Village of Tahsis
Community Wildfire Protection Plan
2020 Update

Submitted to:

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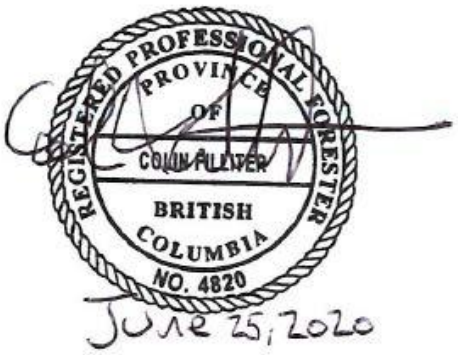	
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EXECUTIVE SUMMARY

The Community Wildfire Protection Plan (CWPP) was completed under the framework established by the Community Resilience Investment program, administered by the Union of BC Municipalities. The area of interest is the wildland urban interface (WUI) surrounding the Village of Tahsis, at the head of Tahsis Inlet on the west coast of Vancouver Island. The area of interest is within the traditional territory of the Mowachaht/Muchalaht First Nation.

The purpose of this CWPP is to update the recommendations made in the initial 2011 Village of Tahsis 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 with pockets of High. The local wildfire risk ranges from Low to High with higher risk areas associated with fuels in close proximity (within 500m) of the community.

Recommendations are summarized in the table below. The recommendations are based on a review of best practices from other jurisdictions, gaps identified through community engagement, the local wildfire risk analysis, prevention of human-caused ignitions, and integration of FireSmart program principles. FireSmart is a national initiative to educate and empower the public on what can be done to protect their families, properties and communities from wildfire. Fuel management (surface and ladder fuel removal) is recommended for High risk areas within 500m of structures in the Village. Community education and awareness also play a critical role in reducing the wildfire risk. Community education focuses on FireSmart principles, understanding fire use restrictions, emergency preparedness and regularly sharing fire safety related information with the community.

The Tahsis Fire Rescue Department (TFRD) provides fire response services for the Village. Currently, the TFRD is at full capacity with as many members as turnout gear, each trained in basic wildland firefighting for structural firefighters. The BC Wildfire Service provides wildfire response services on provincial crown land including Crown land within the municipal boundary. Joint mock exercises and greater cooperation between TFRD and the BC Wildfire Service would improve skills and communication in the event of a WUI incident. The TFRD should also aim to improve water availability for fire suppression in the outlying areas of its service area.

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

SUMMARY OF 2020 CWPP RECOMMENDATIONS

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
1.	Med	To reduce the likelihood of human-caused ignitions by regulating the use of fireworks and other spark/flame generating devices.	Extend the authority of the Fire Chief, or designate, to prohibit the use of fireworks, lanterns and other devices during burning ban periods, either in a new bylaw or amendment of the Fire Protective Services and Regulation Bylaw.	Village
Rationale: Recommended best practice, observed in similar jurisdictions, to reduce the risk of human-caused ignitions.				
2.	High	To engage regional operators and industrial stakeholders on the contents and recommendations in this plan; to improve inter-agency dialogue.	Collaboration amongst regional operators is recommended to reduce fuel hazards on Crown lands and along rights-of-way. Share this plan with Ministry of Transportation and Infrastructure, MFLNRORD, forest tenure holders (ie: Western Forest Products Inc.), and BC Hydro. Areas of critical importance are action plans for fuel hazard management along Head Bay FSR right-of-way for access and evacuation; treatment areas in identified high risk areas on Crown lands; and minimizing fuel hazards along transmission line rights-of-way.	Village and SRD to share this plan and recommendations with regional operators
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.				
3.	High	To reduce the fuel hazard in identified treatment areas (High risk areas within 500m of the community).	Develop and implement site specific fuel management prescriptions. Prescriptions to be completed by a qualified Registered Professional Forester. Recommended treatment areas are listed in Table 8. The forest professional may also refer to Priority 1 treatment areas in the 2011 CWPP. Share this plan and collaborate with regional	Village and/or SRD Share this plan and recommendations with regional operators

			operators (forest tenure holders, BC Hydro, MFLNRORD, etc) where possible. Where treatment areas are identified on Crown lands, consultation is required with Mowachaht/Muchalaht First Nations.	
Rationale: Recommended treatment areas based on local wildfire risk analysis. High risk areas within 500m of community structures or critical infrastructure are priority for treatment.				
4.	High	To reduce the fuel hazard and ignition risk within the FireSmart Structure Ignition Zone (100m) of structures and homes in Village.	Conduct FireSmart Hazard Assessments starting with the priority areas identified in Table 9. Implement hazard assessment recommendations.	Village and/or SRD
Rationale: The FireSmart program is a nationwide initiative. Several post-wildfire examples across the country show how FireSmart activities reduce the structure losses associated with WUI fires. FireSmart activities are a focus area for all CWPP's developed under the UBCM CRI funding program. FireSmart is implemented through best practices in 7 disciplines: education, emergency planning, vegetation management, legislation, development, interagency cooperation and cross-training. Development standards are a FireSmart discipline. Priority areas for hazard assessments based on relative risk of adjacent fuels.				
5.	High	To reduce the ignition risk surrounding critical community infrastructure.	Contact a Local FireSmart Representative to complete FireSmart hazard assessments around critical infrastructure in the Village.	Village
Rationale: Hazard assessments around critical infrastructure were previously recommended in 2011. Hazard assessments are necessary for vegetation management, as described in #5 above.				
6.	High	To reduce fuel hazard on private land and provide alternatives to open burning.	Offer alternative yard waste disposal options including periodic collection and community chipping services.	Village and/or SRD
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.				
7.	High	To make this Plan and its associated maps available to the community.	Upload a digital copy of the CWPP to the Village of Tahsis and SRD websites.	Village and SRD

Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation.				
8.	High	To improve community awareness of the FireSmart program.	Encourage residents to complete the free, online, FireSmart 101 course.	Village and SRD
Rationale: Public education as part of FireSmart program implementation, refer to #5 above.				
9.	Med	To improve community awareness of wildfire threat and risk, and of the actions that can be taken to mitigate risk.	Deliver regular communications to community members (flyers, notice boards, emails, social media, etc.). Recommend at least one fire related communication per month (bi-weekly during fire season if required).	Village
Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation.				
10.	High	To improve community awareness of wildfire threat and risk, and of the actions that can be taken to mitigate risk.	Use SRD and Village 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.				
11.	High	To reduce the risk of human-caused ignitions by improving community awareness of local bylaws, provincial wildfire regulations, and wildfire safety.	Develop a Village specific Fire Safety and Wildfire Preparedness factsheet (paper and digital resource). Send this as an annual mailout to all Village residences. This factsheet should include information on Village Bylaws, what constitutes a “fire hazard” on private property, *Wildfire Regulation* legal requirements, FireSmart principles, and emergency evacuation routes	Village and/or SRD
Rationale: Community education and awareness are necessary for wildfire protection planning and FireSmart program implementation. Concern about fire hazards on private property				

identified during CWPP engagement. Bylaw education is a recommended best practice.				
12.	High	To improve community awareness of wildfire threat and risk, and of the actions that can be taken to mitigate risk.	Organize an annual Community Fire Safety or Community Wildfire Preparedness day. Activities may include checking fire extinguishers and smoke alarms in homes, conducting FireSmart clearing of Priority 1 (up to 10m) zones around critical community infrastructure, FireSmart presentations, fire department demonstrations, etc.	Village
Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation. Addresses education and emergency planning FireSmart disciplines.				
13.	Low	To improve community FireSmart awareness.	Continue to deliver the FireSmart education program in the K-12 public school system. Use the BC FireSmart Education package. Contact the BCWS Coastal Fire Centre Fire Prevention Specialists to borrow education kits and for education support.	Village
Rationale: As described in #5 above. Public education is one of the FireSmart disciplines.				
14.	Med	To improve community FireSmart awareness.	Contact a Local FireSmart Representative to deliver Public education materials at annual community events (ie: Canada Day, Tahsis Days, Fishing Derby)	Village
Rationale: As described in #5 above. Public education is one of the FireSmart disciplines.				
15.	High	To improve inter-agency and cross-jurisdiction communication about wildfire risk, emergency preparedness, response, and recovery.	Arrange an annual meeting, prior to fire season, to include BCWS – North Island Fire Zone, EMBC, and local fire department representatives and Village Administration to review incident command structure, communication strategies and emergency support services in the event of a WUI fire.	SRD
Rationale: Key contacts and individuals may change from year to year. Annual meetings recommended as a best practice to build relationships and improve communication in the				

event of a WUI event. Interagency cooperation and cross-training are FireSmart disciplines.				
16.	Med	To continually communicate with the public on emergency planning activities.	Communicate the Village's completed emergency planning initiatives (including Evacuation Plan and this CWPP). Engage in an emergency response drill or other mock exercise.	Village
Rationale: Recommended best practice for public education and emergency planning.				
17.	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.	SRD
Rationale: Recommended best practice to ensure follow-up on action items.				
18.	High	To reduce the wildfire ignition risk along power line rights-of-way.	BC Hydro to ensure their vegetation management strategy does not contribute to unacceptable fuel loading or diminish the ability of the right-of-way to act as a fuel break. Specifically address any hazards identified around the substation.	Village and/or SRD to share plan recommendations with BC Hydro
Rationale: Carried from 2011 CWPP. 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.				
19.	Med	To promote alternative means of yard management and yard waste disposal.	Provide residents within information on alternatives to burning yard waste. Link this information on the SRD website. Alternatives to burning include yard waste disposal centres, composting or xeriscaping.	Village and SRD
Rationale: Recommended practice, observed from other similar jurisdictions. Contributes to public education and development planning.				
20.	High	To improve water availability for suppression of interface fires in outlying areas.	Purchase a water tanker, portable water tank, and/or portable bladders for improved water availability for wildland fire	Village

			suppression and fire suppression in outlying interface areas beyond the water hydrant system. Consider access conditions, water sources, and most likely application when assessing which apparatus to acquire.	
Rationale: Based on CWPP engagement with the Village/TFRD on water availability for fire suppression in areas outside of hydrant coverage yet within the fire protective services area.				
21.	Med	To improve water availability for suppression of interface fires in outlying areas.	Explore permitting requirements and opportunities for installing dry hydrant systems on Tahsis or Leiner Rivers, or other streams, to improve water availability in outlying areas.	Village
Rationale: Based on CWPP engagement with the Village/TFRD on water availability for fire suppression in areas outside of hydrant coverage yet within the fire protective services area.				
22.	High	To manage and reduce the vegetation/fuel hazard along the Head Bay FSR right-of-way.	Plan for vegetation management, brushing and clearing along Head Bay FSR right-of-way with fuel hazard reduction as an objective (cleared materials should be chipped and hauled away).	Village and/or SRD to share this recommendation with Ministry of Transportation and Infrastructure
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 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 continue to encourage residents to use.				
24.	Low	To maintain sufficient TFRD personnel to respond to emergencies.	Continue to ensure all TFRD members are trained to response to WUI incidents (SPP-WFF 1).	Village
Rationale: As new members join TFRD, to keep SPP-WFF-1 training top of mind.				

25.	High	To maintain and upgrade TFRD personnel certification & training.	Where possible, provide members the ability and resources to complete additional training such as SPP-115, ICS100, FireSmart LFR, or other related courses.	Village
Rationale: Cross-training is one of 7 FireSmart disciplines. WUI and ICS training for fire department members recommended as a best practice.				
26.	High	To maintain and improve communication with BCWS.	TFRD and BCWS (with Gold River Volunteer Fire Department) should coordinate to conduct joint yearly 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.	Village with SRD and BCWS support
Rationale: Based on CWPP engagement with the Village/TFRD opportunities for cross-training would be beneficial. 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.				
27.	Med	To improve equipment availability for structure protection in the event of WUI fires.	Engage the City of Campbell River in a mutual aid agreement regarding the deployment of their Structural Protection Unit.	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.				
28.	Low	To improve equipment availability for structure protection in the event of WUI fires.	Engage Gold River Volunteer Fire 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
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.				
29.	Med	To improve equipment availability for structure protection in the event	Purchase sprinkler kits for public infrastructure and encourage residents to purchase sprinkler	Village

		of WUI fires.	kits for their homes. Training on set up and operational use is just as important as having the equipment readily available. Ensure TFRD members receive SPP-115 training.	
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 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.
Forest Enhancement Society BC (FESBC)	Provincial Crown	• Fuel management treatment prescriptions and prescription implementation
UBCM Community Resiliency Investment Program (CRI)	Municipal First Nations Private	• FireSmart hazard assessments, demonstration projects, off-site debris disposal (ie: chip trucks) • Community Education • Development planning • Emergency planning and cross training
UBCM Community Emergency Preparedness Fund (CEPF)	n/a	• Emergency support services training • Fire department training or equipment • Emergency evacuation planning • Emergency operations training
First Nations Emergency Support Services – Indigenous Services Canada (FNESS/ISC)	First Nations Reserve lands	• Fuel management prescriptions and treatments On-Reserve
BC Wildfire Service	Provincial Crown	• Fuel management treatments (in coordination with local fire zone officer) • Public education and outreach

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LIST OF ACRONYMS

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

SECTION 1: INTRODUCTION

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

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

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

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

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

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

> 5.1 Fuel Management: identifies and prioritizes fuel management treatments
>
> 5.2 FireSmart Planning 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 Tahsis (referred to as the Village, or Tahsis, 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, updated from the previous CWPP completed in 2011 by B.A. Blackwell and Associates.

The goal is to define the threat to human life, property, and critical infrastructure from wildfires within the 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 address the implementation of specific actions that will result in reduced likelihood of wildfire entering the community, reduced impacts and losses to property and critical infrastructure, and reduced negative economic and social impacts to the community.

1.2 CWPP Planning Process

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

The CWPP planning process consists of the following phases:

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

Understanding the relationship of the community to its surrounding environment, and what that means in terms of the wildfire hazard, threat and risk of loss, is critical to help the community 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 in 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.

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

SECTION 2: LOCAL AREA DESCRIPTION

2.1 CWPP Area of Interest

The Village of Tahsis is located at the head of Tahsis Inlet on the west coast of Vancouver Island. Tahsis is situated at the valley bottom where the Tahsis and Leiner Rivers flow into Tahsis Inlet. The Village is within the traditional territory of the Mowachaht/Muchalaht First Nation. Head Bay FSR is the only land-based access route to the Village. Head Bay FSR is mostly gravel with short paved sections and connects Tahsis to the Village of Gold River, 65km to the east. The terrain surrounding the village is rugged and steep. Road access and fire suppression access is limited by the steep topography. Steep slopes surround all edges of the community. Boat or seaplane access to the Village are alternative options.

This plan is an update to the existing 2011 CWPP for the Village of Tahsis. The 2011 CWPP area of interest (AOI) was all area within a 2km buffer of the Village Municipal boundary. The 2020 CWPP update AOI is slightly different than in 2011, as per the CRI program guidelines. The AOI for this plan includes all the area within a 2km buffer of areas with structure density greater than 6 to 25 structures per km^2 - see Map 1. Structure density was provided by the BCWS as part of the provincial strategic threat analysis dataset.

2.2 Community Description

Tahsis is primarily a residential community. Most homes (90%) in Tahsis were constructed prior to 1981 with limited new construction since 1991.[2] Historically, Tahsis was considered a gateway trade route from the west coast to the east coast of Vancouver Island. The Village expanded from a floating forestry camp to a Village and site of a lumber mill which was operated until 2001.[3] Current economic drivers for the Village include commercial forestry/fishing, transportation, services, administration, health care and services, recreation/tourism.

Multiple administrative boundaries exist within the AOI including the Village of Tahsis municipal boundary, Mowachaht/Muchalaht First Nation Indian Reserve Tahsis-11, private land, private managed forest land, and provincial crown forest tenure Tree Farm Licence (TFL) 19 – see Map 2, and Table 2. The BCWS is responsible for wildfire management, including prevention and response, where TFL19 overlaps the municipal boundary.

Village services include the Tahsis Recreation centre, a recycling centre, Tahsis heliport, water and sewage treatment services, weekly garbage pick-up, and the Tahsis Landfill (Comox-Strathcona Waste Management, operated by the Village). School District #84 operates Captain Meares Elementary Secondary School. Emergency services include a Health Centre – staffed by a critical care nurse, BC Ambulance Service, Tahsis Fire Rescue Department (TFRD), and a Nootka Sound RCMP detachment. A Coast Guard / Search and Rescue station is currently being constructed and is expected to be operational in mid-2020 with year-round staff. The Village of Tahsis Fire Protective Services Area (FPSA) includes all areas within the municipal

[2] McElhanney. 2019. Tahsis Community Profile. http://villageoftahsis.com/wp-content/uploads/2019/05/Community-Profile.pdf

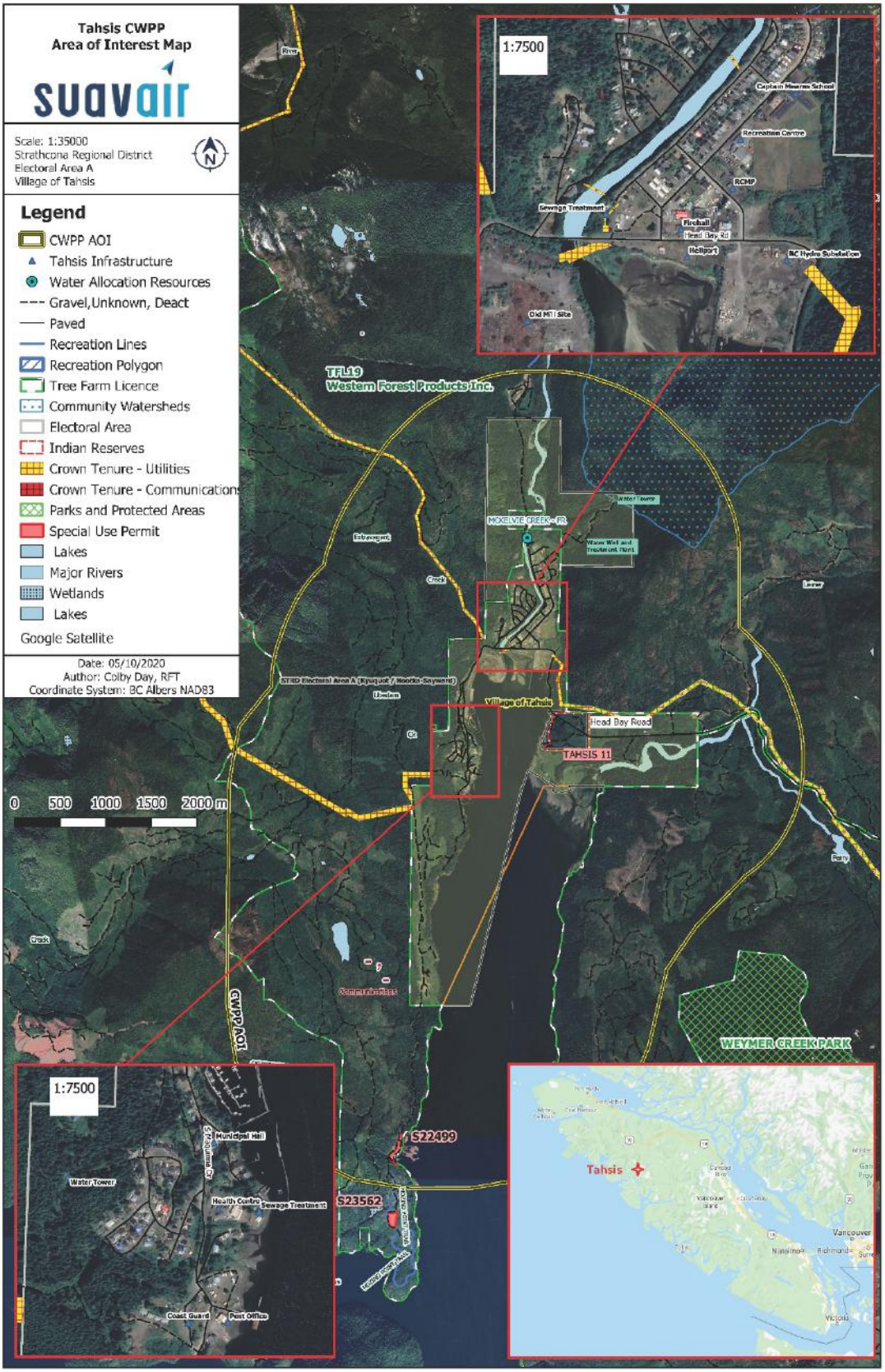
[3] History of Tahsis. http://www.tahsisbc.com/profile/guides/History-of-Tahsis.pdf.

boundary and Mowachaht/Muchalaht IR 11. The TFRD also provides services to the Moutcha Bay Resort[4] approximately 25km to the east on Head Bay FSR.

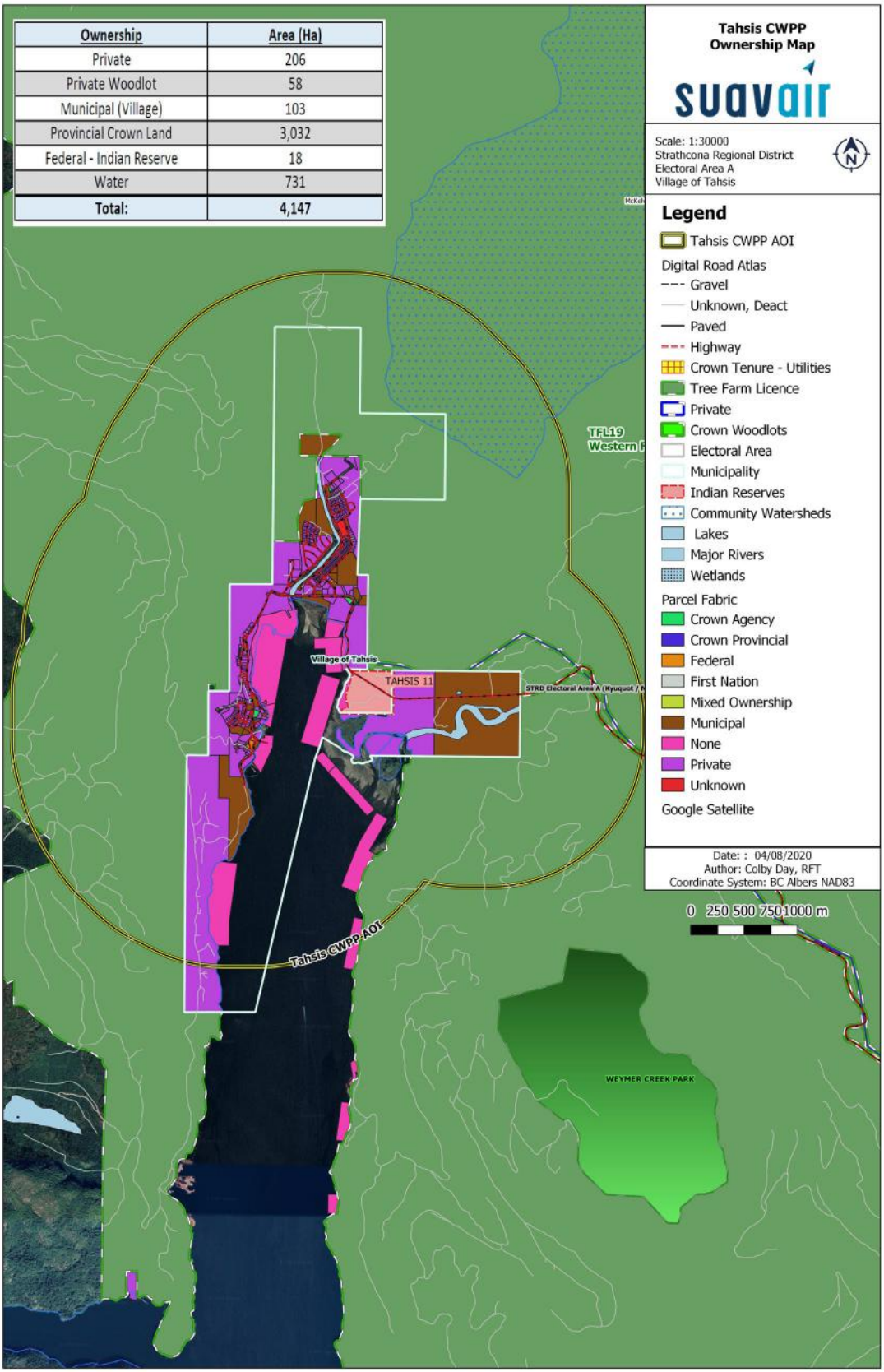
Table 2. Land ownership classes within the AOI.

Land Ownership	Area (ha)	Comments
Private	206	
Private managed forest lands	58	
Municipal (village)	103	
Provincial crown land	3032	Forest tenure TFL 19
Indian reserve	18	Mowachaht/Muchalaht First Nation
Water	731	
Total	4147	

[4] Moutcha Bay Resort. https://www.nootkamarineadventures.com/fishing-resorts/moutcha-bay-resort/



Map 1. Village of Tahsis CWPP area of interest.



Ownership	Area (Ha)
Private	206
Private Woodlot	58
Municipal (Village)	103
Provincial Crown Land	3,032
Federal - Indian Reserve	18
Water	731
Total:	**4,147**

Map 2. Land ownership classes within the AOI.

2.3 Past Wildfires, Evacuations, and Impacts

The Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD) and BCWS manage a provincial database of historical fire ignitions and fire perimeters. This data was reviewed as part of the planning process and historical fires in the area are shown on Map 4. No recent wildfires have posed a serious threat to the Village and no recent fire related evacuation orders or alerts have been issued.

Another recent environmental emergency was a tsunami warning in January 2018 that prompted a community evacuation in the middle of the night. Key learnings from this evacuation event will be applied to emergency evacuation planning for all categories of natural disaster emergencies, including WUI fires.

2.4 Current Community Engagement

B.A. Blackwell & Associates completed the initial Village of Tahsis CWPP in 2011, which included 32 recommendations for the community. Appendix 2: Status of 2011 CWPP Recommendations provides an update on the current status of those recommendations and how or if they were implemented. This CWPP is the only update since the initial 2011 plan.

The current Fire Chief works formally and informally to engage the community in fire prevention and awareness as well as FireSmart principles. He is also a Local FireSmart Representative. Formal engagement includes council meetings, commercial property fire inspections, and improved signage. Informal engagement includes answering phone calls and visiting private property owners. A CRI FireSmart grant in 2019 provided property owners with two days access to free brush and limb chipping and removal. Community participation was limited however the program was considered a good starting point for FireSmart awareness and education. The Village Administration and Fire Chief were engaged throughout this CWPP update process.

2.5 Linkages to Other Plans and Polices

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

2.5.1 Local Authority Emergency Plan

The Village of Tahsis Evacuation Plan was completed in February 2020 by McElhanney Ltd. Head Bay FSR is the sole road access and evacuation option to reach the Village of Gold River, and eventually the City of Campbell River via Highway 28. As a result, the maintenance of Head Bay FSR is critical to emergency evacuation and response. The alternative evacuation routes are marine-based using boats or float plane aircraft, or helicopter evacuations from the Tahsis Heliport.

The Evacuation Plan also outlines a Communications strategy to be followed during various emergencies, including wildfire. The Communications strategy involves reaching residents through the Village website, Facebook page, public notices, and door-to-door notification if required. An additional means of communication recommended in this CWPP is to use the SRD's Community Notifications system, Connect Rocket, where subscribers will receive text

messages (cellular subscribers) or voice calls (landline subscribers) with emergency notification information.[5]

2.5.2 Affiliated CWPPs

The 2011 Village of Tahsis CWPP made 32 recommendations in the areas of Communication and Education, Structural Protection, Emergency Response, Training and Equipment, and Vegetation (Fuel) Management. A summary and status update of the 2011 recommendations is provided in Appendix 2: Status of 2011 CWPP Recommendations. Relevant recommendations from the 2011 plan have been carried forward in this CWPP update. No known operational level fuel treatment prescriptions have been completed within the Tahsis AOI. Other affiliated CWPPs include the plans for SRD Electoral Area A and the Village of Gold River CWPP 2020 Update, both completed concurrently with this plan.

2.5.3 Local Government Plans and Policies

Official Community Plan

The Village recently updated its Official Community Plan (OCP) in 2020.[6] The desired outcomes of the Hazard and Emergency Management policy direction is to be prepared to effectively respond to an emergency when it occurs, and to manage known hazards to limit adverse impacts on property and people. Development permit areas (DPA) include natural environment (watercourses), flood hazard, steep slope hazard, and anthropogenic hazard. There is no wildfire hazard specific DPA.

Bylaw No. 516 – A Bylaw to Regulate Burning within the Village of Tahsis

The burning bylaw regulates open burning of garden waste by requiring a burn permit from the Fire Chief (Section 2.3). Open burning is prohibited during times specified by the Fire Chief or Ministry of Forest as burning ban periods between April 14 and October 14 (Section 2). Section 3 prohibits open burning of other categories of waste within the Village. Campfire and other small fires for cooking are exempt from the bylaw. Section 6 outlines provisions for cost recovery and liabilities.

Bylaw No. 601, 2018 – Ticketing for Bylaw Offences

This Bylaw designates bylaws which may be enforced by means of a ticket, sets fines, and authorizes the role of bylaw enforcement officers. Designated Bylaws that are enforced by ticketing include: Animal Control and Licensing Bylaw, Building Bylaw, Noise Control Bylaw, Solid Waste Management Bylaw, Street and Traffic Regulation Bylaw, and the Zoning Bylaw. The Property Maintenance and Fire Protective services Bylaws each have their own clauses for enforcement and fines.

Bylaw No. 614 – A Bylaw to Regulate the Maintenance of Property, Unsightly Properties and Nuisance Within the Village of Tahsis

Section 9 addresses Unsightliness, Unsanitary Conditions and Graffiti.

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[5] Strathcona Regional District. Community Notifications. Connect Rocket. https://strathconard.connectrocket.com/

[6] Village of Tahsis. 2019. Village of Tahsis Official Community Plan. https://villageoftahsis.com/wp-content/uploads/2020/04/2020-02-13-Final-OCP-incl_Schedules.pdf

9 (3) An Owner or Occupier of Land must not cause or permit to exist on the Land of that Owner or Occupier any unsanitary condition or other condition that is a health, fire, or other hazard.

Section 11 address Plants, Weeds, and Lawn Overgrowth.

11(1) An Owner or Occupier must not cause or permit Weeds of other unintended plants to grow or accumulate on the Land of the Owner or Occupier, including on or near the perimeter of that Land so as to create a fire hazard or obstruct access to that Land in case of an emergency.

Section 12

12. Subject to subsection (2), an Owner or Occupier must not cause or permit any of the following to be stored or to accumulate on the Land of the Owner or Occupier

(c) Refuse

Bylaw No. 621, 2019 – Fire Protective Services and Regulation Bylaw

This Bylaw addresses fire hazard, fire safety regulations, fire inspections, firefighting infrastructure, access routes, and makes provisions for cost recovery. Specific to WUI fire hazard:

Section 14 – Wildfire Hazard

a) where, in the opinion of the Fire Chief, the safety of the forest, woodland, timber or other property, is endangered by debris caused by logging, land clearing or industrial operations, the Fire Chief may require a person carrying on logging, land clearing, or industrial operations, or person who has carried on the operation, or the owner or occupier of the land on which the debris exists:

i) to dispose of the debris by removal or other methods acceptable to the Fire Chief;

ii) cut down all dead standing trees and stumps within the area affected; and

iii) take precautions to prevent the occurrence or escape of fire or damage to property.

Section 15

The Fire Chief may, for the purpose of preventing wildfires, order the temporary closure of public use of outdoor trails, camping areas, and other facilities located in or near forested areas, on public and private land.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
1.	Med	To reduce the likelihood of human-caused ignitions by regulating the use of fireworks and other spark/flame generating devices.	Extend the authority of the Fire Chief, or designate, to prohibit the use of fireworks, lanterns and other devices during burning ban periods, either in a new bylaw or amendment of the Fire Protective Services and Regulation Bylaw.	Village

2.5.4 Higher Level Plans and Relevant Legislation

The AOI is within the Vancouver Island Land Use Plan Enhanced Forestry Zone 19 – Tahsis. The Tahsis Landscape Unit does not have an approved landscape unit plan or landscape unit level objectives. Provincial forest management legislation including the *Forest and Range Practices Act* and its associated regulations; and provincial wildfire legislation including the *Wildfire Act* and its associated regulations apply. Other relevant legislation includes the *Heritage Conservation Act, Land Act, Private Managed Forest Land Act,* and *Environmental Management Act.*

Wildfire Act and Wildfire Regulation

Under the *Wildfire Act*, the government may order open fire bans, create restricted areas, restrict certain activities, and recover fire control costs amongst other activities and actions laid out in the *Act.* The *Wildfire Act* pertains to all "forest land" and "grass land" and lands within 1km of "forest land" and "grass land" regardless of public or private ownership.

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

For industrial activities inside or within 2km of a fire protection district: 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 (ie: forest harvesting) (*Wildfire Regulation,* Section 12.1(2)(a)).

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

Within the AOI, the *Wildfire Regulation* requires that forest tenure holders must conduct fire hazard assessments every 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 within and adjacent to the Village boundary. TFL 19 Management Plan #11, and the WFP Central Island Forest Operations 2017 Forest Stewardship Plan apply. The AOI is within High and Severe risk polygons according to the BCWS Fuel Hazard Assessment and Abatement Fire Risk Map.[7] The risk class determines the

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

threshold for fuel abatement for industrial and prescribed activities as recommended in the Guide to Fuel Hazard Assessment and Abatement in British Columbia.[8]

The MFLRNORD Vancouver Island Central Coast Response Fire Management Plan, a framework for wildfire suppression and response, applies to the area. BCWS/MFLNRORD guidance on wildfire management and fuel management is updated periodically and posted online.[9] MFLRNORD guidance includes the 2019 Fuel Management Prescription Guidance[10] and 2019 Tactical Fuel Management Planning Standard.[11]

The AOI is within the Campbell River Natural Resource District, Discovery Coast Recreation District and North Island Fire Zone. 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.

The following recommendation is made regarding sharing the results of this plan with industry stakeholders.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
2.	High	To engage regional operators and industrial stakeholders on the contents and recommendations in this plan; to improve inter-agency dialogue.	Collaboration amongst regional operators is recommended to reduce fuel hazards on Crown lands and along rights-of-way. Share this plan with Ministry of Transportation and Infrastructure, MFLNRORD, forest tenure holders (ie: Western Forest Products Inc.), and BC Hydro. Areas of critical importance are action plans for fuel hazard management along Head Bay FSR right-of-way for access and evacuation; treatment areas in identified high risk areas on Crown lands; and minimizing fuel hazards along transmission line rights-of-way.	Village and SRD to share this plan and recommendations with regional operators

[8] 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

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

[10] 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

[11] 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 following section is a description of the extent to which wildfire has the potential to impact the values at risk (VAR) within the Tahsis AOI. Human and natural resources that may be impacted by wildfire include human life and property, critical infrastructure, high environmental and cultural values, and other resource values. VAR also include hazardous values that pose a safety hazard. Key identified VAR are illustrated below in Map 3.

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. Wildfire can move quickly and unpredictably. It takes time for people to evacuate an area and safe egress can be blocked by the fire itself or by vehicle congestion or accidents.

The Statistics Canada 2016 Census Profile data shows the population of Tahsis at 248, down from 316 in 2011.[12] About 50% of the community is retired and over 75% of the population is 55+ years old.[13] Mowachaht/Muchalaht First Nation's Tahsis reserve is within the AOI, there are currently no dwellings or residents on this reserve.

The community profile notes 400 dwellings in Tahsis, of which 150 (37.5%) are occupied full time.[14] Several lodges, motels, bed and breakfasts operate during the summer months. Seaside RV Campground and Leiner Creek Provincial Recreation Site are popular campgrounds within the AOI. Considering temporary accommodations, campers, and boat traffic in the summer months, the area population is estimated to be about 1,200 during the parts of the fire season.

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.

Head Bay FSR provides the only road access to the Village. Head Bay FSR is maintained by Mainroad North Island Contracting LP and provides a critical link between Tahsis, the Village of Gold River and the rest of Vancouver Island. The importance of the condition of this road for emergency access and evacuation cannot be overstated.

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[12] Statistics Canada. 2016 Census Profile. Tahsis (Village. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5924030&Geo2=CD&Code2=5924&SearchText=tahsis&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0

[13] http://villageoftahsis.com/2019/07/25/2019-village-of-tahsis-community-survey-results/.

[14] http://villageoftahsis.com/wp-content/uploads/2019/05/Community-Profile.pdf

The Tahsis Recreation Centre serves as a community hub and is also the location of the Emergency Reception Centre. The municipal hall serves as the Emergency Operations Centre. Other critical community infrastructure includes the Health Centre, Captain Meares Elementary Secondary School, two sewage treatment plants, water treatment facility, Nootka Sound RCMP detachment, firehall, public works yard, Coast Guard Station, BC Hydro Substation, BC Hydro transmission lines, heliport, boat launch, seaplane dock, and government wharf.

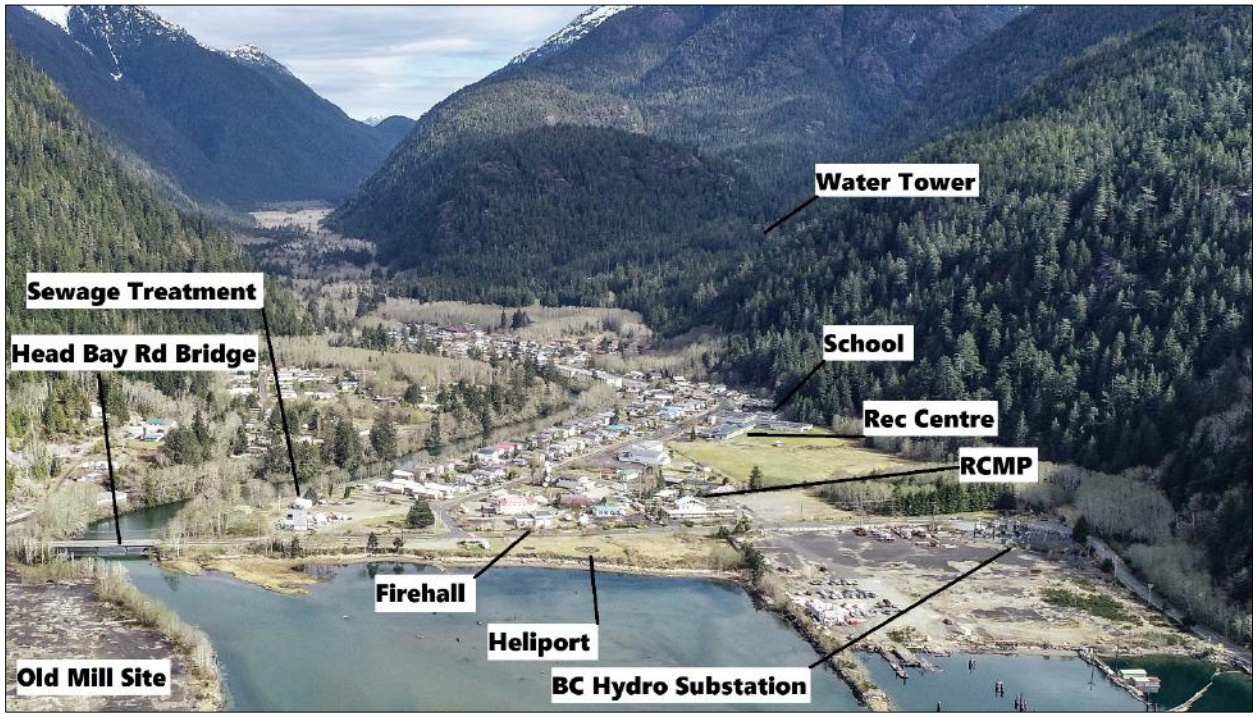


Photo 1. Critical Infrastructure in the northern part of the community.

3.2.1 Electrical Power

A BC Hydro substation is located within the Village boundary (Photo 3). BC Hydro transmission lines approach the Village from the east and exit to the west towards Zeballos. Additional transmission lines to the north connect to the Zeballos Lake Hydro Project. All of these transmission lines have wooden poles. Refer to Map 3.

In the event of a fire at the substation, BC Hydro may shut off power remotely, but it could take several hours before a crew makes it on site. In this eventuality, due to safety concerns, a 300m no-entry zone must be established by the TFRD. This no entry zone would close public access to Head Bay FSR, the sole road option in/out of the community.

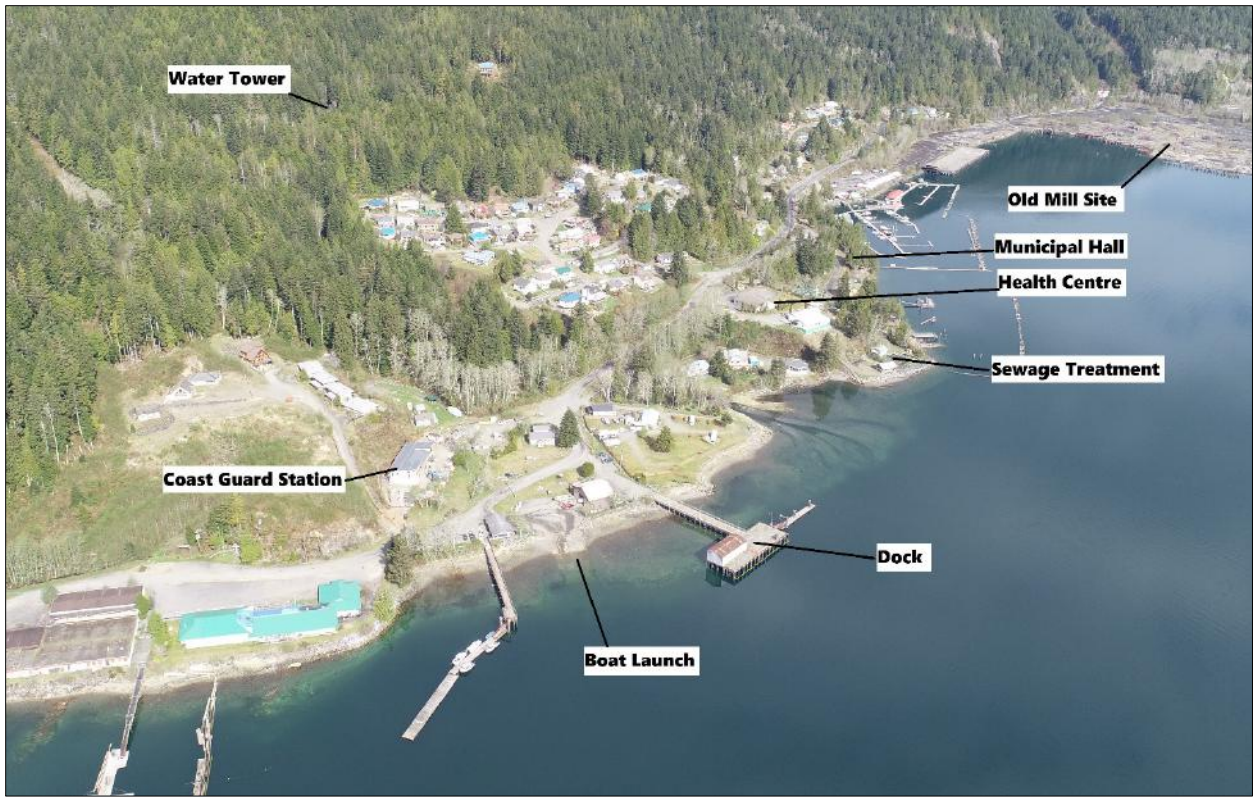
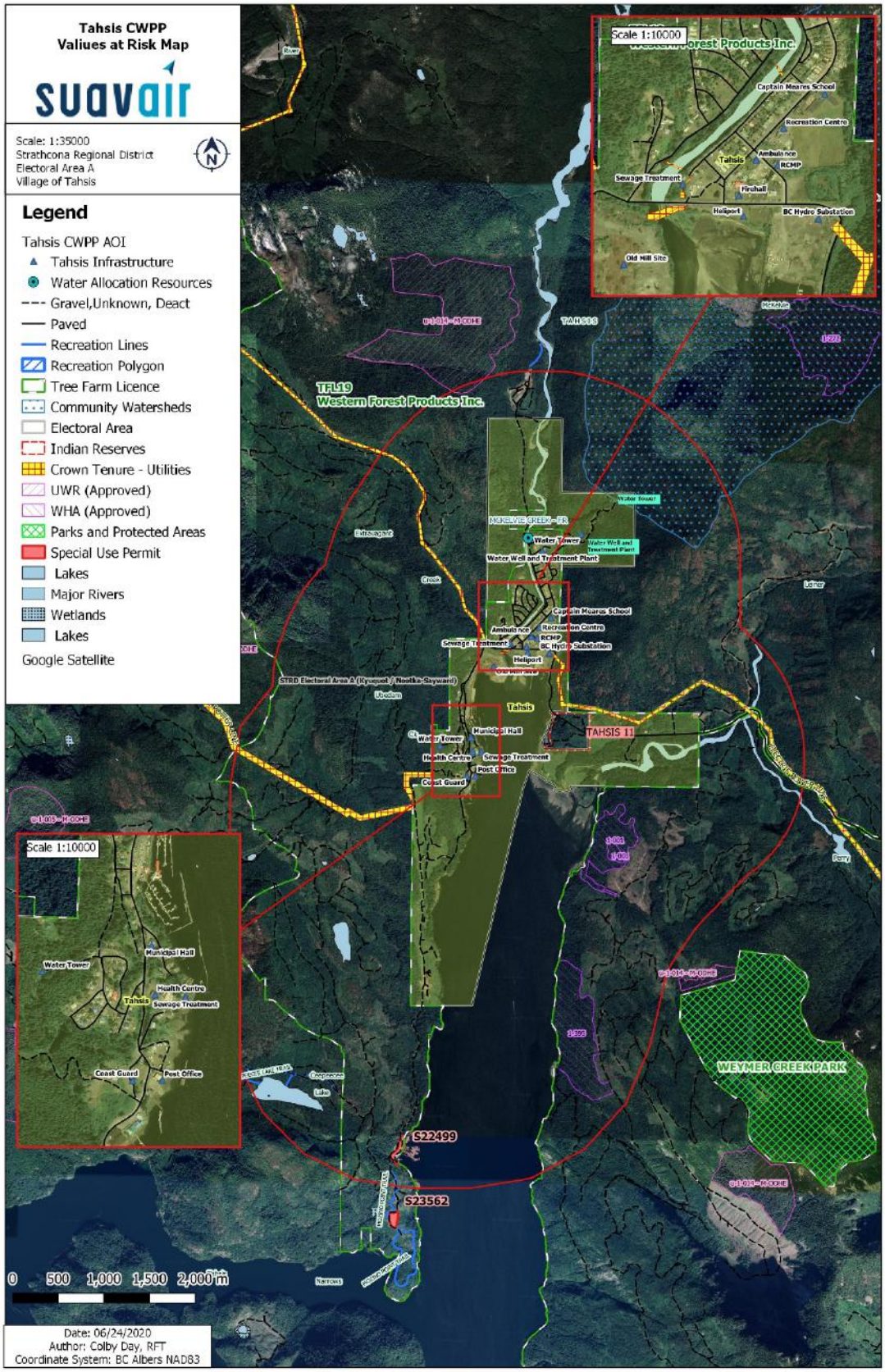


Photo 2. Critical Infrastructure in the southern part of the community.

Photo 3. The BC Hydro substation is located adjacent to the single access road in/out, Head Bay FSR. Wooden poles are the supporting system of the cables.



Map 3. Values at risk and critical infrastructure within the AOI.

3.2.2 Communications, Pipelines and Publicly Owned Buildings

The Village is currently serviced by LTE cellular phone network, telephone, internet, and satellite internet. The Village is home to 8 licensed amateur radio operators (Ham radio). Other forms of emergency communication include VHF radio and satellite phones. The Village does not have an airport, hospital or natural gas service. Communications towers are located near the south end of the Village boundary (Map 3). Communications during an emergency are described in the Tahsis Evacuation Plan.

3.2.3 Water and Sewage Infrastructure

A community production well is located on McKelvie Road. Two storage tanks regulate water pressure in the Village and booster pumps at Churchill Drive ensure supply to the south storage tank. The Village has two sewage treatment plants.

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's primary drinking water source is from a groundwater aquifer. In 2016, Tahsis developed a community production well that supplies the Village with potable drinking water. A community specific Wellhead Protection Plan was completed by McElhanney Ltd. in April 2019.[15] Drinking water protection is an important Village Council strategic issue, as noted in the council's 2019 strategic priorities.[16] As a backup, drinking water could be drawn directly from McKelvie Creek, a designated Community Watershed under the *Forests and Range Practices Act*.

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[17]. The AOI is within the traditional territory of the Mowachaht/Muchalaht First Nation, a member 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

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[15] McElhanney. 2019. Wellhead Protection Plan. http://villageoftahsis.com/resident-services/utilities-taxes/

[16] Village of Tahsis http://villageoftahsis.com/wp-content/uploads/2019/01/VILLAGE-OF-TAHSIS-2019-STRATEGIC-PRIORITIES-2.pdf

[17] 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.

Resource Operations and Rural Development administers the provisions of the HCA and are responsible for making final decisions concerning the management of archaeological resources. Day-to-day planning, research and fieldwork are conducted by professional consulting archaeologists. Due to site sensitivity, the locations of archaeological sites are not made publicly available. Access to the Remote Access to Archaeological Data (RAAD) is required to view archaeological site information. Fuel treatment activities will require a treatment prescription completed by a Qualified Professional. The Qualified Professional should conduct the required reconnaissance surveys and review the presence and location of cultural heritage resources with the identified First Nations

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

3.3.3 High Environmental Values

Within the AOI, established legal objectives under the authority of the *Forests and Range Practices Act* include a wildlife habitat area, ungulate winter range, recreation sites, and visual quality objectives.

Table 3: Established legal objectives within the AOI.

Legal ID	Type	Comments
1-001	Wildlife Habitat Area	Keen's Long-eared myotis
u-1-014	Ungulate Winter Range	Black-tailed deer / Roosevelt elk
REC5856	Recreation Site	Coral Caves
REC16018	Recreation Site	Tahsis View Point
REC6617	Recreation Reserve	Nicolaye Point
REC0276	Recreation Site	Leiner River (campground)
	Visual Quality Objectives	Various objective polygons around Tahsis Inlet

3.4 Other Resource Values

The AOI contains portions of timber harvesting land base within TFL 19, with valuable western red cedar, douglas-fir, sitka spruce, and western hemlock commercial trees species.

The Tahsis and Leiner Rivers are both large, fish bearing rivers that are used by salmon for spawning. The *Forest Planning and Practices Regulation* stipulates riparian reserves and management zones along streams which may constrain fuel treatment opportunities. The Leiner River Trail is popular community trail located along the river and estuary.

3.5 Hazardous Values

The Tahsis landfill is located within the AOI about 150m north of the municipal boundary on North Maquinna Drive. Spontaneous combustion is known to cause fires at landfill sites. Other hazardous values include an old incinerator near the BC Hydro substation, and historic hog fuel accumulations, and historic industrial land fill sites.

The recommended management for hazardous infrastructure is to incorporate FireSmart planning principles around the sites, to ensure protocols for monitoring during high fire danger (especially for debris piles at the landfill), and to ensure emergency shut-off procedures are in place (where necessary).

Photo 4. Debris piles at the Tahsis landfill.

SECTION 4: WILDFIRE THREAT AND RISK

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

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

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

4.1 Fire Regime, Fire Weather and Climate Change

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

4.1.1 Fire Regime and Fire Weather

Natural Disturbance Regime

The AOI is defined by the regional climate of the Coastal Western Hemlock (CWH) very moist maritime subzone (vm) as described in the BC biogeoclimatic zone classification system.[18] The CWHvm climate is generally wet and humid with cool summers and mild winters.[19] CWHvm is classified as natural disturbance type 1 (NDT1) – rare stand-initiating events. The mean return interval for stand replacing disturbances in NDT1 variants is generally 250 years, the longest return interval of all NDT's in the province.[20] When disturbances such as fire occur, they are usually small and result in irregular edge configurations and patterns. However, it is more likely that forest disturbances are caused by wind, terrain instability, or isolated forest disease.

Fire Weather

The Canadian Forest Fire Danger Rating System[21] (CFFDRS) is a computer-based model used to assess fire danger and potential fire behaviour. The two main parts of the CFFDRS are: the

[18] About BEC. https://cfcg.forestry.ubc.ca/resources/cataloguing-in-situ-genetic-resources/about-bec-and-bgc-units/

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

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

[21] 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.

fire weather index system[22] (FWI) and fire behaviour prediction system[23] (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 are summarized by the BC Wildfire Service as follows:

Table 4. Summary and description of Fire Danger Classes.

Fire Danger Classes[24]	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.

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.

Weather Station Data – Fire Danger

The nearest long term BCWS weather station is Woss Camp (about 32km north of the Village). Fire Danger Class Ratings for the Woss Camp Weather Station are available from 1970-2019. Weather conditions in Woss may vary due to its relative inland valley bottom location compared to Tahsis' location at sea level closer to the west coast.

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

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

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

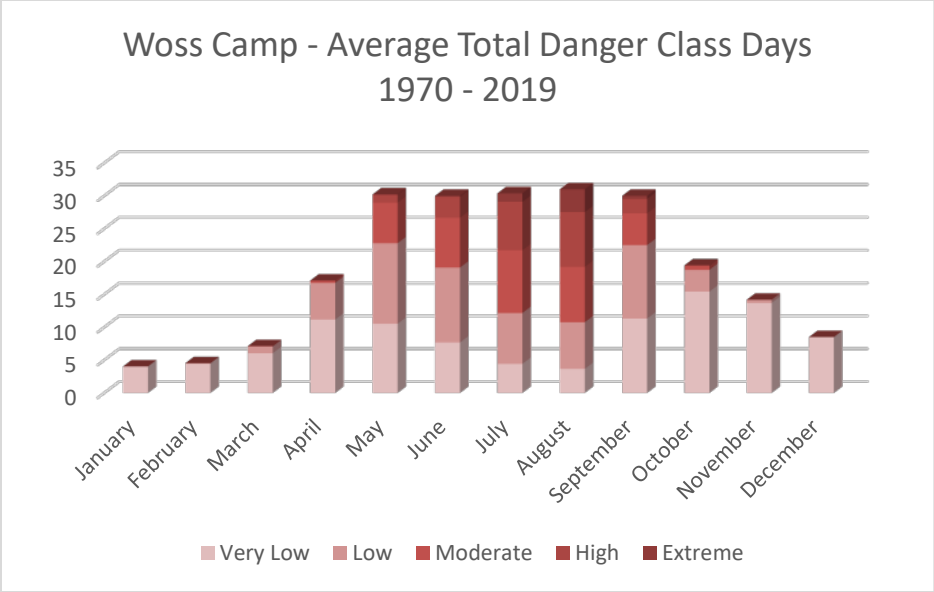

Figure 1. Woss Camp weather station average monthly total danger class days 1970-2019.

The other nearby weather station is TS Artlish, located about 30km northwest of Tahsis. Fire danger class days are available for years 2007-2019. The weather data recorded at TS Artlish is more representative of conditions in Tahsis than the Woss Camp station. In August 2018, when the most recent wildfires in the region took place, TS Artlish recorded 25 of 31 days to be High or Extreme fire danger.

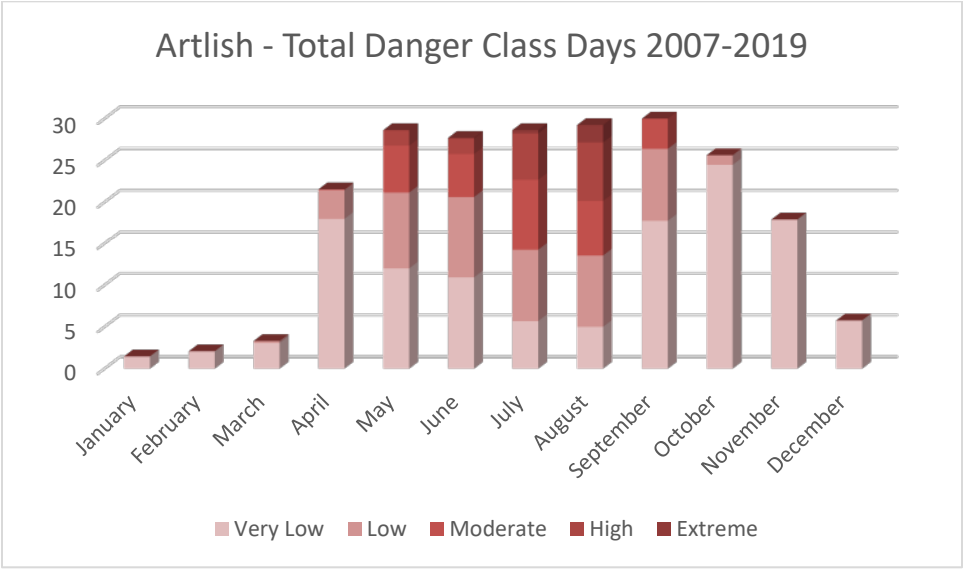

Figure 2. TS Artlish weather station average monthly total danger class days 2007-2019.

Forest Health Issues

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

Human Development and Natural Events

The AOI and surrounding area is within Tree Farm Licence (TFL) 19, held by Western Forest Products Inc. A TFL is an area-based crown forest tenure that assigns timber harvesting rights to a defined area. The most significant human development in the AOI is forest harvesting which has altered the fuel type and hazard around the community. Recent forest fires in 2018 have also altered forest cover in the general area, although not 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.[25] Climate change will continue to impact Vancouver Island by increasing the frequency of relatively warm years, increased intensity of heavy precipitation events, increased flood events, increased summer drought conditions, and increased forest fire frequency and severity due to dry conditions.

In addition to warming temperatures, climate projections for the West Coast region to the 2050s indicates significantly less (-51%) spring snowfall, increased seasonal moisture variability, increased frost-free days, and lengthened dry seasons.[26] 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.[27] 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.[28]

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

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[25] 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

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

[27] 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.

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

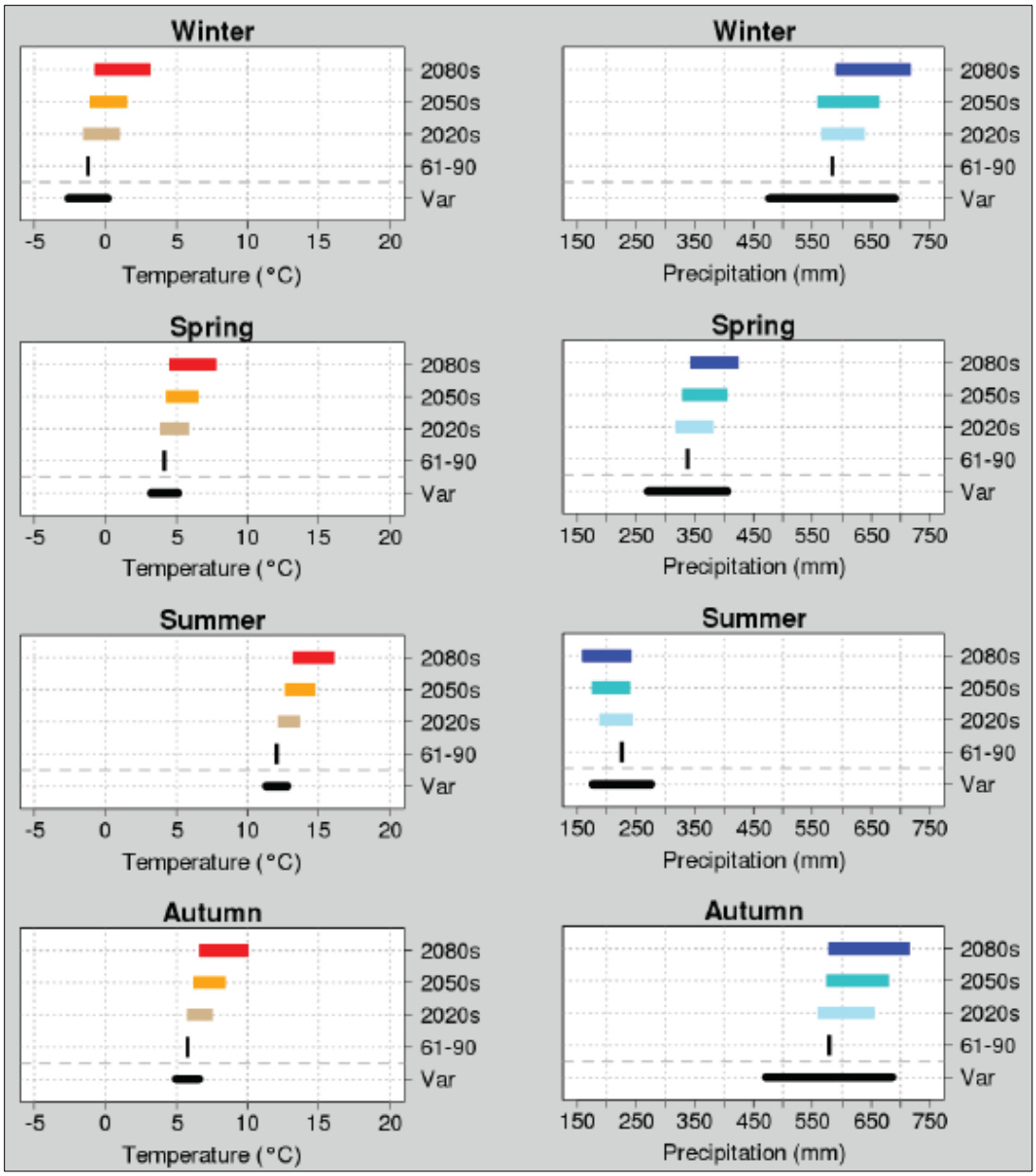

Figure 3: Cumulative seasonal precipitation and mean seasonal temperature projections for 2020s, 2050s, and 2080s.

4.2 Provincial Strategic Threat Analysis (PSTA)

The PSTA[29] is a provincial level geographic information system (GIS) spatial analysis 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.[30] The threat analysis output is a wildfire threat rating classification of No threat, Low, Moderate, High, or Extreme.

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

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

The Wildfire Threat classification is weighted based on 30% fire density, 60% head fire intensity, and 10% spotting impact.

Fire Density

Fire density is the ignition and spread potential based on historic fire patterns. There are 10 fire density classes (1 being the lowest and 10 the highest), based on the approximated weighted fire frequency within a 10km radius. The fire density rating within the AOI is 3 to 5.

Head Fire Intensity

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

Spotting Impact

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

4.2.1 Fire History

According to the BCWS' historical fire data, the largest fire was a 579ha human-caused event that swept through Tahsis and the Tahsis River valley in 1948. This fire (BCWS Fire #24)

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[29] 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

[30] 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.

started at the sawmill from a welding spark and within minutes the whole mill was destroyed. The fire spread from the mill into the surrounding areas, burning 579.8 hectares in the Tahsis valley.[31] Most other fires have been small and isolated occurrences (Map 4).

More recently, a massive lightning storm on August 11, 2018 sparked over 75 wildfires across northern Vancouver Island. Heavy wildfire smoke impacted the community in 2018 due to nearby fires. The closest fire to Tahsis was the Ceepeecee Mountain fire (V82633, total area 43 hectares), about 4km to the south, which was partially within the AOI and was visible from the Village. BCWS monitored the fire but did not send response crews due to the location, access, and heavy resources assigned to other fires in the region at the time.

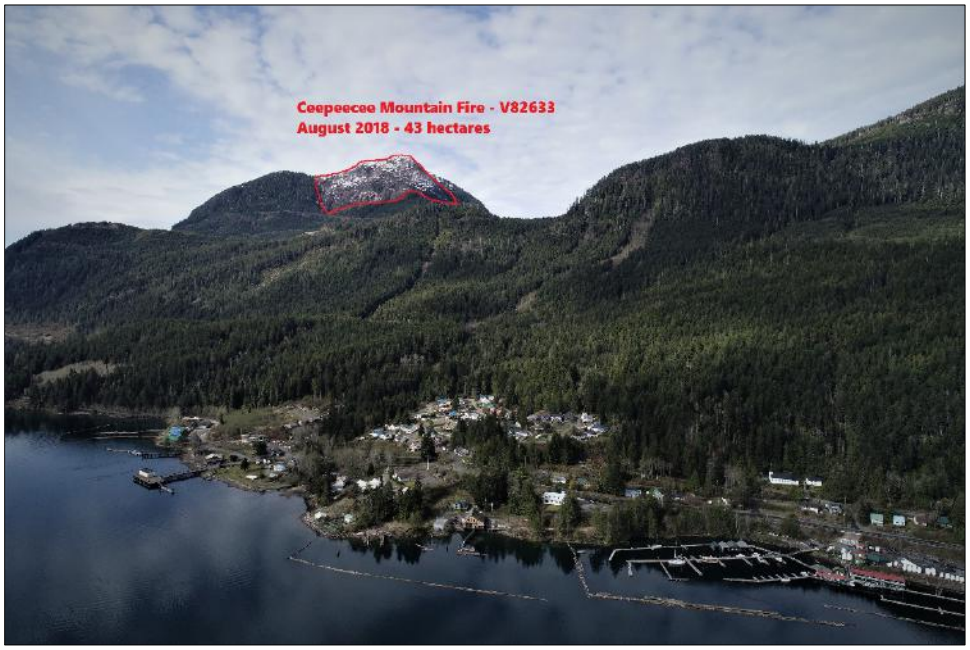


Photo 5. The Ceepeecee Mountain Fire (V82633) that occurred in August 2018, visible from Tahsis.

Another fire of note from August 2018 was the Head Bay Fire (V82449, total area 7 hectares), located 13km to the south east along the BC Hydro powerline adjacent to Head Bay FSR. Although outside the CWPP AOI, it was a concern because of the wooden poles that would have left Tahsis without power if they were destroyed. The BCWS responded to the fire with 10 crew members along with TFRD and BC Hydro staff to protect the poles, ultimately saving the poles from damage. This fire was close to Head Bay FSR, the crucial evacuation route from Tahsis to Gold River, but the road was not closed as a result of the fire. Both fires V82449 and V82633 were outside of the AOI and are not included in the numbers presented in Table 5.

[31] TahsisBC.com (http://www.tahsisbc.com/profile/guides/History-of-Tahsis.pdf)

Photo 6. Head Bay Fire (V82449) that occurred in August 2018.

Recent fire seasons 2017 and 2018 have seen several lightning caused fires on the west coast of Vancouver Island, however, most historical fires in the area are human caused. The 2011 CWPP found that of 12 fires recorded between 1950-2008, 9 were human caused. Fire prevention awareness and education on human caused fires remains an important point of emphasis. Due to reporting and documentation, the number of recorded fires is likely an underestimation of the actual number of fires that have occurred.

Table 5. Provincial data fire history summary within the AOI from 1950-2019 (data from 2011 CWPP).

Size Class (ha)	Total fires 1950-2008	Lightning 1950-2008	Human 1950-2008	Total Fires 2008-2019	Lightning 2008-2019	Human 2008-2019
<4.0	10	1	9	1		1
4.0-10.0						
>10.0	2		2	1	1	
TOTALS	12	1	11	2	1	1

Map 4. Recorded Historical fires in the area surrounding Tahsis, since 1950.

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. The local wildfire threat assessment process is described in further detail in Appendix 1: Local Wildfire Threat Process.

4.3.1 Fuel Type Assessment

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

The available spatial information from Data Catalogue 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
- areas of non-fuel were re-classified to fuels

The changes in fuel type areas are summarized in Appendix A1.1 Fuel Type Attribute Assessment, and shown on the Existing Fuel Type Map (Map 8) and Update Fuel Type Map (Map 9).

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

Initial Spread Index rose from the TS Artlish weather station and the Canadian Wind Atlas[32] model for the Village area are shown in Appendix A1.3 Fire Spread Patterns. CWA data for the AOI shows dominant winds from the southeast, except for summer months (June, July, August) where the dominant wind direction is from the north. The northerly winds recorded in the summer months are characteristic of summer frontal systems approaching from the north.[33] Furthermore, the north-south topographical orientation of Tahsis valley and Tahsis Inlet funnels winds in the north-south direction. The northerly wind direction is considered the dominant direction for the local wildfire threat assessment. Southerly afternoon winds, the result of daytime heating, are also considered as part of the assessment.

4.3.4 Topography

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

Slope Percentage Class

The community is on slopes <20%. To the west of the community, slopes are gentle and <20%. To the west there is a steep stream draw with slopes >60%. North (behind, or above) the community, slopes are >60%. 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

Tahsis 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.

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

[33] NAV Canada. Local Area Weather Manuals – The Weather of British Columbia, Chapter 4 – Seasonal Weather and Local Effects. https://www.navcanada.ca/EN/media/pages/publications-operational-weather-manuals.aspx

4.3.5 Local Wildfire Threat Classification

A local wildfire threat classification was completed; the process of this threat classification is summarized in A1.5 Local Wildfire Threat Classification. For an updated wildfire threat classification map, see below Map 5. A summary of the threat classification areas is provided in Table 6. Generally, the wildfire threat around the Village is Moderate.

Table 6. Wildfire threat class summary from the original PSTA data and updated 2020 CWPP analysis.

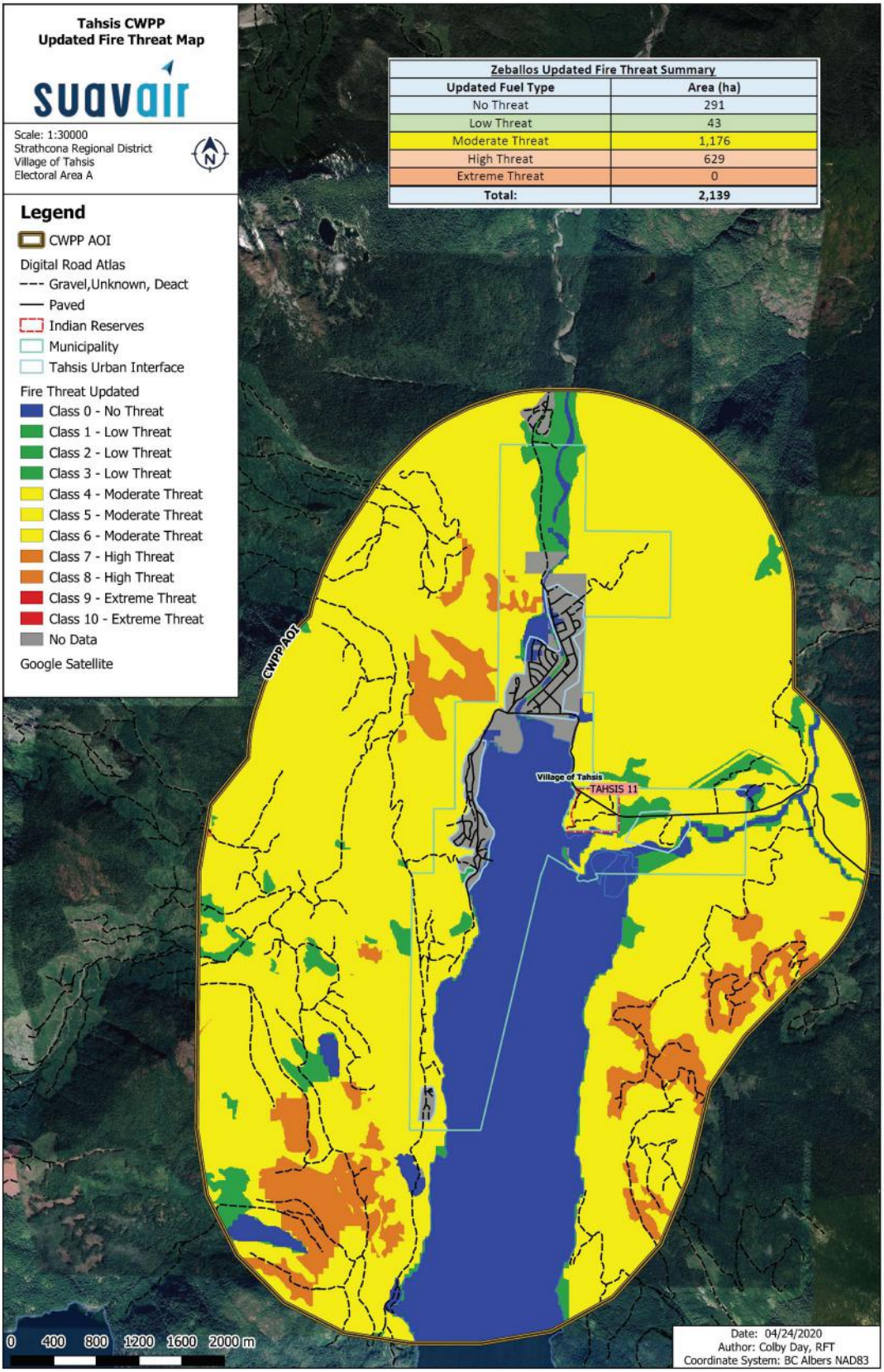
Wildfire Threat Class	2019 PSTA Data		2020 CWPP Analysis	
	Area (ha)	% of AOI	Area (ha)	% of AOI
Extreme	35	1%	0	0%
High	111	3%	290	7%
Moderate	2415	58%	2765	67%
Low	584	14%	187	4%
Very Low / No Threat (Water)	778	19%	784	19%
No Data / Private Land	224	5%	120	3%

4.3.6 Local Wildfire Risk Classification

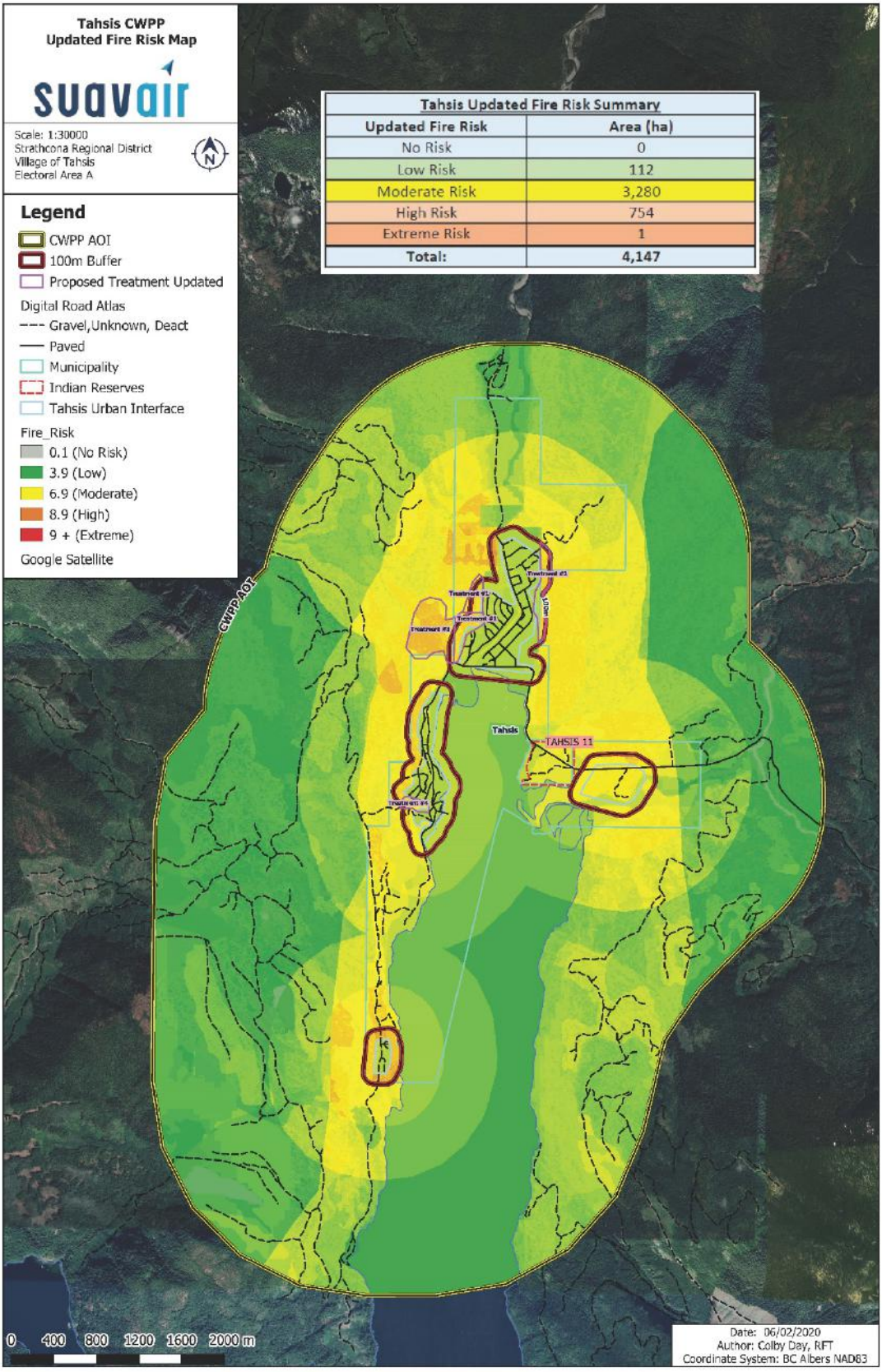
The 2019 PSTA data classifies the Tahsis WUI as Risk Class 5 (Moderate). A local wildfire risk classification was completed based on the updates to the fuel type layer and local wildfire threat classification. Proximity to structures/values, fire spread patterns, and topography are the other key determinants of wildfire risk. The detailed wildfire risk assessment process is found in Appendix A1.6 Local Wildfire Risk Classification. The Local Wildfire Risk Classification ranges from generally Moderate risk, with some pockets of High risk (Map 6 and Table 7). Higher risk areas are generally associated with upwind fuels within 500m to structures in the community.

Table 7. Summary of local wildfire risk class areas.

2020 CWPP Wildfire Risk Class	Area (ha)	% of AOI
Extreme	1	<0.005%
High	754	18%
Moderate	3280	79%
Low	112	3%
Very Low / No Threat (Water)	0	0%
No Data / Private Land	0	0%



Map 5. Local wildfire threat classification for the AOI.



Map 6. Local wildfire Risk classification within the AOI and recommended treatment areas.

SECTION 5: RISK MANAGEMENT AND MITIGATION FACTORS

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

Mitigating wildfire risk is a proactive approach to reducing potential impacts and subsequent losses from devastating wildfires, it 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.[34] Treatment strategies should prioritize surface and ladder fuel changes over canopy changes.[35] Fuel treatments should aim to reduce surface fuel loading, increase the height to live crown through reduction of ladder fuels, and reduce crown closure as necessary.

Crown fires in mature coastal forests require support from heat generated by burning of surface fuels and understory (ladder fuels). Removal surface fuels and ladder fuels are the main considerations for fuel treatments in moist coastal forests. The vertical arrangement of fuels is an important consideration for fuel treatment prescriptions. In mature coastal forests, the natural canopy crown height is elevated from the forest floor. Without significant surface and ladder fuels, it is less likely that crown fires will occur. Figures 4 and 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) also contribute to wildfire hazard across the landscape. Harvested areas dry out faster, dead and down material does not retain moisture and is more susceptible to ignitions. Surface fires in slash tend to spread quickly and can build up heat and intensity, spreading into adjacent mature stands as surface and crown fires. Therefore, fire hazard abatement in harvested cut blocks is critical, especially when harvested areas occur within the WUI.

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[34] 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

[35] Ibid.

Figure 4. Understory thinning can reduce surface and ladder fuels.[36]

Figure 5. The vertical arrangement of ladder fuels can carry a fire from the surface into the forest canopy.[37]

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

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

5.1.1 Fuel Treatment Areas

Priority areas for vegetation (fuel) management were identified in the 2011 CWPP. A total of 53.7ha Priority 1 and 336.7ha of Priority 3 treatment areas were identified based on hazardous fuel types (C-2, C-3, and C-4) and proximity to the WUI. Recommendation 31 in the 2011 CWPP was: *with the help of a qualified Registered Professional Forester, develop treatment prescriptions for fuel management activities within the priority areas. The 2011 recommendation suggested a progressive thinning program to be conducted over the next five to ten years starting with Priority 1 areas.* No known fuel management treatments have been completed to date.

The two main barriers to conducting fuel treatment are cost and land jurisdiction/ownership. The 2011 CWPP Priority 1 treatment areas include significant portions of Private Land. District Lot (DL) 443, DL623, DL595, and DL625 (Art Tahsis / Tahsis Farm) are large sections of forested private land where Priority 1 fuel treatment areas were previously identified. Other portions of Priority 1 treatment areas are Crown forests within TFL 19. Fuel management activities require coordination and participation from private landowners and tenure holders.

This CWPP refines the 2011 treatment areas to smaller, more manageable areas as priority for future fuel treatment prescription development. The three treatment areas recommended are along Ubedam Creek, behind Captain Meeres School, and on the slope above the old firehall (Table 8).

Where fuel treatments are within 100m of structures, FireSmart planning practices apply. FireSmart is described in further detail in Section 5.2 below.

Photo 7. Treatment area #3. Ubedam Creek trail, surface and ladder fuels.

Table 8. Summary of recommended fuel treatment areas (Map 7).

Treatment Area	WUI Threat / Risk	Priority	Approx. Area (ha)	Land Ownership	Comments / Rationale
1	High / High	High	10.4	Private (6.8ha) Crown (4.6ha)	High risk within the WUI100
2	Mod / High	Med	8.0	Crown	High risk within the WUI100.
3	High / High	High	20.1	Crown	High risk within the WUI500, adjacent to transmission lines
4	Mod / Low	Low	2.8	Municipal (0.8ha) Private (2.0ha)	Ubedam Creek Trail, potential community FireSmart project

Photo 8. An aerial image with the location of the three proposed fuel management treatments.

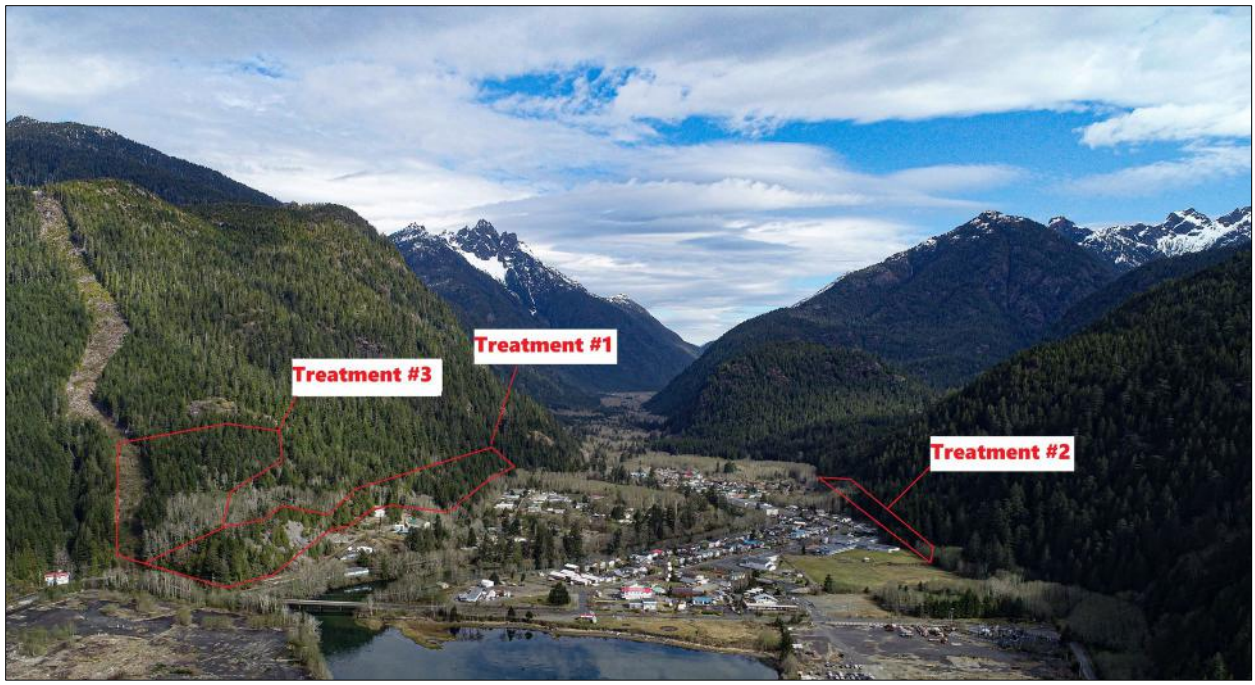
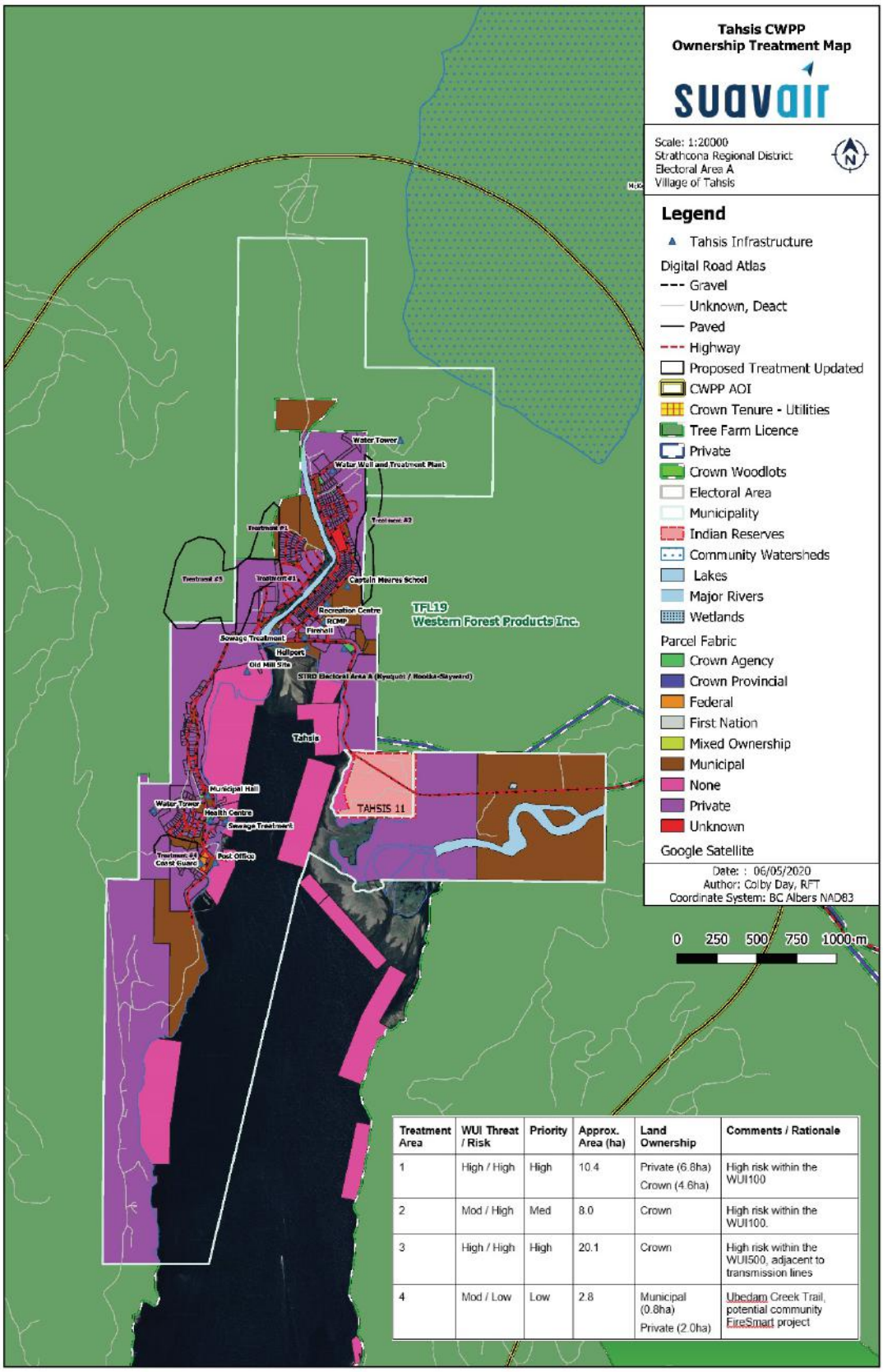


Photo 9. Proposed treatment #1(Captain Meares School & Rec Centre) and treatment #2 (powerlines and homes).



Treatment Area	WUI Threat / Risk	Priority	Approx. Area (ha)	Land Ownership	Comments / Rationale
1	High / High	High	10.4	Private (6.8ha) Crown (4.6ha)	High risk within the WUI100
2	Mod / High	Med	8.0	Crown	High risk within the WUI100.
3	High / High	High	20.1	Crown	High risk within the WUI500, adjacent to transmission lines
4	Mod / Low	Low	2.8	Municipal (0.8ha) Private (2.0ha)	Ubedam Creek Trail, potential community FireSmart project

Map 7. Recommended treatment areas and land ownership classes.

The Forest Enhancement Society of BC[38] (FESBC) provides funding for wildfire risk mitigation projects conducted on Crown land. UBCM CRI funding is available for wildfire risk mitigation, including FireSmart initiatives on municipal, First Nations, or private land.

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.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
3.	High	To reduce the fuel hazard in identified treatment areas (High risk areas within 500m of the community).	Develop and implement site specific fuel management prescriptions. Prescriptions to be completed by a qualified Registered Professional Forester. Recommended treatment areas are listed in Table 8. The forest professional may also refer to Priority 1 treatment areas in the 2011 CWPP. Share this plan and collaborate with regional operators (forest tenure holders, BC Hydro, MFLNRORD, etc) where possible. Where treatment areas are identified on Crown lands, consultation is required with Mowachaht/Muchalaht First Nations.	Village and/or SRD Share this plan and recommendations with regional operators

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.[39]

[38] Forest Enhancement Society of BC. https://fesbc.ca/applying-for-funding.html.

[39] 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

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 Tahsis' 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 6 shows the WUI disaster sequence where citizens and landowners can act to break the sequence.

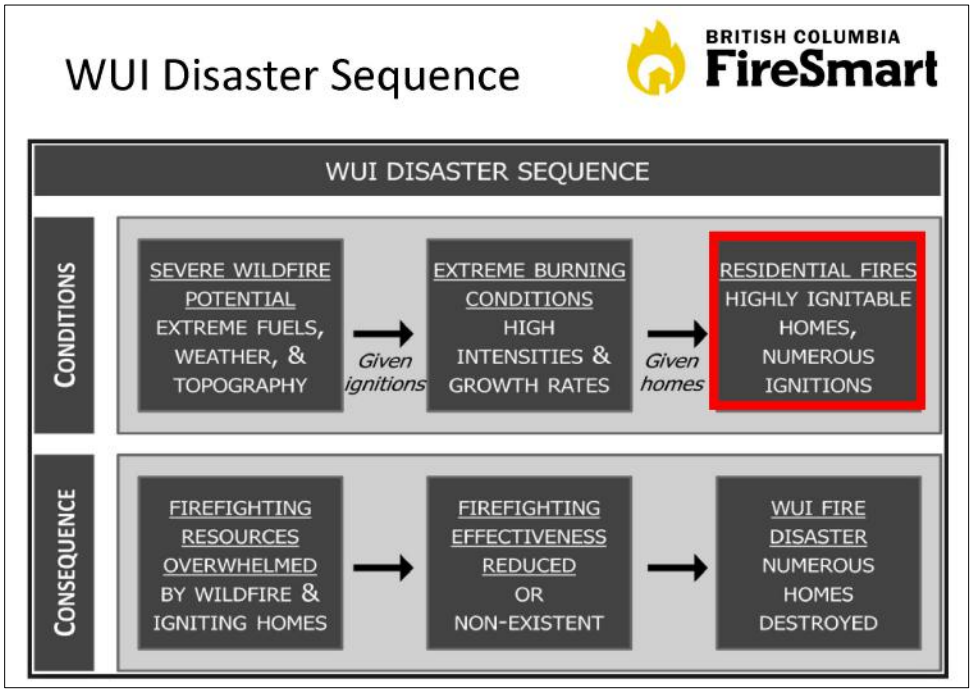


Figure 6. Wildland urban interface disaster sequence and where residents and landowners can break the disaster sequence.

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)[40] are a main determinant of whether a home/structure will be lost due to a WUI fire (Figure 7). Simple actions to modify the SIZ can make a big difference. Figure 8 shows the priority areas for vegetation management within the SIZ.

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

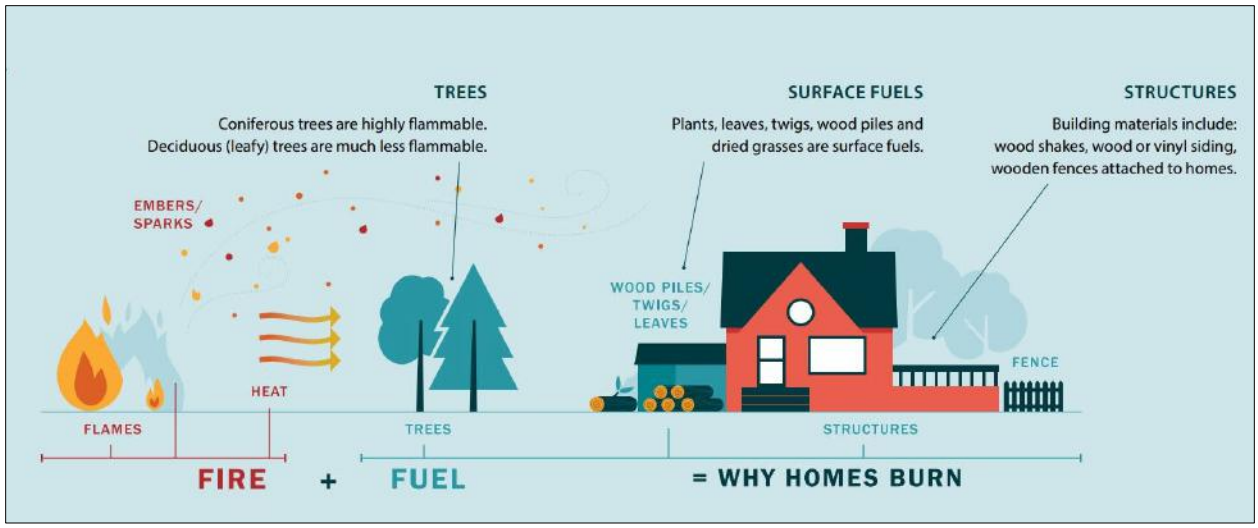


Figure 7. Why homes burn during WUI fire incidents.[41]

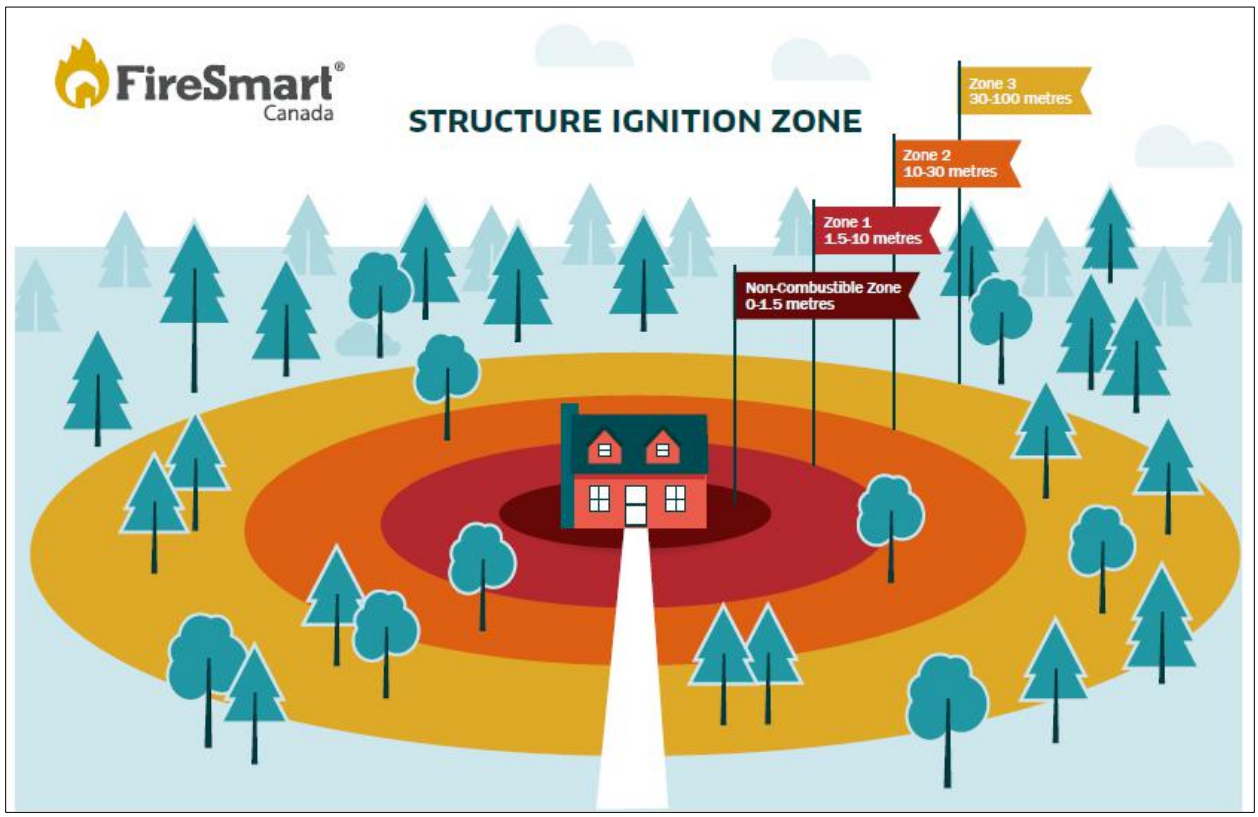


Figure 8. The FireSmart Structure Ignition Zone including Priority Zones breakdown.

[41] 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.[42] 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.

There are several ways the Village and SRD can engage in FireSmart activities.[43] A general list of FireSmart Practices and Activities can be found in Appendix 3: FireSmart Practices and Activities. Previous FireSmart activities conducted in the Village include community chipping days, FireSmart presentations at elementary and secondary schools, and a FireSmart presentation at a Village Council meeting. The Village does not have any Recognized FireSmart Communities.

The 2011 CWPP Recommendation #12 was "*Tahsis should upgrade the vulnerable structures associated with critical infrastructure to meet FireSmart standards.*" To achieve this, the Village should contact an LFR to conduct critical infrastructure FireSmart hazard assessments to provide site specific recommendations. There are now two Local FireSmart Representatives in the Village, both members of the TFRD.

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

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[42] 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

[43] UBC-M. Community Resiliency Investment Program. FireSmart Funding and Supports. https://www.ubcm.ca/EN/main/funding/lgps/community-resiliency-investment.html

- 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 on public buildings planned by the Village, SRD, or other levels of government, 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 other 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[44] and/or contacting a Local FireSmart Representative.[45]

5.2.3 Identify Priority Areas within the Area of Interest for FireSmart

The intent of this sub-section is to use of 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. Table 9 identifies FireSmart priority areas for the Village. All areas identified are important and the numbering is assigned for report organization.

Table 9: Summary of recommended FireSmart Priority Areas.

Priority Area	Wildfire Risk Rating (E/H/M/L)	Recommended FireSmart Activities
#1: Rugged Mountain Mobile Home Park	Mod	• Conduct a FireSmart Community Hazard Assessment • FireSmart awareness education for

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

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

#2: Alpine View Road		neighbourhood residents • Encourage landowners and occupiers to remove all flammable materials from the Non-combustible zone (1.5m from structure) • Regularly mow lawns and thin shrubs • Remove dead branches, small fuels from Priority 1 zone (first 10m) • Remove any overhanging vegetation • Prune tree branches up to 2m (within Priority zone 1)
#3: Critical Infrastructure	Mod	• Ensure all critical infrastructure follow recommended FireSmart guidelines for structures. Contact LFR to complete a hazard assessment on these structures
#4: St. Joseph's Church	Mod	• Conduct a FireSmart hazard assessment around the structure • FireSmart awareness education for community users • Refer to structure ignition zone recommendations listed in Section 5.2.2 above
#5: Tahsis Landfill	Low	• Conduct a FireSmart Hazard assessment around the landfill • Carry out on any recommendations made in the hazard assessment

The photos below show FireSmart priority areas within the Village.

Photo 10. Captain Meeres School priority zone 2 fuels.

Photo 11. Forest fuels in direct contact with or overhanging St. Joseph's Church.

The following recommendations are made regarding the application of FireSmart practices in the community.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
4.	High	To reduce the fuel hazard and ignition risk within the FireSmart Structure Ignition Zone (100m) of structures and homes in Village.	Conduct FireSmart Hazard Assessments starting with the priority areas identified in Table 9. Implement hazard assessment recommendations.	Village and/or SRD
5.	High	To reduce the ignition risk surrounding critical community infrastructure.	Contact a Local FireSmart Representative to complete FireSmart hazard assessments around critical infrastructure in the Village.	Village
6.	High	To reduce fuel hazard on private land and provide alternatives to open burning.	Offer alternative yard waste disposal options including periodic collection and community chipping services.	Village and/or SRD

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. Educations and communication in advance of a WUI incident is required to ensure community members are prepared, informed about their roles and the roles of the Village, fire department, SRD, and BCWS in response.

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 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 recorded video presentation of the plan results and recommendations made available to the Strathcona Regional District Emergency Coordinator, Chief Administrative Officer and Fire Chief
- Hard copies and digital copy of the plan submitted to the Village administration
- A digital copy of the plan should be uploaded to the Village website
- A digital copy should be uploaded to the Strathcona Regional District Emergency Planning website
- Alternative community communication forums can also be used to share selected highlights from the plan, including the Village Facebook page, and Tahsis Living[46] blog for example

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

[46] Tahsis Living. http://tahsisliving.blogspot.com/

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
7.	High	To make this Plan and its associated maps available to the community.	Upload a digital copy of the CWPP to the Village of Tahsis and SRD websites.	Village and SRD
8.	High	To improve community awareness of the FireSmart program.	Encourage residents to complete the free, online, FireSmart 101 course.	Village and SRD
9.	Med	To improve community awareness of wildfire threat and risk, and of the actions that can be taken to mitigate risk.	Deliver regular communications to community members (flyers, notice boards, emails, social media, etc.). Recommend at least one fire related communication per month (bi-weekly during fire season if required).	Village, Fire Department
10.	High	To improve community awareness of wildfire threat and risk, and of the actions that can be taken to mitigate risk.	Use SRD and Village 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
11.	High	To reduce the risk of human-caused ignitions by improving community awareness of local bylaws, provincial wildfire regulations, and wildfire safety.	Develop a Village specific Fire Safety and Wildfire Preparedness factsheet (paper and digital resource). Send this as an annual mailout to all Village residences. This factsheet should include information on Village Bylaws, what constitutes a “fire hazard” on private property, *Wildfire Regulation* legal requirements, FireSmart principles, and emergency evacuation routes	Village and/or SRD
12.	High	To improve community awareness of wildfire threat and risk, and of the actions that can be taken to mitigate risk.	Organize an annual Community Fire Safety or Community Wildfire Preparedness day. Activities may include checking fire extinguishers and smoke alarms in homes, conducting	Village

			FireSmart clearing of Priority 1 (up to 10m) zones around critical community infrastructure, FireSmart presentations, fire department demonstrations, etc.	
13.	Low	To improve community FireSmart awareness.	Continue to deliver the FireSmart education program in the K-12 public school system. Use the BC FireSmart Education package. Contact the BCWS Coastal Fire Centre Fire Prevention Specialists to borrow education kits and for education support.	Village
14.	Med	To improve community FireSmart awareness.	Contact a Local FireSmart Representative to deliver Public education materials at annual community events (ie: Canada Day, Tahsis Days, Fishing Derby)	Village
15.	High	To improve inter-agency and cross-jurisdiction communication about wildfire risk, emergency preparedness, response, and recovery.	The SRD should arrange an annual meeting, prior to fire season, to include BCWS – North Island Fire Zone, EMBC, and local fire department representatives and Village Administration to review incident command structure, communication strategies and emergency support services in the event of a WUI fire.	SRD
16.	Med	To continually communicate with the public on emergency planning activities.	Communicate the Village's completed emergency planning initiatives (including Evacuation Plan and this CWPP). Engage in an emergency response drill or other mock exercise.	Village
17.	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.	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.

A Fire Danger Rating sign has been installed on Head Bay FSR near the entrance of the Village. Campfire ban and other burning restrictions can also be communicated on this sign. Other prevention avenues include aligning Village fire bans with provincial fire bans, enforcement of local bylaws such as the Bylaw to Regulate Open Burning and Fire Protective Services and Regulation Bylaw.

The risk of human-caused ignitions within the AOI are not limited to private property owners, residents, or recreationalists. Power lines and industrial activities pose a risk of ignition. Tree contact with power lines are a common occurrence and pose a significant ignition risk within the AOI Industrial activities are required to comply with the *Wildfire Act* and associated *Wildfire Regulation*. The *Wildfire Regulation* restricts "high risk" industrial activities during certain fire weather conditions specified in the regulation.

The following recommendations are made regarding other prevention measures.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
18.	High	To reduce the wildfire ignition risk along power line rights-of-way.	BC Hydro to ensure their vegetation management strategy does not contribute to unacceptable fuel loading or diminish the ability of the right-of-way to act as a fuel break. Specifically address any hazards identified around the substation.	Village and/or SRD to share plan recommendations with BC Hydro
19.	Med	To promote alternative means of yard management and yard waste disposal.	Provide residents within information on alternatives to burning yard waste. Link this information on the SRD website. Alternatives to burning include yard waste disposal centres, composting or 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 (revised July 2016).[47]

6.1 Local Government Firefighting Resources

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

6.1.1 Fire Departments and Equipment

Fire protection within the Village municipal boundary is the responsibility of the Tahsis Volunteer Fire and Rescue Department (TFRD). The current department has 15 active members, all trained to exterior structural firefighting standards. All members have completed Wildland Firefighting Level 1 (WFF-SPP Level 1) training and five members have completed ICS100 training. In 2018, the BCWS called upon the TFRD to be first responders to a wildland fire on Head Bay FSR under the BC Hydro transmission lines, the fire was contained to 7.3ha. Working with BCWS crews on this fire was regarded as a positive training experience.

The fire department has 2 pumper trucks and the necessary structural firefighting equipment associated with each truck. The department has limited additional wildland fire equipment including 2 pumps, 2 hoses, and 4 backpack pumps. Additional wildland fire equipment to be purchased in 2020 includes 5 portable pumps, forestry hose, and 6 sprinkler kits for structural protection. The TRFD maintains a fire training centre at the old mill site where members can practice suppression of active Class A fires.

The Village does not have any formal mutual aid agreements with other local or regional fire departments. Gold River Volunteer Fire Department is the nearest local fire department. The North Island Fire Zone, Campbell River office is the closest BCWS location.[48] The TFRD is now on the list of approved BCWS contractors and may be retained on stand-by and dispatched to respond to wildfires on Crown lands.

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

[48] BC Wildfire Service. Organizational Overview – 2017. (https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/fire-centres/bcws_organizationaloverview_current.pdf)

Photo 12. Engine 2 - 2018 Freightliner with 300 imperial gallon tank.

Photo 13. Active fire training area at the old mill site.

Photo 14. Active fire training area at the old mill site.

6.1.2 Water Availability for Wildfire Suppression

Water is the most important suppression resource when combating fire. It is essential that there be sufficient water supply available during all times of the year. For structure fires within the community, a consistent water supply is available through the Village hydrant system. Outlying areas including the landfill and Tahsis farm are not serviced by the hydrant system. Water to combat a landfill fire would require running at least 2km of hose from the nearest hydrant.

For most wildland fires within the AOI, the ocean is the nearest water supply. Drafting potential from the ocean is limited by high/low tides. Freshwater sources in the area are limited to small streams or the Tahsis and Leiner Rivers. The rivers provide possible emergency water sources for drafting to temporary reservoirs however the availability is subject to low flow periods during the higher fire danger summer months. There are no nearby lakes accessible by road.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
20.	High	To improve water availability for suppression of interface fires in outlying areas.	Purchase a water tanker, portable water tank, and/or portable bladders for improved water availability for wildland fire suppression and fire suppression in outlying interface areas beyond the water hydrant system. Consider access conditions, water sources, and most likely application when assessing which apparatus to acquire.	Village
21.	Med	To improve water availability for suppression of interface fires in outlying areas.	Explore permitting requirements and opportunities for installing dry hydrant systems on Tahsis or Leiner Rivers, or other streams, to improve water availability in outlying areas.	Village

6.1.3 Access and Evacuation

Evacuation of residents and access for emergency personnel is an important consideration given the amount of forest fuels near many homes in Tahsis. Road networks during an emergency event will serve two purposes, a) evacuation route for residents fleeing the emergency, and b) access for personnel responding to the emergency. Evacuation through aerial or water transportation would be applicable in the most severe of emergencies where road evacuation is no longer safe.

McElhanney Ltd. has completed the Tahsis Evacuation Plan (including routes and maps), submitted to the Village in February 2020. The Evacuation Plan details land, marine, and air evacuation plans. Head Bay FSR is the only land-based access route connecting the Village to other populated parts of Vancouver Island. Maintaining access along Head Bay FSR is a top priority. A fire at the BC Hydro substation would also require closing public access to Head Bay

FSR within 300m of the facility. The single, narrow, winding egress route mostly on gravel surface increases the likelihood of accidents. One accident on this road could block or delay all evacuation efforts. Additionally, WUI fires that may occur along this road present a hazard to emergency access to/from the Village. The mountainous terrain with steep road grades and curves means most WUI fires will require BCWS aerial support for response and suppression. Outside of the WUI100 there is no quality access for emergency equipment. Fuel management along the Head Bay FSR right-of-way is a priority.

The alternatives to land-based access is water access by floatplane or boat, or air access by helicopter. The passenger capacity of marine and air evacuation options are detailed in the Tahsis Evacuation Plan. A future evacuation option may be the multi-purpose ATV trail currently in planning stages. Together with the Village of Zeballos, Mowachaht/Muchalaht First Nation and Ehattesaht Chinehkint First Nation, the Village is planning to construct a multi-purpose trail all-terrain vehicle trail connecting Villages of Zeballos and Tahsis.

The following recommendation is made regarding access and evacuation.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
22.	High	To manage and reduce the vegetation/fuel hazard along the Head Bay FSR right-of-way.	Plan for vegetation management, brushing and clearing along Head Bay FSR right-of-way with fuel hazard reduction as an objective (cleared materials should be chipped and hauled away).	Village and/or SRD to share this recommendation with Ministry of Transportation and Infrastructure
23.	Med	To improve emergency evacuation communications to the community.	Encourage residents to sign up to the SRD's free Connect Rocket emergency notification service which sends out text messages to cellular subscribers and voice calls to landlines.	Village and SRD

6.1.4. Training

Ongoing training opportunities for the TFRD is critical to building capacity for 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. A full list of relevant training courses is listed in Appendix 4: Wildfire and Emergency Response Training Courses. This list includes training opportunities for first responders, Village administration, and community volunteers. TFRD members are scheduled to complete the structure protection program SPP-115 workshop in 2020.

The current level of communication between the TFRD and BCWS is often dictated by fire season demands and there is not a defined system for annual communication. The nature of this relationship will change as the TFRD is now on the approved contractors list for BCWS. Nevertheless, annual in-person meetings between the Fire Chief and the regional BCWS staff

would strengthen working relationships and be beneficial when active fires occur within the AOI. Additionally, an annual review should be completed on the incident command system so both groups understand how to maximize the efficiency of each other during a fire emergency.

The TRFD does not currently engage in cross-training with BCWS and would benefit from coordinated activities. Cross-training with the BCWS would enable the TFRD to prepare its responders with the technical and practical firefighting experience in order to action both structural and wildland fires.

The following recommendations relate to training.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
24.	Low	To maintain sufficient TFRD personnel to respond to emergencies.	Continue to ensure all TFRD members are trained to response to WUI incidents (SPP-WFF 1).	Village
25.	High	To maintain and upgrade TFRD personnel certification & training.	Where possible, provide members the ability and resources to complete additional training such as SPP-115, ICS100, FireSmart LFR, or other related courses.	Village
26.	High	To maintain and improve communication with BCWS.	TFRD and BCWS (with Gold River Volunteer Fire Department) should coordinate to conduct joint yearly 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.	Village with SRD and BCWS support

6.2 Structure Protection

The TFRD is responsible for responding to structural fires within the municipal boundaries and at Moutcha Bay Resort (under a service agreement). The Village currently does not have access to a structural protection unit (SPU). The nearest SPU's are with the Campbell River Fire Department and Comox Fire Rescue. The Village is in the process of acquiring sprinkler kits for WUI fire protection. There is potential for the Village to jointly purchase a SPU with the SRD and Village of Gold River and to make the unit available for contract services with the BCWS.

The following recommendations relate to structure protection.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
27.	Med	To improve equipment availability for structure protection in the event of WUI fires.	Engage the City of Campbell River in a mutual aid agreement regarding the deployment of their Structural Protection Unit.	Village
28.	Low	To improve equipment availability for structure protection in the event of WUI fires.	Engage Gold River Volunteer Fire 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
29.	Med	To improve equipment availability for structure protection in the event of WUI fires.	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 as having the equipment readily available. Ensure TFRD members receive SPP-115 training.	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[49] have applied the CFFDRS/FBP fuel types to the BC context and these fuel type descriptions are used to inform 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).*

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

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

Regarding plantations:

"Coastal conifer plantations represent a specific case of uncertainty – species such as Douglas-fir and western redcedar growing on productive sites, with abundant herbaceous and shrub species in the understory; sometimes these blocks are planted directly through untreated slash; other times, slash is burned before planting; currently, these stands sometimes type out as C-5, sometimes as D-1/2, sometimes as slash (S-3), depending on the time since harvest, tree height and tree age of the dominant cohort; in the authors' opinion none of these is a particularly good fit, and more research is needed to represent managed stands in coastal areas." (p. 32)[50]

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

Table 10. Description of fuel type layers.

Fuel Type	CFFDRS/FBP Description[51]	BC PSTA Description[52]	Local Description	Expected Wildfire Behaviour Under High Wildfire Danger
C-1	Spruce-lichen Woodland (open, parkland)	Pure black spruce stands with sparse vegetation density	Does not occur within the AOI	Similar to C-3
C-2	Boreal black and white spruce. Continuous feather moss, compacted organic layer.	Mid-elevation hybrid spruce stands	Does not occur within the AOI	Crown fire, high to very high fire intensity and rate of spread

[50] 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.

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

[52] 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.

	Continuous shrub, low to moderate down woody fuel, tree crowns extend nearly to the ground. Moderately well stocked black spruce stands, bogs excluded.			
C-3	Mature jack or lodgepole pine. Continuous feather moss, sparse conifer understory, sparse down woody fuels. Fully stocked. Ladder fuels absent.	Pure and mixed Fd stands 4-12m tall; dense pure or mixed (100% conifer) dominated by Cw, Yc, Hw and 4-15m in height or >15m and <60 years old. Dense pole sized stands[53].	Dense Second or third growth douglas-fir/ western hemlock/ western red cedar forests over 4m tall and less than 60 years old. Clean/open understory.	Surface and crown fire, low to very high fire intensity and rate of spread
C-5	Red and white pine. Continuous needle litter; moderate herb and shrub layer, tree crowns separated from the ground. Moderately well stocked stands.	Used to approximate fire behaviour in mature stands of low-mid elevation coastal Fd/Hw/Cw.	Mature Douglas-fir/ western hemlock/ western red cedar forests	Burn rarely and typically with low intensity. Surface fuel loading can be high in older coastal stands, as a result fire intensity can be higher under drought conditions.
M-1/2	Boreal Mixed wood. Continuous leaf litter in deciduous portions, feathermoss and needles in conifer portions. Moderate shrub and continuous herb layers, down woody fuels, conifer crowns extend near	Amabilis fir stands typed as M-2 40% conifer to represent fire behaviour between C-3 and C-5 fuel types Mixed deciduous/coniferous stands	Mature forests dominated by amabilis fir/mountain hemlock Higher elevation stands over 800-900m	Surface fire spread, torching of individual trees and intermittent crowning.

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

	the ground. Moderately well stocked mixed wood stands.			
D-1/2	Aspen. Continuous leaf litter, moderate shrubs and herbs, conifer understory absent. Moderately well stocked, semi-mature.	D-1 leafless; D-2 green Broadleaf species Conifer forest, 2-6 years Post-wildfire (low to moderate fire severity, open to very open stand structure)	Alder, cottonwood, or big leaf maple dominated stands, often along streams.	Surface fire, low to moderate rate of spread and intensity
S-3	Coastal Cedar-Hemlock-Douglas-fir Slash.	Slash types may over predict hazard in areas where slash hazard reduction has occurred (burning, piling, or site preparation)	Recently harvested cut blocks less than 5 years old.	Moderate to high rate of spread and high to very high intensity surface fire
W	Water	n/a	n/a	n/a
ND	No Data / Private Land	n/a	n/a	n/a
NF	Non-fuel	Conifer forest – dense (low fire severity; overstorey mostly unchanged), 1-3 years post-wildfire		

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

Table 11. Fuel type categories and crown spotting potential.

Fuel Type Categories	Fuel Type - Crown Fire/ Spot Potential
1: C1, C2, C4, M3-M4 (>50% C/DF)	High
2: C3, C7, M3-M4 (<50% C/DF) M1-M2 >50% Conifer	Moderate

3: C5, C6, O1a/b, S1- S3[1] M1-M2 (26-49% Conifer)	Low
4: D1, D2, M1-M2 (<26% Conifer)	Very Low

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

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

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

Fuel Type Layer Changes within the AOI

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

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

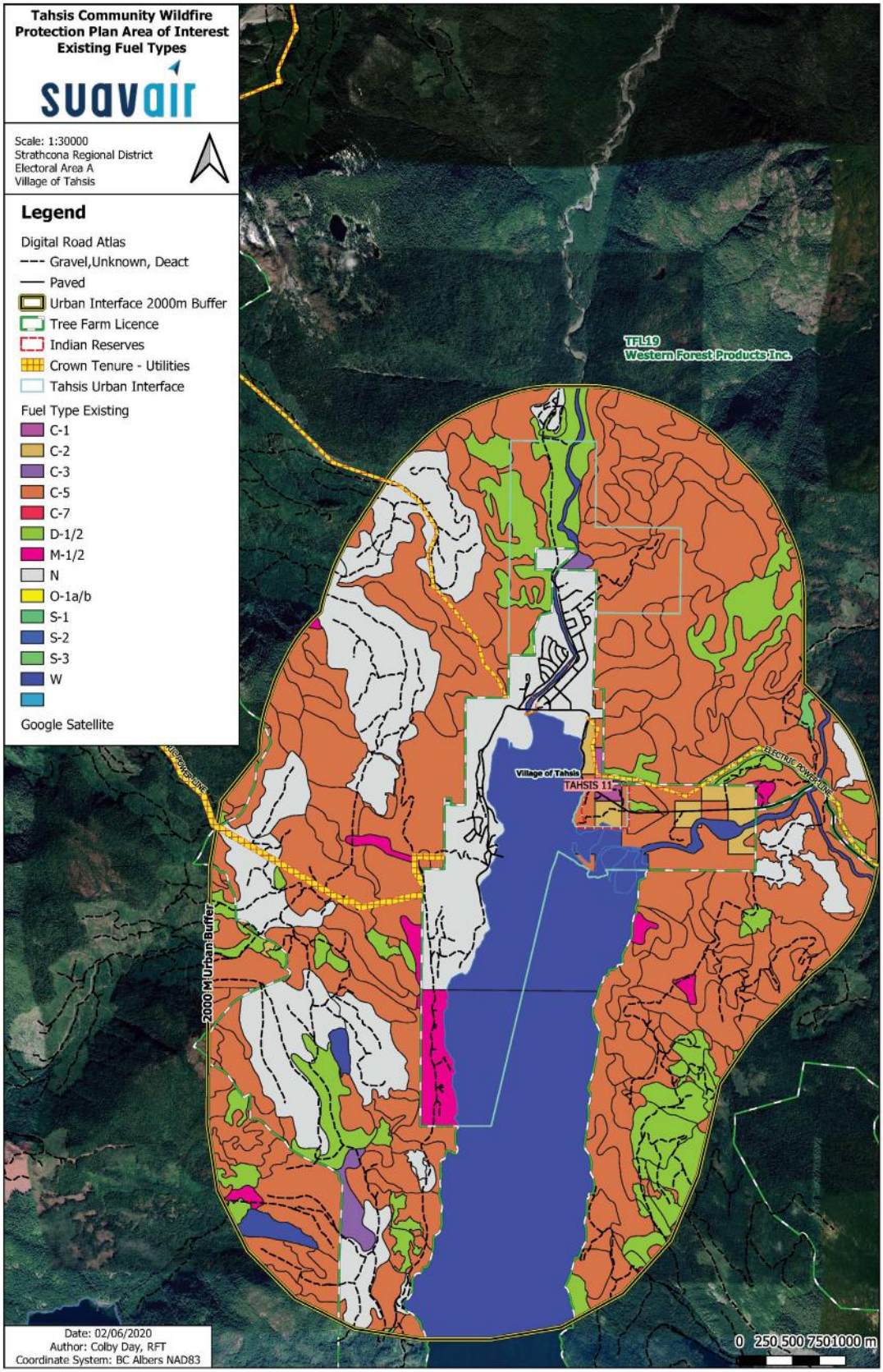
Fuels in the area are generally mature conifer forests (C-5), young and dense conifer forests (C-3), recently harvested cut blocks (S-3), and some alder/cottonwood/maple deciduous patches (D-1/2). The available spatial information from Data Catalogue BC, RESULTS; proprietary LIDAR data, forest cover, 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
- areas of non-fuel were re-classified to fuels

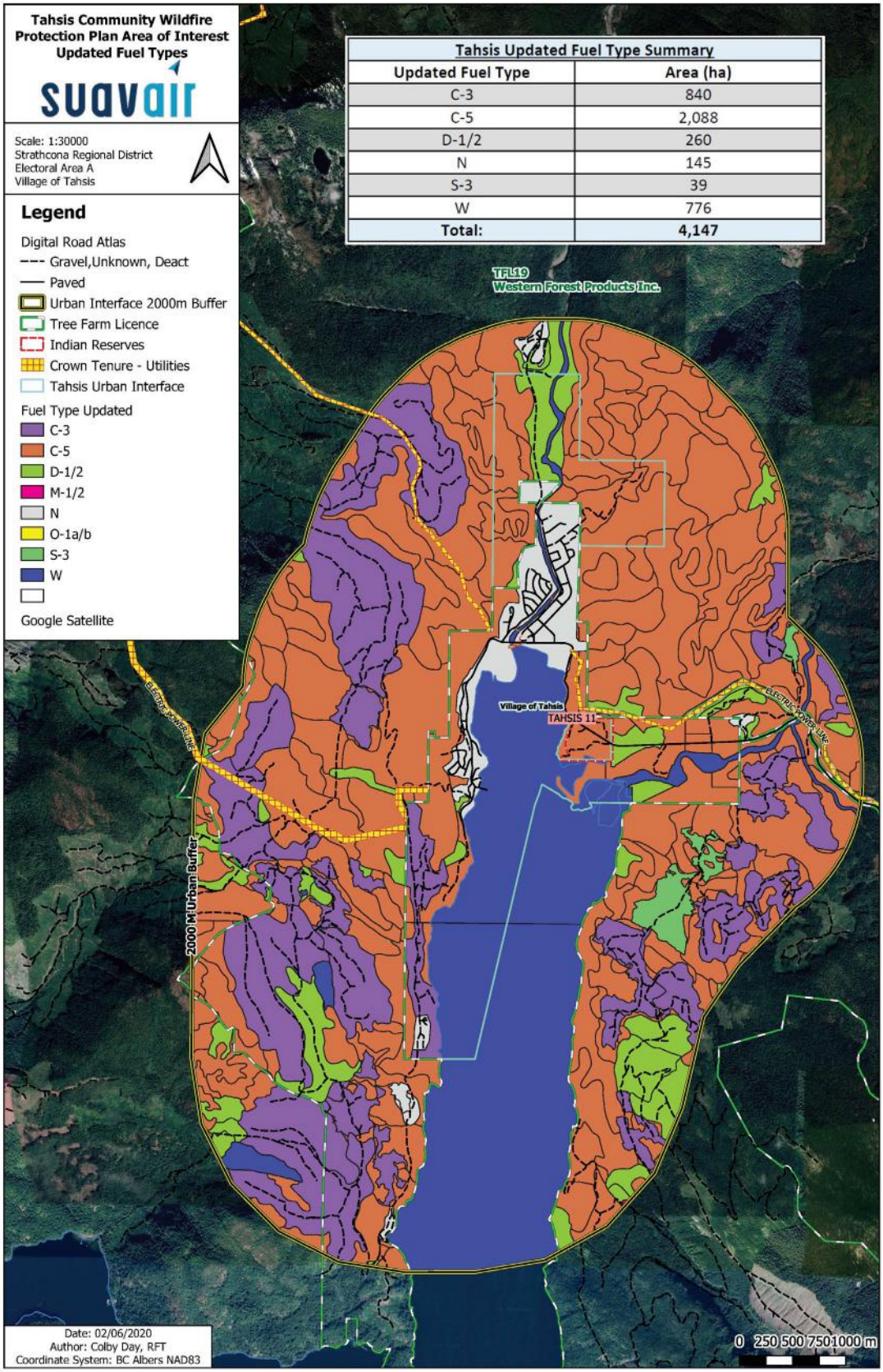
The changes in fuel type areas are summarized in the Table and Maps below.

Table 12. Area summary of fuel type classes within the AOI.

Fuel Type Class	2019 PSTA Original Area	2020 CWPP Updated Area	Net Change
C-1 (spruce woodland)	9	0	-9
C-2 (mid-elevation interior	40	0	-40
C-3 (dense, pole sized	18	741	+723
C-5 (mature coniferous forest)	2101	2149	+48
S-3 (recent harvest)	4	39	+35
D-1/2 (deciduous)	375	302	-73
M-1/2 (mixed conifer/deciduous)	65	0	-65
W (Water)	779	776	-3
Non-Fuel	756	140	-616
Total area	4147	4147	0



Map 8. Existing 2019 PSTA fuel type layer.



Map 9. Updated 2020 CWPP fuel type layer.

A1.2 Proximity of Fuel to the Community

Fuel closest to the community usually represents the highest hazard. The recommended approach is to treat fuels to achieve a desired level of hazard reduction, from the value or structure outward, ensuring mitigation continuity. Untreated areas between treatment areas and the value or structure may allow a wildfire to build in intensity and rate of spread, which can increase the risk to the value. To capture the importance of fuel proximity in the local wildfire threat assessment, the WUI is weighted more heavily from the value or structure outwards. Fuels adjacent to the values and/or structures at risk receive the highest rating followed by progressively lower ratings moving out.

The local wildfire threat assessment process subdivides the WUI into 3 areas – the first 100 meters (WUI 100), 101 to 500 meters (the WUI 500), and 501 to 2000 meters (the WUI 2000). These zones provide guidance for classifying threat levels and subsequent priorities of treatments.

Table 13: Proximity to the Interface

Proximity to the Interface	Descriptor*	Explanation
WUI 100	(0-100 m)	This Zone is always located adjacent to the value at risk. Treatment would modify the wildfire behaviour near or adjacent to the value. Treatment effectiveness would be increased when the value is FireSmart.
WUI 500	(101-500m)	Treatment would affect wildfire behaviour approaching a value, as well as the wildfire's ability to impact the value with short- to medium- range spotting; should also provide suppression opportunities near a value.
WUI 2000	(501-2000 m)	Treatment would be effective in limiting long range spotting, but short-range spotting may fall short of the value and cause a new ignition that could affect a value.
	>2000 m	This should form part of a landscape assessment and is generally not part of the zoning process. Treatment is relatively ineffective for threat mitigation to a value, unless used to form a part of a larger fuel break / treatment.

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

A1.3 Fire Spread Patterns

Wind speed, wind direction, and fine fuel moisture condition influences wildfire trajectory and rate of spread and is summarized in the ISI Rose(s) from the local representative BCWS weather station – TS Artlish from 2007-2015. Wildfire that occurs upwind of a value poses a much more significant threat to that value than a fire that occurs downwind.

The TS Artlish ISI rose indicates winds are predominantly from the south, southwest and southeast during fire season. The TS Artlish weather station is located at an inland position in an east-west orientated river valley. While geographically close by a straight-line distance, the weather station wind exposure is not considered representative of conditions within the AOI.

Another source for wind data is the Canadian Wind Atlas (CWA)[54]. 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. The figure below represents Wind Roses at 50m, the frequency distribution of wind by sector for the Tahsis area, Latitude = 49.902, longitude = -126.672. Available from http://www.windatlas.ca/maps-en.php.

Local knowledge of the area informs us that summer winds in the area are generally northerly in the morning and southerly in the afternoon due to daytime heating in Tahsis Inlet.

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

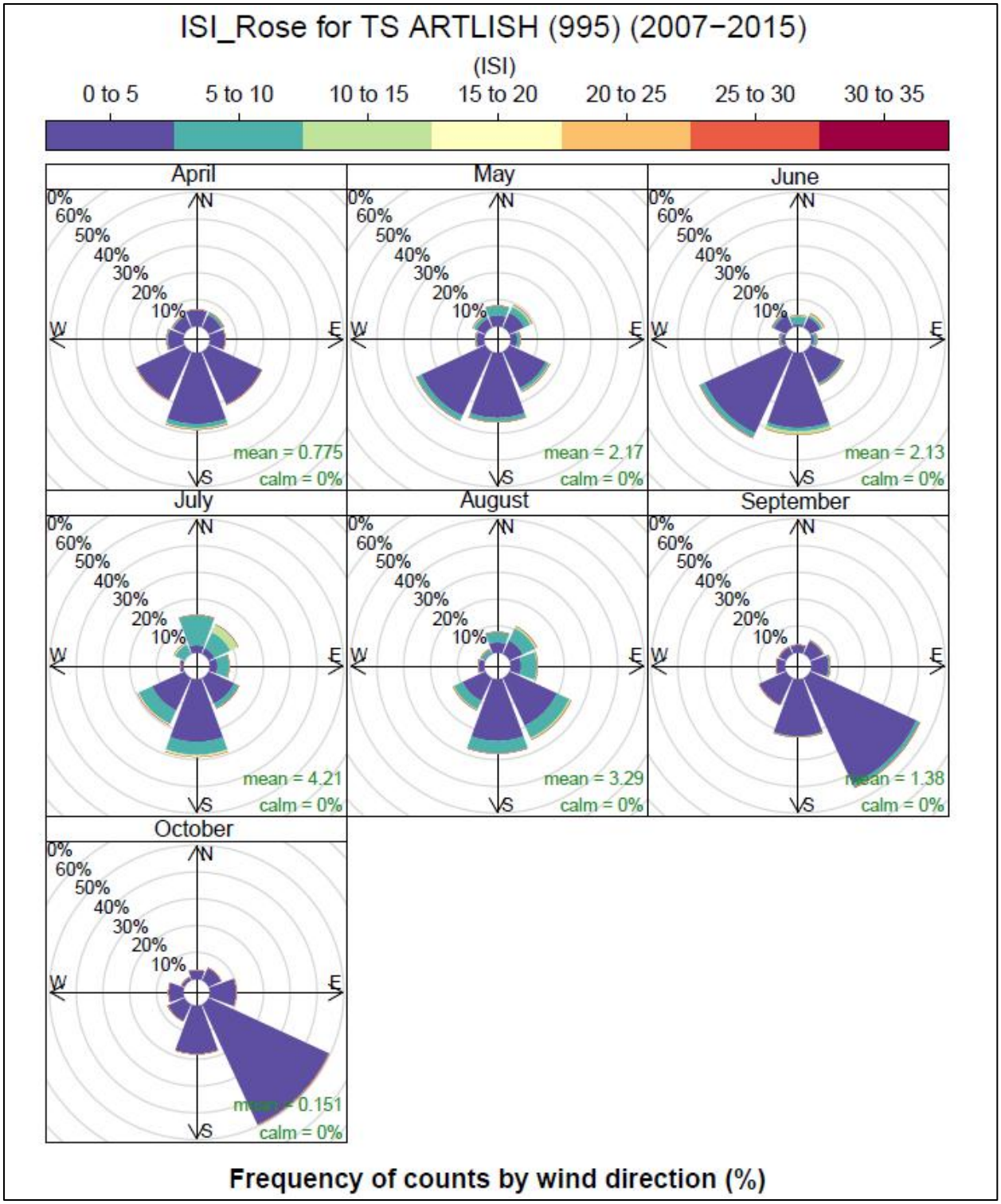


Figure 9. Initial spread index roses for April to October, 2007-2015, recorded at TS Artlish.

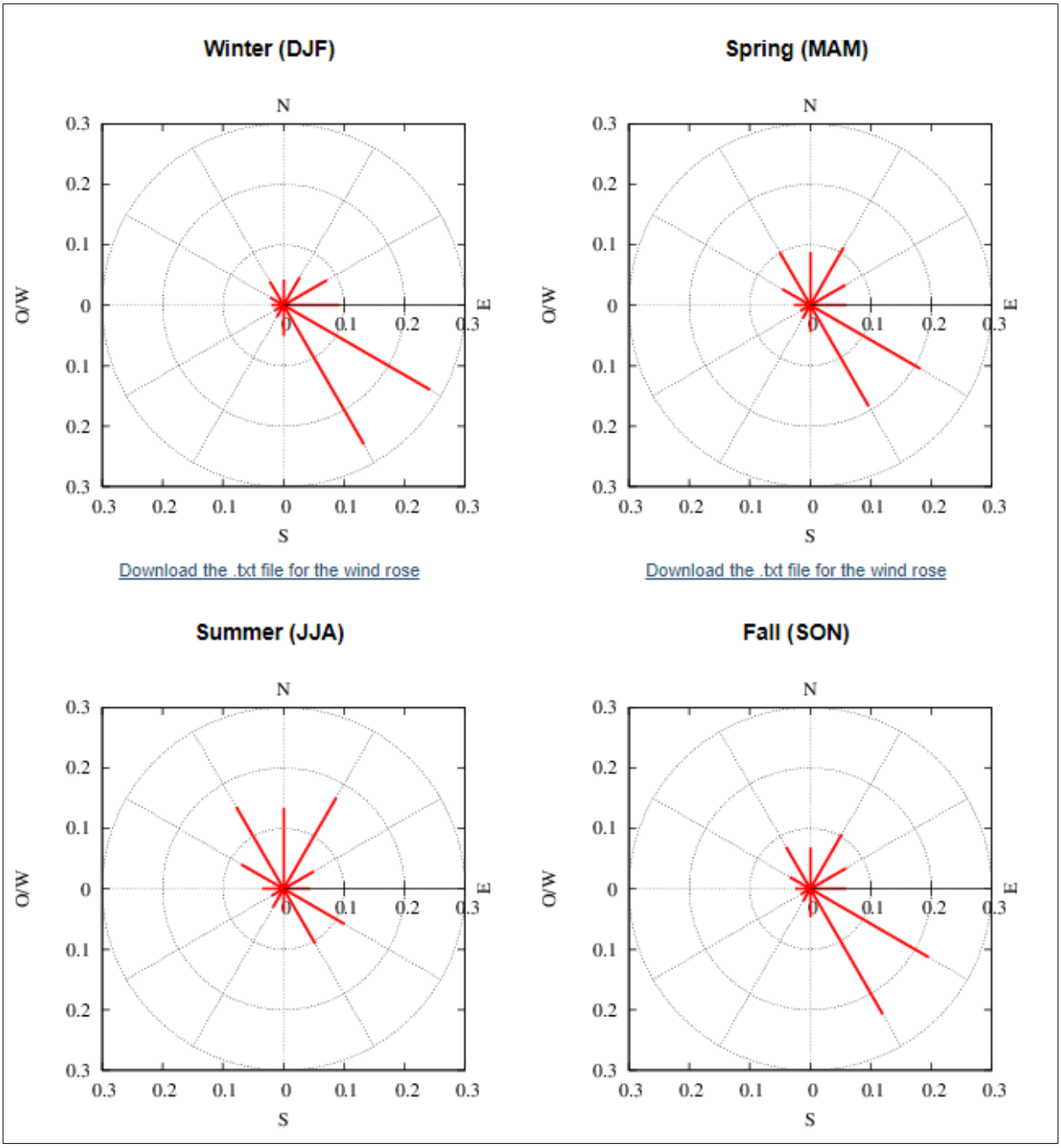


Figure 10. Canadian Wind Atlas wind roses for the Tahsis area. Summer winds from the NE, N, NW and SE.

A1.4 Topography

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

Slope Class

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

Table 14: Slope Percentage and Fire Behaviour Implications

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

Slope Position of the Value

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

Table 15: Slope Position of Value and Fire Behaviour Implications

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

Upper 1/3 of slope	Impacted by extreme rates of spread. At risk to large continuous fire run, preheating and flames bathing into the fuel.

A1.5 Local Wildfire Threat Classification

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

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

Table 16: PSTA Inputs Cross Walk Table (example).

	Head Fire Intensity (60%)	**Fire Density (30%)**	**Spotting Impact (10%)**	**Wildfire Threat Score (100%)**
Original PSTA Values	8 (C-5) 4 (C-5)	4 4	2 1	
Original Weighted Values	48 24	12 12	2 1	62 (10-Extreme) 37 (7-High)
Updated HFI (based on fuel type change)	1-2 (S-3) 1-2 (S-3)	4 4	1 1	
Updated Weighted Values	12 12	12 12	2 1	26 (5-Moderate) 25 (5-Moderate)

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

	Water	Class 0	No Threat
Class 1	0.1 – 5 Low	Class 2	5.1 – 10 Low
Class 3	10.1 – 15 Low	Class 4	15.1 – 21 Moderate
Class 5	21.2 – 27 Moderate	Class 6	27.1 – 33 Moderate

Class 7	33.1 – 40 High	Class 8	40.1 – 47 High
Class 9	57.1 – 55 Extreme	Class 10	55.1 – 81 Extreme

A1.6 Local Wildfire Risk Classification

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

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

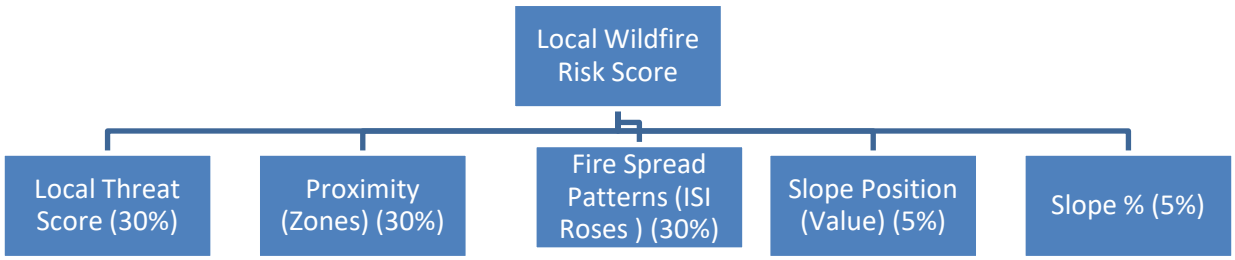


Figure 11: Local Wildfire Risk Inputs

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

Table 18: Local Wildfire Risk Summary

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

Weighted Values

1.98	3	2.4	0.1	0.25	7.73

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

The wildfire risk assessment process outlined above provides a means to determine the wildfire risk as it applies to forest fuel hazard, proximity of fuel to the community, fire spread patterns and topography. These factors all influence how a wildfire could impact the community if ignition 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. Also note any additional local factors that influence (increase or decrease) the wildfire threat information that is unique to the community.

Table 19: Local Wildfire Risk Weighting

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

A1.7 Summary of Fire Risk Classes

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

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

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

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

Extreme (Red): The combination of the local fuel hazard, weather influences, topography, proximity to the community, fuel position in relation to fire spread patterns, and known local wildfire threat factors make it very likely that a wildfire in this area would threaten the community. Stands with continuous surface/ crown fuel and fuel characteristics that tend to support the development of intermittent or continuous crown fires. Rates of spread would average >10 meters/ minute. Fuel type spot potential is probable to impact values at a long distance (400 -1 000m or greater).These forest stands have the greater potential to produce extreme fire behaviour (long range spotting, fire whirls and other fire behaviour phenomena.

APPENDIX 2: STATUS OF 2011 CWPP RECOMMENDATIONS

#	Action	Status
Communication and Education		
1	Tahsis 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. The program should emphasize that most fires around Tahsis are human caused and that reducing these ignitions will significantly contribute to the safety of the community.	Some aspects adopted. FireSmart presentations delivered at elementary and secondary schools in 2018. A sticker program has not been developed.
2	Tahsis should consider displaying and distributing information to participants of the Great Walk. This would help ensure that current and future visitors are aware of the risk of wildfire to the community, the role human ignitions play in fire risk, and could highlight the importance of forests to the community.	No longer applicable. The last Great Walk was held in 2012 and there are no immediate plans to reinstate it.
3	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.	Needs attention. Fire Bans and Fire Restrictions noted on the SRD website.
4	Tahsis in conjunction with Zeballos and Gold River should use the Record (an independent newspaper serving the North Island) to communicate fire danger to the community and region. They should continue to use this and other local media such as pamphlet mailouts to deliver FireSmart educational materials and to communicate information on fire danger during periods of high and extreme fire danger. Tahsis Information 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.
5	Signage consisting of current fire danger, campfire bans and general warnings regarding fire safety should be posted at the entrance and exit of the community on Head Bay Rd to ensure residents and especially tourists are	Complete. A Fire Danger sign has been erected at the

	aware of current conditions.	entrance of the Village.
6	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. The CWPP should be presented to the community and used to highlight the risks facing Tahsis and areas where risk reduction can be undertaken in the community by businesses.	No longer applicable. Chamber of Commerce dissolved in 2014.
Structure Protection		
7	Where homes and businesses are built immediately adjacent to the forest edge, Tahsis and the SRD should consider incorporating building setbacks into bylaw with a minimum distance of 10 m when buildings border the forest interface.	Ongoing The Village's zoning bylaw is to be updated in Spring 2020. New setback requirements to be included in the bylaw.
8	Tahsis 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.	Needs clarification/attention. FireSmart assessments to be completed are prioritized in 2020 recommendations
9	Tahsis and the SRD should review the availability of a bylaw officer to help municipal officials enforce bylaws.	SRD has appointed a Bylaw Compliance Officer, the Village has a service agreement with the SRD for the provision of this service.
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.	Ongoing
11	Tahsis 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	Village of Tahsis does not have any designated Wildfire Development Permit areas in the OCP.

	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.	
12	Tahsis should upgrade the vulnerable structures associated with critical infrastructure to meet FireSmart standards.	Needs clarification/attention. More specific recommendation made in 2020 Update.
13	Debris adjacent to critical infrastructure, such as power poles to the water supply, should be removed and chipped or burned prior to the fire season.	Ongoing
14	The SRD should consider working with the Building Policy Branch to create a policy structure that would enable communities in the SRD to better address wildland urban interface protection considerations for buildings.	Ongoing
Emergency Response		
15	A formal communication structure should be established with the MFML so that information regarding fires in the region is communicated to Tahsis in a timely manner. This might be best achieved through joint cooperation with the SRD, other SRD communities and the MFML.	Not complete. Carried forward to 2020 CWPP Update.
16	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. This should include docks and other marine egress routes. In addition, alternative emergency responder access should be considered.	Complete. Tahsis Evacuation Plan completed by McElhanney Ltd. February 2020.
17	Marshalling points should be identified and signed and communicated to the public. Pre-planning for evacuation from 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.	Complete. Assembly point and EOC location is the Recreation Centre.
18	The use of the public dock as an 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.	Complete. Use of boats and float aircraft for evacuation is addressed in the Tahsis

		Evacuation Plan.
19	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.	Complete. The cooperation and resources of the Ministry of Transportation and Infrastructure, Mainroad North Island Contracting is required for clearing the road.
20	Creation of a second evacuation route between Tahsis and Zeballos should be considered. This would also serve as a secondary route in the case of other natural disasters that close existing evacuation routes. Tahsis, Zeballos, and the SRD should coordinate a feasibility review in conjunction with the Provincial Emergency Program.	The possibility of an ATV trail connecting these communities is in the planning phases. A road network is unlikely to be feasible.
21	During a large wildfire it is possible that critical infrastructure within Tahsis 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. Tahsis 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		
22	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.	Complete
23	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 Zeballos and Gold River.	Ongoing
24	The Fire Department should seek funding to purchase a sprinkler kit to erect in the Village during a wildfire event or be incorporated in a mobile equipment cache. http://www.ubcm.ca/assets/Services~and~Awards/Documents/structural-protection-units-technical-specifications.pdf	Complete 6 sprinkler kits to be purchased with CEPF grant in 2020

25	The SRD and Tahsis should seek funding to acquire a 4x4 truck with compressed air foam (CAF) system for accessing and fighting wildfires in areas that are within village boundaries such as the waters supply infrastructure.	No longer applicable. CEPF funding awarded to the Village in 2020 to purchase other equipment deemed priority by the Fire Chief.
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 proper personal protective equipment and wildland fire fighting tools. Hoses, pumps and other equipment should be compatible with MFML wildland firefighting equipment.	Complete
27	Tahsis should consider working with Gold River, Zeballos, and the SRD to coordinate the creation of a sub-regional mobile cache of wildland firefighting equipment (ie 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.	No longer applicable. Distance, response times, access make this not practical. Refer to SPU recommendation in 2020 Plan
28	Tahsis should continue to encourage long-term and new residents to join the volunteer fire department using Tahsis website, mailouts and the Record to encourage residents to join. It is acknowledged that demographics make this increasingly difficult in Tahsis.	Ongoing
29	Formal mutual aid agreements should be established with MFML to ensure that adequate resources and manpower support are available in the event of a wildfire.	No formal agreement required for Crown lands. Village has confirmed that BCWS is responsible for responding to crown land within municipal boundary
Vegetation (Fuel) Management		
30	Where hazardous fuel types in Tahsis are located on private property, the Village should work with private property owners to ensure they understand the importance and principles of FireSmart. Tahsis should investigate ways to support residents reducing fuels, making homes FireSmart and raising awareness of ignition hazards.	Ongoing. Updated Property Maintenance Bylaw and Fire Bylaws are in draft form.
31	A number of high hazard areas immediately adjacent to or embedded in Tahsis have been identified and should be the focus of a progressive thinning program that is implemented over the next five to ten years. Thinning	Not completed. Carried forward to 2020 CWPP update.

	should be focused on the highest Priority 1 fuels identified in Map 11. A qualified professional forester (RPF), with a sound understanding of fire behaviour and fire suppression, should develop treatment prescriptions. Any treatments that take place on sloped sites must be prescribed with consideration given to slope stability. Where slope stability may be an issue (such as above the western border of the wildland urban interface), a Professional Geotechnical Engineer should review the treatment prescriptions.	
32	Tahsis 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.	Ongoing communications with BC Hydro.

APPENDIX 3: FIRESMART PRACTICES AND ACTIVITIES

AREA OF FOCUS	POTENTIAL PRACTICES AND ACTIVITIES
1. EDUCATION	Develop and/or promote local FireSmart educational activities and tools. Refer to BC FireSmart Resources for FireSmart materials that are currently available. Develop and/or promote education for the reduction of human-caused fires Encourage active participation in Wildfire Community Preparedness Day Organize and host a community FireSmart day, FireSmart events and workshops, and wildfire season open houses Apply for FireSmart Canada Community Recognition
2. PLANNING	Develop or update a CWPP Develop policies and practices for design and maintenance of FireSmart publicly owned land and First Nations land, such as parks and open spaces Develop policies and practices for design and maintenance of FireSmart publicly owned buildings Conduct site visits and FireSmart and/or risk assessments for publicly owned lands, First Nation lands and publicly owned buildings
3. DEVELOPMENT CONSIDERATIONS	Amend Official Community Plans, Comprehensive Community Plans and/or land use, engineering and public works bylaws to incorporate FireSmart policies Revise landscaping requirements in zoning and development permit documents to require fire resistant landscaping Establish Development Permit Areas for Wildfire Hazard in order to establish requirements for the exterior design and finish of buildings[55] 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 management staff, are included
4. INTERAGENCY	Develop and/or participate in regional or local FireSmart planning tables

[55] 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.

CO-OPERATION	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 IN WILDLAND URBAN INTERFACE FIRE

COURSE NAME	TARGET AUDIENCE	FORMAT	FURTHER INFORMATION
S-100 BASIC FIRE SUPPRESSION AND SAFETY (2005)	Contract fire crews	2 day, 16 hour course with classroom and field component	Required by OHS Regulation Section 26.3.1 for wildfire contract crews A list of recognized instructors is found here.
S-100A BASIC FIRE SUPPRESSION AND SAFETY ANNUAL RECURRENCY (ALSO KNOWN AS S-10A)	Refresher training for those with valid S100 training	0.5 day classroom and field components	
S-185 FIRE ENTRAPMENT AVOIDANCE & SAFETY (2006)	All those involved in fire suppression operations. General knowledge course on wildfire safety and entrapment avoidance	2-3 hour classroom training session	BCWS Information on Wildfire Training[56]
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-	

[56] 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[57]
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[58]
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 volunteers	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[59]
EMERGENCY SUPPORT	Community Volunteers	Online or In-Person	Justice Institute of BC[60]

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

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

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

[60] 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[61]
ICS LEVEL 200	First responders, local government administration, community organizations involved in response	Online	JIBC[62]

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

[62] 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.