

Village of Sayward

Community Wildfire Protection Plan

2020 Update



Submitted to:

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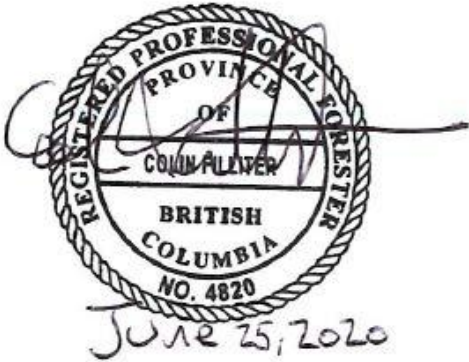
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EXECUTIVE SUMMARY

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 Village of Sayward, within the traditional territories of the K'omoks First Nation, We Wai Kai First Nation, and Wei Wai Kum First Nation. The Village of Sayward is about 75km north of the City of Campbell River by Highway 19.

The purpose of this CWPP is to update the recommendations made in the initial 2011 Village of Sayward CWPP. Using the best available spatial data, this CWPP identifies the wildfire risks surrounding the community, potential consequences of a wildfire to the community, and recommends possible ways to reduce the risk. Relevant recommendations from the 2011 plan are carried forward where applicable.

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.

The recommendations in this report are summarized below. The recommendations are based on a review of best practices from other jurisdictions, gaps identified through community engagement, the local wildfire risk analysis, actions to help prevent 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. Fuel management treatments (surface and ladder fuel removal) are recommended for High risk areas within 100m of structures in the Village. Several FireSmart activities and practices are recommended for private landowners and the Village. 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.

The Sayward Volunteer Fire Department provides fire protective services for the Village. On Crown lands, the BC Wildfire Service manages wildfire response. Continued recruitment and training for volunteer firefighters is critically important to maintaining response capacity for WUI fires and any other emergencies. Emergency evacuation planning is also an identified priority for the Village.

This plan makes 34 recommendations to the Village of Sayward and the Strathcona Regional District. The recommendations should be further prioritized by the Village 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 2020 CWPP RECOMMENDATIONS

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
1.	High	To improve emergency preparedness by developing a Village of Sayward Emergency Preparedness and Evacuation Plan.	Assess and map emergency evacuation routes and muster locations for the Village for wildfire and other emergencies. Make Emergency Evacuation Maps available on the Village and SRD website.	Village and SRD – currently in progress with Behr Integrated Solutions.
Rationale: Based on gaps identified during CWPP engagement. However, this work is ongoing (by a contractor) and is expected to be completed in 2020.				
2.	Low	To reduce wildland urban interface hazards by incorporating wildfire hazard and preparedness considerations into the Village of Sayward Official Community Plan.	Apply a wildfire and wildland urban interface fire hazard lens to applications for rezoning, subdivision or construction. Amend OCP to include wildfire risk language. This may include a specific requirement that wildfire risk management plan be included in the assessment of environmental impacts and proposed mitigating measures, OCP Part 5 Section 2(f)(6). The Village should obtain the proper legal advice prior to adopting any amendments to the OCP or other bylaws.	Village
Rationale: Based on gaps identified from a review of the Village's OCP, and best practices observed in other jurisdictions.				
3.	High	To reduce the fuel hazard within high risk areas identified within 500m of the Village.	Engage a qualified forest professional in creating site level prescriptions, and supervising/coordinating operational implementation of treatments for each recommended treatment area. For additional treatment areas, refer to Priority 1 areas from the 2011 CWPP. Consultation with applicable First Nations, private	Village with SRD support

			landowners, industry tenure holders, municipalities and the SRD will be required as part of the operational planning process.	
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 remove buildup of fuel hazards, especially along evacuation routes, from winter storm damage or other events.	Assess policy tools (bylaws, Fire Chief's authority, <i>Wildfire Act</i>) that can be used to expedite clean up of dead, downed, or windthrown materials that create a fire hazard on private land within the Village boundary.	Village with SRD support
Rationale: Recommended to address fire hazards on private land identified during CWPP engagement.				
5.	Med	To increase community engagement in the FireSmart program through education.	Contact a Local FireSmart Representative to conduct a Local FireSmart Champion workshop to find a local champion to organize community FireSmart initiatives.	Village with SRD support
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.				
6.	High	To reduce fuel hazard within identified FireSmart priority areas (based on critical infrastructure and risk).	Contact a Local FireSmart Representative to conduct Community Hazard Assessments for identified priority areas – MacMillan Drive and Kelsey Recreation Centre areas.	Village with SRD support
Rationale: As above. These areas selected based on proximity to higher risk fuels as per the local wildfire risk analysis.				
7.	Low	To improve community FireSmart awareness through education.	Deliver FireSmart education program within the K-5 public school system. Utilize FireSmart Education Kits and the FireSmart BC Education	Village

			package.	
Rationale: Public education as part of FireSmart program implementation, refer to #5 above.				
8.	Med	To improve community FireSmart awareness through education.	Contact a Local FireSmart Representative to deliver Public education materials at annual community events (i.e. Canada Day, Health Fair, Show and Shine)	Village with SRD support
Rationale: Public education as part of FireSmart program implementation, refer to #5 above.				
9.	High	To reduce fuel hazard on private land and provide property owners alternatives to open burning.	Offer alternative yard waste disposal options including periodic collection and chipping services through community chipping days.	Village with SRD support
Rationale: Fuel management requires the removal of fuels which can be costly and a barrier to action. Providing free or subsidized debris disposal is a best practice for encouraging private landowner participation in fuel management activities.				
10.	High	To improve community awareness of the FireSmart program.	Encourage residents to complete the free, online, FireSmart 101 course.	Village and SRD
Rationale: Public education as part of FireSmart program implementation, refer to #5 above.				
11.	High	To communicate the content of the CWPP and inform the public of the recommendations.	Make the CWPP report and associated maps available to the public through Village and SRD websites.	Village and SRD
Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation.				
12.	High	To improve community awareness and access to FireSmart program information.	Link FireSmart BC program information to Village and Fire Department websites. Make hard copies of resources available at the Municipal Office.	Village and SRD
Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation.				
13.	High	To improve community awareness	Develop a Village specific Fire Safety and Wildfire	Village

		of wildfire regulations, wildfire threat and risk through education.	Preparedness information pamphlet (paper and digital resource). Send this as an annual mailout to all Village residences. This pamphlet should include information on Village Bylaws, <i>Wildfire Regulation</i> legal requirements, FireSmart principles, emergency evacuation routes, wildfire safety, wildfire reporting, and BCWS resources on fire bans, air quality.	
Rationale: Community education and awareness are necessary for wildfire protection planning and FireSmart program implementation. A mailout is an existing mechanism already used by the Village to communicate with residents.				
14.	High	To improve community awareness of wildfire regulations, wildfire threat and risk through education.	Include FireSmart and wildfire awareness information in the monthly Village newsletter, particularly in the months leading up to and including fire season (April to October).	Village
Rationale: Community education and awareness are necessary for wildfire protection planning and FireSmart program implementation. Use the existing Village newsletter to communicate fire related information.				
15.	High	To improve community awareness of wildfire threat and risk; and of what actions can be taken to mitigate risk.	Organize an annual Community Fire Safety or Community Wildfire Preparedness day. 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. The Safety day could be timed with Fire Prevention Week which takes place annually during the 2nd week of October each year. October 4 to 10, 2020 is the next Fire Prevention Week.	Village, Fire Department
Rationale: Recommended best practice for community education and awareness regarding				

wildfire protection planning and FireSmart program implementation. Addresses education and emergency planning FireSmart disciplines (refer to #5).

16.	High	To improve community understanding of wildfire threat and risk; to improve awareness of what actions can be taken to mitigate risk.	Use SRD, Village, and fire department 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.	Village and SRD
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Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation. Addresses education and emergency planning FireSmart disciplines.

17.	Med	To help ensure implementation and continual engagement with this CWPP over time.	Annual check-ins between the Village and SRD should occur to follow-up on recommendations and actions planned and completed. Annual check-ins should also develop an action plan of priority items to be worked on for the year.	Village and SRD
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Rationale: Recommended best practice to ensure follow-up on action items.

18.	High	To engage industrial stakeholders on the contents of this plan for improved communication and awareness.	Share this plan with industrial stakeholders. Collaboration amongst regional operators is recommended to reduce fuel hazards on Crown lands and along rights-of-way. Inquire about slash management (i.e. forestry tenure holders) and fuel hazard management (i.e. BC Hydro or Ministry of Transportation and Infrastructure rights-of-way) initiatives. Fuel hazard abatement is critical along powerline corridors, road rights-of-way when brushing, clearing fallen trees, or other vegetation management work occurs.	Village and SRD
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Rationale: Inter-agency cooperation within the WUI is necessary to maintain evacuation routes and protect a community and its critical infrastructure. Recommended best practice

for information sharing, awareness, collaboration and cooperation. Adapted from 2011 recommendations related to inter-agency cooperation.

19.	Med	To reduce the likelihood of human-caused WUI fire events 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 Village and SRD websites. Alternatives to burning include yard waste disposal centres (Sayward Transfer Station), composting, or xeriscaping.	Village and SRD
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Rationale: Recommended practice, observed from other similar jurisdictions. Contributes to public education and development planning; potential to reduce the likelihood of human-caused WUI fire events.

20.	Med	To improve community awareness of fire bans and other burning restrictions when in effect.	Install additional signage at the Sayward Visitors Centre at Sayward Junction to communicate fire bans and burning restrictions to the Fire Danger Rating sign when applicable.	SRD and Village to work with BCWS North Island Fire Zone
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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.

21.	High	To improve water availability for fire suppression on rural/isolated properties outside of the hydrant coverage area.	Purchase a water tanker truck. Construction of a storage area to house the truck should also be planned for during the acquisition.	Village, Fire Department, and SRD
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Rationale: Water availability in the fire protective services area, outside of the hydrant coverage area was identified as an issue during CWPP engagement.

22.	Med	To improve water availability for fire suppression on rural/isolated properties outside of the hydrant coverage area.	Assess the feasibility and potential locations for dry hydrant installation, and/or other water storage options for fire fighting during drought conditions.	Village and SRD
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Rationale: Water availability in the fire protective services area, outside of the hydrant

coverage area was identified as an issue during CWPP engagement.

23.	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.	Village and SRD
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Rationale: Build up of fuel hazards from previous storm damage were concerns identified by both SVFD and BCWS.

24.	Low	To establish and maintain a secondary emergency evacuation route.	Continue work with industrial stakeholders, private land owners, Western Forest Products Inc., and Mosaic Forest Management to establish M Branch as a regularly maintained and viable evacuation route for community members and private vehicles	Village with SRD support
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Rationale: Best practice recommendation for secondary emergency access and emergency evacuation, based on previously identified limitations with Sayward Road (single lane bridge).

25.	Med	To improve emergency access to the area by designating and maintaining a helicopter landing/staging area for use by BCWS or other agencies during an emergency.	Designate an accessible area to be used as a helicopter landing area. This area should be noted in the Village Emergency Preparedness Plan. Regularly maintain the area to be free of loose objects, obstructions, overhanging vegetation of other obstacles.	Village
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Rationale: Best practice recommendation for emergency access and emergency evacuation, based on gaps identified during CWPP engagement.

26.	Med	To improve emergency evacuation communications to the community.	Encourage residents to sign up to the SRD's free Connect Rocket emergency notification service which sends out text messages to cellular subscribers	Village and SRD
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			and voice calls to landlines.	
Rationale: Existing program/infrastructure to continue to encourage residents to use.				
27.	Low	To continue recruitment and retention efforts for volunteer fire department members.	Regularly schedule open houses or recruitment days. Connect with the community regularly through social media and consider its use as an advertising tool.	Village, Fire Department
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.				
28.	High	To ensure fire department members are trained to respond to wildland fire emergencies.	Ensure all SVFD firefighters are trained to Structural Protection Wildland Firefighter Level 1 (SPP-WFF1) and SPP-115 (structure protection workshop).	Village, Fire Department
Rationale: As new members join SVFD, to keep SPP-WFF-1 training top of mind.				
29.	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.	Village with SRD and BCWS support
Rationale: Based on CWPP engagement with the Village, 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.				
30.	Low	To improve training amongst community members in emergency support	Recruit and train interested community members to serve in roles of emergency support services and incident command	Village and SRD

		services.	systems.	
Rationale: Recommended activity based on CWPP engagement with the Village, limited resources and staff turnover at Village Administration.				
31.	High	To improve inter-agency and cross-jurisdiction communication about wildfire risk, emergency preparedness, response, and recovery.	The SRD should arrange an annual meeting, prior to fire season, to include BCWS – North Island Fire Zone, EMBC, and local fire department representatives and Village Administration to review incident command structure, communication strategies 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.				
32.	High	To improve equipment availability for structure protection during a WUI fire event.	Engage the City of Campbell River / Campbell River Fire Department in mutual aid/service agreements for assistance and deployment of the City's structural protection unit in the event of the WUI fire impacting the Village.	Village
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.				
33.	Low	To improve equipment availability for structure protection during a WUI fire event.	The Village should purchase sprinkler kits for protection of critical Village infrastructure. Demonstration days can be used to raise community awareness and encourage private home/landowners to purchase their own kits for their homes.	Village, Fire Department
Rationale: Based on current inventory, 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.				
34.	Low	To improve equipment availability for structure protection	Encourage private property owners to purchase their own sprinkler kits, particularly those	Village

		during a WUI fire event.	properties outside of the hydrant coverage area.	
Rationale: Based on current inventory, 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 (i.e. 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 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
FNESS	First Nations' Emergency Services Society
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
WFP	Western Forest Products Inc.
WUI	Wildland Urban Interface

SECTION 1: INTRODUCTION

The Community Resiliency Investment (CRI) program is a new provincial program intended to reduce the risk and impact of wildfire to communities in BC through community funding, supports and priority fuel management activities on provincial Crown land.

The Union of BC Municipalities (UBCM), First Nations' Emergency Services Society (FNESS) and the Forest Enhancement Society of BC (FESBC) are working with the Ministry of Forests, Lands, Natural Resource Operations & Rural Development (FLNRORD), represented by the BC Wildfire Service (BCWS), to administer the FireSmart Community Funding & Supports portion of the program for local government and First Nation applicants.

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 organized into the following major sections:

SECTION 1: Introduction - Explains 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 within the AOI

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

SECTION 5: Risk Management and Mitigation Factors - Outlines the strategies a 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 and 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 Preventative 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 AOI, to describe the potential consequences if a wildfire were 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 address 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 Community Resiliency Investment (CRI) Program is a provincial grant program from the Union of BC Municipalities (UBCM). The CRI program helps fund costs associated with writing CWPPs and is the main funding source for the development of this CWPP. 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, using best available information including LiDAR data, updated forest cover and ortho imagery 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

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

plan for mitigation activities and respond to wildfire events. To support this understanding, the BC Wildfire Service (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 used as input to this planning process. Other relevant data was gathered through field visits to the community, stakeholder engagement, proprietary LiDAR data shared for exclusive use on this project by Western Forest Products Inc., and publicly accessible data from the BC government Data Catalogue.

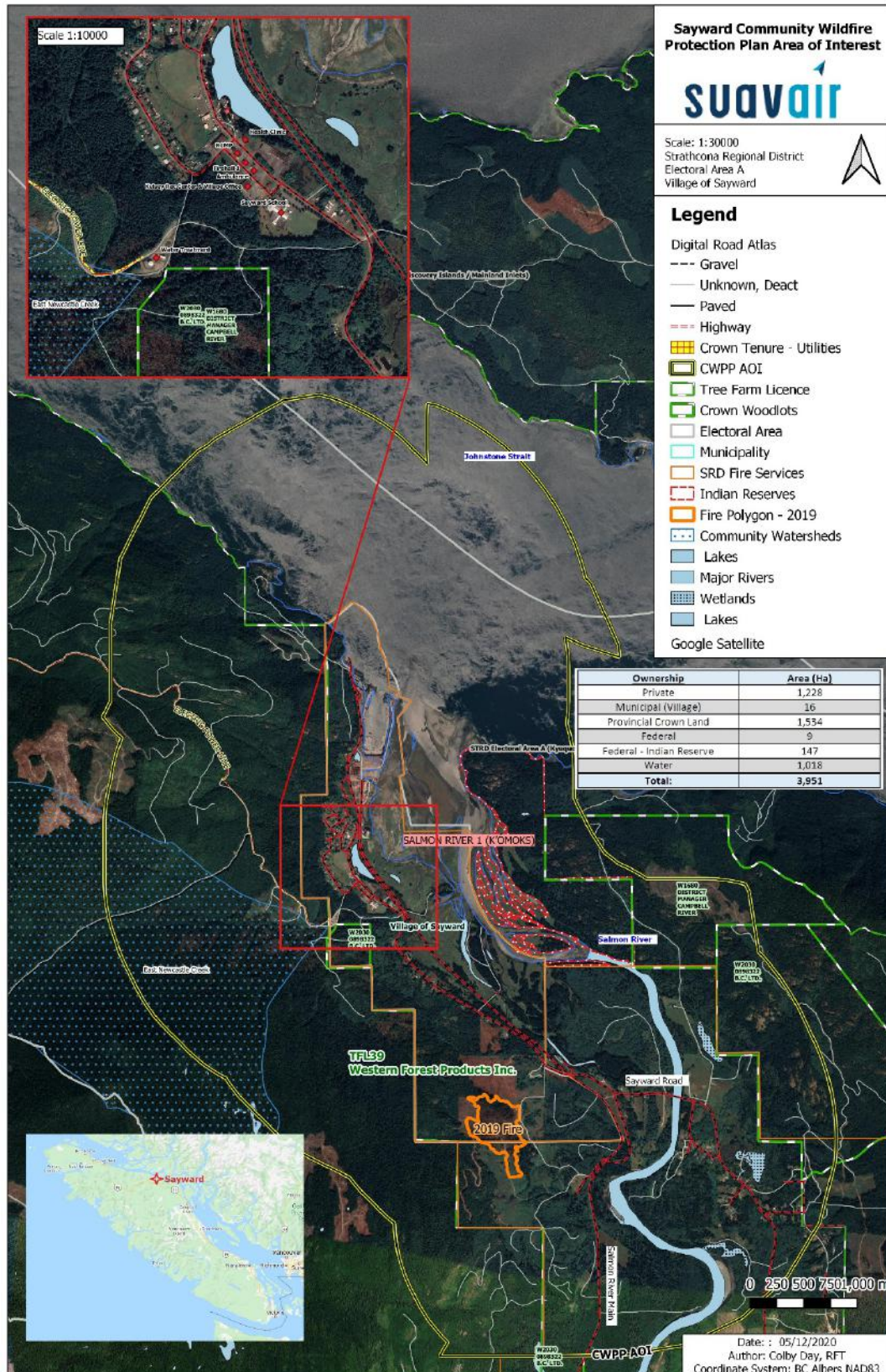
SECTION 2: LOCAL AREA DESCRIPTION

2.1 CWPP Area of Interest

The Village of Sayward is located on the east coast of Vancouver Island, approximately 75km north of the City of Campbell River on Highway 19. The Village is situated at the mouth of the Salmon River, within the traditional territories of the K'omoks First Nation, We Wai Kai First Nation, and Wei Wai Kum First Nation. K'omoks First Nation IR Salmon River 1 is within the AOI although there are no known structures or permanent residents located on the reserve.

The AOI includes the Village and the area within 2km of the Village's municipal boundary where structure density is greater than 6 to 25 structures per km² (Map 1). This definition of the AOI is consistent with the CRI project funding guidelines. The 2011 CWPP AOI encompassed a larger area, including all area within 2km of the Village boundary plus the Sayward Fire Department Fire Protection Local Service Area.

A portion of the 2020 Village AOI overlaps the adjacent SRD Electoral A Sayward Valley 2020 CWPP AOI. At the request of the SRD, separate CWPP documents have been developed to reflect the regional administrative boundaries in the area. However, it is recommended that the results and recommendations of both plans are considered together, as wildfires do not know or respect administrative boundaries.



Map 1. Village of Sayward CWPP area of interest.

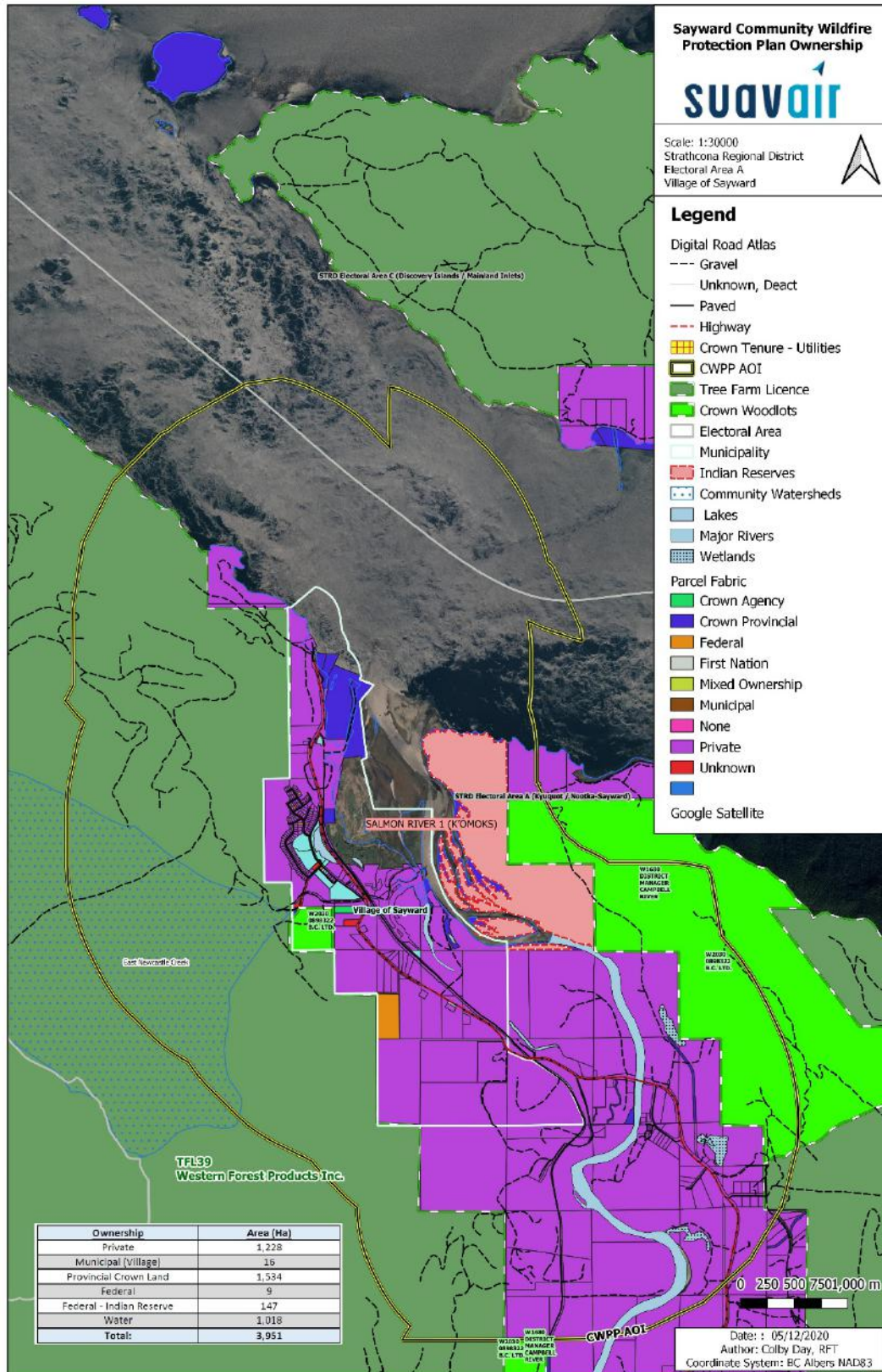
2.2 Community Description

The Village of Sayward is a small coastal settlement with a post-European contact history driven mainly by forestry activities. Present day economic drivers in the area include forestry, aquaculture, public administration, educational services, construction, tourism, and retail/trade services. Kelsey Bay wharf was the southern terminus of the BC Ferries Inside Passage route until 1978 when the Island Highway 19 was paved and extended to Port Hardy.

The Village's services and amenities include the Kelsey Recreation Centre, Village Campground, Sayward Elementary School, BC Ambulance Service, RCMP detachment, Sayward Primary Health Clinic, Sayward Volunteer Fire Department, Canada Post Office, Vancouver Island Regional Library, curbside waste pick up, water and sewage systems, and a recycling depot. Table 2 and Map 2 summarize land ownership classes within the AOI.

Table 2. Land ownership classes within the AOI.

Land Ownership	Area (ha)	Comments
Private	1228	Includes some private managed forest lands parcels
Municipal	16	
Provincial Crown	1534	Includes forest tenures W2030 and TFL 39
Federal Crown	9	
Indian Reserve	147	K'omoks First Nation
Water	1018	Mostly Ocean and some of the Salmon River
Total	3951	



Map 2. Land ownership classes within the Village of Sayward AOI.

2.3 Past Wildfires, Evacuations and Impacts

MFLNRORD and the BC Wildfire Service (BCWS) manage a provincial database of historical fire ignitions and fire perimeters. This data was reviewed as part of the CWPP planning process. The 2011 Village of Sayward CWPP tallied historic fires in the area. 29 fires were documented between 1950-2010, of which 25 were determined to be human caused and 4 lightning initiated.

Since 2010, there has been 1 human caused fire within the AOI. The fire started on private property in May 2019 and spread into standing timber within the Village municipal boundary. The fire was initially responded to by the Sayward Volunteer Fire Department (SVFD) and the 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

The initial CWPP for the Village of Sayward was completed in 2011 by B.A Blackwell and Associates Ltd. of North Vancouver, BC. The 2011 CWPP made 38 recommendations to the Village and SRD, the status of these recommendations are summarized in Appendix 2: Status of 2011 CWPP Recommendations. Fuel treatments were recommended in the 2011 CWPP but no treatments have been completed. FireSmart awareness presentations were delivered by the Fire Chief in 2013-14 to interested community members, however no significant community level FireSmart implementation has occurred to date. Aside from this CWPP update, there are no known wildfire prevention plans or activities ongoing in the AOI. The Village councillors and Fire Department were engaged throughout this CWPP process and their ideas, feedback, and concerns were integrated into this plan wherever possible.

2.5 Linkages to Other Plans and Policies

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 policies that will influence the development of the CWPP.

2.5.1 Local Authority Emergency Plan

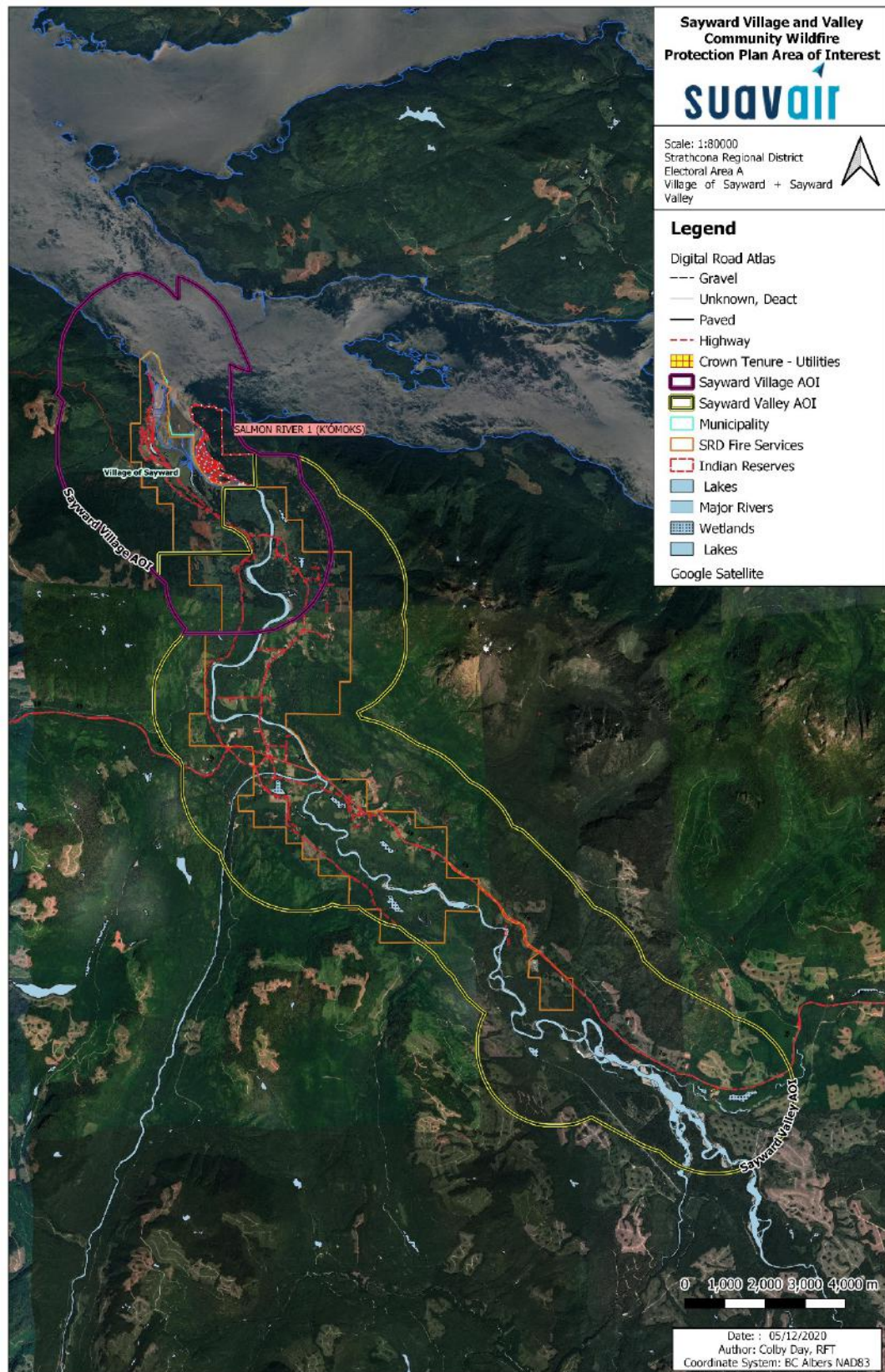
The Village is in the process of updating their Emergency Evacuation and Response Plan. A contractor has been selected, but at the time of writing this CWPP, the evacuation plan is still in the preliminary stages. Preliminary evacuation routes have been outlined as part of this CWPP. The main public access road is Sayward Road. Alternate access routes include industrial roads Salmon River Main and M Branch.

Evacuation routes, once designated in the EPP, should be clearly marked because gravel roads do not have lighting or regular signage, there may be several dead end turn-offs, visitors to the area may not be familiar with the road system, and an emergency evacuation will cause stress and elevated anxiety amongst road users.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
1.	High	To improve emergency preparedness by developing a Village of Sayward Emergency Preparedness and Evacuation Plan.	Assess and map emergency evacuation routes and muster locations for the Village for wildfire and other emergencies. Make Emergency Evacuation Maps available on the Village and SRD website.	Village and SRD – currently in progress with Behr Integrated Solutions.

2.5.2 Affiliated CWPPs

Affiliated CWPP's include the 2011 Village of Sayward CWPP and the 2020 SRD Electoral Area A CWPP completed concurrently with this plan. There is significant overlap between AOI's of the Village of Sayward and the Electoral Area A Sayward Valley 2020 CWPP's. The 2011 Village of Sayward CWPP included all areas within 2km of the Sayward Fire Protective Services boundary, including the Village of Sayward and 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, some duplication occurs. Several recommendations overlap between the Village of Sayward 2020 CWPP and the Electoral Area A 2020 CWPP. The joint implementation of recommendations should be considered wherever possible.



Map 3. The AOI overlap between the Village of Sayward and Sayward Valley (Electoral Area A) CWPP's.

2.5.3 Local Government and First Nation Plans and Policies

The Village of Sayward has several bylaws addressing the use of fire, fire hazard and risk within the Village Boundary. Village Bylaws clearly restrict the use of cooking fires, campfires, and open fires within the Village boundary. A draft bylaw to restrict the use of fireworks was proposed in late 2019. Bylaw awareness and enforcement should be a focus moving forward. To improve bylaw education and awareness, the Village should develop a Use of Fire in the Village of Sayward factsheet for distribution to all residents. Information in the pamphlet should include information on bylaws, burn permit requirements, where/how to access fire weather information, Village of Sayward Fire Department information, BCWS burning ban information, and alternatives to burning for debris disposal. The factsheet should also make residents aware of the possibility of cost recovery actions should open fires escape and require response from the fire department or BCWS.

Bylaw No. 308 and 354 – Official Community Plan for the Village of Sayward

The Village of Sayward Official Community Plan (OCP) was most recently updated in 2000. The OCP outlines the potential scope and nature of information the Village may require for applications for subdivision, construction, rezoning or development. The information required may include buffering requirements, vegetation management plans, and an assessment of environmental impacts and proposed mitigating measures.

Village of Sayward Bylaw No. 272 – Fire Prevention and Regulation Bylaw

Section 1.3 – Administration, subsection 5(e) the Fire Chief may “require owners or occupiers of real property to remove anything and everything from a building or yard which in the opinion of the Fire Chief is a fire hazard or increases the danger of fire...”

Section 1.6 – Permits, subsection 1(g) states that “no person shall light, start, ignite any fire of any kind in the open air between the first day of January and the thirty-first day of December without firstly obtaining a permit from the Fire Chief.”

Open Fire is not defined in the Bylaw. Under the BC *Wildfire Regulation*, open fires include campfires (less than 0.5m x 0.5m), category 2 (1 to 2 concurrently burning piles, less than 2m x 3m) and category 3 fires (any fire larger than 2m x 3m, more than 2 concurrently burning piles).

Small, confined fires for the purpose of cooking food do not require a burning permit.

Village of Sayward Bylaw No. 272, 1995 – Residential Backyard Burning Bylaw

The Residential Backyard Burning Bylaw and Fire Protection Services Bylaw restrict the use of fire within the Village administrative boundary. The Residential Backyard Burning Bylaw requires a person to obtain a burn permit from the Fire Chief for Open Fires, specifies the size of fires and their minimum distance from property lines and vegetation (Village of Sayward Bylaw 272 – Pages 2 and 3). The Bylaw also outlines provisions for cost recovery and liabilities (Page 4).

Village of Sayward Bylaw No. 384, 2010 – Property Maintenance Bylaw

The property maintenance bylaw is in effect to prevent private property in the Village from becoming unsightly or untidy. “Unsightly” is defined in the bylaw and Section (k) of the definition reads “uncontrolled growth of vegetation, brush or grass in excess of 30 centimeters in height.”

Village of Sayward – Proposed Bylaw on Fireworks Use (2020)

The Village of Sayward Council are in the process of creating a new fireworks bylaw. Part of that process will include gathering input from the public and recording feedback. A survey will be available early in 2020 both electronically and by mail. Please stay tuned for more info.

In the meantime, a reminder to all residents in the Village of Sayward that fireworks regulations are currently included in Fire Protective Services Bylaw #383. Section 59, which regulates low hazard fireworks states:

59. No person shall, at any time, sell, give, possess or explode Low Hazard Fireworks, excluding sparklers, Christmas crackers and caps for toy guns, except under the following conditions:

(1) Low Hazard Fireworks may be possessed and exploded at a specified time by a sponsoring organization or person conducting a public event if such event is authorized by written permission of the Fire Chief who has issued a permit for that event as per Schedule ‘A’ attached hereto and forming part of this bylaw; AND

(2) Low Hazard Fireworks may be exploded on private property only with the written consent of the property owner or on Village property with written consent of the Village Chief Administrative Officer or Fire Chief.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
2.	Low	To reduce wildland urban interface hazards by incorporating wildfire hazard and preparedness considerations into the Village of Sayward Official Community Plan.	Apply a wildfire and wildland urban interface fire hazard lens to applications for rezoning, subdivision or construction. Amend OCP to include wildfire risk language. This may include a specific requirement that wildfire risk management plan be included in the assessment of environmental impacts and proposed mitigating measures, OCP Part 5 Section 2(f)(6). The Village should obtain the proper legal advice prior to adopting any amendments to the OCP or other bylaws.	Village

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. The Johnstone Strait Salmon Landscape Unit Plan (LUP) was approved in 2010. The LUP does not contain any wildfire specific comments or objectives. 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 *Environmental Management Act*.

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 Act* and *Wildfire Regulation* require those persons carrying out industrial activities to conduct fire hazard assessments and to abate hazards that are identified. “Industrial activity” is defined in the *Act* to include land clearing.

For industrial activities inside or within 2km of a fire protection district: 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 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 3 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.

2.5.5 Ministry or Industry Plans

Forestry tenures with the 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. The AOI is within the Severe hazard abatement risk polygon according to the BCWS Fuel Hazard Assessment and Abatement Fire Risk Map.² The risk class determines the threshold for fuel

² BCWS Post Harvest Hazard Abatement Map.

<https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=9bb5372c65464f0bab178907a5c39947>

abatement, for industrial and prescribed activities, as recommended in the Guide to Fuel Hazard Assessment and Abatement in British Columbia.³

The AOI is within the MFLNRORD Campbell River Natural Resource District and Discovery Coast Recreation District; and BCWS' North Island Fire Zone. The MFLNRORD 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.⁴ This guidance includes the 2019 Fuel Management Prescription Guidance⁵ and 2019 Tactical Fuel Management Planning Standard.⁶

No fuel treatment plans, forest health plans, ecological restoration plans, parks/protected area plans are known to apply within the AOI at this time.

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 completed 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.

The Statistics Canada 2016 Census Profile data shows the population of the Village of Sayward at 311, down from 317 in 2011.⁷ The census data reports 178 total private dwellings. The Village has an urban core which is moderately densely settled. Outside of the core area, most dwellings are rural or relatively isolated. Hotel accommodations, RV parks and campgrounds within the AOI may boost summer season population numbers.

³ 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

⁴ BCWS. Wildfire Prevention. <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/vegetation-and-fuel-management/fire-fuel-management/fuel-management>

⁵ 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

⁶ https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/fuels-management/2019_tactical_fuel_management_planning_standard.pdf

⁷ Statistics Canada. 2016 Census Profile. Sayward (Village). <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5924039&Geo2=CD&Code2=5924&SearchText=sayward&SearchType=Begin&SearchPR=01&B1=All&TABID=1&type=0>



Photo 1. The residential neighbourhoods of Sayward.

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.

Critical infrastructure for the Village includes the Village Office, Kelsey Recreation Centre, Sayward Elementary School, Sayward Health Clinic, BC Ambulance station, RCMP station, Firehall No. 1, the Newcastle Creek water treatment plant, electrical distribution and telecommunications lines. Critical transportation infrastructure includes Sayward Road, 2 bridges on Sayward Road crossing the Salmon River; Salmon River Main Line (industrial road) and M Branch Mainline (industrial road). An electrical distribution line extends from the Village to communications towers on top of Newcastle Ridge.



Figure 1. Location of critical infrastructure within the Village of Sayward.



Photo 2. An aerial overview of Sayward's critical infrastructure.

3.2.1 Electrical Power

The Village is connected to the BC Hydro grid through the distribution line network. Wooden power poles with coniferous vegetation in close proximity (within 2m) is prevalent throughout the area. Additionally, wooden power poles service a communications tower towards the west of the AOI on the Newcastle mountain range. Water supply is dependent upon electrical supply, however backup generators are in place.

3.2.2 Communications, Pipelines and Publicly Owned Buildings

The Village is not serviced by natural gas pipelines. The Village does not have an airport or hospital. The Newcastle Ridge repeater is located 4.5km due west of the Village. A communications tower is located about 7km northwest of the Village, its electrical supply runs from the Village. Cellular phone service is available throughout the Village.

3.2.3 Water and Sewage Infrastructure

The Village has a water treatment plant and sewage treatment area. The Village is serviced by a hydrant system with coverage from the wharf to the Salmon River Inn on Sayward Road. Water availability for fire suppression outside of the hydrant coverage area within the WUI is a challenge.



Photo 3. Water treatment facility and storage reservoir.

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

The Village draws 100% of its water supply from Newcastle Creek, a designated Community Watershed (CWS) under the *Forest and Range Practices Act*. When the CWS area is hit with heavy rain, boil water advisories may be necessary. If the CWS area is impacted by severe wildfire, it is reasonable to expect surface run off changes and potential terrain stability impacts that would warrant boil water advisories or other more significant impacts to water quality. The analyzed wildfire threat within the CWS area is Moderate, with a small pocket of Low. Wildfire Risk in the CWS area is Low. More detailed information regarding wildfire threat and risk within the community watershed is provided in Section 4.3 Local Wildfire Threat Assessment.

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.”⁸ The AOI is within the traditional territories of the K’omoks First Nation, We Wai Kai First Nation, and Wei Wai Kum First Nation

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

The Salmon River estuary is an ecological reserve area. The Salmon River is a significant drainage providing salmon, trout, dolly varden and steelhead habitat. Old Growth Management Areas and Ungulate Winter Ranges are also located within the AOI. There are no other parks, conservancies, or protected areas within the AOI.

Cryptic paw (*Nephroma occultum*) is a foliose lichen most often growing on living branches in old-growth forests. Cryptic paw is endemic to western North America, it is listed on Schedule 1

⁸ 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.

of the Federal *Species at Risk Act*. The BC Conservation Data Centre has a recorded known occurrence of Cryptic paw within the AOI.

3.4 Other Resource Values

The AOI contains portions of timber harvesting land base with valuable western red cedar, douglas-fir, western hemlock, sitka spruce, and red alder tree species. Other resource values include visual quality objectives and recreation sites.

3.5 Hazardous Values

Hazardous values, such as propane tanks, explosives storage, fuel yards, or landfills pose a safety hazard to emergency responders. The recycling depot and yard waste transfer site is located behind the Kelsey Recreation Centre. A propane tank (fenced off, cleared around and beneath) is also found there. There are no landfills, or large fuel/explosives storage sites within the AOI.



Photo 4. Recycling Depot and Propane Tanks behind the Rec Centre.

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

Through the identification of risk level, priorities for mitigation as well as opportunities for increasing community resiliency are both enhanced.

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 AOI is defined by the regional climate of the Coastal Western Hemlock very dry maritime subzone (CWHxm) as described in the BC biogeoclimatic (BEC) zone classification system. The CWHxm climate is one of warm, dry summers and moist, mild winters.⁹ 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.¹⁰ At higher elevations, the very moist maritime (CWHvm) and Mountain Hemlock moist maritime (MHmm) subzones occur. Compared to the CWHxm, CWHvm and MHmm climates are wetter and cooler.

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.¹¹ Wildfires occurring in NDT2 are moderately sized (20 to 1000ha), larger fires occur after extended periods of drought. In contrast, CWHvm1 and

⁹ A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region, 1994. Available from <https://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh28.htm>.

¹⁰ Ecosystems of British Columbia, February 1991. Available from <https://www.for.gov.bc.ca/hfd/pubs/docs/Srs/Srs06/>

¹¹ BC Forest Practices Code Biodiversity Guidebook September 1995. Available from <https://www.for.gov.bc.ca/hfd/library/documents/bib19715.pdf>.

MHmm1 subzones are classed as natural disturbance type 1 (NDT1), where the mean return interval for stand replacing disturbances is about 250 years. NDT1 is less impacted by fire and more commonly by smaller scale disturbances such as windthrow.

Fire Weather

The Canadian Forest Fire Danger Rating System¹² (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 system¹³ (FWI) and fire behaviour prediction system¹⁴ (FBP). Hourly weather data is collected throughout fire season (April to October) at automated weather stations throughout British Columbia to support the CFFDRS.

Wildfire threat exposure to the AOI 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 3. Summary and description of Fire Danger Classes.

Fire Danger Classes¹⁵	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.
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.

¹² 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>.

¹³ Natural Resources Canada. Background Information: Canadian Forest Fire Weather Index (FWI) System. <https://cwfis.cfs.nrcan.gc.ca/background/summary/fwi>

¹⁴ Natural Resources Canada. Background Information: Canadian Forest Fire Behaviour Prediction (FBP) System. <https://cwfis.cfs.nrcan.gc.ca/background/summary/fbp>

¹⁵ BC Wildfire Service. Fire Danger. <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/wildfire-situation/fire-danger?keyword=danger&keyword=rating>

Regional Weather Stations – Fire Danger

The nearest weather station is BCWS TS Naka Creek, about 34km to the west. Fire danger class ratings for Naka Creek are available from 2006-2019 (Figure 2). The nearest long-term weather station is located at Menzies Camp with data available from 1970-2019 (Figure 3). Annual variations in precipitation and snow-pack impact fire danger especially in early fire season months. The most recent wildfire in Sayward occurred in early May 2019, dry conditions and gusty winds contributed to the spread of the fire.

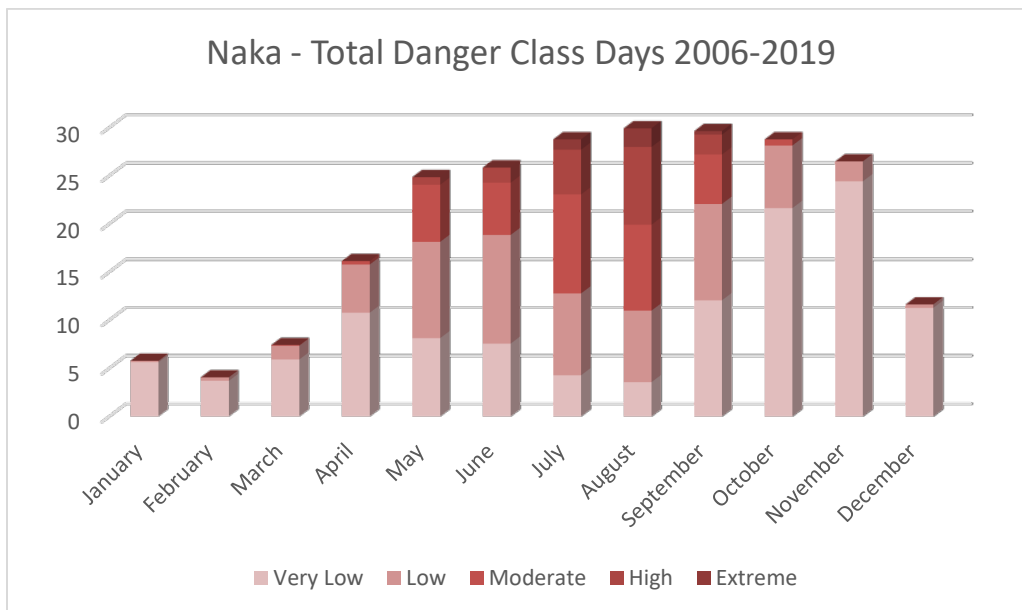


Figure 2. Naka Creek weather station average monthly total danger class days 2006-2019.

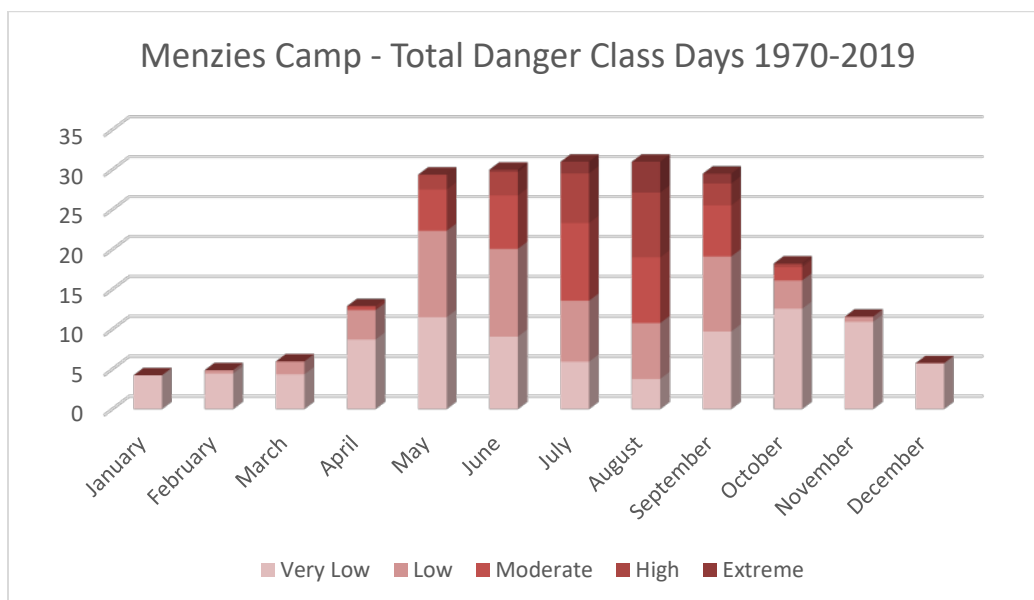


Figure 3. Menzies Camp weather station average monthly total danger class days 1970-2019.

Forest Health Issues

There are no known landscape level forest health issues that contribute to large scale changes in fire regime or forest attributes. However, ongoing drought stress on western red cedar is likely to affect fire hazard in the drier regional climate of the CWHxm.

Human Development and Natural Events

A significant portion of the AOI is within the provincial crown timber harvesting land base or private managed forest lands. Forest harvesting is the main driver of forest cover changes within the AOI.

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 1900-2013.¹⁶ 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.¹⁷ 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.¹⁸ 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 indicate 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.

The scale and scope of climate change impacts are constant 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.

¹⁶ 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

¹⁷ Pacific Climate Impacts Consortium. November 2013. Climate Summary for West Coast Region. Available from <https://www.pacificclimate.org/analysis/publications/climate-summary-west-coast>.

¹⁸ 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>.

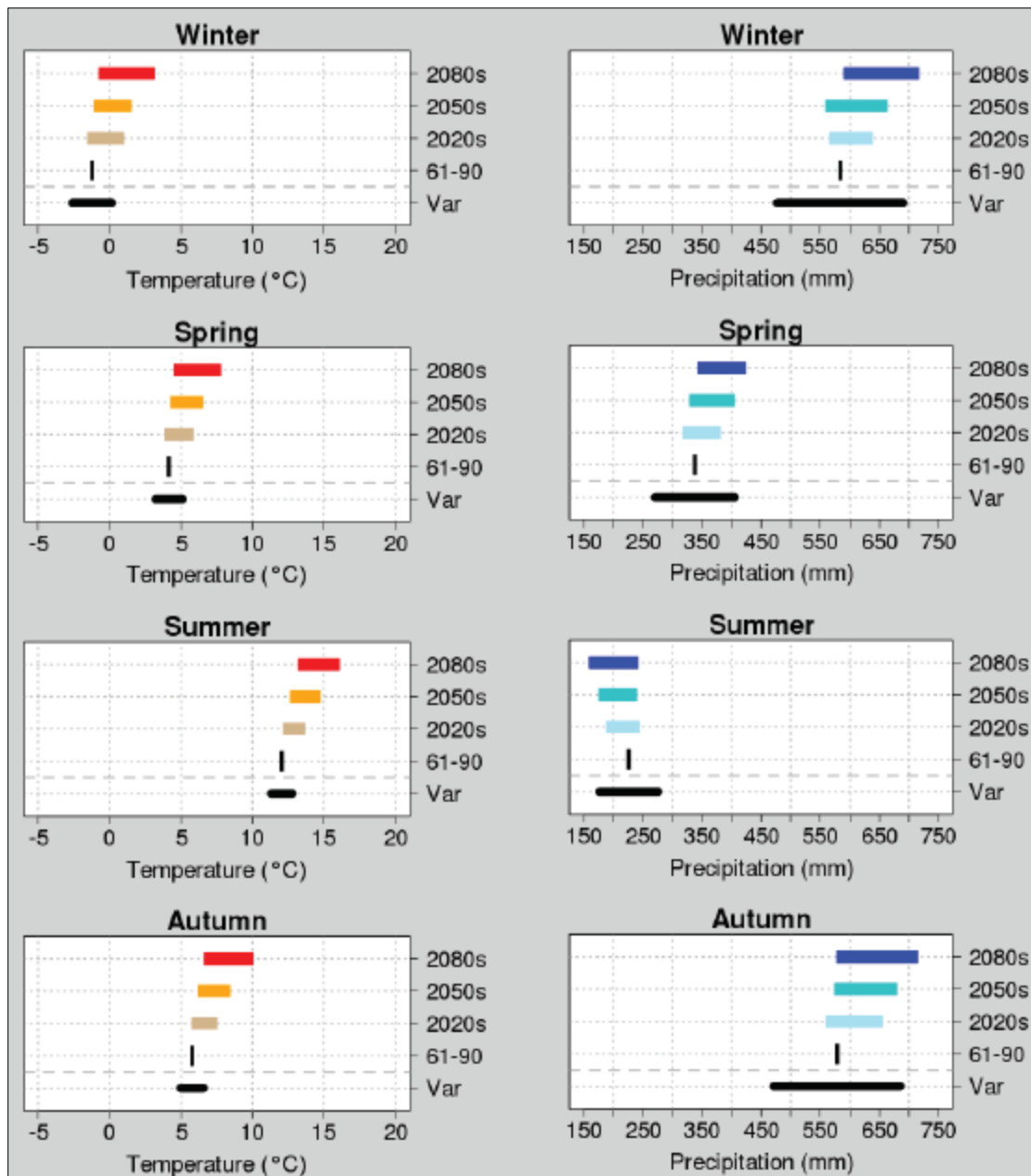


Figure 4. Cumulative seasonal precipitation and mean seasonal temperature projections for 2020s, 2050s, and 2080s.¹⁹ The width of the bands indicates the range of projections.

¹⁹ Pacific Climate Impacts Consortium. November 2013. Climate Summary for West Coast Region. Available from <https://www.pacificclimate.org/analysis/publications/climate-summary-west-coast>.

4.2 Provincial Strategic Threat Analysis (PSTA)

The PSTA²⁰ 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.²¹ 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. The 2019 PSTA data classifies the Sayward WUI as Risk Class 4 (Moderate), with variable fire threat ratings of low to high within the WUI buffer area.

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. The fire density rating within the AOI is 3 to 5.

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. The spotting impact within the AOI is Low to Moderate.

²⁰ 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>

²¹ 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>.

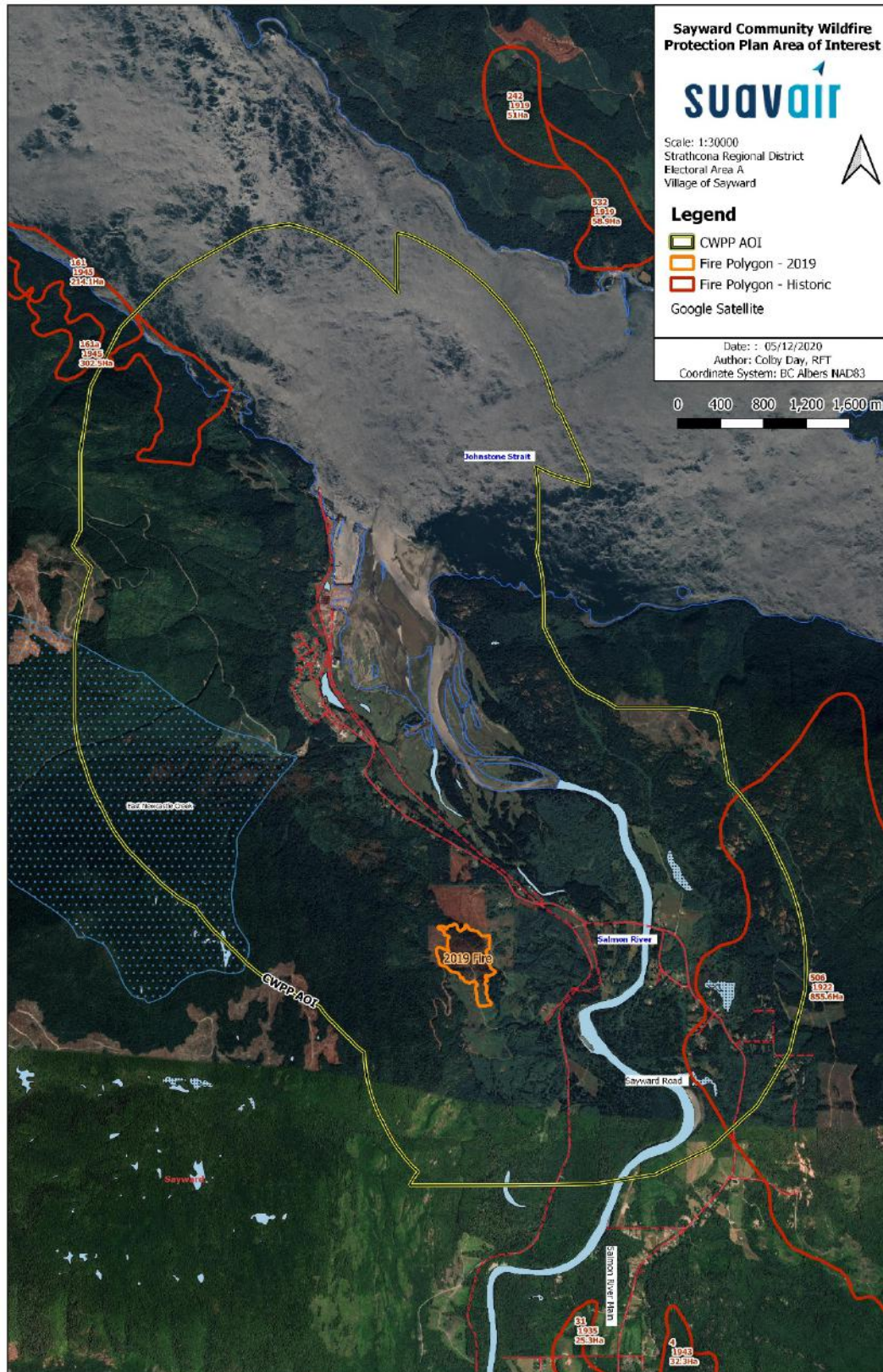
4.2.1 Fire History

Fire ignition and fire perimeter data is recorded by the BCWS and is publicly available through the BC Data Catalogue. An analysis of historical fires revealed 29 recorded fires between 1950-2010, of which 25 were human caused and 4 lightning caused. A large fire within the AOI from 1922 burned 855.6 hectares, while another fire from 1945 burned 302.5ha also within the AOI.

In the last decade (2010 to 2020), only 1 human caused fire has occurred, on May 12, 2019 a human caused fire (V80210) started on private land and escaped to nearby standing timber. BCWS responded to the fire and contained the blaze at 21.5ha. Most historically recorded ignitions are human caused. Human caused ignitions are often near or within the WUI and have greater potential to cause property damage and impact the community. An additional risk comes from fire escapes from open burning of domestic and agriculture related debris piles within SRD Electoral Area A, adjacent to the Village of Sayward, where no open burning bylaws apply. Fires from the neighbouring jurisdiction have the potential to spread towards the Village.



Photo 5. Fire damage from V80210 that occurred in 2019 (photo taken 2020).



Map 4. Historical fires recorded within the AOI.

4.3 Local Wildfire Threat Assessment

The intent of this sub-section is to provide a detailed assessment of the local wildfire threat, including field reviewed fuel characteristics, proximity of fuel to the community, local fire spread patterns, topographical considerations and local factors.

4.3.1 Fuel Type Assessment

Fuels in the area 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. Available spatial information from Data BC, RESULTS; proprietary LIDAR data, forest cover, and other spatial data shared for use on this project by Western Forest Products Inc., and updated Google Earth imagery, were analyzed for fuel type verification and adjustments. The changes in the fuel type layer are summarized in Appendix A1.1 Fuel Type Attribute Assessment. The major changes to the fuel type layer 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 CWA²² 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 Village is on slopes <20%. Slopes to the west of the Village become steeper as the topography rises towards Newcastle Ridge. Generally, slopes will cause preheating of fuel in a direction away from the community rather than towards it. The fire behaviour implications of slope percentage classes are summarized in Appendix A1.4 Topography.

Slope Position of the Value

Sayward is 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 Appendix A1.4 Topography.

²² 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 1: Local Wildfire Threat Process. For an updated wildfire threat classification map, see Map 5. A summary of the threat classification areas is provided in Table 4. Generally, the wildfire threat around the Village is Low to Moderate.

Table 4. Wildfire threat class summary from original PSTA data and updated 2020 CWPP analysis.

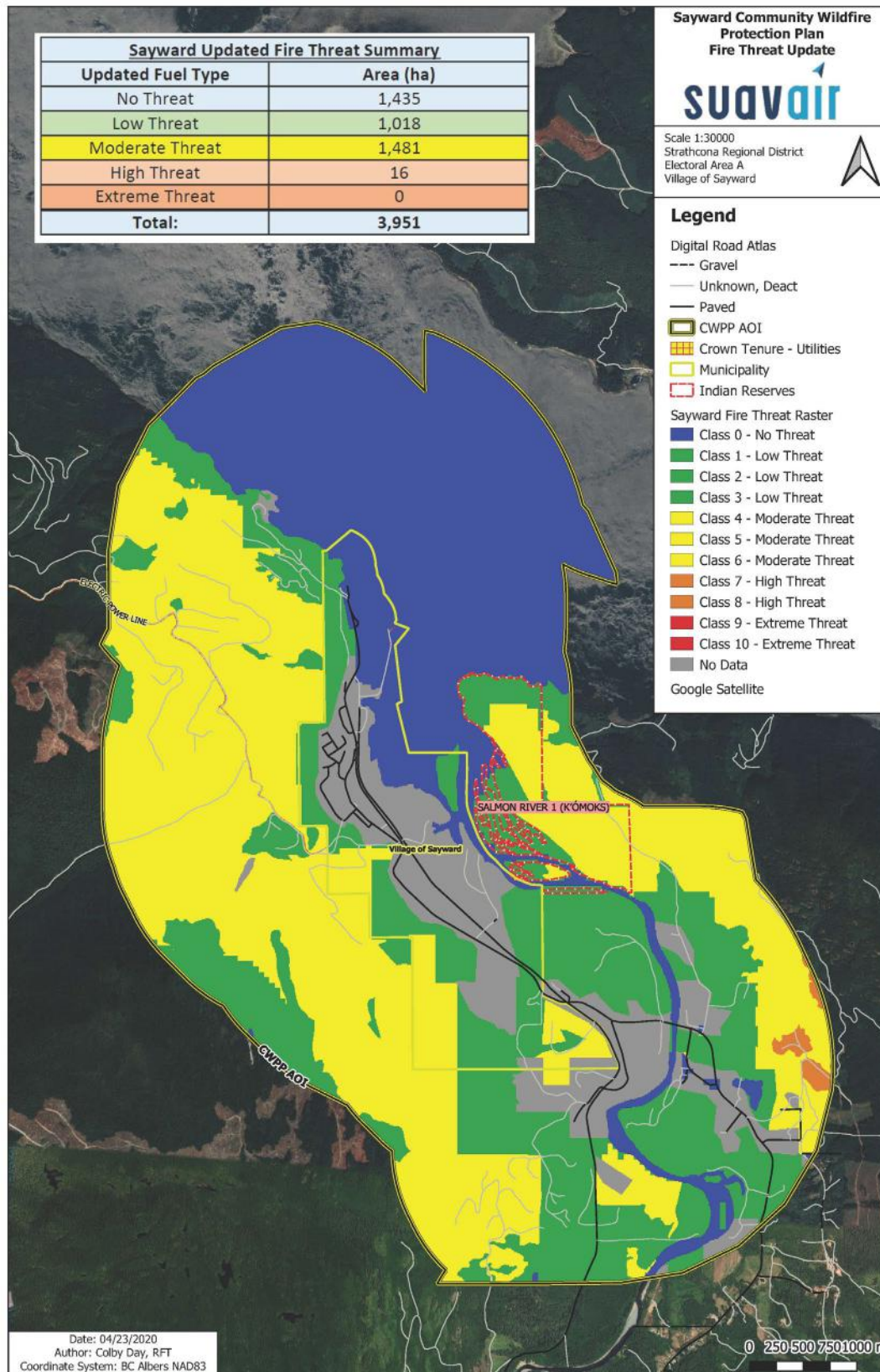
Wildfire Threat Class	2019 PSTA Data		2020 CWPP	
	Area (ha)	% of AOI	Area (ha)	% of AOI
Extreme	6	<0.1%	0	0%
High	10	<0.5%	16	0.5%
Moderate	1134	29%	1481	37%
Low	694	17%	1018	26%
Very Low / No Threat (Water)	2108	53%	1435	36%
Total	3951		3951	

4.3.6 Local Wildfire Risk Classification

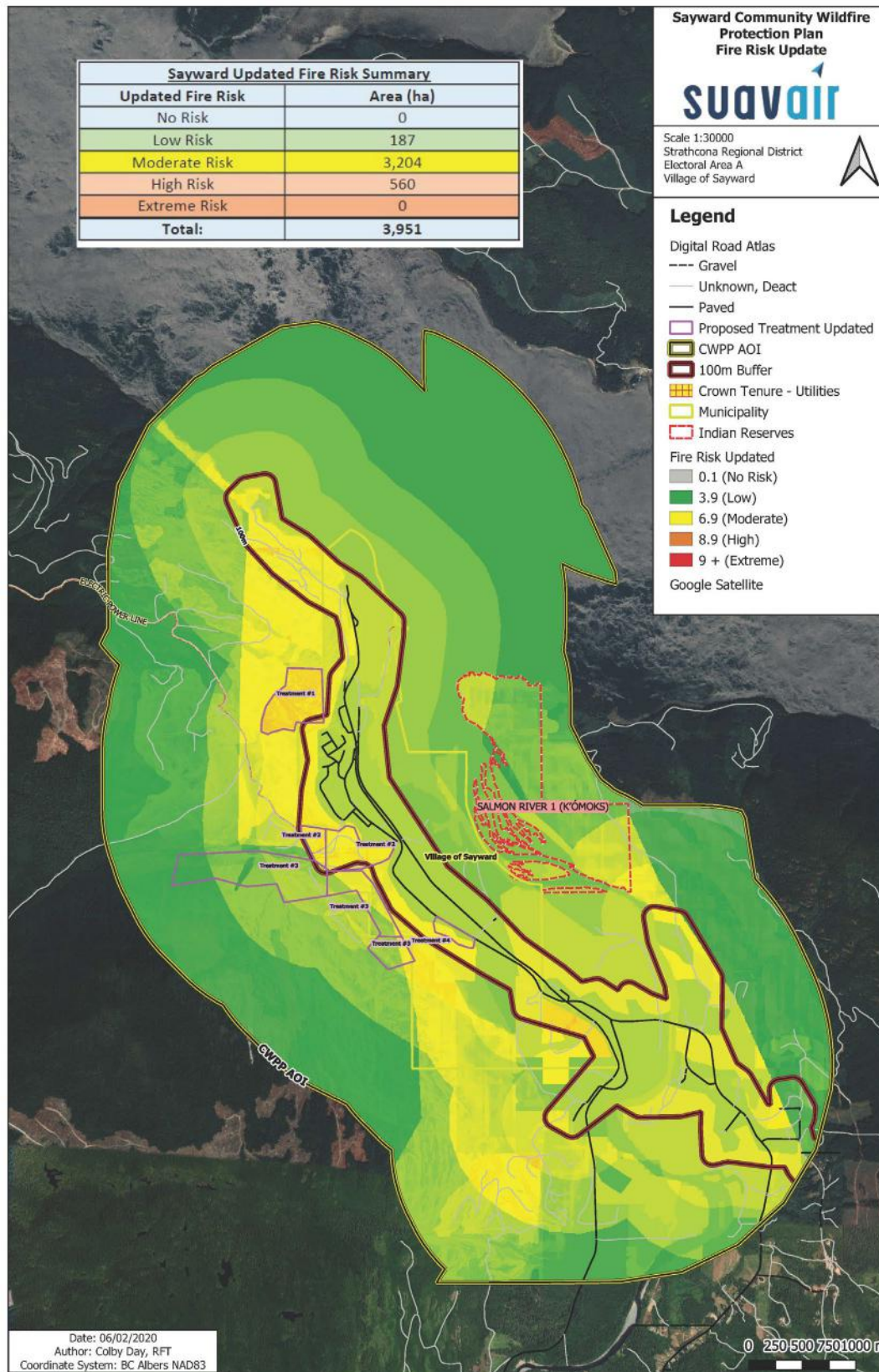
The 2019 PSTA data classifies the Sayward WUI as Risk Class 4 (Moderate). A local wildfire risk classification was completed based on the updates to the fuel type layer and local wildfire threat classification. Proximity to structures/values, fire spread patterns, and topography are the other key determinants of wildfire risk. The local wildfire risk classification is shown in Table 5 and Map 6. The detailed wildfire risk assessment process is found in Appendix 1: Local Wildfire Threat Process. Generally, the local wildfire risk is Low to Moderate with pockets of High.

Table 5. Wildfire risk class summary within the AOI.

Wildfire Risk Class	Area (ha)	% of AOI
Extreme	0	0%
High	560	15%
Moderate	3204	80%
Low	187	5%
No Risk	0	0%
Total	3951	



Map 5. Updated local wildfire threat classification.



Map 6. Updated local wildfire risk classification with proposed treatment areas.

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.²³ Treatment strategies should prioritize surface and ladder fuel changes over canopy changes.²⁴ 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 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. Figures 5 and 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.

²³ 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

²⁴ Ibid.



Figure 5. The role of ladder fuels in supporting crown fires.²⁵



Figure 6. A depiction of understory thinning to reduce ladder fuels.

²⁵ 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

The 2011 CWPP (including the Sayward Village and Sayward Valley) identified priority areas for vegetation (fuel) management. The recommended treatment areas were divided into Priority 1, 2 and 3 Fuel Treatment polygons. Priority 1 Treatment areas totalled 93.6ha. 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.”

To date, no fuel treatments are known to have been completed. 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.

Informed by the updated risk analysis and classification, this CWPP update refines the recommended treatment areas to 4 treatments areas as shown on Map 7 and summarized in Table 6. Fuel management recommendations are focused within first 100m (WUI100) and 500m (WUI500) of the wildland urban interface. On Crown lands, each treatment area requires a site-specific assessment and fuel management prescription to be completed by a qualified registered professional. The BCWS Quinsam Fire Base located in Campbell River may have crews available to assist with fuel treatment work. The qualified registered professional completing site level fuel treatment prescriptions should contact the North Island Fire Zone Wildfire Officer to determine opportunities for operational assistance.

Table 6. Summary of recommended treatment areas.

Treatment Area	WUI Threat / Risk	Priority	Approx. Area (ha)	Land Ownership	Comments / Rationale
1	High / High	High	25.0	Crown – TFL 39	High risk within WUI500
2	Mod / Mod-High	High	23.8	Municipal (5.8ha) and Private (18ha)	Mod risk within WUI100 and near water treatment plant
3	Mod / Mod	Med	68.4	Crown – TFL39 (43.7ha), W2030 (8.7ha), private (16ha)	Previous storm damage – dead/dry fuels within WUI500
4	No data / Mod	High	4.9	Private	Previous storm damage, dead/down fuels along Sayward Road within WUI100



Photo 6. Treatment Area #3 - blowdown timber which resulted in flammable fuel adjacent to the Village of Sayward.

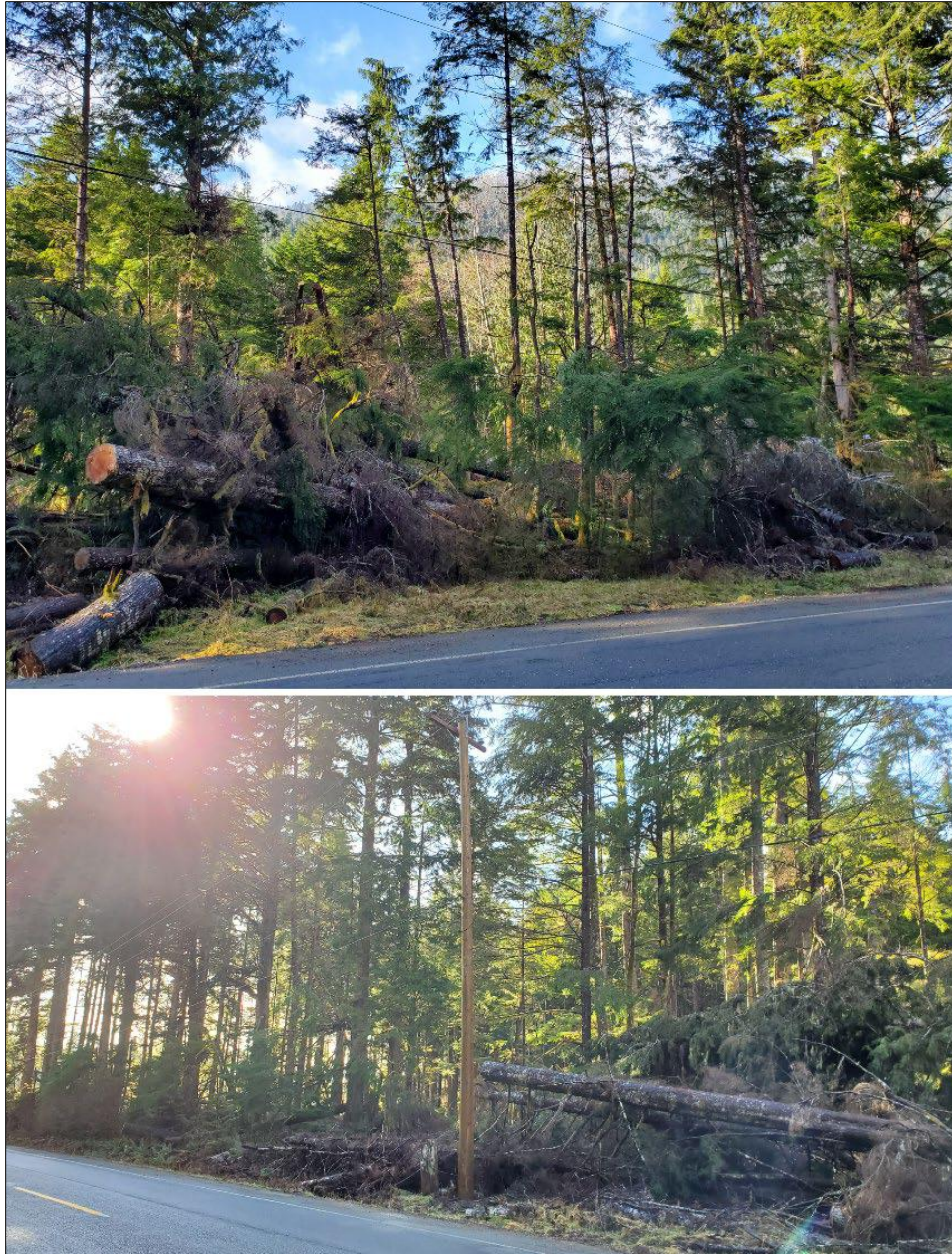
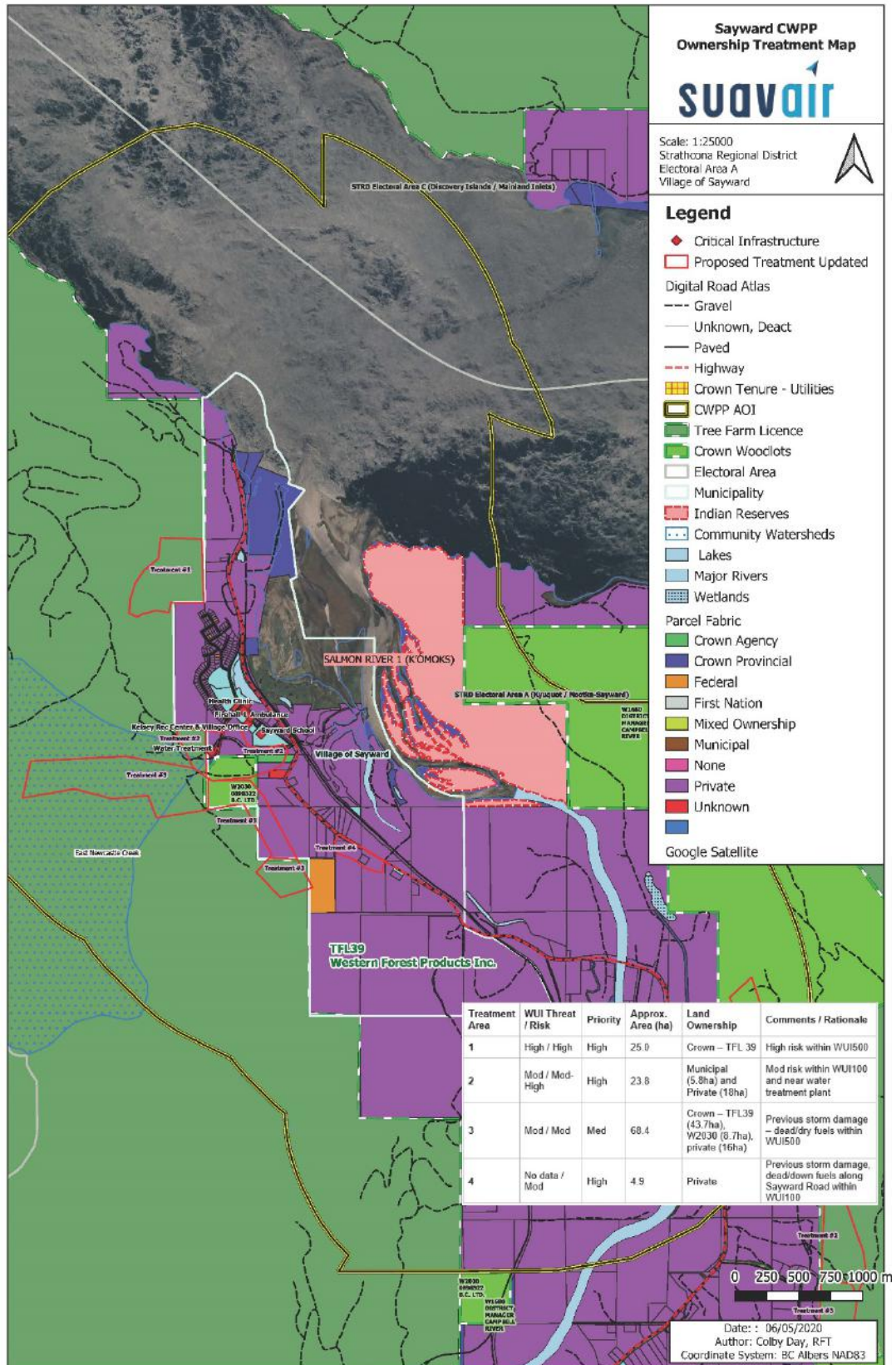


Photo 7. Treatment area #4. Storm damage, windthrown trees along Sayward Road.

No treatment is recommended in the WUI 2000m at this time 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 in the WUI 2000m areas may be recommended.

Proximity affects risk and therefore fuels in closer proximity to the Village, where most Private Land is situated, are higher risk. Private land ownership may be a barrier for the Village and/or SRD to implement the treatments. While it may be unrealistic to expect private landowners to conduct extensive thinning projects, FireSmart activities include fuel management practices such as surface and ladder fuel removal. Refer to Section 5.2 FireSmart Planning & Activities for suggestions on how to motivate private landowners to take on fuel management activities.



Map 7. Proposed fuel treatment areas and land ownership.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
3.	High	To reduce the fuel hazard within high risk areas identified within 500m of the Village.	Engage a qualified forest professional in creating site level prescriptions, and supervising/coordinating operational implementation of treatments for each recommended treatment area. For additional treatment areas, refer to Priority 1 areas from the 2011 CWPP. Consultation with applicable First Nations, private landowners, industry tenure holders, municipalities and the SRD will be required as part of the operational planning process.	Village with SRD support
4.	High	To remove buildup of fuel hazards, especially along evacuation routes, from winter storm damage or other events.	Assess policy tools (bylaws, Fire Chief's authority, <i>Wildfire Act</i>) that can be used to expedite clean up of dead, downed, or windthrown materials that create a fire hazard on private land within the Village boundary.	Village with SRD support

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.²⁶

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.

²⁶ 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

Due to Sayward's remote location and limited fire protection services, it is critically important to consider the impacts of WUI fires in both directions. In the event of WUI fires, fire fighting resources (local or provincial) 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.

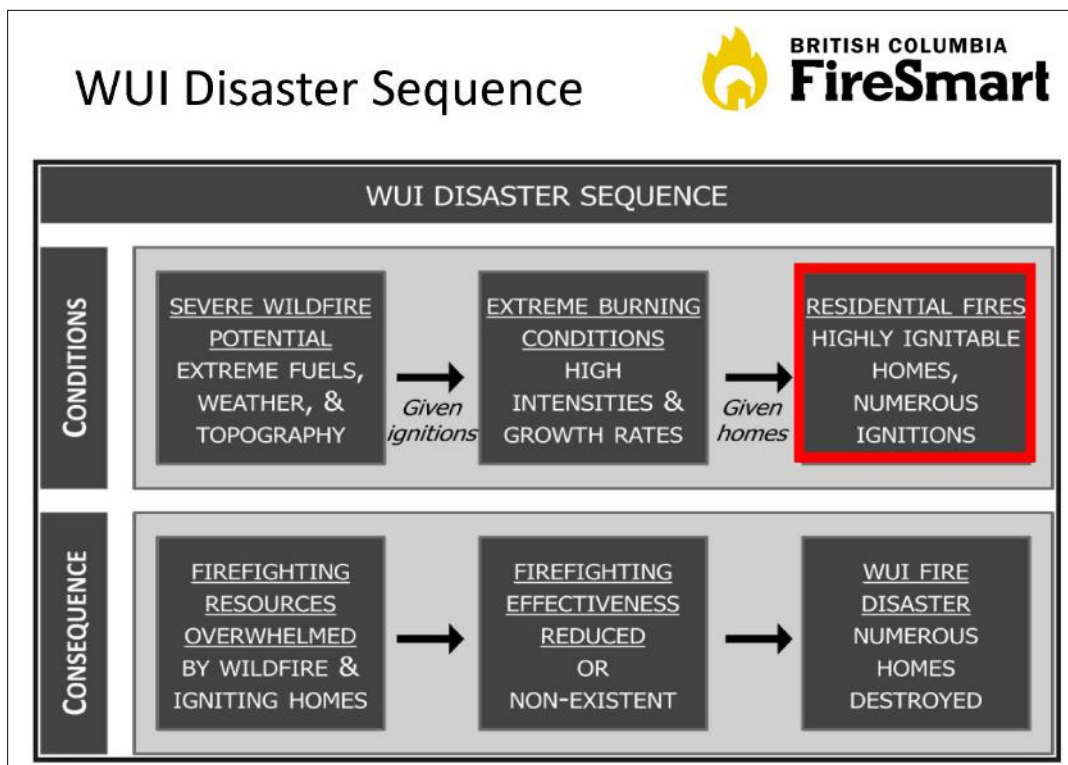


Figure 7. Wildland urban interface disaster sequence and where residents and landowners can break the disaster sequence.

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)²⁷ are a main determinant of whether a home/structure will be lost due to a WUI fire (Figure 8).

²⁷ FireSmart Canada. FireSmart Home Ignition Zone. <https://www.youtube.com/watch?v=k0ClodnHp2c>.

Simple actions to modify the SIJZ can make a big difference. Figure 9 shows the priority areas for vegetation management within the SIJZ.

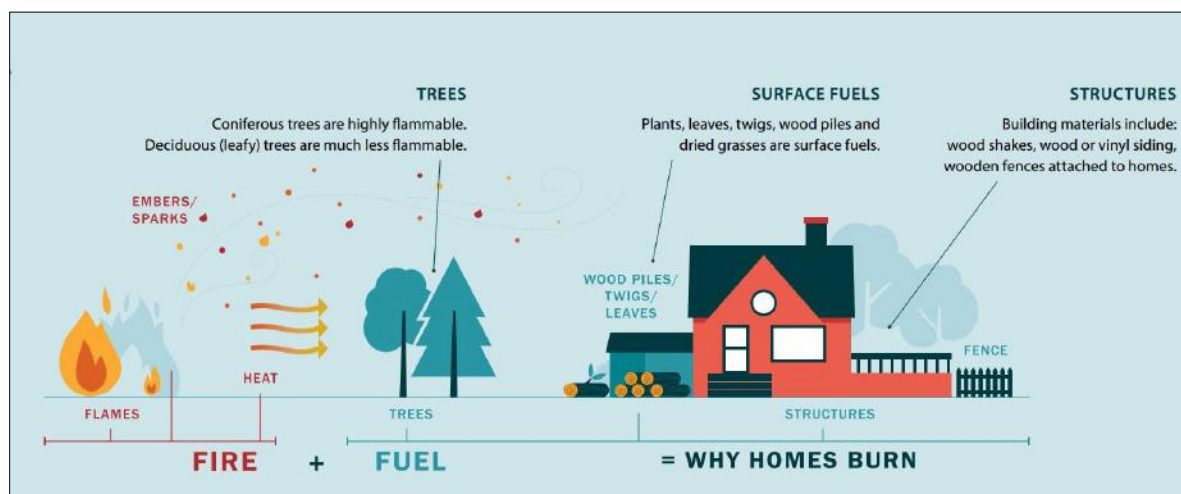


Figure 8. Why homes burn during WUI fire incidents.²⁸

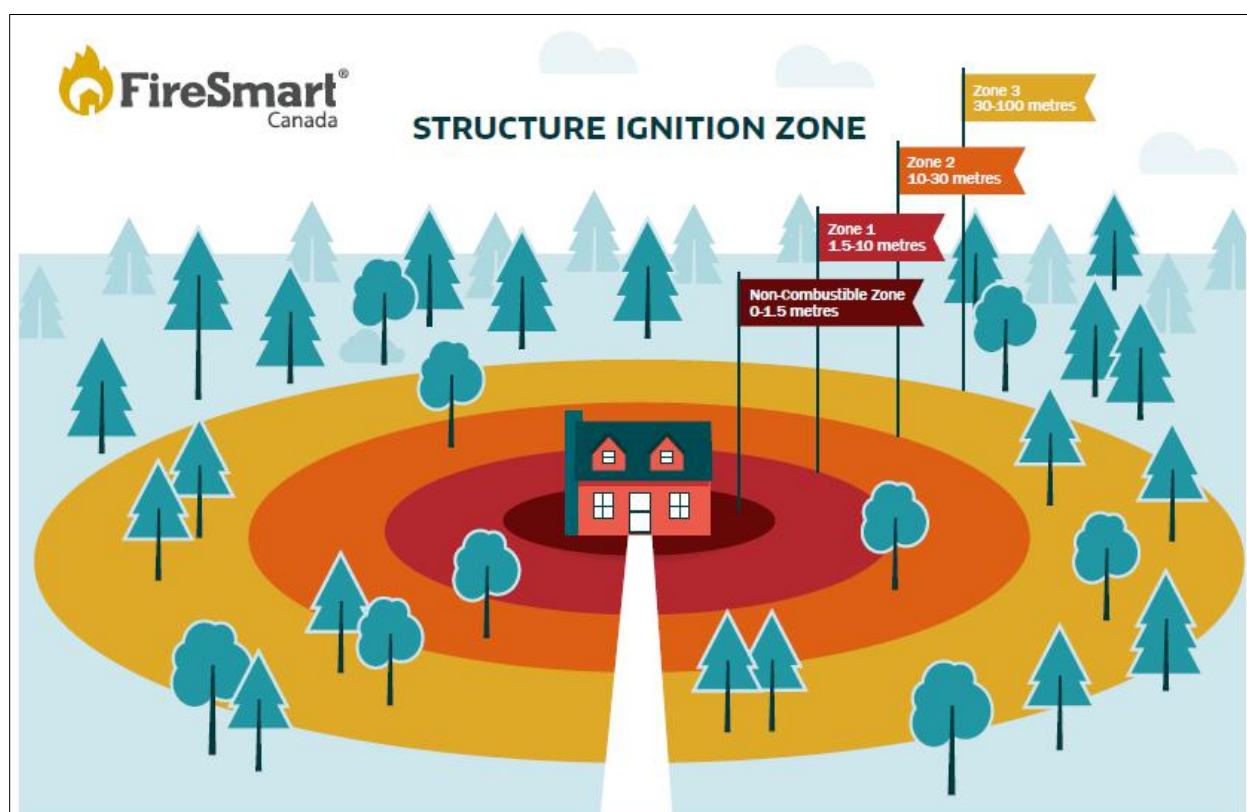


Figure 9. The structure (home) ignition zone (SIJZ) and priority areas for vegetation management.

²⁸ FireSmart – Why Homes burn in WUI Fire Incidents <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/firesmart>

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.²⁹ 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
- 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 3: FireSmart Practices and Activities. Previous FireSmart activities conducted in the Village include FireSmart presentations at the school, and a FireSmart presentation at a Village Council meeting. The Village does not have any Recognized FireSmart Communities. Several Local FireSmart Representatives reside in the City of Campbell River that may be contacted for more information on how to engage in the FireSmart program. Some other examples include:

- Elected officials can adopt bylaws that promote FireSmart principles related to publicly owned buildings and land
- Local government planners can recommend fire-resistant landscaping standards and design FireSmart public spaces
- Developers can design and build FireSmart buildings in accordance with local bylaws
- Private land owners and residents can modify fuels around their property and buildings and follow FireSmart principles
- Industrial managers and businesses can ensure that facilities are constructed and maintained following FireSmart guidelines

The following is generalized guidance for FireSmart activities within the structure/home ignition zone:

²⁹ 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

- 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 are planned by the Village or SRD, 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 Manual³⁰ and/or contacting a Local FireSmart Representative³¹.

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. The 2011 CWPP identified the following priorities for FireSmart activities on private properties.

Recommendation #10: Sayward should conduct a FireSmart hazard assessment of the community on the hazards that exist on their properties and how to mitigate those hazards.

Recommendation #35: The majority of the hazardous fuel types in Sayward are located on private property. Sayward should work with private property owners to ensure that they understand the importance and principles of FireSmart. Sayward should investigate ways to support residents reducing fuels, making homes FireSmart and raising awareness of ignition hazards.

³⁰ BC FireSmart. FireSmart Begins at Home Manual. <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/firesmart>

³¹ Local FireSmart Representative look-up. <https://firesmartbc.ca/local-firesmart-representatives/>

FireSmart priority areas for private land have been refined based on relative fire threat, risk analysis, and the potential visibility of FireSmart activities in an area to serve as demonstration for what is possible and necessary on private properties throughout the AOI. Priority areas for FireSmart activities are described in Table 7 below.

Table 7. Summary of FireSmart priority areas.

Area ID	Wildfire Risk Rating (E/H/M/L)	Recommended FireSmart Activities
Priority Area # 1: MacMillan Drive	Mod	• Contact an LFR to conduct a FireSmart Community Hazard Assessment • Encourage landowners and occupiers to remove all flammable materials from the Non-combustible zone (1.5m from structure) • Regularly mow lawns and thin shrubs • Remove dead branches, small fuels from Priority 1 zone (first 10m) • Remove any overhanging vegetation • Prune tree branches up to 2m
Priority Area # 2: Kelsey Recreation Centre / Yard Waste Drop off (Treatment Unit #2)	Mod	• Conduct a FireSmart Hazard Assessment • Remove all combustibles from within 1.5m of the structure • Remove dead branches and fine fuels within Priority Zone 1 (first 10m) • Prune branches up to 2m within Priority Zone 1 • Remove ladder fuels within Priority Zone 2

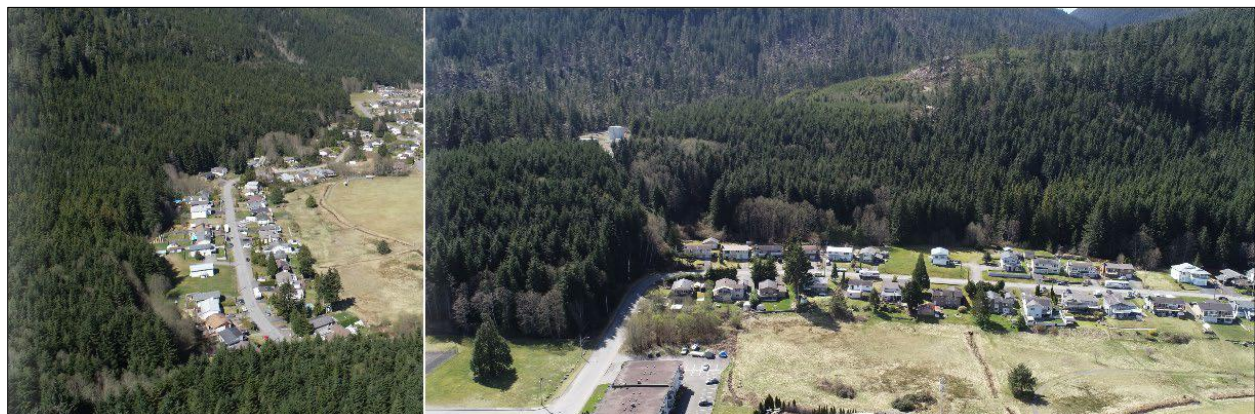


Photo 8. FireSmart Priority #1. MacMillan Drive.



Photo 9. FireSmart Priority #2. Yard waste drop off, Kelsey Recreation Centre.

All FireSmart related recommendations are listed below.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
5.	Med	To increase community engagement in the FireSmart program through education.	Contact a Local FireSmart Representative to conduct a Local FireSmart Champion workshop to find a local champion to organize community FireSmart initiatives.	Village with SRD support
6.	High	To reduce fuel hazard within identified FireSmart priority areas (based on critical infrastructure and risk).	Contact a Local FireSmart Representative to conduct Community Hazard Assessments for identified priority areas – MacMillan Drive and Kelsey Recreation Centre areas.	Village with SRD support
7.	Low	To improve community FireSmart awareness through education.	Deliver FireSmart education program within the K-5 public school system. Utilize FireSmart Education Kits and the FireSmart BC Education package.	Village
8.	Med	To improve	Contact a Local FireSmart	Village with

		community FireSmart awareness through education.	Representative to deliver Public education materials at annual community events (i.e.: Canada Day, Health Fair, Show and Shine)	SRD support
9.	High	To reduce fuel hazard on private land and provide property owners alternatives to open burning.	Offer alternative yard waste disposal options including periodic collection and chipping services through community chipping days.	Village with SRD support
10.	High	To improve community awareness of the FireSmart program.	Encourage residents to complete the free, online, FireSmart 101 course.	Village and 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 Village, SRD and other players 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 provided to the Strathcona Regional District Emergency Coordinator, Chief Administrative Officer and Fire Chief (and Village Council if available) of the plan results and recommendations
- Hard copies and digital copy of the plan submitted to the SRD and Village administration
- A digital copy of the plan should be uploaded to the Village website
- A digital copy should be uploaded to the Strathcona Regional District 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
11.	High	To communicate the content of the CWPP and inform the public of the recommendations.	Make the CWPP report and associated maps available to the public through Village and SRD websites.	Village and SRD
12.	High	To improve community awareness and access to FireSmart program information.	Link FireSmart BC program information to Village and Fire Department websites. Make hard copies of resources available at the Municipal Office.	Village and SRD
13.	High	To improve community awareness of wildfire regulations, wildfire threat and risk through education.	Develop a Village specific Fire Safety and Wildfire Preparedness information pamphlet (paper and digital resource). Send this as an annual mailout to all Village residences. This pamphlet should include information on Village Bylaws, <i>Wildfire Regulation</i> legal requirements, FireSmart principles, emergency evacuation routes, wildfire safety, wildfire reporting, and BCWS resources on fire bans, air quality.	Village
14.	High	To improve community awareness of wildfire regulations, wildfire threat and risk through education.	Include FireSmart and wildfire awareness information in the monthly Village newsletter, particularly in the months leading up to and including fire season (April to October).	Village
15.	High	To improve community awareness of wildfire threat and risk; and of what actions can be taken to mitigate risk.	Organize an annual Community Fire Safety or Community Wildfire Preparedness day. Activities may include checking fire extinguishers and smoke alarms in homes, conducting FireSmart clearing of Priority 1	Village, Fire Department

			(up to 10m) zones around critical community infrastructure, FireSmart presentations, fire department demonstrations, etc. The Safety day could be timed with Fire Prevention Week which takes place annually during the 2nd week of October each year. October 4 to 10, 2020 is the next Fire Prevention Week.	
16.	High	To improve community understanding of wildfire threat and risk; to improve awareness of what actions can be taken to mitigate risk.	Use SRD, Village, and fire department 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.	Village and SRD
17.	Med	To help ensure implementation and continual engagement with this CWPP over time.	Annual check-ins between the Village and SRD should occur to follow-up on recommendations and actions planned and completed. Annual check-ins should also develop an action plan of priority items to be worked on for the year.	Village and SRD
18.	High	To engage industrial stakeholders on the contents of this plan for improved communication and awareness.	Share this plan with industrial stakeholders. Collaboration amongst regional operators is recommended to reduce fuel hazards on Crown lands and along rights-of-way. Inquire about slash management (i.e. forestry tenure holders) and fuel hazard management (i.e. BC Hydro or Ministry of Transportation and Infrastructure rights-of-way) initiatives. Fuel hazard abatement is critical along powerline corridors, road rights-of-way when brushing, clearing fallen trees, or other vegetation management work occurs.	Village and SRD

5.4 Other Prevention Measures

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
19.	Med	To reduce the likelihood 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 Village and SRD websites. Alternatives to burning include yard waste disposal centres (Sayward Transfer Station), composting, or xeriscaping.	Village and SRD
20.	Med	To improve community awareness of fire bans and other burning restrictions when in effect.	Install additional signage at the Sayward Visitors Centre at Sayward Junction to communicate fire bans and burning restrictions to the Fire Danger Rating sign when applicable.	SRD and Village to work with BCWS North Island Fire Zone

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.³² Wildfire response on Crown land is guided by the MFLNRORD Vancouver Island Central Coast Fire Management Plan.

6.1 Local Government and First Nation 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.

6.1.1 Fire Departments and Equipment

The Village of Sayward is serviced by a Volunteer Fire Department (SVFD) with 13 active members in 2019-20. The Fire Protective Services Area extends well beyond the Village boundary and includes rural properties in the Sayward Valley and along Highway 19. The fire department is trained to exterior structural firefighting standards with supplemental Wildland Firefighting Level 1 (for structural firefighters). The SVFD has 2 fire halls, one located in the Village centre and another on Sayward Road, outside of the Village boundary within the SRD Electoral Area A. The apparatuses available include two fire engine pumper trucks, a 6-person fire rescue truck, and a Ford F350 crew cab pickup truck. Wildland fire suppression equipment includes 2 water pumps, 2 water storage bladders, 2000 feet of fire hose with fittings and nozzles, and a selection of hand tools.

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.

6.1.2 Water Availability for Wildfire Suppression

The Village is connected to a hydrant system that is regularly maintained by the Village public works department. The water supply is dependent on electrical supply, and backup generators are in place. The hydrant network covers the Village core area between the wharf and the Salmon River Inn. The hydrant system does not reach most rural and isolated properties within the AOI. For those properties outside of the Village core, water availability for fire suppression is a challenge as it would need to be shuttled, drafted from local sources, or extensive hose lines will need to be laid.

³² 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

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
21.	High	To improve water availability for fire suppression on rural/isolated properties outside of the hydrant coverage area.	Purchase a water tanker truck. Construction of a storage area to house the truck should also be planned for during the acquisition.	Village, Fire Department, and SRD
22.	Med	To improve water availability for fire suppression on rural/isolated properties outside of the hydrant coverage area.	Assess the feasibility and potential locations for dry hydrant installation, and/or other water storage options for fire fighting during drought conditions.	Village and SRD

6.1.3 Access and Evacuation

A detailed evacuation plan for the community is a work in progress with expected completion later in 2020. Evacuation bottlenecks are the bridges over the Salmon River on Sayward Road and Salmon River Main. In the event of emergency evacuations, motor vehicle accidents are a serious concern. The narrow, forested roadways add to this hazard. Limited road networks, narrow roads, and poor road conditions will limit the fire department's ability to access some isolated areas within the Village Boundary.

An alternative evacuation route is M Branch, an industrial forestry road. Install clear signage along secondary evacuation route as road users during an evacuation are likely to be under stress and may be unfamiliar with the area. The road conditions on M Branch are best suited to 4x4 vehicles and in challenging weather conditions its use by cars, campers or motorcycles may be limited. Helicopter access should also be considered as part of the emergency planning process. BCWS standards for helicopter landing areas are outlined in their annual aviation pilot guide.³³

To mitigate wildfire evacuation risk, the Village should focus on right-of-way fuel management, danger tree removal, and potential future upgrades to the single-lane bridge on Sayward Road for emergency access and evacuation.

³³ BCWS Pilot Information Guide. 2020. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/aviation/bcws_pilot_information_guide.pdf



Photo 10. Potential bottleneck for emergency evacuation – single lane bridge on the Salmon River.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
23.	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.	Village and SRD
24.	Low	To establish and maintain a secondary emergency evacuation route.	Continue work with industrial stakeholders, private land owners, Western Forest Products Inc., and Mosaic Forest Management to establish M Branch as a regularly maintained and viable evacuation route for community members and	Village with SRD support

			private vehicles	
25.	Med	To improve emergency access to the area by designating and maintaining a helicopter landing/staging area for use by BCWS or other agencies during an emergency.	Designate an accessible area to be used as a helicopter landing area. This area should be noted in the Village Emergency Preparedness Plan. Regularly maintain the area to be free of loose objects, obstructions, overhanging vegetation of other obstacles.	Village
26.	Med	To improve emergency evacuation communications to the community.	Encourage residents 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.	Village and SRD

6.1.4. Training

Training is important to build capacity within the suppression and emergency management area. Training for SVFD members and emergency support services are considered in this section. Emergency Support Services depend on trained volunteers across the region. Relevant training courses are listed in Appendix 4: Wildfire and Emergency Response Training Courses. Recruitment and training of fire department members is an ongoing activity that should remain a priority for the fire department and the Village.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
27.	High	To continue recruitment and retention efforts for volunteer fire department members.	Regularly schedule open houses or recruitment days. Connect with the community regularly through social media and consider its use as an advertising tool.	Village, Fire Department
28.	High	To ensure fire department members are trained to respond to wildland fire emergencies.	Ensure all SVFD firefighters are trained to Structural Protection Wildland Firefighter Level 1 (SPP-WFF1) and SPP-115 (structure protection workshop).	Village, Fire Department
29.	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	Village with SRD support

			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.	
30.	Med	To improve training amongst community members in emergency support services.	Recruit and train interested community members to serve in roles of emergency support services and incident command systems.	Village and SRD
31.	High	To improve inter-agency and cross-jurisdiction communication about wildfire risk, emergency preparedness, response, and recovery.	The SRD should arrange an annual meeting, prior to fire season, to include BCWS – North Island Fire Zone, EMBC, and local fire department representatives and Village Administration to review incident command structure, communication strategies and emergency support services in the event of a WUI fire.	SRD

6.2 Structure Protection

The Village currently does not have sprinkler kits or a structural protection unit (SPU). Deployment of this equipment is important for structural protection in the event of a WUI fire. The nearest SPU is with Campbell River Fire Department. The Village and SRD should ensure the required mutual aid or service agreements are in place with the City of Campbell River for assistance and deployment of the SPU in WUI emergencies.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
32.	High	To improve equipment availability for structure protection during a WUI fire event.	Ensure mutual aid agreements are in place with the City of Campbell River / Campbell River Fire Department for assistance and deployment of the City's structural protection unit in the event of the WUI fire impacting the Village.	Village
33.	Low	To improve equipment availability for structure protection during a WUI fire event.	The Village should purchase sprinkler kits for protection of critical Village infrastructure. Demonstration days can be used to raise community awareness and encourage private home/landowners to purchase their own kits for their homes.	Village, Fire Department
34.	Low	To improve equipment availability for structure protection during a WUI fire event.	Encourage private property owners to purchase their own sprinkler kits, particularly those properties outside of the hydrant coverage area.	Village

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

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 & Hinks³⁴ have applied the CFFDRS/FBP fuel types to the BC context and these fuel type descriptions are applied in 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 fire hazard highest in dense pole-sized regenerating stands (20-90 years).

³⁴ Perrakis, D., Eade, G., & Hicks, D. 2018. British Columbia Wildfire Typing and Fuel Type Layer Description. <https://cfs.nrcan.gc.ca/publications?id=39432>

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)³⁵

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 8. Description of fuel type layers.

Fuel Type	CFFDRS/FBP Description³⁶	BC PSTA Description³⁷	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 organic layer. Continuous shrub,	Mid-elevation hybrid spruce stands	Does not occur within the AOI	Crown fire, high to very high fire intensity and rate of spread

³⁵ 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>.

³⁶ FBP Fuel Type Descriptions. <https://cwfis.cfs.nrcan.gc.ca/background/fueltypes/c1>

³⁷ 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>.

	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 stands³⁸.	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.
M-1/2	Boreal Mixed wood. Continuous leaf litter in deciduous portions, feathermoss and needles in conifer portions. Moderate shrub and continuous herb layers, down woody fuels, conifer crowns extend near	Amabilis fir stands typed as M-2 40% conifer to represent fire behaviour between C-3 and C-5 fuel types Mixed deciduous/coniferous stands	Mature forests dominated by amabilis fir/mountain hemlock Higher elevation stands over 800-900m	Surface fire spread, torching of individual trees and intermittent crowning.

³⁸ 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>.

	the ground. Moderately well stocked mixed wood stands.			
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-3	Coastal Cedar-Hemlock-Douglas-fir Slash.	Slash types may over predict hazard in areas where slash hazard reduction has occurred (burning, piling, or site preparation)	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; overstorey 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 9: Fuel type categories and crown spotting 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.

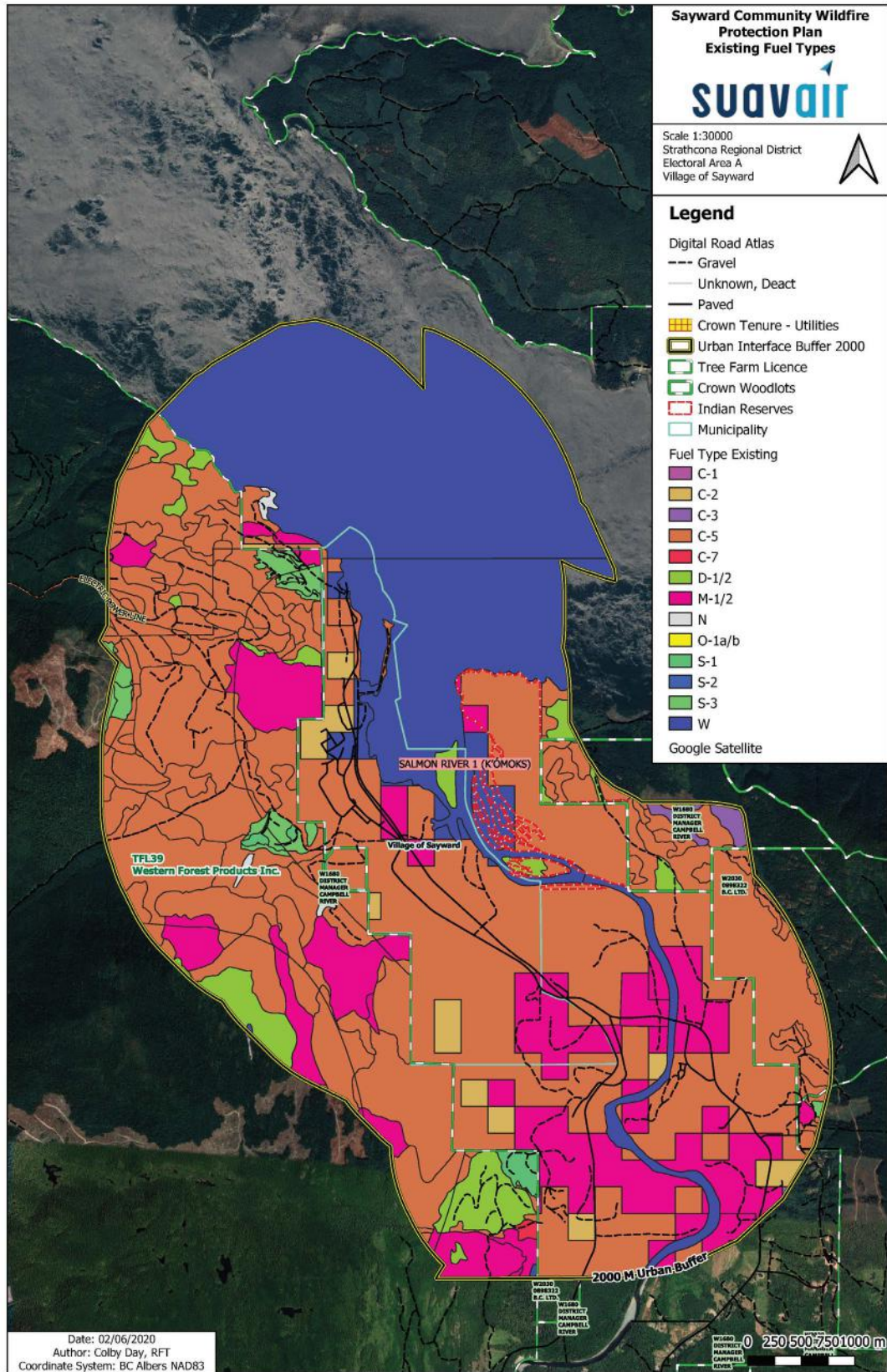
Fuels in the area are generally mature conifer forests (C-5), young and dense conifer forests (C-3), recently harvested cut blocks (S-3), and some alder/cottonwood/maple deciduous patches (D-1/2). The major changes to the fuel type layer included:

- 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

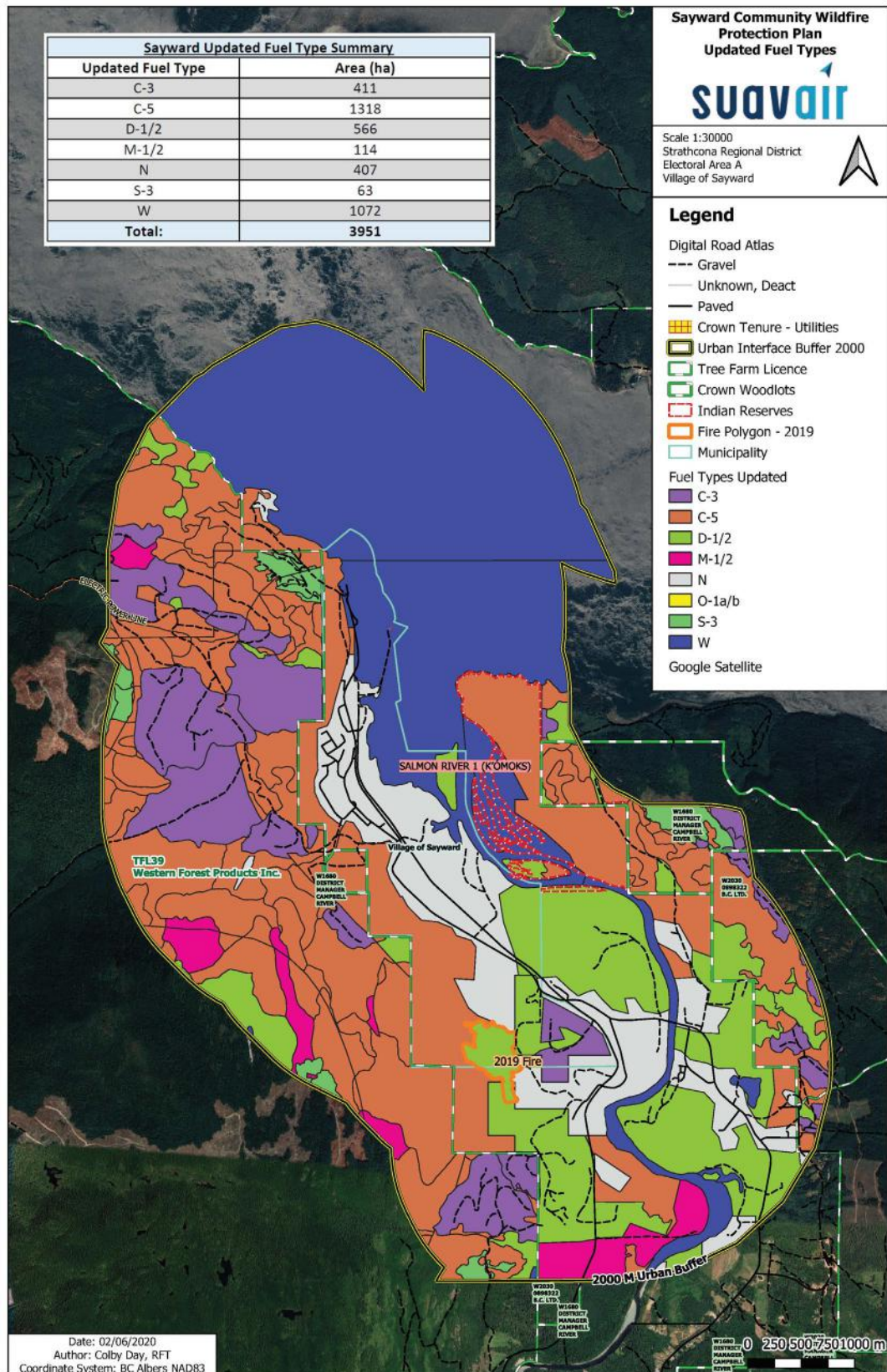
The changes are summarized in Table 10 and the Maps below.

Table 10. Summary of fuel type classes within the AOI.

Fuel Type Class	2019 PSTA Original Area	2020 CWPP Updated Area	Net Change
C-2 (mid-elevation interior spruce)	72	0	-72
C-3 (dense, pole sized coniferous forests)	17	411	+394
C-5 (mature coniferous forest)	2067	1318	-749
C-7 (conifer, sparse cover)	3	0	-3
D-1/2 (deciduous)	130	566	+436
M-1/2 (mixed conifer/deciduous; amabilis fir leading)	540	114	-426
S-1 (recent harvest)	16	0	-16
S-3 (recent harvest)	46	63	+17
W (Water)	1055	1072	+17
Non-Fuel	7	407	+400
Total area	3951	3951	



Map 8. Existing 2019 PSTA fuel types.



Map 9. Updated 2020 fuel types.

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 11: 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.
	>2 000 m	This should form part of a landscape assessment and is generally not part of the zoning process. Treatment is relatively ineffective for threat mitigation to a value, unless used to form a part of a larger fuel break / treatment.

* 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 Initial Spread Index (ISI) rose(s) from the local representative BCWS weather station(s). Wildfire that occurs upwind of a value poses a much more significant threat to that value than a fire that occurs downwind.

The closest weather station to the Village of Sayward is TS Naka Creek Wx (34km to the west). The ISI rose for TS Naka Creek is shown in Figure 10. The Canadian Wind Atlas (CWA) also analyses the frequency distribution of wind by sector based on long term atmospheric data. The CWA wind roses note strong fall and winter winds from the south and southeast; and outflow winds from the northwest and north in the summer months (Figure 11). The dominant wind direction used for this wildfire threat classification is northwest.

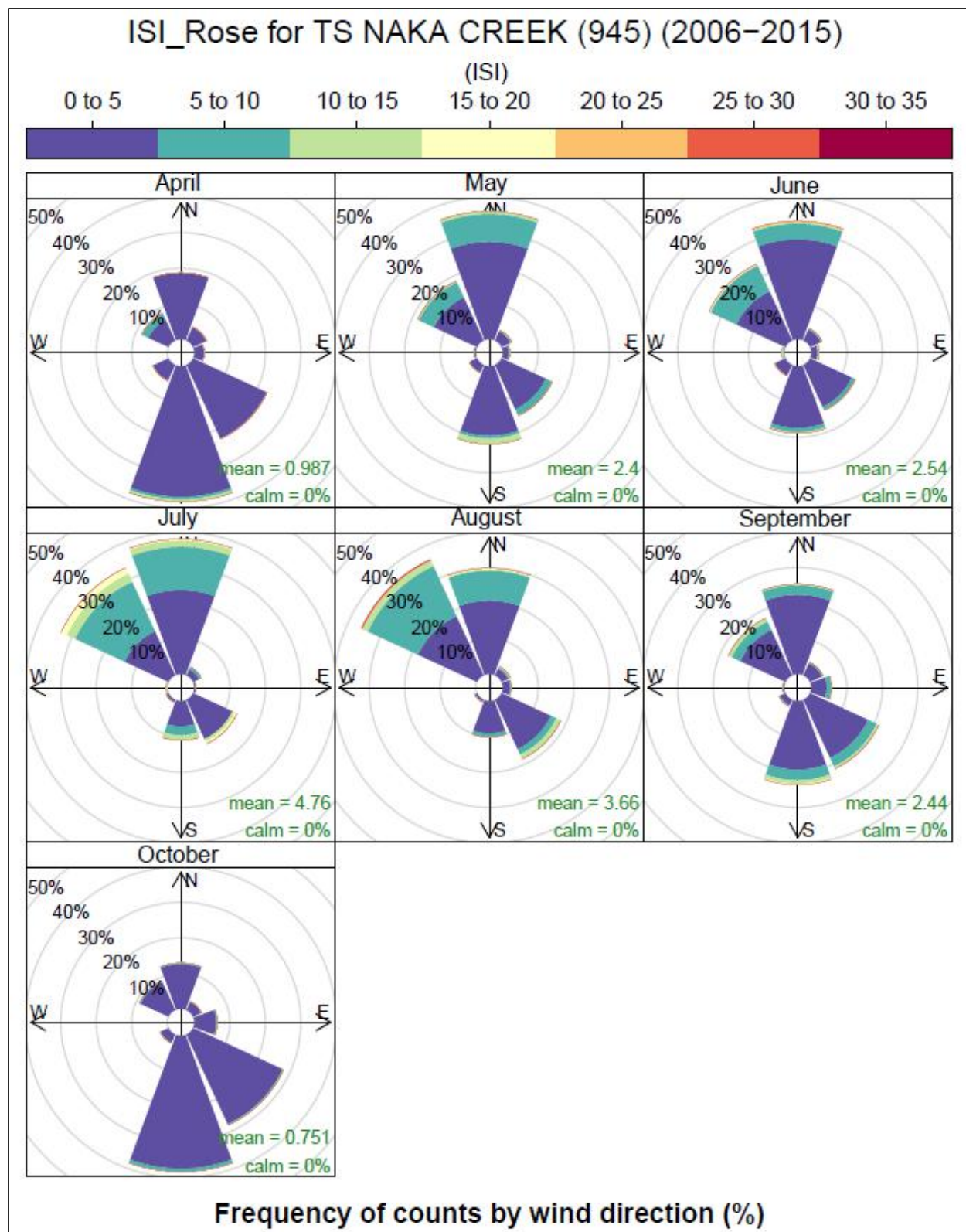


Figure 10: Initial Spread Index (ISI) Rose for Naka Creek TS 2006 to 2015.

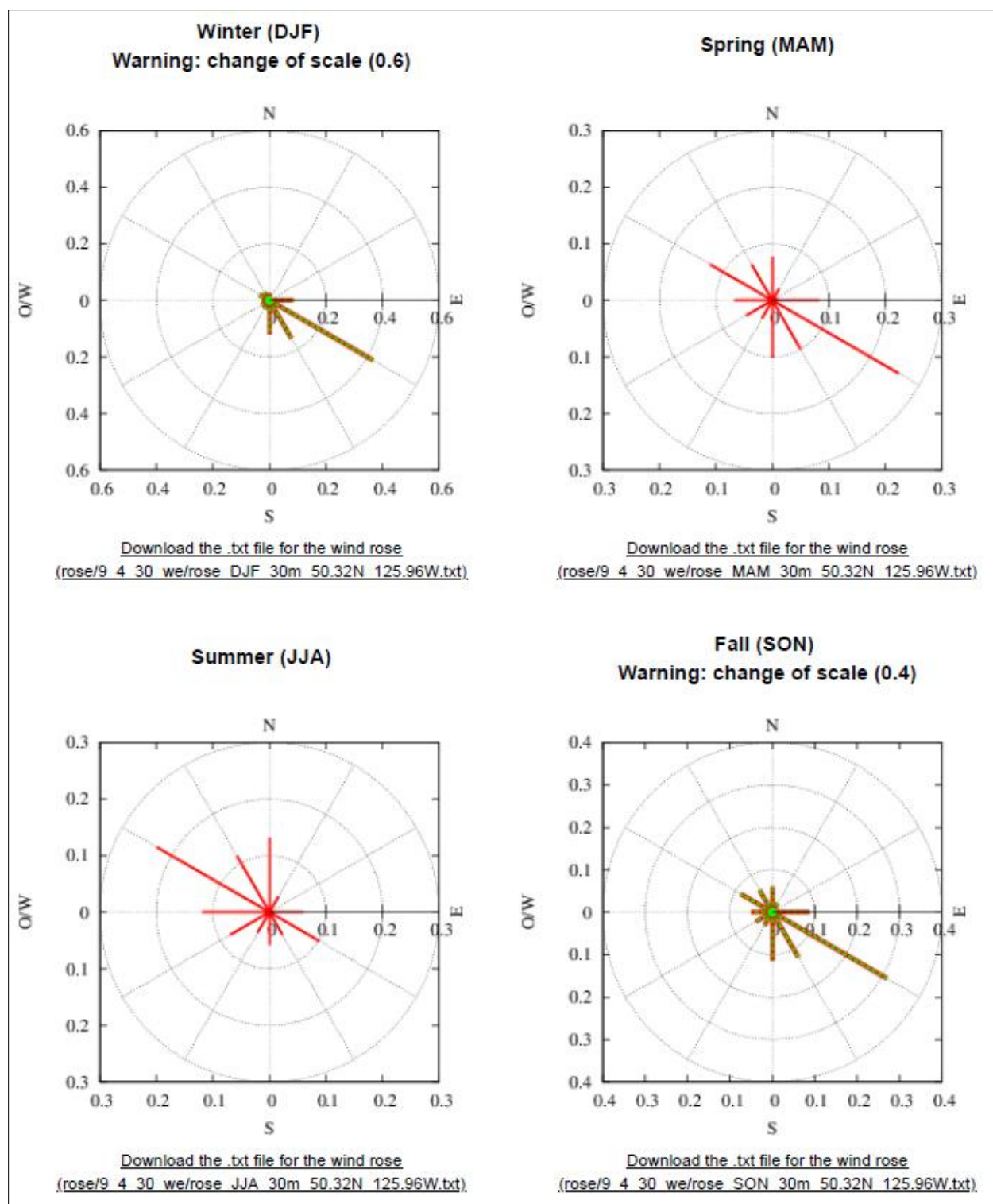


Figure 11. Canadian Wind Atlas wind rose for the Sayward area.

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 12. 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.

Table 13. 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 14. 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) 1 (O-1a/b) 2(O-1a/b)	6 6 4	3 3 3	
Original Weighted Values	6 6 12	18 18 12	3 3 3	27 (5 - Moderate) 27 (5 - Moderate) 27 (5 - Moderate)
Updated HFI (based on fuel type change)	3 (M-1/2) 4 (C-3) 4 (C-3)	6 6 4	3 3 3	
Updated Weighted Values	18 24 24	18 18 12	3 3 3	39 (7 - High) 45 (8- High) 39 (7 - High)

Table 15. 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, the local wildfire risk score was determined while considering the following factors:

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.

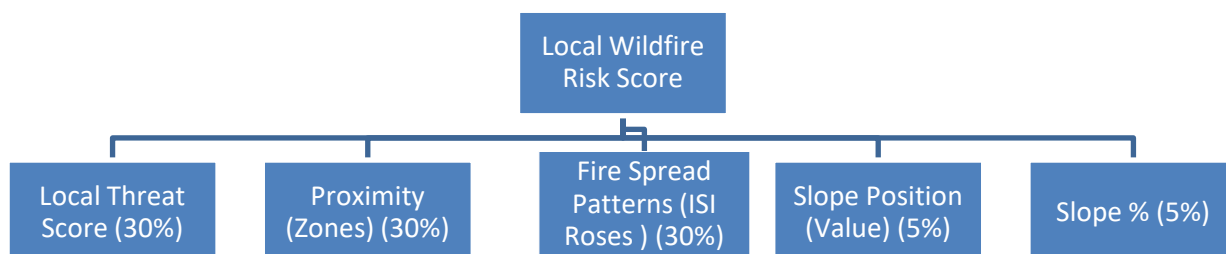


Figure 12: Local Wildfire Risk Inputs

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

Table 16. 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
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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 were 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 17. 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+

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: STATUS OF 2011 CWPP RECOMMENDATIONS

#	Action	Status
Communication and Education		
1	Sayward should consider working with the SRD, other municipalities in the SRD, and the MFML to develop a regional approach to enhancing education and communication. Public education programs could be enhanced by: 1) integrating a unit of “FireSmart” and wildfire safety into the elementary school curriculum for local children; 2) creating a “FireSmart” sticker program where Fire Department members attend residences and certify them as meeting “FireSmart” guidelines.	Not Complete. Currently no formal links between FireSmart education and the elementary school curriculum. Carried forward in 2020 recommendations.
2	Sayward should consider developing a communication plan to outline the purpose, methods and desired results of communication and education in the community. Educational information and communication tools need to be stakeholder specific. To establish effective communication within target groups, the plan should identify spokespersons who can best establish communication ties with target audiences and provide the educational information required.	Not complete. No official communication plan in effect. The Village uses their website, Facebook, Village Fire Department website, and a monthly mailbox newsletter as main forms of communication. The Village also has a Phone Notification system.
3	Sayward should investigate the potential for working with local developers to construct a FireSmart show home or public building with FireSmart landscaping as a tool to educate and communicate the principles of FireSmart to the public.	Not applicable. No local developers.
4	The standard for website information about fire should include an outline of community fire risks and fire danger. Information currently includes fire bans, wildfire hazard ratings updated during the fire season, and links to protection branch and FireSmart. During the fire season, a prominent link to wildfire related information should be placed on the home page. The SRD and the communities should work to produce web-based information that can be hosted on the SRD website and linked to the individual community websites.	Website additions not yet complete.
5	The Fire Department should work with the MFML to ensure that burn permit holders are educated in regard to	Ongoing Community education on

	restrictions related to their permits. Educational material on the permits and how to burn safely should be included and reviewed with each permit.	burn permits and restrictions needed. Carried forward in 2020 recommendations.
6	Where burn permit restrictions are disregarded, a functional and timely mechanism for addressing infractions should be identified and implemented prior to the fire season.	Ongoing No official/formal mechanism for addressing infractions. Fire Department attends calls.
7	Sayward Visitor Centre should be used to communicate fire danger and fire restrictions to tourists visiting the area.	Not yet complete Carried forward in 2020 recommendations.
8	The Fire Department should work with the SRD and the Chamber of Commerce to educate the local business community, particularly businesses that depend on forest use (i.e., tourism and recreation) on FireSmart preparation and planning.	Not applicable. No chamber of commerce.
Structure Protection		
9	Where homes and businesses are built immediately adjacent to the forest edge, Sayward and the SRD should consider incorporating building setbacks into bylaw with a minimum distance of 10 m when buildings border the forest interface.	No action to date.
10	Sayward should conduct a FireSmart hazard assessment of the community to educate residents on the hazards that exist on their properties and how to mitigate those hazards.	Not complete. FireSmart awareness presentations delivered to the community in 2013-14 by the Fire Chief, low level of community uptake.
11	Sayward and the SRD should investigate measures to address ongoing building code violations outside Village boundaries.	No action to date.
12	The community and the SRD should investigate the policy tools available for reducing wildfire risk within the community to create and/or review and revise existing bylaws to be consistent with the development of a FireSmart community. These include voluntary fire risk reduction for landowners, bylaws for building materials and subdivision establishment, covenants for vegetation setbacks, delineation of Wildfire Development Permit	Ongoing. A Bylaw officer has been appointed.

	areas, incentives such as exclusion from a fire protection tax, and education.	
13	Sayward and the SRD should consider requiring the use of roofing materials within new subdivisions that are fire retardant with a Class A and Class B rating. They should consider obtaining legal advice regarding the implementation of building requirements that are more restrictive than the BC Building Code. While restrictions to rated roofing are not supported in the Code at this time, there are several communities which have undergone or are undergoing various processes (e.g., lobbying, legal opinion, declaration of hazard by Fire Chief) to enact roofing bylaws within their Wildfire Development Permit areas.	No action to date.
14	The SRD should consider working with the Building Policy Branch to create a policy structure that would enable communities in the SRD to better address wildland urban interface protection considerations for buildings.	No action to date.
15	While there is currently little development occurring in Sayward, subdivision design plans should be reviewed by the Fire Department to ensure that suitable access routes exist, that hydrant accessibility is adequate where applicable, and that interface fire related issues are addressed.	No action to date.
Emergency Response		
16	A formal communication structure should be established with the MFML so that information regarding fires in the region is communicated to Sayward in a timely manner. This might be best achieved through joint cooperation with the SRD, other SRD municipalities and the MFML.	No action to date. Communication in place during active fires within the Fire Department service area.
17	Consideration should be given to further developing a community evacuation plan. Appropriate evacuation routes should be mapped, considering Disaster Response Routes (DRR). Major evacuation routes should be signed and communicated to the public. The plan should identify loop roads and ensure access routes have sufficient width for two way traffic. In addition, alternative emergency responder access should be considered (for example, using Sayward Rd to evacuate the Village and Salmon Rd as emergency access).	Ongoing A contractor has been selected and awarded the work. Carried forward in 2020 recommendations.
18	Marshalling points should be identified and signed and communicated to the public. Pre-planning for evacuation to these points should be completed prior to a wildfire event to	Ongoing – see above

	identify and correct deficiencies and provide safe, efficient egress for the community.	
19	The use of the waterfront and Marina in Kelsey Bay should be reviewed as a marshalling point and evacuation centre via boats and barges should road egress be unsafe or become blocked. This is vital to ensure that evacuation procedures and limitations are identified and addressed prior to a wildfire event.	Ongoing – see above
20	The wood surface bridge is vulnerable to spotting during a wildfire event. A sprinkler should be located on the bridge to keep the timbers wetted during a wildfire event.	No action to date. Unsure of feasibility
21	As part of the evacuation plan, the community should develop strategies to quickly identify and clear car accidents that block or impede traffic during evacuation efforts.	Ongoing Village has established a working relationship with the local tow truck company
22	Sayward should work towards improving access in areas of the community that are considered isolated and that have inadequately developed access for evacuation and fire control (for example, by opening dead end roads, widening cleared road rights-of-way).	Additional road access is outside of the Village's jurisdiction. Discussions with adjacent land users (Western Forest Products Inc.) in progress.
23	New subdivisions should be developed with multiple access points that are suitable for evacuation and the movement of emergency response equipment. The number of access points and their capacity should be determined during subdivision design and should be based on threshold densities of houses and vehicles within the subdivisions.	No action to date. No new subdivisions planned.
24	Where forested lands abut new subdivisions, consideration should be given to requiring roadways to be placed adjacent to those lands between the houses and the forest. If forested lands surround the subdivision, ring roads surrounding the subdivision should be part of the design.	No action to date. No new subdivisions planned.
25	The loss of communications infrastructure such as telephone lines and the microwave tower is possible. Alternate communication methods such as ham radio should be explored with the SRD for the incident command centre.	Complete. 8 certified ham radio operators in the village. A roster of certified operators and a list of available equipment should be included in the Village Emergency Plan.

26	During a large wildfire it is possible that critical infrastructure could be severely impacted by smoke or fire. It is recommended that contingency plans be developed in the event that smoke causes evacuation of the community's incident command centres. Sayward should co-operate with provincial and regional governments to identify alternate incident command locations and a mobile facility in the event that the community is evacuated.	No action to date.
Training and Equipment		
27	The following training should be considered: 1) The S100 course training should be continued on an annual basis; 2) A review of the S215 course instruction should be given on a yearly basis; 3) The S215 course instruction should be given to Fire Chiefs and Deputies; and, 4) Incident Command System training should be given to Fire Chiefs and Deputies.	Not applicable. Structure Firefighters to be trained with SPP WFF-1
28	The Fire Department should meet with the MFML prior to the fire season to review the incident command system structure in the event of a major wildland fire. The review should include designated radio channels and operating procedures.	No action to date. Carried forward in 2020 recommendations.
29	The SRD and Sayward should seek funding to acquire a 4x4 truck with compressed air foam (CAF) system for accessing and fighting wildfires in areas such as up M Branch towards the water intake.	Complete. The Village has 1 portable CAF unit and one attached to a fire truck.
30	The community should consider reviewing its existing inventory of interface firefighting equipment to ensure that items such as large volume fire hoses, portable pumps and firefighter personal protection equipment (PPE) are adequate to resource the interface area. Fire Department personnel should have correct personal protective equipment and wildland fire fighting tools. Hoses, pumps and other equipment should be compatible with MFML wildland firefighting equipment.	Ongoing Carried forward in 2020 recommendations.
31	The Fire Department should seek funding to purchase a sprinkler kit to erect in the Village during a wildfire event or be incorporated in a mobile equipment cache. http://www.ubcm.ca/assets/Services~and~Awards/Documents/structural-protection-units-technical-specifications.pdf	No action to date. Carried forward in 2020 recommendations.
32	Sayward should consider working with Cortes and Quadra Islands and the SRD to coordinate the creation of a sub-regional mobile cache of wildland firefighting equipment.	Not applicable. Determined unfeasible due

	This would reduce the cost of purchasing and maintaining the cache and provide additional resources in the event of a wildfire.	to access limitations.
33	Sayward should continue to encourage long-term and new residents to join the volunteer fire department using Sayward website, mail outs and signs to encourage residents to join.	Ongoing Carried forward in 2020 recommendations.
34	Formal mutual aid agreements should be established with MFML to ensure that adequate resources and manpower support are available in the event of a wildfire.	No action to date. Unclear what is meant by mutual aid with MFML/FLNRORD since the BCWS would be called on all .
Vegetation (Fuel) Management		
35	The majority of the hazardous fuel types in Sayward are located on private property. Sayward should work with private property owners to ensure that they understand the importance and principles of FireSmart. Sayward should investigate ways to support residents reducing fuels, making homes FireSmart and raising awareness of ignition hazards.	Ongoing Carried forward in 2020 recommendations.
36	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 Error! Reference source not found. 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.	No fuel treatment activities completed to date. Additional downed wood/hazards created from 2018 windstorm. Carried forward in 2020 recommendations.
37	Sayward should consider lobbying the province to identify and document hazardous fuel types on Crown lands that are along the highway. Treatment of these lands would help reduce ignition potential and fire behaviour. Effort should be directed at encouraging the province to initiate a fuel treatment program for these lands. This may include coordinating lobbying initiatives with other local	No action to date. Carried forward in 2020 recommendations.

	governments from within the SRD.	
38	Sayward should work with BC Hydro to ensure that distribution infrastructure can be maintained and managed during a wildfire event.	Ongoing Carried forward in 2020 recommendations.

APPENDIX 3: FIRESMART PRACTICES AND ACTIVITIES

AREA OF FOCUS	POTENTIAL PRACTICES AND 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 buildings³⁹ • 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

³⁹ 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.

	departments, including the fire department and/or emergency 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 4: WILDFIRE AND EMERGENCY RESPONSE TRAINING COURSES

RELEVANT TRAINING COURSES

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 RECURRENCE (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 ⁴⁰
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	Exterior and Interior Structure Firefighter training	7-12 weeks, depending on the delivery format (full-	

⁴⁰ <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/employment-and-contracts/wildfire-training>

(NFPA) 1001 LEVELS 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 ⁴¹
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 ⁴²
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 ⁴³
EMERGENCY SUPPORT	Community Volunteers	Online or In-Person	Justice Institute of BC ⁴⁴

⁴¹ <https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/fire-safety/wildland-urban-interface-fire-information>

⁴² FireSmart 101. <https://firesmartcanada.ca/programs-and-education/firesmart-101/>

⁴³ FNESS. Fire Protection Leadership Governance. <https://www.fness.bc.ca/core-programs/fire-services>

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 ⁴⁵
ICS LEVEL 200	First responders, local government administration, community organizations involved in response	Online	JIBC ⁴⁶

⁴⁴ Justice Institute of BC (JIBC). Emergency Support Services.

https://www.jibc.ca/sites/default/files/emd/images/JIBC-ESS-Slick_Web_Ready_20150623.pdf

⁴⁵ BC Hydro Community Safety Grants. <https://www.bchydro.com/community/community-giving/grants.html#safety>

⁴⁶ JIBC. Incident Command System. <https://www.jibc.ca/course/incident-command-system-level-100>

APPENDIX 5: WILDFIRE THREAT ASSESSMENT – FUEL TYPE CHANGE RATIONALE

Provided in a separate PDF document.