Uchucklesaht Tribe Community Wildfire Resiliency Plan 2021

(Ehthlateese Village, Green Cove, and Seekah Landing)
January 25, 2022

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Uchucklesaht

SIGNATURES

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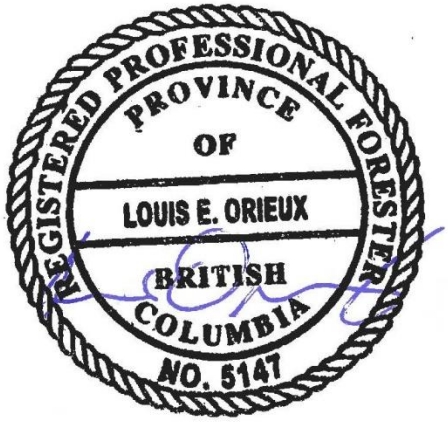
DATE SIGNED	
January 25, 2022	
I certify that the work described herein fulfills the standards expected of a member of the Association of British Columbia Forest Professionals and that I did personally supervise the work.	
Registered Professional Forester Signature and Seal	
	

Cover Photo Credit: Louis Orieux (showing Ehthlateese Village)

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

The Community Wildfire Resiliency Plan (CWRP)process (evolving from the Community Wildfire Protection Plan - CWPP) was created in British Columbia as a response to the devastating 2003 wildfire in Kelowna. As an integral part of the Community Resiliency Investment Program, managed by the Union of BC Municipalities, CWRPs aim to develop strategic recommendations based on the seven FireSmart principles (Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Emergency Planning, and Vegetation Management)to assist communities in improving safety and reducing the risk of damage to property and critical infrastructure from wildfires.

This CWRP is an update to Uchucklesaht Tribe's2013CWPP. The area of interest for this plan is the Uchucklesaht Tribe's Treaty Settlement Lands, with a focus on Ehthlateese Village, Green Cove Store, and Seekah Landing Cabin – all in Uchucklesit Inlet at the south-west end of the Alberni Inlet. This CWRP provides the Uchucklesaht Tribe Government with an updated action plan that can be used to guide the improvement and/or development of emergency plans, emergency response, evacuation plans, communication and education programs, law and policy development in areas of fire risk, and the management of potentially hazardous forest stands in the Wildland Urban Interface (WUI).

Fieldwork allowed for verified and updated fuel types and wildfire threat assessments to be combined with an office-based analysis to update the local wildfire threat for the WUI. The result of the analysis shows that the majority of the WUI is moderate threat class, with some small, but significant high threat class areas within Ehthlateese Village. Overall, the probability of a wildfire ignition within the WUI is low. However, the consequence of a wildfire to Ehthlateese Village would be high, as it is being re-developed and repopulated.

Ehthlateese Village and the structures at Green Cove and Seekah Landing are an intermix community – the homes and structures are largely situated within the vegetated/forested landscape. It is important to consider that the WUI is remote and road access is difficult (weather, travel time, and road conditions), thus limiting effective emergency response access/egress to air and water. The most likely threat of wildfire ignition and spread within the community is from a structure or industrial fire spreading via vegetation to other homes and structures and then into the surrounding forested landscape.

The key to reducing WUI fire structure loss is to reduce structure ignitability. Thus, FireSmart activities on and surrounding homes and critical infrastructure (with a focus on a values-out approach, *i.e.,* starting with activities on the structure itself and then the surrounding area immediately adjacent and continuing outwards) is the number one recommendation in this plan. Mitigation should be centered on construction practices and regulations, vegetation management around structures, and resident education. Public outreach on the range of available activities and the prioritization of activities should help residents to feel empowered to complete simple risk reduction activities on their property.

A total of 34recommendation and action items are presented in Table 1 within this Executive Summary and are more thoroughly discussed in their appropriate sections within the document. Because portions of the WUI extend outside Uchucklesaht's Treaty Settlement Lands onto both provincial Crown land and

private land, UTG's role may be limited to an advocate or influencer in some instances, while other action items can be implemented directly. Ultimately, the recommendation and action items within this plan should be considered a toolbox of options to help reduce the wildfire risk and consequence to Ehthlateese, Green Cove, and Seekah Landing. UTG will have to further prioritize implementation based on resources, strengths, constraints, and availability of funding, and regularly update the prioritization and course of actions as variables change through time.

Table 1: Uchucklesaht's CWRP Action Plan

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Education (Section 5.1)							
Objective: To provide information to Uchucklesaht citizens empowering them to adopt and conduct FireSmart practices to mitigate the negative impacts of wildfire to their homes, businesses, and communities.							
1	High	This CWRP report and associated maps should be made publicly available by UTG through its website and on social media. In addition, this CWRP should be shared with local industry partners who may be interested in collaborating on FireSmart and wildfire risk reduction activities.	Include all members of the ACRD Community FireSmart Resiliency Committee (when active).	UTG	1 year	Available for download or viewing on Uchucklesaht Tribe's webpage	Uchucklesaht (no cost)
2	High	Promote FireSmart approaches for wildfire risk reduction to citizens through FireSmart workshops, open houses, and/or presentations. Supply FireSmart resources during these engagement campaigns and promote the FireSmart Begins at Home mobile app as well as the FireSmart 101 online course.[1]	Aim to conduct the engagement and promotion campaign before and during the fire season. Include education specific to Ehthlateese Village, Green Cove, and Seekah Landing, such as emphasizing the importance of safe debris removal methods and FireSmart firewood storage. Provide information on FireSmart landscaping Enacting an all-encompassing "Safety Day" (coast guard, BC Ambulance, RCMP, BC Wildfire Service, UTG personnel) that incorporates the Wildfire Community Preparedness Day CRI initiative can be an effective way to draw participation from the greatest number of citizens.	UTG	Yearly (pre-fire season)	Growing citizen participation each year.	UBCM CRI funding is available (~40 hours for planning and 1 day for workshop)
3	High	Develop a FireSmart/Wildfire Preparedness page on Uchucklesaht Tribe's website (with a direct link from the opening webpage). Include links to FireSmart BC and other relevant wildfire resources.	Additional consideration should be put towards adding the current wildfire risk level to the Uchucklesaht Tribe opening webpage.	UTG (Consultant)	2 years	Webpage updated	UBCM CRI funding is available (~$3000 contracted service. ~40

[1]This and other FireSmart education and training courses can be accessed via: https://firesmartbc.ca/events/category/course/

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
							hours for set-up. Additional hours for updates as required)
4	High	Encourage local schools to adopt and deploy existing wildfire education programs. Other options/value-added activities include consulting with the Association of BC Forest Professionals (ABCFP) and BCWS (Kamloops Fire Centre) as well as the local fire department and regional FireSmart representatives to facilitate and recruit volunteer teachers and experts to help with curriculum development to be delivered in the schools (field trips, guest speakers, etc.).	Emergency preparedness curriculum is available provincially, which includes preparedness for a variety of natural hazards, including wildfire (Master of Disaster, FireSmart BC Education box). This could be wrapped into an all-encompassing "Hazards Preparedness Day".	UTG	Yearly (pre-fire season)	One FireSmart education day per school year	UBCM CRI funding is available (FireSmart BC Education box - $800 Junior K-Grade 12. Field trips, guest speakers, etc. ~$2500 per school)
5	High	FireSmart BCreleased made-for-BC landscaping guidelines in 2021. Make these guidelines available on the Uchucklesaht Tribe FireSmart webpage and hand out pamphlets/literature relating to it to Ehthlateese Village residents.	Increase FireSmart vegetation management knowledge amongst residents of Ehthlateese. Review and amend the guidelines taking into consideration Uchucklesaht Tribe's culturally valuable plant species.	UTG (Local FireSmart Representatives)	1 year from when the guidelines are made available	Posted on Uchucklesaht Tribe's FireSmart webpage and materials given to Ehthlateese Village residents	UBCM CRI funding is available (~ 20 hours in-house; no cost)
6	Moderate	Promote FireSmart amongst the private landowners within the WUI. Supply FireSmart resources to them via pamphlets left on their docks or at their cabin/home front doors. Promote the FireSmart Begins at Home mobile app as a method for them to conduct home assessments.	This is especially relevant for landowners with structures adjacent to Ehthlateese Village, Seekah Landing, and Green Cove, as fires started on their properties can easily affect UTG structures, property, and lives.	UTG	2 years	FireSmart information provided to adjacent private landowners	UTG (~ 8 hours; boat required for access)
7	Low	UTG and/or Local FireSmart Representatives should support and facilitate Ehthlateese Village to self-organize to attain FireSmart Canada Neighbourhood Recognition Program (FSCNRP) status.	Leverage the leadership of a Local FireSmart Representative.	UTG (Local FireSmart Representative)	5 years	Status achieved for Ehthlateese Village	UBCM CRI funding is available

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Legislation and Planning (Section 5.2)							
Objective: To provide the means for UTG to implement wildfire risk reduction actions through laws and legislation by outlining government responsibilities regarding wildfire.							
8	High	Complete or schedule periodic updates of the CWRP. The frequency of updates is highly dependent upon major changes which would impact local wildfire risk or the rate at which wildfire risk reduction efforts are implemented. An evaluation of major changes (including funding program changes that may lead to new opportunities) and the potential need for a CWRP update should be initiated every 5 years.	A current (i.e., no more than 5 years old) CWRP is currently a requirement for further funding under the CRI Program.	UTG (Consultant)	5-7 years from adopting this CWRP document	Uchucklesaht always has an up-to-date CWRP and action plan	UBCM CRI funding is available (~$30,000 for full document / $10,000 for update)
9	High	Update UTS 46/2015 Zoning Act to include a Wildfire Urban Interface Zone for Ehthlateese Village, Green Cove, and Seekah Landing and imbedding FireSmart principles (especially vegetation and fuel loading limit guidelines) within it.	Consider making this zone the FireSmart Home and CI Ignition Zones 1-3. Fuel loading limit guidelines would help limit the amount of vegetative debris left in a location following any vegetation management (*i.e.*, yard pruning) or resource extraction (*i.e.*, logging) activities.	UTG (Consultant)	1 year	Law updated or created speaking to this requirement	UBCM CRI funding is available
10	High	Update UTR 15/2014 Building Forms Regulation to include FireSmart construction materials and landscaping.	FireSmart construction materials are discussed in the FireSmart Begins at Home – Home Development Guide.[2] Landscaping: reference can be made to UTG's FireSmart landscaping guidelines (recommendation #5).	UTG (Consultant)	1 year	Law updated or created speaking to this requirement	UBCM CRI funding is available
11	High	Update UTS 15/2011 Environmental Protection Act Section 2.1 (e. iv) to prohibit the burning of leaves, foliage, weeds, crops, or stubble for domestic or agricultural use during periods of moderate or higher fire danger risk ratings.	To limit the chance of fire escapement during times of hazardous fire danger, reducing wildfire risk within the WUI.	UTG (Consultant)	1 year	Law updated or created speaking to this requirement	UBCM CRI funding is available
12	High	Update UTS 15/2011 Environmental Protection Act Part 4: Unsightly Land to	To provide a mechanism to manage hazardous materials/fuels buildups on	UTG	1 year	Law updated or created	UBCM CRI funding is

[2]Can be accessed via: https://firesmartcanada.ca/wp-content/uploads/2019/10/FS_Developer_Booklet.pdf

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		include lands that pose a wildfire risk (either risk to ignition or to combustion and sustaining a fire).	lands and around residents, reducing wildfire risk within the WUI.	(Consultant)		speaking to this requirement	available
Development Considerations (Section 5.3)							
Objective: To embed FireSmart practices and considerations into all development within Uchucklesaht territory.							
13	High	Develop a wildfire hazard DPA and update Uchucklesaht Tribe's OCP when completed. To meet objectives, consider including the following elements: • minimum setbacks from forested edges based on FireSmart, • fuel management based upon qualified professional recommendations, • landscaping to FireSmart guidelines, • building materials and design based on NFPA 1144 and FireSmart standards, • underground servicing, • prompt removal of combustible construction materials or thinning/fuel management waste, and a minimum of two access/evacuation routes for all neighbourhoods.	Embed FireSmart values into all aspects of community development and planning.	UTG (Consultant)	3 years	Interface wildfire DPA created and adopted	UBCM CRI funding is available (~$25,000 contracted service and 40 hours in-house)
14	High	Plan and implement work based on the recently completed FireSmart Home and Critical Infrastructure assessments for Ehthlateese Village, Seekah Landing, and Green Cove.	Assessments completed by BA Blackwell & Associates Ltd in 2021. Prioritize works based on priority areas listed in Section 5.	UTG	5 years	All CI upgraded to stated FireSmart standards	UTG ($ and time dependent on scope and scale of work completed)
15	High	If a Wildfire Hazard DPA is not adopted, or prior to its adoption CI works are planned, use fire-resistant construction materials, building design, and landscaping for all CI when completing upgrades or establishing new infrastructure.	Vegetation setbacks around CI should be compliant with FireSmart principles (*e.g.,* no combustible material within 10 m of structures).	UTG	Ongoing	New CI are FireSmart	UTG ($ variable: CI specific)

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16	High	(Aligned with recommendation #5) Develop a landscaping standard that lists flammable, non-compliant vegetation and landscaping materials, non-flammable drought and pest resistant alternatives, and tips on landscape design to reduce maintenance, watering requirements; to avoid wildlife attractants, and to reduce wildfire hazards.	Consider including the landscaping standard as part of the wildfire hazard DPA, as well as making it publicly available for residents outside of the DPA. Refence the made-for-BC FireSmart landscaping guidelines.	UTG	3 years	Landscaping standard created (or adopted) and built into the interface wildfire DPA	UTG; UBCM CRI funding is available ($0 if using FireSmart Canada guidelines; ~20 hours in-house)
17	High	Engage FLNRORD and TFL44 LP (contact listed in Table 18) to discuss avenues for permanent maintenance of the access /egress route to Ehthlateese Village. Include this as a goal within Uchucklesaht Tribe's OCP.	Secure at least two access/egress routes into/out of communities. Ehthlateese Village has secure access/egress via marine transport. The driving route would be a second.	UTG (FLNRORD, TFL44 LP)	5 years	Maintenance agreement for a driving route in/out of Ehthlateese Village completed	UTG (~80 in-house hours)
18	Moderate	OCP: Update Part 4: Land Use, Goals and Policies - Uu-a-thluk/Parks and Natural Spaces so adopted and maintained trails and greenways are considered and protected through a "wildfire lens". Restoration of the landscape and trails within and adjacent to the WUI should be done with a focus on wildfire prevention and reduction.	Trail building and maintenance and park and open space maintenance activities can either increase wildfire risk (through fuels accumulations and unsafe work practices) or decrease wildfire risk (through proper placement, emergency access and evacuation, clean-up of combustible fuels trailside, and work practices).	UTG (Consultant)	5 years	OCP updated	UBCM CRI funding is available
Interagency Cooperation (Section 5.4)							
Objective: To broaden from a department or agency single jurisdiction-based approach to a risk driven, multi-agency and multi-scalable approach.							
19	High	Participate in ACRD Community FireSmart Resiliency Committee (CFRC) and meetings.	Creates opportunities for synergies and information sharing of wildfire risk reduction activities across jurisdictions.	UTG (ACRD + agencies)	Ongoing	Continued participation	UTG (cost to government ~$300/yr)
20	High	Engage and work with surrounding forest licensees (i.e., TFL44 LP) to: 1) Identify the parts of TFL 44 that are in the WUI and what goals would be for this zone regarding harvesting, post-harvest	1) Reduce interface wildfire risk throughout managed forest lands that are closest to structures in the WUI.	1) UTG (FLNRORD,	5 years	1) Discussions and planning initiated	1) UTG (cost to government)

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		debris disposal, and reforestation prescriptions so that both harvesting operations and the future forest stand maintain or enhance wildfire resiliency. 2) Ensure that high-risk activities, such as vegetation management, pile burning, and harvesting do not occur during high/extreme fire danger times. Lobby for adequate fire suppression tools (as per the Wildfire Act and regulations) being on-site during high-risk activities.	Consider involving BCWS Mid-Island Zone and FLNRORD personnel in discussions and planning. 2) Reduce the chance of fire ignitions as per the *Wildfire Act* and reduce spread potential during an ignition event.	Stakeholders, Consultant) 2) Stakeholders		2) High-risk activities not conducted during high/extreme fire danger	2) Cost of equipment paid by stakeholder
21	High	Continue to promote right-of-way best management practices (BMPs) for regular brushing and clearing of woody debris and shrubs in coordination with BC Hydro to help reduce fire risk, utility pole damage, and subsequent outages.	Tree failures adjacent to power lines are common occurrences and represent significant risks to ignition within the WUI.	UTG (BC Hydro)	5 years	BMPs in use for the region	UBCM CRI funding is available (~30 hours in-house)
Cross-Training (Section 5.5)							
Objective: To support the development of comprehensive and effective wildfire risk reduction planning and activities, as well as a safe and effective response.							
22	High	Provide Incident Command System Training to those UTG personnel most directly involved in managing and coordinating emergency response.	Increase UTG's ability to plan and provide appropriate and timely responses in emergency situations.	UTG	2 years	At least one UTG personnel trained	UTG (cost to government)
23	High	UTG should reach out to BCWS Mid-Island Fire Zone for cross-training opportunities to: 1) plan and conduct Wildfire Wildland type-S100 training to UTG personnel and Ehthlateese Village residents, and 2) assess and provide recommendations towards increasing wildfire fighting capabilities.	Increase the wildfire emergency preparedness of UTG personnel and Ehthlateese Village residents and residents' ability to protect themselves from wildfire.	UTG (BCWS)	3 years, then ongoing	UTG and Ehthlateese Village has persons trained in S-100 Some basic wildfire fighting equipment available in Ehthlateese Village, Green Cove, and Seekah Landing	UBCM CRI funding is available for wildfire courses (~$2000/16 hrs. per person)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
24	High	UTG should continue to participate in ACRD (and other regional) wildfire and emergency preparedness/response tabletop exercises.	Simulation exercises create valuable cross-training opportunities across agencies, governments, and jurisdictions.	UTG (participating agencies, governments, etc.)	Ongoing (yearly at minimum)	One regional wildfire (or other emergency) tabletop exercise participated in each year	UTG (cost to government ~$1,000/yr)
25	1) High 2) High	UTG should facilitate… 1) Local FireSmart Representative (LFR) Training, 2) FireSmart Community Champion Training … opportunities for applicable UTG emergency management personnel and Ehthlateese Village residents.	Increase UTG and Ehthlateese Village residents' capabilities to provide FireSmart knowledge, programs, and resources to the community.	UTG (FireSmart Canada)	3 years	1 LFR within 1 year 1 FireSmart Home Partners Mitigation Specialist within 3 years	UBCM CRI funding is available (~$2000/16 hrs per person)
Emergency Planning (Section 5.6)							
Objective: To create specific wildfire response pre-incident plans so those responding to a wildfire emergency know who is available to help with what and when, and to improve UTG's ability to respond to (during and after) a wildfire emergency.							
26	High	Engage with BCWS to: 1) Determine what PPE and wildland equipment resources should be acquired for Ehthlateese Village, Green Cove, and Seekah Landing. 2) Train staff and citizens on how to use the equipment.	1) Provide Ehthlateese Village, Green Cove, and Seekah Landing the means to protect structure and life from wildfire. 2) Additionally, maintain an annual structural and interface training and equipment review program with BCWS.	UTG (BCWS)	Yearly (pre-fire season)	Wildland firefighting equipment resources are complete and training for Ehthlateese Village residents – 5 years	UTG (time and cost dependent amount of equipment purchased and regularity of training)
27	High	Conduct yearly (pre-fire season is best) response exercises with Ehthlateese Village. Identify hazards, barriers to access (i.e., locked gates, tight or no turnarounds), and other response issues and develop measures to address them.	Consider adding this into an all-hazards response exercise day for maximum participation. Test the Evacuation Plan for Ehthlateese Village during these exercises.	UTG (BCWS, Coast Guard, etc.)	Yearly (pre-fire season)	Response exercises conducted at least once every two years	UTG (40 planning hours; 8 person-hours per exercise)
28	High	Update UTG's HRVA and emergency management plan with information and data from this CWRP. Develop wildfire-	Wildfire incident plans and maps will support emergency response in the event of a wildfire and/or evacuation	UTG (Consultant,	5 years	Wildfire incident plans and associated	UTG (Cost to

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		specific incident plans and associated maps. Incorporate items listed in the Pre-Incident Planning subsection above. Local Fire Threat and stakeholders'/tenure holder's contact information should be incorporated within the map. The map should be included in the UTG's Evacuation Plan and shared with fire suppression personnel, BCWS, and industrial operators (TFL44 LP) to support emergency response in the event of a wildfire. The map should be reviewed as needed to incorporate additions and/or changes.	event. These plans help target emergency planning and effort in meaningful and effective ways, such as knowing where fire guards can/can't be built, as well as minimizing the need for using machinery to build cat guards in sensitive areas.	BCWS, ACRD, stakeholders)		maps were created and made available	government. 12 planning hours and ~$8,000 contracted service)
29	High	Ehthlateese Village's mobile EOC[3] (CI) does not have a backup power source (*i.e.,* gas- or diesel-powered generators). Invest in secondary power sources to continue this service in the case of a prolonged or extensive power outage as a result of a wildfire (or another emergency). Upgrade or realign resources, as prioritized.	Ensure that backup gas or diesel generators have sufficient fuel supply for extensive power outages (3 + days) so that they can continue to function as required in the event of an emergency.	UTG	5 years	All CI have backup power sources	Uchucklesaht (~$30,000 per CI - depending on requirements)
30	Moderate	Develop an outreach document for Green Cove and Seekah Landing that outlines emergency fuel/propane shut off best-practices to enact in the event of an approaching wildfire or ember shower. Consider contacting the Emergency Management BC Regional Office for guidance.	Provide remote structures and CI with hazardous infrastructure resources/procedures to reduce hazards during a wildfire event.	UTG	5 years	Document created and distributed	UBCM CRI funding is available (~40 hours in-house; $3000 contracted service)
Vegetation Management (Section 5.7)							
Objective: To reduce the potential wildfire intensity and ember exposure to people, infrastructure, structures, and other values through manipulation of both the natural and cultivated vegetation that is within or adjacent to a community.							
31	High	Proceed with detailed assessment, prescription development, and treatment	If Uchucklesaht's FireSmart fuel management funding application is	UTG	5 years	Prescriptions for high priority	UBCM CRI funding is

[3] UTG has current plans to outfit the EOC with a Tsunami Alert System and a generator that can run both in the event of a power outage.

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		of fuel treatment units identified and prioritized in this CWRP.	successful, proceed with that first. When completed, proceed with this recommendation, planning and implementing fuel treatment work in the remaining untreated areas of the fuel treatment units.	(Consultant)		units developed for all units. Treatment completed for units within the Home and Critical Infrastructure Ignition Zone	available (~$700/ha prescription; ~$9500/ha treatment)
32	High	Where operational fuel treatments are conducted, treatment monitoring 5-10 years afterwards should be completed by a qualified professional. This can be completed with a CWRP update or as a stand-alone exercise.	To assess the efficacy of the treatment and schedule maintenance activities. It is cheaper to perform maintenance early when conifer regeneration is small and fuel loading amounts are low.	UTG (Consultant)	Maximum 10 years post-treatment	All completed fuel treatments are reassessed 5-10 years after treatment.	UBCM CRI funding is available (~150/ha for assessment)
33	Moderate	As part of fuel treatment implementation, UTG should develop interpretive signage to explain and describe pre- and post-fuel treatment forest stand conditions.	Increase citizen awareness and support of fuel management practices.	UTG	1-year post-treatment of an EV-# PTU	Signs placed in one EV-# PTU	UBCM CRI funding is available (~$750/sign)
34	Low	Uchucklesaht's trained Local FireSmart Representatives (LFRs) should assist Ehthlateese Village residents in complying with FireSmart vegetation management principles at both the home and community level.	Increase wildfire resiliency throughout Ehthlateese Village by collectively FireSmarting homes.	UTG (LFR's – when completed training)	5 years, and then ongoing.	LFR's in Ehthlateese Village and are active in promoting FireSmart	UTG (~$500 per home)

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FREQUENTLY USED ACRONYMS

AOI	Area of Interest
BC	British Columbia
BCWS	British Columbia Wildfire Service
BEC	Biogeoclimatic Ecosystem Classification
CDC	Conservation Data Centre
CFFDRS	Canadian Forest Fire Danger Rating System
CFS	Community Funding and Support
CI	Critical Infrastructure
CIIZ	Critical Infrastructure Ignition Zone
CRI	Community Resiliency Investment
CWPP	Community Wildfire Protection Plan
CWRP	Community Wildfire Resiliency Planning
DPA	Development Permit Area
EMBC	Emergency Management British Columbia
FBP	Fire Behavior Prediction System
FNESS	First Nations' Emergency Services Society of British Columbia
FSCCRP	FireSmart Canada Community Recognition Program
HIZ	Home Ignition Zone (also see Structure Ignition Zone)
HRVA	Hazard Risk and Vulnerability Analysis
ISC	Indigenous Services Canada
LRMP	Land and Resource Management Plan
MFLNRORD	Ministry of Forests, Lands, Natural Resource Operations and Rural Development
NDT	Natural Disturbance Type
PSTA	Provincial Strategic Threat Assessment
OCP	Official Community Plan
SWPI	Strategic Wildfire Prevention Initiative
UBCM	Union of British Columbia Municipalities
UTG	Uchucklesaht Tribe Government
VAR	Values at Risk
WRA	Wildfire Response Agreement
WRR	Wildfire Risk Reduction
WUI	Wildland Urban Interface

SECTION 1: INTRODUCTION

In April 2021, B.A. Blackwell and Associates Ltd. was retained to assist the Uchucklesaht Tribe Government (UTG) in developing a Community Wildfire Resiliency Plan, hereinafter referred to as the CWRP. This CWRP revisits areas assessed in Uchucklesaht Tribe's 2013 Community Wildfire Protection Plan (CWPP), but with a focus on integrating the updated Provincial Strategic Threat Analysis (PSTA), updated BC Wildfire Service (BCWS) fuel type mapping, and an improved wildfire threat analysis methodology, all with a focus on the seven FireSmart principles.

Recent wildfire disasters like those experienced in Slave Lake, Alberta (2011), Washington State (2014, 2015), Fort McMurray, Alberta (2016), BC (2017, 2018, 2021), and California (2017, 2018, 2020) all display the vulnerability of communities and the potential toll of wildfires on families, neighbourhoods, public health, and the economy of entire regions. These events, along with important advances in loss prevention programs, have spurred the need for greater consideration and due diligence concerning fire risk in the wildland-urban interface (WUI).[4] CWRPs are an invaluable opportunity to proactively manage wildfire risk and increase community resilience to wildfire.

1.1 PLAN PURPOSE AND GOALS

The purpose of this CWRP is to identify and update the wildfire risk to Uchucklesaht Tribe's Treaty Settlement Lands (with a focus on Ehthlateese Village, Green Cove Store, and Seekah Landing Cabin)and to describe the potential consequences of wildfire to the community, and to examine options and strategies to reduce the wildfire risks. This CWRP provides a reassessment of the level of wildfire risk to the WUI and gives UTG a current and accurate understanding of the wildfire threats to human life, property, and critical infrastructure. The goal of this CWRP is for it to be used as an action plan to:

1) Increase the effectiveness of fire suppression and emergency response,
2) Reduce potential impacts and losses to homes and critical infrastructure from wildfire, and
3) Reduce wildfire behaviour threats within the WUI.

To help guide and accomplish the above strategies, this CWRP will provide UTG's emergency planners and land and resource managers with:

1) an updated assessment of wildfire risk to Ehthlateese Village, Green Cove, and Seekah Landing,
2) an updated assessment of values at risk and potential consequences in the event of a wildfire,
3) updated mapping of fuel types and recommended areas for fuel treatments and forest modifications,
4) an updated assessment of emergency response capacity and community FireSmart status, and
5) options and strategies to reduce wildfire risk in the seven FireSmart disciplines: education, legislation and planning, development considerations, interagency cooperation, cross-training, emergency planning, and vegetation management.

[4] Wildland urban interface is defined as the presence of structures in locations in which conditions result in the potential for their ignition from flames and firebrands/embers of a wildland fire (National Fire Protection Association).

1.2 CWRP DEVELOPMENT SUMMARY

The CWRP development process consisted of five general phases:

1) Consultation involving key UTG representatives, structural and wildfire specialists, and stakeholders. This included UTG Resource and Development Manager (Moses Towell), UTG Director of Lands and Resources (Ryan Anaka), BCWS Mid-Island Fire Zone (Joshua Macy), and Alberni-Clayoquot Regional District Manager of Protective Services (Heather Zenner).
2) Information sharing with First Nations (see Appendix I: List of First Nations and Associated Governments Consulted)and other stakeholders (TFL 44 LP).
3) Review of relevant plans and legislation regarding emergency response and wildfire (Section 2).
4) Identification of the values at risk and assessment of the local wildfire threat (Sections 3 and 4).
5) Developing an action plan with a focus on the seven FireSmart principles (Section 5).

SECTION 2: RELATIONSHIP TO OTHER PLANS AND LEGISLATION

Wildfires can affect all aspects of a community. As a result, there are many plans that relate to this CWRP. The intent of this section is to review all laws, policies, plans, and guidelines and identify sections within that are relevant to wildfire emergency planning and response.

2.1 LOCAL AUTHORITY EMERGENCY PLAN

UTG's emergency preparedness and response is legislated under the Emergency Preparedness Act (UTS 61/2020). The Act defines roles and responsibilities of the Executive, Chief Councilor, Chief Administrative Officer, and the Directory of Lands and Resources with regards to emergency organization, the implementation of higher-level emergency plans, the processes of declaring a state of emergency, and coordinating post-disaster relief programs and assistance.

UTG's 2014 Emergency Preparedness Plan is currently being reviewed and updated. Evacuation planning and management documents are discussed in section 3.2.1.

2.2 LINKAGES TO OTHER CWPPS/CWRPS

Uchucklesaht Tribe's2013 CWPP

Uchucklesaht Tribe's2013 CWPP was reviewed and discussed with UTG's Resource and Development Manager and the Director of Lands and Resources. Recommendations were not implemented due to limited government resources.

Alberni-Clayoquot Regional District (ACRD) 2018CWPP

B.A. Blackwell & Associates completed a 2018 CWPP update for the ACRD. Uchucklesaht Tribe's Treaty Settlement Land, including Ehthlateese Village and Seekah Landing, was included in this plan. Proposed recommendations and action items that pertain to this CWRP include:

- Develop and work with all key stakeholders (BCWS, BC Parks, recreational groups/representatives, ACRD and City of Port Alberni staff, industrial operators (i.e., Mosaic Forest Management and Crown forest tenure holders), and local First Nations) to formalize an Interface Steering Committee. The purpose of the steering committee would be to identify wildfire related issues in the area and to develop collaborative solutions to minimize wildfire risks.

This CWRP recommends UTG engage surrounding forest resource licensees to Identify their management areas that overlap the WUI and what their goals would be for this zone regarding harvesting, post-harvest debris disposal, and reforestation prescriptions so that both harvesting operations and the future forest stand maintain or enhance wildfire resiliency (Section 5.4).

2.3 UCHUKLESAHT TRIBE'S OFFICIAL COMMUNITY PLAN 2008

An Official Community Plan (OCP) documents objectives and policies of the local government and provides it with a long-range framework to guide future land use and development decisions. Uchucklesaht Tribe's current 2015 OCP (UTS 45/2015) is currently under review and being updated with

all FireSmart policies and procedures. Table 2below summarizes the objectives and policies within Uchucklesaht Tribe's2015 OCP that are directly relevant to community wildfire resilience.

Table 2: Summary of Uchucklesaht's2015 Official Community Plan emergency and wildfire-related objectives and policies and their relationship to this CWRP

Section, Sub-section, Goal	Description and Relationship to CWRP
Part 4: Land Use, Goals and Policies - General Development	Development Permit Area (Culturally Significant, Environmentally Significant and Hazardous DPAs) guidelines should apply to all TSL. • *Addressed in section 5.3, a development permit area for interface wildfire is recommended.*
Part 4: Land Use, Goals and Policies - Villages Land Use Designations	Policy that UTG will maintain, review, and update an emergency plan on an annual basis for all village sites to ensure citizens know what to do in an emergency. • *Addressed in section 5.6, an updated emergency plan that accounts for a wildfire disaster is integral to efficient and safe response and evacuation.*
Part 4: Land Use, Goals and Policies - Community Use Areas Land Use Designations	Policy to ensure access is maintained throughout the road and that UTG will work with other agencies to ensure roads are developed on Treaty Settlement Lands. • *Addressed in section 5.3, safe traffic flow and access points to egress routes are vital to emergency evacuations as well as access to emergencies by responders (including during wildfires).* Policy that development permits are required for hazardous lands. Studies should be done to determine environmentally hazardous areas. • *This report will detail wildfire hazardous areas within the WUI (Section 4). Addressed in section 5.3, a development permit area for interface wildfire is recommended.*
Part 4: Land Use, Goals and Policies - Uu-a-thluk/Parks and Natural Spaces	Policy to encourage the identification and protection of trails and greenways to form a continuous network of pathways throughout the TSL. • *Addressed in section 5.3, trails and greenways should be considered and protected through a "wildfire lens". Restoration of the landscape and trails within and adjacent to the WUI should be done with a focus on wildfire prevention and reduction.*
Part 4: Land Use, Goals and Policies - Community Buildings and Infrastructure Policies	(1.) Recommendation for a more detailed mapping network that includes georeferenced sand survey maps for road access and expansion routes, transportation network for active transportation routes and public utilities and infrastructure. • *This data can be put towards updated wildfire incident plans and maps, addressed in section 5.6.* (8.) The backup power supply will be evaluated as to its adequacy in emergency situations. • *Addressed in section 5.6, backup power allows vital infrastructure and emergency reception/department centres to function during power outages.* (9.) Health and Safety Plans will be developed including a CWPP. • *Addressed through the development of this CWRP.*
Part 4: Land Use, Goals and Policies - Transportation Policies	(1.) Existing resource access roads will be researched in relation to goals, including wildfire control. • *Addressed in section 5.3, safe traffic flow and access points to egress routes are vital to emergency evacuations as well as access to emergencies by*

Section, Sub-section, Goal	Description and Relationship to CWRP
	responders (including during wildfires).
Part 4: Land Use, Goals and Policies - Climate Change Mitigation and Greenhouse Gas Reduction	(Objective 4) Consider the impacts of climate change in all land use decisions and assess the risks and vulnerabilities of climate change. • *The impacts of climate change on the WUI's fire weather are addressed in section 4.1.1.*

2.4 UCHUCKLESAHT LAWS

The Maa-nulth First Nations Final Agreement 2011 states that Uchucklesaht Tribe owns the forest and range resources on the treaty lands and similarly may make laws in respect of forest practices and land usage on those lands. Laws regarding forest and range practices on treaty lands must meet or exceed standards set by federal and provincial laws; provincial and federal laws would prevail in the event of a conflict between Uchucklesaht law and federal and/or provincial law.[5]

UTG's laws are currently under review and being updated with all FireSmart policies and procedures. Table 3 below contains existing laws which are directly relevant to community wildfire resilience. A gap in the Building Forms Regulation was identified and should be remediated in the update.

Table 3: Summary of UTG wildfire and emergency-related laws and their relation to this CWRP.

Uchucklesaht Law	Description and Relationship to CWRP
UTR 15/2014 Building Forms Regulation	Establishes building standards and required fees. Relevant clauses include: - Appendix 4: a recommended green-checklist to encourage construction to follow green principles. • *Note: Does not account for FireSmart construction materials and landscaping.*
UTS 15/2011 Environmental Protection Act	Section 2.1 (e. iv) • *Note: Does not prohibit the burning of leaves, foliage, weeds, crops, or stubble for domestic or agricultural purposes.* Part 4: Unsightly Land • *Grounds deemed unreasonably unsightly must be improved in accordance with the directive set out by the inspector.*
UTS 39/2014 Park Act	Part 3: Park Lands • *The Director of Lands and Resources may authorize activities to be carried out on a wilderness area for the purpose of public safety.* Part 4: Resource Harvesting • *A person should not remove timber (or soil, rock, and sand) in the park with the exception of with a Uchucklesaht Tribe Act or Side Agreement.* • *Commercial logging in a Uchucklesaht Park is prohibited.* Part 5: General Provisions • *The Executive may make regulations respecting the establishment, operation, maintenance, and administration of works and services of a public work,*

[5]Bill 45 - 2007: Maa-nulth First Nations Final Agreement Act. http://www.leg.bc.ca/38th3rd/3rd_read/gov45/gov45-3.htm?toc=0. Accessed 16 July 2013.

Uchucklesaht Law	Description and Relationship to CWRP
	including fire protection. • *The Executive may make regulations respecting the establishment, maintenance, administration and the use of roads, trails, docks, wharves, bridges etc. under which they must be open or closed to public traffic.* • *The Executive may make regulations respecting public safety.*
UTS 13/2011 Planning and Land Use Management Act	Part 5: Permits & Fees – 5.1 Designation of Development Permit Areas • *The OFP may designate DPAs for the protection of hazardous conditions.* Part 6: Development Requirements • *The Executive may regulate and require provisions of works and services in relation to subdivisions.*
UTS 46/2015 Zoning Act	• *Depicts various zones within the Treaty Settlement Lands, including an environmentally sensitive and hazardous area (ESA) zone.*
UTS 61/2020 Emergency Preparedness Act	Part 2 • *Establishes the emergency program & annual of the Uchucklesaht Tribe. This section defines roles and responsibilities of the Executive, Chief Councilor, Chief Administrative Officer and the Directory or Lands and Resources.* Section 3.1: Emergency Plan • *Mandates the Executive to approve an emergency plan within one year of the Act's establishment (i.e., 2021), which is to be reviewed annually (3.1).* Section 3.2: Uchucklesaht Emergency Declaration • *Outlines the administrative procedures of an emergency declaration.* Section 3.3: Emergency Operations Centre • *Directs the Director of Lands and Resources to establish, maintain and direct an EOC if an emergency declaration has been made. If the location is not pre-established, the Chief Councilor must approve the location.* Section 3.4: Response Measures • *Authorizes the Executive to implement procedures (e.g., implementing the emergency plan, acquiring land to respond to an emergency, controlling/prohibiting travel, evacuating people/livestock, entering buildings without a warrant, removing trees/structures/crops as necessary, fixing/procuring/rationing supplies) while an emergency declaration is in effect.* Section 3.5: Mandatory Assistance • *The Executive may make a mandatory order requiring a person to provide assistance.*

2.5 LINKAGES TO HIGHER LEVEL PLANS AND LEGISLATION ON CROWN LAND

Table 4 below lists higher-level plans and legislation relevant to wildfire planning and risk mitigation. Fuel management prescriptions and burn plans must address these plans as they relate to on-the-ground restrictions and regulations. All proposed treatment units herein are solely on Uchucklesaht Treaty Settlement Lands.

Table 4: Higher Level Plans and Relevant Legislation on Crown Land within the WUI

Plan/Legislation	Description and Relationship to CWRP
Land Use Plans	Vancouver Island Land Use Plan[6] • Strategic direction for the following categories: 1) Protected Areas Network; 2) Forest Land Base; 3) Regional Biodiversity Direction; 4) Food Production Activities; 5) Settlement Lands; 6) Energy and Mining Opportunities; 7) Integrated Coastal Management; and 8) Community Stability. The plan also identifies Land Use Zones, which are used to delineate areas which require specific management. • No sections of the VILUP deal specifically with wildfire or fuel management.
FRPA – Government Action Regulations (GARs)	Visual Quality Objectives • There are four established VQO polygons within the WUI, none of which are overlapped by proposed treatment units.
Forest Stewardship Plans (FSP)	Illustrate Forest Development Units within which forest licensee's activities are planned and describe strategies to address government objectives that are reflected in higher-level plans. • *Tree Farm License (TFL) 44 overlaps with the WUI and is managed by TFL44 LP.*
BC Provincial Open Burning Smoke Control Regulation (OBSCR)	Governs open burning relating to land clearing, forestry operations and silviculture, wildlife habitat enhancement, and community wildfire risk reduction. • Almost the entire WUI is within a High Smoke Sensitivity Zone (with the remainder in Medium). • One proposed treatment unit (SUMM) is within a Medium Smoke Sensitivity Zone. All other proposed treatment units are within the High Smoke Sensitivity Zone.

[6]The Province of BC, 2000. Vancouver Island Strategic Land Use Plan.

SECTION 3: COMMUNITY DESCRIPTION

Located on the shoreline of Uchucklesit Inlet on the west coast of Vancouver Island, Ehthlateese Village, Green Cove, and Seekah Landing are all within Uchucklesaht Tribe's Treaty Settlement Lands established via the Maa-nulth Final Agreement (2011). This treaty gave each Maa-nulth First Nation, of which there are five, defined treaty rights, including designating Maa-nulth First Nations treaty settlement lands that are owned in fee simple. This means that the approximately 3,100 hectares of Uchucklesaht Treaty Settlement Land is privately owned and exclusively managed by UTG.

Uchucklesaht Tribe has313enrolled citizens, approximately 5of which live at Ehthlateese Village permanently and another 20 that reside there seasonally or part-time.[7] Going through a period of redevelopment (of both residences – 14 new; and supporting infrastructure), the population of the village is expected to grow substantially over the coming years. Seekah Landing Cabin and Green Cove Store, both located southeast from Ehthlateese Village down Uchucklesit Inlet, are single stand-alone structures with docks, accessed via boat, and do not house any permanent residents.

Emergency management, land use planning, building and development, drinking water, solid waste management, and sewer service are provided to Ehthlateese Village by UTG. Electricity is provided by a BC Hydro diesel generation station. Seekah Landing Cabin and Green Cove Store are powered by independent generation systems.

The land rising out of Uchucklesit Inlet is shaped by bedrock and comprised of moderately steep slopes broken by benches. Deep stream channels cut through these slopes, fed by the 6,903 mm of average annual precipitation.[8] The slopes and benches support a lush, mostly second-growth forest of western hemlock and western red cedar trees.

Ehthlateese Village, Green Cove, and Seekah Landing are within the BC Wildfire Service (BCWS) Mid-Island Fire Zone, which is part of the Coastal Fire Centre. Structural fire protection is the responsibility of residents, supported by UTG. Wildfire response agreements[9] are in place between BCWS and Indigenous Services Canada (ISC) relating to Ehthlateese Village specifically. The closest BCWS fire base in located in Port Alberni.

The main concerns relating to wildfire preparedness for Ehthlateese Village expressed by UTG and BCWS are:

1) Access/Egress – road is seasonal with maintenance done by logging licensees only during active harvesting
2) Distance and time to respond to a wildfire and evacuation emergency
3) Inclement weather impacting emergency evacuation and emergency response

[7] UTG Resource and Development Manager (Moses Towell)
[8] https://en.wikipedia.org/wiki/Hucuktlis_Lake
[9] Information on WRA's can be accessed here: https://pfla.bc.ca/wildfire-response-agreements-what-are-they/

3.1 AREA OF INTERESTAND WILDLAND-URBAN INTERFACE

The Area of Interest (AOI) for the CWRP is the Uchucklesaht Tribe's Treaty Settlement Lands surrounding Uchucklesit Inlet and Hucuktlis (formerly Henderson) Lake. The associated eligible WUI represents a one-kilometer buffer around a structure density of 6+ structures/km^2 within the AOI and defines the focus of this CWRP. It encompasses a total of 1,253.5 hectares (48% of which is ocean/lakes). Of the 652.5 ha of land in the WUI, 58% (378.8 ha) is Uchucklesaht Tribe's Treaty Settlement Lands,30% (198.1 ha) is private land, and 12% (75.6 ha) is Crown land. There are no Provincial Parks, National Parks, nor Ecological Reserves within the WUI. The AOI, WUI, and land ownership types are shown on Map 1.

Map 1: Uchucklesaht CWRP AOI and WUI

3.2 VALUES AT RISK

Protection of critical infrastructure and values at risk during a wildfire event is an important consideration for emergency response effectiveness ensuring that coordinated evacuation can occur if necessary and that essential services can be maintained and/or restored quickly in the case of an emergency. Critical infrastructure includes emergency and medical services, electrical and natural gas services, transportation, water and sewer services, social services, evacuation reception centres, and communications infrastructure. Critical infrastructure is shown on Map 2, and Table 5 details the inventory of Critical infrastructure identified in the WUI.

3.2.1 EMERGENCY RESPONSE, PUBLIC SERVICES, AND COMMUNICATIONS

In the event of an evacuation order for Ehthlateese Village, Green Cove, and Seekah Landing, the UTG Department of Lands and Resources is responsible for offering support services, including reception centres, emergency operation centres, and evacuation means. UTG's evacuation planning and management documents are currently under review and being updated, reflecting recent changes such as a gravel road allowing residents to drive in/out of the village (seasonally), and new and upgraded services such as internet service, fire hydrants and firefighting equipment, a septic field, and new homes. Key evacuation routes within the WUI were assessed as part of this CWRP, including docks, as marine evacuation/travel is likely the most reliable and dependable for Ehthlateese Village, Green Cove, and Seekah Landing.

The Ehthlateese Village Health Clinic is located centrally in the Village and includes a kitchen, common area, sleeping cots,[10] and a nurse's station.

Rogers Wireless provides cell service throughout Uchucklesit Inlet, including Ehthlateese Village, Green Cove, and Seekah Landing. Satellite internet and marine radio provide secondary communication sources.

3.2.2 ELECTRICAL POWER

A large fire has the potential to impact electrical service by disrupting the network power distribution through both direct and indirect processes. For example, heat from flames or fallen trees associated with a fire event may cause power outages. Electrical service for Ehthlateese Village is received through a network of wooden pole distribution lines connected to the BC Hydro diesel-powered generating station located in the Village. In the event of a wildfire, BC Hydro will work with UTG emergency personnel and employ their emergency response protocols.[11]Utility right-of-way best management practices such as regular brushing and clearing of woody debris and shrubs are employed to help reduce fire risk, utility pole damage, and subsequent outages. Electricity to Seekah Landing is provided by solar panels with a battery bank, and electricity to Green Cove is provided by independent diesel/gas generators.

[10]Uchucklesaht Tribe Government Emergency Preparedness Plan 2014.
[11]https://www.bchydro.com/safety-outages/emergency-preparation.html

Secondary power sources are important to reduce vulnerability in the event of an emergency that cuts power for days, or even weeks. Vulnerabilities for secondary power sources include mechanical failure, potentially insufficient power sources should a wide-scale outage occur, and fuel shortage in the event of long outages. The BC Hydro generating station has a back-up generator, as well as the cabin at Seeking Landing, but other critical infrastructure do not. This is discussed further in Section 5.6.

3.2.3 WATER AND SEWAGE

Water is provided to Ehthlateese Village by a well, reservoir, and pump station system located upslope from the Village. Drinking water is treated on-site, and all water is gravity-fed from the reservoir. The reservoir holds 156,000 liters, and it was noted by the Resource and Development Manager that there are no concerns relating to water supply to the reservoir during dry summer months, but an electrical failure would limit the amount of water to the Village to what is currently held in the reservoir. The water system is mapped. Water to Green Cove and Seekah Landing is sourced from either nearby creeks or brought in containers.

Ehthlateese Village's sewage system is underground septic – houses have a two chambered system (solids/liquids) whereby the liquids are pumped through two pump houses to the septic field. The sewage system is mapped. There is no sewage system at Seekah Landing nor Green Cove.

3.2.4 HAZARDOUS VALUES

Hazardous values are defined as values that pose a safety hazard to emergency responders and include large propane facilities, landfills/refuse sites, storage facilities containing explosives, etc. Anywhere combustible materials, explosive chemicals, or gas/oil is stored can be considered a hazardous value. Protecting hazardous values from fires is important to preventing interface fire disasters.

Two hazardous values were identified in Ehthlateese Village: large diesel tanks at the BC Hydro generating station, and a small, unofficial refuse/dump site located adjacent (north) to the water reservoir. Hazardous values identified at Green Cove and Seekah Landing were diesel/propane tanks for generators and building appliances.

Refuse for Ehthlateese Village is disposed by on-site maintenance crews transporting it by truck to the Alberni Valley Landfill. Any refuse from Green Cove and Seekah Landing would be incorporated into this (transported by boat first to Ehthlateese Village). There are plans for a waste bin to be to be available for residents on the UTG skiff that would then be collected by Lade Rose Marine Services. Once a handling wharf is completed at the village, the bin will be located there. Yard waste is piled and burned by residents during fire-safe times to do so.

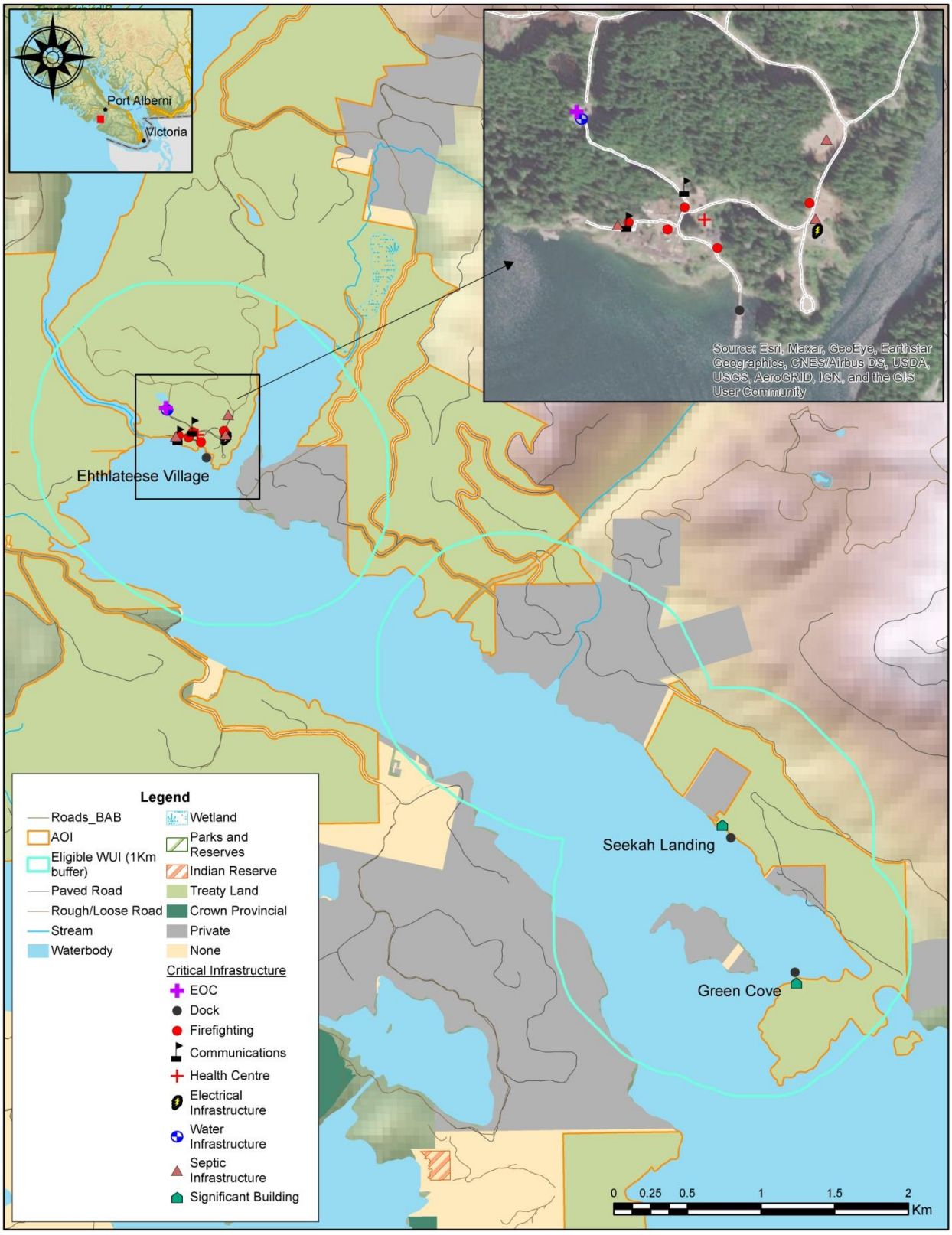
The management and treatment of fuels in proximity to hazardous infrastructure is critical in reducing the risks associated with both structural fire and wildfire. Specifically, best management practices recommended for the management of hazardous values include:

1) Incorporating FireSmart planning and setback requirements for all infrastructure in this category, and

2) maintaining emergency fuel/propane emergency shut off procedures to be enacted immediately and efficiently in the event of an approaching wildfire or ember shower.

Table 5: Critical Infrastructure and hazardous values within the WUI

Critical Infrastructure Type	Critical Infrastructure Name	Address/Intersection/Location
Emergency Response, Public Services, Electrical, and Communications		
Mobile Emergency Operations Centre (EOC)/Incident Command Centre/Place of Refuge	EOC	Ehthlateese Village at the water reservoir
Water	Reservoir, Tanks, Pumps, Treatment Plant	Ehthlateese Village
Sewage	Septic Field	Ehthlateese Village
	Septic Pumps	Ehthlateese Village (2 locations)
	Home Septic Tanks	Ehthlateese Village (each home)
Electricity	BC Hydro Power Generator	Ehthlateese Village
Internet Communications	Communications Tower	Ehthlateese Village
Internet Communications	Communications Hub	Ehthlateese Village
Health Clinic	Health Clinic	Ehthlateese Village
Firefighting	Fire Hydrant and Firefighting tools	Ehthlateese Village (5 locations)
Access/Egress	Dock	Ehthlateese Village
	Dock	Green Cove
	Dock	Seekah Landing
Hazardous Materials		
Diesel Tanks	BC Hydro Power Generator	Ehthlateese Village
Refuse/Dump Site	Unofficial Dump Site	Ehthlateese Village
Diesel Tank	Green Cove Building	Green Cove
Diesel Tank/Propane Tank	Seekah Landing Building	Seekah Landing



Map 2: Critical Infrastructure within the WUI

3.2.5 CULTURAL VALUES

There are many documented historic and archeological sites within the WUI and a high potential for additional sites to be found given the long history of use by Maa-nulth-aht. Known archeological sites are protected under the Heritage Conservation Act, which applies on both private and public lands. In addition, there are resource and cultural values presently held by the Uchucklesaht Tribe that should be known and managed for.

UTG as well as other First Nations with overlapping interests should be involved well before any fuel management projects are initiated to allow for meaningful review and input. Archeological assessments may be required to ensure that known or unknown cultural resources are not inadvertently damaged or destroyed, and that First Nations strategies for land management in their traditional territory are complied with. The soon-to-be ACRD Community FireSmart Resiliency Committee provides an excellent platform for information sharing about cultural values.

3.2.6 HIGH ENVIRONMENTAL VALUES

No known ecosystem nor species at risk occurrences have been identified through the B.C. Conservation Data Center (CDC) within the WUI. However, all fuel management prescriptions must identify and mitigate potential impacts to any high environmental values identified in consultation with land managers and First Nations and may require mitigation measures for harvesting in some areas.

SECTION 4: WILDFIRE RISK ASSESSMENT

This section summarizes the factors that contribute to local wildfire risk in the WUI. Using verified and updated fuel types (Appendix A-1: Fire Risk Threat Assessment Methodology, Map 3) combined with field wildfire threat assessments and office-based analysis (Appendix A: Local Wildfire Risk Process), local wildfire risk for the WUI was updated. There are two main components of this local risk assessment: the *wildfire behaviour threat class* (fuels, weather, and topography sub-components) and the *WUI risk class* (structural sub-component). The local wildfire risk assessment helps to identify the parts of the AOI that are most vulnerable to wildfire.

The relationship between wildfire risk and wildfire threat is defined as follows:

Wildfire Risk = Consequence X Probability

Where:

Wildfire risk is the potential losses incurred to human life and values at risk within a community in the event of a wildfire.

Consequences are the repercussions associated with fire occurrence in an area. Higher consequences are associated with densely populated areas, areas of high biodiversity, etc.

Probability is the threat of wildfire occurring in an area and is expressed by the ability of wildfire to ignite and then consume fuel on the landscape – its *wildfire threat*. Wildfire threat is driven by three major components of the wildfire environment:

1) Fuel – loading, size and shape, arrangement (horizontal and vertical), compactness, chemical properties, and fuel moisture.
2) Weather – temperature, relative humidity, wind speed, and direction and precipitation.
3) Topography – slope and terrain (increase/decrease rate of spread), and aspect (fuel dryness)

4.1 WILDFIRE ENVIRONMENT AND FIRE HISTORY

The ecological context of wildfire and the role of fire in the local ecosystem under both current and historical conditions is an important basis for understanding the current and future wildfire threat to a community.

The Biogeoclimatic Ecosystem Classification (BEC) system classifies the province into zones by vegetation, soils, and climate. Regional subzones are derived from relative precipitation and temperature. Uchucklesaht Tribe's WUI is characterized entirely by the CWHvm1: Coastal Western Hemlock Very Wet Maritime BEC subzone and variant. Historically, these forest ecosystems were usually uneven-aged or multi-storied even-aged, with regeneration occurring in gaps created by the death of

individual trees or small patches of trees.[12]However, extensive logging over the last 100 years within the WUI and surrounding area has left mostly even-aged forest stands. Forest health issues, both biotic and abiotic, can affect stand structure and fuel loading. The most notable forest health issue in the WUI is major windthrow events from hurricane-force winds. The average return interval for these has been approximately 100 years.[12]

4.1.1 WILDFIRE ENVIRONMENT

There are three environmental components that influence wildfire behavior: topography, weather, and fuel. These components are generally referred to as the 'fire behaviour triangle' (the ways in which they individually influence the wildfire environment of the WUI will be detailed below). Fuel is the only component of the fire triangle that can be managed.

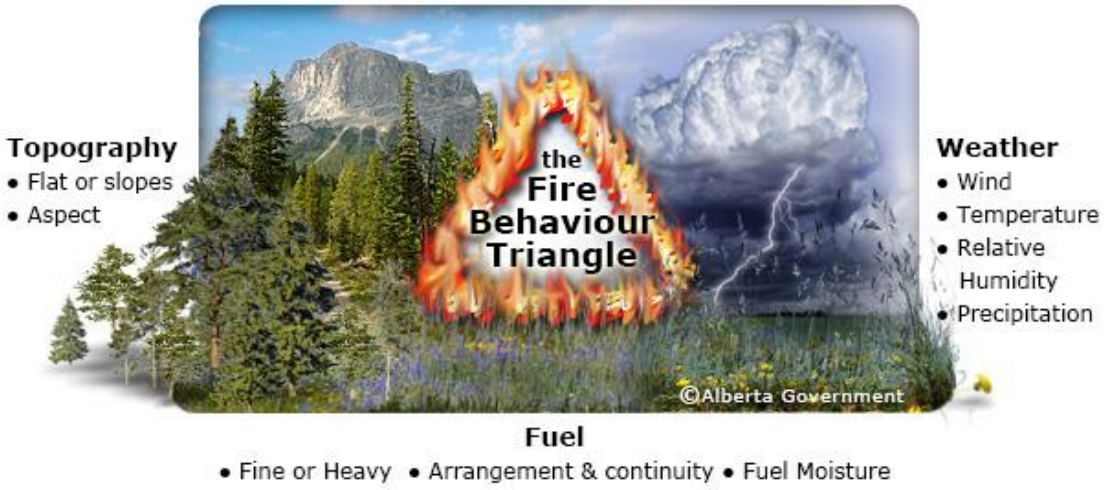


Figure 1. Graphic display of the fire behavior triangle, and a subset of characteristics of each component[13]

Fuel

The Canadian Forest Fire Behaviour Prediction (FBP) System outlines sixteen fuel types based on characteristic fire behaviour under defined conditions.[14] Fuel types (confirmed or updated by fieldwork verification) for the WUI are detailed in Table 6below (excluding water bodies) and onMap 3. The fuel types present that may be considered hazardous in terms of fire behaviour and firebrand spotting potential in the WUI are C-3, particularly if there are large amounts of woody fuel accumulations or denser understory ingrowth, and S-3, of which there is a large area just north of Ehthlateese Village. C-5 fuel types have a moderate potential for active crown fire when wind-driven. An M-1/2 fuel type can sometimes be considered hazardous, depending on the proportion of conifers within the forest stand;

[12]Forest Practices Code Biodiversity Guidebook. Accessed via: https://www.for.gov.bc.ca/ftp/hfp/external/!publish/FPC%20archive/old%20web%20site%20contents/fpc/fpcguide/BIODIV/chap2a.htm#ntv

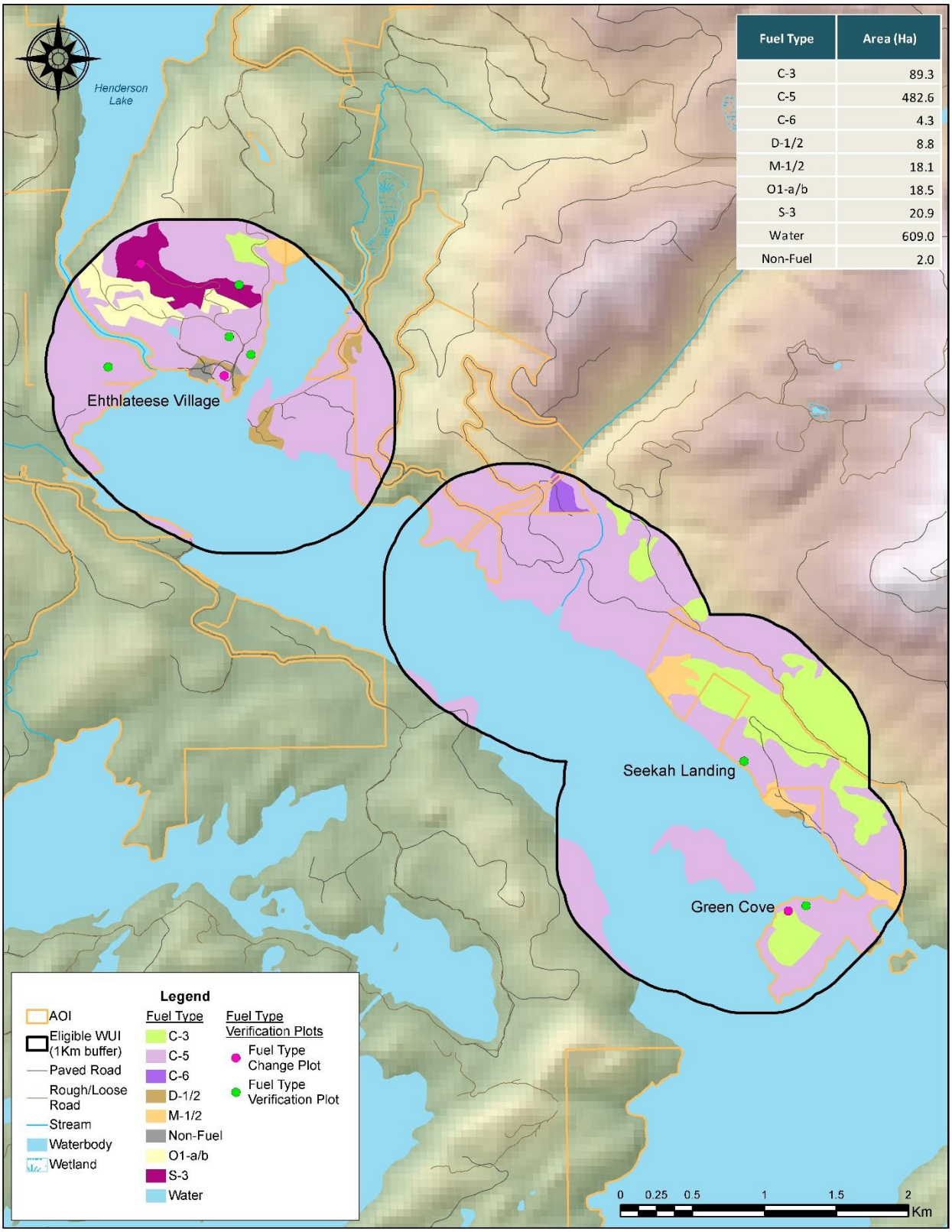
[13] Province of Alberta

[14]Forestry Canada Fire Danger Group. 1992. Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.

conifer fuels include those in the overstory, as well as those in the understory. An O-1a/b fuel type often can support a rapidly spreading grass or surface fire capable of damage or destruction of property and jeopardizing human life, although it is recognized as a highly variable fuel type dependent upon the level of curing.[14]Detailed fuel type descriptions and their associated wildfire risk can be found in Appendix A-1: Fire Risk Threat Assessment Methodology.

Table 6: Updated fuel types (by area and percent of WUI) within the WUI, excluding water

Fuel Type	Fuel Type Description within WUI	Area (ha) of WUI	Percent (%) of WUI
C-3	Fully stocked, late-young conifer forest with Crowns separated from the ground. Often the result of clear-cut logging.	89.3	14.0
C-5	Well-stocked mature forest, Crowns separated from ground. Moderate understory herbs and shrubs. Little grass or surface fuel accumulation. Typically, undisturbed or selectively harvested forests.	482.5	75.0
C-6	Pure, fully stocked conifer plantations with closed Crowns and no understory or shrub layer. Typically, 15-25 years old.	4.3	1.0
D-1/2	Deciduous stands/forest.	8.8	1.0
M-1/2	Moderately well-stocked mixed stand of conifers and deciduous species, low to moderate dead, down woody fuels. Typically, areas harvested 10-20 years ago or floodplain forests.	18.1	3.0
O1-a/b	Matted and standing grass communities; sparse or scattered shrubs; trees and down woody debris; areas harvested <7 years ago *with good slash management*.	18.5	3.0
S-3	Areas recently logged with slash where the cedar component is retaining all its foliage in a cured condition on the branches, but the hemlock and Douglas-fir components have dropped up to 50% of their foliage. Slash fuels tend to be continuous and uncompacted.	20.9	3.0
Non-fuel	Areas with no available fuel, such as gravel dumps, beaches, etc.	2.0	0.3



Map 3: Updated fuel types present in Uchucklesaht's WUI

Weather

It is important for the development of appropriate prevention programs that the average exposure to periods of high fire danger is determined. 'High fire danger' is considered as Canadian Forest Fire Danger Rating System (CFFDRS) Danger Class ratings of 4 (High) and 5 (Extreme). Danger class days were summarized to indicate the fire weather in Uchucklesaht Tribe's WUI. Considering fire danger varies from year to year, historical weather data can provide information on the number and distribution of days when the WUI is typically subject to high fire danger conditions, which is useful information in assessing fire risk.

Figure 2below displays the average frequency of danger class days between the months of April and October for the WUI. The data summarized comes from the Effingham BCWS weather station, which is located 24km northwest of Ehthlateese Village and provides an 11-year fire weather data collection interval. Confirmed during consultation with BCWS as the most appropriate weather station to use data from, BCWS also noted that Effingham is inland and at an elevation of 632m (no weather stations exist along the coast in this region). As such, it may overestimate high danger days.[15]Despite this, representative weather stations in the area are consistently the lowest regarding hazard and the data shown and discussed can be taken as a "worst-case" scenario.

According to Figure 2, fire weather in the WUI is highest in August where an average of five days are 'high' danger class days and one day is 'extreme' danger class. Overall, from July to September (peak fire season), a total of nine of the 92 days (10%) over those three months are 'high' danger class days. This data confirms the BCWS note that fire weather data in this area is generally low hazard, however climate change trends could start increasing the hazard in the future.

[15]Summer conditions in inland-island valleys that produce hazard generally mean that there is a strong maritime influence (*i.e.,* fog) in Ehthlateese Village and the surrounding area (Uchucklesit Inlet).

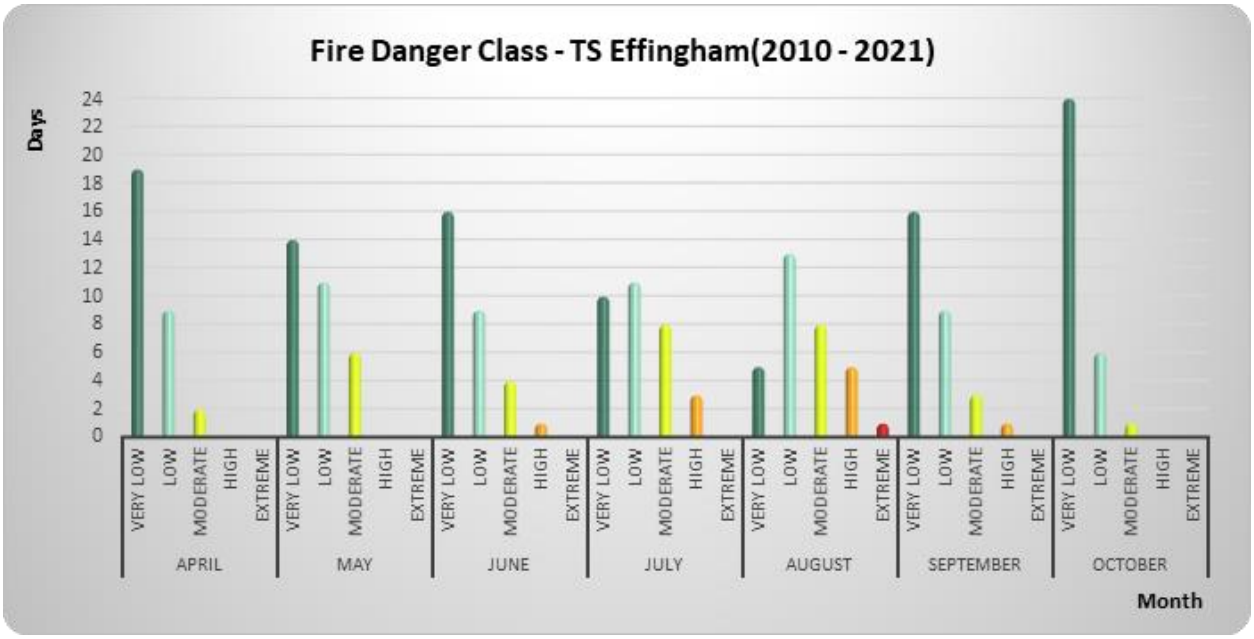


Figure 2: Average number of danger class days for the Effingham fire weather station. Summary of fire weather data for the years 2010-2021.

Climate change is projected to contribute to changes in the fire regime, forest attributes, and fuel hazard across BC. Climate scientists expect that the warming global climate will trend towards wildfires that are increasingly larger, more intense, and more difficult to control. Furthermore, these fires will likely threaten WUI communities more often due to increased potential for intense fire behaviour, fire season length, and fire severity.[16]

Wind speed and direction are also critical components of fire behavior. Information on local wind conditions is found in Appendix A-3: Fire Spread Patterns. Summarized in an Initial Spread Index (ISI) Rose(s) from representative BCWS weather stations, the Initial Spread Index (ISI) is a numeric rating of the expected rate of fire spread that combines the effects of wind speed and fine fuel moisture. A wildfire that occurs upwind of a value poses a more significant threat to that value than one which occurs downwind. Analysis of wind data from the Effingham BCWS weather station shows that during the fire season (April – October) predominant winds originate from the south (see Appendix A-3: Fire Spread Patterns for the August Lake ISI wind roses). Thus, fires south of Ehthlateese Village and other values pose the largest threat.

Topography

Slope steepness influences the fire's trajectory and rate of spread and slope position relates to the ability of a fire to gain momentum uphill. Other factors of topography that influence fire behaviour include aspect, elevation, and configuration of features on the landscape that can restrict (i.e., water bodies, rock outcrops) or drive (i.e., valleys, exposed ridges) the movement of a wildfire.

[16] BC Provincial Government. 2020. Preliminary Strategic Climate Risk Assessment. Retrieved from: https://www2.gov.bc.ca/gov/content/environment/climate-change/adaptation/risk-assessment

Table 7shows the percent of the WUI by slope percent class and those classes fire behaviour implications. Approximately half of Uchucklesaht Tribe's WUI (54%) is on less than 20% slope and will likely not experience accelerated rates of spread. 8% of the WUI is likely to experience an increased rate of spread, 11% a high rate of spread, and 27% is likely to experience a very high or extreme rate of spread.

Table 7. Slope Percentage and Fire Behaviour Implications.

Slope	Percent of WUI	Fire Behaviour Implications
<20%	54%	Very little flame and fuel interaction caused by slope, normal rate of spread.
20-30%	8%	Flame tilt begins to preheat fuel, increasing rate of spread.
30-45%	11%	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
40-60%	19%	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	8%	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

When slope percentage is considered in context with a value's slope position, that value's risk to increased fire behaviour can change dramatically – i.e., a value located in the upper 1/3 of a steep slope (>40%) will be exposed to fires downslope travelling very quickly uphill towards it. Table 8summarizes the fire behaviour implications for slope position. A value located at the bottom of a slope is equivalent to a value on flat ground. A value on the upper 1/3 of the slope would be impacted by preheating and faster rates of spread.

Homes and critical infrastructure in Ehthlateese Village vary in slope position, from bottom slope (at the shoreline) to mid-and-upper slopes for the furthest up homes and critical infrastructure(such as the water reservoir and Emergency Operations Center building). Managing fuel downslope of homes and infrastructure would reduce wildfire risk to those values.

Table 8. 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 increasing 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 terrain break features affecting preheating and flames rolling over 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 rolling over into the fuel.

4.1.2 WILDFIRE HISTORY

Historic Fire Regime

BEC zones have been used to classify BC into five Natural Disturbance Types (NDTs)based on the frequency and severity of pre-European disturbance events (including, but limited to, wildfires) and indicates historical fire regimes.[17]

Uchucklesaht Tribe's WUI is entirely characterized as being NDT 1 – ecosystems with rare stand-initiating events. When disturbances such as wind, fire, and landslides occurred, they were generally small and resulted in irregular edge configurations and landscape patterns.[18] The mean return interval for these disturbances is generally 250 years for the CWH.[17]While natural disturbance regimes are useful for describing the historical disturbance pattern typical for an area, fire history is complex and highly variable across space and time for many ecosystems.[19]

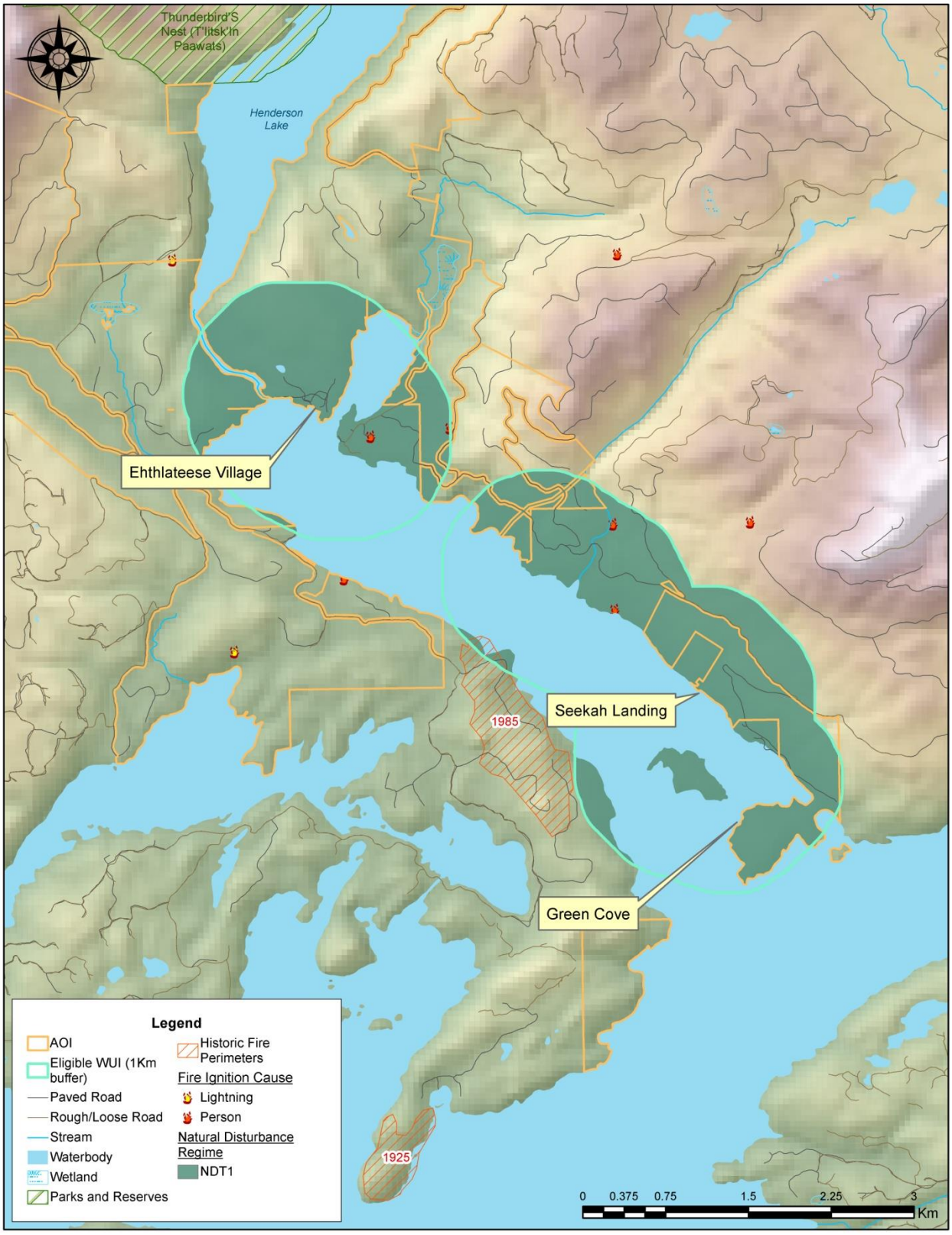
Historical Wildfire Occurrences

Historical fire ignition and perimeter data for the WUI are depicted below in Map 4. Fire ignition data is available from 1950-2020 and fire perimeter data is available from 1919-2020 for the WUI.

Based on the BCWS historical wildfire polygon dataset, wildfires in the WUI are infrequent and ignitions rarely result in a wildfire event. The most recent fire overlapping the WUI occurred in 1985 and burned 86.8 hectares and was the result of slash burning post-harvesting.

Based on the BCWS historical fire ignition data set, all historical ignitions within the WUI are human caused. When including the area surrounding the WUI, but within Uchucklesit Inlet, six out of eight ignitions were human caused (the other two caused by lightning). Three of those ignitions occurred prior to 1988, and the other three were in 2011, 2015, and 2016. Only one of those ignitions was accidental (burning building), while the other two were noted as being open burns in compliance with legislation/permits. Overall, human-caused fires (including structure fires and machine fires) pose the highest wildfire ignition threat to Ehthlateese Village, Green Cove, Seekah Landing, and the surrounding WUI.

[17] Province of British Columbia, 1995. Biodiversity Guidebook.
[18]Forestry Canada Fire Danger Group. 1992. Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.
[19]Hall, E. 2010. Maintaining Fire in British Columbia's Ecosystems: An Ecological Perspective. Report submitted to the Wildfire Management Branch, Ministry of Forests and Range.



Map 4: Natural disturbance regimes and historical fire ignitions and occurrences within the WUI

4.2 PROVINCIAL STRATEGIC THREAT ANALYSIS

The BCWS Provincial Strategic Threat Analysis (PSTA) evaluates multiple datasets to provide a high-level spatial representation of approximate relative wildfire risks across BC. It provides a starting point to assess the local wildfire risk. Three inputs are combined using a sum process to create the PSTA wildfire risk analysis component:[20]

1) **Historic fire density** represents the ignition and fire spread potential based upon historic patterns and fire density weighted by fire size (larger fire perimeters were given a higher weight to reflect the greater cost and damage usually associated with larger fires).
2) **Spotting impact** represents the ability of embers or firebrands from a burning fire to be sent aloft and start new fires in advance of the fire front, or outside of the fire perimeter. Spotting is most associated with high-intensity crown fires in coniferous fuels and structure losses. For the wildfire risk analysis, the spotting analysis is based on estimating the threat to a given point on the landscape from the fuels surrounding it, up to two kilometers. Spotting distances greater than two kilometers are rare and unpredictable.
3) **Head fire intensity (HFI)** represents the intensity (kW/m) of the fire front. HFI is correlated with flame length and fire behaviour. The greater the fire intensity (kW/m), or HFI and fire intensity class, the more extreme the fire behaviour is likely to be and the more difficult the fire will likely be to suppress. The HFI used in the wildfire risk analysis was developed using the 90th percentile fire weather index value.

The final wildfire risk analysis value was developed through an average weighting process of the three layers.[21]The weighting system integrates the three components of fire threat: fire occurrence, represented by fire density; suppression effort and fire impacts, represented by head fire intensity; and spotting. Values were then separated into 10 classes (1 – 10) which represent increasing levels of overall fire threat (the higher the number, the greater the fire threat); threat class 7 is considered the threshold; threat classes of 7 and higher are locations where the threat is severe enough to potentially cause catastrophic losses in any given fire season when overlapping with values at risk. Classes were grouped into the following general threat class descriptions: low (1 – 3); moderate (4 – 6); high (7 – 8); and, extreme (9 – 10).

The PSTA is complemented by a finer scale local wildfire risk analysis considering local factors to improve the wildfire risk assessment. The key steps to completing the local wildfire risk analysis and a detailed assessment of the local wildfire risk are described in Section 4.3below and Appendix A: Local Wildfire Risk Process.

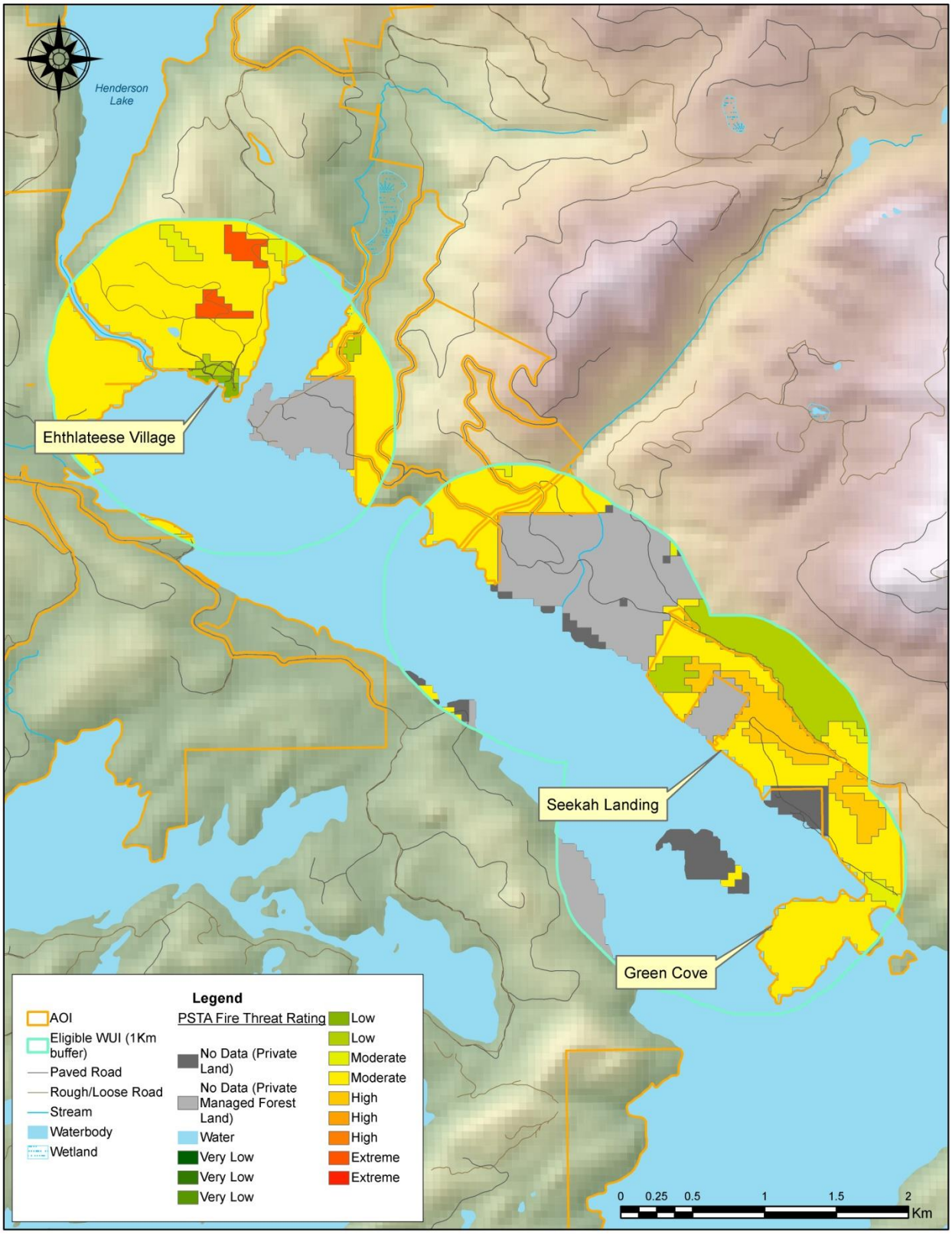
[20]MFLNRORD, BCWS. 2021. BC Wildfire PSTA Fire Threat Rating. Retrieved from: https://catalogue.data.gov.bc.ca/dataset/bc-wildfire-psta-fire-threat-rating

[21] Weighting of the three PSTA wildfire threat analysis components: Fire density 30%; HFI 60%; spotting impact 10% (water bodies were automatically given a value of 'no threat' [-1])

The fire threat ratings from the 2020 PSTA are summarized for the WUI in Table 9 and spatially illustrated in Map 5. Excluding large waterbodies (*i.e.,* Uchucklesaht Inlet), the majority of the WUI (85%) is categorized as moderate threat. Low threat accounts for 13%. The remaining 2% of the WUI is categorized as extreme threat.

Table 9: 2020 PSTA WUI fire threat ratings (excluding large water bodies)

Threat Class	Area (ha)	Threat Class Description	Percent of WUI
0	0.0	No Threat	0%
1	0.0	Low	13%
2	2.3		
3	53.2		
4	14.1	Moderate	85%
5	332.4		
6	32.7		
7	0.0	High	0%
8	0.0		
9	9.8	Extreme	2%
10	0.0		
Total	**444.5**	**-**	**100%**



Map 5: PSTA fire threat map

4.3 LOCAL WILDFIRE THREAT ASSESSMENT

The local wildfire threat assessment process includes several key steps as outlined in Appendix A: Local Wildfire Risk Processand summarized as follows:

- *Fuel type attribute assessment* – ground-truthing/verification and updating as required to develop a local fuel type map (Appendix A-1: Fire Risk Threat Assessment Methodology, Map 3).
- *Consideration of the proximity of fuel to the community* – recognizing that fuel closest to the community usually represents the highest hazard (Appendix A-2: Proximity of Fuel to the Community).
- *Analysis of predominant summer fire spread patterns* – using wind speed and wind direction during the peak burning period using ISI Rose(s) from BCWS weather station(s) (Appendix A-3: Fire Spread Patterns).
- *Consideration of topography concerning values*–slope percentage influences the fire's trajectory and rate of spread and slope position relates to the ability of a fire to gain momentum uphill.
- *Stratification of the WUI* – according to relative wildfire threat based on the above considerations, other local factors, and field assessment of priority wildfire risk areas.

WUI Threat Assessments were completed over several field days in May 2021 in conjunction with verification of fuel types (seeAppendix C: Wildfire Risk Assessment – Worksheets and Photos) to support the development of priority treatment areas.Six WUI threat plots were completed and 45other field stops (e.g., qualitative notes, fuel type verification, and/or photograph documentation) were made across the WUI (see Appendix F: WUI Threat Plot Locations and Map 6) in areas that had road, trail, and boat access to build the most accurate assessment of local fire risk possible.

Field assessment locations were prioritized based upon:

- *Proximity to values at risk*: Field assessments were clustered in the intermix and interface, as well as around critical infrastructure.
- *Prevailing fire season winds*: More field time was spent assessing areas upwind of values at risk, especially in potential locations for landscape-level fuel breaks.
- *Local knowledge*: Areas identified as hazardous, potentially hazardous, with limited access/egress, or otherwise of particular concern as vulnerable to wildfire, as communicated by local fire officials and community forest representatives
- *Observations*: Additional areas potentially not recognized before field work were visually identified as hazardous and assessed during the week.
- *Verifying provincial classification*: areas classified as high threat in the provincial PSTA dataset, or with an uncommon fuel type, were assessed to ground-truth the fuel type and threat, even if they were relatively far from values

4.3.1 WILDFIRE BEHAVIOR THREAT CLASS ANALYSIS

Classes of the wildfire behaviour threat class analysis are as follows:

- Very Low: Waterbodies with no forest or grassland fuels, posing no wildfire threat;
- Low: Developed and undeveloped land that will not support significant wildfire spread;
- Moderate: Developed and undeveloped land that will support surface fires that are unthreatening to homes and structures;
- High: Landscapes or stands that provide continuous forested fuels that will support candling, intermittent Crown or continuous Crown fires. These landscapes are often steeper slopes, rough or broken terrain and/or south or west aspects. High polygons may include high indices of dead and downed conifers; and
- Extreme: Continuous forested land that will support intermittent or continuous Crown fires.

The results of the wildfire behaviour threat class analysis are shown on Map 6 and in Table 10 below. The updated analysis shows that 16% of the WUI is classified as No Data (includes Private Land and Private Managed Forest Land) and as such has not been allocated fire threat data. 63% of the WUI is either water, very low threat, or low threat. The remaining 21% of the WUI is moderate threat or higher, but with only 5% of that high and 0% of that extreme threat classes. Table 10 also shows the differences between the 2020 PSTA data and the updated PSTA data resulting from the methodology.

Table 10: Fire behaviour threat summary for the WUI (PSTA vs. methodology updated data)

Wildfire Behaviour Threat Class	2020 PSTA Data	2020 CWRP Data Update
	% of WUI	% of WUI
Extreme	1%	**0%**
High	22%	**5%**
Moderate	32%	**16%**
Low	2%	**15%**
Very Low/ No Threat (Water)	9%	**48%**
No Data (Private Land and Private Managed Forest Land)	33%	**16%**

4.3.2 WUI THREAT CLASS ANALYSIS

WUI Threat classes are quantified when the Wildfire Behaviour Threat (the above; Table 10) is assessed as high or extreme, causing the potential of unacceptable wildfire threats when near communities and developments. The total combined WUI Threat equals the area of High and Extreme Fire Threat Ratings. WUI Threat Classes are described below:

- **Low**: The high or extreme threat is sufficiently distant from developments, having no direct impact on the community and is located over 2km from structures;
- **Moderate**: The high or extreme threat is sufficiently distant from developments, having no direct impact on the community and is located 500m to 2km distance from structures;

- **High**: The high or extreme threat has the potential to directly impact a community or development and is located 200m to 500m from structures; and
- **Extreme**: The high or extreme threat has the potential to directly impact a community or development and is located within 200m from structures.

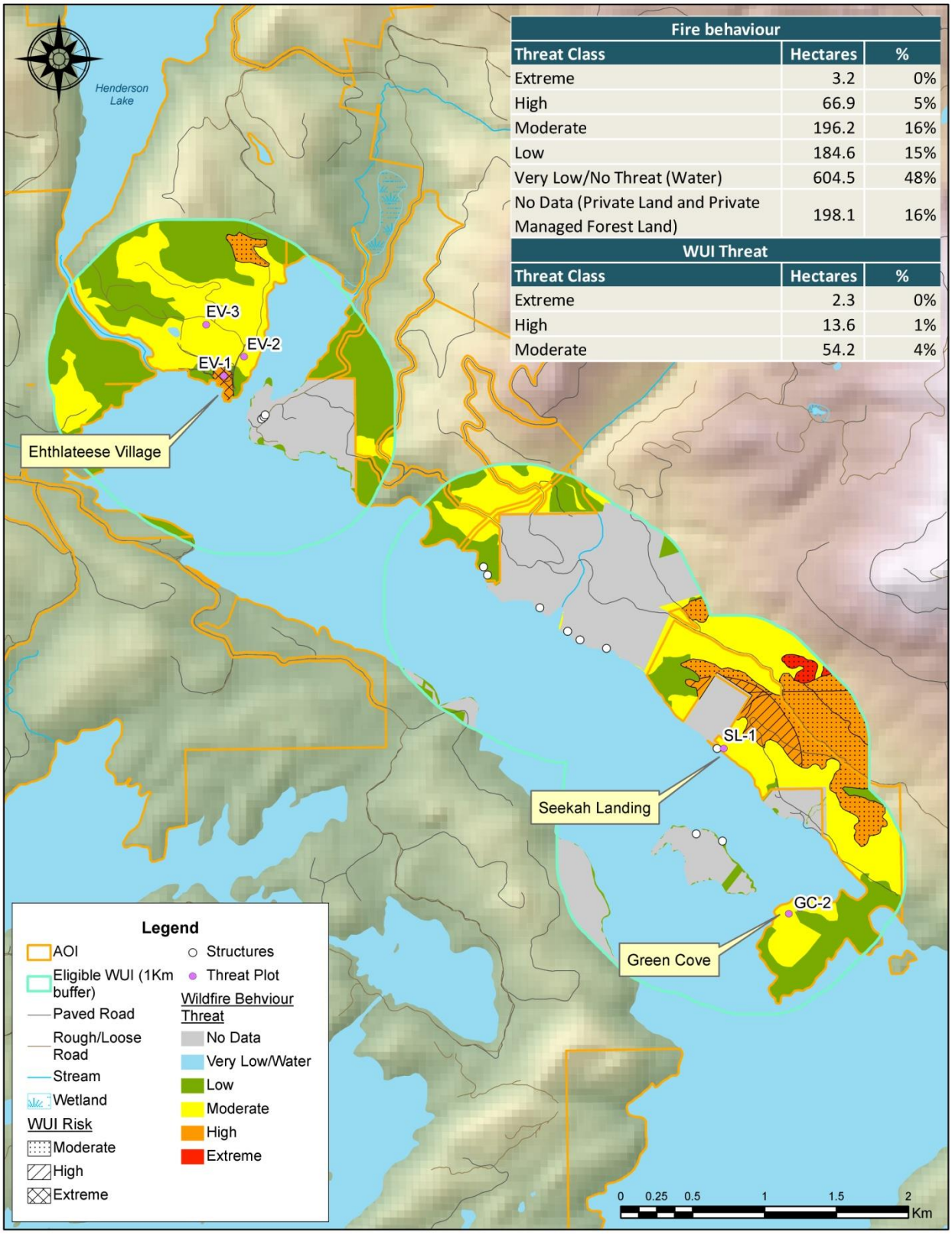
Table 11 below (and displayed on Map 6) summarizes the WUI threat class ratings within Uchucklesaht Tribe's WUI.

Table 11: WUI threat class ratings

WUI Threat	
Threat Class	**Area (ha)**
Extreme	2.3
High	13.6
Moderate	54.2
Low	0.0

Overall, theWUI Threat Class Analysis shows that the majority of the WUI's land base is moderate threat class, with some small, but significant high threat class areas within Ehthlateese Village. The consequence of a wildfire to Ehthlateese Village would be high, as it is being re-developed and repopulated. The consequence of a wildfire to both Green Cove and Seekah Landing would be less severe (no permanent residents).

For detailed field data collection and spatial analysis methodology for the local threat assessment and classification, see Appendix H: Fire Risk Threat Assessment Methodology.



Fire behaviour		
Threat Class	**Hectares**	**%**
Extreme	3.2	0%
High	66.9	5%
Moderate	196.2	16%
Low	184.6	15%
Very Low/No Threat (Water)	604.5	48%
No Data (Private Land and Private Managed Forest Land)	198.1	16%

WUI Threat		
Threat Class	**Hectares**	**%**
Extreme	2.3	0%
High	13.6	1%
Moderate	54.2	4%

Map 6: Local fire behaviour

4.4 HAZARD, RISK, AND VULNERABILITY ASSESSMENT

UTG's Hazard, Risk, and Vulnerability Analysis (HRVA), undertaken as part of the development of a local Emergency Management Plan, is currently being developed. This report should be made available as it may provide additional information, particularly regarding the Local Wildfire Threat Analysis conducted above in Section 4.3.

SECTION 5: FIRESMART PRINCIPLES

FireSmart™ is the leading program in the country aimed at empowering the public and increasing neighbourhood resilience through wildfire mitigation measures. It has been formally adopted by almost all Canadian provinces and territories, including British Columbia in 2000. The FireSmart program covers a wide breadth of preventative measures, which are founded in the seven FireSmart disciplines: Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Cross-Training, and Vegetation Management. These seven disciplines and the guiding principles behind FireSmart can be applied at a number of spatial scales and are not restricted to any type of land ownership, forest type, or property type.

Ehthlateese Village and the structures at Green Cove and Seekah Landing are an intermix community – the homes and structures are largely situated within the vegetated/forested landscape. With the wildfire risk analysis (Section 4) showing that the most likely ignition cause of a wildfire to be from human actions, and the highest risk wildfire behaviour threat class being in Ehthlateese Village, a focus on FireSmart education, FireSmart building materials, and Home and Critical Infrastructure Ignition Zone vegetation management would be the most important actions for UTG to focus on to not only ensure structures and homes survive a wildfire event, but that they also do not ignite one.

FireSmart compliance on all the newly constructed homes and critical infrastructure in Ehthlateese Village is generally high considering building materials, landscaping, and maintaining a 10 m defensible space (where possible). However, older structures (such as the medical clinic) display low FireSmart compliance. FireSmart compliance for the structure at Seekah Landing is moderate-high, while the landscaping and maintaining a 10 m defensible space (where possible) is low. FireSmart compliance for Green Cove is low considering building materials, landscaping, and maintaining a 10 m defensible space (where possible).

FireSmart activities should focus first on the most at-risk communities/areas within the WUI. Based on general field observations, the local wildfire threat assessment, the current level of FireSmart, proximity to the WUI edge, restrictions to access/egress, adjacent fuel types and hazards, etc.), separate areas of focus within the WUI have been prioritized by those that would benefit the most from FireSmart planning and activities: 1) Ehthlateese Village; 2) Seekah Landing; 3) Green Cove.

An evaluation of the current level of FireSmart implementation at Ehthlateese Village, Green Cove, and Seekah Landing is presented below in Table 12. All the activities listed are eligible for funding under the 2022 CRI FireSmart Community Funding and Supports program.

Table 12: FireSmart activities funded under the 2022 UBCM CRI program and their level of implementation in the WUI

FireSmart Discipline/CRI Funding Category	FireSmart Activities	Current Status
Education	Update public signage, social media, websites and/or newsletters.	*Partially achieved.* Wildfire risk signs are posted at major road entrances to Uchucklesaht Treaty Land and at entrances (dock and road) to Ehthlateese Village.
	Distribute FireSmart educational materials and resources.	*Not yet achieved.* Some materials have been received, but none distributed.
	Develop education for the reduction of local human-caused fires.	*Partially achieved.* Fire bans communicated by signage.
	Encourage community participation in Wildfire Community Preparedness Day. Organize and/or host FireSmart events and workshops.	*Not yet achieved.*
	Support neighbourhoods to apply for FireSmart Canada Neighbourhood Recognition Program.	*Not yet achieved.*
	Offer FireSmart rebate program.	*Not yet achieved.*
Legislation and Planning	Develop or amend a CWRP/CWPP.	*Achieved.* 2013Uchucklesaht CWPP and 2021 CWRP update.
	Develop FireSmart policies for the design and maintenance of lands, such as parks, trails, and buildings.	*Achieved* - in progress.
	Conduct FireSmart Assessments for UTG buildings.	*Achieved.* FireSmart home and critical infrastructure assessments were completed in 2021 using the LFR reporting documents.
Development Considerations	Amend OCPs or laws to incorporate FireSmart principles.	*Achieved* - In progress.
	Revise zoning and development permit documents to include FireSmart considerations.	*Not yet achieved.*
	Establish Development Permit Areas for Wildfire Hazard.	*Not yet achieved.*
	Include wildfire prevention and suppression considerations in the design of communities.	*Partially achieved.* FireSmart building materials and firefighting equipment are used/available in Ehthlateese Village.
	Replace building materials (home and critical infrastructure) with fire-resistant materials.	*Partially achieved.* Most, but not all, CI use fire-resistant building materials.

FireSmart Discipline/CRI Funding Category	FireSmart Activities	Current Status
	Develop plans for residential areas: - Conduct HIZ assessments for individual properties - Develop FireSmart Neighbourhood Plans - Undertake Neighbourhood Wildfire Risk Assessments for neighbourhoods (to work towards obtaining an FSCCRP status)	- *Achieved.* Completed 2021. - *Not yet achieved.* - *Not yet achieved.*
Interagency Cooperation	Develop, coordinate, and/or participate in a Community FireSmart Resiliency Committee or multi-agency fire and/or fuel management planning table.	*Not yet achieved.* UTG is planning to be an active member in the ACRD's CFRC when it is organized (planned for 2022).
	Provide Indigenous cultural safety and humility training to emergency management personnel	*Not applicable.*
	Attend 2021 FireSmart BC Conference, to be hosted by the BC FireSmart Committee	*Not yet achieved.*
Cross-Training	Provide or attend training for Local FireSmart Representatives (LFR)	*Not yet achieved.*
	Support LFRs to attend facilitator training	Not yet achieved.
	Cross-train fire department members • SPP-WFF1 Wildland Firefighter Level 1 • S-100 Basic fire suppression and safety • S-185 Fire entrapment avoidance and safety • ICS-100	*Not yet achieved.* No fire department at Ehthlateese Village, however this can apply to residents of the Village.
	Professional development to increase capacity for FireSmart activities	*Partially achieved.* But should continue to grow capacity.
Emergency Planning	Develop and/or participate in cross-jurisdictional meetings and tabletop exercises focused on wildfire preparedness	*Achieved.* UTG participated in a wildfire table-top exercise with ACRD and associated partners.
	Assess structural protection capacity	*Not yet achieved.*
	Use and/or promote EMBC Wildfire Preparedness Guide for community emergency preparedness events focused on wildfire	*Achieved.* Uchucklesaht's Evacuation Plan was updated in 2021 and includes wildfire emergencies.
Vegetation Management	Undertake fuel management on Uchucklesaht Tribe's Treaty Settlement Lands (fuel management prescriptions, treatments, maintenance, or prescribed burns)	*Not yet achieved.*

FireSmart Discipline/CRI Funding Category	FireSmart Activities	Current Status
	Remove or reduce flammable vegetation up to 100 m from critical infrastructure,	*Not yet achieved.*
	Provide vegetative debris disposal for residents: • Provide a dumpster or chipper, • Waive tipping fees.	*Not yet achieved.* Yard waste at Ehthlateese Village, Green Cove, and Seekah Landing is piled and burned during low-hazard periods.

5.1 EDUCATION

Public education and outreach play a critical role in helping a community prepare for and prevent a wildfire. Participating in wildfire risk reduction and resiliency activities also promotes a sense of empowerment and shared responsibility. This discipline often supports the successful implementation of many other FireSmart disciplines by building awareness and understanding within both residents and visitors.

UTG currently communicates fire danger and fire bans via signage at entrances to the community (roads and docks to Ehthlateese Village). FireSmart education materials were received by UTG in summer 2021, but at the time of this document's writing they had not been distributed. To further FireSmart education, UTG should consider actions that get the FireSmart message out to as many citizens as possible, including open houses and education days and a FireSmart webpage with links on its website. Table 13 below details the full list of recommended FireSmart education actions that UTG can implement.

Table 13: Education recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To provide information to Uchucklesaht citizens empowering them to adopt and conduct FireSmart practices to mitigate the negative impacts of wildfire to their homes, businesses, and communities.							
1	High	This CWRP report and associated maps should be made publicly available by UTG through its website and on social media. In addition, this CWRP should be shared with local industry partners who may be interested in collaborating on FireSmart and wildfire risk reduction activities.	Include all members of the ACRD Community FireSmart Resiliency Committee (when active).	UTG	1 year	Available for download or viewing on Uchucklesaht Tribe's webpage	Uchucklesaht (no cost)
2	High	Promote FireSmart approaches for wildfire risk reduction to citizens through FireSmart workshops, open houses, and/or presentations. Supply FireSmart resources during these engagement campaigns and promote the FireSmart Begins at Home mobile app as well as the FireSmart 101 online course.[22]	Aim to conduct the engagement and promotion campaign before and during the fire season. Include education specific to Ehthlateese Village, Green Cove, and Seekah Landing, such as emphasizing the importance of safe debris removal methods and FireSmart firewood storage. Provide information on FireSmart landscaping Enacting an all-encompassing "Safety Day" (coast guard, BC Ambulance, RCMP, BC Wildfire Service, UTG personnel) that incorporates the Wildfire Community Preparedness Day CRI initiative can be an effective way to draw participation from the greatest number of citizens.	UTG	Yearly (pre-fire season)	Growing citizen participation each year.	UBCM CRI funding is available (~40 hours for planning and 1 day for workshop)
3	High	Develop a FireSmart/Wildfire Preparedness page on Uchucklesaht Tribe's website (with a direct link from the opening webpage). Include links to FireSmart BC and other relevant wildfire resources.	Additional consideration should be put towards adding the current wildfire risk level to the Uchucklesaht Tribe opening webpage.	UTG (Consultant)	2 years	Webpage updated	UBCM CRI funding is available (~$3000

[22]This and other FireSmart education and training courses can be accessed via: https://firesmartbc.ca/events/category/course/

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
							contracted service. ~40 hours for set-up. Additional hours for updates as required)
4	High	Encourage local schools to adopt and deploy existing wildfire education programs. Other options/value-added activities include consulting with the Association of BC Forest Professionals (ABCFP) and BCWS (Kamloops Fire Centre) as well as the local fire department and regional FireSmart representatives to facilitate and recruit volunteer teachers and experts to help with curriculum development to be delivered in the schools (field trips, guest speakers, etc.).	Emergency preparedness curriculum is available provincially, which includes preparedness for a variety of natural hazards, including wildfire (Master of Disaster, FireSmart BC Education box). This could be wrapped into an all-encompassing "Hazards Preparedness Day".	UTG	Yearly (pre-fire season)	One FireSmart education day per school year	UBCM CRI funding is available (FireSmart BC Education box - $800 Junior K-Grade 12. Field trips, guest speakers, etc. ~$2500 per school)
5	High	FireSmart BC released made-for-BC landscaping guidelines in 2021.[23]When available, make these guidelines available on the Uchucklesaht Tribe FireSmart webpage and hand out pamphlets/literature relating to it to Ehthlateese Village residents.	Increase FireSmart vegetation management knowledge amongst residents of Ehthlateese. Review and amend the guidelines taking into consideration Uchucklesaht Tribe's culturally valuable plant species.	UTG (Local FireSmart Representatives)	1 year from when the guidelines are made available	Posted on Uchucklesaht Tribe's FireSmart webpage and materials given to Ehthlateese Village residents	UBCM CRI funding is available (~ 20 hours in-house; no cost)
6	Moderate	Promote FireSmart amongst the private landowners within the WUI. Supply FireSmart resources to them via pamphlets left on their docks or at their cabin/home front doors. Promote the FireSmart Begins at Home mobile app as a method for them to conduct home assessments.	This is especially relevant for landowners with structures adjacent to Ehthlateese Village, Seekah Landing, and Green Cove, as fires started on their properties can easily affect UTG structures, property, and lives.	UTG	2 years	FireSmart information provided to adjacent private landowners	UTG (~ 8 hours; boat required for access)

[23]Available for download here: https://firesmartbc.ca/resource/landscaping-guide/

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
7	Low	UTG and/or Local FireSmart Representatives should support and facilitate Ehthlateese Village to self-organize to attain FireSmart Canada Neighbourhood Recognition Program (FSCNRP) status.	Leverage the leadership of a Local FireSmart Representative.	UTG (Local FireSmart Representatives)	5 years	Status achieved for Ehthlateese Village	UBCM CRI funding is available

5.2 LEGISLATION AND PLANNING

Legislation and planning regulation are effective tools for reducing wildfire risk, even more so in small, tight-knit communities versus large regional districts due to ease of communication and enforcement.

A review and summary of Uchucklesaht's current laws relevant to wildfire risk and emergency planning were provided earlier in section2.4.Uchucklesaht's laws are currently under review with a goal to update them *through a wildfire lens* to assess where they inadvertently promote conditions that may contribute to fire spread (*i.e.,* landscaping, fencing), and to determine where laws can be updated or strengthened to reduce wildfire risk to development. Examples include adopting laws tied to wildfire hazard levels and requiring minimum standards for access, water supply, construction materials and techniques, and vegetation management. By doing this, UTG can help accomplish the goal of a more wildfire resilient community. See section 5.3 Development Considerations for a discussion on wildfire hazard Development Permit Areas.

Recommendations and action items UTG can implement relating to legislation and planning are detailed below in Table 14. The laws recommended for updating should not be considered the complete list of laws that should be reviewed and updated, but rather a guide to how FireSmart principles can be viewed and actioned in Uchucklesaht's legislation and planning environment.

Table 14: Legislation and planning recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To provide the means for UTG to implement wildfire risk reduction actions through laws and legislation by outlining government responsibilities regarding wildfire.							
8	High	Complete or schedule periodic updates of the CWRP. The frequency of updates is highly dependent upon major changes which would impact local wildfire risk or the rate at which wildfire risk reduction efforts are implemented. An evaluation of major changes (including funding program changes that may lead to new opportunities) and the potential need for a CWRP update should be initiated every 5 years.	A current (i.e., no more than 5 years old) CWRP is currently a requirement for further funding under the CRI Program.	UTG (Consultant)	5-7 years from adopting this CWRP document	Uchucklesaht always has an up-to-date CWRP and action plan	UBCM CRI funding is available (~$30,000 for full document / $10,000 for update)
9	High	Update UTS 46/2015 Zoning Act to include a Wildfire Urban Interface Zone for Ehthlateese Village, Green Cove, and Seekah Landing and imbedding FireSmart principles (especially vegetation and fuel loading limit guidelines) within it.	Consider making this zone the FireSmart Home and CI Ignition Zones 1-3. Fuel loading limit guidelines would help limit the amount of vegetative debris left in a location following any vegetation management (*i.e.*, yard pruning) or resource extraction (*i.e.*, logging) activities.	UTG (Consultant)	1 year	Law updated or created speaking to this requirement	UBCM CRI funding is available
10	High	Update UTR 15/2014Building Forms Regulation to include FireSmart construction materials and landscaping.	FireSmart construction materials are discussed in the FireSmart Begins at Home – Home Development Guide.[24] Landscaping: reference can be made to UTG's FireSmart landscaping guidelines (recommendation #5).	UTG (Consultant)	1 year	Law updated or created speaking to this requirement	UBCM CRI funding is available
11	High	Update UTS 15/2011Environmental Protection Act Section 2.1 (e. iv) to prohibit the burning of leaves, foliage, weeds, crops, or stubble for domestic or agricultural use during periods of moderate or higher fire danger risk ratings.	To limit the chance of fire escapement during times of hazardous fire danger, reducing wildfire risk within the WUI.	UTG (Consultant)	1 year	Law updated or created speaking to this requirement	UBCM CRI funding is available
12	High	Update UTS 15/2011Environmental Protection Act Part 4: Unsightly Land to include lands that pose a wildfire risk (either risk to ignition or to combustion and sustaining a fire).	To provide a mechanism to manage hazardous materials/fuels buildups on lands and around residents, reducing wildfire risk within the WUI.	UTG (Consultant)	1 year	Law updated or created speaking to this requirement	UBCM CRI funding is available

[24]Can be accessed via: https://firesmartcanada.ca/wp-content/uploads/2019/10/FS_Developer_Booklet.pdf

5.3 DEVELOPMENT CONSIDERATIONS

Embedding FireSmart practices and considerations into development should be a leading priority of UTG. Wildfire risk factors that can be planned for and regulated through the land use planning and development process include:[25]

- Location of development in relation to vegetation, slope, and terrain features that either reduce or increase wildfire threat
- Access and traffic circulation patterns
- Availability and adequacy of water supply
- Type of construction materials on structures and projections
- Structure density
- Design guidelines and architectural standards

Ehthlateese Village has sufficient (and mapped) hydrant coverage. The water supply for the village is good, with no shortage issues reported nor anticipated even during the fire season. The newly constructed homes in Ehthlateese Village have all used FireSmart materials and design principles. Shown below in Figure 3, these include fire-rated roofing materials, non-combustible gutters, non-combustible vents with screening, closed eaves, no cracks in building exterior, non-combustible building exterior, 15cm+ non-combustible vertical ground-to-siding clearance, no combustible debris under decks, and windows that are multi-pane.

Figure 3: FireSmart construction examples of new homes in Ehthlateese Village

Critical infrastructure assessments identified several instances where both the structures and surrounding vegetation were not FireSmart. The structure and vegetation are both combustible and if ignited could spread fire through the community. The medical clinic in Ehthlateese Village is shown below in Figure 4as an example. There is combustible vegetation within FireSmart Home Ignition Zone

[25]CRI FCSF 2021 CWRP Supplemental Instruction Guide

1[26], cracks/openings in the exterior, the exterior construction materials are not fire resistant, and combustible materials are stored under wood decks and stairs.

Figure 4: FireSmart non-compliance issues of the Ehthlateese Village Medical Clinic

Access to/Egress from Ehthlateese Village is a concern as there is only one route – a periodically maintained gravel resource road. Maintenance is dependent upon forest harvesting activities in the area. UTG should engage FLNRORD and TFL44 LP (contact listed in Table 17) to discuss avenues for permanent maintenance of this access route. Include this as a goal within Uchucklesaht Tribe's Official Community Plan (OCP).

The objectives and policies within the OCP that are directly relevant to wildfire risk reduction, emergency response, and community resilience post-disaster were previously summarized in Table 2. The OCP is currently under review for updating, and much like regulations, it is important that that the OCP adopt language and framework *through a wildfire lens* so that future land use and development are guided with wildfire preparedness in mind. One of the most powerful tools UTG can employ is the development of a Wildfire Hazard Development Permit Area (DPA)for the protection of developments from hazardous conditions. The following aspects should be considered in the OCP review and wildfire hazard DPA development:

1) Establish DPA objectives (*e.g.,* minimize risk to structures and people from wildfires, minimize risk to forested areas surrounding communities, and conserve the visual and ecological assets of the forests surrounding communities, etc.).
2) Where possible, it is recommended to *mandate* FireSmart construction materials
3) Engage Uchucklesaht citizens (especially residents of Ehthlateese Village) in the DPA development process to educate, inform, and allow for input. This can be accomplished in a variety of formats, including, but not limited to, workshops, informational sessions, or open houses.

[26]FireSmart Home Ignition Zone and Critical Infrastructure Ignition Zones are described in Appendix A-2: Proximity of Fuel to the Community.

Recommendations and action items that UTG can implement to embed FireSmart practices and considerations into development are detailed below in Table 15. The OCP sections recommended for updating should not be considered the complete list of sections that should be reviewed and updated, but rather a guide to how FireSmart principles can be viewed and actioned in the OCP.

Table 15: Development considerations recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To embed FireSmart practices and considerations into all development within Uchucklesaht territory.							
13	High	Develop a wildfire hazard DPA and update Uchucklesaht Tribe's OCP when completed. To meet objectives, consider including the following elements: • minimum setbacks from forested edges based on FireSmart, • fuel management based upon qualified professional recommendations, • landscaping to FireSmart guidelines, • building materials and design based on NFPA 1144 and FireSmart standards, • underground servicing, • prompt removal of combustible construction materials or thinning/fuel management waste, and • a minimum of two access/evacuation routes for all neighbourhoods.	Embed FireSmart values into all aspects of community development and planning.	UTG (Consultant)	3 years	Interface wildfire DPA created and adopted	UBCM CRI funding is available (~$25,000 contracted service and 40 hours in-house)
14	High	Plan and implement work based on the recently completed FireSmart Home and Critical Infrastructure assessments for Ehthlateese Village, Seekah Landing, and Green Cove.	Assessments completed by BA Blackwell & Associates Ltd in 2021. Prioritize works based on priority areas listed Section 5.0.	UTG	5 years	All CI upgraded to stated FireSmart standards	UTG ($ and time dependent on scope and scale of work completed)
15	High	If a Wildfire Hazard DPA is not adopted, or prior to its adoption CI works are planned, use fire-resistant construction materials, building design, and landscaping for all CI when completing upgrades or establishing new infrastructure.	Vegetation setbacks around CI should be compliant with FireSmart principles (*e.g.,* no combustible material within 10 m of structures).	UTG	Ongoing	New CI are FireSmart	UTG ($ variable: CI specific)
16	High	(Aligned with recommendation #5) Develop a landscaping standard that lists flammable, non-compliant vegetation and landscaping materials, non-flammable drought and pest resistant alternatives, and tips on landscape design to reduce maintenance, watering requirements; to avoid wildlife attractants, and to reduce wildfire	Consider including the landscaping standard as part of the wildfire hazard DPA, as well as making it publicly available for residents outside of the DPA. Refence the made-for-BC FireSmart BC landscaping guidelines.	UTG	3 years	Landscaping standard created (or adopted) and built into the interface wildfire DPA	UTG; UBCM CRI funding is available ($0 if using FireSmart Canada guidelines; ~20

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
		hazards.					hours in-house)
17	High	Engage FLNRORD and TFL44LP (contact listed in Table 18) to discuss avenues for permanent maintenance of the access /egress route to Ehthlateese Village. Include this as a goal within Uchucklesaht Tribe's OCP.	Secure at least two access/egress routes into/out of communities. Ehthlateese Village has secure access/egress via marine transport. The driving route would be a second.	UTG (FLNRORD, TFL44 LP)	5 years	Maintenance agreement for a driving route in/out of Ehthlateese Village completed	UTG (~80 in-house hours)
18	Moderate	OCP: Update Part 4: Land Use, Goals and Policies - Uu-a-thluk/Parks and Natural Spaces so adopted and maintained trails and greenways are considered and protected through a "wildfire lens". Restoration of the landscape and trails within and adjacent to the WUI should be done with a focus on wildfire prevention and reduction.	Trail building and maintenance and park and open space maintenance activities can either increase wildfire risk (through fuels accumulations and unsafe work practices) or decrease wildfire risk (through proper placement, emergency access and evacuation, clean-up of combustible fuels trailside, and work practices).	UTG (Consultant)	5 years	OCP updated	UBCM CRI funding is available

5.4 INTERAGENCY COOPERATION

Identifying and linking stakeholders such as government, private landowners, park and recreation staff/managers, forest land managers, and emergency services can reduce wildfire risk, increase funding opportunities, and allow UTG to obtain valuable local knowledge.

Community FireSmart Resiliency Committee (CFRC)

The CFRC reflects the key planners and responders most involved in local FireSmart, wildfire resiliency planning, and wildfire and emergency response for UTG. It is recommended (and was discussed during project planning meetings) that UTG be represented in the Alberni-Clayoquot Regional District's CFRC, which is planned to be organized and active in 2022. Table 16below details the recommended agencies to be involved, their current representatives and titles, and their anticipated role within the ACRD CFRC.

Table 16: Recommended agencies of the ACRD CFRC, including UTG

Agency	Title	Person[27]	Role	Comments
Uchucklesaht Tribe Government	Resource and Development Manager	Moses Towell	*Primary:* provide data, information, and other relevant plan content; work to determine CWRP actions; conduct outreach with other stakeholders, discuss the plan and receive additional input, and apply for funding.	Implement Uchucklesaht Tribe's CWRP. Provide outreach to and communicate with applicable stakeholders.
	Director of Lands and Resources	Ryan Anaka		
	Funding Specialist	Stephanie Lasuik		
BCWS Coastal Fire Centre	Wildfire Prevention Officer	Tony Botica	*Advisory, support and approval, program development and monitoring:* review and approve funding program (CRI and WRR) applications. Additionally, for potential fuel management activities, provide the technical expertise (proposed treatment areas, prescription review, treatment implementation, and burn plan review).	Centre staff can provide FireSmart subject matter and prevention program and funding program expertise. Reviewing and approving funding program applications by the fire centre is a requirement of the currently available funding streams (CRI and WRR).
BCWS Mid-Island Fire Zone	Wildfire Officer	Joshua Macy	*Advisory and support:* provide local-level fire response knowledge and history and answering operational questions. Assist in a support capacity by providing input and plan review and identifying WRR areas of concern.	Zone staff are considered the local wildfire experts. Zone staff do not approve plans or funding applications nor are they available to manage CRI and WRR programs.

[27]Current person operating in this role at the time this document was written.

Agency	Title	Person[27]	Role	Comments
Alberni-Clayoquot Regional District	Protective Services Manager	Heather Zenner	*Primary:* provide data, information, and other relevant plan content; work to determine ACRD's CWRP actions and how they can be aligned with Uchucklesaht's; conduct outreach with other stakeholders, discuss the plan and receive additional input, and apply for funding.	Implement ACRD's Community Wildfire Resiliency Plan and assist with aligning efforts with Uchucklesaht's CWRP. Provide outreach to and communicate with applicable stakeholders.

Local Stakeholders and Land Managers

TFL44 LP manages a significant portion of the Crown land within Uchucklesaht's WUI. Forestry activities can either increase wildfire risk (through fuels accumulations and unsafe work practices) or decrease wildfire risk (through proper cut-block placement, clean-up of combustible fuels within harvested areas (slash – scattered and pile), and reforestation techniques/planting). Table 17 details TFL44 LP personnel and their roles/title.

Table 17: Local stakeholders and land managers within the WUI to be included in the wildfire, FireSmart, CRI, and WRR activities and communications (as applicable)

Stakeholder or Land Manager	Contact Title	Contact Person
TFL44 LP	Planning Harvest Forester	David Poilievre

Recommendations and action items UTG can implement to continue growing interagency relationships and increase interagency cooperation are listed below in Table 18.

Table 18: Interagency cooperation recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To broaden from a department or agency single jurisdiction-based approach to a risk driven, multi-agency and multi-scalable approach.							
19	High	Participate in ACRD Community FireSmart Resiliency Committee (CFRC) and meetings.	Creates opportunities for synergies and information sharing of wildfire risk reduction activities across jurisdictions.	UTG (ACRD + agencies)	Ongoing	Continued participation	UTG (cost togovernment ~$300/yr)
20	High	Engage and work with surrounding forest licensees (i.e., TFL44 LP) to: 1) Identify the parts of TFL 44 that are in the WUI and what goals would be for this zone regarding harvesting, post-harvest debris disposal, and reforestation prescriptions so that both harvesting operations and the future forest stand maintain or enhance wildfire resiliency. 2) Ensure that high-risk activities, such as vegetation management, pile burning, and harvesting do not occur during high/extreme fire danger times. Lobby for adequate fire suppression tools (as per the Wildfire Act and regulations) being on-site during high-risk activities.	1) Reduce interface wildfire risk throughout managed forest lands that are closest to structures in the WUI. Consider involving BCWS Mid-Island Zone and FLNRORD personnel in discussions and planning. 2) Reduce the chance of fire ignitions as per the *Wildfire Act* and reduce spread potential during an ignition event.	1) UTG (FLNRORD, Stakeholders, Consultant) 2) Stakeholders	5 years	1) Discussions and planning initiated 2) High-risk activities not conducted during high/extreme fire danger	1) UTG (cost to government) 2) Cost of equipment paid by stakeholder
21	High	Continue to promote right-of-way best management practices (BMPs) for regular brushing and clearing of woody debris and shrubs in coordination with BC Hydro to help reduce fire risk, utility pole damage, and subsequent outages.	Tree failures adjacent to power lines are common occurrences and represent significant risks to ignition within the WUI.	UTG (BC Hydro)	5 years	BMPs in use for the region	UBCM CRI funding is available (~30 hours in-house)

5.5 CROSS-TRAINING

All staff who are expected to participate in the development and implementation of this plan, or participate in wildfire response and recovery, should be appropriately trained. There is no fire department nor formally trained structural or wildfire fighting personnel in Ehthlateese Village. UTG has stated that this is due mostly to a lack of able-bodied persons available to do so.[28] UTG's goal within the next year is to have some residents and staff trained in exterior structural firefighting. An additional goal is to have all residents aware of how to use the firefighting equipment cached in the community.[28]

Response training opportunities for UTG staff and residents include:

- Basic Wildland Fire Suppression and Safety
- Incident Command System
- Post wildfire reclamation and recovery
- Post wildfire structure damage assessment
- BC Structure Protection Program- S115

BCWS Mid-Island Fire Zone has stated that they are very open to any form of cross-training with UTG, including on-site training in Ehthlateese Village.[29]In-person cross-training is important as residents have knowledge of community water systems and suppression equipment that would likely be used by BCWS in an emergency.

In fall 2021, UTG recently participated in a wildfire tabletop exercise with the ACRD and associated regional partners. UTG should look to continue participating in these and similar regional simulation exercises as they create valuable cross-training opportunities across agencies, governments, and jurisdictions.

FireSmart specific training is an excellent way to promote and enhance FireSmart education and outreach amongst UTG and its citizens. FireSmart training opportunities include:

- Local FireSmart Representative (LFR) Training:
    - Its purpose is to assist neighbourhood leaders and fire professionals to implement the FireSmart Canada Neighbourhood Recognition Program.
- FireSmart Community Champion Training:
    - Conducted by LFRs, its purpose is to prepare community champions (neighbourhood leaders) to take the initiative to begin the formal process of attaining FireSmart Community recognition status.
    - Half-day workshop with materials and a syllabus available through FireSmart Canada.
- The FireSmart Home Partners Mitigation Specialist Training:

[28]Information shared via information gathering questionnaire sent/received to UTG in September 2021.
[29]Information shared via information gathering questionnaire sent/received to BCWS MIFZ in September 2021.

- Part of the FireSmart Home Partners Program, its purpose is to engage homeowners in voluntary wildfire mitigation activities by offering a professional home assessment and property-specific recommendations.
- Assessments are conducted by trained/qualified fire service professionals.
- Training is a combination of online and a one-day in-person practical course.

Recommendations and action items UTG can implement to create and grow cross-training opportunities are listed below in Table 19.

Table 19: Cross-training recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To support the development of comprehensive and effective wildfire risk reduction planning and activities, as well as a safe and effective response.							
22	High	Provide Incident Command System Training to those UTG personnel most directly involved in managing and coordinating emergency response.	Increase UTG's ability to plan and provide appropriate and timely responses in emergency situations.	UTG	2 years	At least one UTG personnel trained	UTG (cost to government)
23	High	UTG should reach out to BCWS Mid-Island Fire Zone for cross-training opportunities to: 1) plan and conduct Wildfire Wildland type-S100 training to UTG personnel and Ehthlateese Village residents, and 2) assess and provide recommendations towards increasing wildfire fighting capabilities.	Increase the wildfire emergency preparedness of UTG personnel and Ehthlateese Village residents and residents' ability to protect themselves from wildfire.	UTG (BCWS)	3 years, then ongoing	UTG and Ehthlateese Village has persons trained in S-100 Some basic wildfire fighting equipment available in Ehthlateese Village, Green Cove, and Seekah Landing	UBCM CRI funding is available for wildfire courses (~$2000/16 hrs. per person)
24	High	UTG should continue to participate in ACRD (and other regional) wildfire and emergency preparedness/response tabletop exercises.	Simulation exercises create valuable cross-training opportunities across agencies, governments, and jurisdictions.	UTG (participating agencies, governments, etc.)	Ongoing (yearly at minimum)	One regional wildfire (or other emergency) tabletop exercise participated in each year	UTG (cost to government ~$1,000/yr)
25	1) High 2) High	UTG should facilitate… 1) Local FireSmart Representative (LFR) Training, 2) FireSmart Community Champion Training … opportunities for applicable UTG emergency management personnel and Ehthlateese Village residents.	Increase UTG and Ehthlateese Village residents' capabilities to provide FireSmart knowledge, programs, and resources to the community.	UTG (FireSmart Canada)	3 years	1 LFR within 1 year 1 FireSmart Home Partners Mitigation Specialist within 3 years	UBCM CRI funding is available (~$2000/16 hrs per person)

5.6 EMERGENCY PLANNING

When several wildfire emergencies are taking place throughout the province, BCWS resource availability may become scarce. Deployment of provincial resources occurs based on the Provincial Coordination Plan for Wildland Urban Interface Fires.[30]Therefore, government wildfire preparedness and resource availability are critical components of community wildfire resilience– individuals and agencies need to be ready to act. UTG has newly updated emergency plans and existing wildfire response agreements with BCWS.

Pre-Incident Planning

A pre-incident plan is a compilation of essential fire management information needed to save valuable time during fire suppression operations. During a busy wildfire season provincial resources are stretched thin, and any information that local governments can provide to BCWS crews is helpful. A pre-incident plan should be developed and tested using tabletop simulations, and if necessary, revised prior to every fire season. BCWS should be involved in this process to ensure that any mapping done as part of the Fire Management Planning process is not unnecessarily duplicated. These plans and maps (some of which are wholly or partially developed as part of this document) should consider at a minimum:[31]

- **Command:** Authority, constraints, structural protection needs, management constraints, etc.
- **Operations:** Helicopter base locations, flight routes, restrictions, and water intakes, fire control line locations and natural barriers, crew/personnel safety zones and staging locations, fuel caches, etc.
- **Logistics:** Base camp locations, roads and trails, utilities (CI), communications.
- **Planning:** Maps (Village structures, vegetation and fuel, hazards, critical infrastructure, archaeology and environmentally sensitive areas, water sources, access/egress, etc.).

UTG is currently working on a partnership with ACRD to apply for grant funding to conduct extensive evacuation route planning. Evacuation routes should be considered through a wildfire lens, and once determined, UTG should advocate for road-side fuel treatments/buffers of these routes.

Wildfire Preparedness Condition Level

As part of the pre-incident planning, UTG should consider developing local daily action guidelines based on expected wildfire conditions. Table 20 below provides a template that can be tailored specifically to UTG, outlining actions staff can take as fire danger levels change throughout the year (but mostly through the fire season).[32] Year-round, the fire danger signs posted at entrances to Uchucklesaht Tribe's Treaty Settlement Lands and Ehthlateese Village should be updated to reflect the current fire danger.

[30] Provincial Coordination Plan for Wildland Urban Interface Fires. 2016. Retrieved from: 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

[31] CRI FCSF 2021 CWRP supplemental instruction guide

[32] CRI FCSF 2021 CWRP supplemental instruction guide

Table 20: Example of a Wildfire Response Preparedness Condition Guide

FIRE DANGER LEVEL	ACTION GUIDELINES
LOW	• All UTG staff on normal shifts. • Direct citizens to BCWS (or UTG updated FireSmart/Wildfire webpage) for fire danger rating info.
MODERATE	• All UTG staff on normal shifts. • Information gathering and dissemination through ACRD's CFRC. • Regional fire situation evaluated. • Rain profile for assessment after lightning storms. • Direct citizens to BCWS (or UTG updated FireSmart/Wildfire webpage) for fire danger rating info.
HIGH	• All UTG staff on normal shifts. • Regional fire situation evaluated. • Direct citizens to BCWS (or UTG updated FireSmart/Wildfire webpage) for fire danger rating info. • UTG and EOC staff notified of Fire Danger Level. • Establish weekly communications with ACRD CFRC. • Rain profile for assessment after lightning storms. • Emergency evacuation boats docked at Ehthlateese Village dock. • Initiate park/campsite closures to align (or exceed) with the regional situation.
EXTREME	• Rain profile for assessment after lightning storms. • Detection patrols conducted as required. • Direct citizens to BCWS (or UTG updated FireSmart/Wildfire webpage) for fire danger rating info. • Regional fire situation evaluated. • UTG and EOC staff considered for activation level 1 standby. • Wildfire trained citizens considered for stand-by status. • EOC - support staff, a water tender, heavy machinery operators, and arborists may be considered for standby/extended shifts. • Provide regular updates to UTG media, websites, Ehthlateese Village staff/residents on the fire situations. • Provide updates as information changes. • Emergency evacuation boats docked at Ehthlateese Village dock.
FIRE(S) ONGOING	• All conditions apply as for Extreme (regardless of actual fire danger rating). • Mobilize EOC support if evacuation is possible, or fire event requires additional support. • Mobilize Wildfire Incident Command Team. • Implement Evacuation Alerts and Orders based on fire behaviour prediction and under the direction of the EOC or BCWS. • Provide regular updates to UTG media, websites, Ehthlateese Village staff/residents on the fire situations. • Emergency evacuation boats docked at Ehthlateese Village dock.

Mutual Aid Partners

Wildfire response agreements are in place between BCWS and Indigenous Services Canada (ISC) relating to Ehthlateese Village specifically. There is also a Wildfire Response Agreement (WRA) between BCWS and the Maa-nulth treaty members that speaks to the treaty lands as a whole.

Firefighting Resources

Table 21summarizes the available firefighting resources to fire response-trained staff and residents at Ehthlateese Village. The current available firefighting equipment is tailored towards structural firefighting (an example of the toolboxes at each hydrant are shown in Figure 5), with no wildfire fighting specific equipment available at Ehthlateese Village, Green Cove, nor Seekah Landing.

Table 21: Available firefighting resources at Ehthlateese Village

Location	Number of Hydrants (with Toolboxes)	Apparatus Type in Each
Ehthlateese Village	5	Hydrant hose-line
		Hydrant tools
		Spray nozzles
		Hose-line splitter

Figure 5: Firefighting toolboxes in Ehthlateese Village

UTG should work with BCWS to identify any gaps in firefighting resources. It is recommended that the community can deliver water to forested lands adjacent to the community. UTG should regularly evaluate the need for more equipment and training. Recommendations and action items to grow and support emergency planning for UTG are detailed below in Table 22.

Table 22: Emergency preparedness recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To create specific wildfire response pre-incident plans so those responding to a wildfire emergency know who is available to help with what and when, and to improve UTG's ability to respond to (during and after) a wildfire emergency.							
26	High	Engage with BCWS to: 1) Determine what PPE and wildland equipment resources should be acquired for Ehthlateese Village, Green Cove, and Seekah Landing. 2) Train staff and citizens on how to use the equipment.	1) Provide Ehthlateese Village, Green Cove, and Seekah Landing the means to protect structure and life from wildfire. 2) Additionally, maintain an annual structural and interface training and equipment review program with BCWS.	UTG (BCWS)	Yearly (pre-fire season)	Wildland firefighting equipment resources are complete and training for Ehthlateese Village residents – 5 years	UTG (time and cost dependent amount of equipment purchased and regularity of training)
27	High	Conduct yearly (pre-fire season is best) response exercises with Ehthlateese Village. Identify hazards, barriers to access (i.e., locked gates, tight or no turnarounds), and other response issues and develop measures to address them.	Consider adding this into an all-hazards response exercise day for maximum participation. Test the Evacuation Plan for Ehthlateese Village during these exercises.	UTG (BCWS, Coast Guard, etc.)	Yearly (pre-fire season)	Response exercises conducted at least once every two years	UTG (40 planning hours; 8 person-hours per exercise)
28	High	Update UTG's HRVA and emergency management plan with information and data from this CWRP. Develop wildfire-specific incident plans and associated maps. Incorporate items listed in the Pre-Incident Planning subsection above. Local Fire Threat and stakeholders'/tenure holder's contact information should be incorporated within the map. The map should be included in the UTG's Evacuation Plan and shared with fire suppression personnel, BCWS, and industrial operators (TFL44 LP) to support emergency response in the event of a wildfire. The map should be reviewed as needed to incorporate additions and/or changes.	Wildfire incident plans and maps will support emergency response in the event of a wildfire and/or evacuation event. These plans help target emergency planning and effort in meaningful and effective ways, such as knowing where fire guards can/can't be built, as well as minimizing the need for using machinery to build cat guards in sensitive areas.	UTG (Consultant, BCWS, ACRD, stakeholders)	5 years	Wildfire incident plans and associated maps were created and made available	UTG (Cost to government. 12 planning hours and ~$8,000 contracted service)

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
29	High	Ehthlateese Village's mobile EOC[33](CI) does not have a backup power source (*i.e.,* gas- or diesel-powered generators). Invest in secondary power sources to continue this service in the case of a prolonged or extensive power outage as a result of a wildfire (or another emergency). Upgrade or realign resources, as prioritized.	Ensure that backup gas or diesel generators have sufficient fuel supply for extensive power outages (3 + days) so that they can continue to function as required in the event of an emergency.	UTG	5 years	All CI have backup power sources	Uchucklesaht (~$30,000 per CI - depending on requirements)
30	Moderate	Develop an outreach document for Green Cove and Seekah Landing that outlines emergency fuel/propane shut off best-practices to enact in the event of an approaching wildfire or ember shower. Consider contacting the Emergency Management BC Regional Office for guidance.	Provide remote structures and CI with hazardous infrastructure resources/procedures to reduce hazards during a wildfire event.	UTG	5 years	Document created and distributed	UBCM CRI funding is available (~40 hours in-house; $3000 contracted service)

[33] UTG has current plans to outfit the EOC with a Tsunami Alert System and a generator that can run both in the event of a power outage.

5.7 VEGETATION MANAGEMENT

As discussed in Section4.1, fuel is the only aspect of the fire behavior triangle that can be modified to reduce wildfire threat. Fuel or vegetation management reduces potential wildfire intensity and ember exposure to people, structures, and other values through manipulation of both natural and cultivated vegetation within or adjacent to a community. A well-planned vegetation management strategy can greatly increase fire suppression effectiveness and reduce damage to property and values. Three main zones are discussed to appropriately scale and plan vegetation management activities across the WUI landscape (see Appendix A-2: Proximity of Fuel to the Community for expanded descriptions and information):

1) the Home and Critical Infrastructure Ignition Zone (HIZ/CIIZ),
2) the Community Zone; and
3) the Landscape Zone.

Vegetation management can largely be accomplished through two different activities:

Residential-Scale FireSmart Landscaping

Residential FireSmart landscaping refers to the removal, reduction, or conversion of flammable [landscaping] plants to create more fire-resistant areas in the FireSmart Noncombustible Zone and Priority Zones 1, 2 and 3. This is called the Home (or Structure) Ignition Zone (Figure 6).

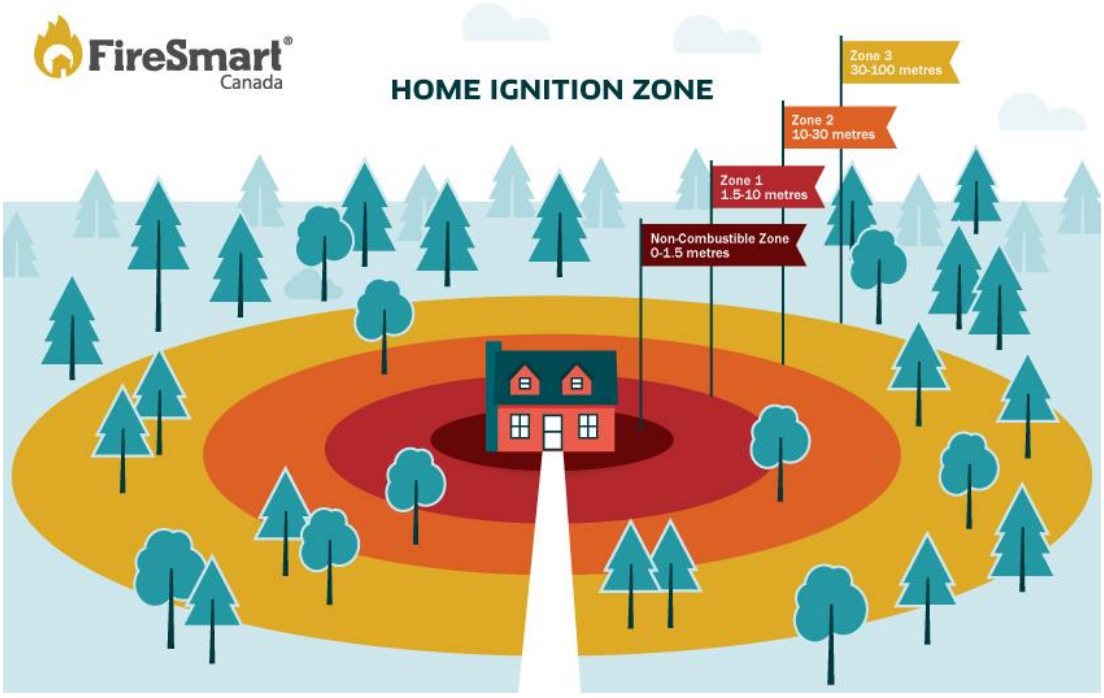


Figure 6: FireSmart home and critical infrastructure ignition zone

It has been found that during extreme wildfire events, most home destruction has been a result of low-intensity surface fire flame exposures, usually ignited by embers. Firebrands can be transported long

distances ahead of the wildfire, across fire guards and fuel breaks, and accumulate within the Structure Ignition Zone (0 – 100 m) in densities that can exceed 600 embers per square meter. Combustible materials found within the Structure Ignition Zone combine to provide fire pathways allowing spot surface fires ignited by embers to spread and carry flames or smoldering fire into contact with structures. Because ignitability of the Structure Ignition Zone is the main factor driving structure loss, the intensity and rate of spread of wildland fires beyond the community has not been found to necessarily correspond to loss potential. For example, FireSmart homes with low ignitability may survive high-intensity fires, whereas highly ignitable homes may be destroyed during lower intensity surface fire events.[34]

It was noted during field visits that compliance to FireSmart vegetation management in the Non-Combustible Zone (0 – 1.5 m) was generally moderate, but FireSmart compliance in the rest of the Structure Ignition Zone was generally poor and management actions should be considered. UTG should assist Ehthlateese Village residents (and plan for at Green Cove and Seekah Landing) in conforming with FireSmart vegetation management principles at both the individual home and community level. This could be implemented by providing vegetation disposal for residents (pre-fire season is best), thus ensuring the work gets completed.[35]

Fuel Management Treatments

Fuel management refers to the manipulation or reduction of living or dead wildland forest and grassland fuels to reduce the rate of spread and head fire intensity and enhance likelihood of successful suppression. Fuel management treatments in the community and landscape should also be considered to further reduce wildfire risk to the community as well as the potential for fire transmission into adjacent forested Uchucklesaht Tribe's Treaty Settlement Lands and Crown land.

Fuel treatment opportunities may be a linear fuel break (minimum of 1 km) or polygon treatments for discrete areas. The intent of establishing fuel treatments is to modify fire behaviour. They should be designed to keep surface fires on the ground to avoid them becoming more dangerous crown fires. Fuel treatments also provide anchor points to fire-fighting crews for suppression activities.[36] The application of appropriate suppression tactics in a timely manner with sufficient resources is essential for fuel treatments to be effective. To increase the efficacy of fuel treatments, FireSmart standards should be applied to structures and associated vegetation and other fuel to reduce the risk of structures igniting. Fuel treatment units require periodic maintenance to retain their effectiveness.

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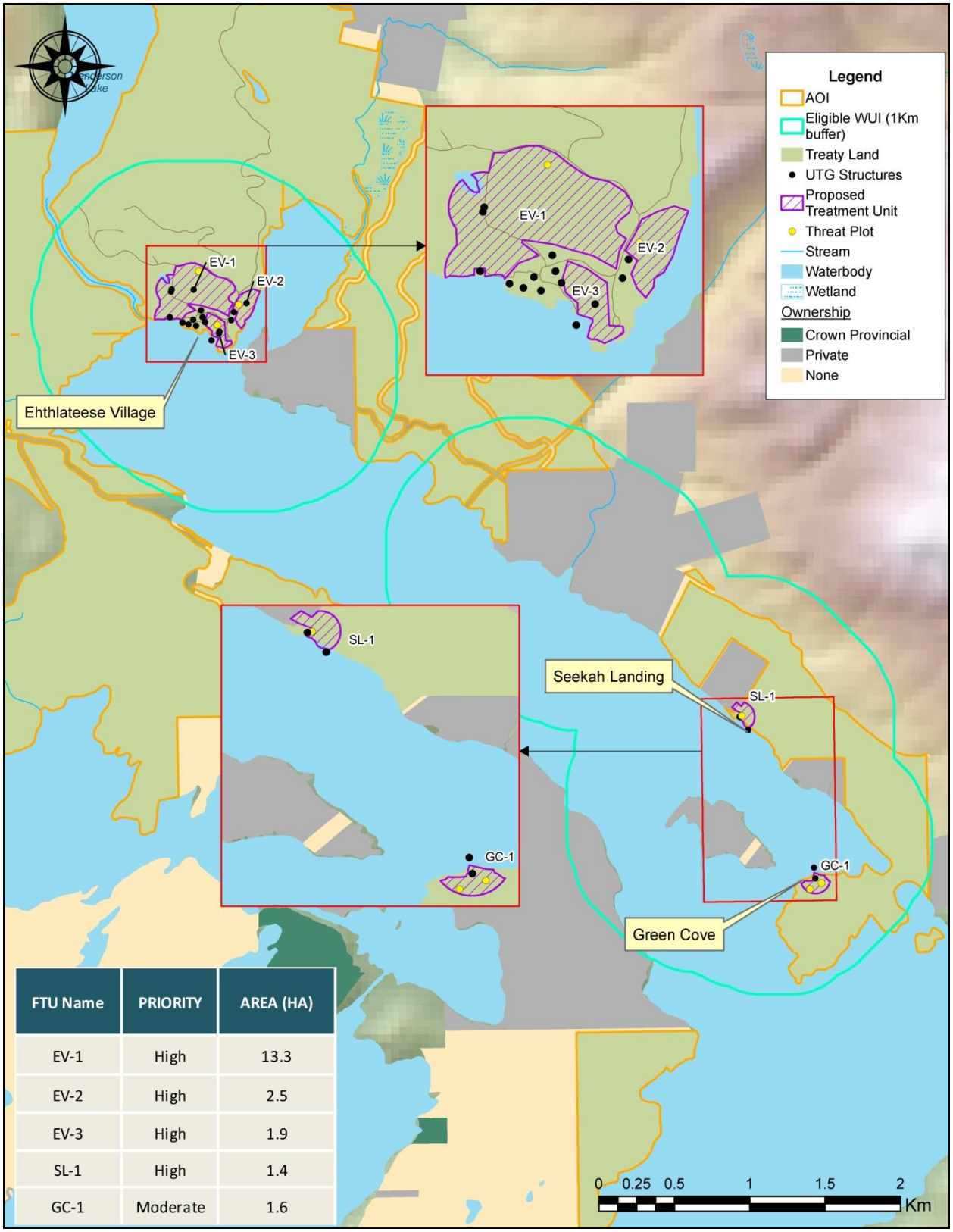
[34]Calkin, D., J. Cohen, M. Finney, M. Thompson. 2014. *How risk management can prevent future wildfire disasters in the wildland-urban interface*. Proc Natl Acad Sci U.S.A. Jan 14; 111(2): 746-751. Accessed online 1 June, 2016 at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3896199/.

[35] Uchucklesaht recently (2021) applied for FireSmart funding to plan and complete fuel reduction treatments within the Home and Critical Infrastructure Ignition Zones 1 and 2 of Ehthlateese Village, Green Cove, Seekah Landing, and Henderson Lake Lodge. Results of the application have not been received yet.

[36] BC Wildfire Service. 2020. 2020 Fuel Management Prescription Guidance. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/fuels-management/2020_fuel_management_prescription_guidance_final.pdf

Multiple proposed fuel treatment units (PTUs), all on Uchucklesaht Tribe's Treaty Settlement Lands, have been proposed both inside and outside of the Ignition Zone of community structures. The treatment units are described in Table 23 and shown on Map 7. Priority rankings have been given based on the Wildfire Risk Assessment completed in Section 4.



FTU Name	PRIORITY	AREA (HA)
EV-1	High	13.3
EV-2	High	2.5
EV-3	High	1.9
SL-1	High	1.4
GC-1	Moderate	1.6

Map 7: Uchucklesaht CWRP Proposed Fuel Treatment Units

Table 23: Summary of Proposed Fuel Treatment Units

FTU Name (Location)	Total Area (ha)	Treatment Unit Location / Type	Priority	Wildfire Behavior Threat (ha)			Overlapping Values / Treatment Constraints	Treatment Rationale
				Extreme + High	Mod.	Low		
EV-1 (Ehthlateese Village)	13.3	HIZ/CIIZ and Community Zone Polygon Treatment Unit	High	0.0	13.2	0.1	Southeast corner of the TU abuts the Ehthlateese Village septic field.	This unit is composed almost entirely of C-5 fuel type surrounding the north and west edges of Ehthlateese Village's WUI. It is a mature, multi-layered stand with a mixed deciduous and conifer understory. Conifers have low Crown base heights and dead branches creating ladder fuel continuity, and there is high surface fuel loading present. Treatment should focus on thinning understory conifers, pruning conifers to at least 2m height, and reducing surface fuel loads. This will reduce local fire threat, reduce the chance of a structure fire entering into the landscape, and help restore natural disturbance fire event cycles and ecological habitat.
EV-2 (Ehthlateese Village)	2.5	HIZ/CIIZ and Community Zone Polygon Treatment Unit	High	0.0	2.4	0.0	South edge borders homes and the Ehthlateese Village BC Hydro generating station.	This unit is composed almost entirely of C-5 fuel type on the east edges of Ehthlateese Village's WUI. It is a mature, multi-layered stand with a mostly deciduous shrub understory. High surface fuel loading present. Hemlock mistletoe infection is heavy on most mature western hemlocks in the stand, creating branch brooms that ultimately add to surface fuel loads as well as creating weakened trees. Treatment should focus on thinning understory conifers, reducing surface fuel loads, and removing the most affected mistletoe broomed hemlocks. This will reduce local fire threat, reduce the chance of a structure fire entering into the landscape, and help restore natural disturbance fire event cycles and ecological habitat.
EV-3 (Ehthlateese Village)	1.9	HIZ/CIIZ Polygon Treatment Unit	High	1.9	0.0	0.1	Ehthlateese Village homes are within the TU. Overhead power lines are adjacent to its north edge.	This unit is composed almost entirely of C-5 fuel type within Ehthlateese Village's WUI. It is a mature, multi-layered stand with a mixed deciduous shrub/conifer regen understory. Moderate surface fuel loading present.

FTU Name (Location)	Total Area (ha)	Treatment Unit Location / Type	Priority	Wildfire Behavior Threat (ha)			Overlapping Values / Treatment Constraints	Treatment Rationale
				Extreme + High	Mod.	Low		
								Treatment should focus on thinning understory conifers and reducing surface fuel loads. This will reduce local fire threat, create a barrier for structure-to-structure fire ignition, and help restore natural disturbance fire event cycles and ecological habitat.
SL-1 (Seekah Landing)	1.4	HIZ/CIIZ Polygon Treatment Unit	High	0.0	1.3	0.1	Private property (with a cabin) abuts the TU's west edge. The Seekah Landing cabin is within the TU. Boat access only.	This unit is composed almost entirely of C-5 fuel type on the north and east edges of Seekah Landing's WUI. It is a mature, multi-layered stand with a mixed deciduous and conifer understory. Conifers have low Crown base heights and dead branches creating ladder fuel continuity. Moderate surface fuel loading present. Treatment should focus on thinning understory conifers and pruning conifers to at least 2m height. This will reduce local fire threat, reduce the chance of a structure fire entering into the landscape, and help restore natural disturbance fire event cycles and ecological habitat.
GC-1 (Green Cove)	1.6	HIZ/CIIZ Polygon Treatment Unit	Moderate	0.0	1.3	0.2	The Green Cove store/building is on the north edge of the TU. Boat access only.	This unit is composed of bothC-3 and C-5 fuel types on the south and edge of Green Cove's WUI. It is a mature stand with conifer understory of which many stems are dead. High surface fuel loading present. Treatment should focus on removing all dead stems, thinning understory conifers, and reducing surface fuel loads. This will reduce local fire threat, reduce the chance of a structure fire entering into the landscape, and help restore natural disturbance fire event cycles and ecological habitat.

Recommendations and action items for FireSmart vegetation management and practices within the WUI and associated Home and Critical Infrastructure Ignition Zones and Community Zones are provided below in Table 24.

Table 24: Vegetation management recommendations and action items

Item #	Priority	Recommendation / Next Steps	Comments	Lead (Involved)	Timeframe	Metric for Success	Funding Source / Est. Cost ($) or Person Hours
Objective: To reduce the potential wildfire intensity and ember exposure to people, infrastructure, structures, and other values through manipulation of both the natural and cultivated vegetation that is within or adjacent to a community.							
31	High	Proceed with detailed assessment, prescription development, and treatment of fuel treatment units identified and prioritized in this CWRP.	If Uchucklesaht's FireSmart fuel management funding application is successful, proceed with that first. When completed, proceed with this recommendation, planning and implementing fuel treatment work in the remaining untreated areas of the fuel treatment units.	UTG (Consultant)	5 years	Prescriptions for high priority units developed for all units. Treatment completed for units within the Home and Critical Infrastructure Ignition Zone	UBCM CRI funding is available (~$700/ha prescription; ~$9500/ha treatment)
32	High	Where operational fuel treatments are conducted, treatment monitoring 5-10 years afterwards should be completed by a qualified professional. This can be completed with a CWRP update or as a stand-alone exercise.	To assess the efficacy of the treatment and schedule maintenance activities. It is cheaper to perform maintenance early when conifer regeneration is small and fuel loading amounts are low.	UTG (Consultant)	Maximum 10 years post-treatment	All completed fuel treatments are reassessed 5-10 years after treatment.	UBCM CRI funding is available (~150/ha for assessment)
33	Moderate	As part of fuel treatment implementation, UTG should develop interpretive signage to explain and describe pre- and post-fuel treatment forest stand conditions.	Increase citizen awareness and support of fuel management practices.	UTG	1-year post-treatment of an EV-# PTU	Signs placed in one EV-# PTU	UBCM CRI funding is available (~$750/sign)
34	Low	Uchucklesaht's trained Local FireSmart Representatives (LFRs) should assist Ehthlateese Village residents in complying with FireSmart vegetation management principles at both the home and community level.	Increase wildfire resiliency throughout Ehthlateese Village by collectively FireSmarting homes.	UTG (LFR's – when completed training)	5years, and then ongoing.	LFR's in Ehthlateese Village and are active in promoting FireSmart	UTG (~$500 per home)

SECTION 6: APPENDICES

6.1 APPENDIX A: LOCAL WILDFIRE RISK PROCESS

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

1. Fuel type attribute assessment, ground-truthing/verification and updating as required to develop a local fuel type map (Appendix A-1: Fire Risk Threat Assessment Methodology).
2. Consideration of the proximity of fuel to the community, recognizing that fuel closest to the community usually represents the highest hazard (Appendix A-2: Proximity of Fuel to the Community).
3. Analysis of predominant summer fire spread patterns using wind speed and wind direction during the peak burning period using ISI Rose(s) from BCWS weather station(s) (Appendix A-3: Fire Spread Patterns). Wind speed, wind direction, and fine fuel moisture conditions influence wildfire trajectory and rate of spread.
4. Consideration of topography in relation to values. Slope percentage and slope position of the value are considered, where slope percentage influences the fire's trajectory and rate of spread and slope position relates to the ability of a fire to gain momentum uphill.
5. Stratification of the WUI based on relative wildfire risk, considering all the above.
6. Consider other local factors (i.e., previous mitigation efforts, and local knowledge regarding hazardous or vulnerable areas).
7. Identify priority wildfire risk areas for field assessment.

The basis for the prioritization of field assessment locations is further detailed in Appendix H: Fire Risk Threat Assessment Methodology. Wildfire Risk Assessment plot worksheets are provided in Appendix C: Wildfire Risk Assessment – Worksheets and Photos(under separate cover), plot locations are summarized in Appendix F: WUI Threat Plot Locations, and the field data collection and spatial analysis methodology is detailed in Appendix H: Fire Risk Threat Assessment Methodology.

6.1.1 APPENDIX A-1: FIRE RISK THREAT ASSESSMENT METHODOLOGY

The Canadian Forest Fire Behaviour Prediction (FBP) System outlines five major fuel groups and sixteen fuel types based on characteristic fire behaviour under defined conditions.[37] Fuel typing is recognized as a blend of art and science. Although a subjective process, the most appropriate fuel type was assigned based on research, experience, and practical knowledge; this system has been used within BC, with continual improvement and refinement, for 20 years.[38] It should be noted that there are significant limitations with the fuel typing system which should be recognized. Major limitations include a fuel typing system designed to describe fuels that sometimes do not occur within the WUI, fuel types which cannot accurately capture the natural variability within a polygon, and limitations in the data used to

[37]Forestry Canada Fire Danger Group. 1992. Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.

[38]Perrakis, D.B., Eade G., and Hicks, D. 2018. Natural Resources Canada. Canadian Forest Service. *British Columbia Wildfire Fuel Typing and Fuel Type Layer Description* 2018 Version.

create initial fuel types.[38] Details regarding fuel typing methodology and limitations are found in Appendix G: Fuel Typing Methodology and Limitations. There are several implications of the aforementioned limitations, which include: fuel typing further from the developed areas of the study has lower confidence, generally; and fuel typing should be used as a starting point for more detailed assessments and as an indicator of overall wildfire risk, not as an operational, or site-level, assessment.

Table 25summarizes the fuel types by general fire behaviour (Crown fire and spotting potential). In general, the fuel type that may be considered hazardous in terms of fire behaviour and spotting potential in the WUI are C-3 and S-3, particularly if there are large amounts of woody fuel accumulations or denser understory ingrowth. C-5 fuel types have a moderate potential for active Crown fire when wind-driven.[38] An M-1/2 fuel type can sometimes be considered hazardous, depending on the proportion of conifers within the forest stand; conifer fuels include those in the overstory, as well as those in the understory. An O-1b fuel type often can support a rapidly spreading grass or surface fire capable of damage or destruction of property, and jeopardizing human life, although it is recognized as a highly variable fuel type dependent upon the level of curing. These fuel types were used to guide the threat assessment.

Forested ecosystems are dynamic and change over time: fuels accumulate, stands fill in with regeneration, and forest health outbreaks occur. Regular monitoring of fuel types and wildfire risk assessment should occur every 5 – 10 years to determine the need for threat assessment updates and the timing for their implementation.

Table 25. Fuel Type Categories and Crown Fire Spot Potential. Only summaries of fuel types encountered within the WUI are provided (as such, other fuel types, i.e., C-1, C-2, C-4, C-7, S-1, and S-2 are not summarized below).

Fuel Type	FBP / CFDDRS Description	WUI Description	Wildfire Behaviour Under High Wildfire Danger Level	Fuel Type – Crown Fire / Spotting Potential
C-3	Mature jack or lodgepole pine	Fully stocked, late young forest (Douglas fir, hemlock, cedar), with Crowns separated from the ground.	Surface and Crown fire, low to very high fire intensity and rate of spread.	Moderate
C-5	Ponderosa pine and Douglas-fir	Well-stocked mature forest, Crowns separated from ground. Moderate understory herbs and shrubs. Little grass or surface fuel accumulation. Typically, undisturbed or selectively harvested forests.	Moderate potential for active Crown fire in wind-driven conditions. Under drought conditions, fuel consumption and fire intensity can be higher due to dead woody fuels	Low
O-1a/b	Grass	Matted and standing grass communities; sparse or scattered shrubs, trees and down woody debris. Seasonal wetlands that have the potential to cure.	Rapidly spreading, high-intensity surface fire when cured	Low
M-1/2	Boreal mixed wood (leafless and green)	A moderately well-stocked mixed stand of conifers and deciduous species, low to moderate dead, down woody fuels; areas harvested 10-20 years ago	Surface fire spread, torching of individual trees and intermittent Crowning, (depending on slope and percent conifer)	<26% conifer (Very Low); 26-49% Conifer (Low); >50% Conifer (Moderate)
D-1/2	Aspen (leafless and green)	Deciduous stands.	Always a surface fire, low to moderate rate of spread and fire intensity	Low
S-3	Coastal Cedar-Hemlock-Douglas-Fir Slash	Slash resulting from clear-cut logging. Slash is typically one season old, with the cedar component retaining all its foliage in a cured condition on the branches, whereas the hemlock and Douglas-fir components will have dropped up to 50% of their foliage. Very large loadings of broken and rotten unmerchantable material may be present. Slash fuel depths may range from 0.5 to 2.0 m.	Moderate to high rate of spread and high to very high-intensity surface fire	Crown fire: Low Spotting potential: High
W	N/A	Water	N/A	N/A
N	N/A	Non-fuel: irrigated agricultural fields, golf courses, alpine areas void or nearly void of vegetation, urban or developed areas void or nearly void of forested vegetation.	N/A	N/A

During field visits, recurring patterns of fuel type errors were found in the provincial dataset. They were:

- C-3 fuel types being incorrectly identified by the PSTA as C-5,
- S-3 fuel types being incorrectly identified by the PSTA as C-5 (from recent harvesting), and
- C-5 fuel types being incorrectly identified by the PSTA as D-1/2.

All fuel type updates were approved by BCWS, using stand and fuel descriptions and photo documentation for the review process (see Appendix B: Wildfire Risk Assessment – FBP Fuel Type Change Rationale for submitted fuel type change rationales). The resulting updated fuel types were shown earlier on Map 3.

6.1.2 APPENDIX A-2: PROXIMITY OF FUEL TO THE COMMUNITY

Home and Critical Infrastructure Ignition Zones

Multiple studies have shown that the principal factors regarding home and structure loss to wildfire are the structure's characteristics and immediate surroundings. The area that determines the ignition potential of a structure to wildfire is referred to as (for residences) the Home Ignition Zone (HIZ) or (for critical infrastructure) the Critical Infrastructure Ignition Zone (CIIZ).[39,40] Both the HIZ and CIIZ include the structure itself and four concentric, progressively wider Priority Zones out to 100 m from the structure (Figure 7 below). More details on priority zones can be found in the FireSmart Manual.[41]

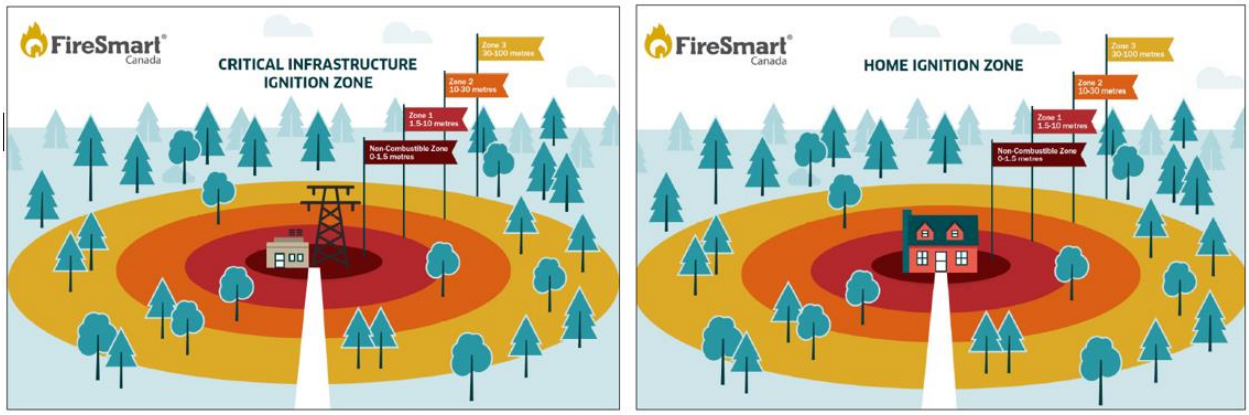


Figure 7: FireSmart Home and Critical Infrastructure Ignition Zone (HIZ, CIIZ)

Because ignitability of the HIZ/CIIZ is the main factor driving structure loss, the intensity and rate of spread of wildland fires beyond the community have not been found to necessarily correspond to loss potential. For example, FireSmart homes with low ignitability may survive high-intensity fires, whereas highly ignitable homes may be destroyed during lower-intensity surface fire events.[40] Increasing ignition resistance would reduce the number of homes simultaneously on fire; extreme wildfire conditions do not necessarily result in WUI fire disasters.[42] It is for this reason that the key to reducing WUI fire structure loss is to reduce structure ignitability. Mitigation responsibility must be centred on the

[39] Reinhardt, E., R. Keane, D. Calkin, J. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management 256:1997 - 2006.
[40] Cohen, J. Preventing Disaster Home Ignitability in the Wildland-urban Interface. Journal of Forestry. p 15 - 21.
[41] https://firesmartcanada.ca/ and https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/firesmart
[42] Calkin, D., J. Cohen, M. Finney, M. Thompson. 2014. *How risk management can prevent future wildfire disasters in the wildland-urban interface*. Proc Natl Acad Sci U.S.A. Jan 14; 111(2): 746-751. Accessed online 1 June, 2016 at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3896199/.

residents. Risk communication, education on the range of available activities, and prioritization of activities should help homeowners to feel empowered to complete simple risk reduction activities on their property.

Community Zone

Vegetation management in the Community Zone encompasses all Uchucklesaht Treaty Land typically beyond 30 metres from homes and structures.[43] Vegetation management planning and implementation on most Community Zone lands should be directed through a formal fuel management prescription developed by a forest professional with wildfire vegetation management within their scope of practice.[43] Depending on the results of FireSmart Structure Ignition Zone assessments on individual structures, vegetation management may be required out beyond 30 metres and up to 100 metres (FireSmart Priority Zone 3) on larger private parcels.[43] Many Community Zone open spaces/lands are often associated with high use by citizens thus increasing accidental ignition potential and the wildfire risk to critical infrastructure and homes surrounding them.

Landscape Zone

The Landscape Zone encompasses provincial Crown lands that are located outside Uchucklesaht Treaty Land. Vegetation (fuel) management planning and implementation is primarily the responsibility of the provincial government, working collaboratively to align landscape objectives with the CWRP objectives[43]. Vegetation management planning and implementation in the Landscape Zone and on all forested provincial Crown lands must be directed through a formal fuel management prescription developed by a forest professional with wildfire vegetation management within their scope of practice.[43]

Fire hazard classification in the WUI is partly dictated by the proximity of the fuel to developed areas within a community. More specifically, fuels closest to the community are considered to pose a higher hazard in comparison to fuels that are located at greater distances from values at risk. As a result, it is recommended that the implementation of fuel treatments prioritizes fuels closest to structures and/or developed areas to reduce hazard levels adjacent to the community. Continuity of fuel treatment is an important consideration, which can be ensured by reducing fuels from the edge of the structures outward. Special consideration must be allocated to treatment locations to ensure continuity, as discontinuous fuel treatments in the WUI can allow a wildfire to intensify, resulting in a heightened risk to values. To classify fuel threat levels and prioritize fuel treatments, fuels immediately adjacent to the community are rated higher than those located further from developed areas. Table 26describes the classes associated with the proximity of fuels to the interface.

[43]CRI FCSF 2021 Supplemental Instruction Guide

Table 26:Proximity to the Interface.

Proximity to the Interface	Descriptor*	Explanation
WUI 100 *HIZ/CIIZ and Community Zones*	(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 *Community and Landscape Zones*	(100-500m)	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 1000 *Landscape Zone*	(500-1000 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.
Landscape Zone	>1000 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.*

6.1.3 APPENDIX A-3: FIRE SPREAD PATTERNS

ISI roses can help plan the location of fuel treatments on the landscape to protect values at risk based on the predominant wind direction and frequency of higher ISI values. Potential treatment areas were identified and prioritized with the predominant wind direction in mind. Figure 8 below displays the daily average ISI values for Effingham fire weather station located 24km northwest of Ehthlateese Village. During the fire season (April – October) predominant winds originate from the south.

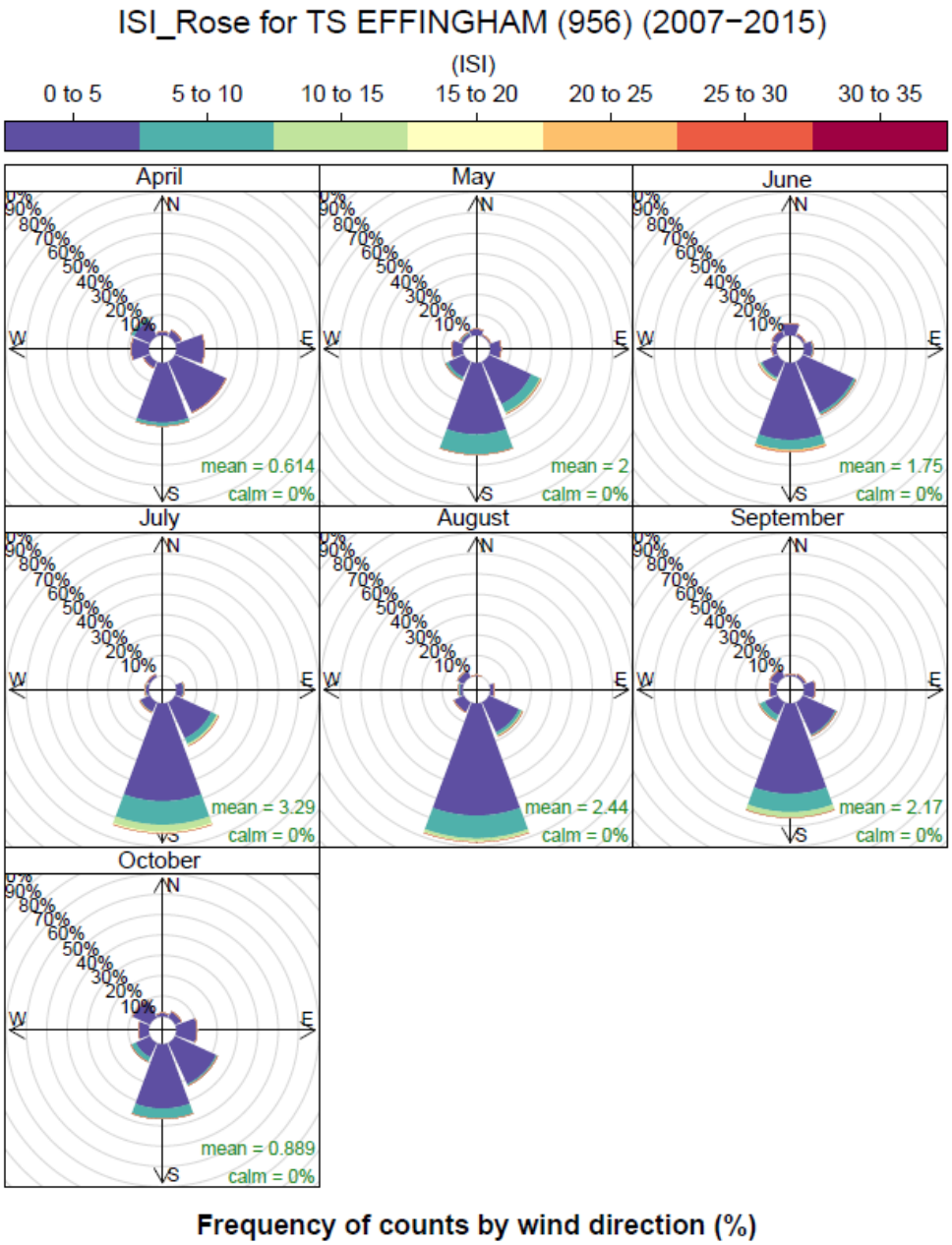


Figure 8: Initial Spread Index (ISI) roses depicting average daily wind speed and direction for each month during the fire season (April – October). Data taken from the Effingham fire weather station 2007 – 2015.

6.2 APPENDIX B: WILDFIRE RISK ASSESSMENT – FBP FUEL TYPE CHANGE RATIONALE

Provided separately as PDF package.

6.3 APPENDIX C: WILDFIRE RISK ASSESSMENT – WORKSHEETS AND PHOTOS

Provided separately as PDF package.

6.4 APPENDIX D: MAPS

Provided separately as PDF package.

6.5 APPENDIX F: WUI THREAT PLOT LOCATIONS

Table 27(and shown on Map 6)summarizes the WUI threat plots completed during CWRP fieldwork. The original WUI threat plot forms and photos will be submitted as a separate document. The following ratings are applied to applicable point ranges:

- Wildfire Behaviour Threat Score:
  - Low (0-40); Moderate (41 – 95); High (96 – 149); Extreme (>149); and,
- WUI Threat Score (calculated if Wildfire Behaviour Threat Score is High or Extreme):
  - Low (0 – 13); Moderate (14 – 26); High (27 – 39); Extreme (>39).

Table 27. Summary of WUI Threat Assessment Worksheets.

WUI Plot ID	Geographic Location	Wildfire Behaviour Threat Class	WUI Threat Class
EV-1	Ehthlateese Village	High (103)	Extreme (45)
EV-2	Ehthlateese Village	Moderate (89)	Low (11)*
EV-3	Ehthlateese Village	Moderate (72)	n/a
GC-1	Green Cove	Moderate (67)	n/a
GC-2	Green Cove	Moderate (91)	n/a
SL-1	Seekah Landing	High (98)	High (30)

**Calculated due to proximity to homes and CI for information gathering and planning purposes*

6.6 APPENDIX G: FUEL TYPING METHODOLOGY AND LIMITATIONS

The initial starting point for fuel typing for the WUI was the 2019 provincial fuel typing layer provided by BCWS as part of the *2018 Provincial Strategic Threat Analysis* (PSTA) data package. This fuel type layer is based on the FBP fuel typing system. PSTA data is limited by the accuracy and availability of information within the Vegetation Resource Inventory (VRI) provincial data; confidence in provincial fuel type data is very low on private land. The PSTA threat class for all private land within the WUI was not available. Fuel types within the WUI have been updated using satellite photo imagery of the area with representative fuel type calls confirmed by field fuel type verification. Polygons not field-verified were assigned fuel types based upon similarities visible in the photo imagery to areas that were field verified. Where polygons were available from the provincial fuel typing layer, they were utilized and updated as necessary for recent harvesting, development, etc.

It should be noted that fuel typing is intended to represent a fire behaviour pattern; a locally observed fuel type may have no exact analog within the FBP system. The FBP system was almost entirely developed for boreal and sub-boreal forest types, which do not occur within the WUI. As a result, the local fuel typing is a best approximation of the Canadian Forest Fire Danger Rating System (CFFDRS) classification, based on the fire behaviour potential of the fuel type during periods of high and extreme fire danger within the local MFLNRORD region. Additionally, provincial fuel typing depends heavily on VRI data, which is gathered and maintained to inform timber management objectives, not fire behaviour prediction. For this reason, VRI data often does not include important attributes which impact fuel type and hazard, but which are not integral to timber management objectives. Examples include surface fuels and understory vegetation.

In some cases, fuel type polygons may not adequately describe the variation in the fuels present within a given polygon due to errors within the PSTA and VRI data, necessitating adjustments required to the PSTA data. In some areas, aerial imagery is not of sufficiently high resolution to make a fuel-type call. Where fuel types could not be updated from imagery with a high level of confidence, the original PSTA fuel type polygon and call were retained.

For information on the provincial fuel typing process used for PSTA data as well as aiding in fuel type updates made in this document, please refer to Perrakis, Eade, and Hicks, 2018.[44]

[44]Perrakis, D.B., Eade G., and Hicks, D. 2018. Natural Resources Canada. Canadian Forest Service. *British Columbia Wildfire Fuel Typing and Fuel Type Layer Description* 2018 Version

6.7 APPENDIX H: FIRE RISK THREAT ASSESSMENT METHODOLOGY PROCESS

As part of the CWRP process, spatial data submissions are required to meet the defined standards in the Program and Application Guide. Proponents completing a CWRP can obtain open-source BC Wildfire datasets, including Provincial Strategic Threat Analysis (PSTA) datasets from the British Columbia Data Catalogue. Wildfire spatial datasets obtained through the BC Open Data Catalogue used in the development of the CWRP include, but are not limited to:

- PSTA Spotting Impact
- PSTA Fire Density
- PSTA Fire Threat Rating
- PSTA Lighting Fire Density
- PSTA Human Fire Density
- Head Fire Intensity
- WUI Human Interface Buffer (1436m buffer from structure point data)
- Wildland Urban Interface Risk Class
- Current Fire Polygons
- Current Fire Locations
- Historical Fire Perimeters
- Historical Fire Incident Locations
- Historical Fire Burn Severity

As part of the program, proponents completing a CWRP are provided with a supplementary PSTA dataset from BC Wildfire Services. This dataset includes:

- Fuel Type
- Structures
- Structure Density
- Eligible WUI (2Km buffer of structure density classes >6).

The required components for the spatial data submission are detailed in the Program and Application Guide Spatial Appendix – these include:

- AOI
- Proposed Treatment Units
- WUI (1Km buffer of structure density classes >6)

The provided PSTA data does not transfer directly into the geodatabase for submission, and several PSTA feature classes require extensive updating or correction. In addition, the Fire Threat determined in the PSTA is fundamentally different from the localized Fire Threat feature class that is included in the Local Fire Risk map required for project submission. The Fire Threat in the PSTA is based on provincial scale inputs - fire density; spotting impact; and head fire intensity, while the spatial submission Fire

Threat is based on the components of the Wildland Urban Interface Threat Assessment Worksheet. For the scope of this project, completion of WUI Threat Assessment plots on the entire WUI is not possible, and therefore an analytical model has been built to assume Fire Threat based on spatially explicit variables that correspond to the WUI Threat Assessment worksheet.

Field Data Collection

The primary goals of field data collection are to confirm or correct the provincial fuel type, complete WUI Threat Assessment Plots, and assess other features of interest to the development of the CWRP. This is accomplished by traversing as much of the WUI as possible (within time, budget, and access constraints). Threat Assessment plots are completed on the 2012 version form, and as per the Wildland Urban Interface Threat Assessment Guide.

For clarity, the final threat ratings for the WUI were determined through the completion of the following methodological steps:

1. Update fuel-typing using orthophotography and field verification.
2. Update structural data using critical infrastructure information provided by the client, field visits to confirm structure additions or deletions, and orthophotography
3. Complete fieldwork to ground-truth fuel typing and threat ratings (WUI threat plots on a variety of fuel types, aspects, and slopes and additional field stops with qualitative notes, fuel type verification, and/or photographs)
4. Threat assessment analysis using field data collected and rating results of WUI threat plots – see next section.

Spatial Analysis

Not all attributes on the WUI Threat Assessment form can be determined using a GIS analysis on a landscape/polygon level. To emulate as closely as possible the threat categorization that would be determined using the Threat Assessment form, the variables in Table 28were used as the basis for building the analytical model. The features were chosen are those that are spatially explicit, available from existing and reliable spatial data or field data, and able to be confidently extrapolated to large polygons.

Table 28. Description of variables used in spatial analysis for WUI wildfire risk assessment.

WUI Threat Sheet Attribute	Used in Analysis?	Comment
FUEL SUBCOMPONENT		
Duff depth and Moisture Regime	No	Many of these attributes are assumed by using 'fuel type' as a component of the Fire Threat analysis. Most of these components are not easily extrapolated to a landscape or polygon scale, or the data available to estimate over large areas (VRI) is unreliable.
Surface Fuel continuity	No	
Vegetation Fuel Composition	No	
Fine Woody Debris Continuity	No	
Large Woody Debris Continuity	No	
Live and Dead Coniferous Crown Closure	No	
Live and Dead Conifer Crown Base height	No	
Live and Dead suppressed and Understory Conifers	No	
Forest health	No	

WUI Threat Sheet Attribute	Used in Analysis?	Comment
Continuous forest/slash cover within 2 km	No	
WEATHER SUBCOMPONENT		
BEC zone	Yes	
Historical weather fire occurrence	Yes	
TOPOGRAPHY SUBCOMPONENT		
Aspect	Yes	
Slope	Yes	The elevation model was used to determine slope.
Terrain	No	
Landscape/ topographic limitations to wildfire spread	No	
STRUCTURAL SUBCOMPONENT		
Position of structure/ community on the slope	No	
Type of development	No	
Position of assessment area relative to values	Yes	Distance to the structure is used in the analysis; position on slope relative to values at risk is too difficult to analyze spatially.

The field data is used to correct the fuel type polygon attributes provided in the PSTA. The corrected fuel type layer is then used as part of the initial spatial analysis process. The other components are developed using spatial data (*ie.,* BEC zone, fire history zone) or spatial analysis (*i.e.,* aspect, slope). A scoring system was developed to categorize resultant polygons as having relatively low, moderate, high, or extreme Fire Threats, or low, moderate, high, or extreme WUI Threats.

These attributes are combined to produce polygons with a final Fire Behaviour Threat Score. To determine the Wildland Urban Interface Score, only the distance to structures is used. Buffer distances are established as per the WUI Threat Assessment worksheet (<200, 200-500 and >500) for polygons that have a 'high' or 'extreme' Fire Behaviour Threat score. Polygons with structures within 200m are rated as 'extreme', within 500m are rated as 'high', within 2km are 'moderate', and distances over that are rated 'low'.

Limitations

There are obvious limitations in this method, most notably that not all components of the threat assessment worksheet are scalable to a GIS model, generalizing the Fire Behaviour Threat score. The WUI Threat Score is greatly simplified, as determining the position of structures on a slope, the type of development and the relative position are difficult in an automated GIS process. This method uses the best available information to produce the initial threat assessment across the AOI in a format that is required by the UBCM CRI program.

The threat class ratings are based initially upon (geographic information systems) GIS analysis that best represents the WUI wildfire risk assessment worksheet and is updated with ground-truthing WUI threat plots. WUI threat plots were completed in a variety of fuel types, slopes, and aspects to be able to confidently refine the GIS analysis. It should be noted that there are subcomponents in the worksheet

which are not able to be analyzed using spatial analysis; these are factors that do not exist in the GIS environment.

The threat assessment is based largely on fuel typing, therefore the limitations with fuel typing accuracy (as detailed in Appendix A-1: Fire Risk Threat Assessment Methodology and Appendix G: Fuel Typing Methodology and Limitations) impacts the threat assessment, as well.

6.8 APPENDIX I: LIST OF FIRST NATIONS AND ASSOCIATED GOVERNMENTS CONSULTED

Organization/Government	Contact Title	Email(s)	Phone #	Location
Ucluelet First Nation	President		250-726-7342	Ucluelet
Huu-ay-aht First Nations	Chief Councillor	IHA@maanulth.ca	250-728-3414	Port Alberni
Toquaht Nation	Director of Lands, Resources and Public Works	davidj@toquaht.ca	250-726-4230	Ucluelet
Maa-nulth First Nations	Maa-nulth Co-Chair	IHA@maanulth.ca	250-332-5259	Kyuqout
Ka:'yu:'k't'h'/Che:k:tles7et'h' First Nations	Legislative Chief	moniquedg@kcfirstnations.com	250-332-5259	Kyuqout
Tseshaht First Nation	Chief and Council		250-724-1225	Port Alberni

6.9 APPENDIX J: GLOSSARY OF TERMS

Danger tree - Live or dead tree whose trunk, root system or branches have deteriorated or been damaged to such an extent as to be a potential danger to human safety.

Fire danger - A general term used to express an assessment of both fixed and changeable factors of the fire environment that determine the ease of ignition, rate of spread, the difficulty of control, and fire impact.

Fire season - The period(s) of the year during which fires are likely to start, spread, and damage values-at-risk sufficient to warrant organized fire suppression; a period of the year set out and commonly referred to in fire prevention legislation.

Fuel - Fuel is any organic matter, living or dead, in the ground, on the ground, or in the air that can ignite and burn.

Available fuel - The quantity of fuel (in a particular fuel type) that would be consumed under specified burning conditions.

- *Fine fuels* - Fuels that ignite readily and are consumed rapidly by fire (e.g. cured grass, fallen leaves, needles, small twigs). Dead, fine fuels also dry very quickly.
- *Ground fuels* - All combustible materials below the litter layer of the forest floor that normally support smoldering or glowing combustion associated with ground fires (e.g. duff, roots, buried punky wood, peat).
- *Ladder fuels* - Fuels that provide vertical continuity between the surface fuels and Crown fuels in a forest stand, thus contributing to the ease of torching and Crowning (e.g. tall shrubs, small-sized trees, bark flakes, tree lichens).
- *Medium fuels* - Fuels too large to be ignited until after the leading edge of the fire front passes, but small enough to be completely consumed.
- *Surface fuels* - All combustible materials lying above the duff layer between the ground and ladder fuels that are responsible for propagating surface fires (e.g. litter, herbaceous vegetation, low and medium shrubs, tree seedlings, stumps, downed-dead roundwood).

Fuel management - Fuel management is the modification of forest structure to reduce forest fuel accumulations available to burn in a wildfire. The main goal of fuel management is improving public safety. This may include treatments such as thinning, spacing and pruning trees, and removal of needles and woody debris from the forest floor.

Fuel type - An identifiable association of fuel elements of distinctive species, form, size, arrangement, and continuity that will exhibit characteristic fire behaviour under defined burning conditions.

High-risk activity - As defined in the Wildfire Regulation (s.1)

a) mechanical brushing;
b) disk trenching;

c) preparation or use of explosives;
d) using fire- or spark-producing tools, including cutting tools;
e) using or preparing fireworks or pyrotechnics;
f) grinding, including rail grinding;
g) mechanical land clearing;
h) clearing and maintaining rights of way, including grass mowing;
i) any of the following activities carried out in a cutblock excluding a road, landing, roadside work area or log sort area in the cutblock:
    i) operating a power saw;
    ii) mechanical tree felling, woody debris piling or tree processing, including de-limbing;
    iii) welding;
    iv) portable wood chipping, milling, processing or manufacturing;
    v) skidding logs or log forwarding unless it is improbable that the skidding or forwarding will result in the equipment contacting rock;
    vi) yarding logs using cable systems

Interface fire - Interface fires are fires that have the potential to involve buildings and forest fuel or vegetation simultaneously in the WUI.

Prescribed fire - The knowledgeable and controlled application of fire to a specific area to accomplish planned resource management objectives. These fires are managed in such a way as to minimize the emission of smoke and maximize the benefits to the site.

Slash - Debris left as a result of forest and other vegetation being altered by forestry practices and other land use activities (e.g. timber harvesting, thinning and pruning, road construction, seismic line clearing). Slash includes material such as logs, splinters or chips, tree branches and tops, uprooted stumps, and broken or uprooted trees and shrubs.

Spot fire - A spot fire is less than 0.01 hectares (10 metres by 10 metres).

Wildfire - An unplanned fire - including natural or unauthorized human-caused fires - occurring on forest or rangelands, burning forest vegetation, grass, brush, scrub, peat, or a planned prescribed fire set under the regulation which spreads beyond the area authorized for burning.

Wildland urban interface - The wildland-urban interface (WUI) is an area where combustible forest fuel is found adjacent to homes, farms, structures or other outbuildings. This may occur at the interface, where development and forest fuel (vegetation) meet at a well-defined boundary, or in the intermix, where development and forest fuel intermingle with no clearly defined boundary.