Nuchatlaht First Nation
Community Wildfire Protection Plan

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NUCHATLAHT FIRST NATION

Strathcona REGIONAL DISTRICT

UBCM

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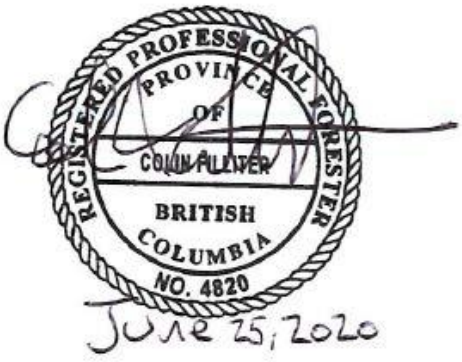	
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EXECUTIVE SUMMARY

The Nuchatlaht First Nation 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 Nuchatlaht First Nation community at Oclucje, at the head of Esperanza Inlet on the west coast of Vancouver Island. Oclucje is a remote community accessed by boat or by Fair Harbour Forest Service Road west of the Village of Zeballos. The purpose of this CWPP is to identify the wildfire risks surrounding the community, potential consequences of a wildfire to the community, and to recommend possible ways to reduce the risk.

The fuel types in the area are predominantly a mixture of mature conifer forests and recently harvested cutblocks. Previous fire history in the area indicates a low number of ignitions from both human and lightning causes. The local wildfire threat classification is Moderate to High. The local wildfire risk classification ranges from Low to High, with higher risk areas associated with fuels in close proximity (within 500m) of the community.

The community's remote location, limited communication networks, and distance from other resources creates unique challenges. The recommendations in this report are summarized in the table below. The recommendations are based on a review of best practices from other jurisdictions, gaps identified through community engagement, the local wildfire risk analysis, prevention 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. In March 2020, Local FireSmart Representatives completed a Community Hazard Assessment report for Oclucje.

Fuel management activities (surface and ladder fuel removal) should focus on the first 100 meters of forested areas near the community. FireSmart practices should start with the first 10 meters around each structure in the community. Additional fuel management treatment areas are recommended on provincial crown land within TFL 19 and along road/transmission line rights-of-way. In addition to fuel management, community awareness and education play a critical role in reducing the wildfire risk. Community awareness focuses on FireSmart principles, understanding fire use restrictions, emergency preparedness, and regularly sharing fire safety related information.

The BC Wildfire Service provides wildfire response services on the provincial Crown land surrounding the community. Oclucje is not served by a local fire department. Due to the small number of full-time residents, the capacity for local fire response is limited. Recommendations in this plan aim to improve the community's emergency and evacuation preparedness.

This plan makes 29 recommendations to the Nuchatlaht First Nation 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 CWPP RECOMMENDATIONS

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
1.	High	To develop a comprehensive Community Emergency Response Plan.	Complete a comprehensive Community Emergency Preparedness and Response Plan. Ensure the response plan considers the effects of wildfire emergencies and addresses the potential impacts of WUI fires, poor air quality, evacuation plans, extended power outages, and road access concerns.	NFN with support from FNESS
Rationale: Best practice recommendation based on gaps identified during CWPP engagement. Emergency planning and evacuation planning are critical for community safety.				
2.	High	To improve dialogue between the Village and forest tenure holders regarding plans and strategies for addressing fire hazard risk and abatement within the WUI.	Meet with the forest tenure holder (Western Forest Products Inc.) to understand post-harvesting fuel risk and risk mitigation strategies within the WUI. Emphasize the importance of fuel hazard management in cut blocks within the WUI (2km around the community). If there are specific concerns with fuel hazard in a particular cutblock within the WUI, contact the BCWS North Island Fire Zone.	NFN, with support from BCWS North Island Fire Zone. Inter-agency cooperation is a shared responsibility with industrial operators.
Rationale: CWPP engagement with NFN noted limited communications between WFP and NFN on industrial activities surrounding Oclucje. Inter-agency cooperation and communication is one of the FireSmart disciplines.				
3.	High	To improve emergency preparedness and evacuation planning for the community during wildfire emergencies.	Implement a regular system for tracking the numbers of elders, children, and others who may need assistance in the event of an emergency evacuation.	NFN
Rationale: Based on CWPP engagement with NFN and discussion on previous emergencies and voluntary evacuations. A process is recommended because travel/access resources may be periodically limited, or external support may need to be called upon in extreme cases.				
4.	High	To mitigate the impact of prolonged or extensive power	In addition to the procurement of portable diesel generators (currently in progress), review the feasibility of other more	NFN with support from

		outages during emergency events.	permanent secondary power sources (i.e.: generators, solar panels, etc.).	FNESS or SRD
Rationale: Based on expressed concerns regarding reliable backup power and power outage restoration during CWPP engagement.				
5.	High	To reduce the fuel hazard in identified treatment areas (high risk areas within 500m of the community, or along FSR right-of-way).	Work with a qualified forest professional to develop and implement site specific assessments and fuel treatment prescriptions for the recommended Treatment Areas.	NFN, SRD, MFLNRO with FNESS and forest tenure holder support. Interagency cooperation required.
Rationale: Recommended treatment areas based on local wildfire risk analysis. High risk areas within 500m of the community or critical infrastructure are a priority for treatment.				
6.	High	To engage in the FireSmart program; to reduce the fuel hazard and ignition risk within identified FireSmart priority areas.	Implement the FireSmart Activities recommended in Table 7 of this report.	NFN, (possibly Operations and Maintenance)
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.				
7.	Low	To reduce the ignition risk of propane tanks located near structures.	If propane is used as a fuel source for new homes/structures, ensure that the tank is located more than 10m from the structure and is located on top of a non-combustible surface (i.e.: gravel bed or concrete pad), and oriented safely away from nearby structures.	NFN
Rationale: Propane tanks are a hazardous fuel and according the FireSmart home development best practices, should be located at least 10m from structures.				
8.	High	To reduce the fuel hazard from previously brushed materials within the community.	Dispose of (chip and haul away, and/or burn) vegetative material that was previously cleared as part of the 2019 community brushing project. Ensure any	NFN

			future materials from brushing or FireSmart activities have plan for removal.	
Rationale: Dead/down/dry surface fuels are a fire hazard. Fuel management requires the removal of surface and ladder fuels. Best practice for removal is to chip and haul away.				
9.	Med	To reduce the ignition risk of structures within the community by following FireSmart guidelines for construction materials.	Ensure that roof replacements, building restoration, or new construction considers the construction materials and principles found in the FireSmart Begins at Home – Home Development Guide. Any new construction occurring within the community should follow the FireSmart Home Development guide.	NFN; construction contractors
Rationale: Best practice as per the FireSmart program, described in #6 above.				
10.	High	To make this Plan and its associated maps available to the community.	Upload a digital copy of the CWPP to the Nuchatlaht First Nation and SRD Emergency Planning websites.	NFN and SRD
Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation.				
11.	Med	To improve community awareness of wildfire risk and raising awareness of the wildfire threat to the community.	Provide regular communications to community members (flyers, notice boards, social media). Recommend at least one fire related communication per month (more often during fire season if required). Content of the communications include reminders on FireSmart practices, fire danger ratings, fire bans, fire prevention tips, air quality alerts etc.	NFN
Rationale: Recommended best practice for community education and awareness regarding wildfire protection planning and FireSmart program implementation.				
12.	High	To improve community awareness of wildfire risk and raising awareness of the	Organize an annual Community Fire Safety day. Activities may include checking fire extinguishers and smoke	NFN with FNESS or SRD support

		wildfire threat to the community.	alarms in homes, conducting FireSmart clearing of Priority 1 (up to 10m) zones around homes, fire extinguisher practice, water suppression system (fire hydrants) practice, water pump practice. The Safety day could be timed with Fire Prevention Week which takes place annually during the 2nd week of October each year. October 4 to 10, 2020 is the next Fire Prevention Week.	
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.	Med	To improve inter-agency communication regarding wildfire risk, emergency preparedness, response, and recovery.	The SRD should arrange an annual regional meeting, prior to fire season, to include First Nations' community administration, BCWS – North Island Fire Zone, EMBC, local fire departments, and Village representative 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.				
14.	High	To engage regional operators and industrial stakeholders on the contents and recommendations in this plan.	Share this plan with regional operators and stakeholders including MFLNRORD, forest tenure holders (Western Forest Products Inc.), and BC Hydro. Areas of concern to highlight include the critical importance of Fair Harbour FSR for access and evacuation and minimizing the fuel hazards along its right-of-way; treatment areas in identified high risk areas on Crown/TFL lands; and minimizing fuel hazards along transmission line rights-of-way.	NFN and SRD Regional operators and stakeholders should review this plan.

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.				
15.	Med	To ensure implementation and continual engagement with CWPP.	Schedule annual check-ins between Nuchatlaht First Nation, SRD, and FNESS to follow-up on recommendation implementation. Annual check-ins should also develop an annual action plan of priority items to be worked on for the year.	NFN, SRD and FNESS
Rationale: Recommended best practice to ensure follow-up on action items.				
16.	Low	To increase awareness and to reduce the risk of human caused ignitions during high/extreme fire danger.	Develop local regulation and policies for establishing community fire/fireworks bans during high/extreme fire danger class.	NFN
Rationale: Recommended best practice to reduce the risk of human-caused ignitions during high fire danger.				
17.	High	To improve community and public awareness of wildfire prevention information.	Work with BCWS North Island Fire Zone to install Wildfire Information signage at the junction of T'ashii-is Road and Fair Harbour FSR.	SRD, NFN
Rationale: Based on CWPP engagement with NFN. Community interest in education and awareness; and increasing awareness of visitors/workers in the area that there is a community at Oclucje.				
18.	Low	To improve the availability of fire suppression equipment and supplies.	Construct a storage building for a future fire truck and for emergency supplies. Ensure that materials used for construction meet FireSmart Development guidelines.	NFN with support from FNESS ISC Capital Facilities Funding, Infrastructure Funding programs
Rationale: Based on CWPP engagement with NFN on possibility of a fire truck donation from the Village of Zeballos.				
19.	Low	To improve community preparedness in	If a pumper truck or other fire suppression equipment is acquired, ensure community	NFN with support from FNESS

		responding to a structure fire.	members are adequately trained in the operation and maintenance of the equipment.	
Rationale: As above.				
20.	High	To improve the availability of fire suppression equipment and supplies.	Conduct an inventory of available hand tools (shovels, pulaskis, axes, backpack water pump, hydrant hoses, fittings/nozzles). Purchase hand tools and spare hoses for community use. Offer training to community members, ideally through the S100 course.	NFN
Rationale: Best practice recommendation based on gaps identified during CWPP engagement. The current equipment inventory includes a water pump and hoses associated with hydrant toolboxes. Other hand tools or spare hoses/nozzles not known.				
21.	High	To improve community preparedness for fire response (i.e.: house fires, back yard burns).	Establish written procedures with roles and responsibilities for responding to structure and WUI fire events in the community. Both documentation and operational practice of the procedures are recommended.	NFN
Rationale: Best practice recommendation based on gaps identified during CWPP engagement.				
22.	Med	To improve water availability for fire suppression.	Hire a qualified professional to assess water availability needs for fire suppression and community use.	NFN
Rationale: Best practice recommendation based on gaps identified during CWPP engagement.				
23.	High	To clear and maintain a helicopter landing area for emergency evacuations and/or wildfire response operations.	Designate an area (within the Emergency Plan) to be used as helicopter landing area. Maintain this area to be free of obstructions, loose debris and overhanging vegetation or obstacles. The best available option is the field.	NFN
Rationale: Best practice recommendation for emergency access, BCWS access, and emergency evacuation, based on gaps identified during CWPP engagement.				

24.	High	To improve emergency preparedness in the event a wildfire or other event disrupting utility services and road access.	Ensure each home has an emergency kit including supplies for staying at home following an emergency, and grab-and-go bags containing the essentials in case of an immediate evacuation. Purchase community emergency supplies in case wildfire cuts off road access to the community including generator and fuel, drinking water, and non-perishable food. A dry, sealed storage area is required to keep these items.	NFN
Rationale: Best practice recommendation for emergency planning based on gaps identified during CWPP engagement.				
25.	Med	To mitigate the impacts of heavy wildfire smoke and poor air quality on the community.	Improve indoor air quality with the purchase and use of High-Efficiency Portable Air (HEPA) filters, etc. Purchase N95 respirator masks for distribution to community members during heavy smoke conditions to reduce smoke exposure.	NFN with support from FNESS and FNHA
Rationale: Recommended equipment for improving indoor air quality during heavy smoke conditions, a concern identified during CWPP engagement.				
26.	Med	To build capacity in the emergency management area.	Work with FNESS to develop an emergency management program and training schedule that meets the needs of the community.	NFN with support from FNESS
Rationale: Best practice recommendation based on gaps identified during CWPP engagement.				
27.	Low	To build capacity in the emergency management area.	Work with FNESS to plan for Foundational Training for governance staff, beginning with Tier 1 and progressing to Tier 3 over the next 5 years.	NFN with support from FNESS
Rationale: Best practice recommendation based on gaps identified during CWPP engagement.				

28.	High	To improve community preparedness in using available fire tools and equipment if required in an emergency.	Organize community training days to practice using the available community fire suppression system and other suppression equipment.	NFN with support from FNESS
Rationale: Best practice recommendation based on gaps identified during CWPP engagement.				
29.	Med	To increase the likelihood that homes survive a WUI fire due to the distance of Oclucje to other protective services.	Purchase exterior sprinkler kits for homes; provide training to the community for how to set up the kits.	NFN with support from FNESS
Rationale: Based on current inventory, the equipment availability for structural protection could be improved. Sprinkler kits are a relatively low-cost option and highly effective option.				

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

Resources	**Land Jurisdiction**	**Types of Projects**
Forest Enhancement Society BC (FESBC)	Provincial Crown	Fuel management treatment prescriptions and prescription implementation
UBCM Community Resiliency Investment Program (CRI)	Municipal First Nations Private	FireSmart hazard assessments, demonstration projects, off-site debris disposal (i.e.: chip trucks) Community Education Development planning Emergency planning and cross training
UBCM Community Emergency Preparedness Fund (CEPF)	n/a	Emergency support services training Fire department training or equipment Emergency evacuation planning Emergency operations training
First Nations Emergency Support Services – Indigenous Services Canada (FNESS/ISC)	First Nations Reserve lands	Fuel management prescriptions and treatments On-Reserve
BC Wildfire Service	Provincial Crown	Fuel management treatments (in coordination with local fire zone officer) Public education and outreach

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LIST OF ACRONYMS

Acronym	Full Name / Phrase
AOI	Area of Interest
BCWS	BC Wildfire Service
CFFBPS	Canadian Forest Fire Behaviour Prediction System
CRI	Community Resilience Initiative
CWPP	Community Wildfire Protection Plan
EMBC	Emergency Management BC
FBP	Fire Behaviour Prediction System
FNESS	First Nations' Emergency Services Society
FNHA	First Nations' Health Authority
FSR	Forest Service Road
FWI	Fire Weather Index
GIS	Geographical Information System
ISI	Initial Spread Index
LIDAR	Light Detection and Ranging
LFR	Local FireSmart Representative
MFLNRORD	Ministry of Forests, Lands, Natural Resource Operations and Rural Development
RESULTS	Reporting Silviculture Updates and Land Status Tracking System
PSTA	Provincial Strategic Threat Analysis
SRD	Strathcona Regional District
TFL	Tree Farm Licence
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 in areas of potentially increased wildfire risk. The Community Wildfire Protection Plan (CWPP) process helps communities develop plans to improve safety, lower the risk of damage to property, and reduce the impacts of wildfires to BC communities. This CWPP is organized into the following major sections:

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

SECTION 2: Local Area Description - Defines and describes the Area of Interest for the CWPP

SECTION 3: Values at Risk - Introduces the extent to which wildfire has the potential to impact values at risk within the area of interest

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 and risk

SECTION 5: Risk Management and Mitigation Factors - Outlines the strategies that can be 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 Nuchatlaht First Nation community at Oclucje reserve (referred to as Oclucje, hereafter). This CWPP provides an updated assessment of the wildfire risk to the area and will examine the potential consequences if a wildfire were to impact the community. The CWPP will discuss and explore different methods to reduce wildfire risk. Sections within this document will cover the threat to human life, property, and critical infrastructure from wildfires within the WUI, will identify measures necessary to mitigate those threats and will outline an action plan to implement those measures.

The CWPP is intended to provide a framework for implementation of actions that should result in:

- reduced likelihood of wildfire entering the community
- reduced impacts and losses to human life, property, and critical infrastructure
- 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 to understand current community engagement with respect to wildfire risk mitigation
3. GIS Analyses – review Provincial Strategic Threat Analysis (PSTA) data, using the best available information including LiDAR data, updated forest cover and ortho imagery to adjust fuel typing errors, and modify threat and risk classification where necessary
4. Field Work – verification of critical infrastructure, fuel types, identification of community specific values at risk
5. Draft report and mapping development – identification of measures to mitigate risks, make recommendations for action
6. Report review – professional peer review, regional district, and community review
7. Community engagement and education – community presentations, follow-up

Understanding the relationship of the community to its surrounding environment, and what that means in terms of the wildfire hazard, threat and risk of loss, is critical to help the community plan for mitigation activities and respond to wildfire events. To support this understanding, the BCWS has conducted a Provincial Strategic Threat Analysis (PSTA) for the identification of wildfire threat and potential fire behaviour. The outputs of the PSTA were made available to SuavAir for the study and analysis. Other relevant data was gathered through field visits to the 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 area of interest (AOI) is defined as the Nuchatlaht First Nation community at Oclucje Reserve IR 7 (Oclucje) and its surrounding wildland urban interface (WUI) polygon. The WUI is a 2km buffer around areas with structure density greater than 6 to 25 structures per km^2. Oclucje Reserve is 13.3ha and the surrounding AOI is 1285ha. See Map 1 for a view of the AOI.

2.2 Community Description

The Nuchatlaht First Nation is a member of the Nuu-chah-nulth Tribal Council, their traditional territory is shown in Map 2. Nuchatlaht First Nation utilizes a Hereditary Chieftainship model; in this model the Chief is appointed by their father or grandfather and then appoints their council.[2] Historically, the main community was at Nuchatl (located at Nuchatl IR1), off the west coast of Nootka Island. In the 1980's, community members moved from Nuchatl to Oclucje for improved access to services.

Oclucje is not within the fire protective services area of any local fire department. The closest fire protection service is the Village of Zeballos' volunteer fire department, about 14km or 30 minutes drive on the gravel Fair Harbour Forest Service Road (FSR). The community does not have a service agreement with the Village of Zeballos due to distance and road conditions that make access unfeasible for fire department trucks.

Access to Oclucje by T'ashii-is Road that junctions from Fair Harbour FSR. From this junction, the Village of Zeballos is 14km to the east and the Fair Harbour Marina is 22km to the north. Fair Harbour FSR and Zeballos FSR are primarily industrial roads but are also the only road networks connecting communities of Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations, Walter's Island (SRD Electoral Area A), Nuchatlaht First Nation, Ehattesaht Chinehkint First Nation, and the Village of Zeballos with the rest of Vancouver Island via Highway 19. The Fair Harbour FSR is under road permit to Western Forest Products Inc. from the Zeballos log sort to the Chum Main junction. The remainder of the FSR to Fair Harbour is managed by the Campbell River Natural Resource District. Road conditions vary depending on active industrial use and weather conditions. The other access options are by air (helicopter) or water – via Espinosa Inlet.

[2] Nuchatlaht First Nation. Governance History. http://www.nuchatlaht.com/strategic-plan.html

Map 1. Nuchatlaht First Nation CWPP area of interest.

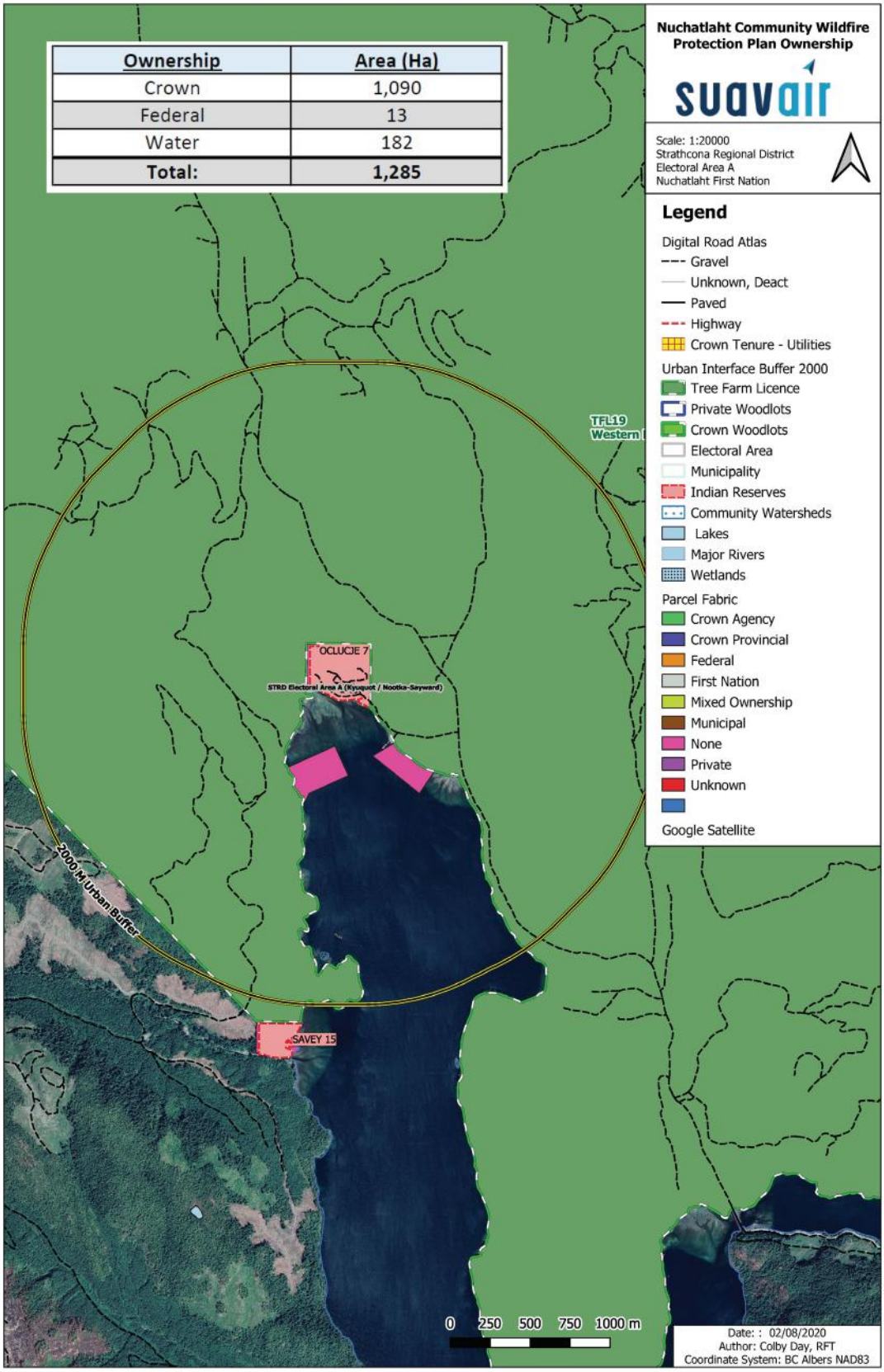
Map 2. Nuchatlaht First Nation's Traditional Territory.[3]

Map 3 shows the land tenure classes within the AOI. The area surrounding Oclucje is Tree Farm Licence (TFL) 19, held by Western Forest Products Inc. Table 2 summarizes the land ownership classes found within the AOI.

Table 2. Summary of land tenure classes and area within the AOI.

LAND OWNERSHIP	AREA (HA)	COMMENTS
Provincial crown land	1090	WFP, Aa'tuu
Federal – Indian Reserve	13	Nuchatlaht FN, Oclucje Reserve
Water	182	
Total	1285	

[3] Nuchatlaht First Nation. Our Territory. http://www.nuchatlaht.com/our-territory.html



Map 3. Land tenure classification within the AOI.

2.3 Past Wildfires, Evacuations, and Impacts

The Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD) and BC Wildfire Service (BCWS) manage a provincial database of historical fire ignitions and fire perimeters. This data was reviewed as part of the planning process.

In August 2018, lightning strikes ignited dozens of wildfires across northern Vancouver Island. Three of these wildfires burned within 10 km of Oclucje (Map 5). The closest fire was V82657 that ignited 2km to the north, burning away from the community in mountainous forested terrain. The fire was monitored by the BCWS but not responded to immediately due prioritization of resources during an exceptional fire season. Fire V82579 was located 3.5 to the south of Oclucje, while the Gold Valley Main fire (V82441) was burning near Zeballos, 6.5km to the east.

Structures in Oclucje were not threatened by any of the 2018 fires, however, a voluntary community evacuation took place due to the impacts of smoke and poor air quality. Other impacts to the community included power outages and another wildfire (Pinder Creek, V92443) occurring upslope of the Zeballos FSR which threatened the only road access connecting the community to the rest of Vancouver Island. Most community members evacuated to stay with family or in hotels in the Campbell River area, with only 2 residents staying behind in the community. Community members were away from their homes for 7-10 days. The physical and emotional toll of the 2018 wildfires, including smoke and evacuations, are significant and cannot be understated.

2.4 Current Community Engagement

This CWPP is the first time Nuchatlaht First Nation has been engaged in wildfire prevention measures and planning around Oclucje. There is no known history of fuel management treatments, FireSmart activities, or other wildfire prevention measures in the area.

2.5 Linkages to Other Plans and Polices

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

2.5.1 Local Authority Emergency Plan

The Nuchatlaht First Nation Administration is currently working with a contractor to update and finalize a new Community Emergency and Evacuation Plan for 2020. The previous Community Emergency Plan did not include detailed information regarding evacuation procedures or an Evacuation Map. It is important to highlight the possible evacuation routes due to the remote and rugged nature of the area. The evacuation plan should also indicate muster points and the location of emergency supplies and provisions.

2.5.2 Affiliated CWPPs

Affiliated CWPPs include plans for the Village of Zeballos and SRD Electoral Area A, completed concurrently with this plan.

2.5.3 First Nation Plans and Policies

The following community plans are available online: Communications Plan (2017), Comprehensive Community Plan (2015), Language Revitalization Plan (2017), 2018-2023 Strategic Plan, 5-year Economic Development Plan (2017), and the Tsunami Preparedness Strategic Plan 2018-2020. [4] The tsunami preparedness strategic plan addressed the need for improved egress routes and evacuation vehicles, emergency communications, and emergency supplies for the community. Several recommendations where made in the Tsunami plan and the implementation of these recommendations is still ongoing. In September 2019, NFN installed and tested a tsunami siren and public announcement speaker system (controlled at the Band Office).

Emergency preparedness plans are operational level plans that assist administrators in carrying out their roles/responsibilities during and after an emergency. A comprehensive Community Emergency Preparedness Plan should detail community information, emergency management organization and roles, emergency social services, evacuation routes, and recovery roles/procedures. It is outside the scope of the CWPP to address all elements of an emergency preparedness plan. Some priority areas are highlighted in the CWPP recommendations.

The completion of a comprehensive community emergency response plan is an urgent priority given the remoteness of the community. The plan should address alternative evacuation routes should the sole access road (Fair Harbour FSR) be blocked or unsafe for use. It is recommended that the evacuation plan include a regularly updated list of licenced automobile and boat operators as well as the number and passenger capacity of vehicles and boats available for use during an emergency evacuation. Where possible, look to coordinate aspects of the emergency preparedness and response plan with the communities of Ka:'yu:'k't'h'/Che:k:tles7et'h First Nations, Ehattesaht Chinehkint First Nation, and the Village of Zeballos.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
1.	High	To develop a comprehensive Community Emergency Response Plan.	Complete a comprehensive Community Emergency Preparedness and Response Plan. Ensure the response plan considers the effects of wildfire emergencies and addresses the potential impacts of WUI fires, poor air quality, evacuation plans, extended power outages, and road access concerns.	NFN with support from FNESS [5, 6]

[4] Nuchatlaht First Nation. Community Planning. http://www.nuchatlaht.com/our-plans.html

[5] FNESS BC. Emergency Management. Community Emergency Preparedness Plan Template. https://www.fness.bc.ca/resources/library/emergency-management/community-emergency-preparedness-plan-template

[6] FNESS BC. Emergency Management. https://www.fness.bc.ca/core-programs/emergency-management

2.5.4 Higher Level Plans and Relevant Legislation

The AOI is within the Vancouver Island Land Use Plan Enhanced Forestry Zone 18 – Eliza. The Eliza Landscape Unit does not have an approved landscape unit plan or landscape unit level objectives. Provincial forestry legislation applicable to provincial Crown Land includes the *Forest and Range Practices Act* and its associated regulations and the *Wildfire Act* and its associated regulations. Other relevant legislation includes the *Heritage Conservation Act, 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 (i.e.: forest harvesting) (*Wildfire Regulation,* Section 12.1(2)(a)).

Oclucje is outside of a Fire Protection District. For industrial activities outside 2km of a fire protection district: fire hazard assessments are required to be conducted at 6-month intervals during the period of industrial activities (*Wildfire Regulation* Section 11(3). The required hazard abatement must occur within 30 months of the beginning date of the activity in the area.

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.

2.5.5 Ministry or Industry Plans

Directly adjacent to the Oclucje Reserve is Western Forest Products Inc. Tree Farm Licence (TFL) 19. TFL 19 Management Plan #11 and the WFP Central Island Forest Operations 2017 Forest Stewardship Plan apply to TFL 19. Aat'uu Forestry Limited Partnership also operates within the AOI in the North Island Timber Supply Area. The AOI is within a Moderate polygon according to the BCWS Fuel Hazard Assessment and Abatement Fire Risk Map.[7] The risk class

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

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

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

No fuel treatment plans, forest health plans, ecological restoration plans, or new 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 improve dialogue between the Village and forest tenure holders regarding plans and strategies for addressing fire hazard risk and abatement within the WUI.	Meet with the forest tenure holder (Western Forest Products Inc.) to understand post-harvesting fuel risk and risk mitigation strategies within the WUI. Emphasize the importance of fuel hazard management in cut blocks within the WUI (2km around the community). If there are specific concerns with fuel hazard in a particular cutblock within the WUI, contact the BCWS North Island Fire Zone.	NFN, with support from BCWS North Island Fire Zone. Inter-agency cooperation is a shared responsibility with industrial 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 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.

3.1 Human Life and Safety

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

Nuchatlaht First Nation has 161 members and approximately 20 members live on reserve in Oclucje.[12] Statistics Canada 2016 census data shows the population of Oclucje as 30.[13] Engagement with the Band Administration during the CWPP process suggests that the 2019 population was 25 although numbers fluctuate seasonally and can be up to 40. The availability of vehicles and drivers can be limited at times, depending on the residents staying in the community. A small marine accessed recreation site (Savey Point, REC6641) is located at the edge of the AOI. Usage numbers are not known.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
3.	High	To improve emergency preparedness and evacuation planning for the community during wildfire emergencies.	Implement a regular system for tracking the numbers of elders, children, and others who may need assistance in the event of an emergency evacuation.	NFN

[12] Nuchatlaht First Nation. About Us. http://www.nuchatlaht.com/about-us.html

[13] Statistics Canada. Census Profile, 2016 Census. Oclucje 7, Indian reserve. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5924833&Geo2=CD&Code2=5924&SearchText=oclucje&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0

3.2 Critical Infrastructure

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

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

Critical infrastructure in Oclucje includes the NFN Office, water treatment plant, water reservoir, electrical power lines (wood poles), telephone lines, and T'ashii-is Road. In addition to the water treatment facilities, Oclucje presently consists of 17 buildings/structures including 9 occupied homes. The Health Clinic building is not operational at this time, although structural upgrades are planned. The NFN Office currently serves as the Health Clinic, administrative centre, and indoor community gathering place.

In the near future, the community plans to construct up to 5 new homes, potentially move 3 homes to higher ground above the tsunami hazard area, and to upgrade the Health Clinic building.

Photo 1. Aerial image of critical infrastructure in Oclucje.

Photo 2. Nuchatlaht First Nation Office above, and water treatment plant below.

3.2.1 Electrical Power

Oclucje is connected to the BC Hydro grid through distribution lines from the Village of Zeballos. Power outages are frequent as the wood pole power line runs along a narrow, windy, forested right-of-way of Fair Harbour FSR. Outage restoration is often delayed due to the remote location of the lines and the community. Frequent outages and a lack of a reliable back-up power supply makes it difficult for the community to maintain supplies (i.e.: refrigerated or frozen items). Electrical power is a concern due to remoteness, lack of services (grocery store, fuel station, etc.), and the limited access routes in/out of the community.

Currently, Oclucje does not have the backup generator capacity to supply the entire community with electricity during outages. The water treatment plant is connected to the BC Hydro grid and has its own back-up propane powered generator in the event of a power outage. Three portable diesel generators were purchased in 2020, with three more planned to be purchased.

The following recommendation is made related to electrical power.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
4.	High	To mitigate the impact of prolonged or extensive power outages during emergency events.	In addition to the procurement of portable diesel generators (currently in progress), review the feasibility of other more permanent secondary power sources (i.e.: generators, solar panels, etc.).	NFN with support from FNESS or SRD

3.2.2 Communications, Pipelines and Community Buildings

Telephone and internet lines are provided by Telus Communications, and satellite internet by Xplorenet. There is no cellular phone service in the area. The nearest cellular service area is around the community of Woss or Port McNeill, both are around 75km away (over 1.5 hours driving time). The Band Office is equipped with a VHF radio and the controls to operate the community's tsunami siren.

The community does not have natural gas service. The Health Clinic building is not operational at this time and health clinic appointments are conducted in the Band Office building. The nearest health clinic is in Zeballos, the closest hospital is in Port McNeill (Mount Waddington Regional District) and airport is in Port Hardy. Nuchatlaht First Nation operates a public dock that is located on Crown land. There are no other known communication lines, public buildings, or other critical infrastructure.

3.2.3 Water and Sewage Infrastructure

The community water supply is drawn from two wells near the community, treated at the water treatment plant, pumped up to and stored in a storage reservoir. Water supply lines are underground. Sewage wastewater is managed by septic fields throughout the community.

The water reservoir supplies each structure in addition to a community fire hydrant system. The hydrant system consists of 4 hydrants and hose boxes that provide coverage throughout most of the community. Additional hoses are required to ensure hose lengths can reach all the buildings in the community. The hydrant systems are tested and flushed at least twice a year.

Photo 3. On the left: the water reservoir (tower). On the right: one of four fire hydrant hose boxes.

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 to effectively determine wildfire risk and identify mitigation activities.

3.3.1 Drinking Water Supply Area and Community Watersheds

Oclucje's drinking water supply comes from two groundwater wells. The well heads are located between the community and Espinosa Creek. There is no designated community watershed in the area. Nuchatlaht First Nation administration shared that the community water supply has been consistent and reliable.

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."[14] The AOI is within the traditional territories of the Nuchatlaht First Nation and Ehattesaht Chinehkint First Nation, both member nations of the Nuu-chah-nulth Tribal Council.

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 FLNRORD administers the provisions of

[14] 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.

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

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

3.3.3 High Environmental Values

The AOI does not overlap with any known species at risk occurrences, established legal orders or objectives. Two recreation sites are located within the AOI at Savey Point (REC6640) and Espinosa Creek (REC6641). A small portion of Espinosa Inlet recreation reserve (REC6639) is also within the AOI. The area is subject to Visual Quality Objectives as it relates to forest harvesting activities under the *Forest Planning and Practices Regulation*.

3.4 Other Resource Values

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

Espinosa Creek is an S2 fish bearing stream. The *Forest Planning and Practices Regulation* stipulates a 30m riparian reserve zone, and a 20m riparian management zone along the length of the stream which may constrain fuel treatment opportunities. However, no fuel treatments are prescribed in the riparian area at this time.

3.5 Hazardous Values

Around 50% of the homes in Oclucje are serviced by propane heat. In most cases, the propane tanks are currently positioned directly next to homes. A propane tank also serves as fuel for the back-up power generator at the water treatment facility. Additionally, there is an old propane tank adjacent to the old generator, it is thought to not have any propane left inside but its status is uncertain. In addition to propane, diesel and gas is stored in jerrycans near homes throughout the community.

There are no other known hazardous values within the AOI. The Zeballos landfill is a 2.5 km away from Oclucje on the Fair Harbour FSR, outside of the AOI. Spontaneous combustion is known to cause fires at landfill sites. The recommended management for hazardous infrastructure is to incorporate FireSmart planning principles and to ensure the proper emergency shut off procedures are in place.

Photo 4. Propane tank serving as the back-up power source for the water treatment facility.

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 variant (vm1) as described in the BC biogeoclimatic zone (BEC) classification system. The CWHvm1 climate is generally wet and humid with cool summers and mild winters.[15] CWHvm1 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.[16] When disturbances such as fire occur, they are usually small and result in irregular edge configurations and patterns. However, it is more likely that natural disturbances are caused by wind, terrain instability, or isolated forest disease.

Fire Weather

The Canadian Forest Fire Danger Rating System[17] (CFFDRS) is a computer-based model used to assess fire danger and potential fire behaviour. The two main parts of the CFFDRS are: the

[15] 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.

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

[17] 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[18] (FWI) and fire behaviour prediction system[19] (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 3. Summary and description of fire danger classes.

Fire Danger Classes[20]	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 35km to the northeast). Fire Danger Class Ratings for the Woss Camp Weather Station are available from 1970-2019 (Figure 1). Weather conditions may differ in Woss due to its relative inland location compared with Oclucje.

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

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

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

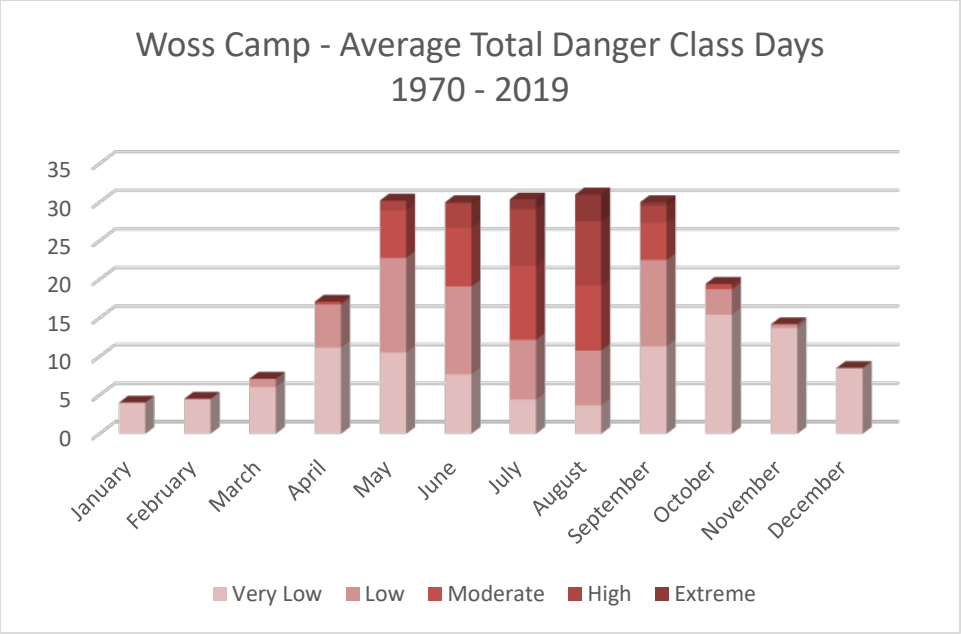


Figure 1. Woss Camp weather station average monthly total danger class days 1970-2019.

The TS Artlish weather station is about 15km northwest of Oclucje and is the nearest fire weather station. Fire Danger Class Ratings for the TS Artlish Weather Station are available for years 2007-2019 (Figure 2). The weather station data suggests that July and August are historically the most critical months for fire danger. Early season fire weather in May and June is more severe than later season weather in September.

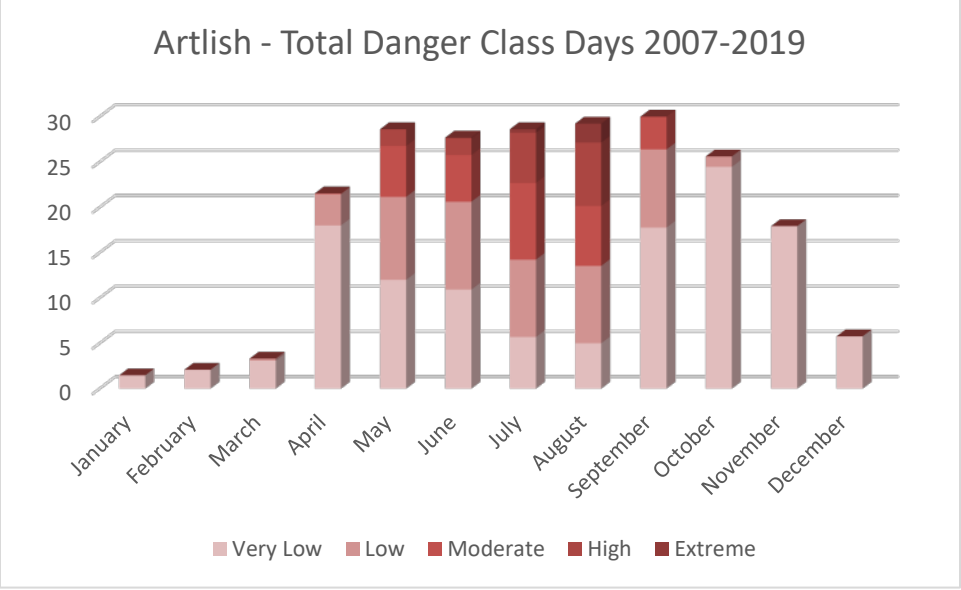


Figure 2. Artlish weather station average monthly total fire danger class days 2007-2019.

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.[21] 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.[22] 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.[23] 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.[24]

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

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[21] 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

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

[23] 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.

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

Vancouver Island moving forward. Climate change impacts emphasize the importance of risk and mitigation actions recommended in this CWPP.

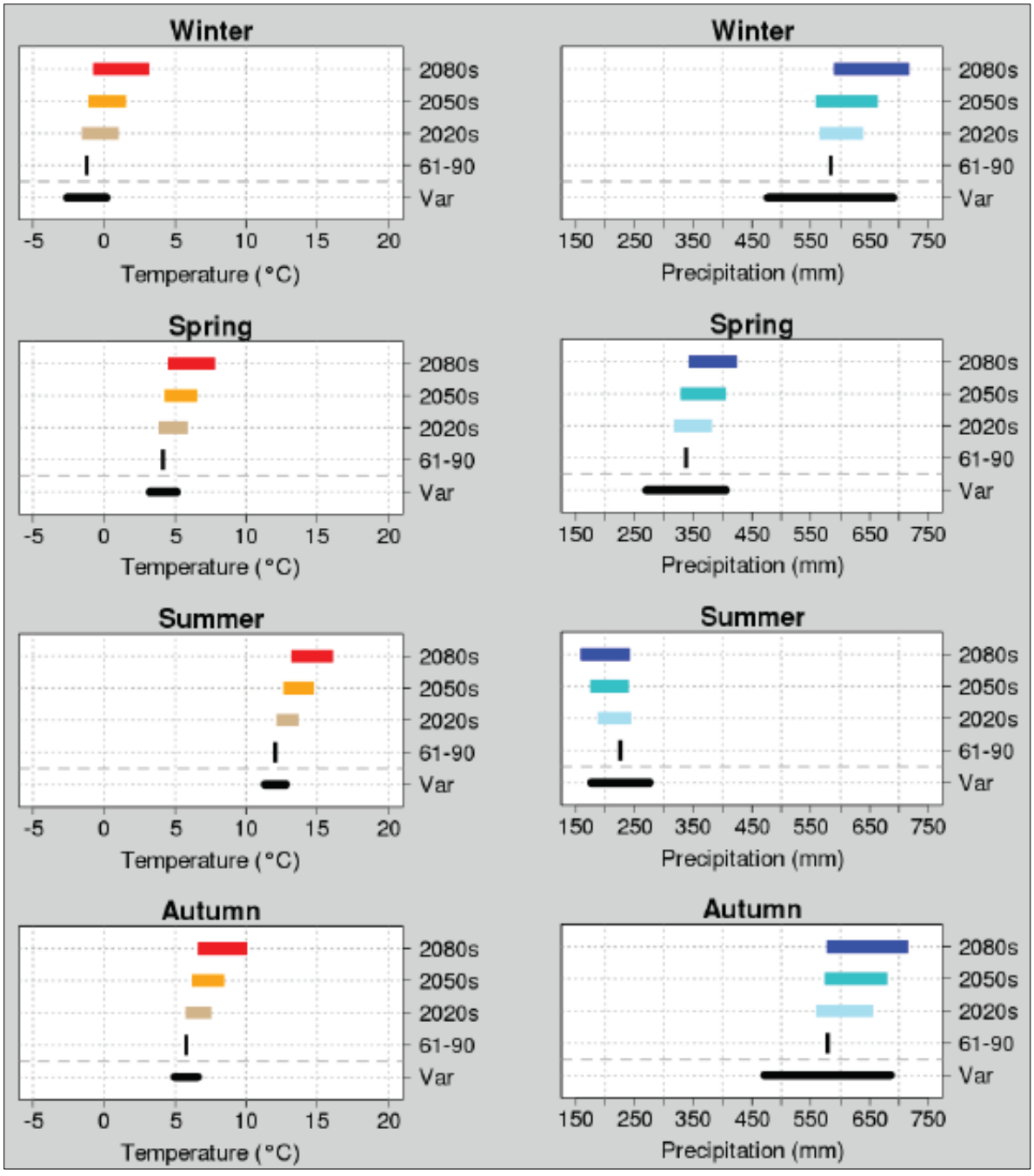

Figure 3: Cumulative seasonal precipitation and mean seasonal temperature projections for 2020s, 2050s, and 2080s.

4.2 Provincial Strategic Threat Analysis (PSTA)

The PSTA[25] 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.[26] The threat analysis output is a wildfire threat rating classification of No threat, Low, Moderate, High, or Extreme.

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

Fire Density

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

A review of historical fire perimeters in the AOI shows that only one documented wildfire has occurred within the AOI since record keeping began in BC (Map 4). On August 11, 2018 a lightning initiated fire (V82657) occurred north of the AOI (Map 5). The total size of the fire was 121.6ha. The initiation point suggests the fire started on the south facing slope and moved in the upslope and sideslope direction to the north and north west.

South facing slopes receive more solar radiation and therefore are drier than slopes of other aspect. The TS Artlish weather station wind rose shows southerly winds being most common in the month of August. Typical fire behaviour is that fires move more quickly uphill than downhill,

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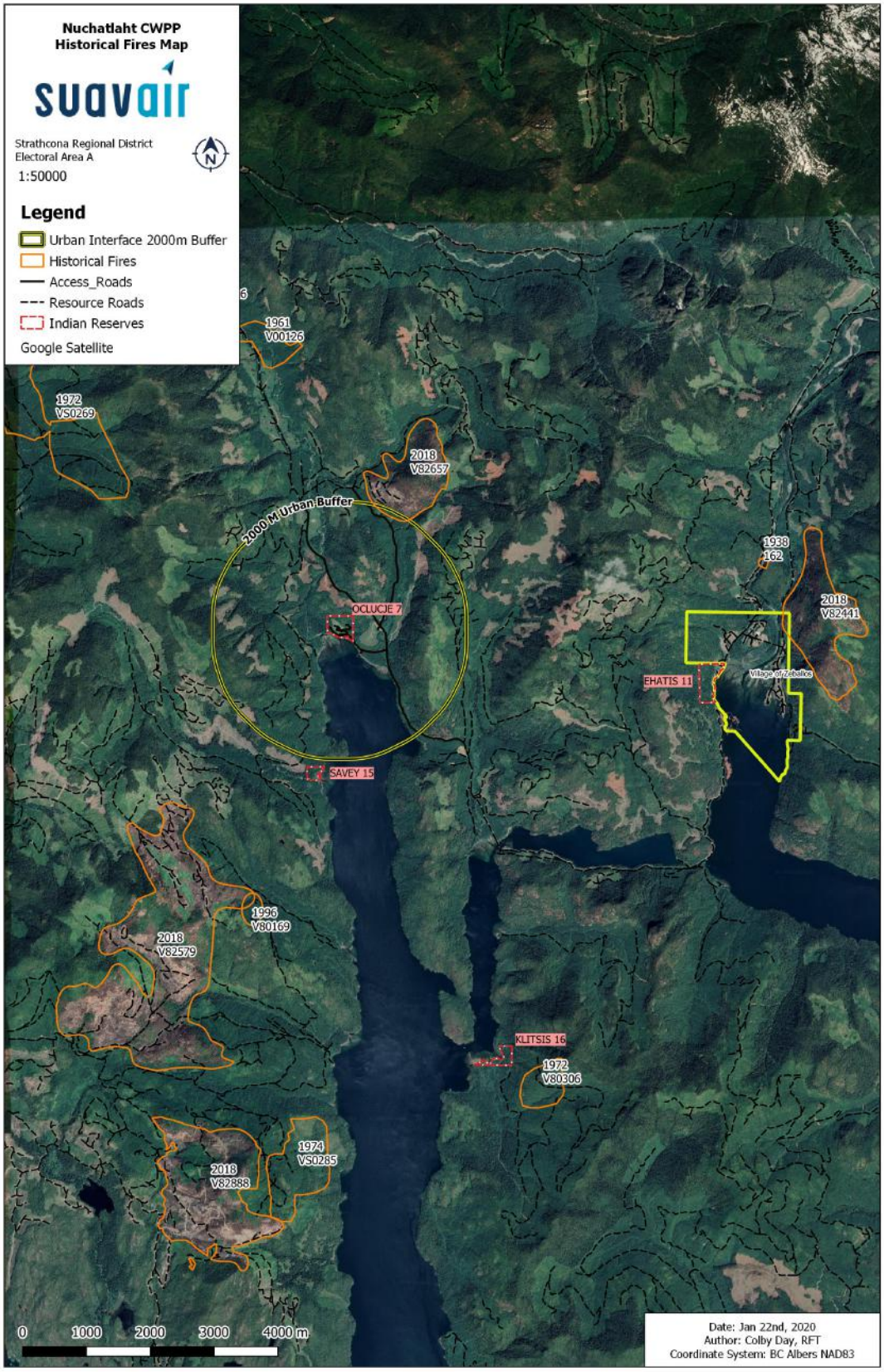
[25] BC Ministry of Forest, Lands, Natural Resource Operations and Rural Development. 2019. Provincial Strategic Threat Analysis: 2019 Update https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/vegetation-and-fuel-management/fire-fuel-management/psta

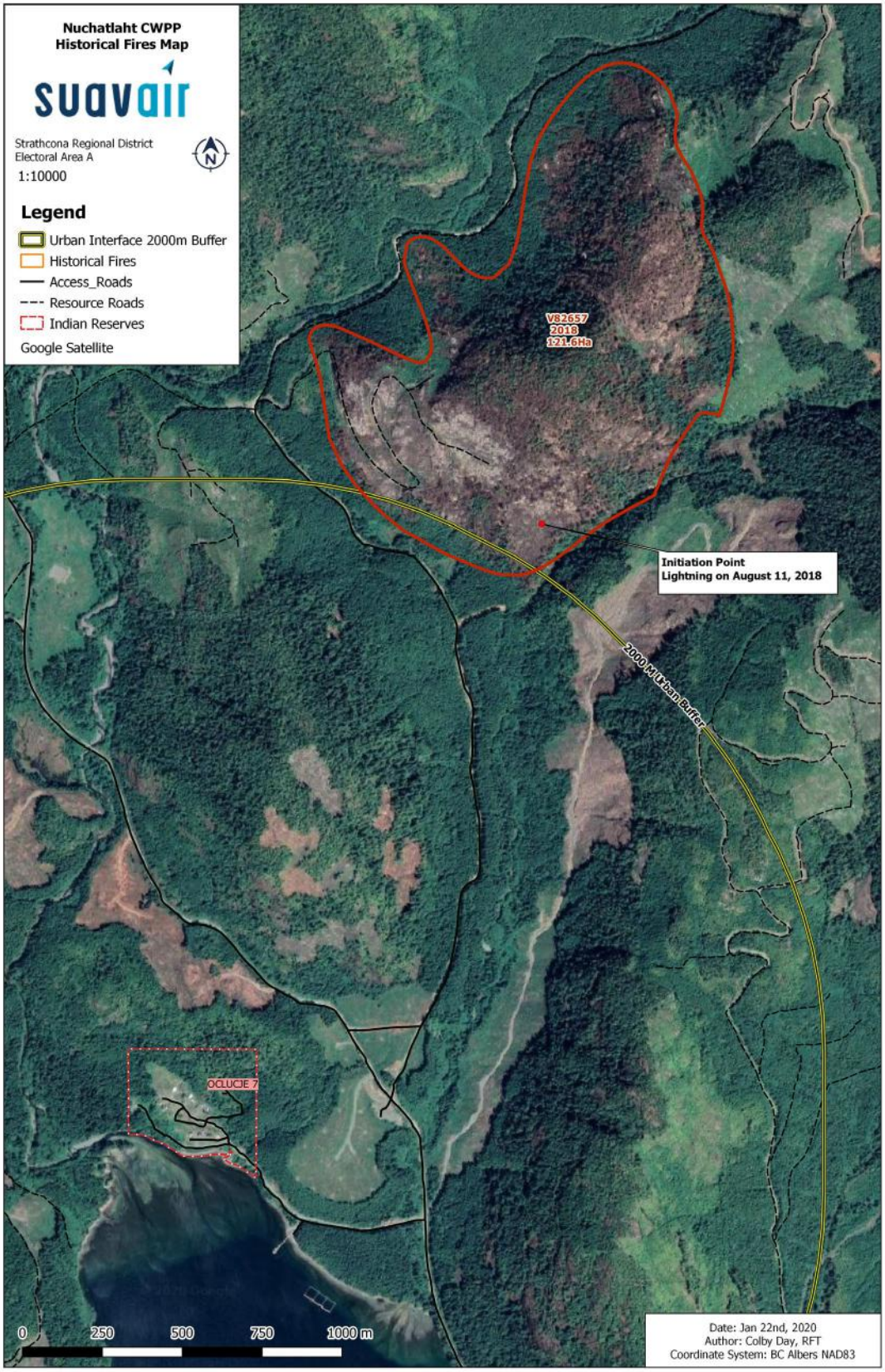
[26] BC Ministry of Forest, Lands, Natural Resource Operations and Rural Development. 2017. Provincial Strategic Threat Analysis: 2017 Update. Available from https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/vegetation-and-fuel-management/fire-fuel-management/psta/download-psta-historic.

and spread more quickly on steeper slopes. The spread of the 2018 fire follows the expected pattern of spread (uphill) given local topography.

Photo 5. Aerial image of Oclucje with the 2018 wildfire V82657 in the distance.



Map 4. Historical fires recorded in the area.



Map 5. 2018 lightning initiated Fire V82657 to the north of the AOI.

4.3 Local Wildfire Threat Assessment

The intent of this sub-section is to provide a detailed assessment of the local wildfire threat, including field reviewed fuel characteristics, proximity of fuel to the community, local fire spread patterns, topographical considerations, and local factors. The local wildfire threat assessment process is described in further detail in Appendix 1.

4.3.1 Fuel Type Assessment

PSTA fuel types have been verified and updated through spatial analysis. Oclucje is located at the head of Espinosa Inlet, therefore there are no fuels directly to the south. Fuels to the north, east, and west are a mosaic of C-5, D-1, and S-3 fuel types. C-5 fuels could support crown fires whereas D-1/2 and S-3 fuels will not. However, the rate of spread through S-3 fuels can be very high during dry conditions.

Available spatial information from Data BC, RESULTS; proprietary LIDAR data, forest cover, and other spatial data shared for use on this project by Western Forest Products Inc., updated Google Earth imagery, was analyzed for fuel type verification and adjustments. The major changes to the fuel type layer that resulted within the AOI included:

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

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

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 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) – See Table 11: Proximity to the Interface. 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 Section 5.2 FireSmart Planning & Activities.

4.3.3 Fire Spread Patterns

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

Dominant wind directions on the coast vary with the seasons. Strong southeast winds are characteristic of winter low-pressure systems. Northerly winds recorded in the summer months

are characteristic of summer frontal systems approaching from the north.[27] Furthermore, the north-south topographical orientation of Espinosa Inlet funnels winds in the north-south direction. Winds from the north, south, and southeast will impact the direction of spread. Due to Oclucje's location at the head of Espinosa Inlet, fuels to the north of the community have the highest hazard related to fire spread patterns. More detailed information regarding wind directions is found in

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 Section A1.4 Topography.

Slope Position of the Value

Oclucje 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 the Appendix Section A1.4 Topography.

[27] 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

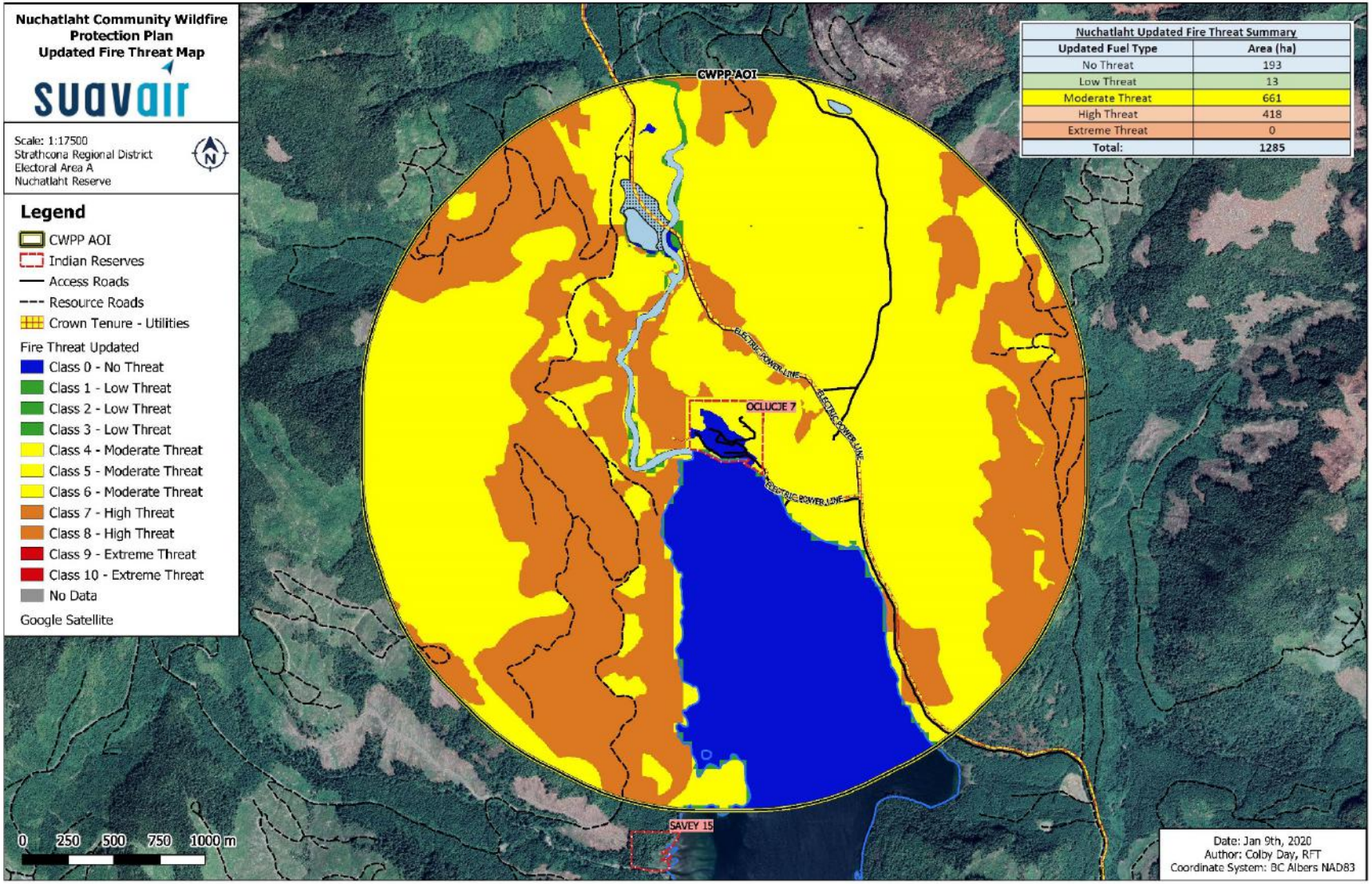
A local wildfire threat classification was completed, the process of this threat classification is summarized in Appendix Section A1.5 Local Wildfire Threat Classification. The updated wildfire threat classification is summarized in Table 4 and on Map 6. Generally, the wildfire threat around Oclucje is Moderate to High.

Table 4. Summary of local wildfire threat classification.

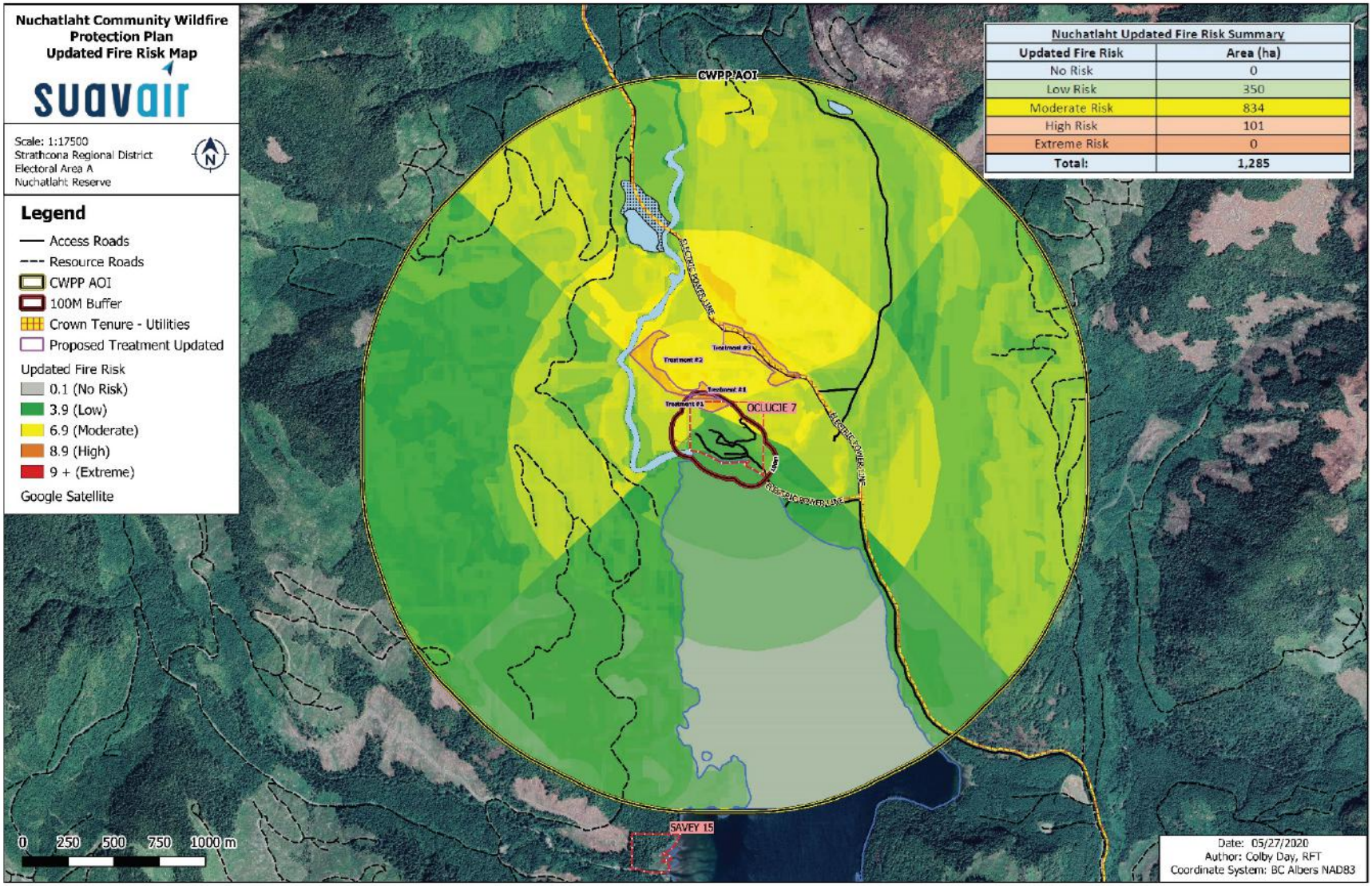
Wildfire Threat Class	2019 PSTA Data		2020 CWPP	
	Area (ha)	% of AOI	Area (ha)	% of AOI
Extreme	94	7%	0	0%
High	405	32%	418	33%
Moderate	583	45%	661	51%
Low	4	1%	13	1%
Very Low / No Threat (Water)	198	15%	193	15%
Total	1285		1285	

4.3.6 Local Wildfire Risk Classification

A local wildfire risk classification was completed based on the updates to the fuel type layer and local wildfire threat classification. Proximity to structures/values, fire spread patterns, and topography are the other key determinants of wildfire risk. A detailed explanation of the wildfire risk assessment process is found in Appendix Section A1.6 Local Wildfire Risk Classification. The calculated local wildfire risk is shown on Map 7. Generally, the wildfire risk is Low to Moderate. An area of High Risk occurs within 500m of the community. Higher risk areas are generally associated with upwind fuels within 500m to structures in the community.



Map 6. Updated local wildfire threat classification.



Map 7. Updated local wildfire risk classification and treatment areas.

SECTION 5: RISK MANAGEMENT AND MITIGATION FACTORS

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

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

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

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

5.1 Fuel Management

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

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

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

[29] Ibid.

Figure 4. Understory thinning can reduce surface and ladder fuels. [30]

Figure 5. The vertical arrangement of ladder fuels can carry a fire from the surface into the forest canopy.[31]

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

[31] Ibid.

5.1.1 Fuel Treatment Areas

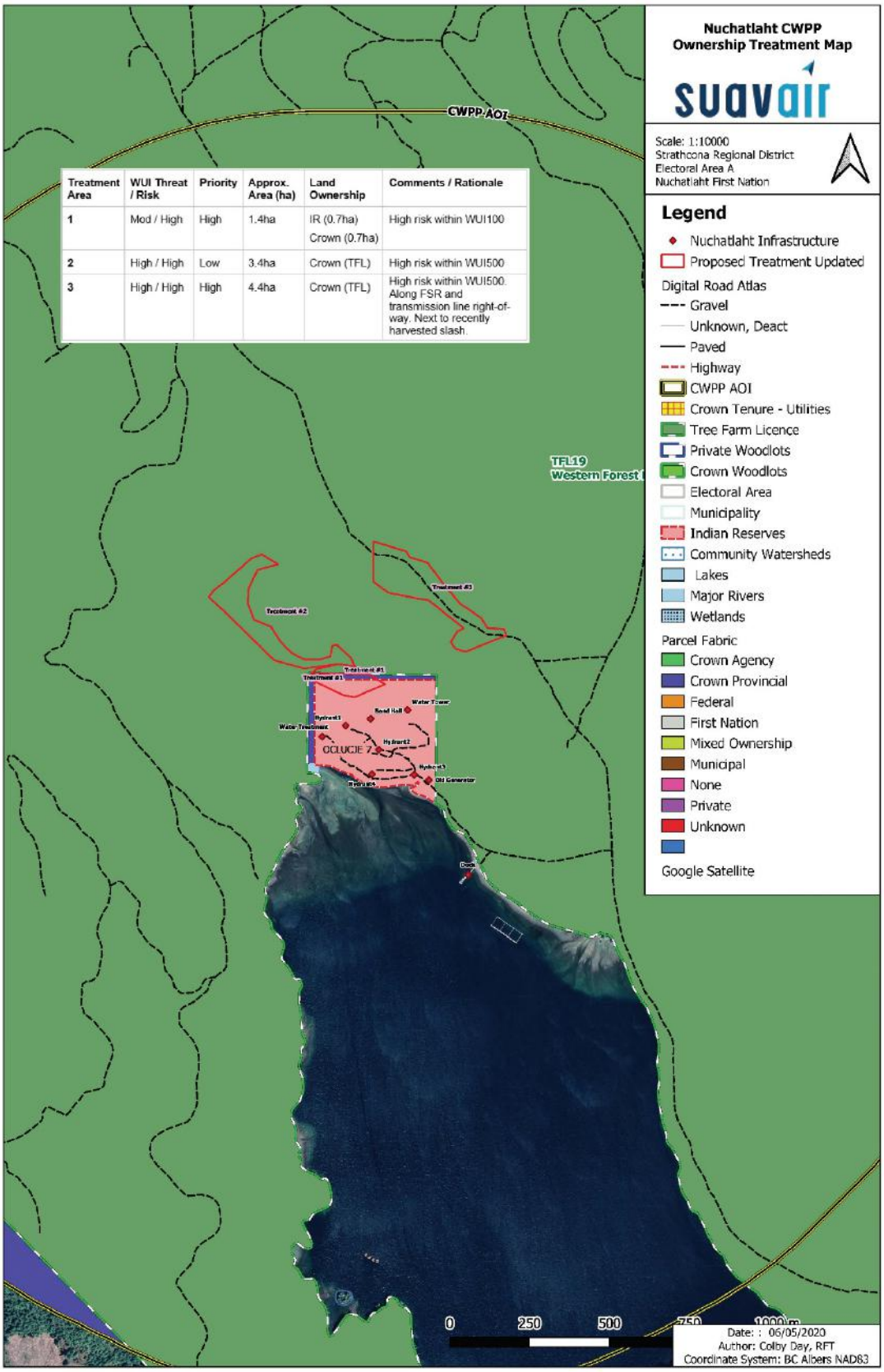
The focal point of fuel management recommendations in this CWPP are within first 100m (WUI100) and 500m (WUI500) of the wildland urban interface. Table 5 summarizes the recommended fuel treatment polygons within the AOI. Treatment areas are also shown on Map 8 and Photo 6. Each treatment area requires a site-specific assessment and fuel management prescription to be completed by a qualified registered professional.

No treatment is recommended outside the WUI500 to the WUI2000 (500 to 2000m away from the community) at this time because it is unlikely to occur over the duration of this CWPP. This CWPP should be re-visited in 5 years to determine progress on recommended actions, at which time additional fuel treatment areas may be recommended.

Table 5. Summary of recommended fuel treatment areas.

Treatment Area	WUI Threat / Risk	Priority	Approx. Area (ha)	Land Ownership	Comments / Rationale
1	Mod / High	High	1.4ha	IR (0.7ha) Crown (0.7ha)	High risk within WUI100
2	High / High	Low	3.4ha	Crown (TFL)	High risk within WUI500
3	High / High	High	4.4ha	Crown (TFL)	High risk within WUI500. Along FSR and transmission line right-of-way. Next to recently harvested slash.

Photo 6. Proposed Fuel Treatment Areas around Oclucje.



Treatment Area	WUI Threat / Risk	Priority	Approx. Area (ha)	Land Ownership	Comments / Rationale
1	Mod / High	High	1.4ha	IR (0.7ha) Crown (0.7ha)	High risk within WUI100
2	High / High	Low	3.4ha	Crown (TFL)	High risk within WUI500
3	High / High	High	4.4ha	Crown (TFL)	High risk within WUI500. Along FSR and transmission line right-of-way. Next to recently harvested slash.

Map 8. Recommended treatment areas and land ownership classes.

5.1.2 Funding Opportunities for Fuel Treatments

Government funding is available to undertake fuel treatment projects within the WUI. The applicable funding agency depends on the jurisdiction and ownership of the land, this information is summarized in Table 6.

Table 6. Summary of funding agencies providing grant money for fuel treatment projects.

Funding Agency	Land Jurisdiction	Types of Fuel Management Projects
Forest Enhancement Society BC (FESBC) [32]	Provincial crown land	Fuel treatment prescriptions and operational treatments
UBCM Community Resiliency Investment Program (UBCM CRI)	Publicly owned lands (municipal) and First Nations lands	FireSmart assessments FireSmart demonstration projects Provide off-site debris disposal (i.e.: chip trucks)
First Nations Emergency Support Services – Indigenous Services Canada (FNESS/ISC) [33]	On-reserve	Fuel treatments On-Reserve

The following recommendation relates to fuel management.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
5.	High	To reduce the fuel hazard in identified treatment areas (high risk areas within 500m of the community, or along FSR right-of-way).	Work with a qualified forest professional to develop and implement site specific assessments and fuel treatment prescriptions for the recommended Treatment Areas.	NFN, SRD, MFLNRO with FNESS and forest tenure holder support. Interagency cooperation required.

[32] Forest Enhancement Society BC. https://fesbc.ca/about-the-fesbc.html.

[33] FNESS/ISC. On-Reserve Operational Fuel Treatment Program. https://www.fness.bc.ca/core-programs/forest-fuel-management/indigenous-services-canada-isc

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.[34]

WUI fires are complex incidents involving both structures and forests. Fires can start towards the community, and from the community towards the forest and therefore impacting more of the community. Due to Oclucje's remote location and lack of structural fire protection services, it is critically important to consider the impacts of WUI fires both from the forest to structures, and from structures to the forest. Figure 6 shows the WUI disaster sequence where citizens and landowners can act to break the sequence.

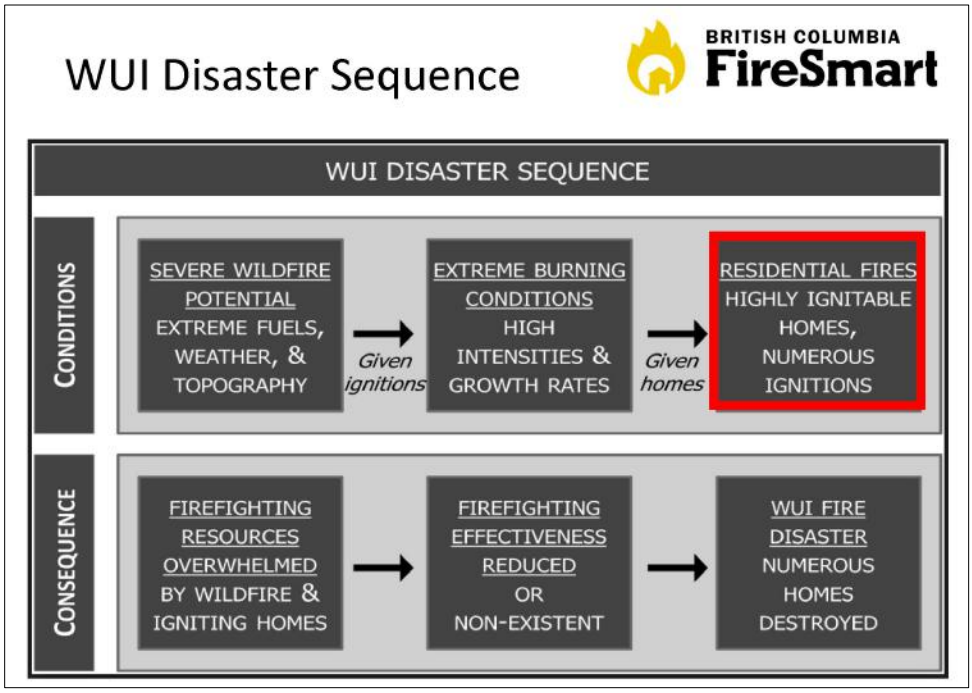


Figure 6. Wildland urban interface disaster sequence and where residents and landowners can break the disaster sequence.

[34] 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

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.[35] This was true in both the urban and rural areas.

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 radiation, convection, and conduction. Embers (small flaming or glowing particles) are associated with more than 50% of home losses from wildfires. Embers can be carried up to 2 kilometres under specific fire weather conditions. Most homes without combustible roofs and with 10m of cleared fire-resistant will 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)[36] 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. FireSmart specifies the following priority zones around structures: the Non-Combustible zone (0-1.5m), Priority 1 zone (1.5-10m), Priority 2 zone (10-30m), and Priority 3 zone (30-100m).

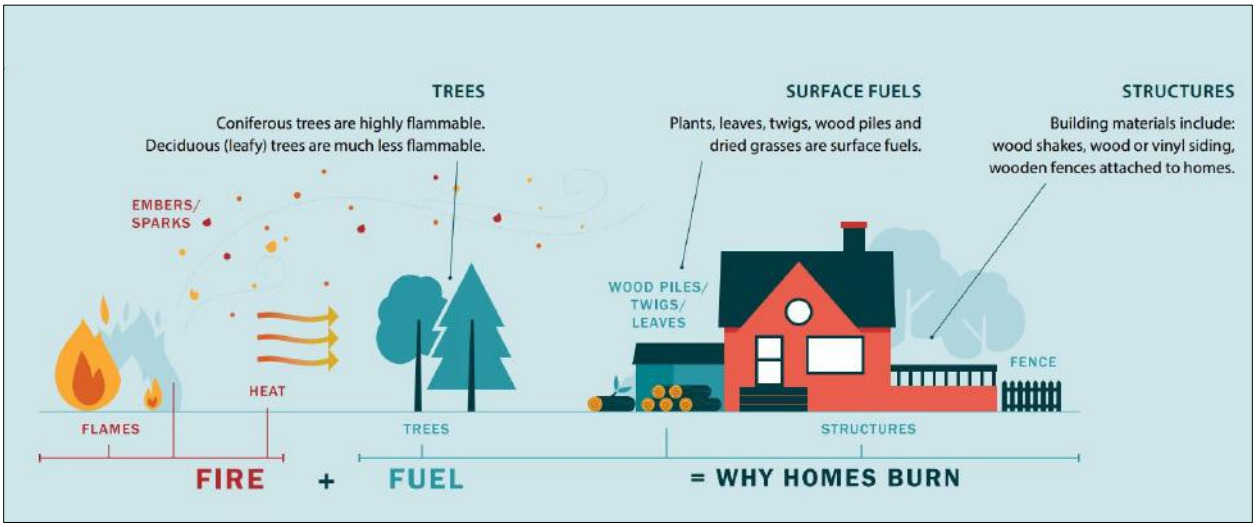


Figure 7. Why homes burn during WUI fire incidents.[37]

[35] 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

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

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

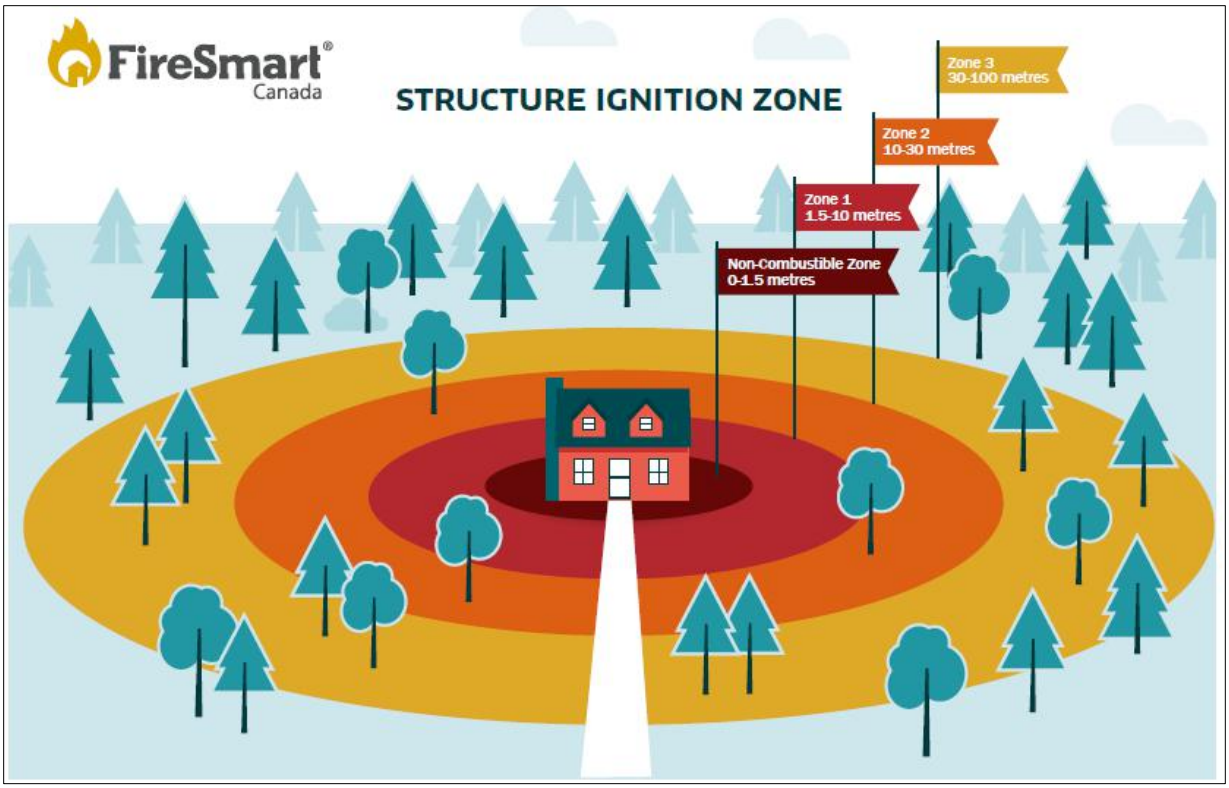


Figure 8. The FireSmart Structure Ignition Zone including the Priority Zones breakdown.

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 First Nations' Governments

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 several ways that members of the community and stakeholders can provide options to mitigate the risk. FNESS[38] administers the FireSmart program for First Nations communities in BC. FNESS also

[38] First Nations' Emergency Support Services. https://www.fness.bc.ca/

administers the On-Reserve Operational Fuel Treatment Program. As part of this CWPP, a FireSmart Community Hazard Assessment Form was completed by SuavAir forest professionals who are also Local FireSmart Representatives. The Hazard Assessment Form is included in Appendix 4: Community FireSmart Hazard Assessment .

General guidance for FireSmart activities within the structure ignition zones includes:

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

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

- Preferred roofing materials: clay/tile, fibreglass/asphalt composite shingles, metal, fibrous cement, tar/gravel.
- Preferred exterior siding: stucco, concrete, metal. Logs or heavy timber are better 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[39] and/or contacting a Local FireSmart Representative.[40]

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

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

5.2.3 Identify Priority Areas within the Area of Interest for FireSmart

The FireSmart priority areas identified in the Community FireSmart Hazard Assessment Form are summarized in Table 7 below.

Table 7: Summary of recommended FireSmart priority areas.

Priority Area	Wildfire Risk Rating (E/H/M/L)	Recommended FireSmart Activities
Priority Area # 1: Homes and Band Office	Moderate	1) Create a Non-combustible zone that is 0-1.5m from each structure in the community. 2) Clear FireSmart priority Zone 1, 1.5-10m from the structure. This zone should be fire-resistant. 3) Close off gaps in metal sheeting below buildings to prevent collection points for embers 4) Clear FireSmart priority Zone 2, 10-30m from the structure. This includes removal of smaller trees ("ladder" fuels), cleaning up woody debris on the ground, pruning tree branches to a height of over 2m off the ground
Priority Area # 2: Water Treatment plant area	Moderate	1) Create a Non-combustible zone that is 0-1.5m from each structure. 2) Clear FireSmart priority Zone, 1.5-10m from the structure. This zone should be fire-resistant. 3) Clear all vegetation at least 3m from the propane tank
Priority Area # 3: Water Reservoir area	Moderate	1) Create a Non-combustible zone that is 0-1.5m from each structure. 2) Clear FireSmart priority Zone, 1.5-10m from the structure. This zone should be fire-resistant. 3) Clear FireSmart priority Zone 2, 10-30m from the structure. This includes removal of smaller trees ("ladder" fuels), cleaning up woody debris on the ground, pruning tree branches to a height of over 2m off the ground

After vegetation is cleared, it should be piled and burned (in accordance with wildfire regulations), hauled away or chipped and dispersed/hauled away. Hiring a chipping truck is the recommended strategy. FireSmart related recommendations are listed below.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
6.	High	To engage in the FireSmart program; to reduce the fuel hazard and ignition risk within identified FireSmart priority areas.	Implement the FireSmart Activities recommended in Table 7 of this report.	NFN, (possibly Operations and Maintenance)
7.	Low	To reduce the ignition risk of propane tanks located near structures.	If propane is used as a fuel source for new homes/structures, ensure that the tank is located more than 10m from the structure and is located on top of a non-combustible surface (i.e.: gravel bed or concrete pad), and oriented safely away from nearby structures.	NFN
8.	High	To reduce the fuel hazard from previously brushed materials within the community.	Dispose of (chip and haul away, and/or burn) vegetative material that was previously cleared as part of the 2019 community brushing project. Ensure any future materials from brushing or FireSmart activities have plan for removal.	NFN
9.	Med	To reduce the ignition risk of structures within the community by following FireSmart guidelines for construction materials.	Ensure roof replacements, building restoration, or new construction considers the construction materials and principles found in the FireSmart Begins at Home – Home Development Guide[41] Any new construction occurring within the community should follow the FireSmart Home Development guide.	NFN, construction contractors

[41] FireSmart Canada. FireSmart Begins at Home – Home Development Guide. https://firesmartcanada.ca/wp-content/uploads/2019/10/FS_Developer_Booklet.pdf

5.3 Community Communication and Education

Following the 2018 wildfire season, wildfire risk was at the forefront of public awareness within the community and more generally on northern Vancouver Island. The challenge is to maintain this level of awareness, interest, and orientation towards action outside of major wildfire seasons. Education plays a critical role in shaping public perception around WUI fires, and the steps that can be taken to reduce risks to human safety and property. Lack of understanding can lead to inaccurate assumptions of the fire hazard, risk, and responsibility for risk reduction. Communication is another critical part of emergency planning and response in the event of a WUI fire. Education and communication in advance of a WUI incident is required to ensure community members are prepared, informed about their roles and the roles of the NFN Administration, FNESS, 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 between Nuchatlaht First Nation, community members, FNESS, SRD, provincial government agencies, and other stakeholders is required for successful implementation of this plan. Continual engagement between the NFN, SRD and other players throughout the duration of this CWPP (at least 5 years) is required to sustain momentum in addressing the recommendations.

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

- A video presentation of plan recommendations made available to Nuchatlaht First Nation and the Strathcona Regional District Emergency Coordinator,
- Hard copies and digital copy of the plan submitted to the SRD and NFN administration
- A digital copy of the plan should be uploaded to the Nuchatlaht First Nation 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 community's Facebook page

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

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
10.	High	To make this Plan and its associated maps available to the community.	Upload a digital copy of the CWPP to the Nuchatlaht First Nation and SRD Emergency Planning websites.	NFN and SRD

11.	Med	To improve community awareness of wildfire risk and raising awareness of the wildfire threat to the community.	Provide regular communications to community members (flyers, notice boards, social media). Recommend at least one fire related communication per month (more often during fire season if required). Content of the communications include reminders on FireSmart practices, fire danger ratings, fire bans, fire prevention tips, air quality alerts etc.	NFN
12.	High	To improve community awareness of wildfire risk and raising awareness of the wildfire threat to the community.	Organize an annual Community Fire Safety day. Activities could include checking fire extinguishers and smoke alarms in homes, conducting FireSmart clearing of Priority 1 (up to 10m) zones around homes, fire extinguisher practice, water suppression system (fire hydrants) practice, water pump practice. The Safety day could be timed with Fire Prevention Week which takes place annually during the 2nd week of October each year. October 4 to 10, 2020 is the next Fire Prevention Week[42]	NFN, with FNESS or SRD support
13.	Med	To improve inter-agency communication regarding wildfire risk, emergency preparedness, response, and recovery.	The SRD should arrange an annual regional meeting, prior to fire season, to include First Nations' community administration, BCWS – North Island Fire Zone, EMBC, local fire departments, and Village representative to review incident command structure, communication strategies and emergency support services in the event of a WUI fire.	SRD

[42] Fire Prevention Week. https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/fire-safety/public-education/fire-prevention-week

14.	High	To engage regional operators and industrial stakeholders on the contents and recommendations in this plan.	Share this plan with regional operators and stakeholders including MFLNRORD, forest tenure holders (Western Forest Products Inc.), and BC Hydro. Areas of concern to highlight include the critical importance of Fair Harbour FSR for access and evacuation and minimizing the fuel hazards along its right-of-way; treatment areas in identified high risk areas on Crown/TFL lands; and minimizing fuel hazards along transmission line rights-of-way.	NFN and SRD Regional operators and stakeholders should review this plan.
15.	Med	To ensure implementation and continual engagement with CWPP.	Schedule annual check-ins between Nuchatlaht First Nation, SRD, and FNESS to follow-up on recommendation implementation. Annual check-ins should also develop an annual action plan of priority items to be worked on for the year.	NFN, SRD and FNESS

5.4 Other Prevention Measures

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

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
16.	Low	To increase awareness and to reduce the risk of human caused ignitions during high/extreme fire danger.	Develop local regulation and policies for establishing community fire/fireworks bans during high/extreme fire danger class.	NFN
17.	High	To improve community and public awareness of wildfire prevention information.	Work with BCWS North Island Fire Zone to install Wildfire Information signage at the junction of T'ashii-is Road and Fair Harbour FSR.	SRD, NFN

SECTION 6: WILDFIRE RESPONSE RESOURCES

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 B.C., these resources are deployed according to BC Provincial Coordination Plan for Wildland Urban Interface Fires (revised July 2016[43]). According to the Provincial Coordination Plan, for WUI fires on First Nations' non-treaty lands (i.e.: Federal Indian Reserves) BCWS will provide fire control services to these area as per the Wildfire Response Agreements with Indigenous and Northern Affairs Canada.

6.1 First Nation Firefighting Resources

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

6.1.1 Fire Departments and Equipment

Nuchatlaht First Nation does not have a fire department and is outside of the service of the Village of Zeballos' Volunteer Fire Department. There are no mutual aid agreements in place due to the travel distance, response time and road conditions. In the event of a structure fire at Oclucje, the community members will respond based on the tools and knowledge available at the time.

The Village of Zeballos has indicated its intention to donate a previously used pumper fire truck, Engine 22. Engine 22 is a 1984 GMC Hub 625 GPM with a 600-gallon water tank.[44] At this time, there is no structure for housing the truck at Oclucje, nor are there individuals trained in its operation and maintenance. The current population of Oclucje does not make the establishment a fire department realistic, instead alternative recommendations are made under this plan.

Existing fire suppression equipment available to the community includes:

- 1 gas powered Honda water pump with fittings and adapters
- 4 fire boxes (next to 4 fire hydrants) each equipped with: 100ft fire hose and nozzle, 1 hydrant split connector, 2" connection standard
- 1 ABC dry chemical agent fire extinguisher in each household

Additional hand tools are recommended as a precaution for campfires, burn barrels, or other open burning that may be conducted by community members. Each household should have one set of basic hand tools (shovel, Pulaski, backpack pump, and fire extinguisher). The community has a portable water pump but limited fire hose availability.

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[43] 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

[44] Zeballos Fire Department. http://www.zeballosfire.com/apparatus/

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
18.	Low	To improve the availability of fire suppression equipment and supplies.	Construct a storage building for a future fire truck and for emergency supplies. Ensure that materials used for construction meet Firesmart Development guidelines.	NFN with support from FNESS ISC Capital Facilities Funding, Infrastructure Funding programs
19.	Low	To improve community preparedness in responding to a structure fire.	If a pumper truck or other fire suppression equipment is acquired, ensure community members are adequately trained in the operation and maintenance of the equipment.	NFN with support from FNESS
20.	High	To improve the availability of fire suppression equipment and supplies.	Conduct an inventory of available hand tools (shovels, pulaskis, axes, backpack water pump, hydrant hoses, fittings/nozzles). Purchase hand tools and spare hoses for community use. Offer training to community members, ideally through the S100 course.	NFN
21.	High	To improve community preparedness for fire response (i.e.: house fires, back yard burns).	Establish written procedures with roles and responsibilities for responding to structure and WUI fire events in the community. Both documentation and operational practice of the procedures are recommended.	NFN

6.1.2 Water Availability for Wildfire Suppression

All WUI fires within the AOI will require BCWS response. The community and/or nearby fire departments do not have the capacity to respond. The water supply for structural fire suppression is the community water reservoir. Community hydrants are connected to the water reservoir. WUI fires or prolonged suppression efforts on structural fires will require bucketing or drafting from the ocean. There are no significant bodies of accessible freshwater within the AOI that could be used to supply fire suppression efforts.

In the event of a power outage, the water treatment plant has a backup generator. An additional water reservoir is recommended to store additional water for emergency use. The following recommendations are made related to improve water availability for wildfire suppression.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
22.	Med	To improve water availability for fire suppression.	Hire a qualified professional to assess water availability needs for fire suppression and community use.	NFN
23.	High	To clear and maintain a helicopter landing area for emergency evacuations and/or wildfire response operations.	Designate an area (within the Emergency Plan) to be used as helicopter landing area. Maintain this area to be free of obstructions, loose debris and overhanging vegetation or obstacles. The best available option is the field.	NFN

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 Oclucje. 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.

T'ashii-is Road is the single access road into Oclucje from Fair Harbour FSR also serves as the only evacuation route. This gravel road is about 780m in length and there is a portable steel bridge located less than 100m from the FSR junction. T'ashii-is Road is maintained by Nuchatlaht First Nation.

Fair Harbour FSR is the only road that connects Oclucje to the rest of Vancouver Island. To the south, Fair Harbour FSR connects to the Village of Zeballos (14km). To the north, the FSR terminates at Fair Harbour (22km), a marina. Western Forest Products Inc. is the road permit holder of Fair Harbour road from Zeballos to the Chum Main junction a couple kilometers north of the Oclucje turn-off. One notable access bottleneck is the causeway bridge that spans Little Espinosa Inlet. Past the Chum Main junction to Fair Harbour, the road is the responsibility of the Campbell River Natural Resource District.

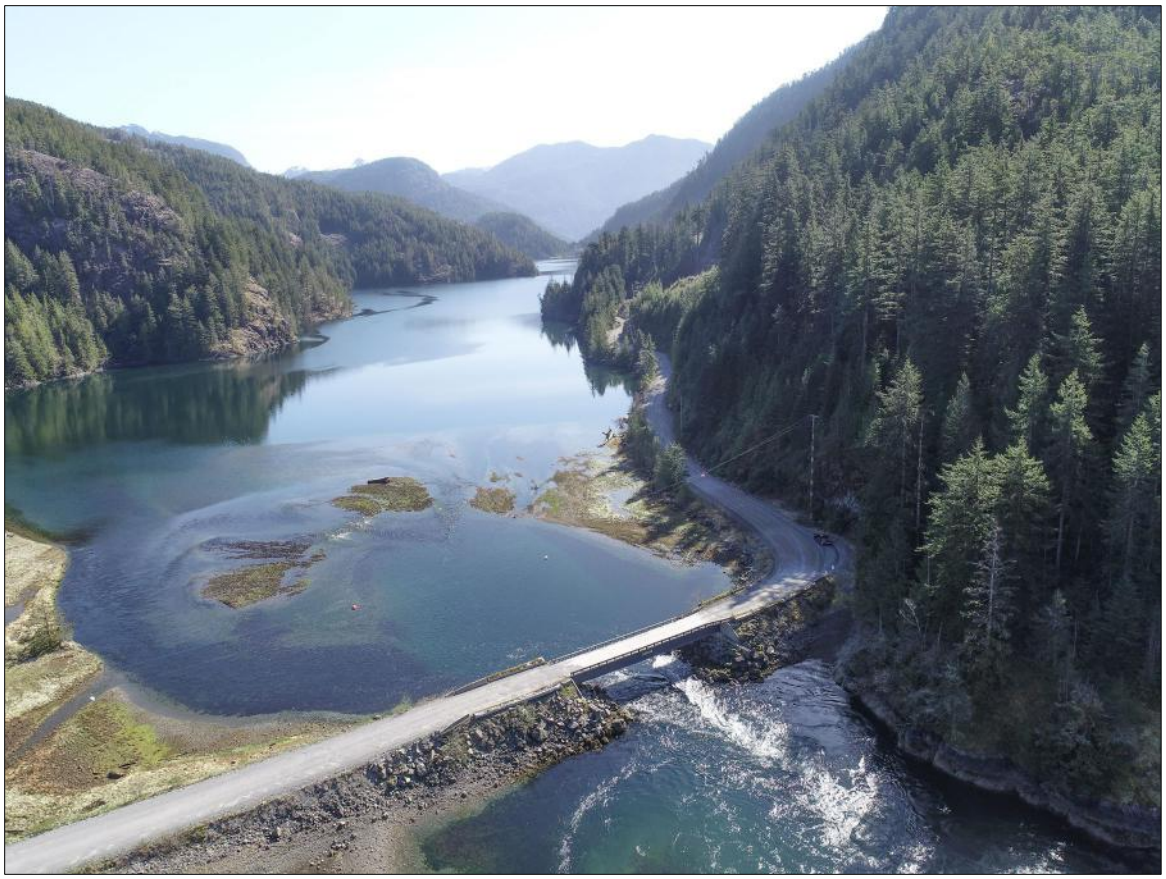
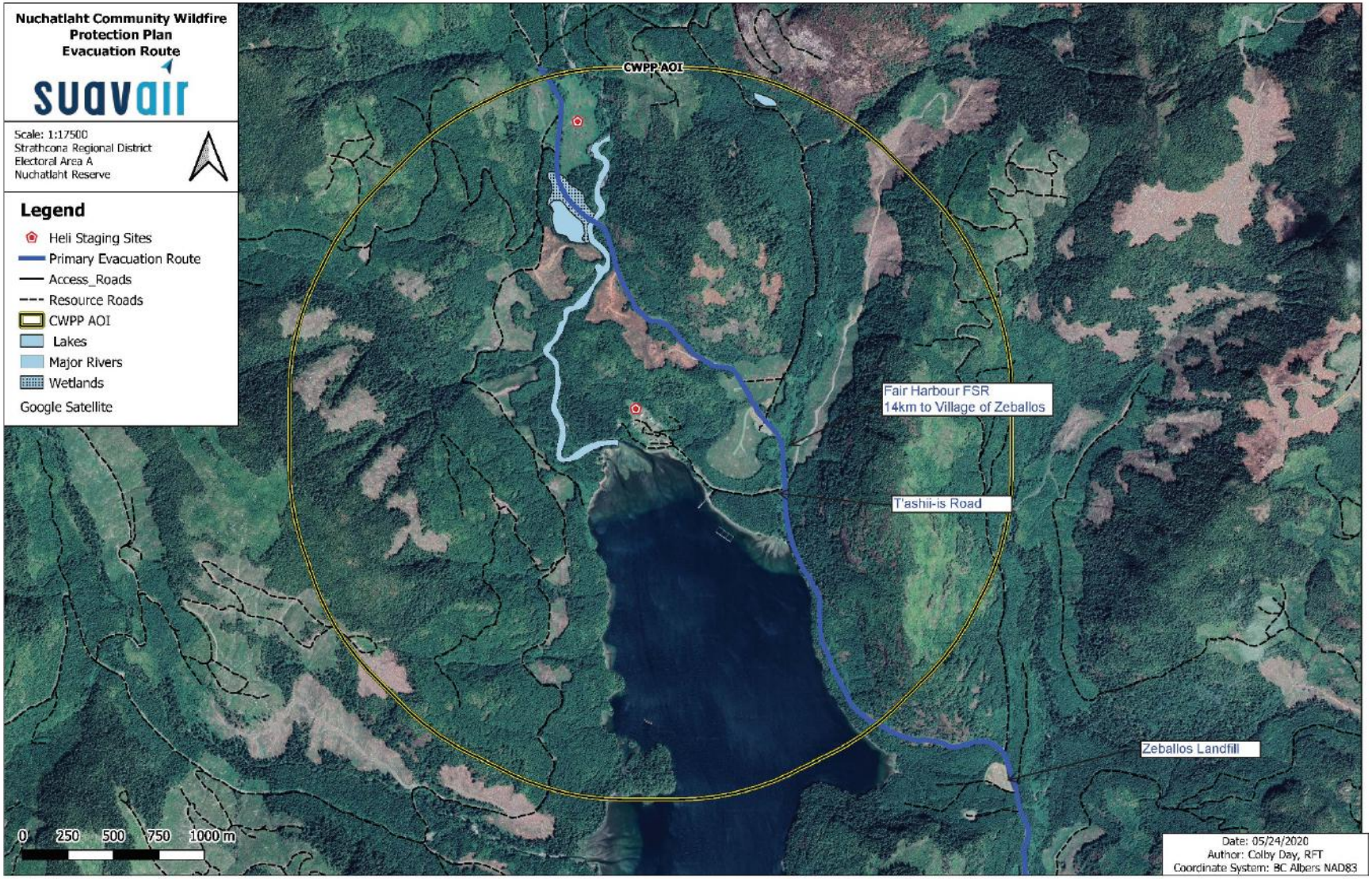


Photo 7. Fair Harbour FSR and the causeway bridge crossing Little Espinosa Inlet.

Maintaining access along T'ashii-is Road and Fair Harbour FSR is a priority. Both Nuchatlaht First Nation and the SRD should regularly review and advocate for improvements to the condition of the FSR, as it is a vital route connecting several communities within Electoral Area A. The single lane, narrow, winding egress route on a 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 Fair Harbour FSR road present a hazard to emergency access to/from all communities that rely on the road.

For BCWS access and other emergencies, a designated helicopter landing area should be identified within the Community Emergency Preparedness and Response Plan. Maintain this area to be free of obstructions, loose debris and overhanging vegetation or obstacles. Vegetation within the landing area should be cut low (less than 1.5m height). Mark the area with paint or permanent signage. The minimum dimensions are 40 paces by 40 paces on flat ground. A suitable area would be the field in Oclucje. An alternative area is the existing helicopter service landing located in TFL 19 off Fair Harbour FSR about 2km north of the community.



Map 9. Evacuation via Fair Harbour FSR, Fair Harbour to the north and Village of Zeballos to the east

Access and evacuation recommendations:

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
24.	High	To improve emergency preparedness in the event a wildfire or other event disrupting utility services and road access.	Ensure each home has an emergency kit[45] including supplies for staying at home following an emergency, and grab-and-go bags containing the essentials in case of an immediate evacuation. [46] Purchase community emergency supplies in case wildfire cuts off road access to the community including generator and fuel, drinking water, and non-perishable food. A dry, sealed storage area is required to keep these items.	NFN Work with FNESS / ISC for program funding options.
25.	Med	To mitigate the impacts of heavy wildfire smoke and poor air quality on the community.	Improve indoor air quality with the purchase and use of High-Efficiency Portable Air (HEPA) filters[47], etc. Purchase N95 respirator masks for distribution to community members during heavy smoke conditions to reduce smoke exposure.[48]	First Nations Health Authority provides resources on wildfire and air quality[49] ISC Emergency Management Assistance Program

[45] Public Safety Canada. Your emergency preparedness guide. http://assets.ibc.ca/Documents/Natural%20Disasters/EPW/national-eng.pdf

[46] PreparedBC. How to build a household emergency kit and grab-and-go bag. https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/preparedbc/build-an-emergency-kit-and-grab-and-go-bag

[47] BC Centre for Disease Control. Portable Air Cleaners for Wildfire Smoke. http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Health-Environment/BCCDC_WildFire_FactSheet_PortableAirCleaners.pdf

[48] BC Centre for Disease Control. Evidence review: Using masks to protect public health during wildfire smoke events. http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Health-Environment/WFSG_EvidenceReview_UsingMasks_FINAL_v5trs.pdf

[49] First Nations Health Authority. Wildfire Information. https://www.fnha.ca/what-we-do/environmental-health/wildfire-information

6.1.4 Training

The FNESS works with Emergency Management BC (EMBC) and Indigenous Services Canada (ISC) to support successful emergency management for First Nations communities in BC. FNESS delivers training for First Nations communities on topics including emergency preparedness, community fire safety, fire department services, wildland fire fighting, and provides other emergency planning support services.[50] In BC, FNESS also administers the FireSmart program for all First Nations communities.[51] See Appendix 3: Wildfire and Emergency Response Training Courses for wildland fire training courses that Nuchatlaht or the SRD may consider for their community members and staff. It is recommended that Nuchatlaht First Nation engage FNESS for assistance in carrying out the recommendations listed in this CWPP.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
26.	Med	To build capacity in the emergency management area.	Work with FNESS to develop an emergency management program and training schedule that meets the needs of the community.	NFN with support from FNESS
27.	Low	To build capacity in the emergency management area.	Work with FNESS to plan for Foundational Training for governance staff, beginning with Tier 1 and progressing to Tier 3 over the next 5 years.	NFN with support from FNESS
28.	High	To improve community preparedness in using available fire tools and equipment if required in an emergency.	Organize community training days to practice using the available community fire suppression system and other suppression equipment.	NFN with support from FNESS

[50] FNESS. Training and Exercise. https://www.fness.bc.ca/core-programs/emergency-management/training-and-exercise

[51] FNESS. Forest Fuel Management. https://www.fness.bc.ca/core-programs/forest-fuel-management/firesmart-home-ignition-zone

6.2 Structure Protection

Nuchatlaht First Nation does not have access to or the capacity to deploy sprinkler systems or a structural protection unit (SPU). The nearest SPU is with Campbell River Fire Department, over 3 hours away. Given the access conditions and distance, NFN should not rely on the prompt deployment of this SPU for structure protection at Oclucje. Fire suppression equipment available in the community is listed in Section 6.1.1 above. Due to the remoteness of the community, distance from the nearest fire protective services, and lack of service/aid agreements, the community should improve its capacity for structure protection.

No.	Priority	Objective	Recommendation / Next Steps	Responsibility
29.	Med	To increase the likelihood that homes survive a WUI fire due to the distance of Oclucje to other protective services.	Purchase exterior sprinkler kits for homes; provide training to the community for how to set up the kits.	NFN with support from FNESS

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[52] 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).*

[52] 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)[53]

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 Table 8 below.

Table 8. Description of fuel type layers.

Fuel Type	CFFDRS/FBP Description[54]	BC PSTA Description[55]	Local Description	Expected Wildfire Behaviour Under High Wildfire Danger
C-2	Boreal black and white spruce. Continuous feather moss, compacted organic layer. Continuous shrub, low to moderate down woody fuel, tree crowns extend nearly to the ground. Moderately well stocked black spruce	Mid-elevation hybrid spruce stands.	Does not occur within the AOI.	Crown fire, high to very high fire intensity and rate of spread.

[53] 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.

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

[55] Perrakis, D., Eade, G., & Hicks, D. 2018.

	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.[56]	Dense Second or third growth douglas-fir/ western hemlock/ western red cedar forests over 4m tall and less than 60 years old. Clean/open understory.	Surface and crown fire, low to very high fire intensity and rate of spread.
C-5	Red and white pine. Continuous needle litter; moderate herb and shrub layer, tree crowns separated from the ground. Moderately well stocked stands.	Used to approximate fire behaviour in mature stands of low-mid elevation coastal Fd/Hw/Cw.	Mature Douglas-fir/ western hemlock/ western red cedar forests.	Burn rarely and typically with low intensity. Surface fuel loading can be high in older coastal stands, as a result fire intensity can be higher under drought conditions.
M-1/2	Boreal Mixed wood. Continuous leaf litter in deciduous portions, feathermoss, and needles in conifer portions. Moderate shrub and continuous herb layers, down woody fuels, conifer crowns extend near the ground. Moderately well stocked mixed wood stands.	Amabilis fir stands typed as M-2 40% conifer to represent fire behaviour between C-3 and C-5 fuel types.	Mature forests dominated by amabilis fir/mountain hemlock. Higher elevation stands over 800-900m.	Surface fire spread, torching of individual trees and intermittent crowning.
D-1/2	Aspen.	D-1 leafless; D-2 green	Alder, cottonwood,	Surface fire, low to moderate rate of

[56] 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.

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

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

Table 9: Fuel Type Categories and Crown Fire Spot Potential

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

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

As part of 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 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.

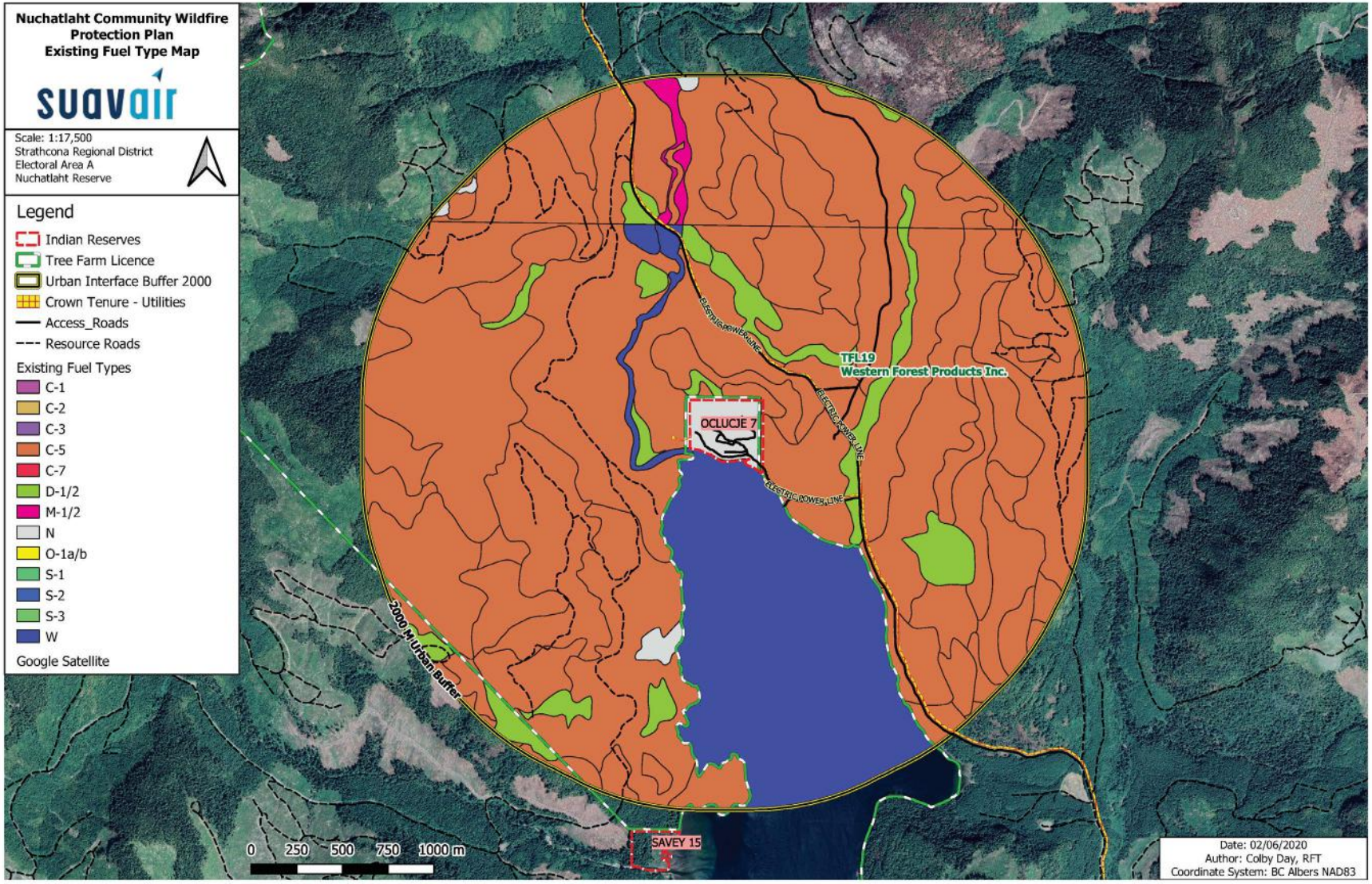
Available spatial information from Data BC, RESULTS; proprietary LIDAR data, forest cover, and other spatial data shared for use on this project by Western Forest Products Inc., updated Google Earth imagery, was analyzed for fuel type verification and adjustments. The major changes to the fuel type layer that resulted within the AOI included:

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

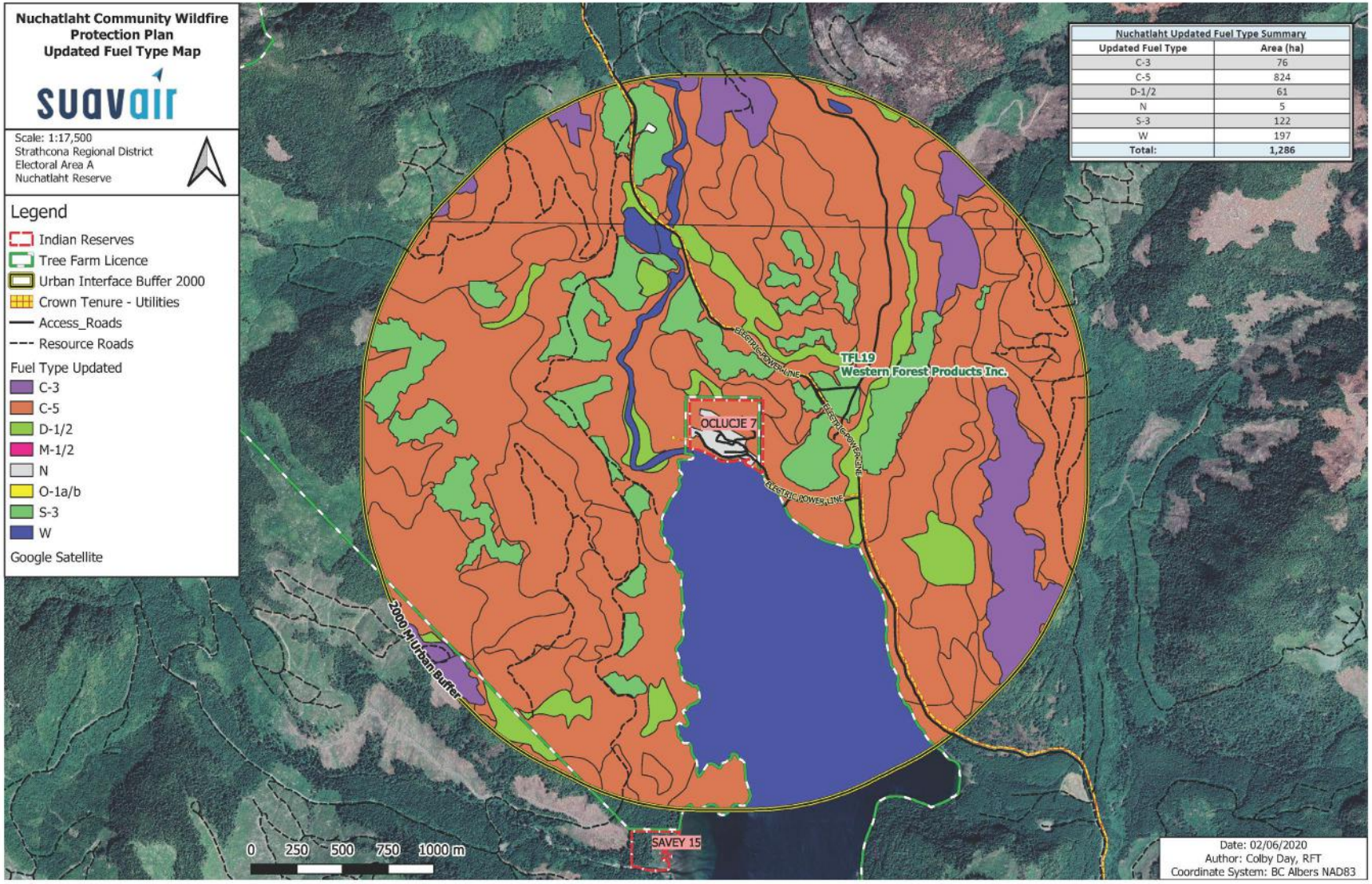
Mostly areas from C-5 and Non-Fuel were re-classified through the GIS analysis process. The table and maps below show the change in fuel type areas within the AOI.

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

Fuel Type Class	2019 PSTA Original Area (ha)	2020 CWPP Updated Area (ha)	Net Change (ha)
C-3 (dense, pole sized forests)	0 ha	76	+76
C-5 (coniferous forest)	1002	824	-176
S-3 (recent harvest)	0	122	+122
D-1/2 (deciduous)	65	61	-4
M-1/2 (mixed conifer/deciduous; amabilis fir leading)	6	0	-6
W (Water)	193	197	+4
Non-Fuel	19	5	-14
Total area	1285	1285	0



Map 10. Existing 2019 PSTA fuel type layer.



Map 11. 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 11: Proximity to the Interface

Proximity to the Interface	Descriptor*	Explanation
WUI 100	(0-100 m)	This Zone is always located adjacent to the value at risk. Treatment would modify the wildfire behaviour near or adjacent to the value. Treatment effectiveness would be increased when the value is FireSmart.
WUI 500	(101-500m)	Treatment would affect wildfire behaviour approaching a value, as well as the wildfire's ability to impact the value with short- to medium- range spotting; should also provide suppression opportunities near a value.
WUI 2000	(501-2000 m)	Treatment would be effective in limiting long range spotting but short range spotting may fall short of the value and cause a new ignition that could affect a value.
	>2 000 m	This should form part of a landscape assessment and is generally not part of the zoning process. Treatment is relatively ineffective for threat mitigation to a value, unless used to form a part of a larger fuel break / treatment.

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

A1.3 Fire Spread Patterns

Wind speed, wind direction, and fine fuel moisture condition influences wildfire trajectory and rate of spread. Wildfire that occurs upwind of a value poses a much more significant threat to that value than a fire that occurs downwind. The Initial Spread Index (ISI) is a rating of the expected fire spread based on wind speed and fine fuel moisture. BCWS weather stations generate ISI Roses.

The nearest BCWS weather station to Oclucje is the TS Artlish station. The initial spread index wind rose for months April to October, from 2007-2015 is shown below (Figure 9). The wind 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). The CWA models wind speeds and direction from large scale and long-term atmospheric data. The CWA data for the AOI shows dominant winds in the summer months (June, July, August) from the north. This information is considered more representative of actual conditions within the AOI. Figure 10 represents CWA Wind Roses at 50m, the frequency distribution of wind by sector for the Oclucje area, Latitude = 49.959, longitude = -126.938. Available from http://www.windatlas.ca/maps-en.php.

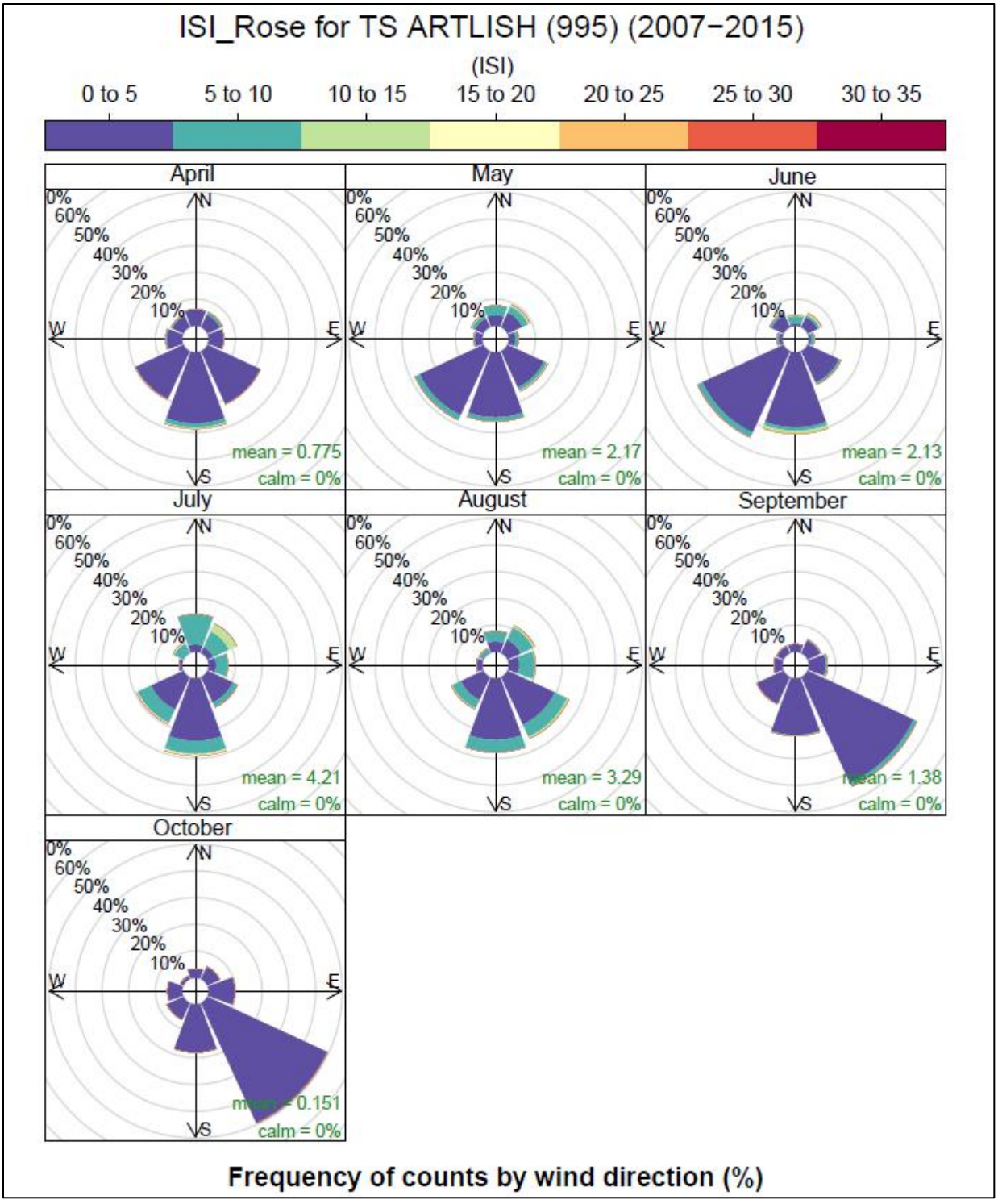


Figure 9. TS Artlish Initial Spread Index rose.

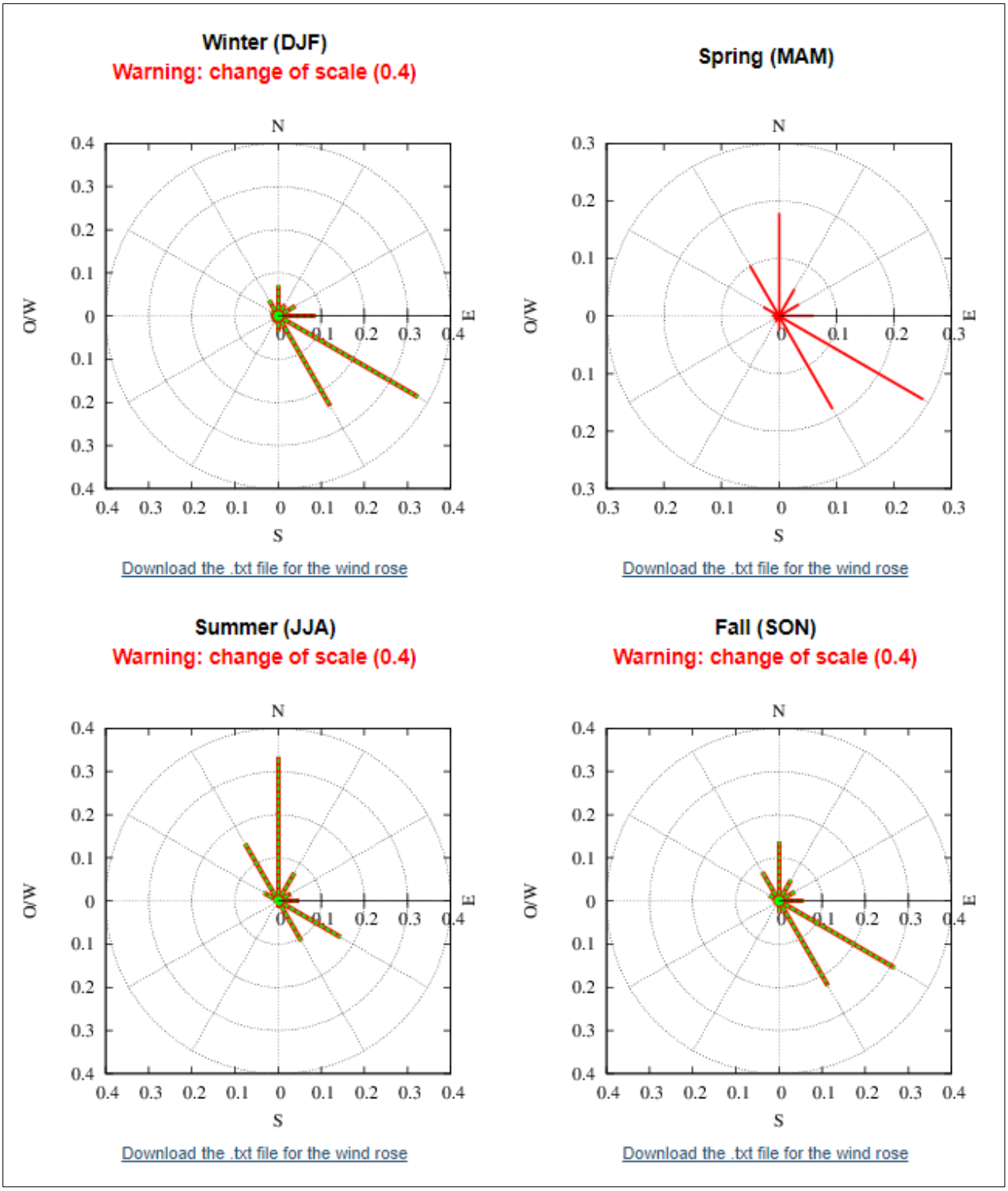


Figure 10. Canadian Wind Atlas wind rose for the Oclucje area.

A1.4 Topography

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

Slope Class

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

Table 12: Slope Percentage and Fire Behaviour Implications

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

Slope Position of the Value

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

Table 13: Slope Position of Value and Fire Behaviour Implications

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

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

A1.5 Local Wildfire Threat Classification

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

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

Table 14: PSTA Inputs Cross Walk Table – 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 15. PSTA Classification table - Low, Moderate, High, Extreme classifications taken from 2017 PSTA document.

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

Class 5	21.2 – 27 Moderate	Class 6	27.1 – 33 Moderate
Class 7	33.1 – 40 High	Class 8	40.1 – 47 High
Class 9	57.1 – 55 Extreme	Class 10	55.1 – 81 Extreme

A1.6 Local Wildfire Risk Classification

As part of the CWPP analysis, 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.

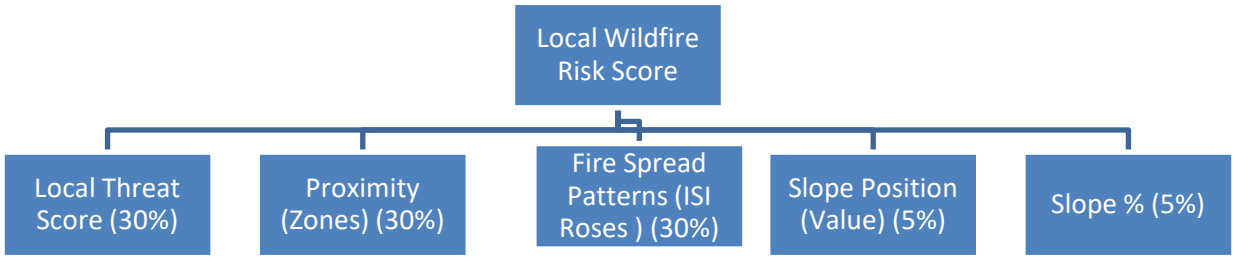


Figure 11: Local Wildfire Risk Inputs

Table 16. Weightings used in determining local wildfire risk.

Local Threat Score (30%)	Proximity (30%)	Fire Spread Patterns (30%)	Slope Position (5%)	Slope Percent (5%)	Wildfire Risk Score (100%)
5/10	10/10	8/10 (Northerly winds in the summer)	1/10 (bottom of the slope)	5/10	
3	3	3	0.5	0.5	10
[(5/10)*3] 1.5	3	[(8/10)*3] 2.4	0.05	0.25	7.20/10 (High)

The wildfire risk assessment process outlined above provides a means to determine the wildfire risk as it applies to forest fuel hazard, proximity of fuel to the community, fire spread patterns and topography. These factors all influence how a wildfire could impact the community if ignition were to occur. It is also important for Professionals to consider and assess high forest fire risk activities, human use, and other environmental factors that affect wildfire threat and risk within different areas of the WUI. Note any additional local factors that influence (increase or decrease) the wildfire threat information that is unique to the community. For example, a review of human fire start history based on BCWS supplied data and BCWS Fire Centre Prevention Plans may identify high fire start areas that present a higher level of local wildfire threat. Contact the local Fuels Management Specialist for this information.

Table 17: Local Wildfire Risk Weighting

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

A1.7 Summary of Fire Risk Classes

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

Low (Green): The combination of the local fuel hazard, weather influences, topography, proximity to the community, fuel position in relation to fire spread patterns, and known local wildfire threat factors make it a lower potential for threatening a community. These stands will

support surface fires, single tree or small groups of conifer trees could torch/ candle in extreme fire weather conditions. Fuel type spot potential is very low, low risk to any values at risk.

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

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

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

APPENDIX 2: 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[57] • 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 CO-OPERATION	• Develop and/or participate in regional or local FireSmart planning tables

[57] 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.

	• 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 homeowners on private land and First Nations land that complete eligible FireSmart activities on their own properties • Provide off-site debris disposal for private landowners who have undertaken their own vegetation management, including: • Provide a dumpster, chipper, or other collection method • Waive tipping fees • Provide curbside debris pick-up

APPENDIX 3: WILDFIRE AND EMERGENCY RESPONSE TRAINING COURSES

RELEVANT TRAINING COURSES IN WILDLAND URBAN INTERFACE FIRE

COURSE NAME	TARGET AUDIENCE	FORMAT	FURTHER INFORMATION
S-100 BASIC FIRE SUPPRESSION AND SAFETY (2005)	Contract fire crews	2-day, 16-hour course with classroom and field component	Required by OHS Regulation Section 26.3.1 for wildfire contract crews A list of recognized instructors is found here.
S-100A BASIC FIRE SUPPRESSION AND SAFETY ANNUAL RECURRENCY (ALSO KNOWN AS S-10A)	Refresher training for those with valid S100 training	0.5-day classroom and field components	
S-185 FIRE ENTRAPMENT AVOIDANCE & SAFETY (2006)	All those involved in fire suppression operations. General knowledge course on wildfire safety and entrapment avoidance	2-3-hour classroom training session	BCWS Information on Wildfire Training[58]
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	

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

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 1001 LEVELS 1 AND 2	Exterior and Interior Structure Firefighter training	7-12 weeks, depending on the delivery format (full-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[59]
TRAINING COURSES IN FIRESMART			
FIRESMART 101	Community members	Online	FireSmart Canada[60]
LOCAL FIRE SMART REPRESENTATIVE WORKSHOP	Fire professionals, resource professionals, emergency preparedness staff	2 days (16 hours), classroom. Offered by FireSmart Canada	FireSmart BC information can be found here.
FIRESMART COMMUNITY CHAMPION WORKSHOP	Community members	2-4 hours, offered by Local FireSmart Representative	Local FireSmart Representatives can be found here.
TRAINING COURSES IN EMERGENCY PLANNING AND MANAGEMENT			
FNESS FIRE PROTECTION LEADERSHIP GOVERNANCE TRAINING	Band council, staff, and administration	Tier 1 – Home Fire Protection Tier 2 – Community Fire Protection Tier 3 – Fire Departments	FNESS[61]

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

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

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

EMERGENCY SUPPORT SERVICES LEVEL 1	Community Volunteers	Online or In-Person	Justice Institute of BC[62]
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[63]
ICS LEVEL 200	First responders, local government administration, community organizations involved in response	Online	JIBC[64]

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

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

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

APPENDIX 4: COMMUNITY FIRESMART HAZARD ASSESSMENT FORM

This Community Wildfire Hazard Assessment form provides a written evaluation of the overall community wildfire hazard – the prevailing condition of structures, adjacent vegetation and other factors affecting the FireSmart status of a small community or neighbourhood. This hazard is based on the hazard factors and FireSmart recommended guidelines found in FireSmart: Protecting Your Community from Wildfire (Partners in Protection, 2003) and will assist the Local FireSmart Representative in preparing the FireSmart Community Assessment Report. NOTE: Mitigation comments refer to the degree to which the overall community complies or fails to comply with FireSmart recommended guidelines with respect to each hazard factor.

Community Name: Oclucje (Nuchatlaht First Nation)	**Date: (mm/dd/yyyy)** 02/25/2020	
Assessor Name: Cynthia Lu	**Accompanying Community Member(s):** Brian Michael	
Hazard Factor	**Ref**	**Mitigation Comments**
1. Roof Assemblies		
a. Type of roofs ULC rated (metal, tile, asphalt, rated wood shakes) unrated (unrated wood shakes)	2-5 3-21	Most homes with shingle or metal. Health office has cedar roof, to be replaced.
b. Roof cleanliness and condition * *Debris accumulation on roofs/in gutters; curled damaged or missing roofing material; or any gaps that will allow ember entry or fire impingement beneath the roof covering*	2-6	Generally clean and free of debris.
2. Building Exteriors		
2.1 Materials		
a. Siding, deck and eaves	2-7 2-8 2-9	Vinyl and wood and a few newer homes with hardi plank Most homes do not have decks. Some have staircases up to the doors. Where decks and staircases are present, they are not closed in.
b. Window and door glazings (single pane, sealed double pane)	2-10	Double pane vinyl windows on all (most) houses.
c. Ember Accumulator Features (scarce to abundant) * *Structural features such as open eaves, gutters, unscreened soffits and vents, roof valleys and unsheathed crawlspaces and under-deck areas*		Eaves and soffits closed off. Under deck or under stairs not closed off. A few buildings have openings in the metal sheeting used to close off the bottom of the structures, however some buildings have openings in the metal sheeting.
d. Nearby Combustibles – firewood, fences, outbuildings	2-11	Firewood and other combustibles nearby or right against the house in most cases. Propane tanks within 10m.

Hazard Factor	Ref	Mitigation Comments
3. Vegetation		
3.1 **PZ-1:** Vegetation - 0 - 10m from structure **Page Reference 3-5**		
a. Overstory forest vegetation (treated vs. untreated)	2-14	No overstory within 10m.
b. Ladder fuels (treated vs untreated)	2-17	The ditch behind band office is a good break at the edge of P1. Remove blackberry, scotch broom within this zone.
c. Surface fuels - includes landscaping mulches and flammable plants (treated vs untreated)	2-16	Grasses, Himalayan blackberry, firewood, some household debris.
3.2 **PZ-2:** Vegetation - 10 - 30m from structures **Page Reference 3-9**		
a. Forest vegetation (overstory) treated vs untreated	2-14	This zone mostly applies to the row of homes and structures along the top side of the community, (i.e.: band office and health centre). Untreated red cedar, western hemlock and red alder.
b. Ladder fuels treated vs untreated	2-17	Untreated ladder fuels include red cedar, western hemlock, and alder.
c. Surface fuels treated vs untreated	2-16	Untreated surface fuels including downed wood/branches, salal, and huckleberry.
3.3 **PZ-3:** Vegetation - 30 - 100m from structures **Page Reference 3-13**		Provide mitigation comments on the prevailing PZ3 fuel type
a. Light fuel - deciduous – grass, shrubs	2-16	Salal and huckleberry mostly.

Hazard Factor	Ref	Mitigation Comments
b. Moderate fuel - mixed wood – light to moderate surface and ladder fuels, shrubs	2-17	Red cedar and western hemlock saplings behind band office/health centre. Otherwise mostly clean understories (next to the field, to the west of the community).
c. Heavy fuel - coniferous - moderate to heavy surface and ladder fuels, shrubs	2-14	Mature second growth douglas-fir, western hemlock and red cedar.
d. Logging slash, dead/down fuel accumulations	2-16	No slash within 100m. Dead limbs from 2019 community brushing project should be removed.
e. Diseased forest – without foliage vs with foliage		N/A
f. Fuel islands within community - treated vs untreated		N/A
4. Topography		
4.1 Slope (within 100m of structures)		
a. Slope - Flat or < 10 %, 10 – 30% or >30%	2-19	0 to 10%.
4.2 Buildings setback on slopes >30 %, position on slope Provide mitigation comments on items a – c as applicable		
a. Setback from top of slope > 10m, or bottom of slope – valley bottom. b. Buildings located mid-slope c. Setback from top of slope <10m, or upper slope	2-12	Bottom of slope.

Hazard Factor	Ref	Mitigation Comments
5. Infrastructure – Access / Egress, Roads, Driveways and Signage		
5.1 Access Routes – Road Layout to FireSmart Recommended Guideline?		
a. Single Road or Looped Road	3-28	Single road access.
5.2 Roads- width, grade, curves, bridges and turnarounds		
a. To FireSmart Recommended Guideline?	3-30	Single road, dead end access. Widths meet recommended standards but there are no turnarounds or through roads. Grades are gentle.
5.4 Fire Service Access / Driveways - Grade, Width/Length, Turnarounds		
a. To FireSmart Recommended Guideline?	3-30	No turn arounds in the community for large vehicles.
5.5 Street Signs / House Numbers		
a. To FireSmart Recommended Guideline?	3-30	House numbers not well marked. The main road to the community is T'ashii-is road. There is a lower road, and upper road towards the water tower.
6. Fire Suppression - Water Supply, Fire Service, Homeowner Capability		
6.1 Water Supply		
a. Fire Service water supply – hydrants, static source, tender or no water supply	3-32	4 fire hydrants throughout the community with fire boxes. Hydrants are fed by the water tower.
6.2 Fire Service		
a. Fire Service < 10 minutes or > 10 minutes, no fire service	2-25	No fire services.
6.3 Homeowners Suppression Equipment		
a. Shovel, grubbing tool, water supply, sprinklers, roof-top access ladder	3-28	Not known or apparent.

Hazard Factor	Ref	Mitigation Comments
7. Fire Ignition and Prevention – Utilities, Chimneys, Burn Barrel / Fire Pit, Ignition Potential		
7.1 Utilities		
a. To FireSmart Recommended Guideline?	2-24	Propane tanks within 10m from homes, most are not clear around for 3m. Overhead powerlines along the main road T'ashii Road.
7.2 Chimneys, Burn Barrel / Fire Pit		
a. To FireSmart Recommended Guideline?	2-22	No burn barrels. Some open piles observed.
7.3 Ignition Potential Provide mitigation comments on items a – d as applicable		
a. Topographic features adversely affect fire behaviour b. Elevated probability of human or natural ignitions c. Periodic exposure to extreme fire weather or winds d. Other	2-21	Topography does not contribute additional hazard because the community is next to the ocean at the bottom of the slope. Lightning ignitions occurred near the community in the summer of 2018.
General Comments: There is minimal fire protection for the community of Oclucje. There are no fire service apparatus serving the community.		

Recommendations:		
1) Continue to provide regular maintenance on roof conditions and cleanliness. Keep roofs, gutters free of debris. For roof replacements planned in the community choose either Metal, Tile or Asphalt shingles.	2) Create a non-combustible zone. Remove all vegetation, firewood, and debris from within 1.5m of structures to create a Non-combustible zone. Clear 3m around all propane tanks. Where and when possible, move propane tanks 10m from structures. 	3) For planning siding replacements use non-combustible siding such as stucco, metal, brick, cement siding (such as Hardie-plank). Wood or vinyl siding is most flammable. Example of hardie-plank siding in the community: 

4) Close off around the bottoms of buildings and structures were there is potential for embers to collect. 	5) Remove (burn, haul away or chip) dead branches from within Priority Zone 1 (within 10m of structures), especially those materials left from brushing activities, blackberry, and scotch broom. For Scotch broom, pull or dig out, do not cut. 	6) In Priority Zone 2 (10-30m from structures) prune tree branches up to at least 2m, remove dead/down branches. Remove (pull or dig out, do not cut) all scotch broom. 

APPENDIX 5: WILDFIRE THREAT ASSESSMENT – FUEL TYPE CHANGE RATIONALE

Provided in a separate PDF document.