



Community Wildfire Protection Plan 2025

Carcross / Tagish First Nation
March 27, 2026



Adoption of the Carcross/Tagish Community Wildfire Protection Plan

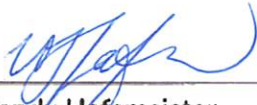
The Carcross/Tagish CWPP represents a collaborative roadmap between Carcross/Tagish First Nation and Government of Yukon, Wildland Fire Management Branch to take action to address the threat of wildland fire to the communities of Carcross and Tagish. This plan is intended to serve as a planning tool for residents and fire and land managers.

By working together, Carcross/Tagish First Nation and Government of Yukon will increase the efficacy of wildfire response and reduce the potential for negative impacts of wildland fires to people, property, infrastructure and other identified values. The CWPP builds on years of meaningful risk reduction work and will support short, medium, and long-term objectives as we strive for more wildfire-resilient communities.



Frank James
Director of Heritage & Natural Resources
Carcross/Tagish First Nation

April 30, 2026
Date



Wendy Hafemeister
Director, Wildland Fire Management Branch
Government of Yukon

June 1, 2026
Date



Michelle Sicotte
Director, Forest Management Branch
Government of Yukon

June 1, 2026
Date

SUBMISSION INFORMATION

Submitted by:

Blackwell Consulting Ltd.
270 – 18 Gostick Place
North Vancouver, BC V7M 3G3
Phone: 604-986-8346
Email: inquiries@bablackwell.com




Submitted to:

Tyler Obediah
Natural Resource Coordinator
Heritage, Lands, and Natural Resources
Carcross / Tagish First Nation
tyler.obediah@ctfn.ca



REGISTERED PROFESSIONAL SIGN AND SEAL

RPF PRINTED NAME	
Quentin Schmidt	RPF #5499
DATE SIGNED	
March 27, 2026	
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: Blackwell Consulting Ltd.

ACKNOWLEDGEMENTS

The authors would like to thank Tyler Obediah (Natural Resource Coordinator, Heritage, Lands and Natural Resources) for their direct involvement with planning, reviewing, and contributing to this Community Wildfire Protection Plan.

The authors would also like to thank the following individuals and groups for their input to the plan through information sharing and/or technical review:

- Amaya Cherian-Hall, Environmental Manager, Carcross / Tagish First Nation
- Martin Haefele, Carcross Volunteer Fire Department
- Rick Seaman, Fire Chief, Tagish Volunteer Fire Department
- Dawn Hansen, FireSmart and Fuel Management Specialist – Yukon Wildland Fire Management
- Luc Bibeau, Manager of Prevention and Mitigation – Yukon Wildland Fire Management
- Keith Fickling, Southern Lakes Regional Protection Manager – Yukon Wildland Fire Management
- How We Walk with the Land and Water

This report would not have been possible without the collaborative funding partnership between Carcross / Tagish First Nation and the Government of Yukon.

EXECUTIVE SUMMARY

In March 2025, Blackwell Consulting Ltd. ('Blackwell', previously B.A. Blackwell & Associates Ltd.) was retained to assist Carcross / Tagish First Nation ('CTFN', 'the Nation') in creating a Community Wildfire Protection Plan (CWPP). A CWPP serves as both a localized risk assessment and an action plan to enhance wildfire resiliency within a region. This CWPP provides strategic recommendations based on the seven FireSmart® disciplines (Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Cross-Training, Emergency Planning, and Vegetation Management) to assist CTFN in improving community safety and reducing the risk of damage to property, critical infrastructure, and cultural places from wildfires. The CWPP can be used to inform updates to community plans, expand emergency response capacity and FireSmart education programs, and to help direct fuel management within the Wildland Urban Interface (WUI).

This is the first community-level wildfire plan specific to CTFN, providing a narrowed scope of the topics that were analyzed and discussed as part of the 2023 Southern Lakes Wildfire Strategy.¹ CTFN and residents of both Carcross and Tagish have actively been working to reduce wildfire risk over the past 20 years – efforts that will be discussed and expanded upon through this CWPP.

Field work and spatial analysis completed for this CWPP indicate that fuel types, terrain, and fire weather collectively result in a high or very high wildfire threat rating across 30% of the WUI, with extensive areas of moderate threat. Importantly, quantitative assessments and analyses were not performed on titled parcels, which cover approximately 6% of the CWPP area and contain most of the infrastructure-based values-at-risk. Analysis was also limited in accuracy in non-forested and developed areas as it is difficult to accurately quantify wildfire threat in developed areas due to the complexity of hazards. Throughout both Carcross and Tagish, conditions on developed properties and forested private properties were commonly observed to have a higher or comparable fire hazard than in surrounding natural areas. In response, many high-priority recommendations within this CWPP emphasize FireSmart education, assessment, and hazard mitigation at the homeowner and neighbourhood scale. Other high-priority recommendations focus on permanent staffing of FireSmart positions, pursuing FireSmart development, expanding fire department capacity, and planning and implementing fuel management treatments.

Wildfire protection, preparedness, and resiliency require a multi-faceted approach to achieve the greatest efficacy and risk reduction outcomes. Recommendations and action items within this CWPP should be considered as a toolbox of options to help reduce wildfire risk within Carcross and Tagish. The Nation will have to prioritize the implementation of these recommendations based on resources, strengths, constraints, and availability of funding, and regularly update the prioritization and course of action as variables change through time. 36 recommendations and action items are presented in Table 1 below and are more thoroughly discussed in their appropriate sections within the document.

¹ The Southern Lakes Wildfire Strategy was a collaborative project between CTFN and Kwanlin Dün First Nation, which produced a video series, *Wildfire Risk Assessment and Risk Reduction Recommendations Report*, and *Indigenous Fire Stewardship Research Report* to better understand and prepare for wildfire risk. Accessible from: <https://www.kwanlindun.com/southern-lakes-wildfire-strategy/>

Table 1. Community Wildfire Protection Plan Recommendations

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Potential Funding Source ²
				(Involved)			
Education - Section 5.1							
<i>Objective: To provide information to C/TFN residents and visitors, empowering them to adopt and conduct FireSmart practices to mitigate the negative impacts of wildfire to their homes, businesses, and communities.</i>							
#1 Host FireSmart Workshops	High	Host annual FireSmart workshops and preparedness. Encourage the Carcross Volunteer Fire Department (CVFD) Tagish Volunteer Fire Department (TVFD), Yukon Wildland Fire Management (WFM), and other partners to collaborate and share insights from the perspectives of first responders.	Community events are a valuable opportunity to communicate information on FireSmart to many residents at the same time. Spring/early summer (the beginning of fire season) is a good time to target messaging. Workshops can cover basic FireSmart education and will reinforce the need to annually assess individual and community preparedness.	C/TFN (CVFD, TVFD, WFM)	Annually.	Annual hosting of at least one community FireSmart day focused on education and preparedness, and/or individual neighbourhood community events.	Yukon Territory - Community Development Fund (CDF). • Eligible funding includes programs and events. Climate Change Preparedness in the North Program.
#2 Distribute FireSmart Materials	High	Distribute FireSmart homeowner materials throughout the community. Examples: <ul style="list-style-type: none"> • FireSmart Homeowners Manual – Yukon.ca • Home Ignition Zone for Indigenous and Northern Communities poster – FireSmart Canada • FireSmart Fact Sheets (Decks and Porches, Gutters and Eaves, Roof, Siding, Yard, etc.) – FireSmart Canada • FireSmart Guide to Landscaping – FireSmart Canada • FireSmart Begins at Home mobile app – FireSmart Canada • FireSmart 101 training – FireSmart Canada 	FireSmart homeowner materials provide helpful and easy-to-digest infographics on how a resident can reduce the hazard on their property. Materials can be provided at community events, posted online, and/or delivered individually.	C/TFN	Distributed in 2025/26, subsequently available at annual events.	Delivery of the Homeowners Manual & “Home Ignition Zone for Indigenous and Northern Communities” poster to all residents. Ensuring FireSmart homeowner materials are available at future events. Link to online courses posted on the C/TFN website.	All resources listed are free online.
#3 Incorporate FireSmart in Schools	Med	Advocate for the use of FireSmart Education Materials (available for free through FireSmart BC) at Ghùch Tlà Community School. Consider inviting the Carcross and Tagish Volunteer Fire Departments, Yukon Wildland Fire Management, and other partners to help present.	Having FireSmart awareness instilled in youth may provide a catalyst for their parents to perform mitigation activities around their home. Instilling FireSmart principles in today’s youth provides the foundation for a FireSmart community in the future. The FireSmart BC Education Program includes a full education curriculum for free online.	C/TFN Ghùch Tlà Community School (CVFD, TVFD, WFM)	1 year.	FireSmart curriculum adopted for use at the Ghùch Tlà Community School; wildfire-themed presentations and guests considered. Coordinated under FireSmart Canada, the FireSmart BC curriculum can be used as an interprovincial educational resource. It is possible to tailor the curriculum to local conditions and fire regimes if necessary.	Education resources free at FireSmart BC.

² Funding may be available on a case-by-case basis depending on the specifics of the project, but eligibility will depend on program criteria.

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Potential Funding Source ²
				(Involved)			
#4 Communicate FireSmart & Fire Hazard Internally	Med	Increase the use of social media, physical signage, and/or the C/TFN website and newsletter to communicate FireSmart initiatives, fire hazard postings, and/or the planning/implementation of fuel management activities (including cultural burning and prescribed fire). Local fire danger rating signs can be installed in high-use areas of the community and updated regularly.	1) FireSmart / fire hazard information could be more easily accessible and readily displayed on the C/TFN website, newsletter, and/or through various social media channels. 2) Brush clearing and the potential use of cultural / prescribed fire are potential risk reduction / ecosystem restoration tools that can be utilized in vegetated areas around the Carcross and Tagish communities. Increasing resident awareness and acceptance of these tools will be key for establishing and implementing a successful fuel management program.	C/TFN	Work with C/TFN departments in 2026, distribute information ASAP and/or in conjunction with FireSmart initiatives.	1) Use of various channels to distribute FireSmart program information. 2) Fire hazard information posted in the community or online. 3) Fuel management information transmitted.	Community Development Fund - Yukon Territory <ul style="list-style-type: none"> • Research and planning • Programs and event Emergency Management Assistance Program (EMAP) – ISC <ul style="list-style-type: none"> • Fire prevention and preparedness capacity building • Signage Climate Change Preparedness in the North Program.
#5 Share the CWPP Publicly	Med-Low	Make this CWPP report and associated maps publicly available through the C/TFN website.	Notification to the community will allow C/TFN members to see the initial steps that the communities are taking to become FireSmart.	C/TFN (WFM)	1 year.	CWPP and maps are available for download or viewing on the C/TFN website.	Internal
Legislation and Planning - Section 5.2							
<i>Objective: To provide the means for C/TFN to implement wildfire risk reduction through laws and legislation by outlining government responsibilities regarding wildfire.</i>							
#6 Enact a FireSmart Landscaping Bylaw	High	Enact a FireSmart landscaping bylaw that prohibits the planting of highly flammable vegetation (e.g., conifer trees and shrubs, cedar hedges) and prohibits the planting of vegetation in the FireSmart Immediate Zone (i.e., within 1.5 m of a building). ³	Although naturally occurring vegetation is primarily found adjacent to structures in Carcross and Tagish, reducing the amount of flammable vegetation within the Immediate FireSmart Zone will mitigate fire spread potential. Landscaping choices have a large impact on the fire risk on and between properties.	C/TFN	Discuss in 2025, implement ASAP.	C/TFN has a legislative method to prevent the planting of highly flammable vegetation, and any vegetation in the Immediate Zone.	Climate Change Preparedness in the North Program (First Nations Infrastructure Fund – non-structural)
#7 Create a Fire Control Bylaw	Med	Enact a Fire Control Bylaw that prohibits the storage and accumulation of combustible materials within 10m of buildings. Include a definition/list of combustible materials.	Accumulations of combustible materials are commonly found throughout the community (e.g., construction materials, furniture, firewood, vehicles, etc.). The development of a specific Fire Control Bylaw may be the best course of action for the management of these materials stored on properties. Increasing communication around such a bylaw (potentially combined with FireSmart communication) and making language clear on what material this bylaw targets may increase understanding for residents and improve voluntary compliance.	C/TFN	Begin in 2025, ongoing.	Completed Fire Control Bylaw that focuses on preventing the storage and accumulation of combustible materials within 10m from a building.	Climate Change Preparedness in the North Program (First Nations Infrastructure Fund – non-structural)

³ Reference the FireSmart Guide to Landscaping: <https://firesmartcanada.ca/wp-content/uploads/2022/01/328254-PIP-Landscape-low-res.pdf>

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Potential Funding Source ²
				(Involved)			
#8 Enforce Unused / Vacant Property Upkeep	Med	Enact a Bylaw that requires the upkeep and maintenance of abandoned and vacant properties, where these pose a fire hazard to other residences or community infrastructure.	Vacant and abandoned properties can pose significant fire risks due to unmaintained and unsupervised conditions. Common hazards include encroaching vegetation around structures, combustible debris accumulating on roofs and in gutters, and stagnant materials left on the property such as old wooden sheds, propane tanks, or vehicles. Enacting a Bylaw that requires the upkeep of vacant lots by removing combustible materials, and maintaining vegetation, as well as applying FireSmart landscaping and control measures to unused houses, will reduce the potential for fires to start or spread in these areas.	C/TFN	Begin in 2025, ongoing.	Developing a vacant / unused property bylaw that mandates the upkeep of vacant lots and unused homes to FireSmart standards.	Climate Change Preparedness in the North Program (First Nations Infrastructure Fund – non-structural)
#9 Update the CWPP	Low	Complete or schedule periodic updates of the CWPP. 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.	Updating the CWPP will help address changes in wildfire risk within the Carcross and Tagish Wildland Urban Interface (WUI). An evaluation of major changes will allow C/TFN’s wildfire risk profile to keep up-to-date (i.e., large developments, fuel type changes, funding program changes that may lead to new opportunities).	C/TFN	After significant changes in wildfire risk – likely 5-7 years.	C/TFN always has an up-to-date CWPP and action plan.	Internal

Development Considerations – Section 5.3

Objective: To embed FireSmart practices and considerations into all development within Carcross and Tagish.

#10 Enforce Development to be FireSmart ⁴	High	Embed FireSmart construction and landscaping principles into future development. This can be accomplished via the creation of a Development Permit Area (DPA) for wildfire hazards or through bylaws. A DPA or bylaws for new builds should strongly consider addressing: <ul style="list-style-type: none"> • Fire-resistant roofing • Fire-resistant siding • Fire-resistant home extensions/outbuildings • A 1.5 m non-combustible Immediate Zone 	Embedding FireSmart principles and the knowledge of qualified wildfire professionals into all aspects of community development and planning in interface areas is crucial to proactively building fire resilience. Embedding FireSmart principles into legislation will increase wildfire resiliency in future development, and enacting a FireSmart construction bylaw as soon as possible will increase the proportion of FireSmart buildings and housing stock in the community.	C/TFN	Ongoing.	Wildland-Urban Interface DPA created and adopted or bylaw creation/changes to ensure new community infrastructure and developments are FireSmart.	Climate Change Preparedness in the North Program
--	------	--	---	-------	----------	---	--

Interagency Cooperation - Section 5.4

Objective: To broaden from a single-jurisdiction approach to a risk-driven, multi-agency, multi-scalable approach to a wildfire emergency.

⁴ Reference FireSmart Canada’s Home Development Guide (https://firesmartcanada.ca/wp-content/uploads/2019/10/FS_Developer_Booklet.pdf) and associated guide on Building a Wildfire-Resistant Home: Codes and Costs (<https://headwaterseconomics.org/wildfire/homes-risk/building-costs-codes/>)

COMMUNITY WILDFIRE PROTECTION PLAN 2025

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Potential Funding Source ²
				(Involved)			
#11 Collaborate Internally	Med	Create a Community FireSmart Resiliency Committee (CFRC) and meet with this group bi-annually at minimum. Committee members can include C/TFN staff and personnel from the Carcross and Tagish Volunteer Fire Departments and wildfire response or prevention agencies.	Mitigating fire risk proactively spans the knowledge of multiple departments and requires decision-making to be collaborative. Fire risk concerns are often not shared and understood across different groups, which can lead to conflicting decisions. Carcross and Tagish departments / working groups such as Governance, Heritage, Lands, & Natural Resources, Infrastructure Culture & Community Services, and the Tagish Local Advisory Council should discuss and collaborate regarding fire risk concerns within the community.	C/TFN	Start a roundtable in 2025/26, meet bi-annually.	Meetings held and collaborative initiatives implemented.	Internal Emergency Management Assistance Program (emergency preparedness)
#12 Advocate to Landowners	Med	Advocate with large corporate land holders (e.g., White Pass and Yukon Route Railway) and private land holders to assess and proactively mitigate wildfire risk on their properties.	Multiple large and forested private land parcels are located in the direct interface with both Carcross and Tagish. When unmanaged these parcels pose a considerable wildfire risk to residential and community infrastructure, especially where they contain high density conifer stands. Performing effective fuel management at the landscape scale is not possible in multiple areas without the assessment and treatment of various parcels.	C/TFN (Private Owners)	Engage in 2025/26.	1) Advocate with landowners 2) Have interface parcels assessed for risk, and treatment options discussed 3) Complete strategic fuel treatments on private parcels	Internal
#13 Responsible Recreation	Med-Low	Work with Travel Yukon, local tourism operators, and the Department of Highways and Public Works to more effectively communicate fire danger ratings and responsible recreation during periods of high and extreme fire danger.	Communicating fire danger ratings and campfire bans using overhead highway signage or physical postings, radio transmissions, etc., can be effective ways to notify tourists of fire hazard and its implications. FireSmart / responsible recreation can be communicated via local tourism operators and at the Carcross Visitor Information Center. C/TFN's Tourism Code of Conduct outlines safe campfire practices, but this information is not widely disseminated.	C/TFN (Travel Yukon, HPW, tourism operators)	Engage in 2025/26, develop an annual communication plan.	1) Engage various tourism and communication groups regarding fire hazard and FireSmart 2) Implement a communication strategy	Internal
Cross Training & Fire Department Resources - Section 5.5							
<i>Objective: To expand the preparedness and qualifications of C/TFN emergency staff.</i>							
Training							
#14 Staffing FireSmart Positions	High	Fund a FireSmart Coordinator position and FireSmart Crew Members to oversee the implementation of FireSmart initiatives within the communities.	The FireSmart Coordinator position will enable a focused and dedicated approach to local FireSmart initiatives. The individual(s) in this role should complete the following training courses: <ul style="list-style-type: none"> • FireSmart 101 (FireSmart Canada) • FireSmart Ambassador (FireSmart Canada) • Home Ignition Zone Specialist (FireSmart Canada) Hiring and training additional crew members will provide dedicated local individuals who can help with residential FireSmart initiatives and fuel management treatments.	C/TFN	Annually fund a FireSmart Coordinator and hire other labour positions as necessary.	1) Fund a FireSmart Coordinator position. 2) Hire a Crew Member or additional dedicated FireSmart staff based on community needs.	Internal ISC – Emergency Management FireSmart program

COMMUNITY WILDFIRE PROTECTION PLAN 2025

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Potential Funding Source ²
				(Involved)			
#15 Expanding FireSmart Training	Med-High	<p>Pursue expanded FireSmart training for C/TFN staff or volunteers at the Carcross and Tagish Volunteer Fire Departments. Training options include:</p> <ul style="list-style-type: none"> • FireSmart 101 (FireSmart Canada) • FireSmart Ambassador (FireSmart Canada) • Home Ignition Zone Specialist (FireSmart Canada) • FireSmart Neighbourhood Recognition Program Specialist (FireSmart Canada) 	<p>FireSmart training for C/TFN community members or CVFD / TVFD members increases their ability to perform specific duties for the community:</p> <ul style="list-style-type: none"> • WUI training: YFNW offers skill-based training on WUIs. Participants will learn to evaluate potential WUIs, deploy necessary resources safely and efficiently, and take steps to minimize property damage. • FireSmart 101: An introduction to FireSmart principles, disciplines, the WUI, and Home Ignition Zones. • FireSmart Ambassador: Trained in promoting general FireSmart knowledge throughout the community. • Home Ignition Zone (HIZ) Specialist: Trained to conduct approved FireSmart home assessments. FireSmart Ambassador training must be completed before taking this course. 	C/TFN	Expand training in 2025/2026 and beyond if necessary.	C/TFN staff, members, or Volunteer Fire Departments members trained on preparedness in the WUI. Expand and track the number of people in the community with FireSmart 101, Ambassador, and HIZ Specialist training.	<p>FireSmart courses are free online</p> <p>ISC – Emergency Management FireSmart program</p>
#16 Expanding Wildfire Training	Med-High	<p>Advocate for expanded wildfire training for members of the Carcross and Tagish Volunteer Fire Departments. Training options include:</p> <ul style="list-style-type: none"> • S-100 / S-185: Basic Fire Suppression & Safety / Fire Entrapment Avoidance & Safety • WSPP-115 (or equivalent): Wildfire Structure Protection Program • Structure Triage Considerations for Wildland Urban Interface Firefighting • Joint training exercises with WFM 	<p>Wildfire-specific training within both CVFD and TVFD is currently limited and experience is gained through actual fire response.</p> <p>Expanding training opportunities will ensure that first responders in Carcross and Tagish can perform wildfire suppression more safely and effectively.</p>	CVFD / TVFD (C/TFN & WFM)	Look into training options in 2026 and expand annually.	Department members with CVFD / TVFD acquire wildfire-specific training.	<p>Internal – work with Yukon WFM</p> <p>ISC – Emergency Management FireSmart program</p>
#17 Expanding ICS Training	Med	<p>Provide Incident Command System / Emergency Management training (e.g., ICS-100 / Intro to EOC) to C/TFN personnel most directly involved with managing or coordinating emergency response.</p>	<p>Expanding internal ICS capacity will allow C/TFN staff to be more involved with and prepared for emergency response.</p>	C/TFN	Ongoing.	C/TFN staff in applicable departments to have ICS-100 and/or Introduction to Emergency Management in Canada training within one year of receiving these recommendations.	ISC - Emergency Management Assistance Program

COMMUNITY WILDFIRE PROTECTION PLAN 2025

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Potential Funding Source ²
				(Involved)			
#18 Demonstrating Structure Protection	Med	Host an annual structure protection demonstration in the community with Carcross and Tagish Volunteer Fire Departments, Yukon Wildland Fire Management branch, and/or trained community members. This can involve the clearing of combustible materials and the setting up of a sprinkler system. Could be combined with a Community Wildfire Preparedness Day.	This activity can demonstrate to residents how they can make conditions easier for first responders to set up structure protection equipment. This recommendation will be reliant on additional structure protection equipment being procured by each department.	C/TFN (CVFD, TVFD, WFM)	Host in 2026 during fire season – repeat annually.	Host an annual structure protection demonstration within the C/TFN community.	ISC - Emergency Management Assistance Program ISC – Emergency Management FireSmart program
Water							
#19 Expand Water Delivery Capabilities	Med-High	Increase or improve water shuttling, drafting, and/or pumping capabilities and water storage systems for both Carcross and Tagish Volunteer Fire Departments.	Water delivery for fire suppression is limited in both Carcross and Tagish as there is no dedicated fire hydrant network. Suppression water currently relies on shuttling via a well system at each fire hall, or from natural water sources. Given that there are multiple natural water sources adjacent to community areas, improving drafting and shuttling capabilities, and the number of storage tanks (e.g., temporary as portable bladders, or permanent as water reservoirs) will drastically improve fire suppression or structure protection capabilities.	C/TFN (CVFD, TVRD)	Ongoing Process	Allotment of water delivery equipment is reviewed and improved.	ISC - EMAP funding for low-value equipment
Equipment							
#20 Increase Allotment of Suppression Equipment	Med-High	Increasing the amount of wildland fire equipment available for the Carcross and Tagish Volunteer Fire Departments, ensuring that members are trained in its use and maintenance. Suggestions include: <ul style="list-style-type: none"> Centrifugal pumps Forestry hose and accessories Structure Protection Units Chainsaws and hand tools (Pulaski, shovels) Off-road vehicle, potentially with a small water tank and pump. 	Having additional gear dedicated to forest fires and/or structure protection will increase the effectiveness of paid-on-call members of the Carcross and Tagish Volunteer Fire Departments.	CVFD and TVFD	Ongoing.	1) Wildland gear inventoried, and deficiencies noted. 2) Required gear ordered. 3) Train personnel on the use of this equipment.	ISC - EMAP funding for low-value equipment ISC – Emergency Management FireSmart program
Emergency Planning - Section 5.6							
<i>Objective: To provide for a quick and effective wildfire response from neighboring fire departments and emergency management personnel through pre-incident planning and community preparedness.</i>							

COMMUNITY WILDFIRE PROTECTION PLAN 2025

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Potential Funding Source ²
				(Involved)			
#21 Address Wildfire Smoke	Med	Look into installing high efficiency particulate air (HEPA) filters in various community buildings (especially those designated as emergency operation centers and shelters) to provide clean-air spaces during smoke events. Additionally (or in the interim), have a supply of N95 masks that can be distributed to community members during smoke events, or research and communicate potential home-made solutions for affordable clean air filters.	Smoke from local or regional wildfires can be harmful to the community's health, especially higher-risk individuals such as elders or those with respiratory issues. Proper air filtration systems provide spaces free from smoke particulate matter (PM _{2.5}). Clean-air spaces can be targeted at gathering buildings such as the C/TFN office, Haa Shagóon Hídi, fire halls, and schools.	C/TFN	Discuss in 2025 – implement ASAP	<ol style="list-style-type: none"> 1) Ensure that prioritized community buildings have HEPA (or equivalent) filters. 2) Have a supply of N95 masks to distribute to “high-risk” community members. 3) Communicate a program for “home-made” clean air filters. 	<p>Climate Change Preparedness in the North Program (First Nations Infrastructure Fund – non-structural) & Climate Change and Health Adaptation Program North</p> <p>ISC - EMAP funding for low-value equipment</p> <p>Capital Facilities and Maintenance Program</p>
#22 Distribute Evacuation Checklists	Med	Distribute the FireSmart Wildland Fire Evacuation Preparedness List in a coordinated fashion to individual properties in the community. Incentivize homeowners (e.g., with a door prize) if they create and/or annually review their home's evacuation plan and prepare an emergency kit.	Proactively improving homeowners' evacuation preparedness is paramount to an efficient and effective evacuation – leaving the community with more time to focus on last-minute hazard reduction and providing more peace-of-mind that property's are better protected and that individual's safety is provided for. Information in these checklists can also be used to guide proactive FireSmart measures at the residential scale.	C/TFN	Distribute checklists in the spring of 2026.	<ol style="list-style-type: none"> 1) Distributing checklists to all community members. 2) Increased participation in homes that develop/review an evacuation plan and have emergency kits prepared – tracked through competition entrants or similar. 	Checklist available from FireSmart Canada. Can use and promote through a Community Preparedness Day or in schools.
#23 Establish an Emergency Communication System	Med-Low	Investigate the use of <i>Alertable</i> or an equivalent emergency communication app that community members can subscribe to, in order to provide reliable and local information to individuals.	Emergency communication applications are designed to notify community members of potential or imminent threats such as wildfires. Providing this information from local emergency management personnel gives a trusted information source and allows accurate and real-time emergency updates to be disseminated. Expanding the number of residents who receive these alerts will support quicker decision-making and contribute to a more coordinated community response during wildfire events.	C/TFN	Discuss in 2025 – implement ASAP	<ol style="list-style-type: none"> 1) Discuss the use of <i>Alertable</i> or equivalent, assess which community personnel could manage and oversee this. 2) Establish a community-specific group 3) Track number of community members signed up for notifications. 	ISC - Emergency Management Assistance Program
#24 Pre-Plan Incident Response	Med-Low	Create wildfire-specific pre-incident plans and associated maps that can be discussed internally with C/TFN emergency personnel, fire departments, and wildfire response agencies. Local fire threats, values at risk, access features, and water sources should be included on any area maps.	Discussing a wildfire-specific incident plan ahead of time can support effective emergency planning and highlight where potential fire guards/control lines can and cannot be located – minimizing the risk of fire guards damaging any culturally or environmentally sensitive areas.	C/TFN	5 Years.	Wildfire incident plans and associated maps created, available, and discussed.	<p>Climate Change Preparedness in the North Program</p> <p>Emergency Management FireSmart Program</p>
#25 Procure Backup Generators	Med	Invest in backup generators for any C/TFN critical infrastructure that does not have one. Prioritize structures that are designated as emergency operations centers, emergency shelters, evacuation reception centers, etc., and any infrastructure associated with emergency water delivery or communications. Encourage businesses that provide critical services, such as gas stations and food stores, to follow suit.	Backup generators for critical infrastructure and community buildings will facilitate both emergency response during a fire event and community recovery (emergency support services) following a fire.	C/TFN	Ongoing.	Major community buildings and critical infrastructure have a backup generator and fuel supply.	<p>ISC - EMAP funding for low-value equipment</p> <p>Internal</p>

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Potential Funding Source ²
				(Involved)			
#26 Investigate a Rooftop Sprinkler Program	Med	<p>Investigate a rooftop sprinkler program for the community - consulting with WFM on which sprinklers would be best suited for the community. Considerations could include:</p> <ul style="list-style-type: none"> • Feasibility of operating rooftop sprinkler systems from nearby natural water sources using pumps and hose, as well as the logistics of deploying this equipment during a wildfire. • Prioritizing sprinklers for critical infrastructure. After this, focus on areas more intermixed with vegetation, or homes that have performed FireSmart work. • Investigate bulk orders of sprinklers from wildfire protection or irrigation companies or commercial gutter-mount kits. • Discuss installation with the local Wildfire Agencies and Volunteer Fire Departments so responders are aware. 	Pre-installed roof-top sprinklers reduce the time and resources needed to set up a structural protection system in a community/neighbourhood threatened by an interface fire.	C/TFN (CVFD, TVFD, WFM)	Consult in 2025, implement ASAP.	Each year, several new homes that are forest interface have rooftop sprinklers installed.	<p>ISC - EMAP funding for low-value equipment</p> <p>First Nations Infrastructure Fund (FNIF)</p> <ul style="list-style-type: none"> - Fire Protection - Structural Mitigation
Vegetation Management - Section 5.7							
<i>Objective: To reduce the potential wildfire intensity and ember exposure to people, structures, infrastructure, and other values through manipulation of both the natural and cultivated vegetation that is within the community.</i>							
Fuel Management Treatments							
#27 Create New Fuel Management Prescriptions	High	Create Fuel Management Prescriptions (FMPs) or treatment plans for Fuel Treatment Units (FTUs) identified through this CWPP.	Through this plan, multiple FTUs within the Carcross and Tagish WUI have been identified. Creating fuel management prescriptions or treatment plans for these areas will allow appropriate and site-specific wildfire risk reduction treatments to be implemented, reducing the wildfire threat within and surrounding the communities.	C/TFN (Contractors)	Begin in 2025, ongoing.	FMPs or treatment plans created for proposed FTUs, starting with the highest priority areas.	Yukon FireSmart.
#28 Complete Fuel Management Treatments	High	Complete fuel management treatments in areas identified in this plan.	Despite historic fuel management efforts, multiple high-hazard forested areas are found adjacent to the Carcross and Tagish communities and associated infrastructure, or in continuous areas at the landscape scale. Treating these areas will reduce the overall fire hazard by reducing the risk of crown fire and breaking up the overall continuity of conifer forests – while retaining healthy and diverse forest ecosystems.	C/TFN (Contractors / WFM)	Continue in 2025, ongoing.	<p>1) A treatment strategy discussed with WFM</p> <p>2) Successive areas treated annually.</p>	ISC - Emergency Management FireSmart program

COMMUNITY WILDFIRE PROTECTION PLAN 2025

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Potential Funding Source ²
				(Involved)			
#29 Maintain Previously Treated Areas	Med-Low	Maintain previously treated fuel management areas by performing manual treatments (e.g., spacing, pruning, abating deadfall, etc.) and/or prescribed burning to keep them in a low-hazard state in perpetuity.	Multiple fuel management treatments have occurred within the Carcross and Tagish WUIs since the early 2000s. Once treated, the forests in these areas will pass through succession (e.g., regenerate with conifers, accumulate deadfall, etc.) and require maintenance. Prescribed fire would likely be a cost-effective maintenance tool that is ecologically appropriate in many upland areas.	C/TFN (Contractors / WFM)	Assess in 2025, ongoing.	1) Create an organized and prioritized list of previous fuel treatments and their status 2) Develop a maintenance plan and complete treatments accordingly.	
#30 Plan Prescribed Burning	Low	Work with the WFM to identify potential prescribed burning areas. Potential areas include treated stands (especially pruning), and untreated stands that are naturally well spaced with high crown base heights (more commonly a characteristic of pine stands).	Prescribed burning can be an effective method of fuel reduction. While it is generally not recommended in areas immediately adjacent to infrastructure, there may be isolated forested areas within the WUI where prescribed surface fires are feasible. The first step toward developing a burn plan is to identify areas suitable for treatment. Successful implementation also requires well-established control lines and secure anchor points to ensure the burn remains contained.	C/TFN (WFM)	Consult with YWFM in 2026	Logical burn units identified in consultation with YWFM.	
Residential FireSmart							
#31 Conduct HIZ Assessments	High	Offer and conduct Home Ignition Zone (HIZ) assessments for individual residential properties throughout the community. Consider creating a sign-up portal on the C/TFN website, and potentially incentivizing residents to have assessments completed (e.g., door prizes, rebates, etc.).	HIZ assessments educate and inform residents of their home's unique wildfire risks and hazards, offering tailored recommendations on how these can be reduced. Assessments and resulting mitigation work can be demonstrated on community-shared buildings.	C/TFN	Begin in 2025, expand program annually	1) Establish a community sign-up or online portal for residents to sign up for HIZ assessments. 2) Complete assessments - track the number of assessments completed annually, seeking an annual increase.	
#32 Establish FireSmart Neighbourhoods	High	Establish the FireSmart Canada Neighbourhood Recognition Program for discrete areas of the community, beginning with performing Neighbourhood Assessments and creating Neighbourhood Plans, ensuring that a Neighbourhood Champion is identified for each neighbourhood / area.	Neighbourhood assessments and plans allow for coordinated neighbourhood-level mitigation activities to occur. Fire hazards within individual Home Ignition Zones are often shared / overlapping between property owners which can limit a home-by-home approach.	C/TFN	Engage communities and begin to perform assessments / plans in 2025, expand annually.	1) Complete Neighbourhood Assessments and Plans for priority neighbourhoods. 2) Identify a Neighbourhood Committee and Neighbourhood Champion for each	Yukon FireSmart ISC – Emergency Management Assistance Program & Emergency Management FireSmart Program
#33 Initiate FireSmart Clean-up	High	Initiate a program where residents can sign up to have FireSmart work done around their home, including removing combustible debris from the Immediate and Intermediate FireSmart Zones, and creating a 1.5-meter non-combustible area (Immediate Zone) around their home. Prioritize the homes of elders or people with limited mobility.	FireSmart mitigation activities often require reasonably onerous physical labour (tree/plant removal, pruning, deadfall cleanup, etc.) or work that requires machinery (removing old debris, construction materials, outbuildings, vehicles, etc.) and may not be able to be performed by certain community members.	C/TFN	Annually.	1) Establish a program and staffing to complete FireSmart work on residential properties. 2) Mitigate hazards on properties annually. Track the number of hours, number of properties with work completed, and the type of work completed.	

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Potential Funding Source ²
				(Involved)			
#34 Establish Debris Disposal Program	High	Develop and implement a community chipping or debris disposal program for residents. Chip trucks can be offered for material that is brought to road-accessible locations, or debris bins can be left in strategic locations that residents can fill and the community can remove.	Challenges with removing debris from FireSmart vegetation management (e.g., tree thinning, pruning, deadfall cleanup) can often makes these activities prohibitive or overly onerous. Providing free debris disposal options is a good incentive to have FireSmart work completed, and helps reduce backyard burning.	C/TFN	Establish ASAP	Debris disposal program initiated in 2025 and offered 1 – 2 times per year.	
#35 Communal Firewood Storage	Med	Research and establish communal firewood storage options for neighbourhoods that have no reasonable alternative to storing wood next to their homes during the fire season – discuss if staffing is required to assist with moving wood.	Most homes in Carcross and Tagish still utilize wood heat. Firewood is often stored adjacent to homes throughout the fire season which presents a fire hazard at a time in which wood heat isn't used as considerably. Having communal storage options in FireSmart containers can provide residents with a place to store their wood during the fire season. ⁵	C/TFN	Discuss in 2025, implement as time permits.	Establish program in 2025/26. Expand annually.	
Critical Infrastructure & Community Assets							
#36 Conduct Critical Infrastructure Assessments & Mitigation	High	Conduct FireSmart assessments and follow-up mitigation work on Critical Infrastructure (CI) or community assets that have blatant structural vulnerabilities or are adjacent to unmaintained vegetation.	CI and Community Assets provide important services for emergency response, day-to-day community activities, and employment services. Assessments allow for mitigation efforts to be effectively tailored to individual buildings, making community infrastructure more resilient.	C/TFN	Perform assessments in 2025/26 and mitigation work ASAP.	1) Have all vulnerable community infrastructure assessed. 2) Have mitigation work or structural upgrades completed on all assessed structures	Assessments: <ul style="list-style-type: none"> • Yukon FireSmart • ISC – Emergency Management Assistance Program & Emergency Management FireSmart Program Mitigation / Renovations: <ul style="list-style-type: none"> • Climate Change Preparedness in the North Program • Community Development Fund

⁵ Reference FireSmart BC's Firewood Shed Guide: https://firesmartbc.ca/wp-content/uploads/2024/08/08.19.24_FSBC_FirewoodShedGuide-1.pdf

TABLE OF CONTENTS

Submission Information.....	ii
Registered Professional Sign and Seal	ii
Acknowledgements.....	iii
Executive Summary.....	iv
Table of Contents.....	xv
List of Figures	xvii
List of Tables	xviii
List of Maps.....	xix
Frequently Used Acronyms.....	xx
SECTION 1: Introduction	1
1.1 Overview.....	1
1.2 CWPP Goals	1
1.3 CWPP Development Summary	2
SECTION 2: Relationship to Other Plans and Legislation.....	3
2.1 Local Authority Emergency Plan.....	3
2.1.1 Hazard, Risk, and Vulnerability Analysis.....	4
2.2 Linkages to Other Yukon Wildfire Plans	5
2.3 Linkages to Other Plans	7
SECTION 3: Community Description	11
3.1 Area of Interest and Wildland Urban Interface.....	11
3.2 Community Information	16
3.2.1 Fire Department Resources	18
3.3 Values At Risk	21
3.3.1 Critical Infrastructure and Community Assets	21
3.3.2 Electrical Power & Heating.....	22
3.3.3 Water and Sewage	23
3.3.4 Cultural and Heritage Values.....	28
3.3.5 Environmental Values	29
3.3.1 Hazardous Values.....	33
3.3.2 Other Resource Values.....	33

SECTION 4: Wildfire Risk Assessment 34

4.1 Local Wildfire Environment 35

4.1.1 Fuel 35

4.1.2 Topography 41

4.1.3 Weather 43

4.2 Wildfire History..... 46

4.2.1 Natural Disturbances..... 46

4.2.2 Historic Wildfire Occurrences..... 48

4.3 Risk Framework and Risk Class Maps 52

4.4 Local Wildfire Risk Assessment..... 55

SECTION 5: FireSmart Disciplines..... 64

5.1 Education..... 68

5.2 Legislation and Planning 70

5.3 Development Considerations 72

5.4 Interagency Cooperation..... 75

5.5 Cross-Training & Fire Department Resources 78

5.6 Emergency Planning 80

5.7 Vegetation and Fuels Management 84

5.7.1 Fuel Treatments 84

5.7.2 Residential FireSmart 97

SECTION 6: CWPP Action Plan 99

6.1 Tracking, Reporting, and Updates 99

Appendix A: Home Ignition Zone..... 100

Appendix B: WTA Plots and Photos 102

Appendix C: Required Maps for Submission 104

Appendix D: Local Wildfire Risk Assessment Process..... 105

Appendix D-1: Fuel Typing Methodology and Limitations..... 106

Appendix D-2: Wildfire Fire Threat Spatial Analysis Methodology..... 107

Appendix D-3: WUI Risk Spatial Analysis Methodology..... 110

LIST OF FIGURES

Figure 1: Study area map from the Southern Lakes Wildfire Risk Assessment and Risk Reduction Recommendations Report - part of the Southern Lakes Wildfire Strategy..... 6

Figure 2: Wildfire consequence rating from the SLWRA. 21

Figure 3: The fire behaviour triangle, and a subset of characteristics within each component. 34

Figure 4: Examples of local fuel types, clockwise from top left: C-2 (dense spruce, thick duff), C-1 (spruce/pine, open canopy, dry forest floor), D-1/2 or M-1/2 < 25% (deciduous dominant, very little conifer, continuous grass and herb), C-3 (high density, even-aged lodgepole pine). 37

Figure 5: Average number of fire danger class days by month at the Carcross weather station..... 43

Figure 6: Historical wildfire ignitions within a 5-kilometer buffer of the Carcross and Tagish areas, categorized by ignition cause and decade. Data from GeoYukon. 48

Figure 7: Historical cumulative area burned by wildfires originating within a 5-kilometer buffer of the Carcross and Tagish WUIs. Data from GeoYukon. 49

Figure 8: FireSmart Home Ignition Zone, adapted for northern communities..... 65

Figure 9: Construction of a new multiplex in the Milk Creek / Squanga subdivision. The structure is very FireSmart though there is untreated and high hazard forest immediately adjacent..... 73

Figure 10: Examples of good right-of-way vegetation management on ATCO corridors in the Choutla subdivision, and along a decommissioned portion of the railway right of way north of the Watson subdivision. 76

Figure 11: Generalized description of the four phases of emergency response as they relate to a wildfire emergency in Carcross or Tagish. 80

Figure 12: Example of side-by-side areas that are untreated (left) and treated (right) in the Carcross area (Montana Mountain). 87

Figure 13: Example of side-by-side areas that are untreated (left) and treated (right) in the Tagish area (Taku / Highway 8). 87

Figure 14: Wildfire risk matrix used for the CWPP, combining wildfire threat with wildfire consequence ratings. 111

LIST OF TABLES

Table 1. Community Wildfire Protection Plan Recommendations v

Table 2. Community wildfire planning relationships with neighboring jurisdictions 5

Table 3: Summary of objectives and policies from the Carcross Local Area Plan (2013) that are related to community wildfire planning. 7

Table 4. Summary of other local plans and policies relevant to community wildfire resilience planning ... 8

Table 5. Higher level plans and relevant legislation 10

Table 6. Spatial statistics and land ownership within the Carcross and Tagish area, based on the CWPP analysis buffer. 11

Table 7. Carcross and Tagish socio-economic statistics..... 17

Table 8. Capacity and equipment of Carcross and Tagish Volunteer Fire Departments, as of September 2025. 18

Table 9: Description of Fire Management Zones in the Carcross and Tagish WUI..... 20

Table 10. Identified critical infrastructure and community assets within the Carcross and Tagish communities. 24

Table 11: Summarized environmental values within the CTFN CWPP area. 30

Table 12. Fuel types in the Carcross and Tagish WUI (public land and Settlement Lands only). 38

Table 13. Slope percentage and fire behavior implications. 41

Table 14. Slope position of value and fire behaviour implications. 42

Table 15: Summary of forest health impacts within the CWPP analysis buffer. 47

Table 16: Summary of notable fire events in southwest Yukon in recent decades..... 49

Table 17: Wildfire Threat Class Analysis ratings. 57

Table 18: Components of the wildfire consequence rating..... 60

Table 19: WUI Risk Analysis ratings 61

Table 20: Overview of varying vulnerabilities and resilience factors by generalized geographic areas. ... 66

Table 21. Summary of local issues relevant to community wildfire planning that can be controlled through legislation..... 70

Table 22. Interagency partners within and external to Carcross / Tagish First Nation. 75

Table 23: Example of a Wildfire Response Preparedness Condition Guide. 82

Table 24: Generalized fuel treatment options..... 85

Table 25: Summary of fuel treatment units identified in the Carcross WUI. 89

Table 26: Summary of fuel treatment units identified in the Tagish WUI..... 93

Table 27. Proximity to the interface 101

Table 28: Carcross / Tagish First Nation WTA Plot Summary 102

Table 29. Description of variables used in spatial analysis for WUI wildfire risk assessment 108

Table 30. Fire Threat Class scoring components 109

Table 31. Wildfire Behaviour Threat Classes and their associated summed scores..... 110

Table 32: Components of the wildfire consequence rating..... 110

LIST OF MAPS

Map 1. Overview of the CWPP Study Area and Analysis Buffer for both Carcross and Tagish.	13
Map 2. Study Area and Analysis Buffer for Carcross, showing Settlement Lands and titled parcels.	14
Map 3: Study Area and Analysis Buffer for Tagish, showing Settlement Lands and titled parcels.	15
Map 4: Community assets and critical infrastructure within the Carcross WUI.....	26
Map 5: Community assets and critical infrastructure within the Tagish WUI.....	27
Map 6. Environmental values in the Carcross WUI (excludes generalized species distribution polygons due to multiple overlaps, as well as HWW data).....	31
Map 7: Environmental values in the Tagish WUI (excludes generalized species distribution polygons due to multiple overlaps, as well as HWW data).....	32
Map 8. Fuel types in the Carcross WUI.....	39
Map 9: Fuel types in the Tagish WUI.	40
Map 10: Historical fire ignitions and fire perimeters within and adjacent to Carcross since 1947.....	50
Map 11: Historical fire ignitions and fire perimeters within and adjacent to Tagish since 1947.	51
Map 12. Overview maps from the SLWRA for the Carcross area, showing wildfire probability (left), consequence (mid), and overall wildfire risk (right). Green represents the lowest values, yellow the middle, and orange and red the highest.....	53
Map 13. Overview maps from the SLWRA for the Tagish area, showing wildfire probability (left), consequence (mid), and overall wildfire risk (right). Green represents the lowest values, yellow the middle, and orange and red the highest.....	54
Map 14: Carcross’s Local Fire Threat Rating.....	58
Map 15: Tagish’s Local Fire Threat Rating	59
Map 16: Wildfire risk ratings across the Carcross WUI.....	62
Map 17: Wildfire risk ratings across the Tagish WUI.	63
Map 18: Overview map of fuel treatment units identified in Carcross’s WUI.	92
Map 19: Overview map of fuel treatment units identified in Tagish’s WUI.....	95

FREQUENTLY USED ACRONYMS

AOI	Area of Interest
CFDRS	Canadian Forest Fire Danger Rating System
CI	Critical infrastructure
CTFN	Carcross/Tagish First Nation
CVFD	Carcross Volunteer Fire Department
CWPP	Community Wildfire Protection Plan
DPA	Development Permit Area
EMR	(Department of) Energy, Mines, and Resources
FBP	Fire Behaviour Prediction System
FMZ	Fire Management Zones
FSCNRP	FireSmart Canada Neighbourhood Recognition Program
HIZ	Home Ignition Zone
HWW	How We Walk (With The Land and Water)
IA	Initial Attack
LAP	Local Area Plan
SPU	Structure Protection Unit
SLWRA	Southern Lakes Wildfire Risk Assessment
TVFD	Tagish Volunteer Fire Department
WRR	Wildfire Risk Reduction
WTA	Wildfire Threat Assessment
WUI	Wildland Urban Interface
YBEC	Yukon Bioclimate Ecosystem Classification Framework
YESAA	Yukon Environmental and Socio-economic Assessment Act
YFNW	Yukon First Nation Wildfire
WFM	Wildland Fire Management (YG)

SECTION 1: INTRODUCTION

1.1 OVERVIEW

In March 2025, Blackwell Consulting Ltd. ('Blackwell') was retained to assist Carcross / Tagish First Nation ('CTFN', 'the Nation') in creating a Community Wildfire Protection Plan (CWPP). This CWPP builds on information presented in the *Yukon Southern Lakes Wildfire Risk Assessment and Risk Reduction Recommendations Report*⁶ but provides a more community-based focus by utilizing updated fuel type mapping and fuel treatment identification, a localized risk assessment, and a foundation in the [seven FireSmart® disciplines](#).⁷ This CWPP accounts for community priorities and FireSmart initiatives that have occurred in the CTFN community in previous years, and takes advantage of proven community wildfire planning frameworks.

Community Wildfire Protection Plans represent the first stage in community wildfire planning in the Yukon, with multiple Yukon communities having completed CWPPs since 2022. The CWPP framework was originally established in British Columbia in response to the series of devastating wildfires in 2003, leading to hundreds of CWPPs having been completed for municipalities, First Nations, and regional districts. CWPPs can be developed at many jurisdictional and geographic scales and are individually tailored to address the needs of different communities in response to their size, their capacity, and the unique threats that they face.

1.2 CWPP GOALS

This CWPP identifies the level of interface wildfire risk in both Carcross and Tagish and gives the community a current and accurate understanding of the threat posed by wildfire to human life, infrastructure, and values at risk. This CWPP is intended to serve as a framework to guide the implementation of specific actions and strategies to:

- Increase the efficacy of fire suppression and emergency response;
- Reduce potential impacts and losses to property, critical infrastructure, and other identified values at risk from wildfire; and
- Reduce wildfire behavior threat within the community.

To help guide and accomplish the above goals, this CWPP will provide CTFN with:

- An assessment of wildfire risk to the community;
- An assessment of values at risk and potential consequences from wildfire;
- Maps of fuel types and recommended areas for fuel treatments;
- A review of emergency and interface wildfire response and recovery capacity; and,
- Options and strategies to reduce wildfire risk in each of the seven FireSmart disciplines.

⁶ Southern Lakes Wildfire Strategy, a shared project between Kwanlin Dün First Nation and CTFN. Technical report and plain language summary accessed from: <https://www.kwanlindun.com/southern-lakes-wildfire-strategy/>

⁷ Education, Legislation & Planning, Development Considerations, Interagency Cooperation, Cross-Training, Emergency Planning and Vegetation Management

1.3 CWPP DEVELOPMENT SUMMARY

The planning area for this CWPP was developed in collaboration with CTFN staff. Analyses and recommendations are focused within the *Study Area*, which in general is a one-kilometer buffer around both the Carcross and Tagish Local Area Plan boundaries and/or community structures. The Study Area defines the immediate Wildland Urban Interface (WUI), which is generally understood as the zone where human development meets or intermingles with undeveloped wildland or vegetative fuels.⁸ The WUI and the Study Area is explained in more detail in Section 3.1 and is illustrated on Map 1.

Developing this CWPP consisted of the following five general phases:

- 1) Consultation with internal and external project stakeholders;
- 2) Review of relevant plans and legislation regarding emergency response, wildfire, and land management (Section 2);
- 3) Description of the community and identification of values at risk (Section 3);
- 4) Assessment of the local wildfire risk (Section 4); and,
- 5) Analysis and action plan for each of the seven FireSmart disciplines (Section 5).

⁸ FireSmart Canada. 'What is the wildland urban interface?' <https://firesmartcanada.ca/about-firesmart-2/the-wildland-urban-interface-wui/>

SECTION 2: RELATIONSHIP TO OTHER PLANS AND LEGISLATION

Wildfire resiliency is influenced by many aspects of community planning, from land use decisions to utilities servicing, development policies, parks and trails planning, bylaw enforcement, and more. As a result, there are multiple local and regional plans that relate to a CWPP. The intent of this section is to review relevant local and higher-level plans and legislation to identify any linkages and content that is relevant to community wildfire planning for Carcross / Tagish First Nation. These topics, as well as recommendations to strengthen and improve community policies and bylaws, are further discussed in Section 5.2.

2.1 LOCAL AUTHORITY EMERGENCY PLAN

Emergency preparedness and response in the Yukon is guided by higher level emergency management legislation. The primary legislation in the Yukon for emergencies is the *Civil Emergency Measures Act* (CEMA) which empowers the government to declare states of emergency, sets the parameters for actions under those declarations, and outlines various responsibilities and powers specific to the emergency. Under CEMA, municipalities must have emergency plans, Emergency Management Committees, and appoint Emergency Coordinators. As Carcross / Tagish First Nation is a self-governing First Nation as per the C/TFN Final Agreement and Self-Government Agreement of 2005, the Nation has authority over its Settlement Lands and citizens. Given that CEMA is a general law, emergencies that are located within or adjacent to Settlement Lands will still likely depend on the territorial government to play a strong and collaborative role in emergency management.

C/TFN have an emergency management program which is guided by a working Emergency Plan current to June 2025 which provides an emergency contact list, an overview of the local emergency response framework, organization of the Incident Command System (ICS), a Hazard Risk and Vulnerability Analysis (HRVA – see Section 2.1.1 below), and various hazard-specific response plans. The Emergency Plan designates the Clan Room - Haa Shagóon Hídi as the primary Emergency Operations Center (EOC), and the alternate EOC as the Fire Department Boardroom or the Yukon University building. The Emergency Plan contains an action plan for wildfires, though this mainly provides information on who to contact and activating the EOC. Having this emergency plan in place allows for more effective organization and response.

The Tagish Emergency Measures Team completed a basic Community Emergency Plan in 2010 with the support and assistance of Yukon's Emergency Measures Organization. This emergency plan sets responsibilities in the event of an emergency, lists various roles under the Incident Command System (ICS) framework, and provides a list of emergency resources, communication systems, and key buildings.

2.1.1 HAZARD, RISK, AND VULNERABILITY ANALYSIS

As part of their emergency management program, local authorities have a mandate to evaluate relative risk. Emergency plans must reflect the local authority's assessment of the relative risk of occurrence and the potential impact on people and property of the emergencies or disasters that could affect all or any part of the jurisdictional area for which the local authority has responsibility. Section 6 of C/TFN's Emergency Plan provides a Hazard, Risk, and Vulnerability Analysis (HRVA) which identifies and ranks relevant natural and anthropogenic hazards that can impact C/TFN communities.

Specifically, the HRVA considers 48 different hazards, with wildfires and structure fires representing two of the top four priorities. The HRVA assigns each hazard a *Likelihood* rating and a *Consequence* rating to come up with an overall risk rating. Both wildfires and structure fires were assigned a likelihood of "almost certain" – occurring once every two years or more frequently – and were scored two of the four highest consequence ratings. Overall, wildfire has the highest risk ranking of all identified hazards to C/TFN.

Tagish's Community Emergency Plan also provides a hazard assessment which ranks the probability of various hazards that could impact the community. Forest fires were the one hazard that was assigned an *Extreme* probability, with a note from previous studies that *"the Taku Subdivision represents one of the most dangerous community wildfire hazard situations in Yukon, both from interface fires and from fires starting within the community."*

The overall emergency management framework and further details regarding wildfire specific emergency planning will be discussed in Section 5.6.

2.2 LINKAGES TO OTHER YUKON WILDFIRE PLANS

Table 2 below summarizes the community wildfire planning status and relationships between Carcross / Tagish First Nation and other Yukon communities and regions. Though FireSmart initiatives need to be tailored to a specific community’s values and their unique wildfire risk, much can be learned by engaging with adjacent communities to discuss the successes and challenges of various initiatives.

Table 2. Community wildfire planning relationships with neighboring jurisdictions

Community	Wildfire Plan	Relevant Information, Recommendations, and Initiatives
Carcross and Tagish	Multiyear FireSmart Plan for Carcross and Tagish Region (2006)	In 2006, Environmental Dynamics submitted a draft report titled <i>Multiyear Fire Smart Plan for Carcross and Tagish Region</i> to the Yukon Government. This plan has not been finalized; hence there is no comprehensive approach to fire management in place to proactively address fire risks in the planning area. The absence of such a plan to manage wildfire risk is a notable gap in community fire protection for several reasons.
City of Whitehorse	Wildfire Risk Reduction Strategy and Action Plan (2021-2024) ⁹	<ul style="list-style-type: none"> Established a FireSmart program to help property owners make their homes more resilient to fire. Includes: <ul style="list-style-type: none"> Public information sessions and workshops; Free FireSmart home assessments; Assisting with the FireSmart Neighbourhood Recognition Program. Proposed amendments to various municipal bylaws and policies regarding landscaping, firewood storage, and greenspace treatments. Initiated implementation of the <i>Whitehorse South / Southwest Fire Risk Reduction Project</i> Initiated planning and implementation of prescribed fires with Yukon Wildland Fire Management.
Village of Teslin	Community Wildfire Protection Plan (2020-2022) ¹⁰	<ul style="list-style-type: none"> Outlines planning to implement a fuel break in Teslin which will transform a forested area to contain less flammable plant species and make timber more accessible.¹¹ Provided planning to maintain previous FireSmart areas Initiated a program to utilize waste wood to fuel a local biomass heating system.
Village of Haines Junction	Community Wildfire Protection Plan (2020-2022) ¹²	<ul style="list-style-type: none"> Established a local FireSmart program to encourage residents to complete work on their properties. Includes: <ul style="list-style-type: none"> Free FireSmart home assessments; Distributing FireSmart educational materials; Initiated implementation of a fuel break and conversion to deciduous stands.

⁹ City of Whitehorse WRR Strategy and Action Plan: <https://www.whitehorse.ca/wp-content/uploads/2022/04/WildfireRiskReductionStrat.pdf>

¹⁰ Village of Teslin CWPP: https://yukon.ca/sites/yukon.ca/files/cs/cwpp_teslin_final.pdf

¹¹ Yukon University, Win-Win Climate Change Adaptation: Creating a natural fire break north of Teslin. Accessed from: <https://www.yukonu.ca/research/projects/firebreak-teslin>

¹² Village of Haines Junction CWPP: https://yukon-ca.webpkgcache.com/doc/-/s/yukon.ca/sites/default/files/cs/haines_junction_cwpp_2022.pdf

Yukon Southern Lakes Wildfire Risk Assessment and Risk Reduction Recommendations Report (2023)

In 2023, CTFN and Kwanlin Dün First Nation worked with B.A. Blackwell & Associates, consultant Tom Wilson, and Two Crow Consulting Inc. to research Southern Lakes wildfire. Both a technical and plain language report were produced which identify and prioritize local values at risk, which were then used as inputs to analyze wildfire risk at the landscape level.⁶ The report recommended ways in which wildfire risk can be reduced that reflect Indigenous principles and relationships with the land and water, align with current best management practices, and are supported by current governance structures. The study area for the Southern Lakes report includes the Yukon portion of the “fire-shed” south of Whitehorse which is a total of 905,533 hectares. The entire *Study Area* for this CWPP is located within the Southern Lakes study area.

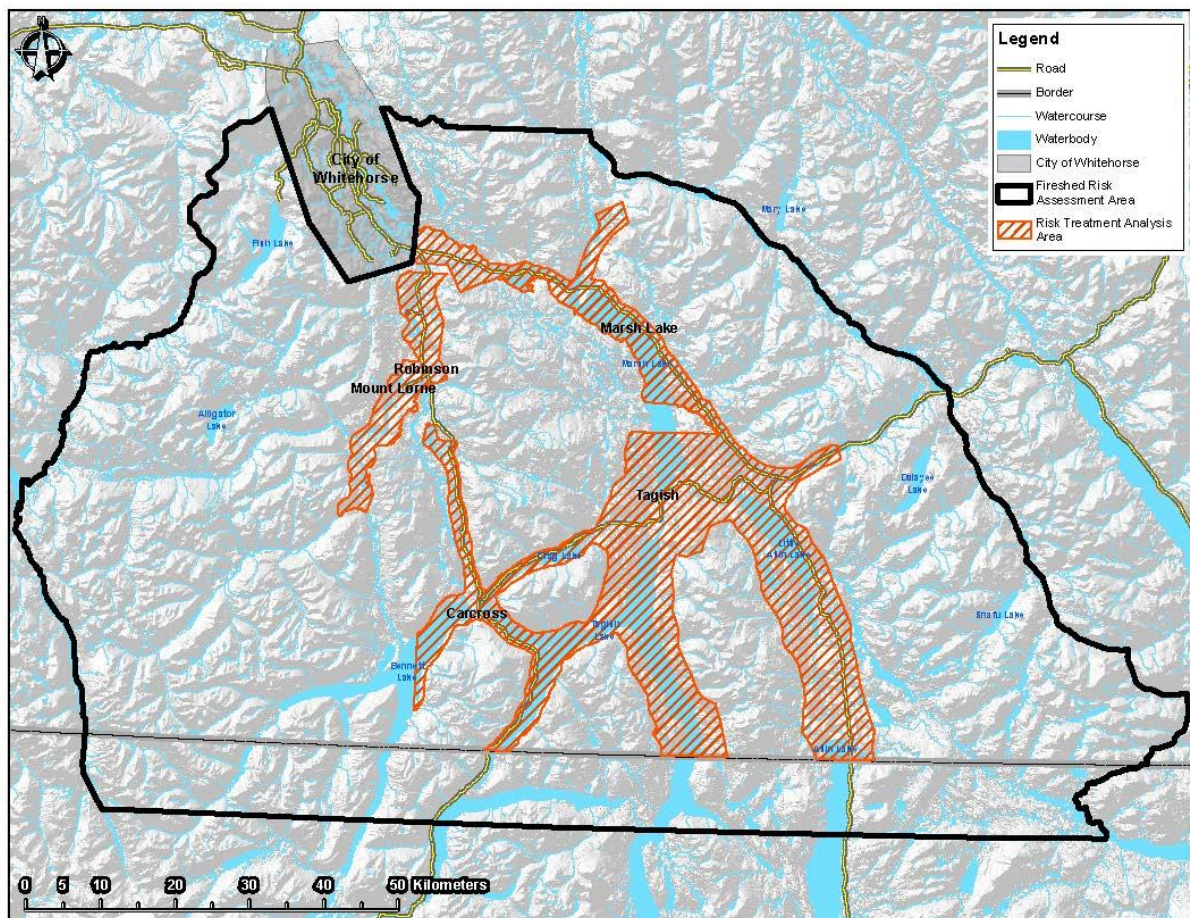


Figure 1: Study area map from the Southern Lakes Wildfire Risk Assessment and Risk Reduction Recommendations Report - part of the Southern Lakes Wildfire Strategy.

The landscape level Southern Lakes report provides a comprehensive look at natural disturbance history, including wildfire, and presents wildfire risk modelling that incorporates both probability and potential consequences. The report outlines various risk mitigation strategies and forest management objectives to protect sensitive First Nation values. Information from the Southern Lakes report will be utilized in this CWPP where appropriate, though analyzing and presenting more detailed and community-focused information is a priority of this CWPP.

2.3 LINKAGES TO OTHER PLANS

Local Area Plan

Both Carcross and Tagish are unincorporated communities in the Yukon, though a Local Area Plan (LAP) had been developed for Carcross in 2013. This LAP had been developed collaboratively between CTFN and the Yukon government. LAPs are planning documents specific to a geographic area that provide a guide for land use, growth, and development. The completed LAP provides a community-level planning tool in Carcross that reflects local values, geography, and priorities. There is no finalized LAP in place for Tagish, though a geographic LAP area has been defined.

The Carcross LAP reviews the existing land use, land tenure, and land ownership within the LAP area. It also identifies planning issues and opportunities related to sustainable development, recreational uses, servicing, health and safety, and traditional land uses, practices, and values. The LAP produced several community-led objectives, policies, and actions, and established multiple land use designations. Ten distinct land use designations were identified, ranging from traditional use areas and environmental protection to residential areas and future development. Given these land use designations, the community can visualize how recommendations from this CWPP fit into the pre-existing land use framework in Carcross. Much of the area within the Carcross LAP are designated as Settlement Lands for C/TFN – which will be discussed in more detail in Section 3. Table 3 below summarizes key objectives and policies within the LAP and their relationship to the objectives of this CWPP.

Table 3: Summary of objectives and policies from the Carcross Local Area Plan (2013) that are related to community wildfire planning.

LAP Section	Description & Relationship to CWPP
Section 5.2: Community Values Description	<p>This section of the LAP lists common and fundamental beliefs and characteristics that bring Carcross residents together, and the features which residents value the most. Despite community development and change, these values are to be respected and protected.</p> <p>Proximity to nature and outdoor recreation choices are two of these common community values. These values align with recommendations within this CWPP that focus on proactive forest management to decrease wildfire risk and increase ecosystem resilience, as well as promoting responsible recreation.</p>
Section 5.3: Community Development Principles	<p>Effective community development in Carcross is based on four guiding principles. Principle #3 discusses how: <i>“Land use management and development policy is guided by highest and best use, a precautionary approach to the maintenance of ecosystem diversity and environmental stewardship and the intent of ensuring future development occurs in a logical, orderly and sustainable manner.”</i></p> <p>This principle connects with FireSmart development which aims to create a community with sustainable and safe infrastructure, and fuel management treatments which are recommended in this CWPP. Fuel management treatments need to be founded in the local ecosystems and display strong environmental stewardship, while balancing with community protection and wildfire risk reduction.</p>

LAP Section	Description & Relationship to CWPP
Section 5.4.2: Environmental Stewardship	<p>The stewardship ethic extends to all elements of the Carcross LAP, highlighting plant, animal, and corridor conservation, while addressing wildfire as a current and future community safety risk. Specifically, developing <i>“a community fire protection strategy that addresses wildfire risk and mitigation measures (e.g., FireSmart treatment), adequate water flow for fire protection of heritage buildings and new development within the townsite, as well as volunteer fire department recruitment and retention.”</i></p> <p>Developing this CWPP (i.e., a community fire protection strategy) addresses this community action item. Recommendations within this CWPP and future wildfire risk reduction work in the community will display how conservation and ecosystem health can be balanced with community protection.</p>
Section 5.5.3 (Environmental Protection) & 5.5.11 (Future Development)	<p>The policies within the Environmental Protection and Future Development land use designations permit fire risk reduction activities as a discretionary use.</p>

Other Local Plans

Table 4 contains other local plans and policies which are directly relevant to the community themes discussed in the LAP and to the goals and objectives of this CWPP.

Table 4. Summary of other local plans and policies relevant to community wildfire resilience planning

Plan	Description and Relationship to CWPP
How We Walk With The Land and Water (2017 – Present)	<p>How We Walk With the Land and Water (HWW) is an Indigenous-led land and water relationship planning initiative between CTFN, Kwanlin Dün First Nation, and Ta’an Kwäch’än Council. The HWW framework builds a unified First Nation vision for the region which is grounded in Indigenous stories and knowledge and affirmed by western science. CTFN members shared features of the <i>Mapped Land Vision</i> from the HWW plan as part of developing this CWPP.</p> <p>The subset of the five traditional principles that guide HWW display a strong and holistic connection with the natural world and call for respect and understanding of each other, wildlife, and the land and water. The principles and values held within HWW reflect a respect for fire as a natural ecosystem process and reflect a need to ensure that land management and wildfire protection decisions are cognizant of the inter-connectedness of all things.</p>
Whitehorse – Southern Lakes Forest Resource Management Plan (2020)	<p>This Forest Resource Management Plan (FRMP) identifies the wide range of forest values and interests in the region and provides a blueprint for the management of these forests. The FRMP follows principles of integrated and sustainable forest management and is guided by the local First Nation Final Agreements, traditional values, and laws, as well as the overarching Forest Resources Act. The FRMP honours forest resources and supports respectful forest use through education, management, and monitoring – integrating traditional ecological knowledge (TEK), community interests, and science to guide forest use for the benefit of current and future generations.</p> <p>Specific to wildfire, the FRMP delineates wildland fire management zones (see Section 3.2.1) and describes the challenges faced with present-day wildfire risk. A primary goal of the FRMP is to consider and utilize timber harvesting to return the forests to a mix of diverse age classes, thus reducing the risk of wildfires.</p>

Plan	Description and Relationship to CWPP
<p>Tagish River Habitat Protection Area Recommended Management Plan (2022)</p>	<p>The Tagish River Management Plan provides considerable information on the importance of the Tagish River area for fish, wildlife, and plant communities, focusing on species at risk as identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and given status under the Species at Risk Act (SARA).</p> <p>The management recommendation for <i>Shoreline Development and Use</i> describes the importance of updating or creating Best Management Practices (BMPs) for development activities to effectively address bird conservation needs within the Tagish River Habitat Protection Area. This encompasses habitat enhancement projects and FireSmart and fuel abatement projects. The plan details the specific potential risks to birds posed by fuel abatement programs.</p>
<p>Community-Based Fish and Wildlife Work Plan (2020 – 2025)</p>	<p>Developed by the Carcross / Tagish Renewable Resource Council with the Yukon Government and CTFN as partners, this community-based plan presents the management priorities of fish, wildlife, and habitat throughout CTFN’s traditional territory. As the Fish and Wildlife Work Plan (FWWP) is founded in the overall importance of the land, it addresses landscape-level topics that extend far beyond the Carcross and Tagish wildland urban interface (e.g., caribou and bear management, declining fish populations, habitat degradation from recreational access pressures, and the need for better use of local and TEK). While few objectives from the FWWP directly connect with community wildfire protection, responsible land management is an important shared objective.</p>

Higher Level Plans and Legislation

Table 5 lists higher-level plans and legislation relevant to wildfire planning and risk mitigation within Carcross / Tagish First Nation. Though these higher-level plans and legislation may not apply within CTFN Settlement Lands, their intent and priorities in terms of fire prevention and wildfire management should be considered. Local legislation is more thoroughly reviewed in Section 5.2.

Table 5. Higher level plans and relevant legislation

Plan/Legislation	Description & Relationship to CWPP
<p>Forest Resources Act (2008 – updated in 2024) & Forest Protection Act (2002)</p>	<p>The Forest Resources Act is Yukon territorial legislation that governs the management, licensing, harvesting, conservation, and protection of forest resources. The Act established the various land management standards and guidelines which are found in the Forest Resources Regulation (see below).</p> <p>The Forest Protection Act (FPA) is administered by the Forest Management Branch in the Department of Energy, Mines and Resources (EMR). The FPA is the primary Yukon law governing wildfire prevention and response. It sets authorities and responsibilities for managing forests which includes wildfire management. Specifically, the FPA addresses the:</p> <ul style="list-style-type: none"> • Prohibition of unattended fires and unpermitted fires between April 1 and September 30; • Establishment of fire bans and closures; • Requirement for fire prevention devices on vehicles; • Requirement for fire guard and fire suppression equipment for primary forest outfits, at the determination of the forest supervisor; • Designation of fire protection areas; • Enforcement against those that contribute to fires; • Regulation of fire suppression and cost recovery, reporting fires, and preventing fires; and, • Regulation of open burning, including the need for a permit and approval from the local Wildland Fire Office.
<p>Forest Resources Regulation (2010 – updated in 2018/19)</p>	<p>The Forest Resources Regulation (FRR) is established under the Act and provides a set of standards & guidelines (e.g. for riparian management, wetlands etc.) that determine how activities such as timber harvesting, forest road building, and environmental protection around watercourses must be done. The FRR provides more specific powers and rules regarding:</p> <ul style="list-style-type: none"> • Restrictions on open burning; • Requirements for fire permits; • Rules for industrial activity during high fire danger periods; and, • Penalties for non-compliance.
<p>Yukon Wildlife Act (2002)</p>	<p>The Yukon Wildlife Act (YWA) sets regulation around hunting, trapping, outfitting, guiding, habitat protection areas, and more. The YWA lists several species as <i>specialty protected</i> including: cougar, gyrfalcon, peregrine falcon, and trumpeter swan. Designated habitat protection areas and species-specific measures must be considered and incorporated when developing fuel management plans.</p>

SECTION 3: COMMUNITY DESCRIPTION

This section defines the CWPP planning area and provides general demographic information about Carcross / Tagish First Nation. Having an understanding of population trends, land use patterns, and values at risk can allow communities to best direct FireSmart outreach and risk mitigation activities.

3.1 AREA OF INTEREST AND WILDLAND URBAN INTERFACE

The focus area for this CWPP combines the area within the Carcross and Tagish Local Area Plans with a one-kilometer buffer from any structures within the Carcross and Tagish communities. This focus area is referred to as the *Study Area*, throughout which field work was performed for this CWPP. Field work provided the basis for detailed analyses and recommendations within the CWPP. To reasonably increase the scope of the CWPP, a desktop analysis was performed on an additional one-kilometer buffer to the Study Area, which will be discussed as the *Analysis Buffer*.

Map 1 provides an overview of the CWPP area, while Map 2 and Map 3 provide an overview specific to Carcross and Tagish respectively.

Given the natural forests and vegetation in Carcross, Tagish, and the surrounding mountains, the entire Study Area can be considered as within the Wildland Urban Interface (WUI). The WUI can be defined as the zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.⁸ The Study Area for the CWPP encompasses 7,570 hectares in total, split between Carcross (3,147 hectares) and Tagish (4,423 hectares). The Analysis Buffer covers an additional 6,422 hectares. A breakdown of land ownership within the Analysis Buffer is provided in Table 6 below. CTFN Settlement Lands extend well beyond the Study Area and Analysis Buffer in both Carcross and Tagish.

Table 6. Spatial statistics and land ownership within the Carcross and Tagish area, based on the CWPP analysis buffer.

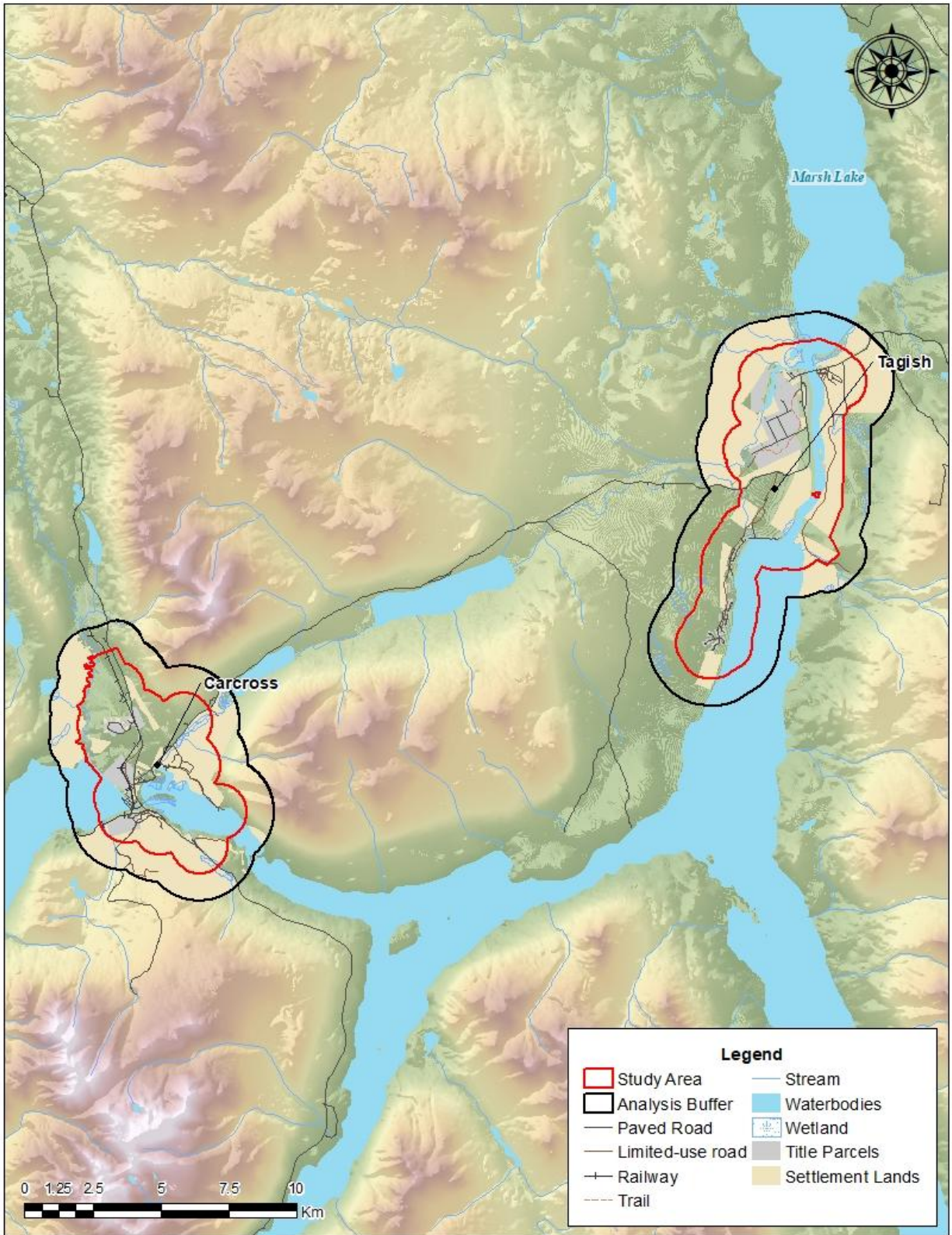
Land Ownership Type	Area (Hectares)	Percent of Analysis Buffer (%)
CTFN Settlement Lands ¹³	5,370	38%
Titled Parcels (Private, Corporate, or Community Ownership)	806	6%
Yukon Government	7,816	56%

Differing land ownership types will be discussed throughout this CWPP as they relate to legislation and planning, development, emergency planning, and fuel management treatments. Specific to CTFN, Settlement Lands are areas designated through the Nation's Final Agreement and Self-Governing Agreement. Within Settlement Lands, CTFN has specific ownership rights, powers, and jurisdiction. Specific to wildfire risk and the recommendations presented within this CWPP, on Settlement Lands CTFN has the ability to make laws regarding land-use, zoning, land management, protection, planning, and more

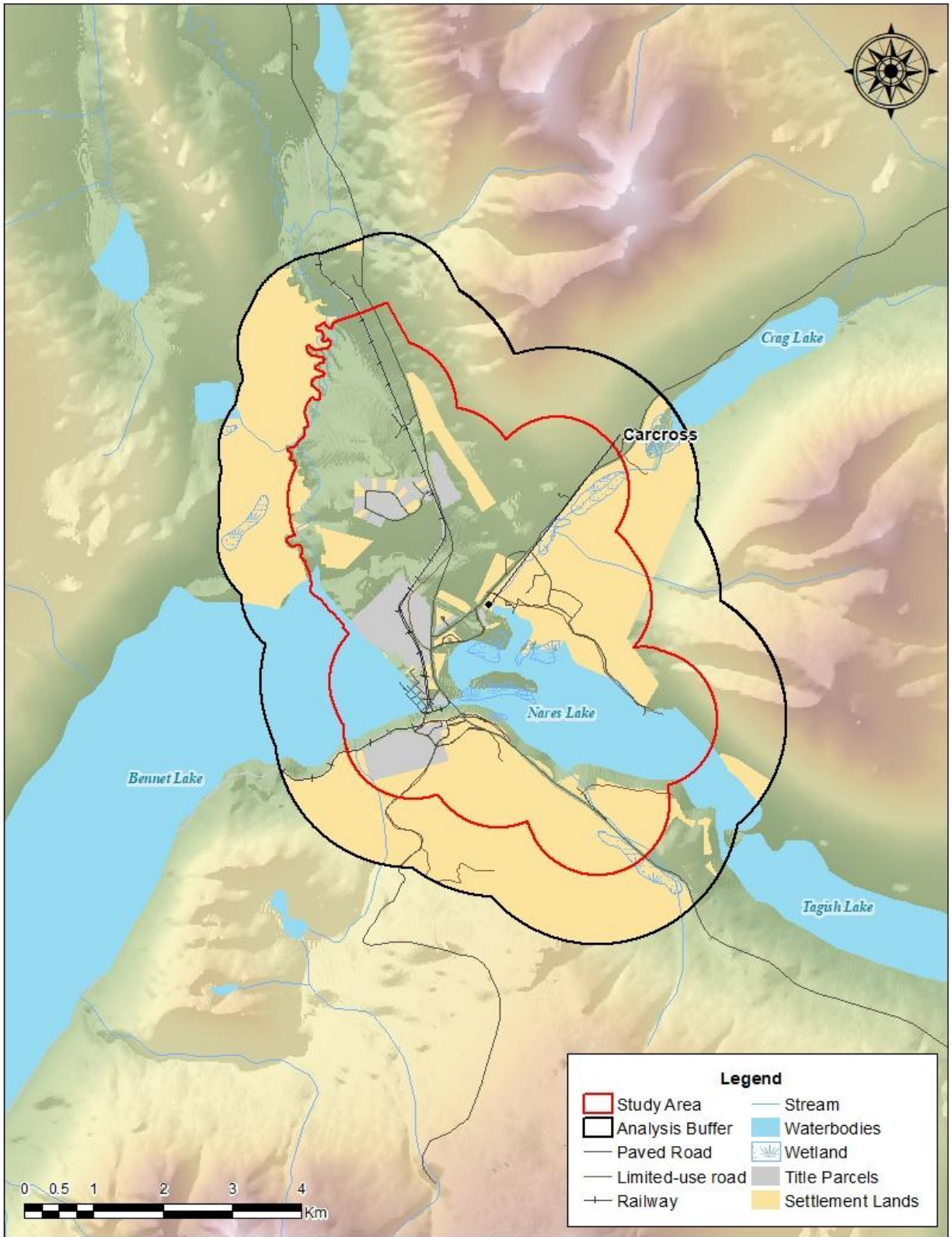
¹³ This includes areas designated as Fee Simple, Surface Rights, and Subsurface Rights.

(see Sections 5.2 and 5.3), as well as decide how forests may be managed (see Section 5.7 Vegetation and Fuels Management).

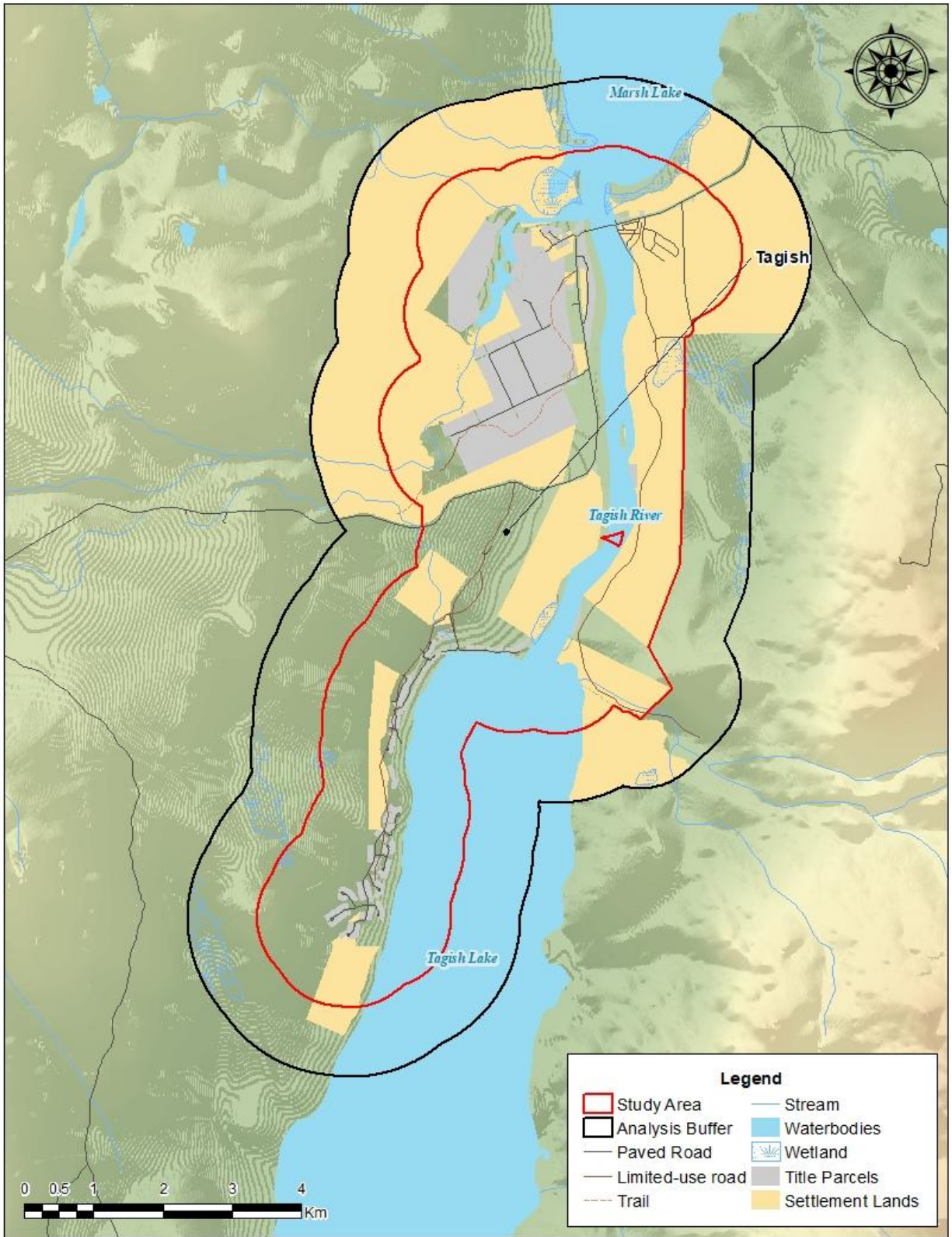
Parcels within the Carcross area which are titled include multiple small residential holdings and many large corporate holdings – including multiple undeveloped and forested parcels that are larger than 60 hectares. A subset of these larger forested parcels have continuously forested areas that span more than 900 meters in length, and are currently unmanaged and adjacent to both homes and community infrastructure. There are no corporately held parcels in the Tagish area, with most titled parcels representing small residential holdings up to 0.5 hectares in size. In both Carcross and Tagish, many of the residential parcels have retained much of the natural forest within, resulting in properties that are heavily intermixed with forestland. A more detailed assessment of fire hazard conditions on private property will be presented throughout Section 5, specifically in the Neighbourhood Overview section.



Map 1. Overview of the CWPP Study Area and Analysis Buffer for both Carcross and Tagish.



Map 2. Study Area and Analysis Buffer for Carcross, showing Settlement Lands and titled parcels.



Map 3: Study Area and Analysis Buffer for Tagish, showing Settlement Lands and titled parcels.

3.2 COMMUNITY INFORMATION

Carcross and Tagish are small rural communities within the Southern Lakes region, located amongst the Coast and Caribou Mountain ranges. Carcross is positioned at the northern end of Bennett Lake near its connection with Nares Lake, while Tagish lies approximately 30 kilometers to the northeast at the outlet of the Tagish River, where the river connects Tagish Lake to Marsh Lake.

Community life in Carcross and Tagish is strongly shaped by Indigenous culture and values. Both communities hold significant cultural and historical importance for Carcross / Tagish First Nation (CTFN), whose people have occupied the region since time immemorial. CTFN is a self-governing First Nation, with governance rooted in both contemporary structures and traditional clan systems.¹⁴ CTFN actively supports language revitalization, cultural education, and the preservation of traditional practices such as fishing, hunting, berry harvesting, and storytelling. Alongside these traditions, both communities are characterized by close-knit populations where residents rely on volunteerism and local organizations to provide essential services. Community infrastructure—such as volunteer fire departments, schools, and multipurpose facilities—serves as a hub for cultural, recreational, and social activities.

The surrounding natural landscapes make this region a year-round destination for outdoor recreation in many forms, including fishing, hunting, hiking, motorbiking, and mountain biking. Carcross is a recognized destination as the present-day terminus of the White Pass & Yukon Route railway, the Carcross Desert, and trail networks on Montana Mountain. The region's economy was historically driven by the fur trade, the Klondike Gold Rush, and local mining projects, though is now shifting to local tourism and culturally-rooted enterprises.

Structure density is generally low in Carcross and Tagish, with residential subdivisions spread out across the area. Commercial and community buildings are limited, with most located in Carcross's town center. A more in-depth description of community areas and a look into their various FireSmart resiliencies and vulnerabilities will be presented in the Neighbourhood Overview in Section 5. Carcross, Tagish, and CTFN are slow growing communities, with a 1.0 – 1.6% projected growth scenario for Carcross based on their Local Area Plan. Despite this, developing and growing with wildfire resilience in mind is a top priority in this CWPP (see Section 5.3 for further information). Various socio-economic statistics and their implications for wildfire resilience are detailed in Table 7.

¹⁴ The Carcross/Tagish First Nation Final Agreement: <https://www.cyfn.ca/wp-content/uploads/2013/08/carcross-tagish-fa.pdf> (Accessed on September 15, 2025)

Table 7. Carcross and Tagish socio-economic statistics.¹⁵

Metric		Value	Implication
Total Population	Carcross	317	A growing population demonstrates the need for FireSmart growth and development. A low population density calls for both widespread vegetation management as well as neighbourhood-level collaboration in FireSmart initiatives.
	Tagish	311	
	CTFN (Registered Individuals) ¹⁶	758	
Population Density (people/km ²)	Carcross	20.4	
	Tagish	6.9	
Population % Change (2016-2021)	Carcross	+ 5.3%	
	Tagish	+ 24.9%	
Proportion of Population, Age: (Averaged; Carcross, Tagish, CTFN)	0 – 14	13%	Importance of having FireSmart education in schools.
	15 – 64	62%	Large share of the community’s working-age population able to carry out FireSmart activities.
	65 +	26%	Highlights the potential need for assistance programs to complete FireSmart activities, as well as potential challenges in emergency situations.
Employment Rate (Averaged; Carcross, Tagish, CTFN)		43.2%	High proportion of individuals not in the labour force (20.3% unemployment rate in the community), which provides additional time for property upkeep / FireSmart initiatives.
Housing Units (# of Private Dwellings – Carcross / Tagish)		335	Relatively small number of properties – scale of FireSmart communication and programs needs to recognize this.

¹⁵ Unless otherwise noted, values are from Statistics Canada. *Census Profile*. 2021 Census of Population. <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E> (accessed September 19, 2025).

¹⁶ First Nation Population Profile (2016 Census Data), Government of Canada. https://fnppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNMain.aspx?BAND_NUMBER=491&lang=eng (August, 2025)

3.2.1 FIRE DEPARTMENT RESOURCES

Fire protection throughout Carcross and Tagish is the responsibility of the Carcross and Tagish Fire Departments – both of which are volunteer departments. Carcross Volunteer Fire Department (CVFD) acts as a co-department alongside Mount Lorne Volunteer Fire Department, automatically responding to assist one another. Mutual-aid agreements are also held between CVFD, Tagish Volunteer Fire Department (TVFD), Whitehorse Fire and Protective Services, Golden Horn Volunteer Fire Department, and the Special Heavy Operations Team – as requested through the Fire Marshal’s Office. Fire protection services of these departments are generally restricted to areas accessible by road, which excludes most backcountry areas and undeveloped forest lands. For brush fires, both CVFD and TVFD automatically request support from Yukon Wildland Fire Management (WFM).

CVFD and TVFD are small departments with basic levels of training, experience, and equipment. One of their most notable challenges is the annual recruitment and retention of members. While their departments’ focus and most of their equipment allotment is for structural fire suppression, both departments are equipped with wildfire response equipment and are routinely exposed to brush and forest fires. Table 8 provides an overview of the fire services capacity in Carcross and Tagish, which is further discussed in Section 5.5.

Table 8. Capacity and equipment of Carcross and Tagish Volunteer Fire Departments, as of September 2025.

Equipment Category / Personnel	Value	Additional Details
Fire Stations	One each, located on Carcross Road and Taku Boulevard / Reid Road respectively.	
Fire Personnel	<ul style="list-style-type: none"> • CVFD: 5 active members, 2 on leave • TVFD: 10 active members 	Many members trained in ICS-100, some in ICS-200. No wildfire-specific training.
Suppression Vehicles	<ul style="list-style-type: none"> • CVFD: 1 Fort Gary midship pumper (900 gal. tank), 1 Fort Gary tender (1,100 gal. tank and porta tank), 1 pickup truck and 1 offroad suburban. • TVFD: 2 structure fire trucks 	<ul style="list-style-type: none"> • Generally restricted to paved roads or good-condition gravel roads. • Good for structural fire response, vehicles reliant on established water sources (i.e., not capable of drafting from natural water sources)
Suppression Equipment	<ul style="list-style-type: none"> • CVFD: Full allotment of structure fire equipment, 1 portable water supply pump, forestry hose and connections, 5 piss-packs, shovels, axes. • TVFD: Basic fire equipment and PPE 	<ul style="list-style-type: none"> • CVFD portable pump is not a pressure pump and is too heavy to reasonably move far. • No designated structure protection equipment.

Since late 2006, CVFD responded to 99 total callouts which included vehicle accidents, structure fires, grass fires, medical incidents, and public hazards (though the available dataset does not have entries for 2008 through 2011). Call volumes fluctuate considerably year-by-year. In the summer of 2024, which was particularly dry, CVFD attended four separate brush fires inside the community. Historic wildfire occurrences and causation will be further discussed in Section 4.2.2. Commonly noted concerns of the CVFD and TVFD regarding fire risk and fire response are as follows:

- Narrow and dead-end roads which limit fire department access and turnaround;
- Inconsistent and often missing address numbering;
- Limited human and equipment resources in each department;
- Build-up of vegetation near homes leading to a lack of defensible space;
- Unpermitted burning activity, fireworks use, and weekend visitors.

Specific to wildfire, in 2023 CTFN signed a Memorandum of Understanding with the Yukon Government to create a new Initial Attack (IA) crew. IA crews are generally small crews (3 – 4 individuals) specialized in fast and initial response to fires, individually lacking the capacity to respond to large-scale, expanded wildfire events. Yukon Wildland Fire Management (WFM) staffs 24 IA crews and additional support staff throughout the Yukon, with crews in Whitehorse being the closest to Carcross and Tagish. When conditions warrant it, WFM will day-base IA crews in Tagish to improve potential response times. The following list details WFM staff in Whitehorse:

- 8 x Initial Attack Crews (Regional Resource);
- 4 x Fire Response Officers (Regional Resource);
- 2 x Air Tanker Groups (Territorial Resource);
- 2 x Helicopters when Fire Danger meets or exceeds High (Regional Resource).

Additionally, crews in Whitehorse currently have two specialized utility terrain vehicles each with 1,200 pounds of equipment, which greatly improves their ability to respond to fires that are located away from main, paved roads. YWFM also has agreements in place with Yukon First Nations Wildfire for staffing multiple Unit Crews which are based out of Whitehorse. Unit Crews are generally 20 person crews specialized in responding to large-scale, expanded wildfire events. As Unit Crews are highly trained, equipped, and well coordinated, they also have the ability to perform year-round forest fuel reduction and prevention and mitigation activities with local communities.

While Unit Crews can be highly effective in an expanding interface fire scenario, the availability of these crews for immediate response cannot be guaranteed as this is dictated by current wildfire activity throughout the territory. This challenge was a reality in recent years (2015, 2023, and 2025) as the territorial wildfire situation overwhelmed available ground resources, requiring resources to be imported from other jurisdictions – British Columbia, Alberta, Ontario, Oregon, Prince Edward Island, etc.

Yukon Wildland Fire Management has divided the Yukon into five discrete *Fire Management Zones* (FMZs) to proactively guide how wildfires are prioritized and responses are planned. The delineation of these FMZs accounts for human values, ecological values, remoteness, and accessibility – striking a balance between public safety and loss prevention, while recognizing the natural ecological role of wildfire. A description of these five FMZs and their distribution throughout the Carcross and Tagish WUI is displayed in Table 9 below, as well as on Map 10 and Map 11 later in this document.

Table 9: Description of Fire Management Zones in the Carcross and Tagish WUI.

Fire Management Zone	Description	Distribution in CTFN WUI
Critical	<ul style="list-style-type: none"> • Highest priority for fire response – includes high-risk areas such as communities and high-use infrastructure. • Quick and aggressive suppression response. 	<ul style="list-style-type: none"> • 71% - 9,948 hectares • Majority of the 1-km WUI, anywhere with structures other than Pennycook Road.
Full	<ul style="list-style-type: none"> • High priority for fire response – though more moderate risk areas. • Full suppression response. 	<ul style="list-style-type: none"> • 17% - 2,371 hectares • Southern Pennycook Road and various areas on the analysis buffer boundary – extends along the entire Crag Lake corridor, Highway 1 east of Tagish, and Highway 2 north of Carcross.
Strategic	<ul style="list-style-type: none"> • Wildfire response is balanced with multiple considerations – cost, difficulty, ecological value. • Fire response may be aggressive or more measured depending on the specific fire and weather conditions. 	<ul style="list-style-type: none"> • Only overlaps lake areas within the analysis buffer. • Covers high elevation areas surrounding the community.
Transitional	<ul style="list-style-type: none"> • More remote fires with fewer human values or infrastructure – less critical to protect. • Fires may be suppressed if early in the season, but may be monitored and allowed to burn later in the season. 	<ul style="list-style-type: none"> • Only overlaps lake areas within the analysis buffer. • Covers mountainous areas on slopes that face away from Carcross or Tagish, generally > 7 km from either community.
Wilderness	<ul style="list-style-type: none"> • Most remote and least developed areas. • The ecological role of fire is more often allowed, suppression may be minimal or delayed. 	<ul style="list-style-type: none"> • No area within the analysis buffer. • Covers mountainous topography that is a far distance or separated by waterbodies from either community.

3.3 VALUES AT RISK

Multiple types of values can be directly or indirectly impacted by a wildfire event and therefore the identification of these values ahead of time is an important consideration for effective emergency response and recovery. The working group for the *Southern Lakes Wildfire Risk Assessment (SLWRA)* developed a *Wildfire Consequence Rating* model that captured various values at risk through the following three components: Community Safety and Property, Indigenous Landscape Values, and Socio-Economic Landscape Resources.

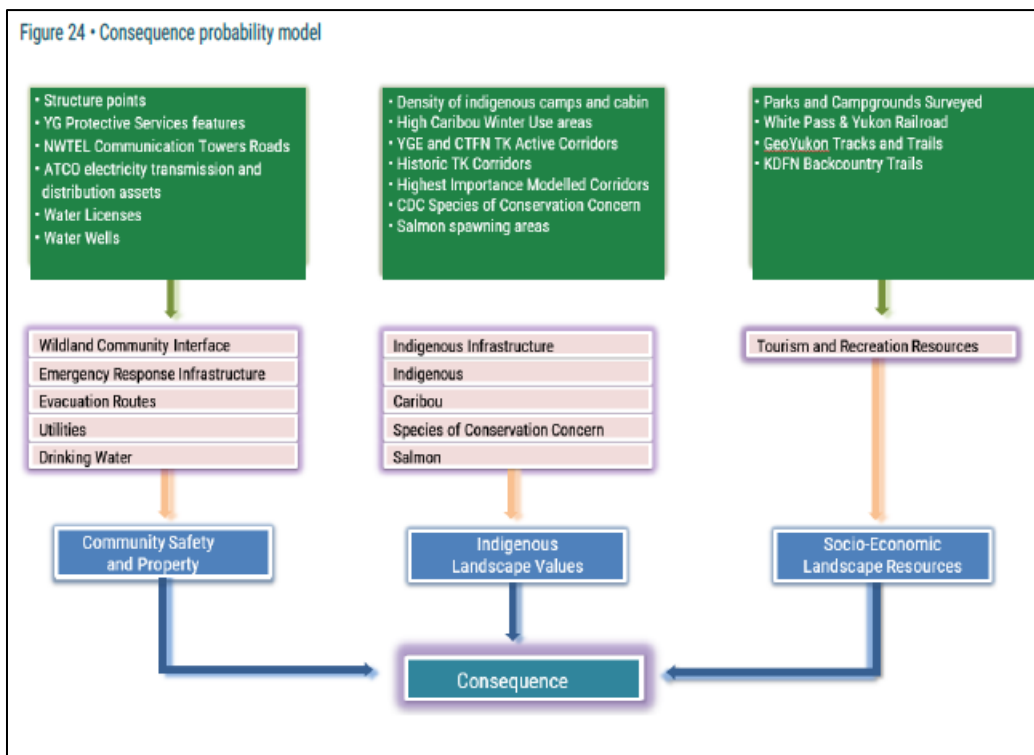


Figure 2: Wildfire consequence rating from the SLWRA.

As this CWPP is community-based, the values at risk that were considered included those from the *Community Safety and Property* subsection of the SLWRA consequence rating – specifically critical infrastructure, community assets, additional structures, evacuation routes, public utilities, and potable water sources. The various values at risk will be discussed throughout the following sections.

3.3.1 CRITICAL INFRASTRUCTURE AND COMMUNITY ASSETS

Publicly or Nation owned critical infrastructure typically consists of infrastructure that is essential to the health, safety, security or economic wellbeing of the community, or for the effective functioning of government (e.g., fire halls, emergency operations centers, radio repeaters, cell towers, etc.). Critical infrastructure and additional values at risk within Carcross and Tagish are shown on Map 4 and Map 5, while Table 10 details the inventory of critical infrastructure and community assets within the WUI. This list may change as the Carcross and Tagish communities continue to grow.

The distinguishing factor between critical infrastructure and community assets is their function during a wildfire event. Critical infrastructure provides essential functions and services during emergencies—such as power, water, communications, and transportation—while community assets are physical spaces or facilities that support daily activities and important community services, such as schools, parks, and community centers. Protecting critical infrastructure through proactive risk mitigation is essential to maintaining emergency response effectiveness, enabling coordinated evacuations when necessary, and ensuring that essential services can be sustained or quickly restored. Applying similar efforts to protect community assets helps build broader community resilience, preserving the facilities that support the culture and regular operations of CTFN. Survival and continued functionality of these facilities not only support the community during an emergency but also determine to a great degree the extent and cost of fire recovery and economic and public disruption during post fire reconstruction.

3.3.2 ELECTRICAL POWER & HEATING

A large fire has the potential to impact electrical service by causing a disruption in network distribution through direct or indirect means. For example, direct heat from flames or fallen trees associated with a fire event may cause power outages. Consideration must be given to protecting this critical service, as well as providing back-up power at key facilities to ensure that emergency response functions are kept reliable. Most electrical service for both Carcross and Tagish is received through a network of wood-pole distribution lines that are supplied by ATCO 25kV transmission lines. These transmission lines originate from a hydro generating station and run north-south to Carcross down the Klondike Highway corridor, connecting east to Tagish. Vegetation along electrical rights-of-way and surrounding electrical infrastructure should be regularly maintained to ensure a low fire-threat condition. Good vegetation management on electrical rights of way was generally observed throughout Carcross and Tagish, though vegetation or dumped material was observed to often be built up around residential power poles.

Additionally, electricity to five community buildings in Carcross is supplied through a Biomass District Heating System, while CTFN’s Culture Camp on the shores of Tagish Lake is powered by a microgrid solar project.¹⁷ The Carcross / Tagish Management Corporation, which is the economic development arm of CTFN, has also been researching the potential for commercially viable wind turbine power.¹⁸

Secondary power sources are important to reduce asset vulnerability in the event of an emergency which can cut 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 very long outages or if a fire prevents access to the site. The Carcross Local Area Plan identifies having *a booster station to provide backup emergency power during outages* as a community development priority. FireSmart assessments of critical infrastructure can identify power vulnerabilities and recommend their improvement, which should remain a priority action item for the community.

¹⁷ Government of Canada, Government Invests in Clean Energy Initiatives in Yukon: <https://www.canada.ca/en/natural-resources-canada/news/2020/09/government-invests-in-clean-energy-initiatives-in-yukon.html>

¹⁸ Government of Canada, Yukon and Northern B.C. Microgrid Projects: <https://www.canada.ca/en/crown-indigenous-relations-northern-affairs/news/2020/08/yukon-and-northern-bc-microgrid-projects.html>

Heating throughout Carcross and Tagish is supplied through a mix of electric baseboard, diesel, and wood heat.

3.3.3 WATER AND SEWAGE

CTFN's Infrastructure Department is responsible for the maintenance and operation of sewer and water treatment facilities as well as water delivery. Potable water in Carcross is sourced from Bennett Lake and treated at the water treatment plant in central Carcross. The public can fill portable containers of water at this location, and water is also distributed throughout the community via a water delivery truck. There are multiple other small public supply wells found throughout Carcross, though the community has shifted away from a reliance on potable well water due to contamination concerns.

On the east side of the Tagish River there is a group of CTFN Community Wells on Cottonwood Creek Road along with a chlorination treatment facility. Once treated, water is delivered throughout the CTFN community via a water delivery truck. West of the Tagish River, there is a group of community wells and a water treatment plant located adjacent to the Tagish Fire Hall. Water is accessible to the public at this location or is distributed throughout the community via a water delivery truck.

Neither of the water wells or potable water systems in Carcross and Tagish are connected to fire hydrants or piped throughout the community. In both communities, water for fire suppression is reliant on water tenders or pumper trucks filling up from these sources, or via direct pumping from natural water sources. Water supply is critical for both fire response and community recovery. The functionality of water infrastructure can be impacted by an interface fire event because of disruptions to power supplies or physical damage. Water supply may also be impacted by wildfire via disturbances to a watershed, though this is less important in Carcross and Tagish due to the surface-water source for many CTFN members water source (i.e., Bennett Lake and groundwater from the Tagish River), though well water does supply drinking water for many individuals in Tagish alongside many private domestic wells.

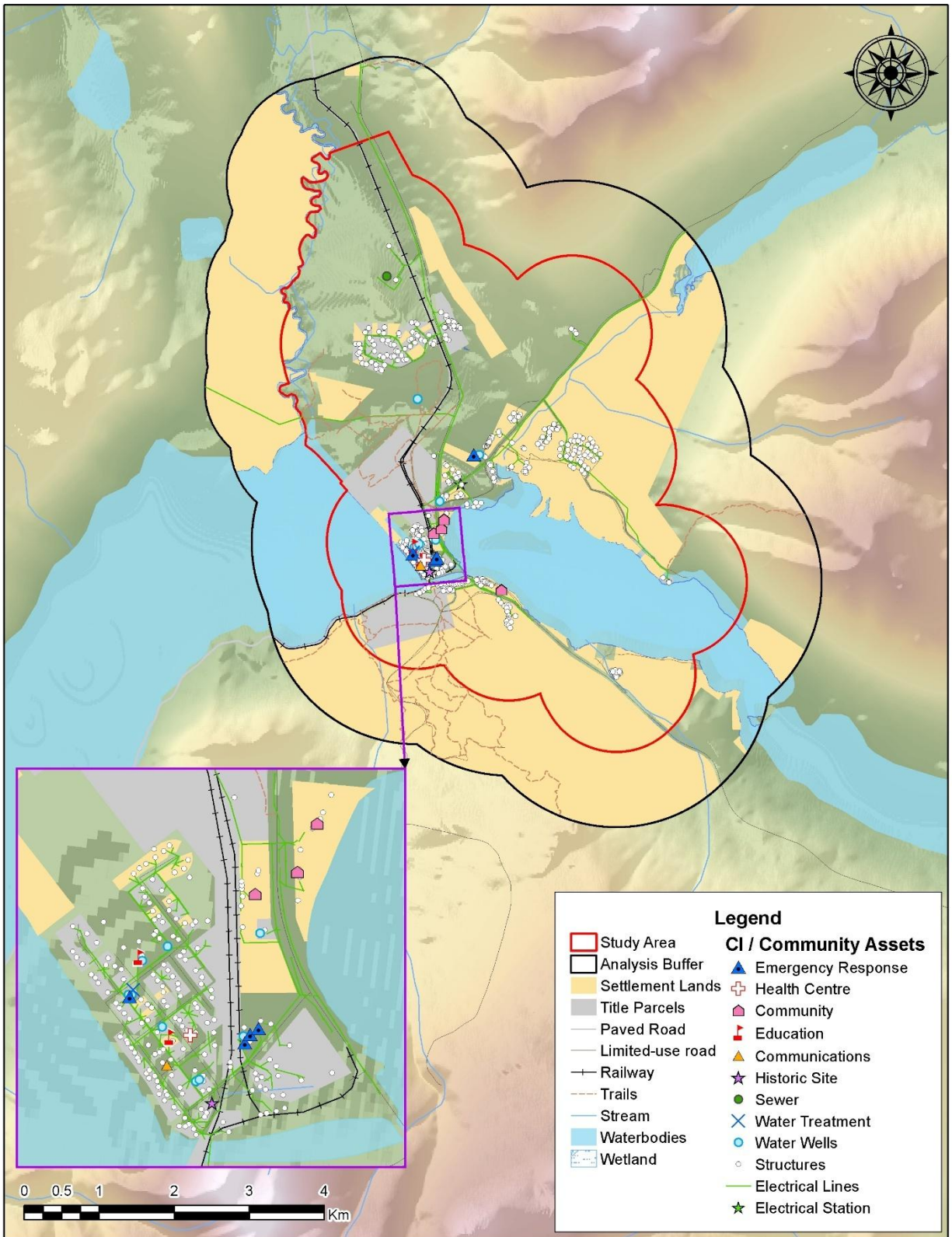
Carcross has an established wastewater collection and treatment system, with treatment occurring at the storage lagoons west of the Klondike Highway off Bill Pringle Way. There is no centralized sewage disposal or treatment system in Tagish.

Table 10. Identified critical infrastructure and community assets within the Carcross and Tagish communities.

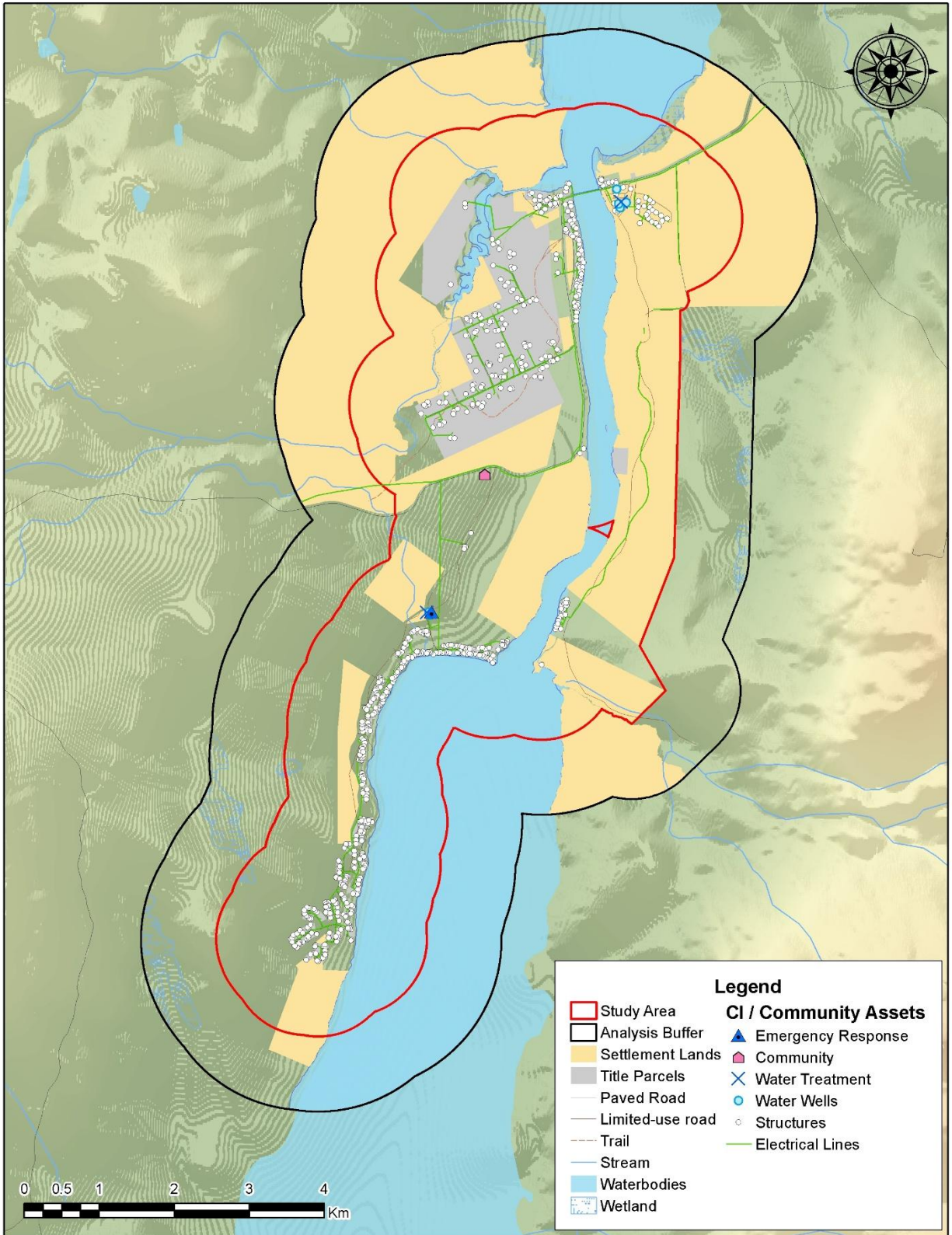
Name	Location	Risk or Resilience Factors
First Responders & Healthcare		
Carcross Volunteer Fire Department	Carcross Road	<ul style="list-style-type: none"> •Structurally FireSmart building •Isolated patch of mixedwood to the north but very little forest surrounding
Tagish Volunteer Fire Department	136 Reid Road	<ul style="list-style-type: none"> •Structurally FireSmart building •Forest surrounding the compound but the perimeter has been fuel treated to approximately 50 meters in all directions and along Reid Road / Taku Boulevard. Very high hazard conifer forests extend to the NE/E beyond this, and additional high hazard stands are found to the west of the main road.
Carcross Search and Rescue	Carcross Road	<ul style="list-style-type: none"> •Structurally FireSmart building •No forest surrounding
Carcross RCMP	Carcross Road	<ul style="list-style-type: none"> •Generally FireSmart building, few vulnerabilities as it is slightly older •Isolated patch of mixedwood to the north
Carcross Emergency Medical Services	1137 Austin Street	<ul style="list-style-type: none"> •Structurally FireSmart building •No forest surrounding, minor landscaping adjacent
Carcross Health Centre	Tagish Ave	<ul style="list-style-type: none"> •Generally FireSmart building •No forest surrounding, private residential properties and landscaping surrounding
Communications		
NW Tel Comms Tower	L0025 Carcross - McMurphy Street	<ul style="list-style-type: none"> •Metal infrastructure, private residential properties and landscaping surrounding
Community Buildings		
Haa Shagóon Hídi	Klondike Highway – Carcross Tagish Learning Center	<ul style="list-style-type: none"> •Structurally FireSmart building •Very minor landscaping around the building, but it is low flammability. Strip of riparian forest to the east of the building, generally low-moderate hazard.
CTFN Office	Klondike Highway	<ul style="list-style-type: none"> •Generally FireSmart building but with wood siding •No forest surrounding and very limited landscaping
Ghùch Tlá Community School	202 Austin Street	<ul style="list-style-type: none"> •Structurally FireSmart building •Minor landscaping throughout the property though majority of it is low flammability
Yukon College Carcross Campus	206 Tagish Ave	<ul style="list-style-type: none"> •Generally FireSmart building but with wood siding •No forest surrounding and very limited landscaping
Caribou Hotel	Dawson Charlie Street	<ul style="list-style-type: none"> •Older building with multiple FireSmart vulnerabilities •No forest surrounding and very limited landscaping

COMMUNITY WILDFIRE PROTECTION PLAN 2025

Name	Location	Risk or Resilience Factors
Montana Services	Montana Ave / Klondike Highway	<ul style="list-style-type: none"> •Generally FireSmart building but with wood siding •No forest surrounding and very limited landscaping
Carcross Cemetery	Waterfront Drive	<ul style="list-style-type: none"> •<i>Did not visit as part of field work</i>
Tagish Cemetery	Taku Blvd	<ul style="list-style-type: none"> •Well maintained area within the cemetery. Roadside areas adjacent have been historically fuel treated though there is considerable moderate-high hazard forest extending beyond this.
Electrical Utilities		
Various ATCO Circuits	Throughout Communities	<ul style="list-style-type: none"> •Wood poles throughout but in general the areas surrounding the poles and the electrical rights-of-way are regularly maintained and in a low-hazard state.
Carcross Substation	Tagish Road / Highway 8 (North of CTFN Campground)	<ul style="list-style-type: none"> •Mix of wood and metal infrastructure with gravel surface – generally low hazard •High hazard conifer forest stands to the south and east with the CTFN campground also located to the south.
Water		
Carcross Water Treatment Plant	105 Austin Street	<ul style="list-style-type: none"> •Structurally FireSmart building •No forest surrounding, minor landscaping adjacent
Carcross Wells (8)	Various locations within Carcross center.	<ul style="list-style-type: none"> •Metal infrastructure. May be vulnerabilities with the buildings they are contained within or the landscaping surrounding these buildings.
CTFN Band Office Well	CTFN Band Office	
Carcross SAR Well	Carcross Road	
CTFN Community Wells (Tagish - 3)	Cottonwood Creek Road	
Tagish Fire Hall Wells (3)	136 Reid Road	<ul style="list-style-type: none"> •Structurally FireSmart building •Forest surrounding the compound but the perimeter has been fuel treated to approximately 50 meters in all directions and along Reid Road / Taku Boulevard. Very high hazard conifer forests extend to the NE/E beyond this, and additional high hazard stands are found to the west of the main road.
Tagish Water Treatment Plant	136 Reid Road	
Tagish Lake Campground Well	Campground / Hwy 8	<ul style="list-style-type: none"> •Metal infrastructure
Sewage		
Carcross Wastewater Lagoons	Bill Pringle Way	<ul style="list-style-type: none"> •Limited above-ground infrastructure •High hazard forest stands in most directions



Map 4: Community assets and critical infrastructure within the Carcross WUI.



Map 5: Community assets and critical infrastructure within the Tagish WUI.

3.3.4 CULTURAL AND HERITAGE VALUES

The people of the Carcross / Tagish First Nation traditional territory are descendants of the Tagish and the Inland Tlingit, who established a strong set of cultural values and practices over thousands of years. The framework of these cultural values has been woven and upheld through a clan system – recognizing two wolf moiety clans, Daklaweidi (Killer Whale) and Yanyedi (Wolf), and four crow moiety clans, Deisheetaan (Beaver), Ganaxtedi (Raven), Ishkahittaan (Frog) and Kookhittaan (Crow). CTFN’s cultural values discuss spirituality, community, and traditional ways of life, but are founded in a powerful connection to the land as something that needs to be respected and cared for.

Alongside the Kwanlin Dün First Nation and Ta’an Kwäch’än Council, CTFN have taken part in a land-relationship initiative titled *How We Walk with the Land and Water* (HWW). Engaging with the community, incorporating Elders’ stories, and recording traditional practices has resulted in a mapped land vision which displays ecological, cultural, and historic values. Specific descriptions or locations of values will not be disseminated as part of this CWPP, though more than 50 sites and 40 areas of cultural importance have been identified within the Carcross and Tagish WUIs, alongside hundreds of other sites and areas within the surrounding landscape.

Local wildfire threat mapping associated with this CWPP can be reviewed amongst the HWW data to determine where proactive land management should take place to protect these features. Where fuel management or other wildfire risk reduction activities have been proposed as part of this CWPP, preliminary reconnaissance surveys should be undertaken to ensure that cultural heritage features are not inadvertently damaged or destroyed, and that locally identified cultural values are specifically managed for. In addition, sites and areas identified through HWW have the potential to be impacted by wildfire or wildfire suppression techniques. Wildfire response and suppression should consider these values, and collaborative approaches should be utilized to protect them.

Regarding heritage values in the Carcross community, the Yukon Government completed a *Summary of Carcross Historic Sites* in 2008, which identified 70 sites of historic interest within the Carcross Local Area Plan boundary. Heritage conservation has been identified as a key community priority in Carcross, which precipitated a *Heritage Management Plan* in 2016 developed for CTFN and Yukon Tourism and Culture.¹⁹ The community has recognized that significant heritage values are at risk from a variety of factors including their structural building condition or physical location (e.g., susceptibility to fire). Recommendations in this CWPP regarding FireSmart development or FireSmart buildings may conflict with structural conditions of heritage buildings (e.g., shake roofing, wooden siding), therefore compromises and unique approaches should be discussed between FireSmart staff and individuals involved with heritage conservation. Where structural changes are not desirable, improved fire resilience for heritage buildings can still be achieved through vegetation management and protective means (e.g., pre-positioned rooftop sprinklers).

Within the Heritage Management Plan, CTFN discusses heritage values as being much more than artifacts from the past – rather a shared experience of people on the land where they lived, traveled, hunted, and

¹⁹ The draft Carcross Heritage Management plan was only able to be accessed during the development of this CWPP.

celebrated their traditions. This traditional connection to the land, their community, and their history provides a much more holistic view of *heritage* values and emphasizes the importance of co-management of land and resources.

3.3.5 ENVIRONMENTAL VALUES

Environmental values include important habitat areas, habitat for species-at-risk, and sensitive ecosystems that may be impacted by wildfires, fire suppression activities, or fuel management. Environmental values within the Carcross and Tagish areas have been identified through the HWW database, as well as territorial databases of *key wildlife areas* and habitat for species of conservation concern. Specific to woodland caribou (*Rangifer tarandus*), both CTFN and the Yukon government have mapped areas of high caribou winter use as well as historic and active caribou corridors.

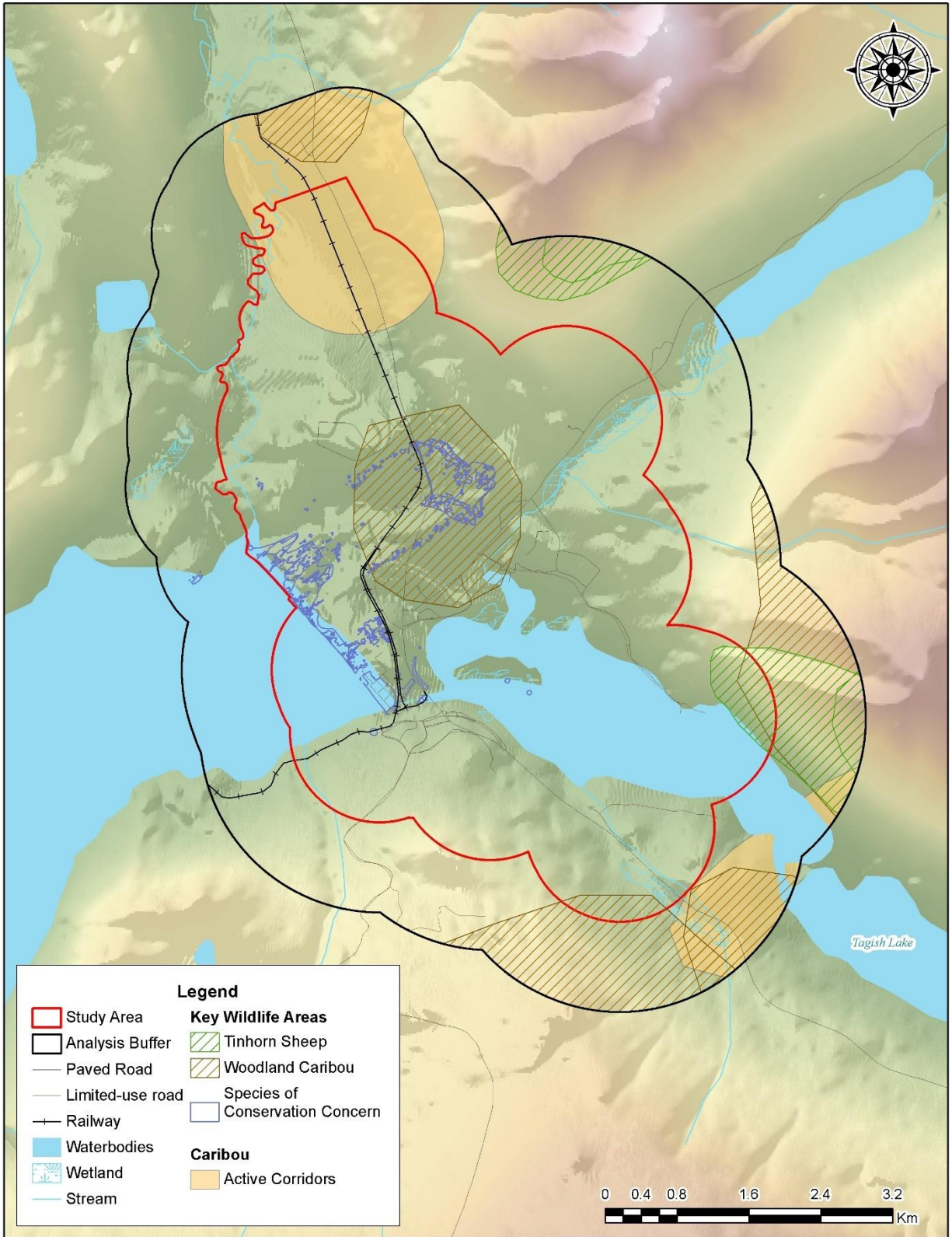
The entirety of the CWPP area is delineated by Yukon government as an important habitat area for either one or multiple species, further described by the season of use and the function (e.g., reproduction, range, breeding, or all functions). In addition, the WUI and the valleys surrounding contain habitat for numerous species at risk. Table 11 contains information regarding both important habitat areas and species at risk habitat.

Table 11: Summarized environmental values within the CTFN CWPP area.

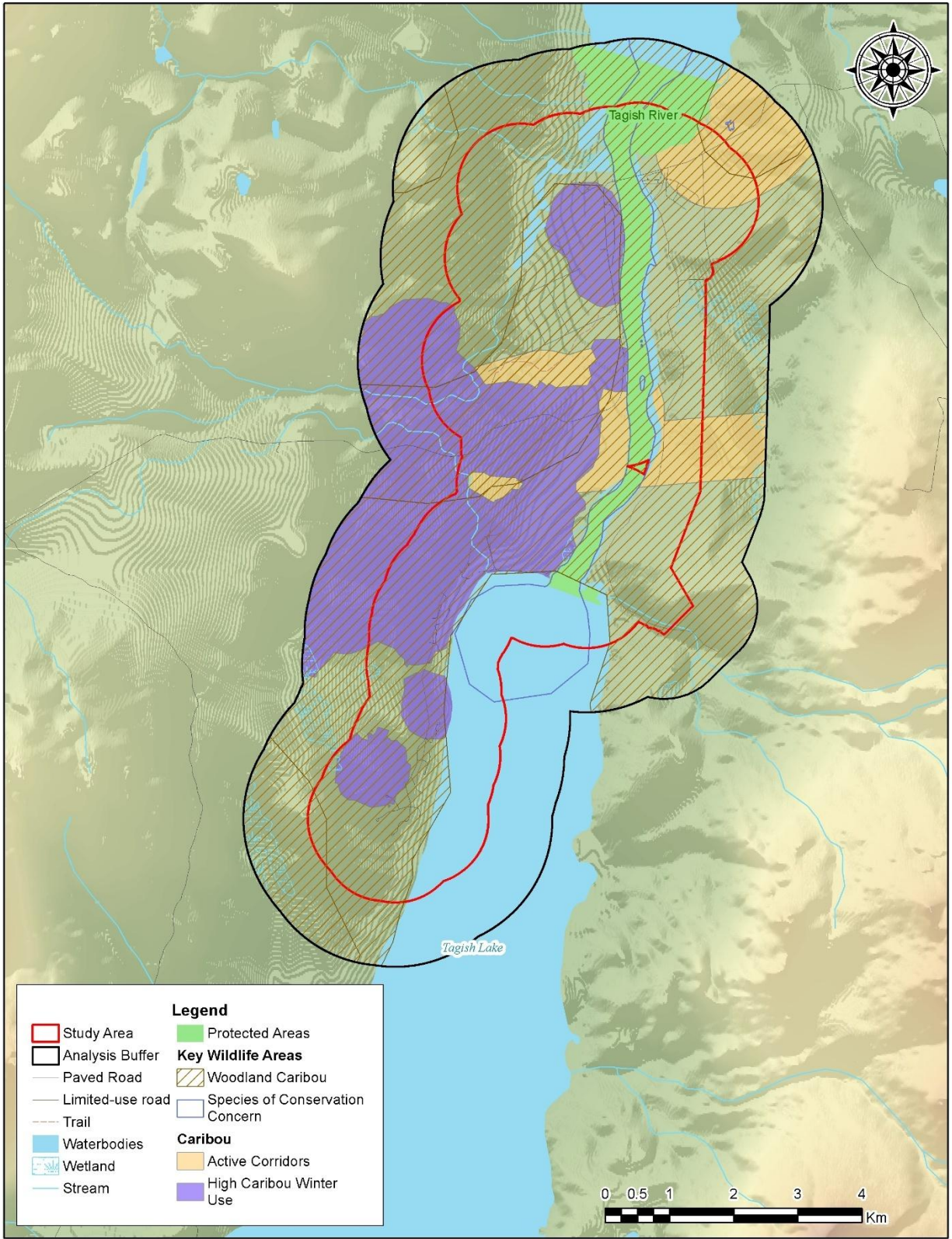
Important Habitat Areas Found Within the CWPP Area				
Common Name	Scientific Name	Seasons & Function		
Alpine Raptor (Gyrfalcon)	<i>Falco rusticolus</i>	Summer; Birthing & Nesting		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Summer; Birthing & Nesting		
Duck	<i>Various</i>	Fall; Staging Spring; Staging		
Golden Eagle	<i>Aquila chrysaetos</i>	Summer; Birthing & Nesting		
Goose	<i>Branta canadensis</i>	Spring; Staging		
Mountain Goat	<i>Oreamnos americanus</i>	Year Round; All Functions		
Swan	<i>Cygnus buccinator</i>	Spring; Staging		
Tinhorn / Dall Sheep	<i>Ovis dalli</i>	Spring; Birthing		
		Winter; Range		
Woodland Caribou	<i>Rangifer tarandus</i>	Fall; Breeding		
		Winter; Range		
Species of Conservation Concern Found Within the CWPP Area				
Common Name	Scientific Name	Taxonomic Group	Yukon Rank ²⁰	Status (COSEWIC)
Short-billed Dowitcher	<i>Limnodromus griseus</i>	Birds	S1B	Endangered
Baikal Sedge	<i>Carex sabulosa</i>	Vascular Plants	S3	Special Concern
Common Nighthawk	<i>Chordeiles minor</i>	Birds	S3B	Special Concern
Western Toad	<i>Anaxyrus boreas</i>	Amphibians	S2	Special Concern
a glass miner moth	<i>Elachista cicadella</i>	Butterflies and Moths	SU	N/A
Dune Tachinid Fly	<i>Germaria angustata</i>	Flies	S2S3	Special Concern
Trumpeter Swan	<i>Cygnus buccinator</i>	Birds	S4B,S1N,S3M	Not at Risk
Saltwater Cress	<i>Eutrema salsugineum</i>	Vascular Plants	S2	N/A
Slim-leaved Goosefoot	<i>Chenopodium leptophyllum</i>	Vascular Plants	SU	N/A
Hourglass Drone Fly	<i>Eristalis brousii</i>	Flies	S1S2	N/A
Water Awlwort	<i>Subularia aquatica</i>	Vascular Plants	S3	N/A
Water Pygmyweed	<i>Crassula aquatica</i>	Vascular Plants	S1	N/A

Operational plans for fuel management treatments and/or wildfire suppression should identify and mitigate potential impacts to all environmental values at risk, while balancing this with desired wildfire risk reduction outcomes. For identified wildlife, the guidance of a qualified professional may be required.

²⁰ Based on NatureServe S (Subnational) Rankings: S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure)



Map 6. Environmental values in the Carcross WUI (excludes generalized species distribution polygons due to multiple overlaps, as well as HWW data).



Map 7: Environmental values in the Tagish WUI (excludes generalized species distribution polygons due to multiple overlaps, as well as HWW data).

3.3.1 HAZARDOUS VALUES

Hazardous values are defined as those that pose a safety hazard to emergency responders. Protecting hazardous values from fires can limit the extent of interface fire disasters. Anywhere large quantities of combustible materials, explosive chemicals, gas, or oil is stored can be considered a hazardous value. Generally, neither Carcross nor Tagish have a considerable number of industrial sites or facilities that can be considered hazardous values at risk, nor is there a local or territorial database of these locations. Additionally, where these values do exist, they are often on privately owned property (e.g., Montana Services gas station, works yards, etc.). Hazardous conditions and the potential to proactively mitigate these on many residential properties will be further discussed in Section 5.7.2.

Identifying hazardous locations at the residential level and triaging these in terms of structure protection in a wildfire event is likely not realistic given the size and capacity of CVFD and TVFD. Appropriate management practices can be communicated within the community for hazardous values, including: 1) incorporating FireSmart planning and setback requirements for all infrastructure in this category; 2) educating property owners regarding FireSmart upkeep of their commercial properties; and 3) maintaining emergency fuel/propane emergency shut-off procedures to be enacted immediately in the event of an approaching wildfire or ember shower.

3.3.2 OTHER RESOURCE VALUES

Forest-based recreation is an important value in Carcross and Tagish both for residents and tourists. Forested areas within the WUI have a high recreational value namely for hiking, biking, snowshoeing, and off-road vehicle use. Carcross is known for the network of world-class mountain bike trails on Montana Mountain which attracts tourists and boosts the local economy. The establishment and upkeep of this trail network has also provided employment opportunities for youth and an opportunity for youth to connect with the land.

With increased recreational traffic in the WUI there is inherently an increased risk of wildfire ignitions (see Section 4.2.2). Additionally, if there is a lack of proactive fuel management in these networks, the potential fire severity can increase over time which decreases the potential safety and efficacy of first responders in the event of a forest fire. After a high-severity fire has occurred in an area, that area may now contain conditions and features which make recreation unsafe (e.g., danger trees, landslide risks, etc.). Many of the proposed fuel management areas in this CWPP overlap with recreational networks, though these networks often extend well beyond the WUI. The regular abatement of deadfall throughout these networks through piling and burning and the removal of snags and hazard trees can promote safe recreation while simultaneously and strategically reducing wildfire risk – especially as pre-existing trails are often used by first responders as access and anchor points.

SECTION 4: WILDFIRE RISK ASSESSMENT

This section summarizes the factors that contribute to local wildfire risk in the Carcross and Tagish wildland-urban interface. The wildfire risk assessment provides a decision support tool to determine the most effective wildfire risk reduction actions and opportunities to increase community resilience.

The relationship between wildfire risk and wildfire threat can be summarized as follows:

$$\text{Wildfire Risk} = \text{Consequence} \times \text{Probability}$$

Where:

Wildfire Risk is the potential losses incurred to human life, property, and critical infrastructure 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, critical infrastructure, etc.).

Probability is the likelihood of fire occurring in an area and that area's ability to ignite, spread, and consume organic material in the forest – its *wildfire threat*. Wildfire threat is driven by three major components of the wildfire environment, often referred to as the 'fire behaviour triangle':

- Topography – Slope and terrain features can influence a fire's rate of spread; aspect can affect pre-heating and fuel moisture content
- Fuel – Loading, size and shape, arrangement, continuity, and fuel moisture can determine the ignition and spread potential, as well as the potential fire intensity.
- Weather – Temperature, relative humidity, wind speed and direction, and precipitation determine the likelihood of ignition, fuel consumption, and spread rate and direction.



Figure 3: The fire behaviour triangle, and a subset of characteristics within each component.²¹

²¹ Province of Alberta.

4.1 LOCAL WILDFIRE ENVIRONMENT

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.

4.1.1 FUEL

A primary factor in determining a community's wildfire threat is its proximity to the surrounding forest as well as the amount of forest within the community, which is the natural 'fuel' in a wildfire scenario. Natural areas and developed areas in the Carcross and Tagish WUI are characterized by different types of vegetation, with some general patterns qualitatively assessed during field work.

Much of the undeveloped WUI in both Carcross and Tagish is dominated by mature conifer-dominated forests which differ in their species composition. In areas with higher soil moisture, often associated with flatter areas and depressions, the overstory primarily contains a mixture of black and white spruce (*Picea mariana* and *Picea glauca*), while more well drained sites contain a proportion of deciduous species (trembling aspen – *Populus tremuloides* and paper birch – *Betula pendula*). In spruce and mixed conifer-deciduous sites there is a well-established herb and shrub layer of willow (*Salix spp.*), prickly rose (*Rosa acicularis*), soapberry (*Shepherdia canadensis*), *vaccinium spp.*, labrador tea (*Rhododendron groenlandicum*), fireweed (*Chamaenerion angustifolium*), and more, along with a thick layer of feathermoss and duff. Vegetation in these forest types can burn at very high intensity under high and extreme fire weather conditions – with the highest potential intensity associated with high conifer densities, high amounts of deadfall, and thick duff layers. Using standardized wildfire threat assessment materials from British Columbia, these stand types range from a moderate to extreme wildfire threat (see Appendix B: WTA Plots and Photos).

Vegetation differs on the driest upland sites. These areas often have higher proportions of lodgepole pine (*Pinus contorta*) mixed with white spruce and deciduous trees, with a much sparser herb and shrub layer and a thin duff layer. The forest floor often contains a high continuity of conifer needles and deadfall, reindeer lichen (*Cladonia rangiferina*), and low-lying shrubs including common juniper (*Juniperus communis*), kinnikinnick (*Arctostaphylos uva-ursi*), and falsebox (*Paxistima myrsinites*). While these dry sites often have a lower potential fire intensity than the spruce stands described above, they can likely ignite and burn more easily at more moderate fire weather conditions. Fire threat within these dry areas ranges from moderate to high, increasing with higher components of deadfall, a higher percentage of spruce, and/or a higher overall conifer density.

There are multiple upland sites throughout the WUI that contain forests dominated by deciduous trees with very little conifer in the understory. These deciduous stands often have a mix of grass and shrub in the understory and have a considerably lower fire threat than adjacent conifer-dominant stands. Lastly, many developed areas within the WUI contain forests which have been historically disturbed and spatially broken up, though in many subdivisions and areas there remains a high continuity of fuel across residential properties and any adjacent forested areas. This continuity is often the result of limited tree or deadfall

management between properties, vulnerable structures and outbuildings, and accumulations of combustible debris such as firewood, construction materials, vehicles.

Fuel Types

The Canadian Forest Fire Behaviour Prediction (FBP) System was used to assess forest stand and structure characteristics as they relate to wildfire behaviour potential. This system outlines sixteen 'fuel types', which are distinctive forest structures each associated with different fire behaviour characteristics under defined conditions. Fuel types were confirmed or updated during fieldwork for all Settlement Lands and Yukon lands within the WUI. The results of this classification process and the verified fuel types that compose the forests within the WUI are shown on the following pages on Map 8, Map 9, and Table 12. Additionally, Figure 4 on the following page displays photos of four of the commonly found fuel types in the WUI.

The most prevalent type of vegetation is mature stands of spruce-dominant forests, which were mostly assigned a fuel type of C-2. Though not able to capture nuances through the FBP system, there is inherent variety in fire hazard within areas typed as C-2: generally, as the density of trees increases, the hazard increases. C-2 stands are one of the most hazardous fuel types in the FBP system. In spruce-dominant areas with a considerable deciduous component, these were assigned a mixedwood fuel type (M-1/2), with an indicator to show the effective percentage of conifer in the stand. Lower-density spruce stands were also assigned mixedwood fuel types, as these are comparable to a C-2 but with a very low horizontal continuity of conifers and consistent deciduous shrub coverage in canopy gaps. Where the conifer component is greater than 50%, mixedwood stands have the potential to be highly hazardous. Many of the forested areas adjacent to Carcross and Tagish that have had the fire threat reduced through fuel treatment were assigned a fuel type of M-1/2 < 25%.

In upland areas, stands were typed with a mixture of C-1 and C-3 with a small proportion of C-7. Where stands were open canopy, lower density, and contained conifer trees with low crowns, a fuel type of C-1 was assigned. The highest density conifer stands in these upland areas were assigned a fuel type of C-3, which represent a highly hazardous fuel type but generally requires more extreme fire weather conditions for initiating and sustaining crown fire.

Finally, a considerable number of large titled land parcels are found within the WUI, many of which are continuously forested. Assessing the fuel type of these and other private land holdings is outside the scope of this plan.

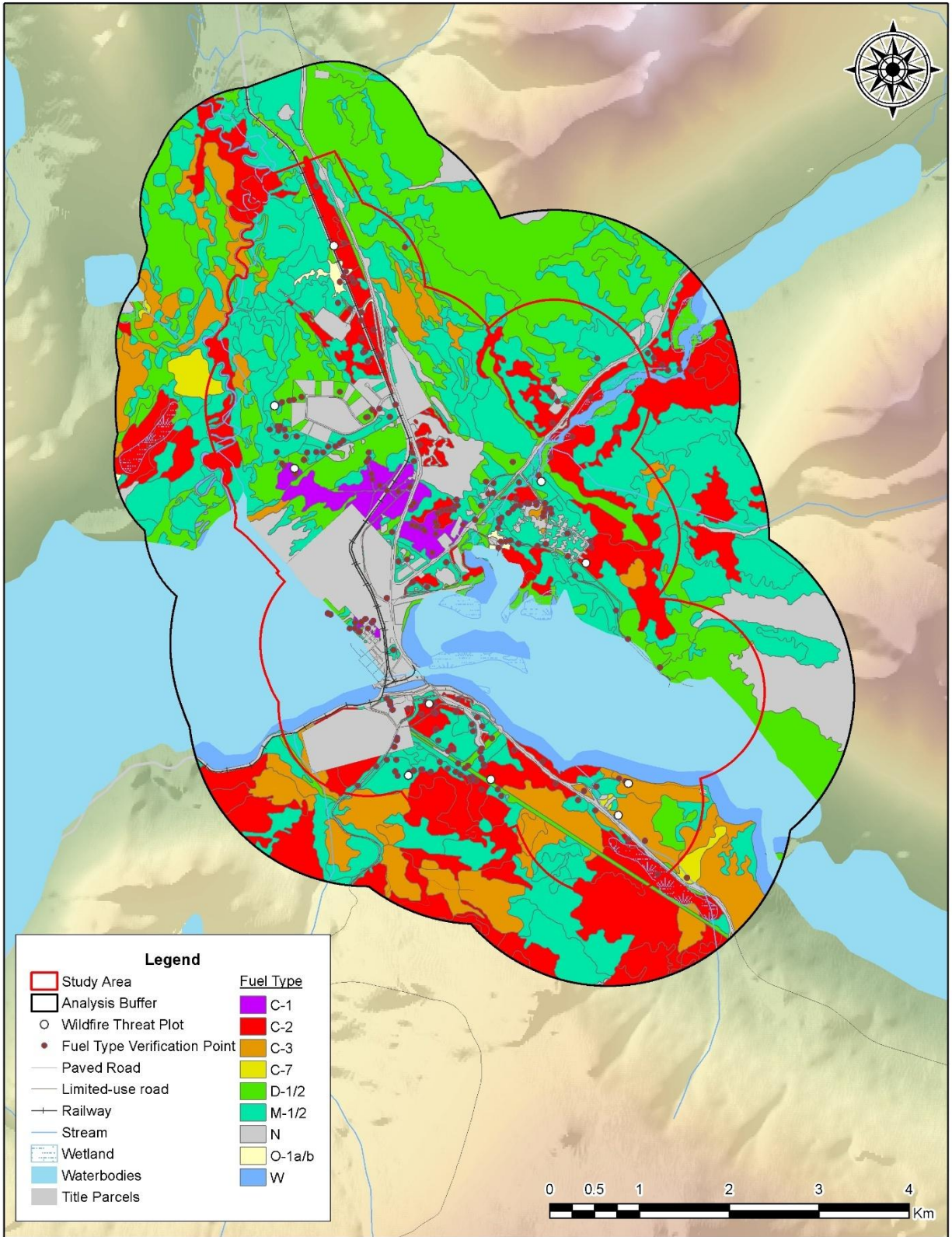


Figure 4: Examples of local fuel types, clockwise from top left: C-2 (dense spruce, thick duff), C-1 (spruce/pine, open canopy, dry forest floor), D-1/2 or M-1/2 < 25% (deciduous dominant, very little conifer, continuous grass and herb), C-3 (high density, even-aged lodgepole pine).

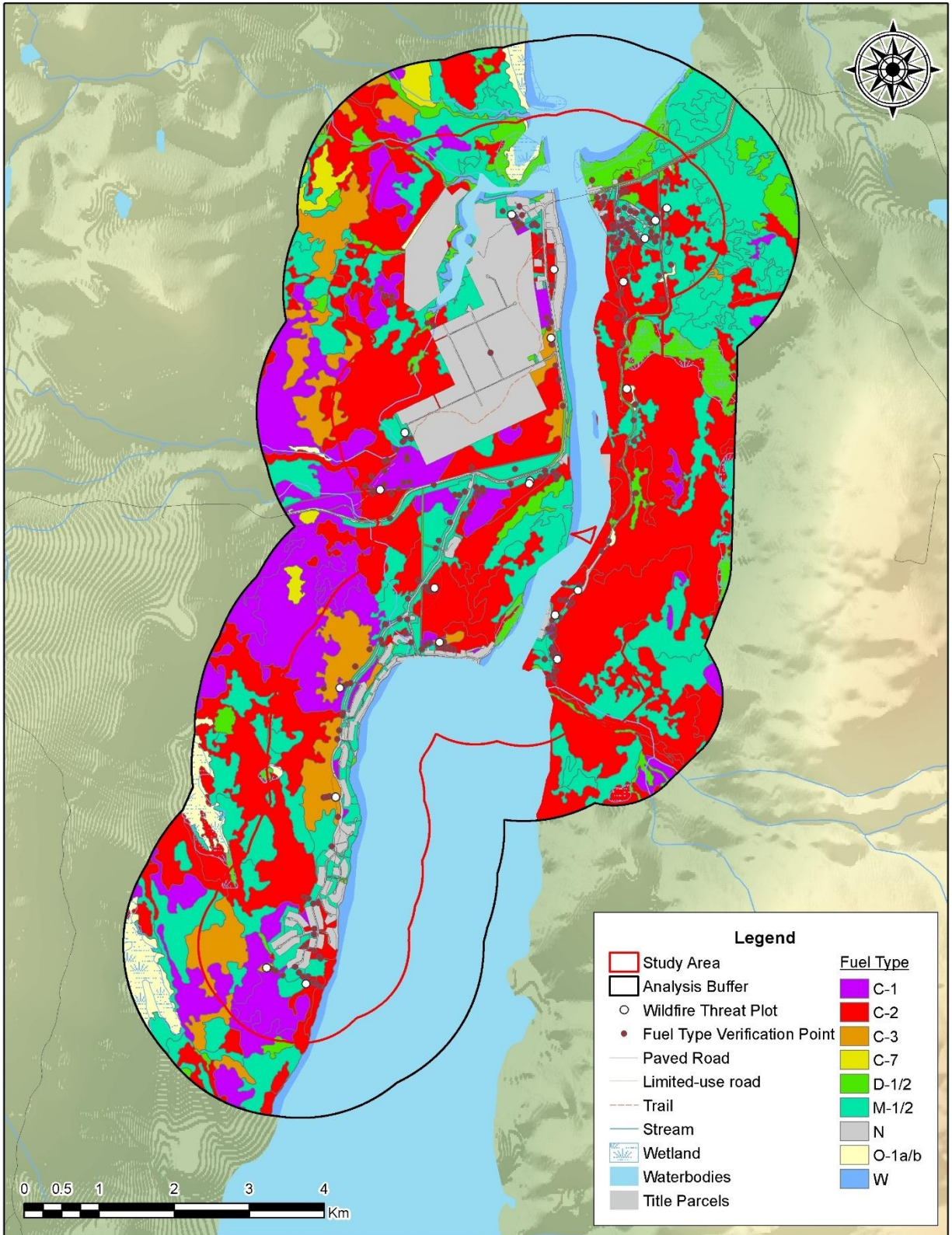
Table 12. Fuel types in the Carcross and Tagish WUI (public land and Settlement Lands only).²²

Fuel Type	Fuel Type Description & Implication	Area (Ha)	Percentage of Public and Settlement Land
C-1	<ul style="list-style-type: none"> Open canopy, parklike spruce and pine stands with minor deciduous. Widely spaced individual and clumped trees. Forest floor contains reindeer lichen, conifer debris, and sparse shrub cover. Tree crowns to the ground – torching of trees is common. 	929	7%
C-2	<ul style="list-style-type: none"> Moderate to high density spruce stands on lowland and upland sites. Consistent shrub cover in canopy gaps, scattered woody debris. High vertical and horizontal continuity – crown fire likely. 	3171	24%
C-3	<ul style="list-style-type: none"> Continuous, high-density, generally closed canopy conifer stands on upland sites – mixed pine and spruce. Generally > 1000 SPH. High crowns on overstory pine trees, scattered understory conifer. Scattered shrub regeneration and deadfall. 	798	6%
C-7	<ul style="list-style-type: none"> Open canopy pine stands on upland sites, similar to C-1 but more of a grass component and higher density. 	92	1%
D-1/2	<ul style="list-style-type: none"> Pure deciduous stands. Hazard increases with the amount of deadfall and higher grass components. Hazard fluctuates seasonally – can be very high during “spring dip” when fuel moisture is low. 	1473	11%
M-1/2	<ul style="list-style-type: none"> Mixed conifer and deciduous stands, typed by the percentage of conifer. Hazard increases with a higher percentage of conifer – high fire threat with > 50% conifer. 	3230	24%
N	<ul style="list-style-type: none"> Non-fuel areas – gravel pits, roadways, dunes, etc. 	580	4%
O-1a/b	<ul style="list-style-type: none"> Open grass patches. 	162	1%
W	<ul style="list-style-type: none"> Water – large rivers, lakes, wetlands. 	2777	21%

²² Canadian Wildland Fire Information System. (2024). *FBP Fuel Types*. <https://cwfis.cfs.nrcan.gc.ca/background/fueltypes/c1>



Map 8. Fuel types in the Carcross WUI.



Map 9: Fuel types in the Tagish WUI.

4.1.2 TOPOGRAPHY

Topography has a varying influence on the wildfire environment of Carcross and Tagish – from both a fire behaviour standpoint and an emergency response standpoint. Slope steepness influences a fire’s trajectory and rate of spread and slope position determines 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., gulleys, exposed ridges) the movement of a wildfire.

The effect of slope on fire behaviour is frequently displayed with fires in the Southern Lakes region of the Yukon and south into British Columbia, with rapid upslope spread on the fires along Tagish Lake in 2018 (adjacent to Conrad) and in 2023 (in British Columbia). In mountainous areas such as Carcross and Tagish, fire spread is likely to be topography-driven for an extended period of time until a short-term weather event pushes the fire into new terrain, after which topography again will become a primary driving factor. Table 13 shows the percent of Carcross and Tagish’s WUI by slope percent class and the associated fire behaviour implications.

Table 13. Slope percentage and fire behavior implications.²³

Slope	Percent of CWPP Area	Fire Behaviour Implications
<20%	91%	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	4%	Steeper slopes tilt flames upward, beginning to preheat fuel and increase rate of spread.
31-45%	3%	Flames are tilted upward, preheating fuels and directing flames towards fuels upslope. High rate of spread.
46-60%	1%	Flames are tilted upward, preheating fuels and directing flames towards fuels upslope. Very high rate of spread.
>60%	1%	Flames are tilted upwards, preheating fuels and directing flames towards fuels further upslope. Extreme rate of spread.

The vast majority of the CWPP area (91%) is on less than a 20% slope and will likely not experience accelerated rates of spread due to topography alone. Greater than 99% of the Tagish WUI falls within this slope class. Considering slope-effect independently, 4% of the WUI is likely to experience an increased rate of spread, with an additional 3% experiencing a high, and 1% a very high or extreme rate of spread. Steep slopes within the WUI are found on Montana Mountain, Nares Mountain, and Caribou Mountain, which are generally more than 200 meters away from structures. Short and isolated steep slopes are found adjacent to the Natasaheeni and Pennycook subdivisions. Steep slopes are a considerably challenging factor for wildfire suppression as these limit the ability of ground crews to access and work an area and often restrict the use of heavy equipment.

When slope percentage is considered alongside a value’s slope position, its risk to increased fire behaviour can change significantly. For example, a value located in the upper one-third of a steep slope (>40%) is likely to be exposed to a fire burning downslope, which can spread rapidly uphill and subject the value to

²³ Slope class delineation based off of BC Wildfire Service: 2020 Wildfire Threat Assessment Guide and Worksheets

increased preheating (convective heat). Table 14 summarizes the fire behaviour implications of slope position.

Table 14. Slope position of value and fire behaviour implications.²⁴

Slope Position of Value	Fire Behaviour Implications
Bottom of slope/ valley bottom	Impacted by normal rates of spread.
Mid-slope (bench)	Impacted by increased rates of spread. Position on a bench may reduce the preheating near the value (reduced exposure if the value is offset from the slope).
Mid-slope (continuous)	Impacted by fast rates of spread. No break in terrain features that are affected by preheating and flames bathing into the fuel ahead of the fire.
Upper third of slope	Impacted by extreme rates of spread. At risk to large continuous fire run, preheating and flames bathing into the fuel.

Most residential areas and community infrastructure in Carcross and Tagish are located on gentler slopes nearer the valley bottom and thus are associated with less slope-driven flame and fuel interaction. The Choutla and Watson Subdivisions have a minor amount of elevation gain leading up to them (approximately 30 m), though the slope is not steep. Very few infrastructure-based values at risk in Carcross or Tagish are located on mid-slope benches, more continuous slopes, or at the top of a slope break.

The aspect of a land base can also greatly affect the potential fire behaviour as the amount and timing of sunlight received affects temperatures, humidities, and fuel moisture amounts. Aspect is variable at a micro-topography scale throughout the Carcross and Tagish WUI, but the effect is considerably less pronounced due to the low slopes on average. Slopes toward Caribou and Nares Mountains have south and west aspects which are generally the hottest and driest aspects, where snow will melt off first and fuel moisture conditions can be the lowest. The portion of Montana Mountain within the Carcross WUI is generally north / northeast facing, which is more sheltered from the sun resulting in higher fuel moisture conditions.

²⁴ Adapted from the BC Wildfire Service: 2020 Wildfire Threat Assessment Guide and Worksheets

4.1.3 WEATHER

Carcross and Tagish experience a subarctic climate that is relatively mild and dry, with cold winters with persistent snow. Summer seasons are short, cool, and dry, with large diurnal temperature fluctuations. Yukon is classified into nine different bioclimate zones, three of which are found in the Carcross and Tagish WUI. 94% of the WUI falls within the Boreal Low – Southern Lakes bioclimate zone, with the highest elevation areas categorized as Boreal High (6%) and Boreal Subalpine (< 1%). The Boreal Low zone hosts consistently dry summers, which is conducive to periods of high fire danger. The Canadian Forestry Service developed the Canadian Forest Fire Danger Rating System (CFFDRS) to assess fire danger and potential fire behaviour. Fire Danger Classes provide a relative index of the ease of ignition and the difficulty of suppression. ‘High fire danger’ includes Danger Class ratings of 4 (High) and 5 (Extreme). At the time of writing the CWPP the methodology for delineating Fire Danger Classes in the Yukon was not able to be determined – therefore the analysis presented below is based off of the Build Up Index (BUI) and Fire Weather Index (FWI) thresholds in Danger Region 1 in British Columbia.²⁵

Fire Danger Class days were summarized from the Carcross weather station between 2017 and 2019 to provide an indication of the fire weather in the Carcross and Tagish WUI.²⁶ As 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 supports an assessment of overall wildfire risk. Figure 5 displays the average frequency of danger class days between the months of April and October, as recorded at the Carcross weather station. At 660 m elevation and within the Boreal Low bioclimate zone, the Carcross weather station is on the north side of Highway 8 across from Airport Road. Yukon Wildland Fire Management operates this weather station, taking daily readings of local weather conditions and calculating fire weather indices and fire danger ratings for the area.

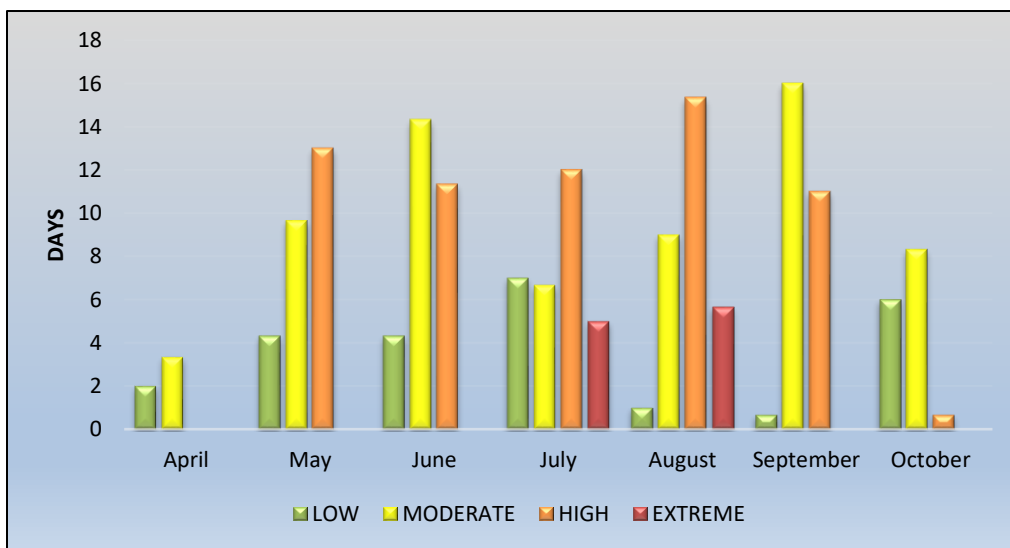


Figure 5: Average number of fire danger class days by month at the Carcross weather station.

²⁵ Wildfire Regulation – BC Laws. See Schedule 1 (Danger Regions) and Schedule 2 (Fire Danger Class). Accessed from: https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/11_38_2005

²⁶ This data had been made available through the SLWRA process. Efforts were made to access additional FWI data through Yukon Wildland Fire Management for this CWPP but the data was not made available in time.

The weather data shows that high fire danger class days regularly occur from May through September, with extreme hazard conditions historically restricted to July and August. From May through September, 48% of days had either high or extreme fire danger, which corresponds to an annual average of 73 days per year. The occurrence of high fire danger days throughout this five-month period indicates that the potential for fire starts begins early in the year and extends well into the fall.

Wind direction and wind speed regularly fluctuates throughout the valley due to the mountainous topography, and local terrain can significantly modify wind direction near ground level. Regardless, the predominant wind direction in Carcross is south-southwest to south-southeast. This aligns with the positioning of Nares Lake and Bennett Lake. In Tagish, the predominant wind direction recorded is from the south to south-southeast, which aligns with Tagish Lake. On an annual basis, wind speeds in Tagish are consistently stronger from April through September, which corresponds with the fire season. Consistent and often heavy winds associated with the large valleys in both Carcross and Tagish is a major concern for fire spread that has been noted by local wildfire officials. Additionally, cold fronts are a common weather system across the Southern Lakes region which often produce heavy and gusty winds. Cold fronts can cause erratic directional wind shifts and result in fire spread which is difficult to predict or control.

Climate Change

Climate change is the largest driver of natural disturbance trends in the Arctic region and the global boreal forest. In 2015 the Yukon Government published the Yukon Climate Change Indicators and Key Findings report which detailed statistical analyses of key climate indicators in the Yukon Territory.²⁷ The following climate projections are specific to the Yukon and have important implications for wildfire risk:

- Annual temperature for the Yukon has increased by 2 °C over the past 50 years and is projected to continue increasing to ~4.5 °C by 2100 (high confidence).²⁸
- Annual precipitation for the Yukon has increased by 6% over the past 50 years and is projected to continue increasing by ~38% by 2100. This trend has medium confidence as the historical records show considerable variability from year to year and from one location to the next. Overall, summers have seen the greatest increase in precipitation.²⁸
- Wildfire in the Yukon has burned increasingly more hectares over the last 50 years but the trend is not statistically significant. However, strong linkages have been shown among increased temperatures and altered precipitation patterns (associated with climate change) and increases in wildfire frequency and severity in the North American boreal forests.
- Insect outbreaks, variability in precipitation, warming temperatures, longer shoulder seasons, and increased winds increase the risk of forest fire in the Yukon in both severity and frequency (high confidence).

²⁷Streicker, J., 2016. Yukon Climate Change Indicators and Key Findings 2015. Northern Climate Exchange, Yukon Research Centre, Yukon College, 84p.

²⁸Gustine DD, Brinkman TJ, Lindgren MA, Schmidt JI, Rupp TS, et al. (2014) Climate-Driven Effects of Fire on Winter Habitat for Caribou in the Alaskan-Yukon Arctic. PLOS ONE 9(7): e100588. <https://doi.org/10.1371/journal.pone.0100588>

- The spruce bark beetle outbreak (in southwest Yukon) intensified by warmer conditions and drought stress, killing half of the mature spruce forest in the region (very high confidence).

William et al (2012)²⁷ stated that relatively infrequent, high intensity crown fires dominate North American boreal forests, but that climate change will result in future altered fire regimes realized through changes in fire weather and fire behaviour. Their study attempted to simulate the impacts of climate change on fire regimes in two large boreal study areas in central Russia and western Canada using three global climate models. The severity of future fire weather conditions increased in both study areas but was more extreme in the Canadian study area. Daily Severity Rating (DSR) and Head Fire Intensity (HFI), which are indicators of fire control difficulty, increased in both boreal regions but were more extreme in western Canada. In western Canada, HFI peaked once in the spring at its most extreme level, and again in the late summer at a slightly lower extreme level. Fuel consumption rate increased in western Canada and exhibited a seasonal increasing trend as fuels dried out as the fire season progressed. Overall, it was stated that fire management will be challenged in the future by increased fire weather severity that could push current suppression capacity beyond a tipping point, resulting in a substantial increase in large fires.

It is expected that climate change will have the following effects on wildfire within the Yukon:

- The period of high and extreme fire danger in any given fire season is likely to increase.
- The area burned within the study area is likely to increase because of increasing numbers of wildfires.
- The severity of wildfires is also likely to increase resulting in greater ecological impacts to habitat, water quality and values at risk.

4.2 WILDFIRE HISTORY

4.2.1 NATURAL DISTURBANCES

The following italicized paragraph is an excerpt from the Yukon Southern Lakes Wildfire Risk Assessment regarding the historical context of landscape-level fire.

Indigenous use of fire for purposes such as wildfire, pest, game and ecosystem management are documented for northern boreal regions including Yukon Territory, BC, Alberta, and Alaska.²⁹ Fire has always been a part of life for the people of the Yukon Southern Lakes: it is part of the land, a necessity, and a tool used in ceremony and for warmth and cooking. In the past, landscape fire was left to burn naturally and contributed to the health of the land. Resources and values were dispersed across the landscape, people were more mobile and would move away from the fire as needed. Fire was respected, even at the landscape level. As people started staying in one place for longer, resources and values became more restricted, people started developing a fear of fire. There is a fear of loss, and a fear of lack of control.

Multiple peer-reviewed publications discuss the presence of landscape-level wildfire in the boreal forest throughout the Holocene, related to both climate-driven (top-down) and fuel-driven (bottom-up) factors.^{30,31} Wildfires have historically influenced the stand size, shape, and spatial arrangement of forests across the landscape. These studies also discuss how a more recent expansion of lodgepole pine and overall forest densification in the southern Yukon indicates a lower mean fire return interval, while current climatic conditions match historical periods in which there were the largest and most numerous fire events in the historical record. Historical and present-day fires within the Boreal Low Bioclimate Zone are generally high-severity and stand-replacing, which is the expected fire regime given the forest types that are found throughout the Carcross and Tagish WUI.

In addition to forest fires, multiple other natural disturbances have been recorded within the Carcross and Tagish WUI and in adjacent forest stands. These forest health agents are summarized in Table 15 below.

²⁹ Christianson, A.C., Sutherland, C.R., Moola, F. *et al.* Centering Indigenous Voices: The Role of Fire in the Boreal Forest of North America. *Curr Forestry Rep* **8**, 257–276 (2022). <https://doi.org/10.1007/s40725-022-00168-9>

³⁰ Prince Tyler J., Pisaric Michael F. J., Turner Kevin W. 2018. Postglacial Reconstruction of Fire History Using Sedimentary Charcoal and Pollen From a Small Lake in Southwest Yukon Territory, Canada. *Frontiers in Ecology and Evolution Vol. 6*. Accessed from: <https://www.frontiersin.org/journals/ecology-and-evolution/articles/10.3389/fevo.2018.00209>

³¹ Kendrick J. Brown, Piyush Jain, Nicholas J.R. Hebda, Nicholas Conder, Richard J. Hebda, and Les C. Cwynar. 2024. Holocene vegetation and wildfire disturbance in boreal central Yukon, Canada. *Arctic Science*. **10**(4): 596-610. <https://doi.org/10.1139/as-2023-0070>

Table 15: Summary of forest health impacts within the CWPP analysis buffer.

Forest Health Factor	Severity	Hectares (ha)	Implication for Fire Risk
Aspen Leaf Miner (Phyllocristis populiella)	Light	441	<ul style="list-style-type: none"> Increased surface fuel from damaged leaves. Lower canopy closure can increase sunlight (i.e., drier surface fuels) and in-stand winds. Susceptibility of the trees is often worsened by drought conditions.
	Moderate	1085	
	Severe	567	
Drought	Light	4	<ul style="list-style-type: none"> Tree mortality can increase surface fuel loads through breakage or blowdown, and ladder fuels can increase where trees become hung-up.
Flooding	Severe	161	
Large Aspen Tortrix (Choristoneura conflictana)	Severe	11	<ul style="list-style-type: none"> More widespread defoliation than Aspen leaf miner – may cause mortality.
Pine Needle Cast (Lophodermella concolor)	Moderate	54	<ul style="list-style-type: none"> Increases short-term surface fuel loads from needle input.
Porcupine	Light	9	<ul style="list-style-type: none"> Localized impacts – causing tree mortality from girdling which can increase fuel continuity in surface and ladder fuel layers.
	Trace	5	
	Very Severe	1	
Spruce Beetle (Dendroctonus rufipennis)	Severe	0.4	<ul style="list-style-type: none"> Localized impacts from tree mortality. Recent spruce beetle outbreaks in the Yukon have been climate-driven and have resulted in more intense fire behaviour. Spruce beetle has historically been the most damaging forest health agent in the Yukon, affecting hundreds of thousands of hectares of mature spruce.
Western Balsam Bark Beetle (Dryocoetes confusus)	Light	29	

Though not captured in this dataset, there have been multiple windthrow events in the Carcross and Tagish area in recent years that have resulted in heavy accumulations of surface fuels in discrete areas. Windthrow effects were observed in both unmanaged forest stands and fuel treatment areas, affecting both spruce and pine trees. Aside from windthrow, in recent years there have not been widespread forest health events in the CWPP area that have caused considerable tree mortality. Without forest management that enhances resilience to forest health impacts, monitoring and proactively responding to outbreaks is critical to managing wildfire risk in the WUI.

While recognizing natural disturbance regimes and natural forest types by Bioclimate Zone provides useful insight into fire risk and land management, it is important to consider the historic context of forests in Carcross and Tagish. Many of the forest types currently found throughout the WUI, especially in and adjacent to developed areas, are not good representations of “natural” forest types that would be found in these ecosystems in the absence of human settlement. This is largely the result of historic land clearing practices (e.g., development, land clearing, mining) and the removal of natural disturbances (e.g., fire suppression).

4.2.2 HISTORIC WILDFIRE OCCURENCES

Historical fire ignition and fire perimeter data for the Carcross and Tagish WUI and the surrounding area are depicted on Map 10 and Map 11, with data sourced since 1947. Analyzing Yukon Wildland Fire Management’s historical fire ignition dataset, there have been 78 recorded ignitions in the surrounding area (within 5 kilometers of the communities) since 1947, with 40 of these having ignited inside the analysis buffer for this CWPP. Although the ignition data goes back to the late 1940’s, Yukon-wide fire detection capability was not fully developed until the 1960’s. Approximately 91% of the 78 fires have been human caused – attributed to general causes, abandoned campfires, equipment use, or fire use. Decadal ignition data and fire causation is summarized in Figure 6. Of these 78 fires only 6 were mapped as being larger than 1 hectare, with the two largest fires in the dataset (333 and 763 hectares respectively) being human caused.

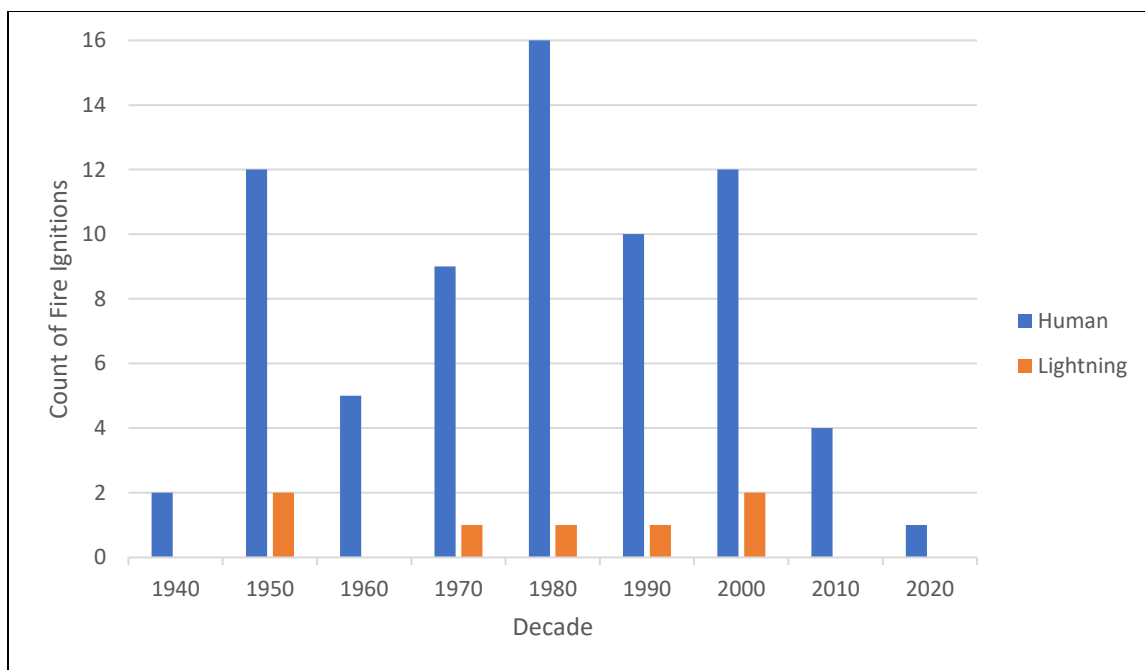


Figure 6: Historical wildfire ignitions within a 5-kilometer buffer of the Carcross and Tagish areas, categorized by ignition cause and decade. Data from GeoYukon.

Figure 7 displays the cumulative area burned in this same 5-kilometer buffer between 1947 and 2024, displaying that very little area has burned since the 1950s. This exclusion of fire from the forests surrounding Carcross and Tagish has allowed for a buildup of fuel within forest stands and a very high continuity of conifer forests at the landscape level.

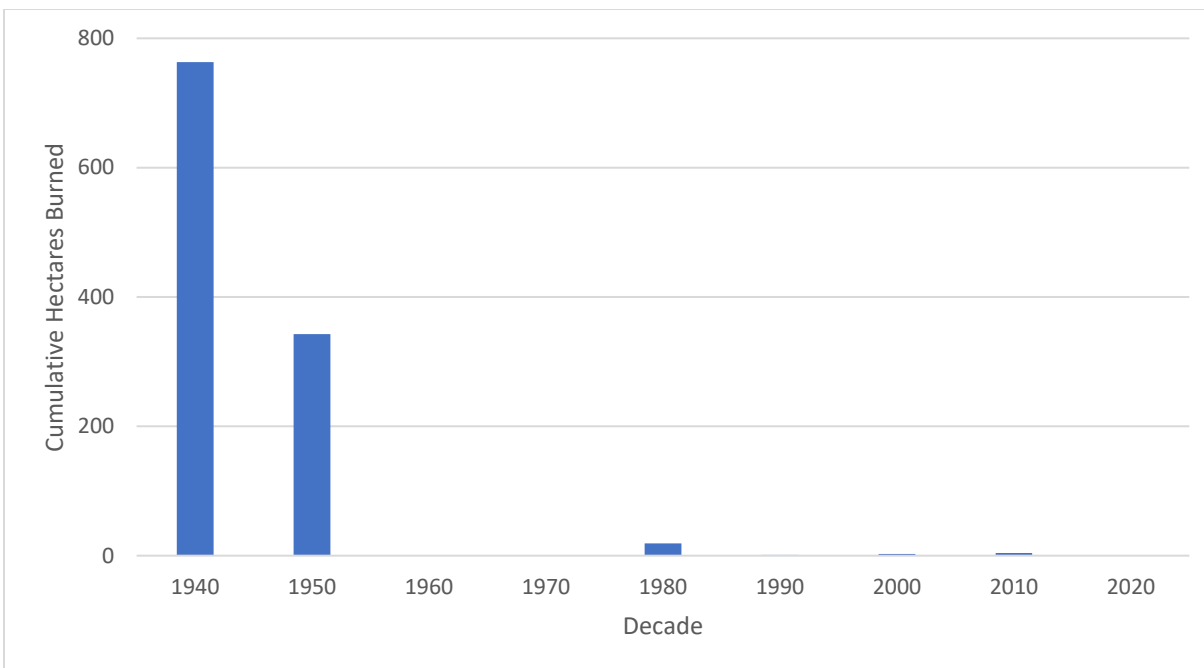


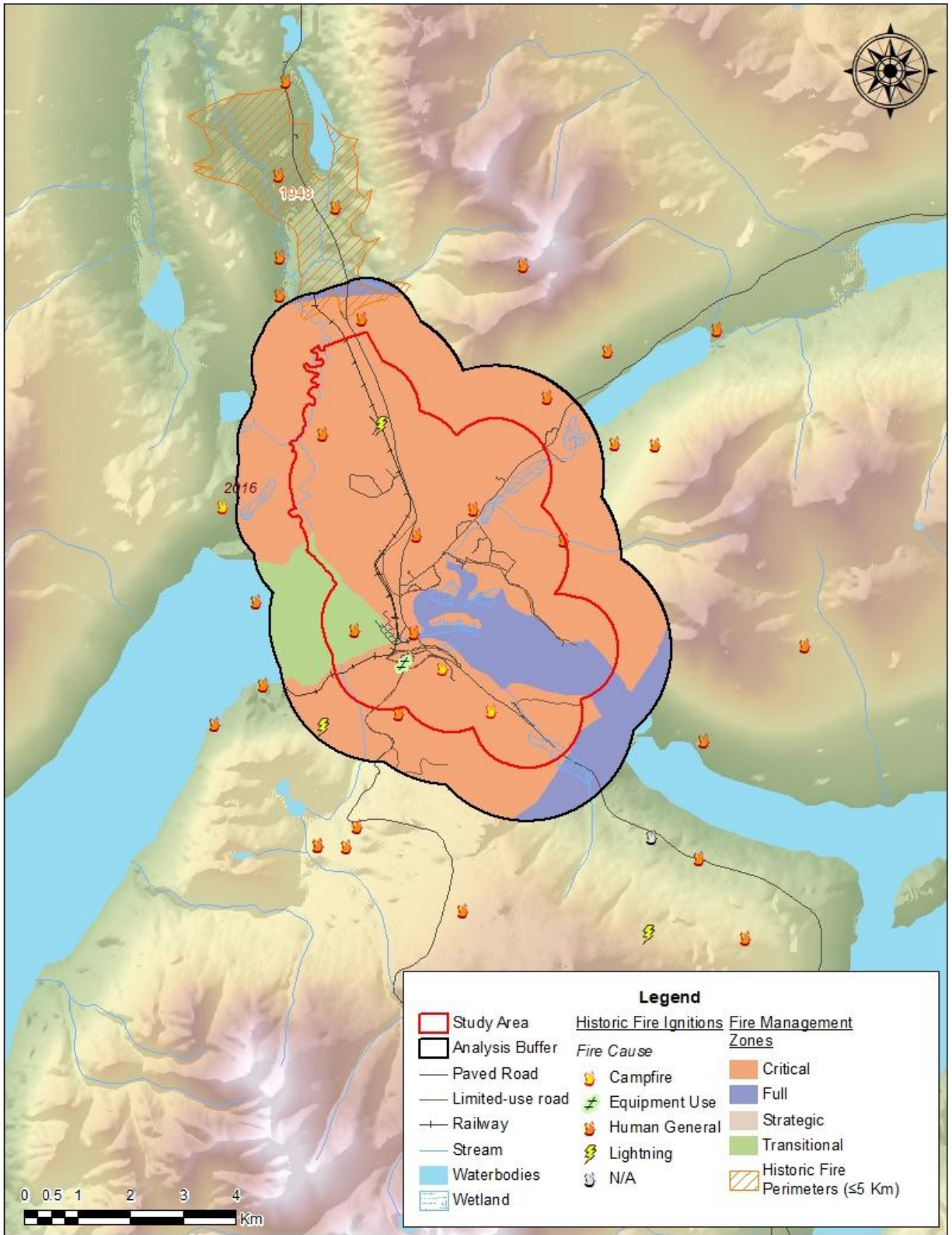
Figure 7: Historical cumulative area burned by wildfires originating within a 5-kilometer buffer of the Carcross and Tagish WUIs. Data from GeoYukon.

Despite the lack of recorded fire ignitions or area burned in the Carcross and Tagish WUIs, there have been large fire events in nearby and comparable ecosystems in recent decades. Three of these notable fires are presented in Table 16 below. These fires demonstrate that human-caused and lightning ignitions, when occurring in areas with continuous fuels, mountainous topography, and summer drought conditions, can lead to substantial fire growth potential in the southern Yukon.

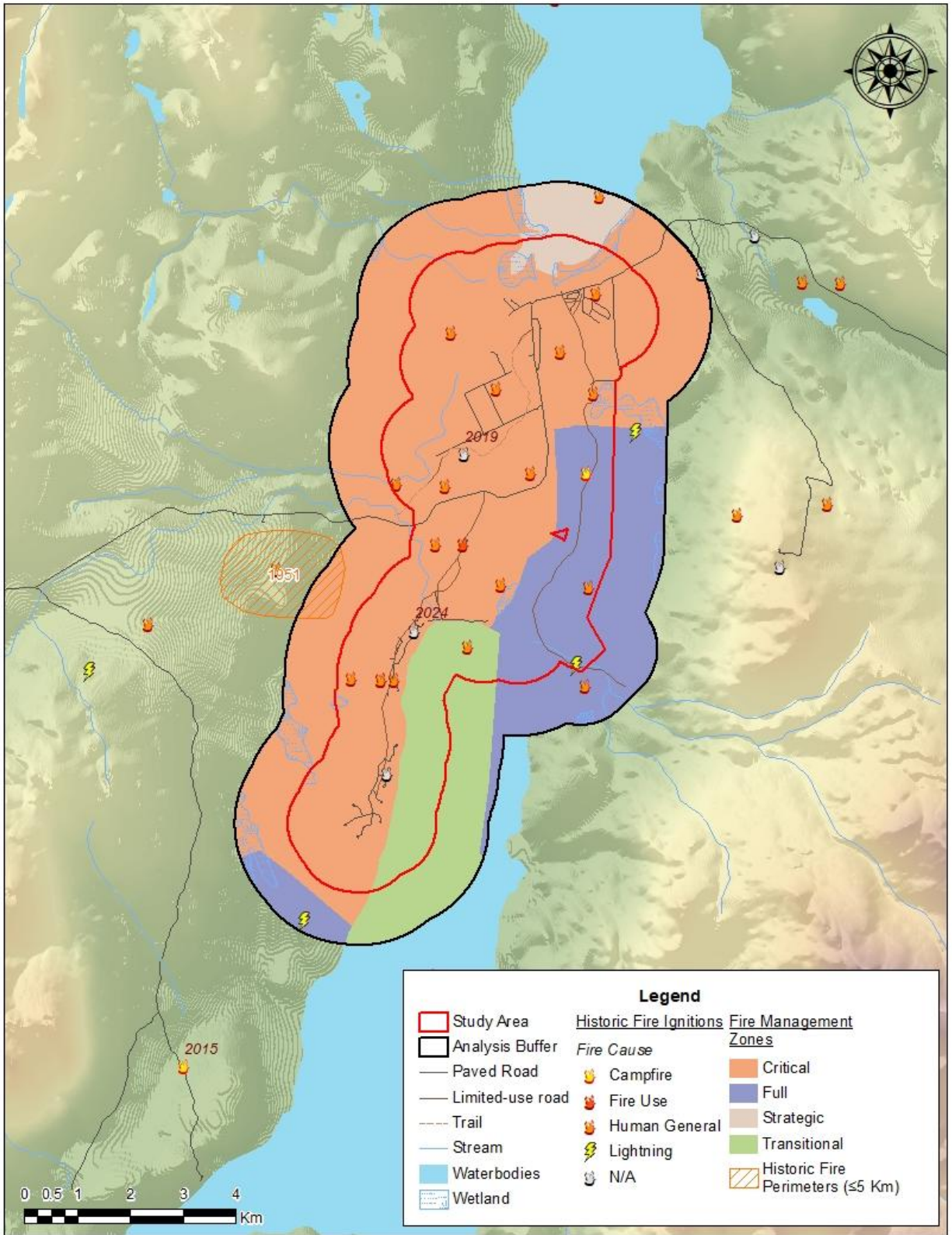
Table 16: Summary of notable fire events in southwest Yukon in recent decades.

Fire Number - Year (Name)	Fire Size (Hectares)	Fire Information
2018 Windy Arm / Conrad	2,147	<ul style="list-style-type: none"> Lightning-caused, ignited on August 6th and burned aggressively throughout August. Approximately 12 kilometers southeast of Carcross. Within a <i>Wilderness</i> Fire Management Zone – resulted in indirect attack, values point protection, and monitoring of the fire.
1999 & 2002 Streak Mountain	4,573 & 507	<ul style="list-style-type: none"> Lightning-caused, <i>Wilderness</i> Fire Management Zone.
1998 Primrose River	10,364	<ul style="list-style-type: none"> Human-caused, <i>Wilderness</i> Fire Management Zone.

Human-caused fires (which includes escaped structure fires, industrial fires, vehicles fires, campfires, arson, etc.) pose a high wildfire ignition risk within the Carcross and Tagish areas and are a major concern of local wildfire officials.



Map 10: Historical fire ignitions and fire perimeters within and adjacent to Carcross since 1947.



Map 11: Historical fire ignitions and fire perimeters within and adjacent to Tagish since 1947.

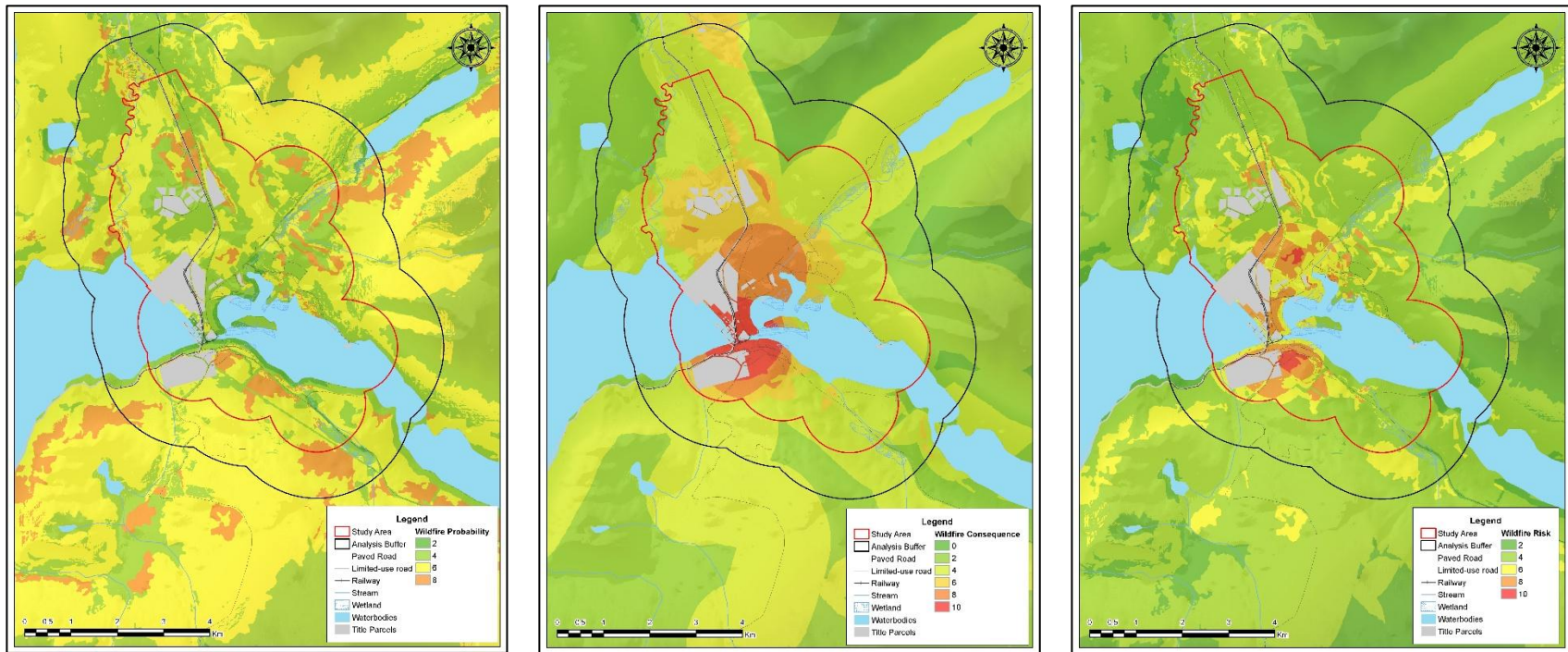
4.3 RISK FRAMEWORK AND RISK CLASS MAPS

Differing risk levels require tailored management strategies to minimize the potential impacts of wildfires on communities and critical infrastructure. The intent is to enable cost effective wildfire risk reduction strategies that will mitigate wildfire threat to communities and values at risk, at both local and territorial scales. Through the identification of risk level, priorities for mitigation and opportunities for increasing community resiliency are both enhanced.

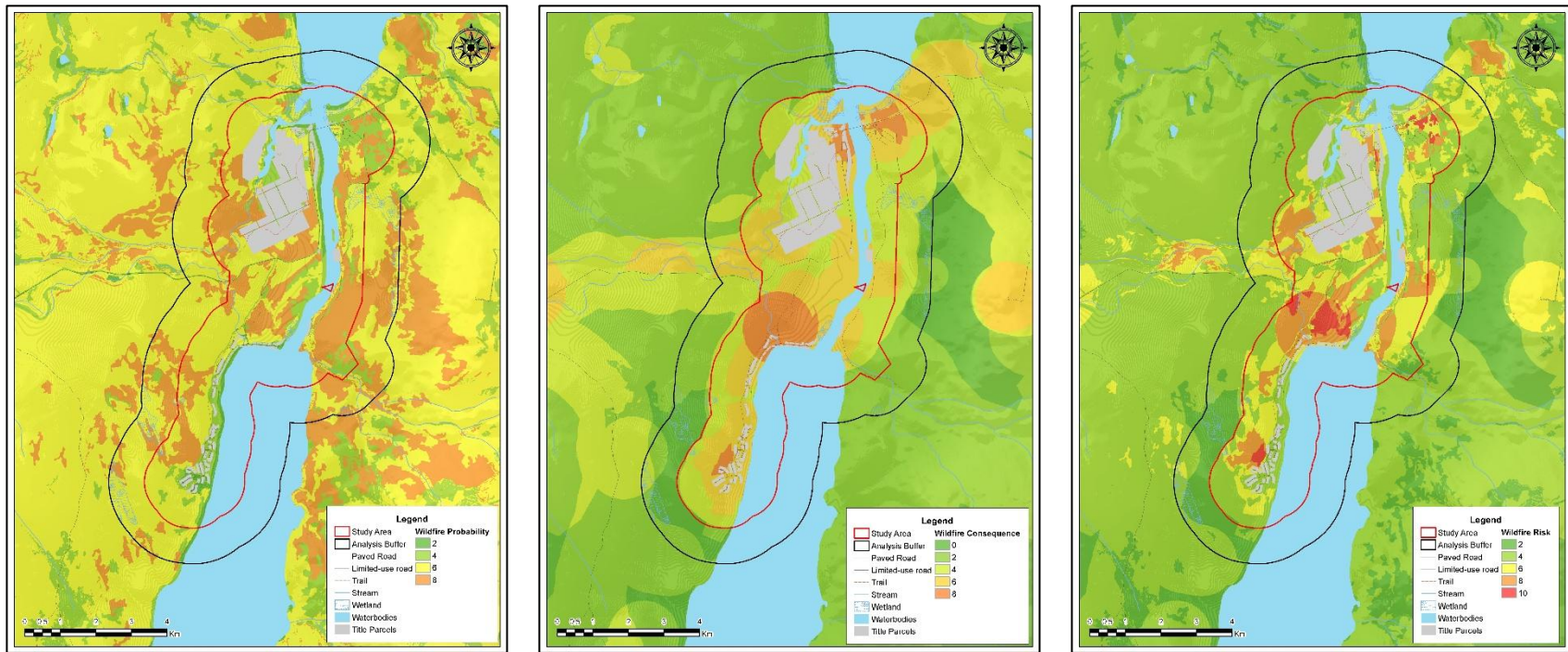
Higher-Level Risk Assessment

There is no fire threat analysis performed at the territorial-level in the Yukon. The assessment conducted as part of the Southern Lakes Wildfire Risk Assessment (SLWRA) provided a practical overview of fire risk for the entire Southern Lakes region, using data comparable to that employed by adjacent jurisdictions (e.g., British Columbia and Alberta) to map fire threat spatially. The SLWRA *Probability of Ignition* and *Potential Fire Behaviour* ratings incorporate broad-scale wildfire threat components which include ignition density, modelled ignition potential by fuel type, fire weather, fuel types (determined via territorial vegetation inventory mapping), and topography. The scope of the SLWRA limits the applicability of its outputs at the community-level, therefore a *Local Wildfire Risk Assessment* has been performed as part of this CWPP (Section 4.4).

Data outputs from the SLWRA for both Carcross and Tagish are shown on the following pages.



Map 12. Overview maps from the SLWRA for the Carcross area, showing wildfire probability (left), consequence (mid), and overall wildfire risk (right). Green represents the lowest values, yellow the middle, and orange and red the highest.



Map 13. Overview maps from the SLWRA for the Tagish area, showing wildfire probability (left), consequence (mid), and overall wildfire risk (right). Green represents the lowest values, yellow the middle, and orange and red the highest.

4.4 LOCAL WILDFIRE RISK ASSESSMENT

There are two main components of the Local Wildfire Risk Assessment for this CWPP: the analysis of the Wildfire Threat Class (which contains fuels, weather, and topography sub-components) and the WUI Risk Class (which includes a consequence sub-component). This process includes several key steps as outlined in Appendix D: Local Wildfire Risk Assessment Process and summarized as follows:

- Fuel type attribute assessment: Ground truthing/verification and updating as required to develop a local fuel type map;
- Consideration of the proximity of fuel to the community: Recognizing that fuel closest to the community usually represents the highest hazard;
- 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.
- 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.

It is important to note that the Local Wildfire Risk Assessment does not apply to any areas outside of the analysis buffer nor any titled parcels (i.e., private land) within. As well, the assessment quantifies threat as it relates to forest fuels and does not include the ignition potential of residential landscaping, structures or other infrastructure. Structure fires and structure-to-structure spread in a wildfire scenario are largely attributable to hazardous conditions in the Home Ignition Zone of a structure (i.e., the area within 30 m of the principal building and/or its attachments) and are a concern of both CVFD and TVFD members. However, the analysis does provide relevant information regarding wildfire threat that should be considered for FireSmart and emergency management planning and preparedness.

Wildfire Threat Class Analysis

Thirty-one Wildfire Threat Assessment (WTA) plots were completed over several field days in August 2025 together with verification of fuel types to support analyses and the potential delineation of fuel management areas (see Appendix B: WTA Plots and Photos). In addition, approximately 700 field stops were documented (e.g., qualitative notes, fuel type verification, and/or photograph documentation) throughout the WUI in areas that had road or trail access to build an accurate assessment of local fire risk. 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.
- 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 representatives.
- Observations: Additional areas potentially not recognized prior to field work were visually identified as hazardous and assessed during the week.

- Verifying SLWRA classification: Areas classified as higher risk in the Southern Lakes Wildfire Risk Assessment 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.

Based on the local wildfire threat analysis, classes of wildfire threat are as follows:

- Very High: Landscapes or stands of continuous forested fuels that will likely support continuous crown fire. Often only associated with C-2 stand types (continuous white/black spruce stands).
- High: Landscapes or stands of continuous forested fuels that will likely support intermittent crown fires or continuous crown fires. Often associated with mixedwood stands with a > 75% conifer component, or sloped terrain with C-3 stands or mixedwood stands with 50 – 75 % conifer.
- Moderate: Forested or vegetated areas where there is a potential for rapid surface fire spread or intermittent crown fires. Often associated with C-3 stands on flatter terrain, C-1 stands on flat or sloped terrain, or mixedwood stands with < 50% conifer component.
- Low: Undeveloped land that will likely not support significant wildfire spread unless heavily wind-driven or during spring-dip when fuel moisture is seasonally low. Generally only associated with deciduous stands. This threat class is also applied to areas typed as “non-fuel”, which can and often does contain high hazard conditions (e.g., structures, combustible materials, landscaping, etc.)
- No Data: Titled parcels which were not included in the threat analysis.
- N/A: Waterbodies with no forest or grassland fuels, posing no wildfire threat.

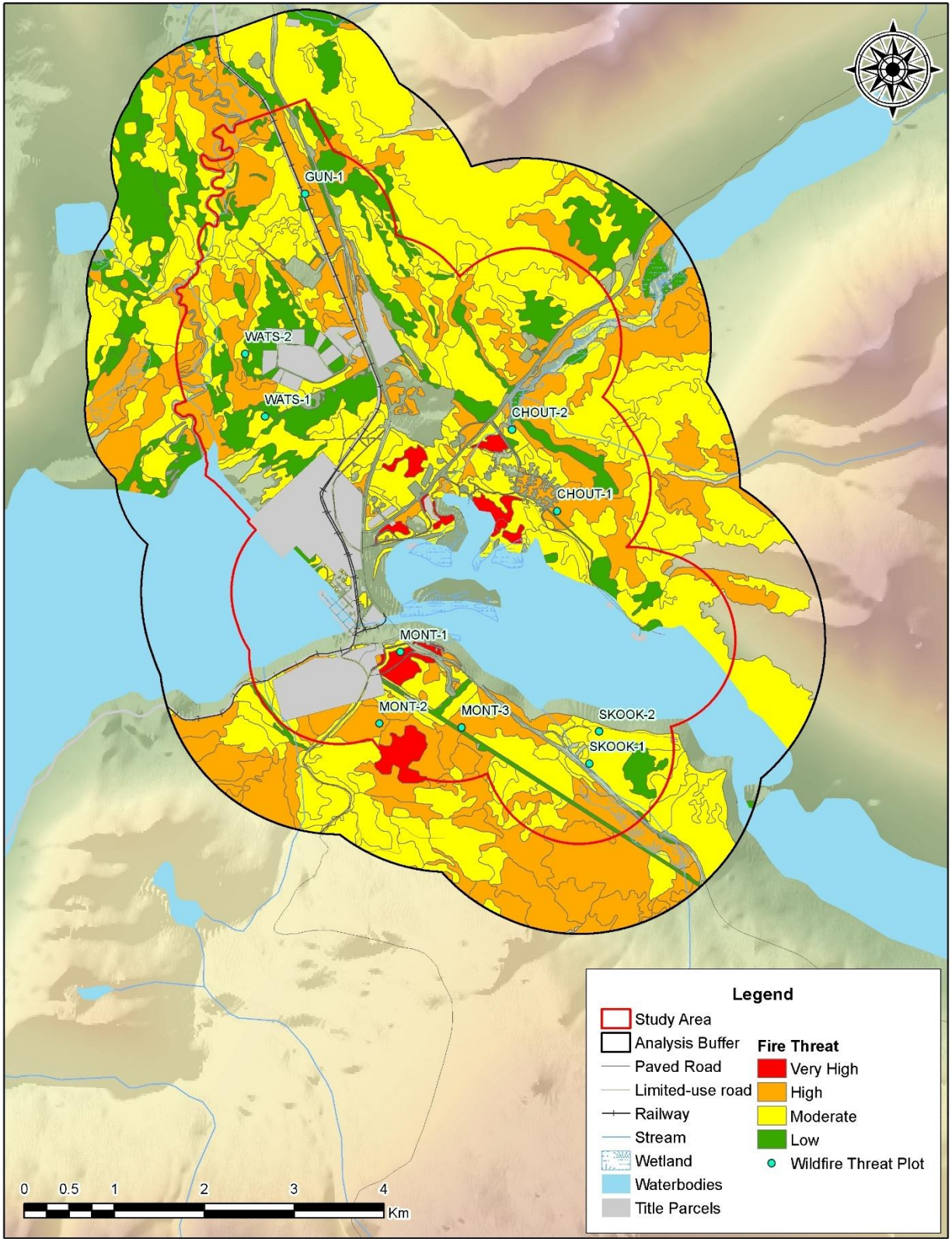
The results of the wildfire threat class analysis are shown on Map 14, Map 15, and in Table 17 below. The local threat analysis shows that 10% of the CWPP area is classified as very high wildfire threat, 20% is high, 34% is moderate, and 10% is low.³² Very high and high threat areas generally represent high to extreme threat stands of continuous conifer or mixedwood on all types of terrain, or slightly less hazardous stands but on sloped terrain. Wildfire threat considerably decreases as the deciduous component of a stand increases, or where there is less of a spruce component in the stand. Areas which have had fuel treatments completed often still contain a moderate wildfire threat given the conifer component and other inherent threat components – though these forest types often have high or extreme threat ratings pre-treatment.

It should be noted that 6% of the CWPP area was not assigned any wildfire threat rating given that it overlaps with titled parcels. Assessment of private land is outside the scope of this CWPP. Conditions on private property were frequently noted to have considerably higher fire threat than in the surrounding forest.

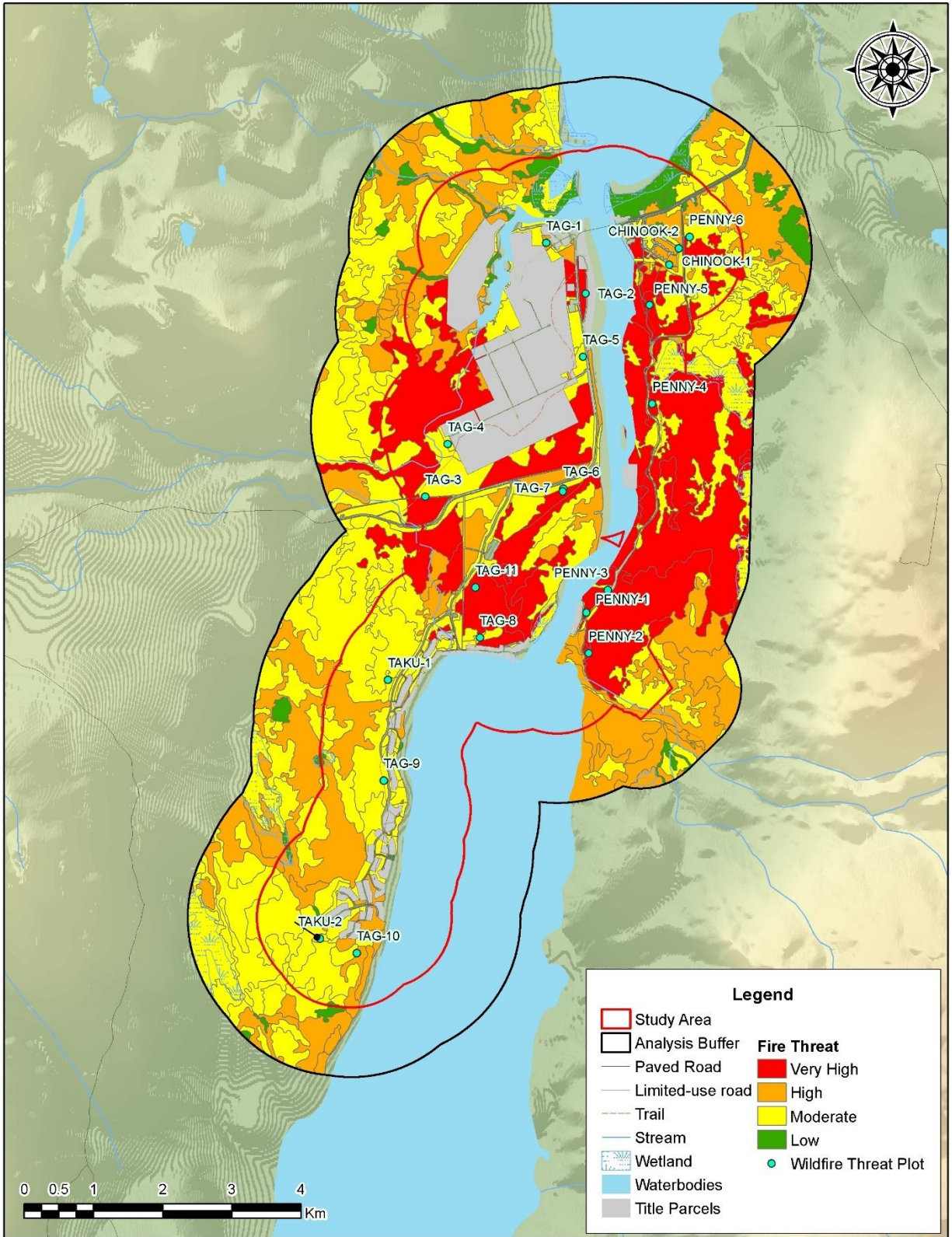
³² 40% of this low-threat area (4% of the analysis buffer) are areas that were assigned a “non-fuel” fuel type. As discussed in Section 4.1.1, non-fuel was assigned to roadways, gravel pits, and dunes, though it was also assigned to developed areas. Developed areas can and often do contain considerable fire hazards though these are not accurately quantifiable through this approach, which should not be overlooked.

Table 17: Wildfire Threat Class Analysis ratings.

Wildfire Threat		
Threat Class	Hectares	Percentage of Analysis Buffer
Very High	1,418	10%
High	2,831	20%
Moderate	4,827	34%
Low	1,359	10%
N/A (Water)	2,777	20%
<i>No Data (Titled Parcels)</i>	806	6%



Map 14: Carcross's Local Fire Threat Rating



Map 15: Tagish's Local Fire Threat Rating

To determine wildfire risk within the WUI, a community-based consequence rating was derived using multiple factors drawn from the *Community Safety and Property* data in the Southern Lakes Wildfire Risk Assessment. The inputs utilized in this CWPP were refined from those used in the SLWRA to better reflect a community-specific analysis. The various consequence inputs are introduced in Table 18.

Table 18: Components of the wildfire consequence rating.

Subcomponent	Input
Wildland Community Interface	Structure Density – weighted across five classes based on the number of structures per square kilometer.
Critical Infrastructure	100 m buffer on various infrastructure: emergency response / communications, utilities, community buildings, water sources.
Evacuation Routes	100 m buffer on main highways and evacuation routes.

The resulting consequence scores for the WUI were then cross-walked with the wildfire threat classes to produce an overall wildfire risk rating for the CWPP area. In this analysis, five classes of wildfire risk were determined:

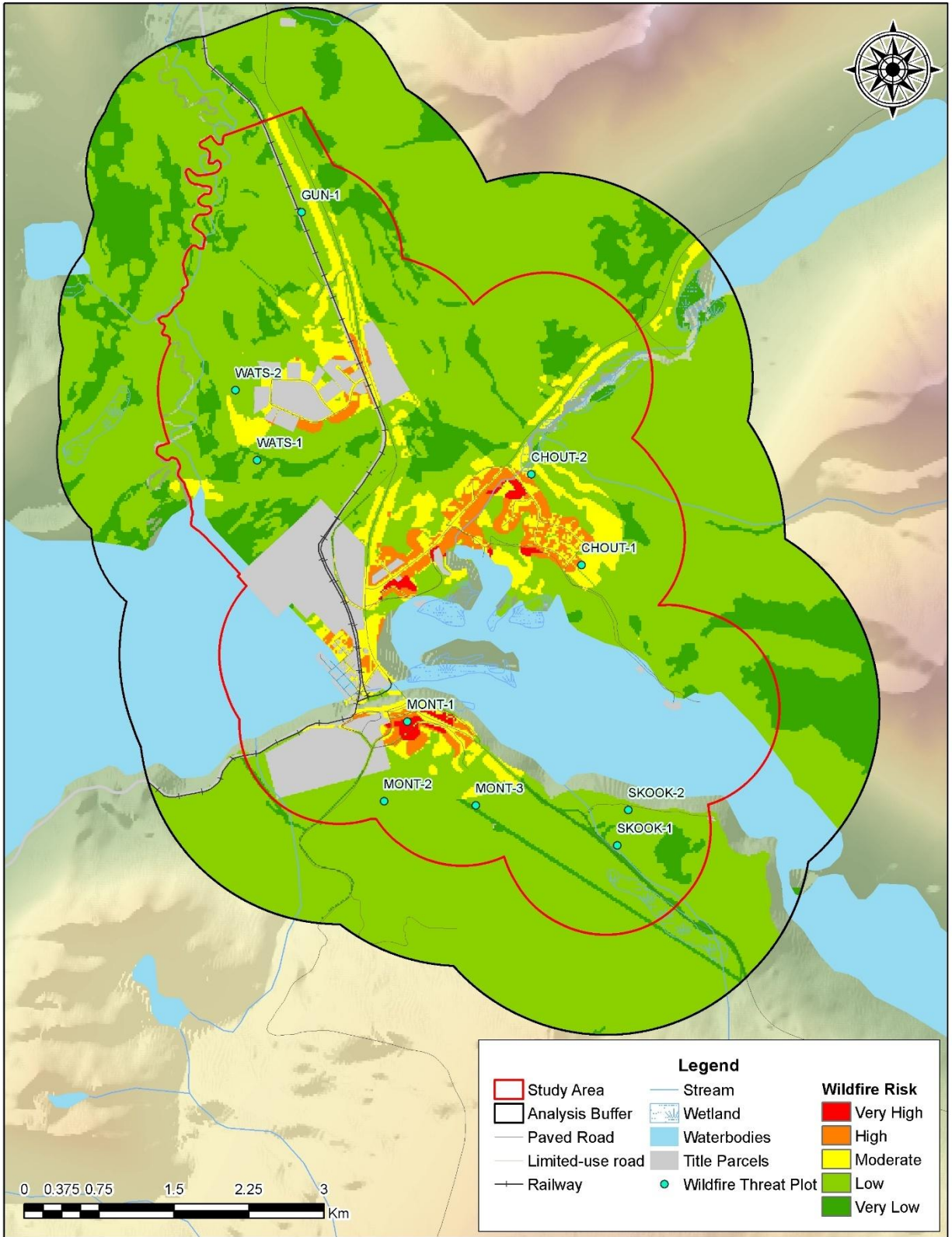
- **Very high:** Associated with a combination of *very high and high* consequence and threat ratings. Generally found in high density areas or where there is considerable community infrastructure, coupled with high threat forests.
- **High:** Associated with *very high* consequence ratings across *low to high* threat ratings, or more *moderate* consequences but where there is a *very high* wildfire threat. Generally found surrounding residential communities.
- **Moderate:** Associated with a broad spectrum – either *moderate* consequence and threat areas or a mixture of *high* and *low* ratings. Generally found in higher threat stands further from neighbourhoods, and along evacuation and utility corridors.
- **Low:** Associated with *very low* threat or consequence areas, with a *low* or *moderate* ranking of the other. Generally found far from any infrastructure but where forest stands still have an appreciable threat.
- **Very Low:** Associated with *very low* ratings for both consequence and wildfire threat. Generally found in isolated deciduous forests or non-fuel areas.

Table 19 below summarizes the WUI Risk Classes within Carcross and Tagish, which are shown on Map 16 and Map 17.

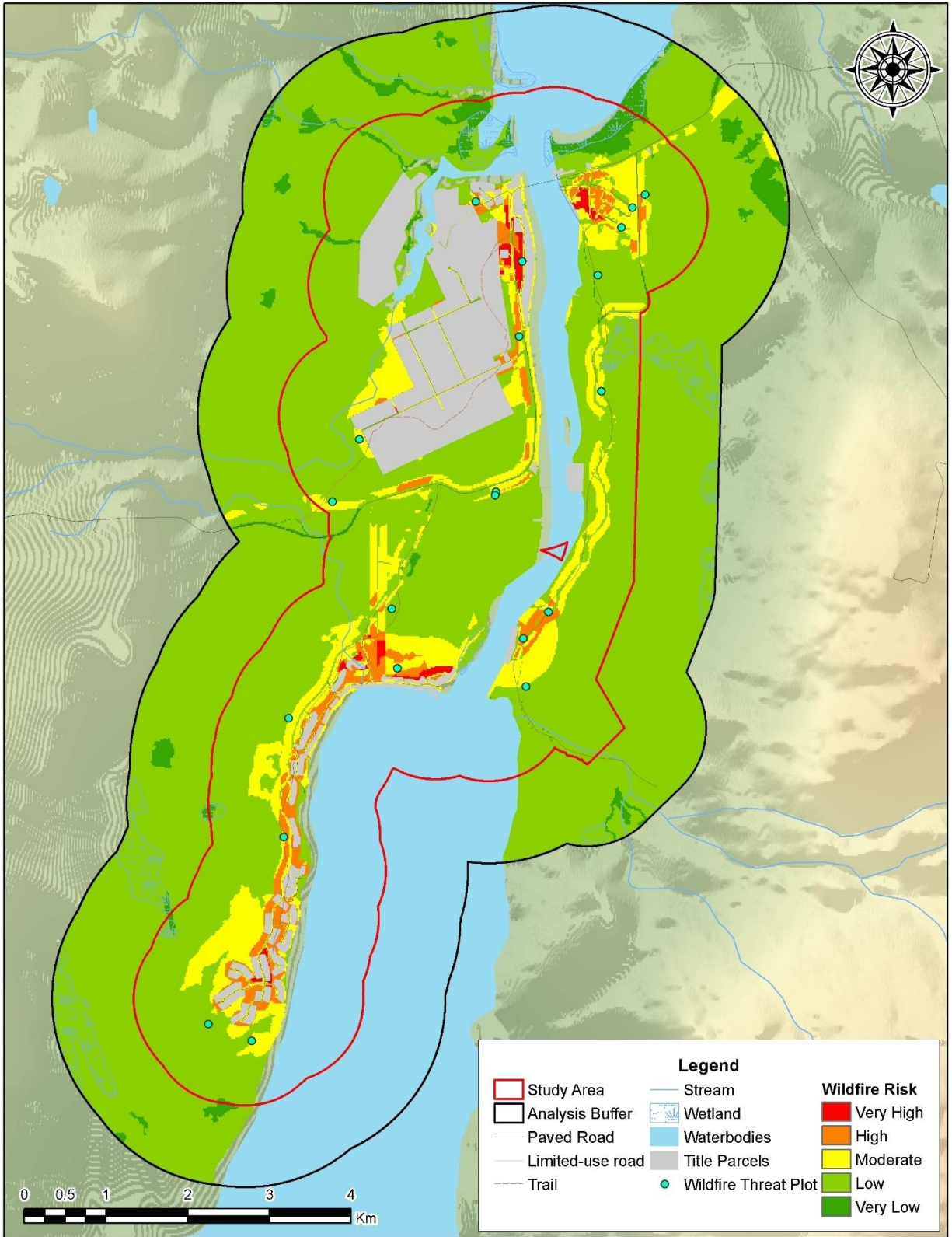
Table 19: WUI Risk Analysis ratings

Risk Classification	Hectares	Percent of CWPP Area
Very High	40.7	0.3%
High	227.7	1.6%
Moderate	848.2	6.1%
Low	8445.3	60.4%
Very Low	873.8	6.2%

Though there is a small proportion of very high, high, and moderate risk area within the CWPP area, these areas represent the majority of the ~300-meter-wide interface area with residential properties, critical infrastructure, and community assets. These areas of heightened wildfire risk coincide with many of the proposed fuel treatment areas that will be presented in Section 5.7.1.



Map 16: Wildfire risk ratings across the Carcross WUI.



Map 17: Wildfire risk ratings across the Tagish WUI.

SECTION 5: FIRESMART DISCIPLINES

FireSmart™ is the leading program in Canada aimed at empowering the public and increasing neighbourhood resilience through wildfire mitigation measures. FireSmart has been implemented at the provincial / territorial level across Canada, including the Yukon, since 1998. Basic FireSmart training for individuals is freely available through FireSmart Canada (FireSmart 101), while the Yukon government has previously hosted Local FireSmart Representative workshops in Whitehorse. There is a plethora of FireSmart resources for homeowners, educators, and land managers made available through the Yukon government,³³ FireSmart Canada,^{34,35} and neighbouring jurisdictions.³⁶ The available training and resources provide the tools for individuals to be ambassadors for wildfire preparedness in their communities. The FireSmart program covers a wide breadth of preventative measures that are founded in the seven FireSmart disciplines:³⁷

- Education
- Legislation and Planning
- Development Considerations
- Interagency Cooperation
- Cross-Training
- Emergency Planning
- Vegetation Management

These seven disciplines and the guiding principles behind FireSmart can be applied at several spatial scales and are not restricted to any type of land ownership, forest type, or property type. Sections 5.1 through 5.6 provide more in-depth information on each of the FireSmart disciplines. Recommended actions are introduced in each section and are further detailed in the Executive Summary (Table 1. Community Wildfire Protection Plan Recommendations). Various actions are likely fundable through the Yukon Government's FireSmart funding program, or other territorial and national funding programs.

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). Firebrands can be transported long distances ahead of a wildfire, across fire guards and fuel breaks, and can accumulate within the home ignition zone (HIZ, see Figure 8 on the following page) in densities that can exceed 600 embers per square meter. Combustible materials found within the HIZ can combine to provide fire pathways which can allow spot surface fires ignited by embers to spread and carry flames into contact with structures. Because ignitability within the HIZ 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.³⁸ Simple and

³³ Yukon Government, Keep your property safe from wildfires: <https://yukon.ca/en/emergencies-and-safety/wildfires/keep-your-property-safe-wildfires>

³⁴ FireSmart Begins at Home Guide: https://firesmartcanada.ca/wp-content/uploads/2019/10/FireSmart_Canada_Home_Development_Guide.pdf

³⁵ FireSmart Home Development Guide: https://firesmartcanada.ca/wp-content/uploads/2019/10/FireSmart_Canada_Home_Development_Guide.pdf

³⁶ FireSmart BC: <https://firesmartbc.ca/>

³⁷ FireSmart BC, The FireSmart Disciplines: <https://firesmartbc.ca/disciplines/>

³⁸ 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/>.

achievable actions by property owners within their own HIZs can drastically reduce the ignitability of structures, vegetation, and materials.



Figure 8: FireSmart Home Ignition Zone, adapted for northern communities.

Neighbourhood Overview

Carcross and Tagish have a varied amount of forest interface due to historic development practices and local topographic conditions. Therefore, implementing FireSmart strategies is more important for some neighbourhoods compared with others. The focus on FireSmart promotion should be on areas at higher risk from wildfire. In areas where development is denser and forest fuel continuity is low – such as central Carcross and in developed commercial areas – adopting FireSmart principles is less important but can still have a considerable impact on the fire risk of individual properties. There are a wide range of factors that contribute both to FireSmart vulnerabilities and resiliency on Settlement Lands, titled parcels, and public land throughout the two communities. These factors are summarized geographically in Table 20 below.

Table 20: Overview of varying vulnerabilities and resilience factors by generalized geographic areas.

Geographic Area / Neighbourhood	FireSmart Vulnerabilities	FireSmart Resilience Factors
Central Carcross	<ul style="list-style-type: none"> Majority of buildings have wood siding, a number have shake roofs. Large titled parcels that are continuously forested to the immediate north and across the river to the south. 	<ul style="list-style-type: none"> Limited forest within the area, mostly scattered trees and landscaping between properties. Valley bottom position, flat topography – easy access throughout the area. Carcross Volunteer Fire Department (CVFD) fire hall within. Limited exposure to continuous conifer forests.
Choutla Subdivision	<ul style="list-style-type: none"> Located on a bench that has a forested slope running up to it from the water. High off-road use throughout the surrounding forest areas. Continuously forested areas surrounding the whole subdivision, many of which are conifer-dominant. Properties are very intermixed with the surrounding forest and often have combustibles located throughout (e.g., firewood, construction material, vehicles, outbuildings) Reliant on shuttling water for fire suppression. 	<ul style="list-style-type: none"> Flat throughout the majority of the subdivision. New builds are structurally FireSmart – asphalt roofs, fibre-cement siding – with good offsets from the surrounding forest. Fuel break work has been completed, and is ongoing, around the perimeter.
Natasaheeni Subdivision	<ul style="list-style-type: none"> Single access in and out of the subdivision. Majority of properties are older and have vinyl or wooden siding and considerable accumulations of combustibles. Properties are heavily intermixed with surrounding forest 	<ul style="list-style-type: none"> Lower slope (landscape scale), and in a north-facing area. Highway right-of-way has good brushing / management. Fuel break (~50m wide) completed to the southeast, with additional fuel management in the forest beyond this.
Watson Subdivision	<ul style="list-style-type: none"> Located on a bench that has a forested slope running up to it from the water. Continuous conifer stands to the east, though broken up by the railway and highway rights-of-way. Limited access to water for fire suppression. 	<ul style="list-style-type: none"> Surrounded by predominantly deciduous forest. Gentle topography throughout the subdivision. Larger residential properties – less continuity of forest / structural fuel.
Milk Creek / Squanga Subdivision	<ul style="list-style-type: none"> High continuity of fuel between properties due to older structural conditions, limited vegetation work, and combustible materials. Considerable forest interface between properties and in all directions surrounding the community. 	<ul style="list-style-type: none"> Lower slope (landscape scale), gentle topography throughout. Water available from the community source and the river (Tagish Volunteer Fire Department [TVFD] is located 5 minutes away). Fuel break work completed around much of the perimeter of the community.

Geographic Area / Neighbourhood	FireSmart Vulnerabilities	FireSmart Resilience Factors
Central Tagish	<ul style="list-style-type: none"> • High continuity of fuel between properties due to older structural conditions, limited vegetation work, and combustible materials. • Considerable forest interface between properties and in all directions surrounding the community – limited amount of fuel break work completed in the perimeter. 	<ul style="list-style-type: none"> • Lower slope (landscape scale), gentle topography throughout. • Water available from the community source and the river (Tagish Volunteer Fire Department [TVFD] is located 5 minutes away).
Tagish Estates	<ul style="list-style-type: none"> • Continuous conifer forests surrounding, very limited fuel management on the perimeter. • Large titled parcels to the east and south – continuously forested though they appear to have been thinned / selectively cleared. 	<ul style="list-style-type: none"> • Valley bottom, flat topography throughout. • Large properties – many of which have a considerable amount of the forest cleared and/or deciduous stands remaining.
Taku Subdivision	<ul style="list-style-type: none"> • Very intermixed properties, patches of conifer forest between the majority. • Single access to many portions of the subdivision. • Structure conditions often not FireSmart (wood siding, multiple outbuildings, combustibles stored near structures). • Continuous conifer forest to the south and west. 	<ul style="list-style-type: none"> • Considerable fuel management work completed in roadside areas and between properties. • TVFD fire hall located within.
Isolated Locations: <i>Pennycook Road, Skookies Camp</i>	<ul style="list-style-type: none"> • Isolated locations – lengthy access for first responders on a single access / egress road in the case of Pennycook. • Very intermixed properties, patches of conifer forest between the majority. • Dense conifer forests along the entire access road / highway. 	<ul style="list-style-type: none"> • Lower slope (landscape level) – though a continuously forested slope running up to Skookies. • Minor fuel management work completed surrounding Pennycook, and fuel removed as firewood surrounding Skookies.

5.1 EDUCATION

Description

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 can also promote a sense of empowerment and shared responsibility. A successful public education campaign that builds awareness and understanding among residents and visitors can support the implementation of projects related to other FireSmart disciplines. FireSmart education activities are the foundation for progress towards resiliency.

Analysis

Expanding fire risk awareness and FireSmart communication and education initiatives throughout Carcross and Tagish is an integral piece in community protection. Though there is a considerable history of fuel management work within these communities, there remains a need to further educate the community at large on what private landowners can do to build a FireSmart community. Individuals are often unaware of the actions they can personally take to reduce the ignition potential of their homes, businesses, lands, and neighbourhoods. Many of the greatest interface fire risks in Carcross and Tagish are found on residential properties.

While there is notable room for improvement in FireSmart awareness and programming in both Carcross and Tagish, there is a sound understanding of the wildfire risk and the FireSmart program among several local staff. FireSmart initiatives other than fuel management treatments have been limited to-date in the communities – though the Southern Lakes Wildfire Strategy has been openly communicated with community members. This strategy includes a series of educational videos which highlight First Nations' relationship with fire, how to plan ahead to reduce their risk, and how this connects with protecting natural resources and heritage. The community has also been provided a plain language summary of the Wildfire Strategy, which allows this information to be more digestible by community members.

Action Planning

It is recommended that CTFN staff work to establish a FireSmart program and provide FireSmart education to the community that goes beyond fuel management treatments. While fuel management treatments are a valuable tool for wildfire risk reduction and community protection, actions need to be taken at the individual property level to effectively reduce their exposure to interface fire. It is recommended that CTFN establish and expand their FireSmart outreach efforts through a variety of programs – staying flexible and adaptive in response to successes and/or challenges that they experience. Examples of FireSmart Education initiatives that could be locally pursued include:

- Hosting FireSmart workshops or open houses, led by CTFN staff, fire department members, and YWFM staff.
- Distributing and delivering FireSmart materials – brochures, manuals, guides, etc.
- Incorporating FireSmart curriculum in local schools.
- Posting FireSmart facts, tips, and local examples publicly or on social media.

Education initiatives in Carcross and Tagish can likely align, as both communities face similar neighbourhood-level risk factors. Many vulnerabilities are common across properties in individual neighbourhoods, and addressing these shared risks at the neighbourhood level can be the most effective strategy for mitigation. Recommendations related directly to FireSmart assessments and work will be covered in detail in Section 5.7.2.

Detailed recommendations related to FireSmart Education can be found in the Executive Summary in Table 1. Community Wildfire Protection Plan Recommendations. In summary, these recommendations include the following (high priority recommendations are in bold):

#1 Host FireSmart Workshops	#2 Distribute FireSmart Materials	#3 Incorporate FireSmart in Schools
#4 Communicate FireSmart & Fire Hazard Internally		#5 Share the CWPP Publicly

5.2 LEGISLATION AND PLANNING

Description

Though laws and bylaws are limited in Carcross and Tagish (both on and off Settlement Lands), reviewing bylaws through a wildfire lens to assess where they inadvertently promote conditions that may contribute to fire spread (e.g., restrictions on vegetation management, unrestricted landscaping, lack of ignition controls), and determining where bylaws can be updated or strengthened to reduce wildfire risk to development, can help a community become more resilient to wildfire.

Analysis & Action Planning

The Forest Resources Act, Forest Protection Act, and Forest Resources Regulation were introduced and reviewed in Section 2.3 as important pieces of legislation that look to limit fire ignitions. Aside from these pieces of legislation (which do not apply on Settlement Lands), there are no notable laws or local bylaws within CTFN that proactively reduce fire risk. As CTFN is a self-governing First Nation with law-making authority on Settlement Lands, they can and do create laws and bylaws that apply to various activities. Table 21 below displays various topics related to community wildfire protection that can be proactively addressed through legislation.

Table 21. Summary of local issues relevant to community wildfire planning that can be controlled through legislation.

Topic	Potential Legislation and Community Planning Controls
Fire Control	<ul style="list-style-type: none"> • Can prohibit the accumulation of combustible materials (i.e., fire hazards) on properties. • Can prohibit accumulations of dead vegetation on properties, or vegetation that is presenting a fire hazard to first responders. • Can prohibit the use of fireworks or other ignition sources during periods of high fire danger.
Community Planning	<ul style="list-style-type: none"> • Can focus development away from high fire risk areas. • Can designate that parks / natural areas should be maintained in a low fire threat state. • Can control subdivision development and servicing – ensuring that there is adequate access and egress from planned neighbourhoods (for emergency equipment) and adequate servicing such as fire hydrant coverage – though recognizing that detailed underground servicing is not currently present in CTFN.
FireSmart Development (Structures)	<ul style="list-style-type: none"> • Can enforce FireSmart development – requiring that FireSmart building materials to be used in siding, roofing, and any building extensions (etc.). <i>Development will be further addressed in Section 5.3.</i>
FireSmart Landscaping	<ul style="list-style-type: none"> • Can enforce landscaping that is compliant with FireSmart guidelines – i.e., avoiding any vegetation in the <i>Immediate Zone</i> and avoiding highly flammable vegetation within 10 m of buildings.
Open Burning	<ul style="list-style-type: none"> • Can ensure that open burning does not take place during periods of high or extreme fire danger. • Can implement permit systems or set rules for where open burning can take place – having provisions for cultural burning.
Vacant Property Upkeep	<ul style="list-style-type: none"> • Can enforce that vacant / abandoned properties are maintained, where they are presenting fire hazards to adjacent properties or forested areas.

Currently, there is limited capacity within CTFN for enacting and enforcing legislation, but many of the ideas introduced in Table 21 span multiple CTFN departments and can therefore be addressed collaboratively. Using education to create a more foundational understanding of FireSmart principles within CTFN departments and the community as a whole will allow for the intent of any new legislation to be better understood.

Detailed recommendations related to Legislation and Planning can be found in the Executive Summary in Table 1. Community Wildfire Protection Plan Recommendations. In summary, these recommendations include the following (high priority recommendations are in bold):

#6 Enact a FireSmart Landscaping Bylaw	#7 Create a Fire Control Bylaw
#8 Enforce Unused / Vacant Property Upkeep	#9 Update the CWPP

5.3 DEVELOPMENT CONSIDERATIONS

Description

Introduced in Section 5.2, there are important structure and neighbourhood design features that can be regulated through land use planning and development processes to mitigate the risk of wildfire impacts. In this context, development refers to any aspect of the built environment, including structures (homes, businesses, accessory structures), attachments to structures (fences, decks), critical facilities (hospitals, schools), and critical infrastructure (fire halls, water systems, bridges). Related considerations include:

- Location of development in relation to high hazard forested vegetation, steep slopes, and other geographical features that contribute to increased fire behavior (See Section 4.1.1 and 4.1.2);
- Vehicle access and egress;
- Availability and adequacy of water supply for firefighting;
- Type of construction materials on structures and attachments;
- Lot size and structure density;
- Design guidelines and architectural standards;
- Addressing and street signage; and,
- Landscaping, screening, and buffering.

A key policy tool that can be used to regulate development and facilitate FireSmart best practices are *Development Permit Areas* (DPAs). These are geographic areas that can be defined in official community planning documents where special conditions must be met – or specific construction and design practices followed – to obtain a development permit for altering land in a known risk area. Development Permit Areas are commonly used to enact FireSmart requirements for new buildings (and specific renovations of existing buildings) and subdivision development.

Analysis & Action Planning

There are currently few regulations for development on CTFN Settlement Lands or elsewhere in Carcross or Tagish. Given this, development is currently free to proceed with no consideration for wildfire risk. Despite this, many new developments and ongoing construction projects in CTFN neighbourhoods have made positive decisions from a fire resilience standpoint. New structures are often being constructed with fire-rated roofs and fibre-cement siding, and landscaping within the properties has generally been limited. Structures themselves are often reasonably offset from the surrounding forest, though that forest is often unmanaged and highly hazardous.



Figure 9: Construction of a new multiplex in the Milk Creek / Squanga subdivision. The structure is very FireSmart though there is untreated and high hazard forest immediately adjacent.

If there is desire to legislate that development be considerate of wildfire hazard, objectives of a Wildfire DPA (or equivalent legislation) can include that:

- Development, people, and property be protected from the risks of wildfire;
- The fire risk presented by structures to adjacent forested areas or important cultural areas be minimized;
- Management activities be promoted that reduce wildfire hazards and protect the environment;
- Land and property is proactively managed to affect potential fire behaviour; and,
- Conserve the ecological, aesthetic, and recreational assets of the urban interface.

Legislation related to wildfire-conscious development should apply to the development of land with the installation of a new single or multi-family dwelling, duplex, or detached secondary suite, or the subdivision of land. This process should require that a Wildfire Hazard Assessment Report be developed by a Qualified Professional. In general, the requirements of a DPA should create defensible space for the 10 meters surrounding buildings and structures by offsetting structures from surrounding forest, planting low-flammability landscaping, and removing or modifying pre-existing conifer trees. Properties that are subject to the requirements of a DPA should be maintained in perpetuity to meet these requirements, which can be enforced by registering the DPA on title to the property. For new subdivisions, the DPA can also require that firebreaks be designed and installed, and that building and road locations accommodate fire fighting vehicles and equipment.

If enacted, the extent of a Wildfire Hazard DPA should be critically reviewed. Priority areas can be delineated based on a fixed distance from a high hazard forest area, with consideration given to potential long-range ember transport into the community – a phenomenon routinely observed and reported as the leading cause of structure ignition in recent urban conflagrations. This transport of embers is not exclusive to forest fires, as these can also occur from independent structure fires and structure fires that spread into adjacent landscaping. Given the current continuity of fuel across many CTFN neighbourhoods, having more resilient structures and properties throughout the community will help to break the WUI fire disaster sequence.³⁹

The detailed recommendation related to Development Considerations can be found in the Executive Summary in Table 1. Community Wildfire Protection Plan Recommendations.

³⁹ National Research Council Canada. National Guide for WUI Fires. Appendix A – The WUI Fire Disaster Sequence. Retrieved from: <https://nrc-publications.canada.ca/eng/view/ft/?id=3a0b337f-f980-418f-8ad8-6045d1abc3b3>

5.4 INTERAGENCY COOPERATION

Description

The goal of interagency cooperation is to approach community wildfire planning from a landscape-level, multi-agency perspective. Coordination and cooperation are required to develop an effective CWPP and to be prepared in the event of a wildfire. When planning occurs only within single agencies or departments, the potential for efforts to be duplicated increases or there can be conflicting outcomes from various community programs. Interagency cooperation also increases the ability of communities to plan for and respond to emergencies effectively. Working together with adjacent jurisdictions can help increase awareness of different agencies’ priorities and concerns.

Committees focused on FireSmart reflect the key planners and responders most involved in local FireSmart, wildfire resiliency planning, wildfire and emergency response, and land management within the WUI. Committees such as this foster collaborative problem solving and planning.

Analysis

For CTFN and the communities of Carcross and Tagish, which are surrounded by large tracts of forest land that are either privately owned or held by the Yukon Government, this FireSmart discipline is of particular importance. This has been recognized by CTFN staff and Tagish community members, and several initiatives have already resulted in collaborative work between local community members and government agencies.

As part of this CWPP, information was compiled from various CTFN departments as well as external stakeholders and fire response agencies. Table 22 shows potential collaborative partners within and external to CTFN which can play important roles in wildfire preparedness and resilience.

Table 22. Interagency partners within and external to Carcross / Tagish First Nation.

Agency	Title / FireSmart Connection
Carcross Volunteer Fire Department	<ul style="list-style-type: none"> • Fire Chief – Oversight into fire suppression and fire preparedness • FireSmart Coordinators or workers – Lead for FireSmart initiatives
Tagish Volunteer Fire Department	
CTFN – Heritage, Lands & Natural Resources Staff	<ul style="list-style-type: none"> • Natural Resource Manager & Coordinator – Lead for vegetation management projects (fuel breaks and residential FireSmart)
CTFN – Infrastructure Staff	<ul style="list-style-type: none"> • Development Manager – Lead for instilling FireSmart principles into development projects • Infrastructure Manager – Lead for the maintenance or expansion of critical community infrastructure
CTFN – Health and Wellness	<ul style="list-style-type: none"> • Managers – Providing community health initiatives during fire or smoke events
CTFN & Yukon Government	<ul style="list-style-type: none"> • Emergency Management Staff – Ensuring that appropriate emergency planning measures are in place and updated with changes to the wildfire environment

Agency	Title / FireSmart Connection
Yukon Wildland Fire Management	<ul style="list-style-type: none"> • FireSmart and Fuels Management Specialist – Lead for vegetation management projects through territorial FireSmart funding • Manager, Prevention and Mitigation – Combined duties with the FireSmart specialist, lead for fire prevention programs • Regional Protection Manager – Wildfire response and risk expert for the Southern Lakes

Land managers play a key role in vegetation management programs at the local and landscape-level, programs which can have marked impacts on fire hazard to residential properties and critical infrastructure. There are multiple rights-of-way within Carcross and Tagish to which external groups have management responsibilities. Electrical and highway rights-of-way were observed to be in a relatively well maintained and low-hazard state – managed by ATCO and the Department of Highways and Public Works respectively (see Figure 10 – left). Both active and decommissioned railway rights-of-way in Carcross have also had regular vegetation management performed, containing cleared areas or low-hazard shrub vegetation (Figure 10 – right). Vegetation management within these rights-of-way is imperative as they have heightened ignition risks and may be used as anchor points by first responders.



Figure 10: Examples of good right-of-way vegetation management on ATCO corridors in the Choutla subdivision, and along a decommissioned portion of the railway right of way north of the Watson subdivision.

Action Planning

While there have been many successful examples of interagency cooperation initiatives in recent years, there are areas where increased engagement could benefit all parties. CTFN staff should look to establish a local committee to discuss various FireSmart initiatives that are ongoing and that could be implemented. It is important for different departments within CTFN and external agencies to discuss the successes and challenges they are experiencing – especially as many of the interface fire hazards that are present in Carcross and Tagish are also present in other Yukon communities. Group discussions will ensure that communications are more unified across the community during fire season. Internally, CTFN staff across various departments need to share and understand the implications of their work on community wildfire protection. For example, residential and community development should include expertise and input from the local fire departments as well as natural resource departments. Mitigating fire risk proactively spans the knowledge of numerous departments and requires decision-making to be collaborative.

CTFN staff and local fire experts have concerns regarding the fire risk posed by large privately or corporately held properties within the WUI that are forested and unmanaged. Many of these properties within Carcross are also heavily used for recreation which increases the ignition risk. CTFN staff should work with the Yukon government to engage these various landowners and discuss proactive risk reduction strategies.

The Southern Lakes region is very popular for tourism throughout the fire season, especially the mountains and forested areas surrounding Carcross. Currently there is a limited amount of communication regarding responsible / FireSmart recreation, and/or the current fire hazard and its implications. CTFN can work with local tourism providers, Yukon Wildland Fire Management, and various territorial departments to ensure that individuals or tourism groups are aware of the current wildfire hazard. Communicating this is a positive step toward reducing human ignitions, especially for tourists who are coming to the area from less fire-prone parts of the world.

Detailed recommendations related to Interagency Cooperation can be found in the Executive Summary in Table 1. Community Wildfire Protection Plan Recommendations. In summary, these recommendations include the following:

#11 Collaborate Internally	#12 Advocate to Landowners
#13 Promote Responsible Recreation	

5.5 CROSS-TRAINING & FIRE DEPARTMENT RESOURCES

Description

All CTFN staff and local partners who are expected to participate in the development and implementation of this plan or participate in wildfire response and recovery should be appropriately trained. Cross-training ensures that CTFN staff are aware of wildfire specifics and wildfire response, that structural firefighters are experienced and trained with wildfire behaviour and suppression, and that first responders are experienced and trained with structure protection.

Analysis

FireSmart initiatives within Carcross and Tagish have been collaboratively overseen by Yukon Wildland Fire Management staff, CTFN staff in the Heritage, Lands & Natural Resources department, local fire departments, and local residential groups. Currently, there is no individual at CTFN whose primary responsibility is delivering the FireSmart program. Additionally, no individuals within the communities have formal FireSmart training. There is also confusion at the local level regarding emergency planning and the various roles to be held during an emergency situation.

Members of both CVFD and TVFD have regular experience with brush fires in the community and given their mutual aid the two departments have recently started to increase joint training. Neither department has undertaken any formal wildfire or FireSmart training to date. Most department training is focused on structural firefighting and vehicle rescue, with some basic scenarios for wildfire suppression. Additionally, there are annual concerns within both CVFD and TVFD regarding employee recruitment and retention which makes the acquisition and transfer of wildfire skills difficult.

The equipment allotment for both CVFD and TVFD was introduced in Section 3.2.1. This allotment is made up of mostly structural fire equipment with a limited amount of wildfire-specific gear, and very little of this wildfire gear is portable or easy to deploy in remote areas. Additionally, the lack of fire hydrant or standpipe systems in either community makes water delivery more complicated and less reliable.

Action Planning

While CTFN and the Carcross and Tagish communities have continued to plan and implement fuel management treatments in recent years, the limited amount of staffing dedicated to this program or other FireSmart initiatives has complicated its expansion. Additionally, it will likely be the responsibility of a staff member such as a FireSmart Coordinator to organize and implement multiple recommendations from this CWPP. Dedicating staffing to a FireSmart Coordinator position is crucial to effectively grow a FireSmart program within CTFN. Holding this position within CTFN will also ensure that it is staffed by a trusted and recognized community member who can then liaise with external departments. In addition to the FireSmart Coordinator position, there are roles that can be funded to support FireSmart initiatives. For example, FireSmart Crew Members or Wildfire Mitigation Specialists can help to host community events, perform local assessments, and perform mitigation work, while Wildfire Forest Professionals can plan and supervise vegetation management throughout the community. To-date, there have been challenges with reliably staffing Initial Attack and FireSmart crew members within CTFN.

As FireSmart and structure protection have become integral components of interface fire risk, increasing the amount of FireSmart training within the local fire departments will improve individual awareness and allow for more fluid communication of risk across the department and within the community. Various training courses are offered by FireSmart Canada or neighbouring jurisdictions – Local FireSmart Representative, FireSmart 101, and modules within Wildfire Risk Reduction Courses. Seeking training courses for CVFD / TVFD staff in wildland fire is also critical to support wildfire response within the WUI or on territorial deployment opportunities.

Hosting or advocating to CVFD / TVFD to attend tabletop exercises or live scenarios of interface fire suppression will also be a critical component of community preparedness. These scenarios make interagency cooperation more fluid and can increase skills within the departments. Practice initiatives are also a great opportunity for community education and outreach – especially in notifying (/teaching) community members the role that they can play in reducing risk and improving first responder safety. Demonstrating structure protection within the community is a valuable way to practice real-life situations with fire department staff, and to communicate to the public what conditions on a property either permit or complicate structure protection setup.

Recommendations related to fire department equipment upgrades, water system upgrades, and other cross-training topics are detailed in the Executive Summary in Table 1. Community Wildfire Protection Plan Recommendations. In summary, these recommendations include (high priority items are bolded):

#14 Staffing FireSmart Positions	#15 Expanding FireSmart Training	#16 Expanding Wildfire Training
#17 Expanding ICS Training	#18 Demonstrating Structure Protection	#19 Expanding Water Delivery Capabilities
#20 Increase Allotment of Suppression Equipment		

5.6 EMERGENCY PLANNING

Description

Deployment of territorial wildfire resources in the Yukon is based on internal prioritization frameworks, which may result in WFM resource availability becoming scarce when several wildfire emergencies take place throughout the territory. As mentioned in Section 3.2.1, various WFM initial attack resources are regionally dedicated while air tanker groups are territorial resources. As a result, local wildfire preparedness and resource availability are critical components of community wildfire protection – individuals and departments need to be ready to act. Wildfires that threaten human life, structures, and critical infrastructure are extremely complex and dynamic incidents to respond to, which can involve multiple concurrent emergency response events. All phases of an emergency response (mitigation, preparation, response, and recovery) should have significant pre-planning in place, or a WUI incident is likely to overwhelm resources and render them ineffective. Figure 11 below demonstrates important considerations for each of these four phases:

Mitigation

- A shared responsibility between various land managers and private property owners - mitigating wildfire risk prior to a fire event (includes FireSmarting homes and properties, performing vegetation management in strategic areas, etc.)

Preparation

- Includes pre-incident planning (see *Analysis & Action Planning* below) by Emergency Management personnel and fire department resources.
- Includes the preparedness of homeowners and business owners prior to an evacuation (e.g., use of the FireSmart Evacuation Checklist, and preparation of "ready-to-go" kits).

Response

- Includes the capable response by CTFN and/or regional Emergency Operations Center staff.
- Includes the capable response by CVFD / TVFD and/or mutual-aid partners, and available YWFM resources.
- Includes the dissemination of emergency information to the public.
- Includes the provisions made to protect Public Health in the event of a wildfire (i.e., mitigating smoke impacts especially to vulnerable populations).

Recovery

- Outlines the ability of the community to respond quickly to values that are affected by an interface wildfire.
- Required recovery efforts will likely decrease with pre-incident improvements in mitigation, preparation, and response.

Figure 11: Generalized description of the four phases of emergency response as they relate to a wildfire emergency in Carcross or Tagish.

Analysis and Action Planning

Wildfire-specific pre-incident plans compile essential fire management information and can be used to save valuable time during fire suppression operations. During a busy wildfire season, territorial resources can be stretched thin and any information that CTFN or local fire departments can provide to WFM or mutual aid crews is helpful. Pre-incident plans should be developed and tested using tabletop simulations, and if necessary, revised prior to every fire season. Yukon Wildland Fire Management should be involved in this process to ensure that any mapping done as part of any regional fire management planning processes is not unnecessarily duplicated. These plans and maps (some of which are wholly or partially developed as part of this CWPP) should consider at a minimum:

- Command: Authority, structural protection needs, management constraints, etc.
- Operations: Helicopter base locations, water sources / intakes, fire control line locations and natural barriers, crew/personnel safety zones and staging locations, etc.
- Logistics: Base camp / EOC locations, roads and trails, utilities (CI), communications, etc.
- Planning: Maps (Structures, critical infrastructure, land status, vegetation and fuel, hazards, culturally and environmentally sensitive areas, water sources, access/egress, evacuation route plans, etc.)

As part of pre-incident planning, CTFN should consider working with local fire departments to develop local daily action guidelines based on the fire danger rating. Table 23 on the following page provides a template that can be tailored to the Carcross and Tagish areas, outlining actions that staff can take as fire danger levels change throughout the fire season.⁴⁰

Access within Carcross and Tagish is generally simple due to the gentle topography and low population density, but many neighbourhoods inherently do have “one way in, one way out” access. Additionally, there are complications with emergency access and evacuation in portions of Carcross whenever a White Pass / Yukon Railway train stops at the downtown station, which temporarily blocks access to the townsite. Basic evacuation planning and community resources are provided in C/TFN’s Emergency Plan, though local fire department members have not been involved in emergency planning processes or outcomes.

⁴⁰ Adapated from the Community Resiliency Investment program in British Columbia. 2025 CWRP Supplemental Instruction Guide: https://www.ubcm.ca/sites/default/files/2024-06/LGPS_CRI_FCFS_2024_CWRP_Instruction_Guide_2024-06.pdf

Table 23: Example of a Wildfire Response Preparedness Condition Guide.

FIRE DANGER RATING	ACTION GUIDELINES
LOW	<ul style="list-style-type: none"> • CTFN staff on normal shifts. • Direct community members to YWFM for fire danger rating info.
MODERATE	<ul style="list-style-type: none"> • CTFN staff on normal shifts. • Regional fire situation evaluated. • Direct community members to YWFM for fire danger rating info, update fire danger signs in the community. • Information gathering and dissemination through CTFN’s internal or external FireSmart committees.
HIGH	<ul style="list-style-type: none"> • CTFN staff on normal shifts. • Regional fire situation evaluated. • CTFN EOC staff notified of Fire Danger Rating. • Daily fire behaviour advisory issued. • Update fire danger rating signs in the community, post updates on social media, work with local radio outlets, Travel Yukon, and the Department of Highways to discuss and display fire danger rating. • Establish weekly communications with the internal or external FireSmart committees.
EXTREME	<ul style="list-style-type: none"> • Same conditions as ‘High’ Danger Rating. • CTFN EOC staff considered for activation standby. • Wildfire Incident Command Team members considered for stand-by / extended shifts.
FIRE(S) ONGOING	<ul style="list-style-type: none"> • All conditions apply as for Extreme (regardless of actual fire danger rating). • Mobilize EOC support if evacuation is possible, or if fire event requires additional support. • Implement Evacuation Alerts and Orders based on fire behaviour prediction and under the direction of the EOC or YWFM.

In addition to emergency and evacuation preparedness, Carcross and Tagish have the potential to be exposed to smoke for prolonged periods of time either from fires burning in British Columbia or in the Yukon. The impact that wildfire smoke can have on public health is an emerging topic of scholarly research, but it is generally well understood that fine particulate matter from wildfire smoke (i.e., PM_{2.5}) has a wide range of negative health effects. Wildfire smoke can affect anyone, and community health should always be at the forefront. There are multiple ways to reduce an individual’s exposure to wildfire smoke, which can be achieved personally and/or facilitated through local programs.⁴¹

⁴¹ The Government of Canada has published guidelines on wildfire smoke and its relationship with public health, including ways to prepare for smoke events and protect your physical and mental health: <https://www.canada.ca/en/services/health/healthy-living/environment/air-quality/wildfire-smoke.html>

Recommendations and action items related to the four phases of emergency management are detailed in the Executive Summary in Table 1. Community Wildfire Protection Plan Recommendations, and are summarized as follows:

#21 Address Wildfire Smoke	#22 Distribute Evacuation Checklists
#23 Establish an Emergency Communication System	#24 Pre-Plan Incident Response
#25 Procure Backup Generators	#26 Investigate a Rooftop Sprinkler Program

5.7 VEGETATION AND FUELS MANAGEMENT

Introduced in Section 4, fuel is the only aspect of the fire behavior triangle that can be realistically modified to proactively reduce wildfire threat. Fuel management or vegetation management reduces potential wildfire intensity and ember exposure to people, structures, and other values through the 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. Reducing fire hazard through vegetation management can largely be accomplished through two different activities:

- **Fuel Management Treatments:** The manipulation or reduction of living or dead forest and shrub fuels to reduce the rate of spread and head fire intensity and enhance likelihood of successful suppression. These treatments are often located outside the Home Ignition Zone to strategically decrease fire behaviour at the forest stand or landscape scale. These are generally prescribed by a professional forester and implemented by qualified staff or contractors.
- **Residential-Scale FireSmart:** The removal, reduction, or conversion of flammable plants and trees to create more fire-resistant areas in the FireSmart Immediate Zone, Intermediate Zone, and Extended Zone (see Figure 8). Efforts should follow a “values-out” approach; starting closest to the value (i.e., structure) and moving outwards. This can generally be self-directed or prescribed by an individual with FireSmart knowledge, arborist, or professional forester, and performed by a homeowner or contractor.

5.7.1 FUEL TREATMENTS

Description

Fuel treatment opportunities in both Carcross and Tagish may represent a linear fuel break or more discrete treatment areas. The intent of establishing fuel treatments is to modify fire behaviour, and these should be designed to keep surface fires on the ground and prevent fires from becoming more dangerous crown fires. Fuel treatments also provide safe and effective anchor points to fire-fighting crews for suppression activities. The application of appropriate fire suppression tactics in a timely manner with sufficient resources is essential for fuel treatments to be effective. In addition, fuel treatment units require periodic maintenance to retain their effectiveness.

Fuel treatments need to be site specific – the same operational plan will not always apply to every treatment area. Considerations need to be taken regarding the local ecology of the forest stand and the current fire hazard – which precipitates the need to include a forest professional in larger-scale projects. Social factors also need to be considered as it may not be desirable to apply more aggressive fuel treatment tactics in the direct interface or in high-use recreation areas – such as clearcuts / patch cuts, and stand conversions from coniferous to deciduous. Finally, operational and cost factors do need to be considered as there may be locations where machine use should be restricted (e.g., high-value cultural or wildlife areas), though there may be areas where it is only economically feasible to treat an area with machinery. Various fuel treatment regimes are generalized in Table 24 below.

Table 24: Generalized fuel treatment options.

Fuel Treatment Regime	Pros	Considerations	Applicable Forest Types
Thinning From Below <i>(Understory Removal, Pruning, Deadfall Cleanup)</i>	<ul style="list-style-type: none"> • Hand treatment – can be more easily completed by community members • Low impact on soils or surface vegetation • Retains overstory trees and shading 	<ul style="list-style-type: none"> • Effective at limiting crown-fire initiation, but can still permit crown fire under extreme conditions • Often more expensive than mechanized treatments 	<ul style="list-style-type: none"> • All forest types, especially in sensitive sites (socially, culturally, environmentally) and already open-canopy types (C-1 fuel types)
Commercial / Overstory Thinning	<ul style="list-style-type: none"> • Often mechanized, can be cost effective • Can produce firewood or timber for locals • Can effectively reduce crown fire potential 	<ul style="list-style-type: none"> • Increased wind exposure can result in windthrow, especially with shallow rooted species or saturated soil 	<ul style="list-style-type: none"> • Better suited for drier upland sites or stands with a deciduous component
Clearcutting (Various Sizes)	<ul style="list-style-type: none"> • Same as with overstory thinning – can be the most cost effective • Can allow for stand conversion to deciduous species 	<ul style="list-style-type: none"> • Highest disturbance or impact of any treatment method 	<ul style="list-style-type: none"> • All forest types, though local and landscape-level moisture regimes need to be managed for
Prescribed Fire	<ul style="list-style-type: none"> • Can cost effectively reduce needle-cast and fine conifer debris which cannot otherwise be removed 	<ul style="list-style-type: none"> • Can impact non-timber forest resources, e.g., availability of reindeer lichen. Intensity needs to be carefully managed 	<ul style="list-style-type: none"> • Dry, upland sites with a high continuity of conifer debris

When located off Settlement Lands, fuel mitigation projects need to abide by the current regulatory framework in the Yukon. *Land Use Permits* or *Performance of Work Within Highway Right-of-Way* permits may apply, though this can be coordinated with YWFM prevention personnel. Additionally, projects that involve a regulated ‘assessable activity’ through the Yukon Environmental and Socio-economic Assessment Act (YESAA) will likely trigger a YESAA project assessment for permits to be given. In the case of fuel mitigation projects, an assessment will be required if the volume of wood to be felled or harvested exceeds 1000 m³ or employs mechanical machinery that will disturb soils. As such, larger mechanical fuel reduction treatments managed by WFM generally require YESAA review, whereas smaller community projects that rely on hand falling often do not.⁴²

⁴² Information adapted from the Southern Lakes Wildfire Risk Assessment – Section 4.1.

Analysis

From the early 2000s onwards, fuel treatments within the Carcross area have been implemented on approximately 39.1 hectares. Fuel treatment areas have all been understory thinning treatments other than the cleared fuel breaks south of the Natasaheeni subdivision and along the old powerline right of way on Montana Mountain.⁴³ The majority of these treatments have been completed by CTFN personnel, with one maintenance treatment completed by an independent contractor. At the time of writing this CWPP, WFM is working with CTFN to continue treating areas adjacent to the Choutla subdivision. In the Tagish area, fuel treatments have been implemented on approximately 113.3 hectares with all being thinning treatments. Work has been completed by CTFN individuals, the Tagish Volunteer Fire Department, and the East Six Mile River Community Association. In both Carcross and Tagish, fuel treatments have been in the near-interface with private properties and community infrastructure, or along main access corridors. When fuel treatment areas are compared with adjacent untreated forest areas of similar type, the wildfire threat rating (based on fuels alone) decreases from high or very high to low or moderate, and the potential for crown fire or hazardous surface fire is substantially reduced.

It was routinely observed that the fuel treatment work that has been completed often still leaves untreated and hazardous vegetation between the treatment and the value (i.e., homes), which goes against the “values-out” approach that should be taken. This is often the result of vegetation conditions on private property, or a decision to offset the treatment boundary from a private parcel line. In the event of an interface fire, conditions like this complicate the efforts of first responders who are performing structure protection.

Personal fuel wood areas have been spatially designated by the Yukon Government as priority areas where locals can access dead and downed wood for personal use. While the cleanup of deadfall can drastically reduce the overall fuel loading and potential fire severity in an area, when fuel wood is collected the suitable (i.e., large) material is removed but all of the fine woody debris (i.e. branch and top material) is often left in elevated accumulations. This results in the fire hazard not being effectively reduced, as leaving accumulations of fine woody debris leaves the potential for high intensity surface fires or fires that can easily climb into the crowns of trees. Where practical, fine woody debris should be piled and burned in these fuel wood areas if they are to function as primary fuel breaks. This is an especially important concept to communicate with locals when they are harvesting fuel wood in the WUI, or as new personal fuel wood areas are delineated.

⁴³ Information regarding completed and planned fuel treatments is adapted from a database managed by Yukon Wildland Fire Management.



Figure 12: Example of side-by-side areas that are untreated (left) and treated (right) in the Carcross area (Montana Mountain).



Figure 13: Example of side-by-side areas that are untreated (left) and treated (right) in the Tagish area (Taku / Highway 8).

Due to the forest types commonly found within the Carcross and Tagish WUI, fuel management can consistently achieve meaningful threat reduction. Many of the conifer or mixedwood fuel types have considerably dense ladder fuel components as spruce trees grow with their crowns to the forest floor. All stand types (deciduous included) often have accumulations of deadfall due to natural stand succession and slow decomposition processes. Where a higher continuity of fuel is found near critical infrastructure, subdivisions, or other identified values at risk, fuel management can considerably reduce the hazard and exposure to these values. Proactively managing this vegetation will provide safe conditions for first responders if structure protection is to be employed, or it may create a hazard that is low-enough where adjacent structures will not be impacted by a fire that occurs. Additionally, fuel management will reduce the potential fire severity within a stand which can allow that stand and its important habitat elements to remain intact.

Performing fuel management in the WUI of Carcross and Tagish is also very feasible due to several factors, including site-specific conditions and anthropogenic influences. As discussed in Section 4.1.2, the topography surrounding Carcross and Tagish is very gentle and operable which allows crews to safely work in many of these areas. Many interface areas also contain a network of “fire roads” or ATV trails throughout which can allow for debris to be removed off-site more easily if piling and burning is not feasible or desirable. Long-lasting snow cover and frozen conditions can complicate fuel management where surface fuel abatement is required, resulting in a need for additional debris removal once the snow melts or more strict ladder fuel management.

Additionally, where fuel management is performed on Settlement Lands or public lands to protect structures that are on titled parcels or residential parcels, the effectiveness of the fuel management is highly dependent on the fuel and structural conditions on the adjacent property. Conditions were frequently observed in both Carcross and Tagish where the fuel or structural conditions on private property are *considerably* more hazardous than in the surrounding forest. This limits the effectiveness of fuel management but opens the door for collaborative projects where fire hazards are strategically mitigated across parcel boundaries.

Action Planning

Multiple areas have been recommended for fuel treatment through this CWPP, referred to as Fuel Treatment Units (FTUs - Table 25 & Map 18 [Carcross], Table 26 & Map 19 [Tagish]). The spatial extent, required fuel management, and objective of these treatment areas are variable, and have therefore been grouped into the following categories:

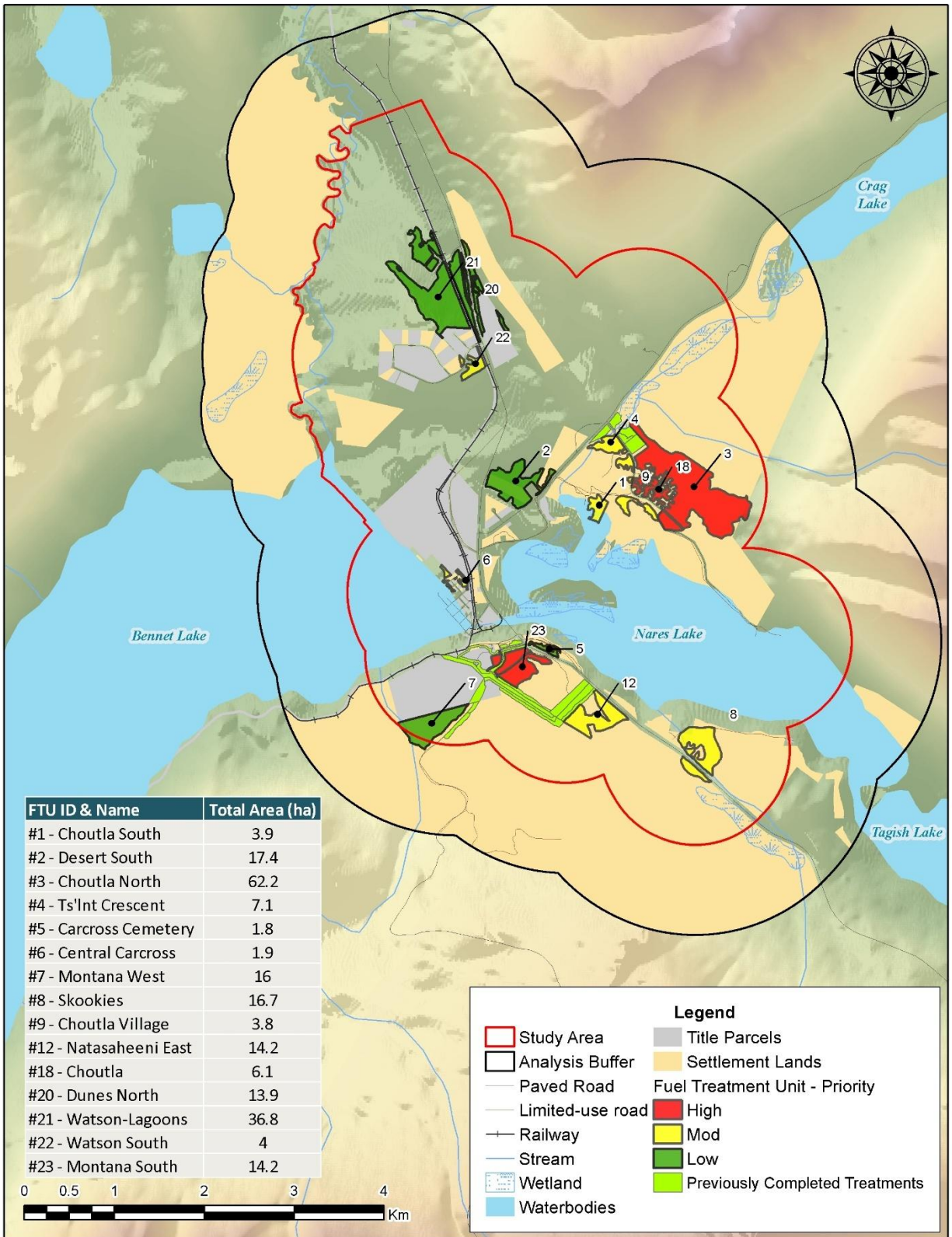
- Interface FTU: An area in the immediate interface with residential properties or community infrastructure, targeting higher hazard forest stands between the infrastructure and another low-hazard or fuel-break feature. May qualify as smaller FireSmart projects or may need YESAA permitting.
- FireSmart FTU: An area between residential properties, often on Settlement Land, that needs basic vegetation management in line with FireSmart principles but would require buy-in and collaboration with property owners.
- Fuel Break FTU: Larger landscape-level fuel breaks targeting continuous forested areas. Would likely require YESAA permitting and may involve industrial-scale machine treatment.

Table 25: Summary of fuel treatment units identified in the Carcross WUI.

FTU #, Name & Category	Total Area (ha)	Priority	Wildfire Behavior Threat (ha)				Treatment Objective / Rationale	Overlapping Values / Treatment Constraints
			Very High	High	Mod.	Low		
#1 Choutla South Interface	3.9	Mod	3.9	-	-	-	Targets a high-hazard spruce stand east of homes at the end of Grayling Bay Rd in the Little Choutla subdivision. These homes are intermixed with the surrounding forest and are fairly isolated. There is one well-established egress route to the highway via Grayling Bay Rd. Implementing a fuel treatment here could enhance suppression efforts and allow for safer evacuation in the event of a wildfire. This FTU does not provide a fuel-break at the landscape scale.	<ul style="list-style-type: none"> Fully within CTFN Settlement Lands. Adjacent to important habitat for duck and identified habitat for Caribou, as well as a berry picking area. Minor overlap with a flooding area from 2009 that caused severe tree mortality. Treatment area could be logically extended to the east, but the priority is a values-out approach.
#2 Desert South Interface –CI	17.4	Low	-	-	17.4	-	This treatment unit is located northeast of the intersection of the Klondike Highway and Tagish Road, targeting a high-density pine and spruce stand (majority C-1) adjacent to a YWFM weather station, small public water supply well, residential properties, and the works yard. Treatment will create a low-hazard fuel break between the two highways and defensible space for firefighters.	<ul style="list-style-type: none"> Mixed land ownership types, approximately 40% is on CTFN Settlement Lands. Identified as important Caribou habitat and a berry picking area. There is a higher-hazard conifer stand (C-2) to the north of this but it was not included as it is in a very wet and swampy area.
#3 Choutla North Interface / Fuel Break	62.2	High	-	43.2	19.0	-	A large landscape level fuel break encompassing a variety of moderate and high-hazard coniferous and mixed wood stands adjacent to the Choutla subdivision. The objective is to lower spread rates and fire intensity. By lowering threat, this FTU would allow for more effective suppression efforts by creating safer access, emergency egress, and anchor points. This FTU connects to recently treated areas and includes planned treatment areas from YWFM.	<ul style="list-style-type: none"> Fully within CTFN Settlement Lands. Contains identified Caribou habitat, Moose habitat, and an important berry picking area.
#4 Ts’Int Crescent Interface	7.1	Mod	4.7	-	2.4	-	Consists of four separate polygons adjacent to the Choutla Subdivision, west of Ts’Int Crescent. The polygons encompass high density spruce and mixedwood stands, protecting a main access corridor and residential structures. These polygons tie into lower threat forest types to the southwest, and treated areas to the northwest, expanding the amount of defensible space. Treatment can likely be a manual thin-from-below with deadfall abatement, though larger mechanized openings could be created in spruce-dominant stands.	<ul style="list-style-type: none"> Fully within CTFN Settlement Lands. Identified Caribou habitat and part of an important berry picking area. ATCO lines adjacent to the roadside areas.

FTU #, Name & Category	Total Area (ha)	Priority	Wildfire Behavior Threat (ha)				Treatment Objective / Rationale	Overlapping Values / Treatment Constraints
			Very High	High	Mod.	Low		
#5 Carcross Cemetery Interface	1.8	Low	1.8	-	-	-	<p>Southeast of Henderson Road, between the Klondike Highway and Waterfront Drive. This PTU is within a high-density mixedwood stand. It provides protection for structures along Henderson Road and the Carcross Cemetery. Additionally, this PTU would lower threat along Waterfront Drive and the highway. Likely a manual thin-from-below, pruning, and deadfall abatement treatment.</p>	<ul style="list-style-type: none"> • Not on CTFN Settlement Lands. • In the interface with private residential properties – access and treatment would likely require coordination with property owners. • Treatment within the cemetery area may need to be restricted or supervised. • Identified Caribou, Moose, and Bald Eagle habitat and part of a larger berry picking area, and adjacent to riparian areas for duck and swan.
#6 Central Carcross FireSmart	1.9	Moderate	-	-	1.9	-	<p>Contains multiple dispersed dry and sandy conifer areas adjacent to residential homes and the Ghùch Tlà Community School, where there should be a focus on basic vegetation management / FireSmart – mainly deadfall removal and tree pruning. Treatment can be community-based and can demonstrate sound FireSmart practices.</p>	<ul style="list-style-type: none"> • Majority of the area is not on CTFN Settlement Lands, though dispersed portions are. • In the interface with private residential properties – treatment would require collaboration and buy-in and should include a commitment to vegetation management on the private properties. • Identified Caribou habitat area and berry picking area. • The broader area contains frequently used hiking and ATV trails.
#7 Montana West Fuel Break	16.0	Low	-	12.5	3.5	-	<p>Targets continuous conifer forests south of the Montana Mountain Road and north of a large White Pass parcel, extending treatment from narrow roadside fuel treated areas.</p>	<ul style="list-style-type: none"> • Fully on CTFN Settlement Lands. • White Pass property adjacent limits the efficacy of fuel treatment, unless it is also treated to create low-hazard conditions to the valley bottom. • Identified Caribou habitat area, berry picking areas, and Mountain Goat habitat.
#8 Skookies Interface	16.7	Mod	-	-	16.5	0.2	<p>Targets continuous conifer and mixedwood areas surrounding Skookum Jim Friendship Center and Camp, aiming to create low-hazard and defensible space in all directions. Dry and pine-dominant stands, treatment would likely focus on deadfall removal and thinning-from-below, with low-intensity prescribed fire an option.</p>	<ul style="list-style-type: none"> • ~90% is on CTFN Settlement Lands, though a portion of the northwest corner along the access road is not. • Identified Caribou habitat area, berry picking areas, and Bald Eagle habitat. Adjacent to important riparian areas for swan and duck. • Treatment could logically extend further to the east, though a values-out approach should be the priority.
#9 Choutla Village Interface	3.8	Mod	2.3	-	1.5	-	<p>Targets mixedwood and conifer areas downslope and in the direct interface with properties in the Choutla Subdivision, tying into areas with a higher percentage of deciduous trees to create a defensible low-hazard area to the south of the neighbourhood.</p>	<ul style="list-style-type: none"> • Fully on CTFN Settlement Lands other than a very small sliver along the roadside. • Efficacy in protecting the community is reliant on continued fuel management and FireSmart work within the subdivision (see FTU #18, #3 and #4) • Includes important Caribou habitat as well as berry picking areas.

FTU #, Name & Category	Total Area (ha)	Priority	Wildfire Behavior Threat (ha)				Treatment Objective / Rationale	Overlapping Values / Treatment Constraints
			Very High	High	Mod.	Low		
#12 Natasheeni East <i>Fuel Break</i>	14.2	Mod	-	13.0	1.1	0.1	Will target the treatment of conifer forests south of Highway 2 and east of previously completed fuel treatments – both a full fuel-break adjacent to Natasheeni and hand-thinned stands beyond that. Could likely involve manual thinning-from-below, pruning, and deadfall abatement, or mechanized removal to break up the continuity of conifer trees. Area adjacent to previous treatments was identified by YWFM as a planned treatment area.	<ul style="list-style-type: none"> Mixed between Settlement Land (western ~40%) and not. Important Moose, Caribou, and Bald Eagle habitat, as well as a berry picking area. Adjacent to important riparian habitat areas north of Highway 2.
#18 Choutla <i>FireSmart</i>	6.1	High	-	6.1	-	-	There is a need for basic vegetation management and FireSmart cleanup between properties throughout the Choutla subdivision. Minor roadside and perimeter areas in the subdivision have been treated, yet there are still dense conifer patches and deadfall accumulations between properties. Wildfire risk reduction needs to begin from the value (i.e., structure) and expand out.	<ul style="list-style-type: none"> Fully on Settlement Lands. In the interface with residential properties – treatment would require collaboration and buy-in and should include a commitment to vegetation management on the properties. Part of a broader Caribou habitat area and berry picking area.
#20 Dunes North <i>Fuel Break</i>	13.9	Low	-	13.9	-	-	Targets multiple dense conifer areas adjacent to the railway right-of-way, the Klondike Highway, and residential / commercial properties, tying into a cliff-band east of the highway.	<ul style="list-style-type: none"> Majority of the area is not on CTFN Settlement Lands, though a sliver at the north end (east of the highway) is. Contains Caribou habitat and an identified Moose corridor, also part of an important berry picking area.
#21 Watson-Lagoons <i>Interface – Fuel Break</i>	36.8	Low	-	21.1	15.7	-	Targets conifer and mixedwood stands between the sewage lagoons, the gun range, and the Watson Subdivision – connecting this with low-hazard deciduous areas and the railway right-of-way. Treatment could likely be mechanized given the scale and continuity of conifer trees, though wet ground may limit this in areas.	<ul style="list-style-type: none"> Not on CTFN Settlement Lands. Contains Caribou habitat and an identified Moose corridor, also part of an important berry picking area.
#22 Watson South <i>Interface</i>	4.0	Mod	-	4	-	-	Targets conifer and mixedwood stands in the interface for residential properties at the east side of the Watson Subdivision – ties into non-fuel (dune) and deciduous areas. Likely a manual thin-from-below treatment given interface location.	<ul style="list-style-type: none"> Portion west of Spirit Drive is on CTFN Settlement Lands, remainder is not. Contains Caribou habitat and is part of an important berry picking area. Access adjacent to private properties required and fire hazard conditions extend onto private property.
#23 Montana South <i>Interface – Fuel Break</i>	14.2	High	13.7	0.5	-	-	Treatment will target high hazard and continuous conifer forests on the lower slopes of Montana Mountain, in the direct interface with residential properties – expanding previous roadside fuel treatment areas (completed prior to 2006) and the old powerline fuel break. Treatment can either thin-from-below, prune, and remove deadfall, or break up the continuity of conifer trees via mechanized means.	<ul style="list-style-type: none"> Majority of the treatment area is on CTFN Settlement Lands, approximately 2.2 hectares at the east end is not. Frequently used access roads (Montana Mountain & Blue Grouse) adjacent, <i>Rabbit</i> hiking/biking trail bisects the unit. Important hunting and berry picking area, habitat for Mountain Goat, and habitat for Caribou.

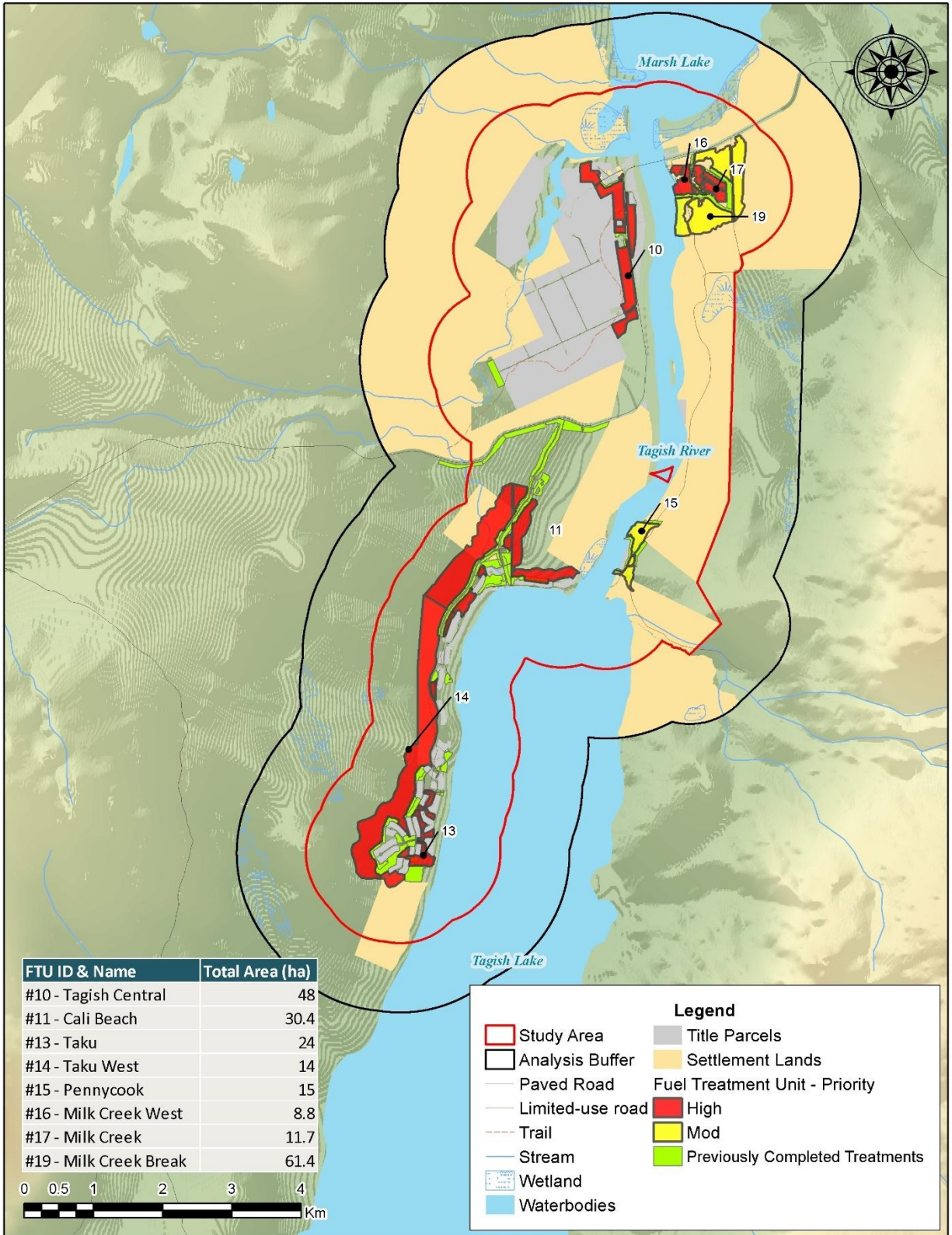


Map 18: Overview map of fuel treatment units identified in Carcross's WUI.

Table 26: Summary of fuel treatment units identified in the Tagish WUI.

FTU #, Name & Category	Total Area (ha)	Priority	Wildfire Behavior Threat (ha)				Treatment Objective / Rationale	Overlapping Values / Treatment Constraints
			Very High	High	Mod.	Low		
#10 Tagish Central Interface	48.0	High	14.3	6.2	27.6	-	High to extreme hazard conifer stands along Highway 8 on both sides of the Tagish Estates Road. Includes Settlement Lands in the interface with residential properties on Tagish River Road, Sidney Street, and Buds Road.	<ul style="list-style-type: none"> Approximately 50% is on CTFN Settlement Lands. Adjacent to private land, and forest continues onto private in many instances – much of the work would need to be completed in conjunction with homeowners, especially for access and debris removal. Part of highly important Caribou habitat (fall breeding and winter range) and berry picking areas.
#11 Cali Beach Interface	30.4	High	25.5	-	4.9	-	Targets moderate-high hazard untreated conifer stands in the direct interface with properties along California Beach. Extends north along the powerline right of way and along Reid Road to capture areas surrounding the fire hall and dump, which contains critical community water infrastructure. Ties into previously treated areas (prior to 2009) and includes a planned treatment area from YWFM.	<ul style="list-style-type: none"> Not on CTFN Settlement Lands. Important Caribou habitat (fall breeding and winter range), as well as a berry picking area. Adjacent to important riparian habitat areas along the Tagish River (duck and goose).
#13 Taku FireSmart	24.0	High	1.2	11.2	11.6	-	There is a need for basic vegetation management and FireSmart cleanup between properties throughout the Taku subdivision. The majority of roadside areas in the subdivision have been treated, yet there are still dense conifer patches and deadfall accumulations between properties, as well as blowdown in treated areas. Wildfire risk reduction needs to begin from the value (i.e., structure) and expand out.	<ul style="list-style-type: none"> Adjacent to private property that is not on Settlement Lands – access to areas and treatment would be difficult and would require buy-in and involvement from community members. Majority of treatment area is not on Settlement Lands. Part of a broader Caribou habitat area and berry picking area.
#14 Taku West Fuel Break	185.1	High	15.4	54.9	113.3	1.5	Targets continuous conifer and mixedwood stands to the west of the Taku Subdivision, between 300 – 350 m from the main access road. A major extension of the previous ~30 m wide roadside treatment areas. Would provide a landscape-level break upslope of properties, and allow for safer roadside suppression and structure protection for first responders. Treatment could likely include a thin-from-below in drier upland sites and targeted harvesting in spruce-dominant / mixedwood stands. Low-intensity prescribed fire in C-1 fuel types could be tested.	<ul style="list-style-type: none"> Mixed CTFN Settlement Lands (north end and central portion), though ~40% is not. Highly important area for Caribou habitat – both fall breeding and winter range, as well as a berry picking area. Efficacy in protecting the community is reliant on continued fuel management and FireSmart work within the subdivision (see FTU #11 and #13).
#15 Pennycook Interface	13.6	Mod	9.1	3.9	0.6	-	Targets multiple continuously forested interface areas surrounding residential properties at the south end of Pennycook Road. Includes a planned treatment area from YWFM and connects to previously treated roadside areas (2009/10, 2024).	<ul style="list-style-type: none"> Mixed CTFN Settlement Land (further from structures) and not. Identified Caribou habitat area (fall breeding and winter range). ATCO line running to community.

FTU #, Name & Category	Total Area (ha)	Priority	Wildfire Behavior Threat (ha)				Treatment Objective / Rationale	Overlapping Values / Treatment Constraints
			Very High	High	Mod.	Low		
#16 Milk Creek West <i>Interface - CI</i>	8.8	High	7.2	1.6	-	-	Targets continuous conifer forests adjacent to the Milk Creek / Squanga subdivision, Tagish campground, and critical drinking water infrastructure (wells and treatment facility). Will expand off of pre-existing roadside treatments vegetation management that has occurred in the campground.	<ul style="list-style-type: none"> Fully on CTFN Settlement Lands. Adjacent to key wildlife habitat within the Tagish River Habitat Protection Area – specifically duck and goose. Part of a broader Caribou habitat area (fall breeding and winter range) and berry picking area.
#17 Milk Creek <i>FireSmart</i>	11.7	High	0.9	7.9	2.9	-	There is a need for basic vegetation management and FireSmart cleanup between properties in the Choutla and Milk Creek / Squanga subdivisions. Portions of the subdivision perimeter and roadside areas have been recently treated, yet there are still dense conifer patches and deadfall accumulations between properties. Wildfire risk reduction needs to begin from the value (i.e., structure) and expand out.	<ul style="list-style-type: none"> Fully on CTFN Settlement Lands, though implementation will require buy-in and involvement from community members. Part of a broader Caribou habitat area and berry picking area.
#19 Milk Creek Break <i>Interface – Fuel Break</i>	61.4	Mod	31.1	21.1	9.2	-	Targets an extended area surrounding the Milk Creek / Squanga Subdivision containing moderate-high hazard conifer and mixedwood stands, expanding from previous fuel treatments (2009) to provide a low-hazard area between the neighbourhood, the Tagish River, highway, and east of Pennycook Road.	<ul style="list-style-type: none"> Fully on CTFN Settlement Lands. Efficacy in protecting the community is reliant on continued fuel management and FireSmart work within the subdivision (see FTU #16 & #17). Active winter range and fall breeding habitat for Caribou, as well as an important berry picking area.



Map 19: Overview map of fuel treatment units identified in Tagish's WUI.

Establishing a framework for entire neighbourhood areas and landscape-level fuel breaks to be maintained in a low-hazard and healthy state is an important piece of long-term land management and community resilience in Carcross and Tagish. Recommendations related to fuel management treatments are detailed in the Executive Summary in Table 1. Community Wildfire Protection Plan Recommendations. In summary, these recommendations include the following (high priority items are bolded):

#27 Create New Fuel Management Prescriptions	#28 Complete Fuel Management Treatments
#29 Maintain Previously Treated Areas	#30 Plan Prescribed Burning

5.7.2 RESIDENTIAL FIRESMART

Description

Residential FireSmart refers to the removal, reduction, or conversion of flammable plants to create more fire-resistant areas in the FireSmart Immediate, Intermediate, and Extended Zones – collectively referred to as the Home Ignition Zone (HIZ; see Figure 8). The names of these FireSmart Zones changed in 2023 and had previously been referred to as the Non-Combustible Zone, Priority Zone 1, and Priority Zone 2 respectively. This section will focus on vegetation management but will also discuss FireSmart structural conditions, which were introduced in Section 5.1.

Analysis

Throughout Carcross and Tagish, compliance with FireSmart vegetation management practices within the HIZ varies. Properties often do not have much planted vegetation or landscaping, but there is often considerable natural forest and vegetation on and between properties. Much of this fuel is highly flammable and continuous between properties. Regular maintenance on properties is also limited to areas closest to the primary home, which results in a large unmaintained area due to larger lot sizes and parcels with multiple outbuildings. This is pronounced in Tagish where many large properties in Tagish Estates have large open fields that are continuously grassy when unmaintained. The most common FireSmart vulnerabilities that were noted for residential structures and community infrastructure were:

- Conifer trees with branches (often dead) that are overhanging homes or in contact with homes, or continuous down to the ground;
- Understory conifer trees or shrubs, including juniper;
- Accumulations of deadfall, both on the ground and hung-up in branches;
- Decadent deciduous areas with continuous grass cover;
- Vulnerable exterior structure conditions: vinyl siding, wood or shake siding;
- Wooden sheds / outbuildings within the Intermediate Zone of the main house, which are often much less FireSmart than the house itself;
- Storage of firewood or other combustible materials within the Immediate or Intermediate Zone of the main house, including construction material and vehicles.

Once a vegetation hazard has been identified on a property, the work required to modify or remove the hazard and dispose of the debris can often be onerous, costly, and prohibitive for homeowners. This is especially true in the case of elders or individuals with limited mobility. Conversely, the limited regulatory framework in Carcross and Tagish does allow for a more streamlined cutting of trees and less restrictions to removing that debris via pile and burning. Most of the vegetation management for residential FireSmart treatments would involve small-scale brushing / thinning, pruning, and deadfall / litter removal activities – activities of which have been completed by community members across various fuel treatment areas for the past 20 years.

Action Planning

FireSmart education initiatives are the foundation of residential FireSmart activities – which were detailed in Section 5.1. Carcross / Tagish First Nation should maintain and expand their programs which communicate FireSmart at the homeowner level, and those which assess, recommend, and perform vegetation management at the residential and critical infrastructure scale. In addition, CTFN should consider the following initiatives to enhance its support for residential FireSmart landscaping:

- Increase opportunities for residents to dispose of yard waste conveniently, without having to travel to the transfer station, by:
 - Offering a chipper program where if individuals place debris in roadside piles, a chipper will come chip and remove the material; or,
 - Providing temporary debris disposal bins in communal neighbourhood areas, which are then taken to the transfer station.
- Demonstrating vegetation management techniques through the mitigation of critical infrastructure hazards and communicating this with the community.
- Promote and facilitate a neighbourhood FireSmart BBQ/clean-up day; this event can count towards FireSmart Canada Neighbourhood Recognition.

Recommendations related to residential FireSmart initiatives are detailed in the Executive Summary in Table 1. Community Wildfire Protection Plan Recommendations. In summary, these recommendations include the following (high priority items are bolded):

#31 Conduct HIZ Assessments	#32 Establish FireSmart Neighbourhoods
#33 Initiate FireSmart Cleanup	#34 Establish Debris Disposal Program
#35 Communal Firewood Storage	#36 Conduct Critical Infrastructure Assessments & Mitigation

SECTION 6: CWPP ACTION PLAN

6.1 TRACKING, REPORTING, AND UPDATES

As Carcross / Tagish First Nation works at implementing recommendations from this CWPP, they should consider scheduling an annual review of progress made towards each action item/recommendation. Tracking and reporting will create accountability and also help with future funding applications. CTFN should prepare for a five-year comprehensive review/update of the entire plan. The update should review the entire plan and consider how risk has changed based on any recent wildfires, vegetation management works completed, significant changes to the built environment due to growth and development, economic changes, or other factors that would influence the overall success of the plan. This would also include a detailed analysis of all completed fuel management treatments within the planning area with an updated status and/or a maintenance plan.

APPENDIX A: HOME IGNITION ZONE

Home and Critical Infrastructure Ignition Zones

Multiple studies have shown that the principal factors that contribute to structure loss by wildfire are the structure's characteristics and immediate surroundings. The area that determines the ignition potential of a structure is referred to as the Home Ignition Zone.^{44,45} The Home Ignition Zone includes the structure itself and three concentric, progressively wider zones out to 30 meters from the structure. More details on this can be found in the FireSmart Manual.⁴⁶

During extreme wildfire events, most home destruction results from low-intensity surface fires, usually ignited by embers. Embers can be transported long distances ahead of the wildfire, across fire guards and fuel breaks, and accumulate within the Home Ignition Zone in densities that can exceed 600 embers per square meter. Combustible materials found within the Home Ignition Zones can create fire 'pathways', allowing surface fires ignited by embers to spread and carry flames into contact with structures.

Because ignitability of the Home Ignition Zone is the main factor driving structure loss, the intensity and rate of spread of wildfires beyond the community does not always correspond to a high potential of loss or damage. 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.⁴⁵ Extreme wildfire conditions do not necessarily result in WUI fire disasters.⁴⁷ It is for this reason that the key to reducing WUI fire structure loss is to reduce structure ignitability. Mitigation responsibility must be centered on structure owners. 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

The Community Zone can be thought of as all public and Settlement Land within the Local Area Plan boundary that is beyond 30 meters from structures. 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. Depending on the results of Home Ignition Zone assessments on individual structures, vegetation management may be required beyond 30 meters and up to 100 meters in certain areas. Local parks and trail systems are all often part of the Community Zone. Often Community Zone lands see high use by the public, which increases the potential for accidental ignitions and the risk to properties surrounding them.

⁴⁴ 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.

⁴⁵ Cohen, J. *Preventing Disaster Home Ignitability in the Wildland-urban Interface*. Journal of Forestry. p 15 - 21.

⁴⁶ <https://firesmartcanada.ca/> and <https://begins-at-home-guide.firesmartbc.ca/>

⁴⁷ 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/>.

Landscape Zone

The Landscape Zone encompasses lands that are located well away from any community infrastructure. Vegetation (fuel) management planning and implementation is primarily the responsibility of the appropriate land manager (e.g., CTFN, Department of Energy, Mines, and Resources, private / corporate landholders) working collaboratively to align landscape objectives with the CWPP objectives. Vegetation management planning and implementation in the Landscape Zone should be directed through a formal fuel management prescription developed by a forest professional with wildfire vegetation management within their scope of practice.

Fire hazard in the WUI is partly dictated by the proximity of fuel to developed areas. Fuels closest to the community pose a higher risk, compared to fuels that are further from values at risk. It is recommended that fuels closest to structures or developed areas are prioritized for treatment first, to reduce the risk closest to the community. Continuity of fuel treatments is an important consideration, achieved by reducing fuels from the edge of the community outward to a defined fuel-break feature (e.g., roadway, low-fuel area, water, etc.). Table 27 describes the classes associated with proximity of fuels to the interface.

Table 27. Proximity to the interface

Proximity to the Interface	Descriptor*	Explanation
WUI 100 <i>Home Ignition Zone, Critical Infrastructure Ignition Zone, and Community Zones</i>	(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 <i>Community and Landscape Zones</i>	(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 <i>Landscape Zone</i>	(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.
<i>Landscape Zone</i>	>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.*

APPENDIX B: WTA PLOTS AND PHOTOS

Thirty-one site-level Wildfire Theat Assessment (WTA) plots were completed during the field work for this CWPP. These plots are summarized in Table 28 below, and the finalized WTA forms have been provided separately as a PDF package. These WTA plots were based on the template and guidance document developed in British Columbia.⁴⁸ The following point ranges are assigned to the Northern Boreal Mountains, Taiga Plains Ecoprovince:

- Wildfire Threat Score:
 - Low (0-39); Moderate (40 – 53); High (54 – 64); Extreme (>65)

Table 28: Carcross / Tagish First Nation WTA Plot Summary

WTA Plot ID	Geographic Location	Wildfire Behaviour Score (Threat Class)
CHINOOK-1	Chinook Road - Milk Creek subdivision east of the Tagish River	60
CHINOOK-2	Chinook Road – fuel treated area	44
CHOUT-1	Choutla Subdivision – east side, untreated	62
CHOUT-2	Choutla Subdivision – northwest side, fuel treated area	43
GUN-1	Between the Carcross gun range and the highway	53
MONT-1	Between Rabbit Way & Blue Grouse Trail	58
MONT-2	East of Montana Mountain Road, 500m south of the bike trails parking lot	55
MONT-3	Corner of old power line right-of-way and fuel break on Montana Mountain	60
PENNY-1	Untreated area by residential properties, south end of Pennycook Road	58
PENNY-2	South of properties on Pennycook Road – CTFN settlement lands	64
PENNY-3	Fuel treated area along Pennycook Road – north of properties at the south end of the road	44
PENNY-4	Midway on Pennycook Road, CTFN settlement lands	75
PENNY-5	North end of Pennycook Road, CTFN settlement lands	53
PENNY-6	North end of Pennycook Road, mixedwood stand east of the CTFN subdivision	47
SKOOK-1	Lodgepole pine flats east of Skookies Camp	56
SKOOK-2	Lodgepole pine area, downslope of Skookies	57
TAG-1	NW corner of Tagish, north of Sidney Street	58
TAG-2	Sliver between Tagish River Road and Highway	62
TAG-3	West end of Tagish, north of Highway (SW of Tagish Estates - adjacent to powerline right-of-way)	51

⁴⁸ 2020 Wildfire Threat Assessment Guide & Worksheets. Government of BC – BC Wildfire Service. Accessed from: <https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/fuels-management/2020-wildfire-threat-assesment-guide-final.pdf>

COMMUNITY WILDFIRE PROTECTION PLAN 2025

TAG-4	Fuel treated area, SW of Tagish Estates properties	43
TAG-5	Tagish Estates, west of highway	67
TAG-6	Treated area south of Highway 8, NE of Taku	45
TAG-7	Untreated area immediately south of TAG-6 WTA plot	64
TAG-8	North of California Beach	53
TAG-9	West of Taku Blvd, CTFN settlement lands	54
TAG-10	South of properties at the south end of Taku Blvd - approx. 200m west of the Tagish River.	49
TAG-11	South of the dump in the Taku subdivision	56
TAKU-1	West of treated areas west of Taku Boulevard	55
TAKU-2	Far SW corner of Taku Boulevard	60
WATS-1	SW of Watson subdivision, along the 10km loop ski trail	51
WATS-2	NW corner of Watson, deciduous stand	46

APPENDIX C: REQUIRED MAPS FOR SUBMISSION

Provided separately as PDF package.

APPENDIX D: LOCAL WILDFIRE RISK ASSESSMENT PROCESS

The Wildfire Threat Assessment results that are described in Section 4.4 were obtained through a process consisting of the following steps:

- Updating fuel typing through in-situ verification (field work) and orthophotography.
- Updating structural data using in-situ verification, spatial data, and orthophotography.
- In-situ observations of wildland fuels and completion of Wildfire Threat Assessment worksheets.
- Wildfire threat spatial analysis to produce mapping and statistics described in Section 4.3, using updated fuel typing, updated structural data, and Wildfire Threat Assessment worksheet results.

This appendix provides methodological information for each of the above steps to produce the Wildfire Threat Assessment, as follows:

- Further details on fuel typing update methodology are provided in Appendix D-1: Fuel Typing Methodology and Limitations
- Wildfire Risk Assessment plot worksheets are provided in Appendix B.
- Wildfire threat spatial analysis methodology to produce results reported in Section 4.4 is detailed in the following sections:
 - Appendix D-2: Wildfire Fire Threat Spatial Analysis Methodology, and
 - Appendix D-3: WUI Risk Spatial Analysis Methodology.

APPENDIX D-1: FUEL TYPING METHODOLOGY AND LIMITATIONS

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.⁴⁹ 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 Canada, with continual improvement and refinement, for 20 years.⁵⁰

There are significant limitations with the fuel typing system which should be recognized:

- The fuel typing system is designed to describe fuels which sometimes do not occur within the area of interest;
- Fuel types cannot fully, and accurately capture the natural variability within a polygon;
- The data used to create initial fuel types also has limitations.

Given these limitations, the following should be considered when using fuel type maps and information, to plan community wildfire resiliency projects:

- Fuel typing further from the developed areas of the study generally has a lower confidence.
- 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.
- 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 updated assessments.

Fuel types found within the WUI were listed and discussed in in Section 4.1.1.

⁴⁹ Forestry Canada Fire Danger Group. (1992). *Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3*.

⁵⁰ 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.

APPENDIX D-2: WILDFIRE FIRE THREAT SPATIAL ANALYSIS METHODOLOGY

Source Data

As the CWPP process in the Yukon is not strictly defined, there are currently no defined standards for spatial data submissions. Proponents completing a CWPP can obtain open-source GeoYukon datasets, in combination with locally-derived datasets specific to each client. Wildfire spatial datasets obtained through GeoYukon or shared by territorial departments that were used in the development of the CWPP include, but are not limited to:

- ATCO Electrical Distribution Lines
- Bioclimate Zones
- Conservation Data Center – Species of Conservation Concern
- Cultural Features
- Designated Historic Sites
- Emergency Management Infrastructure
- Fire Districts
- Fire Management Zones
- Fire History – Ignition Locations & Perimeters
- First Nation Settlement Lands
- Forest Health Aerial Overview
- Heritage Routes & Sites
- Land Use Designations & Land Dispositions
- Parks and Protected Areas
- Personal Use Fuelwood Areas
- Titled Land Parcels
- Trails (various)
- Vegetation Inventory
- Water Licenses
- Water Wells
- Wildlife Key Areas – various species

Spatial Analysis

Not all attributes on the Wildfire Threat Assessment form or regional guidance documents for *Determining Wildfire Threat and Risk at a Local Level* 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 29 were used as the basis for building the analytical model. The features 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 29. 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 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	
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	
Continuous forest/slash cover within 2 km	No	
Weather Subcomponent		
Biogeoclimatic Zone	Yes	Although included, these are broad classifications, meaning most polygons in the Study Area will have the same value
Historical weather fire occurrence	Yes	Determined by creating a 10-point fire incidence rank scale for the entire Yukon, based on historic fire occurrences.
Topography Subcomponent		
Aspect	Yes	Contour model was used to determine aspect.
Slope	Yes	Elevation model was used to determine slope.
Terrain	No	Incorporated through aspect and slope.
Landscape/ topographic limitations to wildfire spread	No	Incorporated as non-fuel or water in the fuel typing attribute.
Structural Subcomponent		
Position of structure/ community on slope	No	Too difficult to quantify – this is a relative value.
Type of development	No	Too difficult to analyze spatially.
Position of assessment area relative to values	Yes	Structure density and distance to critical infrastructure was used in the risk components of this analysis. Being above, below or sidehill too difficult to analyze spatially.

A scoring system was developed to categorize resultant polygons as having relatively low, moderate, high or very high Fire Threat class. Table 30 below summarizes the components and scores to determine the Fire Threat.

Table 30. Fire Threat Class scoring components

Attribute	Indicator	Score
Fuel Type	C-2	35
	M-3/4 > 50% conifer	
	M-1/2, >75% conifer	30
	M-3/4 < 50% conifer	
	M-1/2, 50-75% conifer	25
	C-6, > 3 m LCBH	
	C-3	20
	C-6, < 3 m LCBH	
	M-1/2, 25-50% conifer	
	C-1	15
	C-7	
	O-1a/b	
	S-1, S-2, S-3	10
	C-5	
	M-1/2, <25% conifer	5
	D-1/2	
	Water	0
	Non-Fuel	
Weather – Bioclimate Zone	Alpine / Pacific Maritime Glacierized	1
	Arctic Low / Dwarf Shrub / Subarctic Subalpine	3
	Boreal Subalpine	5
	Subarctic Woodland	7
	Boreal High	10
	Boreal Low	15
Historical Fire Occurrence Zone	A scoring rank of 1 through 10 was assigned across the Yukon Territory by analyzing the density of historic fire ignitions.	
Slope	< 20	1
	21 - 30	5
	31 - 45	10
	46 - 60	12
	> 60	15
Aspect (>15% slope)	North (316-45°)	0
	East (or < 15% slope) (46-135°)	5
	West (226-315°)	10
	South (136-225°)	15

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. As mentioned above there is considerable variability in forest types (fuel types) on the ground, though this variety is not able to be easily captured through a fuel type and scoring process. Historical fire occurrences are based off of fire ignitions in the Yukon Wildland Fire Management datasets, which may not be fully up-to-date, does not capture structure fires or brush fires not reported as wildfires, and may include false reports, smoke chases, or nuisance fires.

Wildfire Threat Determination

Based on the summed scores from the components in Table 30, polygons were placed into the threat classes shown in Table 31.

Table 31. Wildfire Behaviour Threat Classes and their associated summed scores.

Wildfire Behaviour Threat Class	Score
Very Low	0
Low	0 – 34
Moderate	35 – 54
High	55 – 65
Very High	> 65

APPENDIX D-3: WUI RISK SPATIAL ANALYSIS METHODOLOGY

To determine risk within the WUI, a wildfire consequence rating was first derived using the following inputs, which were based off the *Community Safety and Property* inputs from the Southern Lakes Wildfire Risk Assessment. Inputs were refined to better reflect a community-specific analysis.

Table 32: Components of the wildfire consequence rating.

Subcomponent	Input	Notes	Subcomponent Relative Weight	Overall Weight
Wildland Community Interface	Structure Density – number of structures / square kilometer	> 100	10	55%
		50 – 100	8	
		25 – 50	6	
		10 – 25	4	
		1 – 10	2	
Critical Infrastructure	100 m buffer on identified point or line locations	Emergency Response / Communications	10	35%
		Utilities (14 & 25 kV ATCO lines – above ground)	8	
		Community	6	
		Water Sources	4	
Evacuation Routes	100 m buffer on main highways and evacuation routes.	Routes	10%	10%

The combination of the 3 consequence subcomponents results into a raster with values 0 to 10. This raster was split into 5 classes: 0 – 2 (Very Low), 3 – 4 (Low), 5 – 6 (Moderate), 7 – 8 (High), 9 – 10 (Very High).

The resulting consequence class across the WUI was then cross-walked with a rasterized version of the wildfire threat classes. Wildfire threat classes were distributed into five categories which were equivalent with the output of the wildfire threat analysis: very high, high, moderate, low, and very low. Very low was a category assigned to water features. Using a crosswalk method, the consequence and threat rasters were then overlaid to produce an overall wildlife risk rating for the CWPP area.

Threat	Very High	Low	Moderate	High	Very High	Very High
	High	Low	Moderate	Moderate	High	Very High
	Moderate	Low	Low	Moderate	High	High
	Low	Very Low	Low	Low	Moderate	High
	Very Low	Very Low	Low	Low	Moderate	Moderate
		Very Low	Low	Moderate	High	Very High
Consequence						

Figure 14: Wildfire risk matrix used for the CWPP, combining wildfire threat with wildfire consequence ratings.