Village of Gold River
Community Wildfire Protection Plan
2020 Update

Submitted to:

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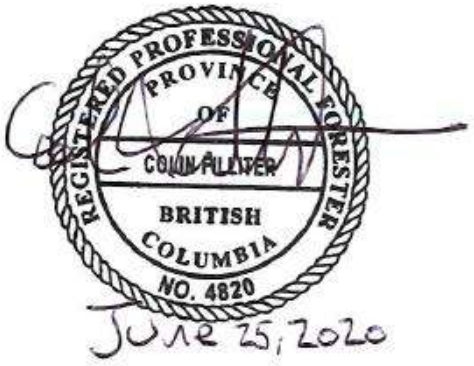
REGISTERED PROFESSIONAL SIGN & SEAL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EXECUTIVE SUMMARY

This 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 Gold River on Vancouver Island. The area of interest is within the traditional territory of the Mowachaht/Muchalaht First Nations. The purpose of this CWPP is to update the recommendations made in the initial 2011 Village of Gold River 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 Moderate. The local wildfire risk ranges from Moderate to High with higher risk areas associated with fuels in close proximity (within 500m) of the community.

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

Fuel management treatments (surface and ladder fuel removal) are recommended for High risk areas within 100m of structures in the Village. In addition to 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. Recent fire seasons and the impacts of a changing climate show that coastal forests of Vancouver Island are not exempt from the impacts of wildfire.

The Gold River Volunteer Fire Department provides fire protective services for the Village and for Mowachaht/Muchalaht First Nations through a service agreement. 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 other emergencies. Evacuation route planning is another identified priority for the Village.

This plan makes 33 recommendations to the Village of Gold River 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 CWPP RECOMMENDATIONS

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
1.	High	To improve inter-agency communication and coordinated response to WUI incidents outside of the municipal boundary but within the fire protective services area.	GRVFD, SRD and BCWS should review, annually prior to each fire season, communication and response protocols for WUI incidents. Review all existing mutual aid and service agreements and update where necessary. Specifically address the right-of-way areas along Highway 28 from the townsite to the mill. Consider installing signage to delineate start and stop of jurisdictions.	Village, SRD to engage BCWS
Rationale: Based on CWPP engagement with the Village/GRVFD on communication related to previous fires that have occurred within the right-of-way. Response could be improved by clarifying jurisdiction issues on the ground.				
2.	High	To improve emergency preparedness and planning resources specific to the Village.	Update the Emergency Preparedness and Response Plan to be more community specific. Assess and map emergency evacuation routes and muster locations for wildfire and other emergencies. Make Emergency Evacuation Maps available on the Village and SRD website.	Village with SRD support
Rationale: No community specific evacuation maps are known to be readily available to the public. Recommended best practice for community preparedness and emergency planning.				
3.	High	To establish a Bylaw that provides the Fire Chief and Deputy Fire Chief with specific authority to address fire hazards in the community.	Develop and enact a Village Fire Protective Services Bylaw that authorizes the Fire Chief to take steps to remove or address fire hazards and risks that pose a danger to life or property. The bylaw should also address the use of fireworks, lanterns, and other spark generating recreational items within the municipal boundary. The bylaw should include provisions for levying penalties and for cost recovery. The Village should obtain legal	Village

			advice prior to adopting any new bylaws.	
Rationale: Recommended best practice, observed in similar jurisdictions, to reduce the risk of human-caused ignitions and fuel hazard build up on private property.				
4.	High	To reduce the fire hazard associated with wood waste and other debris at the old landfill site.	Develop procedures to mitigate ignition risk at the old landfill site. Options may include routine temperature monitoring, hot spot monitoring, fire watch during high/extreme fire danger, removal or redistribution of wood waste piles, reducing pile size, and maintaining moisture. Do not compact the piles.	Village and GRVFD
Rationale: Based on CWPP engagement with the Village/GRVFD on previous fires within the WUI in the past 5 years. The landfill site is a known hazardous site with risk of spontaneous combustion and potential for a fire to spread to adjacent fuels in the WUI. No official protocols currently in place to mitigate this hazard.				
5.	Low	To maintain reduced fuel conditions in previously treated areas.	Previously treated areas should be re-visited every 7-8 years and maintained by collecting/removing dead branches/surface fuels, understory thinning, and pruning where necessary.	Village
Rationale: Recommended best practice for treatment areas to ensure treated stand conditions are maintained in the future.				
6.	High	To reduce fuel hazard in identified treatment units (high risk areas within WUI100) to create residual stand conditions that do not support active crown fire.	Engage a qualified registered professional to develop and implement fuel management prescriptions for the identified treatment areas (Table 6). Where treatment areas are on private land and within 100m of structures (i.e.: within the FireSmart Structure Ignition Zone) a Local FireSmart Representative may be contacted to advise on fuel management treatments.	Village
Rationale: Recommended treatment areas based on local wildfire risk analysis. High risk areas within 100m of community structures or critical infrastructure are priority for treatment.				
7.	High	To increase community	Contact a Local FireSmart Representative to deliver a Local	Village and GRVFD

		awareness and engagement in the FireSmart program.	FireSmart Community Champion workshop	
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. This recommendation addresses public education.				
8.	Med	To improve community FireSmart awareness and engage in FireSmart activities.	Contact a Local FireSmart Representative to deliver Public education materials at annual community events (i.e.: Gold River Days, Show and Shine, etc.)	Village and/or SRD
Rationale: As above.				
9.	High	To increase community awareness and engagement in the FireSmart program.	Arrange a community maintenance day for the existing FireSmart Demonstration Project area near the Municipal Office.	Village, GRVFD
Rationale: As above. Vegetation management and public education are FireSmart disciplines.				
10.	High	To reduce the vegetation/fuel hazard within the FireSmart Structure Ignition Zone (WUI100).	Contact a Local FireSmart Representative to conduct Community Hazard Assessments starting with the priority areas listed in Table 7.	Village and/or SRD
Rationale: As above. Vegetation management and public education are FireSmart disciplines.				
11.	High	To reduce fuel hazard on private land and provide alternatives to open burning.	Provide off-site debris disposal options such as debris collection or chipper services offered through community chipping days.	Village
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.				
12.	Med	To improve public awareness about FireSmart best practices for building material selection.	For new buildings or building permits – Village officials should provide builders information on FireSmart material choices such as those found in the FireSmart	Village

			Home Development Guide.	
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. Development standards is a FireSmart discipline.				
13.	Low	To adopt FireSmart practices on municipal lands, municipal and regional district owned infrastructure.	New construction or structural upgrades to roofing, siding, decking, or other parts of Village or SRD buildings to implement the recommendations in the FireSmart Home Development Guide.	Village
Rationale: As above.				
14.	High	To work cooperatively with BC Hydro to reduce the fuel hazard around the substation.	Work with BC Hydro and have a Local FireSmart representative complete a site hazard assessment on the substation. Implement any recommendations for reducing fuel hazard in substation's structure ignition zone.	GRVFD and BC Hydro
Rationale: As above. Vegetation management and interagency cooperation are FireSmart disciplines.				
15.	High	To improve community awareness of the FireSmart program.	Encourage residents to complete the free, online, FireSmart 101 course.	Village and SRD
Rationale: As above. Public education is one of the FireSmart disciplines.				
16.	Low	To improve community FireSmart awareness and engage in FireSmart activities.	Deliver FireSmart education program within the K-12 public school system. Utilize FireSmart Education Kits and the FireSmart BC Education package.	GRVFD with School District Alternatively, contact the BCWS
Rationale: As above. Public education is one of the FireSmart disciplines.				
17.	High	To make this Plan and its associated maps available to the community.	Upload a digital copy of the CWPP to the Village and SRD Emergency Planning websites	Village and SRD

Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation.				
18.	High	To improve public awareness of wildfire risk and wildfire threat to the community through communication.	Deliver regular communications to community members (flyers, notice boards, emails, social media). Recommend at least one fire related communication per month (bi-weekly during fire season if required). Content of the communications include reminders on FireSmart practices, fire danger ratings, fire bans, fire prevention tips, air quality alerts etc.	Village
Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation.				
19.	High	To improve public awareness of wildfire risk and wildfire threat to the community through communication.	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
Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation.				
20.	High	To improve public awareness of wildfire risk and wildfire threat to the community through education.	Develop a Village specific Fire Safety and Wildfire Preparedness information factsheet (or other media format). Send this as an annual mailout to all Village residences. This factsheet should include information on Village Bylaws, *Wildfire Regulation* legal requirements, FireSmart principles, emergency evacuation routes, wildfire safety, wildfire reporting, and BCWS resources on fire bans, and air quality.	Village
Rationale: Community education and awareness are necessary for wildfire protection planning and FireSmart program implementation. Bylaw education is a recommended best practice as bylaws are updated and changed in the Village.				

21.	High	To improve public awareness of wildfire risk and wildfire threat to the community through education.	Organize an annual Community Fire Safety/Wildfire Community 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, GRVFD
Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation. Addresses education and emergency planning FireSmart disciplines.				
22.	High	To engage regional operators and industrial stakeholders on the contents and recommendations in this plan.	Share this plan with regional operators and stakeholders including MFLNRORD, forest tenure holders (Western Forest Products Inc., woodlot owners), and BC Hydro. Areas of concern to highlight include the critical importance of minimizing the fuel hazards within cut blocks and along rights-of-way. Continue to work with industrial users to maintain Nimpkish Road as a safe secondary evacuation route.	Village and SRD
Rationale: Inter-agency cooperation within the WUI is necessary to protect a community and its critical infrastructure. Recommended best practice for information sharing, awareness, collaboration and cooperation.				
23.	Med	To ensure implementation and continual engagement with CWPP.	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 annual action plan of priority items to be worked on for	Village and SRD

			the year.	
Rationale: Recommended best practice to ensure follow-up on action items.				
24.	Med	To promote alternative means of yard 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, composting, and xeriscaping.	Village and SRD
Rationale: Recommended practice, observed from other similar jurisdictions. Contributes to public education and development planning.				
25.	Med	To improve wildland fire suppression equipment availability.	Procure wildland fire suppression equipment which includes water pumps, hoses, hand tools, back pack pumps, water storage bladders, and personal protective equipment.	GRVFD, Village
Rationale: Based on feedback from the Village/GRVFD on current wildland fire equipment availability.				
26.	High	To improve water availability for WUI fires or fires in isolated areas outside of hydrant coverage.	Purchase portable water tanks or a water tanker truck to be stored at strategic locations during high fire danger in areas outside of hydrant coverage, or away from designated draft sources. Alternatively engage WFP in a mutual aid agreement for the use of their water tanker trucks for WUI fire incidents.	GRVFD, Village
Rationale: Based on CWPP engagement with the Village/GRVFD on water availability for fire suppression within the fire protective services area, outside of hydrant coverage.				
27.	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
Rationale: Existing program/infrastructure to encourage residents to use since cellular service is now available within the Village.				
28.	High	To ensure all GRVFD	Ensure all members of GRVFD	GRVFD

		members are trained to wildland firefighting standards.	complete Wildland Forest Firefighter Level 1 (SPP-WFF 1) training. SPP-115 and ICS100 training is also recommended.	
Rationale: Based on CWPP engagement with GRVFD, not all members have SPP-WFF-1 training, due to timing/availability of the training course and resources. This recommendation is in place to keep this training top of mind.				
29.	Med	To maintain and improve communication with BCWS.	In conjunction with BCWS and Tahsis Fire Rescue Department, coordinate to conduct joint annual mock exercises, where information and technical/practical knowledge are shared, such as: fire line construction, pump operations, sprinkler protection, portable water tank deployment, and wildland hose operations.	GRVFD, SRD with BCWS
Rationale: Based on CWPP engagement with the Village, GRVFD, 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.	Med	To maintain and improve inter-agency and inter-jurisdiction communications in the event of a WUI emergency.	The SRD should arrange an annual meeting, prior to fire season, to include BCWS – North Island Fire Zone, EMBC, and local fire department representatives to review incident command structure and emergency support services in the event of a WUI fire. Recruit community members to take ESS training	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.				
31.	High	To improve equipment availability for structure protection.	Engage the City of Campbell River in a mutual aid/service agreement for the deployment of the structural protection unit in specified WUI fire emergencies	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.				
32.	Low	To improve equipment availability	Engage Tahsis Fire Rescue Department and	Village with

		for structure protection in the event of WUI fires.	Mowachaht/Muchalaht First Nations, on potential for cost sharing and purchase of a Structural Protection Unit for shared use.	SRD support
Rationale: Based on current knowledge and inventory, the equipment availability for structural protection in the region could be improved. The nearest SPU is with the Campbell River Fire Department, its deployment may be affected by time, access conditions, and availability.				
33.	Low	To improve equipment availability for structure protection.	Purchase sprinkler kits for public infrastructure and encourage residents to purchase sprinkler kits for their homes. Training on set up and operational use is just as important has having the equipment readily available. Potential for the GRVFD to provide community training on how to set up kits around homes.	GRVFD, Village
Rationale: Based on current knowledge and 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

LIST OF ACRONYMS

Acronym	Full Name / Phrase
AOI	Area of Interest
BCWS	BC Wildfire Service
CEPF	Community Emergency Preparedness Fund
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
GRVFD	Gold River Volunteer Fire Department
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
TFL	Tree Farm Licence
UBCM	Union of BC Municipalities
WUI	Wildland Urban Interface

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SECTION 1: INTRODUCTION

The Community Resiliency Investment (CRI) program is a 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) work with the Ministry of Forests, Lands, Natural Resource Operations & Rural Development (MFLNRORD), 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 Village of Gold River (referred to as the Village, or Gold River hereafter), to describe the potential consequences if a wildfire was to impact the community, and to examine possible ways to reduce wildfire risk. This CWPP provides an updated assessment of the wildfire risk to the area. The goal is to define the threat to human life, property, and critical infrastructure from wildfires within the area of interest (AOI) defined around the Village; 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 assist with the implementation of specific actions that will result in

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

1.2 CWPP Planning Process

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

Understanding the relationship of the community to its surrounding environment, and what that means in terms of the wildfire hazard, threat and risk of loss, is critical to help the community plan for mitigation activities and respond to wildfire events. To support this understanding, the 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 to prepare 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.

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

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

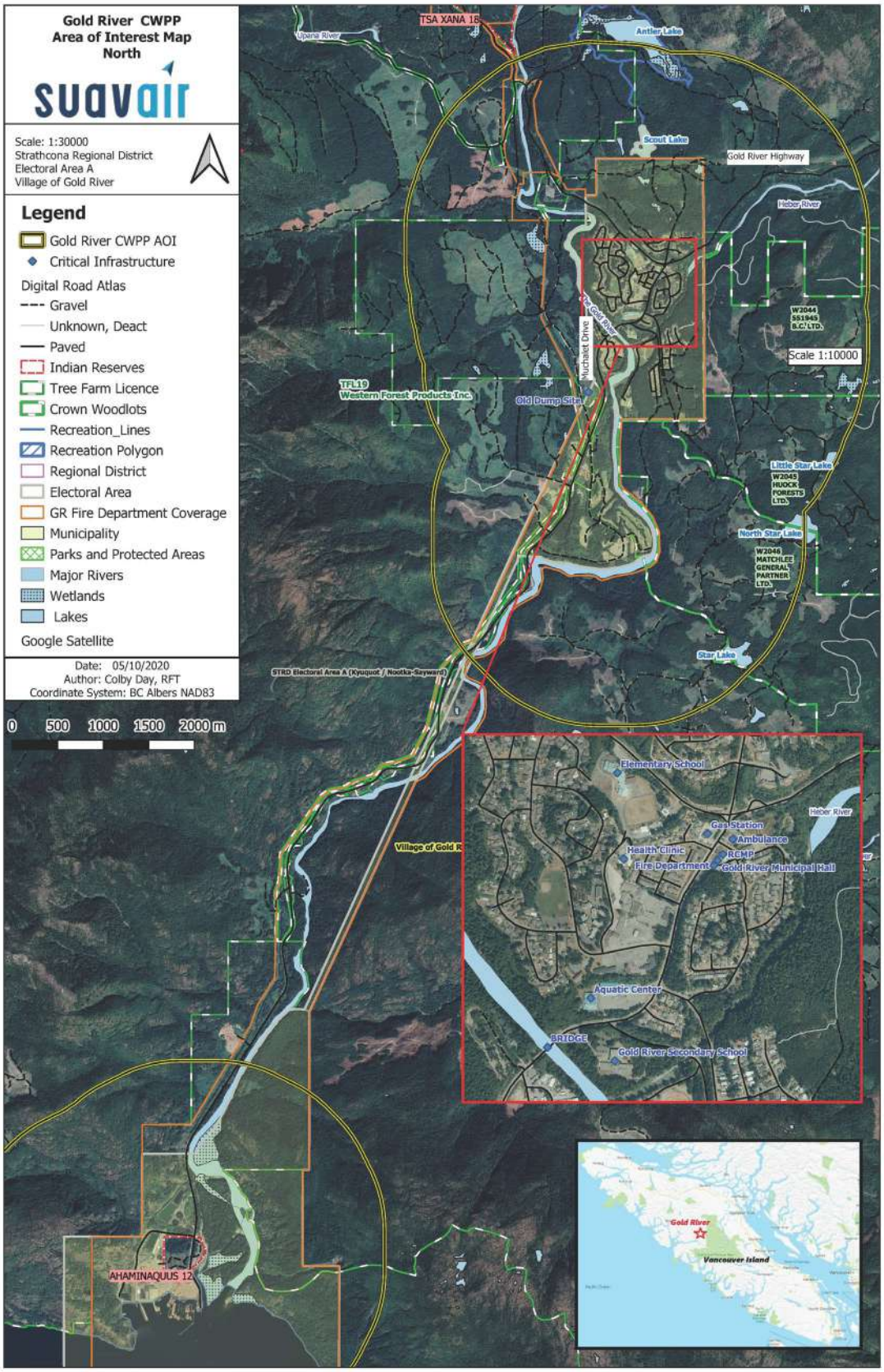
3. GIS Analyses – review Provincial Strategic Threat Analysis (PSTA) data using best available information including LiDAR data, updated forest cover and ortho imagery, adjusting data for fuel typing errors and modifying threat and risk classification where necessary
4. Field Work – verification of critical 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

SECTION 2: LOCAL AREA DESCRIPTION

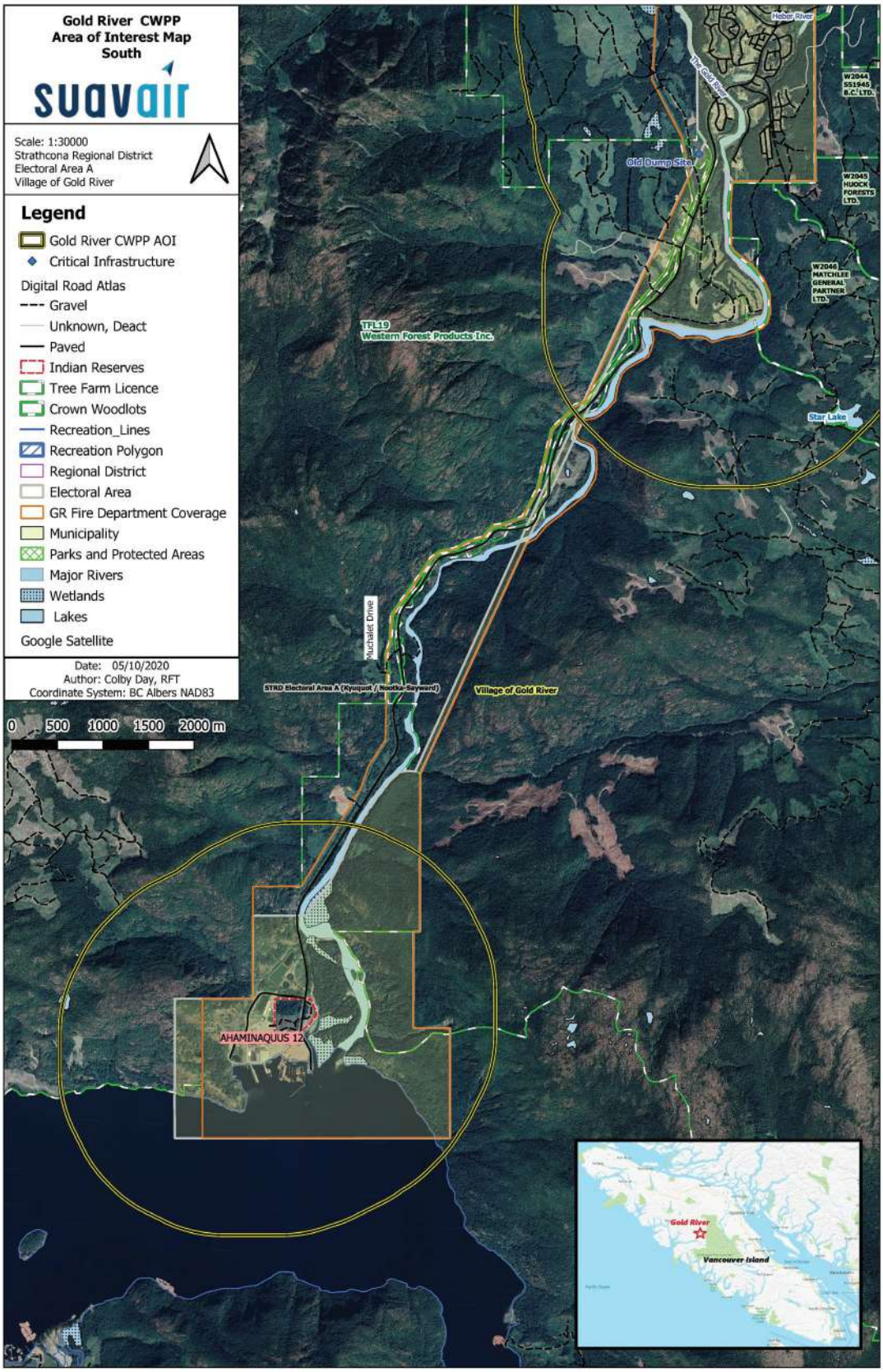
2.1 CWPP Area of Interest

The Village of Gold River is located on Vancouver Island about 90km west of the City of Campbell River on Highway 28. The Village is situated at the confluence of the Heber and Gold Rivers within the traditional territory of the Mowachaht/Muchalaht First Nations. The municipal boundary includes the area around the townsite and a 5km long narrow corridor to the old mill site where the Gold River flows into Muchalaht Inlet. The terrain surrounding the Village is rugged, rocky, and mountainous. Road access for fire suppression is limited by the steep terrain.

This plan is an update to the existing 2011 Village of Gold River CWPP. The 2011 CWPP AOI included all the area within a 2km buffer of the Village Municipal boundary. For this 2020 CWPP update, the AOI includes all the area within a 2km buffer of areas with structure density greater than 6 to 25 structures per km^2 (Map 1 and Map 2). Structure density was provided by the BCWS as part of the provincial strategic threat analysis dataset.



Map 1. Village of Gold River AOI - North.



Map 2. Village of Gold River AOI - South.

2.2 Community Description

The Village of Gold River was constructed in 1965 as a planned community to support a pulp and paper mill. The main thoroughfares are Gold River Road and Highway 28 (Muchalat Drive). The mill closed in 1998 and current economic drivers in the community include commercial forestry, fishing/aquaculture, recreation and tourism, and public administration. Green spaces and trails are intermixed throughout the community (Figure 1). The 2016 Census data shows the population of Gold River at 1212, down from 1267 in 2011.[2] The Mowachaht/Muchalaht First Nations community of Tsaxana, population 187[3], is about 1.5km north of the municipal boundary.

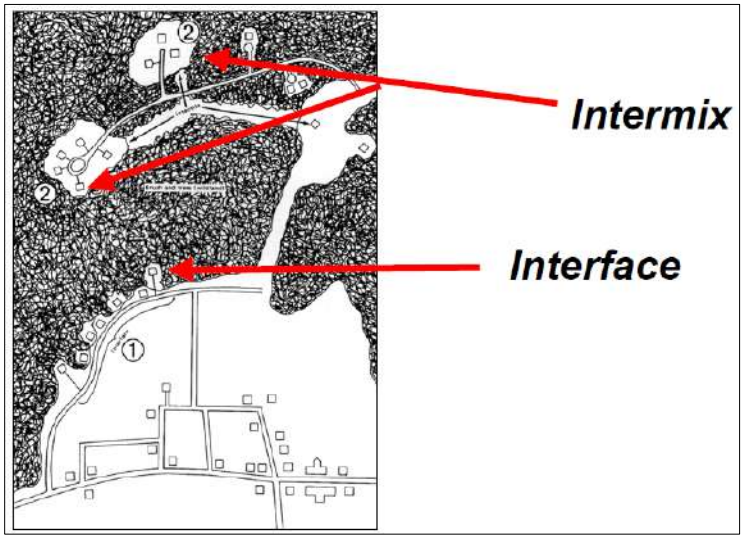


Figure 1. Intermix and interface wildland urban interface.

General land use within the AOI is residential, commercial, light industrial, park land and forests land. The old mill site encompasses a dry land sort, deep sea port, and residual mill infrastructure such as settling ponds. Mowachaht/Muchalaht Indian Reserve Ahaminaquus 12 (no residents) is directly adjacent to the old mill site. Land ownership classes within the AOI are summarized in Table 2 and shown in Map 3 and Map 4.

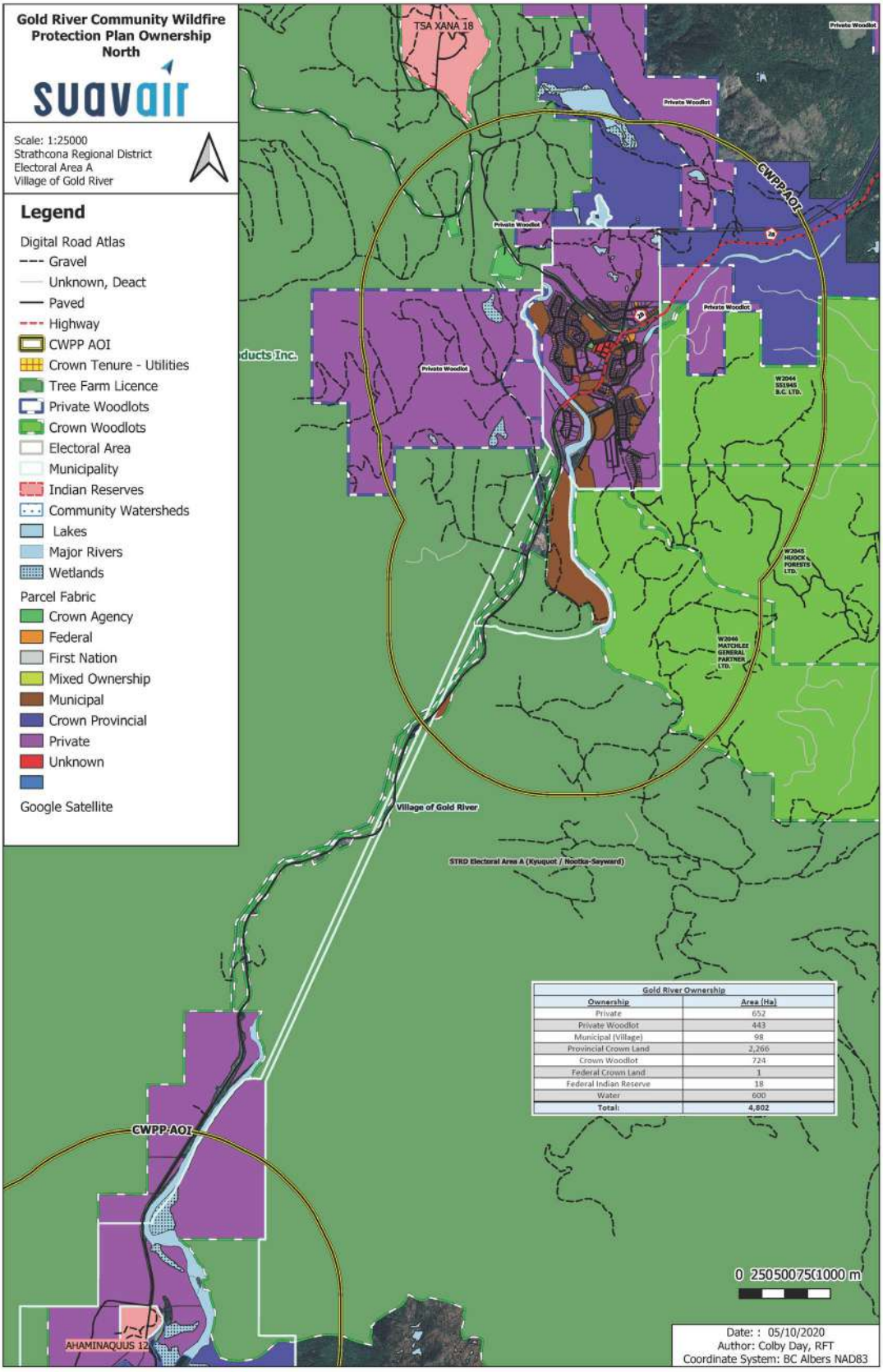
Village emergency services include the Gold River Health Centre, BC Ambulance Service, Nootka Sound RCMP, and Gold River Volunteer Fire Department (GRVFD). The GRVFD provides fire services within the municipal boundary, and emergency response services to the Mowachaht/Muchalaht community of Tsaxana. The Canadian Coast Guard operates an Inshore Rescue Boat station on Nootka Island to the southwest. Other Village services include a wastewater treatment facility, water supply system (aquifer), Ray Watkins Elementary School, Gold River Secondary School, a community ice rink and indoor swimming pool.

[2] Statistics Canada. 2016 Census Profile. Village of Gold River https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5924025&Geo2=CD&Code2=5924&SearchText=gold%20river&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0.

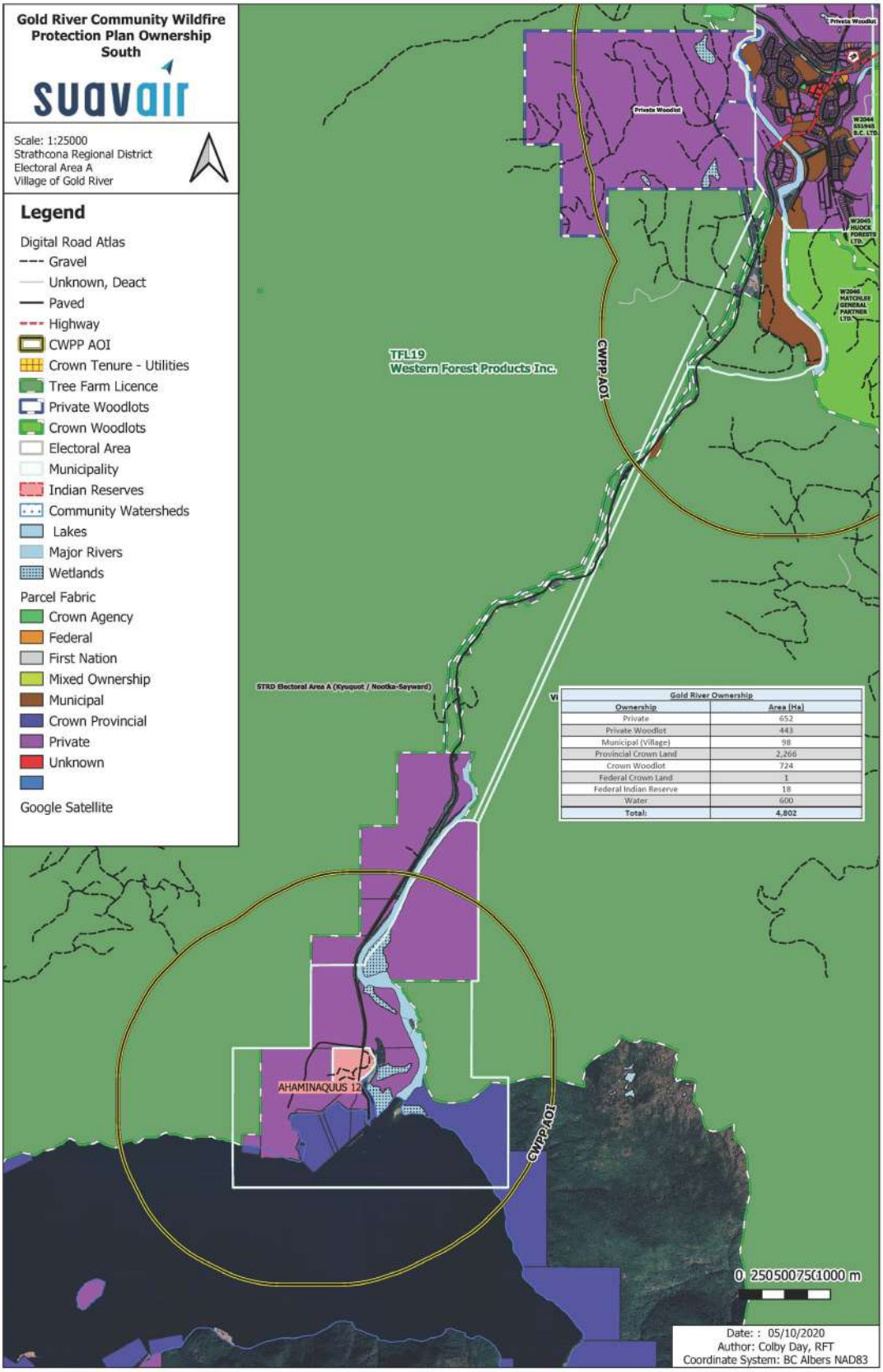
[3] Statistics Canada. 2016 Census Profile. Tsa Xana 18. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5924835&Geo2=CD&Code2=5924&SearchText=tsa%20xana&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0

Table 2. Summary of land ownership classes within the AOI.

Land Ownership	Area (ha)	Comments
Private	652	
Private Managed Forest Lands	443	
Municipal (Village)	98	
Provincial Crown	2,266	TFL 19
Provincial Crown	724	Woodlot licenses
Federal Crown	1	
Federal – Indian Reserve	18	
Water	600	
Total	4802	



Map 3. Land ownership classes AOI - North.



Map 4. Land ownership classes, AOI - South.

2.3 Past Wildfires, Evacuations, and Impacts

Recent wildland fires near the Village include a 1ha person-caused fire next to Highway 28 near the Gold River Golf Course, 2 lightning-initiated fires next to Highway 28 between the town site and mill site (Map 5) and 3 fires at the old municipal dump site associated with spontaneous combustion of the hog fuels. Structural fires within the community have the potential to spread to the forested interface areas due to the intermix and interface distribution (Figure 1) of the community. The most recent structure fire occurred in August 2017 at the mobile home park. The fire displaced 2 people. The GRVFD was able to prevent the fire from spreading to the nearby forested areas.

The largest fire in recent history within the AOI is a 182ha lightning-initiated fire in 2009 (fire V81061), that burned outside the municipal boundary above the Antler Lake recreation area. This fire did not threaten human safety or private property, although it burned near BC Hydro transmission lines and had the potential to impact electricity distribution to the north island. No evacuation orders or alerts were issued.

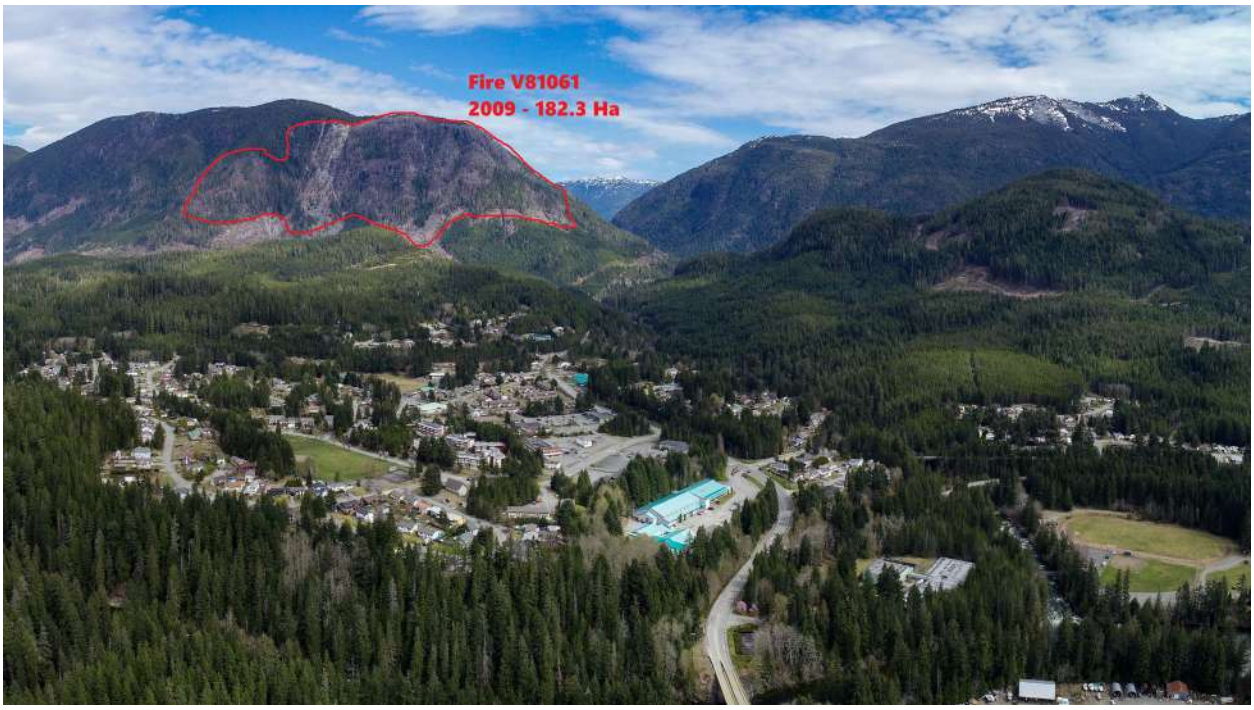
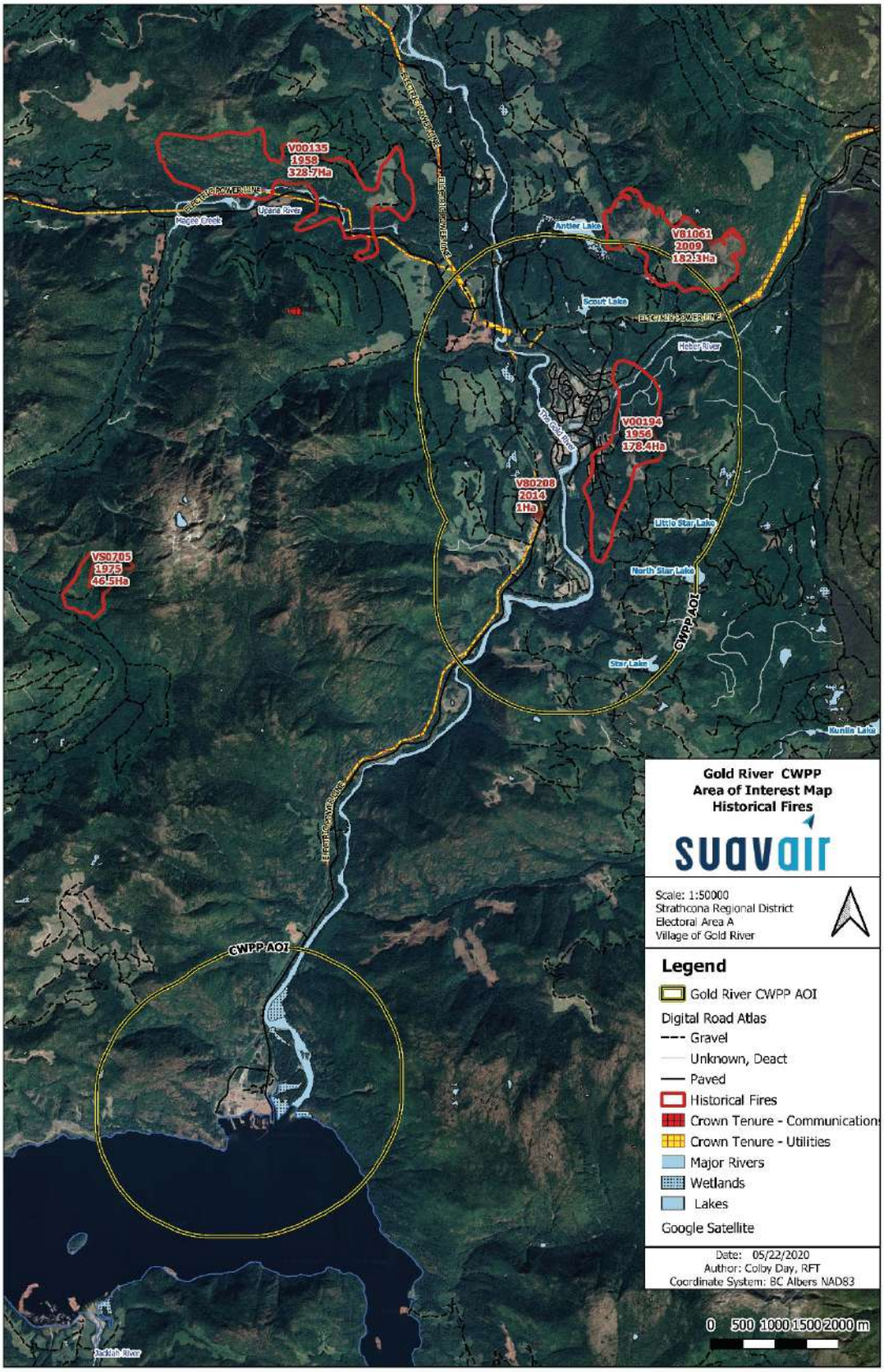


Photo 1. A lightning strike resulted in a fire (V81061) in 2009 that burned 182.3 ha near Antler Lake, north of Gold River.



Map 5. Historical Fires around Gold River.

The municipal boundary corridor from the town site to the mill site (Map 2) does not follow the Highway 28 right-of-way, instead it is a straight line. The jurisdictional issue impacts response time to fires along the highway corridor.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
1.	High	To improve inter-agency communication and coordinated response to WUI incidents outside of the municipal boundary but within the fire protective services area.	GRVFD, SRD and BCWS should review, annually prior to each fire season, communication and response protocols for WUI incidents. Review all existing mutual aid and service agreements and update where necessary. Specifically address the right-of-way areas along Highway 28 from the townsite to the mill. Consider installing signage to delineate start and stop of jurisdictions.	Village, SRD to engage BCWS

2.4 Current Community Engagement

Community engagement in wildfire prevention activities is a critical area of focus for the Village. Following the completion of the 2011 CWPP, a FireSmart wildfire interface demonstration project was completed in 2012 in the forested area adjacent to the Village office. Fuel reduction treatments include thinning, pruning, and removal of dead vegetation (Photo 2 and Photo 3).

In 2019, a FireSmart grant funded two days of free access to brush/limb chipping for residents in the village. Community participation was limited. The lessons learned from the chipping program included: free curbside pick-up is important to encourage participation, and community knowledge and awareness on fire prevention needs significant improvement.

Current community education initiatives include school visits during National Fire Prevention Week, and planned community workshops for FireSmart awareness. The Village is keenly interested in further FireSmart activities and becoming a Recognized FireSmart Community.[4] More information on FireSmart recommendations is provided in Section 5.2. The Village and GRVFD were engaged throughout this CWPP process and their ideas, concerns, and feedback were integrated into the plan wherever possible.

[4] McRae, B. 2019, October 4. Personal communication.

Photo 2. FireSmart fuel treatment informational signage from 2012, located next to the municipal office.

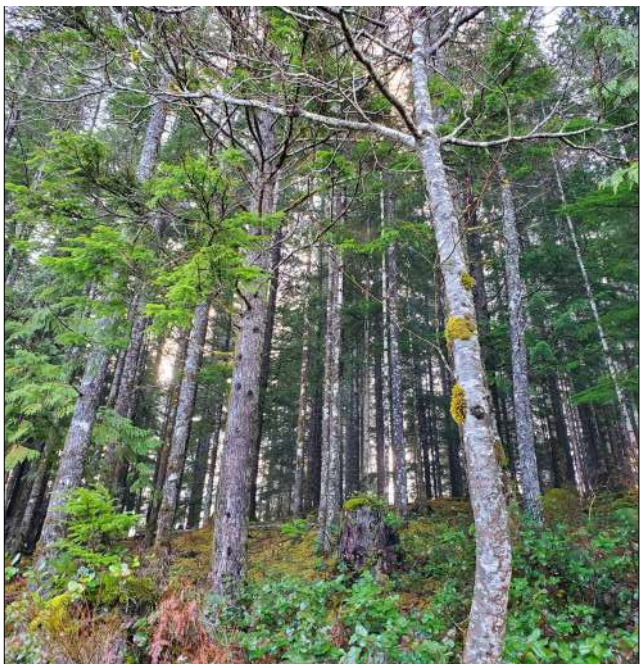


Photo 3. FireSmart area previously treated in 2012.

2.5 Linkages to Other Plans and Polices

The following sections are a summary of the local policies and provincial policies and guidelines that relate to strategic wildfire management, wildfire threat reduction, operational fuel treatments and emergency planning.

2.5.1. Local Authority Emergency Plan

The Village does not have a community specific emergency evacuation plan. A tsunami evacuation plan is in place; however, different hazards require different evacuation and response plans. An updated local emergency plan is required under the *Emergency Act* and must include preparation for, response to, and recovery from, emergencies and disasters. The plan must cover all potential emergencies and disasters that could affect all or any part of the local government, including wildfire. 2011 CWPP Recommendations #15-19 address this issue and should also be referred to when developing the emergency and evacuation plan.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
2.	High	To improve emergency preparedness and planning resources specific to the Village.	Update the Emergency Preparedness and Response Plan to be more community specific. Assess and map emergency evacuation routes and muster locations for wildfire and other emergencies. Make Emergency Evacuation Maps available on the Village and SRD website.	Village with SRD support

2.5.2 Affiliated CWPPs

The initial Village of Gold River CWPP was completed in 2011 by B.A Blackwell and Associates. The 2011 CWPP included 34 recommendations, the status of those recommendations is provided in Appendix 2: Status of 2011 CWPP Recommendations. Affiliated CWPPs include the plan for Strathcona Regional District Electoral A and the Village of Tahsis, completed concurrently with this plan. Joint implementation of Training and Structural Protection recommendations between the Village of Tahsis and Village of Gold River CWPP's should be considered wherever possible.

2.5.3 Local Government Plans and Policies

Official Community Plan

The Village of Gold River Official Community Plan (OCP) was mostly recently adopted in June 2018. The OCP guides land use and community development decisions. The OCP addresses the importance of the scenic values for tourism and maintaining public access to recreation opportunities. The OCP does not address fire hazard, fire risk mitigation, or emergency planning.

Open Fire Regulation Bylaw – Draft (2019)

At the time of preparing this report, a draft bylaw to regulate open burning is under review by the Village Council. The draft bylaw proposes to prohibit open burning between April 15 to October 15 unless permitted by the Village. The bylaw also provides for penalties and cost recovery. Additional considerations for fire related bylaws are recommended.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
3.	High	To establish a Bylaw that provides the Fire Chief and Deputy Fire Chief with specific authority to address fire hazards in the community.	Develop and enact a Village Fire Protective Services Bylaw that authorizes the Fire Chief to take steps to remove or address fire hazards and risks that pose a danger to life or property. The bylaw should also address the use of fireworks, lanterns, and other spark generating recreational items within the municipal boundary. The bylaw should include provisions for levying penalties and for cost recovery. The Village should obtain legal advice prior to adopting any new bylaws.	Village

2.5.4 Higher Level Plans and Relevant Legislation

The AOI is within the Vancouver Island Land Use Plan General Management Zone 22 – Gold. The Gold Landscape Unit does not have an approved landscape unit plan or landscape unit level 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 the *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 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

Western Forest Products Inc. TFL 19 is adjacent to the Village Boundary. TFL 19 Management Plan #11, and the WFP Central Island Forest Operations 2017 Forest Stewardship Plan apply to TFL 19. Provincial crown land woodlots W2044, W2045, and W2046 are also within the AOI. The AOI is within High and Severe polygons according to the BCWS Fuel Hazard Assessment and Abatement Fire Risk Map.[5] The risk class determines the threshold for fuel abatement, for industrial and prescribed activities, as recommended in the Guide to Fuel Hazard Assessment and Abatement in British Columbia.[6]

The AOI is within the Campbell River Natural Resource District, Discovery Coast Recreation District, and BCWS' North Island Fire Zone. The MFLRNORD Vancouver Island Central Coast Response Fire Management Plan, a framework for wildfire suppression and response, applies to the area. BCWS/FLNRORD guidance on wildfire management and fuel management is updated periodically and posted online.[7] MFLRNORD guidance includes the 2019 Fuel Management Prescription Guidance[8] and 2019 Tactical Fuel Management Planning Standard.[9]

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

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

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

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

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

[9] 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

SECTION 3: VALUES AT RISK

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

3.1 Human Life and Safety

In the event of a wildfire approaching a community, the first priority is human life and safety, including the evacuation of at-risk areas. Wildfires 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 2016 Census data shows the population of Gold River at 1212, down from 1267 in 2011.[10] The neighbouring Mowachaht/Muchalaht First Nations' community of Tsaxana, population 187[11], is about 1.5km north of the municipal boundary Mowachaht/Muchalaht Indian Reserve Ahaminaquus 12 currently does not have any residents. The seasonal population in the area increases in the summer from tourist and recreation traffic.

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.

Highway 28 is the primary access route in and out of the Village. A secondary route on privately maintained industrial gravel roads connects the Village with the community of Woss and Highway 19 to the north. Head Bay FSR (publicly maintained) connects the Village with the Village of Tahsis, 65km to the west. Water based access by boat or float plane is possible at the head of Muchalaht Inlet.

Critical public infrastructure includes the Village Office, Fire Hall, Gold River Health Centre (Island Health Authority), electrical substation (BC Hydro), transmission lines (BC Hydro), BC Ambulance Station (BC Emergency Health Services), Nootka Sound RCMP detachment office, Roy Watkins Elementary School (School District 84), Gold River Secondary School (SD84), Anne Fiddick Aquatic Centre, and Gerry Morgan Recreation Centre (Map 6).

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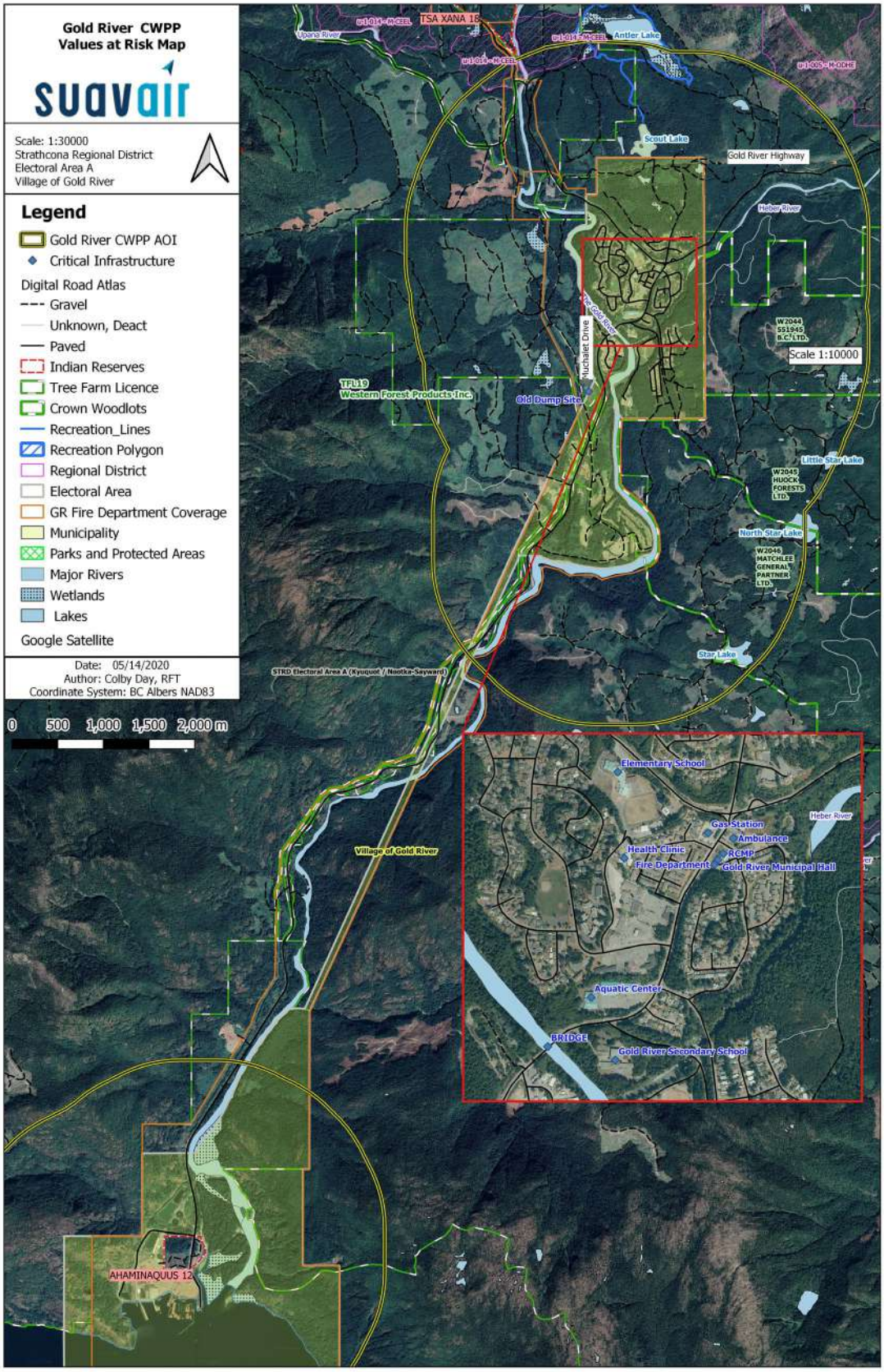
[10] Statistics Canada. 2016 Census Profile. Village of Gold River https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5924025&Geo2=CD&Code2=5924&SearchText=gold%20river&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0.

[11] Statistics Canada. 2016 Census Profile. Tsa Xana 18. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5924835&Geo2=CD&Code2=5924&SearchText=tsa%20xana&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0



Map 6. Village of Gold River values at risk (VAR).

3.2.1 Electrical Power

A BC Hydro electrical substation is located within the AOI. BC Hydro transmission lines within the AOI connect to various other communities on northern Vancouver Island. Transmission line infrastructure includes some wooden poles. A wooden pole distribution line follows Muchalaht Drive/Highway 28 from the Village core to the old mill site at Muchalaht Inlet. Within the Village, electrical power lines are underground. The substation should have a FireSmart hazard assessment completed and the adjacent area is within recommended Treatment Area #2 (refer to Sections 5.1 and 5.2 below).

Photo 4. View of BC Hydro Substation from Gold River Road.

3.2.2 Communications, Pipelines and Publicly Owned Buildings

The Village has no natural gas service, hospital or airport. Repeater and communications towers are located on Big Baldy Mountain and nearby heights of land, outside of the AOI. Cellular phone service (LTE) is available in the Village.

3.2.3 Water and Sewage Infrastructure

The following information about the Village's water and sewer infrastructure was sourced from the Official Community Plan. The Village sewage treatment plant is located adjacent to the Gold River. The wastewater system consists of preliminary treatment screening, an activated sludge secondary treatment process with sludge dewatering, ultraviolet effluent disinfection and effluent discharge to an infiltration basin from May to September and to the Gold River from October to April. The treatment process continues to evolve as upgrades are made to the system. The facility has been assessed as being in good mechanical operation but due to its age will require additional and ongoing maintenance. The system has been effective but with aging there are concerns with infiltration from storm drainage and ground water.

Gold River is served by three wells located on an aquifer adjacent to the confluence of the Gold and Heber Rivers. Although the Village has an excellent supply of water, in the area of Scout Lake, development has reached its maximum due to the height of the existing reservoir. Further development would require an in-line pump system and a reservoir at a greater height. The Heber Heights subdivision has an adequate water supply. Further development in Ucona Flats may require an additional reservoir. The village completed a review of its water supply and distribution system in 2002. The review provided recommendations for upgrades to the existing system; much of which has been completed but continues to be referenced in future planning. Maintenance on the water distribution system continues through implementation of the infrastructure study information.

The Village hydrant network provides coverage throughout the Village but does not cover the electrical substation, gold course area and industrial sites, old landfill site, or old mill site.

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 is served by 3 wells drawing from a subsurface aquifer near the confluence of the Gold and Heber Rivers. The watersheds are not designated community watersheds under the *Forest and Range Practices Act*, therefore there is no specific protection for the watershed areas. The aquifer has a high level of demand and a high level of productivity and water availability.[12]

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.[13] The AOI is within the traditional territory of the Mowachaht/Muchalaht First Nations, members of the Nuu-cha-nulth First Nations.

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

[12] Groundwater Wells and Aquifers. Aquifer 865 Summary. 2019. Available from https://apps.nrs.gov.bc.ca/gwells/aquifers/865

[13] 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.

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

Established legal objectives and orders within the AOI on provincial Crown land include ungulate winter ranges, recreation sites, and visual quality objectives (Map 6).

3.4 Other Resource Values

The AOI contains portions of timber harvesting land base within TFL 19 and woodlot licences with western red cedar, douglas-fir, sitka spruce, and western hemlock commercial trees species. The Gold, Heber and Upana Rivers are large, fish bearing rivers with significant recreational value. The *Forest Planning and Practices Regulation* stipulates riparian reserves and management zones along streams which may constrain fuel treatment opportunities.

3.5 Hazardous Values

Propane tanks located adjacent to homes and mobile homes are a safety hazard in the event of a fire. During the 2017 mobile home park fire, it was reported that several propane tanks were in the yards of the units on fire, and one tank exploded and flew across the street.[14] The old Gold River landfill site, now closed, is still a potential hazard. Spontaneous combustion of wood waste stored at the site is an ignition hazard. A wood waste fire occurred at this site in 2016.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
4.	High	To reduce the fire hazard associated with wood waste and other debris at the old landfill site.	Develop procedures to mitigate ignition risk at the old landfill site. Options may include routine temperature monitoring, hot spot monitoring, fire watch during high/extreme fire danger, removal or redistribution of wood waste piles, reducing pile size, and maintaining moisture. Do not compact the piles.	Village and GRVFD

[14] Chek News. Gold River firefighters prevent major blaze. 2017. Available from https://www.cheknews.ca/gold-river-firefighters-prevent-major-blaze-354189/

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 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.[15] 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.[16] At higher elevations, the very moist maritime subzone (CWHvm) occurs.

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.[17] Wildfires occurring in NDT2 are moderately sized (20 to 1000ha), larger fires occur after extended periods of drought. In contrast, the CWHvm1 subzone is classed as NDT1 – rare stand initiating events, 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.

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

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

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

Fire Weather

The Canadian Forest Fire Danger Rating System[18] (CFFDRS) is a computer-based model used to assess fire danger and potential fire behaviour. The two main parts of the CFFDRS are the fire weather index system[19] (FWI) and fire behaviour prediction system[20] (FBP). Hourly weather data is collected throughout fire season (April to October) at automated weather stations throughout British Columbia to support the CFFDRS. Fire Danger Classes[21] are summarized by the BC Wildfire Service as follows:

Fire Danger Classes	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.

Wildfire threat exposure to the community 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 on the west coast of BC.

Regional Weather Stations

The closest long-term weather station to Gold River is 62km to the northwest, located in Woss. The Woss Wx is also within the CWHxm biogeoclimatic subzone. Fire Danger Class Ratings for the Woss Camp Weather Station are available from 1970-2019 (Figure 2). High fire danger most commonly occurs in July and August, although High danger days are consistently recorded from May to September.

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[18] 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.

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

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

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

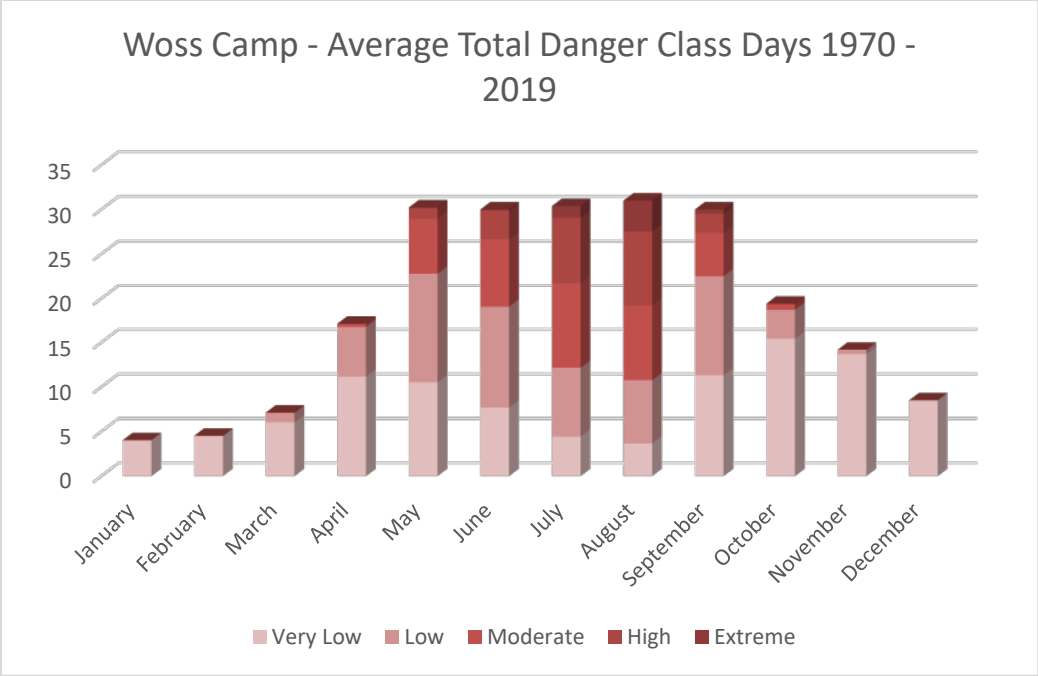

Figure 2. Woss Camp weather station average monthly total danger class days 1970-2019.

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 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.[22] 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,

[22] 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

increased frost-free days, and lengthened dry seasons.[23] 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.[24] Figure 3 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.[25]

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

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

[24] 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.

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

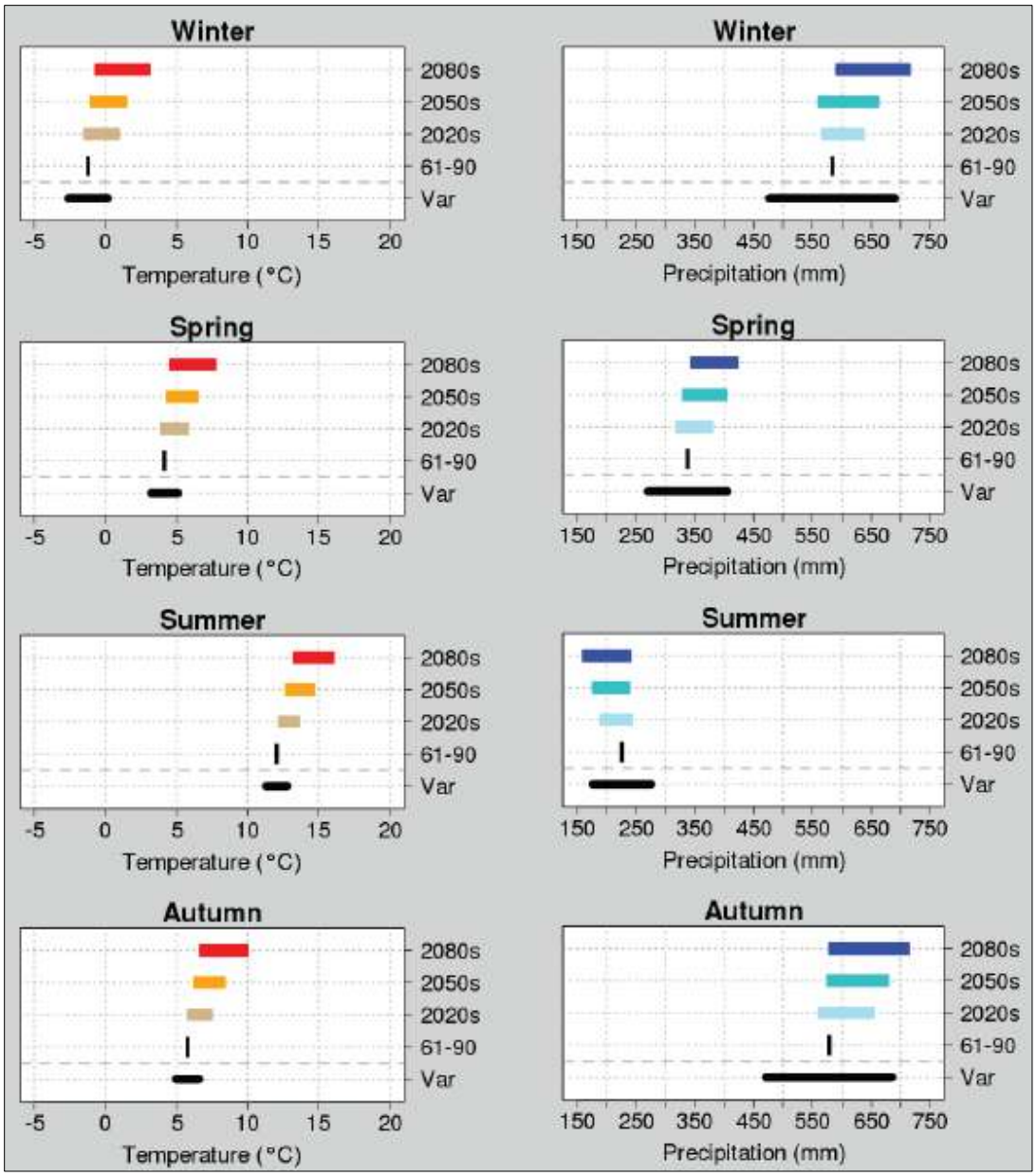

Figure 3. Cumulative seasonal precipitation and mean seasonal temperature projections for 2020s, 2050s, and 2080s. The width of the bands indicates the range of projections. The thin, upper black line and the lower band indicated the average and the variability, respectively, over the 1961-1990 reference period.

4.2 Provincial Strategic Threat Analysis

The PSTA[26] is a provincial level geographic information system (GIS) spatial data set and 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.[27] 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 threat analysis output is a wildfire threat rating classification of No threat, Low, Moderate, High, or Extreme.

The key inputs to the wildfire threat analysis are fire density, head fire intensity, and spotting impact. The Wildfire Threat classification is weighted based on 30% fire density, 60% head fire intensity, and 10% spotting impact.

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 (Low).

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 with small pockets of Moderate.

4.2.1 Fire History

Human-caused fires in this area have been the most common and more concerning than lightning-initiated events. WUI fires can spread from communities to the forest, or from the forest into the community. Since the 2011 CWPP, there have been 2 WUI fires of note. One occurred in July 2014 near Highway 28/Muchalat Drive near the junction with the Gold River Golf Club access road (V80208). The fire was human-caused, burned about 1ha of forested area adjacent to Highway 28 and a BC Hydro transmission line. The fire was responded to by the GRVFD.

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[26] 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

[27] 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.

Another human-caused fire occurred in August 2017 at the Gold River Mobile Home Park.[28] It destroyed 2 trailers and other structures and threatened to spread to the nearby forest. The forested area around the mobile home park was identified as a Priority 1 Fuel Treatment Area in the 2011 CWPP. Preventing human-caused ignitions within the AOI continues to be an area of focus for CWPP recommendations.

Table 3. Summary of total recorded fires within the AOI since 1950. 1950 to 2010 numbers are from the 2011 CWPP.

Size Class (ha)	Total fires 1950-2010	Lightning 1950-2010	Human 1950-2010	Total Fires 2010-2019	Lightning 2010-2019	Human 2010-2019
<4.0	14	2	12	2	0	2
4.0-10.0	-	-	-	-	-	-
>10.0	2	1	1	-	-	-

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), immature coniferous leading stands (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.

The 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., updated Google Earth imagery, was analyzed for fuel type verification and adjustments. The major changes to the fuel type layer that resulted within the AOI included:

- recently harvested cut blocks (less than 5 years) were changed to fuel type S-3,
- water areas were corrected with more accurate spatial data sources,
- harvested blocks older than 5 years, coniferous, dense pole sized stands over 4m tall, less than 60 years old, were updated to C-3 fuel type
- non-fuel areas corrected with more accurate spatial data sources

The updated fuel type areas are summarized in Appendix A1.1 Fuel Type Attribute Assessment.

[28] Chek News. 2017. Gold River Firefighters Prevent Major Blaze. https://www.cheknews.ca/gold-river-firefighters-prevent-major-blaze-354189/

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. Wildfire that occurs upwind of a value poses a much more significant threat to that value than a fire that occurs downwind. From a review of available wind data, the CWPP wildfire risk analysis considers winds from both the north and south/southeast. More detailed information regarding wind directions is found in Appendix A1.3 Fire Spread Patterns.

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 community is on slopes <20%. 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

Gold River 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.

4.3.5 Local Wildfire Threat Classification

A local wildfire threat classification was completed, the process of this threat classification is summarized in Table 4. Map 7 and Map 8 show the updated local wildfire threat classification, a summary of changes is provided in Table 4. Generally, the wildfire threat around the Village is Moderate.

Table 4. Summary of wildfire threat classification within the AOI.

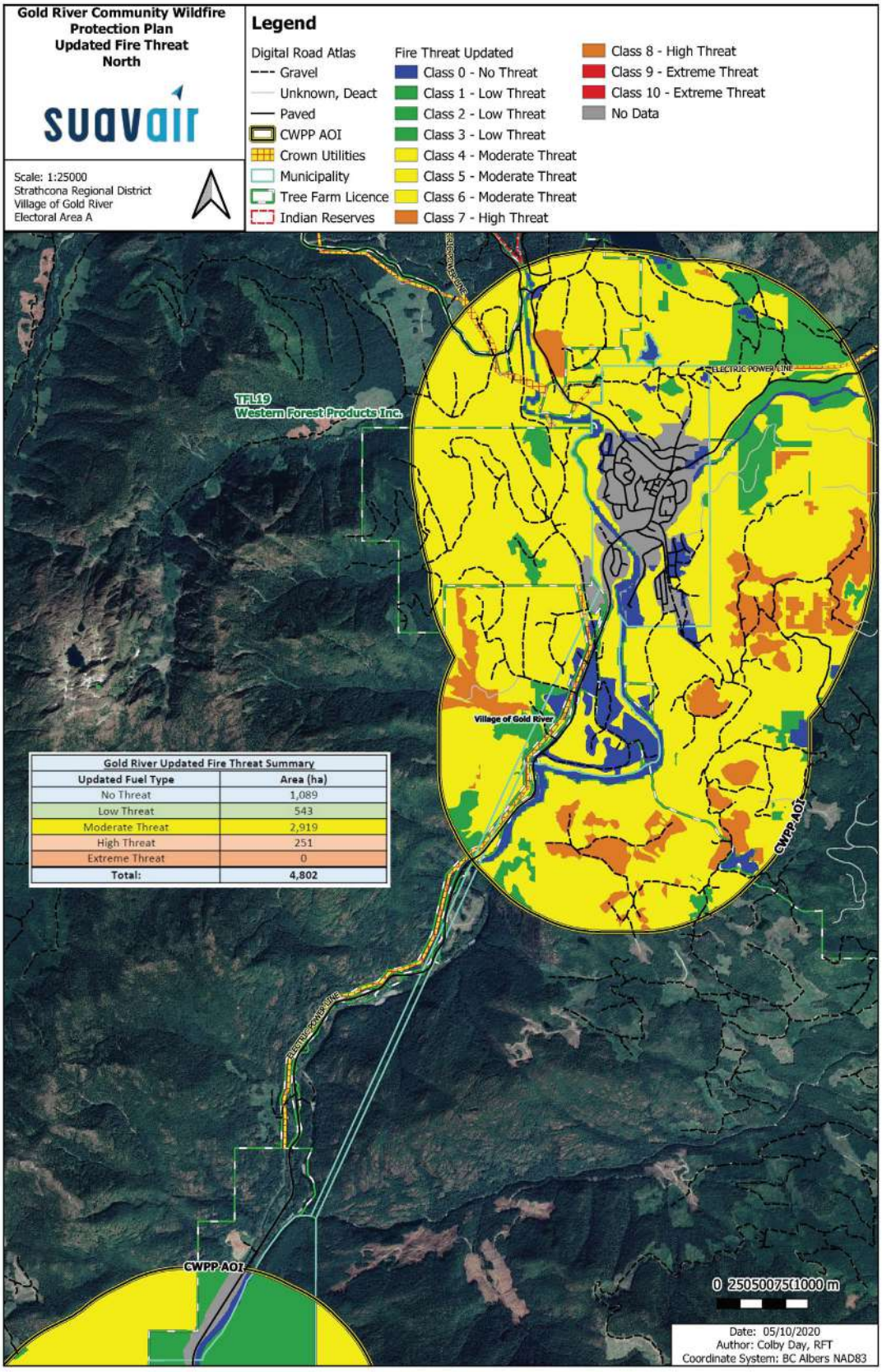
Wildfire Threat Class	2019 PSTA Data		2020 CWPP	
	Area (ha)	% of AOI	Area (ha)	% of AOI
Extreme	157	3%	0	0%
High	104	2%	251	5%
Moderate	2289	48%	2919	61%
Low	312	6%	543	11%
Very Low / No Threat	1938	40%	1089	23%
Total	4801		4801	

4.3.6 Local Wildfire Risk Classification

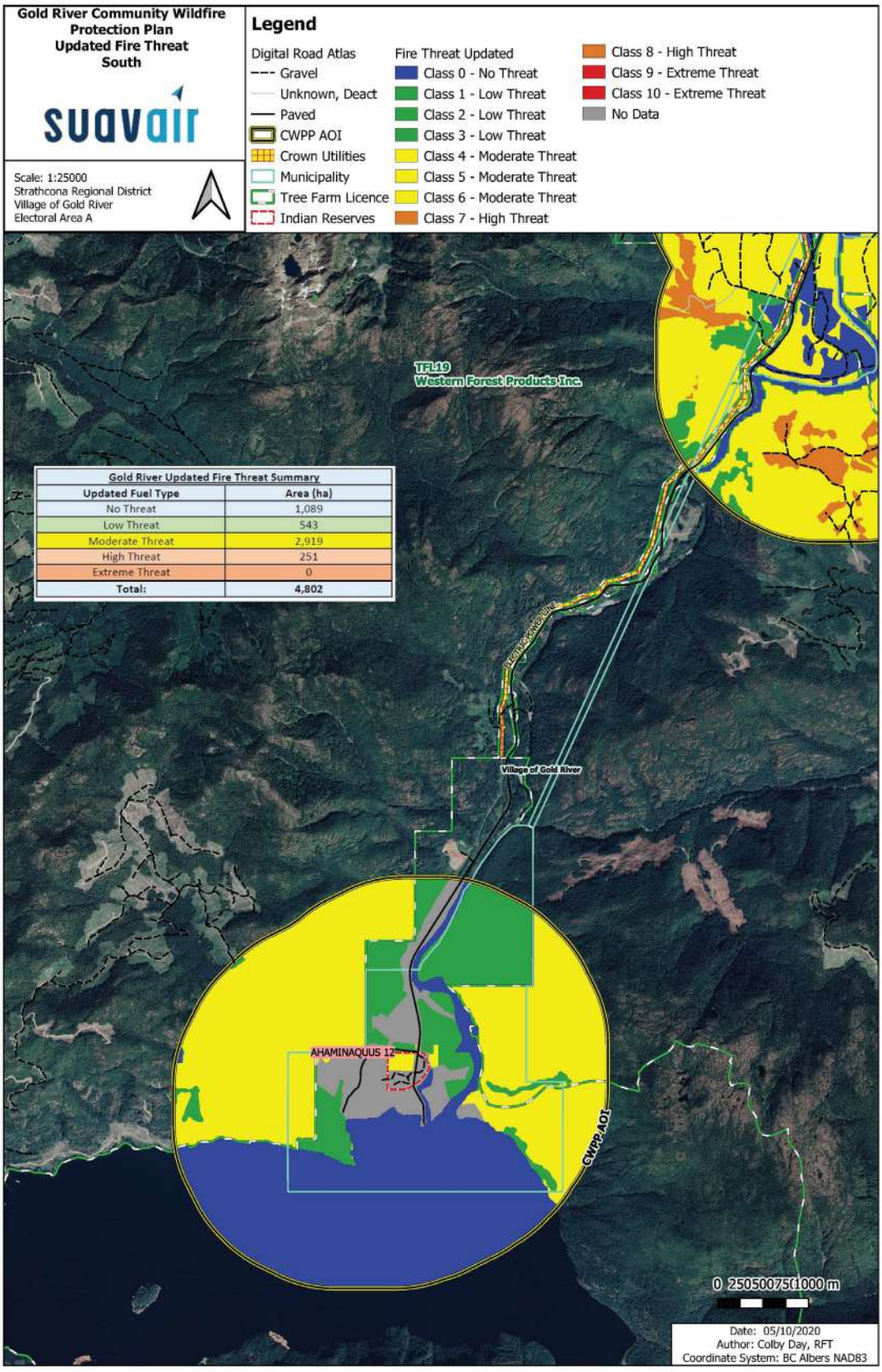
A local wildfire risk classification was completed based on the updates to the fuel type layer and local wildfire threat classification. Proximity to structures/values, fire spread patterns, and topography are the other key determinants of wildfire risk. The detailed wildfire risk assessment process is found in Appendix A1.6 Local Wildfire Risk Classification. Map 9 and Map 10 show the local wildfire risk classification, the areas are summarized in Table 5. Generally, the wildfire risk around the Village core (AOI – North) is Moderate to High, and risk around the old mill site (AOI – South) is Low. Fuels closer to the community are considered higher risk due to proximity.

Table 5. Summary of local wildfire risk classification within the AOI.

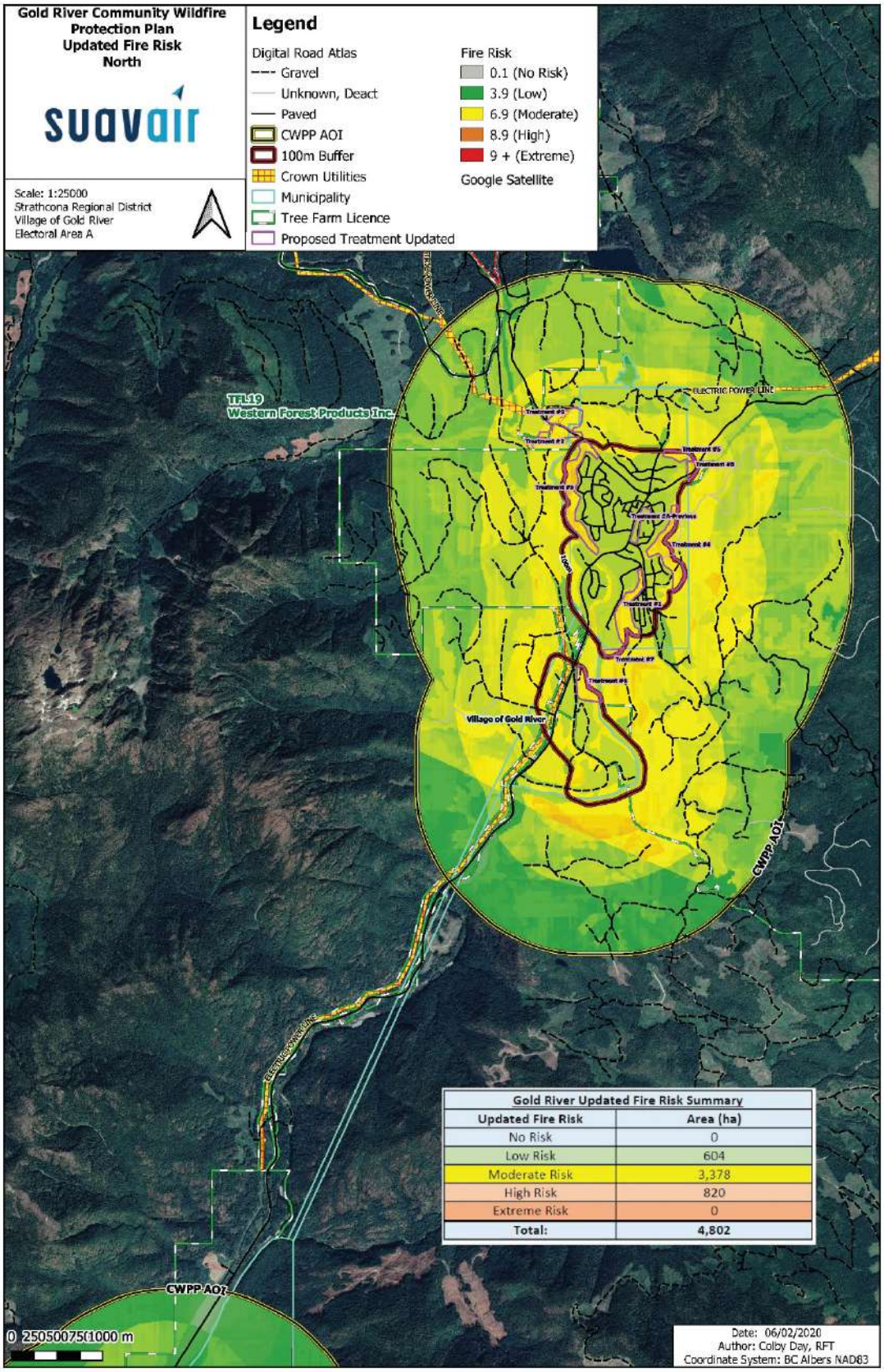
2020 CWPP Local Wildfire Risk Class	Area (ha)	% of AOI
Extreme	0	0%
High	820	17%
Moderate	3378	70%
Low	604	13%
No Risk	0	0%



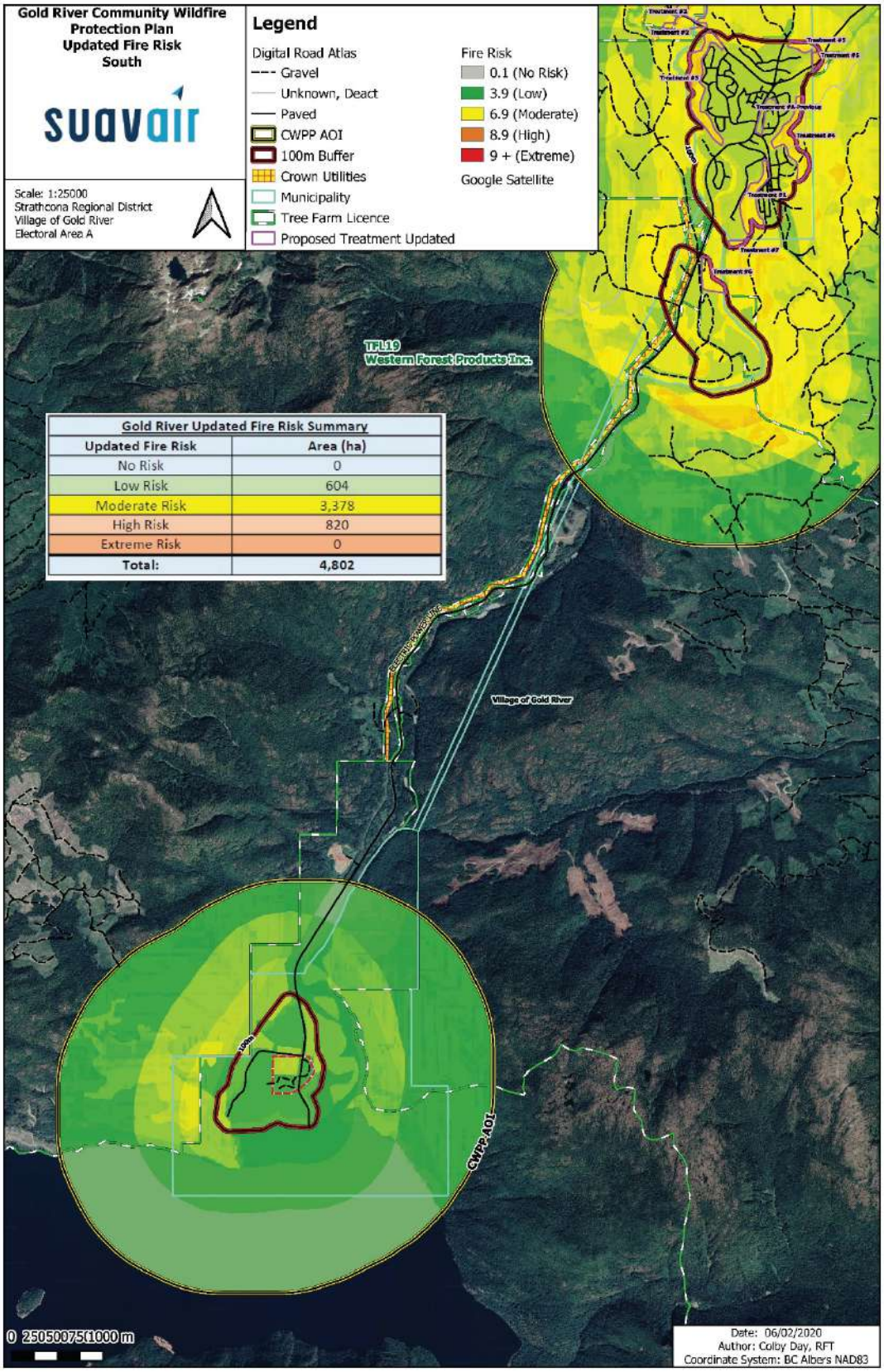
Map 7. Updated local wildfire threat classification, AOI - North.



Map 8. Updated local wildfire threat classification, AOI – South.



Map 9. Local wildfire risk classification and recommended treatment areas, AOI - North.



Map 10. Local wildfire risk classification, AOI - South.

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.[29] Treatment strategies should prioritize surface and ladder fuel changes over canopy changes.[30] 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). Understory thinning of surface fuels and ladder fuels are the main consideration for fuel treatments in moist coastal forests. The vertical arrangement of fuels is an important consideration for fuel treatment prescriptions. In mature coastal forests, the natural canopy crown height is elevated from the forest floor. Without significant surface and ladder fuels, it is less likely that crown fires will occur. Figure 4 and Figure 5 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) are another hazard. Harvested areas dry out faster, dead and down material does not retain moisture and is more susceptible to ignitions. 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 within the WUI. Fuel hazard and hazard abatement associated with forest harvesting on provincial crown land is regulated by the *Wildfire Act* and *Wildfire Regulation.* The tenure holder is responsible for conducting hazard assessments and hazard abatement activities within the timeframes required by legislation.

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[29] 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

[30] Ibid.

Figure 4. An example of how understory thinning can reduce surface and ladder fuels.[31]

Figure 5. The vertical arrangement of ladder fuels can carry a fire from the surface into the forest canopy.[32]

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

[32] Ibid.

5.1.1 Fuel Treatment Areas

This CWPP recommends 7 fuel treatment areas. 5 of the treatment areas are within the first 100m (WUI100) of the wildland urban interface. 2 treatment areas are within 500m (WUI500) of the WUI. 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.

The 2011 CWPP identified a total of 832ha for treatment, of which 127ha was considered Priority 1. Recommendation #32 from the 2011 CWPP was:

"Gold River 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 Gold River 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 10. 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."

In 2012, 1.5ha of municipal land was treated as part of a FireSmart demonstration project near the Village Office. Treatments included understory thinning, pruning, and removal of dead/down material. No other areas are known to have been treated to date. One of the barriers to conducting fuel treatment is land jurisdiction and ownership. 2011 Priority 1 treatment areas include significant portions of Private Land. Fuel management activities require coordination and participation from private landowners and tenure holders.

Figure 6. Highlighted area shows the 2012 FireSmart demonstration project treatment area.

The Village and SRD can support treatments on private land by working with landowners and securing grant funding to pay for activities such as debris disposal. The BCWS North Island Fire Zone may also have crews available to carry out fuel treatment activities during the off season, if included in fuel treatment planning process at an early stage.

Informed by the updated risk analysis, this CWPP update further refines the 2011 recommended Priority 1 treatment areas down to 7 treatment units as shown on Map 11 and summarized in Table 6. Each treatment area requires a site-specific assessment and fuel management prescription that should be completed by a qualified registered professional, or in the case of FireSmart activities, completed by a Local FireSmart Representative.

Table 6. Summary of recommended treatment areas.

Treatment Area	WUI Threat / Risk	Priority	Approx. Area (ha)	Land Ownership	Comments / Rationale
1	High	High	10.2	Private	Mobile Home Park, high risk within WUI100
2	High/ Moderate	Medium	10.5	Crown	BC Hydro Substation, Powerlines; high risk near critical infrastructure
3	High	High	15.0	Municipal	Peppercorn Park / Trail; high risk within WUI100
4	High	High	12.0	Private	Heber River South, high risk within WUI100
5	High	High	3.5	Private / Crown	Ridge, Highway 28; high risk within WUI100
6	Moderate	Medium	5.5	Municipal	Gold Course/WFP office turn off; moderate risk on Municipal lands
7	High	Medium	1.2	Woodlot	Public works yard; high risk within WUI100

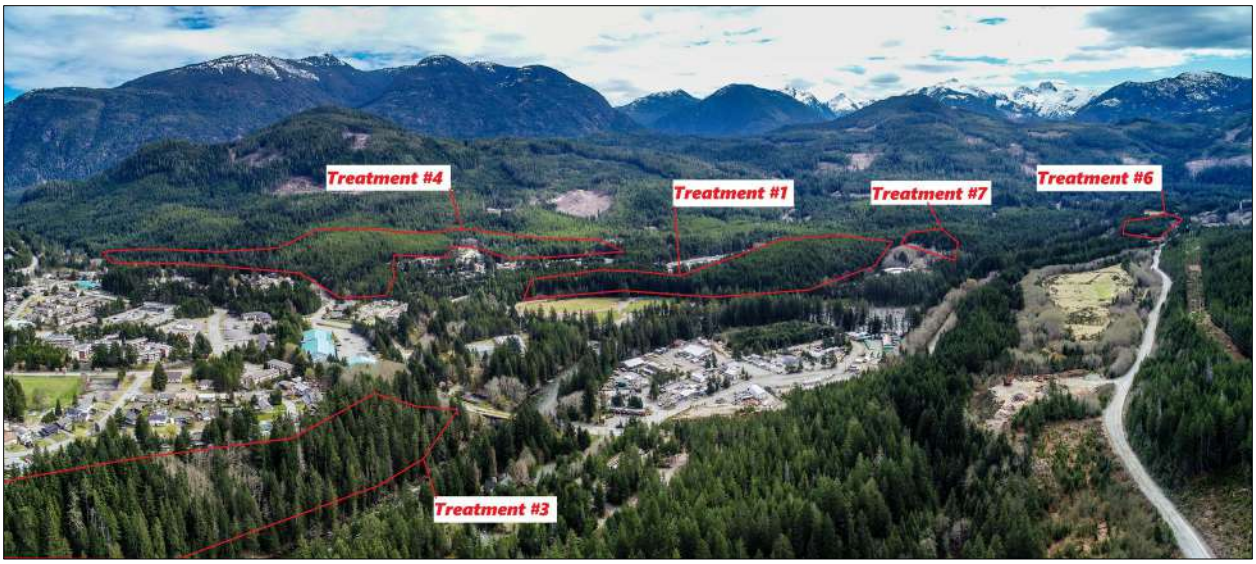


Photo 5. Aerial view of treatment unit areas 1, 3, 4, 6, and 7.

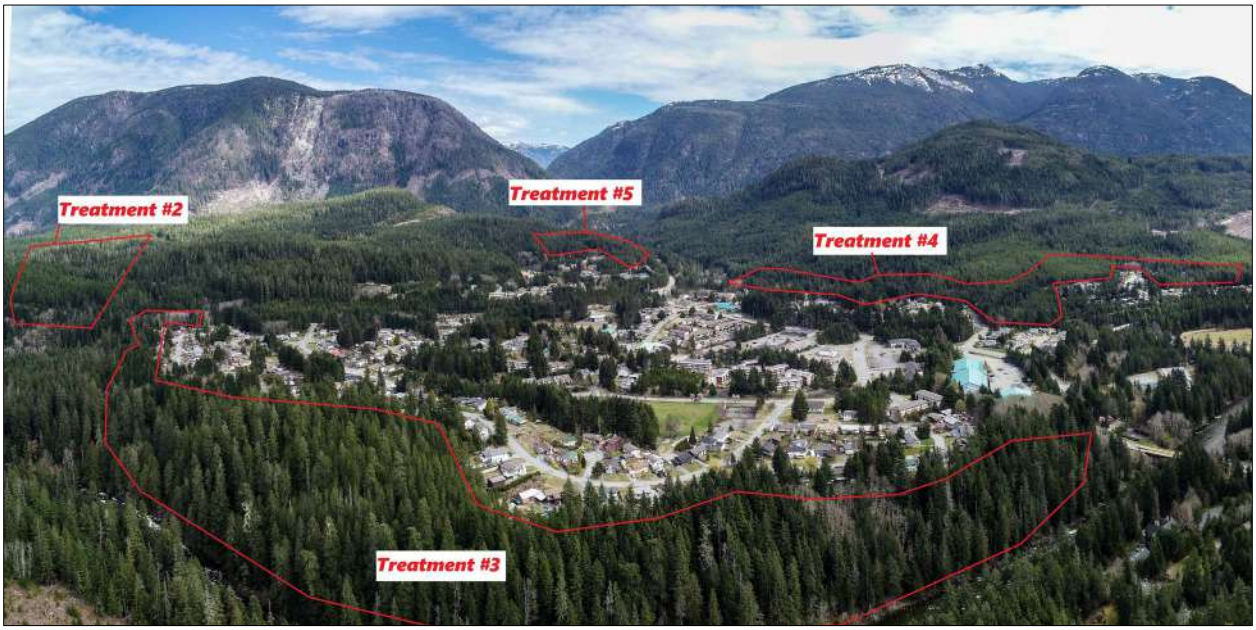
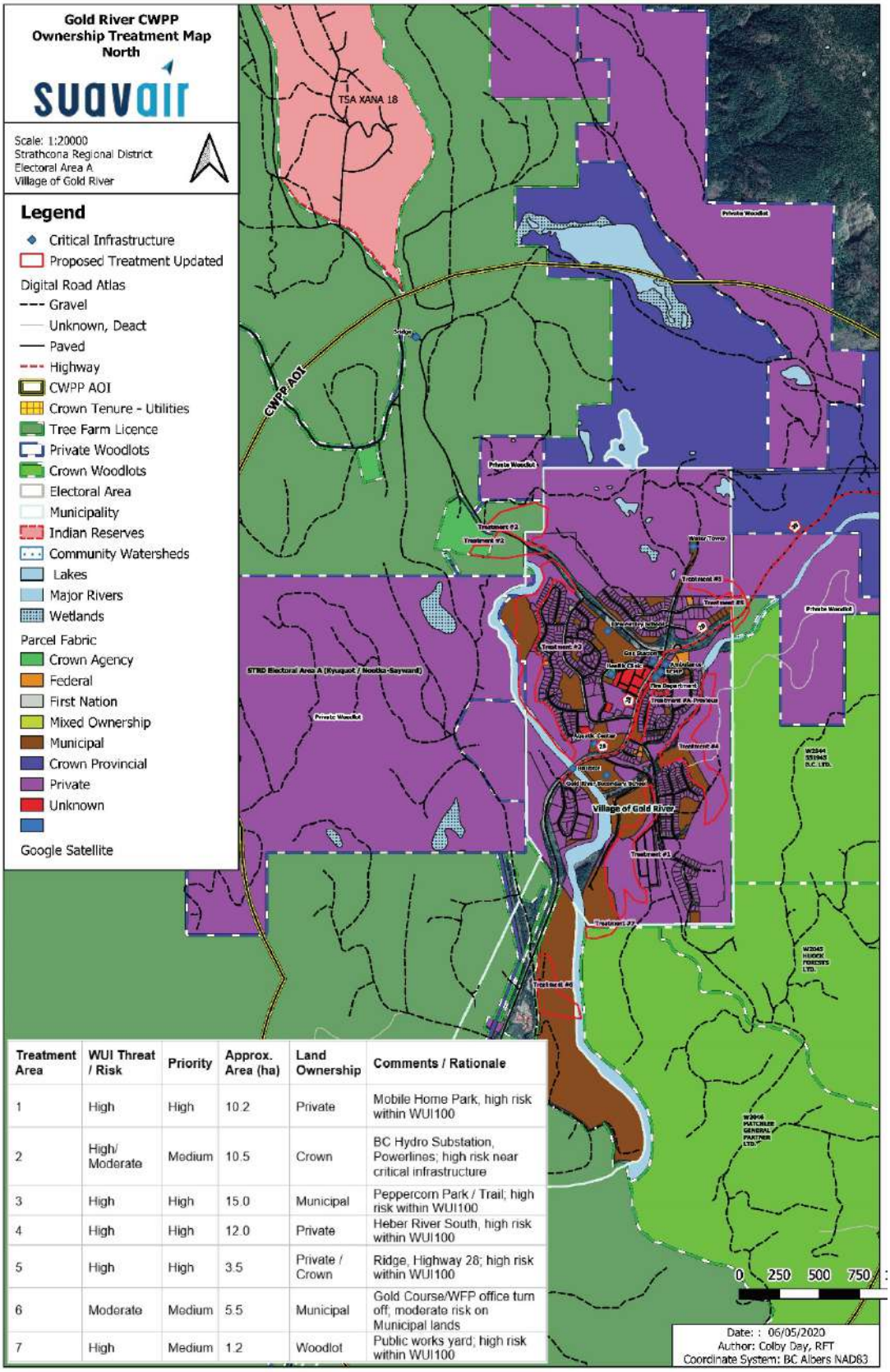


Photo 6. Aerial view of treatment unit areas 2, 3, 4, and 5.



Treatment Area	WUI Threat / Risk	Priority	Approx. Area (ha)	Land Ownership	Comments / Rationale
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2	High/ Moderate	Medium	10.5	Crown	BC Hydro Substation, Powerlines; high risk near critical infrastructure
3	High	High	15.0	Municipal	Peppercorn Park / Trail; high risk within WUI100
4	High	High	12.0	Private	Heber River South, high risk within WUI100
5	High	High	3.5	Private / Crown	Ridge, Highway 28; high risk within WUI100
6	Moderate	Medium	5.5	Municipal	Gold Course/WFP office turn off; moderate risk on Municipal lands
7	High	Medium	1.2	Woodlot	Public works yard; high risk within WUI100

Map 11. Recommended treatment areas and land ownership classes.

Recommendations related to fuel treatment within the AOI:

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
5.	Low	To maintain reduced fuel conditions in previously treated areas.	Previously treated areas should be re-visited every 7-8 years and maintained by collecting/removing dead branches/surface fuels, understory thinning, and pruning where necessary.	Village
6.	High	To reduce fuel hazard in identified treatment units (high risk areas within WUI100) to create residual stand conditions that do not support active crown fire.	Engage a qualified registered professional to develop and implement fuel management prescriptions for the identified treatment areas (Table 6). Where treatment areas are on private land and within 100m of structures (i.e.: within the FireSmart Structure Ignition Zone) a Local FireSmart Representative may be contacted to advise on fuel management treatments.	Village

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.[33]

WUI fires are complex incidents involving both structures and forests. Wildland fires can spread towards the community and structural fires can spread from the community towards the forest. Due to Gold River's relatively 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

[33] 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

shows the WUI disaster sequence where citizens and landowners can act to break the sequence.

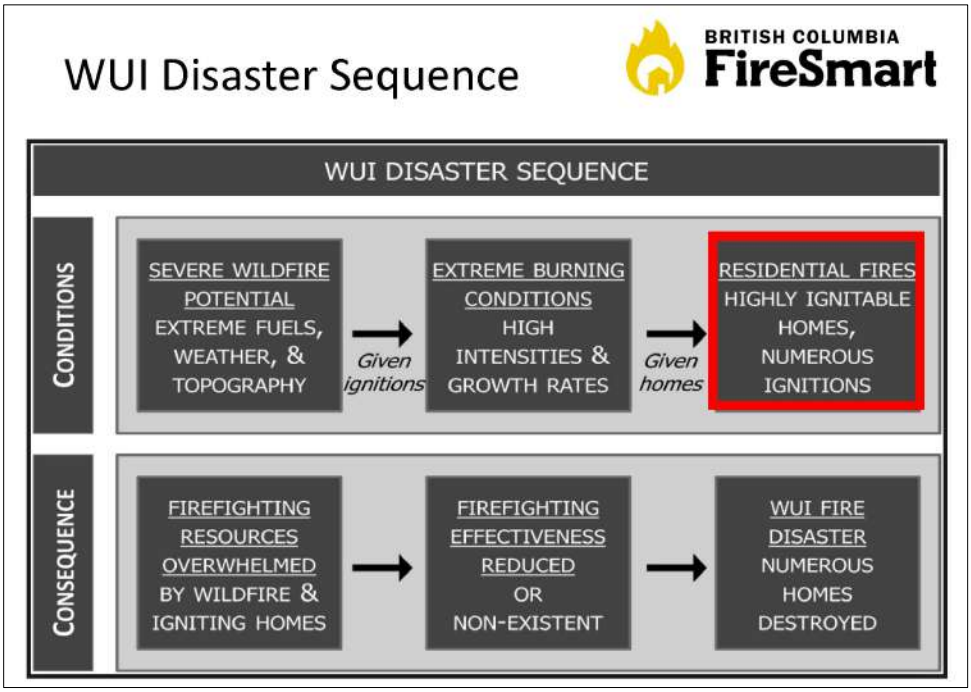


Figure 7. Wildland urban interface disaster sequence and where residents and landowners can break the disaster sequence.

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)[34] are a main determinant of whether a home/structure will be lost due to a WUI fire (Figure 8). Simple actions to modify the SIZ can make a big difference. Figure 9 shows the priority areas for vegetation management within the SIZ, beginning from the structure with the Non-Combustible zone (0-1.5m), Priority 1 zone (1.5-10m), Priority 2 zone (10-30m), and Priority 3 zone (30-100m).

[34] FireSmart Canada. FireSmart Home Ignition Zone. https://www.youtube.com/watch?v=k0ClodnHp2c.

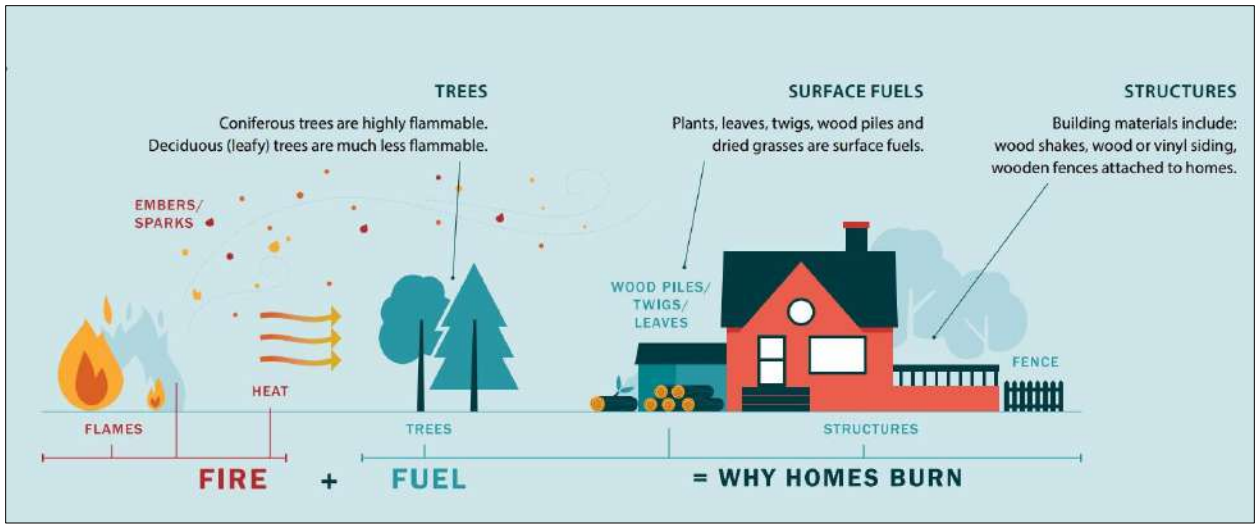


Figure 8. Why homes burn during WUI fire incidents.[35]

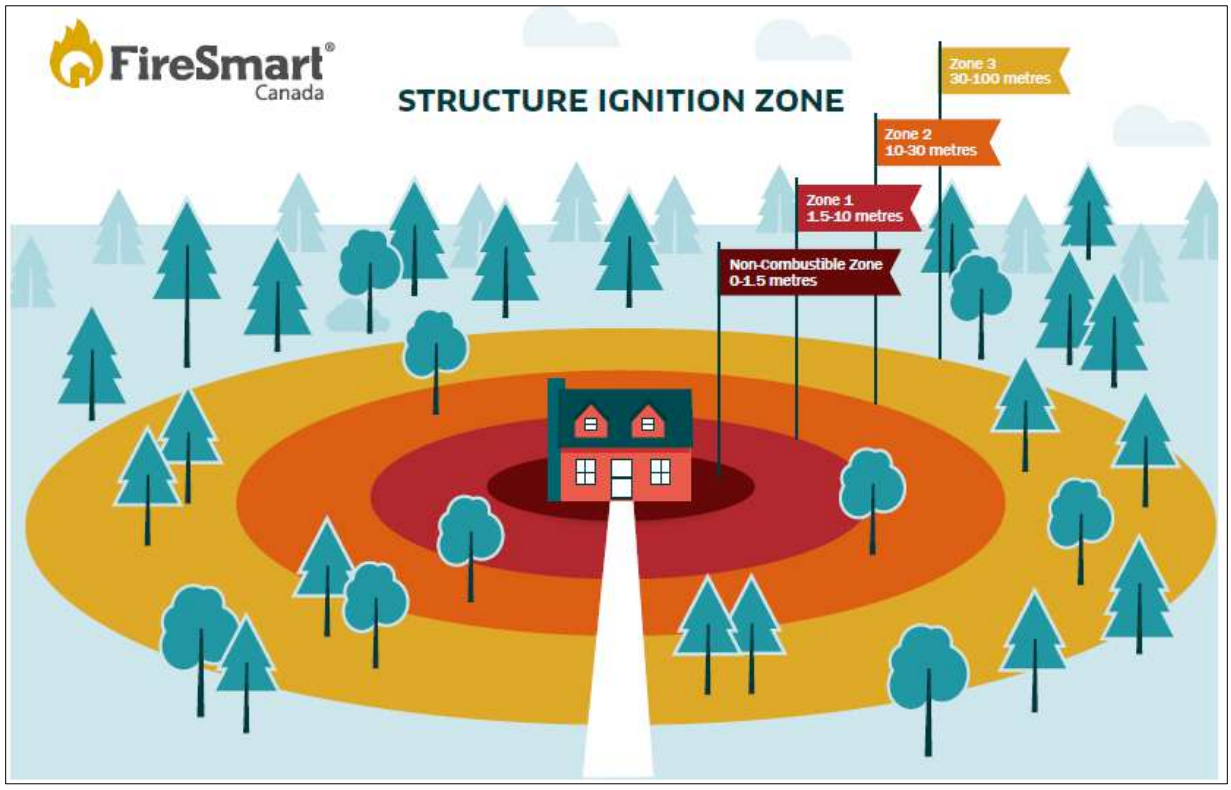


Figure 9. The FireSmart Structure Ignition Zone (SIZ) and priority areas for vegetation management.

[35] 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.[36] 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.[37]

- 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 mangers and businesses can ensure that facilities are constructed and maintained following FireSmart guidelines

Currently, the Village is not a recognized FireSmart Community. One FireSmart demonstration project was completed in 2012; however, there are no other known FireSmart activities taking place in the Village at this time. Moving forward, the GRVFD and Village administration have expressed interest in working towards community recognition over the next few years. The

[36] 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

[37] FireSmart BC. Resources. https://firesmartbc.ca/resources/

Local FireSmart Representative (also the GRVFD Fire Chief) plans to host community FireSmart education and awareness workshops in 2020.

Appendix 3: Example FireSmart Planning Activities outlines a list of potential FireSmart activities that can be adopted by the community. The following is generalized guidance for FireSmart activities within the structure/home ignition zone:

- 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 Manual[38] and/or contacting a Local FireSmart Representative[39].

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 #9: *Gold River 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.*

Recommendation #31: *The majority of the hazardous fuel types in Gold River are located on private property. Gold River should work with private property owners to ensure that they*

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

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

understand the importance and principles of FireSmart. Gold River should investigate ways to support residents reducing fuels, making homes FireSmart and raising awareness of ignition hazards.

Six of seven proposed treatment areas (Table 6) are within the WUI100 and would fall within the structure ignition zone of homes and be included with the FireSmart program. However, this plan recognizes the work to be done by individual homeowners is immense and treatment areas could be more broadly addressed through a site prescription by a qualified registered professional with work carried out by contractors. Homeowners should focus on FireSmart activities within the first two priority zones around their homes or neighbourhoods.

To provide a further starting point, FireSmart priority areas are listed in Table 7, based on the updated risk analysis completed for this plan.

Table 7: Recommended FireSmart Priority Areas.

Area ID	**Wildfire Risk Rating (E/H/M/L)**	**Recommended FireSmart Activities**
Priority Area # 1: Gold River Mobile Home Park / Ucona Ball Field (Treatment Area #1)	High	• Contact a Local FireSmart Representative to conduct a community/neighbourhood hazard assessment. Identify and train a Community Champion to lead a local FireSmart Board.
Priority Area # 2: Critical Public Infrastructure	Moderate	• Contact a Local FireSmart Representative to conduct structure hazard assessments on the Village office/Firehall, BC Hydro substation, and Gold River Secondary School.
Priority Area # 3: Scout Lake, water tower, Ridge, (Treatment Area #5)	Moderate	• Contact a Local FireSmart Representative to conduct a community/neighbourhood hazard assessment. Identify and train a Community Champion to lead a local FireSmart Board.

A complete list of FireSmart related recommendations are found below.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
7.	High	To increase community awareness and engagement in the FireSmart program.	Contact a Local FireSmart Representative to deliver a Local FireSmart Community Champion workshop.	Village and GRVFD
8.	Med	To improve community FireSmart awareness and engage in FireSmart	Contact a Local FireSmart Representative to deliver Public education materials at annual community events (i.e. Gold	Village and/or SRD

		activities.	River Days, Show and Shine, etc.).	
9.	High	To increase community awareness and engagement in the FireSmart program.	Arrange a community maintenance day for the existing FireSmart Demonstration Project area near the Municipal Office.	Village, GRVFD
10.	High	To reduce the vegetation/fuel hazard within the FireSmart Structure Ignition Zone (WUI100).	Contact a Local FireSmart Representative to conduct Community Hazard Assessments starting with the priority areas listed in Table 7.	Village and/or SRD
11.	High	To reduce fuel hazard on private land and provide alternatives to open burning.	Provide off-site debris disposal options such as debris collection or chipper services offered through community chipping days.	Village
12.	Med	To improve public awareness about FireSmart best practices for building material selection.	For new buildings or building permits – Village officials should provide builders information on FireSmart material choices such as those found in the FireSmart Home Development Guide.	Village
13.	Low	To adopt FireSmart practices on municipal lands, municipal and regional district owned infrastructure.	New construction or structural upgrades to roofing, siding, decking, or other parts of Village or SRD buildings to implement the recommendations in the FireSmart Home Development Guide.	Village
14.	High	To work cooperatively with BC Hydro to reduce the fuel hazard around the substation	Work with BC Hydro and have a Local FireSmart representative complete a site hazard assessment on the substation. Implement any recommendations for reducing fuel hazard in substation's structure ignition zone.	GRVFD, BC Hydro
15.	High	To improve community awareness of the FireSmart program.	Encourage residents to complete the free, online, FireSmart 101 course.	Village Administration, SRD
16.	Low	To improve community FireSmart awareness	Deliver FireSmart education program within the K-12 public	GRVFD with

		through education.	school system. Utilize FireSmart Education Kits and the FireSmart BC Education package.[40]	School District Alternatively, contact the BCWS.[41]

5.3 Community Communication and Education

Following the 2018 wildfire season, wildfire risk was at the forefront of public awareness within the community and more generally 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. Education 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 made available to the Strathcona Regional District Emergency Coordinator, Chief Administrative Officer, and Fire Chief 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 the contents of the plan, Gold River Buzz[42], for example

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.

[40] BC FireSmart Education Package. https://firesmartbc.ca/resource-types/education-materials/

[41] BCWS Coastal Fire Centre Directory. https://dir.gov.bc.ca/gtds.cgi?show=Branch&organizationCode=FLNR&organizationalUnitCode=CoFC

[42] Gold River Buzz. https://www.goldriverbuzz.com/

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
17.	High	To make this Plan and its associated maps available to the community.	Upload a digital copy of the CWPP to the Village and SRD Emergency Planning websites	Village and SRD
18.	High	To improve public awareness of wildfire risk and wildfire threat to the community through communication.	Deliver regular communications to community members (flyers, notice boards, emails, social media). Recommend at least one fire related communication per month (bi-weekly during fire season if required). Content of the communications include reminders on FireSmart practices, fire danger ratings, fire bans, fire prevention tips, air quality alerts etc.	Village
19.	High	To improve public awareness of wildfire risk and wildfire threat to the community through communication.	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
20.	High	To improve public awareness of wildfire risk and wildfire threat to the community through education.	Develop a Village specific Fire Safety and Wildfire Preparedness information factsheet (or other media format). Send this as an annual mailout to all Village residences. This pamphlet should include information on Village Bylaws, *Wildfire Regulation* legal requirements, FireSmart principles, emergency evacuation routes, wildfire safety, wildfire reporting, and BCWS resources on fire bans, and air quality.	Village
21.	High	To improve public awareness of wildfire risk and wildfire threat to the community through education.	Organize an annual Community Fire Safety/Wildfire Community Preparedness day. Activities may include checking fire extinguishers and smoke alarms in	Village, GRVFD

			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.	
22.	High	To engage regional operators and industrial stakeholders on the contents and recommendations in this plan.	Share this plan with regional operators and stakeholders including MFLNRORD, forest tenure holders (Western Forest Products Inc., woodlot owners), and BC Hydro. Areas of concern to highlight include the critical importance of minimizing the fuel hazards within cut blocks and along rights-of-way. Continue to work with industrial users to maintain Nimpkish Road as a safe secondary evacuation route.	Village and SRD
23.	Med	To ensure implementation and continual engagement with CWPP.	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 annual action plan of priority items to be worked on for the year.	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
24.	Med	To promote alternative means of yard 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, composting, and xeriscaping.	Village and SRD

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.[43] 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 GRVFD currently has 19 active members and the department is trained to exterior structure firefighting standards. 17 members have completed additional Wildland Forest Firefighter Level 1 training. The department has 2 pumper trucks, a rescue vehicle, and Chief's truck and trailer with the equipment necessary to draft water from designated alternative sources (the Gold River). The primary pumper truck is equipped with a compressed air foam system and has capacity for 1000 gallons of water. The GRVFD does not have any specific WUI fire equipment. Wildland fire equipment would include portable water pumps, backpack pumps, portable water tanks, forestry hose lines/nozzles, hand tools, and personal protective equipment.

In early 2020, the Village worked with an external consultant to review fire suppression water availability, water flow capacity, GVRFD's equipment to ensure the department and Village infrastructure are adequately resourced to serve the community's needs. The results of this review are forthcoming and together with this CWPP will suggest equipment purchases and upgrades.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
25.	Med	To improve wildland fire suppression equipment availability.	Procure wildland fire suppression equipment which includes portable water pumps, hoses, hand tools, back pack pumps, water storage bladders, and personal protective equipment.	GRVFD and Village

[43] 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

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. Water availability for fire suppression outside of the hydrant coverage area is a challenge and water would need to be shuttled, drafted from local sources, or extensive hose lines will need to be laid. There are no usable hydrants at the former mill site and government dock. Hydrant coverage is also limited near the sports fields on Hilke Road. In both cases, water would be drafted from designated areas on the river. The old municipal dump site is also outside of the hydrant coverage area, water would be relayed from the nearest hydrant within the Village network.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
26.	High	To improve water availability for WUI fires or fires in isolated areas outside of hydrant coverage.	Purchase portable water tanks or a water tanker truck to be stored at strategic locations during high fire danger in areas outside of hydrant coverage, or away from designated draft sources. Alternatively engage WFP in a mutual aid agreement for the use of their water tanker trucks for WUI fire incidents.	Village

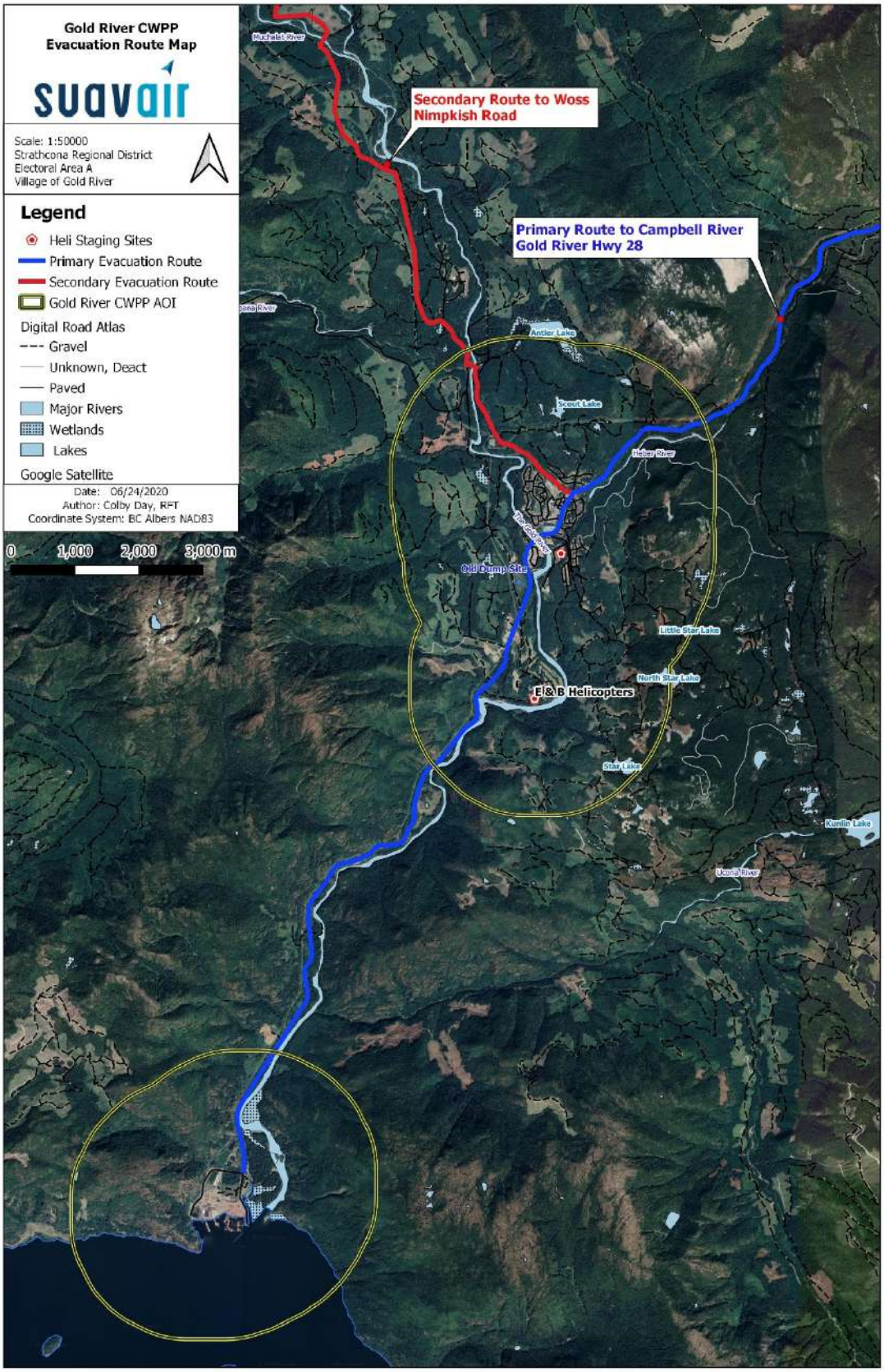
6.1.3 Access and Evacuation

An updated, Village specific, emergency evacuation plan is required (see Recommendation #2). Possible access and evacuation routes (Map 12) are Highway 28 east towards Campbell River, Head Bay Road west towards the Village of Tahsis, and Nimpkish Main Line (industrial road). As a last resort, Highway 28 south of Gold River terminates at the head of Muchalat Inlet where water-based evacuation is possible if sufficient watercraft are available.

Mowachaht/Muchalaht First Nations' Tsaxana community is located to the north of the Village and access is via Wickkinanish Road at the Gold River Road-Head Bay Road junction. The Head Bay Road, Gold River Road, Wickkinanish Road, and Nimpkish Road junction area also serves as an access/evacuation route for Tsaxana Reserve and the Village of Tahsis. The fuels along the corridor of Highway 28, Gold River Road, and Head Bay Road are of particular importance for the maintenance of access and evacuation routes during an emergency.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
27.	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.[44]	Village and SRD

[44] Strathcona Regional District. Connect Rocket Sign Up. https://strathconard.connectrocket.com/



Map 12. Main evacuation routes for the Village of Gold River and Tsaxana.

6.1.4. Training

Ongoing training opportunities for the GRVFD are critical to building capacity for WUI fire suppression and emergency management at the local level. It is essential to have core knowledge developed through certification in courses, but also maintained through refresher courses and ongoing practical experience. Inter-agency cross-training exercises can be a meaningful way to share experience, improve capacity, and strengthen relationships. Cross-training and joint mock exercises (table-top and practical) should include the BCWS, Tahsis Fire Rescue Department, and SRD as participants. Relevant training courses are listed in Appendix 4: Wildfire and Emergency Response Training Courses. All recommendations related to Training are listed in the table below.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
28.	Med	To maintain sufficient volunteer fire department personnel to respond to emergencies.	Continue recruitment efforts for Gold River Volunteer Fire Department to ensure adequate personnel are trained and available to respond to WUI incidents	GRVFD, Village
29.	High	To ensure all GRVFD members are trained to wildland firefighting standards.	Ensure all members of GRVFD complete Wildland Forest Firefighter Level 1 (SPP-WFF 1) training. SPP-115 and ICS100 training is also recommended.	GRVFD
30.	Med	To maintain and improve communication with BCWS.	In conjunction with BCWS and Tahsis Fire Rescue Department, coordinate to conduct joint annual mock exercises, where information and technical/practical knowledge are shared, such as: fire line construction, pump operations, sprinkler protection, portable water tank deployment, and wildland hose operations.	GRVFD, SRD with BCWS
31.	Med	To maintain and improve communication across agencies and jurisdictions.	The SRD should arrange an annual meeting, prior to fire season, to include BCWS – North Island Fire Zone, EMBC, and local fire department representatives to review incident command structure and emergency support services in the event of a WUI fire. Recruit community members to take ESS training	SRD

6.2 Structure Protection

The Village currently does not have sprinkler kits or a structural protection unit (SPU). The nearest SPU is with Campbell River Fire Department. The Village and SRD should ensure the required service/mutual aid agreements are in place with the City of Campbell River for assistance and deployment of the SPU in WUI emergencies. The GRVFD also responds to emergencies within the Mowachaht/Muchalaht First Nations' community at Tsaxana. The structural protection equipment available with the Mowachaht/Muchalaht First Nations is not known.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
32.	High	To improve equipment availability for structure protection.	Engage the City of Campbell River in a mutual aid agreement for the deployment of the structural protection unit in specified WUI fire emergencies.	Village
33.	Low	To improve equipment availability for structure protection in the event of WUI fires.	Engage Tahsis Fire Rescue Department and Mowachaht/Muchalaht First Nations, on potential for cost sharing and purchase of a Structural Protection Unit for shared use.	Village with SRD support
34.	Low	To improve equipment availability for structure protection.	Purchase sprinkler kits for public infrastructure and encourage residents to purchase sprinkler kits for their homes. Training on set up and operational use is just as important has having the equipment readily available. Potential for the GRVFD to provide community training on how to set up kits around homes.	GRVFD, 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 & Hinks[45] have applied the CFFDRS/FBP fuel types to the BC context and these fuel type descriptions are used to prepare 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). These findings have been incorporated into the present fuel typing scheme*

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

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)[46]

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 DESCRIPTION[47]	BC PSTA DESCRIPTION[48]	LOCAL DESCRIPTION	EXPECTED WILDFIRE BEHAVIOUR UNDER HIGH FIRE 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, low to moderate down woody fuel, tree crowns extend nearly to the ground.	Mid-elevation hybrid spruce stands	Does not occur within the AOI	Crown fire, high to very high fire intensity and rate of spread

[46] 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.

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

[48] 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.

	Moderately well stocked black spruce stands, bogs excluded.			
C-3	Mature jack or lodgepole pine. Continuous feather moss, sparse conifer understory, sparse down woody fuels. Fully stocked. Ladder fuels absent.	Pure and mixed Fd stands 4-12m tall; dense pure or mixed (100% conifer) dominated by Cw, Yc, Hw and 4-15m in height or >15m and <60 years old. Dense pole sized stands[49].	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 the ground. Moderately well stocked mixed wood stands.	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.
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-	Slash types may over	Recently harvested	Moderate to high

[49] 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.

	Hemlock-Douglas-fir Slash.	predict hazard in areas where slash hazard reduction has occurred (burning, piling, or site preparation)	cut blocks less than 5 years old.	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 fire 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 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.

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.

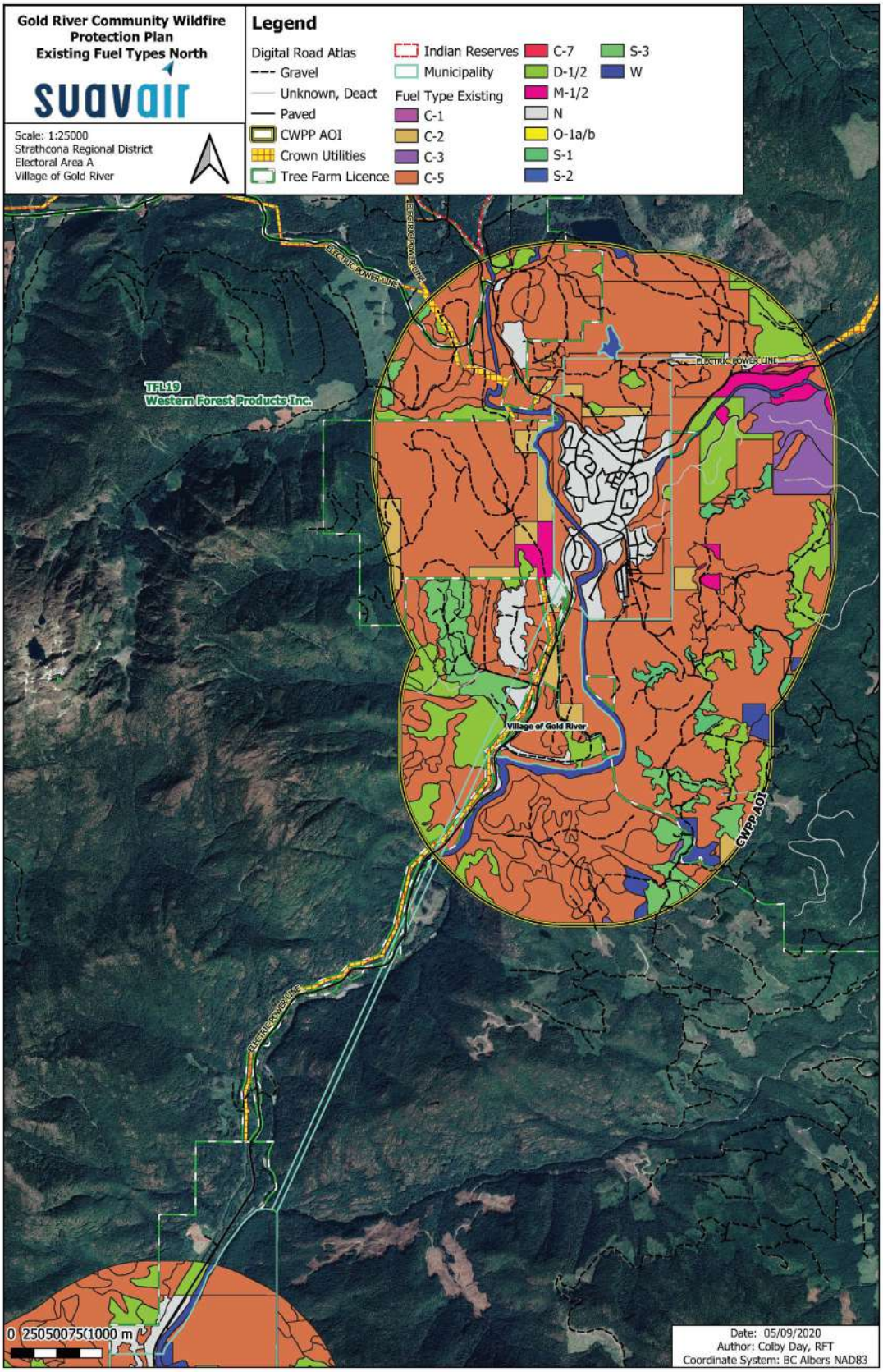
6. Major disturbances (harvesting, wildfires, or land clearing for industrial purposes).
7. C7 fuel types with high Crown Closure.

The 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., updated Google Earth imagery, was analyzed for fuel type verification and adjustments. The major changes to the fuel type layer that resulted within the AOI included:

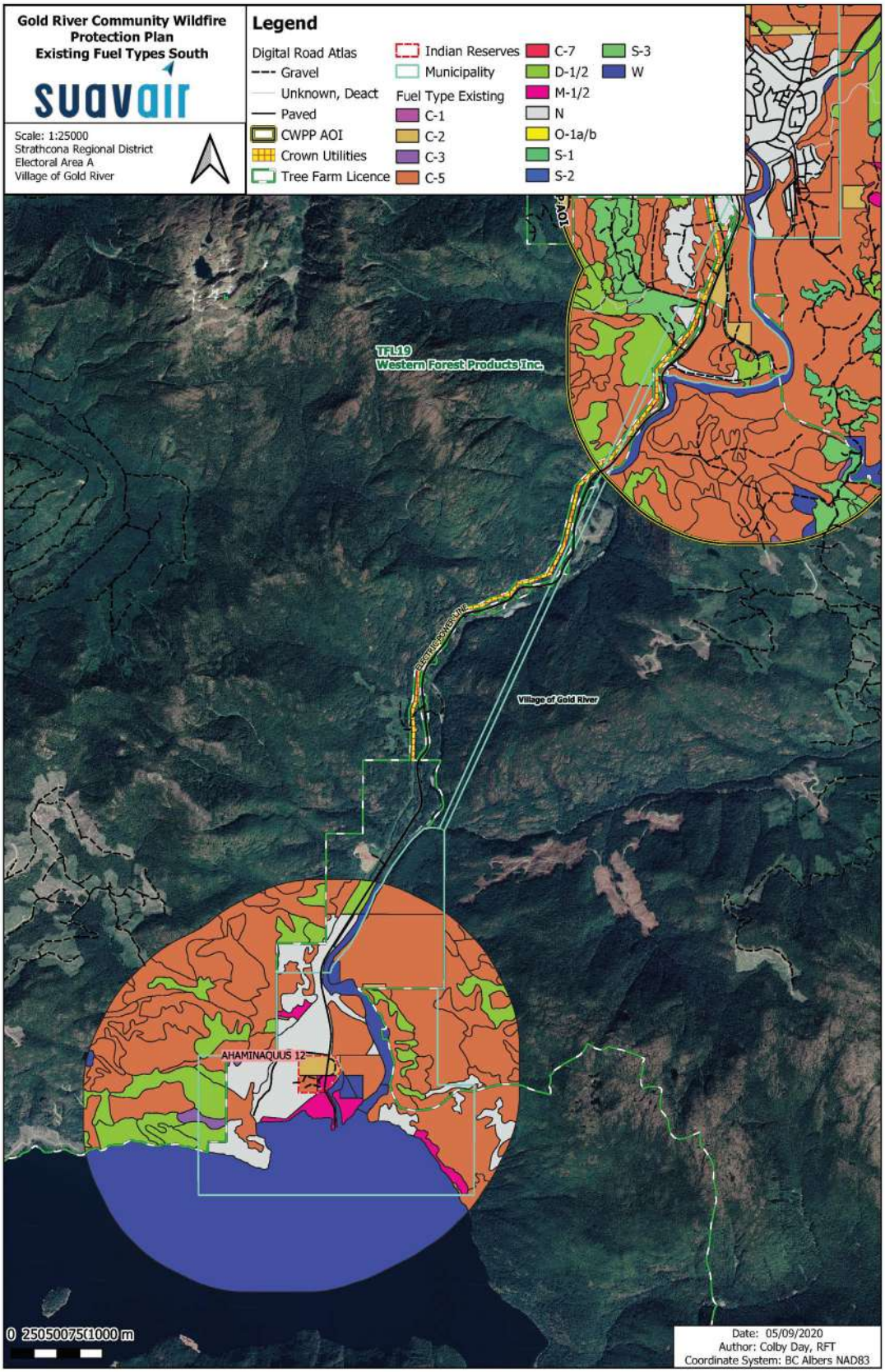
- recently harvested cut blocks (less than 5 years) were changed to fuel type S-3,
- water areas were corrected with more accurate spatial data sources,
- harvested blocks older than 5 years, coniferous, dense pole sized stands over 4m tall, less than 60 years old, were updated to C-3 fuel type
- non-fuel areas re-classified

Table 10. Summary of fuel type layer changes.

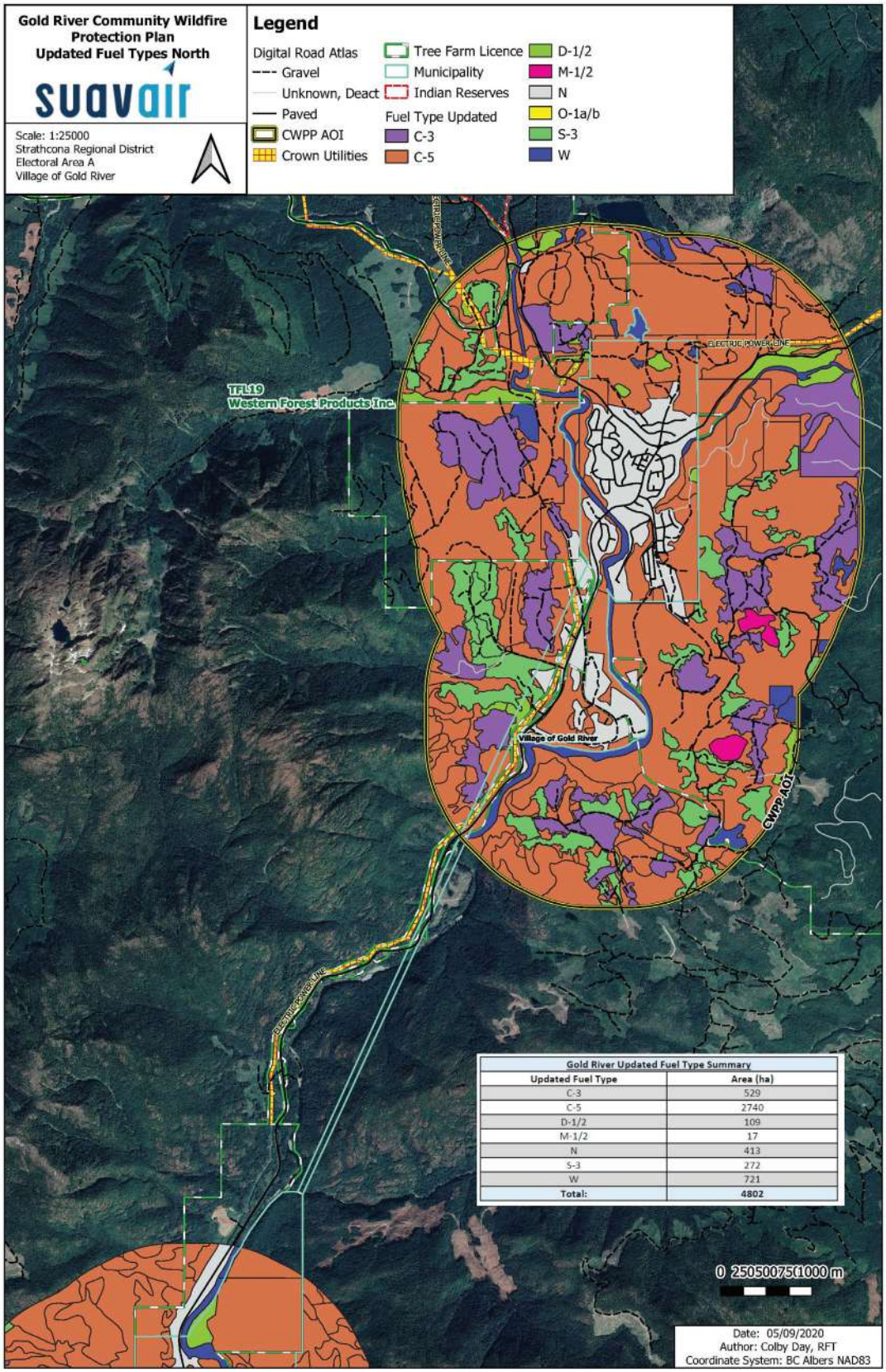
Fuel Type Class	2019 PSTA Original Area (ha)	2020 CWPP Update Area (ha)	Net Change (ha)
C-2 (mid-elevation interior spruce)	107	0	-107
C-3 (dense, pole sized coniferous forests)	92	529	+437
C-5 (mature coniferous forest)	2817	2740	-77
S-1 (recent harvest)	38	0	-38
S-3 (recent harvest)	124	272	+148
D-1/2 (deciduous)	438	109	-329
M-1/2 (mixed conifer/deciduous; amabilis fir leading)	81	17	-64
W (Water)	716	721	+5
Non-Fuel	387	413	+26
Total area	4801	4801	



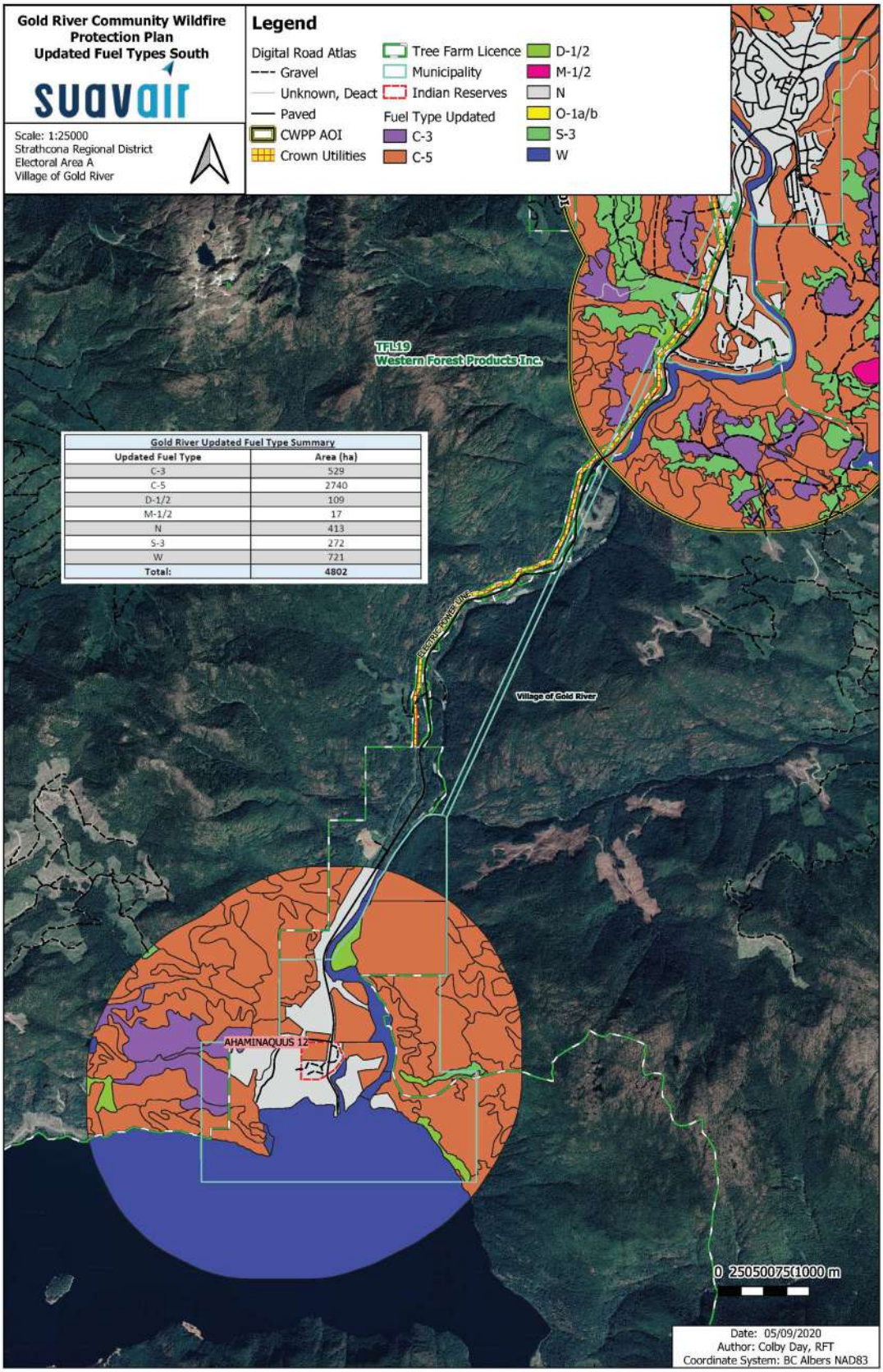
Map 13. Existing 2019 PSTA fuel types, AOI – North.



Map 14. Existing 2019 PSTA fuel types, AOI - South.



Map 15. Updated fuel types, AOI - North.



Map 16. Updated fuel types, AOI - South.

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

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

A1.3 Fire Spread Patterns

Wind speed, wind direction, and fine fuel moisture condition influences wildfire trajectory and rate of spread. Wind data is summarized in the ISI Rose(s) from the local representative BCWS weather station – Woss Camp from 1996-2015 (Figure 10). Wildfire that occurs upwind of a value poses a much more significant threat to that value than a fire that occurs downwind. The wind rose indicates winds are predominantly from the northwest during summer months (June, July, August) but can also originate from the southeast and east during spring/fall months (April, May, September, October).

Another source for wind data is the Canadian Wind Atlas (CWA). The CWA models wind speeds and direction from large scale and long-term atmospheric data. The CWA data for the AOI shows dominant winds in the summer months (June, July, August) from the north. This information is considered more representative of actual conditions within the AOI. Figure 11 represents Wind Roses at 50m, the frequency distribution of wind by sector for the Gold River area, Latitude = 49.77, longitude = -126.05. Available from http://www.windatlas.ca/maps-en.php.

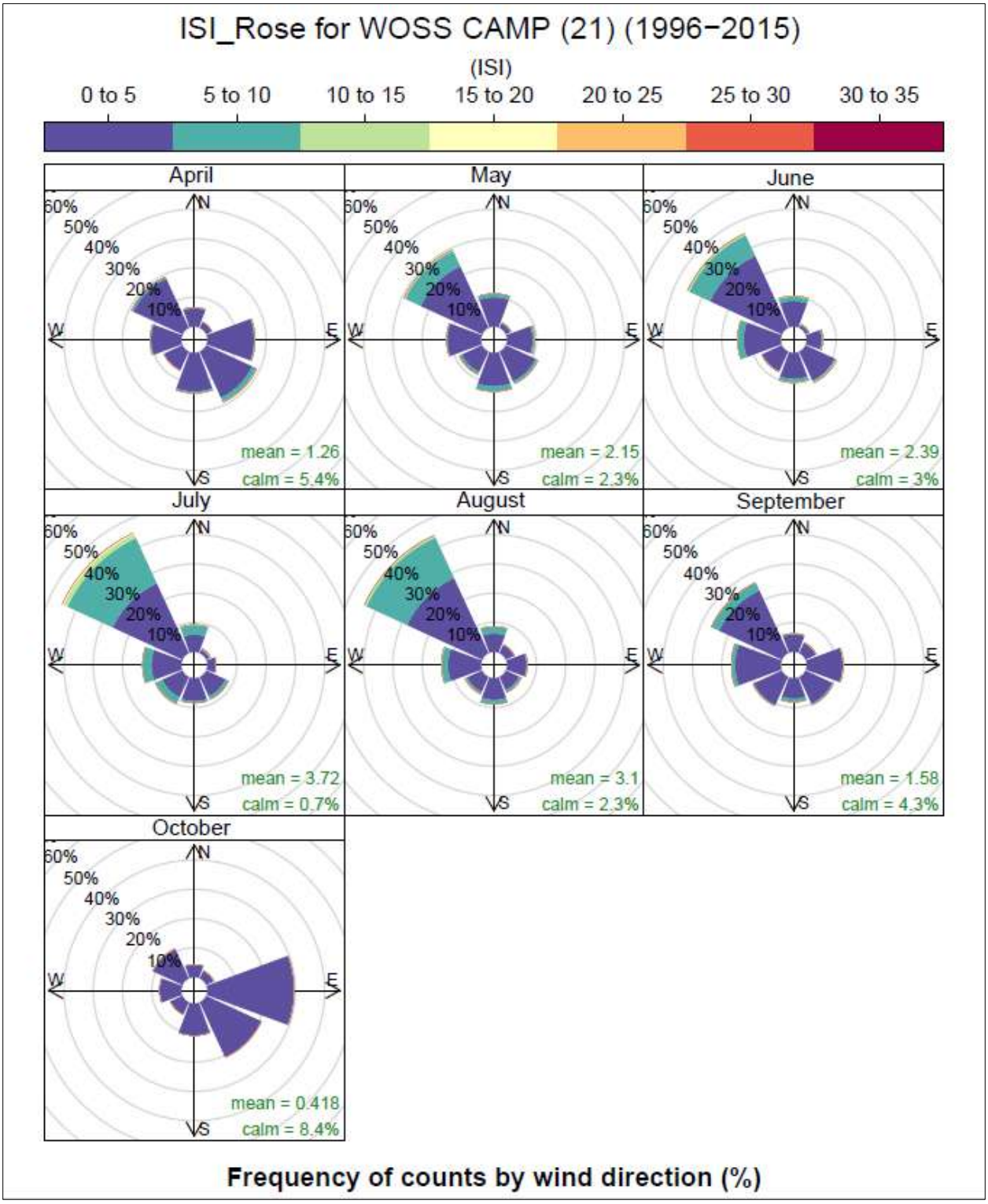


Figure 10. Initial spread index rose for Woss Camp weather station, April to October, 1996-2015.

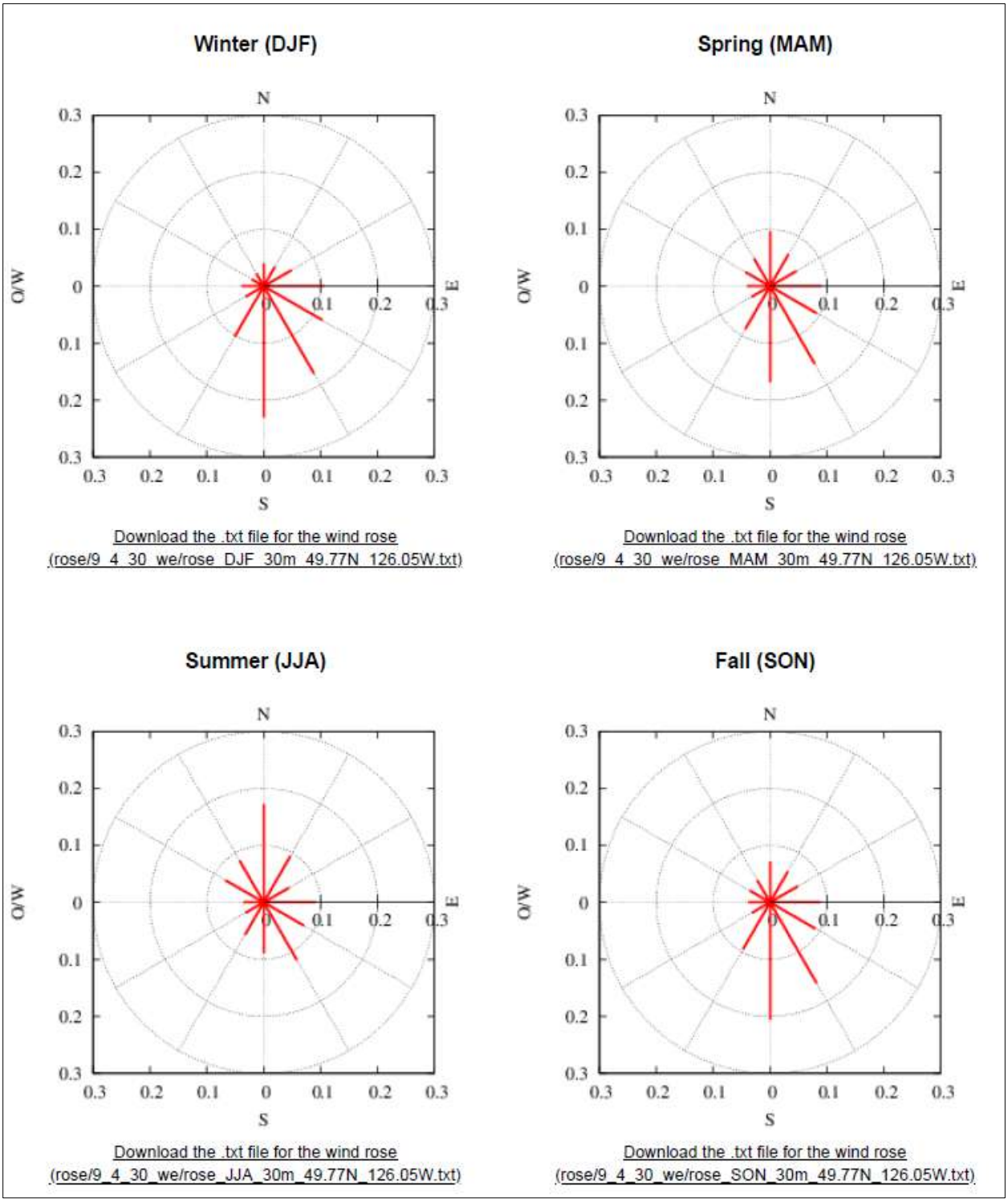


Figure 11. Canadian Wind Atlas wind frequency roses for the Gold River area.

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.

Determine the values' location relative to the slope (bottom, mid-slope on a bench, mid-slope on a continuous slope, upper 1/3 of slope). When different portions of the community are in different relative slope positions, assess the portions separately. General fire behaviour implications of slope position to the value are summarized in the following table:

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

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

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 3	10.1 – 15 Low
Class 2	5.1 – 10 Low	Class 4	15.1 – 21 Moderate
Class 5	21.2 – 27 Moderate	Class 6	27.1 – 33 Moderate
Class 7	33.1 – 40 High	Class 8	40.1 – 47 High
Class 9	57.1 – 55 Extreme	Class 10	55.1 – 81 Extreme

A1.6 Local Wildfire Risk Classification

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

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

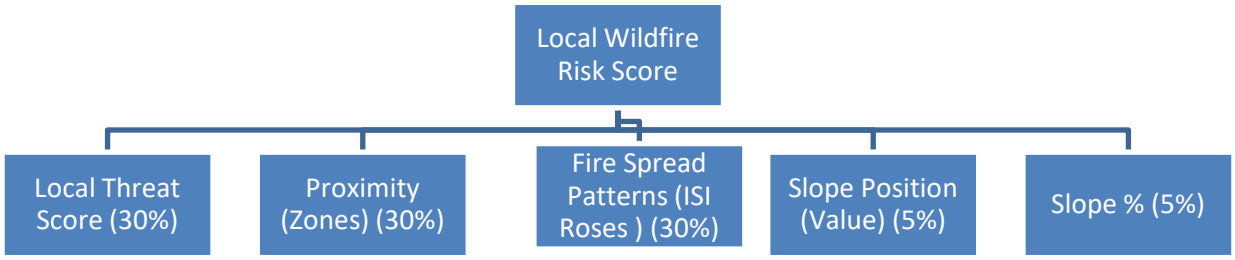


Figure 12: Local Wildfire Risk Inputs

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

Table 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

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+

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

A1.7 Summary of Fire Risk Classes

No Risk (Gray): The combination of the local fuel hazard (usually PSTA Class 0 or 1), weather influences, topography, proximity to the community, fuel (non-fuel) position in relation to fire spread patterns, and known local wildfire threat factors make it a no risk for threatening a community. These areas are non-fuel or sparsely vegetated and will not support spreading fires, and any patches of vegetation will usually self-extinguish. 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	Gold River 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.	Some aspects adopted. Ongoing FireSmart education in the school district occurring
2	Gold River 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 completed. Town is working on creating communication procedures in the town through a combination of online and print techniques.
3	Gold River 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 completed but not practical due to limited new development within Gold River
4	The standard for website information about fire should include an outline of community fire risks and fire danger. Information should include fire bylaws, campfire bans, and wildfire hazard ratings updated during the fire season. 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.	Ongoing - Gold River developing a new website and social media communications
5	Gold River should use the Record (an independent newspaper serving the North Island) to communicate fire danger to the community. They should continue to use this and other local media such as pamphlet mail outs to deliver FireSmart educational materials and to communicate information on fire danger during periods of high and extreme fire danger. Gold River Visitor Centre should be used to communicate fire danger and fire restrictions to tourists visiting the area.	No longer applicable - The Record ceased publication in 2014. Village now operates various social media accounts for communication.

6	Signage consisting of current fire danger and campfire bans should be posted along main routes in Gold River.	Completed - fire danger sign at Highway 28 junction maintained / operated by BC Wildfire Service / FLNRO.
7	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.	Ongoing
Structure Protection		
8	Where homes and businesses are built immediately adjacent to the forest edge, Gold River and the SRD should consider incorporating building setbacks into bylaw with a minimum distance of 10 m when buildings border the forest interface.	Not completed - Zoning Bylaw #706 was updated in 2018 without this implemented
9	Gold River 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 completed. Carried forward in 2020 recommendations.
10	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 areas, incentives such as exclusion from a fire protection tax, and education.	Not completed. Carried forward in 2020 recommendations.
11	Gold River 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.	Not completed but not practical.
12	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.	Not applicable - SRD does not have a Building Policy Branch and there is

		not a plan to develop one
13	While there is currently little development occurring in Gold River, 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.	Ongoing - CAO and Fire Departments reviews all new subdivisions
Emergency Response		
14	A formal communication structure should be established with the MFML so that information regarding fires in the region is communicated to Gold River in a timely manner. This might be best achieved through joint cooperation with the SRD, other SRD municipalities and the MFML.	Completed / Ongoing
15	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.	Not completed. Carried forward in 2020 Recommendations.
16	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 in order to identify and correct deficiencies and provide safe, efficient egress for the community.	Partially completed - Roy Watkins Elementary School identified in Tsunami Plan as Marshalling Point. Community would benefit from formal Fire Evacuation Plan
17	Gold River and Tsaxana Reserve should coordinate evacuation planning in the event of a wildfire. The use of the waterfront at the terminus of Gold River Hwy as a marshalling point and evacuation centre via boats and barges should be reviewed. This is vital to ensure that evacuation procedures and limitations are identified and addressed prior to a wildfire event.	Not completed - No official wildfire evacuation plan / route developed.
18	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.	Not completed
19	Gold River 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 to Matchlee Dr.).	Not completed

20	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.	Ongoing - CAO and Fire Department reviews all new subdivisions
21	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 around the subdivision should be part of the design.	Ongoing - CAO and Fire Department reviews all new subdivisions. Community would benefit from formal Fire Evacuation Plan
22	During a large wildfire it is possible that critical infrastructure within Gold River could be severely impacted by smoke. It is recommended that contingency plans be developed in the event that smoke causes evacuation of the community's incident command centres. Gold River 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.	Jurisdiction issue. If EOC is impacted by smoke, then likely the whole Village will need to be evacuated, then EMBC will take control.
Training / Equipment		
23	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.	Completed / Ongoing
24	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. This could be coordinated with Tahsis and Zeballos.	Ongoing - EMBC sets the structure and village works with SRD
25	The SRD and Gold River should seek funding to acquire a 4x4 truck with compressed air foam (CAF) system for accessing and fighting wildfires in areas such as the Scout Lake area that are within village boundaries.	Not completed / Ongoing - Requires further research by the Village of Gold River on liability / cost sharing

26	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 firefighting tools. Hoses, pumps and other equipment should be compatible with MFML wildland firefighting equipment.	Not completed. Carried forward in 2020 recommendations.
27	The Fire Department should seek funding to purchase a sprinkler kit to erect in the Village during a wildfire event or to be incorporated in a mobile equipment cache. http://www.ubcm.ca/assets/Services~and~Awards/Documents/structural-protection-units-technical-specifications.pdf	Not completed. Carried forward in 2020 recommendations.
28	Gold River should consider working with Zeballos, Tahsis and the SRD to coordinate the creation of a sub-regional mobile cache of wildland firefighting equipment (i.e. one cache for Gold River, Tahsis and Zeballos). This would reduce the cost of purchasing and maintaining the cache and provide additional resources in the event of a wildfire.	Not completed / No longer applicable - Distance, response times, access makes this not practical.
29	Gold River should continue to encourage long-term and new residents to join the volunteer fire department using the Gold River website, mail outs and the Record to encourage residents to join. It is acknowledged that demographics make this increasingly difficult in Gold River.	Ongoing. Carried forward in 2020 recommendations.
30	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.	Not applicable
Training / Equipment		
31	The majority of the hazardous fuel types in Gold River are located on private property. Gold River should work with private property owners to ensure that they understand the importance and principles of FireSmart. Gold River should investigate ways to support residents reducing fuels, making homes FireSmart and raising awareness of ignition hazards.	Ongoing. Carried forward in 2020 recommendations.
32	Gold River 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 Gold River 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 10. 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	Partially completed – 1.47 hectare demonstration fire smart forest was thinned with vegetation management in 2012 adjacent to the Village Office.

	prescription.	
33	Gold River 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 governments from within the SRD.	Not completed / not practical for lobbying although ongoing treatment for Scotch Broom along highway should be considered in future
34	Gold River should work with BC Hydro to ensure that: 1) transmission infrastructure can be maintained and managed during a wildfire event; and 2) the right-of-way vegetation management strategy includes consultation with the community and the Fire Department so that wood waste accumulations or vegetation do not contribute to unacceptable fuel loading or diminish the ability of the right-of-way to act as a fuel break.	Not completed. Carried forward in 2020 recommendations.

APPENDIX 3: EXAMPLE FIRESMART PLANNING ACTIVITIES

FOCUS AREA	EXAMPLE ACTIVITIES
1. EDUCATION	• Develop and/or promote local FireSmart educational activities and tools. Refer to BC FireSmart Resources for FireSmart materials that are currently available. • Develop and/or promote education for the reduction of human-caused fires • Encourage active participation in Wildfire Community Preparedness Day • Organize and host a community FireSmart day, FireSmart events and workshops, and wildfire season open houses • Apply for FireSmart Canada Community Recognition
2. PLANNING	• Develop or update a CWPP • Develop policies and practices for design and maintenance of FireSmart publicly owned land and First Nations land, such as parks and open spaces • Develop policies and practices for design and maintenance of FireSmart publicly owned buildings • Conduct site visits and FireSmart and/or risk assessments for publicly owned lands, First Nation lands and publicly owned buildings
3. DEVELOPMENT CONSIDERATIONS	• Amend Official Community Plans, Comprehensive Community Plans and/or land use, engineering and public works bylaws to incorporate FireSmart policies • Revise landscaping requirements in zoning and development permit documents to require fire resistant landscaping • Establish Development Permit Areas for Wildfire Hazard in order to establish requirements for the exterior design and finish of buildings[50] • Include wildfire prevention and suppression considerations in the design of subdivisions (e.g. road widths, turning radius for emergency vehicles, and access and egress points) • Amend referral processes for new developments to ensure multiple departments, including the fire department and/or emergency

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

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

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

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

APPENDIX 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 RECURRENCY (ALSO KNOWN AS S-10A)	Refresher training for those with valid S100 training	0.5 day classroom and field components	
S-185 FIRE ENTRAPMENT AVOIDANCE & SAFETY (2006)	All those involved in fire suppression operations. General knowledge course on wildfire safety and entrapment avoidance	2-3 hour classroom training session	BCWS Information on Wildfire Training[51]
S-215 FIRE OPERATIONS IN THE WILDLAND/URBAN INTERFACE	Advanced training for wildland fire fighters	3 day instructor led course	
S-230 SINGLE RESOURCE LEADER (CREW BOSS)	Advanced training for wildland fire fighter supervisors	4 day instructor led course	
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 1001 LEVELS	Exterior and Interior Structure Firefighter training	7-12 weeks, depending on the delivery format (full-	

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

1 AND 2		time or part time)	
STRUCTURE PROTECTION PROGRAM WILDLAND FIREFIGHTER LEVEL 1 (SPP-WFF 1)	Additional training for structure firefighters	6 hours - classroom	Replaces S-100 for Structure Firefighters. BCWS information for structure firefighters working with WUI fires[52]
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[53]
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[54]
EMERGENCY SUPPORT	Community Volunteers	Online or In-Person	Justice Institute of BC[55]

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

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

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

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

SERVICES LEVEL 1			
EMERGENCY SUPPORT SERVICE DIRECTOR	Community Volunteer	In-person	
INCIDENT COMMAND SYSTEM (ICS) LEVEL 100	First responders, local government administration, community organizations involved in response	In-person, on site; or Online	Justice Institute of BC. Eligible for BC Hydro Community Safety grant[56]
ICS LEVEL 200	First responders, local government administration, community organizations involved in response	Online	JIBC[57]

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

[57] 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.