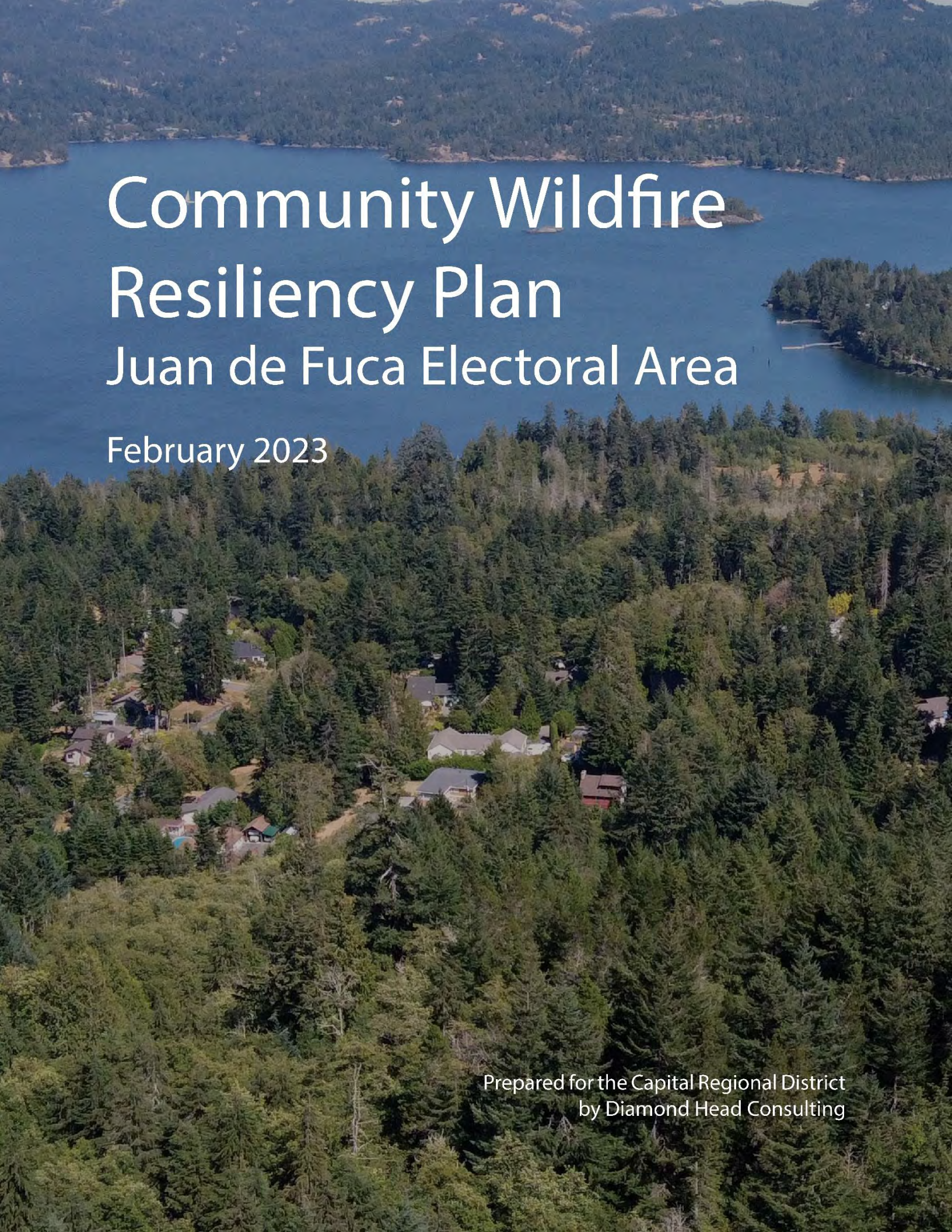

Community Wildfire Resiliency Plan

Juan de Fuca Electoral Area

February 2023

Prepared for the Capital Regional District
by Diamond Head Consulting

Community Wildfire Resiliency Plan for Juan de Fuca Electoral Area in the Capital Regional District

February 2023

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Making a difference...together

Professional Seal and Signatures

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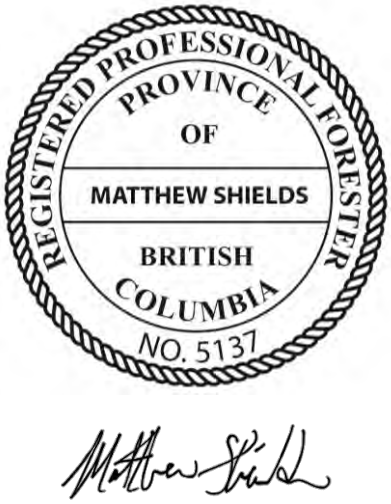
Date signed: February 17, 2023

I certify that the work described herein fulfills the standards expected of a registrant of the Association of British Columbia Forest Professionals and that I did personally supervise the work.



Matthew Shields, R.P.F.

Date signed: February 17, 2023

I certify that I have reviewed this document and, while I did not personally supervise the work described, I have determined that this work has been completed to the standards expected of a registrant of the Association of British Columbia Forest Professionals.

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Tables and Figures

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Frequently Used Acronyms

AOI	Area of Interest
BC	British Columbia
BCWS	British Columbia Wildfire Service
CFFDRS	Canadian Forest Fire Danger Rating System
CFBPS	Canadian Fire Behaviour Prediction System
CFS	Community Funding and Supports
CRD	Capital Regional District
CRI	Community Resiliency Investment
CVRD	Cowichan Valley Regional District
CWPP	Community Wildfire Protection Plan
CWRP	Community Wildfire Resiliency Plan
DP	Development Permit
DPA	Development Permit Area
EA	Electoral Area
EMBC	Emergency Management British Columbia
EMP	Emergency Management Plan
ESVFD	East Sooke Volunteer Fire Department
FCFS	FireSmart Community Funding and Supports
FRPA	Forest & Range Practices Act
GIS	Geographic Information Systems
HRVA	Hazard, Risk, and Vulnerability Analysis
JDF	Juan De Fuca electoral area
LRMP	Land and Resource Management Plan
MOE	Ministry of Environment
MFLNRORD	Ministry of Forests, Lands, Natural Resource Operations and Rural Development
OCP	Official Community Plan
OPVFD	Otter Point Volunteer Fire Department
PRVFD	Port Renfrew Volunteer Fire Department
PSTA	Provincial Strategic Threat Assessment
SVFD	Shirley Volunteer Fire Department
SWPI	Strategic Wildfire Prevention Initiative
UBCM	Union of British Columbia Municipalities
WPVFD	Willis Point Volunteer Fire Department
WRR	Wildfire Risk Reduction
WUI	Wildland-urban Interface

Executive Summary

The Capital Regional District (CRD) prepared this Community Wildfire Resiliency Plan for the Juan de Fuca (JDF) Electoral Area, which includes the communities of East Sooke, Malahat, Otter Point, Port Renfrew, Willis Point, Shirley, and Jordan River. This plan examines wildfire risk in the wildland-urban interface of JDF and makes recommendations for the CRD to help build FireSmart communities.

JDF is heavily forested with relatively isolated communities, despite its proximity to the largely urbanized Victoria region. JDF residents live near and amid the forest. In many communities in BC there is a clear boundary between forests and developed communities, which is called the wildland-urban interface (WUI). However, in communities like those of JDF this boundary is not distinct, and the WUI is an intermix of forests and homes. Much of the infrastructure critical to the functioning of these communities, including water wells and electrical utilities, fire stations, communications, and community buildings, is located within the WUI.

In the WUI, wildfire consultants conducted wildfire risk assessments on public land, examining structures and the characteristics of forest vegetation. These assessments and data from the Provincial Strategic Threat Analysis (PSTA) were used to map the wildfire risk in relation to known values throughout the WUI. The analysis shows that most of the public land base is characterized by a moderate wildfire risk. This wildfire risk increases from north to south in JDF. Development in JDF has placed buildings and infrastructure near forests that can sustain fires during the typical fire season. Moderate wildfire threat means that a forest is expected to readily support wildfire of moderate intensity during the peak fire season. The risk associated with fires of moderate intensity should not be underestimated. These are fires that can support the torching of trees, send embers into nearby neighbourhoods, and present considerable suppression challenges, even if the most aggressive wildfire behaviour is unlikely. Wildfire risk on private land was not modelled; however risk on private land is likely moderate, similar to adjacent public land. Risk on private land cannot be modelled under the grant funding terms for this project.

Wildfire risk can be reduced through proactive management, which includes education to increase public awareness, expanding FireSmart programming for residents and CRD operations, emergency planning and interagency cooperation, and fuel management on public lands. Public education and awareness of wildfire risk and options for mitigation and preparedness is a critical component of this Community Wildfire Resiliency Plan. The FireSmart program is the foundation for raising public awareness of wildfire in JDF. Adapting FireSmart guidance to local circumstances is the overarching task of initiatives proposed in the Action Plan included in this document.

This Community Wildfire Resiliency Plan has been developed to acknowledge existing wildfire risk in JDF. Risk is increasing with climate change and will continue to do so, making the cyclical and repeat nature of community wildfire planning necessary and apparent. Recommendations in the Action Plan are framed with suggested priorities and implementation timeframes. The project partners recognize this plan as a fundamental first step towards improving the resilience of JDF to the impacts of wildfires.

Introduction

Overview

This Community Wildfire Resiliency Plan (CWRP) examines wildfire risk in the Juan De Fuca (JDF) Electoral Area and makes recommendations for managing that risk in support of building resiliency to wildfire. The purpose of the plan is to identify pathways toward building a community resilient to wildfire, focusing on actions that are within the Capital Regional District's (CRD) mandate and capacity. Wildfire resiliency is not a single destination with a defined roadmap. Although the recommendations made by the plan can each improve wildfire resiliency, many involve multiple values or long timeframes which deserve further consideration.

To be resilient means to recover from difficulty. In JDF, wildfire can cause great difficulties for people and communities. Emergency preparedness, wildfire response, vegetation management, community planning, and personal readiness are all important elements of building resiliency to wildfire. Being resilient doesn't mean that wildfire will never impact JDF; instead, it means that communities will emerge from a wildfire disaster intact and recognizable.

This plan is the result of a partnership between provincial and local governments that has allowed communities to access funding for community wildfire prevention since 2004. Funding for this plan was provided through the ***Community Resiliency Investment Program***. The CWRP assesses risk within the ***wildland-urban interface*** (WUI), an area of land where natural vegetation and urban development are in proximity. The WUI is where wildfire can travel from wildland vegetation into JDF and is where there is the highest concern for potential wildfire activity. To create the CWRP, professional foresters visited public lands in the WUI to create accurate maps of wildfire risk. Although wildfire risk is not assessed for private land, the recommendations of the CWRP are a resource for all residents of JDF.

The ***Community Resiliency Investment Program*** is a program funded by the government of British Columbia to reduce the risk of wildfires and mitigate their impacts on BC communities.

Wildland-urban interface is the area around communities where development is among or abuts forest, and consequently where development faces greater wildfire risk.

Plan Goals

Wildfire is a feature of the ecological communities within JDF. The patchwork of forests surrounding homes and communities are vulnerable to fire whether it is caused by lightning or by human ignitions. The goals of the CWRP respond to this reality in several ways and set an agenda that influences each following section of the plan. They represent *what the plan sets out to do*. Table 1 sets out the goals of the CWRP.

Table 1. Goals of the CWRP

Goals	
Public Health and Safety	Public safety is enhanced through all activities to prevent, prepare for, or manage wildfire.
Protection of infrastructure	Community infrastructure, including private property, public structures, and facilities is protected from wildfire.
Interagency Co-operation and Policy	Wildfire management planning, preparedness, prevention, suppression, ecosystem rehabilitation, and education occurs in co-operation with all relevant agencies and neighbouring local governments and First Nations.
Public Awareness, Education and Advocacy	Public understanding, support and awareness of wildfire risk management is increased through effective education, advocacy, and communication.
Sustainable Planning	Growth and development planning considers wildfire risk and mitigation as best practice.
Environmental Protection and Enhancement	Ecosystems that support biodiversity and environmentally sensitive features are protected and enhanced by wildfire management activities.
Adaptive Management	The effectiveness of wildfire management initiatives is monitored and continuously improved by reviewing actions and decision-making processes.
Financial Responsibility	Wildfire resiliency initiatives are pursued within sustainable budgets. Where appropriate, the CRD will seek external partnerships to expand funding available for wildfire resiliency initiatives.

Plan Objectives

The following objectives provide context on *how the plan will achieve its goals*. The primary objectives are to:

- Provide an updated understanding of wildfire risk within the WUI based on the provincial data available and site assessments.
- Identify high and extreme risk areas where the CRD should prioritize action to reduce wildfire risk and/or protect homes and infrastructure.
- Examine opportunities to adjust CRD bylaws, policies, or programs to support improved wildfire preparedness and prevention.
- Help build capacity in fire suppression and response by identifying ways this plan can support the wildfire preparedness of local fire departments.
- Engage community members with information on wildfire risk management and respond to community concerns.
- Consider where partnerships with residents, communities, organizations, or other governments may be needed to improve wildfire preparedness and/or address wildfire hazard.

Plan Development Summary

This CWRP is one in a series of three for the CRD, one for each unincorporated electoral area. These plans are funded by the 2021 Union of British Columbia Municipalities Community Resiliency Investment Program Grant. The previous community wildfire protection plans for these areas were prepared over ten years ago and individually for East Sooke, Malahat and Durrance, Otter Point, Port Renfrew, Willis Point, Shirley, and Jordan River. The Community Resiliency Investment Program has since superseded this initiative and has created updated guidance for preparing a CWRP. The CRD issued a request for proposals in the spring of 2022 for the development of a new plan meeting the Province's updated standards. The contract for preparing the plan was awarded to Diamond Head Consulting Ltd. in May 2022. Field assessments took place in the summer of 2022. Stakeholder information sessions were held in September 2022, with direct engagement occurring throughout the project with specific stakeholders. A draft plan was submitted for review by stakeholders in January 2023. After final revisions, the final plan was submitted for consideration by the CRD Board.

The first three sections of the plan following this introduction consider the context of JDF and present the findings of the wildfire risk assessment. The community's planning context and background for the creation of the CWRP are presented in *Relationship to Other Plans* (p.16). A description of the community, including more detail on how the WUI is defined as well as a brief discussion of socioeconomic and environmental features within the plan area is contained in *Community Description* (p.20). The results of wildfire threat assessments and local wildfire risk mapping are presented in *Wildfire Risk Assessment* (p.46). This section also contains information on the historic fire regime and climate change factors that may influence future wildfire risk.

The next section bridges between the *Community Wildfire Risk Assessment* and the seven FireSmart disciplines, providing an *Introduction to FireSmart* (p.72) for readers who may not be familiar with FireSmart programming and concepts and how they are currently implemented in the CRD. This section also contains advice for the CRD on overarching initiatives critical to implementing recommendations embedded in the CWRP.

The next seven sections identify community resources and needs in each of the seven FireSmart Disciplines:

- *Education* (p.80). This section examines how the CRD can improve or enhance outreach with residents or communities to increase awareness of wildfire risk and support for wildfire management.
- *Legislation and Planning* (p.87). This section addresses the major pieces of law and policy that are of relevance to wildfire management and discusses how they could be amended or expanded to support wildfire prevention and preparedness.
- *Development Considerations* (p.93). This section looks at the regulation of development by municipal bylaws. Influencing development patterns is a useful way to shape FireSmart communities for the long-term.
- *Interagency Cooperation* (p.101). Making recommendations for the ongoing effort to engage multiple stakeholders and partner institutions is the focus of this section.
- *Cross-Training* (p.104). This section concerns opportunities and challenges in ensuring more wildfire training for relevant emergency response personnel and neighbourhood FireSmart representatives.
- *Emergency Planning* (p.108). This section considers how parallel emergency planning processes and procedures can incorporate wildfire risk and reflect wildfire preparedness.
- *Vegetation Management* (p.112). This section discusses the costs and benefits of fuel management at the site, neighbourhood, and landscape scale to reduce wildfire risk. High-priority opportunities for FireSmart landscaping treatments are identified for critical infrastructure and neighbourhoods, or for the development of a fuel management prescription by a Registered Professional Forester.

The FireSmart Disciplines sections are followed by the *Action Plan & Implementation* (p.122), which provides notes about potential actions discussed in the preceding sections and prioritizes recommendations for implementation. The Action Plan can stand alone with the Executive Summary as a summary of the guide to improving wildfire resiliency in JDF. 35 recommendations to improve wildfire resiliency in the community are provided, organized by the appropriate FireSmart discipline and suggested priority.

Appendices (p.131) to the plan provide additional details, including a glossary of terms and a description of how public input was received and incorporated.

Photo 1. Forests near Port Renfrew.

Relationship to Other Plans

The Community Wildfire Resiliency Plan (CWRP) is a strategic document that informs Capital Regional District (CRD) priorities for emergency services, operations, and community planning. The plan recommendations are not mandates, but suggestions that can be worked into the CRD's policies, programs, and activities. Implementation of the plan depends on changes to informal procedures, stated policy, new planning processes, and in some cases amendments to local government bylaws. The CRD's plans for government operations, emergency management and evacuation, corporate strategies, climate action, parks and urban forestry are all relevant to this plan. The plans of other governments, such as provincial or Indigenous resource management plans, may also be of relevance to aspects of wildfire management.

Linkages to Existing Community Wildfire Plans

Community Wildfire Protection Plans were prepared for the communities of East Sooke, Malahat and Durrance, Otter Point, Port Renfrew, Willis Point, Shirley, and Jordan River in 2011. These documents were prepared under the previous Strategic Wildfire Prevention Initiative Standards. The CWRPs are now being replaced with a more regional approach at the Juan De Fuca (JDF) electoral area level. This plan has been developed in tandem with two other CWRPs, one for each other electoral area in the CRD.

Table 2. Linkages to existing community wildfire plans.

Plan	Description	Relationship to CWRP
Community Wildfire Protection Plan – East Sooke, BC (2011)	This is the community wildfire plan currently in place for the community of East Sooke. 19 recommendations accompany the plan, including several that are within the authority of the CRD. These include policy changes in various CRD plans and bylaws, as well as various water supply recommendations. The creation of a CRD led Wildfire Suppression Group is also recommended.	The plan provides context for the present CWRP and informs current recommendations. This plan may remain relevant for actions/goals internal to the CRD.
Community Wildfire Protection Plan – Malahat and Durrance, BC (2011)	This is the community wildfire plan currently in place for the Malahat and Durrance Fire Protection Areas. 9 recommendations accompany the plan, mostly focused on education and communications. Several recommendations are policy driven and within the authority of the CRD, including revision of some CRD plans and bylaws to include provisions regarding wildfire.	The plan provides context for the present CWRP and informs current recommendations. This plan may remain relevant for actions/goals internal to the CRD.
Community Wildfire Protection Plan – Otter Point, BC (2011)	This is the community wildfire plan currently in place for the community of Otter Point. 13 recommendations accompany the plan, mostly focused on education and communications. Several recommendations are policy driven and within the authority of the CRD, including revision of some CRD plans and bylaws to include provisions regarding wildfire.	The plan provides context for the present CWRP and informs current recommendations. This plan may remain relevant for actions/goals internal to the CRD.
Community Wildfire Protection Plan – Port Renfrew, BC (2011)	This is the community wildfire plan currently in place for the community of Port Renfrew. 19 recommendations accompany the plan, mostly focused on education and communications. Several recommendations are policy driven and within the authority of the CRD, including revision of some CRD plans and bylaws to include provisions regarding wildfire.	The plan provides context for the present CWRP and informs current recommendations. This plan may remain relevant for actions/goals internal to the CRD.

Community Wildfire Protection Plan – Willis Point, BC (2011)	This is the community wildfire plan currently in place for the community of Willis Point. 19 recommendations accompany the plan, mostly focused on education and communications. Several recommendations are policy driven and within the authority of the CRD, including revision of some CRD plans and bylaws to include provisions regarding wildfire.	The plan provides context for the present CWRP and informs current recommendations. This plan may remain relevant for actions/goals internal to the CRD.
Community Wildfire Protection Plan – Shirley and Jordan River, BC (2011)	This is the community wildfire plan currently in place for the community of Willis Point. 19 recommendations accompany the plan, mostly focused on education and communications. Several recommendations are policy driven and within the authority of the CRD, including revision of some CRD plans and bylaws to include provisions regarding wildfire.	The plan provides context for the present CWRP and informs current recommendations. This plan may remain relevant for actions/goals internal to the CRD.

Linkages to Other Plans

The CRD acts as the primary local government for its unincorporated areas. Regional districts operate on a special service basis, providing only the services that are approved by their communities and using taxes/levies only to support this spending. Communities in unincorporated areas can also form Improvement Districts for specific taxation purposes, such as running a volunteer fire department. The CRD retains responsibility for most local government services, such as parks operations and bylaw enforcement. Local government plans for these services can influence the wildfire risk environment and reflect preparedness.

Table 3. Relationship of the CWRP to local government plans.

Plan	Description	Relationship to CWRP
East Sooke Official Community Plan (Bylaw No. 4000, 2018)	This plan is prepared by the CRD and develops a vision for land use within the community. Under the *Local Government Act*, Official Community Plans must address how a local government area's land is to be allocated by land use. These documents can also set local government policy for a variety of social and economic issues. Bylaws adopted by the local government must be consistent with the adopted Official Community Plan.	The plan addresses planning and land use in East Sooke containing policies regarding growth and development that indirectly influence wildfire risk. The plan contains limited policy guidance directly addressing wildfire risk, though it includes a policy to encourage public preparedness for natural disasters such as wildfire. The plan does not identify wildfire as a natural hazard for the purposes of the Hazard Lands Development Permit Area.
Malahat Official Community Plan (Bylaw No. 3721, 2012)	This plan is prepared by the CRD and develops a vision for land use within the community. Under the *Local Government Act*, Official Community Plans must address how a local government area's land is to be allocated by land use. These documents can also set local government policy for a variety of social and economic issues. Bylaws	The plan addresses planning and land use in Malahat containing policies regarding growth and development that indirectly influence wildfire risk. The plan makes requirements for mitigating wildfire risk in development, including NFPA 1144 requirements. Additional requirements are included for high and extreme wildfire risk areas, which are mapped in the OCP appendices.

Plan	Description	Relationship to CWRP
	adopted by the local government must be consistent with the adopted Official Community Plan.	This plan does not include wildfire as a development permit area.
Otter Point Official Community Plan (Bylaw No. 3819, 2014)	This plan is prepared by the CRD and develops a vision for land use within the community. Under the *Local Government Act*, Official Community Plans must address how a local government area's land is to be allocated by land use. These documents can also set local government policy for a variety of social and economic issues. Bylaws adopted by the local government must be consistent with the adopted Official Community Plan.	The plan addresses planning and land use in Otter Point containing policies regarding growth and development that indirectly influence wildfire risk. The plan includes wildfire as a Natural Hazard Area. High risk areas, as mapped in the 2011 CWPP, must have 10m buffers. All other areas must be developed in an area that reduces risk associated with wildfire, and development must address requirements in NFPA 1144. This plan does not include wildfire as a development permit area.
A Bylaw to Adopt an Official Community Plan and a Land Use Bylaw for Port Renfrew (Bylaw No. 3109, 2003)	This plan is prepared by the CRD and develops a vision for land use within the community. Under the *Local Government Act*, Official Community Plans must address how a local government area's land is to be allocated by land use. These documents can also set local government policy for a variety of social and economic issues. Bylaws adopted by the local government must be consistent with the adopted Official Community Plan.	The plan addresses planning and land use in Port Renfrew containing policies regarding growth and development that indirectly influence wildfire risk. The plan includes a development policy to ensure development proposals incorporate designs that reduce forest fire risks for homes within and at the edge of forested lands. (4.6, (2)). This plan does not include wildfire as a development permit area.
Comprehensive Community Plan for Willis Point (Bylaw No. 3027, 2002)	This plan is prepared by the CRD and develops a vision for land use within the community. Under the *Local Government Act*, Official Community Plans must address how a local government area's land is to be allocated by land use. These documents can also set local government policy for a variety of social and economic issues. Bylaws adopted by the local government must be consistent with the adopted Official Community Plan.	The plan addresses planning and land use in Willis Point containing policies regarding growth and development that indirectly influence wildfire risk. The plan includes a development policy recommending development proposals incorporate designs that reduce forest fire risks for homes within, and at the edge of forested lands. (4.3, (9)). This plan does not include wildfire as a development permit area.
Shirley-Jordan River Official Community Plan (Bylaw No. 4001, 2018)	This plan is prepared by the CRD and develops a vision for land use within the community. Under the *Local Government Act*, Official Community Plans must address how a local government area's land is to be allocated by land use. These documents can also set local government policy for a variety of	The plan addresses planning and land use in Shirley-Jordan River containing policies regarding growth and development that indirectly influence wildfire risk. The plan includes a policy to encourage public preparedness for wildfire through education. This plan does not include wildfire as a

Plan	Description	Relationship to CWRP
	social and economic issues. Bylaws adopted by the local government must be consistent with the adopted Official Community Plan.	development permit area.
Rural Resources Lands Official Community Plan (Bylaw No. 3591, 2010)	This plan is prepared by the CRD and develops a vision for land use within the community. Under the *Local Government Act*, Official Community Plans must address how a local government area's land is to be allocated by land use. These documents can also set local government policy for a variety of social and economic issues. Bylaws adopted by the local government must be consistent with the adopted Official Community Plan.	This plan makes requirements for mitigating wildfire risk in development, including NFPA 1144 requirements to reduce forest fire risks within and at the edge of forested lands. Developments must be consistent with FireSmart principles, and a report demonstrating the proposed development is safe from wildfire hazards must be prepared by a Qualified Professional.
Emergency Management Plan	The CRD Corporate Emergency Plan was updated in 2020. The plan is updated periodically and considers the organization and hierarchy within the CRD during an emergency event, as well as the setup of the Emergency Operations Centre. This document includes a Hazard, Risk, and Vulnerability Assessment and Consequence Analysis, which identified wildfire as a high likelihood, high consequence event.	The Emergency Plan identifies processes and procedures the CRD will follow to secure infrastructure and provide emergency services to residents during a wildfire. The CWRP can inform emergency planning about wildfire risk, helping the CRD to make resource allocation and response decisions.

In addition to local government plans, higher government land use plans can apply to all or specific portions of JDF. The Vancouver Island Summary Land Use Plan (2000), established by order, guides forest practices in several "special management zones", none of which are located within JDF. Besides provincial land use planning, orders and notices established through the *Land Act*, *Forest and Range Practices Act, Oil and Gas Activities Act, Environment and Land Use Act*, and *Wildlife Act* can also influence the priorities and recommendations of the Community Wildfire Resiliency Plan due to constraints they may place on the crown land base. The British Columbia Wildfire Service may also create landscape level "tactical fuel management plans" or risk management plans for specific provincial landscape units. No such plans are currently in place for JDF.

Community Description

Area of Interest

Juan De Fuca (JDF) is a large, heavily forested electoral area located on the southwest tip of Vancouver Island. The terrain is mountainous and rugged, with slopes rising from the coastline. Habitation is mostly limited to the coastline along Highway 14 with several distinct communities between Port Renfrew and Sooke. JDF also includes the Malahat and Willis Point communities, which are not accessible by road from the rest of the electoral area without passing through the incorporated municipalities around Victoria. The communities in JDF are:

- Port Renfrew: located at the north end of JDF, this small community (pop. 100) is the most isolated in the JDF. Port Renfrew is located along the San Juan River and is far enough from the rest of JDF that it experiences a distinct, much moister climate. The Pacheedaht First Nation, the largest Indigenous settlement in JDF, is located adjacent to Port Renfrew.
- Shirley and Jordan River: These two small (pop. 450) rural communities are located along Highway 14 near the Jordan River. These communities are mainly rural residential.
- Otter Point: located near the incorporated community of Sooke in the southern portions of JDF, this is one of the more populous communities (pop. 2,000) in JDF. This area is primarily rural with large portions of forest and agricultural lands, as well as some commercial and industrial lands. Access is via Highway 14 and Otter Point road.
- East Sooke: this community is one of the larger in JDF (pop. 1,500), located between the incorporated municipalities of Sooke and Metchosin in the southern extent of JDF. This community is mainly rural residential, however, a majority of the land is heavily forested in East Sooke Regional Park. East Sooke has single access via East Sooke Road at Gillespie Road.
- Malahat: This small community (pop. 150) is separated from the rest of JDF and is located on the Malahat Highway north of Langford. This area is primarily rural residential.
- Willis Point: Another small community (pop. 450). Separated from the rest of JDF, this community is located on the eastern shores of the Finlayson Arm west of Brentwood Bay. Most of the land in this community is in parks and open spaces, with only a small component developed, mostly with rural residential homes.

Wildland-Urban Interface

The Wildland-Urban Interface (WUI) is the area where combustible forest fuels are found adjacent to homes, businesses, farm structures, or other buildings and infrastructure. This plan defines the WUI as the area within one km of a density of six buildings (or “structures”) per square km. This creates a bubble around the populated areas of JDF, where most buildings and people would be at risk if a wildfire were to occur. The distance of one km has been selected to align this Community Wildfire Resiliency Plan (CWRP) with guidance from the Province and BC Wildfire Service, which use structure density classes to help plan wildfire response and prevention.

The shape and appearance of the WUI depends on the form of development that characterizes the community. The WUI can be thought of as having two broad types that influence wildfire response. The first is simply called “interface” and refers to landscapes where the boundary between forests and developed areas can be seen at the scale of a neighbourhood or a community. Interface conditions imply a distinct boundary between homes and forests, and often result where development includes

multiple-lot subdivision and land clearing, or where forests are separated from communities by farmland. The second type of WUI is called “intermix”, which refers to landscapes where the boundary between forests and urbanized areas is indistinct and may only be apparent at the scale of an individual property. In these landscapes, homes and infrastructure are set among forest vegetation. This type of development is common in rural areas where subdivision or farming has not resulted in extensive land clearing. Most of JDF lacks significant clearing for development or agriculture and is thus mostly characterized by intermix conditions. This is typical of rural communities on Vancouver Island. Figure 1 shows examples of these two conditions.

Interface conditions are where the boundary of urbanized and forested areas is visible at the scale of whole neighbourhoods. Note this photo is outside JDF.

Intermix conditions are where the boundary of urbanized and forested areas is visible at the scale of single houses or groups of houses.

Near Otter Point

Near East Sooke

Figure 1. Visual comparison of "interface" and "intermix" conditions.

The shape of the boundary between homes and forests influences the pathways to home ignition and appropriate mitigation strategies. Forests and vegetation provide fuel to wildfires, although not all forests are equally hazardous. Homes in the intermix are surrounded by forest vegetation and are at risk of ignition through direct contact with flame, radiant heat from nearby fire, and wind-borne embers or firebrands. Homes in the interface next to the forest boundary also face these three ignition sources, while homes toward the interior of a neighbourhood or subdivision remain at risk of wind-borne embers alighting on building surfaces or landscaping. Managing the landscape around buildings and using fire-resistant construction can help people living in the interface avoid damage to property during an oncoming wildfire. Since a significant number of wildfires are of human origin, managing the fuels between humans and forests also helps to contain human-caused fires before they spread into the surrounding landscape and become catastrophic events.

The Area of Interest (AOI) defines the assessment boundaries for the CWRP. The plan focuses on the portion of JDF within the WUI, rather than the entirety of JDF. A majority of JDF is uninhabited forest land with minimal development, and as such will have a lower wildfire risk relative to the WUI around communities. The overall area of JDF is 291,574 hectares, while the WUI for this plan is 19,324 hectares. In addition, this plan focuses in particular on public land in the WUI, as this is the only land that the CRD can directly manage for wildfire risk mitigation. Public land comprises 12.4% of the AOI. Table 4 provides a simplified summary of ownership by area.

Table 4. Ownership summary in AOI

Jurisdiction	Area within the AOI (ha)	% of area within the AOI	Area within the AOI – water excluded (ha)	% of area within the AOI (water excluded)
AOI	**19,324.60**	**100%**	**12,131.54**	**100%**
CRD Owned Land	1,049.68	5.4%	1,031.66	8.5%
Federal/Crown Federal	756.74	3.9%	728.82	6.0%
First Nation	0	0.0%	0	0.0%
Other	105.42	0.5%	101.29	0.8%
Private	7,656.70	39.6%	7,633.30	62.9%
Provincial Crown Land*	834.78	4.3%	798.24	6.6%
Unknown	1,778.78	9.2%	1,316.10	10.8%

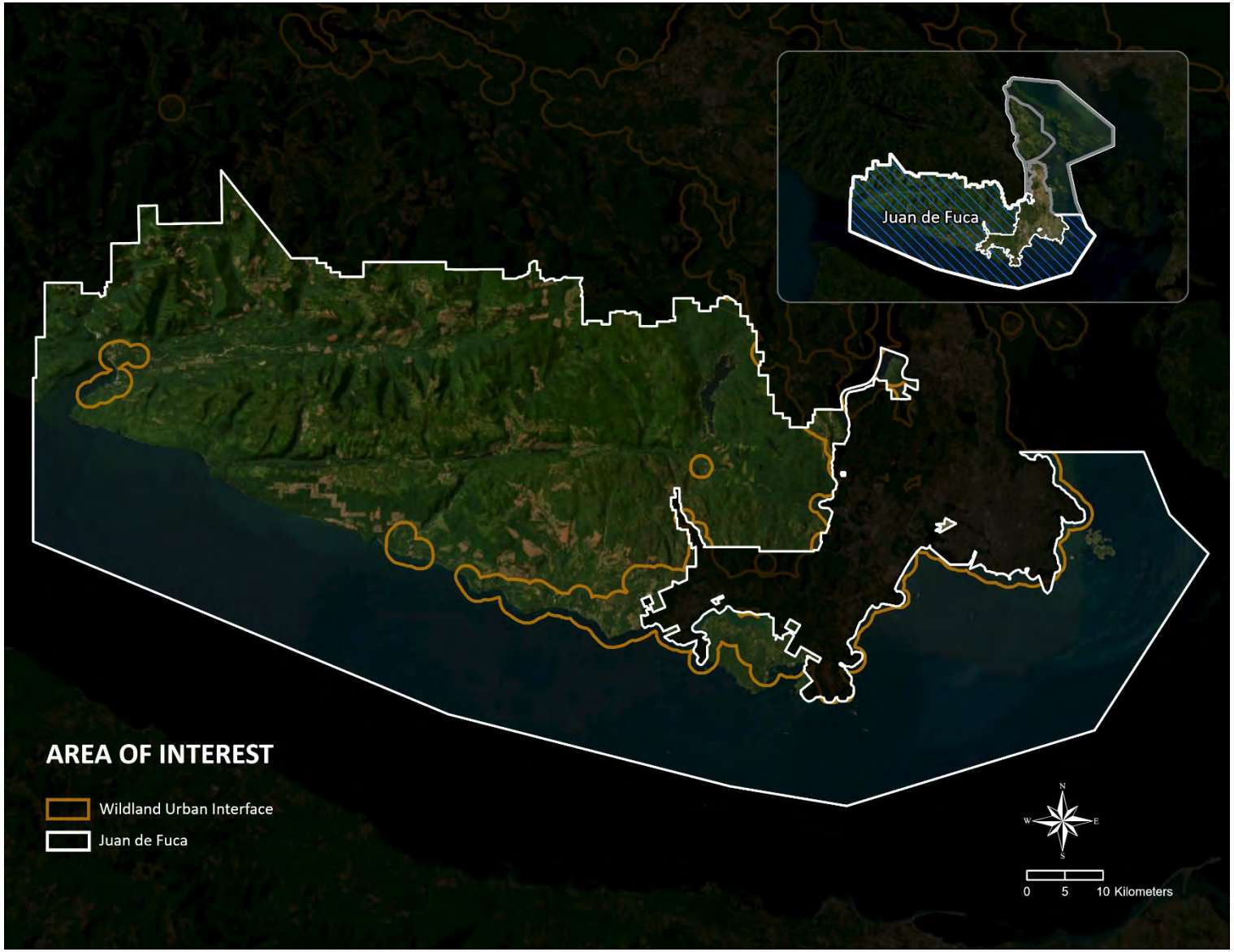

Figure 2. Area of interest for the plan and WUI.

Community Information

Demographics and Housing

The growth of JDF and how housing is developed can have a large impact on the resilience to wildfire. This is because patterns of development influence wildfire risk, and a rising population puts additional demands on local emergency responders. If carefully planned, growth can help JDF become resilient to wildfire by replacing outdated construction with modern building standards, introducing FireSmart development patterns, increasing the tax base, and adding new neighbours to shoulder the effort of community organizing and planning.

JDF constitutes two census subdivisions for Statistics Canada. The population of JDF at the 2021 Census was 5,132[1]. The number of private dwellings was 2,938, with 2,409 of these reported as being permanently occupied. The proportion of seasonal residences (18%) is higher than the provincial and regional average. Detailed community demographic information is found in Table 5.

The population of JDF differs from the rest of the CRD. The median age is slightly older, with higher household incomes and less low income residents. This is likely attributed to the higher proportion of retired and semi retired individuals. As in other unincorporated areas, homeowners greatly outnumber other residents, partly due to a lack of suitable housing for renters or other forms of occupancy.

The CRD completed a first Housing Needs assessment for JDF in 2020, which reviewed data from the 2016 census and other available market information to assess the suitability of JDF's housing stock to levels of demand for rentals and home ownership . The report identified several areas where housing supply is unsuitable or otherwise inaccessible for families and individuals in Core Housing Need. This was connected to the lack of diverse forms of housing in the community, such as a lack of affordable housing and overall shortage of housing of all types.

Demographics will influence risk and appropriate emergency planning and response. JDF demographics are similar to the rest of the CRD, with higher household incomes being the notable outlier. JDF also has a much lower population density than the rest of the CRD, which reflects its much more rural character. This rural, low density population is typical of rural Vancouver Island communities located on the periphery of larger urban areas and is often associated with an extensive and dispersed wildland-urban interface. These rural areas are also difficult to manage in emergency situations, as the movement of responders and evacuation (if required) is hampered by the dispersed population. This is particularly true of the communities along Highway 14, which have limited egress routes.

[1] Statistics Canada. 2022. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released October 26, 2022. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed November 24, 2022).

Table 5. Community Information for JDF.

Community Information	JDF	CRD	Province of British Columbia
Total Population	**5,132**	415,451	5,000,879
Land area (km^2)	**1488.5**	2,338.22	920,686.00
Population density (persons/km^2)	**3.4**	177.7	5.4
Number of private dwellings	**2,938**	198,435	2,211,694
Number of dwellings occupied by usual residents	**2409**	185,206	2,041,834
Average household income ($)	**106,100**	106,900	108,600
Average household size (persons)	**2.1**	2.2	2.4
Households by tenure – owner	**2005 (68%)**	116,530 (63%)	1,363,190 (61%)
Households by tenure – renter	**310 (11%)**	68,425 (37%)	669,450 (30%)
Prevalence of low-income, after tax (LICO-AT) (%)	**3.4**	4.5	5.8
Median age (years)	**51.6**	45.5	42.8
Data Sources:	*Statistics Canada. 2022. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released October 26, 2022. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed November 24, 2022).*		

Fire and Emergency Response

Fire response is provided in JDF by several fire departments through service establishment bylaws. All the fire departments are community-based volunteer departments. This includes the East Sooke, Otter Point, Port Renfrew, Shirley, and Willis Point Volunteer Fire Departments. The services area for each of these communities matches the community boundaries. A CRD bylaw provides for a local community-based Advisory Commission to ensure the service provided meets the community's needs. Each fire department has its own fire hall and equipment. Durrance Road and Malahat and are both serviced through contract via the Municipality of Saanich and the Cowichan Valley Regional District respectively. Jordan River lacks fire service.

Table 6. Major resources for fire response inside JDF.

Organization	Major Resources for Fire Response
East Sooke Volunteer Fire Department	- 17 firefighters - 2 engines, 1500 and 840 gpm - 2 tenders, 1250 and 1500 gallon capacity - 1 squad and 1 chief pickup
Willis Point Volunteer Fire Department	- 25 volunteer firefighters trained to exterior playbooks. - All members with ICS 100, 50% with S-100, S-185, or WFF1 and WSSP. - 2 engines, 840 and 1000 gallon capacity.
Port Renfrew Volunteer Fire Department	- 16 volunteer firefighters trained to exterior playbook, currently upgrading training to NFPA 1006 - 1 engine (1000 gallon capacity) and 1 tender (800 gallon capacity) - Squad rescue truck (400 gallon capacity)
Shirley Volunteer Fire Department	- 15 volunteer firefighters trained, partially trained with NFPA 1001 full service standard. - All firefighters with SPP WFF1, ICS 100. Some trained to SP 115, one engine boss, strike team/task force leader. - 2 engines, both 840 gpm and 1000 gallons.
Otter Point Volunteer Fire Department	- 2 full time and 18 volunteer firefighters, all trained to NFPA 1001 full service standard. - Most members with S-100, S-185, and ICS-100 training. - One engine and one tender, one wildland/bush truck, one response vehicle.

Mutual aid agreements between the departments enable each to access additional resources during a major event inside JDF. In recent years, automatic aid agreements have been growing in number among the CRD's fire departments and surrounding municipal and Improvement District departments. Negotiations for these agreements have helped support interagency cooperation between first responders. Fire departments

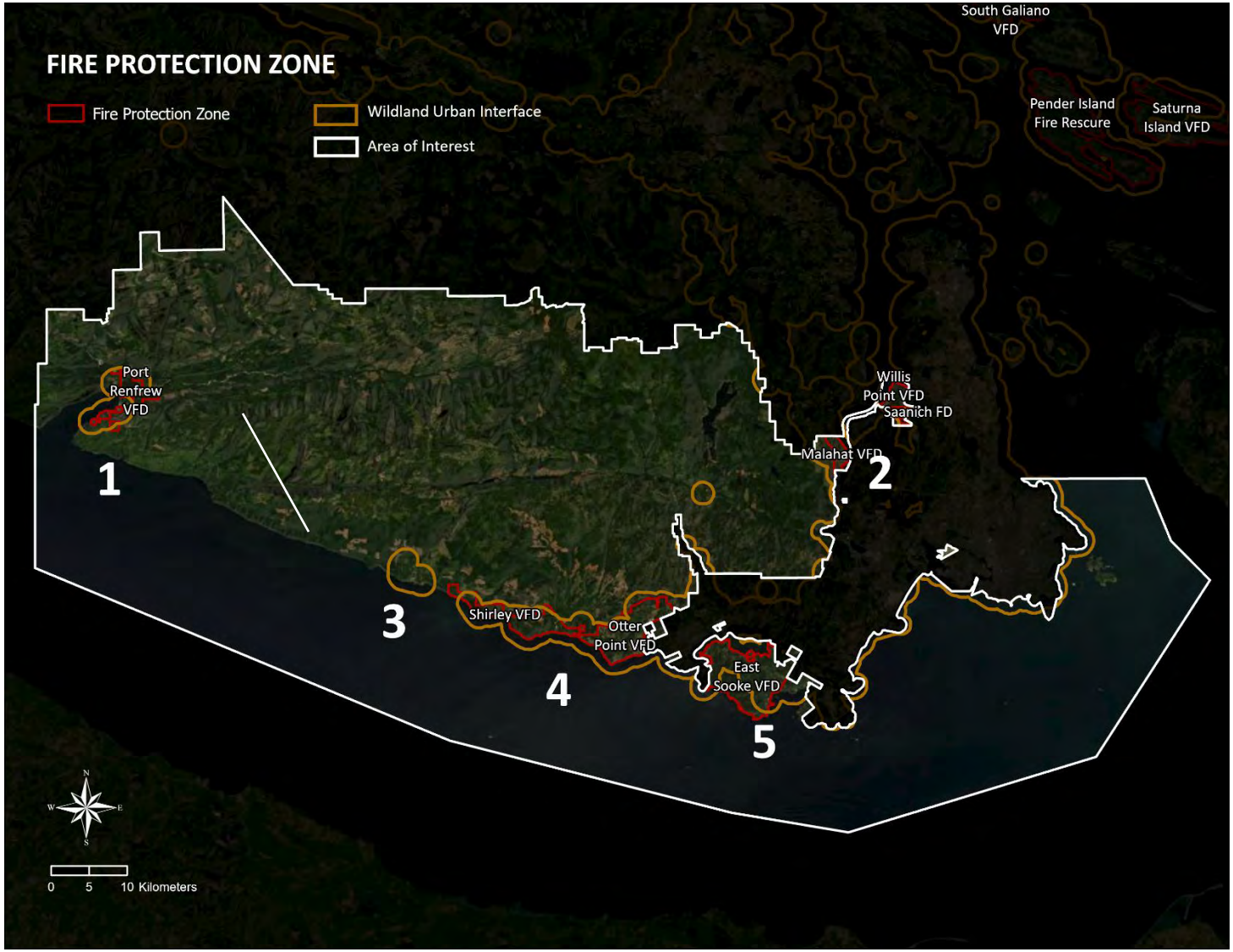

Figure 3. Fire Protection Districts in JDF.

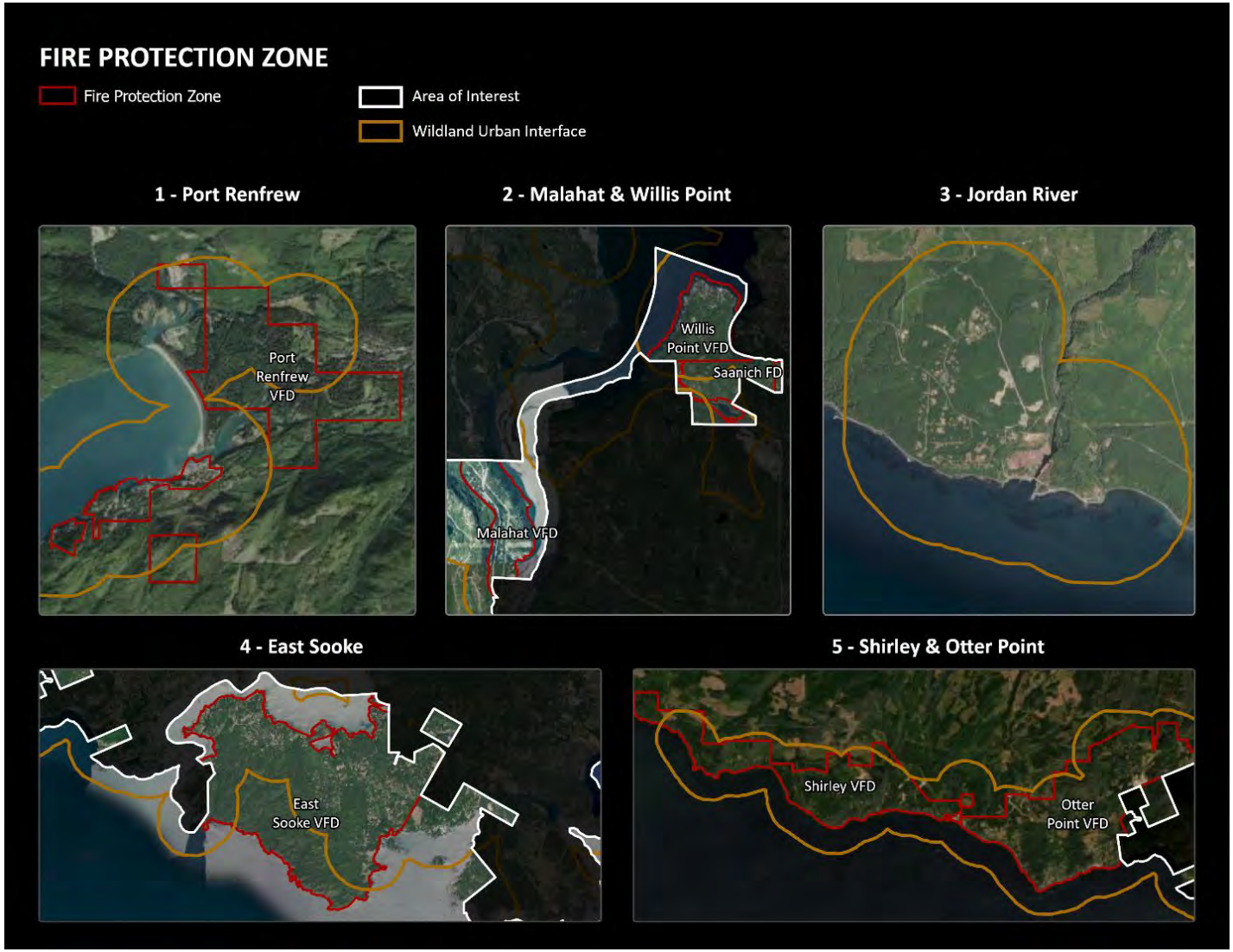

Figure 4. Magnified view of Fire Protection Districts in JDF.

Values at Risk

Human Life and Safety

The protection of human life is the top priority in the event of wildfire in the urban interface. While an imperfect measure, wildfire planning in British Columbia uses the density of "structures", typically buildings with civic addresses, as a proxy for population density. Areas with an average density of more the six structures per square km form the core of the WUI. Structure density is mapped in Figure 5 and Figure 6

The relationship between structure density and wildfire risk can be complicated by local geography. Intermix areas tend to have a lower density of structures, leaving room for native forest vegetation between homes and buildings. This is often associated with higher wildfire risk for this form of development where relatively high-threat forest fuels predominate. Interface developments may have low or high density of structures, depending on the landscape design and other land uses accompanying the construction of homes. At low structure densities, the layout of private property in intermix and interface areas may be quite similar; the difference is the yards of homes in intermix areas are treed while the yards of homes in interface areas will be substantially clear of native forest vegetation. While high structure densities are typically found toward the centre of towns and settlements, recent decades have seen more homes located on the outskirts of communities adjacent to forests. This has occurred for several reasons, including rising land prices and the opposition of existing homeowners to new housing in their communities. This places more people at a higher risk of wildfire than building new homes in central locations.

Development conditions and structure density affect all aspects of fire management response and can strongly influence fire behaviour. The connection between how communities are built and fire risk is discussed in greater detail in *Introduction to FireSmart* (p.87) and *Development Considerations* (p.93).

Human Health

In addition to the direct risks to life and safety, large uncontrolled wildfires can cause other human health impacts over a wide area. JDF is familiar with the negative impact of poor air quality from wildfire smoke, which has been experienced on BC's South Coast during several recent fire seasons. Heavy smoke disproportionately affects vulnerable populations of the elderly, or people with pre-existing medical conditions like asthma[2]. Smoke can also worsen the outcome of acute respiratory diseases like COVID-19.

[2] BC Centre for Disease Control. 2021 (October). "Wildfire Smoke" [webpage]. http://www.bccdc.ca/health-info/prevention-public-health/wildfire-smoke. Accessed October 21, 2021.

By focusing on the wildfire or smoke event as a discrete emergency, the long-term negative effects of wildfire on physical and mental health may be underrated. People who have been evacuated, lost property, been injured, or seen loved-ones struggle with health issues during an emergency may have significant and lasting trauma that inhibits their day-to-day routine and makes ordinary tasks and experiences difficult. Mental health issues such as depression and anxiety can linger in a community that has experienced wildfire long after the original emergency[3].

Photo 2. Smoke can reduce air quality and cause human health problems.

[3] Belleville, G., M.-C. Ouellet, & C.M. Morin. 2019. Post-traumatic stress among evacuees from the 2016 Fort McMurray Wildfires: Exploration of psychological and sleep symptoms three months after the evacuation. *International Journal of Environmental Research and Public Health. 2019*(16):1604 (14pp).

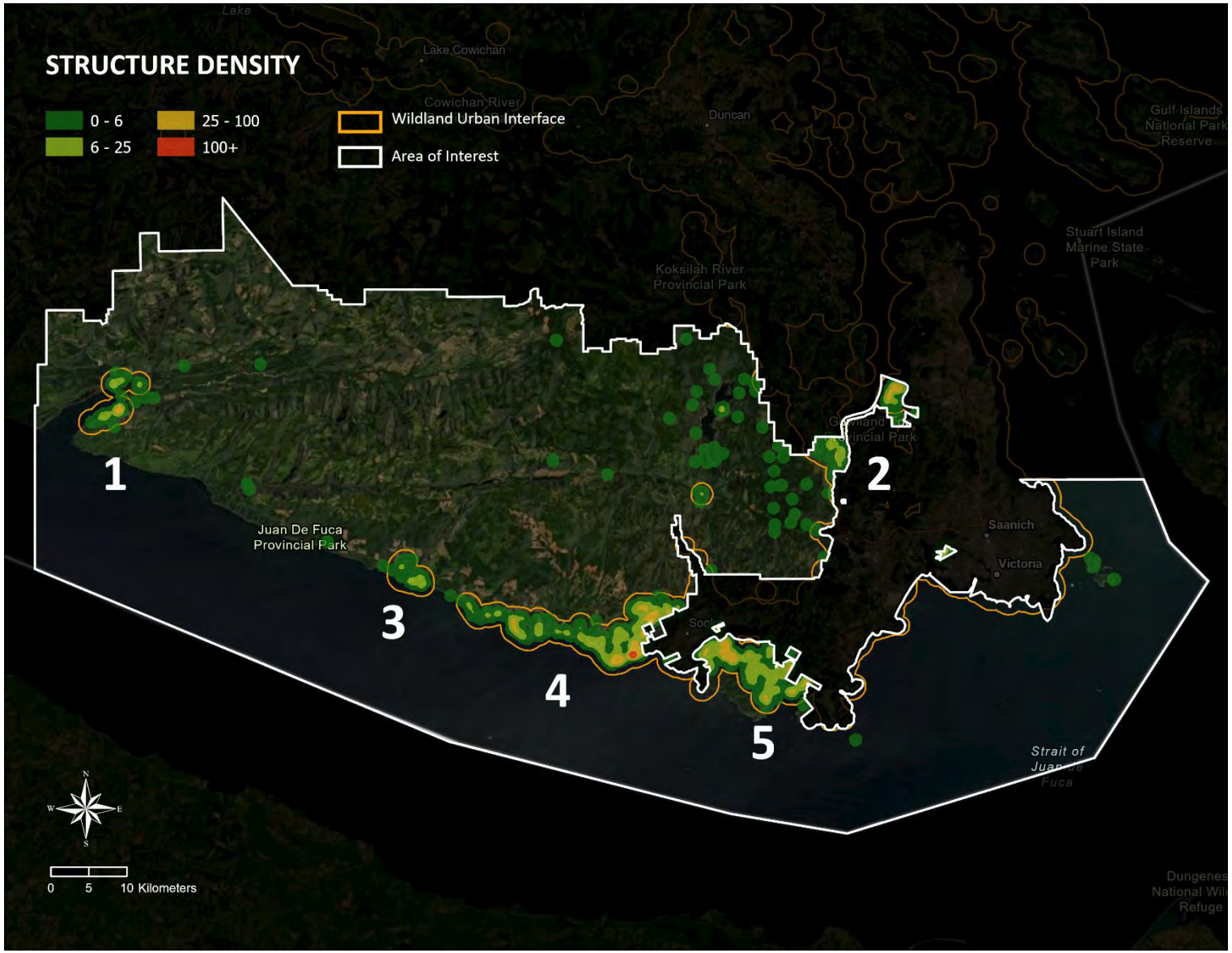

Figure 5. Structure density within the project area. The WUI represents a buffer of one km around areas of 6 structures per km^2 or higher.

Figure 6. Structure density within key communities of the project area. The WUI represents a buffer of one km around areas of 6 structures per km^2 or higher.

Environment and Protected Areas

Ecosystems in BC are defined using the Biogeoclimatic Ecosystem Classification (BEC) system.[4] JDF contains two distinct ecosystems, the Coastal Western Hemlock (CWH) BEC zone and the Coastal Douglas-fir (CDF) zone. The CWH is characterized by dry summers and moist, mild winters. The CWH zone is BC's wettest biogeoclimatic zone, and the subzones covered by JDF are some of the wettest in this category. Forests are largely composed of western hemlock, western redcedar, and Douglas-fir. Understory shrubs include salal, dull Oregon-grape, and red huckleberry. This dominates the northern portion of JDF near Port Renfrew, but gradually shifts to the CDF in the south.

The CDF is the smallest, warmest, and driest BEC zone in the AOI, and is home to uncommon species like Garry oak (Quercus garryana) and arbutus (Arbutus menziesii), among sprawling forests of Douglas-fir. The mild, borderline Mediterranean climate allows animals and plants to thrive that are not found elsewhere in Canada. In addition, JDF's coastal location means the area also hosts travelling and resident marine wildlife whose habitats can be impacted by what happens on shore. Birds like the federally protected Marbled Murrelet, dependent on coniferous forests, cliffs, and marine fishing grounds, bridge the divide between land and sea each day. A long history of logging in JDF has resulted in many dense, even-aged stands with noticeable gaps between the canopy and understory. Approximately 10% of the AOI is within parks and protected areas. Other public lands and suitable private lands increase the proportion of the area that offers natural and semi-natural habitats.

Wildlife, Species at Risk, and Protected Ecosystems

The BC Conservation Data Centre (CDC) records BC's most vulnerable vertebrate animals and vascular plants, each of which is assigned to a provincial red or blue list according to their provincial conservation status rank. Species or populations at high risk of extinction are placed on the red list and are candidates for formal endangered species status. Blue-listed species are considered vulnerable to human activity and natural events. See Table 7 for a summary of these species and communities. Figure 7 and Figure 8 depict publicly available locations of these species and ecological communities.

Table 7. Species and ecological communities with designated provincial conservation status in JDF.[5]

Name	Type	Conservation Status
Arbutus / hairy manzanita	Ecological Community	Red
Audouin's night-stalking tiger beetle	Invertebrate Animal	Red
Banded cord-moss	Nonvascular Plant	Blue
Black knotweed	Vascular Plant	Blue
Blue-grey taildropper	Invertebrate Animal	Blue
Coast microseris	Vascular Plant	Red
Common bluecup	Vascular Plant	Blue
Common ringlet, *insulana* subspecies	Invertebrate Animal	Red

[4] See the Wildfire Risk Assessment for more details on the BEC system.

[5] B.C. Conservation Data Centre: CDC iMap [web application]. 2022. Victoria, British Columbia, Canada. Available: http://maps.gov.bc.ca/ess/sv/cdc/ (Accessed Sept 7, 2022)

Common sharp-tailed snake	Vertebrate Animal	Red
Douglas-fir / arbutus	Ecological Community	Red
Douglas-fir / dull Oregon-grape	Ecological Community	Red
Dun skipper	Invertebrate Animal	Blue
Dwarf maiden-hair fern	Vascular Plant	Blue
Estuarine paintbrush	Vascular Plant	Blue
Garry oak / California brome	Ecological Community	Red
Giant chain fern	Vascular Plant	Blue
Grand fir / dull Oregon-grape	Ecological Community	Red
Grand fir / three-leaved foamflower	Ecological Community	Red
Howell's violet	Vascular Plant	Red
Island tiger moth	Invertebrate Animal	Red
Macoun's meadow-foam	Vascular Plant	Red
Northern painted turtle - Pacific coast population	Vertebrate Animal	Red
Northern red-legged frog	Vertebrate Animal	Blue
Ozette coralroot	Vascular Plant	Blue
Phantom orchid	Vascular Plant	Red
Prairie lupine	Vascular Plant	Red
Propertius duskywing	Invertebrate Animal	Red
Rayless goldfields	Vascular Plant	Red
Red alder / salmonberry / common horsetail	Ecological Community	Blue
Red alder / slough sedge [black cottonwood]	Ecological Community	Red
Seaside bone	Fungus	Red
Slimleaf onion	Vascular Plant	Blue
Smith's fairybells	Vascular Plant	Blue
Threaded vertigo	Invertebrate Animal	Blue
Twisted oak moss	Nonvascular Plant	Blue
Wandering salamander	Vertebrate Animal	Blue
Warty jumping-slug	Invertebrate Animal	Red
Western branded skipper, *oregonia* subspecies	Invertebrate Animal	Red
Western redcedar / common snowberry	Ecological Community	Red
Western redcedar / vanilla-leaf	Ecological Community	Red

In addition to provincial conservation status, several specific species with federal protections under Canada's *Species at Risk Act (SARA)* are known or believed to inhabit the project area. These include 8 species of plants and 9 species of animals, detailed in Table 8.

Table 8. Known occurrences of species with federal protections in JDF.[6]

Name	Type
Audouin's night-stalking tiger beetle	Animal
Banded cord-moss	Plant
Blue-grey taildropper	Animal
Coast microseris	Plant
Common sharp-tailed snake	Animal
Dun skipper	Animal
Macoun's meadow-foam	Plant
Northern painted turtle - Pacific coast population	Animal
Northern red-legged Frog	Animal
Phantom orchid	Plant
Prairie lupine	Plant
Rayless goldfields	Plant
Seaside bone	Plant
Threaded vertigo	Animal
Twisted oak moss	Plant
Wandering salamander	Animal
Warty jumping-slug	Animal

[6] B.C. Conservation Data Centre: CDC iMap [web application]. 2023. Victoria, British Columbia, Canada. Available: http://maps.gov.bc.ca/ess/sv/cdc/ (Accessed Feb 16, 2023)

Wildfire can have positive and negative relationships with biodiversity, depending on the scale of time and space. Many plants, animals, and ecological communities in JDF developed in the context of sporadic wildfire. Many plants and animals have adapted to wildfire disturbance.[7,8]. In the Salish Sea lowlands, Indigenous people used prescribed wildfire pre-colonization to maintain desirable meadow forage and food plants like camas[9,10]. In the CDF, some tree species and ecosystems have become altered through the absence of natural wildfire. For example, there is evidence that Garry Oak meadows unique to the CDF are being replaced by conifer trees due to reduced wildfire frequency, associated with modern fire suppression.[11] Wildfires can support biodiversity by re-establishing a diversity of forest ages and tree sizes, the infrastructure of diverse ecosystems, within an area. Conversely, large, high intensity fires can reduce biodiversity by destroying ecosystems and habitat features over large areas. Despite this, large fires can also play an important role in preserving the long-term health of an ecosystem by acting as a check on the proliferation of forest pathogens and other diseases of animals and trees. Because of urban development, climate change, and extensive modification of ecosystems, it is important to protect remaining reserves of high-biodiversity habitat or ecological communities from loss to wildfire when possible, or ensure wildfire affecting these areas is of a scale and intensity that supports the ecological community as a whole.

[7] Murphy, S. F., M. G. Pellatt, & K. E. Kohfeld. (2019). A 5,000-year fire history in the Strait of Georgia Lowlands, British Columbia, Canada. *Frontiers in Ecology and Evolution*. 10 April 2019.

[8] Lucas, J. D. & T. Lacourse. (2017). Holocene vegetation history and fire regimes of *Pseudotsuga menziesii* forests in the Gulf Islands National Park Reserve, southwestern British Columbia, Canada. *Quaternary Research, 79* (3)-366-376.

[9] Beckwith, B.R. (2004). The Queen Root of this Clime: Ethnoecological Investigations of Blue Camas (*Camassia quamash, C. leichtlinii*; Liliaceae) Landscapes on Southern Vancouver Island, British Columbia. PhD dissertation, University of Victoria.

[10] Turner, N. J., D. Duer, & D. Lepofsky. (2013). Plant management systems of British Columbia's First Peoples. *BC Studies*, no. 179 (Autumn 2013), 107-133

[11] Pellatt, M.G., Ze'ev, G., McCoy, M., Bodtker, K., Cannon, A., Smith, S., Beckwith, B., Mathewes, R., & Smith, D. (2007). *Fire History and Ecology of Garry Oak and Associated Ecosystems in British Columbia: Final Report for the Interdepartmental Recovery Fund Project 733.* Western and Northern Service Centre, Parks Canada.

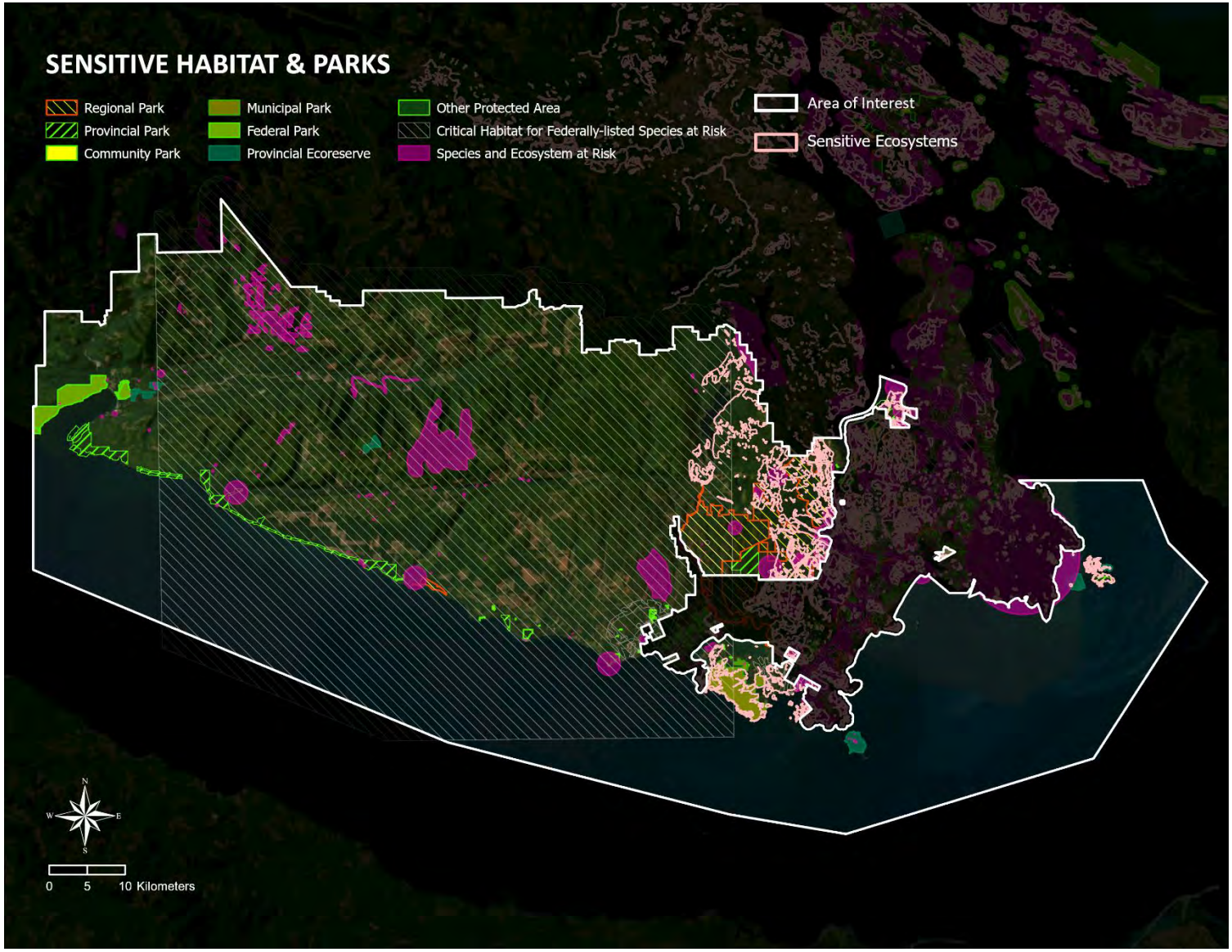

Figure 7. Protected areas and known locations of protected species or habitat.

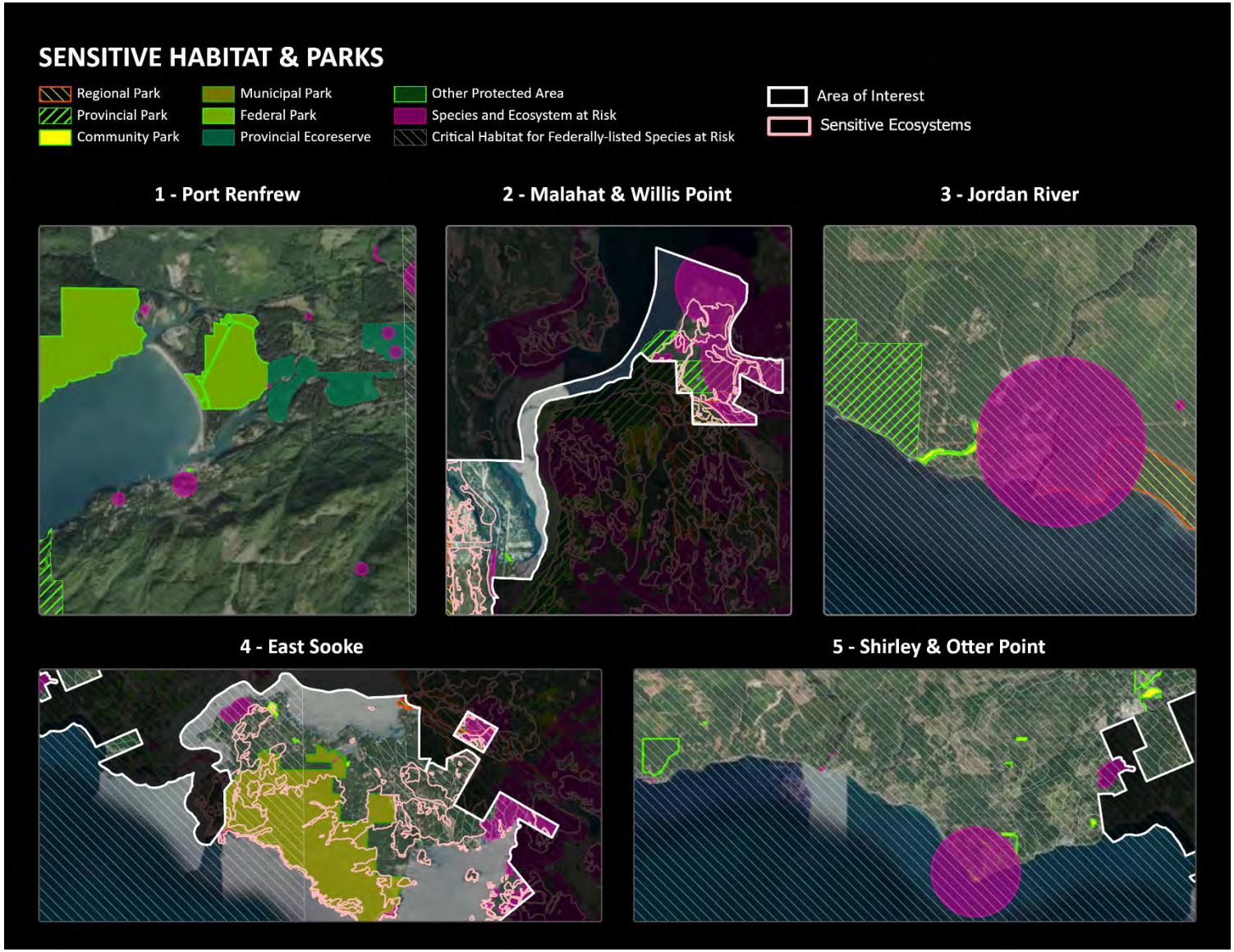

Figure 8. Protected areas and known locations of protected species and habitat near key communities.

Cultural and Archaeological Values

The landscape of JDF contains thousands of years of Indigenous history and culture. This lengthy history between Indigenous peoples and the land has fostered a relationship that continues up to the present day. The area now within JDF includes lands of the T'sou-ke, Pacheedaht, Scia'new, and Tsartlip peoples. Indigenous people have lived in this landscape since time immemorial and continue to advocate for the return of unceded lands and settlement of modern treaties which would restore parts of their territories. Actions to advance wildfire management in Indigenous traditional territory must involve local nations to include Indigenous values and stewardship priorities.

The protection of pre-colonization cultural sites is supported by the Province through the *Heritage Conservation Act*. This *Act* allows the Archaeology Branch of the Ministry of Forests, Lands, Natural Resource Operations and Rural Development to maintain a spatial database of archaeological and historical (post-colonization) sites related to Indigenous culture and history. These can include cache pits, trails, fishing sites, cooking features, lithics (stone tools), grave sites, and findings of human remains. Because of the sensitive nature of many of these sites, their locations cannot be published. Within JDF, 111 archaeological sites have been documented within provincial databases. Additional archaeological sites are likely present and known to nation members and local archaeologists. Activities with physical impacts on the land, such as fuel management, within 50 m of archaeological sites must engage a qualified archaeologist to ensure sites are adequately protected under the *Act*.

Wildfire can cause loss of cultural values by causing damage to ecosystems and soils as well as historic and archaeological remains. While physical damage to cultural sites as the result of wildfire management is unacceptable, activities like fuel modification can help preserve cultural values by reducing the likelihood of high intensity, damaging wildfire. In other cases, wildfire management activities like prescribed burning or the clean-up of fine fuels can be planned to align with or even enhance cultural values and practices.

Hazardous Values

During a wildfire, some land-uses or economic activities are associated with higher risk because they involve flammable materials, high temperature machinery, or chemicals hazardous to human health if improperly handled but are nonetheless important to the economic and social function of the community. In larger communities, hazardous values include railways, industrial facilities, gas stations, military installations, and landfills. In JDF, the most significant stores of hazardous values are likely to be fuel or other supplies located within commercial fuel stations or industrial properties. As the risks associated with storing flammable materials can never be fully eliminated, any properties with a propane tank or stores of fuel are the location of potentially hazardous values. During a wildfire, any known or unidentified location of hazardous values presents a danger to emergency responders and the public.

Other Resource Values

Wildfires can be large, landscape-scale events that create long-term impacts on sections of the economy which rely on forest resources or access to land, including eco-tourism, forest harvesting, fish and game, non-timber forest products, and mineral extraction.

A loss of mature forests to wildfire in the area would be felt emotionally by residents and visitors and may be measurable in reduced property values or tourism and overnight stays. Tourism is an important part of the community's economy, with several popular provincial park campgrounds and tourist attractions.

Forest harvesting is a major forest land use in JDF. Forestry operators are responsible for managing wildfire risk under the *Wildfire Act*. The largest private land forest companies in the area have crews trained to respond to wildfires within their tenures. Wildfire is challenging particularly for holders of small private land parcels or forest tenures, who are less resilient to landscape-scale disturbance.

Critical Infrastructure

Critical infrastructure are the publicly owned assets, whether by the CRD, the Province, local Improvement Districts, or First Nation, that underpin the health and safety of the community and allow governance to take place. Critical infrastructure also includes public assets identified in a Hazard, Risk & Vulnerability Assessment undertaken by a local government. In developing this CWRP, the CRD provided a list of facilities that are considered critical infrastructure as part of its emergency planning.

Electrical Power

Electrical power is provided to most of JDF by overhead transmission lines. The electrical distribution network relies almost exclusively on above-ground transmission lines fastened to wood utility poles. Wooden poles are vulnerable to fire, and in many locations these lines are within a few metres of forests. Power lines are also a source of ignition because branches and foliage that fall onto charged electrical lines can readily catch fire. High-voltage lines are somewhat less likely to become sources of ignition because wider rights-of-way reduce the chance of vegetation contacting charged lines. BC Hydro inspects and manages vegetation along its utility corridors.

Electrical networks can be compromised in the event of a large wildfire. Not only can wildfire ignite electrical infrastructure but burned trees can fall on lines and disrupt service. Ensuring emergency operations have access to a sufficient supply of back-up power is an important part of wildfire preparedness.

Communications Infrastructure

Primary connections to telephone and internet service in most of JDF are provided via the same overhead connections used for electrical power. Some rural residences are served by satellite telecommunications providers.

Cellular telephone service and text-based messaging services are frequently residents' primary means of communication. Cell service is provided by the three major Canadian telecommunications companies to all parts of the Electoral Area. Smaller providers may have incomplete network coverage in the area. One prominent telecommunications tower is located in East Sooke Regional Park near Mount Maguire.

Radio communication is an important part of emergency response. CRD maintains an network of amateur radio repeaters and radio rooms that provide emergency communication. Rogers communications is currently completing new cell towers with CREST service attached. Once completed, the radio network will cover most of the JDF. In northern parts of JDF, backup service is provided through satellite phones and messaging services.

Public Buildings and Facilities

A small number of institutions and public buildings are crucial for maintaining the function of government and community services. These buildings can include municipal halls or offices, physical emergency operations centres, fire halls, schools, hospitals, and transportation facilities. Ensuring the safety of public buildings and institutions during a wildfire is important for emergency response and the continuation of community recovery after an event. During an emergency, these facilities may also be used as muster locations, reception centres, or relief and supply points. Table 9 lists the facilities of critical importance to the CRD's emergency plans. This list has been developed using JDF's evacuation planning guide. Locations are show in Figure 9 and Figure 10.

Table 9. Critical infrastructure within JDF

Community	Facility or Building Name	Type	Location
East Sooke	Telus Tower	Communications	Mount Matheson
East Sooke	CREST Repeater	Communications	Mount Maguire
East Sooke	Telus, Rogers, Shaw Towers	Communications	Mount Maguire
East Sooke	East Sooke Volunteer Fire Dept.	Emergency Services	6071 East Sooke Road
East Sooke	JDF SAR	Emergency Services	1397 Copper Mine Road
East Sooke	RCMP SAR HQ	Emergency Services	6040 East Sooke Road
East Sooke	JDF EP Emergency Supplies Storage	Emergency Services	6071 East Sooke Road
East Sooke	ESS - Reception Centre	Emergency Services	1397 Copper Mine Road
East Sooke	Cheanuh Marina	Transportation	4901 East Sooke Road
East Sooke	Beecher Bay Marina	Transportation	240 Becher Bay Road
East Sooke	Wilderness Mountain Service Reservoir	Water	Cains Way
East Sooke	Wilderness Mountain Service WTP	Water	Ambience Place
East Sooke	Copper Mine Reservoir	Water	Copper Mine Road
Jordan River	JDF EP Emergency Supplies Storage	Emergency Services	12036 W. Coast Rd.
Jordan River	Jordan River Bridge	Transportation	11902 West Coast Road
Jordan River	Jordan River Diversion Dam System	Electricity	11902 West Coast Road
Jordan River	Hydro Generating Station	Electricity	11902 West Coast Road
Otter Point	JDF EA EOC	Emergency Services	#3 - 7450 Butler Road
Otter Point	Otter Point Volunteer Fire Dept.	Emergency Services	3727 Otter Point Road
Otter Point	JDF EP Emergency Supplies Storage	Emergency Services	3727 Otter Point Road
Otter Point	JDF EP Emergency Supplies Storage	Emergency Services	#3 - 7450 Butler Road
Otter Point	ESS - Group Lodging	Emergency Services	#3 - 7450 Butler Road
Otter Point	Min. of Transp. & Infrastr., Bin #19	Public Works	Blackfish Road
Otter Point	Muir Creek Bridge	Transportation	West Coast Road
Shirley	Shirley Volunteer Fire Dept.	Emergency Services	2795 Sheringham Point Road
Shirley	JDF EP Emergency Supplies Storage	Emergency Services	2795 Sheringham Point Road
Shirley	ESS - Reception Ctr & Grp. Lodging	Emergency Services	2795 Sheringham Point Road

Willis Point	Willis Point Volunteer Fire Dept.	Emergency Services	6933 Willis Point Road
Willis Point	ESS - Reception Ctr & Grp. Lodging	Emergency Services	6933 Willis Point Road
Willis Point	JDF EP Emergency Supplies Storage	Emergency Services	6933 Willis Point Road
Port Renfrew	BCEHS Station #115	Emergency Services	6645 Klannanith Drive
Port Renfrew	Port Renfrew Volunteer Fire Dept.	Emergency Services	6637 Deering Road
Port Renfrew	JDF EP Emergency Supplies Storage	Emergency Services	6637 Deering Road
Port Renfrew	ESS - Reception Centre and Group Lodging	Emergency Services	6638 Deering Road
Port Renfrew	ESS - Reception Centre and Group Lodging	Emergency Services	6633 Deering Road
Port Renfrew	Bridge	Transportation	Deering Road
Port Renfrew	Bridge	Transportation	Deering Road
Port Renfrew	Government Wharf	Transportation	17310 Parkinson Road
Port Renfrew	Port Renfrew Marina & RV Park	Transportation	7505 Gordon River Road
Port Renfrew	Pacific Gateway Marina	Transportation	17110 Parkinson Road
Port Renfrew	Butch's Wharf	Transportation	Pachidah Road @ Kalaid Street
Port Renfrew	Port Renfrew Wastewater Treatment	Water	6682 Queesto Drive
Port Renfrew	Port Renfrew Water Reservoir	Water	Wickaninnish Road
Port Renfrew	West Coast Trail Muster Point	Parks Canada	305B Pachidah Road (Pacheedaht Campgrnd)
Port Renfrew	Parks Can. Visitor Safety/Rescue Stn.	Parks Canada	16939 Tsonoqua Drive

Water Supply & Waste Treatment

Sources of freshwater are limited in the area and very few areas have shared community water service. Almost all properties rely on independent wells. A handful of subdivisions or strata developments in JDF have collective water service areas, generally relying on shared wells or reservoirs. There are few sources of surface freshwater in lakes and streams in the area, though nearby properties often have licenses to use these resources. In recent years JDF, along with other parts of coastal British Columbia, has experienced severe water shortages during the summer due to a combination of reduced summer precipitation, warmer temperatures, and increased water use.

Liquid waste is handled for most properties by septic systems. Some areas have combined sewerage services relying on collective septic fields. One exception is Port Renfrew, which does have a wastewater treatment plant and sewer system.

Wildfire has a complex relationship with water supply. Fires tend to increase surface runoff by removing insulating, absorbent organic matter at the soil surface and increasing the so-called "splash impact" of raindrops on newly exposed mineral soils[12]. This impacts the rate of groundwater recharge, as well as affecting surface water sources with sedimentation and excess mineral nutrients downslope of burned areas.[13]. There have been cases where debris flows that have damaged homes and infrastructure were attributed to wildfire damage to soils[14]. The temperature and duration of heat in the soil can also impact the rate of groundwater recharge. At low to moderate temperatures, fire can create a water repellent layer in the subsoil that restricts infiltration, while at higher temperatures this layer may form but then be weakened or removed[15,16]. In JDF, protecting the drinking water supply and existing septic systems means protecting local hydrology from the potential impacts of wildfire and erosion.

[12] Paige, G., & Zygmunt, J. (2013). The Science Behind Wildfire Effects on Water Quality, Erosion. *Living with Wildfire in Wyoming*. (p. 31-34). University of Wyoming: Laramie, WY.
[13] Emelko, M., & Sham, C. (2014). Wildfire Impacts on Water Supplies and Potential for Mitigation: Workshop Report. (p. 36). Waterloo, ON: Canadian Water Network and Water Research Foundation.
[14] Jordan, P., K. Turner, D. Nicol, & D. Boyer. (2006). Developing a risk analysis procedure for post-wildfire mass movement and flooding in British Columbia. *1st Specialty Conference on Disaster Mitigation, 23-26 May 2006, Calgary, AB, DM-013* (pp. 1-10). Montreal, QC: Canadian Society for Civil Engineering.
[15] Robichaud, P. R., J.W. Wagenbrenner, F.B. Pierson, K.E. Spaeth, L.E. Ashmun, & C.A. Moffet. (2016). Infiltration and interrill erosion rates after a wildfire in western Montana, USA. *Catena* 142 (2016) 77-88.
[16] Wieting, C., B.A. Ebel, & K. Singha. (2017). Quantifying the effects of wildfire on changes in soil properties by surface burning of soils from the Boulder Creek Critical Zone Observatory. *Journal of Hydrology: Regional Studies*. *13* (2017) 43-57.

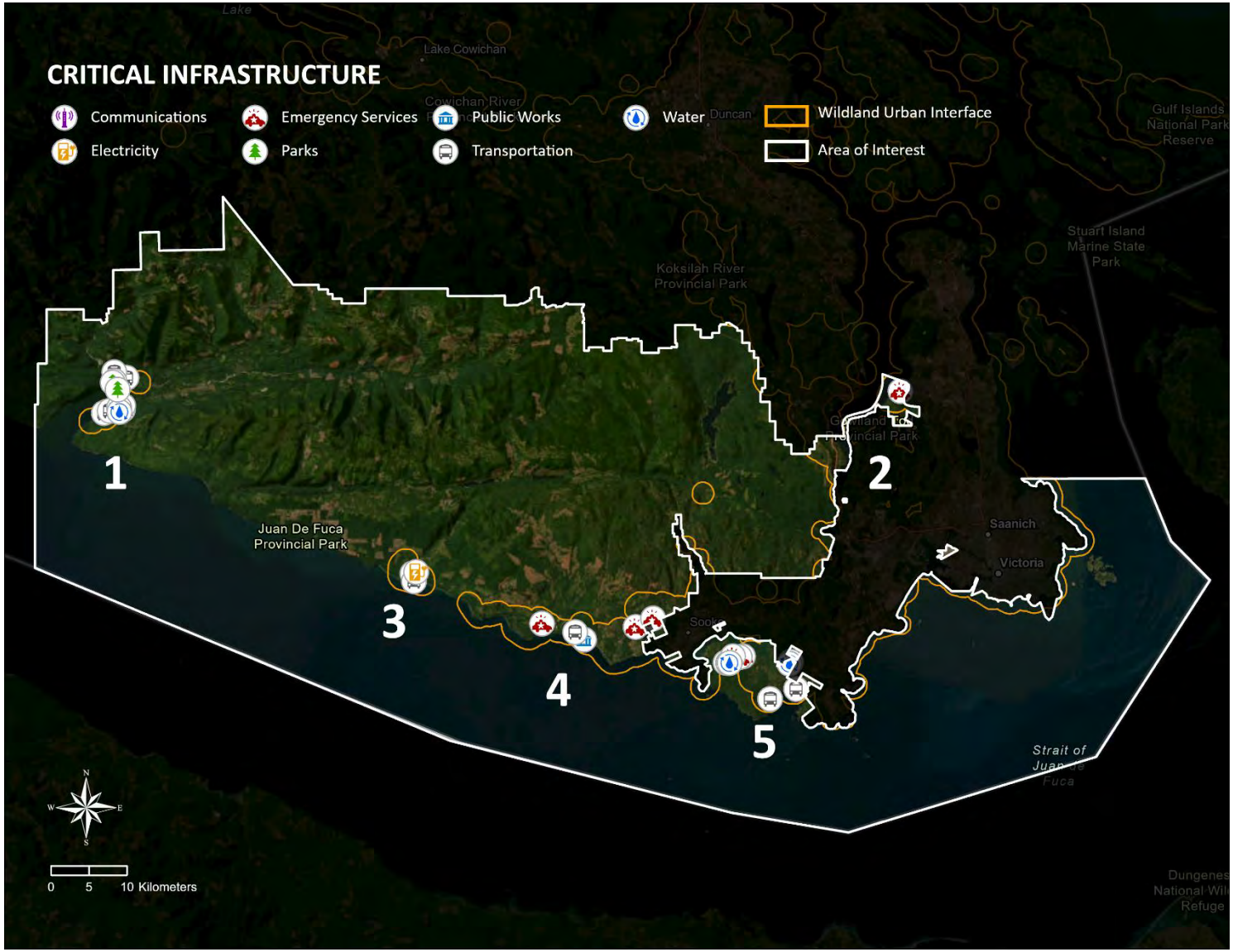

Figure 9. Public facilities considered critical infrastructure.

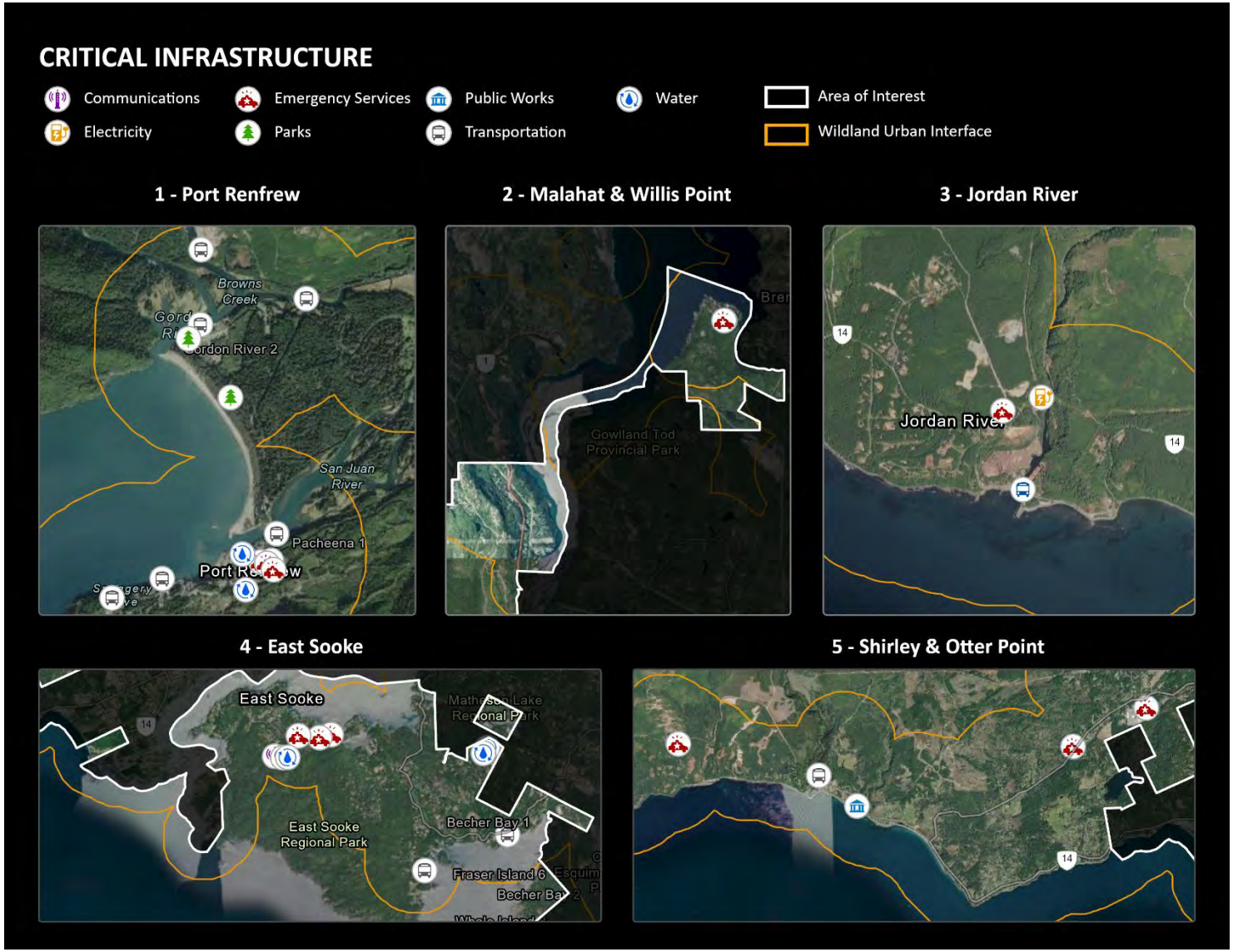

Figure 10. Public facilities considered critical infrastructure near key communities.

Wildfire Risk Assessment

Crucial to building wildfire resiliency is understanding where wildfire risk is the highest, so that investments made by the Capital Regional District (CRD) are effective, sensible, and balanced with other community values and interests.

In this Community Wildfire Resiliency Plan (CWRP), the terms ***wildfire threat*** and ***wildfire risk*** refer to different components of Juan de Fuca's (JDF) vulnerability to wildfire. Both threat and risk have been modelled using data collected from forests in JDF. Wildfire threat refers to the potential fire behaviour that a natural area could sustain. Rating wildfire threat means looking at the factors of fuel loading, type, and distribution, slope and aspect, and weather conditions. Wildfire threat has no relationship to how close a forest is to populated areas or other values. Wildfire risk builds on wildfire threat by considering the proximity of forests to populated areas and other values.

Wildfire threat is a ranking of potential fire behaviour based on fuel conditions, weather conditions, slope, aspect, and other biophysical factors.

Wildfire risk is a measure of the probability of a wildfire occurring combined with the consequences or impacts it would cause.

Wildfire Environment

This section describes the components of wildfire threat in JDF. These components are topography, forest fuels (vegetation, debris and organic soil), and weather.

Topography

Topography influences wildfire behaviour in several ways. In hills or mountains in the northern hemisphere, fuel loading is often less on south and west aspects because these are the warm aspects with higher amounts of solar exposure and consequently drier microclimates less supportive of vegetation. Higher fuel loading is found on cooler north and east aspects, which at this latitude are more protected from direct solar exposure. Conversely, southern aspects are often warmer and drier. Therefore, while warm aspects burn more frequently on average, during the most extreme fire weather cooler aspects can support more severe fire behaviour. On any considerable slope, wildfire spread is faster in the uphill direction. Hot air from a fire below will rise uphill, preheating forests above the head of the fire and drying fuels in advance of the flame. On steep slopes, flames also bathe the nearest upslope fuels to accelerate combustion. For these reasons, areas of steeper slopes are expected to have higher potential wildfire behaviour.

The terrain of JDF is diverse. Most of the electoral area is comprised of mountainous terrain reaching up to approximately 1,000 m, with mountain ranges paralleling the coast. The San Juan River forms a prominent valley near Port Renfrew in the north of JDF, with various smaller creeks and streams also forming smaller valleys throughout. Most communities in the AOI are located on slopes near the water. These vary from the relatively flat terrain in Port Renfrew, to the steeper more variable terrain of East Sooke and Willis Point.

Fuels (vegetation)

Forest fuels are the dead and living vegetation and burnable soils within JDF. Fuel conditions vary with the composition of tree species, live and dead proportions, density of understory shrubs and other plants, and other ecosystem characteristics. Fuels dominated by coniferous trees and shrubs are typically more flammable than deciduous forests due to their relatively low moisture content. Some plants produce volatile chemicals that readily burn, such as oils produced by scotch broom or gorse. Grasses burn quickly due to the large ratio of surface area to volume in their leaves, and often dieback during dry seasons in a process called curing. Deciduous broadleaved fuels, conversely, are more resistant to ignition due to their higher moisture content. Deciduous fuels may be left unburned during a wildfire that torches surrounding coniferous forests.

Forest fuels belong to one of four layers. First are ground fuels – this is the organic matter in the soil (soil carbon). Next are surface fuels, which includes all the dead branches, leaf litter, and low plants on or just above the surface of the ground. Above this, ladder fuels are the large shrubs, branches, and small trees that extend between the surface fuels and the overall height of the tree canopy. Lastly, crown fuels are the foliage, branches, and other vegetation lodged within the tree canopy.

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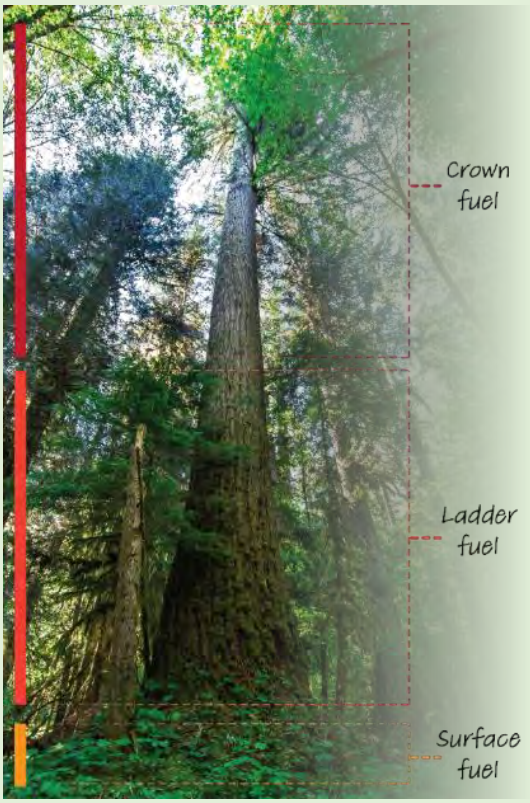

Photo 3. Forest fuel layers.

The combination of fuels from each of these layers is a strong influence on how quickly wildfire can grow and build intensity. The difference in behaviour between high intensity and low intensity fires is significant for preparedness planning and response. For example, BC Wildfire Service ground crews will action a fire burning with an intensity of more than 2,000 kilowatts per metre (kw/m). This is a measure of energy being put out by head of an advancing fire. In forested environments, fires with high intensities can climb into tree crowns via ladder fuels. If conditions are right, ignition in the tree canopy will become an active ***crown fire*** – one where fire is spreading along the ground and through the crown simultaneously. These fires consume whole forests, from the soil to the tops of the trees, send embers far ahead on the wind to light new blazes, and are too dangerous to fight directly.

Crown fire is a wildfire that involves fuels in the tree canopy. It can be "active", meaning fire is advancing through tree crowns simultaneously with surface fire spread, or "passive", meaning surface fire intensity is great enough to cause torching of single trees or small tree patches.

Photo 4. A wildfire with active crown fire. (Example from outside the CRD)

Crown fire becomes more likely where hazardous coniferous fuels have low ***vertical*** and ***horizontal separation***. Amid the amazing variety of forests, some combinations of species, sites, and climates naturally produce ecosystems that have less separation between the fuel layers (vertical separation) or neighbouring tree crowns (horizontal separation). The fuel characteristics of forests also change drastically over time as the ecosystem develops. In Canada, a standardized system of assigning real forests to 16 simplified fuel types is used to help model wildfire threat and risk. These are the fuel types of the Canadian Fire Behaviour Prediction System. Although the fuel types were developed with the rest of Canada in mind, practice in British Columbia and applied research by the Canadian Forest Service and BC Wildfire Service has resulted in several standard rules for assigning forests fuel types.

Vertical* and *horizontal separation refer to fuel distribution within a forest and are used to help classify forests into standardized fuel types.

Most native coniferous forests on southern Vancouver Island are represented by the C-5 fuel type. This represents a coniferous forest with relatively high horizontal and vertical separation of fuels, where a high intensity of surface fire would be required under normal weather conditions to create an active crown fire. As a result, C-5 forests on flat ground are typically rated to have moderate wildfire threat (potential wildfire behaviour). Young forests are typically denser and may have less separation between fuel layers and neighbouring tree crowns. In this area these forests are assigned the C-3 fuel type, which is associated with high wildfire threat. Other common fuel types in this area are M-2 (mixed wood) and D-1 (deciduous). Stands with a high proportion of deciduous trees are expected to have reduced wildfire threat. The wildfire threat in M-2 stands is significantly affected by the proportion of conifers found in them. Table 10 provides a breakdown of fuel types by total area. Figure 11 and Figure 12 show how fuel types are distributed throughout JDF.

Table 10. Summary of fuel types within JDF.

Fuel Type Name	Area (ha)	General description
C-3	358	Young conifer stands with high stem densities, generally younger than 40 years and less than 15 m in height.
C-5	6,584	Mature, low to moderate density stands of native conifers, generally over 40 years in age and over 15 m in height.
C-6	72	Conifer plantation with continuous needle litter, and no understory or shrub layer
D-1/2	3,325	Deciduous stands with fewer than 25% coniferous composition.
M-1/2	1,518	Mixedwood stands having between 25 and 75% coniferous and deciduous composition.
N	49	Non-fuel areas – pavement, rock, extensive sand.
O-1a/b	123	Grass fuel types, also used to represent agricultural fields and large lawns.
W	7,295	Bodies of water, including freshwater and the ocean.

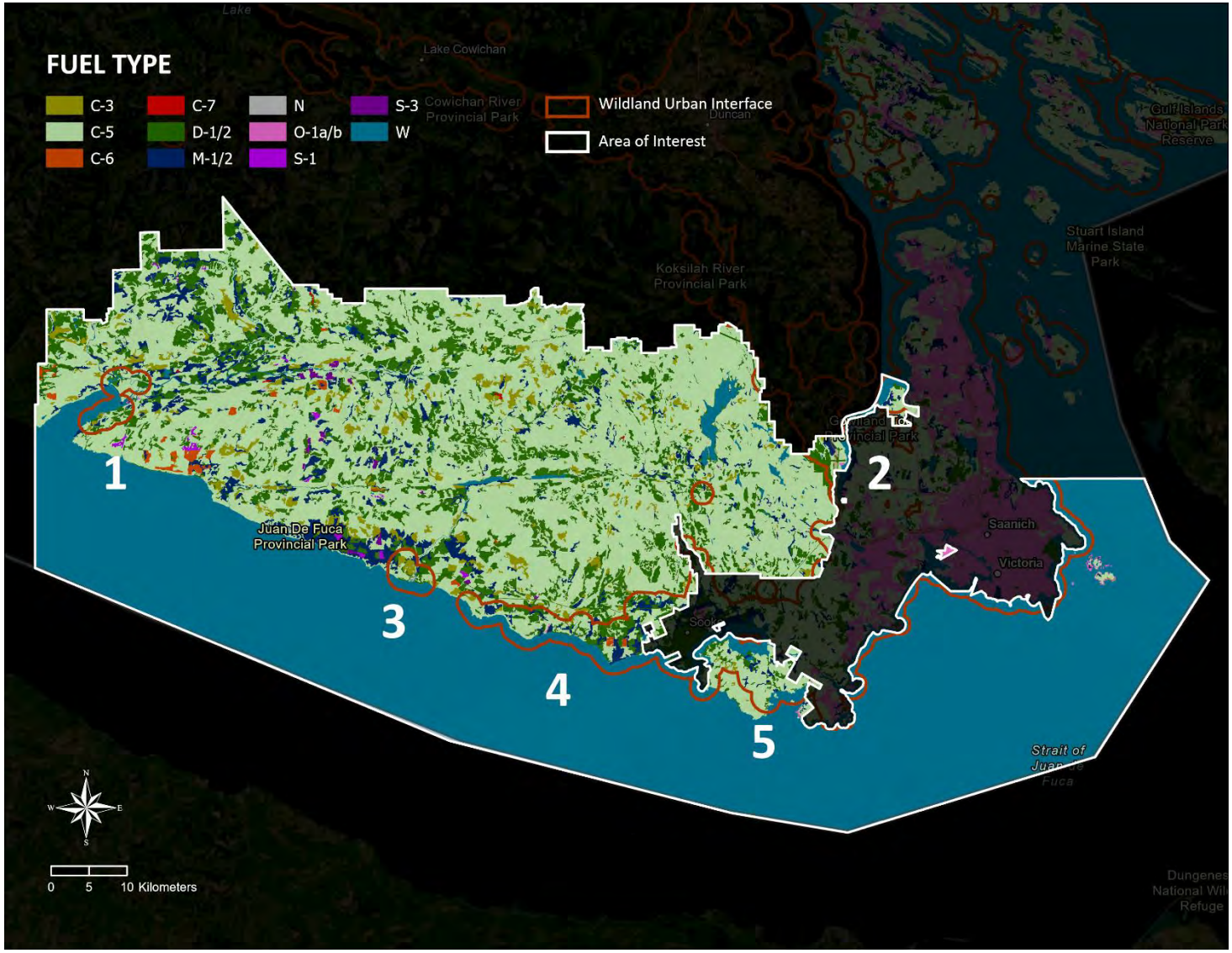

Figure 11. Fuel types in JDF.

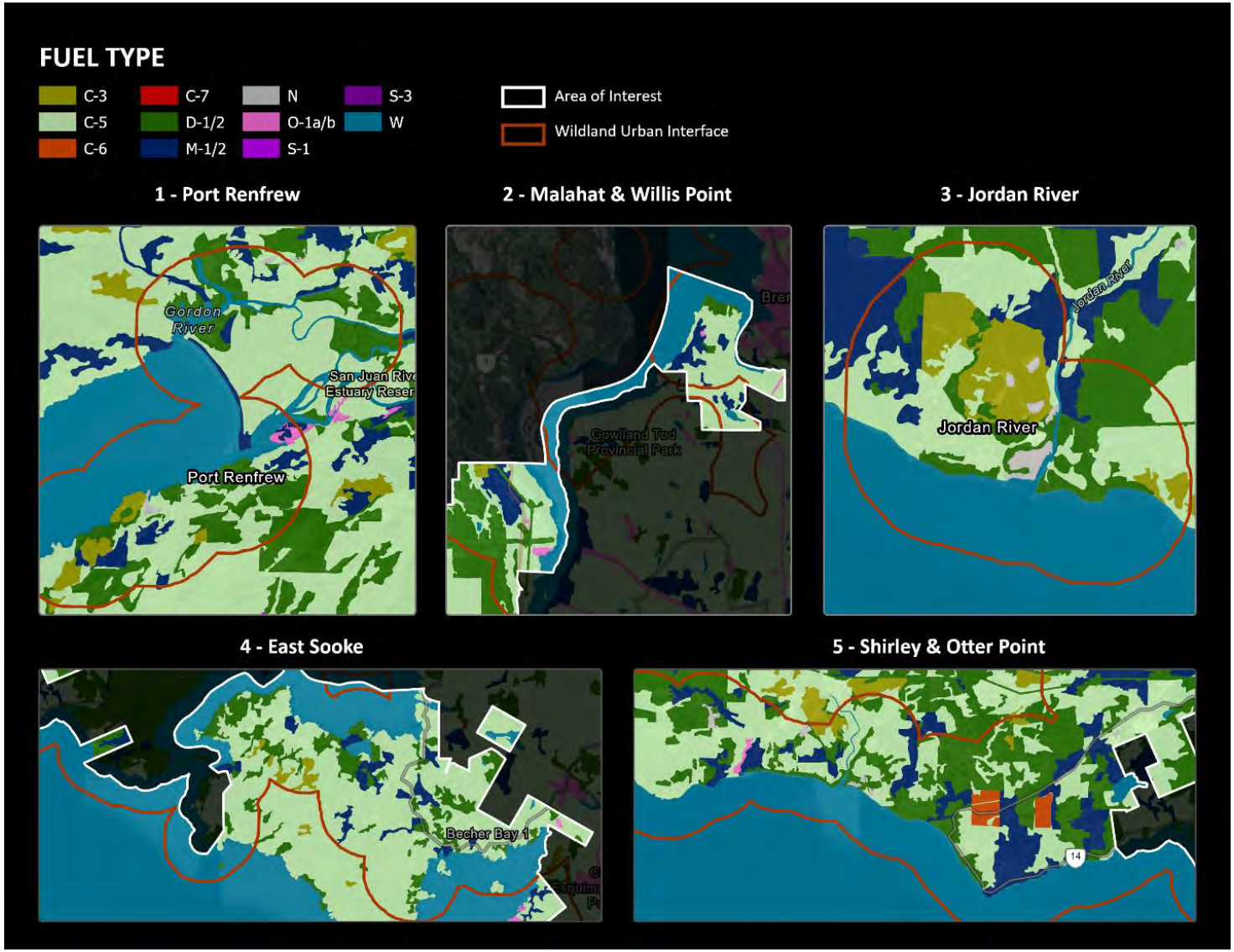

Figure 12. Fuel types in and near key communities in JDF.

Weather

Weather in JDF is strongly moderated by the Pacific Ocean. Sea breezes cool the air during the summer and increase local humidity. In this section, weather data for Jordan River are shown because of its central location in JDF. Note that the climate is variable in JDF due to the rain shadow influence of the Olympic Mountains, which yields a drier climate in areas in their lee. This affects the southern portions of JDF but does not affect northern areas such as Port Renfrew. Therefore, Port Renfrew is significantly moister than the southern areas, Average daily highs have ranged between 8°C (December) and 25°C (July & August). Most precipitation arrives in fall, winter, and spring, with sharply reduced precipitation in July, August, and September. Snow is rare and may fall only two or three times per year.

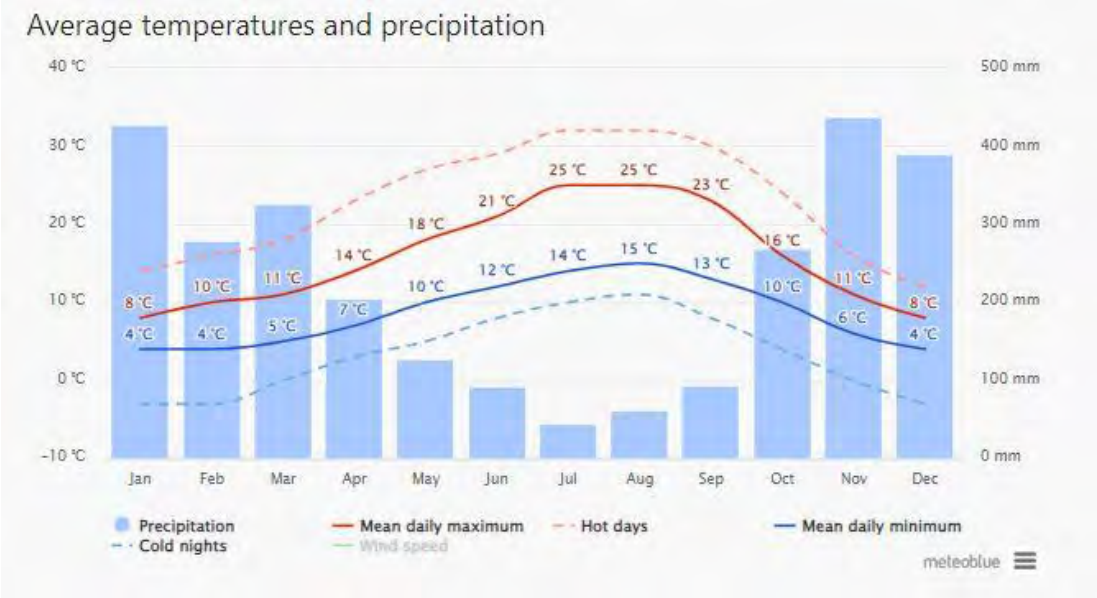

Figure 13. 30-year modelled climate averages for Jordan River (meteoblue).

Winter is the windiest time of year when the North Pacific storm track sends high winds and moisture to the area from the south. These events are often experienced in JDF as strong south-southwesterly winds. Note that local variations in terrain can significantly alter these broad winds on a local scale. Winds are subdued in the summer months when the area experiences high air pressure and mostly stable skies. The peak fire season is mostly characterized by many warm, blue days. A notable exception are the infrequent "outflow" winds, where high pressure over the BC Interior forces warm, dry air out to the coast. These events result in lower relative humidity, high temperatures, and higher winds. Further south in Washington and Oregon similar east-to-west summer airflows have been linked historically to catastrophic fire events with hundreds of thousands of hectares burned[17]. The periods of the highest wildfire danger on the south coast occur when outflow winds occur after a persistent dry spell, creating weather and fuel moisture conditions that can support high and extreme wildfire behaviour.

[17] Abatzoglou, J.T., D.E. Rupp, L.W. O'Neill, & M. Sadegh. (2021). Compound extremes drive the western Oregon wildfires of September 2020. *Geophysical Research Letters 48*(8):

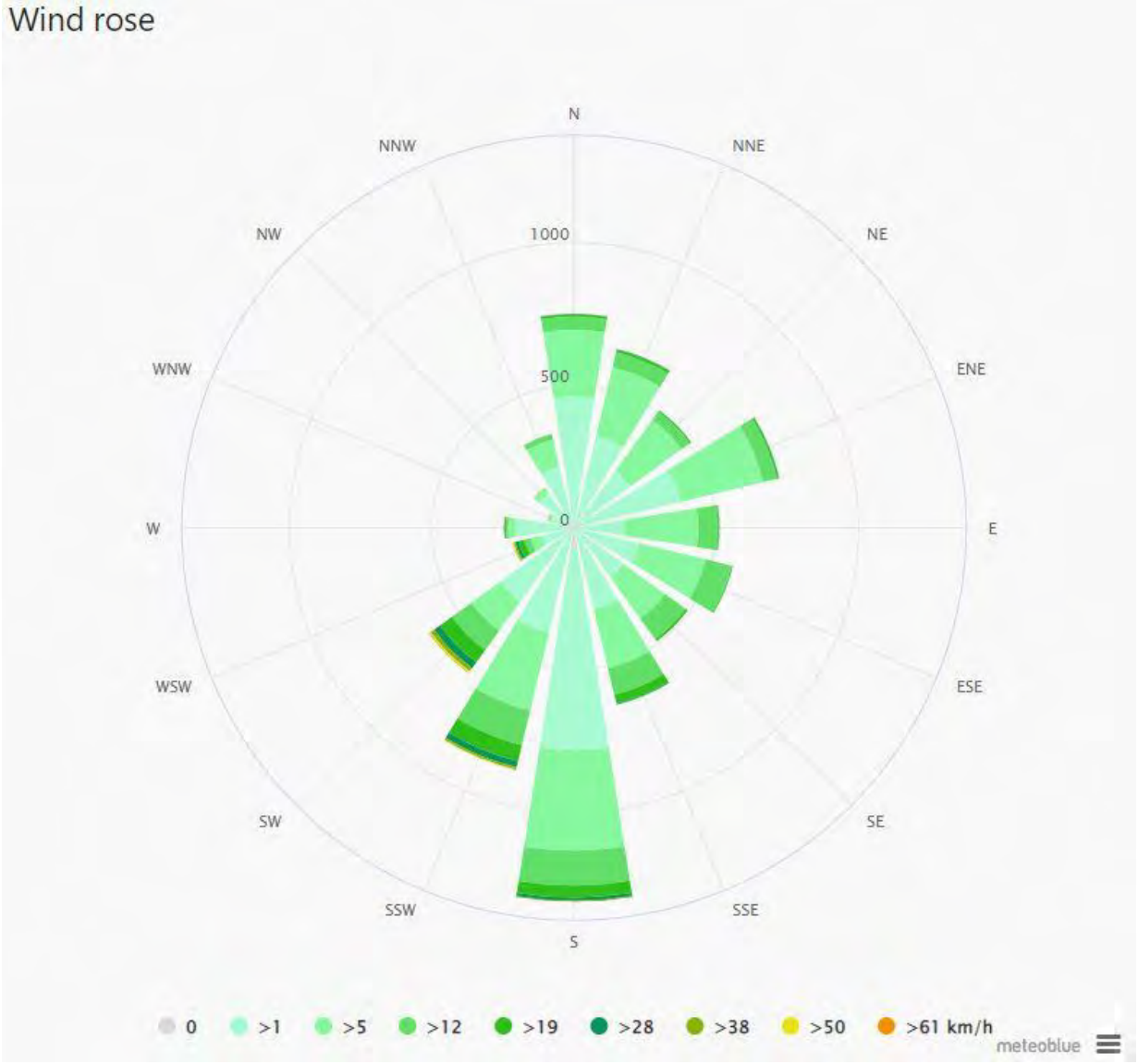

Figure 14. Wind rose diagram for Jordan River (meteoblue). The diagram shows cumulative hours (the wind rose radius) at an average windspeed from each cardinal direction during the average year (1990-2020).

Fire Weather Rating

Fire Weather Rating is the use of weather measurements to assess likely fire behaviour for a defined forecast period. The BC Wildfire Service monitors weather throughout the province. Fire weather is an essential component in most fire prediction models and is used to help determine a community's landscape level wildfire threat. In Canada, temperature, relative humidity, wind, and 24-hour precipitation are tracked daily and recombined to calculate several index components of fire weather. While these variables are tracked annually, during most of the rainy season weather measurements fail to meet thresholds for the publication of calculated fire weather indices. The Canadian Forest Fire Danger Rating System carries rules about when in the year fire weather ratings need to be updated daily so the public and emergency responders can plan activities to mitigate fire risk. This is an estimate of the fire season, which is the period in the year during which wildfire activity is reasonably foreseeable. Historically wildfire season begins May 1 and lasts until September 30.

Table 11 shows weather averages during the core fire season (May-September) for the nearest CRD weather station, which is located in the CRD watershed. Data shown covers the period between 2011 and 2021, inclusive. Comparison statistics from 2021 are presented separately to illustrate weather during a recent year with elevated fire danger. The statistics show fire season weather is characterized by an extended period of hot, dry conditions in the area. In 2021, a year that featured highly active wildfire seasons in the rest of the province, prolonged drought occurred throughout July and August alongside higher-than-average temperatures.

Table 11. Average weather (2011-2021), from 14G.

	Weather Attribute	May	Jun	Jul	Aug	Sep
2011-2021	Maximum Daily High (°C)	27.5	40.4	33.8	34.3	31.6
	Daily Average High (°C)	16.4	19.1	22.9	23.5	19.1
	Monthly Average Rainfall (mm)	44.6	29.6	11.4	19.5	88.2
2021	Maximum Daily High (°C)	22.9	40.4	32.2	34.3	27.2
	Daily Average High (°C)	15.6	22.5	25.4	23.7	18.1
	Monthly Rainfall (mm)	28.4	22.9	0	9.9	162.2

Climate Change and Wildfire Behaviour

Climate change is causing changes to temperatures and precipitation patterns that impact forest health and wildfire risk. In 2021, JDF faced a late-June heatwave that brought temperatures rarely recorded and touched off a long summer of drought. The 2021 "Heat Dome" was assessed by climate scientists to have been made 150 times more likely by human caused climate change[18]. The Pacific Climate Impacts Consortium has modelled anticipated climate impacts for each regional district in British Columbia using the RCP 8.5 (high emissions) greenhouse gas emissions scenario[19]. The CRD has translated these large scale projections down to the regional level through their own assessment in 2017. [20]The estimates present what the climate could soon look like if little action is taken to reduce greenhouse gas emissions. By the 2050s, the CRD could see annual average temperatures increase by 3.3°C. Rainfall is expected to increase by 5% annually but this increase will be uneven: summers are expected to become much drier, with a projected summer precipitation decrease of 18%. The average figures for temperature and precipitation conceal an expected increase in the frequency of extreme events, such as the June 2021 heatwave. A shift to more intense rainfall events could counterintuitively contribute to predicted dryness, because intense precipitation events more often exceed the water infiltration capacity of soils and cause increased surface runoff rather than downward recharge of soil moisture.

Predictions for warmer, drier summers are ingredients for a longer wildfire season. Patterns observed in other parts of BC and North America suggest that hotter, drier conditions are likely to result in an overall increase in wildfire frequency[21,22]. Warmer temperatures in spring and fall will extend the duration of the fire season, extending periods of high wildfire risk[23].

Climate change affects forest fuels as well as fire weather ratings. Climate change affects forest health by creating a mismatch between trees and the physical environment, which creates the conditions for outbreaks of insects and tree diseases[24]. More frequent or prolonged droughts reduce tree health and

[18] Philip, S.Y., S.F. Kew, G.J. van Oldenborgh, W. Yang, G.A. Vecchi, F.S. Anslow, S. Li, S.I. Seneviratne, L.N. Luu, J. Arrighi, R. Singh, M. van Aalst, M. Hauser, D.I. Schumacher, C.P. Marghidan, K.I. Ebi, R. Bonnet, R. Vautard, J. Tradowsky, D. Courmou, F. Lehner, M. Wehner, C. Rodell, R. Stull, R. Howard, N. Gillett, & F.E.L. Otto. (2021). Rapid attribution analysis of the extraordinary heatwave on the Pacific Coast of the US and Canada June 2021. World Weather Attribution. [Unpublished]. Accessed October 21, 2021. https://www.worldweatherattribution.org/western-north-american-extreme-heat-virtually-impossible-without-human-caused-climate-change/

[19] Pacific Climate Impacts Consortium. 2021. Plan2Adapt [Online tool]. Accessed October 21, 2021. https://services.pacificclimate.org/plan2adapt/app/

[20] Vines, G.A. (2017). *Climate Projections For The Capital Region.* Capital Regional District.

[21]Kirchmeier-Young, M.C., N.P. Gillett, F.W. Zwiers, A.J. Cannon, & F. Anslow. (2019). Attribution of the influence of human-induced climate change on an extreme fire season. *Earth's Future, 7*: 2-10.

[22] Taylor, S., Régnière, J., St-Amant, R., Spears, J., & Thandi, G. (2010). High resolution simulations of fire weather indices and wildfire risk in British Columbia with climate scenarios. Victoria: Canadian Forest Service.

[23] Abatzoglou, J., & Williams, A. (2016). Impact of anthropogenic climate change on wildfire across western US forests. *Proc Natl Acad Sci USA* 113(42):11770–11775.

[24] Woods, A. J., Heppner, D., Kope, H. H., Burleigh, J., & Maclauchlan, L. (2010). Forest health and climate change: A British Columbia perspective. *The Forestry Chronicle, 86*(4), 412-422.

vigour, also increasing susceptibility to pathogens and pests[25]. Declining forest health tends to increase forest fuel loads because it increases tree mortality and morbidity. Forest health damage agents can be biotic, like mountain pine beetle, or abiotic, like an unusual windstorm or frost. For example, in the drier biogeoclimatic zones on the south coast, the widespread decline of western redcedar has been observed due to drought stress. This has increased fuel loads in some cedar forests, particularly the fine fuel load of small branches and dropped foliage that contribute to increased surface fire intensity. At the same time, longer growing seasons may increase fuel production by allowing more photosynthesis.

Despite uncertainty about the pace of climate change and the drive toward mitigation, BC's fire season has lengthened in recent years. The moist winter climate creates high volumes of foliage and woody material which are potential fuels during summer droughts. It is reasonable to expect that climate change impacts on forest health and weather patterns will result in an increase in wildfire intensity and frequency in the JDF.

Photo 5. Forest pest outbreaks may increase with climate change, leading to increased mortality and higher fuel loading. This photo shows the results of a severe Hemlock Looper outbreak in 2021 in a CWH forest.

[25] Sturrock, R., Frankel, S., Brown, A., Hennon, P., Kliejunas, J., Lewis, K., Woods, A. (2011). Climate change and forest diseases. *Plant Pathology, 60*(1), 133-149.

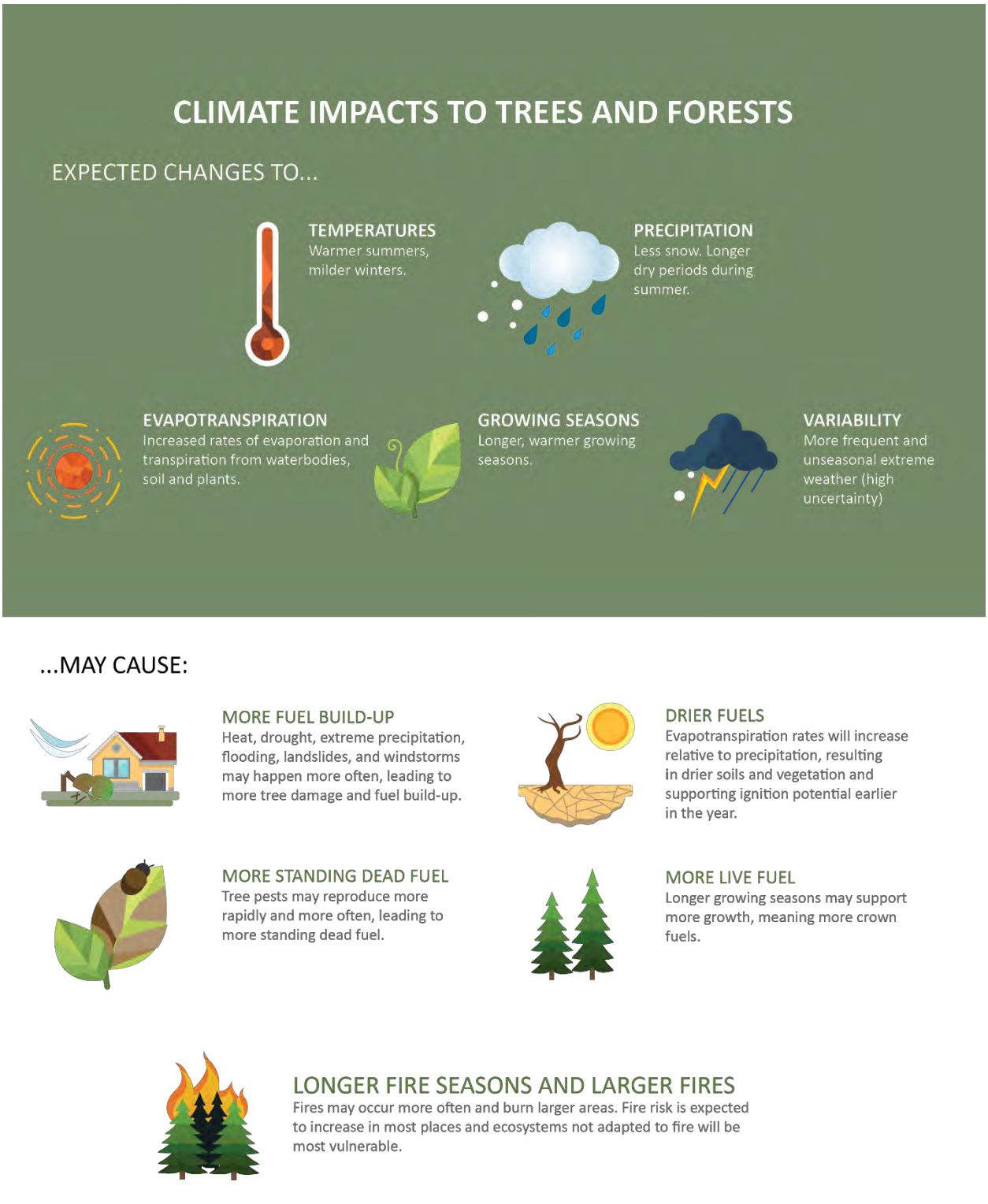

Figure 15. Potential impacts of climate change on wildfire behaviour.

Fire History

Climate and Ecosystems

JDF is within a zone of climate characterized by cool, wet winters and warm summers with long dry periods. The climate helps shape the ***biogeoclimatic ecosystem classification (BEC)*** and ***fire regime***. The BEC system is used in British Columbia to describe ecosystems by vegetation, soil, and climate. The entire province is divided into regional or landscape-scale classifications called "zones", which each present a dominant vegetation community as the result of interactions between soils, climate, and ecology. In JDF, wildfire is a disturbance that is directly related to the kind of ecosystems found here. The pattern of returning fire in the landscape is called the fire regime. Understanding fire regime helps contextualize risk in JDF and appropriate responses for management.

Biogeoclimatic ecosystem classification (BEC) is the province-wide system used to relate climate, physical geography, and plant communities.

Fire regime is the pattern of returning fire in a landscape, dependent on climate, ecological, and anthropological factors.

The wide range in climate in JDF has created a wide range of ecosystems. The influence of the Olympic Mountains of Washington creates a rain shadow in its leeward areas, which includes the areas south and east of the Jordan River area. These areas receive considerably less rainfall than areas north outside of the lee of the Olympic Mountains. For example, Port Renfrew receives 3670 mm of precipitation annually, while Willis Point and East Sooke average less than 1000 mm annually. Forests are highly influenced by precipitation, and therefore the moist forests around Port Renfrew are much different from those in the southern portions of the AOI. In turn, the natural frequency of wildfire will vary throughout the AOI.

Most of JDF is within the Coastal Western Hemlock (CWH) BEC zone, with small portions around East Sooke and Willis Point in the Coastal Douglas-Fir (CDF) BEC Zone. The CDF is the smallest BEC zone in BC. In contrast, the CWH zone is the largest BEC zone in BC, stretching from East Sooke in JDF to the province's northernmost coastal border with Alaska. Because of this range, the CWH zone has many units (subcategories) that define the climate of more localized climate types across the coast. A variety of these subcategories are found within the AOI. The ecosystems in the AOI generally get drier from north to south.

Table 12. Climate data for BEC zones in the AOI.

Biogeoclimatic Zone	Avg. Annual Precipitation (mm)	Avg. Summer Precipitation (mm)	Avg. Annual Temperature (°C)	Summer Heat to Moisture Index*
CWHvh1	2894	608	8.6	25
CWHvm1	2976	624	7.8	27
CWHvm2	3416	733	6.5	22
CWHmm1	2531	402	7.8	43
CWHmm2	3096	447	6.9	36
CWHxm2	2087	355	8.3	49
CWHxm1	1427	285	9.3	62
CDFmm	1038	198	9.8	89

* Summer heat to moisture index is the mean warmest month temperature divided by the mean summer precipitation, multiplied by one thousand.

Disturbance Regime

All ecosystems are influenced by periodic disturbances that vary in size, severity, and frequency. Examples of common disturbances include wildfire, windthrow, ice and freeze damage, water, landslides, insect, and disease outbreaks as well as human caused events such as logging. Historically, agents of disturbance were viewed as unhealthy and a threat to the integrity of the forest as a timber resource. Today, foresters and ecologists alike recognize the role of periodic disturbance in maintaining healthy and diverse forests and ecosystems.

All BEC subzones have been separated into natural disturbance types (NDT) according to the Forest Practices Code Biodiversity Guidebook. These natural disturbance types are classified into five categories based on the size and frequency of natural disturbances that occur in those ecosystems:

- NDT 1 Ecosystems with rare stand-initiating events
- NDT 2 Ecosystems with infrequent stand-initiating events
- NDT 3 Ecosystems with frequent stand-initiating events
- NDT 4 Ecosystems with frequent stand-maintaining fires
- NDT 5 Alpine Tundra and Sub-alpine Parkland ecosystems

Most of the CWH and CDF zones within the AOI are considered to belong to NDT 2 – ecosystems with infrequent stand-initiating events. This means that, before colonization, most new forests in the area would have sprouted after fires of moderate to severe intensity. "Stand-initiating" refers to the act of destruction that removes the existing forest and frees up space and resources for a new forest stand to grow in its place. Species like Douglas-fir and shore pine are relatively shade intolerant, meaning they cannot grow competitively under the shade of other trees. For this reason, some forests in JDF need stand-initiating fire disturbance to reset ecosystems and allow new trees to grow. Pre-colonization ***fire return intervals*** in coastal Douglas-fir forests are estimated to be 200 years. Fires would have been of moderate size (20 to 1000 ha) with unburned areas resulting from local geography and chance. Forests would have taken the appearance of a mosaic of even-aged stands with scattered veteran, fire-scarred trees[26]. Site-specific studies have shown through charcoal analysis that the fire interval was more frequent than 200 years in some coastal Douglas-fir forests[27, 28].

Fire return interval is the time between fires in a defined area, typically measured at the landscape scale.

Photo 6. CDF forest burned near North Cowichan, BC.

[26] Province of British Columbia. (1995). Biodiversity Guidebook. *Forest Practices Code of British Columbia*, p. 22.
[27] Murphy, S.F., M.G. Pellatt, & K.E. Kohfeld. (2019). A 5,000-year fire history in the Strait of Georgia lowlands, British Columbia, Canada. *Frontiers in Ecology and Evolution 7*(90).
[28] Lucas, J.D. & T. Lacourse. (2013). Holocene vegetation history and fire regimes of *Pseudotsuga menziesii* forests in the Gulf Islands National Park Reserve, southwestern British Columbia, Canada. *Quaternary Research 79*(2013): 366-376.

Changes in fire return interval

Ecologists believe the present landscape of Douglas-fir forests and other mixed tree species took shape in the past 4500 years, following a period of pronounced warmer climate. The influence of Indigenous land management is evident in charcoal and pollen records from the CDF zone, showing a practice of cultural burning with low severity fire that caused meadows to persist despite a cooling of the climate, more favourable to closed-canopy Douglas-fir forest[29]. These cultural burns were small fires set in the spring and fall to reduce the build up of debris in forests, clear productive meadows of new conifer trees, and enhance valuable food crops and game forage among other purposes. In fact, there are accounts from early settlers noting the use of fire in coastal areas of BC, including Sooke.[30] Indigenous burning was seen as threatening by settlers, despite settlers using fire to clear land for farming. Cultural burning was restricted by the colonial government's Bush Fire Act of 1874. This ushered in a period of increasing government control over the land base and oppression of Indigenous people and cultural practices. The 20th century was dominated by a "put-it-out" philosophy that emphasized the suppression of all fires in a bid to protect timber resource and forest communities. The effectiveness of this approach is now being questioned as British Columbia's worst fire seasons accumulate in recent decades.

Recorded fires in the project area

On the coast, large fires in recent history have been caused by human activities. Forest stands in many areas of coastal British Columbia originate after several hot, dry years between the 1880s and 1920s, during which land clearing, lumbering, railways, camping, and mining activities provided many sources of ignition[31].

The BC Wildfire Service provides information on historic fires throughout British Columbia. Wildfires not actioned by the BCWS, such as those supressed by local agencies such as fire departments or CRD watershed protection, are not included in the BCWS data. Since 1950, there have been 322 wildfires recorded by the Wildfire Service in the Electoral Area. 48 of these were classified as "nuisance fires", which are fires that did not spread to surrounding vegetation but were nevertheless called in to the Wildfire Service. 269 fires did spread to vegetation and required fire suppression, while 5 reported fires were not located.

The Wildfire Service also keeps longer reaching information on large fires. Between 1919 and 2020, 68 large fires (> 1 ha) occurred in the Electoral Area. Most of these fires occurred before 1950, with only 10 occurring since then. Additionally, only medium sized (20-100 ha) fires occurred since 1950. The largest escaped fire during this period occurred in 1926 and burned over 1500 ha in the CRD watershed. In the last hundred years, fires have burned an estimated 10,000 ha in the vicinity of the communities.

[29] Brown, K.J., N.J.R. Hebda, G. Shoups, N. Conder, K.A.P. Smith, J.A. Trofymow. (2019). Long-term climate, vegetation and fire regime change in a managed municipal water supply area, British Columbia, Canada. *The Holocene 29*(():1411-1424.

[30] Turner, N. "Time to Burn" Traditional Use of Fire to Enhance Resource Production by Aboriginal Peoples in British Columbia. In Boyd, R. (Ed.), *Indians, Fire, and the Land.* Oregon State University Press.

[31]Parminter, J.V. (1978). An Historical Review of Forest Fire Management in British Columbia. [Thesis]. Vancouver: University of British Columbia.

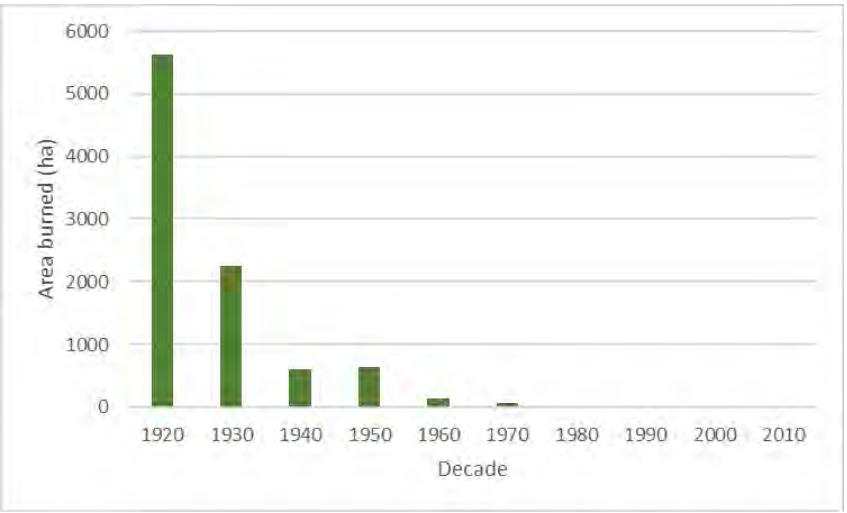

Figure 16. Area burned by decade, 1920-2020.

Human intervention in the forest, both deliberate and unintentional, has impacted the fire regime in this area. Of the fires recorded by the BC Wildfire Service since 1950, 314 have been caused by humans, 10 by lightning, and 9 are of unknown cause. Prohibition of Indigenous cultural practices, growing opposition to slash-burning in expanding communities, and effective fire suppression have all limited fire occurrence since the major fires of the early 20th century. While there are still many ignitions in the interface owing to campfires, recreation, and other human causes, most are extinguished by firefighters, community members, or unsuitable weather conditions

Table 13. Fires by cause (1950-2020). BCWS data.

Decade	Lightning	Person	Unknown
1950s	1	72	
1960s		69	
1970s	4	61	
1980s	1	27	
1990s	1	22	1
2000s		37	7
2010s	1	26	1
Total	**10**	**314**	**9**

Urban development in the forest interface has impacted forest stands by compacting soils, changing how water flows through the landscape, and opening stands to new wind and sun exposure. While these physical impacts can decrease forest health[32] and contribute to forest fuel conditions, the larger impact of urban development is to increase the potential sources of ignition within the forest by placing people, machines, and buildings – and the activities that involve sources of heat or energy, close to forest fuels. Warmer, drier conditions caused by climate change in combination with more sources of ignition are increasing the risk associated with the interface of these temperate rainforests.

[32] Zipperer, W.C. & R.V. Pouyet. (1995). Urban and suburban woodlands: a changing forest system. Syracuse, NY: United States Forest Service, US Department of Agriculture.

Provincial Strategic Threat Analysis

The Provincial Strategic Threat Analysis (PSTA) is a wildfire risk mapping exercise conducted at a provincial scale. This analysis is intended to be used as a starting point for assessments of local wildfire threat, which can then be refined and focused through a CWRP. The PSTA includes several spatial layers, including wildfire threat and fuel typing. The CWRP involves updating these components of the PSTA by integrating local weather and making field corrections to fuel typing for public land in the area of interest.

The analysis includes information and maps that describe fuel types, historical fire density, the potential for embers to land in an area (spotting impact), head fire intensity, and a final calculated wildfire threat score. Scores are then used to assign locations within the province into one of ten Fire Threat Classes. Threat Class 7 is a threshold used to describe where the most severe wildfire behaviour is expected. Areas of the province that fall into these higher classes are most in need of wildfire planning and mitigation. Areas rated as Class 7 or higher are where fire intensity, frequency and spotting can potentially cause catastrophic losses in any given wildfire season wherever ratings overlap with values at risk. Class 6 areas are also considered prone to dangerous crown fires at lower frequencies.

This analysis was completed at a coarse scale by the BCWS to allow efficient processing of large areas. The PSTA identified about half the public land as having a high wildfire threat, and half as having a moderate threat. Overall, 66% of the land in the AOI is either water or privately owned and cannot be rated by this analysis.

Table 14. Summary of wildfire threat from the PSTA

PSTA Threat Rating (class)	Area (ha)*	% of area
Extreme (9-10)	109.03	1%
High (7-8)	1,706.99	9%
Moderate (4-6)	1,679.15	9%
Low (1-3)	127.25	1%
No Data (Private Land)	5,414.59	28%
Water	7,324.45	38%

*Minor differences in area totals between PSTA data and other tables result from different data resolutions.

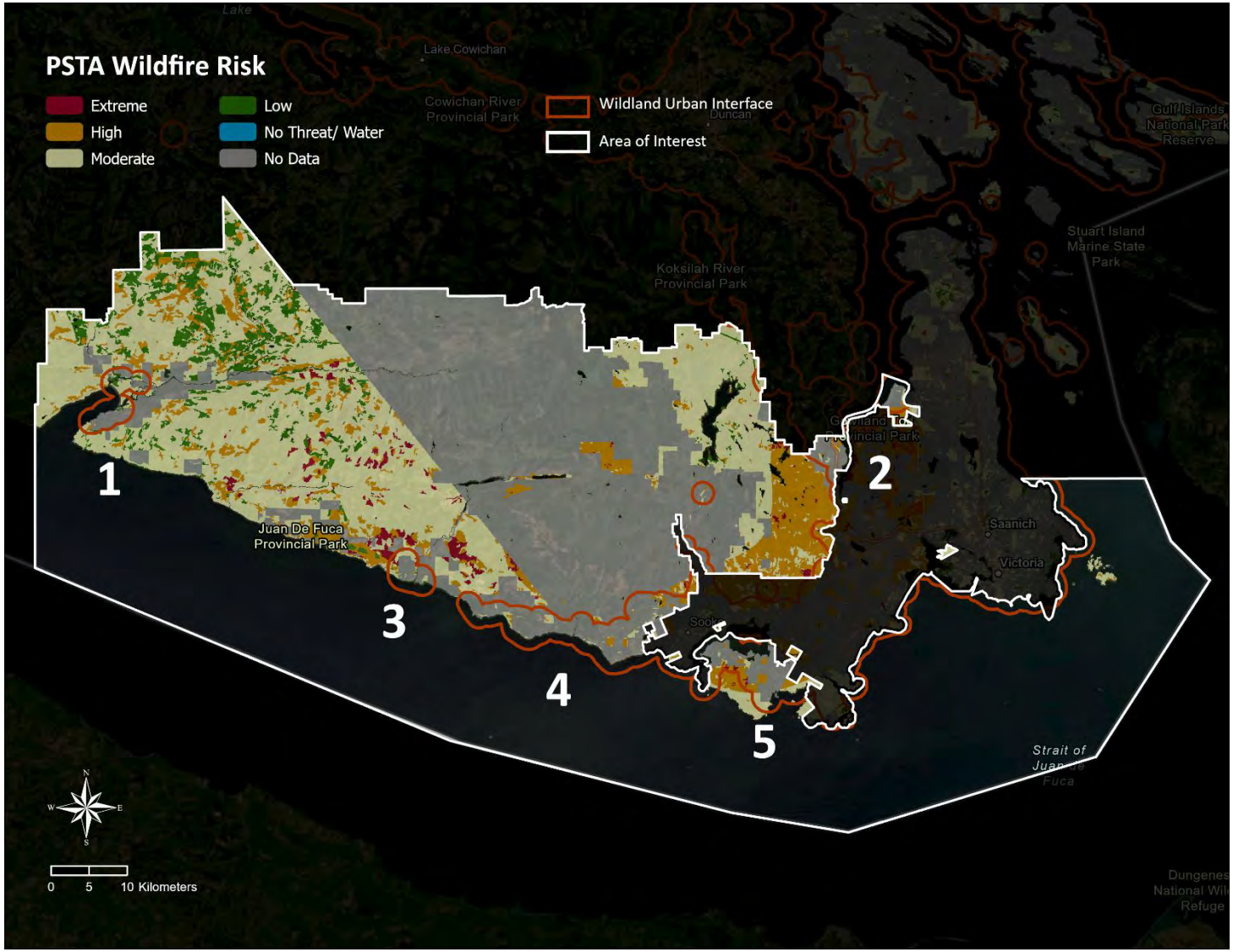

Figure 17. Wildfire threat ratings from the PSTA

Figure 18. Wildfire threat ratings from PSTA in and near key communities.

The PSTA is completed as a province-wide spatial layer with a 50-m pixel size. This tool is useful for higher-level wildfire analysis and strategic emergency planning but lacks detail to support a local analysis of wildfire risk. Errors or mismatches are often identified when focusing on a specific area within this dataset. A key component of the CWRP process is refining provincial data into a more granular local assessment.

Wildfire Risk Assessment

Field checks of provincial data on public land were completed in August 2022. The determination of local wildfire risk under the current (2022) guidance for CWRP creation uses PSTA threat rating data as a weighted input unless field assessors determine a different threat rating is more appropriate. No such areas were discovered in JDF. These site visits were focused on parcels owned, leased, or otherwise maintained by the CRD within the WUI, though other public lands were also visited. The goal of these site visits was to assess the wildfire threat, ground truth the provincial data, and identify feasible potential fuel treatment areas. Sites were identified for assessment in advance using desktop analysis which considered the following:

1. PSTA – High and Extreme wildfire threat areas
2. Structure Density – areas near high structure densities
3. Critical infrastructure – sites identified in collaboration with the CRD as critical for emergency response and governance.
4. Crown and municipal land – only public land was visited. Privately owned land was not visited.
5. Locally identified areas – areas recommended for field checks by CRD staff and fire department personnel.

Figure 19 and Figure 20 show the updated local wildfire risk.

Table 15. Summary of wildfire risk from the local threat assessment.

Wildfire Risk	Area (ha)	% of land area
Extreme	0	0%
High	130.4	1.1%
Moderate	3349.6	27.5%
Low	150.2	1.2%
Freshwater*	176.2	1.5%
No Data (Private Land)	8377.6	68.7%

*ocean water is not included in the wildfire risk summary

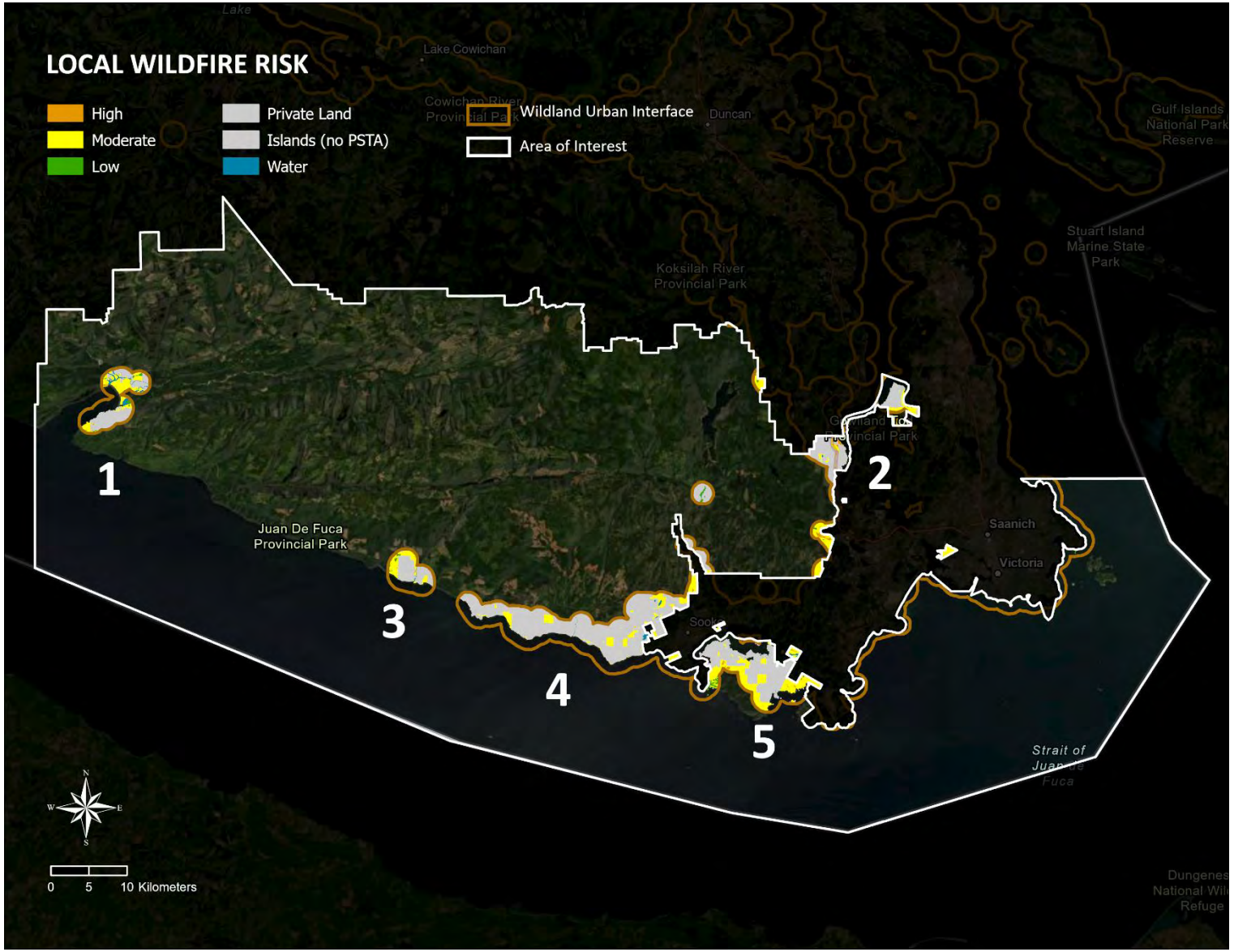

Figure 19. Wildfire threat and risk resulting from the local threat assessment.

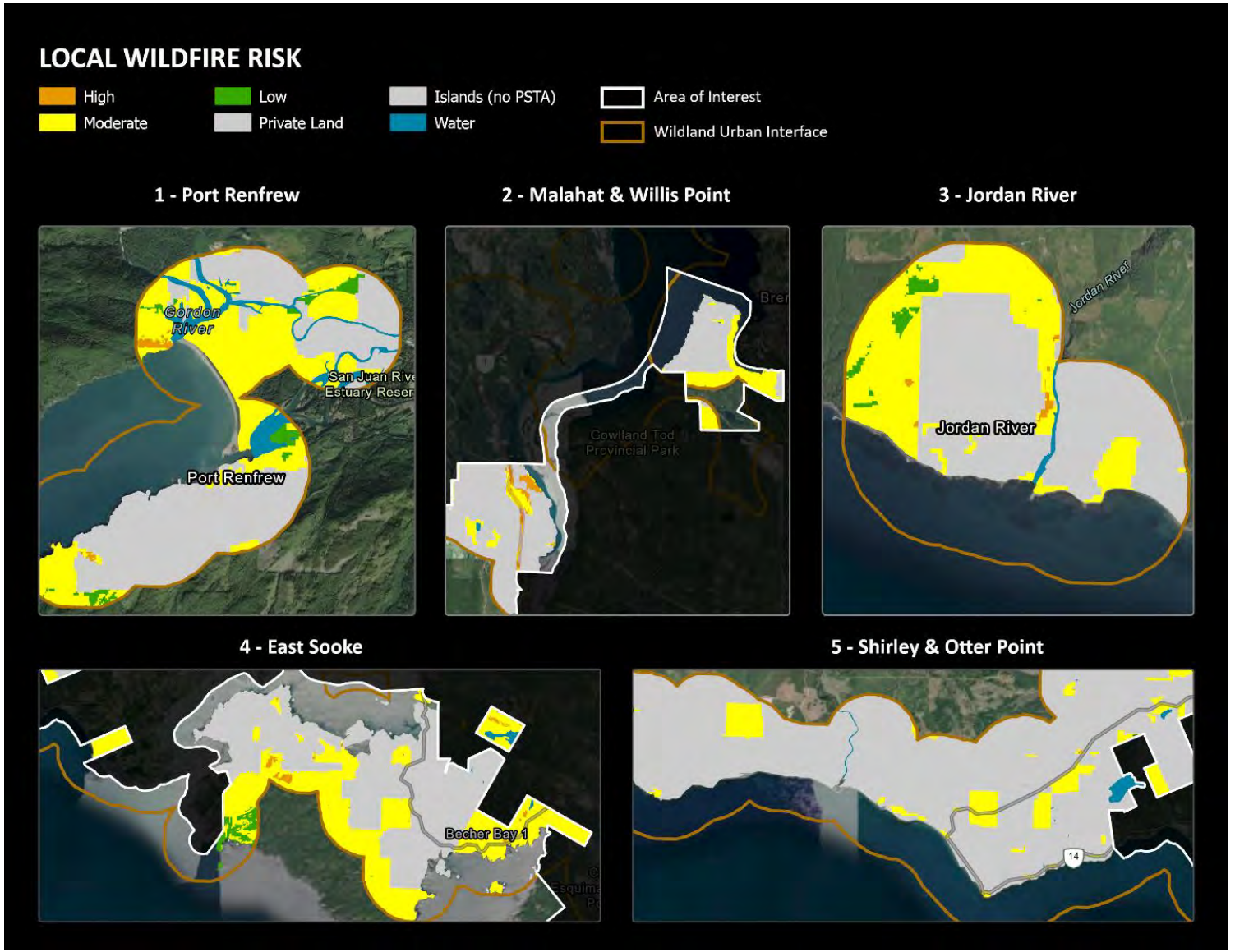

Figure 20. Wildfire threat and risk resulting from the local threat assessment near key communities.

Local Wildfire Risk Summary

Wildfire risk expresses where wildfire behaviour is expected to threaten homes and other values. Risk is estimated based on the local wildfire threat assessments and conducting a geospatial analysis, combined with modelling of expected fire spread patterns. The highest areas of wildfire risk are adjacent communities, near higher threat fuels, and downwind of typical spread patterns. For a detailed description of the wildfire risk analysis, see Appendix B: Local Wildfire Risk Process.

Wildfire risk in JDF is moderate. Destructive wildfires are possible, and control of these wildfire may be challenging for local fire departments and the BCWS. However, extreme wildfire behaviour is unlikely in most cases. The risk varies, increasing from north to south, following the climate and BEC zone gradient of JDF. The key factor driving wildfire risk is the extensive intermix development in all the communities, where most homes and values are within 100m of the forest. However, although the WUI is extensive, the area of high and extreme risk is small. This is because a majority of the forests in the WUI are older conifer forests with a moderate wildfire behaviour potential. These forests are capable of supporting fire during a typical fire season but have a reduced likelihood of supporting a fire of high intensity. These forests require extreme fire weather and ignition conditions before they are expected to support active crown fire.

High and extreme risk areas within the WUI are located in areas where fuels are near values and upwind of those values. These are forests that could support fire during typical summer conditions, and these fires would likely spread toward adjacent values. Examples of these areas include portions along the northern borders of East Sooke Regional Park and forests around the Malahat area. In contrast, isolated forests downwind of communities are low wildfire risk. This would include the forests upslope north of Jordan River.

Neighbourhoods of Higher Relative Risk

A complete understanding of risk requires us to consider factors affecting the trajectory of a potential wildfire. These include the availability of access routes to and from affected areas for the public and emergency responders, as well as the availability of water supply for firefighting and the level of training or response within communities that are geographically isolated from each other.

Almost all of the population of JDF is located near the coastline. Most winds in JDF are southwesterly, which are also on shore. This limits the landscape exposure to wildfire for most of the AOI, as wildfire will tend to spread away from the coast and away from most communities in the AOI. However, a few areas in JDF, such as East Sooke and the inland portions of Otter Point, are in fact upwind of large forested areas. These communities are the most at risk to landscape level wildfire in JDF. Other parts of JDF, while less vulnerable to landscape level conflagrations, are primarily at risk from small wildfires that may occur very near values.

Most of the communities in the AOI have limited access. Port Renfrew, Jordan River, and Shirley only have paved road access via Highway 14. There is secondary access to Port Renfrew from Duncan via Pacific Marine Road, however this narrow winding road has limited capacity. East Sooke, Malahat, and Willis Point similarly have poor access via narrow, winding access roads. East Sooke is the largest community in the AOI that only has single access, making it quite isolated despite its geographic proximity to the broader CRD.

Areas with a single point of access are at an inherently higher risk during a wildfire because secondary routes can safeguard emergency access and evacuation during rapidly changing events. Single access areas like East Sooke, Malahat, and Willis Point are mainly characterized by intermix conditions, where individual homes are surrounded by forest vegetation. The access roads themselves are surrounded by intermix fuels which could potentially compromise the access. Intermix development presents intrinsically higher risk by offering more pathways for wildfire between forest vegetation and homes.

Water supply is generally from independent wells throughout JDF. Portions of East Sooke and Port Renfrew are the only communities with hydrant coverage. The few sources of surface water in JDF are in steep sided river valleys, make drafting water for fire suppression challenging. In the event of a wildfire, which would likely correspond with periods of summer drought, water sources would be even further limited. Particular areas of concern are the higher population areas that lack water distribution, such as Otter Point, Willis Point, and the areas of East Sooke that are not part of the water distribution network.

Hazard, Risk, and Vulnerability Analysis

Hazard, Risk and Vulnerability analysis is undertaken by local governments in British Columbia as part of their efforts to develop an Emergency Management Plan. This process results in a report which rates different kinds of disasters and emergencies by their likelihood and consequence, and deals with similar concepts to wildfire threat (the potential for a disaster to occur) and wildfire risk (the consequences of that potential disaster). The CRD completed a Hazard Risk and Vulnerability Analysis for JDF in 2014. This HRVA identified wildfire as a high risk disaster event, consistent with the findings of this CWRP.

Photo 7. The HRVA identified wildfire and tsunami as the highest risk hazards in JDF.

Introduction to FireSmart

FireSmart is a nation-wide program for wildfire preparedness and prevention. Each province has established a committee to prepare FireSmart guidance for landowners, residents, developers, local government, and emergency responders to help them understand wildfire risk and preparedness concerns and to support implementing actions to manage wildfire risk. FireSmart is a system of knowledge shared throughout Canada's wildland-urban interface (WUI) – training is available for individuals to become ambassadors for wildfire preparedness in their communities.

FireSmart is organized into seven "disciplines" or topic areas which address different aspects of wildfire preparedness:

- Education (p.80)
- Legislation and Planning (p.87)
- Development Considerations (p.93)
- Interagency Cooperation (p.101)
- Cross-Training (p.104)
- Emergency Planning (p.108)
- Vegetation Management (p.112)

The following seven major sections of the Community Wildfire Resiliency Plan (CWRP) discuss each of these disciplines in turn and consider recommendations the Capital Regional District (CRD) may pursue to improve wildfire preparedness. Where available, examples of programs, initiatives, policies, or actions that fit within each discipline are provided along with further sources of information. See the Action Plan (p.122) for a summary of recommendations and suggested priorities.

The CWRP uses FireSmart terminology to discuss risk and recommendations in the community. If you are unfamiliar with FireSmart, this section provides an overview of FireSmart concepts and ideas. For additional detail, you may wish to review the resources of BC's FireSmart Committee to better understand the program's focus and language. You can find this information online at firesmartbc.ca.

FireSmart – How it Works

FireSmart programming and materials make recommendations for building and landscaping based on wildfire science. The focus of this program is on homes, but recommendations are generally applicable to any building in the WUI. During a wildfire, homes are ignited by:

- Sparks or embers landing and accumulating on vulnerable surfaces such as roofs, verandas, eaves, and openings. Embers can also land on or in nearby flammable materials such as bushes, trees or woodpiles causing a fire close to a structure.
- Extreme radiant heat from flames up to 30 m away from a structure that melts or ignites siding or breaks windows.
- Direct flame from nearby forest vegetation.

Figure 21. Pathways to home ignition in the WUI.

FireSmart assessments divide the area around the home into three “priority zones”, which radiate out from the structure and reflect the different ignition pathways.

The **Non-Combustible Zone** is the area immediately adjacent to a structure, out to 1.5 m. A non-combustible surface should extend around the entire structure and any attachments, such as decks. Creating a non-combustible surface can be as easy as clearing vegetation and combustible material down to mineral soil.

Zone 1 is the area within 1.5 and 10 m of the home or building. In this area life and property are at higher risk from radiant heat. It has been shown through analysis of recent large-scale wildfires that the most important factors in protecting structures are the exterior construction materials and immediate

landscaping next to homes[33]. FireSmart guidance emphasizes the use of non-combustible or fire-resistant building materials for decks and outbuildings along with landscaping plans that reduce the potential for direct exposure of the home to radiant heat or flame in this area. Cleaning up debris, garbage, or storage from around the home is also of primary importance in this area.

Zone 2 includes the area from 10 m to 30 m from a structure. Wildfire in forests within this zone can subject the building to radiant heat and may produce an ember shower onto the building. Forest fuels are generally treated aggressively in this area to prevent a crown fire from establishing and reduce the intensity of radiant heat and ember production. Treatments may include the removal of ground fuel, thinning of trees, and lift pruning of retained trees.

Zone 3 includes the area from 30 m out to 100 m. People and structures are at risk from ember transport associated with a wildfire in this area. FireSmart guidance in this area can recommend forest stand thinning, fuel management, and the designation of access and egress. The goal in this area is to prevent a crown fire, but the distance from the home means fuel management is generally not as aggressive as treatments in Zone 2.

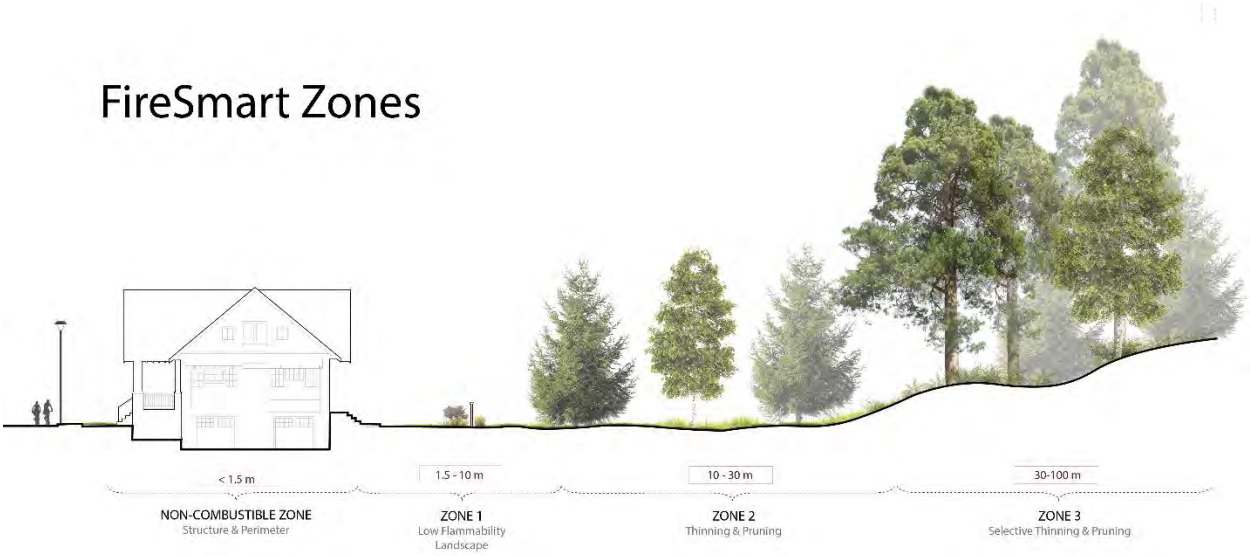

Figure 22. The FireSmart zone system.

The fire resistance of homes in the interface can be improved by achieving FireSmart standards for building materials, ignition sources and combustible fuels within each of these zones. If a wildfire does threaten the area, suppression capability is improved with good access to the interface area, defensible spaces around values, and a good water supply.

[33] Westhaver, A. 2017. Why some homes survived: Learning from the Fort McMurray wildland/urban interface fire disaster. *Institute for Catastrophic Loss Reduction* (ICLR) research paper series – number 56. (March 2017).

It is important to note that the FireSmart zones and guidance are developed at a provincial scale to provide general guidelines for mitigating wildfire vulnerability. These are not designed or intended to be a one size fits all approach, but rather a starting point for assessment and mitigation. The guidance often requires tailoring to fit specific fuel circumstances and wildfire contexts. Certain practices that may reduce wildfire risk in one ecosystem may be ineffective in other ecosystems. Standard FireSmart recommendations in the priority zones should be contextualized within the broader wildfire environment of the area. Slight deviations may be required based on site characteristics such as moisture regime and fuel loading. The guidance of a Local FireSmart Representative can assist in contextualizing traditional FireSmart guidance within the JDF forests.

Photo 8. The unique forests of coastal BC may require adjustments to traditional FireSmart guidance.

FireSmart – Goals and Objectives

The overall goal of FireSmart is to encourage private landowners to adopt and conduct FireSmart practices to minimize potential wildfire damage to life and property. Specific objectives include:

1. Reduce the potential for an active crown fire to move through private land.
2. Reduce the potential for ember transport through private land and structures.
3. Create landscape conditions around properties where fire suppression efforts can be effective and safe for responders and resources.
4. Treat fuels adjacent to structures to reduce the probability of ignition from radiant heat, direct flame contact, and/or ember transport.
5. Implement measures that reduce the probability of ignition of structures, infrastructure, and other assets.

CRD FireSmart Program

Broad regional resilience planning in the CRD electoral areas is conducted though CRD Protective Services. This department conducts meetings with local fire departments, coordinates emergency plans such has evacuation plans, disaster preparedness plans, and Hazard, Risk, and Vulnerability Analysis . This CWRP has been commissioned by CRD Electoral Area Fire and Emergency Programs, and applicability of this CWRP will be maintained by this Emergency Program.

The CRD Electoral Area Fire and Emergency Programs provides FireSmart programs throughout JDF. A majority of these are provided through the FireSmart Ambassador position. This part-time, contract position provides a variety of FireSmart services to residences within all three unincorporated electoral areas in the CRD. This includes home assessment, rebates, chipping, and education events. This program is supported by local FireSmart representatives in various local fire departments, who provide similar services where possible.

Key Aspects of FireSmart for Local Government

FireSmart is the chosen frame for the Province's support of community wildfire planning at a local government scale. The province supports local governments to prepare CWRPs and conduct other FireSmart initiatives via the Community Resiliency Investment (CRI) Program. The CRI program is administered by the Union of British Columbia Municipalities. This program allows local governments to access additional funding for wildfire risk management. The program encourages local government to:

- Update or develop a CWRP.
- Develop policies and practices for FireSmart design in public projects.
- Conduct FireSmart risk assessments on public buildings and critical infrastructure.
- Amend high-level strategic community plans to accommodate wildfire risk analysis.
- Train employees in fire management and emergency response.
- Collaborate across jurisdictions on wildfire matters.

Program requirements change each year. Requirements and guidelines for funding for the current year and recent past program years can be found on the website of the Union of British Columbia Municipalities.

The 2024 CRI intake, which occurs in fall 2023, requires communities have several initiatives in place to be eligible for fundings. CRI has signalled that these new requirements will remain for subsequent program years. These initiatives are therefore critical to building and maintaining community resiliency to wildfire, and overlap with several of the FireSmart disciplines. Applicants are required to have:

1. A current CWRP that is acceptable to the BCWS Wildfire Prevention Officer.
2. A FireSmart Coordinator position.
3. A Community FireSmart and Resiliency Committee.

These three initiatives are critical for maintaining CRI program eligibility but moreover as the strategic basis for the Regional District's programming in all seven FireSmart disciplines.

Pillars of a Community FireSmart Program

Maintaining the CWRP

Wildfire risk is not static. Forest composition changes, altering fuel conditions and wildfire behaviour potential. Climate is changing, which will likely increase the probability of severe wildfire. Finally, the composition of communities changes, often increasing values at risk in the interface. Our understanding of wildfire risk is also evolving with new understanding of the science behind fire behaviour and structure vulnerability. CWRPs therefore must be updated to ensure they remain accurate to wildfire risk and relevant to the community's context and needs. Five years is recommended as the time between plan updates to adequately monitor drivers of change and changing local needs.

Create a FireSmart Coordinator Role

Navigating all the aspects of FireSmart can be challenging for local government and private landowners. Local governments often lack the capacity to implement the FireSmart programming in addition to existing departmental responsibilities. To help with this issue, the CRI program encourages local governments to apply for term contract funding for a FireSmart Coordinator. The CRD currently has a FireSmart Ambassador responsible for all three electoral areas. This part-time position is operating beyond its capacity given the geographic size, isolation of communities, and population in the WUI in all three areas. This position is more suitable as a full-time FireSmart Coordinator, with local FireSmart representatives and ambassadors at the community or individual electoral area level. This position could be housed within the Protective Services department. This position would create new capacity for FireSmart programs and enable the CRD to have more contacts with members of the public. Hands-on tasks, such as education, assessments, and public events would remain within the scope of the FireSmart Ambassador(s) or representatives at a local level, with the coordinator providing background support. The primary responsibilities that could be assigned to this coordinator are summarised in Table 16. The CRI program has made funding available for this initiative through its FireSmart Community Funding and Supports stream.

Table 16. Potential Roles of the FireSmart Coordinator

FireSmart Activity Category	Role of FireSmart Coordinator
Education	• Support the development of a detailed communications strategy for FireSmart • Distribute FireSmart materials through community partners and online.
Community Planning	• Support neighbourhoods to apply for FireSmart Canada Neighbourhood Recognition, including by supporting facilitation and FireSmart events and demonstration projects.
Development considerations	• Comment on wildfire issues within a development permit process on behalf of the Protective Services department.
Interagency co-operation	• Coordinate FireSmart initiatives between electoral areas and external partners as applicable, such as by representing the CRD in working groups or committees.
Emergency planning	• Provide comments on wildfire issues during emergency plan and response preparation.
FireSmart Implementation	• Coordinate retrofits and vegetation management for critical infrastructure. • With homeowners' consent: o Conduct Home Ignition Zone Assessments for residential properties or homes. o Help communities develop FireSmart Neighbourhood Plans. • Coordinate chipping days or bin programs to facilitate vegetative debris disposal.
Other	• Report on program implementation, progress, and community feedback regarding FireSmart to the Emergency Planning Coordinator and Manager, Protective Services. • Prepare grant applications

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Develop a Community FireSmart and Resiliency Committee

A Community FireSmart and Resiliency Committee brings together emergency planners, first responders, and with community representatives and the CRD to plan and implement FireSmart initiatives in areas of identified need. This should be conducted at the electoral area level for JDF. FireSmart BC proposes that these committees represent a missing link for fire preparedness in British Columbia between emergency planners and fire suppression staff, and the communities they serve. The intent of developing a Community FireSmart and Resiliency Committee is to ensure that planners and emergency staff are building resiliency in the community in line with local expectations and interests. The CRI program has made funding available for this initiative through its FireSmart Community Funding and Supports stream.

The committee can be an annual or semi-annual body. Its purpose would be to act as a sounding board for the initiatives planned by the CRD with support from the BC Wildfire Service and local fire departments. It may be valuable to have some or all representatives from the authorities identified in the "factors for success", as well as additional representatives of stakeholder groups as the CRD sees fit. Additional members could include representatives of specific neighbourhoods, industries or businesses, or demographic groups.

The tasks of such a committee could include:

- Adopt terms of reference for the committee.
- Provide review of the CRD's CRI funding applications
- Suggest initiatives for inclusion in the funding applications.
- Coordinate Community FireSmart Days and advocate for FireSmart planning in priority neighbourhoods.
- Research alternate funding sources for priority projects not supported by CRI.
- Advocate for FireSmart and proposed activities among members' communities and organizations
- Provide feedback on the implementation of FireSmart initiatives in the spirit of continued learning.
- Represent the interests of a diverse community in advancing FireSmart locally.
- Liaise with the BC FireSmart Committee to provide learning and feedback on program design and availability.

The CRD's role would be to convene the committee and support its operation by providing start-up support (administration time and initial grant application) and to develop a draft Terms of Reference to be discussed during the first meeting. The structure of the committee may be served by having a multi-member executive to share responsibilities after the first meeting and avoid capacity issues in participating organizations. An executive composed of one representative from each of the East Sooke, Otter Point, Port Renfrew, Shirley, and Willis Point fire departments is recommended. Durrance and Malahat receive fire protection externally from the CRD, however representatives from either those fire departments or members of each community are welcomed. Various other CRD staff should be invited as needed, when particular initiatives may require specific department input. Quarterly meetings are recommended.

Education

Education is first among the seven FireSmart disciplines. Education is enhanced awareness of wildfire risk and prevention, which encourages individuals to act on private property while also building public support for initiatives by government. An education component is currently mandatory for applications to Community Resiliency Investment (CRI) Program grants for wildfire preparedness. The Capital Regional District (CRD) currently leads various FireSmart education initiatives in Juan de Fuca (JDF), primarily delivered through the FireSmart Ambassador.

Recommendations attached to the Education discipline are meant to promote a sense of understanding, empowerment, and eventually shared responsibility. The goal of initiatives in this discipline is to create citizens, emergency responders, and government officials who can explain and act on wildfire risk in their communities. Because over 60% of the land base in the community is privately owned, education is also the primary tool available to local government for influencing wildfire risk. By sharing the knowledge and techniques of FireSmart building and landscaping design, the CRD encourages residents to assess and address risk factors on their properties. Education is not just about emergency management personnel sharing information with residents, however. It's also about representing a vision of a FireSmart community that can inspire the CRD's own departmental operations and feature in its communications with other public authorities and First Nations.

The CRD should plan its education activities to complement existing outreach in JDF. The communities have a wealth of knowledge among dedicated individuals who are already acting to manage wildfire risk. Direct outreach should be conducted by local fire departments wherever possible, as these local departments have much more community context. The CRD can support these local organizations by coordinating education and supporting joint grant applications for FireSmart activities that further the interest of community wildfire resiliency. Local fire departments may have limited capacity for education activities. If capacity is a challenge, the CRD can provide support through Protective Services and the FireSmart Coordinator.

Factors for Success

Vision of a FireSmart community

Public engagement is one of the most challenging aspects of community wildfire planning. For public engagement to be effective, the CRD needs to reframe managing wildfire risk as a collective undertaking with community and individual benefits. The CRD needs to present a vision of FireSmart that works for the communities and still adequately represents forest character. To do this, public messaging and materials should emphasize that any action to reduce fire hazard can have value. Building a FireSmart community takes time, and a focus should be made on promoting the FireSmart process rather than a scoring outcome.

Photo 9. Education is a key part of developing a FireSmart community.

Audience for communications

A second factor in the effectiveness of education initiatives is the appropriate targeting of different audiences. The communities within JDF vary in demographics, community design, and also wildfire risk. Appropriate audiences for communications development depend on:

- **Different community areas.** Risk depends on factors like population density, community design, wildfire potential, and demographics. JDF is comprised of communities that are distinct from one another, despite some shared characteristics. In addition, some communities are more connected to the broader CRD, while others remain more isolated. FireSmart communications should be tailored to the specific community and challenges they face.
- **Age and household size.** The communities of JDF contain many families with young children while also remaining an attractive place for one- or two-person households of older retirees. Both young families and older people may face cost pressures that keep them from engaging in emergency preparedness or FireSmart initiatives. Ensuring that different groups are informed about wildfire risk is important to building resilience. Some members of these households may have difficulty with the manual labour involved in FireSmarting a property, and additional support may be required.

- **Secondary homeowners.** Many homes in JDF are vacation properties that are uninhabited for extended periods. Owners of these homes may not be as connected to local community media and communications channels, and alternative approaches should be considered.
- **CRD staff.** CRD staff in various departments work to provide services for the residents of the Electoral Area. Promoting FireSmart awareness among staff is an important part of improving policy within other departments. The CRD can work to ensure its departmental managers share the same understanding of FireSmart. CRD Protective Services can lead internal training and information sharing to ensure core personnel are familiar with the FireSmart program and principles.
- **Other jurisdictions and agencies.** The CRD is part of a web of local governments, improvement districts, and First Nations that provide administration to residents of the JDF. There may be value in continuing to liaise with other governments serving the community to develop a shared understanding of wildfire threat and FireSmart. This can involve ensuring other organizations like the independent fire departments or BC Parks are provided with the plan.

Information placement

A third factor for effective education is information placement. Both the timing and location of information provided to the public can influence the size of the audience for outreach and the impact of the information presented. Timing of active outreach should respond to the cycle of the year, with in-person contacts and community events timed to correspond with and respect the calendar of festivals, school, and summer holidays that make the community unique. Informational contacts regarding CRD projects, such as fuel management, should take place during the shoulder season when important stakeholders like the BC Wildfire Service and members of the public have more time to dedicate to their review. In addition, communication should consider when secondary homes are most likely to be occupied and consider using additional outreach such as print mail-outs to ensure engagement. Education can also be undertaken through passive outreach, through initiatives such as updating CRD webpages and informational signage in key parks. This factor also includes targeting the use of existing CRD resources wherever possible. Today, most people expect resources to be presented in digital and physical formats on request, so resources of both types should be considered. Leveraging existing resources means incorporating FireSmart information into places that are already being managed and maintained by the CRD, and can include physical locations like popular parks, or digital property like the CRD's website and social media identities. To increase the reach of emergency information during a wildfire, the CRD can continue to promote the CRD Public Alert Notification System (PANS), which is the CRD's mass emergency notification system.

Strategic communications

The final factor in successful public engagement around wildfire issues is the careful planning and documentation of a Communications Strategy for each FireSmart initiative undertaken. A strategy may be one or more documents comprising the CRD's plan to engage with specific populations or groups. The strategy can be available to the public or intended for internal use only. The purpose of such a strategy is to identify goals for an education initiative, several key messages for increasing public awareness of wildfire and FireSmart and expected outcomes of the proposed activity. Planning should be used to focus and correctly scope all CRD communications on wildfire, including printed and digital media and during in-person or online events.

Table 17. Potential key messages for a wildfire communications strategy

Potential Key Messages for Public Communications
• The communities of Juan de Fuca are set among forests, making them vulnerable to wildfires. • The wildfire risk in coastal forests during the wildfire season is real, and most forests will support wildfire of moderate intensity that may be challenging to control. • Predicted and observed climate change in the region are consistent with more aggressive wildfire behaviour. • Private landholders have a large role to play in protecting life and property by adopting FireSmart practices for building and landscape maintenance and by being knowledgeable about local emergency plans. • Wildfire preparedness is required at all levels of society, not just at the government scale. Personal and business emergency plans, preparedness, and emergency kits are necessary components of wildfire resilience. • There are resources to support private landholders and neighbourhoods in becoming more FireSmart. • The CRD can help reduce wildfire risk by strategically managing forest fuels on its land and supporting FireSmart community development.

Initiatives to Consider

Creating opportunities for passive outreach

In developing initiatives within the Education discipline, the CRD should seek to leverage its existing resources and programs where residents already come into contact with local government. Passive outreach means presenting and providing information about wildfire risk in a variety of formats that are received by residents in a self-directed fashion. The resources the CRD can use to create these opportunities include its digital and physical properties, human resources, and community liaisons.

Today, digital resources may be preferred and/or seen by more people. The Community Wildfire Resiliency Plan (CWRP) should be made public on the CRD's website. Additionally, the CRD has a dedicated public engagement platform, *Get Involved*, which is used for projects with time limited public engagement. When wildfire projects are planned, this page can include links to BCWS and FireSmart BC webpages. Additional resources that could be created are interactive maps, videos, and infographics. These resources can be advertised using the CRD's social media, or by appending a temporary completion announcement and link in outgoing CRD emails.

One of the CRD's major resources in JDF is its network of community and regional parks. The largest CRD park in JDF is East Sooke Regional Park (1433 ha), a very large forested park occupying a large portion of East Sooke. Jordan River Regional Park (187 ha) is another large, prominent park that sees frequent public use, including overnight camping. Community parks with their small trail networks are often highly used in JDF and sometimes include significant areas of forest cover. The CRD can initiate passive education by installing wildfire awareness signage and educational material in relatively high-traffic locations, including trailheads, such as those in East Sooke Regional Park. Popular recreational areas are high-visibility locations where people are already thinking about forests– this is a good opportunity to make connections between forests and fire in familiar environments.

Provincial funding requirements specifically support integrating education initiatives with other FireSmart activities, such as vegetation management. Planned fuel management or FireSmart landscaping could be used as a focus of education initiatives, with signage or self-guided tour routes developed to engage visitors to these park properties. This component of provincial funding is focused on proposed activities, so any activity-related education materials should be planned in advance and included as a part of an application for implementation funding.

Expanding access to FireSmart information and services

The CRD's FireSmart Ambassador provides home assessments throughout JDF and the Southern Gulf Islands. This large geographic area, which also includes remote island communities, can often limit capacity. Additional staff, either electoral area ambassadors or a higher level FireSmart Coordinator, drastically improves the capacity for these education initiatives, as well as administrative work related to future grant applications.

Hosting a community wildfire preparedness or clean-up day

The CRD can promote wildfire awareness while achieving FireSmart benefits simultaneously by organizing a community clean up or "Wildfire Community Preparedness Day" event. These are public events where members of the public are invited to come and conduct light work around a community park or facility while receiving information about FireSmart. Activities can include removing debris from the vicinity of buildings or pathways, pruning shrubs and bushes, removing invasive species, and raking leaves or needles. The CRD would be responsible for identifying target vegetation for the clean up and bagging and chipping or removing waste. The events can include an educational component, such as a presentation about FireSmart landscaping.

Suitable locations for such an event depend on community interest as much as with identified fuel hazard concerns. In many cases, these areas are of marginal impact to landscape wildfire risk and should therefore be combined with a program of more comprehensive fuel management. Because clean up days are focused primarily on education and demonstration of FireSmart principles in a small area, they do not follow the stricter guidance for locating areas for fuel management. High-use areas are often ideal locations because they allow for corresponding opportunities for passive outreach related to project completion. Ideally, events would be dispersed across JDF and throughout the year. Potential locations include community parks in JDF, such as Carpenter Road, Copper Mine, or Priest Cabin Community Parks.

FireSmart Canada Neighbourhood Recognition Program

There is a considerable variety in wildfire risk across JDF. However, this quantitative analysis does not fully capture the vulnerability of communities, often due to isolation or limited access. FireSmart Neighbourhood Plans are a key method to create a more focussed, neighbourhood-specific plan for mitigating wildfire risk. These plans focus on neighbourhood involvement, engagement, and education at the neighbourhood level, and can refine this CWRP to a more focussed scale.

The process starts when a neighbourhood representative contacts FireSmart Canada to organize a site visit by a Local FireSmart Representative. The Local FireSmart Representative is someone who has completed FireSmart Canada training certification to assess wildfire hazard in the wildland-urban interface (WUI) and can support the neighbourhood FireSmart planning process. Before and concurrent with hazard assessments, leading neighbours should be organizing in their community to increase participation and the number of home assessments. The end goal of this organization is the formation of a neighbourhood committee to receive the hazard assessments and steward the creation of a FireSmart Neighbourhood Plan on the advice of the Local FireSmart Representative. The Neighbourhood Plan will assess wildfire hazard on participating properties and identify actions specific to the area for improvement.

The CRD can assist with some parts of this process by applying for grant funding, as well as lending the expertise of the FireSmart ambassador and possible FireSmart coordinator for these plans. There is also funding available to offer half-day FireSmart Neighbourhood Champion training (See p. 107) for interested residents and/or distributing FireSmart material to households facing barriers to accessing this information. In areas where neighbourhood organization is underway, the CRD may be able to help facilitate a start up event by including costs on its application to the province for grant money. Criteria for providing this support should be developed so that serious initiatives with widespread interest in the community are prioritized for resources. Neighbourhoods that may make suitable sub-areas based on shared access, identity, and geographic profile are listed in Table 18. Larger communities like East Sooke and Otter Point may be broken down into smaller neighbourhoods if necessary.

Table 18. Potential sub-areas for FireSmart planning and neighbourhood initiatives.

Name	Wildfire Risk Rating*	Area Description	Fire Protection	Recommended FireSmart Activities
Port Renfrew	M	Mix of interface and intermix conditions in area. Highly isolated.	Port Renfrew Volunteer Fire Department	The CRD should liaise with representatives of each area's local fire department, some of which are actively conducting FireSmart initiatives. A Neighbourhood Plan would include communications and engagement goals and a strategy for FireSmart assessments of private property and community park lands. The plan would be led by neighbourhood committees with the CRD acting as a local government representative and providing support such as coordination with the local FDs, BC Wildfire Service, and other actors as applicable. It may be desirable to negotiate sharing efforts with local FDs, to avoid duplication. The CRD may also include eligible neighbourhood FireSmart activities in its CRI grant applications.
Shirley and Jordan River	M	Intermix conditions, isolated community.	Shirley Fire Volunteer Fire Department	
Otter Point	M	Intermix conditions.	Otter Point Volunteer Fire Department	
East Sooke	M/H	Intermix conditions, limited landscape access, adjacent large Regional Park.	East Sooke Volunteer Fire Department	
Malahat	M/H	Intermix conditions.	CVRD – Malahat Volunteer Fire Department	
Willis Point	M/H	Intermix conditions.	Willis Point Volunteer Fire Department	

**Ratings reflect modelled wildfire threat on public land in each area. Ratings are L(ow), M(oderate), H(igh), E(xtreme).*

Evacuation Alerts and Orders

During a wildfire emergency, the CRD has several means by which it will publish an evacuation alert or order. The most direct of these is the free, sign-up based CRD Public Alert Notification System (PANS). PANS lets registrants receive emergency notifications via app, SMS (text message), voice call, or email. Because it allows messages directly to user devices or emails, PANS is a crucial piece of technology for advising residents about wildfire. Placing invitations to join PANS should be part of any communications between the CRD and the public regarding this CWRP. For more information on how to register for PANS, visit the CRD PANS website.

Local authorities like the CRD also have access to the National Public Alerting System, Alert Ready. This allows authorities to provide alerts through technical infrastructure, which includes radio stations, television stations, and mobile networks. The CRD can access this service to provide evacuation alerts and orders in the event of a severe interface wildfire.

Legislation and Planning

This discipline considers the bylaws, regulations, and policies or acts of higher levels of government that create the legal environment around wildfire risk. Idea development in this section aims to address how the Capital Regional District (CRD) conducts its own business, including management of parks, waste, and infrastructure, to mitigate wildfire risk. In this section of the plan, higher-level acts and policies providing important scope to the CRD's authority and ability to regulate are discussed, as are regulatory levers at the CRD's disposal.

Federal Acts and the Community Wildfire Resiliency Plan

The Government of Canada makes laws concerning matters of national interest. Natural resources, land management, and emergency response are generally the authority of the provinces, which means relatively few federal acts and policies are directly relevant to the recommendations of this Community Wildfire Resiliency Plan (CWRP). The Government of Canada is not a significant forest landowner in Juan de Fuca (JDF).

The Federal legislation with the greatest implications on wildfire management are the acts that protect animals, plants, and ecosystems, including the *Fisheries Act* and *Species at Risk Act*. These acts confer protection by prohibiting damage and assessing penalties. Activities that remove vegetation, such as fuel management, may trigger reviews under either act if a protected species or habitat is compromised. Any fuel management prescription must consider whether federally protected species or habitats (See p. 33) will be impacted and how these impacts can be avoided. These Acts also affect how local governments apply bylaws and development permit requirements.

Provincial Acts and the Community Wildfire Resiliency Plan

The Province of British Columbia has core authority over lands, natural resources, and municipalities, making it the source of local government jurisdiction and a primary influence on forest and land management, including wildfire. Provincial legislation that affects the other FireSmart disciplines includes the *Building Act* and *Building Code*, *Emergency Program Act*, *Environmental Management Act*, *Forest and Range Practices Act, Local Government Act,* and *Wildfire Act*. Regulations under each of these enactments, such as the Open Burning Smoke Control Regulation, provide legal guidance and objectives for aspects of community development, land management, wildfire prevention, and emergency response.

Role of the CRD

The role of a regional district in wildfire risk mitigation is to manage wildfire risk within its jurisdiction in unincorporated areas. Typical areas of authority include the provision of services for waste management, including green waste or vegetation debris, community planning functions and the regulation of development, the maintenance and management of community and regional parks, the administration of bylaw enforcement, and other key areas identified by the *Local Government Act*. The CRD works mainly under a special service model and provides only those services that the elected representatives of the unincorporated areas have determined are needed and can be funded by their communities. For this reason, delivering new bylaws or additional programming may require levies or taxes to be sustainable.

The CRD also has the authority under BC's Wildfire Act to restrict open burning in Fire Protection Areas.[34] This includes open burning bans, as well as permitting requirements for open burning, as well as restricting high risk activities. The CRD is currently developing a new open burning bylaw, which will take effect in April of 2023.

Factors for Success

Ensuring public support and social equity

Changes in law or policy properly result from changes in public expectations over how the community governs itself. Therefore, education about wildfire risk and the benefits of FireSmart often precedes initiatives in other disciplines. Without public support, a change to policy or bylaw may not only fail but be unjust. Ideally, new bylaws or public policies will have widespread public support, so that policy changes reflect the whole community. It is important to consider the equity implications of new policies before they are enacted, including whether all groups impacted by a new policy have been adequately heard by the decision-making process.

Recognizing the CRD's jurisdiction

Another factor in the success of a policy initiative is recognizing the CRD's scope of authority. As discussed, the CRD operates on a special service basis within the unincorporated areas. While promoting FireSmart design is a key principle of any CWRP, the CRD's role will also rely on supporting neighbourhood and community involvement in FireSmart and leveraging CRD assets. Policy changes within the scope of the CRD's authority include adjusting policies for community planning and development review, managing the use of CRD-owned park land, and developing the capacity for bylaw or policy enforcement.

Considering the need to enforce new bylaws or policies

The enforceability of a policy or bylaw is a major part of its effectiveness. Conducting analysis before a policy change can help decision-makers think about whether contacts about non-compliance will be both manageable in terms of volume and feasible in terms of staff training and expertise. Policies that require additional investments in training or equipment to allow enforcement should be carefully considered to ensure they fit within the community's vision and goals.

[34] *Wildfire Act*, SBC 2004, c. 31.

Initiatives to Consider

Adopt restrictions on problematic activities or uses of regional park lands

The CRD may be able to reduce ignition likelihood on its public lands by adopting restrictions on use. Sources of ignition include cigarette butts, hot vehicles and motors, cooking fires, bonfires, firecrackers and fireworks, discarded items, and deliberate arson. It is important to collect information about problematic uses of park land to ensure appropriate targeting of prohibitions. The CRD's parks department should begin to identify in its service records where problematic uses occur within areas of higher wildfire threat. Improving reporting on social issues as they relate to wildfire risk is a key part of improving decision making.

Restrictions could be developed to be:

- Time dependent – in place only during periods of high or extreme fire danger
- Space-dependent – applying to locations with identified high or extreme fire risk
- Both

When designing a prohibition or ban it should be noted that fire threat shown in this plan represents the potential fire behaviour during 90th percentile fire season weather conditions. These are the days that represent periods of high or extreme fire danger, typically at the peak of summer. While worrisome, ignitions during the cool and wet parts of the year are unlikely to result in spreading wildfires. The impacts of climate change are affecting the 90th percentile weather values used to estimate potential fire behaviour, which is a reason to support cyclical review of this CWRP and consider any growth in problematic uses.

Assess wildfire hazard on CRD-owned properties

The CRD can adopt internal policies to make sure parks and CRD-owned property and facilities receive wildfire hazard assessment at an appropriate level of service.

The assessment tools for vacant land and CRD facilities vary. The highest standard is a burn probability analysis, which is a comprehensive landscape wildfire model that assessed the likelihood and potential spread rate of wildfire in a large area. This tool is most suitable for very large forested areas, such as the CRD watershed, or very assessing the entirety of large regional parks like East Sooke. For smaller forested land or sub-areas of parks, the appropriate assessment tool is the most recent provincial standards for Wildfire Threat Assessment. These assessments constitute the practice of professional forestry and should be completed by a Registered Professional Forester with the appropriate expertise. For facilities and infrastructure, the appropriate standard is likely the FireSmart Critical Infrastructure Assessment, which provides a hazard score to reflect vulnerability (risk) of the capital asset in the context of the immediately surrounding fuels. Critical infrastructure and permanent structures in parks should receive this assessment alongside stand-level wildfire threat assessment. While there is no legal requirement that FireSmart assessments be completed by accredited professionals, a Local FireSmart Representative or Wildfire Mitigation Specialist are recommended for completing these assessments.

An appropriate level of service for both kinds of assessment is the same cycle recommended for review and update of the CWRP – once every five years. New assessments exceeding this schedule are advisable if changes in forest health or the environment are believed to have adversely affected the forest fuel components of wildfire threat and FireSmart.

Conduct FireSmart assessments for publicly-owned critical infrastructure

The CRD can complete FireSmart Home Ignition Zone or Critical Infrastructure assessments as appropriate for publicly owned buildings and pieces of critical infrastructure. This is supported by the Community Resiliency Investment (CRI) program to allow local governments to develop a FireSmart program for their capital assets and emergency infrastructure. With assessments in place, the CRD could apply for implementation funding to complete re-landscaping or even exterior renovations of its facilities up to a per structure maximum of $53,500.

Some items of critical infrastructure in JDF are not owned or managed by the CRD. This includes some communications infrastructure and water supply infrastructure. The CRD should support the managers of these assets in assessing these facilities using the appropriate FireSmart assessment form. This could involve the CRD providing assessments at no cost, or including assessments as part of a larger project for all critical infrastructure.

Update the building policies to incorporate FireSmart design principles in CRD facilities

As part of a FireSmart program for its properties and critical infrastructure, the CRD should recommend that its major departments include FireSmart design principles in building and landscaping. Completed facilities are opportunities to educate members of the public about FireSmart building and landscaping techniques.

Photo 10. East Sooke Fire Hall is an example of a new facility employing FireSmart construction materials and techniques.

Create a program to reduce or eliminate green waste tipping fees for FireSmart projects

An impediment for residents to FireSmart their home's landscaping is the difficulty and expense of removing green waste. The CRD can address this challenge by providing green-waste bins at central community locations where the disposal of debris is provided free of charge for eligible materials such as small conifers and dead branches. This is typically done on individual scheduled days as an event, which can also include educational material for users. Attendance by the CRD FireSmart Coordinator is encouraged to facilitate education, as well as prevent illegal dumping of non-FireSmart related materials. This kind of initiative is supported by the CRI program.

The CRD maintains the Hartland Landfill, which is the main area for green waste disposal. Various other private facilities throughout the CRD also accept green waste. The CRD can waive tipping fees at the Hartland Landfill for the disposal of green waste from FireSmart activities. For communities with long travel times, the CRC could organize a community drop off location, then relay the waste to the Hartland Landfill. The CRI program supports this kind of application, which may involve rebating, reducing, or eliminating tipping fees. One way to ensure the connection between FireSmart and green waste would be to require residents to present a FireSmart assessment for their property when dropping off waste. Another means could be to register residents for reduced tipping fees at the time of the FireSmart Assessment and allow free loads of green waste up to a weight maximum or until a predetermined date. In either case, the Emergency and Waste and Recycling departments would need to collaborate to ensure facility attendants are given clear instructions on the eligibility and quantity of green waste for reduced fees.

Development Considerations

Role of the Capital Regional District

Community planning tools are important for building fire resiliency because they can be used to influence the design of interface and intermix areas on private property. The Capital Regional District (CRD) has authority over the use of land, zoning, and official community planning in Juan de Fuca (JDF). Land use planning in JDF is complicated by the diversity of the communities, each with their own planning context.

Bylaws that affect zoning, land use, subdivision, and construction have large impacts on the future fire safety of communities. This is why there have long been building codes in North America to ensure buildings are constructed to acceptable standards. In recent decades, attention has been placed on the design of development, buildings, and landscaping as they influence the risk of wildfire in the wildland-urban interface (WUI). The National Fire Protection Association (NFPA), a US-based international organization, has developed codes and standards for the recommended design of subdivisions and buildings in the WUI, NFPA 1141 and NFPA 1144. NFPA 1141 addresses the design of subdivisions and fire protection infrastructure at the neighbourhood scale, while NFPA 1144 considers the appropriate materials and requirements for building and landscaping on individual properties. Several municipalities in British Columbia have used these standards to integrate FireSmart development planning and enforce compliance.

FireSmart principles in the Non-Combustible Zone (0-1.5 m) and Zone 1 (1.5-10m) are often the focus of regulations in municipalities which consider wildfire hazard in their subdivision (or relevant zoning and development) bylaws. This is because in many suburban municipalities, development in the interface is characterized by small-lot residential development in which the future management of off-site areas is impractical, unfeasible, or undesirable. Guidelines for subdivision in the interface often support the creation of a “fuel-free zone” within these zones, meaning vegetation and landscaping in this area are intended to be of low flammability and non-combustible building materials are preferred.

The Ministry of Transportation and Infrastructure is the authority responsible for subdivision approvals, referring applications for subdivision to local authorities like the CRD and Improvement Districts as part of its process. The CRD is empowered to place additional requirements on the subdivision of land through its bylaws, to better suit community circumstances. Subdivision and development control in rural residential areas can support FireSmart by ensuring developments have a buffer of 10 m between homes and coniferous vegetation, adequate fire design (including turnarounds, cisterns, or local hydrant networks where warranted), and lot layout that either provides or plans for future secondary access to neighbourhoods depending on size. In more rural areas with larger lot sizes, where portions of Priority Zones 2 (30m) and 3 (100m) are also located on-site, there are benefits to maintaining FireSmart guidance for landscaping and development in these areas in addition to Zone 1. NFPA 1141 contains industry-accepted guidance on the design of subdivisions in the WUI.

Zoning and Subdivision Bylaws

Zoning

The CRD regulates land use in JDF through the Land Use Bylaw,[35] which is a single land use planning document for the entire electoral area. Zoning provisions relate to allowable land uses and buildable space on each parcel in the CRD. Zoning policies can influence the fire resilience of communities by setting rules for how development on each lot relates to the street and to neighbouring parcels. Buildings are provided with minimum setbacks by zone. This effectively establishes the distance between buildings and forest vegetation on many properties. Setbacks of no less than 10 m between buildings and the outer limit of forest vegetation enable homeowners to take action within this crucial area. Siting buildings at least 10 m away from adjacent forest vegetation can provide value to communities and support active landscape maintenance by homeowners. However, often this is not possible due to lot size, and setbacks are 0 to 4.5m in most zones.

Zoning bylaws can specify requirements on vegetation, however, none of the general regulations or general zones currently specify this guidance. The design of landscape buffers can influence wildfire risk, as common hedging species like cedar and yew are ignition hazards that should be kept at least 10 m away from buildings in the WUI.

Using zoning to guide fire-resilient community development can sometimes be inefficient. The geography of different zones may not align with an identifiable interface and is often specified more finely than guidelines for interface development need to be. This means that properties affected by a zoning amendment may not face an appreciable wildfire hazard. Even when appropriately targeted, using zoning to address community wildfire hazard can create a substantial burden of variance for non-conforming properties. This occurs where zoning amendments apply to existing developments. In new developments rezoning with new zones can reduce elements of unfairness but can lead to complicated bylaws. Typically, Development Permit Areas are a more suitable tool for addressing fire resilient community development.

[35] Bylaw No. 2040 (1992). Juan De Fuca Land Use Bylaw.

Development Permit Areas

Development Permit Areas (DPAs) are areas within a community where a local government can establish additional information needs or regulatory requirements on new development applications. In these areas, construction projects must receive a Development Permit showing that the project will meet guidelines established for the area before they can be issued a Building Permit to begin construction. DPAs can be used for a variety of purposes established by the *Local Government Act*, including protection from natural hazards such as wildfire. To be in effect, DPAs must be adopted as part of an Official Community Plan (OCP). The CRD has subdivided JDF into seven different communities, all of which have their own unique OCP.

The CRD has adopted DPAs in the OCPs for East Sooke, Malahat, Otter Point, Shirley-Jordan River, Rural Resources Lands, and Willis Point. None of the OCPs in JDF currently have a DPA for wildfire hazard. Considerations for creating such a tool are found in the following section (p. 97). Several of the current plans do make provisions for wildfire risk management in the development process:

- Malahat and Otter Point require developments to mitigate wildfire risk as part of a Natural Hazard Area Policy, generally recommending development be conducted in a manner that reduces wildfire risk.
- Willis Point requires development to meet NFPA 299 standards; however, this is an old standard that has been replaced by NFPA 1141 and 1144.
- The Rural Resource Lands requires development proposals to achieve NFPA 1144 standards. Rezoning applications will also require a report evaluating wildfire risk and recommendations to reduce that risk in the context of the development.

Subdivision

The Zoning bylaw sets out regulations for the creation of new parcels through subdivision. The regulations affect the number, size, and shape of parcels in a new development and control the standard for community services like fire hydrants. For this reason, subdivision control is a highly effective tool for ensuring new neighbourhoods or developments are set up to be FireSmart. The CRD's regulations are mostly limited in scope to the regulation of minimum parcel sizes and shapes, establishing additional requirements to the Ministry of Transportation and Infrastructure's highway standards. Amending rules around subdivision may also be more acceptable to the public than zoning changes or development permit systems (discussed below) because subdivision approvals are typically tied to new multi-lot development and not all new construction.

Subdivision review is a secondary role for the CRD. In unincorporated areas, the provincial Ministry of Transportation and Infrastructure is responsible for subdivision approvals, and reviews proposals in consultation with local governments. During this process, the CRD can provide comments on the suitability of subdivision applications and make recommendations for amendments to subdivision design to better meet community expectations from the OCP and legal requirements in the Land Use Bylaw. Applying FireSmart principles to subdivision design requires collaboration between the CRD Protective Services and CRD Planning departments. Where possible, it may make sense to request the design of more effective fuel free areas on the edges of new developments. Having good communications with the development community is an important part of this advocacy. Liaising with fire protection personnel to present a consistent voice calling for more FireSmart design can help improve the level of hazard in neighbourhoods over time.

Development Information, Development Permits, and the Official Community Plan

Development Approval Information

The BC Building Code sets the minimum acceptable standards for structures. However, the code does not contain guidance special to the development of homes and buildings in the WUI. For this reason, the *Local Government Act* provides that OCPs can contain special areas where additional regulations on development apply. There are two mechanisms available to local government under these powers. The first is "development approval information" (S. 484-487), which allows local governments to delineate areas where applicants for rezoning, development permits, and temporary use permits may be required to provide supplementary information. This can include wildfire hazard information, such as a wildfire hazard assessment of the subject property. This is one way for local governments to collect information about wildfire hazard on private land which is not available in this CWRP.

The CRD has established areas of JDF as a Development Approval Information (DAI) Area, meaning that a development application may be required to provide additional information pertinent to the approval. This includes all of East Sooke, Malahat, Rural Resource Lands, Shirley-and Jordan River, and portions of Otter Point, Port Renfrew, and Willis Point. The CRD can request additional information relevant to any policy within the Official Community Plan or in accord with any adopted bylaw. the CRD can therefore request additional information within the communities that have OCPs or any other bylaws that recognize wildfire as a hazard. This is the case in Willis Point, Malahat, Otter Point, and Rural Resources Lands, and therefore the CRD can request wildfire information for development applications in these areas. However, in East Sooke, Shirley, Jordan River, and Port Renfrew, the OCPs do not recognize wildfire as a hazard, and therefore the CRD cannot request wildfire information for development applications in these areas. In the absence of a suitable DAI mechanism, the CRD may choose to explore alternative methods of assessing wildfire risk on private land.

Development Permit Areas Implementation

The second mechanism goes beyond development approval information and allows local government to designate DPAs within the Official Community Plan (S. 488-491). Because DPAs are used to enforce special standards on design and construction, the purposes of the DPA must be justified. Many local governments in British Columbia have used these provisions to establish "Wildfire Hazard" DPAs which rely on the accepted purpose of "protecti[ng] development from hazardous conditions" stated in the *Act*.

A DPA has two core components: a map, indicating the properties to which the DPA applies, and guidelines which describe the requirements that must be met during development. Like development approval information areas, local government can also require wildfire hazard assessments on private land as a required submission for a development permit. This introduces an optional third component, professional reliance, whereby local government relies on professional hazard assessment and recommendations to adapt DPA guidelines to the circumstances of a specific property.

The DPA map will be adopted by amendment to the OCP and must show the properties within the DPA. Many communities with existing wildfire hazard DPAs distinguish their mapping between areas of high and extreme risk, and provide guidance tailored to this risk. While this approach is made possible by the mapping prepared for the CWRP, it is unlikely to provide fair or effective results in a landscape dominated by intermix conditions on private land. Another approach to mapping a wildfire hazard DPA

is to identify all properties within a buffer distance of the forest interface. Buffer distances of 100 or 200 m are commonly used to help address the risk of ember-spotting from a nearby wildfire into a neighbourhood. When designing a DPA map for wildfire risk, it is important to recognize that the level of wildfire threat changes over time as forests grow and land uses change. For this reason, it is desirable to commission specific mapping that identifies the long-term interface of the community based on the vision in the OCP.

Photo 11. Example of properties within a wildfire DPA.

Guidelines for development in the DPA must be adopted as a schedule to the OCP. Local government can set basic requirements in relation to wildfire risk respecting the character of the development, including landscaping, and the siting, form, exterior design and finish of buildings and other structures as well as restrict the type and placement of trees and other vegetation in proximity to the development. Guidelines are often based on NFPA 1144, with elements of NFPA 1141 and FireSmart adapted as needed to address outstanding issues with subdivision design and vegetation management.

If desired, local governments may require a professional wildfire risk assessment that provides site context and advice to local government on appropriate standards for design and construction, which may vary the guidelines. Codified guidelines are less flexible to site circumstances but provide greater certainty to applicants within the DPA and may be administered without requiring a professional report. Risk assessment reports can help to establish wildfire threat on private land and may improve the public acceptance of any change to development control by allowing for more consideration of individual circumstances.

DPAs, unlike subdivision control, apply to new construction as well as subdivision application. While their purpose is the same – to improve the physical environment of homes in the community as it relates to wildfire risk – DPAs allow established neighbourhoods to be renewed with FireSmart construction over time. This strategy of gradually transitioning existing communities toward FireSmart through the permitting of new construction should be carefully explained if it is promoted as a solution to long-term fire risk. Any amendment to an OCP requires a broad base of public support.

Initiatives to Consider

Amend the Official Community Plan to recognize wildfire hazard

Several OCPs in JDF do not recognize wildfire as a hazard of high likelihood and consequence in the community. Although several OCPs in JDF do recognize wildfire as a hazard, it is through different policies and addressed inconsistently. All OCPs should be amended to acknowledge the presence of wildfire as a hazard. Addressing wildfire hazard in the OCPs does not require substantial new policy; even simple recognition of wildfire as a potential event can help staff investigate wildfire hazard under DAI provisions and elevate community awareness. Each OCP should be updated individually, but with consistent policies and frameworks to include wildfire as a hazard.

Investigate using the Development Approval Information provisions to request wildfire threat assessment on private lands.

A key message of this CWRP is that wildfire threat does not stop at the border between public and private land. To improve the CRDs understanding of wildfire risk on private land, Development Approval Information provisions of the *Local Government Act* can be used to begin requesting assessments of wildfire threat as key parts of the information required to approve major developments. There are concerns with a sudden increase in the number of reports required for development. These include ensuring there is sufficient capacity to review the resulting reports internally within reasonable timeframes, setting standards for a potential “wildfire hazard information report” such as desired content, methods, professional qualifications, and working to promote the program as a reasonable and acceptable step to the development community and the general public. DAI provisions do not immediately allow the CRD to begin mandating FireSmart design on affected properties – this requires the creation of a DPA where additional guidelines for design and construction in the WUI apply. However, the “wildfire hazard information report” would symbolize the commitment of the CRD to increasing its understanding of wildfire risk on private land and could help build awareness of hazard mitigation for property owners in the interface. Requesting a “wildfire hazard information report” for any development proposed on forest land should be a standard requirement of the development approval process.

Using Development Approval Information provisions to request wildfire threat assessment on private lands is currently only possible in Willis Point, Malahat, Otter Point, and Rural Resources Lands, as their OCP’s include wildfire as a hazard. The OCPs for East Sooke, Shirley, Jordan River, and Port Renfrew do not recognize wildfire as a hazard; therefore wildfire specific information cannot be requested until the OCPs are revised as discussed above.

Provide FireSmart information as standard issue within all DP or building permit application packages.

The CRD can ensure homeowners in the interface have the information they need to develop fire-resilient design for their properties. The permit application process is the primary means for the CRD to disseminate FireSmart information and occurs at a significant time in the design process. To maximize the effect of this information the CRD could prepare a 1-sheet handout explaining the WUI and the importance of considering fire risk, with links to this report, the FireSmart homeowner's guide, and the contact information for the proposed CRD FireSmart Ambassador. This requires collaboration with Planning staff to provide all materials needed for this initiative and could also provide basic internal training to planners and front-counter staff to promote FireSmart as an "all department" initiative.

Consider how future introduction of a DPA for wildfire hazard could support community safety and resiliency.

Wildfire hazard is believed to be increasing in the CRD as climate change progresses. The widespread interface and intermix conditions in JDF place the community at an inherent risk of wildfire damage or loss. It would be valuable to adopt guidance for development in the WUI so that only resilient designs are permitted via a DPA for wildfire hazard. Moving to require new building materials, landscaping, and site servicing standards to address the natural hazard of wildfire is a multi-year process that should involve comprehensive community engagement and be started before it is needed. Introducing a new DPA to address wildfire hazard requires public confidence and widespread awareness of the condition and sources of that hazard. This is why education and voluntary FireSmart initiatives are prioritized by this CWRP, along with initiatives to improve the CRD's understanding of wildfire risk on private property.

Creation of DPA for wildfire in JDF will be a complex process, with numerous stakeholders and consultation required. Several separate OCPs will require amending to incorporate wildfire as a DPA, each requiring a unique approach that reflects the community context. In addition, the wildfire risk profile in each community varies, which may require varying requirements by community. Often the introduction of new regulations is opposed, and the CRD must provide leadership in educating community members. A DPA should be promoted as a tool that conserves a community's character by protecting it from catastrophic loss. A phased approach may be appropriate to slowly introduce DPAs to higher risk communities, such as East Sooke. A phased approach will allow the CRD to refine their process for creating wildfire DPAs, as well as to develop effective guidelines that can be used as a starting point in other JDF communities.

Interagency Cooperation

Several agencies and authorities influence wildfire in the community and work to protect Juan De Fuca (JDF) from catastrophic loss. These actors include the Capital Regional District (CRD), local fire departments, representatives of the BC Wildfire Service, First Nations, CRD departments in addition to Protective Services, and land managers like BC Parks. In many cases, these organizations already have extensive contact with each other, though not in the frame of strategic planning to manage community wildfire risk. The CRD's role as the provider of emergency management and planning services to JDF means that it can act as an intermediary between different agencies and groups that together prepare JDF for wildfire. It takes the collaborative efforts of multiple stakeholders working together to achieve a fire resilient community.

Factors for Success

Identifying Actors and Roles

Emergency response responsibilities are divided in the province. Recognizing who needs to be present during conversations about wildfire preparedness is critical. The following agencies and groups have important roles in preparing and responding to wildfire in JDF:

- **The CRD** – conducts emergency and evacuation planning, initiates and staffs Emergency Operations Centre during a wildfire, declares local states of emergency and exercises local emergency powers to direct residents out of a fire zone (under the Emergency Program Act). The CRD also manages properties in the community and regional parks system.
- **BC Wildfire Service** – before a wildfire, supports wildfire risk reduction through projects on provincial crown land and joint training; collaborates with local fire departments and local governments on FireSmart projects. During a wildfire, acts as the official first suppression response to a wildfire in areas of JDF outside local fire protection districts.
- **Local fire departments** – provide first suppression response within their fire protection areas. Conduct outreach within their communities to promote responsible fire use and control.
- **First Nations** – JDF is within several overlapping traditional territories, and also contains Reserves of the Pacheedaht First Nation Reserve. First Nations can consult emergency responders on social, economic, and cultural values threatened by fire prevention or suppression activities.
- **Parks Canada** – Manage areas within Canadian National Parks, specifically Pacific Rim National Park near Port Renfrew. Parks Canada maintains their own wildfire management program, which includes fire crews and overhead personnel, and also conducts wildfire risk mitigation within National Parks.
- **Emergency Management BC** – before, during, and after a wildfire supports local government response.
- **Ministry of Forests** – provides review and issues tenures to fuel management projects located on crown land, typically conducted through their Wildfire Risk Reduction (WRR) program.
- **BC Parks** – Manage areas within Provincial Parks, such as Juan de Fuca and French Beach Provincial Parks. The BC Wildfire Service manages wildfire response in BC Parks. Wildfire risk mitigation is done through a WRR program, however this is distinct from the MFLNRORD WRR program.

- **Ministry of Transportation and Infrastructure** – maintain public roads in unincorporated areas, responsible for subdivision approval.
- **Private land forestry companies** – provide fire hazard abatement as mandated under the *Wildfire Act* to their properties. Sometimes provide firefighting support to BCWS on contract during fire seasons.

Not all of these agencies will be relevant to every discussion in a community about fire resiliency. The CRD should strive to maintain positive relationships with representatives of these organizations and more. Matching issues and interested parties can be part of any communications plan for FireSmart initiatives led by the CRD.

Regular Communications Through a Semi-Annual or Annual Meeting

While most of these organizations communicate with each other, there is not currently a schedule for these communications or a shared sense of strategic planning for wildfire among all organizations. There is an annual JDF specific wildfire meeting in preparation of wildfire season, however this meeting currently focuses on operations rather than strategic wildfire resilience planning. FireSmart and the BC Wildfire Service recommend the organization of a working group or committee for fire resiliency that meets on at least an annual basis, such as in advance of the wildfire season. Establishing regularity of communications builds trust among organizations and helps promote momentum for fire preparedness planning. These meetings can occur as part of the regular community level FireSmart and resiliency committee meetings, or be expanded to a regional JDF Community FireSmart and Resiliency Committee.

Setting Expectations for Interagency Cooperation

With so many actors involved in emergency response, it is important to set goals, scope, and limitations on any regular communications. This is largely the goal of any regular committee or working group established to bring representatives of the different emergency responders and land managers together. A committee charter can be used to establish the rules and organization of a working group's activities and acts as a contract between partners to build trust and promote coordination of emergency planning functions.

Initiatives to Consider

Advocate for an Interagency Fire Response and Preparedness Working Group

A wildfire working group would serve as an annual meeting to discuss wildfire management across the CRD, including internal and external agencies or departments responsible for wildfire management. The purpose of this group would be to ensure effective relationships are in place in advance of wildfire events, which in turn would ensure an effective coordinated response. This could also be a forum to discuss interagency events, such as tabletop planning exercises. In addition, this group would also facilitate collaboration on regional FireSmart initiatives. This could include joint fuel management projects between levels of government, or ensuring participation in education events by various wildfire management agencies. Possible participants in this working group are CRD Protective Services, local fire departments, local First Nations, the BCWS, and BC Parks.

The CRD is well positioned to coordinate such a meeting because of its existing relationships with the fire departments and role as the primary local government for unincorporated areas. CRD Emergency Programs acts as a key liaison between local fire departments and other CRD departments, as well as external agencies such as BCWS and Parks Canada. Staff from this department are the logical hosts and coordinators for the Interagency Fire Response and Preparedness Working Group. Recommended timing for meetings would be annually before wildfire season.

Provide cultural sensitivity training to better partner with Indigenous communities

Ensuring that all communities receive an equitable standard of service and care during a wildfire is an important public duty. Approximately 5% of the population of JDF self-identified as Indigenous ("aboriginal identity") on the latest Census[36]. As a discipline involving land management, wildfire prevention can affect Indigenous cultural values, and Indigenous peoples should be involved in the planning of vegetation management. This is particularly relevant with prescribed burning, which may benefit from including a cultural component to reflect the history of Indigenous burning in the area. JDF also contains several known sites of archaeological value and many dozens more of continuing cultural significance. Ensuring emergency responders are trained to provide culturally sensitive assistance to Indigenous residents during a wildfire and to have positive proactive relationships with representatives of Indigenous nations is an important aspect of reconciliation.

CRI supports providing cultural safety and humility training to emergency management personnel involved in both wildfire prevention and suppression. The CRD could provide staff members in its Emergency Operations Centre with this cultural training any time the services of the Emergency Operations Centre are required. Similarly, CRD's representative to any community committee or working group should have this training.

[36] Statistics Canada. 2022. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released October 26, 2022. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed November 24, 2022).

Cross-Training

This discipline is intended to develop the level of ability and knowledge among emergency managers and first responders in Juan De Fuca (JDF) so that all actors can understand additional roles in wildfire management. Cross-training means bringing the knowledge of one role together with the knowledge of another and is a major component of facilitating FireSmart programming and interagency cooperation. The Community Resiliency Investment (CRI) program recognizes the value of a variety of training for emergency responders but focuses investment on a set of selected courses mostly dealing with suppression training and FireSmart implementation.

Cross-training can also describe initiatives to extend FireSmart training and certifications to the backbone of community wildfire resiliency – community members. Residents are able, through FireSmart BC or FireSmart Canada programming, to attain training to become recognized Neighbourhood Champions. These are roles that are embedded in communities and provide advocacy for wildfire preparedness at a grassroots level. This is particularly effective in contextualizing FireSmart education in individual communities.

Factors for Success

Identify Needs

Because of the dedication of community members, JDF's communities have an existing base of knowledge and training in wildfire preparedness and response. The various fire departments in JDF have robust training to meet provincial requirements for registered departments. These departments have also taken steps to train members to respond to wildfire interface events, and within JDF there is knowledge of structural protection unit deployment and incident command system. Members of each department have a variety of experience working with or for the BC Wildfire Service and some have served as contract structural protection crews on interface wildfires elsewhere in the province. Having additional members access training and experience can help build resilience in JDF.

Identify Funding Eligibility

Local fire departments can refer to this document and the annual updated CRI program information to understand which courses or opportunities are covered by grant funding. Currently, direct funding opportunities for training within CRI are limited to certain courses and professional roles for enrolment. For example, only volunteers with Fire Departments registered with the Office of the Fire Commissioner can access the suite of courses related to fire suppression. The following courses can be funded for members of East Sooke, Otter Point, Port Renfrew, Shirley, and Willis Point Fire Departments.

- **Wildfire Risk Reduction Basics Course –** This course is intended as an introduction to the key concepts to minimize the negative impacts of wildfires.
- **Fire Life and Safety Educator –** This course is designed to help facilitate the delivery of fire and life safety education to the public.
- **ICS 100 Incident Command System Level 100** – This course, offered by the Justice Institute, introduces the Canadian Incident Command System to emergency management staff and local first responders. This training is also available to emergency management personnel outside of fire departments.
- **SPP-WFF1 Wildland Firefighter Level 1** – This course, designed by the Office of the Fire Commissioner, provides training to structural firefighters in the specifics of wildland firefighting and enables structural firefighters to participate in the province's Structural Protection Program, or field deployments during the fire season. This course replaces S-100 and S-185 for structural firefighters participating in wildland deployments with the BC Wildfire Service.
- **S-100 Basic Fire Suppression and Safety** – This course, designed by the BC Wildfire Service, is the minimum basic standard for any person to participate as a wildland firefighter in British Columbia.
- **S-185 Fire Entrapment Avoidance and Safety** – This course, designed by the BC Wildfire Service, provides basic knowledge of entrapment avoidance and survival techniques during a wildfire.
- **S-231 Engine Boss** – This course, designed by the BC Wildfire Service, trains firefighters with wildland experience to lead an engine and crew during an interface event and allows contract firefighters to act in higher capacities while on deployment.
- **WSPP-115 –** This course is required for structural firefighters before being deployed on structure protection crews. It focuses on structure protection in the context of a wildfire.

Having both firefighters and CRD staff complete ICS-100 ensures that emergency responders and staff participating in an Emergency Operations Centre have the same language of site and scene control. Emergency management staff can also receive training in the province's Wildfire Risk Reduction Basics Course, which supports interagency cooperation between local government and the BC Wildfire Service on fuel management projects outside the designated wildland-urban interface (WUI).

Emphasize community preparedness

Empowering local community members in JDF is possible through the Neighbourhood Champions initiative of FireSmart BC. Neighbourhood Champions are Local FireSmart Representatives, intended to be the frontline in a community for FireSmart resources. These Champions ideally establish a neighbourhood FireSmart committee to develop a FireSmart neighbourhood plan (discussed under *Education* p.80). The local FireSmart Ambassador, or possible FireSmart Coordinator, is a resource in supporting training and facilitating these groups and plans.

Initiatives to Consider

Collaborate with the local fire departments to access additional training for members

Verify that all members have received S-100 and S-185 training or equivalent SPP-WFF1, and support the Fire Department to nominate members for S-231 Engine Boss training. This would ensure all members, who will be the first responders to a wildfire in JDF have the same knowledge of wildland suppression and enable all members to participate in structural protection deployments with the BC Wildfire Service if desired. Engine Boss training supports higher roles for contract members in the province's Structural Protection Program, valuable interface firefighting experience that can be brought back to the communities in JDF.

Support CRD Protective Services staff to become Local FireSmart Representatives or facilitators

Currently, two staff members of the CRD's Protective Services department are certified Local FireSmart Representatives. As staff are added to the department, or as outreach is conducted within communities, it could be valuable for a staff member to be a designated facilitator for the LFR workshop. This would enable CRD to use in-house talent to build up FireSmart awareness and capacity in its unincorporated communities. Alternately, the CRD could seek this qualification when hiring additional emergency staff or the role of a regional FireSmart Coordinator, if such a role is created.

Help interested community members access Neighbourhood/Community Champion training

Every member of the public who contacts local government or their local fire department looking for information about wildfire resiliency is a potential Neighbourhood Champion. This role is for self-directed leaders who want to learn more about the principles of FireSmart and the Neighbourhood Recognition process so that they can organize their communities for fire preparedness. The CRD can help direct people to this program. Workshops are given by Local FireSmart Representatives and could be held by the CRD if sufficient interest is present in several communities.

Assess future potential for a Home Partners Program approach to FireSmart assessment

The Home Partners Program is another means to provide homeowners with personalized property assessments. While Local FireSmart Representatives are trained to develop neighbourhood recognition, the Home Partners Program is focused on delivering targeted assessments to individual properties within an area, regardless of neighbourhood FireSmart activity. The focus on individual property rather than reducing neighbourhood level fire risk means delivery of the program depends on FireSmart certified "Wildfire Mitigation Specialists". Specialists conduct home assessments in the program, providing a personalized report to property owners that contains specific discussion about the features of their home and how the fuel environment on their property is likely to behave during a wildfire event. These assessments are currently completed by the CRD FireSmart Ambassador.

Training for the Wildfire Mitigation Specialist role can be funded through the CRI program. The CRD has funded training sessions for fire department members in JDF in the past, and it is recommended that this continue.

https://firesmartbc.ca/homepartners/

Emergency Planning

This FireSmart discipline addresses the Capital Regional District's (CRD) own preparedness and examines connections between the Community Wildfire Resiliency Plan (CWRP) and the CRD's emergency planning mandate. The primary purpose of this section is to consider how wildfire can be incorporated into emergency planning conducted by the CRD and appropriate levels of readiness during the fire season. This discipline also includes related interagency actions such as coordinating joint training and scenario exercises.

Wildfires are complex and dynamic events that have the potential to combine multiple emergencies within communities. Wildfires rapidly change behaviour depending on winds, weather, the fuel environment, and topography. Respecting the dynamism of wildfire is the first step to making a successful plan.

The CRD prepares emergency plans for its electoral areas, declares states of local emergency (SoLE) and issues evacuation alerts, orders and rescinds, and coordinates an Emergency Operations Centre during periods of need. Emergency planning, including evacuation planning, by the CRD focuses on rapid situation assessment, and an all hazards approach, rather than prescriptive plans that may quickly be overcome by situational uncertainty. During a wildfire emergency, multiple routes and resources may quickly become unpassable or unsafe or need to be reserved for emergency responders.

Local emergency and evacuation plans cover the general initiation of an Emergency Operations Centre, the declaration of orders and alerts affecting residents and properties, and the CRD's relationship with supporting organizations like Emergency Management BC. The role of the CWRP is to provide wildfire-related guidance for emergency planning by the CRD, pre-incident planning by local firefighters, and to propose levels of service for emergency readiness, called "Wildfire Preparedness Condition Level" by the province.

Factors for Success

Wildfire Preparedness Condition Level

Within the CRD's Protective Services department, adopting a guide to emergency preparedness levels in relation to wildfire danger can help prioritize limited departmental resources during fire season. This guide will associate CRD staffing and activities with the levels of fire danger, with more action to prepare for wildfire being appropriate whenever fire danger rises above low. Fire danger can be monitored daily on the BC Wildfire Service website. Developing an appropriate guide to Community Wildfire Response Condition Level has not been undertaken as part of this CWRP, but the CRD can work towards implementing a level of service based on the example below, adapted from the BC Wildfire Service's guidance.

Table 19. Sample Guide to Wildfire Response Condition Level.

Preparedness Level/ Fire Danger Rating	Action Guidelines
I Low	• Staff monitor fire danger rating weekly
II Moderate	• Staff monitor fire danger rating daily
III High	• Staff on normal shifts • Notify proposed Community FireSmart and Resiliency Committee of preparedness level. • Establish weekly communications with local fire responders regarding preparedness concerns. • Promote wildfire awareness and reporting mechanisms on social media channels. • Publish fire danger rating on CRD website. • Consult with CRD Parks on potential area closures in zones of high and extreme wildfire threat.
IV Extreme	• EOC and parks staff on standby. • Notify proposed Community FireSmart and Resiliency Committee of preparedness level. • Weekly communications with local fire responders regarding preparedness concerns. • Weekly communications with parks department staff over internal preparedness. • Promote wildfire awareness and reporting mechanisms on social media channels. • Publish fire danger rating on CRD website. • Consider area closure notices in park zones of high and extreme wildfire threat.
V Ongoing fire(s)	• Issue area closures in affected parks and publicize with media release and CRD website. • Mobilize EOC if evacuation is needed, or if fire requires additional support from Emergency Management BC. • Issue Evacuation Alerts and Orders based on fire behaviour prediction as appropriate in consultation with BC Wildfire Service and publicize with media release and CRD website. • Assist evacuated residents with support access and emergency lodging. • Daily communications with local fire responders, BC Wildfire Service, and parks department. • Daily public updates via social media and public release.

Initiatives to Consider

Coordinate a tabletop scenario exercise with the members of the proposed Fire Response and Preparedness Working Group

The CRD has facilitated two wildfire exercises with JDF fire departments since 2020. Due to resource constraints, the BCWS was unable to participate. These exercises present a wildfire scenario, then allows all participants to confirm their roles and follow through a chain of action during a hypothetical wildfire event. These exercises are an opportunity for primary fire responders to share their knowledge and suppression capacity with emergency planners. These exercises are encouraged and should occur on an annual basis.

Conduct a community info session about emergency preparedness during a wildfire

CRD Emergency Programs delivered a webinar series entitled “Living with Fire” in July 2021 for Salt Spring Island. The content of this webinar is applicable to JDF, and introduces the community to emergency planning concepts based on the Emergency Management BC Wildfire Preparedness Guide. Initiatives like this are supported by CRI and encourage residents to prepare for wildfire by having a household or family plan for communications, evacuation, and provisions. These events should continue on an annual basis.

Establish a guide for Protective Services preparedness levels during wildfire season

The CRD can help allocate the limited resources of the Protective Services department during fire season by developing and following a guide to Wildfire Response Condition Levels (Table 19), tied to fire danger reporting updated daily by the province. The table presented previously in this section can be used as a sample of the content and actions to be considered by the Protective Services department in defining its level of service for different fire danger ratings.

Pre-Incident Planning

The pre-incident plan is a body of knowledge for wildfire response prepared by emergency responders in JDF, led by the local fire departments. During a wildfire, the fire departments will provide the suppression response and incident control while the CRD declares a state of emergency as necessary and directs communities to evacuate affected areas. All partners in fire suppression and emergency response should know where key fire suppression resources are located in the community, including water sources and resources, vehicles, structural protection units, and even stores of hand equipment. This section is mainly provided as guidance for local fire departments who lead the first response to a wildfire and provide incident control at the scene. The following issues should be addressed by a pre-incident plan:

Command

- First responder
- Incident command and delegation
- Management constraints
- Area closure procedures
- Interagency agreements

Logistics

- Alert/Order publication and notification
- Location of utilities and de-energization
- Communications protocols
- Roads, trails, and access
- Emergency Operation Centre location

Operations

- Air and water access
- Control line locations
- Natural barriers
- Safety zone options
- Staging area locations
- GPS locations for key points

Planning

- Topographic maps
- Vegetation and fuel maps
- Community base map
- Hazardous values
- Archaeological/cultural values
- Protected or rare environmental features
- Land ownership
- Access control

Preparing a pre-incident plan is logically an opportunity to simulate a wildfire response effort. Developing the plan can be part of joint training exercises coordinated between the CRD, BC Wildfire Service, and local fire departments. Such a meeting would be within the scope and core purpose of a proposed Fire Response and Preparedness Working Group, as discussed in *Interagency Cooperation* (p.101).

Vegetation Management

In the context of a wildfire, manipulating the fuel environment is often an effective way to reduce wildfire threat or risk. Vegetation, or fuel management, is a process that aims to reduce wildfire risk on a variety of scales by reducing the potential wildfire threat through vegetation modification. This discipline addresses opportunities to mitigate wildfire risk by altering both natural forest vegetation and the cultivated landscaping around the homes and critical infrastructure. Considerations for this section are divided into two categories corresponding to the common forms of implementation: FireSmart landscaping focused closely on homes and infrastructure, and larger scale fuel management in forest areas. This division reflects the difference in goals and methods between the two scales.

Managing Vegetation through FireSmart

FireSmart vegetation management is intended to reduce the risk of ignition to a specific building or piece of infrastructure, assuming a fire has occurred in the area. Accordingly, FireSmart vegetation management focuses heavily on achieving guidelines in the Non-Combustible Zone (0-1.5m) and Zones 1 (1.5-10m), 2 (10-30m) and 3 (30-100m) around a home or piece of infrastructure. Goals for management vary with the distance from the structure. In the Non-Combustible Zone, the emphasis is placed on using non-combustible or fire-resistant building materials and covers to reduce the likelihood of ignition by direct flame. Within Zone 1, emphasis is placed on creating an area free of hazardous fuels like coniferous trees and woody debris and using fire-resistant landscape construction (decks and outbuildings), while goals for Zones 2 and 3 emphasize proper spacing, pruning, and removal of some underbrush. The goal is to prevent a structure ignition and create a defensible space around the home that firefighters can work within. Vegetation management for FireSmart is often guided by an assessment report prepared by a Local FireSmart Representative or Wildfire Mitigation Specialist, though some homeowners may wish to undertake FireSmart treatments on their own. The expertise of a Registered Professional Forester is recommended for projects where management includes areas of native forest vegetation.

Supports are available through the Community Resiliency Investment (CRI) program for FireSmart activities on private land in residential areas and publicly owned critical infrastructure. On private land, only planning and assessment program costs are covered, with the homeowner expected to cover the cost of implementing recommendations. While this can seem daunting, the Local FireSmart Representative can help homeowners understand which actions may be “quick starts” to improve resiliency, and which are appropriate to save until money or time are available. To help, the CRD can apply for funding to offer limited rebates to homeowners who complete activities. The CRD piloted a rebate program in 2022, and this should be further expanded and publicized to increase uptake. Development of other FireSmart initiatives for private land is discussed in the *Education* (p.80) and *Planning* (p.87) sections.

A FireSmart Assessment Program for CRD Critical Infrastructure

Local government can apply for funding to implement the recommendations from a FireSmart assessment for publicly owned critical infrastructure. This is available only for structures critical to wildfire response (such as water infrastructure, communications towers, and electrical infrastructure) having a completed FireSmart assessment score card at the time of application. Reassessment with the appropriate score card following the mitigation works is also a covered cost for publicly owned critical infrastructure.

Fuel Management for Forest Landscapes

Fuel management in the wider landscape is not as focused on preventing the ignition of specific homes or structures. Instead, fuel management is about strategically altering the characteristics of a forest to transition it towards a lower wildfire threat and thereby reduce the general risk to the community. This facilitates easier wildfire response, and a reduction in the resources required by response agencies to action a wildfire. Sometimes, fuel management is used to produce future fire suppression opportunities such as anchor points or safety zones, locations to initiate defensive back-burns, or improved access to a remote areas of a community. Directions for how many trees to remove and retain, as well as how to protect other values in the forest landscape, are contained in a fuel management prescription prepared by a Registered Professional Forester and reviewed by the BC Wildfire Service. The intent of fuel management is generally to support healthy forest development while reducing wildfire risk. Fuel management is only supported through CRI on public land.

Fuel management is completed through three phases:

1. Identify areas for fuel treatment within a Community Wildfire Resiliency Plan (CWRP) or other high level strategic plan.
2. Develop a detailed Fuel Management Prescription which identifies objectives and strategies to reduce wildfire risk.
3. Operational implementation of the Fuel Management Prescription.

This CWRP is the first step in identifying and prioritizing candidate areas for fuel management prescription development. Fuel management is a process of starting wide and narrowing down potential treatment areas as constraints are identified and areas are further ground verified. The areas shown on the map in this section form a discussion piece to be used in pursuing a fuel management program and do not compel or imply fuel management to occur. The process from the initial identification of a treatment area to implementation on the ground typically takes several years.

Photo 12. Example of a forest prior to fuel management. (Example from outside the CRD)

Photo 13. In the same area as previous photo, post fuel treatment. (Example from outside the CRD)

Methods for identifying potential fuel treatment areas

Areas on public lands that were identified as having potentially high wildfire risk within 100m of densely populated areas or critical infrastructure were visited in the field. Fuel plots were established in representative areas of the forest stands to determine wildfire threat. Assessments of the fuel condition were completed following the provincial assessment system using the 2020 Wildfire Threat Assessment Guide. This is the provincial standard for field assessments of fuel hazard in the WUI and is used to plan fuel hazard mitigation works. Fuel types are scored under this system which is used to help prioritize the areas for fuel hazard mitigation funding under the Community Resilience Investment Program.

The fuel component of wildfire threat is driven by the density and continuity of fuel on the forest floor, in the canopy, and in the ladder fuels that connect the two. The highest threat fuel types are composed of dense coniferous trees with high vertical and horizontal continuity, with high fuel loading on the forest floor in the form of dead logs and branches.

Interface fuel treatments change the composition of a forest to reduce the wildfire threat, thereby reducing the wildfire risk. This involves reducing the overall fuel load and disrupting both the vertical and horizontal continuity to create gaps between the fuel layers. The overall objective of the fuel treatment prescriptions is to change the fire behaviour potential of forests from a crown fire to a surface fire under the most dangerous weather conditions (the 90th percentile weather conditions). Successful fuel management allows suppression resources to be able to act on the wildfire and defend the adjacent values. The detailed strategies for reducing fire behaviour potential are detailed in a fuel management prescription, which is developed by a Registered Professional Forester with wildfire management experience. Potential strategies include tree thinning, spacing, pruning, surface debris removal, or creating fuel gaps. Treatment areas should be adjacent to the values at risk, with a target of at least 100m wide and located up against made and natural fuel breaks when possible.

Surface fire is where only fuels in contact with the ground are involved in a wildfire.

Crown fire is where tree crowns, including foliage and branches, are involved in a wildfire. Crown fire can be *passive*, meaning only single tree crowns or groups of trees are involved, or *active*, meaning fire is readily spreading between tree crowns.

Figure 23. Comparison of surface and crown fire behaviour.

Potential Treatment Areas

The CRD is a minor landowner in JDF. While all forms of public land ownership within the WUI are potential fuel treatment areas in this CWRP, the CRD only has the authority to advance treatments that occur solely or partially on its property. Fuel management on other forms of public land ownership must be advanced through partnership with the agency having authority and the BC Wildfire Service. In addition, not all CRD land is suitable for fuel management. This is often due to limited access, challenging terrain, or the limited effectiveness of fuel management for reducing wildfire risk.

Five potential areas for fuel management were identified and prioritized based on wildfire threat and risk. These candidate fuel treatment areas are all located in the southern portions of JDF, reflecting the higher relative wildfire risk. Four of these areas are located in the CRD managed East Sooke Regional Park. These four treatment areas are designed to gradually create a fuel break to protect homes and critical infrastructure adjacent to the park. The fifth treatment area is located in Otter Point and is located on provincial crown land.

Figure 24 shows the location of potential treatment areas identified by this CWRP. The areas are described in more detail in Table 20.

Photo 14. Dense conifer forest surrounds critical infrastructure in East Sooke Regional Park.

Fuel Management in Regional Parks

Most of the CRD land within the AOI is in the form of regional parks. As such, most of the identified fuel management areas identified in this CWRP are located within regional parks. The purpose of this document is to identify preliminary candidate areas for fuel management for further study in the form of a fuel management prescription document. This fuel management prescription will identify strategies and objectives for fuel management to reduce wildfire risk, but also objectives and strategies to protect important values at risk that must be protected during any fuel management activities. Regional parks in the CRD exist to provide a multitude of values, including ecological and recreational values, which may either synergize or conflict with fuel management activities. While these have been identified at a landscape scale in the Community Description portion of this CWRP, this description is intended as a broad, non-exhaustive survey of some of the important values present. A fuel management prescription is a site-specific, study that will account for all the values that must be managed in a specific area. Furthermore, a fuel management prescription will utilize more diverse and accurate sources of data such as detailed biological, archaeological, and geotechnical assessments, or varied geospatial sources.

Minimal large scale vegetation management for wildfire risk mitigation has occurred in CRD regional parks historically. This is tied to the low frequency of historical wildfire and the fuel conditions. The CRD Regional Parks are under pressure to manage wildfire risk through fuel management by incorporated member communities that abut regional parks, as these communities contain the values at risk by potential wildfire in these parks. Similarly, communities within unincorporated areas are also interested in fuel management in regional parks in and adjacent their communities. This is challenging as at times fuel management objectives may conflict with some of the ecological, recreational, or social objectives that are part of the CRD Regional Parks department policy framework. As such, fuel management activities must include the CRD Regional Parks department as a critical project partner at the first stages of planning.

The regional parks managed by the CRD are disbursed throughout the regional district and are located in the WUI of different municipalities and electoral areas. Many of these municipalities have individual wildfire plans, which have identified regional parks in their respective WUI's as high priorities for fuel management. This has created a patchwork of prospective fuel management areas, all with varying priorities within the wildfire plans that have identified them. This creates a challenge for strategic planning for the CRD Parks department, as these plans are not prioritized or synthesized at a regional level. The CRD Parks department could benefit from creating a strategic plan, not only to prioritize treatments at the regional level, but to identify specific management goals that must be included in fuel management activities within regional parks. This would provide clear direction to municipalities that are proposing fuel management within regional parks, as well as create a system of prioritization for projects at the regional scale. This could be formulated with input from Protective Services as part of emergency planning for the CRD.

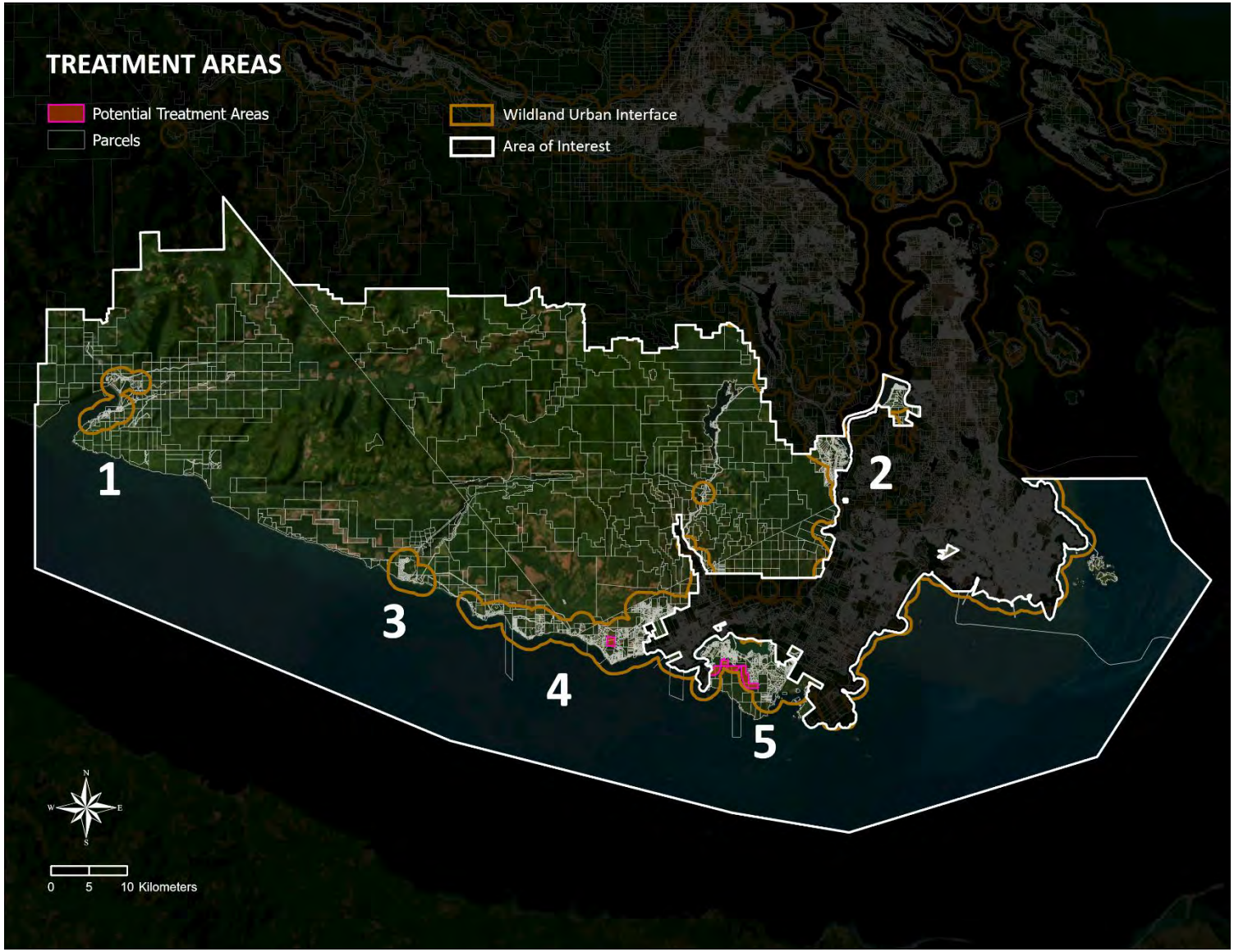

Figure 24. Map of potential fuel management areas in JDF.

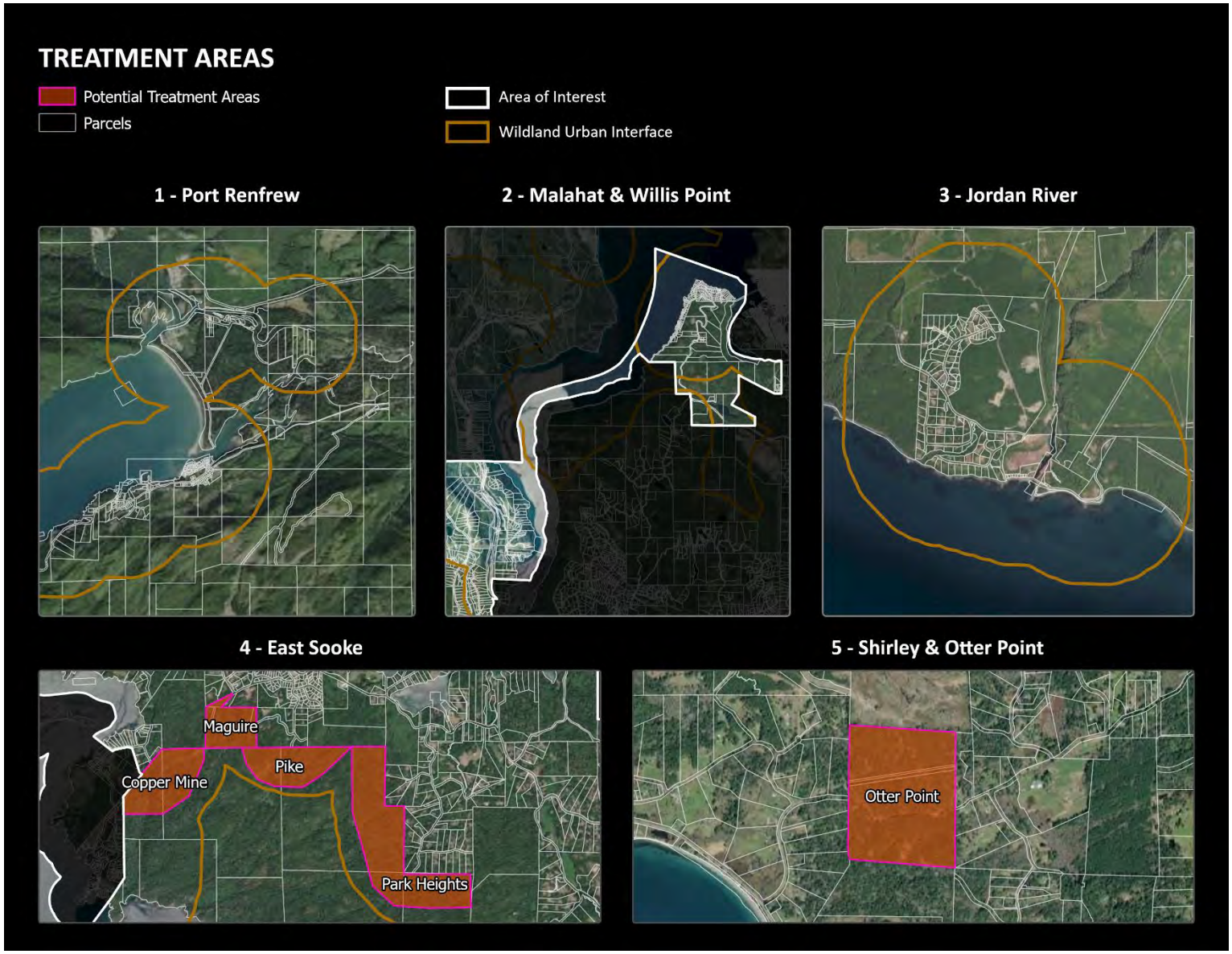

Figure 25. Map of potential fuel management areas near key communities.

Table 20. Areas with the highest potential for fuel management in JDF

Treatment Name	General Location	Jurisdiction	Local Fuel Threat (Hectares)			Total Area (ha)	Priority	Treatment Rationale / Constraints
			Moderate	High	Unknown*			
Maguire	East Sooke Regional Park	CRD-Regional Park	24.8	5.1	2.6	32.5	High	Mature conifer fuels dominate, patches of high density ladder and surface fuels. Surrounds critical infrastructure (comms tower) and adjacent community. Upwind of prevailing fire spread direction. Excellent access via Valentine Road (gated). Areas of steep terrain, likely mix of manual and mechanical treatment. Likely thin from below to reduce ladder fuel loading. Survey likely required for final boundary location. Site located in CRD Regional Park, and includes sensitive ecosystems. Coordination with CRD Parks required
Copper Mine	East Sooke Regional Park	CRD-Regional Park	50.9	0	2.1	53	High	Mature conifer fuels dominate, patches of high density ladder and surface fuels. Access via Copper Mine Road. Thin from below to create fuel strata gap. Terrain mostly operable with some bluffs and small steep slopes. Directly adjacent Maguire and Pike treatment areas; four treatment areas within East Sooke Regional Park will form a semi-continuous fuel break between homes and the high and extreme threat areas of East Sooke Park. Recommend establishing access to Park Heights treatment area at time of treatment. Site located in CRD Regional Park, and includes sensitive ecosystems. Coordination with CRD Parks required.
Pike	East Sooke Regional Park	CRD-Regional Park	38.2	6.6	1.1	45.9	High	Mature conifer fuels dominate, patches of high density ladder and surface fuels. Adjacent homes northwest (downwind) of East Sooke Park. Thin from below to create fuel strata gap. Challenging terrain with areas of limited operability, likely significant net down reducing total area as a result during detailed prescription phase. Directly adjacent Maguire treatment area; four treatment areas within East Sooke Regional Park will form a semi-continuous fuel

Treatment Name	General Location	Jurisdiction	Local Fuel Threat (Hectares)			Total Area (ha)	Priority	Treatment Rationale / Constraints
			Moderate	High	Unknown*			
								break between homes and the high and extreme threat areas of East Sooke Park. Site located in CRD Regional Park, and includes sensitive ecosystems. Coordination with CRD Parks required.
Park Heights	East Sooke Regional Park	CRD-Regional Park	113.9	0.6	3.9	118.6	Mod	Mature conifer fuels dominate, patches of high density ladder and surface fuels. Adjacent homes east of East Sooke Park, slightly downwind. Thin from below to create fuel strata gap. Operable terrain, however recommended access would be via Copper Mine Road and Copper Mine treatment area. No other practical access. Terrain mostly operable with some small bluff and steep slopes. Directly adjacent Copper Mine treatment area. Four treatment areas within East Sooke Regional Park will form a semi-continuous fuel break between homes and the high and extreme threat areas of East Sooke Park. Site located in CRD Regional Park, and includes sensitive ecosystems. Coordination with CRD Parks required.
Otter Point	Otter Point Road	Crown	48.1	0	1.7	49.9	Mod	Appears to be old woodlot, 2nd growth conifers planted. Immature, low crown base and high density. Treatment includes pruning, ladder fuel removal, and some light thinning. Crown land and falls under Wildfire Risk Reduction, indicating project must be crown led. Excellent access and operable terrain.

***The unknown field is due to a discrepancy between the PSTA and the local land ownership layer. Final fuel treatment will refine these boundaries and the area totals.**

Action Plan & Implementation

This section takes discussion from the preceding sections on FireSmart Disciplines and summarizes recommendations for the Capital Regional District (the CRD) to consider pursuing. Successful implementation of the Community Wildfire Resiliency Plan (CWRP) requires a strategy for implementation, tracking mechanisms for success, and a schedule for revisiting issues left unresolved. The Action Plan follows the SMART criteria for outlining potential initiatives:

- **Specific**: Target exactly what is to be achieved
- **Measurable**: quantify or suggest an indicator of progress
- **Assignable**: specify who will be responsible for implementation
- **Realistic**: state what results can reasonably be achieved
- **Time Bound**: state expected time for completion. Note that some recommendations must be implemented on a recurring basis annually or biannually. For example, an annual social media campaign to raise awareness.

Plan monitoring and updates

While priorities and timelines are assigned below, the CRD may, with feedback from its community, decide some initiatives are of greater importance than others. The risk environment will continue to change beyond the completion of the plan and require adjusting expectations and resource allocation for building wildfire resiliency programming. This is a natural part of the implementation process of any plan. For these reasons, the CWRP and this Action Plan should be revisited from time-to-time to ensure they are meeting the needs of JDF. A formal review after five years is recommended, with at least annual reviews of the Action Plan.

Tracking and Reporting

There are funding sources available to help implement many of these recommendations, subject to a competitive application program open to all local governments. UBCM manages the Community Resilience Investment (CRI) Program which offers up to 100% funding for a range of wildfire mitigation initiatives. Many of the recommendations made in this report are eligible for CRI funding. Estimated costs for implementing these recommendations are in addition to existing operating budgets.

Initiatives pursued by the CRD in the Action Plan should become part of Protective Services department's annual progress review. The Action Plan can be recreated and modified to add columns for noting whether items are in progress or have been completed, as well as capture specific measurable outcomes that can help justify JDF's wildfire resiliency initiative.

Following the Action Plan, Table 21 provides a sample tracking and reporting tool.

Table 21. Action Plan.

Recommendation/Action	Lead(s)	Priority	Cost (Est.)	Resources Required	Metric for Success	Notes
Renewing the Plan and Building Resiliency						
Objective: View the Community Wildfire Resiliency Plan as a Living Document and incorporate wildfire resiliency into strategic decisions						
1. Conduct a formal review of the CWRP contents every 5 years. Review the Action Plan every year.	CRD Protective Services	High	$30,000 per update	Continuing program capacity for wildfire preparedness within the Protective Services department.	Maintain annual tracking and monitoring information on initiatives in the Action Plan	CRI funding eligible (CWRP updates). **Required for 2024 CRI funding applications.**
2. Establish a regional FireSmart Coordinator position within CRD Protective Services	CRD Protective Services	High	$60,000-$70,000 per year (one year contract)	Develop a job plan (title, responsibilities, priority initiatives, manager, term) Funding for this position can be supported by CRI up to 100% of salary.	Fill this position and establish a job plan for the first contract year. This may be a new role, or an enhanced role for the existing FireSmart Ambassador.	CRI funding eligible. **Required for 2024 CRI funding applications.**
3. Develop-a Community FireSmart and Resiliency Committee	FireSmart Coordinator CRD Protective Services	High	up to $5,000 per meeting	Develop terms of reference, network participants, support participation	Host initial meeting Approve draft terms of reference	CRI funding eligible. Can be conducted at the community and/or Electoral Area level. **Required for 2024 CRI funding applications.**
Education						
Objective: Promote FireSmart as a strategy for wildfire preparedness and demonstrate the Region's commitment to wildfire resiliency in the community						
4. Publish the CWRP, risk maps, and highlights on the CRD's website and digital communications tools.	CRD Protective Services	High	Staff time	IT support Coordination between departments	Successful publication within one year after receipt by the Board of Directors	
5. Install wildfire awareness signs at key park locations.	CRD Protective Services CRD Parks	Medium	$5,000	Staff time, communications materials, signs Coordination between departments	Installation of sign at highest traffic trailheads in JDF.	
6. Continue voluntary FireSmart assessment program for private property everywhere in JDF	Local FireSmart Representative / FireSmart Coordinator	High	See Item 3. Incidental expenses beyond FS Coordinator salary.	Coordination with local fire departments recommended. FireSmart Coordinator within CRD Protective Services	Offer an annual opportunity to residents to have their property assessed	CRI funding eligible
7. Host a Community Clean	Local FireSmart	Medium	$5,000	Coordination with CRD Parks to	Number of participants	CRI funding eligible

Recommendation/Action	Lead(s)	Priority	Cost (Est.)	Resources Required	Metric for Success	Notes
Up Day in a Community Park or another suitable park as a demonstration of FireSmart principles.	Representative / FireSmart Coordinator			designate clean-up areas, desired outcomes	Weight of vegetation/debris removed Reduce surface fuel loading near homes.	
8. Promote FireSmart Neighbourhood Planning in neighbourhoods at relative risk.	FireSmart Coordinator or Local Fire Departments	Medium	$3,000-$5,000	Coordination with local fire recommended. FireSmart Coordinator within CRD Protective Services	Number of households represented, participating Offer neighbourhood champion workshop to regional residents.	CRI funding eligible
9. Expand participation in PANS	CRD Protective Services	High	Staff time	IT Support Outreach with local organizations Community advertising	Registrations as a percent of population. Registrations by area	
Legislation and Planning						
Objective: Ensure Regional District by-laws and policies support wildfire resiliency						
10. Explore restrictions on high risk activities in parks (smoking, campfires, etc)	CRD Protective Services CRD Parks and Environmental Services	Medium	Cost to be estimated by further study	Coordination between departments Assess compliance and enforcement capabilities	Completion of meetings with CRD Parks to assess feasibility	
11. Assess wildfire hazard on CRD-owned properties	CRD Protective Services	Medium	$1,000 per structure, 400 $/ha for parks.	Coordination between departments	Assessment of all CRD properties in JDF	CRI funding eligible.
12. Create FireSmart program (assessments and mitigation) of existing CRD critical infrastructure.	CRD Protective Services	High	$25,000-$30,000	Coordination between departments	Completed FireSmart Assessment Score Cards for all CRD-owned critical infrastructure.	CRI funding eligible.
13. Support authorities having jurisdiction to conduct FireSmart Assessments of non-CRD critical public infrastructure, such as by completing joint CRI application for this purpose	CRD Protective Services Improvement Districts School District Local fire depts	Medium	Incidental	Coordination between CRD and authorities having jurisdiction.	Completed FireSmart Assessment Score Cards for all critical infrastructure identified in JDF	CRI funding eligible.
14. Update the building policies to incorporate	CRD	Medium	Staff time	Coordination between departments	New capital projects reflect recognition of FireSmart	Review and revision may be CRI funding eligible

Recommendation/Action	Lead(s)	Priority	Cost (Est.)	Resources Required	Metric for Success	Notes
FireSmart design principles in CRD facilities					building design and principles.	depending on scope.
15. Create a program to reduce or eliminate green waste tipping fees for FireSmart projects at the Hartland regional landfill	CRD Parks and Environmental Services CRD Protective Services	High	Cost to be estimated by further study	Coordination between departments Baseline studies Operational capacity and training	Green waste by weight associated with a completed FireSmart assessment Fees deferred	Tipping fees: CRI funding eligible.
Development Considerations						
Objective: Consider FireSmart design principles in planning and development bylaws.						
16. Amend all OCP's to include wildfire as a hazard.	CRD Planning CRD Legal CRD Protective Services	High	Staff time	Capacity in CRD planning for administration and ES/Fire Services for review. Coordination between departments.	Wildfire threat established as a hazard in each OCP.	It is preferred that all OCPs use the same language, however this may not be feasible given different timelines for OCP updates.

Recommendation/Action	Lead(s)	Priority	Cost (Est.)	Resources Required	Metric for Success	Notes
17. Investigate use of the Development Approval Information provisions to request and collect information on wildfire hazard on private property, particularly during land subdivision.	CRD Planning CRD Legal CRD Protective Services	Medium	Staff time	Capacity in CRD planning for administration and ES/Fire Services for review. Coordination between departments. Updated OCP's for all communities to include wildfire as a hazard. In absence of OCP updates, the DAI provisions are only an option in Point, Malahat, Otter Point, and Rural Resources Lands.	Bring a workable pathway to request wildfire hazard assessment reports for development applications on private land to the CRD Electoral Area Services Committee.	CRI funding eligible, subject to scope limitations around the bylaw review. Pursuing wildfire hazard information on private land through the DAI mechanism helps establish wildfire risk on private land in JDF. This information need not be requested from every application. Designating a DAI zone for wildfire hazard can be part of the investigation process.
18. Improve understanding of wildfire risk in multi-ownership environments.	CRD Protective Services	Medium	Staff time	Capacity in CRD Protective Services.	Developing a framework for assessing wildfire risk outside of public land.	Possible to combine this recommendation with #18 above. Landowners consent may be required for comprehensive risk assessments.
19. Provide FireSmart information (bulletins, brochures, web resources) with development application materials	CRD Planning	High	Staff time	Coordination between Protective Services and Planning Department	FireSmart information is provided with all development permit application templates.	CRI funding eligible, to a pre-determined maximum (physical materials); web resources free
20. Consider preparing mapping of a designated wildfire hazard area for future OCP updates.	CRD Planning CRD Protective Services	High	$25,000-30,000	Potentially significant investment in methodology, mapping, and community engagement if DPA pursued. However, savings expected if done once for entire JDF rather than individually for each OCP.	Map community-supported zones for wildfire interface hazard. Integrate mapping into JDF OCP renewals as they occur.	CRI funding eligible, subject to scope limitations. If incorporated into the OCP, mapping can be used for future DPA mechanisms to gather information on wildfire hazard on private land and/or guide

Recommendation/Action	Lead(s)	Priority	Cost (Est.)	Resources Required	Metric for Success	Notes
						development toward FireSmart principles.
21. Create Development Permit Areas for the higher risk communities at their next OCP updates.	CRD Planning CRD Legal CRD Protective Services	High	$5,000 to $15,000	Completion of mapping as per above recommendation Planning support	Creation of Wildfire DPA's for East Sooke, Otter Point, Jordan and Shirley, Malahat, and Willis Point as part of next OCP update	Although current OCPs do include wildfire risk mitigation policies, these are varied and often vague. Updates to the OCP's should focus on harmonizing these policies and creating consistent and applicable guidelines.
Interagency Cooperation						
Objective: Ensuring wildfire response is effective						
22. Initiate a region-wide Interagency Fire Response and Preparedness Working Group	CRD Protective Services	High	$2,000 per meeting	Participation of local fire depts, BCWS, regional emergency responders	Host initial meeting Host tabletop exercise for incident planning	CRI funding eligible
23. Provide cultural sensitivity training to Protective Services staff to support positive partnerships with Indigenous people and communities	CRD Protective Services	Medium	Staff time & facilitation fee		1 on duty or on call EOC staffer with cultural sensitivity training at all times during emergency. Consider expanding to all staff.	CRI funding eligible
Cross Training						
Objective: Ensuring emergency responders have a variety of training and experience						
24. Support local fire departments to access additional training on future CRI funding applications.	FireSmart Coordinator	Medium	Incidental	Identify training needs for new recruits, transfers Local depts to identify candidates for training and desired courses.	Full participation in training by members who want it	CRI funding eligible
25. Support additional CRD staff or local fire department members to become Local FireSmart Representatives	CRD Protective Services	Medium	Staff time		At least 2 persons in CRD Protective Services to have active LFR certification at all times. LFR trained in every local department	CRI funding eligible.
26. Host a neighbourhood	CRD Protective	Medium	$5,000 per	Successful fostering of a	Neighbourhood champions	CRI funding eligible

Recommendation/Action	Lead(s)	Priority	Cost (Est.)	Resources Required	Metric for Success	Notes
champion training workshop for interested community members	Services Local Fire Departments		event	FireSmart neighbourhood planning program	trained in each priority identified areas.	
27. Train CRD staff or Local FireSmart Representatives to be Wildfire Mitigation Specialists	CRD Protective Services	Low	$8,500 - $10,000	Expression of interest in WMS programming from local fire depts or general public.	Certification of a WMS within the CRD Protective Services department.	CRI funding eligible WMS assessments of private land require requests from public. CRD Parks have expressed interest in this program.
Emergency Planning						
Objective: Enhance emergency response capacity						
28. Continue and expand tabletop scenario exercises with the members of the proposed Fire Response and Preparedness Working Group	CRD Protective Services Local Fire Departments BCWS	Medium	$2,140 per meeting	Suitable event space, pre-scenario planning	Number of attendees	CRI funding eligible
29. Continue and expand community information sessions about emergency preparedness and evacuation during a wildfire	CRD Protective Services Local Fire Departments	Medium	$5,000 per event,	Conclusion of evacuation planning process.	Host event Number of attendees	CRI funding eligible
30. Create an emergency preparedness guidebook for local residents.	CRD Protective Services	Medium	$5,000	CRD Protective Services	Creation and distribution of guidebook	
31. Establish a guide for Protective Services EOC preparedness levels during wildfire season	CRD Protective Services	High	Staff time	Administrative capacity in ES.	Adopt as policy a Guide to Wildfire Preparedness Condition Levels	Sample for development provided in Emergency Planning section
32. Contribute towards a pre-incident plan for wildfire events with local suppression experts	Interagency Fire Response and Preparedness Working Group	High	Staff time.	Participation of emergency responders and suppression authorities	Complete annual pre-incident plan and discuss with regional working group for fire response in pre-season meeting	CRI funding eligible when developed as part of a working group of Community FireSmart and Resiliency committee
Vegetation Management						
Objective: Modify fuel environments to reduce risk around infrastructure and communities						
33. Work to implement FireSmart Assessment	CRD Protective Services	High	TBD based on assessment	Administrative capacity	Completed FireSmart activities and updated score	CRI funding eligible, when initial FireSmart

Recommendation/Action	Lead(s)	Priority	Cost (Est.)	Resources Required	Metric for Success	Notes
recommendations for critical infrastructure, such as by supporting joint applications to CRI for infrastructure designated in the HRVA.			outcomes.		cards	assessment has been completed. Up to $50,000 per structure.
34. Develop guidelines and/or strategy for fuel management in Regional Parks	CRD Parks CRD Protective Services	High	$25,000	CRD Parks staff time CRD Protective Services support	Development of a region wide strategy including guidelines (values to protect, priorities, etc) that can be incorporated into fuel management prescriptions	Region wide plan could be reference material for fuel management activities throughout CRD Regional Parks.
35. Consider developing fuel management prescriptions in East Sooke Regional Park and other proposed treatment areas.	CRD Parks CRD Protective Services	Medium	Up to $400/ha for fuel management prescription	Coordination with BC Wildfire Service CRD staff time	Develop a fuel management prescription with CRD Regional Parks.	CRI funding eligible, with fuel management prescription. May serve as a pilot to test guidelines as discussed in Rec #34.

Table 22. Sample tracking and reporting tool.

Recommendation/Action	Lead	Date Completed	Cost	Successes, challenges, and lessons learned	Follow up – provide description
Action	Who lead this implementation?	When was the implementation completed? Or is this an annual project?	What was the cost? Include manpower hours here	Was the metric for success achieved? If not, why? Was the metric unrealistic? What unexpected challenges were encountered?	How does implementation or failure to implement impact other actions? Did implementation of this action lead to new required actions?

Appendices

Appendix A: Glossary of Terms

Term	Definition
Area of Interest (AOI)	The geographic study area for a Community Wildfire Protection Plan, within which the extent of the boundaries of the WUI are determined.
Community Wildfire Resiliency Plan	A plan adopted by a local government or First Nation to identify wildfire threat and risk throughout the study area, examine policy and planning responses, and assess emergency response capacity while providing action item recommendations for building community resilience, supported by the Province through the Community Resiliency Investment Program.
Critical Infrastructure	Assets, structures, or features that underpin the health and safety of the community and allow governance to take place
Crown fuels	Forest fuels occurring in the above the level of the ground, on tree stems or in tree canopies, including live and dead branches attached to trees, bark, and foliage.
Fire Return Interval	The time between fires in a defined area, typically measured at the landscape scale.
FireSmart	A term for that describes living with the risk of wildfire while reducing the adverse affects of wildfire. Also refers to a program of disciplines for mitigating the risks of wildfire
Fuels	Those elements of a forest that can burn, including organic material on the forest floor, logs, dead branches and needles, shrubs and herbs, and the bark, wood, and foliage of live trees.
Fuel management	Coordinated action to reduce wildfire risk by modifying the structure and density of forest fuels.
Fuel management prescription	A document that identifies fuel management strategies to reduce wildfire risk in a defined area, while also ensuring other values are protected.
Fuel treatment	The implementation of a fuel management prescription, which may involve the physical modification of fuels by heavy machinery or ground workers.
Interface	A pattern of urban development where contiguous development directly abuts native vegetation.
Intermix	A pattern of urban development where buildings are closely placed within and among trees.

Landscape Unit Plan	A plan prepared by the Province that provides objectives for resource management within a defined area, including policies related to forest biodiversity and wildlife habitat.
Official Community Plan	A local government plan for an electoral area(s) or municipality, mandated by provincial legislation, that shows how land use will be planned and how local government will meet other provincial policy objectives. Official Community Plans may also include additional policies based on local needs and interests.
Suppression	Actions taken in response to fire to control the spread of the fire or reduce it in area or severity.
Surface fuels	Forest fuels found on top of the organic layer of the soil and below the crowns of trees, typically including understory vegetation, dead branches, needles, and logs.
Wildfire	A form of natural landscape disturbance involving the combustion of vegetation.
Wildfire risk	The probability of a wildfire occurring combined with the consequences or impacts it would cause.
Wildfire season	The period of the year during which wildfires generally take place due to weather and fuel conditions. In BC, this is typically April – September.
Wildfire threat	A classification of potential fire behaviour based on fuel conditions, weather conditions, slope, aspect, and other biophysical factors.
Wildland-Urban Interface (WUI)	The geographic area where homes and buildings meet continuous areas of natural vegetation.

Appendix B: Local Wildfire Risk Process

This appendix describes the methodology used to determine wildfire risk. The findings of this analysis have been integrated into the main body of the report in the Wildfire Risk Assessment section.

The local wildfire risk assessment process involves:

1. Verification of local fuel types to develop a fuel type map
2. Assessment of fire spread patterns
3. Consideration of topography
4. Stratification of the WUI based on relative wildfire threat and proximity to communities.
5. Identify priority wildfire risk areas

Steps 1-3 of the above provide an assessment of the potential wildfire behaviour throughout the study area. Wildfire risk is assessed by integrating the probability of severe wildfire with the consequences of wildfire in step 4; the highest risk forests are directly adjacent communities, and where severe wildfire is probable.

Fuel Type Attribute Assessment

Fuel typing falls into sixteen national benchmark fuel types that are used by the Canadian Fire Behaviour Prediction System[37]. This system divides fuels into 5 major groups and 16 more specific fuel types. These groups are used to describe fuels according to stand structure, species composition, surface, and ladder fuels, and the organic (duff) layer. The current Canadian Forest Fire Behaviour Prediction (FBP) System does not include coastal forests in their fuel type descriptions[38], therefore the fuel type that most closely represents forest stand structure was identified.

Different fuel types are associated with different levels of wildfire threat (wildfire behaviour potential). Therefore, accurate fuel typing is a critical input to wildfire behaviour and threat assessment mapping. Conifer fuel types typically have the highest wildfire behaviour potential and are the most likely to support continuous crown fire and spotting potential. Different conifer fuel types have different crown fire and spot fire potential.

[37] Natural Resources Canada. (April 2021) FBP Fuel Type Descriptions. https://cwfis.cfs.nrcan.gc.ca/background/fueltypes/

[38] Perrakis, Daniel D.B., Eade, George. (2018). British Columbia Wildfire Fuel Typing and Fuel Type Layer Description. Victoria, B.C. Canadian Forest Service, Pacific Forestry Centre.

C-3 and C-5 - Conifer Fuel Types

There are 7 possible conifer dominated fuel types (Figure 26), only 5 of which are typically encountered in British Columbia. Two of these fuel types, C-3 and C-5, are commonly found in the AOI. Both characterize second growth conifer stands. C-3 includes a higher density stand with lower crown heights, while C-5 is lower in density and has higher crown heights.

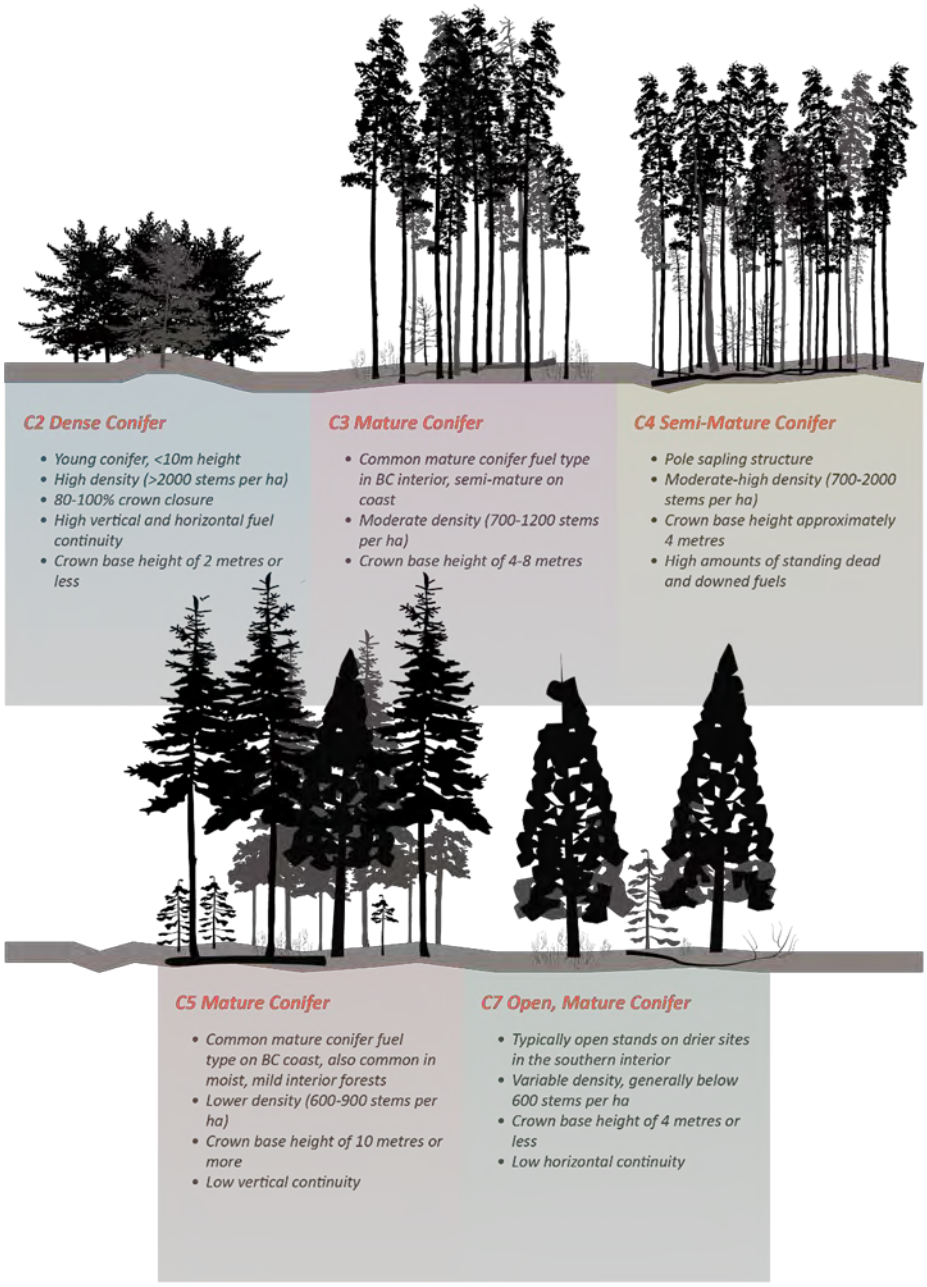

Figure 26. Characteristics of the seven conifer fuel types. C-3 and C-5 are prevalent within the AOI.

Photo 15. Example of a stand classified as C-3 fuel type.

Photo 16. Example of a stand classified as C-5 fuel type.

Fuel type M-1/2 – Mixed stands

This fuel type is found throughout the study area, often around riparian areas or areas historically disturbed. They are characterized by stands comprised of a mix of coniferous and deciduous species. The conifer component in these stands is mostly a mix of Douglas-fir, western redcedar and western hemlock. The deciduous component varies and includes bigleaf maple and red alder. In a few locations, the broad-leaved evergreen tree arbutus contributes to the deciduous component of the stand. Fire behaviour potential in these stands increases with and is highly dependent on the number of coniferous trees present.

Photo 17. Example of a stand classified as M-2 fuel type.

Fuel type D-1/2 - Deciduous

This fuel type consists of stands that are generally moderately stocked and dominated by deciduous trees. Within the AOI, there is little area classified as this fuel type. These stands occur primarily in areas that have historically been disturbed. They can include a small amount of conifer trees, usually in patches or as single trees. Dead and down round wood fuels are a minor component of this fuel complex. During the summer months, the principal fire-carrying surface fuel consists chiefly of deciduous leaf litter and cured herbaceous material. Areas dominated by shrubs are also included in this type. These are dense plant communities with few trees and a variety of shrub species. These deciduous stand and shrub communities will all have a relatively low fire behaviour potential.

Photo 18. Example of a stand classified as D-1/2 fuel type.

Fuel type O1 a/b– Grass

This fuel type consists of grass cover with minimal tree cover. This fuel type is applied to unmaintained, native grasses, rather than large maintained lawns or irrigated crops which are much less flammable. Grass fuels are dominated by fine fuels and are very responsive to moisture inputs or deficits. As such, wildfire behaviour varies widely based on recent weather conditions. Under dry and windy conditions, grass fuels can support extreme rates of spread and fire intensity. However, small amounts of moisture can drastically limit wildfire spread or behaviour. Therefore, the wildfire behaviour potential in these areas is dependent on the degree of curing, which is typically quite high during the wildfire season.

Photo 19. 01 a/b fuels in foreground. Note the contrast with irrigated, maintained grass in rear.

A map of the fuel types in the AOI was obtained from the Provincial Strategic Threat Analysis (PSTA) dataset. The PSTA fuels data, based on the FBP system, is created from existing provincial data and algorithmic interpretation of orthophotos. When examined at a local scale for a CWPP, errors are evident. These are often due to recent disturbance, such as logging or land clearing for development. Another source of error is very fine differences in fuel types that are difficult to capture in a large scale analysis, such as selection cut harvesting, or tree mortality from disturbance. As such, part of the local wildfire risk process is ensuring this map is as accurate as is feasibly possible.

The following process, developed with consultation with the BCWS Provincial Fuels Specialist, is used to update the fuel map for the AOI:

1. DHC reviewed the fuel type layer with latest ortho imagery. Identified obvious errors at this scale. This included areas identified as forest but have recently been cleared. In some areas the VRI-derived fuel type was classified as grass or slash, but the polygon in the aerial imagery is clearly treed. These were classified using air photo interpretation and referencing the nearest treed polygons.

2. Areas were identified for ground truthing. This focuses on areas adjacent values and communities as priorities.

3. Field work was conducted to ground truth the fuels layers. Polygons adjacent to values were visited by forester and the accuracy of fuel typing layer confirmed. Where errors were encountered, the fuel layer was updated and representative photos were taken. Fuel type change forms are completed for each fuel type change.

4. Finalize the spatial fuels layer.

5. Submit fuel type change forms to BCWS for review.

Fire Spread Patterns

Initial Spread Index (ISI) is a rating of the expected rate of spread of a fire. ISI is derived by combining wind speed with the Fine Fuel Moisture Index (FFMC), which measures the moisture content of the most easily ignited fuels. High winds, FFMC, and ISI will result in an increased rate of spread and wildfire intensity and are therefore reviewed together. Data for FFMC and ISI is recorded at local BCWS weather stations. In addition, local weather stations record wind speed and direction. This data is then assessed under typical wildfire conditions to determine rates of spread potential, potential wildfire intensity, and spread direction.

Topography

Steep slopes significantly increase wildfire spread through increasing radiant and convective heat. Aspect on steep slopes will also affect wildfire spread, as south-facing slopes will be much warmer and drier than other aspects. Areas with steep, vegetated slopes below them are at higher risk than flat areas with similar fuel loading.

Table 23 Slope percentage and fire behaviour implications.

Slope Percent Class	Fire Behaviour Implications
<20%	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	Flame tilt begins to preheat fuel, increase rate of spread.
31-45%	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
46-60%	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

Table 24 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 increased rates of spread. Position on a bench may reduce the preheating near the value. (Value is offset from the slope).
Mid slope – continuous	Impacted by fast rates of spread. No break in terrain features affected by preheating and flames bathing into the fuel ahead of the fire.
Upper 1/3 of slope	Impacted by extreme rates of spread. At risk of large continuous fire run, preheating and flames bathing into the fuel.

Local Wildfire Threat Classification

Integrating fuels, fire spread patterns, and topography provides an assessment of local wildfire threat, or the wildfire behaviour potential under severe wildfire conditions. Severe wildfire conditions are defined as the 90th percentile weather conditions over the last 10 years. These are the times when wildfire is most likely, and suppression conditions are most challenging. This analysis highlights the locations most likely to support high or extreme wildfire behaviour that may be beyond the suppression capability of BCWS or local fire departments.

Proximity of Fuel to the Community

Fuel closest to the community usually represents the highest hazard. To capture the importance of fuel proximity, the wildland urban interface (WUI) is weighted more heavily from the value or structure outwards. Fuels adjacent to the values and/or structures at risk receive the highest rating followed by progressively lower ratings moving out.

The local wildfire threat assessment process subdivides the WUI into 3 areas (Table 25):

1. Areas within 100 m of the WUI (WUI 100)
2. Areas from 101 to 500 m from the WUI (the WUI 500)
3. Areas 501 to 1000 m from the WUI (the WUI 1000).

Table 25 Proximity to the Interface.

Proximity to the Interface	Descriptor*	Explanation
WUI 100	(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	(101-500m)	Treatment would affect wildfire behaviour approaching a value, as well as the wildfire's ability to impact the value with short- to medium- range spotting; should also provide suppression opportunities near a value.
WUI 1000	(501-1000 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.
	>1 000 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.

Local Wildfire Risk Classification

Wildfire risk at a local level is determined by combining fuel, fire spread patterns, and topography with proximity zones. This estimates the likelihood of severe wildfire occurring near communities. The BCWS has provided a systematic process to model wildfire risk in a community which involves using weighted averages to provide a numerical wildfire risk score (Figure 27). This score is then ranked as Low, Moderate, High, and Extreme, which is then mapped for easy visual reference. Areas of high and extreme risk are typically directly adjacent to communities, and downwind of dense conifer forests. The areas of highest risk are prioritized for field assessment to ground truth and determine management options.

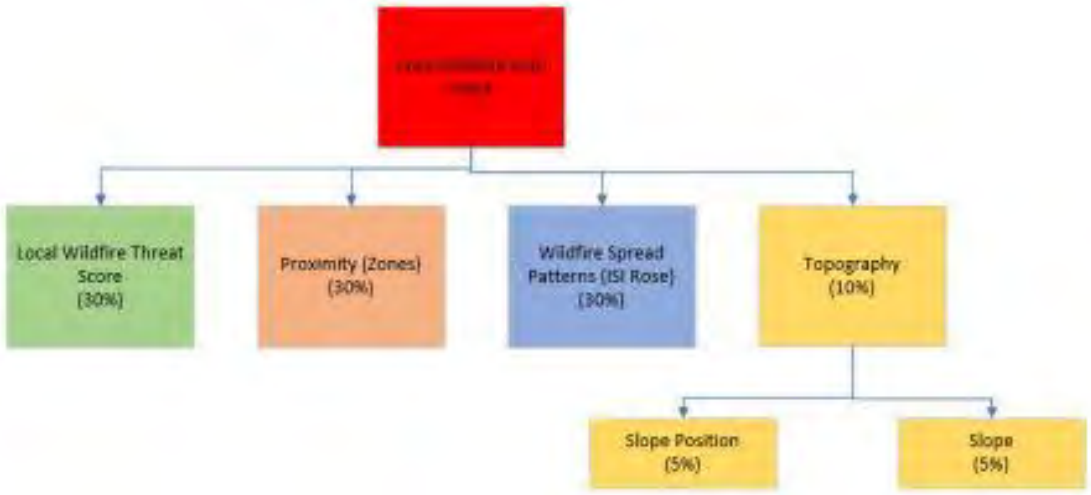

Figure 27. Weighted averages used to determine wildfire risk.

Appendix C: Large Format Maps

Large format maps supplied separately.