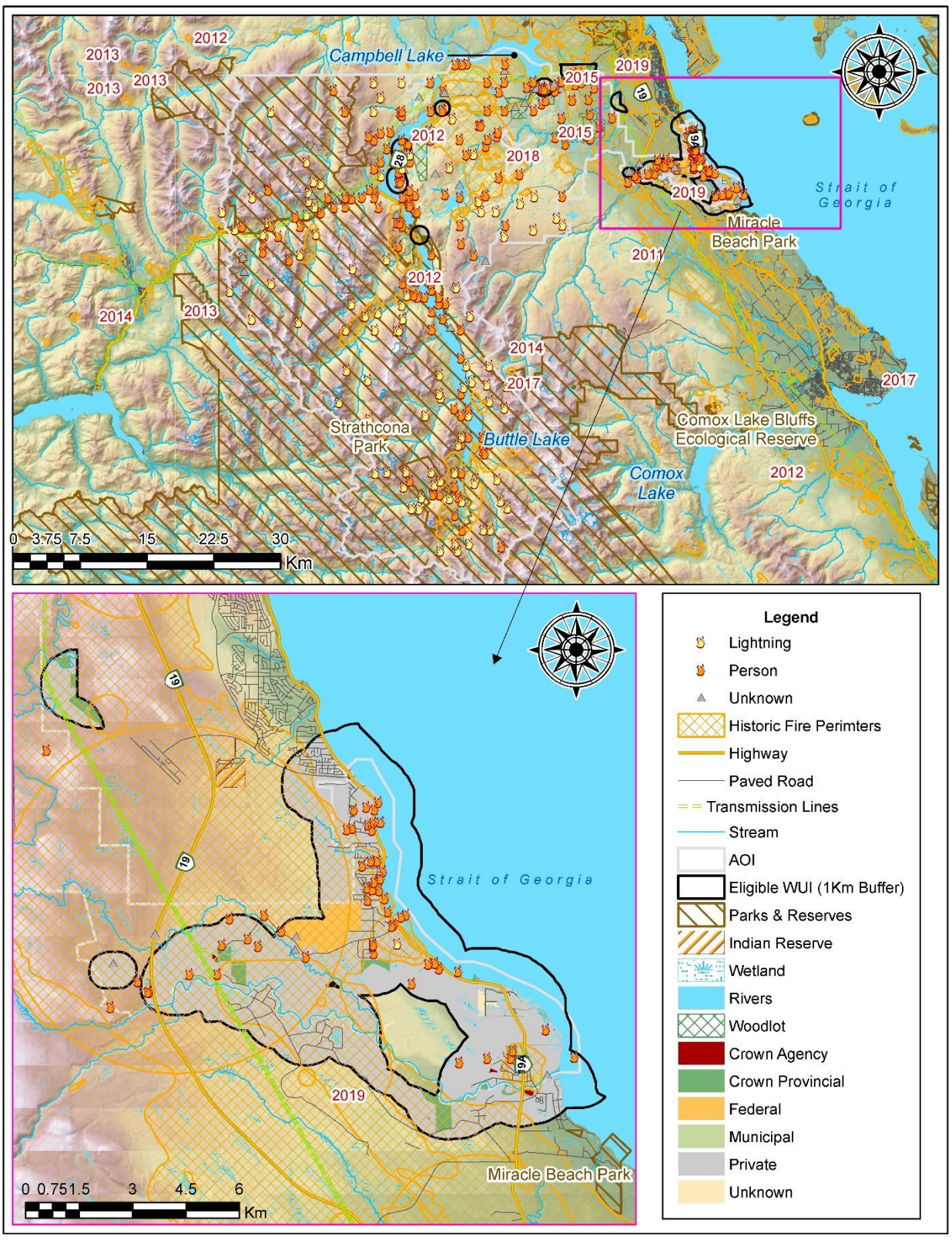


Figure 4: Historical wildfire ignition data (Wildland-Urban Interface, by decade)

Based on the BCWS historical wildfire polygon dataset, wildfires in the WUI are relatively rare – since 1922 there have been 13 fires of mappable size overlapping the WUI. Since 1956 there has been only one fire (0.1 ha). However, of the 13 fires occurring prior to 1956, five were over 1,000 hectares, one of which was 28,972 hectares – known as "the Bloedel Fire of 1938".[28] As is typical in NDT2, the Bloedel Fire occurred after a period of extended drought.[28] It had been the driest June since weather records were first collected in 1874.[28] This shows that, although rare, under the right conditions large fires can occur in the region.

[28] Parminter, John. Darkness at Noon – The Bloedel Fire of 1938. B.C. Forest Service Research Branch. Victoria, BC. October 1994. Accessed via web: https://www.for.gov.bc.ca/hfd/pubs/docs/scv/scv871.pdf



Map 4: Historical fire ignitions and perimeters within the Wildland-Urban Interface

4.3 LOCAL WILDFIRE THREAT ASSESSMENT

The local wildfire threat assessment process includes several key steps as outlined in Appendix A: Local Wildfire Risk Processand summarized as follows:

- *Fuel type attribute assessment* – ground-truthing/verification and updating as required to develop a local fuel type map (Appendix A-1: Fire Risk Threat Assessment Methodology, Map 3).
- *Consideration of the proximity of fuel to the community* – recognizing that fuel closest to the community usually represents the highest hazard (Appendix A-2: 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) (Appendix A-3: Fire Spread Patterns).
- *Consideration of topography concerning values* – 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 (4.1 – Topography).
- *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.

It is important to note that the Local Wildfire Threat Assessment analyses only apply to the Crown and municipal land base within the WUI as assessment of private property is not supported by UBCM CRI grant funding. Thus, approximately 62% of the land base is excluded. However, the analyses do provide relevant information regarding wildfire threat that should be considered for FireSmart and emergency management planning and preparedness.

4.3.1 WILDFIRE THREAT CLASS ANALYSIS

Classes of the wildfire behaviour threat class analysis are as follows:

- Very Low: Waterbodies with no forest or grassland fuels, posing no wildfire threat;
- Low: Developed and undeveloped land that will not support significant wildfire spread;
- Moderate: Developed and undeveloped land that will support surface fires that are unthreatening to homes and structures;
- High: Landscapes or stands that provide continuous forested fuels that will support candling, intermittent crown or continuous crown fires. These landscapes are often steeper slopes, rough or broken terrain and/or south or west aspects. High polygons may include high indices of dead and downed conifers; and
- Extreme: Continuous forested land that will support intermittent or continuous crown fires.

The results of the wildfire threat class analysis are shown on Map 5 and in Table 12 below. The updated analysis shows that, for the assessable area within the WUI (and also removing area covered by waterbodies), 82% is either very low threat, or low threat. The remaining ~18% of the WUI is almost all moderate threat, with high and extreme threat classes together totaling less than 1% total.

Table 12: Fire behaviour threat summary for the Wildland-Urban Interface, excluding private land, ocean, and lakes

Wildfire Threat Class	Percent of assessable WUI land base (ocean removed)
Extreme	0%
High	<1%
Moderate	18%
Low	37%
Very Low/ No Threat	45%

For comparison, results of the Wildfire Threat Class analysis, including private land and waterbodies, is shown below in Table 13.

Table 13: Wildfire Threat Class analysis for the Wildland Urban Interface

Wildfire Threat Class	Percent of WUI
Extreme	0%
High	<1%
Moderate	4%
Low	9%
Very Low/ No Threat (including waterbodies)	25%
No Data (Private Land and Private Managed Forest Land)	62%

4.3.2 WUI RISK CLASS ANALYSIS

WUI Risk Classes are quantified when the Wildfire Threat (the above; Table 12/13) is assessed as high or extreme, causing the potential of unacceptable wildfire risk near communities and developments. The total combined WUI Risk equals the area of High and Extreme Fire Threat Ratings. WUI Risk Classes are described below:

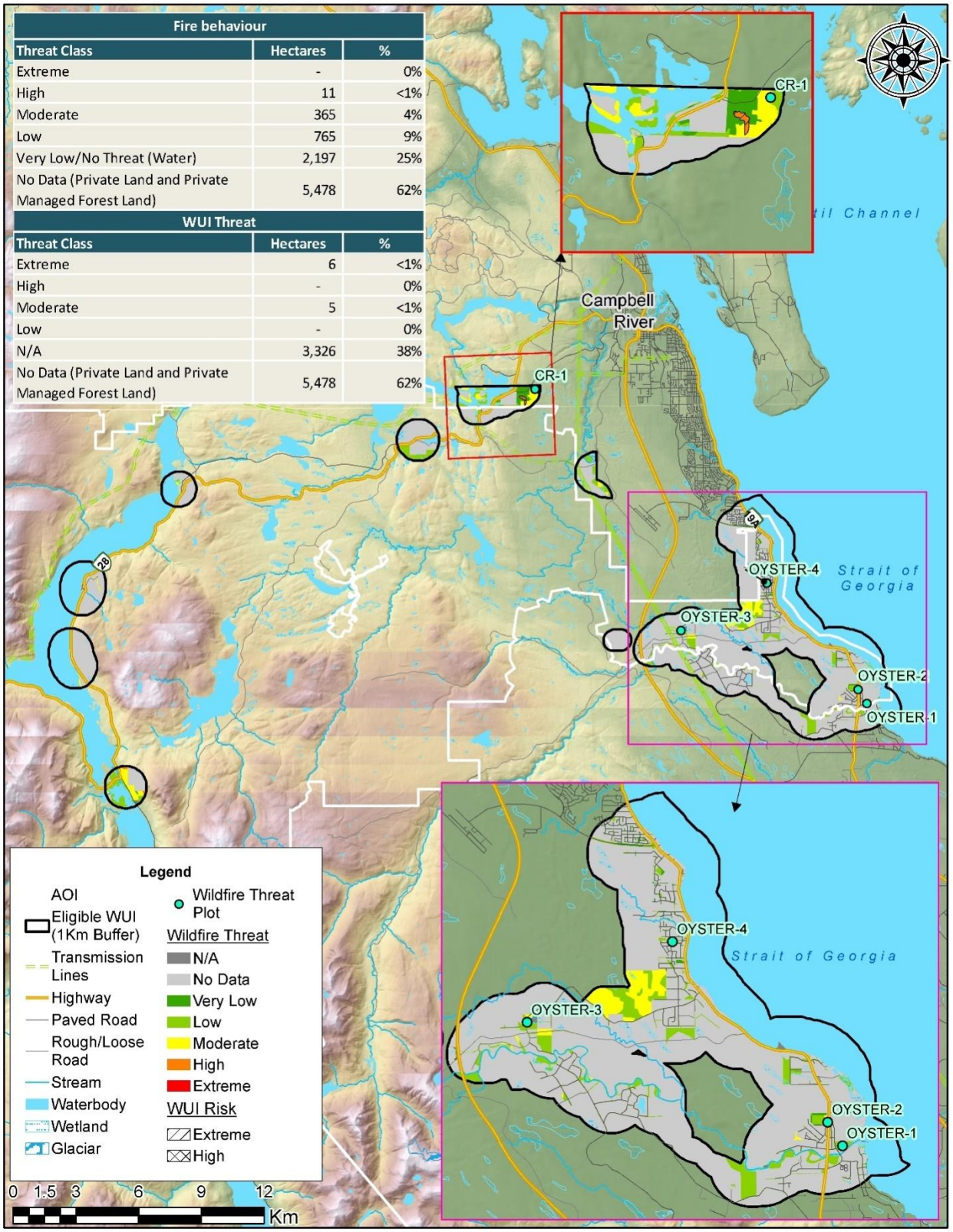
- **Low**: The high or extreme threat is sufficiently distant from developments, having no direct impact on the community and is located over 2Km from structures;
- **Moderate**: The high or extreme threat is sufficiently distant from developments, having no direct impact on the community and is located 500m to 2Km distance from structures;
- **High**: The high or extreme threat has the potential to directly impact a community or development and is located 200m to 500m from structures; and
- **Extreme**: The high or extreme threat has the potential to directly impact a community or development and is located within 200m from structures.

Table 14 below (and displayed on Map 5) summarizes the WUI Risk Class ratings within EA D's WUI. Only 11 hectares total have a WUI Risk Class rating of Moderate or higher.

Table 14: Wildland-Urban Interface risk class ratings

WUI Risk		
Risk Class	**Area (ha)**	**% of WUI**
Extreme	6	<1%
High	0	0%
Moderate	5	<1%
Low	0	0%
N/A	3,326	38%
No Data (Private Land and Private Managed Forest Land)	5,478	62%

For detailed field data collection and spatial analysis methodology for the local wildfire threat assessment and classification, see Appendix F: Fire Risk Threat Assessment Methodology.



Map 5: Local Wildfire Threat and Wildland-Urban Interface Risk Class Map

4.4 WILDFIRE THREAT ASSESSMENT FIELD WORK

Wildfire Threat Assessments were completed over several field days in July of 2021 in conjunction with verification of fuel types (see Appendix B: Wildfire Risk Assessment – Worksheets and Photos) to support analyses and the development of priority treatment areas. Five WUI threat plots were completed along with 51 other field stops (e.g., qualitative notes, fuel type verification, and/or photograph documentation) were made across the WUI (see Appendix D: WUI Threat Plot Locations and Map 5) in areas that had road or trail access to build the most accurate assessment of local fire risk possible.

Field assessment locations were prioritized based upon:

- *Proximity to values at risk*: Field assessments were clustered in the intermix and interface, as well as around critical infrastructure.
- *Prevailing fire season winds*: More field time was spent assessing areas upwind of values at risk, especially in potential locations for landscape-level fuel breaks.
- *Local knowledge*: Areas identified as hazardous, potentially hazardous, with limited access/egress, or otherwise of particular concern as vulnerable to wildfire, as communicated by local fire officials and community forest representatives
- *Observations*: Additional areas potentially not recognized before field work were visually identified as hazardous and assessed during the week.
- *Verifying provincial classification*: areas classified as high threat in the provincial PSTA dataset, or with an uncommon fuel type, were assessed to ground-truth the fuel type and threat, even if they were relatively far from values

4.5 HAZARD, RISK, AND VULNERABILITY ASSESSMENT

The Hazard, Risk and Vulnerability Analysis (HRVA) that local governments undertake as part of the legislative requirements to develop a local Emergency Management Plan may provide additional locally derived information that can augment the PSTA, particularly regarding critical infrastructure.[29] Updated critical infrastructure locations ('values at risk') were used to prioritize field data collection for the Local Wildfire Threat Analysis conducted above in Section 4.3. Additionally, critical infrastructure assessments, changes to values at risk within the WUI, and changes to wildfire risk and consequences within the WUI are addressed in their respective FireSmart sections below.

[29] CRI FCFS 2021 SCRP Supplemental Instruction Guide

SECTION 5: FIRESMART PRINCIPLES

FireSmart™ is the leading program in the country 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 across spatial scales and are not restricted to any type of land ownership, forest type, or property type.

The denser, more developed and populated eastern shoreline of EA D features some interface neighbourhoods, but most homes/structures are part of intermix communities – the homes and structures are largely situated within the vegetated/forested landscape. With the wildfire risk assessment (Section 4) showing that the most likely ignition cause of a wildfire to be from human actions, a focus on FireSmart education, FireSmart building materials, and Home and Critical Infrastructure Ignition Zone vegetation management would be the most important actions for the SRD to focus on to not only ensure structures and homes survive a wildfire event, but that they also do not ignite one.

FireSmart compliance on private properties is highly variable across the WUI, but generally moderate when considering building materials, landscaping, and maintaining a 10 m defensible space (where possible). Many homes lack setbacks from vegetated edges, use wood construction for decking, fences, and siding, have planted cedar and other volatile hedges, and store combustible items (firewood, propane cylinders, vehicles – as seen below in Figure 5) adjacent to the home and out-buildings. However, most structures within the WUI have Class A (high resistance to fire) roofing materials, which is a critical component of preventing structure ignition. Overall, the primary concern is the lack of defensible space structure-to-structure and structure-to-forest (especially considering how much private managed forest land is in the WUI). A secondary concern is the ubiquity of flammable building and landscaping materials. A tertiary concern is overall home fire safety.

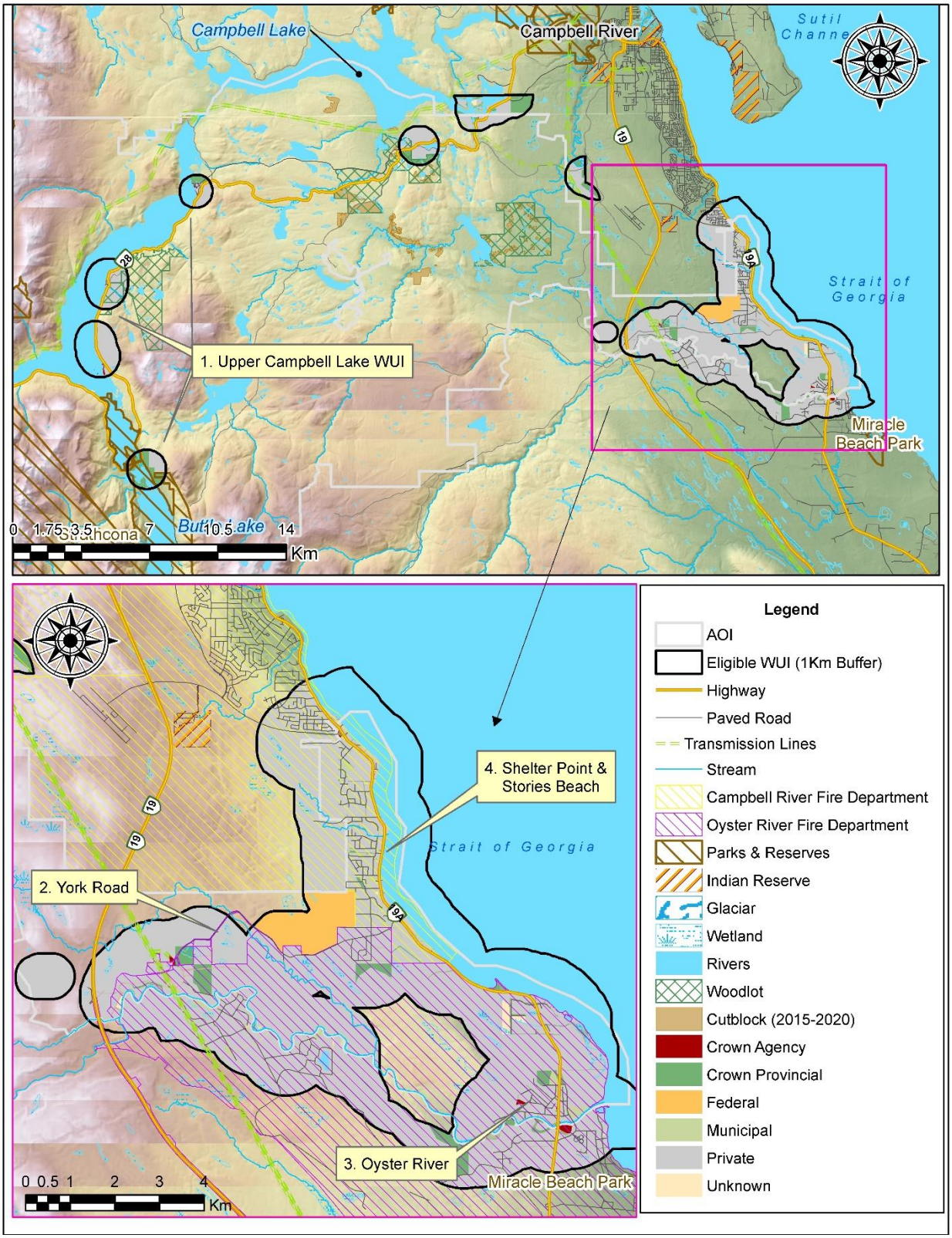
Figure 5: Example of combustible material (firewood) stored against a building in EA-D

FireSmart activities should focus first on the most at-risk communities/areas within the WUI. Based on general field observations, the local wildfire threat assessment, the current level of FireSmart, proximity to the WUI edge, restrictions to access/egress, adjacent fuel types and hazards, in/out of a fire response area, etc.), separate areas of focus within the WUI have been prioritized in Table 15 and shown below on Map 6 by those that would benefit the most from FireSmart planning and activities.

Table 15: Priority areas within the Wildland-Urban Interface

Community and Priority Number	Rationale	Suggested Priority Actions
1. Upper Campbell Lake WUI communities	Outside of both Campbell River FD and Oyster River FD fire response areas. Downwind (and up valley) of predominant fire season winds. Properties are steep-sloped and adjacent to active Crown land and private managed forest land forestry operations. Very low FireSmart compliance on structures and properties.	• FireSmart vegetation management in the Home (Structure) Ignition Zone, including continuing the community yard waste/debris chipping program. • Continued FireSmart education campaigns to owners. • FireSmart home assessments to guide owners on structure and vegetation FireSmart improvements. Rebate program for eligible FireSmart activities/improvements completed. • Neighbourhood Wildfire Assessments. • Assisting the development of FireSmart neighbourhood recognition status via a community champion – to foster and implement community-led FireSmart and wildfire education and actions.
2. York Road	In the northwest corner of the Oyster River FD fire response area. Single access/egress rural, intermixed, large-lot, community (along York Road) and industrial properties adjacent to private	• FireSmart vegetation management in the Home (Structure) Ignition Zone, including continuing the community yard waste/debris chipping program. • Continued FireSmart education campaigns to owners.

Community and Priority Number	Rationale	Suggested Priority Actions
	managed forest land, a BC Hydro overhead primary transmission corridor and FortisBC gas transmission pipeline. York Road community identified by the Oyster River FD Fire Chief as having water supply issues that add to fire suppression challenges.	• FireSmart home assessments to guide owners on structure and vegetation FireSmart improvements. Rebate program for eligible FireSmart activities/improvements completed. • Community Neighbourhood Wildfire Assessments. • Assisting the development of FireSmart neighbourhood recognition status via a community champion – to foster and implement community-led FireSmart and wildfire education and actions.
3. Oyster River	Within the Oyster River FD fire response area. Intermix community adjacent to private managed forest land. Downwind of other intermix homes and industrial properties.	• FireSmart vegetation management in the Home (Structure) Ignition Zone, including continuing the community yard waste/debris chipping program. • Continued FireSmart education campaigns to owners. • FireSmart home assessments to guide owners on structure and vegetation FireSmart improvements. Rebate program for eligible FireSmart activities/improvements completed. • Community Neighbourhood Wildfire Assessments.
4. Shelter Point & Stories Beach	Within the Campbell River FD fire response area. Some intermix, but mostly interface communities on the eastern shoreline with primate managed forest land adjacent to the west. A mix of small and medium sized properties. Reliable fire hydrant coverage.	• FireSmart vegetation management in the Home (Structure) Ignition Zone, including continuing the community yard waste/debris chipping program. • Continued FireSmart education campaigns to owners. • FireSmart home assessments to guide owners on structure and vegetation FireSmart improvements. Rebate program for eligible FireSmart activities/improvements completed. • Community Neighbourhood Wildfire Assessments.



Map 6: FireSmart priority neighbourhoods within EA D

An evaluation of the current level of FireSmart implementation within EA D's WUI is presented below in Table 16. All the activities listed are eligible for funding under the 2022 UBCM CRI FireSmart Community Funding and Supports program. Of the 37 applicable mitigation activities, 35% have already been achieved, 8% partially achieved, and 57% not achieved. Items not achieved are addressed in their respective FireSmart sections below.

Table 16: FireSmart activities funded under the 2022 UBCM CRI program[30] and their level of implementation in EA D's Wildland-Urban Interface

CRI Funding Category	FireSmart Activities	Current Status
1. Education	Update public signage, social media, websites and/or newsletters, and community education materials or displays related to a proposed activity in categories 2-9 (below).	*Partially Achieved.* Oyster River FD has achieved. Wildfire risk signs are posted at major entrances to Oyster River and BC Parks. Oyster River FD notifies community groups via email.
	Organize and host public information meetings related to a proposed activity in categories 2-9 (below).	*Achieved.* See below.
	Promote and distribute FireSmart educational materials and resources.	*Partially Achieved.* Mailouts of some FireSmart materials have been done by SRD.
	Encourage community participation in a Wildfire Community Preparedness Day.	*Achieved.* FireSmart workshops conducted.
	Support the organization of a Farm and Ranch Wildfire Preparedness workshop, Neighbourhood Champion workshop, community FireSmart day, FireSmart events and workshops, and/or wildfire season open houses.	*Achieved.* FireSmart events and workshops organized yearly by SRD and fire departments.
	Support neighbourhoods to apply for FireSmart Canada Neighbourhood Recognition Program.	*Not achieved.*
2. Legislation and Planning	Develop or amend a CWRP/CWPP (to the 2020 template).	*Achieved.* SRD EA D 2021 CWRP.
	Develop FireSmart policies for the design and maintenance of public lands, such as regional parks, or buildings.	*Not achieved.*
	Conduct FireSmart Assessments for publicly owned buildings to support future FireSmart projects for critical infrastructure (see category 7).	*Not achieved.*

[30] CRI 2022 FireSmart Community Funding and Supports Program and Application Guide: https://www.ubcm.ca/sites/default/files/2021-09/LGPS_CRI-FCFS_2022ApplGuide_2021-09-03_0.pdf

CRI Funding Category	FireSmart Activities	Current Status
3. Development Considerations	Amend OCPs or bylaws to incorporate FireSmart principles.	*Not achieved.*
	Revise landscaping requirements in zoning and development permit documents to require fire resistant landscaping or include other FireSmart considerations.	*Not achieved.*
	Establish Development Permit Areas for Wildfire Hazard.	*Not achieved.*
	Include wildfire prevention and suppression considerations in the design of subdivisions.	*Not achieved.*
	Amend referral processes for new developments to ensure multiple departments, including the fire department and/or emergency management personnel, are included.	*Not achieved.*
4. Interagency Cooperation	Develop, coordinate, and/or participate in a Community FireSmart Resiliency Committee or multi-agency fire and/or fuel management planning table.	*Not achieved*. No active CFRC for SRD EA D.
	Provide Indigenous cultural safety and humility training to emergency management personnel.	*Achieved.* SRD staff have completed.
	Attend the annual FireSmart BC Conference, to be hosted by the BC FireSmart Committee.	*Achieved.* SRD staff have attended.
5. Emergency Planning	Develop and/or participate in cross-jurisdictional meetings and tabletop exercises focused on wildfire preparedness and suppression, including seasonal wildfire readiness meetings.	*Achieved.* 2017 interface emergency response drill.
	Assess community water delivery ability as required for suppression activities, limited to current water system evaluation and available flow analysis.	*Not achieved.*
	Assess structural protection capacity.	*Achieved.* EA D fire response area FDs with BCWS.
	Use and/or promote EMBC Wildfire Preparedness Guide for community emergency preparedness events focused on wildfire.	*Achieved.*
6. Cross-Training	Provide or attend training for Local FireSmart Representatives (LFR).	*Achieved.* Multiple members of EA D fire response area FDs have completed training. SRD staff have completed training.
	Support LFRs to attend facilitator training.	*Partially achieved.* Oyster River FD has one LFR facilitator.
	Home Partners Program – Wildfire Mitigation Specialist training.	*Not achieved.*
	Support local government or First Nation staff that have completed Wildfire Mitigation Specialist training to qualify as facilitators.	*Not achieved.*

CRI Funding Category	FireSmart Activities	Current Status
	Cross-train fire department members to include structural and interface wildfire training: - SPP-WFF1 Wildland Firefighter Level 1 - S-100 Basic fire suppression and safety - S-185 Fire entrapment avoidance and safety - S-231 Engine Boss - ICS-100	*Achieved.*
	Cross-train emergency management personnel: - ICS-100 - WRR Basics Course	ICS-100: *Achieved.* WRR Basics Course: *Not achieved.*
7. FireSmart Projects for Critical Infrastructure	Completion of recommended mitigation activities identified in a FireSmart Home Ignition Zone or Critical Infrastructure Ignition Zone Assessment.	*Not achieved.*
	Completion of a FireSmart Home Ignition Zone or Critical Infrastructure Ignition Zone Assessment once mitigation work has been completed.	*Not achieved.*
8. FireSmart Activities for Residential Areas[31]	Conduct Home Ignition Zone Assessments for individual residential properties or homes.	*Not achieved.*
	Offer local rebate programs to residential property or homeowners that complete eligible FireSmart activities.	*Not achieved.*
	Undertake Neighbourhood Wildfire Hazard Assessments.	*Not achieved.*
	Support the development of FireSmart Neighbourhood Plans for specific areas.	*Not achieved.*
	Conduct Home Partners Program wildfire mitigation assessment for individual residential properties or homes.	*Not achieved.*
	Provide off-site vegetative debris disposal for residential property or homeowners who have undertaken their own vegetation management, including: - Provide a dumpster, chipper, or other collection method. - Waive tipping fees. - Provide curbside debris pick-up.	*Achieved.* Active chipper program.
9. Fuel Management	Undertake planning and development for fuel management on publicly owned land (fuel management prescriptions, burn plans, demonstration projects).	*Not achieved.*

[31] To be eligible for funding, all FireSmart activities for residential areas must be located in the FireSmart Home Ignition Zone which includes the home and surrounding yard area - FireSmart Non-Combustible Zone and Priority Zones 1, 2 and 3 (only with residential property and/or homeowners' consent).

CRI Funding Category	FireSmart Activities	Current Status
	Undertake new fuel management treatments on publicly owned land (including demonstration projects).	*Not achieved.*
	Undertake fuel management maintenance activities on publicly owned land.	*Not achieved.*
	Undertake prescribed burns on publicly owned land or First Nations land when the primary objective is fuel management for community wildfire risk reduction.	*Not applicable to SRD EA D.*

5.1 EDUCATION

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

The SRD has an ongoing FireSmart education campaign within EA D assisted by Oyster River and Campbell River FDs. Fire danger and fire bans are communicated through social media as well as with signs at main entrances to Oyster River. One to two times a year, the SRD has conducted FireSmart education sessions which saw attendances of 20 people. SRD and Oyster River FD have links to fire bans and fire restrictions on their webpages. Oyster River FD's webpage also has a front-page bulletin showing the current fire danger rating and a dedicated section for wildfire risk reduction and management, but no links to, or mention of, FireSmart. The Campbell River FD's website is run through the City of Campbell River's webpage. It has a section dedicated to FireSmart and fire prevention.

Funded under a FireSmart grant to the City of Campbell River, a Campbell River FireSmart Guide to Gardening document has been created to educate residents on proper FireSmart landscaping plants and techniques. SRD has handed this out to all communities within the region, including EA D.

Overall home fire safety should be considered an important education topic. Items to promote (added on to pamphlets, through social media, etc.) to residents include having fire extinguishers at home and keeping them maintained, and fireplace safety and chimney maintenance (*i.e.,* chimney inspections and cleaning from a chimneysweep).

Starting fire, wildfire, and FireSmart education early helps embed and spread awareness and knowledge throughout communities. SRD should encourage School District 72 to adopt and deploy existing wildfire education programs. Carihi Secondary School in Campbell River has an existing forestry program which would be a great platform to include FireSmart education on to.

Fire Chiefs for both FDs noted that the public, in general, is quite receptive to FireSmart events and education, but carries an "it won't happen here" mentality. To further FireSmart education, SRD, Campbell River FD, and Oyster River FD should continue to consider actions that get the FireSmart message out to as many residents and visitors as possible, including the youth. Table 17 below details recommended actions and activities to do so. Of note are FireSmart activities for residential areas – funding is available for FireSmart assessments to be completed on both individual homes/properties as well as collective neighbourhoods, taking the onus of FireSmart assessments and planning off individual property owners, providing them with actions they can prioritize and implement to reduce wildfire and ignition risks on their structures and properties.

Table 17: Education recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To provide information to residents empowering them to adopt and conduct FireSmart practices to mitigate the negative impacts of wildfire to their homes/businesses, properties, and neighbourhoods.							
1	High	This CWRP report and associated maps should be made publicly available by SRD through its website, Campbell River FD's website, Oyster River FD's website, and on social media. In addition, this CWRP should be shared with local industry partners who may be interested in collaborating on FireSmart and wildfire risk reduction activities.	Include all members of the Community FireSmart Resiliency Committee, as well as other relevant industries and businesses in the WUI ((*i.e.,* woodlots, Mosaic Forest Management and other private forest land managers, BC Parks, and local First Nations).	SRD; City of Campbell River	1 year from document completion	Available for download or viewing on SRD's and FDs' webpages	SRD; City of Campbell River (~5 hours to update one website)
2	High	SRD, Campbell River FD, and Oyster River FD should continue to promote FireSmart education through FireSmart workshops (*i.e.,* SRD EA D's 'Safety Day'), open houses, presentations, and information mailouts. Supply FireSmart resources during these engagement campaigns and promote the FireSmart Begins at Home mobile app as a method of conducting home assessments. Promote overall home fire safety by providing information on fire extinguishers, fireplace maintenance, chimney maintenance, etc.	Educate homeowners of FireSmart principles and encourage residents to FireSmart their homes. Aim to conduct the engagement and promotion campaign before and during the fire season. The SRD should consider FireSmart workshops for each of the priority neighbourhoods separately hosted in/near their community to attract as many residents as possible. Consider providing fire extinguisher maintenance and re-certification at these workshops.	SRD (Campbell River FD, Oyster River FD, Local FireSmart Representatives)	Yearly (pre-fire season)	1 workshop per neighbourhood per year	UBCM CRI funding is available (~40 hours for planning and 1 day for each workshop)
3	High	SRD and Oyster River FD should, where missing, develop FireSmart/Wildfire Preparedness pages on their websites with links to FireSmart BC information, local updates, etc.	Websites are effective platforms to distribute information. SRD should consider creating a fire weather decal on its front page displaying the current fire weather (that could double as a button to its FireSmart page).	SRD (Oyster River FD, Consultant)	1 year	Webpages updated	UBCM CRI funding is available (~$3000 contracted service. ~40 hours for set-up. Additional hours for updates as required)
4	High	SRD should apply for funding to complete Home Ignition Zone	HIZ assessments can be completed by a Local FireSmart Representative	SRD	5 years	Interface homes in each priority	UBCM CRI funding is available for both

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		Assessments (HIZ) or Home Partners Program (HPP)Wildfire Mitigation Assessments on residential properties. Inform residents (through mail-outs, social media, etc.) of the program and provide online and mail-in sign-up options for a set of potential assessment dates.	and assess the home and property's risk from wildfire. HPP Wildfire Mitigation Assessments[32] area more detailed and comprehensive assessment completed by fire professionals (*ex.* firefighter) that have completed FireSmart Wildfire Mitigation Specialist training. The assessment process accurately evaluates a home and property for wildfire exposure, while engaging the homeowner in their unique risk and ways to reduce it.	(LFR or HPP Mitigation Specialists – may be a consultant)		neighbourhood (Table 15) have been assessed.	HIZ and HPP assessments. (~$250/structure)
5	High	In conjunction with recommendation #4, SRD should offer a local rebate program to residential property/homeowners that have completed eligible FireSmart assessments and activities. (Rebates are limited to 50% of the total cost of eligible activities, up to $500/property)	Rebate programs can be difficult to incentivize owners to participate in. Currently underway in the Squamish-Lillooet Regional District[33], inform residents (through mail-outs, social media, etc.) that those who have had a HIZ or HPP assessment completed automatically qualify for the rebate program. Provide online and mail-in registration options.	SRD (Consultant)	5 years	Rebate program implemented in EA D.	UBCM CRI funding is available (cost/time dependent on number of registered properties)
6	High	SRD should apply for funding to complete Neighbourhood Wildfire Assessments for each of the priority neighbourhoods listed in Table 15.	Neighbourhood Wildfire Assessments provide a written evaluation of the overall neighbourhood wildfire hazard and should be completed by a certified Local FireSmart	SRD (Local FireSmart Representative, Consultant)	5 years	Assessments completed for neighbourhoods.	UBCM CRI funding is available (~$400-1000/neighbourhood

[32] More information on HPP assessments can be found here: https://www.firesmartcanada.ca/programs-and-education/firesmart-home-partners-program/
[33] Contact the SLRD for more information on how they have implemented this program. Additional information located here: https://www.slrd.bc.ca/emergency-program/preparedness/firesmart-program

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
			Representative to be recognized by FireSmart Canada. This could be contracted out in conjunction with recommendation #4.				depending on location and size)
7	High	Links to the Campbell River FireSmart Guide to Landscaping should be created on SRD's, Campbell River FDs, and Oyster River FD's webpages. SRD should continue to include it, or reference to it, in annual FireSmart education mail-outs.	Increase FireSmart vegetation management knowledge amongst EA D's residents. Consider a social media 'blast' relating to it.	SRD (Campbell River FD, Oyster River FD)	1 year	Posted on SRD's and FDs' FireSmart webpages	UBCM CRI funding is available (~ 20 hours in-house)
8	Moderate	SRD should support and facilitate priority neighbourhoods to self-organize to attain FireSmart Canada Neighbourhood Recognition Program (FSCNRP) status. Once completed, support the development of FireSmart Neighbourhood Plans.	Neighbourhood Wildfire Assessments are a steppingstone towards FSCNRP status. Leverage the leadership of a Local FireSmart Representative.	SRD (Local FireSmart Representatives)	5 years	Completed for priority neighbourhoods	UBCM CRI funding is available ($5000/ neighbourhood; 40 hours/ initiative)
9	Moderate	SRD should encourage School District 72 to adopt and deploy existing wildfire education programs. Other options/value-added activities include consulting with the Association of BC Forest Professionals (ABCFP) and BCWS (North Island Mid Coast Fire Zone) as well as the SRD EA D FD and regional FireSmart representatives to facilitate and recruit volunteer teachers and experts to help with curriculum development to be delivered in the schools (field trips, guest speakers, etc.).	Emergency preparedness curriculum is available provincially, which includes preparedness for a variety of natural hazards, including wildfire (Master of Disaster, FireSmart BC Education box).	SRD	Yearly (pre-fire season)	One FireSmart education day per school year	UBCM CRI funding available (FireSmart BC Education box - $800 Junior K- Grade 12. Field trips, guest speakers, etc. ~$2500 per school)

5.2 LEGISLATION AND PLANNING

Legislation and planning regulation are effective tools for reducing wildfire risk due to ease of communication and enforcement.

A review and summary of bylaws and regulations relevant to wildfire risk and emergency planning were provided earlier in Section 2.4. Actions such as reviewing zoning bylaws *through a wildfire lens* to assess where they inadvertently promote conditions that may contribute to fire spread (*i.e.,* landscaping, fencing), and determining where bylaws can be updated or strengthened to reduce wildfire risk to development (such as adopting bylaws tied to wildfire hazard levels and requiring minimum standards for access, water supply, construction materials and techniques, and vegetation management) can help accomplish the goal of a more wildfire resilient community (note: development requirements addressing minimum standards for access, water supply, construction materials and techniques, and vegetation management can also be implemented through a wildfire hazard Development Permit Area – which is proposed as part of this CWRP and discussed below in Section 5.3 Development Considerations).

When considered through a wildfire lens, the Black Creek – Oyster Bay Fire Protection Service Regulation Bylaw is robust and fulfills almost all needs for addressing fire and wildfire risks, hazards, and mitigation on private, regional district, and Crown lands, but only within its fire protection area. Within the fire protection area serviced by the Campbell River FD, the FD has no authority to enforce open burning unless there is a (Provincial government) fire ban in place. This is an issue and cause for confusion among residents.[34] Additionally, the knowledge the Fire Chief has of local wildfire conditions and risks is not leveraged for maximum wildfire risk reduction. Although recommended in the previous CWPP to resolve, no action has occurred to rectify it. Outside of the fire protection areas serviced by both FDs, SRD enacts fire regulations and bans according to Provincial regulations. The SRD should consider some form of legislation that, at a minimum, extends fire and wildfire risk bans enacted in the Black Creek – Oyster Bay Fire Protection Service Area to the Campbell River FD Service Area, thus eliminating confusion on what regulations apply where and reducing wildfire risk across the most populated part of the WUI. This, and additional recommendations and action items SRD can implement relating to legislation and planning in EA D are detailed below in Table 18.

[34] As noted by the Campbell River FD Fire Chief via CWRP information gathering questionnaire July 2021.

Table 18: Legislation and planning recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To provide the means for Strathcona Regional District to implement wildfire risk reduction actions through by-laws and legislation by outlining local government responsibilities regarding wildfire.							
10	High	Complete or schedule periodic updates of the CWRP. The frequency of updates is highly dependent upon major changes which would impact local wildfire risk or the rate at which wildfire risk reduction efforts are implemented. An evaluation of major changes (including funding program changes that may lead to new opportunities) and the potential need for a CWRP update should be initiated every 5 years.	A current (i.e., no more than 5 years old) CWRP isa requirement for further funding under the UBCM CRI Program.	SRD (Consultant)	5 years from adopting this CWRP document	EA D always has an up-to-date CWRP and action plan	UBCM CRI funding is available (~$25,000 for full document / $10,000 for update)
11	High	Update/Amend the Black Creek – Oyster Bay Fire Protection Service Regulation Bylaw (or create separate legislation applicable to Campbell River FD's response area in EA D) that extends fire bans and other associated wildfire risk bans enacted to cover both FD's fire protection areas.	One bylaw, or two equal bylaws should cover both fire response areas to eliminate confusion on what regulations apply where, and to reduce wildfire risk across the WUI.	SRD (Consultant/Lawyers)	5 years	Legislation updated/created	UBCM CRI funding is available ($3000 contracted service)

5.3 DEVELOPMENT CONSIDERATIONS

Embedding FireSmart practices and considerations into development should be apriority of the SRD in EA D. Wildfire risk factors that can be planned for and regulated through the land use planning and development process include:[35]

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

Noted in Section 3.2.3, homes and businesses in the most developed parts of EA D (eastern shoreline) have serviced water and fire hydrants. The Campbell River Fire Chief noted that water supply through their system is reliable year-round, but access to drafting sites (lakes/creeks/ponds), if needed, is a challenge. Water drafting sources are digitally mapped and available on GPS enabled units within their response vehicles. The Campbell River Fire Chief also noted that York Road has limited hydrant services and shuttling water from a hydrant or pond to a fire in this area is a possibility.

Oyster River FD has less fire hydrant service in its fire response area within EA D. The Oyster River Fire Chief noted that the water supply has always been reliable and more wells are currently being added to upgrade the system.[36] Drafting water from lakes/creeks/ponds is a possibility, however these sites are not mapped. The Fire Chief echoed the Campbell River Fire Chief's statement about fire suppression challenges in York Road. A means to have water secured and stored close to WUI communities with no or limited fire hydrant coverage for firefighting purposes, especially during the fire season, should be explored by the SRD.

Protection of functional critical infrastructure during a wildfire event is an important consideration for emergency response effectiveness, ensuring that coordinated evacuation can occur if necessary and that essential services can be maintained and/or restored quickly in the case of an emergency. Critical infrastructure construction materials and vegetation/landscaping are equally important to consider – the structure itself may not be susceptible to fire, but the vegetation surrounding it could be, creating a barrier to access if ignited and a vector for fire spreading to surrounding homes and through the community. The Oyster River Water Treatment Plant is shown below (Figure 6) as an example of good FireSmart principles applied to critical infrastructure. The structure itself is FireSmart (non-flammable materials, no windows) and the FireSmart priority zones adhere (mostly) to vegetation management

[35] CRI FCSF 2021 CWRP Supplemental Instruction Guide
[36] As noted by the Oyster River FD Fire Chief via CWRP information gathering questionnaire July 2021.

principles (vegetation-free space to 3m, non-combustible deciduous vegetation, high crown base heights on surrounding conifer trees, etc.).

Figure 6: Oyster River Water Treatment Plant

Secondary power sources are important to reduce critical infrastructure vulnerability in the event of an emergency that cuts power for days, or even weeks. Vulnerabilities for secondary power sources include mechanical failure, potentially insufficient power sources should a wide-scale outage occur, and fuel shortage in the event of long outages. All functional critical infrastructure should be assessed and retrofitted with back-up power sources, as required.

EA D residents value the quiet, spacious and friendly, single-family neighbourhoods with limited commercial development – the low density, rural and suburban settlement offers an alternative to city life.[37] However, this results in the formation of highly intermix and interface neighbourhoods with limited points of access and evacuation routes (often just one both out of the neighbourhood and from the neighbourhood to another part of the island). Additionally, properties are variable in building age and construction, with FireSmart compliance varying from one lot to the next. The properties shown below in Figure 7 demonstrate aspects of non-compliance to key FireSmart principles: [left picture]

[37] Oyster Bay – Buttle Lake Official Community Plan

conifer branches overhanging and touching the roof, unmanaged cured grass; [right picture] highly flammable cedar hedging.

Figure 7: Example of a home and property within the WUI with low FireSmart adherence.

Much like regulations, it is important that that the OCP adopt language and framework *through a wildfire lens* so that future land use and development are guided with wildfire risk reduction and preparedness in mind, especially within the WUI. One example would be to incorporate FireSmart principles into the Rural Design Guidelines. Currently, they state:[38]

"Rural design guidelines are development principles which encourage landowners to:

a) maintain the existing topography, vegetation and other natural and man-made features of a site when developing;
b) design buildings and structures to reflect and enhance the form and character of the community;
c) site buildings, roads and required services to be unobtrusive and absorbed by the landscape."

Incorporating key FireSmart principles such as maintaining a 10m defensible space from structure to vegetation, structure setbacks from slope breaks, and replacing flammable plants/trees with fire resistant ones can be accomplished in a way that maintains the natural aesthetic of the property and communities.

One of the most powerful tools SRD can employ is the development of a Wildfire Hazard Development Permit Area (DPA) for the protection of developments from hazardous conditions. Example municipalities and regional districts that have added Wildfire DPAs into their respective OCPs include the District of West Vancouver and the Regional District Okanagan-Similkameen. The following aspects should be considered in the OCP review and wildfire hazard DPA development:

[38] Oyster Bay – Buttle Lake Official Community Plan

1) Establish DPA objectives (*e.g.,* minimize risk to property and people from wildfires, minimize risk to forested areas surrounding the municipality, and conserve the visual and ecological assets of the forests surrounding communities, etc.).
2) Where possible, it is recommended to mandate FireSmart construction materials, some of which may be beyond the BC Building Code within the established wildfire hazard development permit area.
3) Engage the development community in the DPA development process to educate, inform, and allow for input. This can be accomplished in a variety of formats, including, but not limited to, workshops, informational sessions, or open houses.

Important to note is that not all the above aspects need to be included in the Wildfire DPA. It can have zones specifying which aspects are required where based on that properties position in the community and its position relative to interface boundaries.

Recommendations and action items that the SRD can implement to embed FireSmart practices and considerations into development are detailed below in Table 19.

Table 19: Development considerations recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To embed FireSmart practices and considerations into all development within Electoral Area D.							
12	High	Develop a Wildfire Hazard DPA and update the Oyster Bay – Buttle Lake Official Community Plan (OCP) when completed. To meet objectives, consider including the following elements: • minimum setbacks from forested edges based on FireSmart, • fuel management based upon qualified professional recommendations, • landscaping to FireSmart guidelines, • building materials and design based on NFPA 1144 and FireSmart standards, • underground servicing, • prompt removal of combustible construction materials or thinning/fuel management waste, and • a minimum of two access/evacuation routes for all neighbourhoods.	To embed FireSmart values into all aspects of community development and planning, especially to those communities within the WUI. Variations of a Wildfire DPA, with differing levels of FireSmart adherence required, are being developed/employed by municipalities and regional districts across BC.[39]	SRD (Consultant)	5 years	Interface wildfire DPA created and adopted	UBCM CRI funding is available (~$20,000 contracted service and 40 hours in-house)
13	High	Explore opportunities to enhance water access/drafting sites across the WUI for EA D fire response area fire departments and wildland firefighters. Opportunities include building permanent cisterns/reservoirs adjacent to/within communities that can be filled during the winter, or are on the edge/near known accessible drafting sites and are gravity fed and covered to reduce evaporation during fire season.	This will likely involve multiple jurisdictions and entities including SRD, EA D fire response area fire departments, BCWS, FLNRORD and multiple professional assessments (engineering, riparian, biology). Example cistern locations would be half-way up York Road and adjacent to the small housing communities along Upper Campbell Lake.	SRD (BCWS, EA D FD's, FLNRORD, Consultant)	5 years (for siting and planning)	Locations for cisterns / reservoirs identified in priority neighbourhoods.	SRD (unknown)

[39] Example municipalities and regional districts include District of West Vancouver and the Regional District Okanagan-Similkameen.

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
14	High	SRD EA D's functional infrastructure (*i.e.,* Firehalls, Emergency Reception Centres, Emergency Housing Locations, water lift/pump stations, etc.) should have backup gas- or diesel-powered generators. SRD and EA D fire response area fire departments should invest in secondary power sources, as/if required, to continue these services in the case of a prolonged or extensive power outage because of a wildfire. Upgrade or realign resources, as prioritized.	Ensure that generators have sufficient fuel supply for extensive power outages (3 + days) so that they can function as required in the event of an emergency.	SRD (SRD EA D FDs)	5 years	All functional critical infrastructure have backup power sources	SRD SRD EA D FD (~$30,000 per site - depending on requirements)
15	High	Engage a qualified professional (such as a Local FireSmart Representative) to complete formal FireSmart assessments of all critical infrastructure. Plan and implement action items in the sequence of importance. Additionally, SRD should request that Telus Communications Inc, FortisBC and BC Hydro conduct FireSmart assessments their key infrastructure and implement mitigation work as required.	Critical infrastructure, such as fire halls and emergency shelters, are identified in Table 7.	SRD (Local FireSmart Representative or Consultant)	3 years	Assessments completed and action items being planned for	UBCM CRI funding is available (~$1000 per location – contracted service)
16	High	Use fire-resistant construction materials, building design, and landscaping for all critical infrastructure when completing upgrades or establishing new infrastructure.	Vegetation setbacks around critical infrastructure should be compliant with FireSmart principles (*e.g.,* no combustible material within 10 m of structures).	SRD	Ongoing	New and upgraded critical infrastructure are FireSmart	SRD ($ variable: CI specific)
17	High	The Campbell River FireSmart Guide to Gardening should be set as a standard and applied to SRD EA D zoning and development permit documents.	Consider including the landscaping standard as part of the wildfire hazard DPA.	SRD	5 years	Landscaping standard built into zoning and/or an interface wildfire DPA	UBCM CRI funding is available ($/time dependent on actions taken)
18	High	Conduct a full review and updating of the Oyster Bay – Buttle Lake Official Community Plan to imbed FireSmart principles within the stated objectives and policies and to guide future land	The OCP sections recommended for updating should not be considered the complete list of sections that should be reviewed	SRD (Consultant)	5 years	Required OCP sections updated	UBCM CRI funding is available

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		use and development decisions. Examples include updating: • Rural design guidelines and development principles. • Existing designated development permit areas: (401) Neighbourhood Commercial, (402) Tourist Commercia Development, (403) Cottage Industry, (404) Protection of the Natural Environment, Its Ecosystems and Biological Diversity, (405) Industrial, and (406) Upland Habitat Greenways.	and updated, but rather a guide to how FireSmart principles can be viewed and actioned in it. See the Fraser Valley Regional District Electoral Area D OCP Update, the Cariboo Regional District Electoral Area G OCP, and other regional district electoral areas as examples.				(~20 in-house hours and ~$10,000 including $1,500 for administration (SRD) and $8,500 for consultant costs (100 hrs @ $85/hr).
19	Moderate	Existing single access/egress neighbourhoods should be reassessed for potential secondary access/evacuation routes. There could be opportunities for an easement or agreement-on-use on the edge of an individual's private property, routes through private managed forest land, or using BC Hydro right-of-way corridors (to be used only in emergency evacuation situations).	It is recognized that landscape geography and private property can make this difficult. Start by contacting land managers and owners and discuss using resource roads as emergency evacuation routes. An example is constructing a connection from the end of York Road west to Highway 19, or from the end of York Road south to existing forest resource roads creating access to Duncan Bay Road.	SRD	5 years	Where determined possible, secondary egress routes are being planned for development	SRD (Cost/time dependent on level of discussions and planning)

5.4 INTERAGENCY COOPERATION

Identifying and linking stakeholders such as government, private landowners, park and recreation staff/managers, forest land managers, and emergency services can reduce wildfire risk, increase funding opportunities, and allow SRD to obtain valuable local knowledge.

Community FireSmart Resiliency Committee (CFRC)

EA D's CFRC reflects the key planners and responders most involved in local FireSmart, wildfire resiliency planning, and wildfire and emergency response specific to the region. Table 20 below details the agencies involved, their current representatives and titles, and their role within the CFRC. The CFRC should meet regularly to discuss wildfire preparedness, plans to implement recommendations and action items within this CWRP, and to share relevant, local wildfire information.

Table 20: SRD EA D's Community FireSmart Resiliency Committee (CFRC)

Agency	Title	Person[40]	Role	Comments
Strathcona Regional District	Protective Services Coordinator	Shaun Koopman	*Primary:* provide data, information, and other relevant plan content; work to determine CWRP actions; conduct outreach with other stakeholders and the public to discuss the plan and receive additional input.	Implement SRD EA D's Community Wildfire Resiliency Plan. Provide outreach to and communicate with applicable stakeholders.
Oyster River Fire Department	Fire Chief	Bruce Green		
Campbell River Fire Department	Fire Chief	Thomas Doherty		
BCWS North Island Mid Coast Fire Centre	Wildfire Technician	Dan Harris	*Advisory, support and approval, program development and monitoring:* review and approve funding program (CRI and WRR) applications. Additionally, for potential fuel management activities, provide the technical expertise (proposed treatment areas, prescription review, treatment implementation, and burn plan review).	Centre staff can provide FireSmart subject matter and prevention program and funding program expertise. Reviewing and approving funding program applications by the fire centre is a requirement of the currently available funding streams (CRI and WRR).
	Wildfire Officer	Todd Flanagan		

[40] Current person operating in this role at the time this document was written.

Local Stakeholders and Land Managers

Almost all the Crown land within the WUI is managed under either an active woodlot license or BC Parks. Additionally, a large portion of the private land in the WUI is managed as private managed forest land (the largest owner/operator being TimberWest). Forestry activities can either increase wildfire risk (through fuels accumulations and unsafe work practices) or decrease wildfire risk (through proper cut-block placement, size, and distribution, clean-up of combustible fuels within harvested areas (*i.e.,* slash – scattered and piled), and reforestation techniques/planting). Local land managers and stakeholders within the WUI should be included in communications regarding wildfire, FireSmart, CRI, and WRR activities planned in and around areas they manage/have interests with, as well as be consulted on what parts of their tenure overlap with SRD EA D's WUI and how they can reduce wildfire risk to adjacent homes and structures. Table 21 details these entities, their contacts, and other additional information.[41]

Table 21: Local stakeholders and land managers within the WUI to be included in the wildfire, FireSmart, CRI, and WRR activities and communications (as applicable)[42]

Stakeholder or Land Manager	Contact Title	Contact Person	Comments
TimberWest North Island Operations	Campbell River Office	n/a	Largest private managed forest landowner/operator in the WUI.
Woodlot 1641	Woodlot License Manager	TrueWood Forests Ltd	Responded to initial CWRP information gathering questionnaire.
BC Parks	BC Parks Area Supervisor	n/a	Strathcona-Westmin Park

Communications with the licensee of Woodlot 1641 highlighted strategies currently employed to reduce wildfire risk in the tenure area. These include reducing woody fuel on site immediately post-harvest by piling in block and creating larger burn piles along road edges to be burned in December. The woodlot access roads are gated, but BCWS and the MFLNRORD district office have access keys. There has been no formal training/education between the woodlot and BCWS – something the SRD could facilitate (potentially via a forest licensee – BCWS specific workshop) to provide an opportunity for further wildfire education and training opportunities to those most directly involved in managing wildland forest fuels within the WUI.

CWRP field work included an assessment of the Buttle Lake Campground within the Strathcona Provincial Park, located at the south end of Buttle Lake and part of BC Parks infrastructure. The campground had fire danger signs and fire bans posted at all entrances and within it. However, recent habitat restoration vegetation management debris piles were left on the beach/forest edge. Composed of dried, highly flammable Scotch broom (*Cytisus scoparius*), these should be removed immediately as they pose a significant fire risk.

[41] Copper Mountain Mining Corporation, operator of the mine approximately 20km south of SRD EA D, did not respond to inquiries regarding involvement in the preparation of this document.
[42] As identified in BC Data Catalogue FLNRORD Managed License data and/or current Woodlot Management Plans

Figure 8: Fire danger/ban sign and vegetation debris piles at Buttle Lake Campground

The Campbell River Fire Chief noted that the last two most recent wildfires in the area (2020 and prior), but outside the WUI, were a result of downed BC Hydro transmission lines in remote areas with limited access.[43] SRD should encourage BC Hydro to continue to manage vegetation in right-of-way corridors, especially those in and near interface areas.

FireSmart BC hosts an annual conference that brings together wildfire practitioners from across the province and is open to all participants but is of special interest to those involved in wildfire and emergency management. The SRD's Protective Services Coordinator attended and presented in 2021.

Additional recommendations and action items that the SRD can implement to continue growing interagency relationships and increase interagency cooperation are listed below in Table 22.

[43] Via CWRP information gathering questionnaire July 2021.

Table 22: Interagency cooperation recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To broaden from a department or agency single jurisdiction-based approach to a risk-driven, multi-agency and multi-scalable approach.							
20	High	Engage with forest licensees and private managed forest landowners/operators within the WUI to: 1) Identify parts of the license/operations area that are in the WUI and what goals would be for this zone regarding harvesting, post-harvest debris disposal, and reforestation prescriptions so that both harvesting operations and the future forest stand maintain or enhance wildfire resiliency, especially at interface edges. 2) Gauge interest in facilitating a forest licensee – BCWS specific wildfire education and training day/workshop.	1) Reduce interface wildfire risk throughout managed forest lands that are closest to structures in the WUI. Consider involving BCWS North Island Mid-Coast Zone and FLNRORD personnel in discussions and planning. Slash management is a priority for wildfire risk reduction. 2) Promote wildfire management and wildfire mitigation tools/tactics to those managing the wildland forest land base. Consider adding the S-100 course/training to those who attend.	1/2) SRD (FLNRORD, Stakeholders, BCWS, Consultant)	5 years	1) Forest landowners and managers know where their tenure area overlaps with the WUI 2) Licensee – BCWS specific workshop/training day completed.	1) SRD (time/cost dependent) 2) UBCM CRI funding is available – education (~40 hours for planning and 1 day for each workshop)
21	High	Plan SRD EA D CFRC scheduled meetings, especially before and during the fire season.	Forward relevant information to forest landowners and managers within the WUI, including BC Parks.	SRD (Stakeholders)	Ongoing	1 meeting each year prior to fire season	SRD (~$300/yr)
22	High	Continue to have relevant SRD members attend annual FireSmart BC conferences, hosted by the BC FireSmart Committee.	Participation will continue to foster a strong relationship between SRD and FireSmart BC/Canada. Notify the EA D fire response area FDs of the conference and encourage attendance.	SRD (EA D fire response area FDs)	Ongoing – yearly	SRD rep. and EA D fire response area FDs' Fire Chiefs attend yearly	UBCM CRI funding is available (cost/time dependent on conference location)
23	Moderate	Encourage BC Parks to apply FireSmart vegetation management principles at campsites and that no hazardous fuel accumulations are left in campsite locations (whether accumulated naturally or by human activities).	Reduce wildfire risks at BC Park campsites within the WUI.	SRD (BC Parks)	5 years	Consultation with BC Parks completed	SRD (~2 hours)
24	Moderate	Continue to promote right-of-way best management practices (BMPs) for regular	Tree failures adjacent to power lines (transmission and distribution) are	SRD	5 years	BMPs in use for the district.	UBCM CRI funding is

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		brushing and clearing of woody debris and shrubs in coordination with FortisBC and BC Hydro to help reduce fire risk, utility pole damage, and subsequent outages.	common occurrences and represent significant risks to ignition within the WUI. Encroachment of understory vegetation and overhanging trees were noted by consultants in various locations.	(BC Hydro, FortisBC)			available (~30 hours in-house)

5.5 CROSS-TRAINING

All staff who are expected to participate in the development and implementation of this plan, or participate in wildfire response and recovery, should be appropriately trained. This includes both SRD staff and members of Campbell River and Oyster River FDs.

Campbell River FD is a full-service level fire department as per the BC Structural Firefighter Competency and Training Playbook. All members are trained to the NFPA 1001 FF Level II level. Paid on call members also practice weekly FD members also take wildfire training courses – 65 members have SPP-WFF1 and SPP-115 training; four members have Task Force/Strike Team Leader training; and two members have S-290 training. Six fire department staff members have completed FireSmart Local FireSmart Representative (LFR) training. Campbell River FD has as strong relationship with local BCWS at Quinsam base. Campbell River FD has conducted cross-training with BCWS that includes the use of portable pumps and the use of BCWS Quinsam base for exercises, and the FD has also partnered with BCWS in education events and UBCM grant funding opportunities.

Oyster River FD is also a full-service fire department as per the BC Structural Firefighter Competency and Training Playbook. Members complete comprehensive structural firefighting training. Wildfire specific training includes SPP-WFF 1- 40, SPP- 115- 25, S-185-25, S-290- 3, Task Force Team Leader 5, and Engine Boss 5. There are four LFRs on staff, one of which is a facilitator (trainer) for the program. The FD conducts cross-training with BCWS on an annual basis that includes equipment inspection, use, and training, and running through mock wildfire scenarios. Oyster River FD recently attained Superior Tanker Shuttle Service accreditation. This certifies that the FD can supply enough water to have some areas without fire hydrants qualify as having a fire hydrant within 300m of their house (this can also potentially lower insurance rates for property owners within the Oyster FD fire response area).

SRD staff members have completed indigenous cultural safety and humility training and ICS-100 training. One staff member has completed FireSmart LFR training.

Additional wildfire training/certification that can be conducted by both FDs is the FireSmart Wildfire Mitigation Specialist training. This would create local capacity to administer Home Partner's Program Wildfire Mitigation Assessments (see recommendation #4).

Emergency simulation exercises involving those who participate in wildfire response and recovery create valuable cross-training opportunities. For EA D, this would include SRD staff, fire departments, local, RCMP, and BCWS. In 2017, an interface evacuation exercise was conducted and included participation by SRD, RCMP, local fire departments, and BCWS. Previously, a wildfire drill was conducted specific to Oyster River. The SRD should look to continue these drills and exercises, identifying and addressing weaknesses in evacuation communication, coordination, and implementation. Conducting a wildfire specific tabletop exercise prior to the wildfire season is recommended.

Additional recommendations and action items SRD can implement to create and continue to grow cross-training opportunities are listed below in Table 23.

Table 23: Cross-training recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To support the development of comprehensive and effective wildfire risk reduction planning and activities, as well as a safe and effective response.							
25	High	Complete and participate in regular testing of, and updates to, the Evacuation Plan for SRD EA D. Include yearly (pre-fire season is best) wildfire emergency simulation exercises. Identify hazards, barriers to access (i.e., locked gates, tight or no turnarounds), and other response issues and develop measures to address them.	Include SRD emergency response staff, BCWS, RCMP, and mutual aid partner fire departments.	SRD (see comments)	Yearly (pre-fire season)	Table-top response exercises conducted at least once every two years	UBCM CRI funding is available (12 planning hours; 60 person-hours per exercise)
26	High	SRD should facilitate: 1) additional Local FireSmart Representative (LFR) Training for SRD EA D residents and District staff. EA D fire response area FDs should facilitate: 2) FireSmart Home Partners Mitigation Specialist Training opportunities for EA D fire response area fire department staff.	Increase SRD's and EA D fire response area FDs' capabilities to provide FireSmart programs and resources to the community.	SRD/SRD EA D fire response area FDs	2 years	1+ additional LFR in SRD staff 1+ Mitigation Specialist on both Campbell River and Oyster River FDs' staff	UBCM CRI funding is available (~$2000/16 hrs per person)
27	Moderate	SRD should leverage Local FireSmart Representatives (LFR) to: 1) conduct outreach into priority FireSmart Neighbourhoods to identify potential community champions, and 2) schedule and conduct FireSmart Community Champion Training.	Increase EA D's FireSmart priority neighbourhoods' capabilities to assume FireSmart planning and mitigation activities themselves.	SRD (LFRs)	1) 2-3 years 2) 2-4 years	Community champion identified for each high-risk FireSmart neighbourhood.	1) SRD: ~80 hours 2) UBCM CRI funding is available

5.6 EMERGENCY PLANNING

When several wildfire emergencies are taking place throughout the province, BCWS resource availability may become scarce. Deployment of provincial resources occurs based on the Provincial Coordination Plan for Wildland Urban Interface Fires.[44] Therefore, government wildfire preparedness and resource availability are critical components of community wildfire resilience – individuals and agencies need to be ready to act.

Pre-Incident Planning

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 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 Fire Management Planning process is not unnecessarily duplicated. These plans and maps (some of which are wholly or partially developed as part of this document) should consider at a minimum:[45]

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

The SRD's evacuation planning and management documents divide EA D into evacuation zones, by community, with dedicated evacuation routes. Communication of an emergency to EA D residents can go out via the Connect Rocket Community system. The system will call or text cellphones and call landlines at a rate of 300 numbers per minute but is limited to only those numbers registered to it.

Wildfire Preparedness Condition Level

As part of pre-incident planning, SRD should consider developing local daily action guidelines based on expected wildfire conditions. Table 24 below provides a template that can be tailored specifically to the region, outlining actions that SRD staff, fire response area FD personnel, and other emergency staff can

[44] Provincial Coordination Plan for Wildland Urban Interface Fires. 2016. Retrieved from: https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf
[45] CRI FCSF 2021 CWRP supplemental instruction guide

take as fire danger levels change throughout the year (but mostly through the fire season).[46] Year-round, the fire danger signs posted throughout EA D should be updated to reflect the current fire danger.

Table 24: Example of a Wildfire Response Preparedness Condition Guide

FIRE DANGER LEVEL	ACTION GUIDELINES
LOW	• All SRD and FD staff on normal shifts. • Direct public to BCWS (or updated FireSmart/Wildfire webpages) for fire danger rating info.
MODERATE	• All SRD and FD staff on normal shifts. • Information gathering and dissemination through SRD EA D's CFRC. • Regional fire situation evaluated. • Rain Profile for assessment after lightning storms. • Direct public to BCWS (or updated FireSmart/Wildfire webpages) for fire danger rating info.
HIGH	• All SRD and FD staff on normal shifts. • Regional fire situation evaluated. • SRD conducts a social media blast directing public to BCWS (or updated FireSmart/Wildfire webpages) for fire danger rating info. • SRD EOC staff notified of Fire Danger Level. • Establish weekly communications with SRD EA D CFRC. LFRs/Community Champions going door to door in their neighbourhoods to discuss fire danger levels and mitigation actions. FD wildfire fighting equipment is tested. • Rain profile for assessment after lightning storms.
EXTREME	• Rain profile for assessment after lightning storms. • Detection patrols conducted by SRD and emergency response personnel, as possible. • SRD conducts a social media blast directing public to BCWS (or updated FireSmart/Wildfire webpages) for fire danger rating info. • SRD EOC staff considered for activation level 1 standby. • EOC support staff, a water tender, heavy machinery operators, and arborists may be considered for standby/extended shifts. • Provide regular updates to the public via social media and websites on the fire situations. • Provide updates as information changes – consider using the Connect Rocket system for Extreme fire weather danger notification.
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. • Implement Evacuation Alerts and Orders based on fire behaviour prediction and under the direction of the EOC or BCWS. • Provide regular updates to the public via social media, websites, and Connect Rocket on the fire situations.

[46] CRI FCSF 2021 CWRP supplemental instruction guide

Mutual Aid Partners

Both the Campbell River FD and Oyster River FD are part of the Comox Valley Fire Department Mutual Aid Agreement that includes nine regional fire departments. Both FD's also have a separate agreement with the 19 Wing Comox Fire Department as well as an interagency agreement with BCWS (allowing for responses to wildfires at the request of BCWS under a Response #/Task #). Mutual aid, for both FD's, is utilized approximately 5-10 times a year.[47] Additionally, road rescue services are provided outside of fire response areas under the EMBC Road Rescue Program.

Firefighting Resources – Campbell River FD

Table 25 below summarizes the available wildfire firefighting resources of both Campbell River and Oyster River FDs. It is recommended that they continue to work with BCWS to train with wildfire fighting equipment and to regularly evaluate the need for more equipment and training. Both FD's are well-equipped to handle WUI wildfire response, but additional equipment, such as more structure protection units (sprinklers), are recommended.

Table 25: Campbell River Fire Department (FD) firefighting resources

Fire Department	Number of Members	Firefighting Equipment Type	Apparatus Type	Description / Comment
Campbell River FD	42 Career Staff (paid) 40 Paid Volunteer On-Call Members	Wildfire	Type 2 SPU Unit	With 4 Wick 375 portable pumps
			Wildland bush truck	1,136 litre capacity; 38 litre foam; 719 litre/minute pump capacity; hand tools
			Water tender	13,627 litre capacity;1,135 litre/minute pump capacity
			UTV Side-by-side	(planned procurement 2022) for remote location access
			High-volume portable pump	11 HP Honda high volume portable water pump
			Portable pump	Mini-striker portable pump
			Portable water tanks	1 on Brush 1 truck and 1 on Tender 1truck; 2 Bladder Tanks; 1 steel frame dump tank; 1 4,000 gallon folding tank
Oyster River FD	3 Career Staff (paid) 40 Paid Volunteer On-Call Members	Wildfire	Type 2 SPU Unit	
			Skid Unit	180 gallon capacity; 100 gallons/minute pump capacity
			Portable pump	5 x Honda Mark 3 pumps; 4 x Mini-striker portable pumps
			Porta-tanks	4 x 2,000 gallon portable tanks; 2 x 1500 gallon portable tanks

[47] Via CWRP information gathering questionnaire with Campbell River FD and Oyster River FD July 2021

Additional emergency response recommendations and action items are detailed below in Table 26.

Table 26: Emergency preparedness recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To create specific wildfire response pre-incident plans so those responding to a wildfire emergency know who is available to help with what and when, and to improve SRD's, SRD EA D FD's, and communities' ability to respond to (during and after) a wildfire emergency.							
28	High	Campbell River and Oyster River FDs should continue engaging BCWS to conduct annual reviews ensuring PPE and wildland equipment resources are complete, in working order, and the crews are well-versed in their set-up and use. Identify equipment deficiencies and plans to fill them.	Maintain an annual structural and interface training and equipment review program and maintain a strong relationship between SRD EA D FDs and BCWS.	EA D fire response area FDs	Yearly (pre-fire season)	Wildland firefighting equipment resources are complete	EA D fire response area FDs (~20 hours in-house)
29	High	Oyster River FD should digitize important fire and emergency response information, such as water drafting sites and have the information available on units within response vehicles.	To ensure prompt and effective response to fire emergencies within their fire response area. Oyster River FD should reach out to the SRD to see if the District's GIS department can provide this service. The data should be made available on the NI911 Fire Dispatch mapping service so it is available on all mobile CAD units on emergency response vehicles.	Oyster River FD	2 years	Required information is digitized and available electronically	Oyster River FD
30	High	SRD should apply for UBCM CRI funding to hire a FireSmart coordinator (full-time basis).	To manage the planning and implementation of recommendations and action items in this report. Note: funding is guaranteed only on a year-by-year basis. For continuity of multi-year and ongoing FireSmart projects, SRD should explore creating a position not reliant on grant funding.	SRD (Local municipalities)	2 years	FireSmart coordinator hired	UBCM CRI funding is available ($59,000 contract pay)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
			Potential option to collaborate with City of Campbell River and other municipalities to create a joint position.				
31	Moderate	Develop an Evacuation Plan pamphlet that summarizes key components of the Evacuation Plan, specific to resident roles during an evacuation event. The pamphlet should be made available online and could be available as a hard copy at general stores.	Consider adding a section for "what we need for prompt response on your property"[48] that details key information/items/locations first responders and emergency responders require when responding to incidents.	SRD (EA D fire response area FDs)	5 years	Pamphlets created and available to the public	SRD (Cost to develop: 40 hours total and $5.00/ pamphlet)
32	Moderate	Update SRD EA D's HRVA and/or emergency management plans with information and data from this CWRP. Develop wildfire-specific incident plans and associated maps. Incorporate items listed in the Pre-Incident Planning subsection above. Local Fire Threat and stakeholders'/tenure holder's contact information should be incorporated within the map. The map should be included in the SRD EA D Evacuation Plan and shared with EA D Fire Departments, the City of Campbell River, BCWS, and industrial operators (Woodlots, private managed forest landowners) to support emergency response in the event of a wildfire. The map should be reviewed as needed to incorporate additions and/or changes.	Wildfire incident plans and maps will support emergency response in the event of a wildfire and/or evacuation event. These plans help target emergency planning and effort in meaningful and effective ways, such as knowing where fire guards can/can't be built, as well as minimizing the need for using machinery to build cat guards in sensitive areas. Overall, all emergency and evacuation plans should be shared with those persons and entities responsible for local emergency response.	SRD (Consultant, BCWS)	5 years	Wildfire incident plans and associated maps were created and made available	SRD (Cost to EOC/EPC; 12 planning hours and ~$6,000 contracted service)

[48] Recently conducted on Thetis Island.

5.7 VEGETATION MANAGEMENT

As discussed in Section 4, fuel is the only aspect of the fire behavior triangle that can be modified to reduce wildfire threat. Fuel or vegetation management reduces potential wildfire intensity and ember exposure to people, structures, and other values through manipulation of both natural and cultivated vegetation within or adjacent to a community. A well-planned vegetation management strategy can greatly increase fire suppression effectiveness and reduce damage to property and values. Three main zones are discussed to appropriately scale and plan vegetation management activities across the WUI landscape (see Appendix A-2: Proximity of Fuel to the Community for expanded descriptions and information):

1) the Home and Critical Infrastructure Ignition Zone,
2) the Community Zone; and
3) the Landscape Zone.

Vegetation management can largely be accomplished through two different activities:

Residential-Scale FireSmart Landscaping

Residential FireSmart landscaping refers to the removal, reduction, or conversion of flammable [landscaping] plants to create more fire-resistant areas in the FireSmart Noncombustible Zone and Priority Zones 1, 2 and 3. This is called the Home (or Critical Infrastructure) Ignition Zone (Figure 9).

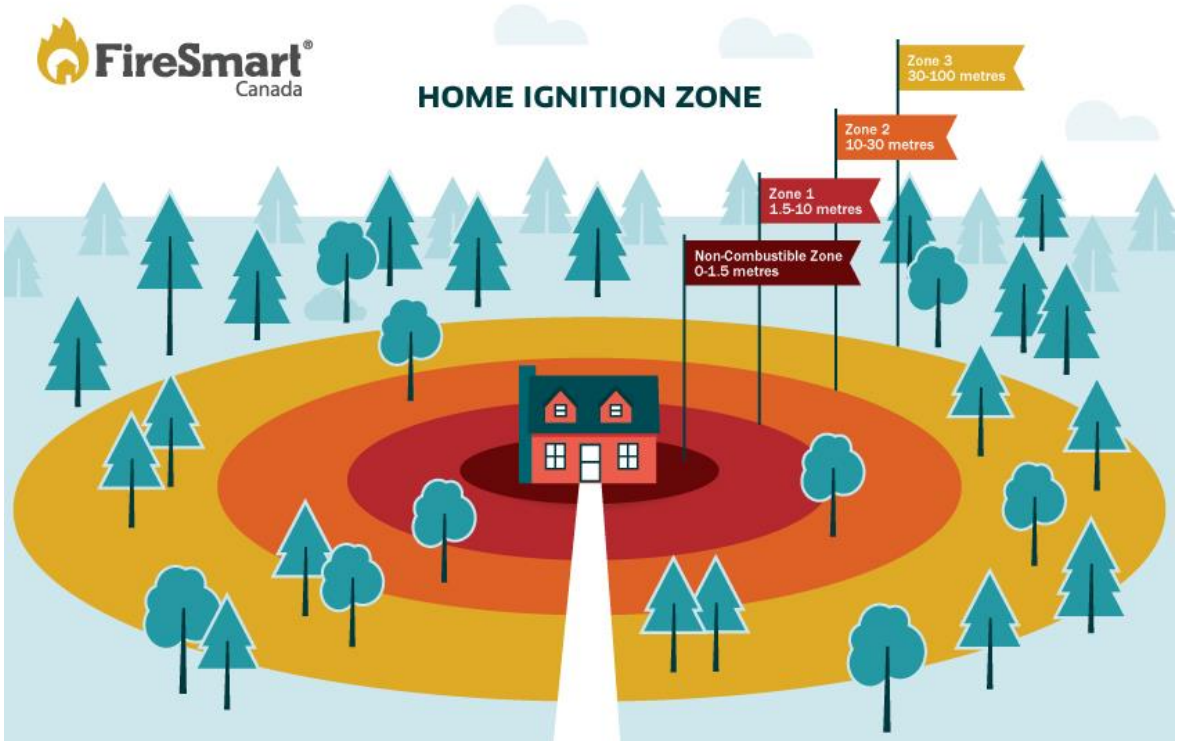
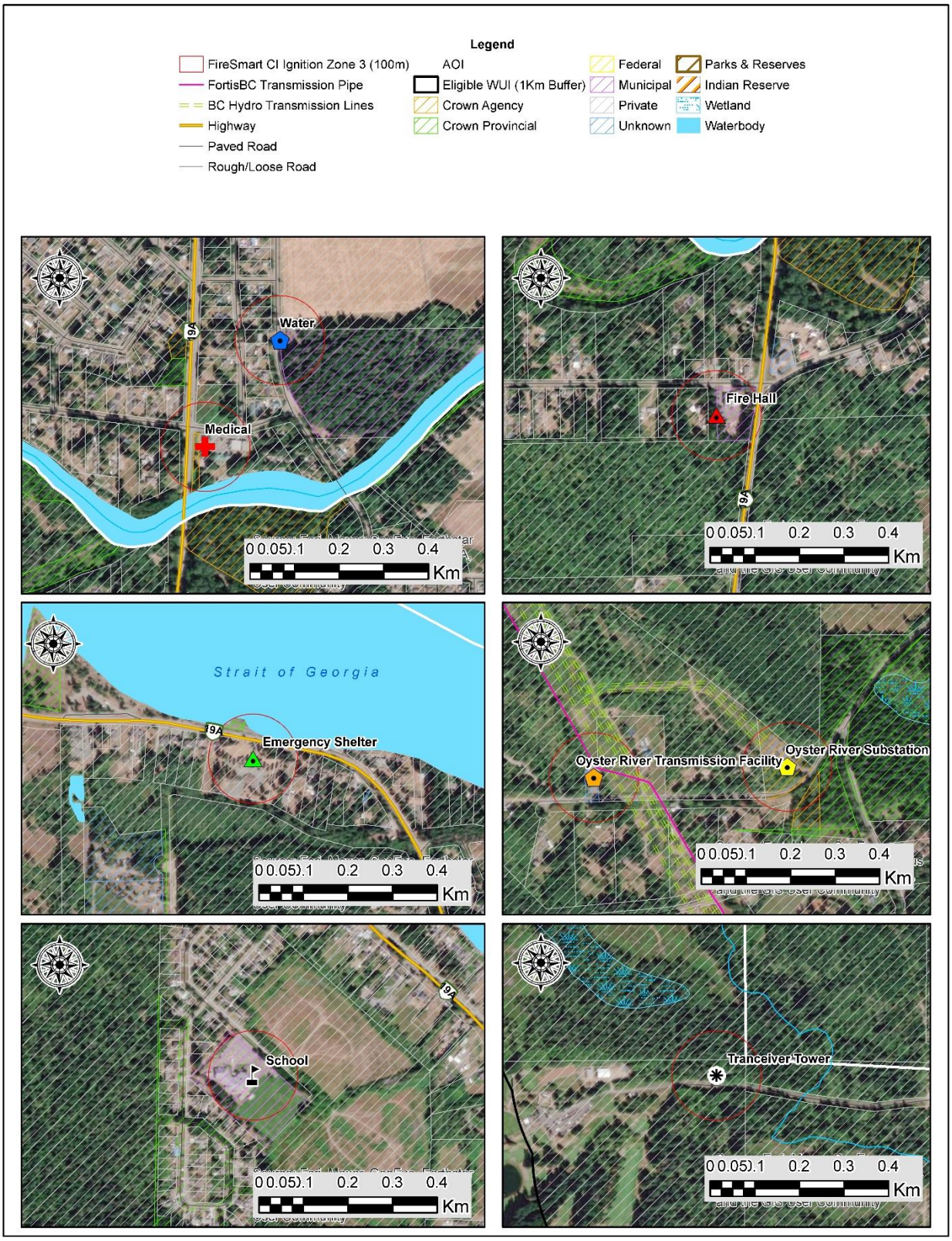


Figure 9: FireSmart home and critical infrastructure ignition zone

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 firebrands (embers). Firebrands can be transported long distances ahead of the wildfire, across fire guards and fuel breaks, and accumulate within the Home or Structure Ignition Zone (0 – 100 m) in densities that can exceed 600 embers per square meter. Combustible materials found within the Home or Structure 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 the Home and Structure Ignition Zone 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. For these reasons, it is recommended SRD conduct Critical Infrastructure Ignition Zone FireSmart assessments on all critical infrastructure within EA D and then plan risk reduction activities within FireSmart Zones 1-3, as prescribed. The extents (100m) of FireSmart Zone 3 on critical infrastructure (listed previously in Table 7) is shown below on Map 7 along with land ownership types it overlaps.

It was noted during field visits that compliance to FireSmart vegetation management was highly variable between properties and that, overall, FireSmart vegetation management actions should be continued to be considered. The SRD has organized and implemented (2021 was the first year) an annual wood and yard waste chipping disposal program in EA D which was very well received. SRD has applied again to UBCM CRI for funding to continue the program and should look to do so each year.



Map 7: Map of FireSmart Critical Infrastructure Zone 3 for EA D critical infrastructure

Fuel Management Treatments

Fuel management refers to the manipulation or reduction of living or dead wildland forest and grassland fuels to reduce the rate of spread and head fire intensity and enhance likelihood of successful suppression. Fuel treatments proposed within a CWRP can only be applicable to publicly owned land (*i.e.,* municipal, Crown). Fuel management treatments within the community and landscape zones have not been proposed within EA D's WUI. Field work and office analysis determined that there are no suitable areas for fuel reduction treatment, considering fuel type, surface fuel loading, and efficacy.

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

Table 27: Vegetation management recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To reduce the potential wildfire intensity and ember exposure to people, infrastructure, structures, and other values through manipulation of both the natural and cultivated vegetation that is within or adjacent to a community.							
33	High	Continue implementing the yearly community/neighbourhood chipping program. Education of FireSmart yard and landscaping principles, including chipping specifications should be incorporated into the program.	To reduce wildfire hazards on private property within the WUI and promote FireSmart vegetation management knowledge and education.	SRD	Yearly	Continued high amount of participation by EA D residents	UBCM CRI funding is available (Costs/time in line with previous year)
34	High	1) In conjunction with recommendation #15, initiate detailed assessment, prescription development, and treatment of forest stands on Crown or municipal land within FireSmart Structure Ignition Zones 1-3 of functional critical infrastructure. 2) Contact private landowners within FireSmart Structure Ignition Zones 1-3 of noted critical infrastructure and lobby for either them to plan and implement similar wildfire risk reduction activities on their land, or have SRD do that on their behalf.	To reduce wildfire risk to functional critical infrastructure in the WUI. Plan to complete FireSmart critical infrastructure assessments first. If hazardous fuels are noted within FireSmart Structure Ignition Zones 1-3, a prescription may be required for treatment implementation.	SRD (Consultant)	5 years	Prescriptions for high priority units developed. Treatment completed on one TU.	UBCM CRI funding is available (~$500/ha prescription; ~$8000/ha treatment)
35	High	When fuel treatments are conducted (on critical infrastructure), treatment monitoring 10 years out should be completed by a qualified professional. This can be completed with a CWRP update or as a stand-alone exercise.	Assess the efficacy of the treatment and schedule maintenance activities. It is cheaper to perform maintenance early when regeneration is small.	SRD (Consultant)	10 years	All completed fuel treatments are reassessed within 10 years, and ongoing, post-treatment	UBCM CRI funding is available (~100/ha for assessment)
36	High	In line with recommendation #20, SRD should	Consider involving BCWS and promoting	SRD	5 years	Post-harvest slash	SRD

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		emphasize the importance of post-harvest slash management to those forest license holders and private forest landowners within the WUI.	tools such as the Critical Surface Intensity Worksheet[49,50] – developed to assess if the surface fuel loading prescribed/present will limit the chances of crown fire ignition, based on the retained height to live crown (or prescribed pruning height) of the treated/harvested stands.	(BCWS, WUI forest license holders)		management in the WUI is considering wildfire risk reduction	(~40 hours consultation with BCWS and outreach to forest license holders)

[49] Worksheet located here: https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/critical_surface_intensity_worksheet_v4.xlsx
[50] Additional information and tools located here: https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/vegetation-and-fuel-management/fire-fuel-management/fuel-management

SECTION 6: APPENDICES

6.1 APPENDIX A: LOCAL WILDFIRE RISK PROCESS

The key steps to complete the local wildfire risk assessment are outlined below:

1. Fuel type attribute assessment, ground-truthing/verification and updating as required to develop a local fuel type map (Appendix A-1: Fire Risk Threat Assessment Methodology).
2. Consideration of the proximity of fuel to the community, recognizing that fuel closest to the community usually represents the highest hazard (Appendix A-2: Proximity of Fuel to the Community).
3. 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) (Appendix A-3: Fire Spread Patterns). Wind speed, wind direction, and fine fuel moisture conditions influence wildfire trajectory and rate of spread.
4. Consideration of topography in relation to values. Slope percentage and slope position of the value are considered, where slope percentage influences the fire's trajectory and rate of spread and slope position relates to the ability of a fire to gain momentum uphill.
5. Stratification of the WUI based on relative wildfire risk, considering all the above.
6. Consider other local factors (i.e., previous mitigation efforts, and local knowledge regarding hazardous or vulnerable areas)
7. Identify priority wildfire risk areas for field assessment.

The basis for the prioritization of field assessment locations is further detailed in Appendix F: Fire Risk Threat Assessment Methodology. Wildfire Risk Assessment plot worksheets are provided in Appendix B: Wildfire Risk Assessment – Worksheets and Photos(under separate cover), plot locations are summarized in Appendix D: WUI Threat Plot Locations, and the field data collection and spatial analysis methodology is detailed in Appendix F: Fire Risk Threat Assessment Methodology.

6.1.1 APPENDIX A-1: FIRE RISK THREAT ASSESSMENT METHODOLOGY

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.[51] 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.[52] It should be noted that there are significant limitations with the fuel typing system which should be recognized. Major limitations include a fuel

[51] Forestry Canada Fire Danger Group. 1992. Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.
[52] 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.

typing system designed to describe fuels that 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.[52] Details regarding fuel typing methodology and limitations are found in Appendix E: Fuel Typing Methodology and Limitations. There are several implications of the aforementioned limitations, which include: fuel typing further from the developed areas of the study has 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.

Table 28 summarizes the fuel types by general fire behaviour (crown fire and spotting potential). The fuel type present that may be considered most hazardous in terms of fire behaviour and firebrand spotting potential in the WUI is C-3, particularly if there are large amounts of woody fuel accumulations or denser understory ingrowth, and S-3. C-5 fuel types have a moderate potential for active crown fire when wind-driven.[52] An M-1/2 fuel type can sometimes be considered hazardous, depending on the proportion of conifers within the forest stand; conifer fuels include those in the overstory, as well as those in the understory. An O-1b fuel type often can support a rapidly spreading grass or surface fire capable of damage or destruction of property, and jeopardizing human life, although it is recognized as a highly variable fuel type dependent upon the level of curing. These fuel types were used to guide the threat 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 28. Fuel Type Categories and Crown Fire Spot Potential. Only summaries of fuel types encountered within the WUI are provided (as such, other fuel types, i.e., C-1, C-2, C-4, C-6, S-1, and S-2 are not summarized below).

Fuel Type	Fuel Type Description within WUI	Area (ha) of WUI	Percent (%) of WUI (excluding water)
C-3	Fully stocked, late-young conifer forest with crowns separated from the ground. Often the result of clear-cut logging.	119	1.8%
C-5	Well-stocked mature forest, crowns separated from ground. Moderate understory herbs and shrubs. Little grass or surface fuel accumulation. Typically, undisturbed, or selectively harvested forests.	328	4.9%
C-7	Open, sparsely populated conifer stands with grass and low-lying shrubs underneath. Often on dry, rocky ridges and outcrops. Tree crowns usually close to or at the ground.	23	0.3%
D-1/2	Deciduous stands/forest.	178	2.6%
M-1/2	Moderately well-stocked mixed stand of conifers and deciduous species, low to moderate dead, down woody fuels. Typically, areas harvested 10-20 years ago or mature wet/floodplain forests.	466	6.9%
O1-a/b	Matted and standing grass communities; sparse or scattered shrubs; trees and down woody debris; areas harvested <7 years ago *with good slash management*.	28	0.4%
S-3	Areas recently logged with slash where the cedar component is retaining all its foliage in a cured condition on the branches, but the hemlock and Douglas-fir components have dropped up to 50% of their foliage. Slash fuels tend to be continuous and uncompacted.	0	n/a
N (non-fuel)	Areas with no available fuel, such as gravel dumps, beaches, etc.	114	1.7%
W (water)	Large waterbodies.	2,082	n/a

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

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

- C-3 fuel types being incorrectly identified by the PSTA as C-5, and
- S-3 fuel types being incorrectly identified by the PSTA as C-5.

The resulting updated fuel types were shown earlier on Map 3.

6.1.2 APPENDIX A-2: PROXIMITY OF FUEL TO THE COMMUNITY

Home and Critical Infrastructure Ignition Zones

Multiple studies have shown that the principal factors regarding home and structure loss to wildfire are the structure's characteristics and immediate surroundings. The area that determines the ignition

potential of a structure to wildfire is referred to as (for residences) the Home Ignition Zone (HIZ) or (for critical infrastructure) the Critical Infrastructure Ignition Zone (CIIZ).[53,54] Both the HIZ and CIIZ include the structure itself and four concentric, progressively wider Priority Zones out to 100 m from the structure (Figure 10 below). More details on priority zones can be found in the FireSmart Manual.[55]

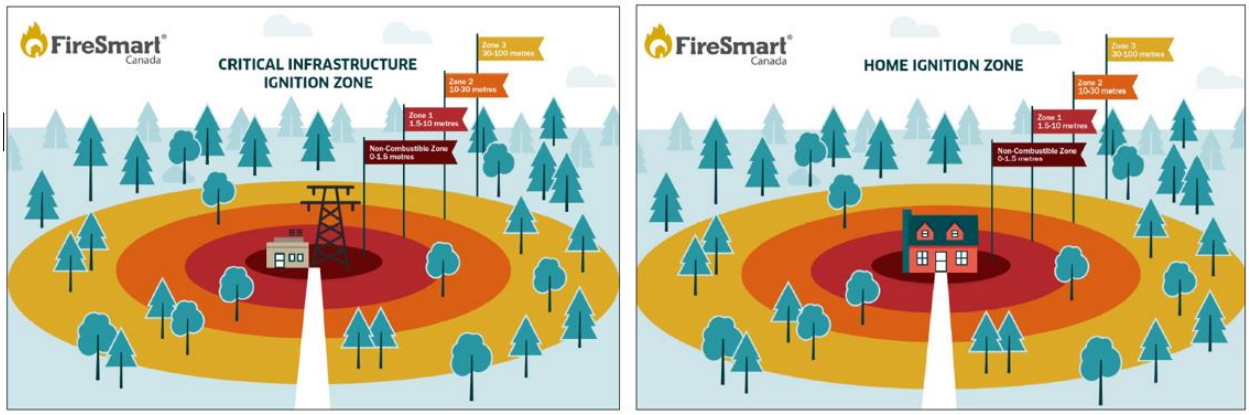


Figure 10: FireSmart Home and Critical Infrastructure Ignition Zone (HIZ, CIIZ)

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

Because ignitability of the HIZ/CIIZ is the main factor driving structure loss, the intensity and rate of spread of wildland fires beyond the community have 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.[54] Increasing ignition resistance would reduce the number of homes simultaneously on fire; extreme wildfire conditions do not necessarily result in WUI fire disasters.[56] It is for this reason that the key to reducing WUI fire structure loss is to reduce structure ignitability. Mitigation responsibility must be centred on the owners of structures and the real property. Risk communication, education on the range of available activities,

[53] 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.
[54] Cohen, J. Preventing Disaster Home Ignitability in the Wildland-urban Interface. Journal of Forestry. p 15 - 21.
[55] https://firesmartcanada.ca/ and https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/firesmart
[56] 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/.

and prioritization of activities should help homeowners to feel empowered to complete simple risk reduction activities on their property.

Community Zone

Vegetation management in the Community Zone encompasses all non-provincial Crown publicly owned lands that are within SRD EA D's municipal boundary and are typically beyond 30 metres from private structures (in some cases, this may also include small isolated provincial Crown land parcels within administrative boundaries)[57]. Vegetation management planning and implementation on most Community Zone lands should be directed through a formal fuel management prescription developed by a forest professional with wildfire vegetation management within their scope of practice[57]. Depending on the results of FireSmart Structure Ignition Zone assessments on individual structures, vegetation management may be required out beyond 30 metres and up to 100 metres (FireSmart Priority Zone 3) on larger private parcels[57]. Municipal parks, municipal trails, municipal outdoor event spaces and fields, etc. are all part of the Community Zone. Many Community Zone open spaces/lands are often associated with high use by the public thus increasing accidental ignition potential and the wildfire risk to properties and homes surrounding them.

Landscape Zone

The Landscape Zone encompasses provincial Crown lands that are outside SRD EA D's administrative boundary and are greater than 100m from structures. Vegetation (fuel) management planning and implementation is primarily the responsibility of the provincial government, working collaboratively to align landscape objectives with the CWRP objectives[57]. Vegetation management planning and implementation in the Landscape Zone and on all forested provincial Crown lands must be directed through a formal fuel management prescription developed by a forest professional with wildfire vegetation management within their scope of practice.[57]

Fire hazard classification in the WUI is partly dictated by the proximity of the fuel to developed areas within a community. More specifically, fuels closest to the community are considered to pose a higher hazard in comparison to fuels that are located at greater distances from values at risk. As a result, it is recommended that the implementation of fuel treatments prioritizes fuels closest to structures and/or developed areas, to reduce hazard levels adjacent to the community. Continuity of fuel treatment is an important consideration, which can be ensured by reducing fuels from the edge of the community outward. Special consideration must be allocated to treatment locations to ensure continuity, as discontinuous fuel treatments in the WUI can allow a wildfire to intensify, resulting in a heightened risk to values. To classify fuel threat levels and prioritize fuel treatments, fuels immediately adjacent to the community are rated higher than those located further from developed areas. Table 29 describes the classes associated with the proximity of fuels to the interface.

[57] CRI FCSF 2021 Supplemental Instruction Guide

Table 29. Proximity to the Interface.

Proximity to the Interface	Descriptor*	Explanation
WUI 100 HIZ/CIIZ and Community Zones	(0-100 m)	This Zone is always located adjacent to the value at risk. Treatment would modify the wildfire behaviour near or adjacent to the value. Treatment effectiveness would be increased when the value is FireSmart.
WUI 500 Community and Landscape Zones	(100-500 m)	Treatment would affect wildfire behaviour approaching a value, as well as the wildfire's ability to impact the value with short- to medium-range spotting; should also provide suppression opportunities near a value.
WUI 1000 Landscape Zone	(500-1000 m)	Treatment would be effective in limiting long-range spotting but short-range spotting may fall short of the value and cause a new ignition that could affect a value.
Landscape Zone	>1000 m	This should form part of a landscape assessment and is generally not part of the zoning process. Treatment is relatively ineffective for threat mitigation to a value unless used to form a part of a larger fuel break/treatment.

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

6.1.3 APPENDIX A-3: FIRE SPREAD PATTERNS

Figure 11 below displays the daily average Initial Spread Index values for Quinsam Base, which represents wind speeds and directions for the WUI.

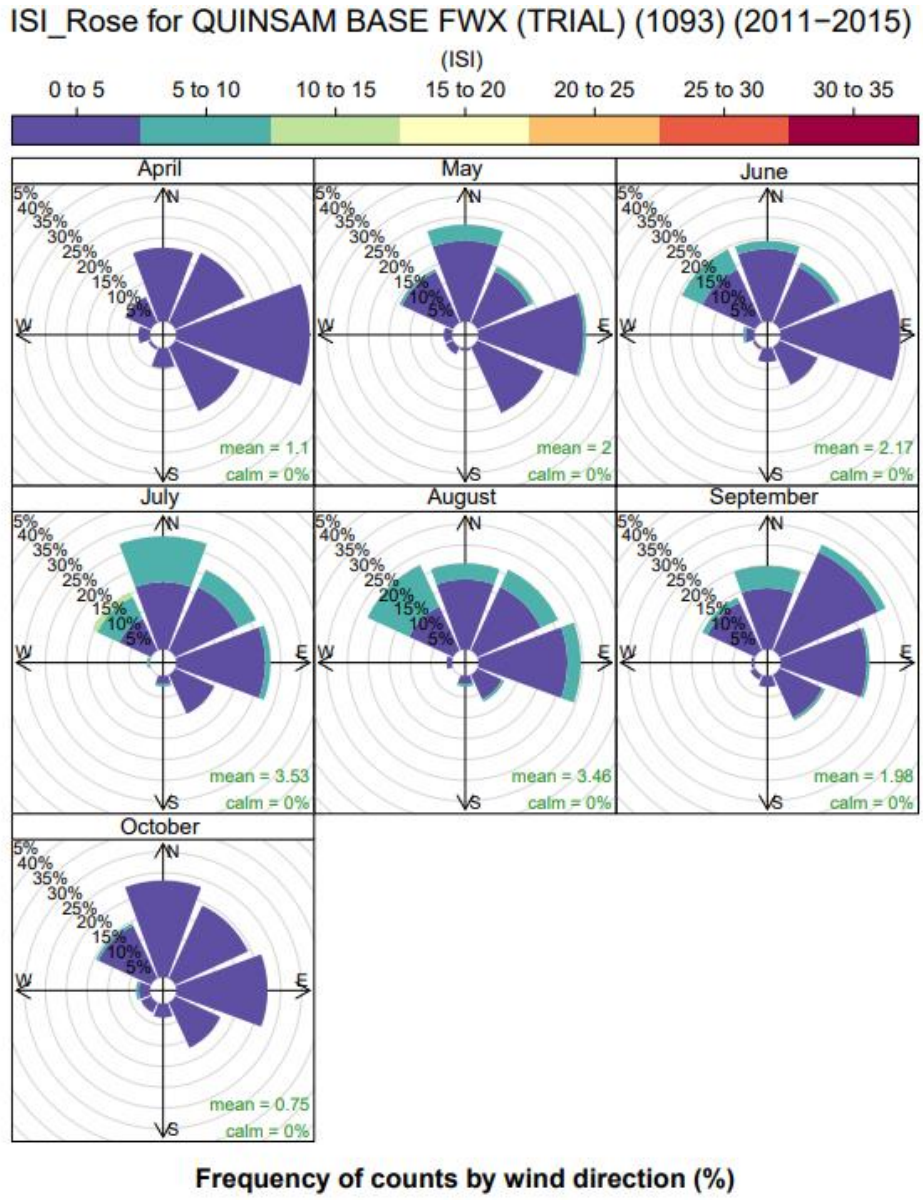


Figure 11: Initial Spread Index (ISI) roses depicting average daily wind speed and direction for each month during the fire season (April – October). Data taken from the Quinsam Base fire weather station 2011 – 2015.

6.2 APPENDIX B: WILDFIRE RISK ASSESSMENT – WORKSHEETS AND PHOTOS

Provided separately as PDF package.

6.3 APPENDIX C: MAPS

Provided separately as PDF package.

6.4 APPENDIX D: WUI THREAT PLOT LOCATIONS

Table 30 displays a summary of all WUI threat plots completed during CWRP fieldwork. The original WUI threat plot forms and photos will be submitted as a separate document. The following ratings are applied to applicable point ranges:

- Wildfire Behaviour Threat Score –Low (0-40); Moderate (41 – 95); High (96 – 149); Extreme (>149); and,
- WUI Threat Score – Low (0 – 13); Moderate (14 – 26); High (27 – 39); Extreme (>39).

Table 30. Summary of WUI Threat Assessment Worksheets.

WUI Plot ID	Geographic Location	Wildfire Behaviour Threat Class	WUI Threat Class*
CR-1	East side of the Campbell River landfill	Moderate	n/a
OYSTER-1	Oyster River Nature Park	Moderate	n/a
OYSTER-2	Adjacent to Oyster River Elementary School	Low	n/a
OYSTER-3	Oyster River community	High	Moderate
OYSTER-4	Stories Creek Park	Low	n/a

*Note that WUI threat scores are only collected for untreated polygons that rate high or extreme for Wildfire Behaviour Threat score.

6.5 APPENDIX E: FUEL TYPING METHODOLOGY AND LIMITATIONS

The initial starting point for fuel typing for the WUI was the 2019 provincial fuel typing layer provided by BCWS as part of the 2018 Provincial Strategic Threat Analysis (PSTA) data package. This fuel type layer is based on the FBP fuel typing system. PSTA data is limited by the accuracy and availability of information within the Vegetation Resource Inventory (VRI) provincial data; confidence in provincial fuel type data is very low on private land. The PSTA threat class for all private land within the WUI was not available. Fuel types within the WUI have been updated using satellite photo imagery of the area with representative fuel type calls confirmed by field fuel type verification. Polygons not field-verified were assigned fuel types based upon similarities visible in the photo imagery to areas that were field verified. Where polygons were available from the provincial fuel typing layer, they were utilized and updated as necessary for recent harvesting, development, etc.

It should be noted that fuel typing is intended to represent a fire behaviour pattern; a locally observed fuel type may have no exact analog within the FBP system. The FBP system was almost entirely developed for boreal and sub-boreal forest types, which do not occur within the WUI. As a result, the local fuel typing is a best approximation of the Canadian Forest Fire Danger Rating System (CFFDRS) classification, based on the fire behaviour potential of the fuel type during periods of high and extreme fire danger within the local MFLNRORD region. Additionally, provincial fuel typing depends heavily on VRI data, which is gathered and maintained to inform timber management objectives, not fire behaviour prediction. For this reason, VRI data often does not include important attributes which impact fuel type and hazard, but which are not integral to timber management objectives. Examples include surface fuels and understory vegetation.

In some cases, fuel type polygons may not adequately describe the variation in the fuels present within a given polygon due to errors within the PSTA and VRI data, necessitating adjustments required to the PSTA data. In some areas, aerial imagery is not of sufficiently high resolution to make a fuel-type call. Where fuel types could not be updated from imagery with a high level of confidence, the original PSTA fuel type polygon and call were retained.

For information on the provincial fuel typing process used for PSTA data as well as aiding in fuel type updates made in this document, please refer to Perrakis, Eade, and Hicks, 2018.[58]

[58] 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

6.6 APPENDIX F: FIRE RISK THREAT ASSESSMENT METHODOLOGY

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

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

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

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

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

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

The provided PSTA data does not transfer directly into the geodatabase for submission, and several PSTA feature classes require extensive updating or correction. In addition, the Fire Threat determined in the PSTA is fundamentally different than the localized Fire Threat feature class that is included in the Local Fire Risk map required for project submission. The Fire Threat in the PSTA is based on provincial

scale inputs - fire density; spotting impact; and head fire intensity, while the spatial submission Fire Threat is based on the components of the Wildland Urban Interface Threat Assessment Worksheet.

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 CWPP. This is accomplished by traversing as much of the study area as possible (within time, budget, and access constraints). Threat Assessment plots are completed on the latest version (2013) form, and as per the Wildland Urban Interface Threat Assessment Guide.

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

1. Update fuel-typing using 2015 orthophotography provided by the client and field verification.
2. Update structural data using critical infrastructure data provided by the client and orthophotography
3. Complete field work to ground-truth fuel typing and threat ratings
4. Threat assessment analysis using field data collected and rating results of WUI threat plots – see next section.

Spatial Analysis

Not all attributes on the WUI Threat Assessment form can be determined using a GIS analysis on a landscape/polygon level. To emulate as closely as possible, the threat categorization that would be determined using the Threat Assessment form, the variables in Table 31were used as the basis for building the analytical model. The features chosen are those that are spatially explicit, available from existing and reliable spatial data or field data, and able to be confidently extrapolated to large polygons.

Table 31: Fire Threat Class and WUI Risk Class inputs

WUI Threat Sheet Attribute	Used in analysis?	Explanation
Fuel		
1. Duff depth and Moisture Regime	No	Many of these attributes assumed by using 'fuel type' as a component of the Fire Threat analysis. Most of these components are not easily extrapolated to a landscape or polygon scale, or the data available to estimate over large areas (VRI) is unreliable.
2. Surface Fuel continuity	No	
3. Vegetation Fuel Composition	No	
4. Fine Woody Debris Continuity	No	
5. Large Woody Debris Continuity	No	
6. Live and Dead Coniferous Crown Closure	No	
7. Live Deciduous Crown Closure	No	
8. Live and Dead Conifer Crown Base height	No	
9. Live and Dead suppressed and Understory Conifers	No	
10. Forest health	No	
11. Continuous forest/slash cover	No	

	within 2km		
Weather			
12.	BEC Zone	Yes	Although included, these are broad classifications, meaning most polygons in the Study Area will have the same value
13.	Historical Fire Weather Occurrence	Yes	
Topography			
14.	Aspect	Yes	
15.	Slope	Yes	Elevation model was used to determine slope.
16.	Terrain	No	
17.	Landscape/topographic Limitations to Wildfire Spread	No	
Structural			
18.	Position of Structure/Community on slope	No	Too difficult to quantify – this is a relative value.
19.	Type of development	No	Too difficult to analyze spatially.
20.	Position of assessment area relative to values	Yes	Only distance to structures is used in this analysis, being above, below or sidehill too difficult to analyze spatially.

The 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 32 below summarizes the components and scores to determine the Fire Behaviour Threat.

Table 32. 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	

Attribute	Indicator	Score
	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'.

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 Threat Score is greatly simplified, as determining the position of structures on a slope, the type of development and the relative position are difficult in an automated GIS process. Structures are considered, but there is no consideration for structure type (also not included on threat assessment worksheet). This method uses the best available information to produce accurate and useable threat assessment across the study area in a format which is required by the UBCM SWPI program.

6.7 APPENDIX G: LIST OF FIRST NATIONS AND ASSOCIATED GOVERNMENTS CONSULTED

Organization/Government	Contact Title	Email(s)	Phone #	Location
Cowichan Tribes	Referrals Coordinator	candace.charlie@cowichantribes.com	250-748-3196	5760 Allenby Road, Duncan, BC, V9L 5J1
Penelakut Tribe	Chief and Council	robert@penelakut.ca	250-246-2321	P.O. Box 360, Chemainus, BC, V0R 1K0
Lake Cowichan First Nation	Chief and Council	carole@lcfn.ca	250-749-3301	P.O. Box 159 313B Deer Road, Lake Cowichan, BC, V0R 2G0
Lyackson First Nation	Chief and Council	referrals@lyackson.bc.ca	1-888-592-5766	7973A Chemainus Road, Chemainus, BC, V0R 1K5
Stz'uminus First Nation	Chief and Council	referrals@coastsalishdevcorp.com	250-245-7155	12611A Trans Canada Highway, Ladysmith, BC, V9G 1M5
Halalt First Nation	Chief and Council	referrals@halalt.org	250-246-4736	7973 Chemainus Road, Chemainus, BC, V0R 1K5
Nanwakolas Council	n/a	referrals@nanwakolas.com	250-286-7200	1441 16th Avenue, Campbell River, BC, V9H 1V8
Wei Wai Kum Nation	Chief and Council	referrals@weiwaikum.ca	250-286-6949	1650 Old Spit Road, Campbell River, BC, V9W 3E8
We Wai Kai Nation	Main Office	samantha.chickite@weweaikai.com	250-914-1890	690 Headstart Crescent, Campbell River, BC, V9H 1P9
Homalco First Nation	n/a	referrals@homalco.com	250-923-4979	1218 Bute Crescent, Campbell River, BC, V9H 1G5
K'omoks First Nation	Chief and Council	reception@komoks.ca	250-339-4545	3330 Comox Road, Courtenay, BC, V9N 3P8
Tla'amin Nation	Chief and Council	derek.kowalchuk@tn-bc.ca	604-483-9646	4779 Klahanie Road, Powell River, BC, V8A 0C4
Klahoose First Nation	Economic Development and Treaty	kathyfrancis@klahoose.org kevinpeacey@klahoose.org	250-935-6536	P.O. Box 9, Squirrel Cove, Cortes Island, BC, V0P 1T0
Mowachaht/ Muchalaht First Nation	Council of Chiefs	lands@yuquot.ca	250-283-2015	P.O. Box 459, Gold River, BC, V0P 1G0
Ahousaht First Nation	n/a	info@ahousaht.ca	250-670-9563	General Delivery, Ahousaht, BC, V0R 1A0
Tseshaht First Nation	Chief and Council	dross@tseshaht.com	250-724-1225	5091 Tsuma-as Drive, Port Alberni, BC, V9Y 8X9
Hupacasath First Nation	Chief and Council	roger@hupacasath.ca Brandy@hupacasath.ca	250-724-4041	P.O. Box 211, Port Alberni, BC, V9Y 7M7

6.8 APPENDIX H: GLOSSARY OF TERMS

Danger tree - Live or dead tree whose trunk, root system or branches have deteriorated or been damaged to such an extent as to be a potential danger to human safety.

Fire danger - A general term used to express an assessment of both fixed and changeable factors of the fire environment that determine the ease of ignition, rate of spread, the difficulty of control, and fire impact.

Fire season - The period(s) of the year during which fires are likely to start, spread, and damage values-at-risk sufficient to warrant organized fire suppression; a period of the year set out and commonly referred to in fire prevention legislation.

Fuel - Fuel is any organic matter, living or dead, in the ground, on the ground, or in the air that can ignite and burn.

Available fuel - The quantity of fuel (in a particular fuel type) that would be consumed under specified burning conditions.

- *Fine fuels* - Fuels that ignite readily and are consumed rapidly by fire (e.g. cured grass, fallen leaves, needles, small twigs). Dead, fine fuels also dry very quickly.
- *Ground fuels* - All combustible materials below the litter layer of the forest floor that normally support smouldering or glowing combustion associated with ground fires (e.g. duff, roots, buried punky wood, peat).
- *Ladder fuels* - Fuels that provide vertical continuity between the surface fuels and crown fuels in a forest stand, thus contributing to the ease of torching and crowning (e.g. tall shrubs, small-sized trees, bark flakes, tree lichens).
- *Medium fuels* - Fuels too large to be ignited until after the leading edge of the fire front passes, but small enough to be completely consumed.
- *Surface fuels* - All combustible materials lying above the duff layer between the ground and ladder fuels that are responsible for propagating surface fires (e.g. litter, herbaceous vegetation, low and medium shrubs, tree seedlings, stumps, downed-dead roundwood).

Fuel management - Fuel management is the modification of forest structure to reduce forest fuel accumulations available to burn in a wildfire. The main goal of fuel management is improving public safety. This may include treatments such as thinning, spacing and pruning trees, and removal of needles and woody debris from the forest floor.

Fuel type - An identifiable association of fuel elements of distinctive species, form, size, arrangement, and continuity that will exhibit characteristic fire behaviour under defined burning conditions.

High-risk activity - As defined in the Wildfire Regulation (s.1)

a) mechanical brushing;

b) disk trenching;
c) preparation or use of explosives;
d) using fire- or spark-producing tools, including cutting tools;
e) using or preparing fireworks or pyrotechnics;
f) grinding, including rail grinding;
g) mechanical land clearing;
h) clearing and maintaining rights of way, including grass mowing;
i) any of the following activities carried out in a cutblock excluding a road, landing, roadside work area or log sort area in the cutblock:
    i) operating a power saw;
    ii) mechanical tree felling, woody debris piling or tree processing, including de-limbing;
    iii) welding;
    iv) portable wood chipping, milling, processing or manufacturing;
    v) skidding logs or log forwarding unless it is improbable that the skidding or forwarding will result in the equipment contacting rock;
    vi) yarding logs using cable systems

Interface fire - Interface fires are fires that have the potential to involve buildings and forest fuel or vegetation simultaneously in the WUI.

Prescribed fire - The knowledgeable and controlled application of fire to a specific area to accomplish planned resource management objectives. These fires are managed in such a way as to minimize the emission of smoke and maximize the benefits to the site.

Slash - Debris left as a result of forest and other vegetation being altered by forestry practices and other land use activities (e.g. timber harvesting, thinning and pruning, road construction, seismic line clearing). Slash includes material such as logs, splinters or chips, tree branches and tops, uprooted stumps, and broken or uprooted trees and shrubs.

Spot fire - A spot fire is less than 0.01 hectares (10 metres by 10 metres).

Wildfire - An unplanned fire - including natural or unauthorized human-caused fires - occurring on forest or rangelands, burning forest vegetation, grass, brush, scrub, peat, or a planned prescribed fire set under the regulation which spreads beyond the area authorized for burning.

Wildland urban interface - The wildland-urban interface (WUI) is an area where combustible forest fuel is found adjacent to homes, farms, structures or other outbuildings. This may occur at the interface, where development and forest fuel (vegetation) meet at a well-defined boundary, or in the intermix, where development and forest fuel intermingle with no clearly defined boundary.