

Mayo

**Draft Fuel Management Plan
2024**

Wildland Fire Management



Mayo Fuel Management Plan

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1. Plan Implementation

The following section highlights actionable tools proposed for wildfire risk management in Mayo, including forest fuel treatments and other risk management activities, and is derived from the Mayo Community Wildfire Protection Plan (CWPP). It also describes the risk factors and key vulnerabilities for each area of interest (i.e. geographic areas) and proposed methods to reduce those risks.

1.1 Proposed Forest Fuel Treatments

The proposed areas in this report 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 without field verification. The goal was to identify large general risk areas within the area of interest (AOI). Further assessment of the identified polygons by a wildland fire professional will be completed in summer as soon as is practicable. Treatment polygons have been identified through high-level desktop planning and has not accounted for factors such as riparian areas or wetland protection areas. Therefore, the final areas may be subject to adjustments following on-site visits by wildland fire professionals.

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.

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

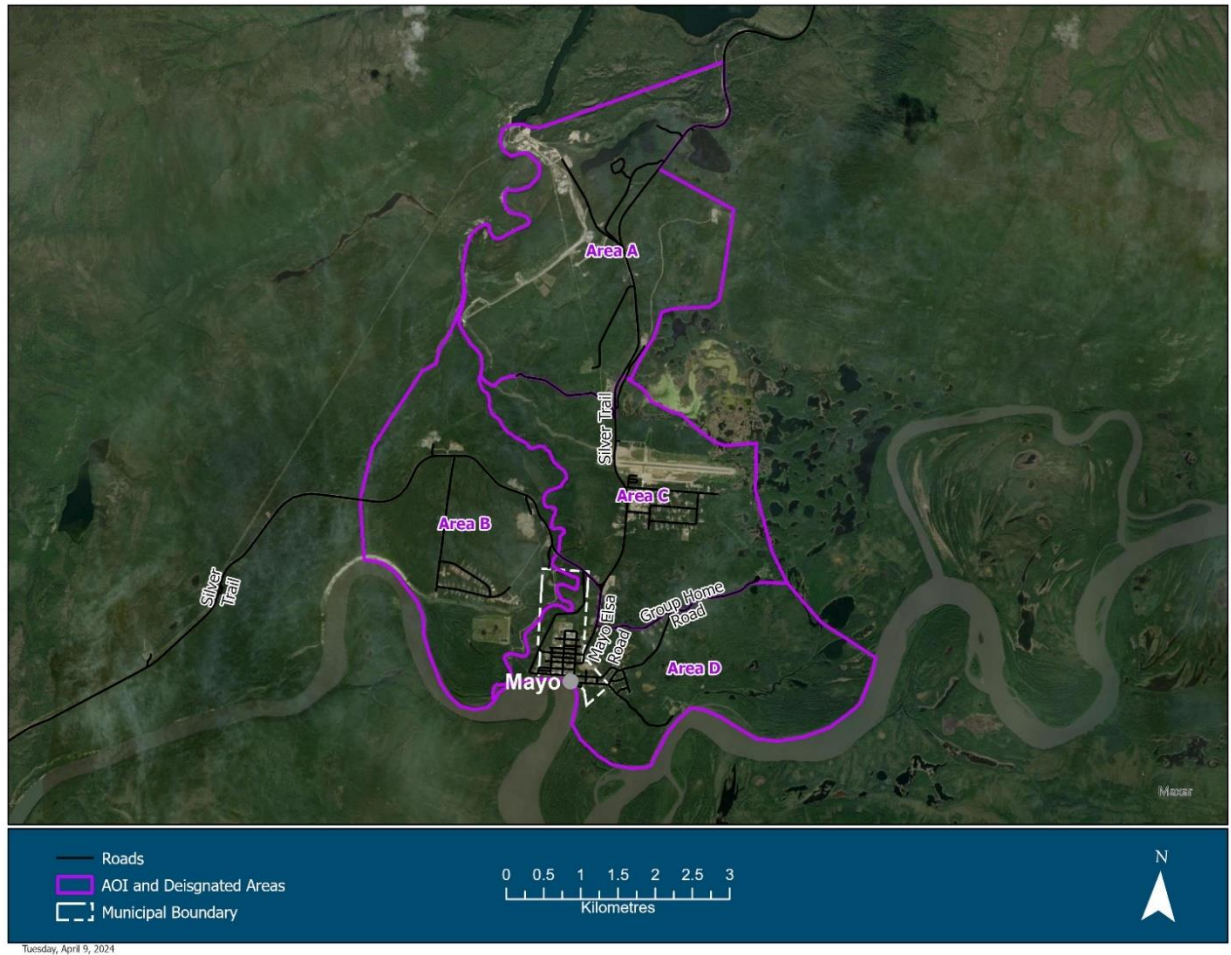


Figure 1: Area of Interest (AOI) for the Mayo Community Wildfire Protection Plan and accompanying Fuels Management Plan

1.1.1 FireSmart

FireSmart 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. The FireSmart program introduces several principles from assessments of materials used to build homes, how a property owner can make their property more fire resilient, to forest fuel treatments on public land.

Treatment of forest fuels in volatile fuel types can reduce the risk of wildfire by reducing the potential intensity, severity and rate of spread. FireSmart projects are commonly implemented as 2-5 metres spacing of conifer species, retention of less flammable deciduous species, pruning limbs of remaining timber to a minimum height of 2 metres and pile and burning debris. It is also important that surface fuels are removed from the forest floor, as they can carry fire spread especially in areas with heavy litter or downed trees. These programs are generally targeting the wildland urban interface zone where human development meets or intermingles with the natural environment.

FireSmart projects have been completed throughout the planning area and will continue to be implemented in strategic areas within the wildland urban interface, or intertwined with larger, landscape level fuel

abatement work. FireSmart education and events will be incorporated into the CWPP as part of the broader risk mitigation actions and responsibilities to provide opportunities for community members to reduce the risk to their personal properties.



Figure 2: FireSmart Project in Mayo

1.1.2 Fuel Abatement

Fuel abatement is a term to describe large-scale landscape level forest fuels 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 removes and/or reduces surface, ladder and crown fuels 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 provide strategic vantage points for firefighting operations such as direct attack or backburning. The treated areas also create defensible space which enables safer access and egress (i.e. escape) for firefighters to suppress a wildfire.

The following describes the fuel abatement tools proposed under this plan:

A **Fire Guard** is a linear feature where all vegetation and organic matter is removed down to mineral soil. Linear fire guards can provide some fire behaviour reduction benefits; however they mostly provide strategic, operational outcomes. These linear units enable safer access and egress (i.e. escape) for firefighters and necessary equipment into fuel treatment areas or into high-risk areas to attack a wildfire. They also serve as control lines to enable planned ignition strategies such as burning out and back burning to remove fuels adjacent the fire guard.

Fire guards are typically always linear, straight lines due to the ease for wildland firefighters to travel and conduct back burns.

Fire guards can be constructed using a bulldozer or other relevant heavy equipment to remove vegetation and bring the ground down to mineral soil. They are generally the width of a bulldozer blade (5-8 metres) and can be wider in some instances. Mineral soil is not considered flammable and thus could stop or slow an oncoming low intensity surface fire as well as create access and space for wildland fire fighters to safely suppress fire.

Fire guards are popular for recreational pursuits by community members including carrying out traditional practices, walking, snowmobiling, and use by motorized off-road vehicles. Care and consideration should be exercised when planning and implementing permanent fire guards, as they may become water saturated over time in areas with an existing high-water table. Additionally, long, linear clearings that are permanently established may result in changes to large predator/prey interactions. Monitoring and maintenance of the fire guards long term is essential.

During the 2023 wildfire season, several fire guards were constructed, utilizing bulldozers, surrounding the Mayo AOI in response to the approaching MA033 wildfire from the south. These fire guards were strategically placed at a distance from the Village of Mayo to serve as practical points of defensibility and areas for wildfire crews to implement backburning operations.

Fire guards are relevant to the Fuel Management Plan as they are retained on the landscape to support future fire suppression activities. To be useful, fire guards should provide continued vehicle access, while being managed for erosion and controlled for invasive species ingress. Fire guard restoration is an opportunity for the Government of Yukon and the Mayo community to collaborate to support restoring native plants used for traditional or medicinal purposes, while maintaining fire protection for the community.

A **Fuel Break** is a larger parcel 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:

- **Shelterwood 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 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 fuels on the surface to reduce the potential for fire to reach critical surface intensity as well as spread to a crown fire.

It is worth noting that both fire guards and fuel breaks provide tactical tools to assist with both direct and indirect attack on an approaching wildfire; however, it is understood that these will not in themselves stop an approaching wildfire without the addition of suppression tactics. Even with suppression, there is potential for wildfires to jump the guards; however, direct and indirect attack utilizing these guards reduces this potential.

The most common distance for ember travel (i.e. cause of spot fires) is 100-500m ahead of the fire front, where embers can travel up to nine kilometers ahead of the fire under extreme conditions and start new spot fires. For this reason, a fuel break alone is unlikely to stop a running crown fire, unless the fuel break is used to support ignition strategies.



Figure 3: Example of a fire guard constructed during a wildfire response to MA011 near the Victoria Gold Mine Site. 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 in an emergency.



Figure 4. Example of variable retention treatment in Haines Junction on the left, mulching completed in the Mary Lake Shaded Fuelbreak in Whitehorse on the right.

1.1.3 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 (trembling aspen or white 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 are 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 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 wildfire.
- Reduce frequency of maintenance in a fuelbreak.

Wildland Fire Management may assist in stand conversion strategies through planting native fire resilient deciduous species. An important characteristic of deciduous as a fuel break is whether the stand has leafed-out or not. Prior to green-up, deciduous stands can carry fire through cured grass (if present). Once the vegetation has greened-up in the spring, ignition probability and spread potential often reduces considerably.



Figure 5: 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.

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1.1.4 Prescribed Fire

Prescribed fire involves the introduction of a planned and controlled fire to an area under specific 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 location, site requirements and include an operational plan that considers safety and weather. Prescribed fire makes it difficult for a natural fire to ignite as fuels are already burnt and it is also used as a strong tool to enrich and prepare the ground for stand conversion.



Figure 6: Prescribed burn in the Duke River Meadows

1.2 Areas of Interest for Fuel Treatment

1.2.1 Area A – 5 Mile Lake

The Five Mile Lake area, situated northwest of Mayo, encompasses a Territorial Campground and the Wareham Lake Dam—an integral part of the Mayo Generating Facility supplying power to Mayo and Dawson City residents (Figure 7). High Fire Weather Index Values (FWI) for the Mayo area, particularly associated with north winds during spring and summer (as referenced in the *Mayo Community Wildfire Protection Plan*), increase the likelihood of fires starting north of Mayo and being driven towards the community.

Considering this, the Five Mile Lake Territorial Campground faces an elevated risk of fire starts during fire seasons, often triggered by recreational activities like unattended campfires (see TU-2). To address this risk, a proposed fuel treatment area has been delineated around the Territorial Campground, focusing on **FireSmart** treatments. This approach aims to preserve the park's aesthetics while reducing the threat of new fires rapidly surpassing early suppression capabilities.

Given the significance of the Wareham Lake Dam as critical infrastructure, fuel treatment polygons have been delineated in the northern forested areas surrounding this infrastructure (TU-1). These proposed treatments, well-suited for **FireSmart** fuel mitigation methods, aim to enhance the protection of this critical facility against potential wildfires driven by predominant north winds.



Figure 7: Treatment units proposed in Area A of the AOI.

1.2.2 Area B – C6 Subdivision

Along with its subdivision of homes, the C6 Subdivision is surrounded by a mixed-wood forest characterized by a high deciduous component (Figure 8). A high deciduous component generally indicates a lower fire risk.

Existing **FireSmart** treatments are in place along the egress road from the community. **FireSmart** treatments along egress routes serve dual purposes: acting as enforced fire breaks and creating a corridor for residents in the event of a prompt evacuation. Monitoring and retreating these existing treatments at an appropriate time is essential to ensure continued effectiveness.

Satellite imagery identified a potential secondary egress route along the northern portion of TU-3 from the Na-Cho Nyak Dun Government House to the Silver Trail Highway. This area has been selected for additional **FireSmart** treatments along the egress route.

Along the western portion of TU-3, a fuel treatment area was identified behind the subdivision, consisting of a mixed-wood forest with a high deciduous component. Recommended treatments include the installation of low-intensity fuel breaks, such as hiking or quad trails. These trails would not only provide easy accessibility for firefighters but also help break up continuous fuels, reducing the risk of fire spreading toward the subdivision.

The existing historic fuelbreak (FB1) on the western edge of Area B is currently about 50m wide and would benefit from maintenance or restoration with traditional and medicinal plants as heavy spruce regeneration is present. The historic fuelbreak (FB2) to the north near the dump does not require re-treatment currently as it is mostly aspen.

Treatment Unit TU-4 encompasses part of a 2023 dozer guard. To ensure their continued effectiveness, the dozer guard should be regularly maintained and kept accessible for vehicles, which are necessary for practical use by fire crews. For the proposed Treatment Units, it is recommended to consider implementing a **stand conversion** fuel treatment on the town-facing side of the dozer guard, transitioning to a deciduous species such as aspen or traditional and medicinal plants. This **stand conversion**, coupled with the dozer guard, would act as a fire guard lowering fire intensity. On the opposite side of the dozer guard, facing away from the AOI, it is recommended to implement **fuel abatement** treatments. This approach would lower fire risk while allowing firefighters to implement backburn operations effectively.

There is also a section of 2023 dozer guard directly east of the C6 subdivision which does not require reinforcement as there are FireSmart treatments adjacent to the guard.



Figure 8: Treatment units proposed in Area B of the AOI.

1.2.3 Area C – Mayo Airport

The area surrounding the Mayo airport supports a mixture of forests and values. To the north of the airport is mixed-wood forest with a high coniferous component and variety of lakes and wetlands (Figure 9). To the south of the airport is a residential area surrounded by a mixed-wood forests with a medium conifer component.

A cause for concern in the Mayo area is strong winds from the north during periods of high fire risk (as referenced in the *Mayo Community Wildfire Protection Plan*). The Mayo Airport runs linearly east-west acting as a large fuel break. It is recommended that the community consider maintaining the existing historic fuel break (FB-3) to the west of the airport from the 1970's adjacent to the airport. Maintenance of this fuel break and/or restoration with traditional or medicinal plants would provide a large linear break in fuels connecting from the Mayo River to the eastern edge of the airport. Considering that this treatment ties into a riparian area, exploring a **Stand Conversion** treatment is recommended. This approach would lower fire intensity and minimize potential damage to the riparian area.

The area south of the airport has existing **FireSmart** treatments in place. Monitoring and retreating these existing treatments at an appropriate time is essential to ensure continued effectiveness.

New **FireSmart** fuel treatment areas are proposed south of Galena Road to tie into the existing **FireSmart** treatments and the Silver Trail Rd (TU-5). Once completed, these treatments south of Galena Rd would provide a linear fuel treatment that would be utilized to protect the residential area from fires approaching from the southeast.

The historic fuelbreak (FB4) to the east, requires field verification and likely re-treatment or restoration to minimize any conifer regeneration.

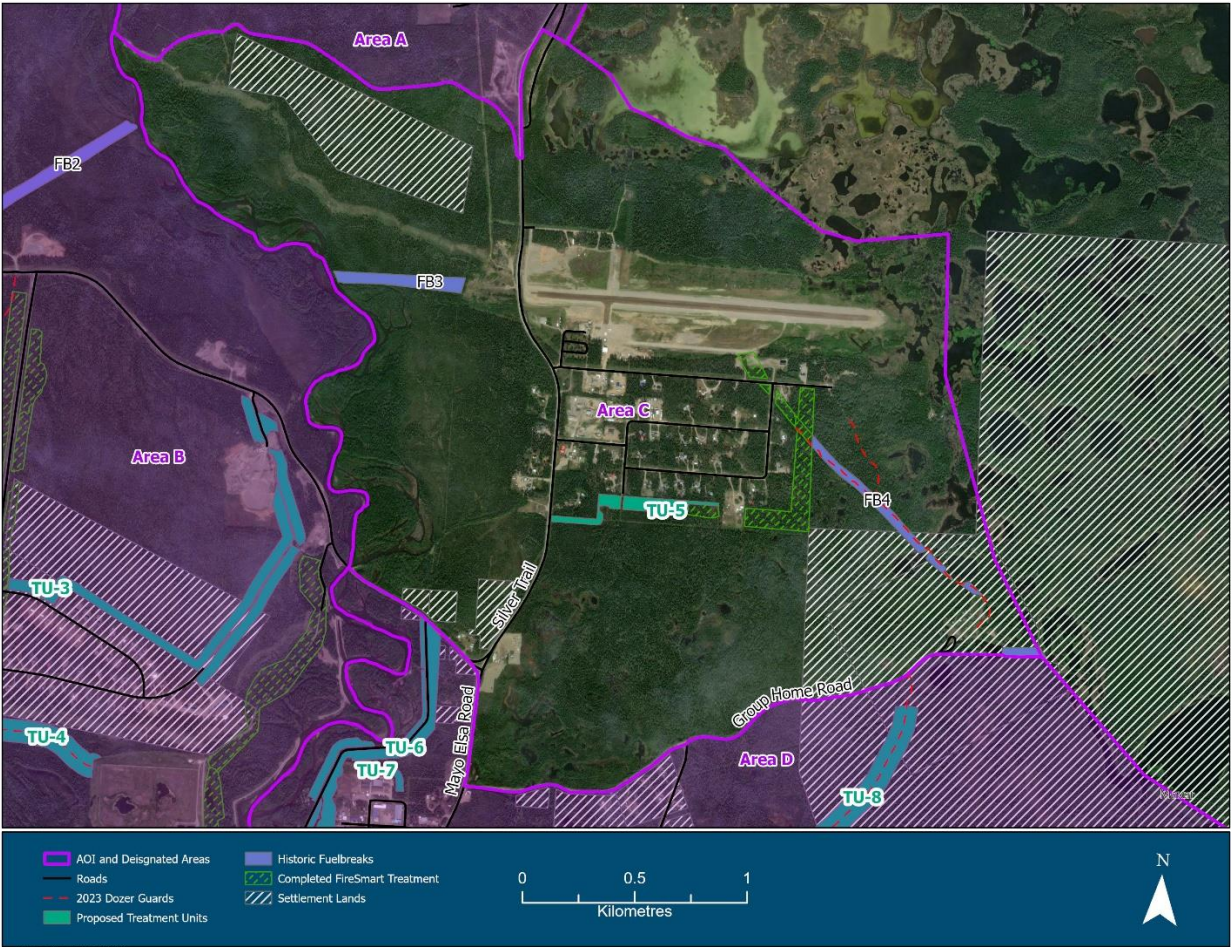


Figure 9: Treatment units proposed in Area C of the AOI.

1.2.4 Area D – Mayo Central

The Mayo central area, housing the Village of Mayo, is bordered to the south by the Stewart River and to the west by the Mayo River. This region is surrounded by mixed-wood forests with varying conifer content, ranging from low to high. Two primary egress routes, Dyke Road on the western side of town and Mayo Elsa Road connect to the Silver Trail Highway.

Existing **FireSmart** treatments are already in place in the Mayo area, and it is crucial to monitor and retreat these treatments at appropriate intervals to ensure continued effectiveness (Figure 10).

Fuel treatments were delineated along Dyke Road, a key egress route from town that would be utilized in the event of a fire (TU-6). This area takes precedence over Mayo Elsa Road fuel treatment area due to overgrown vegetation encroaching on Dyke Road, rendering it unsafe in its current state during a wildfire event as an egress route. Treatment recommendations include clearing vegetation along Dyke Road and to create a 5-30 meter treatment strip along either side of the road.

The area surrounding the Yukon College Mayo Campus and the Mayo Community Center, identified as high-value assets to the community, also received recommendations for **FireSmart** treatments to enhance their protection (TU-7).

Treatment Units TU-8 and TU-9 encompass 2023 dozer guards. To ensure their continued effectiveness, the dozer guards should be regularly maintained and kept accessible by vehicles, which are necessary for practical use by fire crews. For the proposed Treatment Units, it is recommended to consider implementing a **stand conversion** fuel treatment on the town-facing side of the fire guard, transitioning to a deciduous species such as aspen, traditional or medicinal plants. This **stand conversion**, coupled with the fire guard, would act as a fuel break lowering fire intensity.

On the opposite side of the fire guard, facing away from the AOI, it is recommended to implement **fuel abatement** treatments. This approach would lower fire risk while allowing firefighters to implement backburn operations effectively.

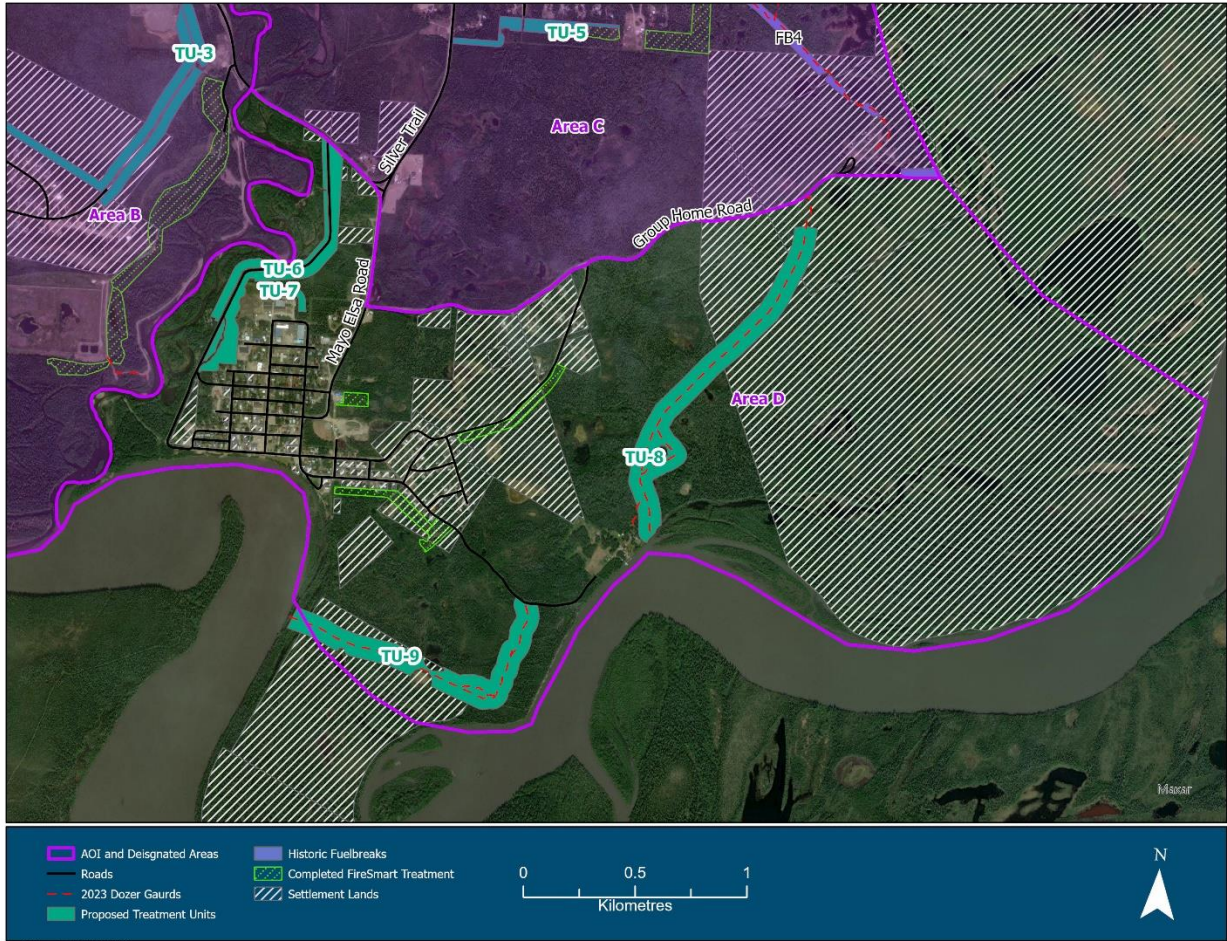


Figure 10: Treatment units proposed in Area D of the AOI.

1.3 Summary of Treatments

Below is a table summary and a map (Figure 11) of all of the proposed treatments in each treatment area. Next steps would be to potentially prioritize the treatments for scheduling.

Table 1: Treatment proposed in the AOI

Treatment Area A – 5 Mile Lake		Area (ha)	Priority
- TU 1	FireSmart treatment.	3.3	
- TU 2	FireSmart treatment.	5.8	
Treatment Area B – C6 Subdivision			
- TU-3	FireSmart treatment and fuelbreak 10-20m wide to north.	14.8	
- TU-4	Maintain dozer guard, fuel treatment and stand conversion on town side of guard. Fuel treatment on opposite side of dozer guard.	7.0	
- 2023 Dozer Guards	Requires long term maintenance to serve as access or egress for emergency personnel. In the event of additional development in this area, new fuel breaks should be established including a fire guard down to mineral soil.	-	
- Existing fuelbreaks FB1 and FB2 west and north	FB1 requires maintenance removal of conifer, FB2 fuelbreak is mostly aspen.	3.2 & 4.0	
Treatment Area C – Mayo Airport			
- Existing historic fuelbreaks FB 3 and FB4 west and east of airport	Maintenance removal of conifer, consider stand conversion.	3.0 & 4.0	
- Existing FireSmart treatments	Plan for re-treatment	11.6	
- TU-5	FireSmart treatment to tie into existing FireSmart treatments south of Galena Road.	3.1	
Treatment Area D – Mayo Central			
- Existing FireSmart treatments	Plan for re-treatment.	5.6	
- TU-6	Fuelbreak 5-30m on either side of the Dyke Road.	9.5	
- TU-7	FireSmart treatment.	0.7	
- TU-8 and TU-9	Maintain 2023 dozer guard, fuel treatment and stand conversion on town side of guard. Fuel treatment on opposite side of dozer guard.	18.3 & 14.0	

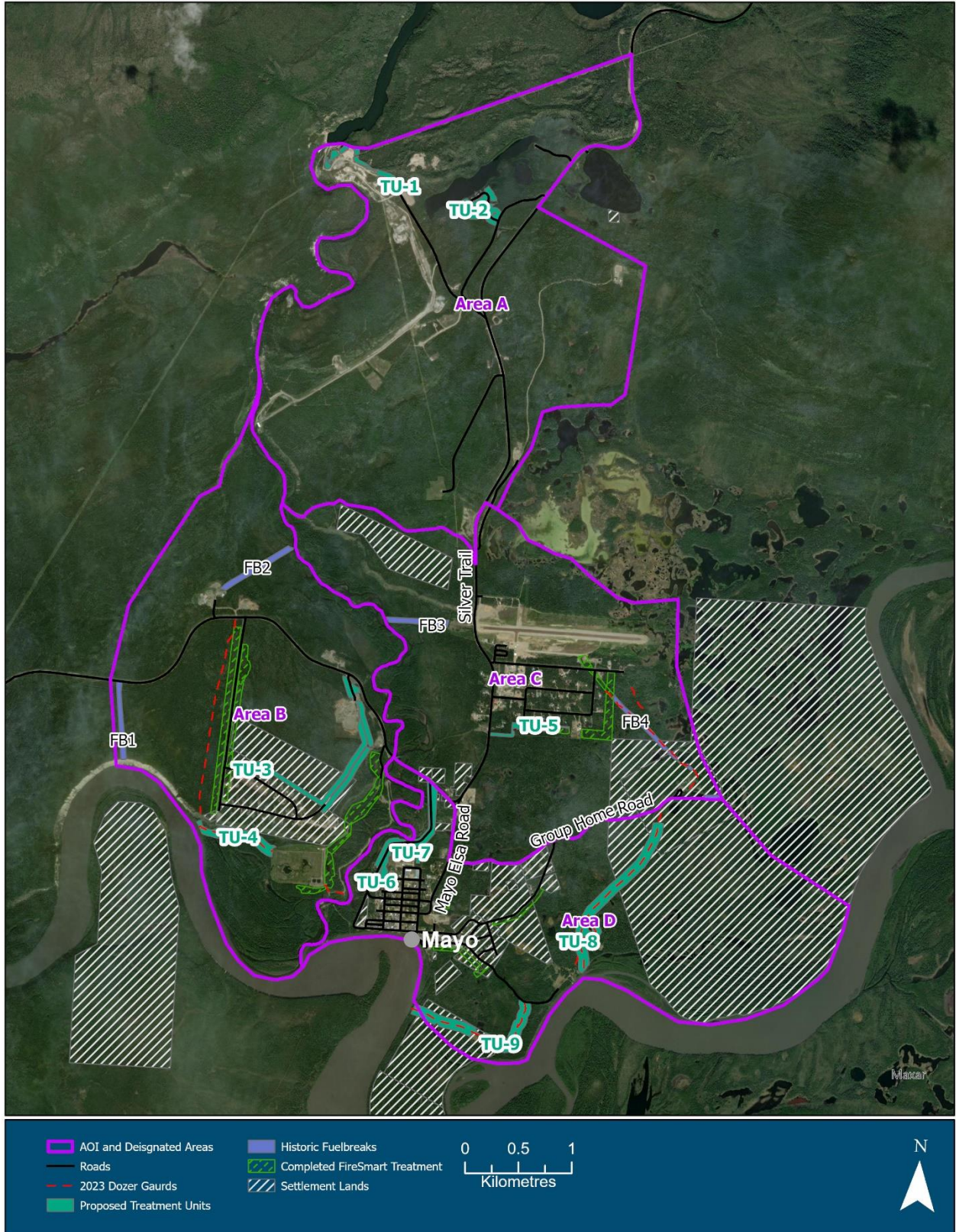


Figure 11: Overview of all treatment units proposed in around Mayo within the AOI.