DRAFT Kluane Lake (Lhù'ààn Mân) Community Wildfire Protection Plan

(Burwash Landing, Destruction Bay, Silver City & Cultus Bay)

Yukon

Adoption of the Kluane Lake (Lhù'ààn Mân) Community Wildfire Protection Plan

The Kluane Lake (Lhù'ààn Mân) CWPP represents a collaborative effort between Kluane First Nation, Champagne and Aishihik First Nations and Government of Yukon, Wildland Fire Management Branch to take action to address the threat of wildland fire to the communities of Burwash Landing, Destruction Bay, Silver City and Cultus Bay that border Kluane Lake (Lhù'ààn Mân). As directed by this plan wildfire prevention and mitigation activities will be completed on public lands and Settlement Lands.

_____ _____

{Name} Date
{Title}
Kluane First Nation

_____ _____

{Name} Date
{Title}
Champagne and Aishihik First Nations

_____ _____

Devin Bailey Date
Director, Wildland Fire Management Branch
Government of Yukon

Contents

Glossary 4
1. Introduction: 4
2. Community Wildfire Protection Plan Area: 5
3. Relevant Plans: 5
4. Wildfire Summary: 6
4.1. Fire Suppression: 6
4.2. Fuel Types: 6
4.3. Fire History: 8
4.4. Prevailing Winds: 9
4.5. Human-Caused Ignitions: 10
4.6. Natural Ignitions: 10
4.7. Spruce Bark Beetle: 10
4.8. Climate Change: 11
5. Risk Management: 12
6. Fuel Abatement: 13
6.1. Fuels Treatment: 13
6.1.1. Selective thinning AKA “FireSmarting”: 14
6.1.2. Shelterwood: 14
6.1.3. Variable Retention: 16
6.2. Fuel Conversion: 16
6.3. Fire Guard: 17
6.4. Prescribed/Controlled Fire: 18
6.5. Strategic Timber Harvesting: 19
7. Action Plan: 20
7.1. Burwash Landing & Copper Joe Subdivision: 20
7.2. Destruction Bay: 22
7.3. Silver City: 24
7.4. Cultus Bay: 26
7.5. Congdon Creek Campground: 26
7.6. Remote and Rural Properties & Structures: 27
7.7. Community Engagement: 28
8. Final Recommendations 29

Glossary

Back Burn: setting controlled fires to eliminate the fuels in the path of an oncoming wildfire.
Crown Fire: fires that burn forest canopy fuels, which include live and dead foliage/ branches, lichens in trees, and tall shrubs that lie well above the surface fuels. They are usually ignited by a surface fire.
Even-aged: forest stands where the range of tree ages within a stand do not vary by more than 20%
Fireline: the leading edge of a wildfire.
Fragmentation: the breaking of large, contiguous forested areas into smaller forest patches.
Fuels: combustible material including vegetation such as grass, leaves, ground litter, plants, shrubs, and trees that feed a wildfire.
Fuel Abatement: techniques to manage fire risk by reducing and/or removing the fuels available to burn or changing the type of fuels.
Fuel Treatment: selective thinning of trees or full removal of trees which serves to reduce the fire intensity and rate of spread.
Ground Fire: burn in decayed roots below ground and in the duff layer (i.e. compacted dead plant materials such as leaves, bark, needles and twigs). Ground fires are sustained by glowing combustion (without flames) and can go undetected for a long time.
Katabatic Winds: a drainage wind that carries high-density air downward using the force of gravity. High density cold air can develop over ice sheets, such as those in the Kluane Icefields.
Ladder Fuels: live or dead vegetation that allows a fire to climb up from the surface or forest floor into the tree canopy, potentially initiating a crown fire.
Merchantable Timber: timber usable as sawlogs or fuelwood defined by a diameter of greater than 12.5 centimetres at breast height (1.3 metres above the ground).
Natural Succession: the process in which tree species in a stand or community change over time
Retention: an approach to forest management that leaves small sections of forest or individual trees in a stand intact.
Spot Fire: A new fire that occurs when embers land on the unburned side of a fireline.
Stand: a contiguous area that contains a number of trees that are relatively homogeneous or have a common set of characteristics.
Stem: An individual tree.
Suppression: activities involved in controlling and extinguishing fires.
Surface Fire: fires that burn loose needles, moss, lichen, herbaceous vegetation, shrubs, small trees, and saplings that are at or near the surface of the ground, mostly by flaming combustion.
Volatile: Highly flammable.
Windthrow: trees that have been uprooted or knocked over by wind.

1. Introduction:

The purpose of the Kluane Lake (Lhù'ààn Mân) Community Wildfire Protection Plan (CWPP) is to serve as a strategic tool to guide wildfire management planning and preparedness to protect the communities of Burwash Landing, Destruction Bay, Silver City and Cultus Bay from potential oncoming wildfire.

The target audience for this document is wildfire and land managers as well as residents of the Kluane Lake (Lhù'àän Mân) area. The plan provides information on the local risk of wildland fire to understand the importance of developing a strategy for wildfire risk management. Additionally, the document shall be used as an action plan for residents and land managers to partner on strategies to reduce those risks.

The core objectives of the CWPP are to:

1. Provide a contextual background to the importance of fuels treatments;
2. Identify roles and collaboration on reducing risk of wildfire impacts to communities;
3. Propose actionable and achievable fuels treatments to support community safety through hazard and wildfire fuel reduction;
4. Introduce the who, what, where, when, and why for proposed fuels treatments;
5. Introduce measures that local residents can take to reduce risk;

2. Community Wildfire Protection Plan Area: The CWPP applies to the communities and assets surrounding Kluane Lake (Lhù'àän Mân) including Burwash Landing, Destruction Bay, Silver City and Cultus Bay and Congdon Creek campground. Each community represents a unique context in terms of hazards that influence potential wildfire and appropriate tools to reduce risk. Section 7: Action Plan describes these factors in detail.

3. Relevant Plans: There are several plans that are relevant to the Kluane Lake (Lhù'àän Mân) Community Wildfire Protection Plan. All information provided in the CWPP is intended to support and be implemented in conjunction with the following plans:

- **Kluane National Park and Reserve Wildfire Management Plan (2023):** summarizes fire management planning for Kluane National Park and Reserve (KNPR) adjacent to the CWPP area. The plan can be made available by request from Parks Canada Yukon.
- **Kluane First Nation Forest Resources Management Plan (2022):** Response to carry out sustainable forest management that balances the environmental, social, cultural and economic values that forests provide. The document can be made available by contacting Kluane First Nation's Lands, Resources, and Heritage Department.
- **Kluane Lake East Timber Harvest Plan (2013):** identifies standing dead fuelwood harvesting opportunities on the east shore of Kluane Lake (Lhù'àän Mân) where the majority of the spruce trees have been killed by the spruce bark beetle.
- **Kluane First Nation Community Land Use Plan (2012):** developed to direct and guide decision making on different types of development on KFN settlement land. The CLUP includes some zones where forest harvesting is an allowable activity.
- **Silver City Community Fuel Abatement Plan (2008):** provides an implementation plan to reduce fire risk and facilitate fuelwood harvesting with the purpose of removing and utilizing fuels for a wildfire to protect the community of Silver City

- **Champagne and Aishihik Traditional Territory Strategic Forest Management Plan:** This plan provides direction for sustainable forest management in the Champagne and Aishihik Traditional Territory. It includes a framework and practical guidelines for forest managers and planners and only applies to the Silver City area for the purposes of the CWPP.
- **Integrated Landscape Plan for the Champagne and Aishihik Traditional Territory:** This integrated landscape plan provides management priorities and guidelines for the planning of timber harvesting in the Champagne and Aishihik First Nations Traditional Territory. This plan guides the implementation of the goals of the Champagne and Aishihik First Nations Traditional Territory Strategic Forest Management Plan and only applies to the Silver City area for the purposes of the CWPP.

4. Wildfire Summary: This section of the CWPP provides essential information to understand the local context for wildfire hazard and why action for risk reduction is necessary. This includes a summary of the fire suppression, fuel types, fire history and common causes for ignition and spread of wildfire. This is an overview for the general planning area and further details of factors affecting the hazard for each community are identified in Section 7: Action Plan.

4.1. Fire Suppression:

As has historically been the case across Canada, common practice in the past has been to suppress all wildfires in the region. As a result of suppression, the forest within the CWPP area hosts even-aged mature white spruce trees that are susceptible to extreme wildfire behaviour. It is now widely recognized that wildfire creates fragmentation across the landscape that generally lowers the risk of wildfire by lowering the overall intensity when fires approach previously burnt area.

The even-aged, purely spruce forests of the CWPP area provide continuous forest fuels that are at risk of carrying an intense wildfire with minimal fragmentation to stop or slow its spread. Because the boreal forest type of the CWPP area supports intense crown fires, this can be hazardous when burning close to communities.

4.2. Fuel Types:

The Canadian Forest Fire Behaviour Prediction (FBP) System was developed by the Canadian Forest Service for the purposes of classification of forest types and predicting wildfire behaviour and spread. The FBP System has developed fuel type descriptions which have become a national standard for understanding forest types in the context of their fire behaviour.

The white spruce forests of the planning area are most associated with the FBP system's C2-Boreal Spruce type. C2-Boreal Spruce is very likely to support the conditions for intense crown fires. Figure 3 maps the FBP fuel types in the CWPP area and shows C2-Boreal Spruce as prevalent around all communities and assets. It is noteworthy that there are less C2-Boreal Spruce fuels around Burwash Landing then mapped as this does not account for the change in fuel type in the area burned in 1999. As a result, there is less volatile FBP fuel type than shown surrounding Burwash Landing. Figure 3 also shows the location of this fire.

Figure 1: Volatile C2-Boreal Spruce (pure, white spruce forest) FBP fuel type and potential wildfire behaviour.

Figure 2: A boreal mixed wood FBP fuel type mixed with spruce and trembling aspen.

The most prevalent fuel type in the CWPP area is M2 – Boreal Mixwood Green – 75% Conifer; which is characterized as having 75% or greater coniferous tree species (i.e. white spruce) with deciduous species like trembling aspen and Balsam poplar mixed-in. See Figure 2. Deciduous species are less flammable due to higher moisture content in the trunk, branches and leaves; therefore, this fuel type may be less volatile than pure white spruce stands (C2-Boreal Spruce) but still has a high percentage of this flammable coniferous species.

4.3. Fire History:

From 1946 to 2023 there were seventy-two wildfire starts in the CWPP area. Figure 2 shows the most significant fires (i.e. wildfires greater than 200 hectares in area) in the CWPP area. There is a very low number of historic wildfires in the region compared to other regions of the Yukon.

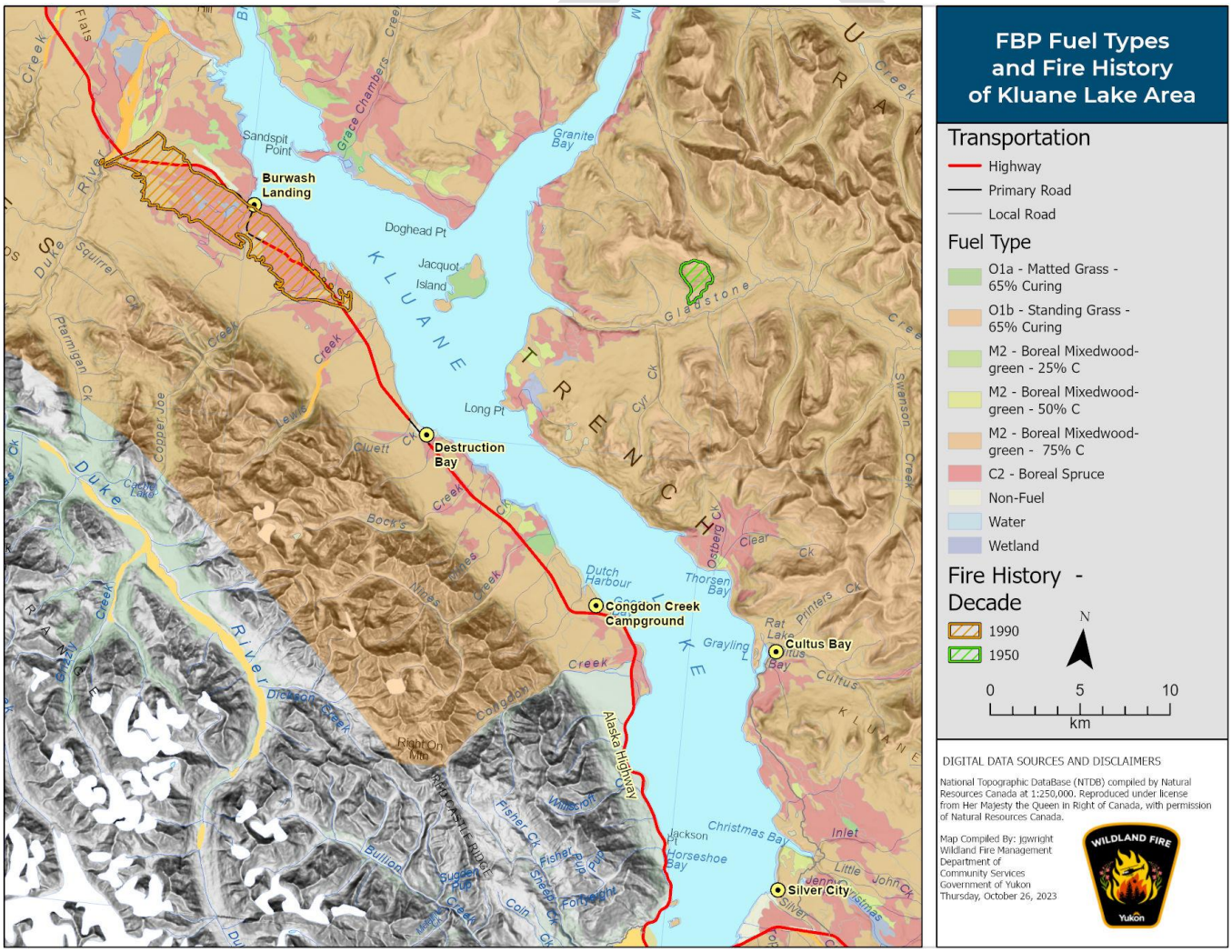

Figure 3: FBP Fuel Types and Fire History of Kluane Lake (Lhù'àän Mân) Area

A key fire to note is the June 1999 fire in Burwash Landing that burned 3,098 hectares and five homes. The fire originated from burning garbage in the local dump 7.5 kilometers south of Burwash Landing. Garbage burning is no longer practiced in this location. A positive result of the 1999 fire adjacent to Burwash Landing is that it has lowered the likelihood of fire risk by removing the highly flammable fuels and causing fragmentation on the landscape. A fire could still occur in this area but is likely to be significantly lower intensity.

Please note, due to the age of the data it is possible that FBP types for this area are not entirely accurate.

4.4. Prevailing Winds:

A significant factor in the wildfire risk to communities in the CWPP area is the direction and strength of prevailing winds. Strong wind events have a considerable influence on wildfire spread patterns and increase intensity.

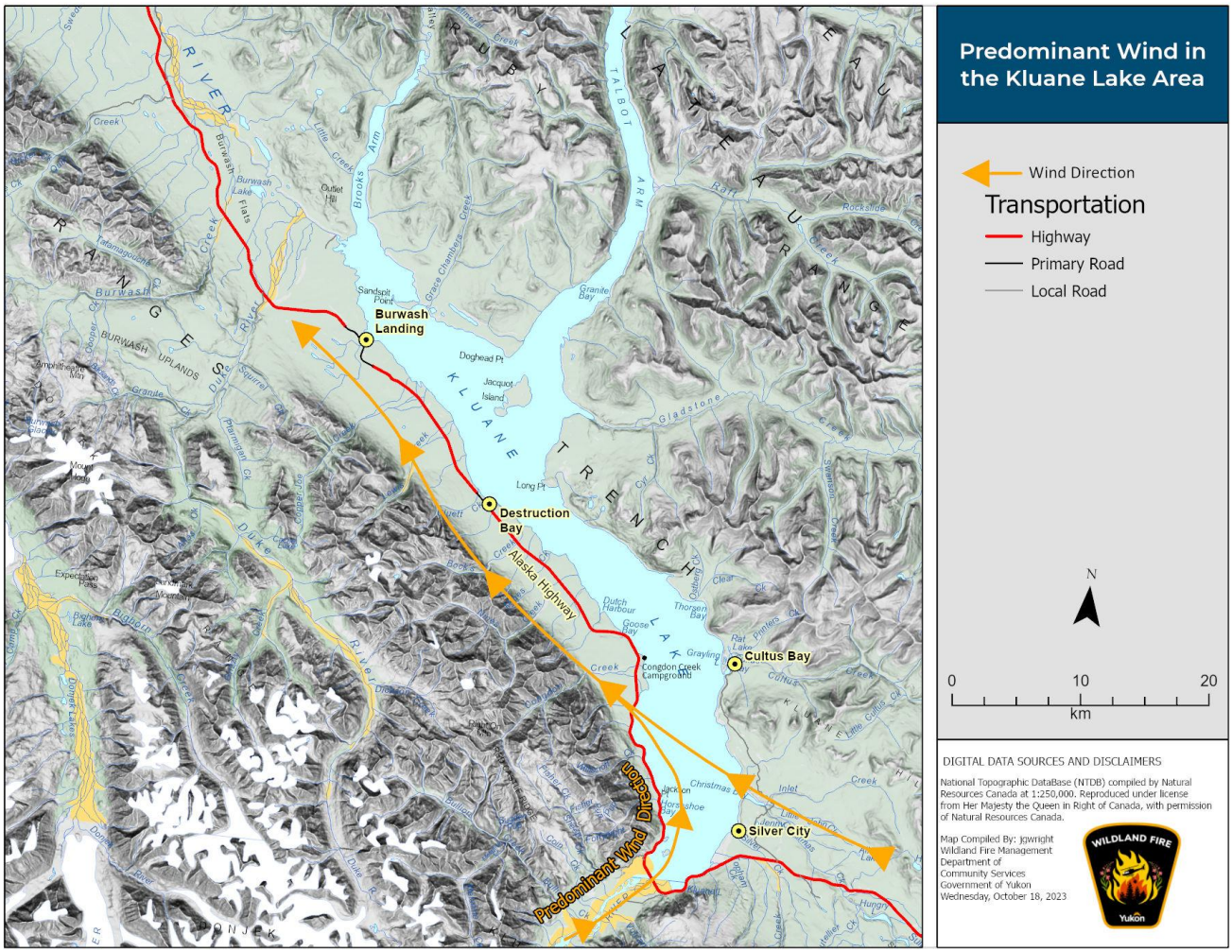

Figure 4: Predominant Wind in the CWPP Area

Wind patterns in the area are generated by the nearby icefields and extreme topography. Figure 4 represents the prevailing wind directions. Winds generally form from the Slims River (Ä'äy Chù) Valley at the southern end of Kluane Lake (Lhù'àän Mân) and directs a southwesterly wind towards Burwash Landing and Destruction Bay. Winds from Ä'äy Chù are typically generated in the Kluane Icefields. Glacial and katabatic winds can be the cause of strong windstorms. Silver City and Cultus Bay receive strong winds from Ä'äy Chù as well as from the valley to the southeast.

4.5. Human-Caused Ignitions:

Of seventy-two wildfire starts in the CWPP area, 64 were the result of human-caused ignition. This includes cigarette butts, campfires, burning brush piles and garbage, etc. On days of high to extreme fire danger everyday activities like welding, chainsaw use and operating heavy equipment can generate a spark that ignites a wildfire. Although it is rare, large winter burn piles can burn as a ground fire and surface months later in warmer weather, typically called holdover fires.

4.6. Natural Ignitions:

Across the Yukon Territory, lightning strikes are a significant natural ignition for wildfires; however, the shadow effect of the St Elias Mountains has reduced the incidence of lightning in the Kluane Lake (Lhù'àän Mân) area relative to the Yukon average. As a result, only one fire out of seventy-two in the area have been ignited due to lightning. The remaining seven fires that are not human-caused or lightning caused are listed as miscellaneous.

Despite the low ignitions due to lightning, a review of data collected by the Canadian Lightning Detection Network over the last two decades show a 47% percent increase in the number of cloud to ground strikes from 2011 to 2021 in the Kluane Lake (Lhù'àän Mân) area. As a result, lightning ignitions may become more prevalent, particularly on hot, dry weather days.

4.7. Spruce Bark Beetle:

The spruce bark beetle is a naturally occurring species in the area; however, in 2004 an outbreak peaked resulting is mortality of 400,000 hectares of white spruce forest and over 80% of forests in Kluane National Park and Reserve. Figure 5 represents the spruce bark beetle extent in the planning area.

Beetle-killed trees ignite more readily and intensely on account of the lower moisture content. This results in unpredictable and extreme fire behaviour. Even under moderate conditions, crown fires in beetle-killed forest become more common as has been documented in Alaska and southwest Yukon.

Heavy windthrow has been observed adjacent to Kluane Lake (Lhù'àän Mân) due to decaying beetle-killed spruce. Windthrow can contribute to wildfire hazard because as trees fall onto the ground or get 'hung up' on nearby trees they create a ladder fuel that allow a low intensity fire on the surface to spread into a high intensity crown fire.

4.8. Climate Change:

Warming temperatures have been predicted to increase twice as fast in the arctic and sub-arctic compared to southern latitudes. The impact of a changing climate will not only include an increase in temperatures but also changes in rainfall and snowfall. An increase in precipitation does not necessarily equate to a reduced fire hazard. Wetter conditions lead to more growth in vegetation which in turn provides more fuel for potential fires.

Change in climate is expected to result in an increase in extreme weather events and natural disturbance events such as pest and disease outbreaks and intense and more frequent fires. The spruce bark beetle outbreak is partially attributed to a warming climate as the beetle larvae do not experience cold enough winters to kill them as they were historically. Pest and disease outbreaks, like the spruce bark beetle, contribute to the availability of dry fuels and the potential for wildfire spread.

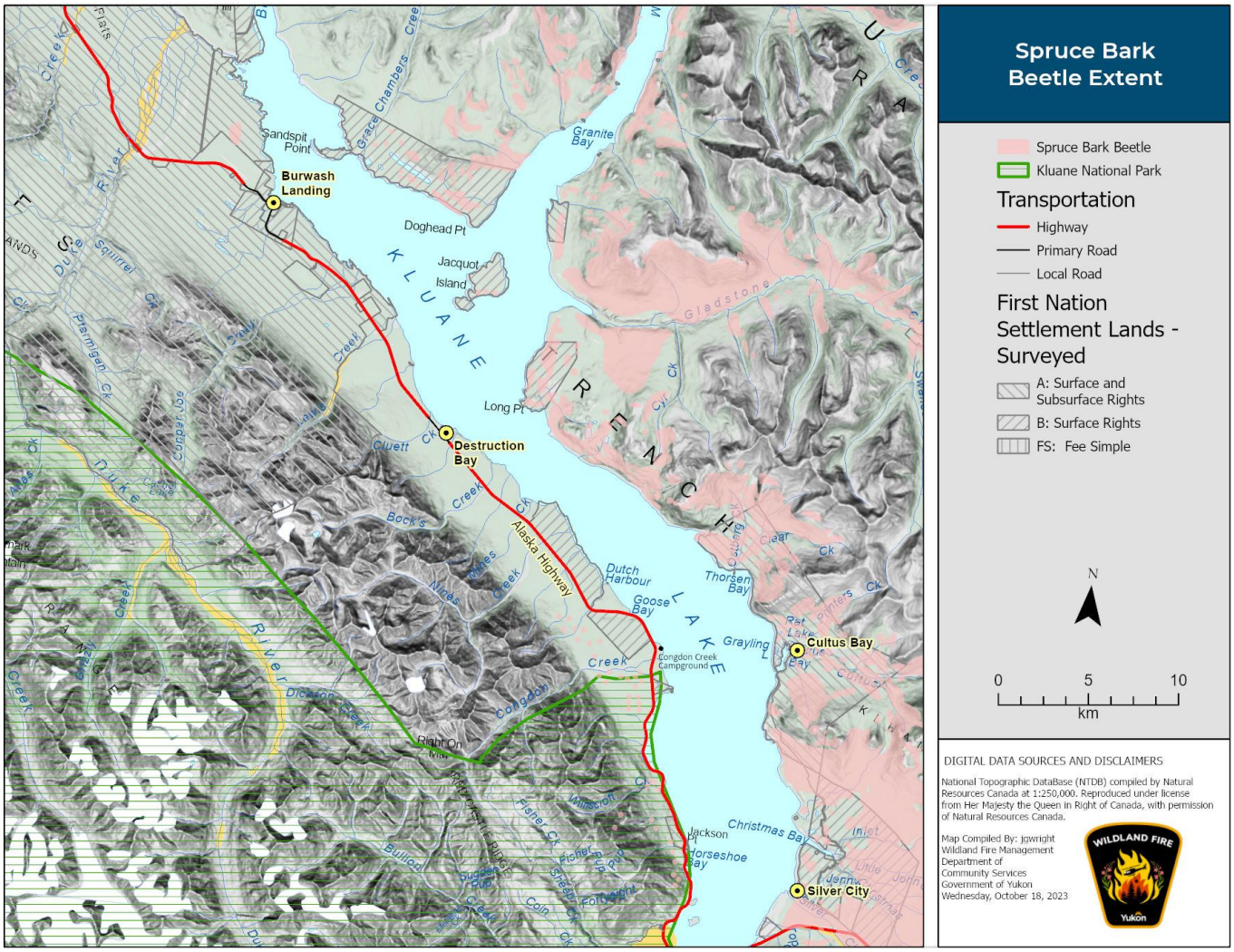

Figure 5: Spruce Bark Beetle Extent in CWPP Area

These factors combined with a fire season that starts earlier and is ending later than historical averages has opportunity to increase wildfire ignition.

5. Risk Management: Wildfire suppression for the Kluane Lake (Lhù'ààn Mân) communities is led by the Government of Yukon's Wildland Fire Management (WFM) Branch. The nearest WFM fire centre and crews are located in Haines Junction and includes helicopters that may be dispatched to carry out wildfire suppression operations, as needed. Airtankers that drop fire retardant are on standby in Whitehorse during the fire season and are deployed as needed.

The protection and safety of human life (community residents and firefighters) is the priority in any fire response from WFM. Following human life, fire response adheres to a priority basis of five wildland fire management zones. See Figure 6 for zonation in the CWPP area.

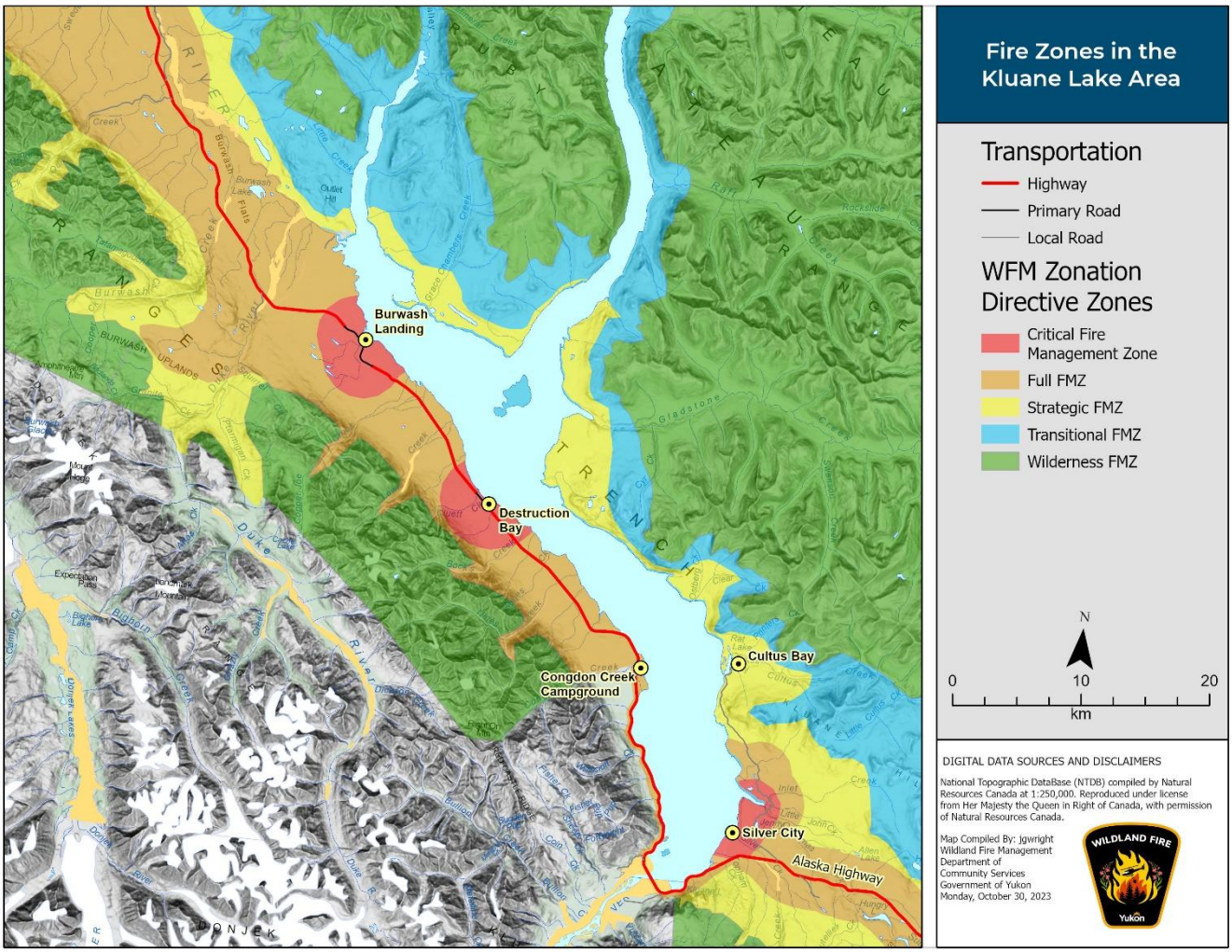

Figure 6: Fire Management Zones for CWPP Area

1. **Critical Fire Management Zone:** Highest priority for suppression as it contains the greatest concentration of homes and community infrastructure. All fire in this zone are fully suppressed.
2. **Full Fire Management Zone:** Next highest priority to prevent wildfire spread into the critical fire management zone. All fire in this zone are fully suppressed.
3. **Strategic Fire Management Zone**: Fires also typically managed with suppression, depending on zonation of other active wildfires.
4. **Transitional Fire Management Zone**: fires are occurring away from communities, but may be monitored or suppressed depending on assessment.
5. **Wilderness Fire Management Zone:** fires are only monitored and not actively suppressed. Firefighters aim to protect outlying cabins, lodges or other values.

Like many Yukon communities, the communities in the CWPP have a limited capacity to respond to fires from within the community. There are 1-2 firetrucks located in Burwash Landing at a time and are reliant on volunteer fire department members. Due to low capacity within the community as well as distance for wildfire crews and suppression tools, it is crucial that residents in the CWPP area take direct action to ensure their homes are wildfire resilient and support overall community protection. See Section 7.6 and 7.7 for details.

It also emphasizes the importance of fuels treatments surrounding communities as proposed in this plan. Fuels treatments are designed to reduce intensity and slow down the spread of fire. This includes limiting an oncoming wildfire to a low-intensity surface fire, rather than a fast-moving, high-intensity crown fire, and reducing potential for spot fires. This can potentially stop a fire or buy time while fire fighting crews arrive.

6. Fuel Abatement:

Land managers may use techniques to manage fire risk by reducing and/or removing the fuels available to burn or changing the type of fuels to less volatile types.

For fuel abatement work, all merchantable timber (>12.5 cm diameter) on public land is salvaged from project areas. Timber may become ownership of the contractor to remove and sell as fuelwood and/or sawlogs, or be processed into four-foot lengths for public salvage.

All merchantable timber (>12.5 cm diameter) on KFN settlement lands is under ownership of the First Nation. Government of Yukon may assist KFN in facilitating hauling or other opportunities for use of merchantable timber on settlement lands.

Common techniques for fuel abatement includes:

6.1. Fuels Treatment:

Forest fuel treatments serve to reduce fire intensity and access for suppression so that firefighters have a better opportunity to catch the fire safely and effectively. Fuel treatments also increase safety for people evacuating an area when a fire is approaching. Fuel treatments do this by reducing the fire

intensity and rate of spread and increasing the odds of suppression. Fuels treatments commonly utilized by the Government of Yukon, Wildland Fire Management Branch include:

6.1.1. Selective thinning AKA “FireSmart”:

Includes 3-5 metre spacing of conifer species, retention of less flammable deciduous species, pruning limbs to minimum 2m in height from the surface and pile and burning or chipping non-merchantable timber and debris (e.g. limbs). These treatments are typically conducted utilizing handfalling crews and no machinery. Handfalling crews will typically process timber into four-foot lengths and leave timber on-site for salvage by the public. FireSmart is most likely to be utilized directly within the communities and as a visual buffer from communities roads, and/or trails.

Figure 7: Example of a FireSmart Project in Whitehorse

6.1.2. Shelterwood:

Shelterwood is designed to mimic a low intensity surface fire in which dominant conifer tree species and deciduous are thinned but low-lying vegetation, twigs/branches, small diameter conifers, etc are removed. This includes:

- Increased spacing between the stems and crowns 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.
- Thin or space trees so that stems are 5 to 8 metres apart;

- Retention of less flammable, healthy deciduous trees. Deciduous trees in poor health can be cut to promote root suckering;
- Removal of surface fuels to reduce the potential for fire to reach critical surface intensity;
- Stumps of removed stems to be cut low to the ground, no angled stumps;
- Removal of deadfall, ground fuels and debris (e.g. limbs, tops, stumps) through burning, chipping (i.e. biomass), mulching and/or removal from site for other uses;
- Removal of ladder fuels (e.g. lichens, branches) by pruning up to 2 metres which to prevent fire from reaching the tops of trees (i.e. crown fire);
- Removal of juvenile spruce understory;

Shelterwood is typically conducted using mechanized techniques (e.g. skid steer, feller buncher, mulcher, etc) or semi-mechanized (i.e. mixture of mechanized techniques and handfalling). Semi-mechanized may be utilized where topography (e.g. rocky ground and/or steep slopes) or social factors (e.g. trails) exist.

Figure 8: Shelterwood Forest Fuels Treatment in the Mary Lake Shaded Fuelbreak, Whitehorse

6.1.3. Variable Retention:

Designed to mimic a crown fire that completely removes the stand due to high intensity with irregular patches where the fire did not burn due to the rapid pace of the fireline, moist/wet conditions, less flammable stands (such as deciduous), topography, etc. This includes:

- Clearcut to create landscape-scale fragmentation in forest fuels;
- Removal of all coniferous stems;
- Retention of healthy deciduous stems is preferred;
- Removal of surface fuels to reduce the potential for fire to reach critical surface intensity (ie. the transition to a crown fire).
- Stumps of removed stems to be cut flush with ground, no angled stumps;
- Removal of deadfall, ground fuels and debris (e.g. limbs, tops, stumps) through burning, chipping (i.e. biomass), mulching and/or removal;
- To be left cleared or conversion of the stand to primarily less flammable deciduous vegetation;
- Dispersed retention of forested area within the block

Similarly to shelterwood fuels treatments, variable retention is competitively contracted and designed to be specific to the site. Variable retention will more commonly be conducted using mechanized equipment only but may be semi-mechanized due to terrain constraints. All use of heavy equipment will be required to go through evaluation by the Yukon Environmental and Socio-economic Assessment Board (YESAB).

All three fuel treatments may be utilized in one site. For example, a variable retention may include FireSmart along the edges as a visual buffer. These details are specified prior to contracting.

6.2. Fuel Conversion:

Replacing conifers with native deciduous species such as trembling aspen or white birch through tree planting projects. Deciduous species are less flammable than conifers due to a higher moisture content in their stems, branches and leaves. This will typically occur following a fuels treatment.

Figure 9: Photo depicting a wildfire where conifer trees (lodgepole pine) were completely charred from bottom of the tree to crown; whereas fire resilient aspen only burned approximately one quarter of the stem and leaves remaining intact.

6.3. Fire Guard:

Utilizing a bulldozer or other relevant heavy equipment to remove vegetation and bring the ground down to mineral soil. Mineral soil is not considered flammable and thus could stop or slow a surface fire or lower intensity crown fire as well as create access and space for wildland fire fighters to safely suppress fire and increase success.

Fire guards can be anywhere from the width of a bulldozer blade (5-8 metres) to multiple blade widths up to 30 metres. More commonly, fire guards are created as access with other fuels treatments (i.e. FireSmart, shelterwood, variable retention) being conducted adjacently.

Fire guards are typically always linear, straight lines for the ease of wildland firefighters to travel and conduct back burns. Straight lines offer the greatest success in suppression efforts as bends act as weak points for the fire to overtake. They also are popular for recreational pursuits by community members including walking, snowmobiling and use by motorized off-road vehicles; though, Wildland Fire Management does have the authority to gate new fire guard development to reduce access.

Figure 10: Example of a fire guard constructed during a wildfire response in Southern Yukon. Preventative fire guards have the benefit of time to construct in a clean, tidy manner and considering community values versus fire guards constructed in haste of an emergency situation.

6.4. Prescribed/Controlled Fire:

Action items in the Kluane First Nation Forest Resources Management Plan states: "*Review opportunities to implement controlled burns in order to reduce fire risk where compatible with social values and community priorities*" and "*investigate methods for addressing the accumulation of fuel loads, i.e. through prescribed burning*".

The role of burning is increasingly recognized as a tool to maintain and restore ecological integrity and reduce future fire intensity. Prescribed fire is defined as burning under controlled conditions to reduce flammable fuels and is only carried out under specific weather conditions to minimize risk of spread. Prescribed fire can be effective in combination with other fuel treatments to reduce the total fuels on the surface. For example, mulching in a variable retention treatment and then conducting a prescribed fire to reduce the amount of mulch left on the surface.

Figure 11: Prescribed Burn Conducted by Wildland Fire Management and Kluane First Nation at Duke Meadows

In May 2023 a prescribed fire was conducted in Duke Meadows, north of Burwash Landing, to burn off the flammable dry grass and encroaching shrubs to allow for less-flammable new, green growth as well as improve conditions for the Yukon Handgames Championships. Thus, prescribed burn can also offer community benefits.

6.5. Strategic Timber Harvesting:

This tactic includes strategically planning areas that are at risk of wildfire to be harvested for commercial or personal use timber as fuelwood and/or sawlogs. The Kluane First Nation Forest Resource Management Plan identifies priority areas for timber and firewood harvest where fire risk is highest for communities and property and applies to public land and settlement land.

Additionally, the Silver City Community Fuel Abatement Plan and Kluane Lake East are active timber harvest plans that allow permits for commercial fuelwood harvesting. Permits for harvest are available through the Government of Yukon, Forest Management Branch.

Fuels treatments are preferred over strategic timber harvesting due to the ability to control debris management through harvest instructions and contract terms to ensure the most effective thinning and clearing is being conducted to reduce risk. If timber harvest areas show excessive debris from commercial operations, WFM may opt to go in after the fact to reduce the amount of flammable fuels.

7. Action Plan: The following represents the actionable items for risk reduction for each community within the CWPP area. Each area provides unique social, economic and ecological circumstances that will affect the recommended priority and methods for fuels treatment. The main objectives of the proposed fuels treatments are to:

1. Reduce intensity and slow the spread of a wildfire;
2. Reduce probability of a surface fire spreading into a crown fire, as well as ember transport associated with a crown fire that ignite spot fires ahead of the fireline;
3. Create a safe defensible space for wildland fire fighters to suppress a fire from.

7.1. Burwash Landing & Copper Joe Subdivision:

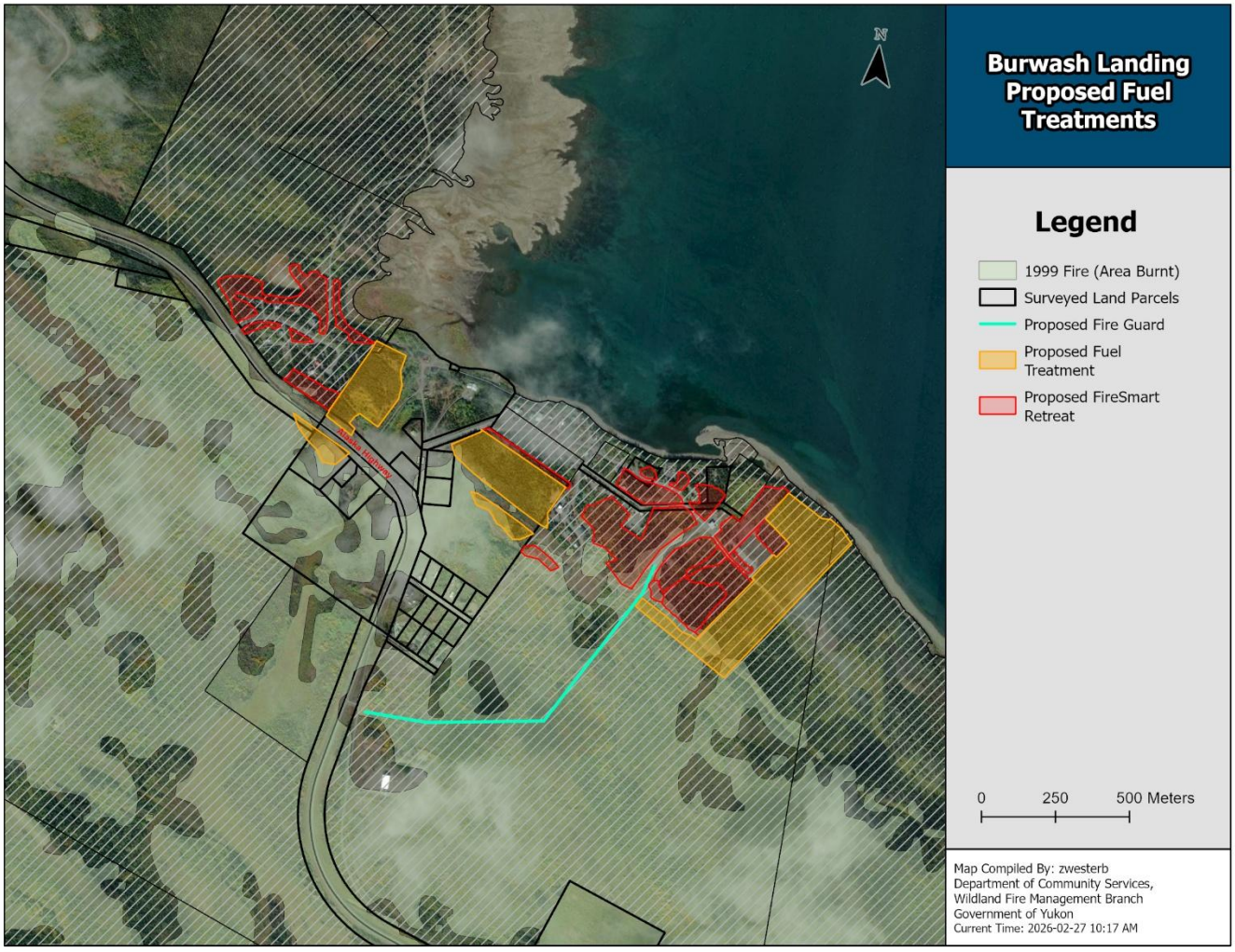

Figure 12: Burwash Landing Proposed Fuel Treatments

Burwash Landing is the largest community within the CWPP area with a population of around 64 people and hosts the administrative centre of the Kluane First Nation as well as other important

values such as the post office, community centre, youth centre, daycare, gym and others; therefore, it is considered a priority area for fuels treatments.

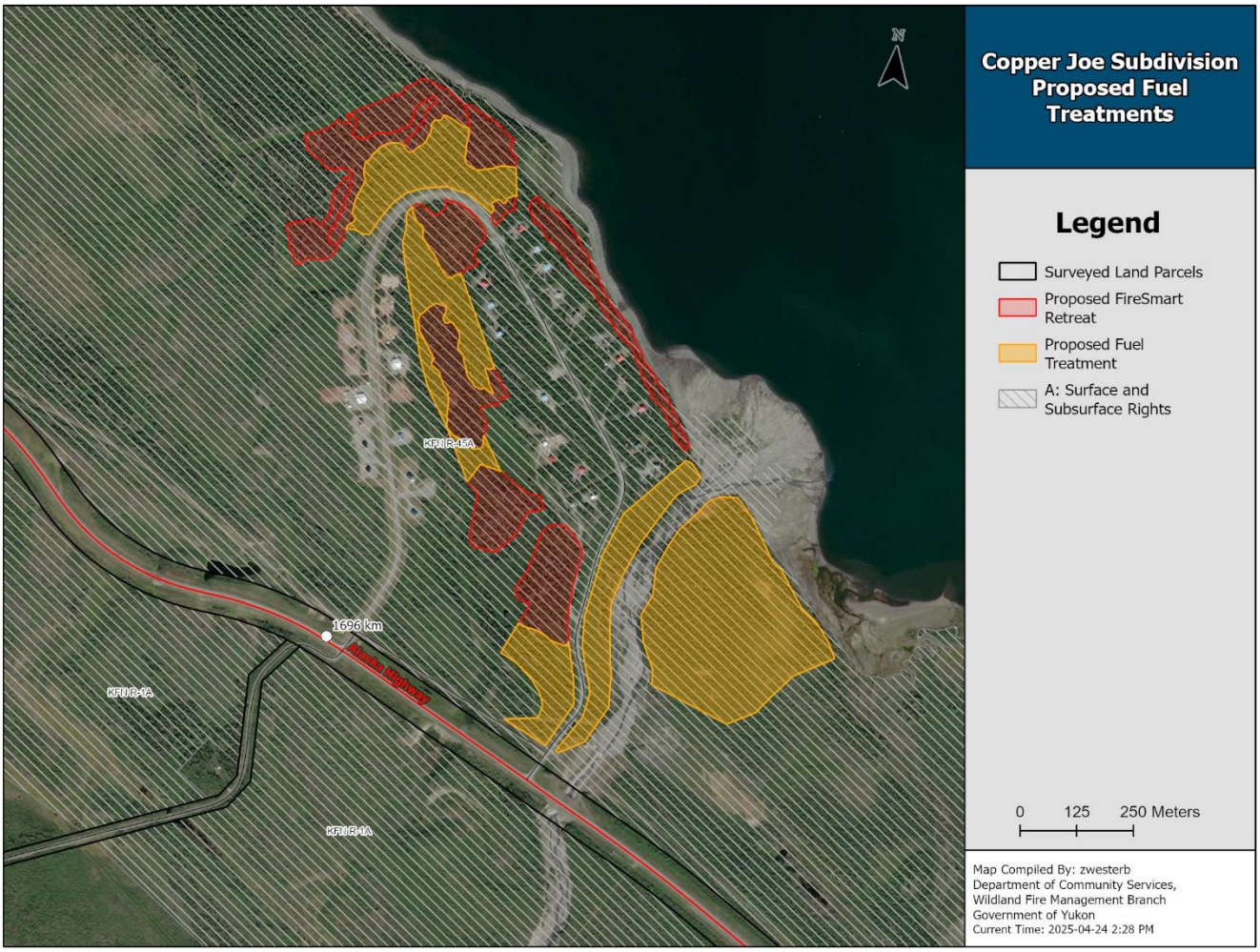

Figure 13: Copper Joe Subdivision Proposed Fuel Treatments

The 1999 fire burned much of the available fuels adjacent to Burwash Landing, particularly to the west and southwest. As a result, the community is less at-risk of intense wildfire behaviour; however, as shrubs and trees return in the burned area fire risk will increase. See Figure 6 and 12 for area of the 1999 fire and proposed fuel treatments.

Much of the community has undergone thinning of the forest through the territorial FireSmart program. Overtime, vegetation returns to these areas through natural succession. As vegetation returns and as trees die-off or fall and contribute to ladder fuels the area is less likely to meet objectives of reducing risk of wildfires. Areas identified in Figure 12 and 13 for re-treatment of existing areas have been previously treated with FireSmart and will be maintained to current FireSmart standards or treated with a more effective shelterwood fuel treatment.

Locations identified in Figure 12 and 13 as ‘Proposed Fuel Treatment’ may be treated to a FireSmart fuel treatment or the more effective shelterwood fuel treatment via handfalling or mechanized methods. Identified areas in Figure 12 and 13 are entirely located on Kluane First Nation Settlement Land or private land owned and operated by Kluane First Nation.

7.2. Destruction Bay:

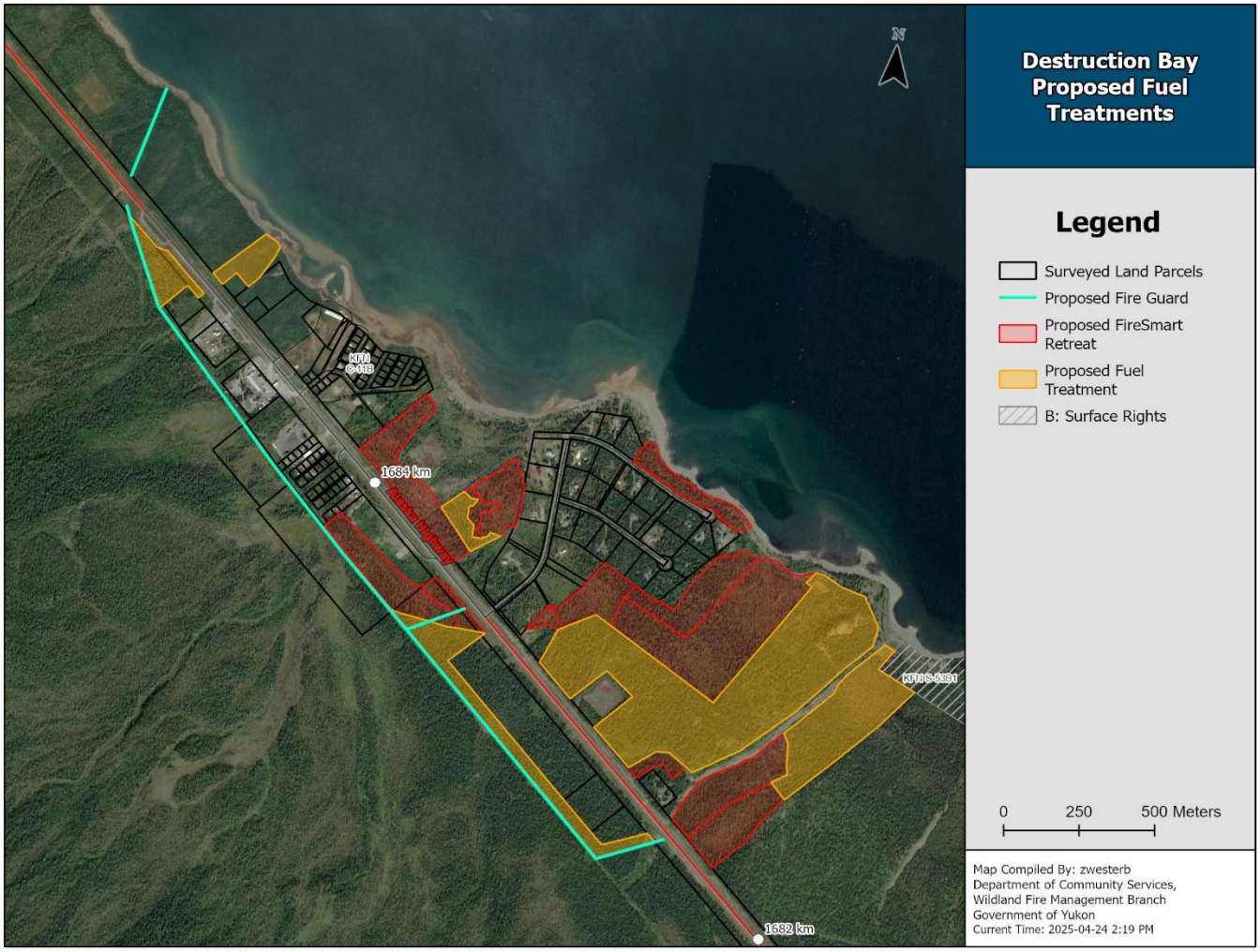

Figure 14: Destruction Bay Proposed Fuel Treatment

Destruction Bay has the second highest population of the communities in this plan with a population of around 40 people with more travellers present in the community in the summer. A number of government services are located in the community, including the Destruction Bay Health Centre, Highways and Public Works facility and Kluane Lake School. There are several local businesses including a motel and restaurant, gas station and small store.

Destruction Bay is more at risk to potential wildfire than Burwash Landing due to the continuous, dense spruce forest surrounding the community and as the closer community to Ä'äy Chù valley

where prevailing winds may push a wildfire north. Additionally, Congdon Creek Campground is 17 km to the south and unattended campfires can present fire risk during busy summer season. While the probability of an ignition from the campground is very low, high winds and continuous spruce forest coupled with an ignition can spread a fire north towards Destruction Bay. As a result, Destruction Bay is a priority for wildfire risk reduction.

Due to these factors, a fire guard is proposed in the location shown in Figure 14 that flanks the south and west boundary of the community. The fire guard will utilize the existing linear feature of the decommissioned pipeline parallel the town and may be up to 30m in width. A bulldozer and/or other heavy equipment would be contracted by Wildland Fire Management Branch for installation of the fire guard. The exact location will be confirmed following future fieldwork and will require screening under the Yukon Environmental and Socio-economic Assessment Board.

Similar to Burwash Landing and Copper Joe, Figure 14 also shows where retreatments of existing FireSmart areas will be maintained to current standards or treated with a more effective shelterwood fuel treatment. Creating thinned forest spaces within the boundaries of the community reduces chances of a surface fire from human-caused ignition such as backyard campfire, cigarette butt, etc to become a high intensity crown fire, as well as manage ignition of spot fires.

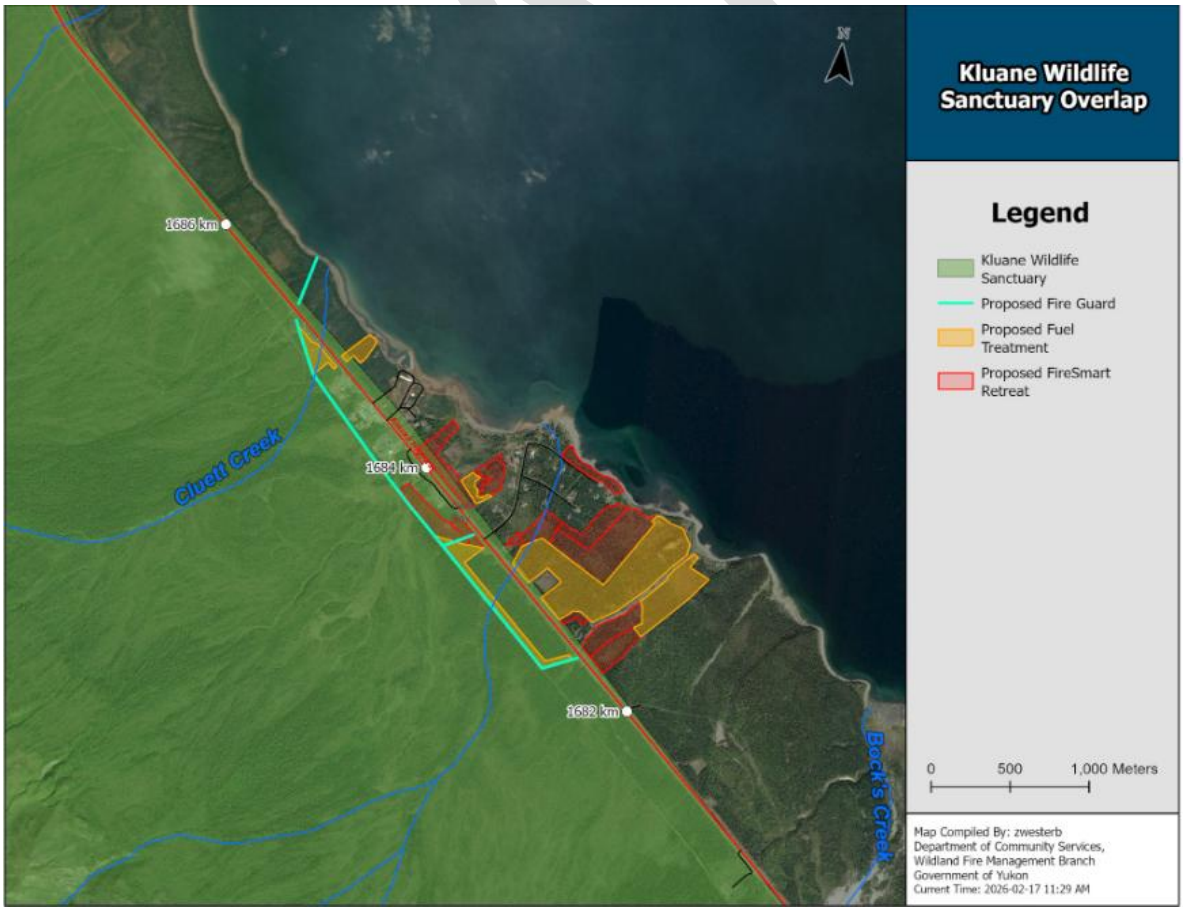

Figure 15: Kluane Wildlife Sanctuary overlap with Destruction Bay

A portion of these proposed blocks fall within the boundaries of the Kluane Wildlife Sanctuary (KWS). There are no land use restrictions or withdrawals in place within the KWS. Gates can be installed on the proposed fire guard to reduce public access. Department of Environment had no concerns with the proposed overlap with the wildlife sanctuary.

7.3. Silver City:

Silver City is vulnerable to fire due to its continuous forest fuels, location at the confluence of multiple valleys as well as the high presence of beetle killed timber.

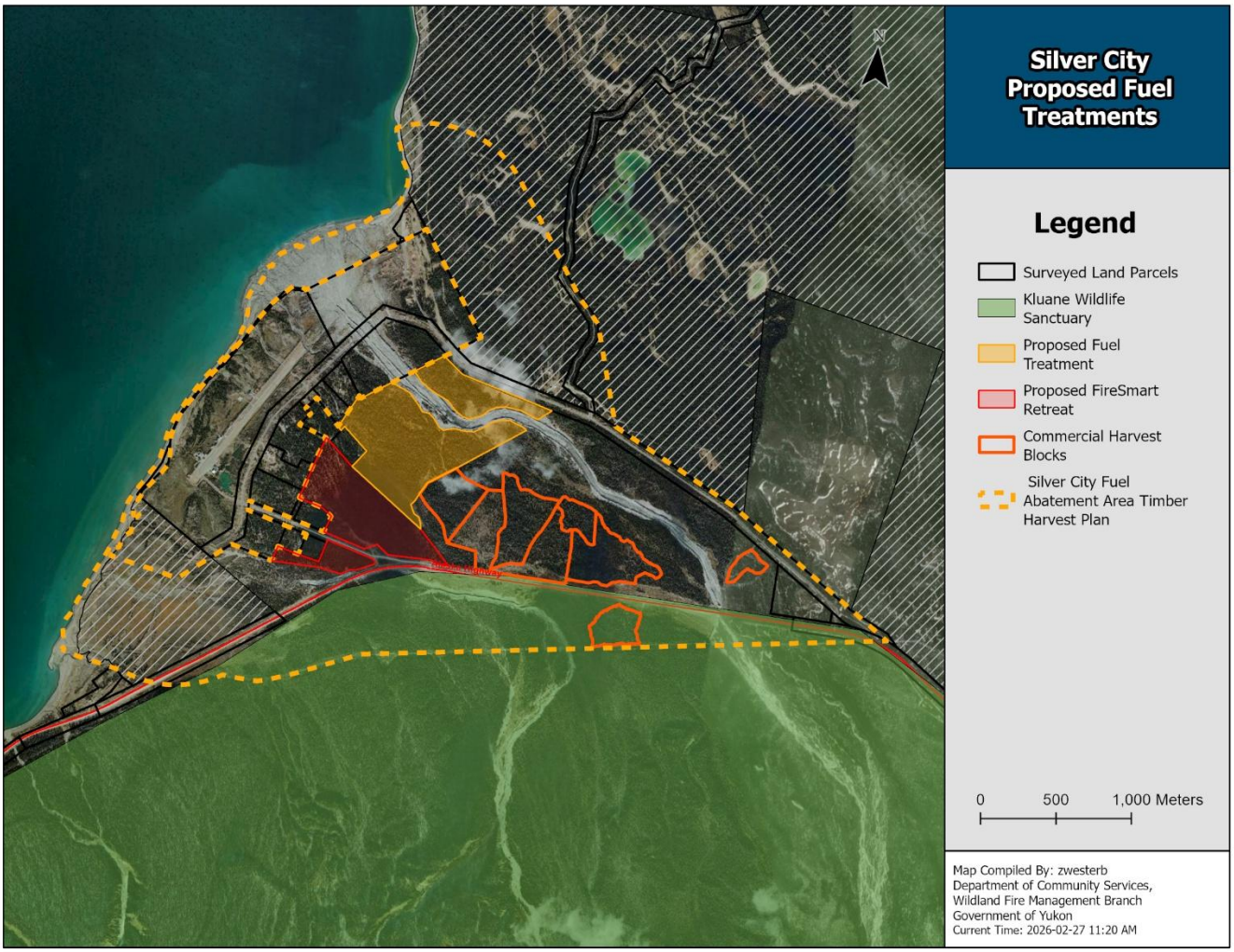

Figure 17: Silver City Fuel Abatement Options

Background information regarding wildfire hazards and priorities can be found in the approved Silver City Community Fuel Abatement Plan (2008). As per this plan, it is proposed to conduct fuels treatments in sub-zone A which is defined as "*closest to the community and is of higher priority. This is where fuel abatement treatment contracts should be considered*". Sub-zone A is highest priority due to: (1) proximity to higher values at risk; (2) frequency of use by people that heighten probability of igniting a human-caused fire; (3) highly flammable spruce-bark beetle infested timber; (4) surface

fuels including evergreen understory vegetation; and (4) ease of suppression due to accessibility by vehicle/equipment and access to water. See Figure 16 for map of subzones from the plan.

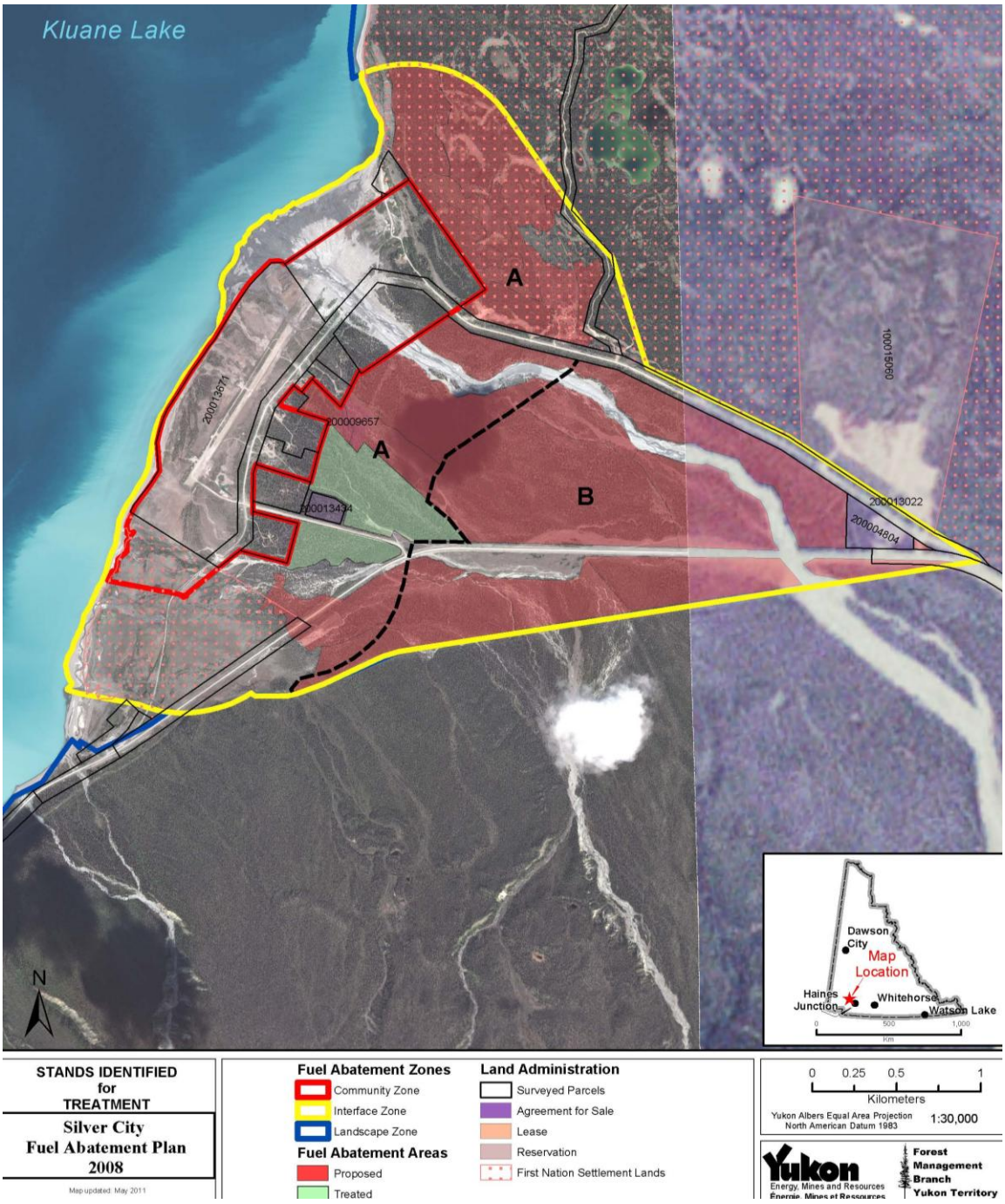

Figure 18: Silver City Fuel Abatement Areas and Sub-Zones

Figure 16 outlines Sub-zone A and an area that has been previously treated that is proposed for re-treatment. Figure 15 outlines proposed treatment area in Sub-zone A which is proposed to be treated with FireSmart and shelterwood with potential for some variable retention methods. Shelterwood or

FireSmart would be used to buffer existed properties. The proposed fuel treatments will work in conjunction with clearings that has created a fragmented forest in sub-zone B through fuelwood harvesting permitted through the Government of Yukon, Forest Management Branch. WFM may opt to re-treat commercial harvesting blocks that have excessive flammable debris from harvesting. No work is proposed under the CWPP across the Alaska Highway in the overlap with the Kluane Wildlife Sanctuary (see Figure 15).

Silver City is considered less of a priority for treatment compared to more populated communities with critical infrastructure including Burwash Landing and Destruction Bay.

7.4. Cultus Bay:

Located on the east side of Kluane Lake (Lhù'ààn Mân), Cultus Bay is a culturally significant location for the Kluane First Nation. The area is namely at risk from the high presence of flammable spruce beetle killed timber as well as prevailing winds from the southeast and southwest.

The area includes a culture camp for Kluane First Nation citizens. Cultus Bay is the only listed community that is not considered a critical fire management zone. See Figure 5. Therefore, fuels treatments are especially important in this area to protect values in years where wildfire suppression response is focused in other critical areas.

The Kluane First Nation Forest Resources Management Plan scopes in a 'potential fuelbreak woodlot' at the Cultus Bay camp. The 'fuelbreak woodlot' at Cultus Bay is proposed to reduce risk of wildfire impacting the camp. Field verification has not been confirmed for the area scoped into the KFN FRMP and may be conducted jointly with Wildland Fire Management Branch and Kluane First Nation. This may be supplemented by small-scale FireSmart projects around the culture camp. Private cabins should be managed for fire risk by the owners. See Section 7.6 and 7.7 for tools.

Wildland Fire Management Branch will work with Kluane First Nation and provide guidance into appropriate treatments to reduce risk in this area.

7.5. Congdon Creek Campground:

Congdon Creek Campground as a strategic location to reduce wildfire risk spread from ignition within or occurring outside of the campground. Thinning of the forest is proposed within the campground to reduce the probability of crown fire initiation and spread as well as creating a safe defensible space for wildland fire fighters to suppress a potential wildfire. Achieving these goals will require working with the Department of Environment, Yukon Parks to develop an actionable plan on the park reserve land.

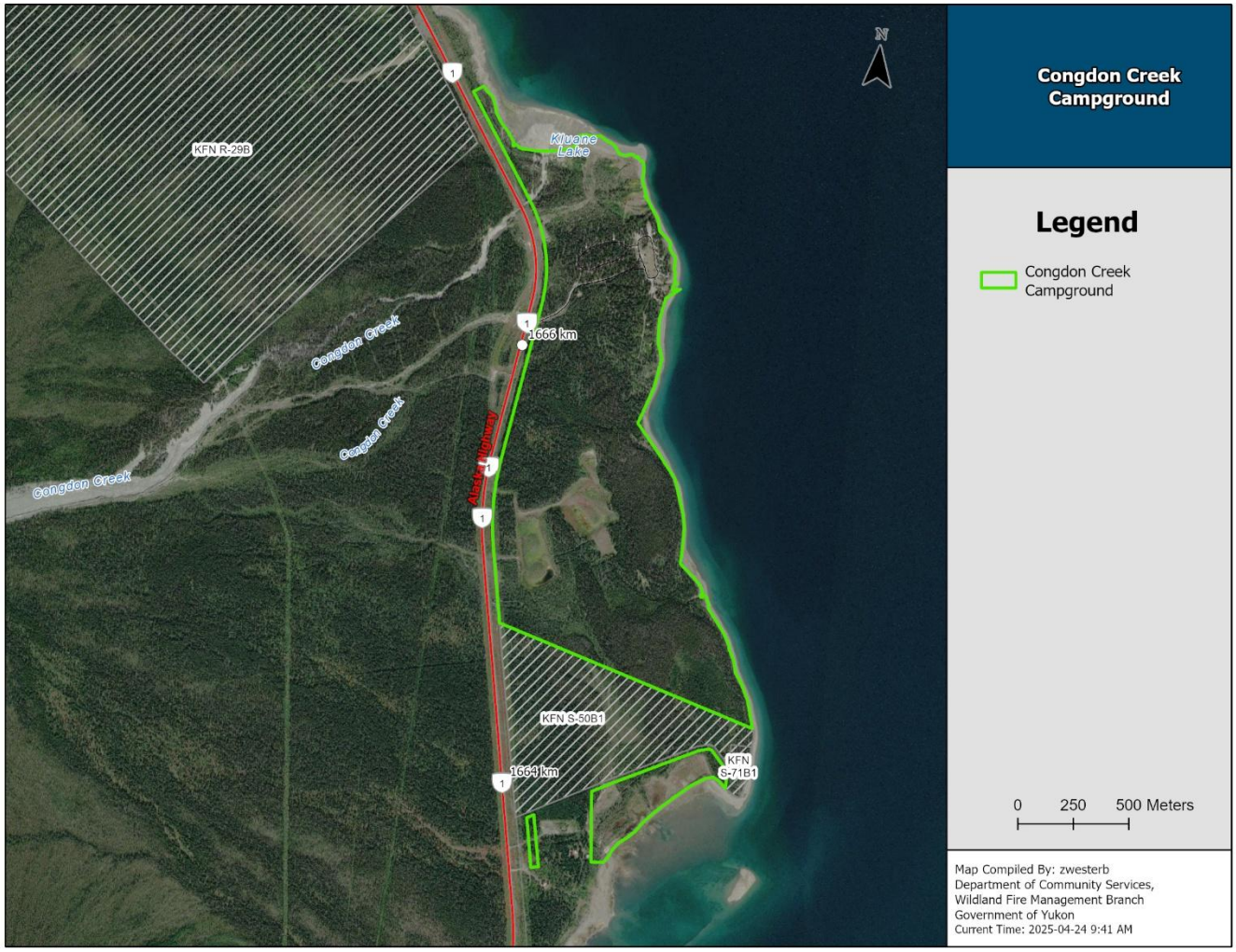

Figure 19: Congdon Creek Campground

7.6. Private Properties & Structures:

Private owners of remote, rural and in-town structures are strongly recommended to adopt FireSmart principles on their properties. FireSmart Canada is a national program developed by the Canadian Interagency Forest Fire Centre. The program promotes the reduction of fire risk and fire protection and has developed the following guidelines for communities and homeowners to reduce risk:

Immediate zone (0-1.5 metres from structures):

The Immediate Zone is a non-combustible area that starts at the house and extends to 1.5m perimeter around the home and attached structures, including decks. Reduce the chance of wind-blown embers igniting your home by starting with these proactive steps:

- Choose non-combustible building materials when constructing or renovating your home.
- Clear vegetation and combustible material down to mineral soil and cover with non-combustible materials like gravel, brick, or concrete.
- Avoid planting woody shrubs or trees. If any are present, prune and maintain them regularly

Intermediate zone (1.5 – 10 metres from structures):

Elements in the Intermediate Zone are managed so they don't transmit fire to your home. Here are a few actions you can take to reduce your home's vulnerability:

- Plant fire-resistant vegetation and select non-combustible landscaping materials.
- Avoid incorporating any woody debris, including mulch.
- Keep combustible items like firewood piles, construction materials, patio furniture, tools, and decorative pieces out of this zone.
- Move trailers, recreational vehicles, storage sheds, and other combustible structures into the Extended Zone. If that's not possible, store firewood inside your mitigated garage, shed, or other ember resistant structures.
- Create a non-combustible ground cover, like a gravel pad, underneath and 1.5 metres around trailers, recreational vehicles, and sheds.

Extended zone (10-30 metres from structures):

The goal in the Extended Zone is not to eliminate fire, but to reduce its intensity. If your property extends into this zone, a few important steps you can take include:

- Selectively remove evergreen trees to create at least 3 metres of horizontal space between the single or grouped tree crowns.
- Remove all branches to a height of 2 metres from the ground.
- Regularly clean up accumulations of fallen branches, dry grass, and needles to eliminate potential surface fuels.
- Continue to apply these principles if your property extends beyond 30 m. Work with your neighbours in overlapping zones and seek guidance from a forest professional if affected by other conditions like steep slopes.

Detailed information can be found in the Yukon Homeowner's FireSmart Manual which can be accessed online at Yukon.ca, at WFM fire centres across the territory or by contacting the Wildland Fire Management Branch.

7.7. Community Engagement:

A community that is engaged and informed on wildfire protection can move forward with an understanding of the need to manage fire risk through prevention education, fuels management, and reducing fire ignition potential around properties.

The responsibility and agency to become fire resilient is shared by the community. Homeowners are encouraged to do their part in reducing fire risk to their property and working with their neighbours. While homeowners and businesses within the listed communities will benefit from fuels management proposed in this plan, FireSmart principles are also strongly recommended on private land to create the best opportunity for reducing impacts of potential wildfire on homes and property.

The following objectives can be taken by an individual to increase their own and their communities wildfire resiliency:

1. Make use of Yukon.ca as a go-to source of practical information before and during fire season;
2. Engage with Kluane First Nation and Government of Yukon, Forest Management Branch and Wildland Fire Management on strategic locations and practices for fuelwood harvesting that also reduce fuels for a fire;
3. Organize community brush clean-up days targeting dead and down woody debris and ladder fuels;
4. Inform power utility companies when trees are hung-up over powerlines or when powerline rights-of-way need to be cleared of emerging trees and vegetation;
5. Support fuel management projects within and adjacent to municipal and First Nation lands;
6. Practice emergency scenarios with your family, friends and neighbours and keep a 72 hour emergency kit;
7. Educate yourself on FireSmart practices and principles and implement them on your property, including maintaining your property and home to reduce structure ignition potential;
8. Check the fire hazard prior to burning and obtaining burn permits, when necessary;

8. Final Recommendations

The following outlines the final recommendations as laid out in this plan:

Item	Responsibility
Implement FireSmart Canada principles on private land	Local Citizens
Follow the principles presented in this document, particularly in Section 7.7 Community Engagement. These practices rely on individuals to take their part in assisting with wildfire resiliency, reporting and education.	Local Citizens
Plan and implement fuel abatement work on public lands	YG, Wildland Fire Management
Implement fuel abatement work on settlement lands with planning and funding assistance from Wildland Fire Management	Kluane First Nation
Plan and issue permits for strategic timber harvesting on settlement land.	Kluane First Nation
Explore possibilities for undertaking prescribed burns to reduce landscape level wildfire risk	YG, Wildland Fire Management Kluane First Nation
Conduct field work to plan and implement fuel abatement work in Cultus Bay	YG, Wildland Fire Management Kluane First Nation
Plan and issue permits for strategic timber harvesting on public land, particularly in the existing Silver City Fuel Abatement Timber Harvest Plan.	YG, Forest Management Branch
Provide guidance and advice for implementation of fuel abatement on adjacent federal and territorial park land	Parks Canada YG, Department of Environment YG, Wildland Fire Management