DRAFT - Watson Lake

3-Year Community Wildfire Protection Plan 2025

Wildland Fire Management

Yukon

Adoption of the Watson Lake 3-Year Community Wildfire Protection Plan

_____ _____

XXX XXX Date

XXX

Town of Watson Lake

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XXX XXX Date

XXX

Liard First Nation

_____ _____

Devin Bailey Date

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Government of Yukon

Acknowledgments

We respectfully acknowledge that the land within this Community Wildfire Protection Plan is in traditional territory of the Kaska Dena people and overlaps with the Interim Protected Lands of the Liard First Nation. We acknowledge with respect the diverse history and culture of the Kaska Dena and Liard First Nation peoples.

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Executive Summary

The Watson Lake 3-Year Community Wildfire Protection Plan (CWPP) is being developed between August 2024 and January 2025 and represents a collaborative effort between Liard First Nation, the Town of Watson Lake, and Government of Yukon to take action to address the threat of wildland fire to the Watson Lake community. The goal is to take immediate actions around vegetation management in the community with the construction of strategic fuelbreaks and continued implementation of FireSmart activities within a 3-year time frame from 2025 to 2028 to reduce the vulnerability of the community to wildland fire risk.

In recognition of the greater integrated land use planning process ongoing within the region, this plan does not wholistically address wildfire hazard, preparedness and mitigation efforts. The integrated land use planning process will provide direction and inform a comprehensive Wildfire Protection Plan that incorporates the interests of all people and lands in the vicinity of Watson Lake. Future development of a CWPP is intended to serve as a planning tool for residents and fire and land managers. It will enable them to assess risks associated with wildland fire, identify mitigation strategies, and make and implement recommendations for reducing those risks.

Watson Lake Community Wildfire Protection Plan

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1 Purpose

Wildfire is an essential natural process in the Yukon's boreal forests. It is a key driver of ecological resilience and both plant and animal species rely on its occurrence. Wildfire also poses a threat to human life, homes, infrastructure and, when at unusually high severity or frequency, the natural environment as well. As human development expands further into natural ecosystems, more communities and industries are at risk of wildfire impacts.

Future development of a comprehensive CWPP will delve deeper into the factors that contribute to the wildfire risk potential within and surrounding the Watson Lake CWPP planning area and describes the values at risk of wildfire impacts within the Area of Interest (AOI).

It will also contextualise the active governance, community, social and cultural aspects of the community and the surrounding environment to identify the wildfire risk potential, and ways to mitigate or reduce the risk. The goal of a CWPP is to examine all aspects of community wildfire planning by structuring strategies based on the seven FireSmart disciplines:

1. Education,
2. Legislation and Planning,
3. Development Considerations,
4. Interagency Cooperation,
5. Cross-training Emergency Planning, and
6. Vegetation Management

The purpose of the 3-Year Community Wildfire Protection Plan (CWPP) is to focus exclusively on the 6th item – Vegetation Management, providing interim measures to immediately reduce wildfire risks to the town of Watson Lake with the inclusion of strategic, landscape level fuelbreaks and continued emphasis on FireSmart treatments.

A fuelbreak is a strip of land on which the forest fuels and ground vegetation has been reduced or modified to reduce the fire's ability to spread rapidly. Landscape level fuelbreaks allow safe and operational spaces for wildfire crews to respond to wildfires.

2 Planning Area

2.1 Planning Area Description

Watson Lake is located in the southeastern corner of the Yukon. It is a key transportation hub, situated at the junction of the Alaska Highway and the Robert Campbell Highway (two key routes into the Yukon). Often called *The Gateway to the Yukon*, Watson Lake is just 14km from where the Alaska Highway crosses the border between the Yukon and British Columbia (BC), and 20km from the Stewart-Cassiar Highway crossing into BC. It is approximately 455km southeast of Yukon's capital, Whitehorse (Figure 1).

Figure1: Watson Lake location in the Yukon

The CWPP planning area encompasses the Watson Lake townsite, extends to the west to include Upper Liard, and extends to the north to include the Watson Lake Airport. The planning area encompasses Liard First Nation Interim Protected Land, along with territorial land. The AOI begins immediately adjacent to private land boundaries and extending to logical barriers to fire spread (ie: existing fireguards, natural features, proposed tactical fuel breaks etc).

2.2 Governance

The AOI of this CWPP is within the traditional territory of the Kaska Dena people (or "Kaska") and partially overlaps Interim Protected Lands of the Liard First Nation. The Liard First Nation operates under a self-governance structure in accordance with Kaska customs and traditional laws. The Liard First Nation Land and Resource Department participates in any land and resource decisions that could affect the Liard First Nations members or traditional territory.

Liard First Nation is one of three Yukon First Nations that has not finalized a land claim agreement under the Umbrella Final Agreement process. Although a land agreement was not established, under the Umbrella Final Agreement the Liard First Nation was allocated "interim protected" Settlement Lands that have been protected from certain third-party interests on behalf of the Liard First Nation, pending the

settlement of a land claim agreement. Additionally, there are a number of federally-administrated land parcels identified as “Land Set Aside” for the use of Liard First Nation.

2.3 Natural Disturbance and Forest Succession

Wildfire has historically been the dominant agent of disturbance of the boreal ecosystems found in and around the AOI.[1] The forest cover in most of the Yukon is a mosaic resulting from successive forest fires. These wildfire events can be characterized as relatively infrequent but burn with a high fire intensity and can be stand replacing when they occur.

Boreal forest relies on fire to develop and maintain a healthy ecosystem. As many of the pine stands within and around the community are over-mature, fire will play an inevitable role in the natural lifecycle of these forests. Therefore, the hazard and risk of fire to Watson Lake area is in part attributed to the existing fuels, their maturity, and to their high concentration around the community.

3 Wildfire Summary

3.1 Drivers of a wildfire

There are three interacting elements that drive a wildfire, commonly referred to as the ‘fire triangle’ (Figure 2): fuel, weather and topography. These three factors determine how a wildfire behaves – how fast is spreads and how intensely it burns.

Fuel refers to any flammable material including vegetation (leaves, bark, trees, duff) that are burned by the fire. It can also include man-made fuels, such as buildings. The fuel type, dryness, size and arrangement can all influence the speed, size and severity of a wildfire. Fuel is the only component of a wildfire that we can control, and also the most significant (no fuel, no fire). Fuel treatment plans aim at changing the arrangement, size and even type of fuel in an area around an asset or a community to change how a fire behaves. Reducing fire behaviour to allow wildfire response crews to control or extinguish a fire is a critical objective of fuel treatment plans.

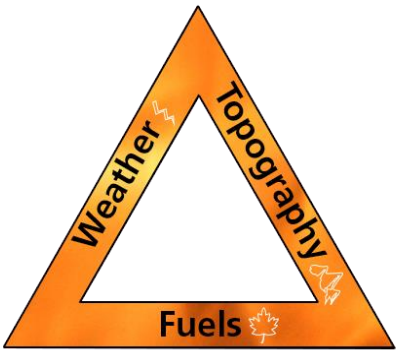

Figure 2. The fire triangle – interacting components that drive a wildfire.

Topography describes land shape, elevation above sea level, steepness and the direction of a slope (e.g. south facing). Topography also includes land features such as canyons and valleys. All of these features can help or slow wildfire spread. Elevation influences weather conditions (like air temperature). Slope aspect influences vegetation growth and dryness (south facing slopes have more heat from the sun and so are drier). Slope also influences how fast a fire moves: faster uphill due to pre-heating of vegetation from rising hot air and flame, and slower downhill. Features such as valleys influence wildfire spread by directing wind flow.

Weather also influences how fast a fire moves and how intensely it burns. It also influences whether an ignition, like a lightning strike, will extinguish or develop into a large fire. Winds at ground level and at higher elevations will drive a fire forwards, enable the spread of embers and supply the fire with oxygen to increase combustion. Further, atmospheric dryness, lack of rain and high air temperature will contribute to the degree and rate of fuels drying, making them more available to burn. At extreme weather conditions, weather becomes a more significant factor in fire growth than the type of fuel.

3.2 Wildfire Regime

While some of the First Nations people in the Yukon used fire as a land management tool, the history of cultural burning practices in the Watson Lake area is currently unknown.

Important weather variables to consider for wildfire threat are wind speed and direction. Wind is a key driver of fire behaviour and the path in which the fire spreads. The geographical influence on wind direction around Watson Lake is the transition from mountainous terrain into the more open Liard River. Wind funnels through valleys when in mountainous terrain and then moves in the predominant weather pattern wind direction in open and low elevation terrain.

Wind records can be analysed to show the number of times a wind direction was recorded at the weather station to gain an understanding of which wind directions are most frequent. Wind records were formatted into a wind rose (Figure 3). These diagrams are informative to determine the most frequent wind direction and strength. Figure 3 shows that Watson Lake weather station predominantly recorded winds from the west, east and south-east. The colour of the wind rose displays the frequency of wind speeds recorded in each direction.

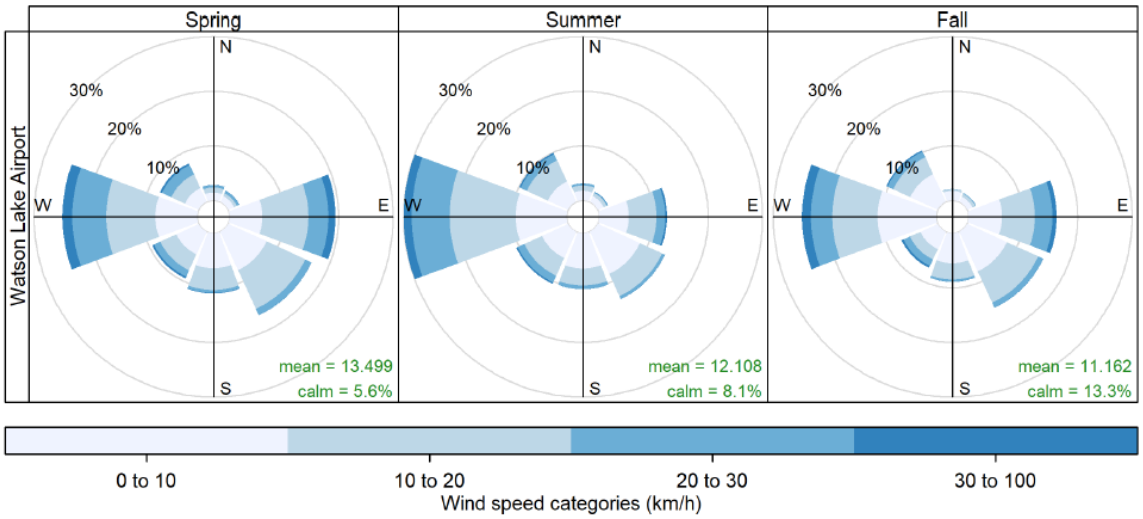

Figure 3. Wind rose using Watson Lake weather station historic data for each season.

3.3 Wildfire History

The area around Watson Lake in the southeast Yukon has a significant history of wildfires. Fires spread along lower elevation forests and in valleys. This is evident in the mapped fire perimeters, which show direction of fire spread (Figure 4) in a southerly direction along Robert Campbell Highway to the north of Watson Lake and in an easterly direction on the low elevation areas to the east and away from Watson Lake.

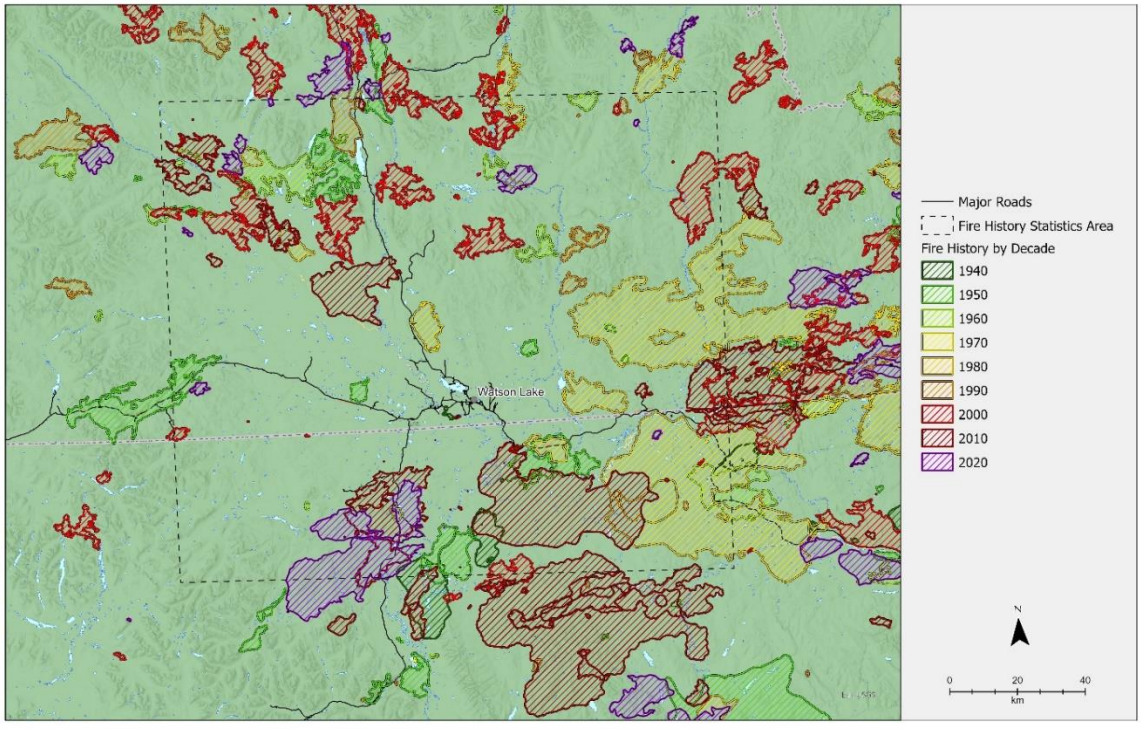

Figure 4. Wildfire history around Watson Lake, YT. Source: GeoYukon.

Analysis of wildfire history within the statistics area in Figure 4 and Table 1 show that 132 wildfires have been recorded in the area since 1940. The majority of wildfires reached a reasonable size with a few quite large fires in the Liard Plain area, Table 1.

Table 1. Wildfire History Summary (1946 – 2024) near Watson Lake – Fire History Statistics Area is defined in Figure 4.

Number of fires	Total Area burned	Maximum Fire Size
132	1,327,823 ha	166,698 ha

Source: GeoYukon and British Columbia Geographic Warehouse

4 Types of Vegetation Management

4.1 Fuel Abatement

Fuel abatement is a term to describe larger-scale landscape level vegetation management treatments that extend past the wildland urban interface zone and into the landscape zone. Fuel abatement projects tend to be larger in size than FireSmart projects with a greater amount of removal of forest fuels.

Larger fuel treatments have the ability to slow or completely stop oncoming wildfire by removing and/or reducing surface, ladder and crown fuels will achieve goals to reduce the rate of spread, fire intensity and reduce the likelihood of a transition from a manageable surface fire to an aggressive crown fire.

Larger fuel treatments also provide strategic vantage points for firefighting operations. The treated areas enable safer access and egress (i.e. escape) for firefighters to suppress a wildfire. They also enable a strategic location for attack strategies such as back burning.

The following describes the fuel abatement tools proposed under this plan:
A **fire guard** is an area where all vegetation and organic matter is removed down to mineral soil. The purpose to remove combustible materials on the surface, create an access for firefighters to suppress wildfire and provide an egress route for firefighters and members of the public in the event of advancing wildfire.

A **fuelbreak** is a strip of land on which the forest fuels and ground vegetation has been reduced or modified to reduce the fire's ability to spread rapidly. A fuel break may include:

- Thinning the forest through hand falling and/or mechanical cutting. A shelterwood thinning treatment includes an increased spacing (5-8 metres) between stems of trees in order to reduce the potential for sustained crown fire and reduce the spread rate of fires that travel through the forest canopy.

- Variable retention includes clearing to create a landscape-scale fragmentation in forest fuels through removal of all coniferous stems and retention of healthy deciduous stems.

- Mastication and mulching using machinery to remove and/or reduce surface fuels to reduce the potential for fire to reach critical surface intensity as well as spread to a crown fire.

Proposed areas are positioned to take advantage of existing terrain features and infrastructure as well as linear breaks in the fuels and access such as trails and roads. The areas were also selected based on the most likely direction of an encroaching wildfire based on weather, winds, forest fuels, fire history and ignitions and ability to protect the areas of interest and values at risk.

4.2 Prescribed Fire

Prescribed fire involves the introduction of a planned and controlled fire to an area under ideal (i.e. safe) conditions. Prescribed fire offers an efficient and cost-effective method following fuel abatement to reduce slash loading and thick duff layers (i.e. surface fuels). It may also be used as a removal treatment in a

mixed wood to eliminate more flammable conifers and stimulate deciduous growth (i.e. forest fuels). Individual prescribed fire prescriptions will be developed based on site requirements and include an operational plan that considers safety and weather. Prescribed fire is also a strong tool to enrich and prepare the ground for stand conversion.

4.3 Stand Conversion

Stand conversion has also been supported by research as a strategy to reduce the risk of a catastrophic wildfire. Stand conversion is defined as the removal of flammable species (e.g. coniferous) and replacing with less flammable species (e.g. deciduous), whether through tree planting or allowing deciduous to regenerate naturally.

Native deciduous trees (aspen, poplar, or birch) may be damaged from fire but seldom contribute as a fuel to the wildfire unless under extreme fire conditions. This is due to their inner moisture content (trunks and thick branches) as well as the green leaves retain much more moisture than pine/spruce needles. Additionally, naturally there is very rarely any 'ladder fuels' (i.e. branches/leaves) on the lower two thirds of a mature native deciduous species. 'Ladder fuels' contribute to fire severity by allowing a fire on the surface to travel to the crown of the tree. A fire in the crown of the trees spreads at a much more accelerated rate and higher intensity and is therefore more difficult to suppress.

Therefore, stand conversion from spruce/pine to native deciduous species has the benefits of:

- Having the potential to slow or completely stop a wildfire in certain conditions.
- Buying wildland firefighters more time to conduct a response to an approaching wildfire
- Increasing safety for the wildland firefighters initiating a response by reducing the intensity of approaching wildfire

Wildland Fire Management may assist in stand conversion strategies through planting native fire resilient deciduous species.

4.4 FireSmart

FireSmart™ Canada is a national program that helps Canadians increase neighborhood resilience to wildfire and minimize its negative impacts. It was founded over 20 years ago to address common concerns about wildfire in the wildland urban interface.

Research investigating recent Wildland Urban Interface (WUI) disasters presents the case that catastrophic loss of homes due to wildfires is often due to structure ignition from ember showers which can ignite fuels surrounding, or in contact with, the structure.[1,2] Once a home or other infrastructure is ignited, the fire can spread through the built environment and quickly overwhelm suppression resources.

[1] An Examination of the Lytton, British Columbia wildland-urban fire destruction. Summary Report to the British Columbia FireSmart Committee. Cohen JD, Westhaver A. 2022. Available: https://firesmartbc.ca/wp-content/uploads/2022/05/An-examination-of-the-Lytton-BC-wildland-urban-fire-destruction.pdf

[2] Housing arrangement and vegetation factors associated with single-family home survival in the 2018 Camp Fire, California. fire ecol 17, 25. Knapp, E.E., Valachovic, Y.S., Quarles, S.L. et al. 2021. Available: https://doi.org/10.1186/s42408-021-00117-0

Figure 5. FireSmart Home Ignition Zones (Source: FireSmart.ca)

The best strategy to prevent loss of values is to mitigate the hazard on the property. The Home Ignition Zone (HIZ) is the area within 30m of your home and structures. Is has three areas (Figure 5): Immediate Zone, Intermediate Zone and Extended Zone.

Homeowners can minimise home and property vulnerability to wildfire by addressing threats in each of these zones. Start with the most vulnerable zone, the Immediate Zone, and work outwards.

For information on each Home Ignition Zone, training, tips and checklists on how to protect your home and further resources such as project funding opportunities, see FireSmart Canada and FireSmart Yukon websites.[3]

Aside from encouraging residents to follow 'FireSmart Homeowner' practices there are other factors that can be planned for and regulated. Some factors that influence the susceptibility of WUI structures, effectiveness of response, and level of public safety during a wildfire include:

- Location of development, including hazardous or vulnerable land uses, in relation to the higher hazard forested vegetation types, steep slopes, and other geographical features that contribute to extreme fire behavior,
- Access to and within the community and circulation/travel patterns,
- Availability and adequacy of water supply,
- Design guidelines and architectural standards,
- Residential addressing and street signage,
- Type of construction materials used to build structures and attachments,
- Lot size and structure density.

[3] FireSmart Canada website: https://firesmartcanada.ca/

5 Plan Implementation

5.1 Strategic Fuelbreaks

The general goal of implementing strategic fuelbreaks through vegetation management is to reduce the potential wildfire intensity and ember exposure to people, infrastructure, structures and other values through manipulation of both the natural and cultivated vegetation that is within or adjacent to a community. A well-planned vegetation management strategy that is coordinated with development, planning, legislation and emergency response wildfire risk reduction objectives can greatly increase fire suppression effectiveness and reduce damage and losses to structure and

The proposed areas in this plan were identified using existing terrain features, infrastructure, and linear breaks in fuel continuity, such as preexisting trails or access roads. It is important to note that the proposed fuel treatments were determined through desktop analysis and were field verified. The goal was to identify general risk areas within the area of interest. Further assessment of the identified polygons by wildland fire personnel is ongoing. Therefore, the final areas may be subject to adjustments following on-site visits by wildland fire professionals. The volume of merchantable timber removed from each treatment unit will be determined as part of ongoing reconnaissance conducted by Wildland Fire Management Branch.

When planning and prioritizing fuel management units, three parameters were considered:

1. Prevailing wind and fire history patterns.
2. Proximity to and density of Values at Risk.
3. Fuel type and forest stand structure.
4. Access and egress for emergency response personnel.
5. Areas with strategic and tactical importance for wildfire suppression.

In addition to the finalized areas for treatment determined by wildland fire professionals, recommendations will be made to utilize one or a combination of the following methods to reduce wildfire hazard: Fuel Abatement, Prescribed Fire and Stand Conversion.

Goal: Proactively manage vegetation, or forest fuels, at multiple scales to reduce the potential wildfire intensity and ember exposure to people, infrastructure, and other values.

Context: It is important to note that no fuel abatement treatment will stop all wildland fires. The magnitude and intensity of a wildland fire (especially in coniferous dominated forests) has the potential to overwhelm treatments such as the large linear fuelbreaks proposed in this plan. In addition, the effectiveness of a fuel abatement treatment to protect the Watson Lake community will be compromised if residents have not managed the fuels around their homes and infrastructure by adhering to the FireSmart principles.

Actions:

- Build strategic fuelbreaks as part of the vegetation management strategy identified in treatment units in the Watson Lake area of interest identified in Figures 5-8 below.
- Treatment areas identified on Commissioners land will be competitively tendered via Qualified Source List established bi-annually by Wildland Fire Management. The First Nation Procurement Policy will apply to competitive tenders.
- Identify new areas for treatment as part of future planning beyond the 3-Year CWPP, in conjunction with the Town of Watson Lake, Government of Yukon and Liard First Nation. The Integrated Land Use Planning process will guide and inform future fuel abatement actions.
- Treatment areas will be maintained and monitored in perpetuity as natural infrastructure, resilient to wildland fire. Ongoing maintenance actions may involve prescribed fire, planting deciduous species such as aspen, poplar, or birch, brushing or mulching of conifer regeneration.

5.1.1 Proposed Strategic Fuelbreaks for the Watson Lake 3-Year CWPP

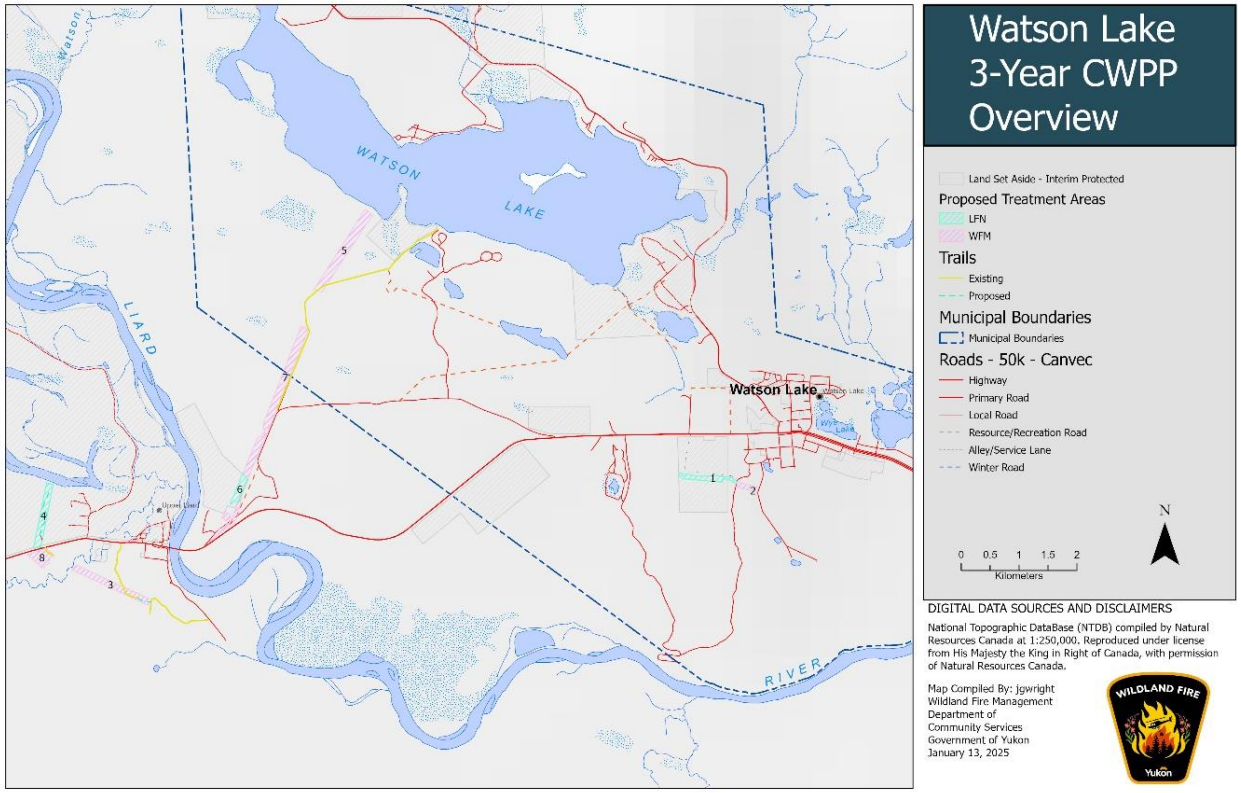

Figure 5. Proposed fuel management treatment areas.

Table 2: Planned fuel management tactical fuelbreaks within and around Watson Lake. NOTE: these are draft areas of interest and may be altered or reduced in scope. Full removal of vegetation is not planned for each treatment unit.

ID	Treatment Block Name	Treatment Type	Area (Ha)	Average Volume/Ha (m3)	Total Vol (m3/ha)	Land
1	Hardy Road Fuelbreak	Clear	7.5	34.5	259.0	Land Set Aside / Interim Protected
2	Hardy Lagoon Doubling	Clear	3.3	133.8	439.9	Commissioner
3	Watson Lake South Fuelbreak	Clear	15.9	145.0	2301.3	Commissioner
4	Upper Liard North Fuelbreak	Clear	13.7	140.7	1932.2	Land Set Aside / Interim Protected
5	Watson Lake North Deflection Line	Clear	23.9	139.6	3339.1	Commissioner
6	Old Highway - LFN	Clear	5.9	167.6	987.5	Land Set Aside / Interim Protected
7	Old Highway	Clear	39.1	176.8	6914.6	Commissioner
8	Albert Creek Guard	Thin (25% stem removal) Clear/widen Highway RoW 25m	7.9	221.3	1741.9*	Commissioner
		TOTALS	117.2		17,915	

*Note – the full volume of this block will not be harvested as it is slated for a thinning treatment, and the Highway Right of Way will be cleared an additional 25m.

The treatment areas identified were assessed for forest stand information and volumes by a Registered Professional Forester in the fall of 2024. The data is extrapolated for best fit or estimate where treatment areas have been adjusted due to logistical or other constraints. Volumes therefore are an estimate based on quantitative data collected.

Access:

There are existing access points in place for all the treatment areas. Access may require upgrading to accommodate fuelbreak construction activities which will involve heavy equipment and logging trucks. New skid trails or class 2 Forest Resource Roads will be required in select treatment areas. Definitive access will be assessed and submitted as part of the application to YESAB.

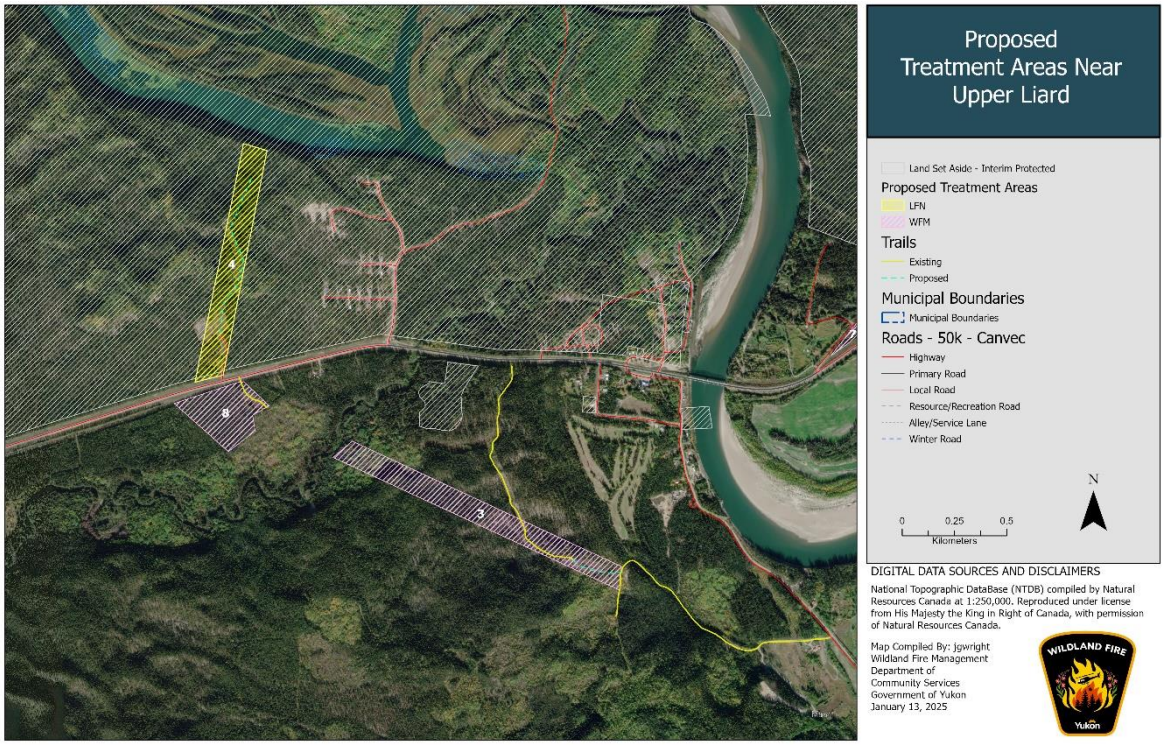

Figure 6. Proposed fuel management treatment areas near Upper Liard

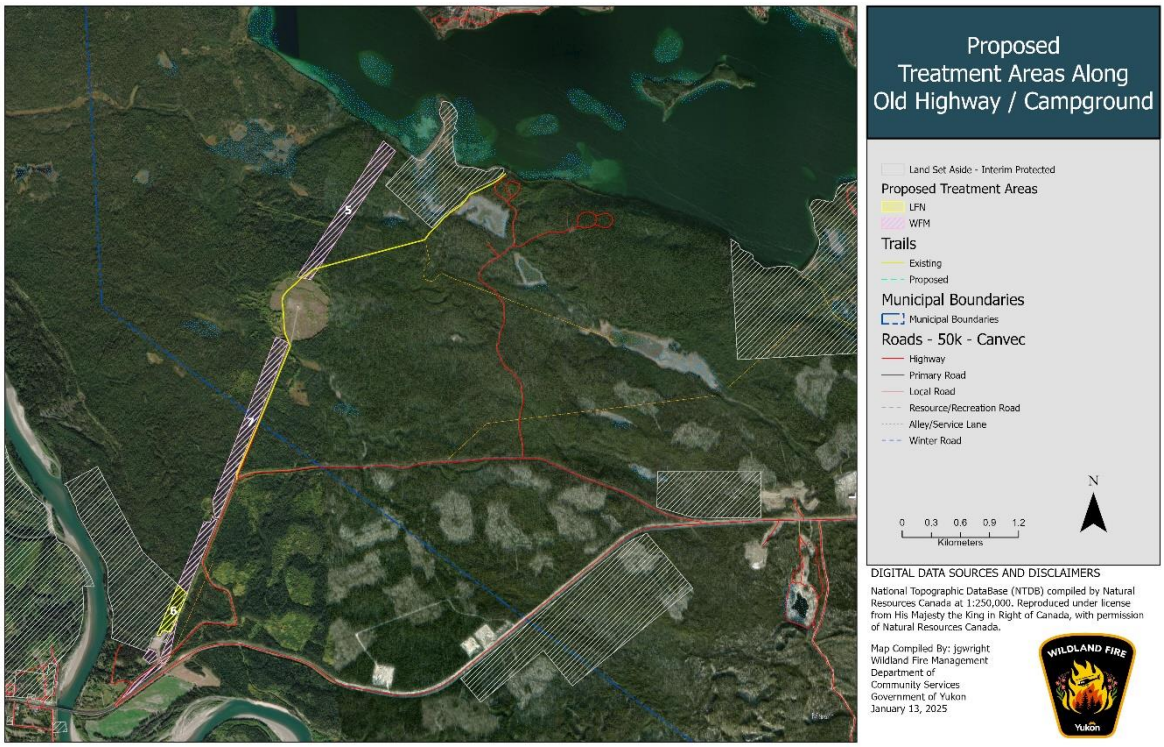

Figure 7. Proposed fuel management treatment areas along the Old Highway / Campground

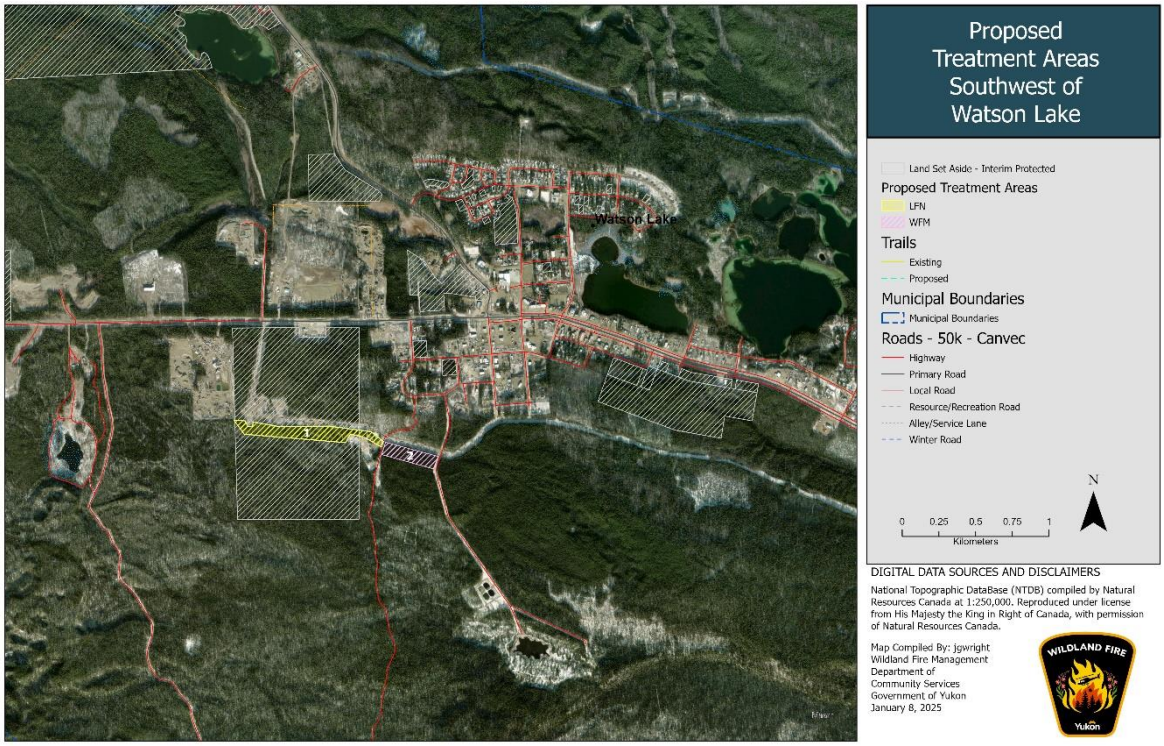

Figure 8. Proposed fuel management treatment areas southwest of Watson Lake

5.2 FireSmart

Watson Lake has an established FireSmart program through which volatile forest patches in the community are being abated. This is an ongoing process being addressed by the Regional Fire Protection Manager working collaboratively with Watson Lake stakeholders.

Goal: Proactively manage vegetation in the wildland urban interface to reduce wildfire intensity and ember transport in and around town dwellings and infrastructure.

Context: FireSmart is an important part of any fuel abatement program. Reducing the vulnerability of built structures to ignition will ultimately lead to increased community resiliency in the event of a wildland fire.

Actions:

- Continue efforts to identify areas that require FireSmart treatment in the Watson Lake area of interest.
- Identify and act on opportunities to further FireSmart education and training of local FireSmart Ambassadors and Home Ignition Zone Specialists.
- Work with Wildland Fire Management Branch to identify funding opportunities for the Town of Watson Lake and Liard First Nation to implement FireSmart treatments.

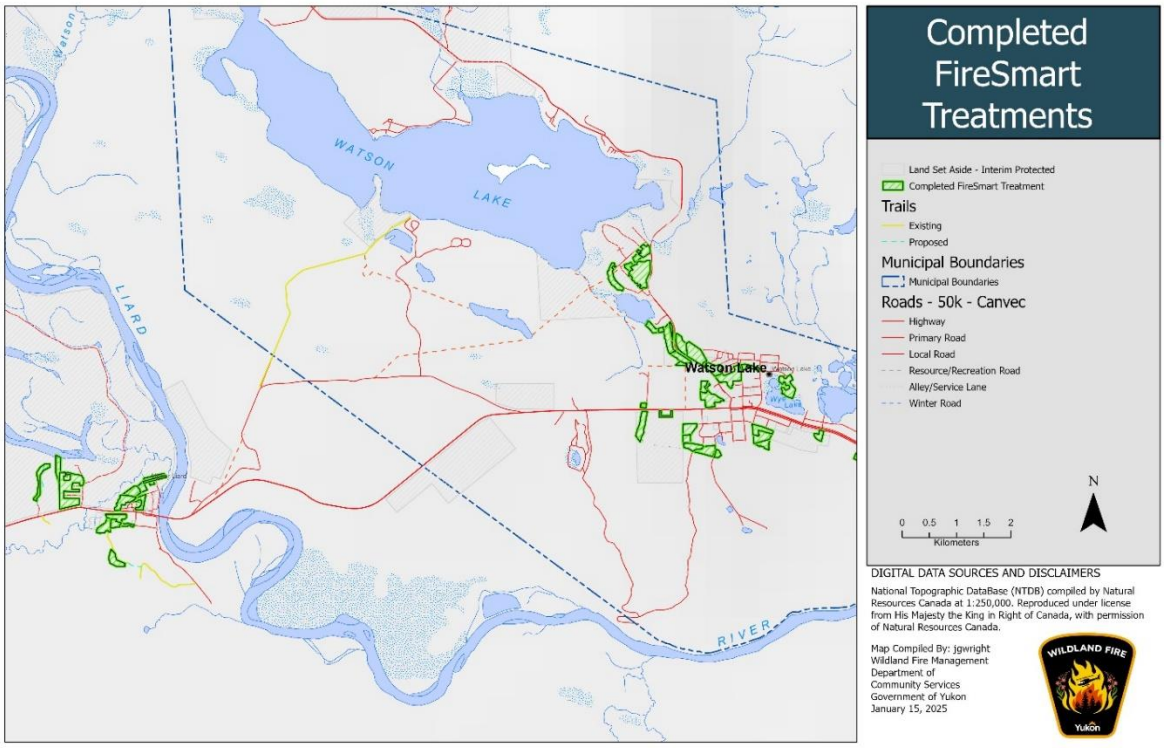

Figure 9. Completed and planned FireSmart areas in Watson Lake area of interest

5.3 Next Steps

Once the Watson Lake 3-Year CWPP is approved by Government of Yukon, the Town of Watson Lake and Liard First Nation, the fuelbreak areas identified for treatment will require evaluation from the Yukon Environmental and Socio-Economic Board (YESAB).

The triggers for assessment are as follows:

- The project is located in the Yukon;
- The project involves activities listed in Schedule 1 of the YESAA Regulations:
    - Part 13 – Miscellaneous
    - Item 11 – On public land moving of earth or clearing land using a stationary power-driven machine other than a power saw.
    - Item 12 – On public land, moving earth or clearing land using a self-propelled power-driven machine
    - Item 13 – On public land, levelling, grading, clearing, or snow ploughing of a trail, right-of-way or road
    - Item 18 – On public land, cutting or removal of more than 1000m3 of standing or fallen trees
    - Item 19 – Starting an open fire to burn forest debris that has been piled or gathered using machinery.

Reconnaissance activities of the areas identified for timber values, heritage features and environmentally sensitive areas are currently initiated and will be prepared for the submission to YESAB. WFM will engage with the Department of Environment, as well as the Federal Government prior to submission to YESAB to determine project requirements and to assist with determining project effects. Citizens of Watson Lake as well as community groups and stakeholders will be engaged prior to the final 3-Year CWPP being submitted to YESAB. Authorizations in the form of permits from various governing bodies will be required.

At the end of the 3-year period, this plan will be reviewed and an assessment of the progress achieved will be made. Wildland Fire Management will continue to provide relevant information in support of the integrated land use planning process, in order to develop a wholistic CWPP for the Watson Lake area in the future.