Strathcona Regional District

Electoral Area A

2020 Community Wildfire Protection Plan

Submitted to:

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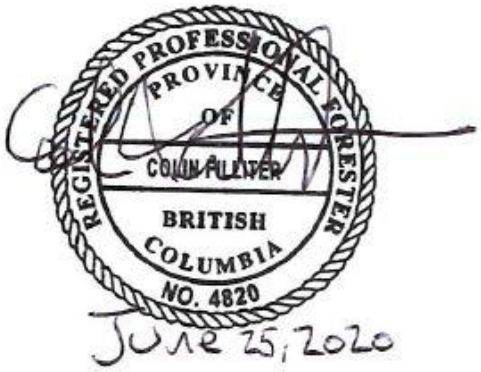
REGISTERED PROFESSIONAL SIGN & SEAL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EXECUTIVE SUMMARY

The Community Wildfire Protection Plan (CWPP) was completed under the framework established by the Community Resilience Investment program, administered by the Union of BC Municipalities. The area of interest is the wildland urban interface (WUI) surrounding the Strathcona Regional District (SRD) Electoral Area A communities of Sayward Valley, Walter's Island, Brown's Bay, Eagle's Cove, and Esperanza. The AOI's are within the traditional territories of the Wei Wai Kum First Nation, We Wai Kai First Nation, K'omoks First Nation, Homalco First Nation (Xwemalhkwu), Ehattesaht Chinehkint First Nation, and Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations. This CWPP identifies the wildfire risks surrounding the communities, potential consequences of a wildfire to the communities, and recommends possible ways to reduce the risk.

A local wildfire threat and risk assessment was completed for the Sayward Valley using the best available spatial data. The fuel types in the area are a mosaic of mature conifer forests, recently harvested cut blocks, immature forests, and deciduous patches. Previous fire history in the area indicates low fire density from both human and lightning caused fires. The local wildfire threat is Low to Moderate. The local wildfire risk ranges from Low to High with higher risk areas associated with fuels in close proximity (within 500m) of the community.

A local wildfire threat/risk assessment was not completed for the Walter's Island, Esperanza, Brown's Bay and Eagle's Cove AOI's. In general, the Provincial Strategic Threat Analysis finds the wildfire threat for these areas to be Low to Moderate. FireSmart planning and activities are recommended for all areas of interest.

Recommendations are summarized in the table below. The recommendations are based on a review of best practices from other jurisdictions, gaps identified through community engagement, the local wildfire risk analysis, prevention strategies for human-caused ignitions, and integration of FireSmart program principles. FireSmart is a national initiative to educate and empower the public on what can be done to protect their families, properties, and communities from wildfire. Several FireSmart activities and practices are recommended for all areas of interest.

Fuel management treatments (surface and ladder fuel removal) are recommended for High risk areas within the Sayward Valley. Along with fuel management, community awareness and education play a critical role in reducing the wildfire risk. Community awareness focuses on FireSmart principles, understanding fire use restrictions, emergency preparedness, and regularly sharing fire safety related information with the community. Emergency evacuation planning is also identified as priority for each of the AOI's.

The Sayward Volunteer Fire Department provides fire protective services for the Sayward Valley. Continued recruitment and training for volunteer firefighters is critically important to maintaining response capacity for WUI fires and any other emergencies. No other AOI's have fire department protective services. On Crown lands, the BC Wildfire Service manages wildfire response.

This plan makes 29 recommendations to the Strathcona Regional District. The recommendations should be further prioritized by the SRD depending on local strengths, opportunities, and the availability of human, financial, and physical resources. At minimum, the plan should be revisited every five years to assess the progress and relevance of previous recommendations and for the continual improvement of wildfire protection planning as more information becomes available.

SUMMARY OF CWPP RECOMMENDATIONS

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
1.	High	To develop emergency preparedness and evacuation plans specific to each of the AOI's, accounting for local and regional access challenges.	Assess and map emergency evacuation routes and muster routes for each AOI. Make Emergency Evacuation Maps available on the SRD website.	SRD
Rationale: Based on gaps identified during CWPP engagement. No specific evacuation routes or muster point mapping available.				
2.	High	To reduce the likelihood of human-caused ignitions by regulating open burning in Electoral Area A with a local bylaw.	SRD should enact an Open Burning Bylaw to regulate the timing of fires, size of fires, required availability of suppression materials, and materials permitted to be burned. At minimum, the bylaw should apply to the Electoral Area within the Sayward Fire Department Fire Protective Services Area.	SRD
Rationale: Based on best practice observed in similar jurisdictions to reduce the likelihood of human-caused WUI fire events.				
3.	Med	To reduce the fuel hazard within the high risk areas identified within 500m of structures (WUI500).	Engage a qualified forest professional in creating site level prescriptions, and supervising/ coordinating operational implementation of treatments for each recommended treatment area. Consultation with applicable First Nations, private landowners, industry tenure holders, municipalities and the SRD will be required as part of the operational planning process.	SRD
Rationale: Recommended treatment areas based on local wildfire risk analysis. High risk areas within 500m of community structures or critical infrastructure are priority for treatment.				

4.	High	To engage private landowners in the FireSmart program and planning to help reduce the likelihood of disaster in the event of a WUI fire.	Host Community Champion Workshops for remote/isolated areas. Consider remote or virtual workshop delivery. For Sayward Valley consider working with the Sayward Community Recreation Association.	SRD
Rationale: The FireSmart program is a nationwide initiative. Several post-wildfire examples across the country show how FireSmart activities reduce the structure losses associated with WUI fires. FireSmart activities are a focus area for all CWPP's developed under the UBCM CRI funding program. FireSmart is implemented through best practices in 7 disciplines: education, emergency planning, vegetation management, legislation, development, interagency cooperation and cross-training.				
5.	High	To engage private landowners in the FireSmart program and planning to help reduce the likelihood of disaster in the event of a WUI fire.	Contact a Local FireSmart Representative to conduct FireSmart Community Hazard Assessments as noted in Table 9.	SRD
Rationale: As above in #4. Priority areas encompass remote AOI's and critical infrastructure in the Sayward Valley AOI.				
6.	High	To improve community FireSmart awareness and to reduce hazards in the structural ignition zone of critical community infrastructure.	Conduct a FireSmart Hazard Assessment around community/municipal infrastructure such as Firehall No. 2, and Sayward Heritage Hall.	SRD, coordinate with Sayward Volunteer Fire Department
Rationale: As above in #4. Priority areas encompass remote AOI's and critical infrastructure in the Sayward Valley AOI.				
7.	Low	To improve community FireSmart awareness and to reduce hazards in the structural ignition zone of homes.	Recommend/encourage fire resistant landscaping materials to residents and to design public spaces with fire resistant landscaping materials where possible. Refer to FireSmart Canada's yard and landscaping guidelines.	SRD
Rationale: FireSmart best practice, as referred to in #4.				
8.	High	To reduce the ignition risk within the FireSmart	Connect property owners to FireSmart guides for selecting	SRD

		structural ignition zone by making property owners aware of preferred FireSmart building materials.	building materials and incorporating FireSmart principles into construction and location. The FireSmart Home Development Guide is a key resource. In the absence of an Electoral Area A building bylaw, the SRD should recommend best practices for building within Area A to minimize WUI risk. Make the resources available online where other SRD building code/bylaw information is located.	
Rationale: FireSmart best practice, as referred to in #4.				
9.	High	To improve community awareness of the FireSmart program principles and activities through education.	Encourage residents and property owners to complete the free, online, FireSmart 101 course.	SRD
Rationale: Recommended practice for public education discipline of FireSmart, as referred to in #4.				
10.	High	To communicate the content of the CWPP and improve community awareness of wildfire planning.	Make the CWPP video, report, and associated maps available to the public through the SRD website. Share CWPP with forest tenure holders and industrial operators within the AOI.	SRD
Rationale: Recommended practice for public education discipline of FireSmart, as referred to in #4.				
11.	High	To improve community understanding of wildfire threat and risk; to improve awareness of what actions can be taken to mitigate risk.	Use SRD social media accounts to regularly share wildfire preparedness, wildfire safety, and FireSmart practices information. Posts can redirect followers to the established resources of FireSmart BC, BC Wildfire Service, and Prepared BC.	SRD
Rationale: Recommended practice for public education discipline of FireSmart, as referred to in #4.				

12.	Med	To improve community awareness of local bylaws, wildfire regulations, and fire safety information.	Develop a Sayward Valley specific Wildfire Safety and Preparedness informational pamphlet for distribution to residents within the Fire Protective Services Area. Information should include best practices for open burning, where/how to access fire weather information, venting index information, open fire/campfire bans (BCWS), relevant Bylaws and legal information.	SRD
Rationale: Recommended practice for public education discipline of FireSmart, as referred to in #4.				
13.	High	To improve public awareness of wildfire threat and risk; and awareness of what actions can be taken to mitigate risk.	Organize an annual Community Fire Safety or Community Wildfire Preparedness day (for Sayward Valley) Activities may include: checking fire extinguishers and smoke alarms in homes; conducting FireSmart clearing of Priority 1 (up to 10m) zones around critical community infrastructure, FireSmart presentations, fire department demonstrations, etc.	SRD, coordinate with Village of Sayward
Rationale: Recommended practice for public education discipline of FireSmart, as referred to in #4.				
14.	Med	To reduce the risk of human-caused ignitions by promoting alternative means of yard/property waste disposal beyond open fires.	Provide residents with information on alternatives to burning yard waste. Link this information on the SRD website. Alternatives to burning include yard waste disposal centres (Sayward Transfer Station), composting, or xeriscaping.	SRD
Rationale: Recommended practice, observed in similar jurisdictions to reduce the likelihood of human-caused WUI fire events.				
15.	Med	To reduce the fuel hazard along powerline	Work with BC Hydro to mitigate risks along right-of-ways. Communicate the importance of	SRD, coordinate with Village of

		right-of-ways.	fuel hazard abatement along powerline corridors when brushing, clearing fallen trees, or other vegetation management work occurs.	Sayward
Rationale: Recommended best practice to address inter-agency cooperation within the WUI. Refer to FireSmart program implementation in #4.				
16.	Med	To improve public awareness of Fire Danger and burning restrictions when in effect.	Install additional signage at the Sayward Visitors Centre at Sayward Junction to communicate fire bans, burning restrictions and the Fire Danger Rating.	SRD, coordinate with Village of Sayward, SVFD, and BCWS
Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation. Sayward Junction is a high traffic, highly visible location for signage.				
17.	Low	To improve water availability for fire suppression in isolated areas in the Sayward Valley.	For areas in the Sayward Valley, assess the feasibility and potential locations for dry hydrant installation, and/or other water storage options for fire fighting during drought conditions	SRD, coordinate with SVFD
Rationale: Water availability in the fire protective services area, outside of the hydrant coverage area was identified as an issue during CWPP engagement.				
18.	Med	To improve water availability for fire suppression in isolated areas in the Sayward Valley.	Work with the Village of Sayward, Sayward Volunteer Fire Department to procure a water tanker truck. Construction of a storage area to house the truck should also be planned for during the acquisition.	SRD, coordinate with Village of Sayward and SVFD
Rationale: Water availability in the fire protective services area, outside of the hydrant coverage area was identified as an issue during CWPP engagement.				
19.	High	To improve water availability for fire suppression in isolated areas in the Sayward Valley.	Assess, maintain, and/or upgrade the water storage reservoirs located at Firehall #2 and Sayward Junction. Routine maintenance checks should be performed to ensure reliable water supply for fire suppression.	SRD, coordinate with SVFD

Rationale: Gap identified during CWPP engagement. Water availability for fire suppression is a concern, the status of these reservoirs was not able to be confirmed.				
20.	Low	To improve emergency evacuation communications to the community.	Encourage residents/ landowners to sign up to the SRD's free Connect Rocket emergency notification service which sends out text messages to cellular subscribers and voice calls to landlines.	SRD
Rationale: Existing program/infrastructure to continue to encourage residents to use.				
21.	Low	To identify, clear and maintain helicopter landing areas for emergency evacuations and/or wildfire response operations.	Identify potential helicopter landing sites throughout the AOI's. Designate areas within a Local Emergency Plan. Helicopter landing sites should be continually maintained to be free of obstructions, loose debris and overhanging vegetation or obstacles; and visibly marked where possible. Landing areas should be easily accessible and easily controlled spaces. BCWS helicopter landing area specifications are available in their Pilot Guide.	SRD
Rationale: Recommended best practice for emergency access and evacuation planning. Safe and clear landing areas concern brought forward by BCWS.				
22.	High	To maintain and upgrade the condition of the main access and emergency evacuation route along Sayward Road.	Develop annual action plans for regular maintenance of the Sayward Road right-of-way including brushing, danger tree and surface fuel management. Ensure plans are in place for timely removal of storm damaged trees and debris prior to each fire season. Long-term planning to replace the single-lane bridge is recommended.	SRD, coordinate with Village of Sayward
Rationale: Build up of fuel hazards from previous storm damage were concerns identified by both SVFD and BCWS.				
23.	Med	To continue recruitment and retention efforts for volunteer fire	Regularly schedule open houses or recruitment days for the Sayward Volunteer Fire	SRD, coordinate with SVFD

		department members.	Department. Connect with the community regularly through social media and consider its use as an advertising tool.	
Rationale: Based on CWPP engagement, recruitment of members is a challenge in small communities. Recommended practice from other jurisdictions is to use social media as a tool to connect with the community.				
24.	Med	To ensure all volunteer fire department members are trained to wildland firefighting standards.	Ensure all members of Sayward Volunteer Fire Department complete Wildland Forest Firefighter Level 1 (SPP-WFF 1) training. SPP-115 (structure protection workshop) and ICS100 are also recommended.	SRD, coordinate with Village of Sayward and SVFD
Rationale: As new members join SVFD, to keep SPP-WFF-1 training top of mind.				
25.	Med	To maintain SVFD's readiness for responding to WUI fires.	Include wildfire-specific training sessions that include: fire line construction, pump operations, sprinkler protection, portable water tank deployment, and wildland hose operations. Interface training should include completion of a wildfire simulation exercise and safety training specific to wildland fire and risks inherent with natural areas. Work with the BCWS North Island Fire Zone, and SRD to conduct annual joint training or mock exercises.	SRD, coordinate with Village of Sayward and SVFD
Rationale: Based on CWPP engagement with the SVFD and BCWS, no such coordination is known to be in place. Interagency cooperation and cross-training are FireSmart disciplines. The BCWS North Island Fire Zone has indicated cross-training is an area of interest for future development.				
26.	High	To maintain and improve inter-agency communication during emergencies.	The SRD should arrange an annual meeting, prior to fire season, to include BCWS – North Island Fire Zone, EMBC, and local fire department representatives to review incident command structure and emergency support services in the event of a WUI fire.	SRD

Rationale: Key contacts and individuals may change from year to year. Annual meetings recommended as a best practice to build relationships and improve communication in the event of a WUI event. Interagency cooperation and cross-training are FireSmart disciplines.				
27.	High	To improve equipment availability for structure protection in the event of a WUI fire.	Ensure mutual aid or service agreements are in place with the City of Campbell River / Campbell River Fire Department for deployment of the City's structural protection unit in the event of the WUI's threatening structures in the Electoral Area.	SRD
Rationale: Recommended as a best practice emergency planning activity, to identify priorities or conditions for deployment of equipment prior to the event of a WUI fire.				
28.	High	To improve community preparedness for structure protection due to the remote and isolated location of properties and in some cases, absence of a local fire department.	Develop a checklist for property owners of fire suppression equipment and emergency supplies to keep readily available during fire season. Items should include smoke alarms, fire extinguishers, hand tools, personal protective equipment, communications devices, and a first aid kit.	SRD
Rationale: Recommended best practice for emergency preparedness considerations that uniquely address isolated/remote local conditions of the WUI.				
29.	Med	To improve capacity and equipment availability for structure protection.	Encourage property owners to purchase sprinkler kits and water supply systems for sprinkler kits to deploy on their homes/critical structures.	SRD
Rationale: Based on CWPP engagement, the equipment availability for structural protection in the region could be improved. Sprinkler kits are a relatively low-cost option and highly effective option for the Village and residents.				

Table 1. Summary of the known resources and funding supports for recommended activities.

Resources	Land Jurisdiction	Types of Projects
Local government taxation	Municipal Private	• Various projects as directed by local governments including FireSmart assessments and activities, debris disposal, equipment purchases, training, etc.
Regional District Grant-In-Aid	n/a	• Non-profit community organizations eligible to apply for funding for projects that benefit the general community
Forest Enhancement Society BC (FESBC)	Provincial Crown	• Fuel management treatment prescriptions and prescription implementation
UBCM Community Resiliency Investment Program (CRI)	Municipal First Nations Private	• FireSmart hazard assessments, demonstration projects, off-site debris disposal (ie: chip trucks) • Community Education • Development planning • Emergency planning and cross training
UBCM Community Emergency Preparedness Fund (CEPF)	n/a	• Emergency support services training • Fire department training or equipment • Emergency evacuation planning • Emergency operations training
First Nations Emergency Support Services – Indigenous Services Canada (FNESS/ISC)	First Nations Reserve lands	• Fuel management prescriptions and treatments On-Reserve
BC Wildfire Service	Provincial Crown	• Fuel management treatments (in coordination with local fire zone officer) • Public education and outreach

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LIST OF ACRONYMS

Acronym	Full Name / Phrase
AOI	Area(s) of Interest
BCWS	BC Wildfire Service
CFFBPS	Canadian Forest Fire Behaviour Prediction System
CRI	Community Resilience Initiative
CWPP	Community Wildfire Protection Plan
EMBC	Emergency Management BC
FBP	Fire Behaviour Prediction System
FSR	Forest Service Road
FWI	Fire Weather Index
GIS	Geographical Information System
ISI	Initial Spread Index
LIDAR	Light Detection and Ranging
LFR	Local FireSmart Representative
MFLNRORD	Ministry of Forests, Lands, Natural Resource Operations and Rural Development
RESULTS	Reporting Silviculture Updates and Land Status Tracking System
PSTA	Provincial Strategic Threat Analysis
SRD	Strathcona Regional District
SVFD	Sayward Volunteer Fire Department
TFL	Tree Farm Licence
UBCM	Union of BC Municipalities
VRI	Vegetation Resource Inventory
WFP	Western Forest Products Inc.
WUI	Wildland Urban Interface

SECTION 1: INTRODUCTION

Wildfire is an integral part of British Columbia's ecosystems and landscapes, including areas where citizens settle and communities grow. Due to an increasing population with expanding rural development and the impacts of climate change, more communities in B.C. are located in areas of potentially increased wildfire risk. The Community Wildfire Protection Plan (CWPP) process helps communities develop plans to improve safety, lower the risk of damage to property, and reduce the impacts of wildfires to BC communities. This CWPP is broken into the following sections:

SECTION 1: Introduction - introduces the purpose of a CWPP and the CWPP planning process

SECTION 2: Local Area Description - defines the Area of Interest (AOI) for the CWPP; provides a description of the community (or communities) within the AOI; summarizes current community engagement, and; identifies linkages to other plans that provide valuable information to reduce the threat of wildfires

SECTION 3: Values at Risk - introduces the extent to which wildfire has the potential to impact values within a community

SECTION 4: Wildfire Threat and Risk - describes the process that was undertaken to identify and summarize the fuel hazard and other factors that contribute to the wildfire threat around a community

SECTION 5: Risk Management and Mitigation Factors - outlines the strategies the community can put into practice to reduce the risk and the impact of a wildfire in four subsections

5.1 Fuel Management - identifies and prioritizes fuel management treatments

5.2 FireSmart Planning & Activities - summarizes the current level of FireSmart implementation and identifies priority areas for future FireSmart activities

5.3 Community Communication and Education - describes the key steps required to build engagement and support within the community for the CWPP. This includes education and outreach and local community prevention programs.

5.4 Other Prevention Measures - identifies local actions and strategies that reduce the threat of wildfires

SECTION 6: Wildfire Response Resources - provides a high-level overview of the resources that are available to local governments in the case of a wildfire.

1.1 Purpose

The purpose of this CWPP is to identify the wildfire risks within and surrounding the areas of interest (AOI), to describe the potential consequences if a wildfire was to impact the community, and to examine possible ways to reduce wildfire risk. This CWPP provides an updated assessment of the wildfire risk to the area. The goal is to define the threat to human life, property, and critical infrastructure from wildfires within the AOI; identify measures necessary to mitigate those threats; and outline an action plan to implement those measures. The CWPP is intended to provide the community with a framework to inform the implementation of specific actions that will result in

- reduced likelihood of wildfire entering the community,
- reduced impacts and losses to property and critical infrastructure and
- reduced negative economic and social impacts to the community.

1.2 CWPP Planning Process

The CRI program is a provincial grant program administered by the Union of BC Municipalities (UBCM) to help fund costs associated with preparing CWPPs. Since the CRI program was founded in 2018, over 120 First Nations and local governments have received funding for CWPP development.[1] The Strathcona Regional District (SRD) obtained a CRI grant to develop community wildfire protection plans for Electoral Area A including participating communities of the Village of Sayward, Village of Gold River, Village of Tahsis, Village of Zeballos, Nuchatlaht First Nation, Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations; and for Read Island within Electoral Area C. In Fall 2019, SuavAir Aerial Imaging Inc. was contracted by the SRD to carry out the project in collaboration with municipal governments, First Nations, regional stakeholders, provincial government agencies, and residents.

The CWPP planning process consists of the following phases:

1. Background research – general community characteristics, economic profiles, demographics, community plans, emergency planning, critical infrastructure, fire history, fire weather, property values, environmental values, cultural values, land jurisdiction, and relevant legislation.
2. Consultation with local governments, First Nations, regional district, provincial agencies – to identify values at risk, existing fire suppression capacity, and understand current community engagement with respect to wildfire risk mitigation
3. GIS Analyses – review Provincial Strategic Threat Analysis (PSTA) data. Use best available information from the Data Catalogue (including Vegetation Resource Inventory data) and updated Google Earth imagery, to adjust data for fuel typing errors, modify threat and risk classification where necessary
4. Field Work – verification of critical infrastructure, fuel types, identification of community specific values at risk
5. Draft report and mapping development – identification of measures to mitigate risks, make recommendations for action
6. Report review – professional peer review, regional district and community review
7. Community engagement and education – community presentations, follow-up

Understanding the relationship of the community to its surrounding environment, and what that means in terms of the wildfire hazard, threat and risk of loss, is critical to help the community plan for mitigation activities and respond to wildfire events. To support this understanding, the BCWS has conducted a Provincial Strategic Threat Analysis (PSTA) for the identification of wildfire threat and potential fire behaviour. The outputs of the PSTA were made available to SuavAir for the study and analysis. Other relevant data was gathered through field visits to the communities, stakeholder engagement and meetings, and publicly accessible data from the BC Government Data Catalogue published by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLRNORD).

[1] Union of BC Municipalities. Community Resiliency Investment. (https://www.ubcm.ca/EN/main/funding/lgps/community-resiliency-investment.html)

SECTION 2: LOCAL AREA DESCRIPTION

2.1 CWPP Area of Interest

SRD Electoral Area A (Area A) covers approximately 9,050 square kilometres and neighbours the Villages of Sayward, Gold River, Tahsis & Zeballos, and the City of Campbell River. The region runs from the northern boundary of the City of Campbell River north to the Village of Sayward, and it extends to the west coast of Vancouver Island, including the world-famous Kyuquot Sound and Nootka Sound. The region is known for stunning landscapes and waterways, abundance of wildlife, recreational opportunities including hiking, camping, cave exploration, mountain biking and world-class fishing.[2] The AOI's addressed in this CWPP are the more densely populated communities within Area A currently without a CWPP and outside of a municipal boundary or First Nations reserve. The AOI's include Sayward Valley, Walter's Island, Esperanza, Eagle's Cove, and Brown's Bay. The broad coverage of this CWPP includes the traditional territories of the Wei Wai Kum First Nation, We Wai Kai First Nation, K'omoks First Nation, Homalco First Nation (Xwemalhkwu), Ehattesaht Chinehkint First Nation, and Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations.

2.2 Community Descriptions

Sayward Valley is the most populated area within Electoral Area A. Residents are spread throughout the valley on rural acreages on either side of Sayward Road, Highway 19, and the Salmon River. The local wildfire threat assessment (Section 4.3.1) focuses on the Sayward Valley due to the data availability, population density, structural density, access, and complexity of the wildland urban interface area. Sayward Valley has close ties to the Village of Sayward but for administrative jurisdiction reasons, the "Valley" and "Village" are addressed in separate CWPP's. Both the Village and the Valley are within the service area of the Sayward Volunteer Fire Department. Wildfires and WUI incidents do not respect administrative boundaries, so although the plans are separate documents at the request of the SRD, wildfire management and preventative measures should be coordinated across jurisdictions as much as possible.

Brown's Bay, Eagle's Cove, Esperanza, and Walter's Island do not fall within the fire fighting jurisdiction of any local fire department. WUI fires on Crown lands are responded to by the BCWS. Brown's Bay Resort is a private resort, lodge and RV campground that attracts mainly summer season visitors. Brown's Bay is the site of Brown's Bay Packing, a fish processing plant. Brown's Bay is located on the oceanfront and is connected to Highway 19 by Brown's Bay Road, a one way in/out access route. Eagle's Cove is an isolated collection of private lots and recreational properties accessed by Elk Bay FSR at its junction with Highway 19 near Roberts Lake.

[2] Strathcona Regional District. Electoral Area A. https://srd.ca/about/srd-electoral-areas/electoral-area-a/

Photo 1. Brown's Bay aerial overview.

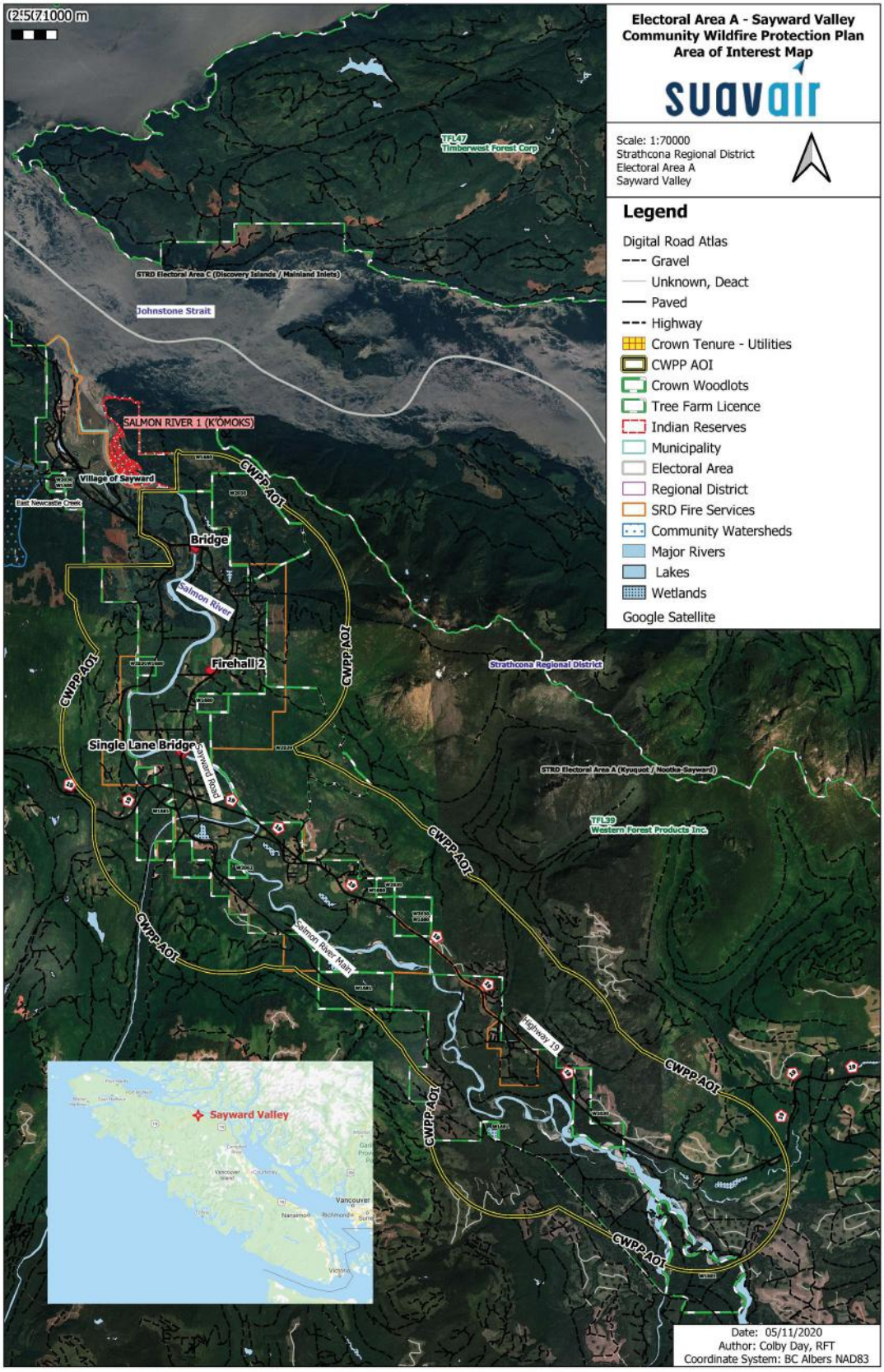
Photo 2. Eagle's Cove aerial overview.

Esperanza is a remote community on the west coast of Vancouver Island on the northern shores of Esperanza Inlet. Esperanza was the site of a historic Mission Hospital and is now a Christian community[3] that offers youth camps. Access to Esperanza is by boat or float plane only. There are no roads in the area.

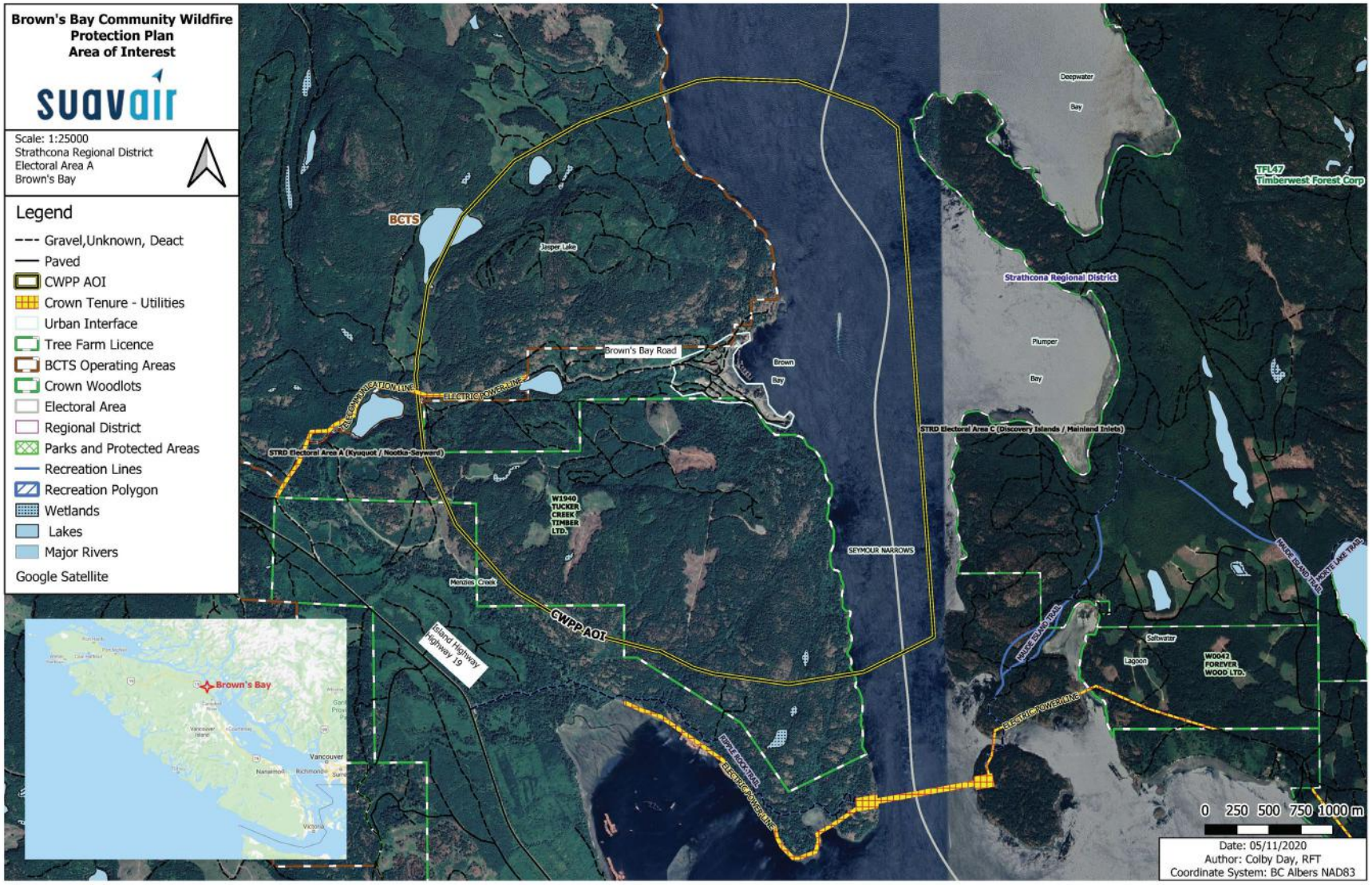
Walter's Island is located off the west coast across from the Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations' community Kyuquot. A few smaller adjacent islands have residents and infrastructure as well. There are no roads on Walter's Island or any of the adjacent smaller islands. Access is by boat or float plane only.

Photo 3. Walter's Island aerial overview.

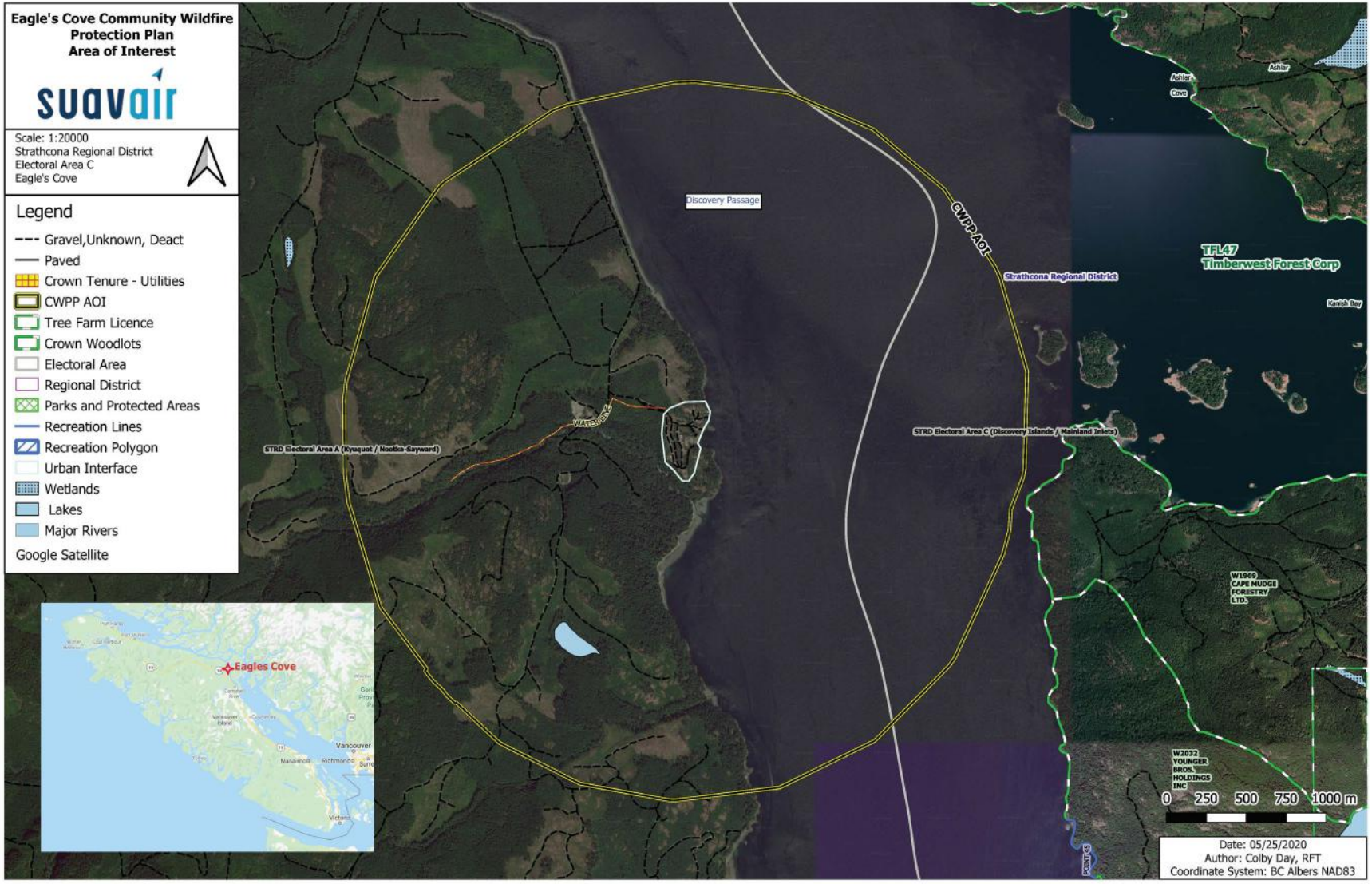
[3] Esperanza. http://www.esperanzaministries.com/



Map 1. Sayward Valley area of interest.

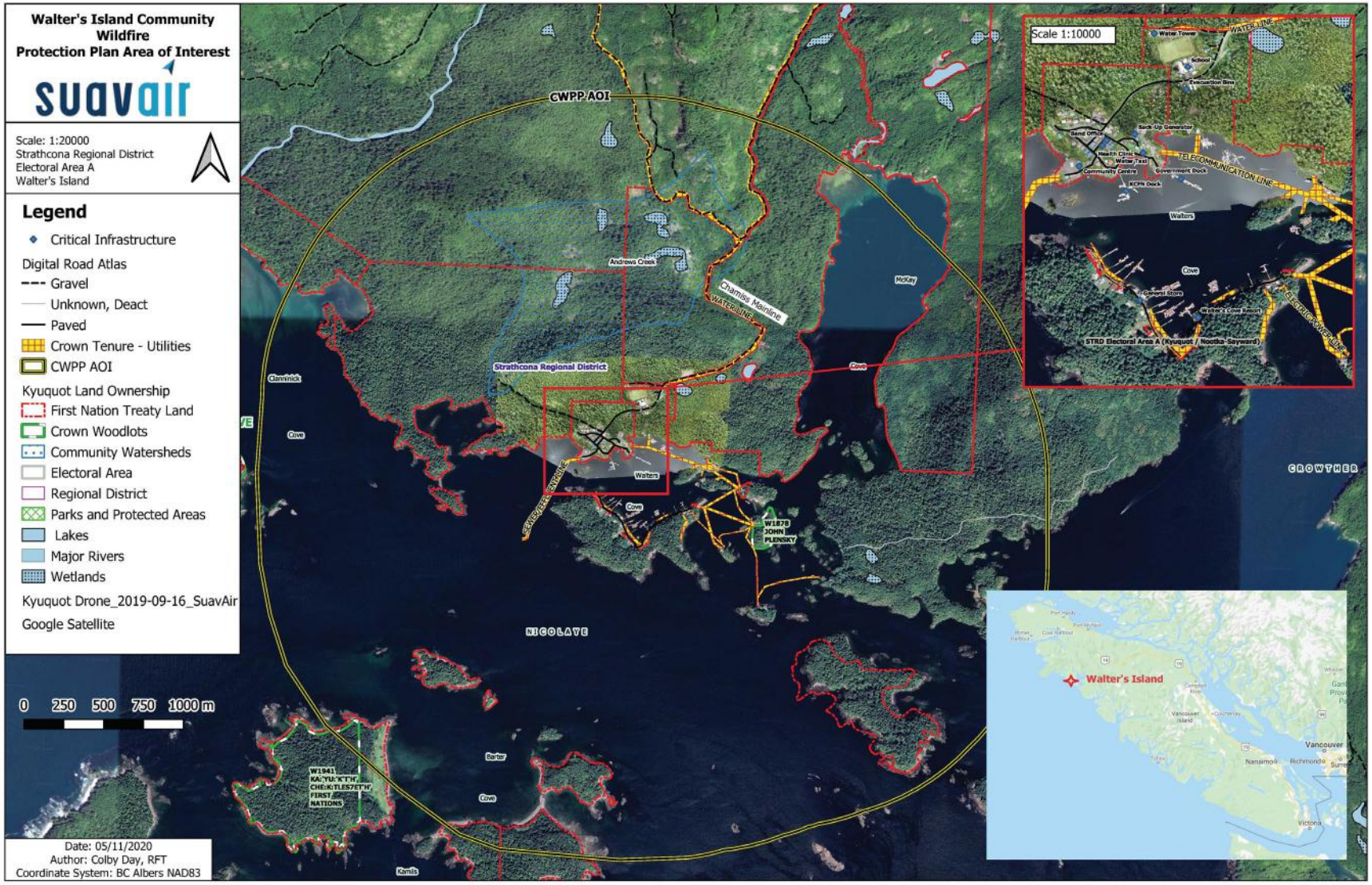


Map 2. Brown's Bay area of interest.



Map 3. Eagle's Cove area of interest.

Map 4. Esperanza area of interest.



Map 5. Walter's Island area of interest (from Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations' 2020 CWPP).

2.3 Past Wildfires, Evacuations and Impacts

The Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD) and BC Wildfire Service (BCWS) manage a provincial database of historical fire ignitions and fire perimeters. This data was reviewed as part of the planning process. For the Walter's Island, Eagle's Cove, Brown's Bay and Esperanza AOI's, wildfires and WUI incidents are not known to have precipitated any evacuation alerts or orders in the recent memory. Heavy smoke impacted the entire area during the 2018 fire season.

A human-caused fire started on private property in May 2019 and spread into standing timber from the Electoral Area towards and into the Village of Sayward municipal boundary. The fire was initially responded to by the Sayward Volunteer Fire Department (SVFD) and then BC Wildfire Service was called in for support. The BCWS contained the fire at 21 hectares. As a precaution, 1 property was placed under evacuation order but no structures were threatened or damaged.

2.4 Current Community Engagement

B.A. Blackwell & Associates completed the 2011 Village of Sayward CWPP which included the current Sayward Valley AOI plan area. Fuel treatments were recommended in the 2011 CWPP but no treatments have been completed. The other AOI's in this plan have not engaged in formal CWPP processes, FireSmart hazard assessments, or other formalized wildfire prevention measures.

2.5 Linkages to Other Plans and Polices

The intent of this sub-section is to identify the sources and linkages to other documents in order to minimize duplication while identifying other plans or legal requirements that are relevant to the CWPP planning process. It also discusses the relevance of objectives, strategies and polices that will influence the development of the CWPP.

2.5.1 Local Authority Emergency Plan

SRD provides fire protection services in the Sayward Valley under a mutual aid agreement with the Village of Sayward – Sayward Volunteer Fire Department (SVFD); the other AOI's with Area A are not covered by fire department or other services. Currently, a local emergency management plan or evacuation plan is not available for Area A. The following recommendation is made regarding local emergency planning:

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
1.	High	To develop emergency preparedness and evacuation plans specific to each of the AOI's, accounting for local and regional access challenges.	Assess and map emergency evacuation routes and muster routes for each AOI. Make Emergency Evacuation Maps available on the SRD website.	SRD

2.5.2 Affiliated CWPPs

Initial CWPP's for the Villages of Sayward, Zeballos, Tahsis, and Gold River were completed in 2011. Plans for each Village are being updated in 2020. CWPP's were completed for Nuchatlaht First Nation and Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations in 2020 as well. Each of these plans address jurisdictions within or neighbouring Electoral Area A.

The 2011 Village of Sayward CWPP included all areas within 2km of the Sayward Fire Protective Services boundary, including the Sayward Valley. This combined AOI, between the Village and the Valley is a logical integration for a regional level plan such as a CWPP. However, for the 2020 update, the SRD specifically requested the Village and Valley AOI's be divided into separate plans. As a result, duplication of recommendations and AOI overlaps occur (Appendix 4: CWPP Area of Interest Overlap). Several recommendations overlap between the Village of Sayward 2020 CWPP and the Sayward Valley portion of this plan. The joint implementation of recommendations should be considered wherever possible.

2.5.3 Local Government Plans and Policies

Currently, no Electoral Area Bylaws regulate the use of open fire within the AOI's. The BCWS Coastal Fire Centre fire bans and regulations apply. One of the concerns is residents' level of awareness of fire bans, how they apply, and how to keep up to date as conditions change during fire season. As of 2019, the BCWS Coastal Fire Centre (CFC) "fog zone" exemptions for open fire prohibitions no longer apply. The area described as the "fog zone" is now subject to all the prohibitions applicable to other areas within the CFC's coverage.

The risk of human ignitions in the Sayward Valley is high. Forested fuels and logging slash are intermixed with rural properties creating a complex WUI in the Sayward Valley. Fire suppression in the Valley is constrained by limited fire department resources, water availability, and challenging road access. Building permits are not required for Electoral Area A. A local open burning bylaw is a common practice in other regional districts with dispersed rural properties to reduce the risk of human-caused ignitions.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
2.	High	To reduce the likelihood of human-caused ignitions by regulating open burning in Electoral Area A with a local bylaw.	SRD should enact an Open Burning Bylaw to regulate the timing of fires, size of fires, required availability of suppression materials, and materials permitted to be burned. At minimum, the bylaw should apply to the Electoral Area within the Sayward Fire Department Fire Protective Services Area.	SRD

2.5.4 Higher Level Plans and Relevant Legislation

The AOI is within the Vancouver Island Land Use Plan Enhanced Forestry Zone 30 - Salmon, Agriculture Areas, and Settlement areas. Additionally, the Sayward Landscape Unit Plan was approved in 2003. Provincial forest management legislation – *Forest and Range Practices Act* and its associated regulations; and provincial wildfire legislation – *Wildfire Act* and its associated regulations apply to provincial Crown land. Other relevant legislation includes the *Heritage Conservation Act, Land Act, Private Managed Forest Land Act,* and the *Environmental Management Act – Open Burning Smoke Control Regulation.*

Wildfire Act and Wildfire Regulation

Under the *Wildfire Act*, the government may order open fire bans, create restricted areas, restrict certain activities, and recover fire control costs amongst other activities and actions laid out in the *Act.* The *Wildfire Act* pertains to all "forest land" and "grass land" and lands within 1km of "forest land" and "grass land" regardless of public or private ownership. The *Wildfire Regulation* has provisions for seeking cost recovery and damages from those who contravene the regulation and act (*Wildfire Regulation* sections 28-24).[4]

The *Wildfire Act* and *Wildfire Regulation* require those carrying out industrial activities to conduct fire hazard assessments and to abate hazards that are identified.

For industrial activities inside or within 2km of a fire protection district (Sayward Valley): fire hazard assessments are required to be conducted at 3 month intervals during which industrial activities are taking place (*Wildfire Regulation,* Section 11(2)(a)). For non-forest tenure holders conducting industrial activities: hazard abatement is required within 6 months of the hazard assessment (*Wildfire Regulation,* Section 12 (1)). Forest tenure holders are required to abate hazards within 24 months of the beginning date of the industrial activity (i.e. forest harvesting) (*Wildfire Regulation,* Section 12.1(2)(a)).

For industrial activities outside of a fire protection district (Walter's Island, Esperanza, Brown's Bay, Eagle's Cove): fire hazard assessments are required to be conducted at 6 month intervals during which industrial activities are taking place (*Wildfire Regulation,* Section 11(3)(a)). For non-forest tenure holders conducting industrial activities: hazard abatement is required within 12 months of the hazard assessment (*Wildfire Regulation,* Section 12(1)). Forest tenure holders are required to abate hazards within 24 months of the beginning date of the industrial activity (ie: forest harvesting) (*Wildfire Regulation,* Section 12.1(2)(a)).

For utility transmission operations, the *Wildfire Regulation* Section 10, requires that utility transmission equipment operating on or within 300m of forest land or grass land must be maintained in a manner that reduces the likelihood of producing an ignition source, and the site maintained in a manner that prevents fire spreading from the site.

Within the AOI, the *Wildfire Regulation* requires that forest tenure holders must conduct fire hazard assessments every 6 months following the start of their industrial activities. Forest harvesting activities that create fuel hazards within the AOI are legally required to be abated within 24 months of the activity start date.

[4] *Wildfire Act.* Wildfire Regulation.
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/11_38_2005

2.5.5 Ministry or Industry Plans

Forest tenure holders within the Sayward Valley AOI include Western Forest Products Inc. Tree Farm Licence 39 (TFL 39), and woodlot licence W2030, held by 0898322 BC Ltd. TFL 39 Management Plan #9 and the WFP Central Island Forest Operations 2017 Forest Stewardship Plan apply to TFL 39. BC Timber Sales and other forest licensees may operate within the AOI's of Brown's Bay, Eagle's Cove and Esperanza. The AOI's are within the following risk polygons (listed in the table below) according to the BCWS Fuel Hazard Assessment and Abatement Fire Risk Map.[5] The risk class determines the threshold for fuel abatement, for industrial and prescribed activities, as recommended in the Guide to Fuel Hazard Assessment and Abatement in British Columbia.[6]

The timbered crown land portion of Walter's Island is within a Crown *Land Act* reserve. No fuel treatment plans, forest health plans, ecological restoration plans, parks/protected area plans are known to apply within the AOI's at this time.

Table 2. Summary of BCWS Fuel Hazard Assessment and Abatement Risk classifications for each AOI.

AOI	Risk Class
Sayward Valley	Severe
Brown's Bay	Moderate/High
Eagle's Cove	Low
Esperanza	Moderate
Walter's Island	Low

The AOI is within the MFLNRORD Campbell River Natural Resource District and Discovery Coast Recreation District; and BCWS' North Island Fire Zone. The MFLRNORD Vancouver Island Central Coast Response Fire Management Plan, a framework for wildfire suppression and response, applies in the area. BCWS/FLNRORD guidance on wildfire management and fuel management is updated periodically and posted online.[7] MFLRNORD guidance includes the 2019 Fuel Management Prescription Guidance[8] and 2019 Tactical Fuel Management Planning Standard.

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[5] BCWS Post Harvest Hazard Abatement Map. https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=9bb5372c65464f0bab178907a5c39947

[6] Wildfire Management Branch. A Guide to Fuel Hazard Assessment and Abatement in British Columbia. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/hazard-assessment-abatement/bcws_hazard_assessment_abatement_guide.pdf

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

[8] https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/fuels-management/2019_fuel_management_prescription_guidance.pdf

SECTION 3: VALUES AT RISK

The intent of this section is to introduce the extent to which wildfire has the potential to impact values within a community and should be primarily driven by the Critical Infrastructure Assessment competed under the Local Emergency Planning process. Values at risk (VAR) are the human or natural resources that may be impacted by wildfire. This includes human life, property, critical infrastructure, high environmental and cultural values, and resource values.

3.1 Human Life and Safety

In the event of a wildfire approaching a community, the priority is human life and safety, including the evacuation of at-risk areas. Wildfire can move quickly and unpredictably. It takes time for people to evacuate an area and safe egress can be blocked by the fire itself or by vehicle congestion or accidents.

Statistics Canada's 2016 Census Profile for SRD Electoral Area A shows a population of 764, down from 807 in 2011.[9] Most SRD Electoral Area A residents live in the Sayward Valley, however there is no community specific population data within the electoral area. Properties are scattered throughout the Valley therefore a large AOI is considered in this CWPP. Other Electoral Area A communities are much smaller in population and geographical size, the estimated population numbers are shown in Table 3.

Table 3.Summary of estimated number of structures found within each AOI, excluding Sayward Valley.

AOI	Estimated # of structures	Estimated Population
Walter's Island	35	35 full-time plus seasonal
Brown's Bay	12	50 Seasonal residents/campers
Eagles' Cove	12	20 Seasonal residents
Esperanza	15	10 full-time plus seasonal

K'omoks First Nations Reserve Salmon River 1 is located along the east bank of the Salmon River. Currently there are no residential settlements on the reserve. Big Tree Creek Hatchery is located with the Sayward Valley and Brown's Bay Packing within the Brown's Bay AOI. These workplaces

Seasonal Tourism

Seasonal tourism brings a significant number of visitors to Area A whether they are travelling through or staying in the area. Within the Sayward Valley AOI, Elk Creek Campground, a BC Recreation Site near the Sayward Road Junction and Highway 19 has 7 campsites open to the public from May to October. Several private campgrounds and RV parks are located throughout

[9] Statistics Canada. Census Profile, 2016 Census. Strathcona A. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/Page.cfm?Lang=E&Geo1=CSD&Code1=5924048&Geo2=PR&Code2=59&SearchText=strathcona%20regional%20district&SearchType=Begins&SearchPR=01&B1=All&type=0

the Valley and bring an influx of visitors through the summer/fire season months. The Kusam Klimb[10] is an annual trail running race that occurs in mid-June. An estimated 500 people attend the race each year. The race begins and ends at the Sayward Valley Heritage Hall.

Seasonal tourism and recreation also boosts local population numbers in the Brown's Bay, Eagle's Cove, Esperanza, and Walter's Island AOI's.

3.2 Critical Infrastructure

The intent of this sub-section is to clearly identify and understand where critical infrastructure is located in order to effectively determine the wildfire risk and identify mitigation activities.

- **Publicly and provincially owned critical infrastructure (CI)** are assets owned by the Provincial government, local government, public institution (such as health authority or school district), First Nation or Treaty First Nation that are essential to the health, safety, security or economic wellbeing of the community and the effective functioning of government, or assets identified in a Local Authority Emergency Plan Hazard, Risk & Vulnerability and Critical Infrastructure assessment.

There are no hospitals, airports, schools, waste treatment or water treatment facilities in the AOI. Esperanza, Brown's Bay, and Eagle's Cover are primarily seasonal and off-the grid areas. The Sayward Heritage Hall and Sayward Volunteer Fire Department Firehall #2 are critical public infrastructure.

Photo 4. Sayward Volunteer Fire Department Firehall No. 2.

[10] Kusam Klimb. http://kusamklimb.com/

Photo 5. Sayward Heritage Hall.

3.2.1 Electrical Power

Walter's Island is connected to the BC Hydro grid through wooden pole distribution lines from Zeballos, across Kyuquot Sound from Fair Harbour to Chamiss Bay and south to Kyuquot/Walter's Island. Kyuquot Power Ltd. operates the distribution utility lines from Fair Harbour to Kyuquot. Wooden poles are particularly vulnerable to fire. Additionally, the distribution line travels along forested rights-of-way vulnerable to fire and storm damage.

Sayward Valley and Brown's Bay are connected to the BC Hydro grid. As above, wooden pole distribution lines are particularly vulnerable to fire, and lines follow narrow forested rights-of-way vulnerable to fire and storm damage. Esperanza and Eagle's Cove are not connected to the grid.

3.2.2 Communications, Pipelines and Publicly Owned Buildings

Publicly owned buildings within the AOIs include the Sayward Heritage Hall, SVFD Firehall #2, and Sayward Visitor's Centre. There are no airports, hospitals, gas lines, communication towers, or repeaters within the AOIs.

3.2.3 Water and Sewage Infrastructure

Wastewater and sewage are managed by septic fields or other means throughout the area. The AOI's are not connected to sewage treatment or wastewater services. There are no hydrants to support fire suppression.

3.3 High Environmental and Cultural Values

The intent of this sub-section is to clearly identify and understand where high environmental and cultural values are located within the AOI in order to effectively determine wildfire risk and identify mitigation activities.

3.3.1 Drinking Water Supply Area and Community Watersheds

Water supply to the AOI's is not related to any designated community watersheds. Drinking water sources are local licenced domestic groundwater wells or surface water points of diversion.

3.3.2 Cultural Values

Indigenous cultural heritage resources include archaeological sites, traditional use sites, historic buildings and artifacts, and heritage trails, or any other objects or places of "historical, cultural or archaeological significance to British Columbia, a community or an aboriginal people.[11] The AOI is within the traditional territories of the Wei Wai Kum First Nation, We Wai Kai First Nation, K'omoks First Nation, Homalco First Nation (Xwemalhkwu), Ehattesaht Chinehkint First Nation, and Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations.

Archaeological sites in British Columbia that date to 1846 or earlier are protected from alteration of any kind by the Heritage Conservation Act (HCA) (1996). The provisions of the HCA apply to archaeological sites located on both public and private land, known and unknown, and are binding on government. The Archaeology Branch of the Ministry of Forests, Lands and Natural Resource Operations and Rural Development administers the provisions of the HCA and are responsible for making final decisions concerning the management of archaeological resources. Day-to-day planning, research and fieldwork are conducted by professional consulting archaeologists. Due to site sensitivity, the locations of archaeological sites are not made publicly available. Access to the Remote Access to Archaeological Data (RAAD) is required to view archaeological site information. Fuel treatment activities will require a treatment prescription completed by a Qualified Professional. The Qualified Professional should conduct the required reconnaissance surveys and review the presence and location of cultural heritage resources with the identified First Nations

Non-archaeological cultural heritage in BC is generally not protected by statute, but the use of and access to these resources is enshrined as a constitutionally protected Aboriginal right. Locally identified cultural heritage values that may be impacted by wildfire or suppression efforts can be included, if agreed to by the local First Nation.

3.3.3 High Environmental Values

Several established legal objectives and orders occur within the areas of interest including ungulate winter ranges, wildlife habitat areas, and old growth management areas. Within the Sayward Valley AOI, the Salmon River is a significant drainage providing salmon, trout, dolly varden and steelhead habitat.

[11] Archer, CRM. 2009. Cultural Heritage Resource Identification and Management in Forestry Developments: A Supplement to the FREP Protocol. Ministry of Forest Lands and Natural Resource Operations.

3.4 Other Resource Values

The AOI's include portions of the timber harvesting land base, with valuable commercial species of western red cedar, douglas-fir, western hemlock, amabilis fir, and sitka spruce. Other resource values throughout the AOI's include visual quality objectives and recreation sites/campgrounds.

3.5 Hazardous Values

Hazardous values, such as propane tanks, explosives storage, fuel yards, or landfills pose a safety hazard to emergency responders. Within the AOI's fuel storage and propane tanks are the main area of concern. Brown's Bay Marina offers gas, diesel, and oil services. Mid-Island Co-op operates a gas station and propane services at the Highway 19-Sayward Road junction. Western Forest Products has a storage yard at the Dyer Road-Salmon River Main junction that may periodically store fuel and other hazardous materials. Long-term fuel storage areas should apply FireSmart planning practices to mitigate vegetation hazard and ignition risks.

Photo 6. Highway 19 and Sayward Road junction.

SECTION 4: WILDFIRE THREAT AND RISK

The intent of this section is to summarize the factors that help determine the wildfire risk around the community. These factors include natural fire regime and ecology, Provincial Strategic Threat Analysis, and a local wildfire risk analysis.

A risk-based framework consists of the consideration of the likelihood of an unwanted wildfire event and the consequences to communities and high value resources and assets as the measure of risk, as follows:

- Likelihood is the probability of the unwanted wildfire event occurring
- Consequence is the amount of damage occurring as a result
- Risk is measured as the product of likelihood and consequence but multiple inputs are also required in order to effectively quantify risk, including severity, value type, and vulnerability

4.1 Fire Regime, Fire Weather and Climate Change

The intent of this sub-section is to provide the ecological context of wildfire for the community and to describe the role of fire (frequency and intensity) in the local ecosystem under historical conditions, and the potential implications of future conditions, caused by the interruption of the natural fire cycle and/or climate change.

4.1.1 Fire Regime and Fire Weather

Natural Disturbance Regime

The Sayward Valley, Eagle's Cove, and Brown's Bay AOI's are defined by the regional climate of the Coastal Western Hemlock (CWH) very dry maritime subzone (xm) as described in the BC biogeoclimatic (BEC) zone classification system. The CWHxm climate is one of warm, dry summers and moist, mild winters.[12] The CWHxm is the driest subzone on northern Vancouver Island, the mean annual precipitation is about 1505mm, and mean precipitation from April-September is about 363mm.[13] The CWHxm subzone is classified as Natural Disturbance Type 2 (NDT2) – infrequent stand initiating events. The mean return interval for stand replacing disturbances (large scale forest disturbance) is about 200 years.[14] Wildfires occurring in NDT2 are moderately sized (20 to 1000ha); larger fires occur after extended periods of drought.

The Walter's Island AOI is within the CWH very moist hypermaritime (vh) subzone, as described in the BEC system. CWHvh is characterized by a cool climate where fog, cloud, and drizzle are common throughout the year. The natural disturbance regime (NDT) of the CWHvh1 is NDT1 – rare stand initiating events.[15] The mean return interval for stand replacing disturbances in NDT1

[12] A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region, 1994. https://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh28.htm.

[13] Ecosystems of British Columbia, February 1991. https://www.for.gov.bc.ca/hfd/pubs/docs/Srs/Srs06/

[14] BC Forest Practices Code Biodiversity Guidebook September 1995. https://www.for.gov.bc.ca/hfd/library/documents/bib19715.pdf.

[15] BC Forest Practices Code Biodiversity Guidebook September 1995. Available from https://www.for.gov.bc.ca/hfd/library/documents/bib19715.pdf.

variants is generally 250 years, the longest return interval of all NDT's in the province. When disturbances such as fire occur, they are usually small and result in irregular edge configurations and patterns. However, it is more likely that natural disturbances are caused by wind, terrain instability, or isolated forest health issues.

The Esperanza AOI is defined by the regional climate of the CWH very moist maritime subzone (vm) as described in the BEC system. The CWHvm climate is generally wet and humid with cool summers and mild winters. CWHvm is also classified as NDT1 – rare stand-initiating events.

Fire Weather

The Canadian Forest Fire Danger Rating System[16] (CFFDRS) is a computer-based model used to assess fire danger and potential fire behaviour. The two main parts of the CFFDRS are: the fire weather index system[17] (FWI) and fire behaviour prediction system (FBP).[18] Hourly weather data is collected throughout fire season (April to October) at automated fire weather stations throughout British Columbia to support the CFFDRS.

Wildfire threat exposure to the AOI's will vary throughout the fire season based on the fuels present, the moisture content of fuels, and fire weather conditions. Consequences of a threat may be realized when an ignition occurs during high or extreme wildfire conditions, as represented by Fire Danger Rating. "High Fire Danger" is considered as danger class ratings IV or V (high or extreme). High fire danger occurs mostly in July and August, however it can begin as early as May and extend through September. The Fire Danger rating classes are summarized in the table below.

Table 4. Summary and description of fire danger classes.

Fire Danger Classes[19]	Definition / Fire Behaviour Summary
Class I/II – Very Low/Low	Fires may start easily and spread quickly but there will be minimal involvement of deeper fuel layers or larger fuels.
Class III – Moderate	Forest fuels are drying and there is an increased risk of surface fires starting. Carry out any forest activities with caution.
Class IV – High	Forest fuels are very dry and the fire risk is serious. New fires may start easily, burn vigorously, and challenge fire suppression efforts. Extreme caution must be used in any forest activities. Open burning and industrial activities may be restricted.

[16] Natural Resources Canada. Forest fire danger rating tool. 2016. https://www.nrcan.gc.ca/our-natural-resources/forests-forestry/wildland-fires-insects-disturban/forest-fire-danger-rating-tool/14470.

[17] Natural Resources Canada. Background Information: Canadian Forest Fire Weather Index (FWI) System. https://cwfis.cfs.nrcan.gc.ca/background/summary/fwi

[18] Natural Resources Canada. Background Information: Canadian Forest Fire Behaviour Prediction (FBP) System. https://cwfis.cfs.nrcan.gc.ca/background/summary/fbp

[19] BC Wildfire Service. Fire Danger. https://www2.gov.bc.ca/gov/content/safety/wildfire-status/wildfire-situation/fire-danger?keyword=danger&keyword=rating

Class V – Extreme	Extremely dry forest fuels and the fire risk is very serious. New fires will start easily, spread rapidly, and challenge fire suppression efforts. General forest activities may be restricted, including open burning, industrial activities and campfires.

Regional Weather Stations

The nearest weather stations to the Sayward Valley are the TS Naka Creek and Menzies Camp stations. Menzies Camp is also the closest station to Brown's Bay and Eagle's Cove. The nearest weather station to Walter's Island and Esperanza is TS Artlish. Fire danger class ratings for TS Naka Creek are available from 2006-2019 (Figure 1), for TS Artlish from years 2007-2019 (Figure 2). Menzies Camp is a long-term weather station with data available from 1970-2019 (Figure 3). Annual variations in precipitation and snow-pack impact fire danger especially in early fire season months.

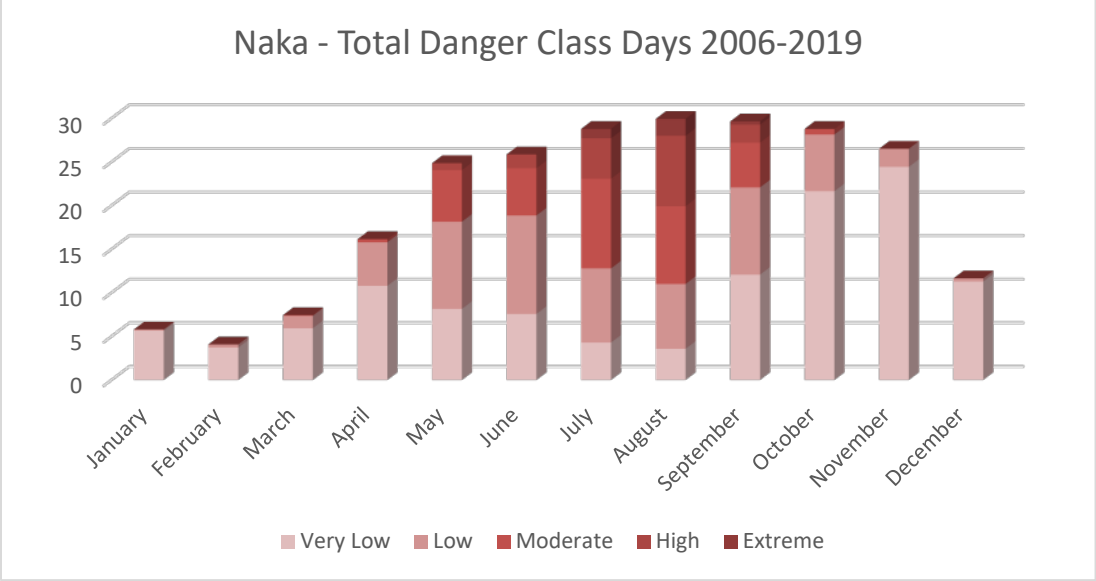

Figure 1. TS Naka Creek weather station average monthly total danger class days 2006-2019.

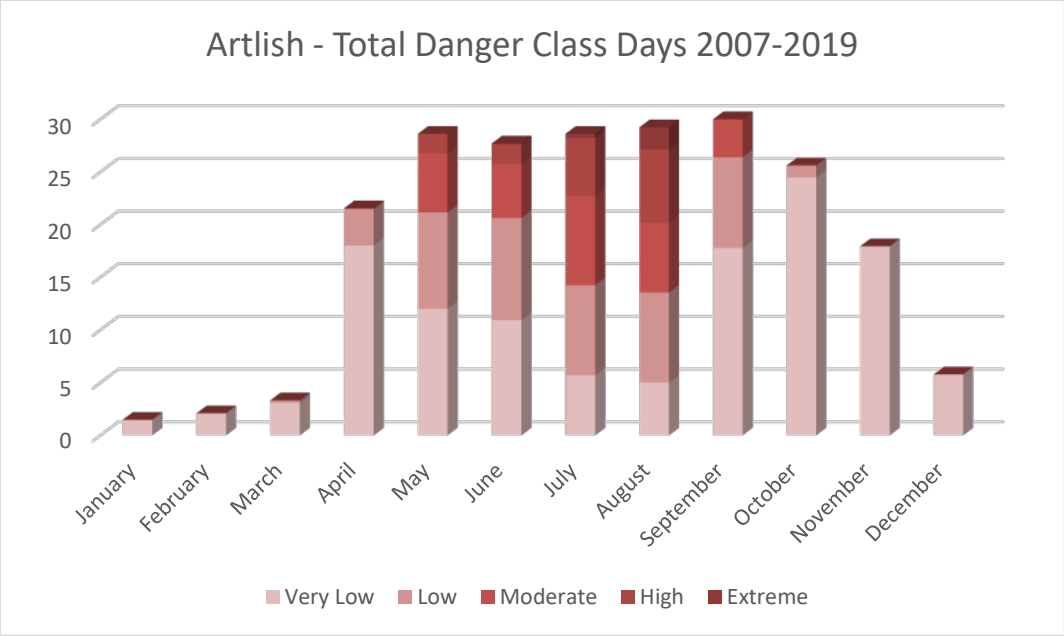

Figure 2. TS Artlish weather station average monthly total danger class days 2007-2019.

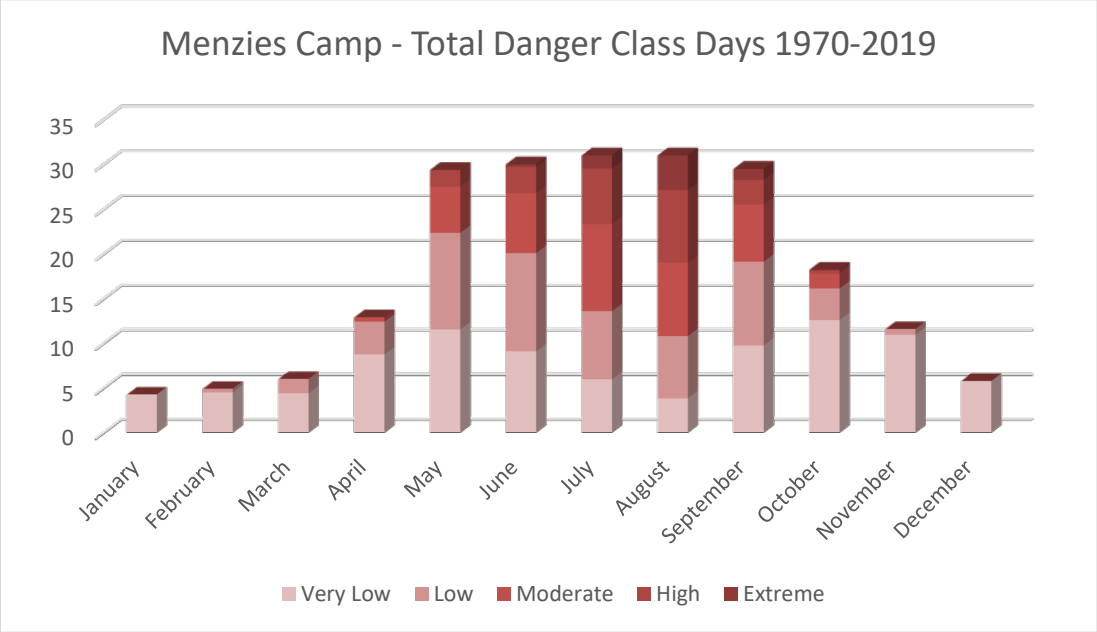

Figure 3. Menzies Camp weather station average monthly total danger class days 1970-2019.

Forest Health Issues

There are no known landscape level forest health issues that contribute to large scale changes in fire regime or forest attributes. Forest harvesting is the main driver of forest cover changes within the AOI's.

Human Development and Natural Events

Forest harvesting is the most significant human development within the AOI's that alters fuel types and hazard. In the Sayward Valley, forest harvesting and subsequent land clearing for conversion to farmland or residential acreages also drives fuel type changes.

4.1.2 Climate Change

Climate change actively impacts coastal forests, weather patterns, soils, hydrology, and seasonal water availability. For Vancouver Island, climate change has resulted in a 0.8°C increase in annual temperature from 1900-2013.[20] Climate change will continue to impact Vancouver Island by increasing the frequency of relatively warm years, increased intensity of heavy precipitation events, increased flood events, increased summer drought conditions, and increased forest fire frequency and severity due to dry conditions.

In addition to warming temperatures, climate projections for the West Coast region to the 2050s indicates significantly less (-51%) spring snowfall, increased seasonal moisture variability, increased frost-free days, and lengthened dry seasons.[21] Reduced snow-pack and moisture variability suggest that watersheds may transition to be rainfall-dominated, requiring greater need for water conservation and storage. The expected impacts of climate change on the Strathcona Regional District area include decrease in snowpack, high intensity precipitation, increase in hot/dry conditions, increase in temperature, longer dry season, and reduced water supply.[22] Figure 4 shows the 30-year regional averages for cumulative seasonal precipitation and temperature projections for the west coast of BC for the 2020s, 2050s, and 2080s. The width of the bands indicates the range of the projections. Note the trend toward warmer temperatures in all seasons, and greater variability in seasonal precipitation with less precipitation in the summer months. This figure was directly sourced from the Pacific Climate Impacts Consortium.[23]

The scale and scope of climate change impacts are constantly evolving. Climate projections describe the inevitability of longer dry seasons, reduced spring/summer moisture availability, and warmer temperatures – which lead to greater numbers of high/extreme fire danger class days. Climate change contributes to the likelihood of more intense wildfire seasons on Vancouver Island moving forward. Climate change impacts emphasize the importance of risk and mitigation actions recommended in this CWPP.

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[20] Lewis, J. April 2019. Climate Change and Vancouver Island. Available from https://srd.ca/wp-content/uploads/2018/10/Climate_Change_Campbell_Riv_2018_Lewis.pdf

[21] Pacific Climate Impacts Consortium. November 2013. Climate Summary for West Coast Region. Available from https://www.pacificclimate.org/analysis/publications/climate-summary-west-coast.

[22] Pacific Climate Impacts Consortium. 2012. Summary of Climate Change for Strathcona in the 2050s. Available from http://www.plan2adapt.ca/tools/planners?pr=27&ts=8&toy=14.

[23] Pacific Climate Impacts Consortium. November 2013. Climate Summary for West Coast Region. Available from https://www.pacificclimate.org/analysis/publications/climate-summary-west-coast.

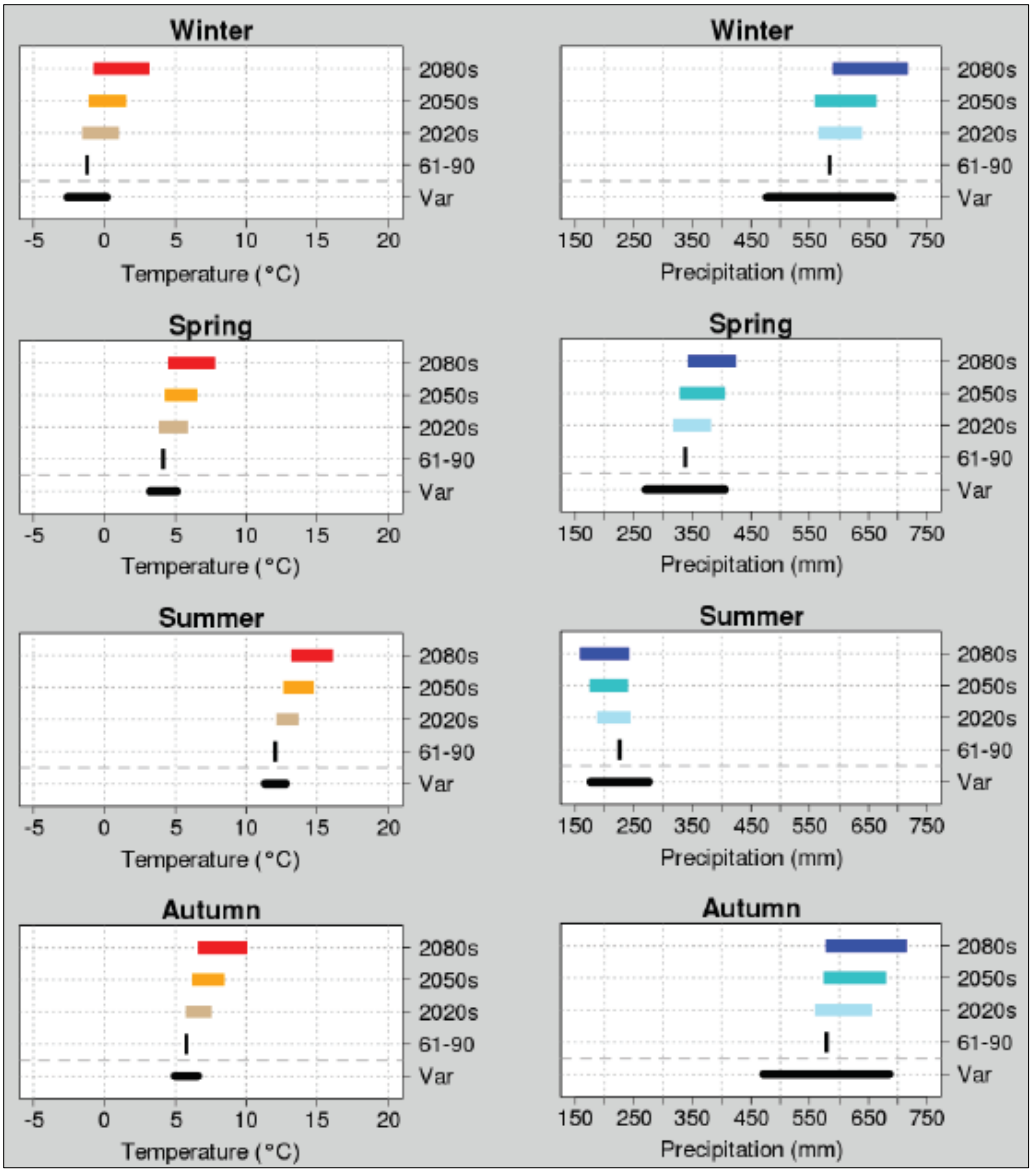

Figure 4. Cumulative seasonal precipitation and mean seasonal temperature projections for 2020s, 2050s, and 2080s. The width of the bands indicates the range of projections.

4.2 Provincial Strategic Threat Analysis (PSTA)

The PSTA[24] is a provincial level geographic information system (GIS) spatial analysis and risk framework that provides a starting point to assess the local wildfire threat. The PSTA utilizes and interprets provincial fuel type mapping, historical fire occurrences, topography, and historical weather station data.

The PSTA assesses wildfire threat within wildland urban interface (WUI) polygons at a provincial level. The WUI, or interface, is the area where human development and wildland vegetation mix; where human developments intermingle with forests and other vegetative fuel types.[25] The threat analysis output is a wildfire threat rating classification of No threat, Low, Moderate, High, or Extreme.

Wildfire threat is directly related to the likelihood of hazardous fuel igniting and fire spreading into the community either directly or through ember transport. The PSTA provides information to help evaluate the three conditions necessary for a wildfire to threaten a community:

1. an ignition occurs (Fire History)
2. the resulting fire generates sufficient intensity (Head Fire Intensity) and spreads rapidly, and
3. the fire spreads into and/or transports embers into the community (Spotting Impact)

The Wildfire Threat classification is weighted based on 30% fire density, 60% head fire intensity, and 10% spotting impact. Table 5 summarizes the PSTA data for each of the areas of interest.

Fire Density

Fire density is the ignition and spread potential based on historic fire patterns. There are 10 fire density classes (1 being the lowest and 10 the highest), based on the approximated weighted fire frequency within a 10km radius.

Head Fire Intensity

Head fire intensity (HFI) is the intensity of the flaming fire front during 90th percentile weather conditions (highest 10% temperatures, and lowest 10% of relative humidity values). Head fire intensity is related to the rate of spread and fuel consumption of the leading edge of a fire. This factor is important to know for fire suppression effort and safety.

Spotting Impact

Spotting impact is the ability of burning embers to be sent into the air for some distance and start new fires. Embers cause most of the structural losses in the event of interface wildfires.

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[24] BC Ministry of Forest, Lands, Natural Resource Operations and Rural Development. 2019. Provincial Strategic Threat Analysis: 2019 Update https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/vegetation-and-fuel-management/fire-fuel-management/psta

[25] BC Ministry of Forest, Lands, Natural Resource Operations and Rural Development. 2017. Provincial Strategic Threat Analysis: 2017 Update. Available from https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/vegetation-and-fuel-management/fire-fuel-management/psta/download-psta-historic.

Table 5. Values from the 2019 PSTA data for each AOI.

AOI	FIRE DENSITY	HEAD FIRE	SPOTTING IMPACT	PSTA THREAT	PSTA RISK
BROWN'S BAY	Low	Low	Low	Moderate	Moderate
EAGLE COVE	Low	Low	Low	Low-Mod	n/a
ESPERANZA	Low	Low	Low	Moderate	n/a
WALTER'S ISLAND	Low	Low	Low	Low-Mod	Moderate
SAYWARD VALLEY	Low	Low	Low-Mod	Mod-High	Moderate

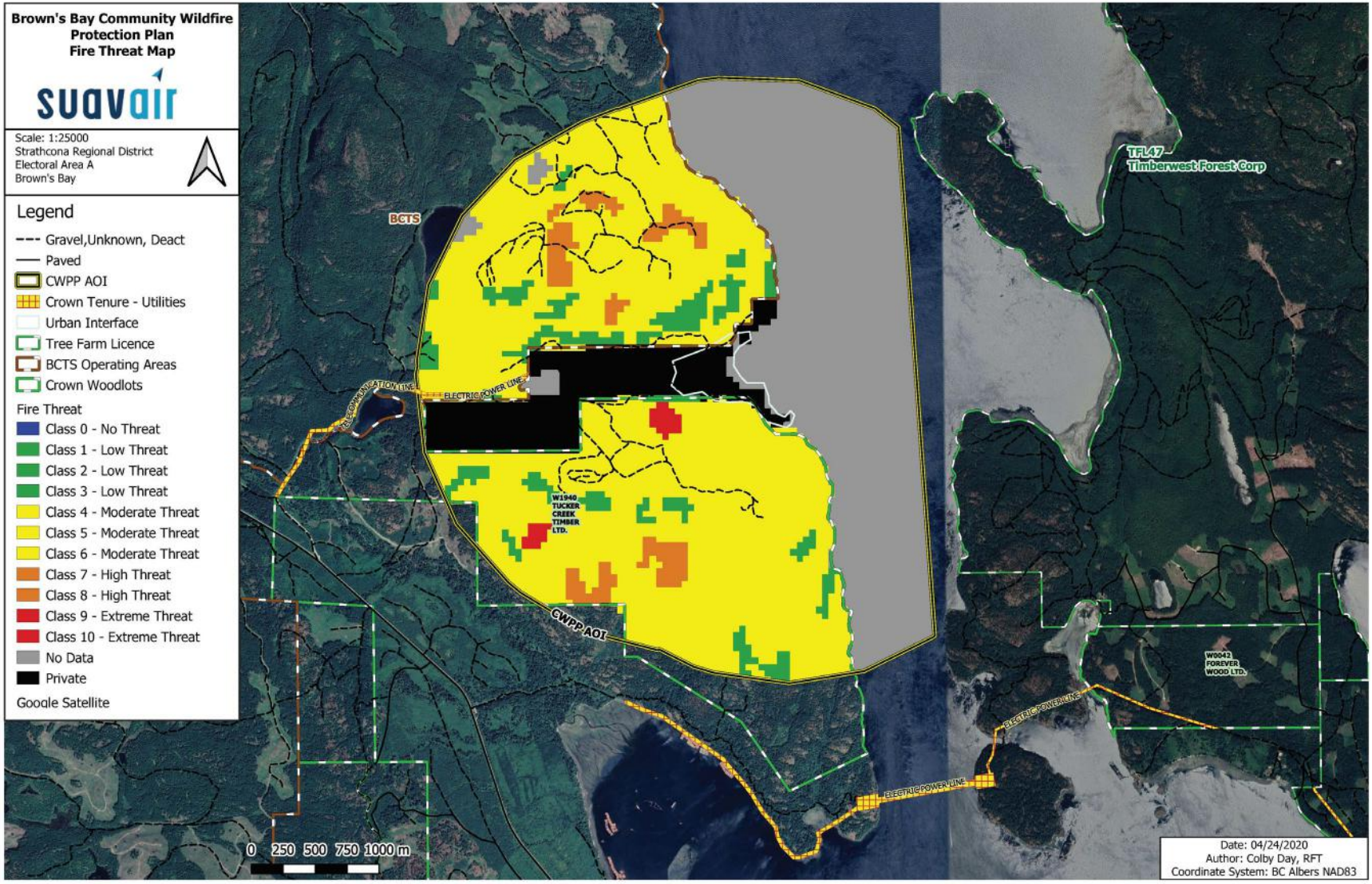
Maps 6 to 9 show the PSTA threat classification for the Brown's Bay, Eagle's Cove, and Esperanza AOI's. The Walter's Island AOI local threat classification is borrowed from the local threat classification completed for the Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations' 2020 CWPP.

4.2.1 Fire History

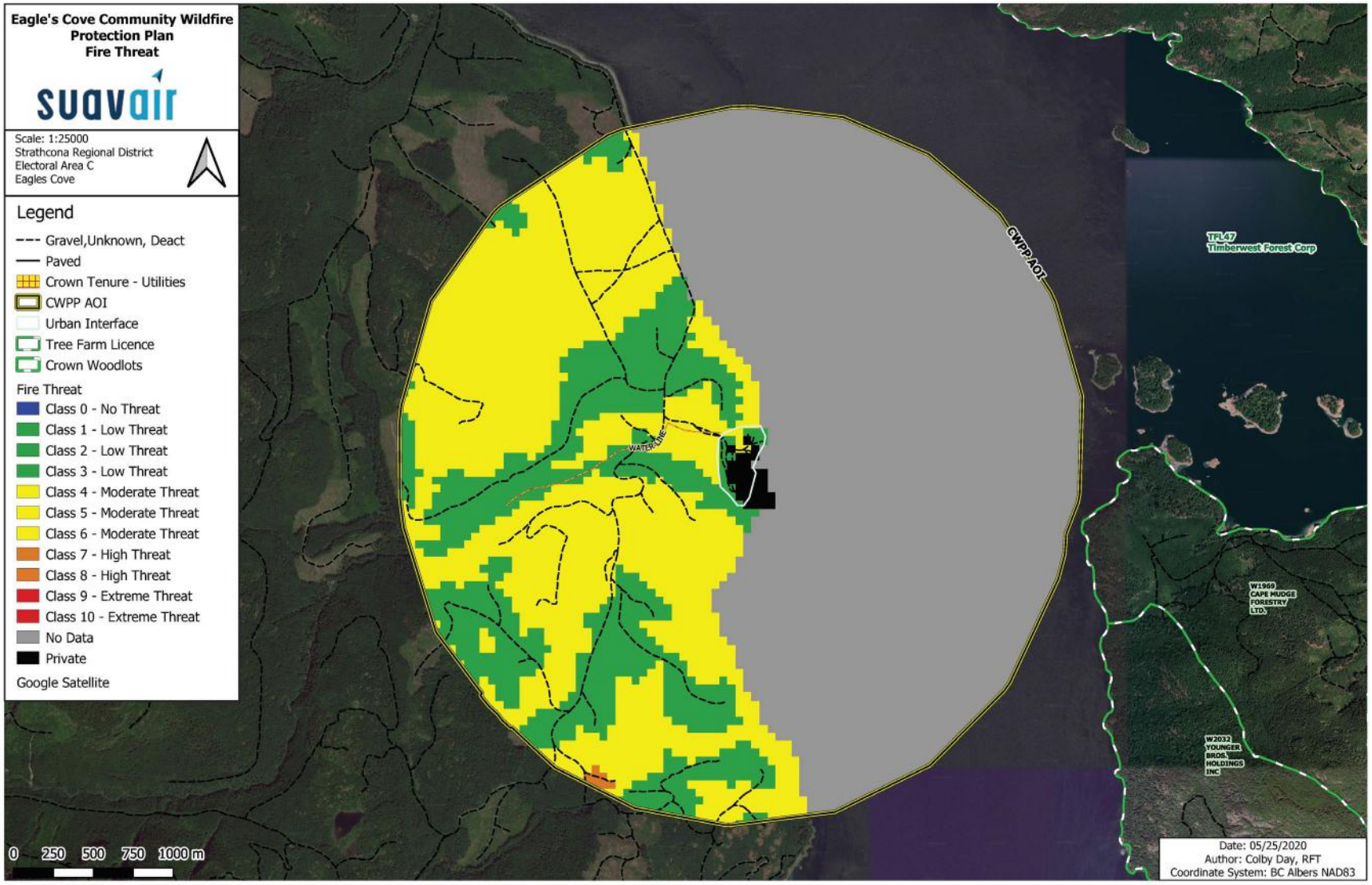
MFLRORD and the BCWS maintain the BC Historical Fires Database.[26] Fires that occurred between 1950-2019, larger than 4 hectares have been captured in this database. The historical fire density in each of the AOI's is Low. No historic fire perimeters have been recorded within the Walter's Island or Esperanza AOI's. Within the Brown's Bay and Eagle's Cove AOI's, the most recent recorded fires occurred in the 1920's, likely associated with historical logging practices.

Within the Sayward Valley AOI, the most recent wildfire occurred in May 2019. This fire was human-caused and contained by the BCWS at 21 hectares. Prior to 2019, historic fires in the Valley occurred mainly between the 1920-1940's (Map 10).

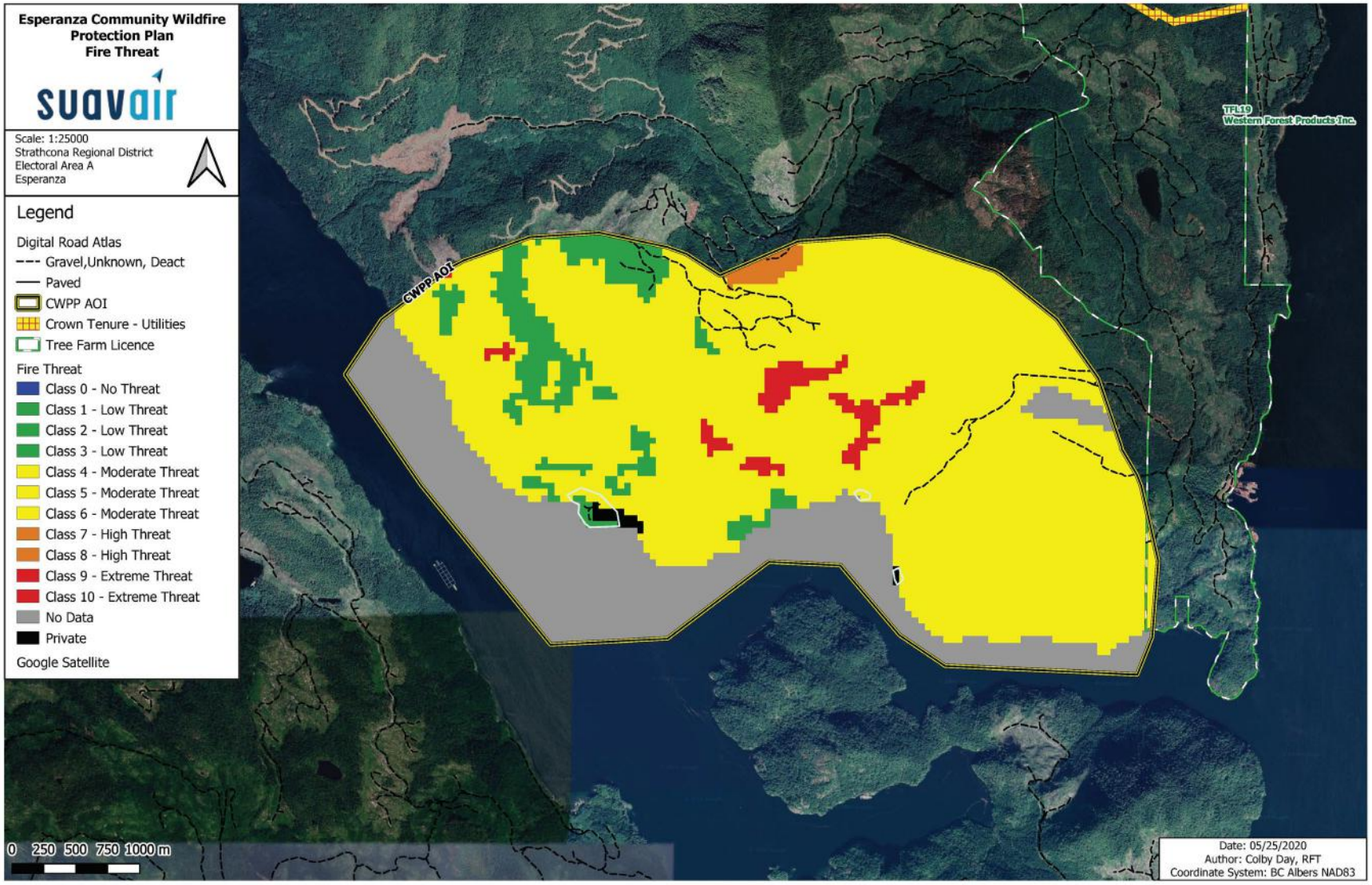
[26] BC Data Catalogue. Fire Incident Locations – Historical. https://catalogue.data.gov.bc.ca/dataset/e2dadc60-292f-4d98-b42b-56ca9e4fe694



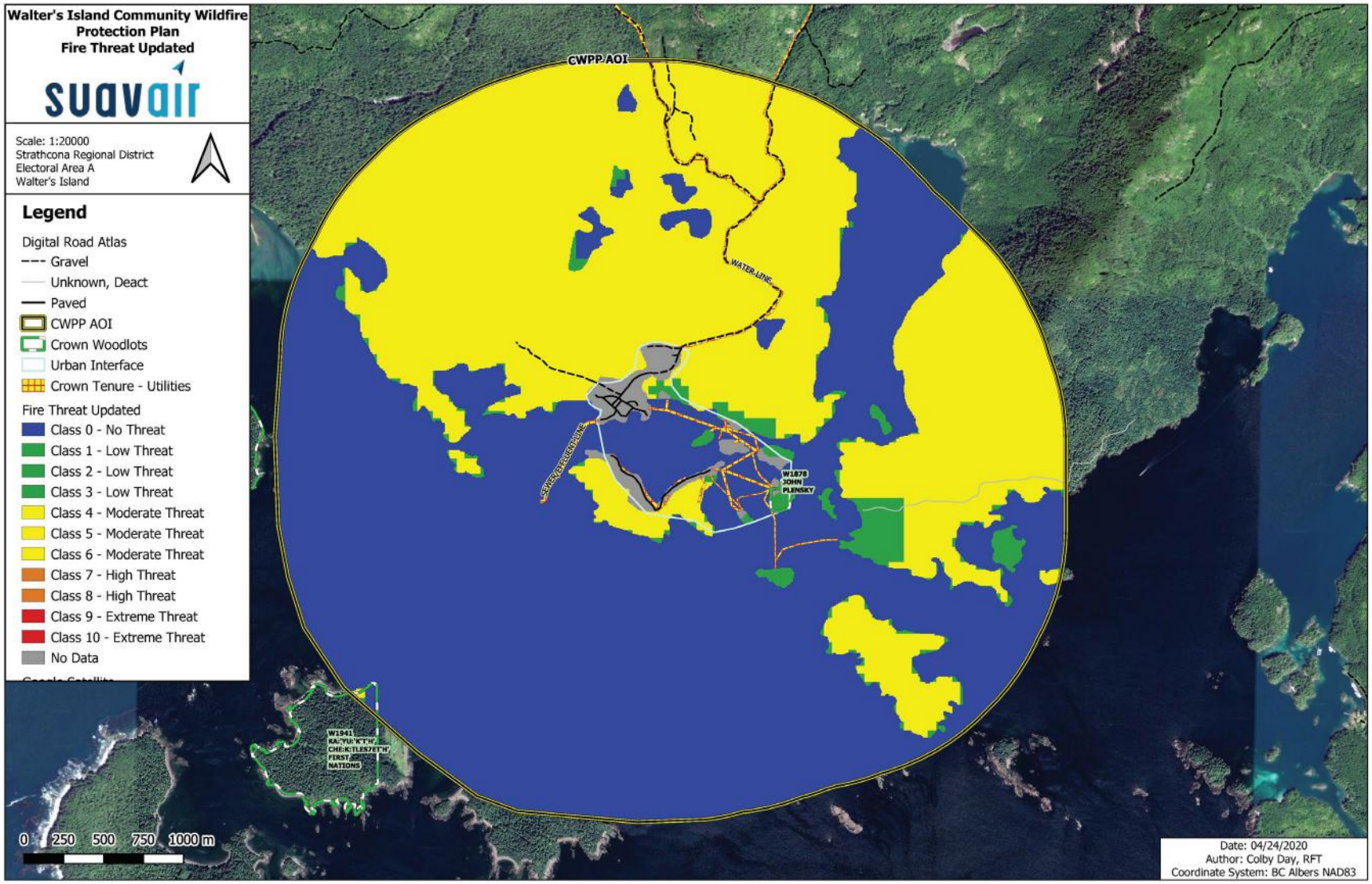
Map 6. BCWS 2019 PSTA threat classification for Brown's Bay AOI.



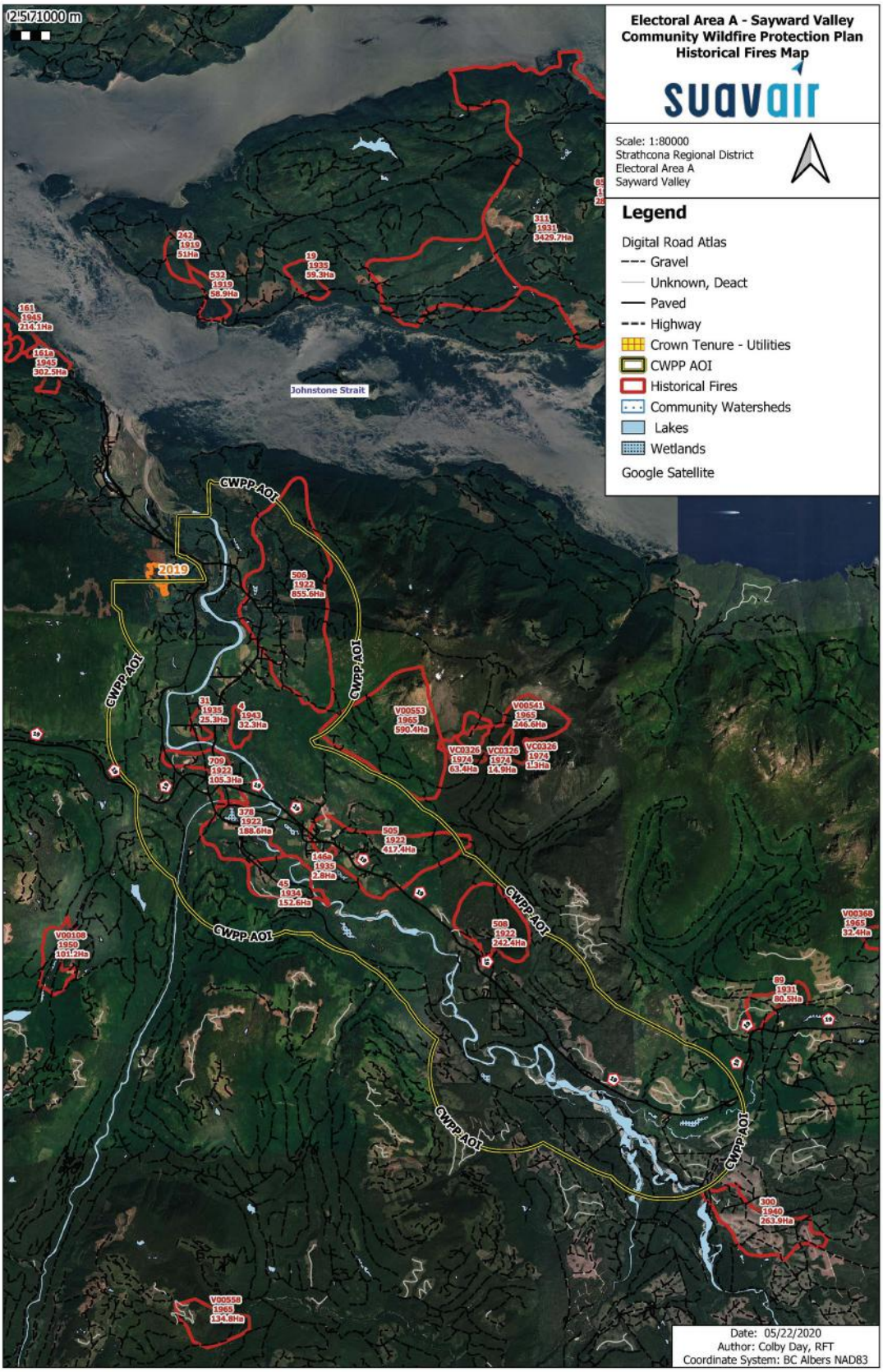
Map 7. BCWS 2019 PSTA threat classification for Eagle's Cove AOI.



Map 8. BCWS 2019 PSTA threat classification for Esperanza AOI.



Map 9. Local wildfire threat classification for Walter's Island AOI, from Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations' CWPP.



Map 10. Historical fire boundaries within the Sayward Valley AOI.

4.3 Local Wildfire Threat Assessment

A local wildfire threat assessment was completed for the Sayward Valley area due to its proximity to critical infrastructure, and higher population and structure density. Further information regarding the local threat assessment is provided in Appendix 1: Local Wildfire Threat Process. A local wildfire threat assessment was not completed for Walter's Island, Brown's Bay, Eagle's Cove, or Esperanza. The 2019 PSTA data is presented in Section 4.1 above.

4.3.1 Fuel Type Assessment

Fuels in the Sayward Valley AOI are generally mature conifer forests (C-5), young and dense conifer forests (C-3), recently harvested cut blocks (S-3), and some alder/cottonwood/maple deciduous patches (D-1/2). A detailed description of fuel types is provided in Appendix A1.1 Fuel Type Attribute Assessment.

PSTA fuel types have been verified through spatial analysis. The available spatial information from Data Catalogue BC, VRI data, RESULTS; and updated Google Earth imagery were analyzed for fuel type verification and adjustments. The major changes to the fuel type layer that resulted within the AOI included:

- recently harvested cut blocks (less than 5 years) were changed to fuel type S-3,
- water areas along the Salmon River were corrected with more accurate spatial data sources,
- coniferous, dense pole sized stands over 4m tall, less than 60 years old, were updated to C-3 fuel type
- C-5; M-1/2 types reclassified to D-1/2 types based on ortho imagery and forest cover data interpretation
- C-7 and S-1 fuel types reclassified
- Areas of residential and rural development, land clearing and land conversion reclassified as Non-fuel

4.3.2 Proximity of Fuel to the Community

Fuel closest to the community usually represents the highest hazard as it is the most likely to spread fire to nearby infrastructure. The recommended approach is to treat fuels to achieve a desired level of hazard reduction, from the value or structure outward, ensuring mitigation continuity. Fuels adjacent to the values and/or structures at risk receive the highest rating followed by progressively lower ratings moving away from the value.

The local wildfire threat assessment process subdivides the WUI into 3 areas – the first 100 meters (WUI 100), 101 to 500 meters (the WUI 500), and 501 to 2000 meters (the WUI 2000). These zones provide guidance for classifying threat levels and subsequent priorities of treatments. The first 100m (WUI 100) is further broken down into Priority Zones 1, 2, and 3 in the FireSmart Planning and Activities Section 5.2 below.

4.3.3 Fire Spread Patterns

Wind speed, wind direction, and fine fuel moisture condition influences wildfire trajectory and rate of spread. These effects are summarized in the Initial Spread Index (ISI) Rose(s) from the local representative BCWS weather station. Wildfire that occurs upwind of a value poses a much more significant threat to that value than a fire that occurs downwind. For example,

prevailing northerly winds (wind blowing from the north) will mean the greatest spread potential is from the north, and therefore fuels to the north are higher priority treatment areas.

The TS Naka weather station recorded mainly north/northwest winds from May to September, and southerly winds from October to April. The TS Naka ISI rose is found in Appendix A1.3 Fire Spread Patterns. Another source for wind data is the Canadian Wind Atlas (CWA). The CWA[27] models wind speeds and direction from large scale and long-term atmospheric data. CWA data for the AOI shows dominant winds from the northwest for the summer months of June, July, and August. The northwesterly wind direction is considered the dominant direction for the local wildfire threat assessment.

4.3.4 Topography

Topography is the arrangement of natural and physical features in an area, it influences fire behavior and wildfire risk to values. Slope percentage influences a fire's trajectory and rate of spread. Slope position of the value relates to the ability of a wildfire to gain momentum during an uphill run and affects the potential impact to the value.

Slope Percentage Class

The structures within the AOIs generally situated on slopes <20%. Slopes tend to rise up and away from the locations of structures which are generally near the waterfront. Generally, slopes will cause preheating of fuel in a direction away from structures rather than towards it. The fire behaviour implications of slope percentage classes are summarized in A1.4 Topography.

Slope Position of the Value

Generally, structures within the AOI are located at the bottom of the slope where normal rates of fire spread apply. Slope position of a value relates to the ability of a wildfire to gain momentum during an uphill run. A value at the bottom of the slope is equivalent to a value on flat ground; a value on the upper 1/3 of the slope would be impacted by high preheating and faster rates of spread than a value on flat ground. The fire behaviour implications of slope position are summarized in A1.4 Topography.

[27] Canadian Wind Atlas. http://www.windatlas.ca/maps-en.php

4.3.5 Local Wildfire Threat Classification

A local wildfire threat classification was completed, the process of this threat classification is summarized in Appendix A1.5 Local Wildfire Threat Classification. A summary of the local wildfire threat classification within the Sayward Valley AOI is provided in Table 6 and Map 11 below.

Table 6. Summary of wildfire threat classification within the Sayward Valley AOI.

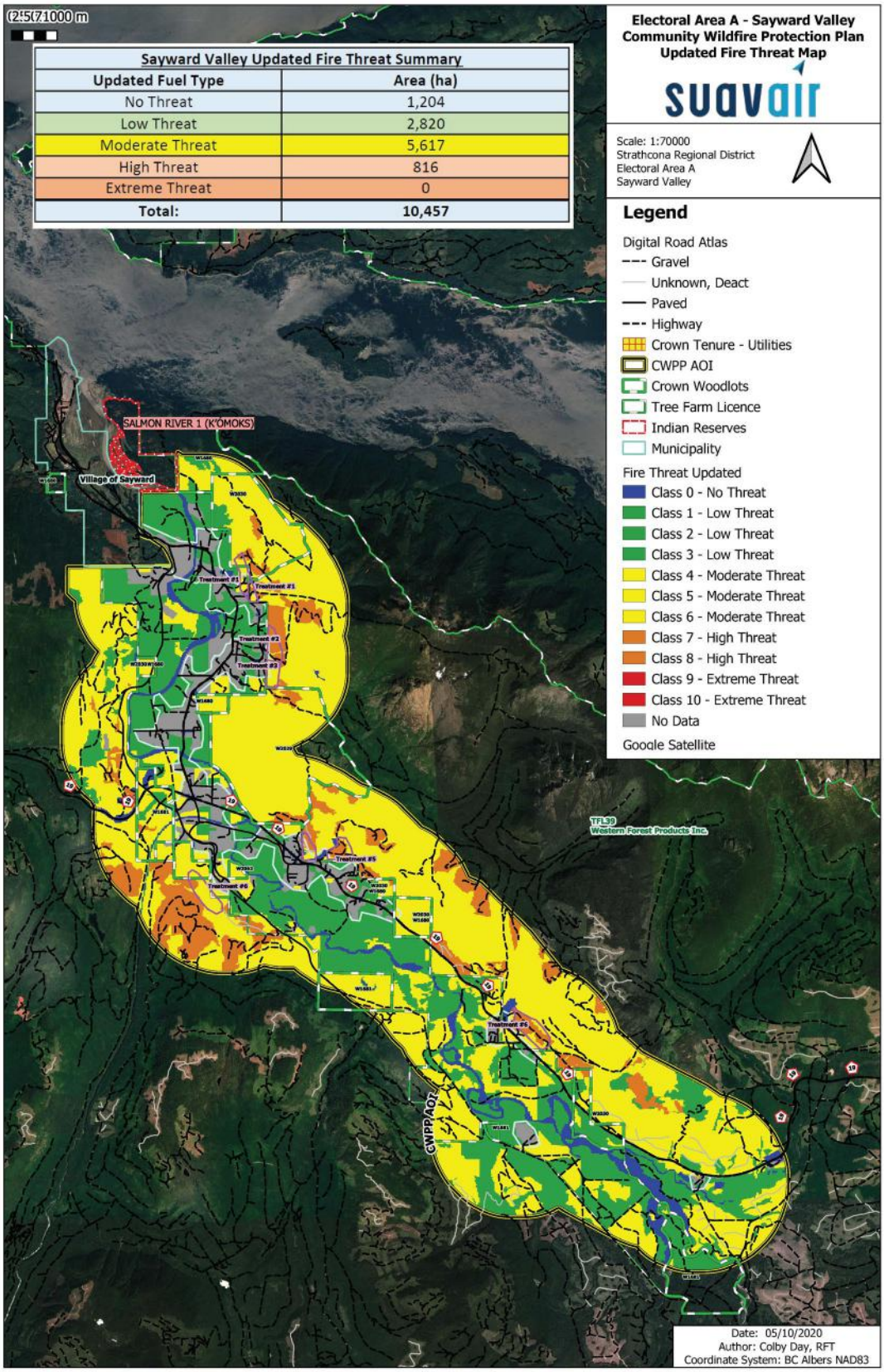
Wildfire Threat Class	2019 PSTA Area (ha)	2019 PSTA % of AOI	Updated 2020 Area (ha)	Updated 2020 % of AOI
Extreme	187	2%	0	0%
High	684	6%	816	8%
Moderate	4554	44%	5617	54%
Low	1313	13%	2820	27%
Very Low / No Threat (Water)	3719	35%	1204	11%
Total	10457		10457	

4.3.6 Local Wildfire Risk Classification

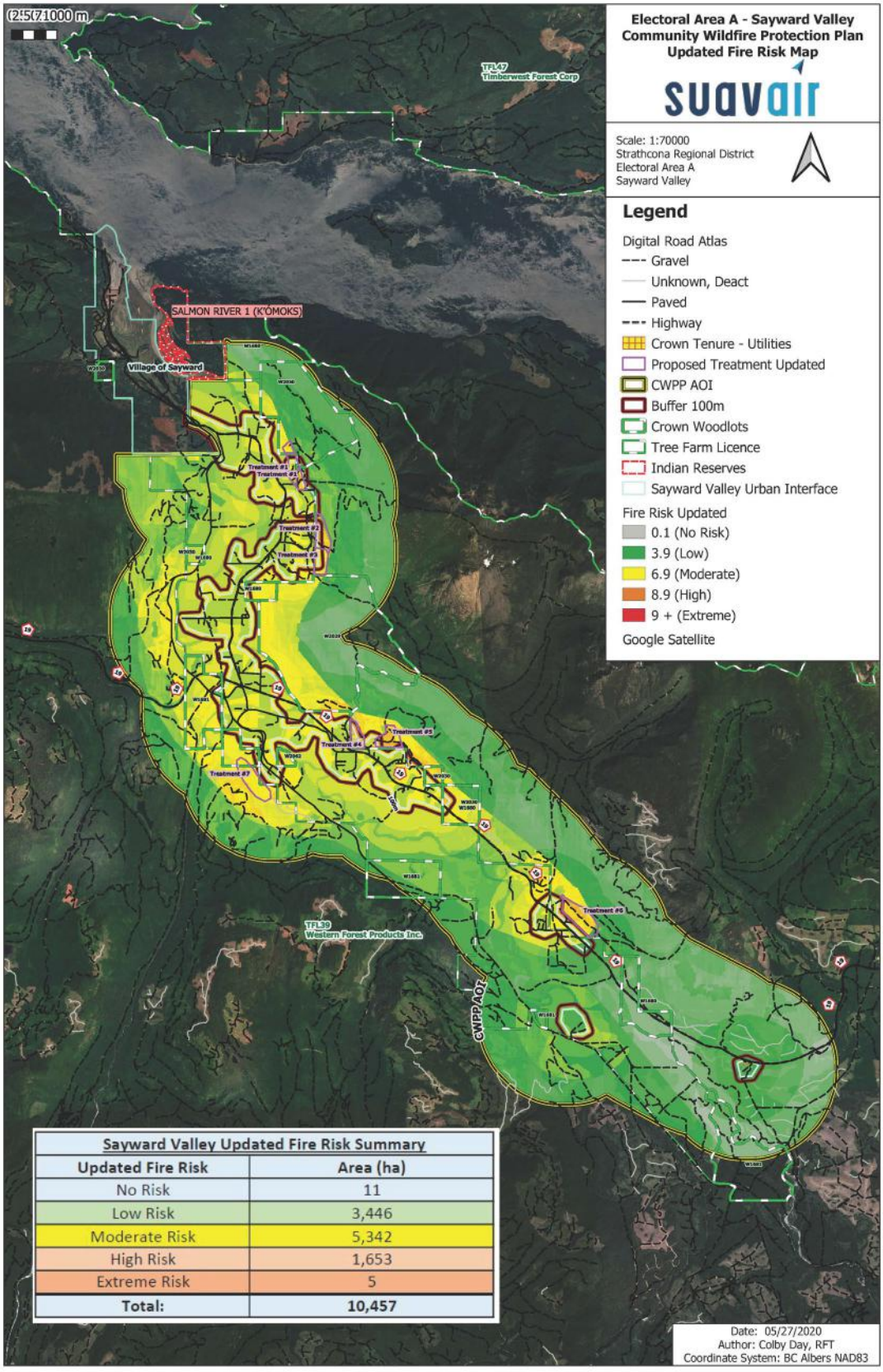
The 2019 PSTA data classifies the Sayward Valley WUI polygon as Risk Class 4 (Moderate). An updated local wildfire risk classification was completed and found the risk to be Moderate with pockets of High (Map 12). Proximity to structures/values, fire spread patterns, and topography are the other key determinants of wildfire risk. The risk is generally higher within the WUI100 due to proximity. The detailed wildfire risk assessment process is found in Appendix A1.6 Local Wildfire Risk Classification.

Table 7. Summary of local wildfire risk classification within the Sayward Valley AOI.

Wildfire Risk Class	Area (ha)	% of AOI
Extreme	5	<0.05%
High	1653	15%
Moderate	5342	51%
Low	3446	33%
No Risk	11	1%
Total	10457	



Map 11. Local wildfire threat classification for the Sayward Valley AOI.



Map 12. Local wildfire risk classification for the Sayward Valley AOI.

SECTION 5: RISK MANAGEMENT AND MITIGATION FACTORS

The intent of this section is to outline the strategies the community can put into practice to reduce the risk and the impact of a wildfire. Risk mitigation choices can vary by community, fuel type, ecology, hazard, terrain factors, land ownership, other unique local risk factors, local government and First Nation capacity, and/or public acceptance.

Mitigating wildfire risk is a proactive approach to reducing potential impacts and subsequent losses from devastating wildfires and is best conducted in a coordinated fashion amongst applicable land managers/owners that may include provincial and federal governments, local governments, First Nations, and private landowners. Understanding and assessing all of the risks that apply to a given community is a key consideration when determining actions that local governments or First Nations can undertake to mitigate and manage the wildfire risk within and adjacent to their respective jurisdictions.

There are many different risk mitigation options available. Three have been identified for this section:

1. Fuel Management – reduce fire behaviour potential
2. FireSmart – reduce fire spread into community and impacts to values
3. Communication and Education – reduce fire occurrence

5.1 Fuel Management

In general, fuel treatment activities create post-treatment stand conditions that will result in reduced fire behaviour.[28] Treatment strategies should prioritize surface and ladder fuel changes over canopy changes.[29] Fuel treatments should aim to reduce surface fuel loading, increase the height to live crown through reduction of ladder fuels, and reduce crown closure as necessary.

Crown fires in mature coastal forests require support from heat generated by burning of surface fuels and understory (ladder fuels). Removal of surface fuels and ladder fuels are the main considerations for fuel treatments in moist coastal forests. The vertical arrangement of fuels is an important consideration for fuel treatment prescriptions. In mature coastal forests, the natural canopy crown height is elevated from the forest floor. Without significant surface and ladder fuels, it is less likely that crown fires will occur. Figure 5 and Figure 6 illustrate the role of understory thinning and how ladder fuels can contribute to crown fires.

Surface fuels that remain in harvested cut blocks (slash, distributed or piled) also contribute to wildfire hazard across the landscape. Harvested areas dry out faster, dead and down material does not retain moisture and is more susceptible to ignitions. Surface fires in slash tend to spread quickly and can build up heat and intensity, spreading into adjacent mature stands as surface and crown fires. Therefore, fire hazard abatement in harvested cut blocks is critical, especially when harvested areas occur within the WUI.

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[28] BCWS Fuel Management Prescription Guidance 2019. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/fuels-management/2019_fuel_management_prescription_guidance.pdf

[29] Ibid.

Figure 5. The role of ladder fuels in supporting crown fires.[30]

Figure 6. Understory thinning to reduce ladder fuels.

[30] Partners in Protection. FireSmart Protecting Your Community from Wildfire. https://firesmartcanada.ca/wp-content/uploads/2018/10/FireSmart-Protecting-Your-Community.pdf.

5.1.1 Fuel Treatment Areas

Sayward Valley

The 2011 Village of Sayward CWPP identified priority treatment area recommendations for areas within the Sayward Valley. Recommendation 36 from the 2011 CWPP:

"Sayward should investigate the potential for fuel management programs in conjunction with the SRD. A number of high hazard areas immediately adjacent to or embedded in Sayward have been identified and should be reviewed further for treatment suitability. Suitable areas should be the focus of a progressive thinning program that is implemented over the next five to ten years. Thinning should be focused on the highest Priority 1 fuels identified in Map 11. A qualified professional forester (RPF), with a sound understanding of fire behaviour and fire suppression, should develop treatment prescriptions. Any treatments that take place on sloped sites must be prescribed with consideration given to slope stability. Where slope stability may be an issue, a Professional Geotechnical Engineer should review the treatment prescription."

So far, no treatments have been conducted within the AOI. Two main barriers to conducting fuel treatments are cost and land ownership/jurisdiction. Most Priority 1 treatment areas from 2011 are on Private land. Some forest harvesting (unrelated to fuel management objectives) has since occurred in a portion of the Priority 1 treatment areas.

Making use of the updated risk analysis and classification, this CWPP refines the recommended treatment areas to 7 treatment areas summarized in Table 8.

Any fuel management activities planned on Crown land, or beyond those described in the FireSmart Activities section, should engage the professional advice of a qualified Registered Professional Forester. Qualified professionals should be relied on to create site level fuel management prescriptions that have specific measurable targets, contain site specific objectives, and align with other legal and non-statutory objectives including First Nations consultation requirements.[31]

Table 8. Summary of recommended treatment areas in the Sayward Valley AOI.

Treatment Area	WUI Threat / Risk	Priority	Approx. Area (ha)	Land Ownership	Comments / Rationale
1	Mod / Mod	Med	23.5	Private, Crown (woodlot)	Mod-High risk within WUI100
2	High / High	High	19.5	Crown (TFL)	High risk within WUI100
3	High / High	High	15.4	Crown (TFL)	High risk within WUI100
4	High / High	High	13.9	Crown (TFL)	High risk within WUI100

[31] BCWS Fuel Management Prescription Guidance 2019. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/fuels-management/2019_fuel_management_prescription_guidance.pdf

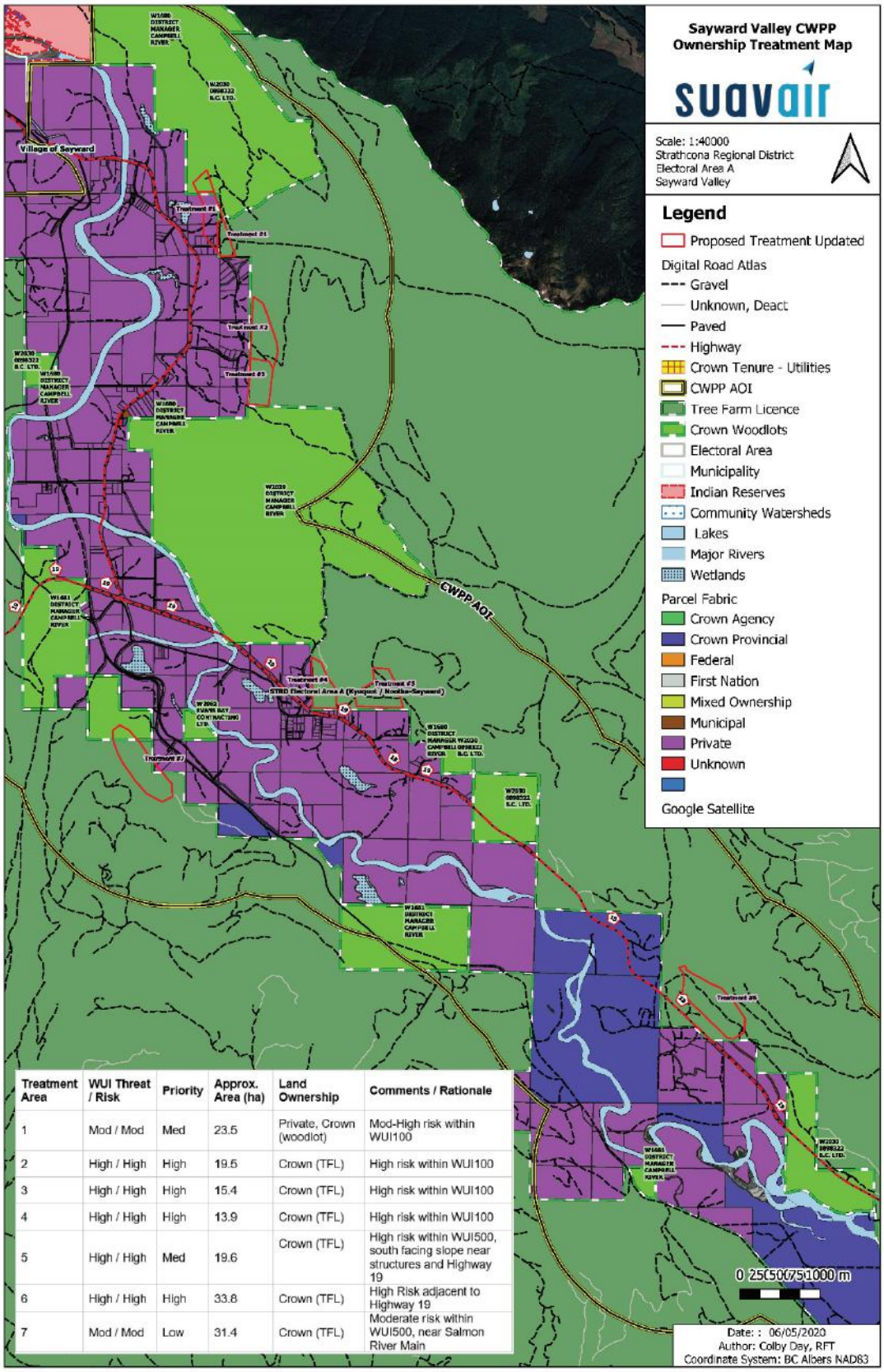
5	High / High	Med	19.6	Crown (TFL)	High risk within WUI500, south facing slope near structures and Highway 19
6	High / High	High	33.8	Crown (TFL)	High Risk adjacent to Highway 19
7	Mod / Mod	Low	31.4	Crown (TFL)	Moderate risk within WUI500, near Salmon River Main

Proximity affects risk and therefore fuels in closer proximity to structures in the Valley, where private land is situated, are higher risk. Therefore, recommended treatment areas are within 500m (WUI500) of structures in the Valley. No treatment is recommended beyond the WUI500 because it is unlikely to occur over the lifetime of this CWPP. This CWPP should be re-visited in 5 years to determine progress on recommended actions, at which time additional fuel treatment areas may be recommended.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
3.	Med	To reduce the fuel hazard within the high risk areas identified within 500m of structures (WUI500).	Engage a qualified forest professional in creating site level prescriptions, and supervising/ coordinating operational implementation of treatments for each recommended treatment area. Consultation with applicable First Nations, private landowners, industry tenure holders, municipalities and the SRD will be required as part of the operational planning process.	SRD

Walter's Island, Esperanza, Eagle's Cove, Brown's Bay

No treatment areas are recommended within these AOI's due to the relatively low threat and risk. Residents and property owners within these areas should refer to the recommendations made in Section 5.2 FireSmart Planning & Activities below.



Treatment Area	WUI Threat / Risk	Priority	Approx. Area (ha)	Land Ownership	Comments / Rationale
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2	High / High	High	19.5	Crown (TFL)	High risk within WUI100
3	High / High	High	15.4	Crown (TFL)	High risk within WUI100
4	High / High	High	13.9	Crown (TFL)	High risk within WUI100
5	High / High	Med	19.6	Crown (TFL)	High risk within WUI500, south facing slope near structures and Highway 19
6	High / High	High	33.8	Crown (TFL)	High Risk adjacent to Highway 19
7	Mod / Mod	Low	31.4	Crown (TFL)	Moderate risk within WUI500, near Salmon River Main

Map 13. Recommended treatment areas and land ownership classes.

5.2 FireSmart Planning & Activities

The intent of this section is to summarize the current level of FireSmart that has been completed, is under implementation, and to identify areas that are FireSmart, or have received FireSmart recognition through the FireSmart Canada Recognition Program, and to identify future FireSmart activities within the AOI.

FireSmart is a planning tool to help communities living in the wildland urban interface (near forests) reduce the likelihood of disaster and catastrophic loss in the event of a wildfire near their community. The 7 disciplines of FireSmart are: vegetation management, public education, legislation, development, planning, cross-training, and interagency cooperation. The BC FireSmart Begins at Home Manual provides detailed information on how residents can work towards protecting their homes from wildfire.[32] Currently, the AOI's are not FireSmart recognized communities.

WUI fires are complex incidents involving both structures and forests. Wildland fires can spread towards the community and structural fires can spread from the community towards the forest. Due to the remote location and absence of fire protection services, it is critically important to consider the impacts of WUI fires in both directions. In the event of WUI fires, BCWS resources should not be solely relied on to save properties. Figure 7 shows the WUI disaster sequence where citizens and landowners can act to break the sequence.

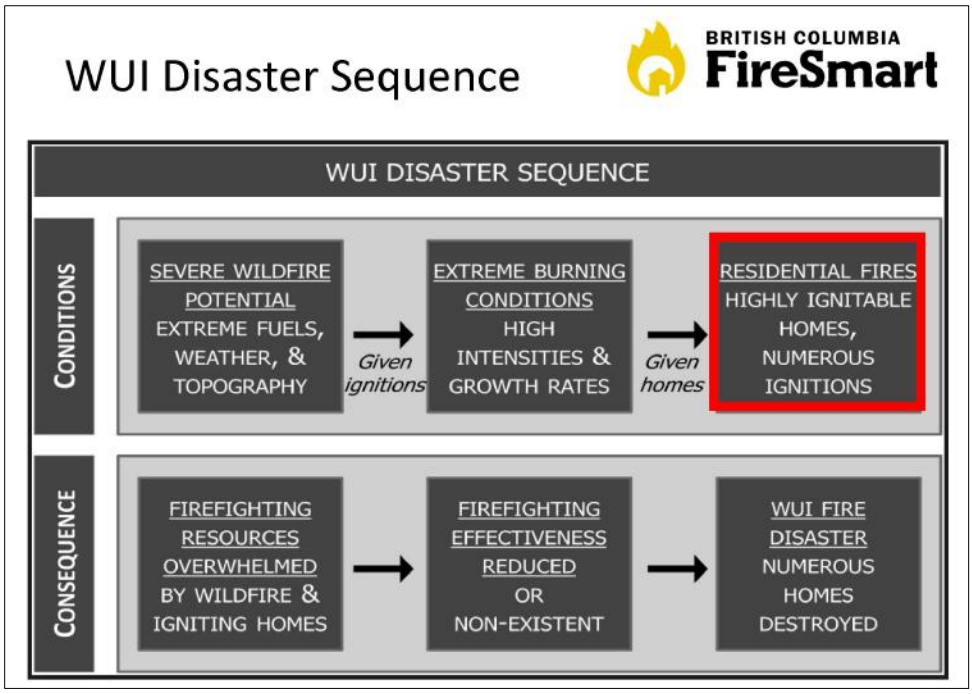

Figure 7. Wildland urban interface disaster sequence and where residents and landowners can break the disaster sequence.

[32] BC FireSmart Begins at Home Manual. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/prevention-home-community/bcws_homeowner_firesmart_manual.pdf

Wildfires have the potential to impact communities in many ways. Structure losses and evacuations are the main impacts of wildfire and both can cause significant emotional, financial, and physical stress. Structure and home losses due to wildfire are a result of fire ignitions caused by radiant heat, convective flames, and wind driven embers. Embers (small flaming or glowing particles) are associated with more than 50% of home losses from wildfires. Embers can be carried up to 2km's under specific fire weather conditions. 85-90% of homes without combustible roofs and with 10m of clearance from combustible materials will likely survive a major wildfire.

Adopting FireSmart principles and engaging in FireSmart practices is the best way private landowners can take responsibility and action on reducing the WUI fire hazard and risk of loss to their homes and communities. The conditions of the Structure (Home) Ignition Zone (SIZ) are a main determinant of whether a home/structure will be lost due to a WUI fire (Figure 8). Simple actions to modify the SIZ can make a big difference. Figure 9 shows the priority areas for vegetation management within the SIZ.

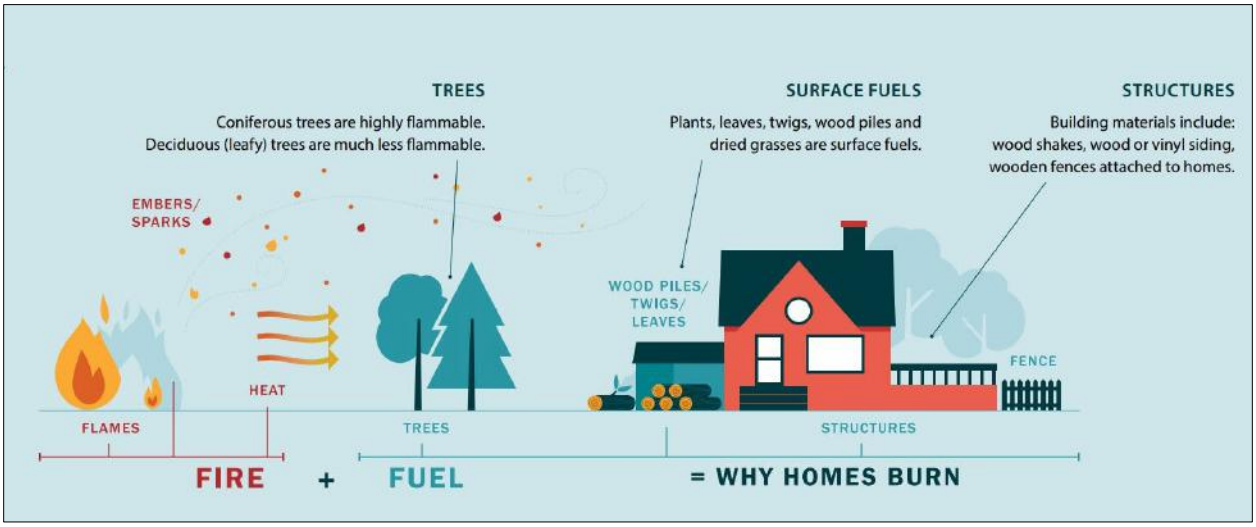

Figure 8. Why homes burn during WUI fire incidents.[33]

[33] FireSmart – Why Homes burn in WUI Fire Incidents https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/firesmart

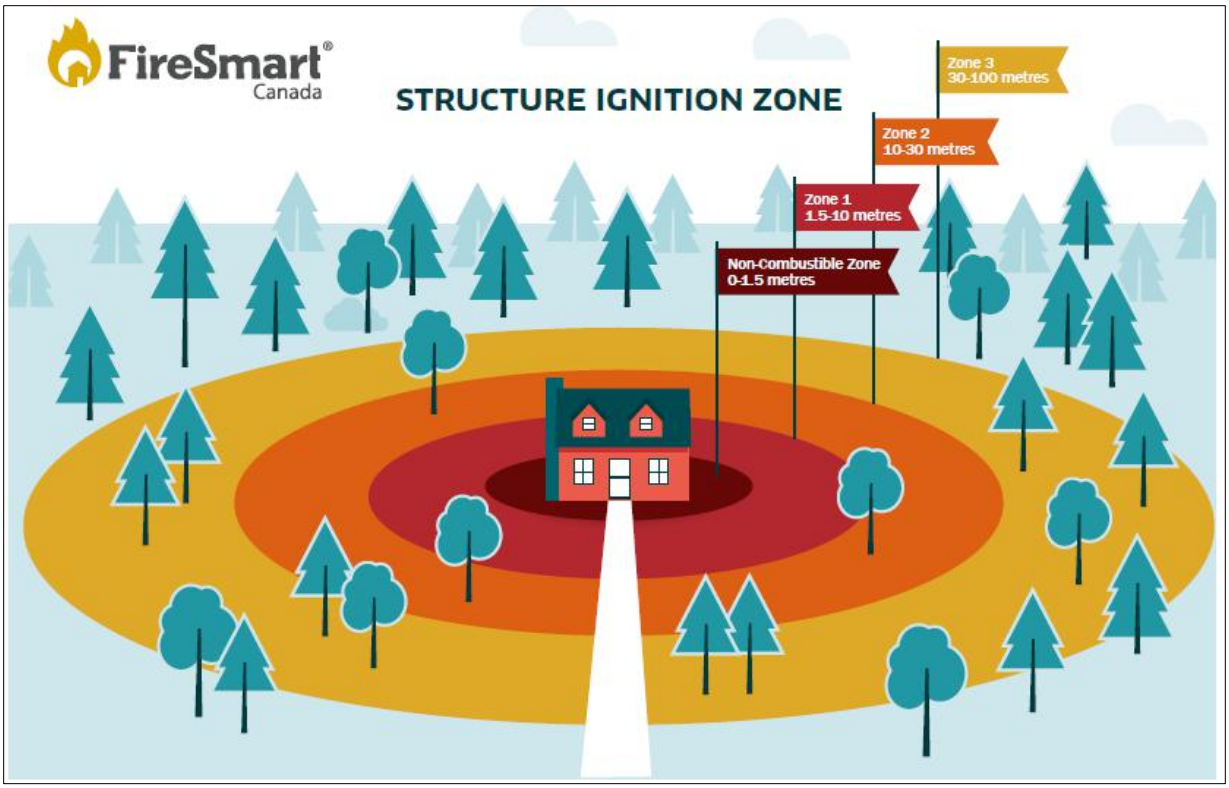

Figure 9. The FireSmart Structure Ignition Zone.

5.2.1 FireSmart Goals & Objectives

The general goal of FireSmart is to encourage communities and citizens to adopt and conduct FireSmart practices to mitigate the negative impacts of wildfire to assets on public and private property. Findings from a study of the 2016 Horse River wildfire in Fort McMurray indicate that FireSmart principles were one of the main reasons why individual homes survived, regardless of the broader wildfire threat surrounding them.[34] This was true in both the urban and rural areas.

Goals of FireSmart

The goal of FireSmart is to encourage homeowners to conduct FireSmart practices on their property to reduce damages and minimize the hazards associated with wildfire. These practices should aim to:

- Reduce the potential for an active crown fire to move through private land
- Reduce the potential for ember transport through private land and structures
- Create landscape conditions around properties where fire suppression efforts can be effective and safe for responders and resources

[34] Al Westhaver, Why some homes survived: Learning from the Fort McMurray wildfire disaster (Toronto: Institute for Catastrophic Loss Reduction, 2016). https://issuu.com/iclr/docs/westhaver_fort_mcmurray_final_2017.

- Treat fuel adjacent and nearby to structures to reduce the probability of ignition from radiant heat, direct flame contact and ember transport
- Implement measures to structures and assets that reduce the probability of ignition and loss

5.2.2 Key Aspects of FireSmart for Local Governments and First Nations

The intent of this sub-section is to provide a summary of FireSmart activities that can be used to measure current level of implementation and to recommend next steps. There are many different ways that members of the community and stakeholders can provide options to mitigate the risk. A general list of FireSmart practices and activities can be found in Appendix 2: FireSmart Planning Activities.

Due to the remoteness of the AOI's, limited infrastructure, and limited or lack of access to fire protective services, it is highly recommended that all private property owners and community members engage with the FireSmart program and begin adopting FireSmart practices around their homes and properties.

The following is generalized guidance for FireSmart activities within the structure/home ignition zone, this guidance applies to all structures within the WUI:

- Regularly clear roofs of debris build up (moss, leaves, branches)
- Remove all combustible materials within 1.5m of the structure
- Remove all vegetation and flammables 3m from gas/propane tanks. Gravel/rock fill materials should be used directly below the tanks.
- Remove all dead/down materials (branches, leaves, etc.) from within 10m of the structure
- Store firewood piles at least 10m from the home
- The areas around fire pits and burn barrels should be free of flammable materials for at least 3m
- Cover burn barrels with fine (6mm) mesh
- Close in eaves with fascia and screen soffits (3mm mesh)
- Clean out flammable items from below decks/balconies; and close in the areas below decks/balconies to prevent the accumulation of embers
- Maintain 3m tree spacing in Zone 2 (10-30m from structure)
- Prune all branches to a height of at least 2m within Zone 2

If structural upgrades or new construction is planned, it is recommended that FireSmart guidelines for materials are followed:

- Preferred roofing materials: clay/tile, fibreglass/asphalt composite shingles, metal, fibrous cement, tar/gravel.
- Preferred exterior siding: stucco, concrete, metal. Logs or heavy timber are better than wooden siding or vinyl.
- Use fire resistant materials for decks, close in the areas below balconies and decks

More information regarding FireSmart guidelines is available in the BC FireSmart Begins at Home Manual[35] and/or contacting a Local FireSmart Representative.[36]

[35] BC FireSmart. FireSmart Begins at Home Manual. https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/firesmart

5.2.3 Identify Priority Areas within the Area of Interest for FireSmart

The intent of this sub-section is to use the information gathered on local wildfire threat and risk assessments (Section 4.0 above) to best understand the priority areas for FireSmart planning and activities. This could be based on the relative level of wildfire risk adjacent to established neighbourhoods, although the application of FireSmart principles to isolated critical infrastructure could also be a priority.

Table 9: Summary of recommended priority FireSmart areas.

Area ID	Wildfire Risk Rating (E/H/M/L)	Recommended FireSmart Activities
Priority Area # 1: Sayward Firehall #2	Mod	• Contact a LFR to conduct a FireSmart Structure Hazard Assessment • Carry out Hazard Assessment Recommendations
Priority Area # 2: Brown's Bay Resort	Mod	• Contact a LFR to conduct a FireSmart Community Hazard Assessment • Identify a Community Champion • Create a Local Community FireSmart Board • Carry out Hazard Assessment Recommendations
Priority Area # 3: Eagle's Cove	Mod	
Priority Area # 4: Esperanza	Mod	
Priority Area # 5: Walter's Island	Low	

All FireSmart related recommendations are listed below.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
4.	High	To engage private landowners in the FireSmart program and planning to help reduce the likelihood of disaster in the event of a WUI fire.	Host Community Champion Workshops for remote/isolated areas. Consider remote or virtual workshop delivery. For Sayward Valley consider working with the Sayward Community Recreation Association.	SRD
5.	High	To engage private landowners in the FireSmart program and	Contact a Local FireSmart Representative to conduct FireSmart Community Hazard	SRD

[36] Local FireSmart Representative look-up.https://firesmartbc.ca/local-firesmart-representatives/

		planning to help reduce the likelihood of disaster in the event of a WUI fire.	Assessments as noted in Table 9.	
6.	High	To improve community FireSmart awareness and to reduce hazards in the structural ignition zone of critical community infrastructure.	Conduct a FireSmart Hazard Assessment around community/municipal infrastructure such as Firehall No. 2, and Sayward Heritage Hall.	SRD, coordinate with Sayward Volunteer Fire Department
7.	Low	To improve community FireSmart awareness and to reduce hazards in the structural ignition zone of homes.	Recommend/encourage fire resistant landscaping materials to residents and to design public spaces with fire resistant landscaping materials where possible. Refer to FireSmart Canada's yard and landscaping guidelines.	SRD
8.	High	To reduce the ignition risk within the FireSmart structural ignition zone by making property owners aware of preferred FireSmart building materials.	Connect property owners to FireSmart guides for selecting building materials and incorporating FireSmart principles into construction and location. The FireSmart Home Development Guide is a key resource. In the absence of an Electoral Area A building bylaw, the SRD should recommend best practices for building within Area A to minimize WUI risk. Make the resources available online where other SRD building code/bylaw information is located.	SRD
9.	High	To improve community awareness of the FireSmart program principles and activities through education.	Encourage residents and property owners to complete the free, online, FireSmart 101 course.	SRD

5.3 Community Communication and Education

Following the 2018 wildfire season, wildfire risk was at the forefront of public awareness on northern Vancouver Island. The challenge is to maintain this level of awareness, interest, and orientation towards action outside of major wildfire seasons. Education plays a critical role in shaping public perception around WUI fires, and the steps that can be taken to reduce risks to human safety and property. Lack of understanding can lead to inaccurate assumptions of the fire hazard, risk, and responsibility for risk reduction. Communication is another critical part of emergency planning and response in the event of a WUI fire. Educations and communication in advance of a WUI incident is required to ensure community members are prepared, informed about their roles and the roles of the Village, fire department, SRD, and BCWS.

Moving from the planning phase to successful implementation of specific activities requires that the community be well informed of the reasons for, and the benefits of, specific mitigation activities. Communication with First Nations' communities, residents, visitors, landowners, industrial stakeholders, and provincial government agencies is required for the successful implementation of this plan. Continual engagement between the SRD and other stakeholders throughout the duration of this CWPP (at least 5 years) is required to sustain momentum in addressing the recommendations.

The CWPP will be made accessible to the community in the following ways:

- A video presentation made available to the SRD Emergency Coordinator
- Hard copies and digital copy of the plan submitted to the SRD
- A digital copy should be uploaded to the SRD Emergency Planning website
- Alternative community communication forums can also be used to share selected highlights from the plan, including social media accounts.

The development of a comprehensive communication and/or public education strategy is outside the scope of this CWPP. However, important communication and education initiatives are recommended below.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
10.	High	To communicate the content of the CWPP and improve community awareness of wildfire planning.	Make the CWPP video, report, and associated maps available to the public through the SRD website. Share CWPP with forest tenure holders and industrial operators within the AOI.	SRD
11.	High	To improve community understanding of wildfire threat and risk; to improve awareness of what actions can be taken to mitigate risk.	Use SRD social media accounts to regularly share wildfire preparedness, wildfire safety, and FireSmart practices information. Posts can redirect followers to the established resources of FireSmart BC, BC Wildfire Service, and Prepared BC.	SRD

12.	Med	To improve community awareness of local bylaws, wildfire regulations, and fire safety information.	Develop a Sayward Valley specific Wildfire Safety and Preparedness informational pamphlet for distribution to residents within the Fire Protective Services Area. Information should include best practices for open burning, where/how to access fire weather information, venting index information, open fire/campfire bans (BCWS), relevant Bylaws and legal information.	SRD
13.	High	To improve public awareness of wildfire threat and risk; and awareness of what actions can be taken to mitigate risk.	Organize an annual Community Fire Safety or Community Wildfire Preparedness day (for Sayward Valley) Activities may include: checking fire extinguishers and smoke alarms in homes; conducting FireSmart clearing of Priority 1 (up to 10m) zones around critical community infrastructure, FireSmart presentations, fire department demonstrations, etc.	SRD, coordinate with Village of Sayward

5.4 Other Prevention Measures

Human-caused ignitions are preventable and will continue to be a focus of wildfire prevention measures. Human-caused ignitions can from industrial activities, campfire use, arson, cigarette butts, open burning debris pile escapes, discarded materials, fireworks, amongst other sources. The recorded Historical Fires data shows that the overwhelming majority of fires in the AOI have been human-caused. Therefore, a focus of this CWPP is to make recommendations that will reduce the number of human-caused ignitions.

Fire prevention can be achieved through communication and education initiatives, as well as through the development and implementation of policies and regulations, including operational guidelines and restrictions. Fire prevention can be addressed at the community level through various avenues. Danger class rating signs within fire protection zones, public communication, industrial work restrictions and fire bans are examples of public fire prevention measures.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
14.	Med	To reduce the risk of human-caused ignitions by promoting alternative means of yard/property waste disposal beyond open fires.	Provide residents with information on alternatives to burning yard waste. Link this information on the SRD website. Alternatives to burning include yard waste disposal centres (Sayward Transfer Station), composting, or xeriscaping.	SRD
15.	Med	To reduce the fuel hazard along powerline rights-of-way.	Work with BC Hydro to mitigate risks along rights-of-way. Communicate the importance of fuel hazard abatement along powerline corridors when brushing, clearing fallen trees, or other vegetation management work occurs.	SRD, coordinate with Village of Sayward
16.	Med	To improve public awareness of Fire Danger and burning restrictions when in effect.	Install additional signage at the Sayward Visitors Centre at Sayward Junction to communicate fire bans, burning restrictions and the Fire Danger Rating.	SRD, coordinate with Village of Sayward, SVFD, and BCWS

SECTION 6: WILDFIRE RESPONSE RESOURCES

The intent of this section is to provide a high level overview of the resources that are available to local governments in the case of a wildfire. Interface fires are complex incidents that typically involve both wildland and structural fires. During times when many fires are burning in the Province and threatening multiple communities at the same time, resource requests can exceed the resources available. In BC. these resources are deployed according to BC Provincial Coordination Plan for Wildland Urban Interface Fires (revised July 2016).[37]

6.1 Local Government Firefighting Resources

The intent of this sub-section is to identify implications of wildfire that impact firefighting efforts (e.g. loss of electrical power and water pressure and supply), the contingencies that have been put in place, and any recommended measures that would help to make community firefighting more effective. Include a high level summary of mutual aid agreements.

6.1.1 Fire Departments and Equipment

The Sayward Valley is within the Fire Protective Services Area of the Sayward Volunteer Fire Department.[38] SVFD has 13 active members (2019-20 numbers). The fire department is trained to exterior structural firefighting standards and to the Wildland Firefighting Level 1 for structural firefighters. The SVFD has 2 fire halls, one located in the Village of Sayward and another on Sayward Road (Firehall #2) in the Valley. The apparatuses available include two fire engine pumper trucks, a 6-person fire rescue truck, and a Ford F350 crew cab pickup truck.

Several volunteers work in jobs that make them unavailable for response during the workday/week. The fire department has limited personnel resources and therefore response capacity for WUI fires. The priority for the fire department is public safety, securing access, implementing evacuation alerts/orders, and working on other public safety directives. In most cases, the fire department will call on BCWS for assistance with WUI fire suppression.

Brown's Bay, Eagle's Cove, Esperanza, and Walter's Island do not have local fire departments or any known mutual aid agreements.

6.1.2 Water Availability for Wildfire Suppression

Water availability for fire suppression is a challenge in each of the AOI's. The Sayward Valley is not connected to a hydrant system. Water storage tanks/wells are located at Firehall #2 and at the Sayward Road/Highway 19 junction, however the status and reliability of these storage reservoirs is not known. Water availability may be a challenge for the Sayward Valley due to the reliance on surface water and the sensitivity of surface water to summer drought.

Esperanza, Walter's Island, Eagle's Cove and Brown's Bay are also not connected to hydrant systems. Due to proximity to the ocean, the main water source for fire suppression in the latter

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[37] BC Provincial Coordination Plan for Wildland Urban Interface Fires. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf

[38] Sayward Volunteer Fire Department. http://www.saywardfire.com/

four AOI's will be ocean water, either bucketed with a helicopter or drafted through a water pump and hose system.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
17.	Low	To improve water availability for fire suppression in isolated areas in the Sayward Valley.	For areas in the Sayward Valley, assess the feasibility and potential locations for dry hydrant installation, and/or other water storage options for fire fighting during drought conditions	SRD, coordinate with SVFD
18.	Med	To improve water availability for fire suppression in isolated areas in the Sayward Valley.	Work with the Village of Sayward, Sayward Volunteer Fire Department to procure a water tanker truck. Construction of a storage area to house the truck should also be planned for during the acquisition.	SRD, coordinate with Village of Sayward and SVFD
19.	High	To improve water availability for fire suppression in isolated areas in the Sayward Valley.	Assess, maintain, and/or upgrade the water storage reservoirs located at Firehall #2 and Sayward Junction. Routine maintenance checks should be performed to ensure reliable water supply for fire suppression.	SRD, coordinate with SVFD

6.1.3 Access and Evacuation

Highway 19 runs through the Sayward Valley. The Valley residents are dispersed along a combination of through-roads, one-way in/out roads, and forest industry roads. Highway 19 is a critical travel corridor for residents on northern Vancouver Island and maintaining the access and integrity of this travel corridor is important for all emergencies. Brown's Bay and Eagle's Cove are accessed by forest service roads. Brown's Bay FSR is a one-way in and out access road. Eagle's Cove can be accessed by Elk Main FSR to the north, and Menzies Main FSR to the south. These FSR's connect to Island Highway 19, north of the City of Campbell River.

Walter's Island is a small remote island that is only accessible by boat or floatplane. On land, there are no roads and all structures are within walking distance to the shoreline. Esperanza is also remote and only accessible by boat or floatplane. All structures are located within walking distance to the shoreline. Esperanza is accessible only by boat, float plane, or helicopter. There are no roads connected to the community. An emergency evacuation plan should be completed for each of the AOI's (Recommendation #1).

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
20.	Med	To improve emergency evacuation	Encourage residents/landowners to sign up to the SRD's free	SRD

		communications to the community.	Connect Rocket emergency notification service which sends out text messages to cellular subscribers and voice calls to landlines.	
21.	Low	To identify, clear and maintain helicopter landing areas for emergency evacuations and/or wildfire response operations.	Identify potential helicopter landing sites throughout the AOI's. Designate areas within a Local Emergency Plan. Helicopter landing sites should be continually maintained to be free of obstructions, loose debris and overhanging vegetation or obstacles; and visibly marked where possible. Landing areas should be easily accessible and easily controlled spaces. BCWS helicopter landing area specifications are available in their Pilot Guide.	SRD
22.	High	To maintain and upgrade the condition of the main access and emergency evacuation route along Sayward Road.	Develop annual action plans for regular maintenance of the Sayward Road right-of-way including brushing, danger tree and surface fuel management. Ensure plans are in place for timely removal of storm damaged trees and debris prior to each fire season. Long-term planning to replace the single-lane bridge is recommended.	SRD, coordinate with Village of Sayward

6.1.4. Training

Training is important to build capacity within the suppression and emergency management area. Training for SVFD members, emergency support services, and community members are considered in this section. Emergency Support Services depend on trained volunteers across the Province. Relevant training courses are listed in Appendix 3: Wildfire and Emergency Response Training Courses. Recruitment and training of volunteer fire department members is an ongoing activity that should remain a focus for the Sayward Valley.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
23.	Med	To continue recruitment and retention efforts for	Regularly schedule open houses or recruitment days for the Sayward Volunteer Fire	SRD, coordinate with SVFD

		volunteer fire department members.	Department. Connect with the community regularly through social media and consider its use as an advertising tool.	
24.	Med	To ensure all volunteer fire department members are trained to wildland firefighting standards.	Ensure all members of Sayward Volunteer Fire Department complete Wildland Forest Firefighter Level 1 (SPP-WFF 1) training. SPP-115 (structure protection workshop) and ICS100 are also recommended.	SRD, coordinate with Village of Sayward and SVFD
25.	Med	To maintain SVFD's readiness for responding to WUI fires.	Include wildfire-specific training sessions that include: fire line construction, pump operations, sprinkler protection, portable water tank deployment, and wildland hose operations. Interface training should include completion of a wildfire simulation exercise and safety training specific to wildland fire and risks inherent with natural areas. Work with the BCWS North Island Fire Zone, and SRD to conduct annual joint training or mock exercises.	SRD, coordinate with Village of Sayward and SVFD
26.	High	To maintain and improve inter-agency communication during emergencies.	The SRD should arrange an annual meeting, prior to fire season, to include BCWS – North Island Fire Zone, EMBC, and local fire department representatives to review incident command structure and emergency support services in the event of a WUI fire.	SRD

6.2. Structure Protection

The intent of this section is to provide a summary of what is available to the community for structure protection and provide any recommendations. Campbell River Fire Department has the nearest structural protection unit (SPU). SRD should ensure that mutual aid agreements or other necessary agreements are in place for the deployment of these SPU's to accessible portions of the AOI's. The deployment of SPU's is not practical for Walter's Island and Esperanza AOI's.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
27.	High	To improve equipment availability for structure protection in the event of a WUI fire.	Ensure mutual aid or service agreements are in place with the City of Campbell River / Campbell River Fire Department for deployment of the City's structural protection unit in the event of the WUI's threatening structures in the Electoral Area.	SRD
28.	High	To improve community preparedness for structure protection due to the remote and isolated location of properties and in some cases, absence of a local fire department.	Develop a checklist for property owners of fire suppression equipment and emergency supplies to keep readily available during fire season. Items should include smoke alarms, fire extinguishers, hand tools, personal protective equipment, communications devices, and a first aid kit.	SRD
29.	Med	To improve capacity and equipment availability for structure protection.	Encourage property owners to purchase sprinkler kits and water supply systems for sprinkler kits to deploy on their homes/critical structures.	SRD

APPENDIX 1: LOCAL WILDFIRE THREAT PROCESS

This section is only required for local government land or First Nations land and is optional for provincial Crown land

For this CWPP this assessment process applies to the Sayward Valley AOI only

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

1. Develop local fuel type map
2. Consider the proximity of fuel to the community
3. Consider fire spread patterns (i.e. ISI Roses)
4. Consider topography
5. Stratify the WUI based on relative wildfire threat
6. Consider other local factors
7. Identify priority wildfire risk areas for field assessment as outlined in the document below

A1.1 Fuel Type Attribute Assessment

The primary forest fire modelling system applied in Canada is the Canadian Forest Fire Danger Rating System (CFFDRS) which uses fuel types described in the Fire Behaviour Prediction (FBP) system. The diversity of ecosystems and biogeoclimatic zones in BC makes fuel typing a complex endeavour. The CFFDRS/FBP system is based largely on fire-prone forest types across Canada. Coastal forest types, including all the forest types within the AOI of this CWPP, are not as thoroughly researched or modelled to understand forest fire behaviour. Coastal forest types have different tree species, shrubs/herbs species, and stand structure when compared to the fuel types classified in the CFFDRS/FBP system.

Perrakis, Eade & Hinks[39] have applied the CFFDRS/FBP fuel types to the BC context and these fuel type descriptions are used within this CWPP. Regarding coastal forests, Perrakis et al. note the following:

> *"Coastal forests dominated by coastal Douglas-fir, redcedar and western hemlock at low elevations; and Amabilis fir and mountain hemlock at higher elevations, represent a unique challenge. These stands are very different in structure and vegetation composition than the boreal or sub-boreal vegetation that is addressed by most FBP fuel types. Older low elevation stands, with high canopies and low light and wind penetration, are typed as C-5, as described above. For varying ages of younger stands, research studies have suggested a U-shaped model for surface fuel hazard, where fine surface fuel loading is highest in younger (<20 years) and old-growth stages, and lower in pole-sized and mature stands (100-200 years) (Agee and Huff 1987); however, crown fire hazard was not considered. A similar pattern was also found by Feller and Pollock (2006), who examined different stand ages following harvesting in southwestern BC; however, that study also included a model of crown fire hazard, which showed a very different pattern, with crown*

[39] Perrakis, D., Eade, G., & Hicks, D. 2018. British Columbia Wildfire Typing and Fuel Type Layer Description. https://cfs.nrcan.gc.ca/publications?id=39432

fire hazard highest in dense pole-sized regenerating stands (20-90 years). These findings have been incorporated into the present fuel typing scheme by classifying dense pole-sized stands as C-3 (see above). Amabilis fir stands have been typed as M-2 40%conifer, representing predicted ROS and HFI values somewhere between C-5 and C-3 outputs (Figure 5). In most fire weather conditions, M-2 40%C produces ROS near the C-3 prediction, although at high and extreme fire danger conditions (ISI > 25 or so), the predicted spread rate is lower, representing more canopy openings and discontinuities which are believed to occur in these stands." (p. 26)

Regarding plantations:

"Coastal conifer plantations represent a specific case of uncertainty – species such as Douglas-fir and western redcedar growing on productive sites, with abundant herbaceous and shrub species in the understory; sometimes these blocks are planted directly through untreated slash; other times, slash is burned before planting; currently, these stands sometimes type out as C-5, sometimes as D-1/2, sometimes as slash (S-3), depending on the time since harvest, tree height and tree age of the dominant cohort; in the authors' opinion none of these is a particularly good fit, and more research is needed to represent managed stands in coastal areas." (p. 32)[40]

Generally, fuel types are defined by overall vegetation structure, dominant species, understory/ladder, and forest floor characteristics. Wildfire fuel types referred to in this CWPP are summarized in the table below.

Table 10. Description of fuel type layers.

Fuel Type	CFFDRS/FBP Description[41]	BC PSTA Description[42]	Local Description	Expected Wildfire Behaviour Under High Wildfire Danger
C-1	Spruce-lichen Woodland (open, parkland).	Pure black spruce stands with sparse vegetation density.	Does not occur within the AOI.	Similar to C-3.
C-2	Boreal black and white spruce. Continuous feather moss, compacted	Mid-elevation hybrid spruce stands.	Does not occur within the AOI.	Crown fire, high to very high fire intensity and rate of spread.

[40] Perrakis, D., Eade, G., & Hicks, D. 2018. *British Columbia Wildfire Fuel Typing and Fuel Type Layer Description.* Natural Resources Canada, Canadian Forest Service, Pacific Forestry Centre, Victoria, BC. Retrieved from https://cfs.nrcan.gc.ca/publications?id=39432.

[41] FBP Fuel Type Descriptions. https://cwfis.cfs.nrcan.gc.ca/background/fueltypes/c1

[42] Perrakis, D., Eade, G., & Hicks, D. 2018. *British Columbia Wildfire Fuel Typing and Fuel Type Layer Description.* Natural Resources Canada, Canadian Forest Service, Pacific Forestry Centre, Victoria, BC. Retrieved from https://cfs.nrcan.gc.ca/publications?id=39432.

	organic layer. Continuous shrub, low to moderate down woody fuel, tree crowns extend nearly to the ground. Moderately well stocked black spruce stands, bogs excluded.			
C-3	Mature jack or lodgepole pine. Continuous feather moss, sparse conifer understory, sparse down woody fuels. Fully stocked. Ladder fuels absent.	Pure and mixed Fd stands 4-12m tall; dense pure or mixed (100% conifer) dominated by Cw, Yc, Hw and 4-15m in height or >15m and <60 years old. Dense pole sized stands[43].	Dense Second or third growth douglas-fir/ western hemlock/ western red cedar forests over 4m tall and less than 60 years old. Clean/open understory.	Surface and crown fire, low to very high fire intensity and rate of spread.
C-5	Red and white pine. Continuous needle litter; moderate herb and shrub layer, tree crowns separated from the ground. Moderately well stocked stands.	Used to approximate fire behaviour in mature stands of low-mid elevation coastal Fd/Hw/Cw.	Mature Douglas-fir/ western hemlock/ western red cedar forests.	Burn rarely and typically with low intensity. Surface fuel loading can be high in older coastal stands, as a result fire intensity can be higher under drought conditions.
C-7	Ponderosa pine/Douglas-Fir	Sparse density conifer stands in drier BEC zones (PP, IDF).	Does not apply to AOI.	N/A
M-1/2	Boreal Mixed wood. Continuous leaf litter in deciduous portions, feathermoss and needles in conifer	Amabilis fir stands typed as M-2 40% conifer to represent fire behaviour between C-3 and C-5 fuel types.	Mixed deciduous-conifer stands Mature forests dominated by amabilis fir/mountain	Surface fire spread, torching of individual trees and intermittent crowning.

[43] Poles are defined as "a tree between a sapling and small sawtimber size. Size varies by region, e.g. for boreal and eastern forests 12-20cm dbh. Retrieved from https://cfs.nrcan.gc.ca/terms/category/21.

	portions. Moderate shrub and continuous herb layers, down woody fuels, conifer crowns extend near the ground. Moderately well stocked mixed wood stands.		hemlock. Higher elevation stands over 800-900m	
D-1/2	Aspen. Continuous leaf litter, moderate shrubs and herbs, conifer understory absent. Moderately well stocked, semi-mature.	D-1 leafless; D-2 green Broadleaf species Conifer forest, 2-6 years Post-wildfire (low to moderate fire severity, open to very open stand structure).	Alder, cottonwood, or big leaf maple dominated stands, often along streams.	Surface fire, low to moderate rate of spread and intensity.
S-1	Jack or lodgepole pine slash.	Slash types may over predict hazard in areas where slash hazard reduction has occurred (burning, piling, or site preparation).	Does not apply to AOI.	N/A
S-3	Coastal Cedar-Hemlock-Douglas-fir Slash.	Same as above.	Recently harvested cut blocks less than 5 years old.	Moderate to high rate of spread and high to very high intensity surface fire.
W	Water	n/a	n/a	n/a
ND	No Data / Private Land	n/a	n/a	n/a
NF	Non-fuel	Conifer forest – dense (low fire severity; overstory mostly unchanged), 1-3 years post-wildfire.		

The following table shows the fire behaviour potential of the FBP fuel types grouped into 4 categories based on their relevance to a wildfire threat assessment.

Table 11: Fuel Type Categories and Crown Fire Spot Potential

Fuel Type Categories	Fuel Type - Crown Fire/ Spot Potential
1: C1, C2, C4, M3-M4 (>50% C/DF)	High
2: C3, C7, M3-M4 (<50% C/DF) M1-M2 >50% Conifer	Moderate
3: C5, C6, O1a/b, S1- S3[1] M1-M2 (26-49% Conifer)	Low
4: D1, D2, M1-M2 (<26% Conifer)	Very Low

The accuracy of the local fire threat determination and fuel treatment design is directly linked to the accuracy of the fuel type information. If the fuel typing is incorrect based on significant disturbance such as harvesting or major fire, to the degree that the associated fire behaviour will drastically change the corresponding threat information will also be incorrect. BCWS annually produces a comprehensive fuel type layer for fire behaviour prediction using the Vegetation Resources Inventory (VRI) data, this layer is made available in the PSTA dataset. The BCWS fuel type layer attribute information should be verified using current data sources including imagery, new treatments, new developments or updated disturbance data.

As part of the CWPP planning process the BCWS fuel type layer attribute information should be verified using current data sources including imagery, new treatments, new developments or updated disturbance data.

As part of this process all changes should be documented and rationale provided, using the Wildfire Threat Assessment_FPB Fuel Type Change Rationale worksheet. This worksheet must be submitted to BCWSPrevention@gov.bc.ca for review and when approved incorporated into the CWPP.

Fuel Type Layer Changes Within the AOI

PSTA fuel types have been updated through spatial analysis to determine any areas where fuel type mapping appears to be potentially inaccurate and a quality assurance process to validate. This process focused on areas that present the greatest potential inaccuracy, such as those listed below:

1. Areas with fuel management treatments (including Prescribed Fire) that are not mapped.
2. Recent silviculture treatments such as spacing and pruning.
3. Coniferous mapped as deciduous.
4. Grasses or shrubs mapped as forest.
5. Areas of non-fuel mapped as a fuel type.
6. Major disturbances (harvesting, wildfires, or land clearing for industrial purposes).
7. C7 fuel types with high Crown Closure.

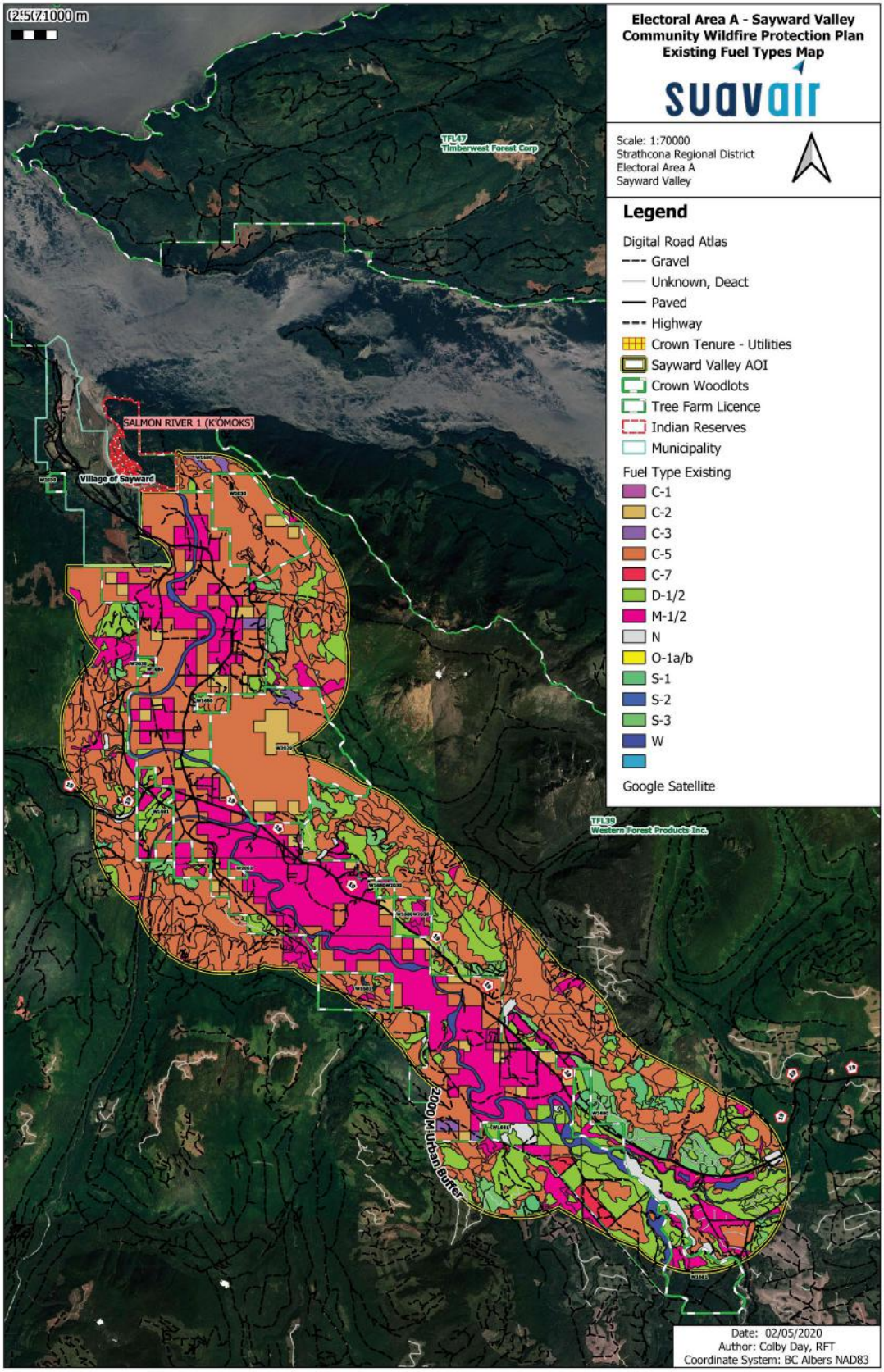
Fuels in the area are generally mature conifer forests (C-5), young and dense conifer forests (C-3), recently harvested cut blocks (S-3), alder/cottonwood/maple deciduous patches (D-1/2), and some mixed coniferous-deciduous stands (M-1/2). The available spatial information from Data Catalogue BC, VRI data, RESULTS, updated Google Earth imagery, proprietary LiDAR and associated data shared for use by Western Forest Products Inc. were analyzed for fuel type verification and adjustments. The major changes to the fuel type layer that resulted within the AOI included:

- recently harvested cut blocks (less than 5 years) were changed to fuel type S-3,
- water areas along the Salmon River were corrected with more accurate spatial data sources,
- coniferous, dense pole sized stands over 4m tall, less than 60 years old, were updated to C-3 fuel type
- C-5 and M-1/2 types reclassified to D-1/2 types based on ortho imagery and forest cover data interpretation
- C-7 and S-1 fuel types reclassified
- Areas of residential and rural development, land clearing and land conversion reclassified as Non-fuel

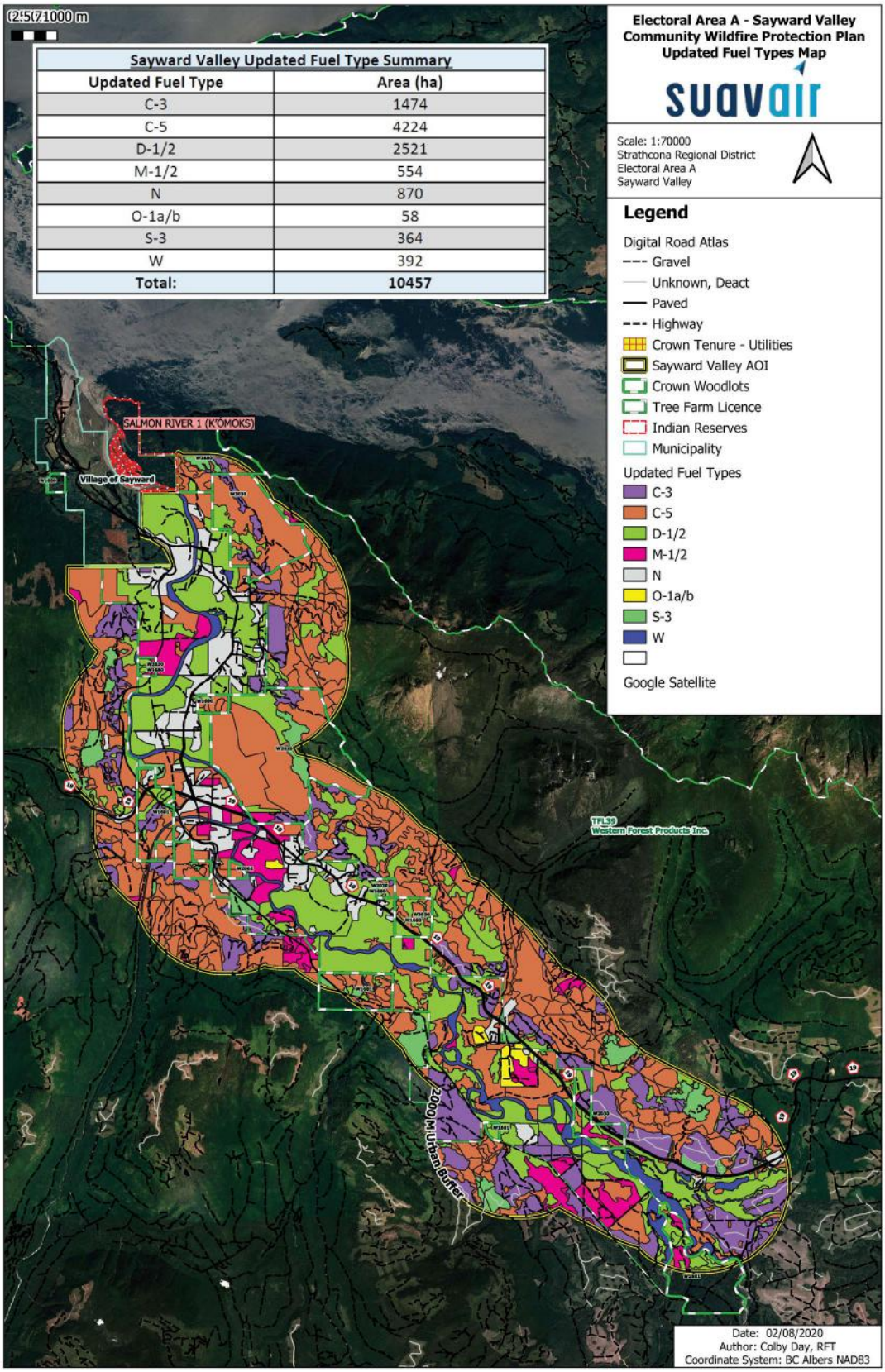
The changes in fuel type areas are summarized in Table 12 and the Maps below for the Sayward Valley AOI.

Table 12. Summary of fuel type classes within the Sayward Valley AOI.

Fuel Type Class	2019 PSTA Original Area	2020 CWPP Updated Area	Net Change
C-2 (mid-elevation interior spruce)	295	0	-295
C-3 (dense, pole sized coniferous forests)	70	1474	+1404
C-5 (mature coniferous forest)	5318	4224	-1094
C-7 (conifer, sparse cover)	51	0	-51
D-1/2 (deciduous)	1547	2521	+974
M-1/2 (mixed conifer/deciduous)	2176	554	-1622
S-1 (recent harvest)	129	0	-129
S-3 (recent harvest)	385	364	-21
O-1 (grass, irrigated field)	0	58	+58
W (Water)	301	392	+91
Non-Fuel	181	870	+689
Total area	10457	10457	



Map 14. 2019 PSTA existing fuel type layer for the Sayward Valley AOI.



Map 15. Updated fuel type layer for the Sayward Valley AOI.

A1.2 Proximity of Fuel to the Community

Fuel closest to the community usually represents the highest hazard. The recommended approach is to treat fuels to achieve a desired level of hazard reduction, from the value or structure outward, ensuring mitigation continuity. Untreated areas between treatment areas and the value or structure may allow a wildfire to build in intensity and rate of spread, which can increase the risk to the value. To capture the importance of fuel proximity in the local wildfire threat assessment, the 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 – the first 100 meters (WUI 100), 101 to 500 meters (the WUI 500), and 501 to 2000 meters (the WUI 2000). These zones provide guidance for classifying threat levels and subsequent priorities of treatments.

Table 13: 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 2000	(501-2000 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.
	>2000 m	This should form part of a landscape assessment and is generally not part of the zoning process. Treatment is relatively ineffective for threat mitigation to a value, unless used to form a part of a larger fuel break / treatment.

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

A1.3 Fire Spread Patterns

Wind speed, wind direction, and fine fuel moisture condition influences wildfire trajectory and rate of spread and is summarized in the ISI Rose(s) from the local representative BCWS weather stations TS Naka Creek and long-term station Menzies Camp. A wildfire that occurs upwind of a value poses a much more significant threat to that value than a fire that occurs downwind.

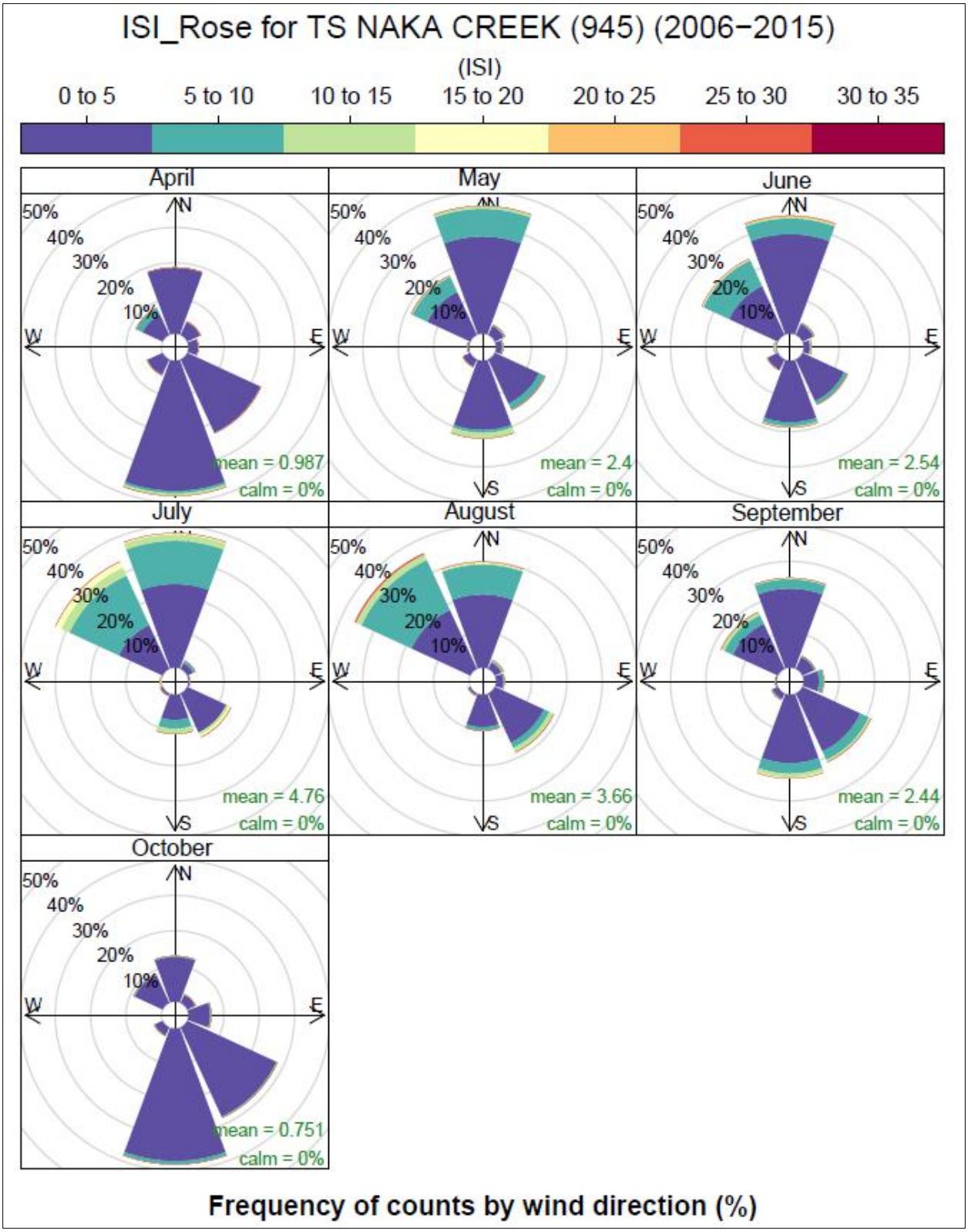


Figure 10. Initial spread index wind roses for TS Naka Creek weather station April to October, 2006-2015.

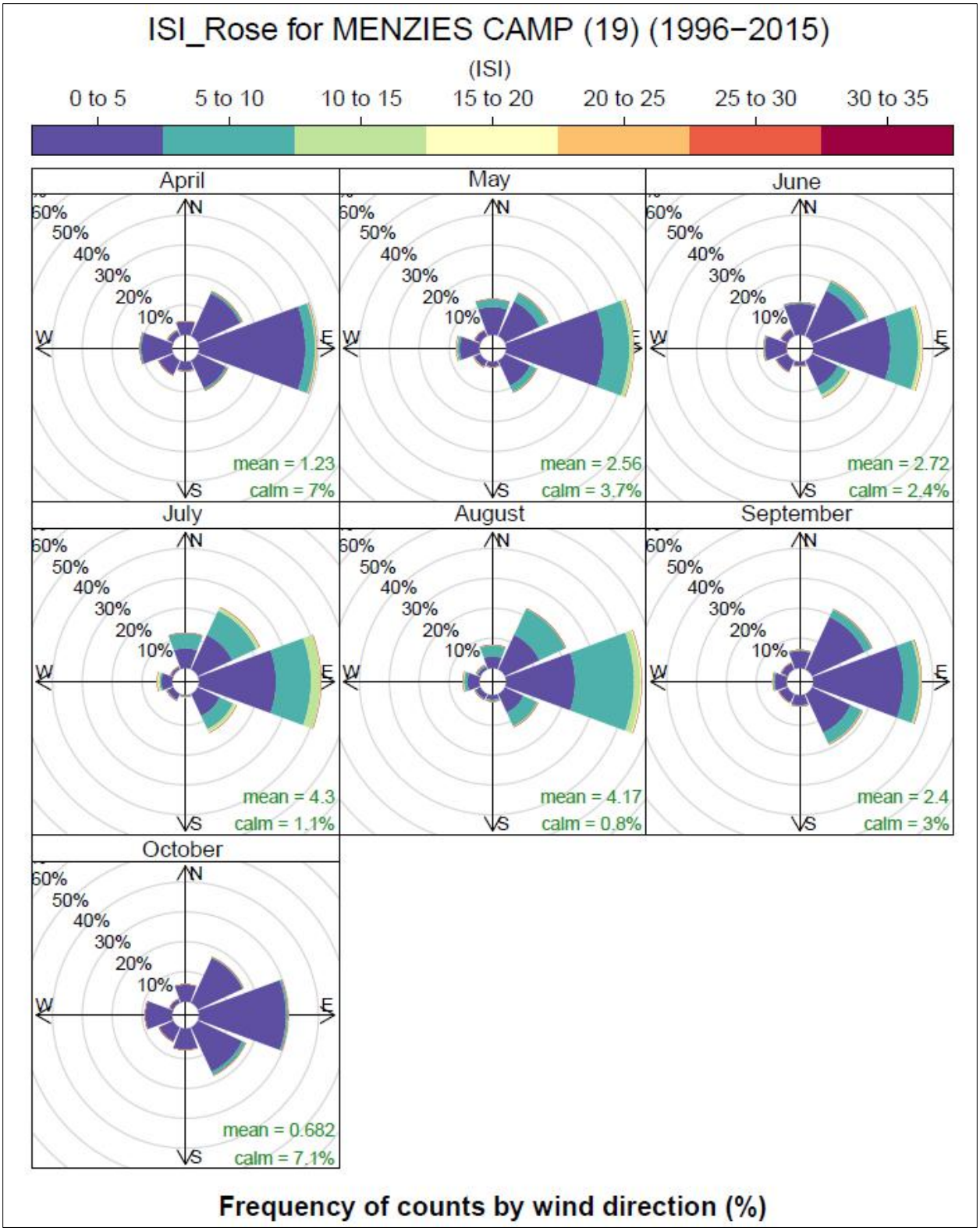


Figure 11. Initial spread index wind roses for Menzies Camp weather station April to October, 1996-2015.

A1.4 Topography

Slope percentage and slope position of the value are both considered. Slope percentage influence a fire's trajectory and rate of spread. Slope position of the value relates to the ability of a wildfire to gain momentum during an uphill run and affects the potential impact to the value.

Slope Class

Determine slope percentages/classes for the WUI area. General fire behaviour implications of slope classes are summarized in the following table:

Table 14: Slope Percentage and Fire Behaviour Implications

Slope Percent	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.

Slope Position of the Value

Slope position of a value relates to the ability of a wildfire to gain momentum during an uphill run. A value at the bottom of the slope is equivalent to a value on flat ground; a value on the upper 1/3 of the slope would be impacted by high preheating and faster rates of spread than a value on flat ground. General fire behaviour implications of slope position to the value are summarized in the following table:

Table 15: Slope Position of Value and Fire Behaviour Implications

Slope Position of Value	Fire Behaviour Implications
Bottom of Slope/ Valley Bottom	Impacted by normal rates of spread.
Mid Slope - Bench	Impacted by increase rates of spread. Position on a bench may reduce the preheating near the value. (Value is offset from the slope).
Mid slope – continuous	Impacted by fast rates of spread. No break in terrain features affected by preheating and flames bathing into the fuel ahead of the fire.
Upper 1/3 of slope	Impacted by extreme rates of spread. At risk to large continuous fire run, preheating and flames bathing into the fuel.

A1.5 Local Wildfire Threat Classification

The process for determining local wildfire threat is described hereafter. Classify the WUI into Local Wildfire Threat Classes based on the updated fuel map (Section 4.3.1). The following explains the process to be used in determining local wildfire threat:

1. Acquire the Provincial Strategic Threat Analysis and metadata from BCWS clipped to the area of interest.
2. Using the previously corrected fuel type map for the area of interest, find areas where the fuel types have been changed. Areas where there is no fuel type change use the PSTA threat score.
3. Look for a similar fuel type in the local area, crosswalk the HFI value from the similar fuel type to the corrected fuel type polygon and place into a table to recalculate the wildfire threat for the corrected polygon. Fire density and spotting impact numbers should not change due to any input at a local level. If the fire density seems to be misrepresentative of the local fire history, this can be captured in the rationale at the treatment design stage.

Table 16: PSTA Inputs Cross Walk Table (Updated January 2018)

	Head Fire Intensity (60%)	Fire Density (30%)	Spotting Impact (10%)	Wildfire Threat Score (100%)
Original PSTA Values	1 (O-1a/b)	6	3	
	1 (O-1a/b)	6	3	
	2(O-1a/b)	4	3	
Original Weighted Values	6	18	3	27 (5 - Moderate)
	6	18	3	27 (5 - Moderate)
	12	12	3	27 (5 - Moderate)
Updated HFI (based on fuel type change)	3 (M-1/2)	6	3	
	4 (C-3)	6	3	
	4 (C-3)	4	3	
Updated Weighted Values	18	18	3	39 (7 - High)
	24	18	3	45 (8- High)
	24	12	3	39 (7 - High)

PSTA Classification table - Low, Moderate, High, Extreme classifications taken from 2017 PSTA document.

Table 17. PSTA Classification table - Low, Moderate, High, Extreme classifications taken from 2017 PSTA document.

	Water	Class 0	No Threat
Class 1	0.1 – 5 Low	Class 2	5.1 – 10 Low
Class 3	10.1 – 15 Low	Class 4	15.1 – 21 Moderate
Class 5	21.2 – 27 Moderate	Class 6	27.1 – 33 Moderate
Class 7	33.1 – 40 High	Class 8	40.1 – 47 High
Class 9	57.1 – 55 Extreme	Class 10	55.1 – 81 Extreme

A1.6 Local Wildfire Risk Classification

As part of the CWPP analysis, local wildfire risk will need to be determined. The following factors are assessed to determine the local wildfire risk score.

1. Corrected wildfire threat (based on locally verified fuel type changes) is described in Section 4.3.6 – Local Wildfire Threat Calculation. This category is weighted at 30% of the total risk score.
2. Proximity is described in Section 4.3.2 – Proximity of Fuel to the Community. This weighs the risk of fuel based on distance from the community, giving a higher score for risk nearest to the values at risk in the community. This is described as “working from the value outward to mitigate risk”. This category is weighted at 30% of the total risk score.
3. Fire spread patterns (Section 4.3.3) use ISI roses and fire perimeter history to forecast the most likely potential fire spread direction for an approaching wildfire to the relative position of the community. Stratify the WUI into areas that tend to be downwind, upwind, or off-set, to these fire spread patterns. Due to the high variability of this information from community to community, generic relative weightings are not provided here, and local evaluation and weightings based on the strength of the local wind direction and intensity patterns is required. This category is weighted at 30% of the total risk score (when clear patterns are evident).
4. Topography (Section 4.3.4) is an important factor in increasing the rate of spread and the resulting head fire intensity of a wildfire. Slope may have little influence depending on the area of the province where the community is located. This category is weighted at 10% (5% for position and 5% for slope class) of the total risk score.

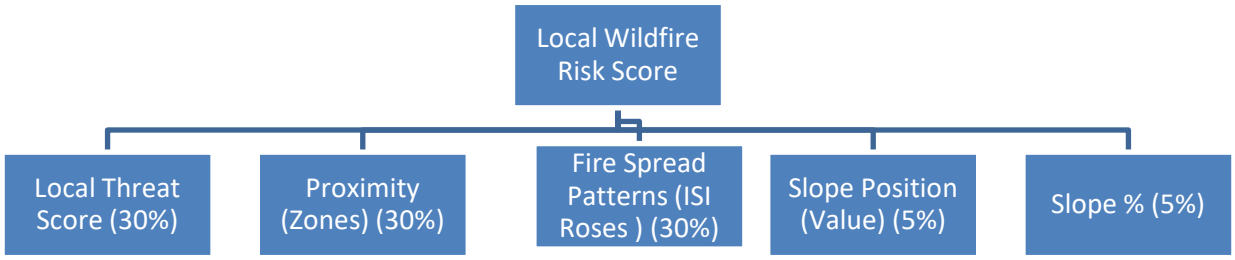


Figure 12: Local Wildfire Risk Inputs

Table explaining the weightings used in determining local wildfire risk are provided below:

Table 18: Local Wildfire Risk Summary

Local Threat Score (30%)	**Proximity (30%)**	**Fire Spread Patterns (30%)**	**Slope Position (5%)**	**Slope Percent (5%)**	**Wildfire Risk Score (100%)**
6.6/10	10/10 (within 100 m of value)	8/10 (west of community with predominant SW to NE wildfire spread pattern)	2/10 (lower part of the slope)	5/10 (30% slope)	7.73/10 (High)

Weighted Values

1.98	3	2.4	0.1	0.25	7.73

NB: Example of the process, not actual values used.

The wildfire risk assessment process outlined above provides a means to determine the wildfire risk as it applies to forest fuel hazard, proximity of fuel to the community, fire spread patterns and topography. These factors all influence how a wildfire could impact the community if ignition was to occur. It is also important for Professionals to consider and assess high forest fire risk activities, human use, and other environmental factors that affect wildfire threat and risk within different areas of the WUI. Note any additional local factors that influence (increase or decrease) the wildfire threat information that is unique to the community.

Where local factors are sufficient to justify changes to the wildfire risk values determined above, document the rationale and provide a map of any alterations, as part of the CWPP. Considering all of the factors noted above should allow the Professional to provide a comprehensive assessment of the wildfire hazard and risk.

Table 19: Local Wildfire Risk Weighting

Relative Risk	Weighting
No Risk	<0.1
Low	0.1 – 3.9
Moderate	4 – 6.9
High	7 – 8.9
Extreme	9+

NB: The scoring system is based on a maximum score of 10.

A1.7 Summary of Fire Risk Classes

No Risk (Gray): The combination of the local fuel hazard (usually PSTA Class 0 or 1), weather influences, topography, proximity to the community, fuel (non-fuel) position in relation to fire spread patterns, and known local wildfire threat factors make it a no risk for threatening a community. These areas are non-fuel or sparsely vegetated and will not support spreading fires, and any patches of vegetation will usually self-extinguished. Low to no risk to any values at risk.

Low (Green): The combination of the local fuel hazard, weather influences, topography, proximity to the community, fuel position in relation to fire spread patterns, and known local wildfire threat factors make it a lower potential for threatening a community. These stands will support surface fires, single tree or small groups of conifer trees could torch/ candle in extreme fire weather conditions. Fuel type spot potential is very low, low risk to any values at risk.

Moderate (Yellow): The combination of the local fuel hazard, weather influences, topography, proximity to the community, fuel position in relation to fire spread patterns and known local wildfire threat factors make it possible that a wildfire in this area would threaten the community. Areas of matted grass, slash, conifer plantations, mature conifer stands with very high crown base height, and deciduous stands with 26 to 49% conifers. These stands will support surface fires, single tree or small groups of conifer trees could torch/ candle. Rates of spread would average between 2-5 meters/ minute. Forest stands would have potential to impact values in extreme weather conditions. Fuel type spot potential is unlikely to impact values at a long distance (<400m).

High (Orange): The combination of the local fuel hazard, weather influences, topography, proximity to the community, fuel position in relation to fire spread patterns, and known local wildfire threat factors make it likely that a wildfire in this area would threaten the community. This includes stands with continuous surface/ crown fuel that will support regular torching/ candling, intermittent crown and/or continuous crown fires. Rates of spread would average 6 - 10 meters/ minute. Fuel type spot potential is likely to impact values at a long distance (400 -1 000m).

Extreme (Red): The combination of the local fuel hazard, weather influences, topography, proximity to the community, fuel position in relation to fire spread patterns, and known local wildfire threat factors make it very likely that a wildfire in this area would threaten the

community. Stands with continuous surface/ crown fuel and fuel characteristics that tend to support the development of intermittent or continuous crown fires. Rates of spread would average >10 meters/ minute. Fuel type spot potential is probable to impact values at a long distance (400 -1 000m or greater).These forest stands have the greater potential to produce extreme fire behaviour (long range spotting, fire whirls and other fire behaviour phenomena.

APPENDIX 2: FIRESMART PLANNING ACTIVITIES

FOCUS AREA	EXAMPLE ACTIVITIES
1. EDUCATION	• Develop and/or promote local FireSmart educational activities and tools. Refer to BC FireSmart Resources for FireSmart materials that are currently available. • Develop and/or promote education for the reduction of human-caused fires • Encourage active participation in Wildfire Community Preparedness Day • Organize and host a community FireSmart day, FireSmart events and workshops, and wildfire season open houses • Apply for FireSmart Canada Community Recognition
2. PLANNING	• Develop or update a CWPP • Develop policies and practices for design and maintenance of FireSmart publicly owned land and First Nations land, such as parks and open spaces • Develop policies and practices for design and maintenance of FireSmart publicly owned buildings • Conduct site visits and FireSmart and/or risk assessments for publicly owned lands, First Nation lands and publicly owned buildings
3. DEVELOPMENT CONSIDERATIONS	• Amend Official Community Plans, Comprehensive Community Plans and/or land use, engineering and public works bylaws to incorporate FireSmart policies • Revise landscaping requirements in zoning and development permit documents to require fire resistant landscaping • Establish Development Permit Areas for Wildfire Hazard in order to establish requirements for the exterior design and finish of buildings[44] • Include wildfire prevention and suppression considerations in the design of subdivisions (e.g. road widths, turning radius for emergency vehicles, and access and egress points) • Amend referral processes for new developments to ensure multiple departments, including the fire department and/or emergency

[44] Local governments should refer to Changes for Local Governments Under Section 5 of the Building Act: Appendix to Section B1 of the Building Act Guide (Revised February 2017) for information on the use of development permits for wildfire hazard.

	management staff, are included
4. INTERAGENCY CO-OPERATION	• Develop and/or participate in regional or local FireSmart planning tables • Participate in multi-agency fire and/or fuel management tables
5. EMERGENCY PLANNING	• Develop and/or participate in cross-jurisdictional meetings and tabletop exercises, including seasonal readiness meetings • Review structural protection capacity (i.e. Fire safety assessments)
6. CROSS TRAINING	• Cross-train fire departments to include structural fire and interface wildfire training (e.g. S-100) • Provide or attend training for Local FireSmart Representatives and community champions • Support professional development to increase capacity for FireSmart activities

7. FIRESMART DEMONSTRATION PROJECTS	• Undertake FireSmart Demonstration Projects for publicly owned buildings or publicly and provincially owned critical infrastructure. This may include:
	  ○ Replacing building materials (i.e. siding or roofing) with fire-resistant materials
	  ○ Replacing landscaping with fire-resistant plants as outlined in the FireSmart Guide to Landscaping

8. FIRESMART ACTIVITIES FOR PRIVATE LAND	• Planning for private land (only with private property owners' consent)
	  ○ Develop FireSmart Community Plans for specific areas
	  ○ Conduct FireSmart home and property assessments
	• Offer local rebate programs to home owners on private land and First Nations land that complete eligible FireSmart activities on their own properties
	• Provide off-site debris disposal for private land owners who have undertaken their own vegetation management, including:
	  ○ Provide a dumpster, chipper or other collection method
	  ○ Waive tipping fees
	  ○ Provide curbside debris pick-up

APPENDIX 3: WILDFIRE AND EMERGENCY RESPONSE TRAINING COURSES

RELEVANT TRAINING COURSES IN WILDLAND URBAN INTERFACE FIRE

COURSE NAME	TARGET AUDIENCE	FORMAT	FURTHER INFORMATION
S-100 BASIC FIRE SUPPRESSION AND SAFETY (2005)	Contract fire crews	2 day, 16 hour course with classroom and field component	Required by OHS Regulation Section 26.3.1 for wildfire contract crews A list of recognized instructors is found here.
S-100A BASIC FIRE SUPPRESSION AND SAFETY ANNUAL RECURRENCY (ALSO KNOWN AS S-10A)	Refresher training for those with valid S100 training	0.5 day classroom and field components	
S-185 FIRE ENTRAPMENT AVOIDANCE & SAFETY (2006)	All those involved in fire suppression operations. General knowledge course on wildfire safety and entrapment avoidance	2-3 hour classroom training session	BCWS Information on Wildfire Training[45]
S-215 FIRE OPERATIONS IN THE WILDLAND/URBAN INTERFACE	Advanced training for wildland fire fighters	3 day instructor led course	
S-230 SINGLE RESOURCE LEADER (CREW BOSS)	Advanced training for wildland fire fighter supervisors	4 day instructor led course	
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 1001 LEVELS	Exterior and Interior Structure Firefighter training	7-12 weeks, depending on the delivery format (full-	

[45] https://www2.gov.bc.ca/gov/content/safety/wildfire-status/employment-and-contracts/wildfire-training

1 AND 2		time or part time)	
STRUCTURE PROTECTION PROGRAM WILDLAND FIREFIGHTER LEVEL 1 (SPP-WFF 1)	Additional training for structure firefighters	6 hours - classroom	Replaces S-100 for Structure Firefighters. BCWS information for structure firefighters working with WUI fires[46]
SPP-115 STRUCTURE PROTECTION WORKSHOP	Additional training for structure firefighters	7-8 hours, including classroom and practical	Focuses on the use of wildfire pumps and hose, application of sprinklers
TRAINING COURSES IN FIRESMART			
FIRESMART 101	Community members	Online	FireSmart Canada[47]
LOCAL FIRE SMART REPRESENTATIVE WORKSHOP	Fire professionals, resource professionals, emergency preparedness staff	2 days (16 hours), classroom. Offered by FireSmart Canada	FireSmart BC information can be found here.
FIRESMART COMMUNITY CHAMPION WORKSHOP	Community members	2-4 hours, offered by Local FireSmart Representative	Local FireSmart Representatives can be found here.
TRAINING COURSES IN EMERGENCY PLANNING AND MANAGEMENT			
FNESS FIRE PROTECTION LEADERSHIP GOVERNANCE TRAINING	Band council, staff, and administration	Tier 1 – Home Fire Protection Tier 2 – Community Fire Protection Tier 3 – Fire Departments	FNESS[48]
EMERGENCY SUPPORT	Community Volunteers	Online or In-Person	Justice Institute of BC[49]

[46] https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/fire-safety/wildland-urban-interface-fire-information

[47] FireSmart 101. https://firesmartcanada.ca/programs-and-education/firesmart-101/

[48] FNESS. Fire Protection Leadership Governance. https://www.fness.bc.ca/core-programs/fire-services

[49] Justice Institute of BC (JIBC). Emergency Support Services. https://www.jibc.ca/sites/default/files/emd/images/JIBC-ESS-Slick_Web_Ready_20150623.pdf

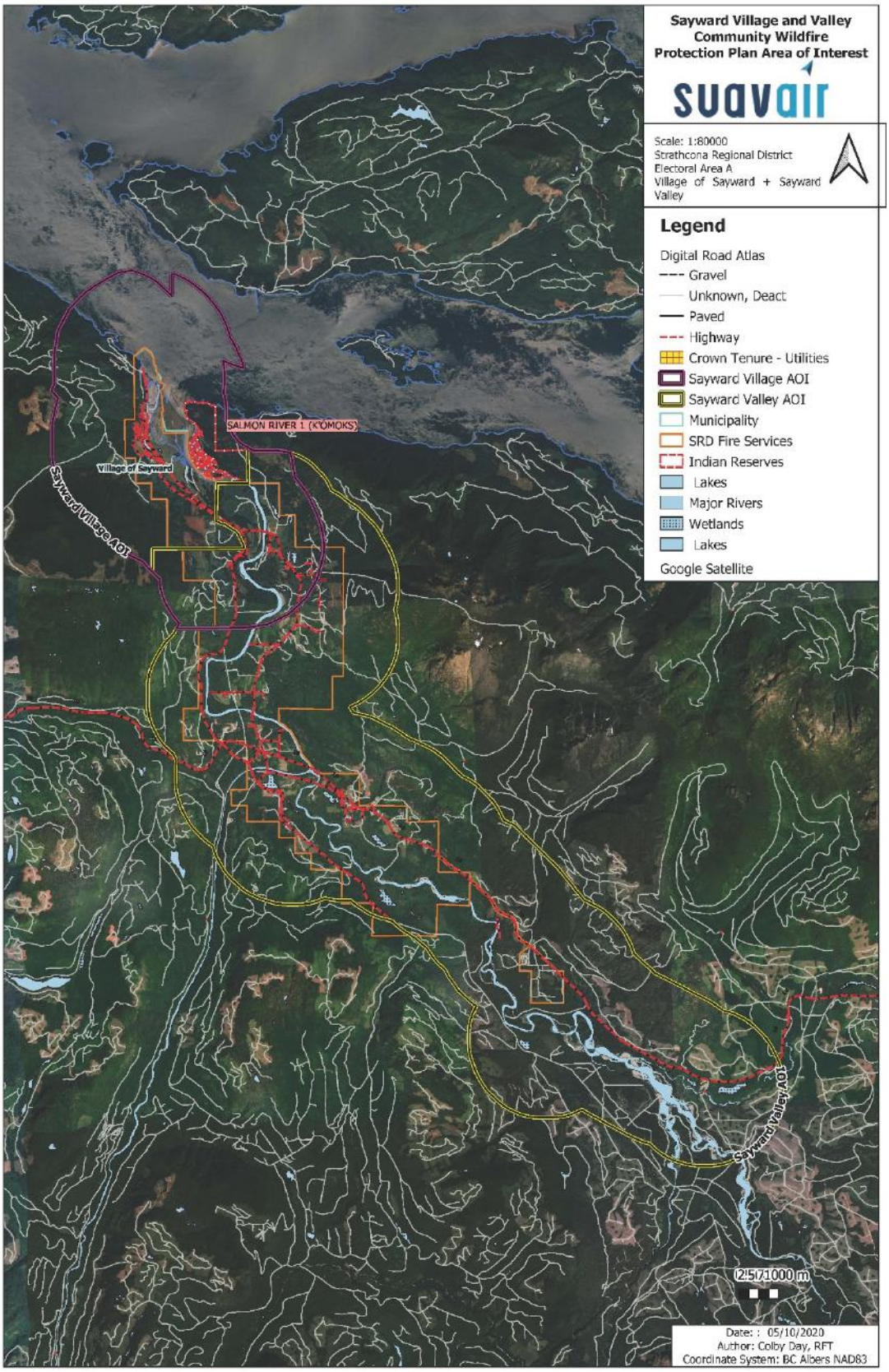
SERVICES LEVEL 1			
EMERGENCY SUPPORT SERVICE DIRECTOR	Community Volunteer	In-person	
INCIDENT COMMAND SYSTEM (ICS) LEVEL 100	First responders, local government administration, community organizations involved in response	In-person, on site; or Online	Justice Institute of BC. Eligible for BC Hydro Community Safety grant[50]
ICS LEVEL 200	First responders, local government administration, community organizations involved in response	Online	JIBC[51]

[50] BC Hydro Community Safety Grants. https://www.bchydro.com/community/community-giving/grants.html#safety

[51] JIBC. Incident Command System. https://www.jibc.ca/course/incident-command-system-level-100

APPENDIX 4: CWPP AREA OF INTEREST OVERLAP

The area of interest overlap between Sayward Valley AOI (this CWPP) and the Village of Sayward CWPP is significant. Joint implementation of recommendations should be considered wherever possible.



Map 16. Sayward Valley CWPP AOI and Village of Sayward CWPP AOI overlap.

APPENDIX 5: WILDFIRE THREAT ASSESSMENT – FUEL TYPE CHANGE RATIONALE

Provided in a separate PDF document.