City of Yellowknife
Community Wildfire Protection Plan Review

Prepared for:

City of Yellowknife

GNWT Forest Mgt Division

Northwest Territories Environment and Natural Resources

March 2019

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1 Introduction

The City of Yellowknife is a wildland/urban interface community. The term "wildland/urban interface" is used to define areas where combustible wildland fuels are found adjacent to human development and wildfires have the potential to interact with that development (PIP, 2003).

The Yellowknife Community Wildfire Protection Plan (CWPP) (Walkinshaw, 2012) was developed based on current FireSmart best practices. The Plan evaluated wildfire hazard and risk and provided recommendations to reduce the wildfire threat to wildland/urban interface development based on the seven disciplines of wildland/urban interface.

1. Vegetation Management
2. Development
3. Legislation
4. Public Education and Engagement
5. Inter-Agency Cooperation
6. Cross-Training
7. Emergency Planning

The City of Yellowknife and GNWT Environment and Natural Resources, Forest Management Division (ENR) have implemented some of the CWPP recommendations and have identified the need to update the CWPP based on current FireSmart best practices to:

- Update the wildfire hazard assessment;
- Review FireSmart mitigation accomplishments, and;
- Set new FireSmart implementation priorities for the next five-year period.

This CWPP review:

- Evaluates the progress of recommendation accomplishments from the 2012 plan;
- Updates the wildfire hazard assessment based on the new FireSmart Wildfire Exposure Assessment Tool (FireSmart Canada, 2018), and;
- Provides updated recommendations for each of the seven-disciplines of wildland/urban interface.

While implementation of FireSmart mitigative options will **reduce** the threat of wildfire to structures, it will never **remove** the threat.

This plan should be reviewed and updated at approximately **five-year intervals or earlier**, based on progress, to ensure it is based on current conditions.

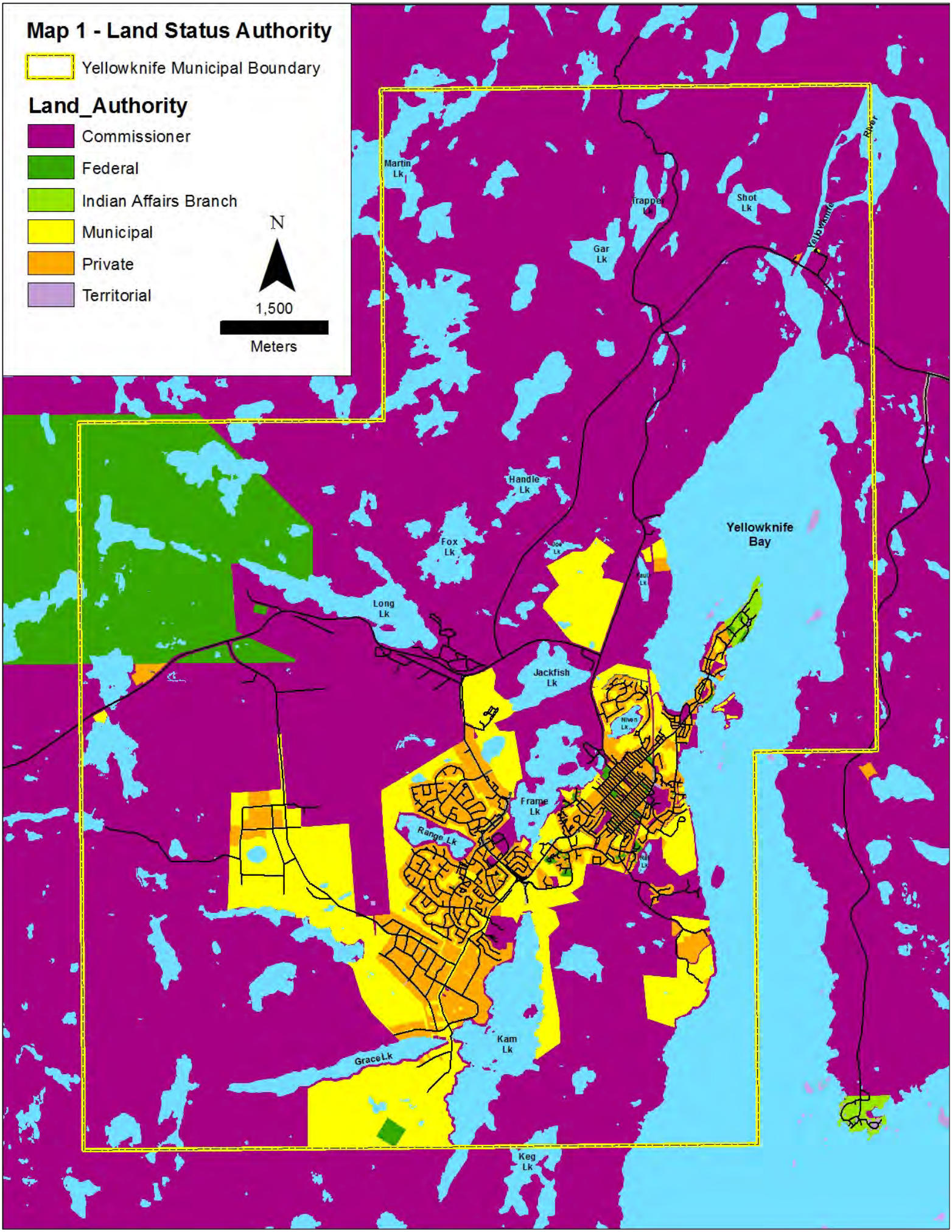
2 Planning Area

The planning area includes all lands within the City of Yellowknife boundary. Lands within the Yellowknives Dene First Nation are not included in the planning area for the Yellowknife Community Wildfire Protection Plan.

Land status authority is represented by the following (Map 1):

- Commissioner
- Federal
- Municipal
- Private

Land status authority within the developed area is primarily private or municipal. Lands adjacent to the developed areas are primarily Commissioner lands with smaller parcels under the authority of the Federal government.


Map 1 - Land Status Authority
Yellowknife Municipal Boundary
Land_Authority
Commissioner
Federal
Indian Affairs Branch
Municipal
Private
Territorial
N
1,500
Meters
Martin Lk
Trapper Lk
Shot Lk
Gar Lk
Yellowknife River
Handle Lk
Fox Lk
Yellowknife Bay
Long Lk
Jackfish Lk
Niven Lk
Frame Lk
Range Lk
Kam Lk
Grace Lk
Keg Lk

3 FireSmart Mitigation Accomplishments

A progress status review of the recommendations in the Yellowknife Community Wildfire Protection Plan (2012) was completed with City of Yellowknife and GNWT Environment and Natural Resources, Forest Management Division personnel.

2012 Recommendation	2019 Status
Recommendation 1: Encourage residents to establish adequate Zone 1 defensible space around their structures.	**Not Completed.**
Recommendation 2: Zone 2-3 fuels reduction and maintenance is the responsibility of the Land Status Authority holder(s) and should be implemented based on the priorities identified in this plan.	**In-Progress** - 3.2 hectares of 113 ha of recommended Priority A vegetation management completed from 2015 to present.
Recommendation 3: Ensure that all existing fuel modification projects are inspected on a regular basis and maintained as necessary to ensure fuel modification effectiveness. Maintenance should be the responsibility of the land manager or landowner.	**Not Required Yet** - minimal vegetation management completed.
Recommendation 4: If a new development removes or reduces the effectiveness of any existing or proposed FireSmart mitigation measures or introduces new wildfire hazards, the area must be assessed and measures implemented to maintain the community protection standards.	**Not Completed** – Grace Lake North and South residential subdivisions developed without planning and implementation of adequate FireSmart mitigation measures resulting in neighbourhoods at Extreme threat to wildfire.
Recommendation 5: Recognize wildfire as a development constraint in the City of Yellowknife General Plan to ensure that wildfire is considered in the development planning process.	**Not Completed.**
Recommendation 6: Request Developers to provide a Wildfire Risk Assessment, developed by a qualified professional, for any new developments located in High or Extreme hazard areas.	**Not Completed.**
Recommendation 7: Revise the City of Yellowknife Zoning By-law to include FireSmart best-practices.	**Not Completed.**

2012 Recommendation	2019 Status
Recommendation 8: Public education on acceptable FireSmart Zone 1 standards and evacuation planning is recommended for all residents.	**In-Progress** – some public education done in 2014 and FireSmart home assessments planned for perimeter communities in 2019.
Recommendation 9: Develop a FireSmart Committee, consisting of all relevant stakeholders, to coordinate and lead the FireSmart program for the area.	**Not Completed.**
Recommendation 10: The Yellowknife Fire Department and GNWT MACA & ENR should partner on cross-training initiatives to ensure emergency responders are cross-trained to the following minimum standards: ▪ Wildland Firefighter ▪ Structure and Site Preparation Workshop (S-115) ▪ Fire Operations in the Wildland/Urban Interface (S-215) ▪ Incident Command System (I-100 to I-400) as applicable	**In-Progress.** ▪ Sprinkler workshop provided at NWT Fire Chiefs Association AGM in 2013. ▪ Yellowknife Fire Department provided response personnel and apparatus to the 2016 Reid Lake wildland/urban interface fire. ▪ Some Fire department officers have attended Wildland Fire Fighting (NFPA1051 Level I) training.
Recommendation 11: Develop a Community Wildfire Pre-Plan for the community to provide greater operational detail to emergency responders during a wildland/urban interface incident.	**In-Progress** – Yellowknife Fire Department is currently developing a pre-plan for wildland/urban interface response with Yellowknife.

4 Hazard & Risk Assessment

Wildfire risk assessment uses wildfire incidence and wildfire hazard assessment uses historic fire weather data and wildland fuel types to analyze wildfire behaviour potential.

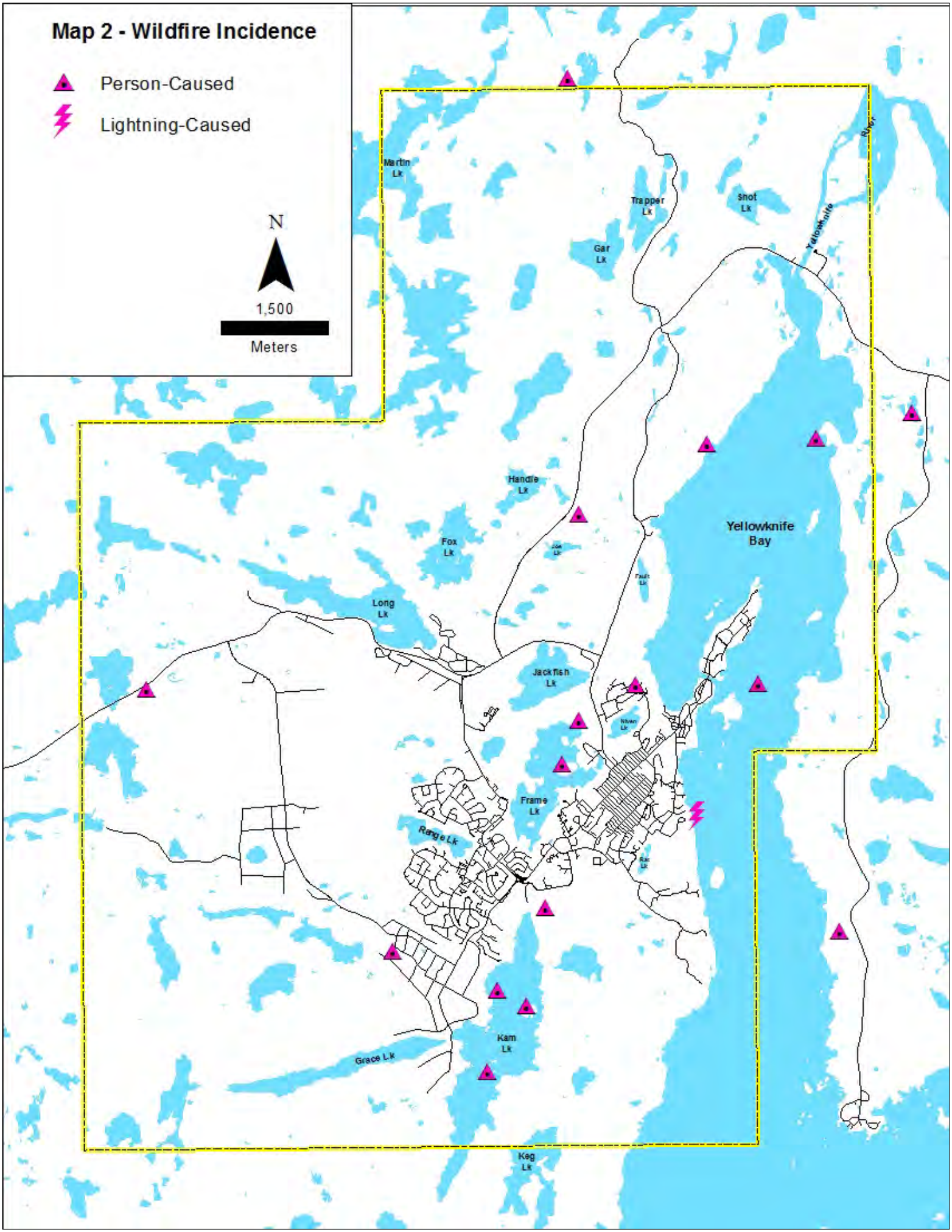
4.1 Wildfire Risk Assessment

Wildfire risk was assessed using historical fire data from GNWT Environment and Natural Resources (ENR) for the ten-year period from 2009 to 2018.

Fourteen wildfires were discovered within the City of Yellowknife boundary, 93% (13) were person-caused and 7% (1) were lightning-caused. An additional eighteen wildfires were discovered within a 10 kilometre radius of the Yellowknife boundary, 72% (13) were person-caused and 28% (5) were lightning-caused (Map 2). The City of Yellowknife Fire Department reports that they respond to numerous abandoned campfires each year, particularly in the Tin Can Hill, sand pits, legislative assembly, and hospital areas.

Note: City of Yellowknife wildfires are not shown on Map 2.

The risk of wildfire in the planning area exists and most frequently occurs in areas accessible to residents and recreating public.


Map 2 - Wildfire Incidence
Person-Caused
Lightning-Caused
N
1,500
Meters
Martin Lk
Trapper Lk
Shot Lk
Gar Lk
Yellowknife River
Handle Lk
Fox Lk
Yellowknife Bay
Long Lk
Jackfish Lk
Frame Lk
Range Lk
Kam Lk
Grace Lk
Keg Lk

4.2 Wildfire Hazard Assessment

Wildfire behaviour potential is used to quantify wildfire hazard within the City of Yellowknife and can be used to identify wildfire threat for existing and new development areas and to assist with prioritizing areas for FireSmart vegetation management and/or public education programs. Wildfire behaviour potential will require regular revision based on changes to wildland vegetation conditions within and surrounding Yellowknife.

Structure ignition from wildfires occurs as a result of radiant heat/direct flame impingement, short-range spotting, and/or long-range spotting. Structure ignition from radiant heat/direct flame impingement occurs where hazardous fuels are located at distances less than 30 metres from structures, from short-range spotting where hazardous fuels are located at distances less than 100 metres from structures, and from long-range spotting where hazardous fuels are located at distances less than 500 metres from structures (Beverly et.al., 2010). The FireSmart Wildfire Exposure Assessment Tool (FireSmart Canada, 2018) is used to identify which Yellowknife neighbourhoods are exposed to wildfire ignition potential and which surrounding wildland fuels are causing the exposure in these locations. Hazardous fuels within 100 metres from the "built environment" are identified for priority FireSmart vegetation management treatments.

Wildfire behaviour potential uses Territorial fire-weather data and wildland fuel types (Map 3) to analyze probable wildfire behavior potential and threat to development from direct flame impingement, radiant heat, and/or short and long-range ember transport (Beverly, 2010).

- Fire weather data for a fifteen-year period (2004-2018) from Yellowknife is used to determine average number of "spread-event days" per year and the predominant wind direction and speed on those days. A "spread-event" day is defined as "a day when the fire actively spreads with high intensity" which corresponds to a Fire Weather Index value of 19 or higher (Very High or Extreme fire danger) (Podur & Wotton, 2011).
- Fuel types from satellite imagery analysis and field inspections and the GNWT fire behaviour prediction (FBP) fuel grid were used.

Fire behaviour potential classes are assigned to each fuel type (Table 1 and Map 4) based on expected fire intensity and rate of spread on "spread-event" days.

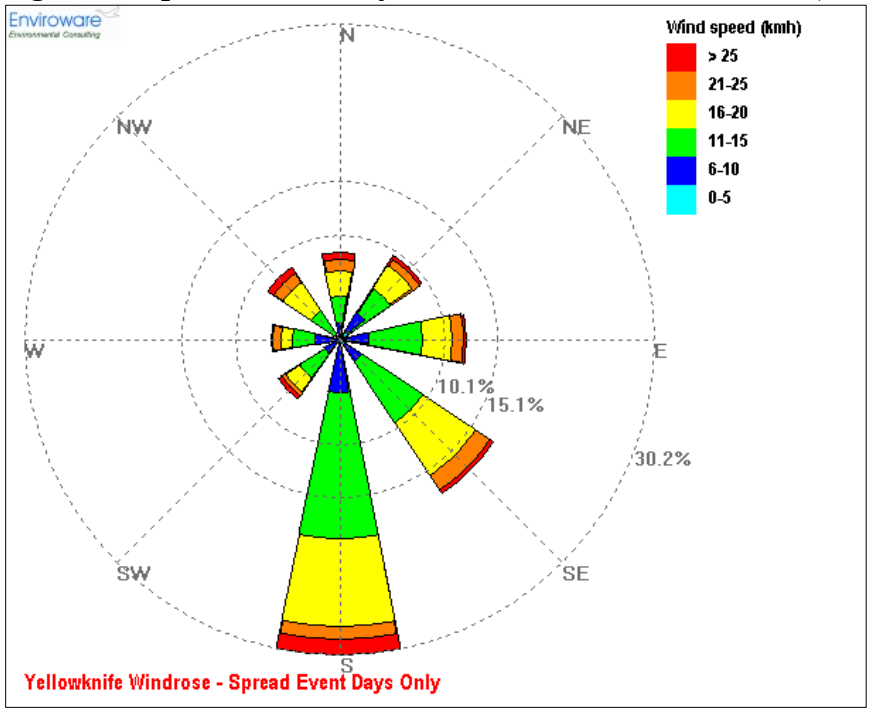
Table 1: Wildfire Behaviour Potential for Wildland Fuel Types

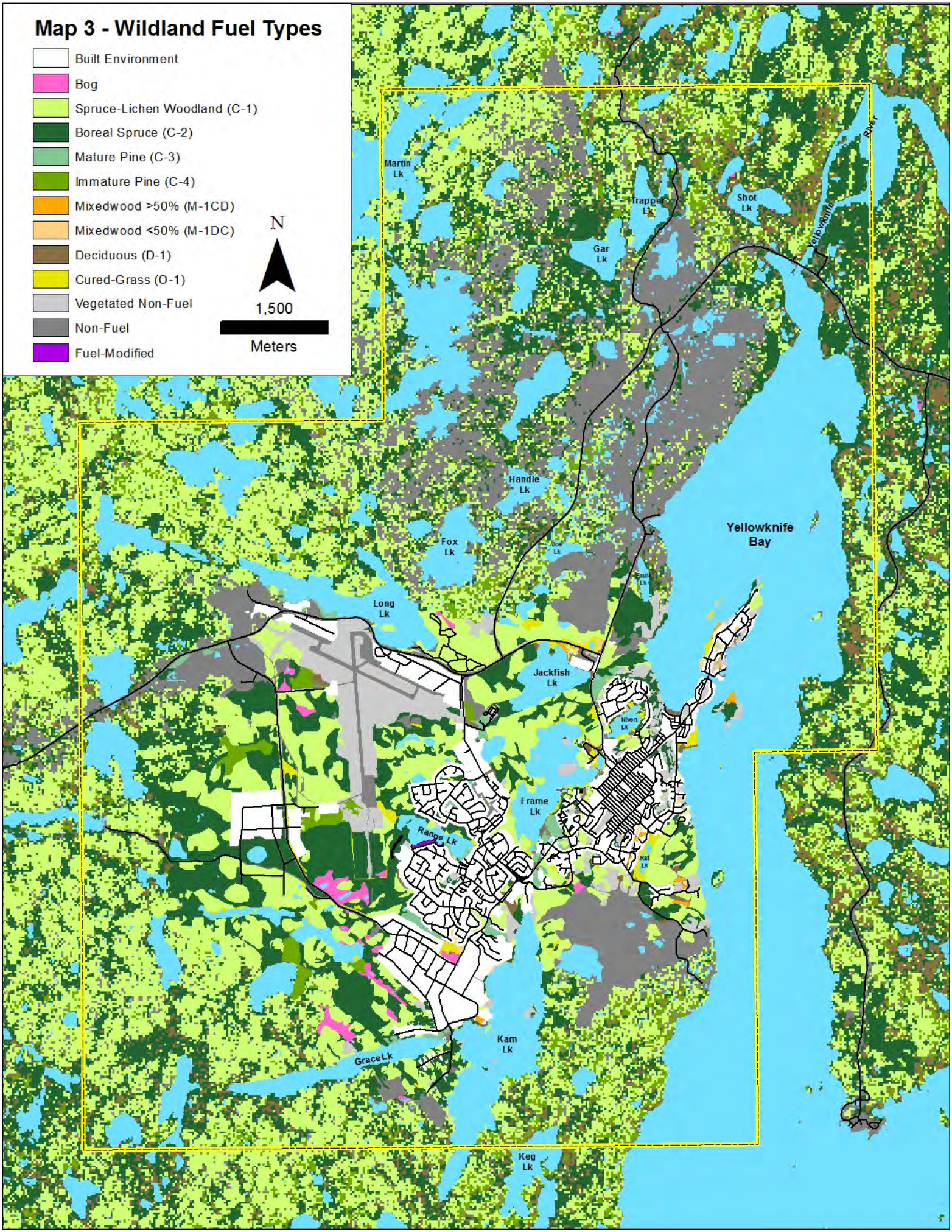
Wildland Fuel Type (Map 3)	Wildfire Behaviour Potential Class (Map 4)
Boreal Spruce (C-2)	Extreme
Mature Pine (C-3)	Extreme
Immature Pine (C-4)	High
Mixedwood >50% Coniferous (M-1CD)	High
Spruce-Lichen Woodland (C-1)	Moderate - High
Mixedwood <50% Coniferous (M-1DC)	Moderate
Cured-Grass (O-1)	Moderate
Deciduous (D-1)	Low
Bog	Low
Vegetated Non-Fuel (VNF)	Low

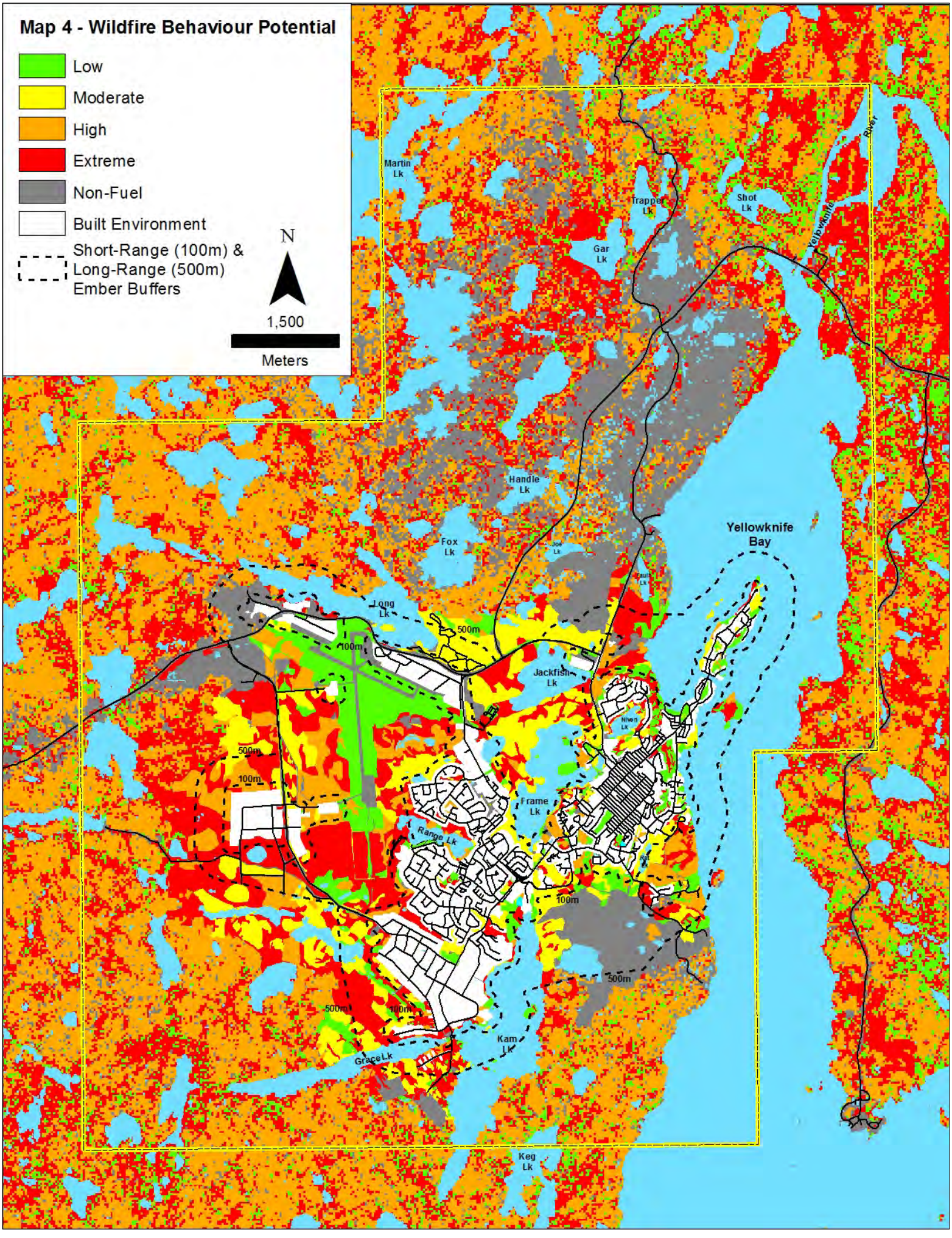
Wildfire behaviour potential analysis indicates:

- There are approximately 35 days per year with Very High or Extreme fire danger levels (FWI>=19) and winds on those days are predominantly from the south and southeast (Figure 1).
- Combustible wildland fuels on the south, north, and west perimeters of the urban developed areas present High-Extreme landscape-level wildfire threat to perimeter developments.
- Combustible wildland fuels within the urban developed area are confined to smaller occluded patches except for larger tracts on Tin Can Hill and surrounding Frame Lake.

Figure 1: Spread-Event Day Predominant Wind Direction (Yellowknife 2004-2018)




Map 3 - Wildland Fuel Types
Built Environment
Bog
Spruce-Lichen Woodland (C-1)
Boreal Spruce (C-2)
Mature Pine (C-3)
Immature Pine (C-4)
Mixedwood >50% (M-1CD)
Mixedwood <50% (M-1DC)
Deciduous (D-1)
Cured-Grass (O-1)
Vegetated Non-Fuel
Non-Fuel
Fuel-Modified
N
1,500
Meters
Martin Lk
Trapper Lk
Shot Lk
Gar Lk
Handle Lk
Fox Lk
Yellowknife Bay
Long Lk
Jackfish Lk
Niven Lk
Frame Lk
Range Lk
Rat Lk
Kam Lk
Grace Lk
Keg Lk

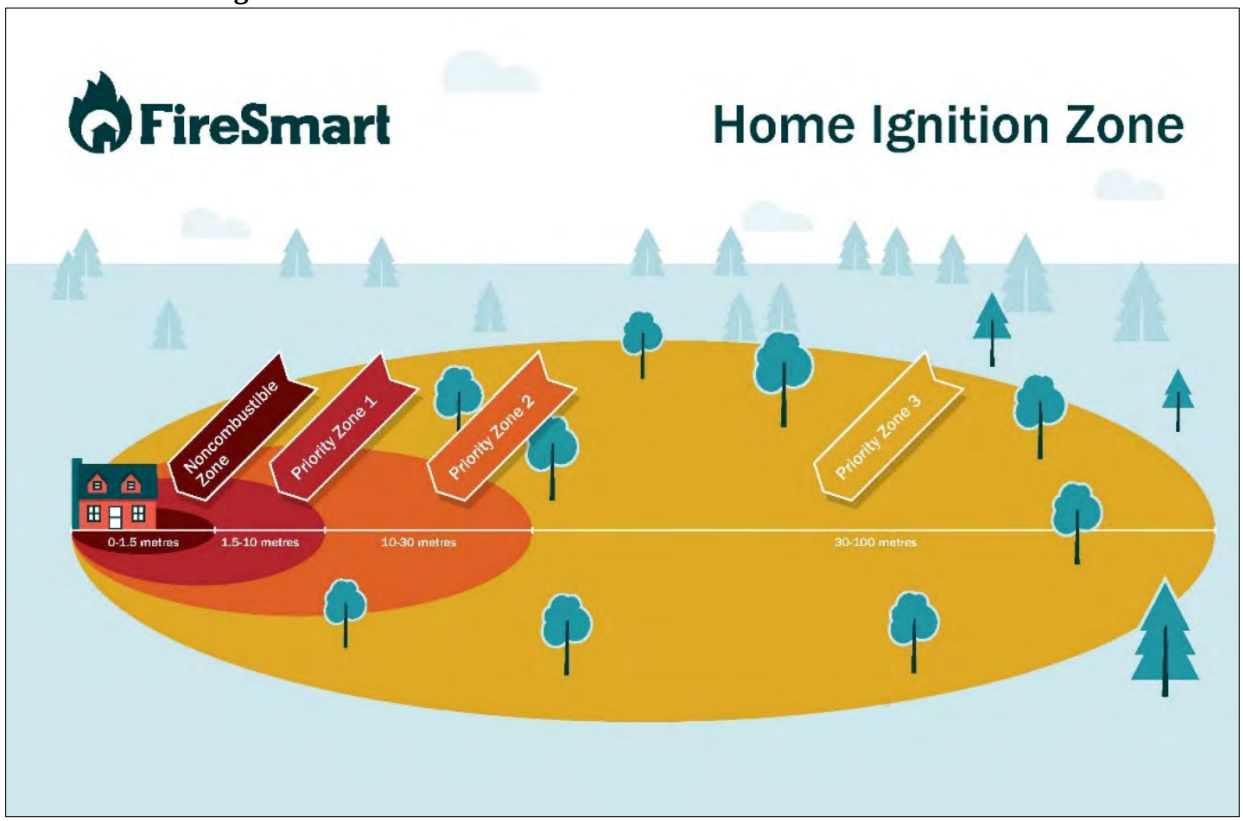

Map 4 - Wildfire Behaviour Potential
Low
Moderate
High
Extreme
Non-Fuel
Built Environment
Short-Range (100m) & Long-Range (500m) Ember Buffers
N
1,500
Meters
Martin Lk
Trapper Lk
Shot Lk
Gar Lk
Yellowknife River
Handle Lk
Fox Lk
Yellowknife Bay
Long Lk
Jackfish Lk
Niven Lk
Frame Lk
Range Lk
Kam Lk
Grace Lk
Keg Lk
100m
500m

5 Vegetation Management Options

The goal of vegetation management is to create a fuel-reduced buffer between structures and flammable wildland vegetation to reduce the intensity and rate of spread of wildfire approaching or leaving the development. Vegetation management options are proposed to reduce the threat of wildfire to developed areas however **they do not ensure structure survival under all hazard conditions.**

FireSmart standards refer to four Priority Zones with vegetation management for interface structures recommended in the Non-Combustible Zone and Zones 1 and 2 at a minimum and in Zone 3 based on hazard and risk.

FireSmart Home Ignition Zone



FireSmart Home Ignition Zone

Non-Combustible Zone extends from the structure and all attachments a minimum of 1.5 metres in all directions and **consists of completely non-combustible materials** (gravel/rock, pavement, irrigated/maintained green lawn).

Priority Zone 1 extends from the edge of the Non-Combustible Zone (1.5m) to 10 metres in all directions from the structure and **consists of an environment that will not support any wildfire spread**.

FireSmart **Priority Zone 1** vegetation management options to reduce the wildfire threat to structures may include:

- **Removal** of all flammable forest vegetation in the immediate area of the structure and **reduction** of flammable forest vegetation away from the immediate area of the structure.
- **Pruning** of all limbs to a minimum height of 2 metres from ground level on residual evergreen trees.
- **Establishment** of a non-combustible surface cover **including removal of flammable ornamental landscaping species and bark mulch.**
- **Removal** of all dead and down forest vegetation.
- **Removal** of all combustible material piles (firewood, lumber, etc.) within 10 metres of the structure.
- Regular **maintenance** to ensure that all combustible needles and leaves are removed and annual grasses are mowed to less than 10 centimetres.

Priority Zones 2 and 3 extend from the edge of Priority Zone 1 (10m) to 30 metres (Zone 2) and 100 metres or farther (Zone 3). FireSmart guidelines recommend **reduction** of combustible wildland fuels in Zones 2 and 3, based on hazard and risk, with the objective to **create an environment that will only support fires of lower intensity and rate of spread**.

FireSmart **Priority Zone 2-3** vegetation management options include:

- **Thinning and/or removal** of flammable forest vegetation.
- **Pruning** of all limbs to a minimum height of 2 metres from ground level on residual evergreen trees.
- **Removal** of all dead and down forest vegetation from the forest floor.
- Regular **maintenance** to ensure that all flammable regrowth, dead and down and dead standing are removed.

5.1 Priority Zone 1

Most Yellowknife structures have adequate Priority Zone 1 standards. Some homes have inadequate Priority Zone 1 standards due to forest fuels and/or cured-grass on private and/or Municipal and Territorial lands within 10 metres of the structure. Some homes have firewood piles immediately adjacent to or underneath the structure increasing the threat of ignition from wildfire.

Adequate Priority Zone 1 Standards

Inadequate Priority Zone 1 Standards

Inadequate Combustible Storage

Recommendation 1: Educate and encourage all Yellowknife residents to establish FireSmart recommended guidelines for the Non-Combustible Zone and Priority Zone 1 within 10 metres of their structures.

5.2 Priority Zones 2-3

5.2.1 Completed Vegetation Management

The City of Yellowknife has completed 2.4 hectares of fuel reduction and 0.7 hectares of fuel removal and ENR has completed 0.1 hectares of fuel reduction for a total of 3.2 hectares completed since 2015 (Map 5).

Parker Park Fuel Removal – 2016

Range Lake South Fuel Reduction - 2018

Matonabee St. Fuel Reduction - 2015

5.2.2 Proposed Vegetation Management

Proposed vegetation management units have been identified on Municipal and Territorial lands and include (Table 2 & Map 5):

- Units identified in the previous CWPP (2012) but not yet completed;
- New units based on recent development;
- New units in occluded patches within developed areas.

General FireSmart recommended guidelines for fuels reduction and fuels removal are provided below.

Fuels Reduction:

- Thin spruce and pine to achieve 2-3 m crown spacing.
- Remove deciduous shrub understory.
- Remove all dead standing and dead & down coniferous and deciduous.
- Retain all live deciduous overstory stems.
- Prune limbs to 2 metres above ground-level.
- Dispose of all debris.

Fuels Removal:

- Remove all wildland fuels to provide a fuelbreak adjacent to development a **minimum** width of 50 metres.
- Dispose of all debris.

Proposed fuels management areas are conceptual at this time and will require detailed fuels reduction planning to identify fuels management prescription, unit boundaries, and operational constraints.

Vegetation management units are prioritized as Priority A, B, or C. Land managers should complete units by priority ranking however may complete lower priority units before higher priority units based on operational or budgetary considerations. Numbers following Priority Zone A areas (e.g. A1, A2, etc.) (Table 3) are only for unit identification and **do not** indicate priority ranking.

Priority	Comments
Priority A	▪ Highest priority. ▪ Located around community perimeter to reduce the threat of wildfire moving from the landscape into the community and/or for protection of critical infrastructure.
Priority B	▪ Moderate priority. ▪ Larger occluded patches of hazardous wildland fuels within communities with the potential to produce radiant heat and short-range ember potential.
Priority C	▪ Lowest priority. ▪ Small occluded patches of hazardous wildland fuels within communities with limited potential to produce short-range ember potential.

Table 2: Proposed FireSmart Vegetation Management by Priority and Land Authority.

Land Authority	No. of Hectares			Totals
	Priority A	Priority B	Priority C	
Municipal	133.5	10.7	11.7	**156.0**
Commissioner	75.3	7.1	6.3	**88.7**
Federal	0.2	0.0	0.0	**0.2**
Private	0.0	4.4	0.0	**4.4**
Totals	**209.0**	**22.2**	**18.0**	**249.2**

Table 3: Priority A Fuel Modification Areas

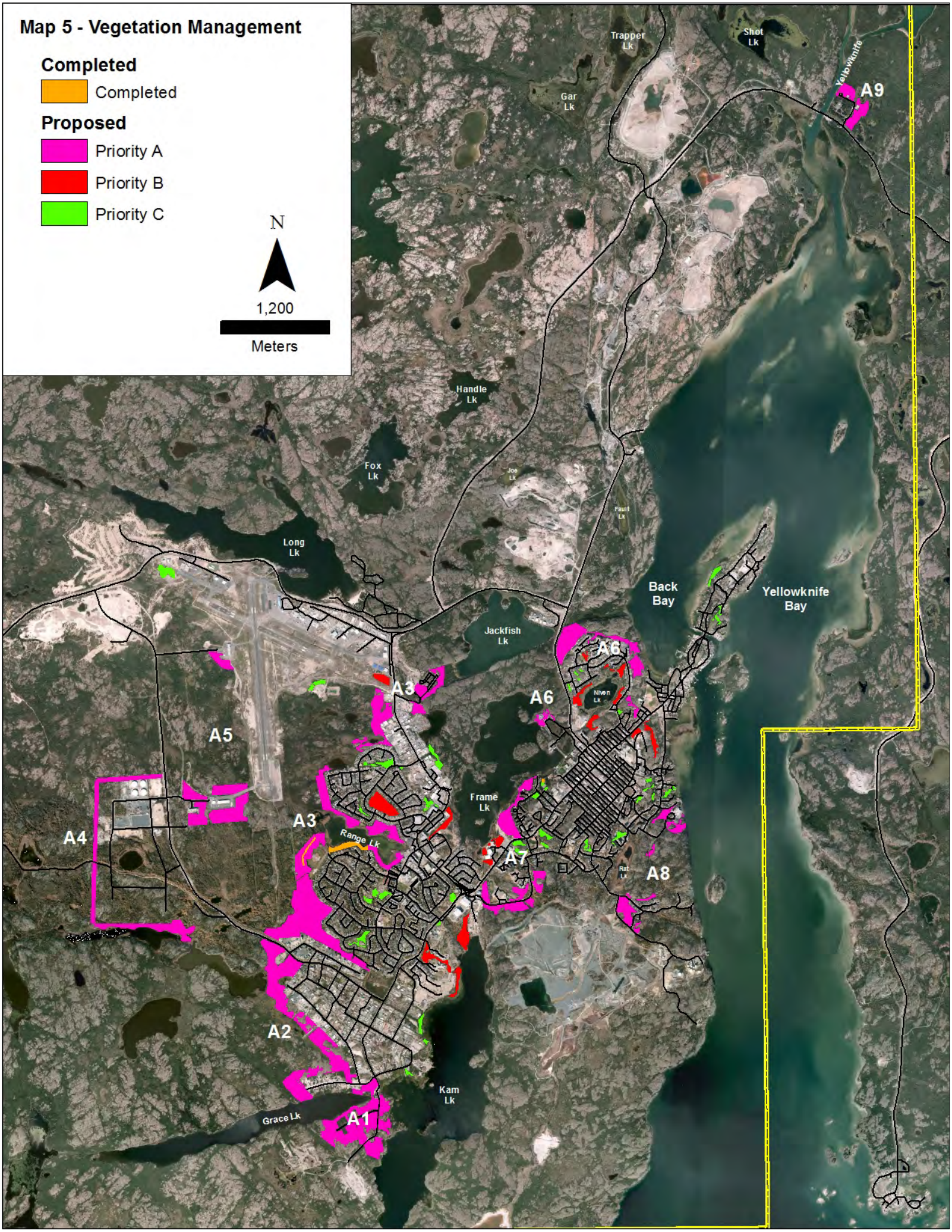
Priority Area	Vegetation Mgt. Type	Land Status	Approximate Area (Ha)
A1	Fuel Reduction	Municipal Commissioner	23.3
A2	Fuel Reduction	Municipal Commissioner	36.8
A3	Fuel Reduction	Municipal Commissioner	64.0
A4	Fuel Removal & Fuel Reduction	Municipal Commissioner	19.4
A5	Fuel Reduction	Commissioner	20.3
A6	Fuel Reduction	Municipal Commissioner	14.6
A7	Fuel Reduction	Municipal Commissioner Federal	16.1
A8	Fuel Reduction	Municipal Commissioner	8.6
A9	Fuel Reduction	Municipal Commissioner	5.9

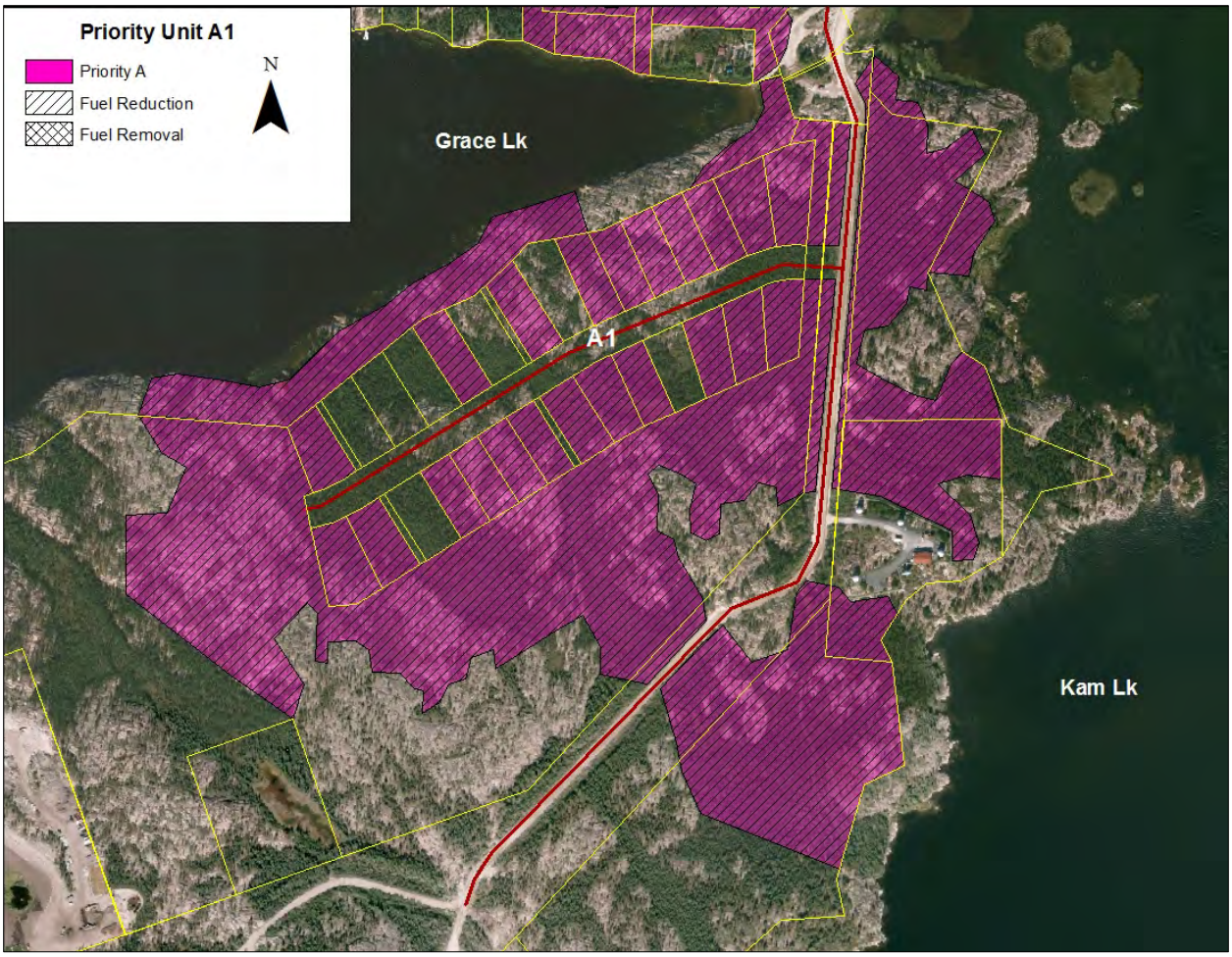
Recommendation 2: Complete proposed Zone 2-3 fuel reduction on Municipal and Territorial lands based on priority and funding.

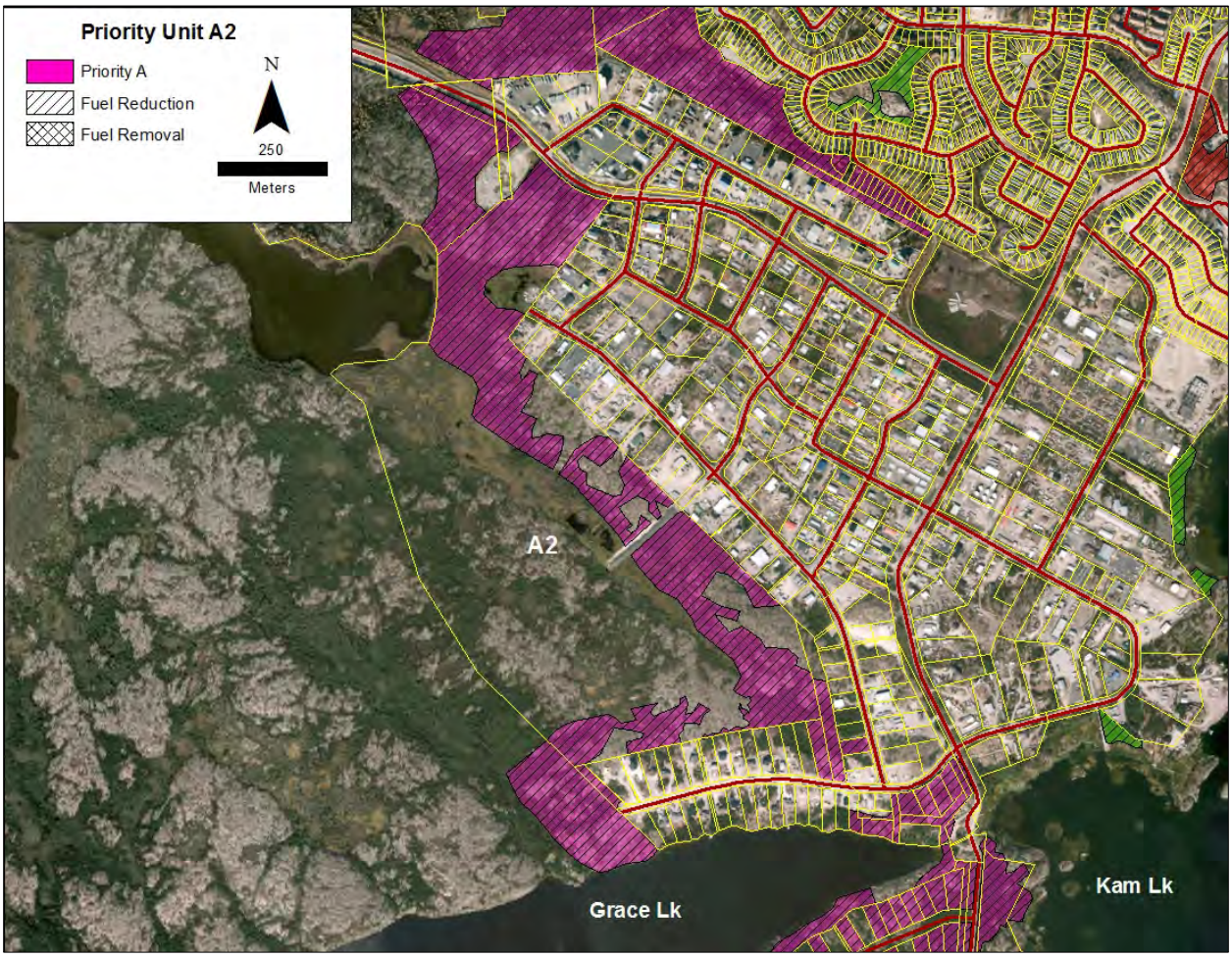
5.3 Vegetation Management Maintenance

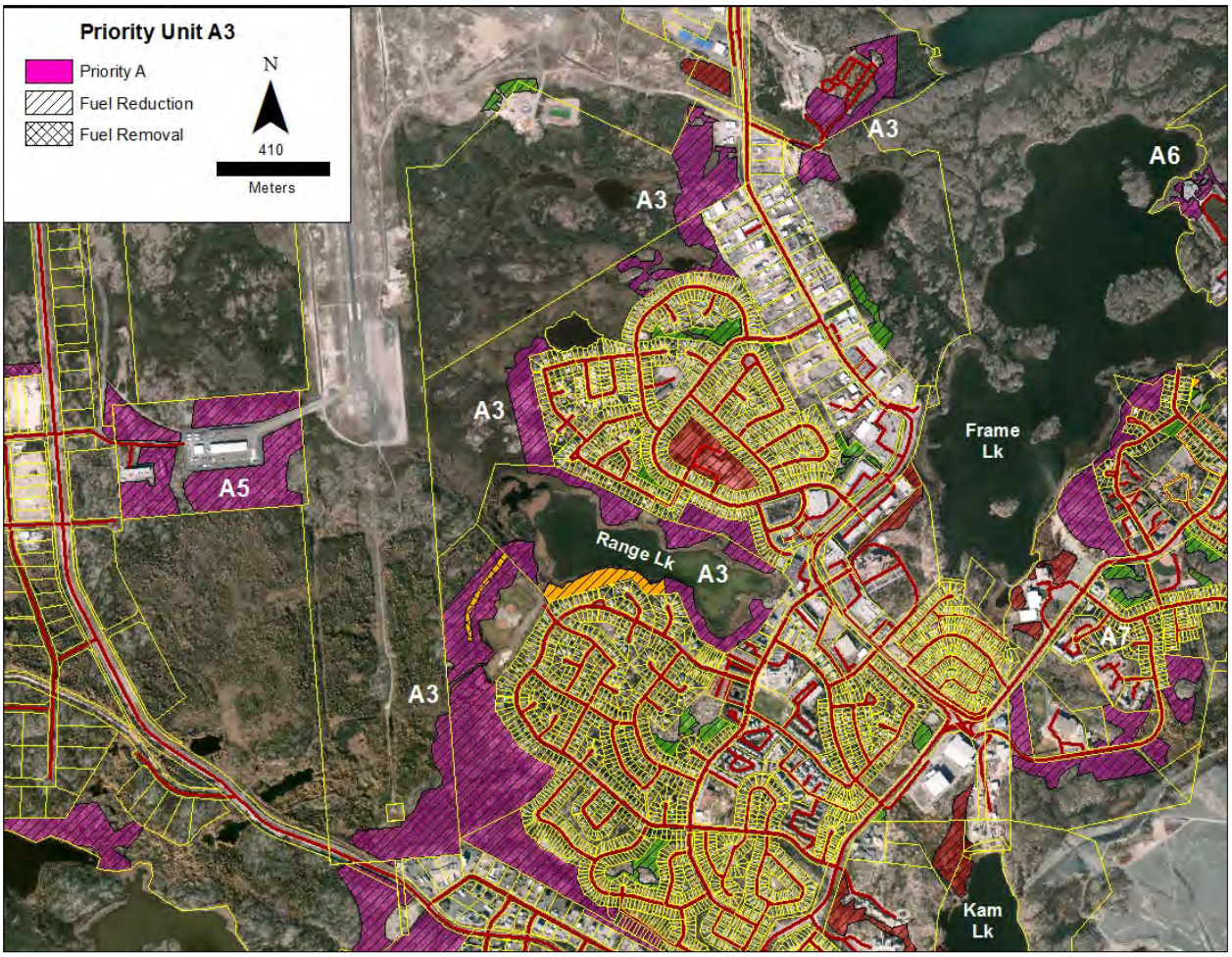
Completed Priority Zone 2-3 vegetation management blocks will require regular inspections and maintenance to ensure the future effectiveness of fuelbreaks. Completed units should be inspected every five years to determine maintenance needs.

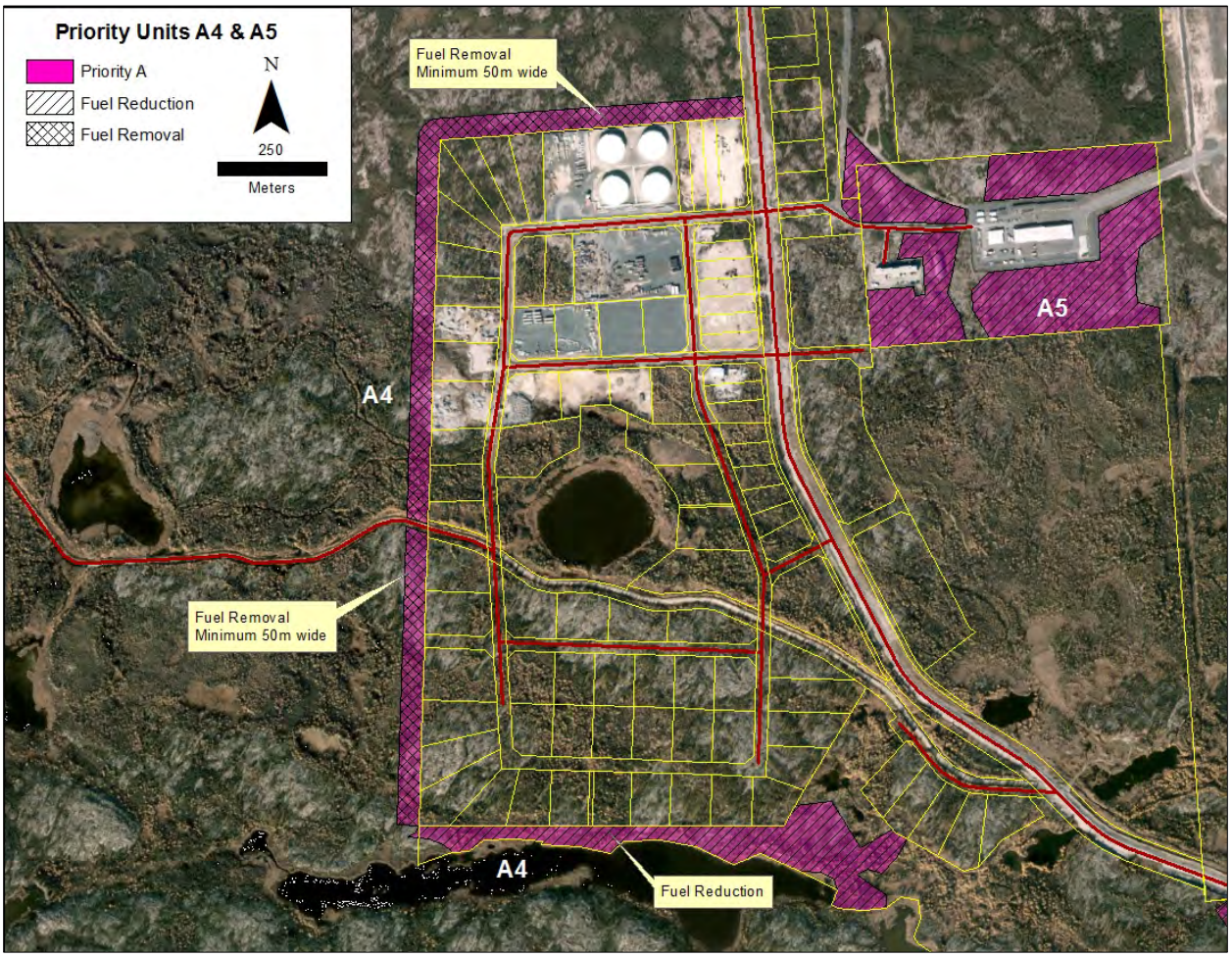
Recommendation 3: Conduct inspections of all completed fuelbreaks and implement maintenance for those that require it.

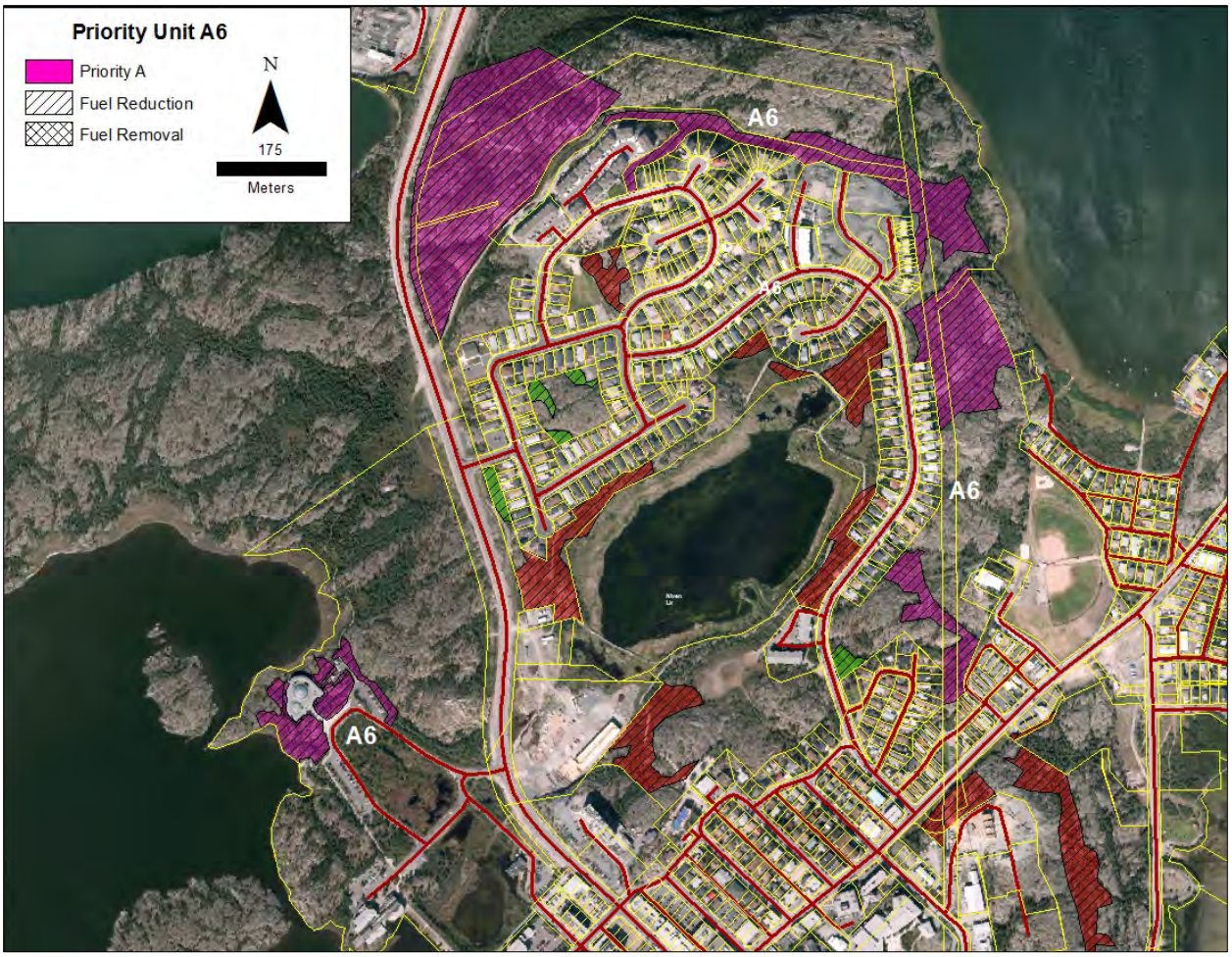

Map 5 - Vegetation Management
Completed
Completed
Proposed
Priority A
Priority B
Priority C
N
1,200
Meters
Trapper Lk
Shot Lk
Yellowknife
Gar Lk
A9
Handle Lk
Fox Lk
Joe Lk
Fault Lk
Long Lk
Back Bay
Yellowknife Bay
Jackfish Lk
A6
A3
A6
Niven Lk
A5
Frame Lk
A3
A4
Range Lk
A7
Rat Lk
A8
A2
Kam Lk
Grace Lk
A1

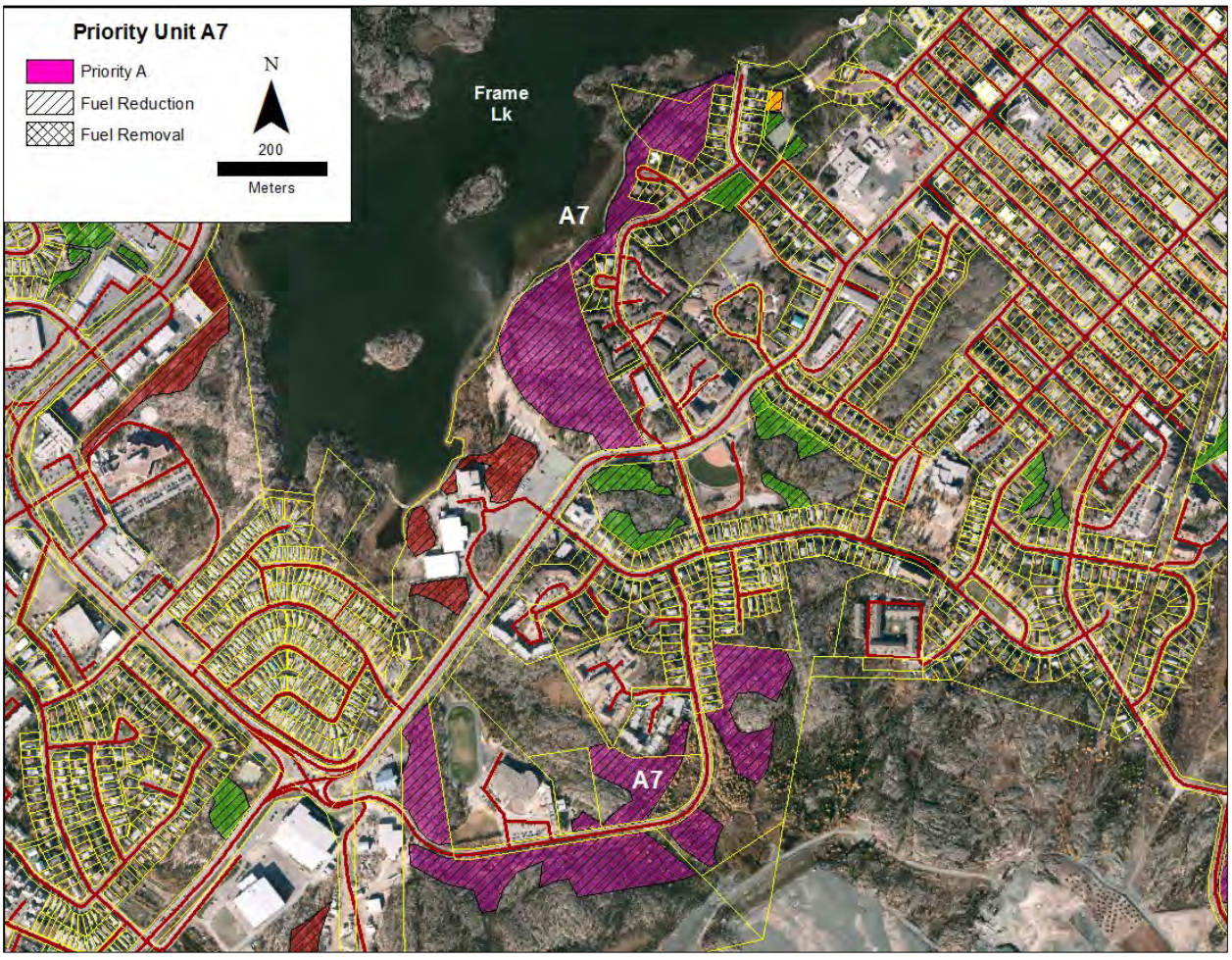

Priority Unit A1
Priority A
Fuel Reduction
Fuel Removal
N
Grace Lk
A1
Kam Lk

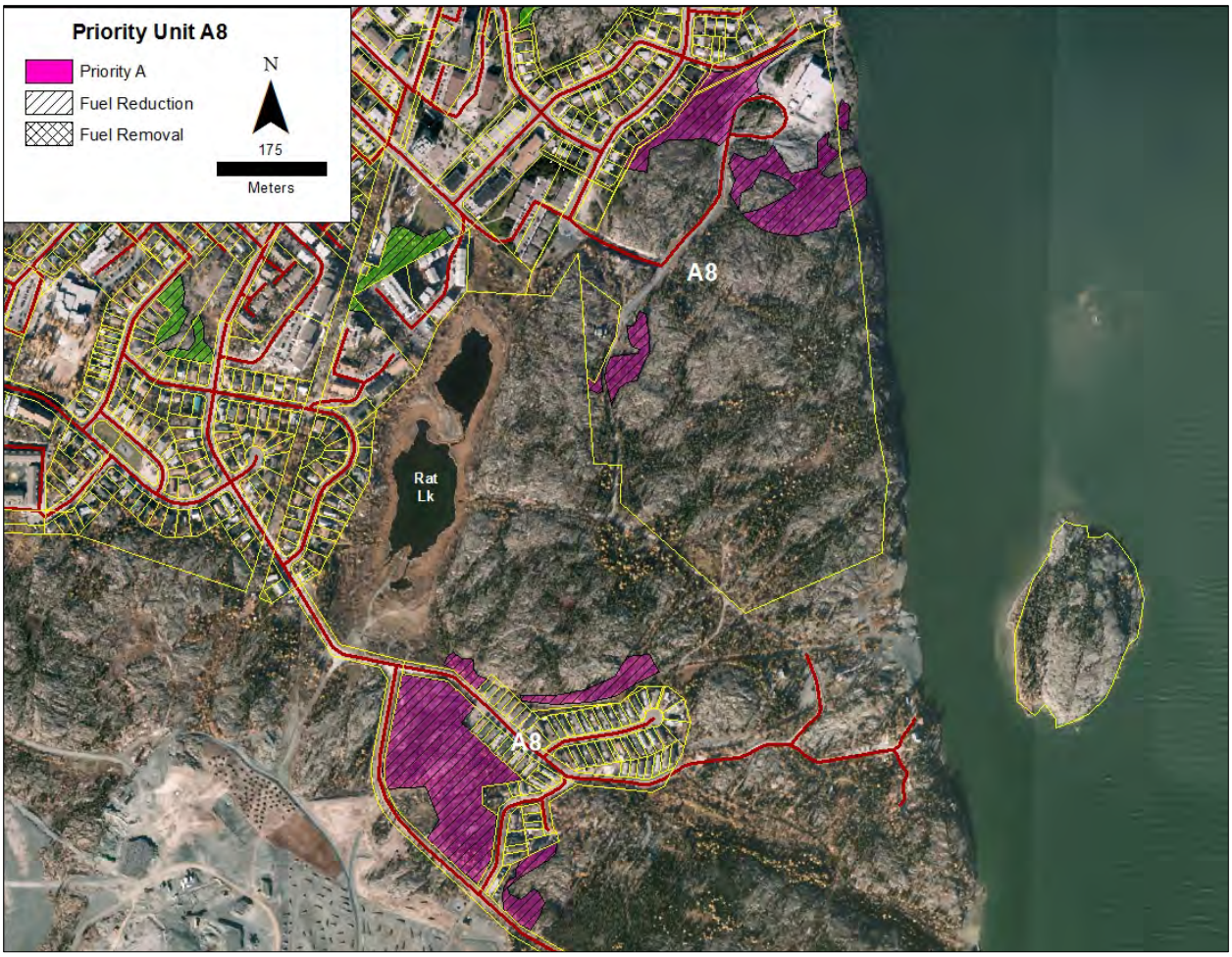

Priority Unit A2
Priority A
Fuel Reduction
Fuel Removal
N
250
Meters
A2
Grace Lk
Kam Lk

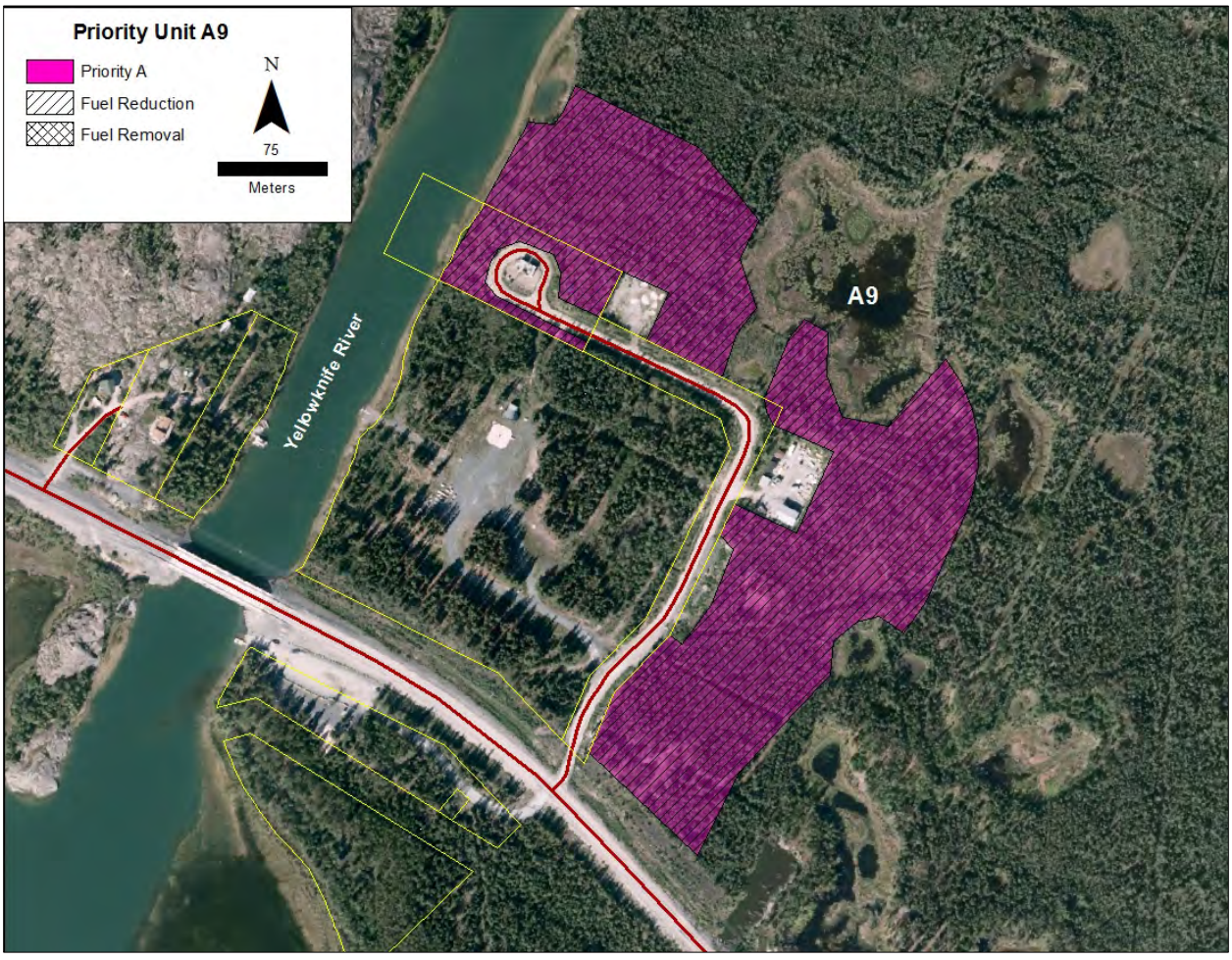

Priority Unit A3
Priority A
Fuel Reduction
Fuel Removal
N
410
Meters
A3
A6
A3
A3
Frame Lk
A5
Range Lk
A3
A7
A3
Kam Lk


Priority Units A4 & A5
Priority A
Fuel Reduction
Fuel Removal
N
250
Meters
Fuel Removal
Minimum 50m wide
A5
A4
Fuel Removal
Minimum 50m wide
A4
Fuel Reduction


Priority Unit A6
Priority A
Fuel Reduction
Fuel Removal
N
175
Meters
A6
A6
A6


Priority Unit A7
Priority A
Fuel Reduction
Fuel Removal
N
200
Meters
Frame
Lk
A7
A7


Priority Unit A8
Priority A
Fuel Reduction
Fuel Removal
N
175
Meters
A8
Rat
Lk
A8


Priority Unit A9
Priority A
Fuel Reduction
Fuel Removal
N
75
Meters
A9
Yellowknife River

6. Development and Legislation Options

Consideration of wildfire at the development planning stage is encouraged to ensure that wildfire hazard is identified and the appropriate mitigation measures are implemented prior to and/or during development. FireSmart recommended guidelines for structural and infrastructure options may be implemented through developer and resident education and engagement and through adoption of development legislation and policy that recognizes FireSmart principles for new and existing developments.

Fire-resistant exterior structure products are becoming more common in interface community development and reduce the losses during interface wildfires (CAL-FIRE, 2011). The Fort McMurray (2016) wildfire provided excellent information on the need for fire-resistant exterior structure materials in interface communities to reduce the likelihood of structure ignition from airborne firebrands and/or radiant heat (Westhaver, 2017).

6.1 Exterior Structural Materials

Structural characteristics that contribute to a structure's ability to withstand wildfire ignition include type of roofing, siding, and decking material, and proper construction and maintenance of eaves, vents, and openings that can accumulate flammable debris and allow wildfire to gain entry to the structure.

The most common roofing materials in the planning area are asphalt-shingle and metal with scattered combustible wood-shake roofs throughout.

The most common siding materials are combustible wood or vinyl with scattered metal, stucco, and log throughout.

Combustible wood decks with open undersides are common.

6.2 Infrastructure Options

Infrastructure options include provision of adequate access standards to ensure quick and safe ingress and egress for residents and emergency responders during a wildfire, adequate and accessible water supply for structure protection and suppression, and utility installation standards that do not increase risk to emergency responders during a wildfire emergency.

5.2.1 Access

Access road standards throughout the planning area are mainly adequate for an interface community. Most access roads are all-weather loop-road or dead-end design and with adequate turnaround dimensions for fire apparatus.

5.2.2 Water Supply

Yellowknife has municipal fire hydrant water-supply for the majority of the city except for the Kam Lake Industrial Park, Old Town, Engle Business District, Old Airport Road from the Coop corner to Highway 3, and the new Grace Lake North and South developments. The city water pumphouses have diesel backup fire pumps.

5.2.3 Franchised Utilities

Franchised utilities affected by an interface fire include electrical power and heating fuel distribution. Proper installation and maintenance of these services can minimize the risk to residents and emergency services personnel.

Electrical Power

Power transmission is provided by the Northwest Territories Power Corporation (NTPC) Snare River and Bluefish hydro-stations and the Jackfish Lake diesel-electric plant. The NTPC completed a wildfire risk assessment on all of their power generation and transmission facilities in 2018/19 and will be conducting mitigation measures to reduce the threat of wildfire to the facilities.

Power distribution and residential service is provided by Northland Utilities through above-ground distribution lines.

Heating Fuel

Heating fuel is primarily provided by diesel tank supply with a small percentage of structures relying on propane tank supply.

6.3 Development Legislation and Policy

The Yellowknife Community Wildfire Protection Plan (2012) offered recommendations to include FireSmart best-practices into the City of Yellowknife General Plan and Zoning Bylaw. Recommendations included:

- Recognition of wildfire as a development constraint.
- Developer requirement to provide a Wildfire Risk Assessment for any new developments located in hazard areas.
- Review of landscaping requirements to ensure they do not conflict with FireSmart recommended guidelines.
- Regulation requiring the use of fire-rated roofing materials and fire-resistant siding materials for all new, replacement, or retro-fitted buildings.
- Regulation requiring skirting of all new, replacement, or retro-fitted decks/porches.
- Regulation requiring the establishment of FireSmart Zone 1 vegetation management standards for all new development.

A review of these documents reveals that the recommendations offered have not been included in the most recent revisions.

Inclusion of FireSmart best-practices into City of Yellowknife development legislation and policy is recommended including:

- Recognize wildfire as development constraint.
- A requirement for developers to complete a wildfire risk assessment and mitigation plan, developed by the Yellowknife Fire Department and/or GNWT Environment and Natural Resources, for submission at the subdivision approval stage and to implement the recommendations at the development stage.
- Develop standards for the use of FireSmart exterior building materials for new construction and re-builds.
- Develop standards for FireSmart vegetation management and landscaping requirements on all new developments.

Recommendation 4: Include FireSmart best-practices into future revisions of the City of Yellowknife development legislation and policy.

7. Public Education & Engagement Options

FireSmart public education and awareness are a key component to taking action. Residents, business owners, and City of Yellowknife administration and elected officials all need to be aware of the FireSmart hazard and the solutions to minimizing the risk and become a partner in implementation of FireSmart solutions in their own backyards and communities.

7.1 FireSmart Education and Awareness

Residents and stakeholders can refer to the GNWT ENR, Forest Management Division website at www.nwtfire.com for further information on the GNWT FireSmart program, current wildfire updates, and other wildfire management-related information.

The City of Yellowknife provided FireSmart public information in 2014 related to the findings and recommendations of the Yellowknife Community Wildfire Protection Plan (2012), however a focused and repetitive public education program based on key messages is required to engage residents to take actions on their properties.

FireSmart home assessments for residents, conducted by trained Fire Department personnel, are an excellent method for providing FireSmart key messages to residents on a one-on-one basis to engage them to "take action in their own backyards". The Yellowknife Fire Department will be conducting assessments in the perimeter neighbourhoods at highest threat during the 2019 season.

7.2 Key Messages

FireSmart key messages for residents should include:

- Use non-combustible roofing, siding, decking, and fencing materials for new structures or renovations of existing structures.
- Skirt the undersides of your decks and porches to reduce the chances of fire getting underneath.
- The Non-Combustible Zone and Priority Zone 1 are the most important area for residents to conduct FireSmart vegetation management. Both Zones should not support wildfire of any kind.
    - Establish a minimum of 1.5 metre non-combustible zone surrounding the structure and all extensions.
    - Use fire-resistant trees and shrubs in Zone 1.
    - Maintain and irrigate grass and/or have a non-combustible surface cover.
    - Do not use bark mulch or wood chips for landscaping beds.
    - Store all combustible firewood piles greater than 10m from the structure.
    - Remove ground litter and dead/down and dead standing trees annually.
- Clear all vegetation from around fuel and propane tanks for a minimum of 3 metres.
- Call the City of Yellowknife Fire Department to arrange for a FireSmart Hazard Assessment of your home and property.
- Develop an evacuation plan for yourself and your family.

7.3 FireSmart Canada Community Recognition Program

FireSmart Canada has initiated the FireSmart Community Recognition Program to motivate and engage residents to plan and take FireSmart actions in their "own backyards" to reduce wildfire losses from the "grassroots" level. Grant funding is available for community neighbourhoods wishing to take FireSmart actions in their neighbourhoods through the FireSmart Canada Community Preparedness Day program.

The program is driven through identification and training of key Municipal and Territorial fire agency personnel to act as Local FireSmart Representatives to guide the process and community members to act as Community Champions to lead and implement the FireSmart Community Recognition Program within their community. GNWT Environment and Natural Resources sponsored a Local FireSmart Representative workshop in 2017 and the Yellowknife Fire Department attended.

Recommendation 5: Develop and deliver a focused, repetitive, long-term FireSmart education and awareness program, including FireSmart home assessments, to ensure that residents are aware of options available to reduce the hazard and risk to their properties and are engaged and assisted to take action in their own backyards.

8. Inter-Agency Cooperation and Cross-Training Options

Interagency cooperation and cross-training between all stakeholders is necessary to ensure cooperative and effective implementation of FireSmart mitigation options and to coordinate an effective multi-agency response to a wildland/urban interface fire.

8.1 Interagency Cooperation

Interagency stakeholders within the planning area include:

- City of Yellowknife.
- Government of the Northwest Territories.

Recommendation 6: Develop a FireSmart Committee, consisting of all relevant stakeholders, to coordinate and lead the FireSmart program for the area.

The Yellowknife Fire Department and GNWT ENR currently hold a Memorandum of Understanding regarding wildfire jurisdiction and mutual-aid response. The City of Yellowknife is responsible for all wildfires within the City limits however GNWT ENR has the authority to respond if they identify significant threat or if requested by Yellowknife Fire Department.

8.2 Cross-Training

The Yellowknife Fire Department has trained their Chief Officers and Lieutenants to the Advanced Incident Command System (I-400) level. Based on the wildland/urban interface hazard and risk for Yellowknife, wildfire and wildland/urban interface fire training is recommended. The following cross-training courses are available.

Wildland Fire

- Wildland Firefighter (S-131, NFPA 1051 Level I, S-100, or equivalent)

Wildland/Urban Interface Fire

- Structure and Site Preparation Workshop (S-115)
- Fire Operations in the Wildland/Urban Interface (S-215)

Incident Command System

- ICS Orientation (I-100)
- Basic ICS (I-200)
- Intermediate ICS (I-300)
- Advanced ICS (I-400)

Recommendation 7: The Yellowknife Fire Department and GNWT should partner on cross-training initiatives to ensure emergency responders are cross-trained to the appropriate standards.

9. Emergency Planning Options

Emergency preparedness is an important part of any disaster planning. The need for organization, clear chain of command, and an understanding of job responsibilities during a wildland/urban interface fire are of paramount importance.

9.1 Emergency Measures Plan

The Yellowknife Emergency Measures Plan (2016) is used to provide authority and direction during an emergency. Emergency exercises to test emergency plans provide learnings for all involved mutual-aid partners.

Recommendation 8: Design and implement a table-top and/or functional exercise to test emergency management preparedness for a wildland/urban interface fire.

9.2 Wildfire Pre-Plan

The City of Yellowknife currently does not have a wildfire pre-plan to provide emergency responders with detailed tactical information with respect to values at risk and operational strategies and tactics to minimize losses during a wildland/urban interface fire. Wildfire pre-plans should provide operational information and mapping related to values at risk, protection strategies and tactics for values at risk, resources, water supplies, staging areas, and communications.

Recommendation 9: Develop a Community Wildfire Pre-Plan for the City of Yellowknife to provide greater operational detail to emergency responders during a wildland/urban interface incident.

9.3 Structure Protection Equipment

The Yellowknife Fire Department currently has 12 sprinkler kits and 6 portable pumps for deployment during a wildland/urban interface fire. The Fire Department is also considering purchase of additional sprinklers to be deployed by residents on their structures when needed.

10 Recommendations Summary

Vegetation Management

Item	Recommendation	Responsible Agency
Priority Zone 1	**Recommendation 1:** Educate and encourage all Yellowknife residents to establish FireSmart recommended guidelines for the Non-Combustible Zone and Priority Zone 1 within 10 metres of their structures.	City of Yellowknife GNWT
Priority Zone 2-3	**Recommendation 2:** Complete proposed Zone 2-3 fuel reduction on Municipal and Territorial lands based on priority and funding.	City of Yellowknife GNWT
Maintenance	**Recommendation 3:** Conduct inspections of all completed fuelbreaks and implement maintenance for those that require it.	City of Yellowknife GNWT

Development & Legislation

Item	Recommendation	Responsible Agency
Legislation	**Recommendation 4:** Include FireSmart best-practices into future revisions of the City of Yellowknife development legislation and policy.	City of Yellowknife

Public Education & Engagement

Item	Recommendation	Responsible Agency
Public Education	**Recommendation 5:** Develop and deliver a focused, repetitive, long-term FireSmart education and awareness program, including FireSmart home assessments, to ensure that residents are aware of options available to reduce the hazard and risk to their properties and are engaged and assisted to take action in their own backyards.	City of Yellowknife

Interagency Cooperation & Cross-Training

Item	Recommendation	Responsible Agency
FireSmart Committee	**Recommendation 6:** Develop a FireSmart Committee, consisting of all relevant stakeholders, to coordinate and lead the FireSmart program for the area.	City of Yellowknife
Cross-Training	**Recommendation 7:** The Yellowknife Fire Department and GNWT should partner on cross-training initiatives to ensure emergency responders are cross-trained to the appropriate standards.	City of Yellowknife GNWT

Emergency Planning

Item	Recommendation	Responsible Agency
Emergency Exercise	**Recommendation 8:** Design and implement a table-top and/or functional exercise to test emergency management preparedness for a wildland/urban interface fire.	City of Yellowknife GNWT
Community Wildfire Pre-Plan	**Recommendation 9:** Develop a Community Wildfire Pre-Plan for the City of Yellowknife to provide greater operational detail to emergency responders during a wildland/urban interface incident.	City of Yellowknife

11 References

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