

Fort McPherson Community Wildfire Protection Plan



Prepared for:
Government of the Northwest Territories
Environment and Natural Resources - Forest Management Division



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Table of Contents

1	Introduction	1
2	Planning Area	1
3	Hazard & Risk Assessment	3
	3.1 Wildfire Ignition Potential	
	3.2 Wildfire Behaviour Potential	
	3.3 FireSmart Hazard Assessments	
4	Vegetation Management Options	10
	4.1 Existing Vegetation Management	
	4.2 Proposed Vegetation Management	
	4.3 Vegetation Management Maintenance	
5	Development Options	15
	5.1 Structural Options	
	5.2 Infrastructure Options	
6	Public Education Options	17
7	Interagency Cooperation and Cross-Training Options	18
8	Emergency Planning Options	19
9	Implementation Plan	20

1 Introduction

The Fort McPherson Community Wildfire Protection Plan was developed to provide practical and operational wildland/urban interface risk mitigation strategies to reduce the threat of wildfire to developments within the community.

The project objectives include:

- Assess and quantify community wildland/urban interface hazard and risk
- Based on interface hazard and risk:
 - Develop and prioritize fuel management and maintenance recommendations and prescriptions
 - Develop a summary of significant factors within the community that would enhance its exposure to wildfire and offer recommendations to reduce that threat.

This Community Wildfire Protection Plan was developed using standardized FireSmart hazard assessment protocols and mitigative measures were developed based on the seven disciplines of wildland/urban interface approach and current research and knowledge in interface community protection.

An implementation plan is included in this Plan to assist stakeholders to budget and complete projects based on the priorities identified.

This plan should be reviewed and updated at five year intervals to ensure it is based on current conditions.

2 Planning Area and Stakeholders

The planning area includes all lands within Fort McPherson and a two-kilometre buffer surrounding the community (Map 1).

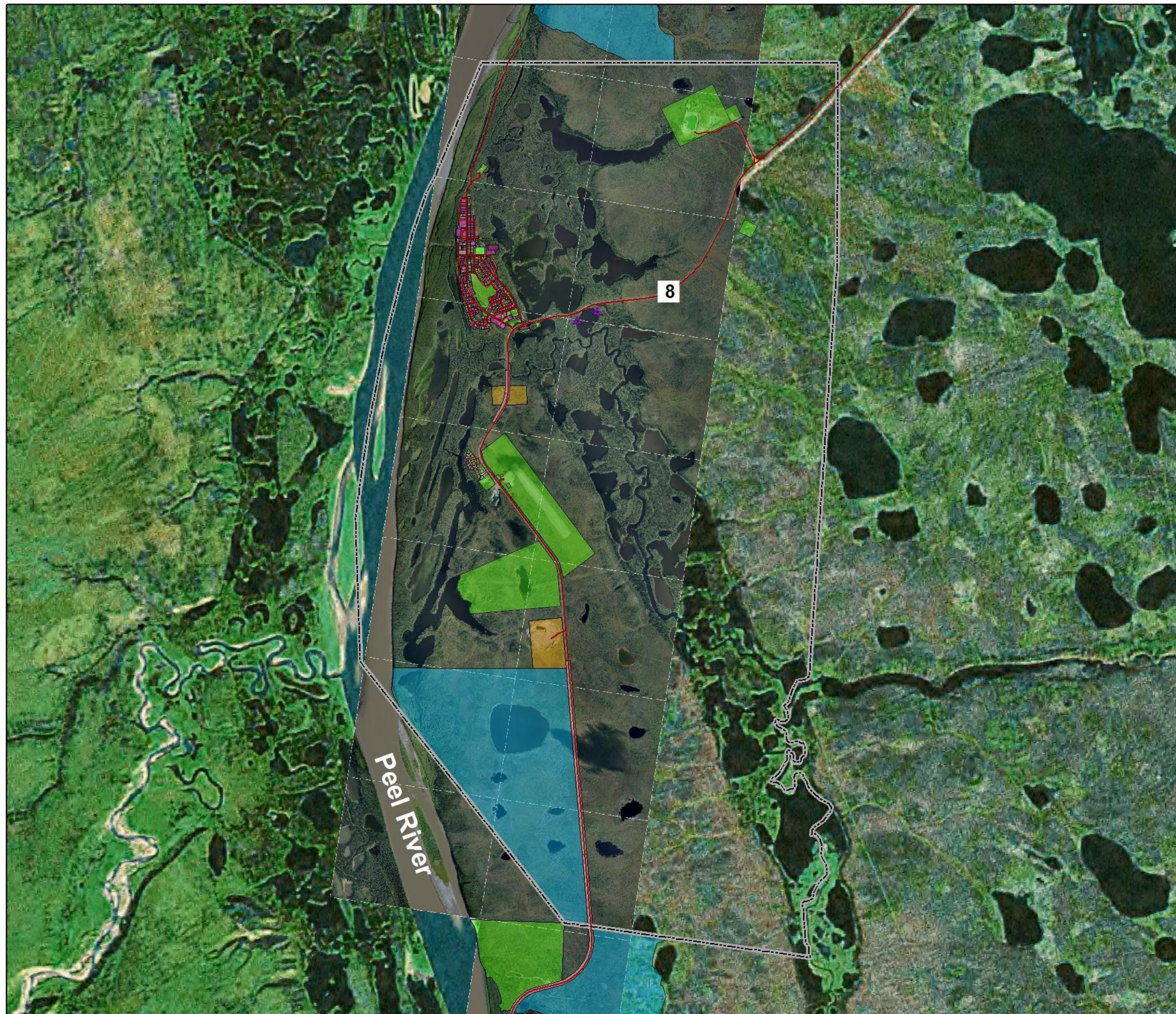
Stakeholders consulted with in the planning process included:











- | | |
|--------------------------------------|------------------------------|
| ▪ Martin Callaghan, Manager, Forests | GNWT ENR Inuvik Region |
| ▪ Newt Hanson, S.A.O. | Hamlet of Fort McPherson |
| ▪ Susan Blake, Band Manager | Tetlit Gwich'in Band Council |

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

- Commissioner (GNWT MACA)
- Federal
- Gwichin
- Mixed
- Municipal
- Private
- GNWT Crown lands (GNWT ENR)

Map 1 - Planning Area Fort McPherson



-  Community Boundary
-  Roads
-  Remote Structure Site
- Land Status Authority**
-  Commissioner
-  Federal
-  Indian Affairs Branch
-  Mixed
-  Municipal
-  Private
-  Gwichin



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3 Hazard & Risk Assessment

The hazard and risk assessment process analyses the risk of wildfire ignition through analysis of fire incidence, the wildfire behaviour potential through analysis of fuels and weather data, and the values at risk to wildfire through FireSmart hazard assessments.

3.1 Wildfire Ignition Potential

The assessment of recent fire incidence was completed using historical fire data from GNWT Environment and Natural Resources (ENR) for the ten-year period from 2002 to 2011.








Fire incidence data indicates that 10 wildfires were discovered within a 10 kilometre radius of the community, 50% were human-caused and 50% were lightning-caused (Table 1). One fire in 2004 (EV-006) escaped initial attack, spread to within 8.5 kilometres of Fort McPherson, and was eventually contained at approximately 2450 hectares (Map 2).

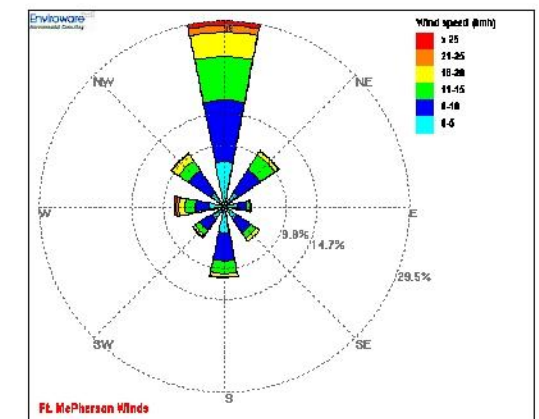
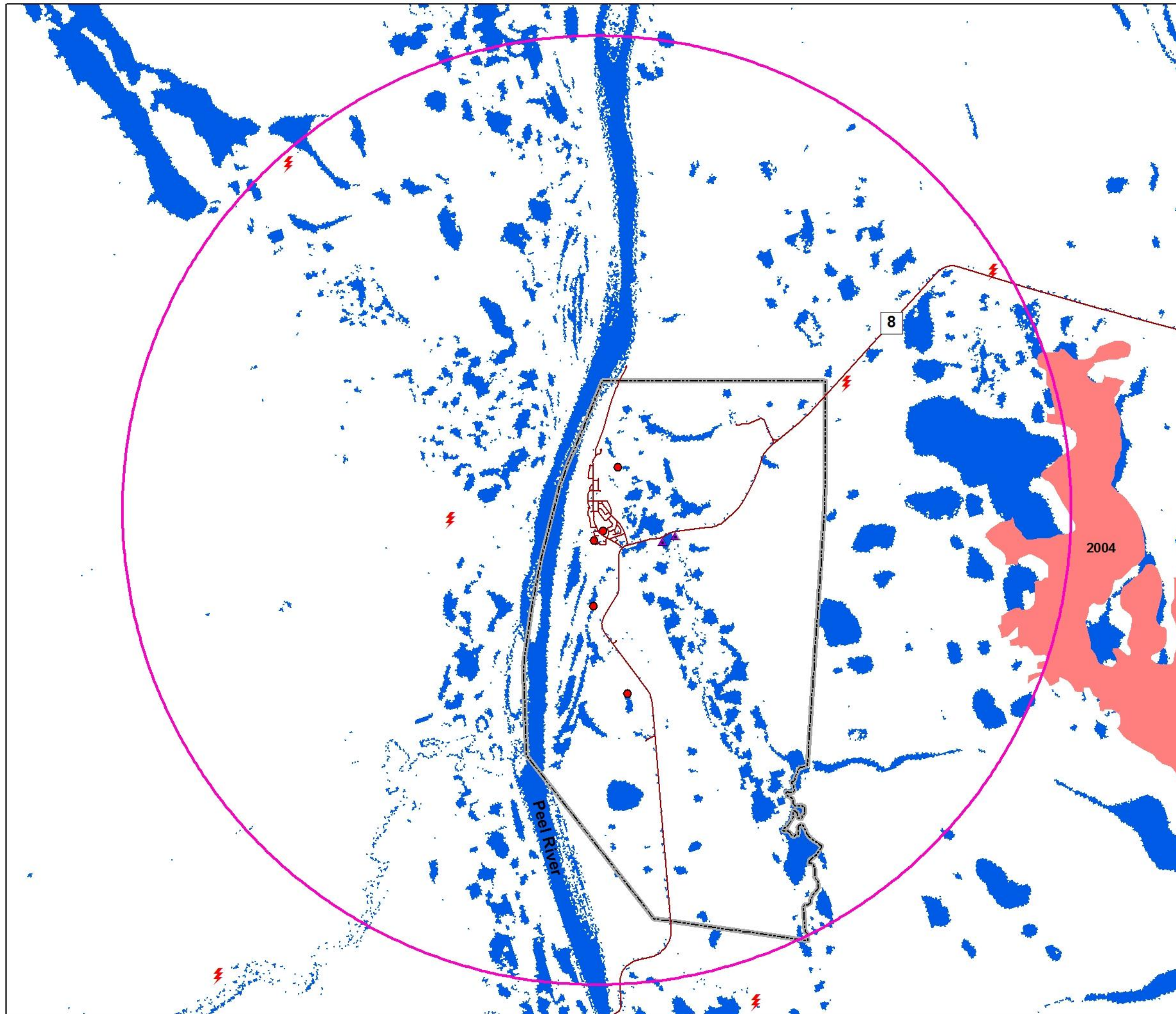
Table 1: Fire Incidence by Cause (2002 – 2011)

General Cause	Number of Fires	Percent of Total
Human-Caused	5	50
Lightning-Caused	5	50
Totals	10	100

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 Fort McPherson

-  10 Km Boundary
-  Human-Caused Wildfire
-  Lightning-Caused Wildfire
-  Wildfire > 4 hectares
-  Community Boundary
-  Roads
-  Remote Structure Site



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3.2 Wildfire Behaviour Potential

3.2.1 Wildland Fuel Types

Fire Behaviour Prediction (FBP) fuel types were used to analyze the fuel types and fire behaviour potential within and adjacent to Fort McPherson (Map 3).

The planning area is dominated with boreal spruce (C-2) fuels with patches of spruce-lichen woodland (C-1), mixedwood (M-1/M-2), cured grass (O1), and deciduous (D-1) fuel types. There is a row of lakes along the east-side of the community that provides some break from the C-2 fuels to the east and the Peel River on the west boundary provides a good break.

3.2.2 Fire Weather Analysis

Fire weather data from the Fort McPherson weather station was used to determine the predominant wind directions during the fire season. The predominant and strongest wind direction is from the north (Figure 1).

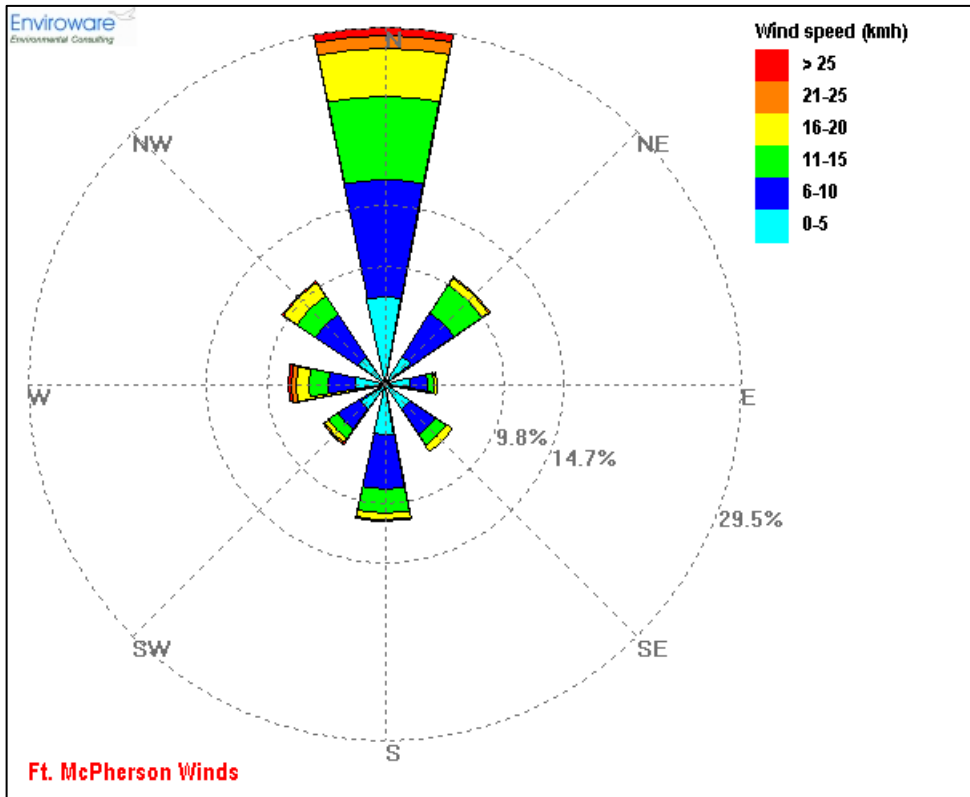










Figure 1 – Fort McPherson Windrose

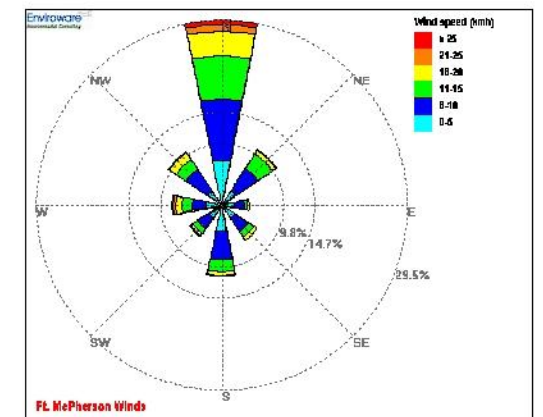
Wildland fuel types and fire weather data indicates that the potential for landscape-level wildfire exists in C-2 fuel types to the north, south, and east of Fort McPherson.

Map 3 - FBP Fuel Types Fort McPherson

-  Community Boundary
-  Roads
-  Remote Structure Site

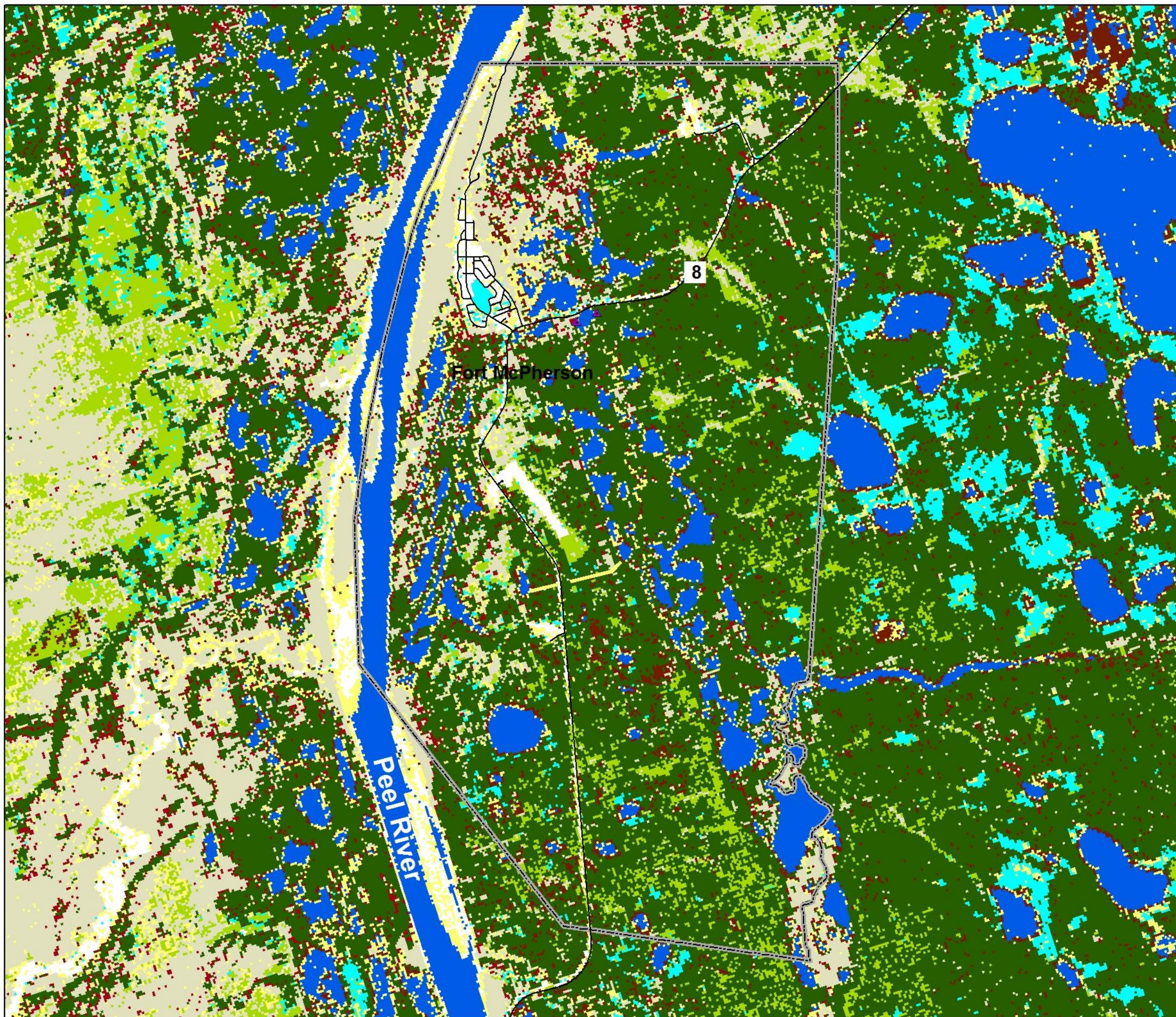
FBP Fuel Type

-  Spruce-Lichen Woodland (C-1)
-  Boreal Spruce (C-2)
-  Mature Pine (C-3)
-  Immature Pine (C-4)
-  Deciduous (D-1)
-  Mixedwood (M-1)
-  Bog
-  Non-Fuel (NF)
-  Cured Grass (O1)



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3.3 FireSmart Hazard Assessments

FireSmart hazard assessments (P.I.P., 2003) were conducted on development areas and adjacent wildland fuel types within the planning area. Structures in the southwest corner of the Community and the cabin sites east of the community are at the highest threat to wildfire (Table 2 & Map 4).

Table 2: FireSmart Hazard Assessments

Development Area	Structure/Site Hazard (0 – 30m)
Ft. McPherson Community	Low - High
Airport/Industrial	Low - Moderate
East Cabins	High - Extreme

Hazard factor’s for each of the development areas are discussed below.

Fort McPherson Community

FireSmart hazard for the main community is **LOW-MODERATE** for the majority of the community except for structures in the southwest corner backing onto the mixedwood fuels which are at **HIGH** hazard. Fuels primarily consist of non-fuel and cured-grass with patches of deciduous (D-1) and open-spruce (C-1) scattered throughout the developed area. Exterior structure materials are primarily asphalt-shingle or metal roofing and wood, log, hardiplank, or vinyl siding.



Airport/Industrial

FireSmart hazard for the Airport/Industrial Area is **LOW-MODERATE**. The area includes the Airport, ENR firebase, and one private yard. Fuels primarily consist of non-fuel (NF) and deciduous (D-1) immediately adjacent to structures with open-density spruce (C-1) and mixedwood (M-1/M-2) on the site perimeters. Exterior structure materials are primarily metal or asphalt roofing and metal, vinyl, or wood siding.




East Cabins

FireSmart hazard for the two cabins east of the community on Hwy 8 is **HIGH-EXTREME**. Both sites are surrounded by spruce fuels (C-2) with inadequate defensible space. Exterior structure materials are asphalt-shingle roofing and wood siding.







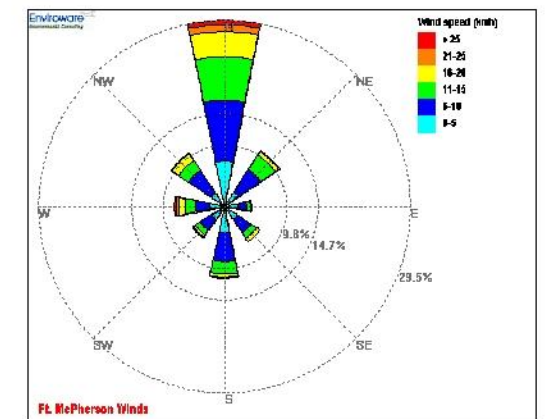
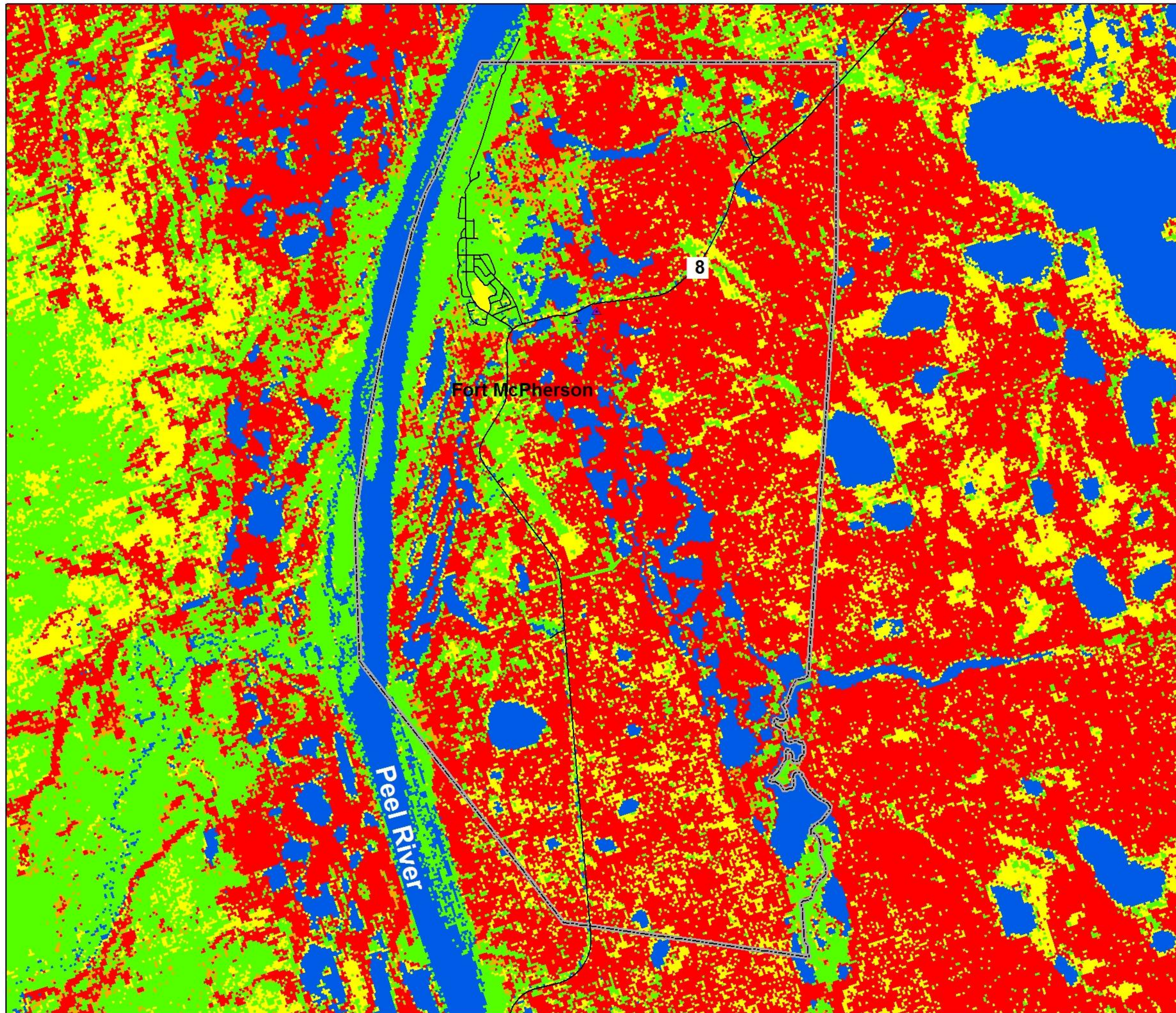
FireSmart hazard is High for the Fort McPherson southwest residential area, High-Extreme for the cabins to the east of Fort McPherson on Hwy 8, and Low-Moderate for the remainder of the community.

Map 4 - FireSmart Hazard Fort McPherson

-  Community Boundary
-  Roads
-  Remote Structure Site

FireSmart Hazard

-  Low
-  Moderate
-  High
-  Extreme



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4 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 at the appropriate scale, based on hazard and risk, to reduce the threat of wildfire to developed areas. **While fuel modification projects reduce the threat of wildfire to developments, they do not ensure structure survival under all hazard conditions.**

Vegetation management consists of one or any combination of the following options:

- Fuel removal
- Fuel reduction
- Species conversion

Complete descriptions of the methods included in each of the above options are included in *“Fire-Smart Protecting Your Community from Wildfire”* (PIP 2003).

FireSmart standards refer to three interface priority zones with vegetation management for interface structures recommended in Zones 1 and 2 at a minimum and in Zone 3 based on hazard and risk.

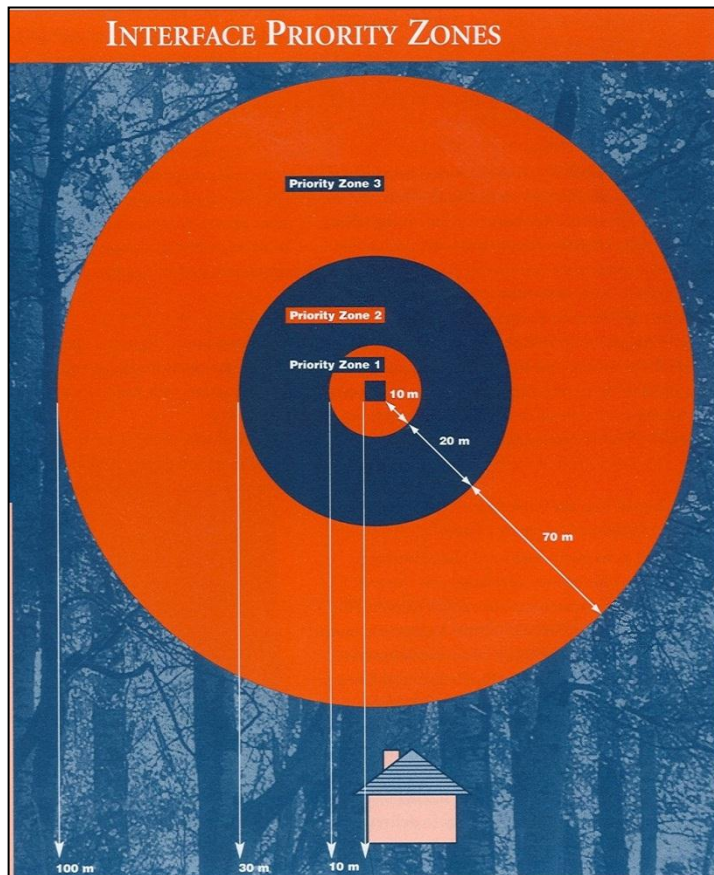


Figure 3 – Interface Priority Zones (PIP, 2003)

4.1 Existing Vegetation Management

The north and south fuelbreaks, constructed by ENR in the 1980's, have been significantly overgrown and some no longer act as adequate fuelbreaks for the community (Table 3 & Map 5). A portion of the south fuelbreak was maintained in the winter of 2011. It requires some final debris disposal of brush piles to the east of Hwy 8 (Map 5).

Table 3: Existing Vegetation Management Areas

Name	Area (ha)	Year Established	Agency	Comments
North Fuelbreak	0.9	1980's	GNWT ENR	Overgrown and ineffective, requires maintenance
South Fuelbreak	9.0	1980's	GNWT ENR	East of Hwy 8 maintained in 2011 but requires minor debris disposal West of Hwy 8 requires completion to the Peel River



North Fuelbreak



South Fuelbreak



South Fuelbreak – 2011 Debris Disposal Required

4.2 Proposed Vegetation Management

4.2.1 Zone 1

Zone 1 vegetation management is **inadequate** for many of the residential structures, with a lack of defensible space from native grass, deciduous, and mixedwood fuels.



FireSmart Zone 1 vegetation management options include:

- Removal of flammable forest vegetation within 10 metres of structures.
- Removal of all coniferous ladder fuels (limbs) to a minimum height of 2 metres from ground level on residual overstory trees.
- Removal of all dead and down forest vegetation from the forest floor.
- Increased maintenance to ensure that all combustible needles, leaves, and native grass are removed from on and around structures.
- Establishment and maintenance of a non-combustible surface cover around the structure including the use of FireSmart landscaping species.
- Removal of all combustible material piles (firewood, lumber, etc) within 10 metres of the structure.

For more information on FireSmart Zone 1 standards refer to *FireSmart – Protecting Your Community from Wildfire* (PIP 2003).

Recommendation 1: Encourage residents to establish adequate Zone 1 defensible space around their structures.

4.2.2 Zone 2-3

Priority areas are recommended for Zone 2-3 fuels management based on hazard and risk (Table 4 & Map 5). 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.

Table 4: Priority Fuel Modification Areas

Priority	Area (Ha)	Proposed Fuel Modification Standards	Land Status Authority
FM1 South Fuelbreak	4.3	<ul style="list-style-type: none"> ▪ Fuels Removal on old existing fuelbreak to clear re-growth to minimum 40 metre width ▪ Dispose of debris by piling and burning onsite including existing debris piles from 2011 maintenance 	<ul style="list-style-type: none"> ▪ Commissioner ▪ GNWT ENR
FM2 North Fuelbreak	1.5	<ul style="list-style-type: none"> ▪ Fuels Removal on old existing fuelbreak (0.9 ha) to clear re-growth to minimum 40 metre width between lakes and new fuel removal to tie the fuelbreak into the road ▪ Dispose of debris by piling and burning onsite 	<ul style="list-style-type: none"> ▪ GNWT ENR
FM3 Southwest Residential	6.8	<ul style="list-style-type: none"> ▪ Fuels Reduction by thinning a minimum of 50% of spruce to achieve 3 m crown spacing ▪ Remove birch and alder shrubs ▪ Remove all dead standing and dead & down coniferous and deciduous ▪ Retain all live deciduous stems ▪ Prune limbs to 2 metres ▪ Dispose of debris by piling and burning onsite or use as biomass or other product 	<ul style="list-style-type: none"> ▪ GNWT ENR
Total	12.6		

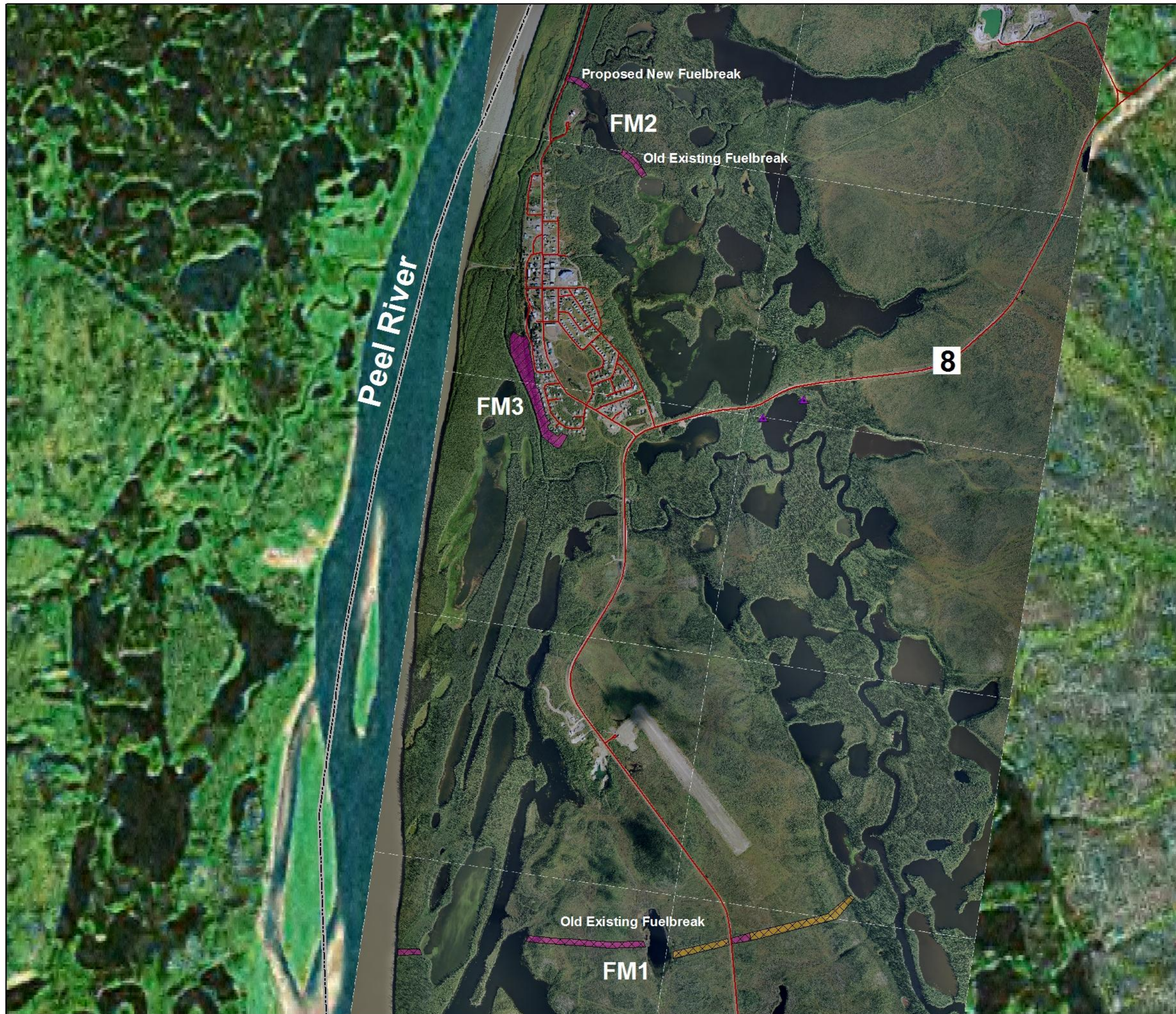
Recommendation 2: Zone 2-3 fuels reduction and maintenance is the responsibility of the Land Status Authority holder(s) and should be implemented based on the priorities identified in this plan.







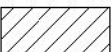
4.3 Vegetation Management Maintenance

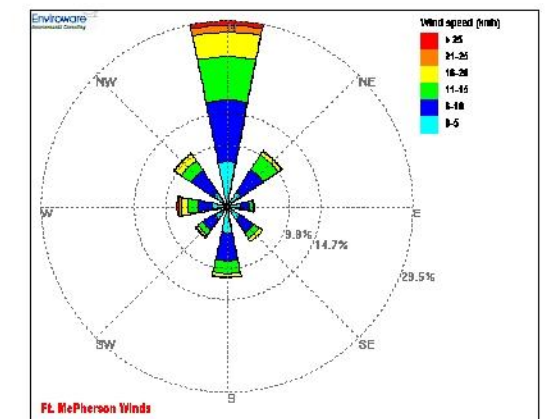
Fuel modification area maintenance schedules depend on many factors including fuel type, soil and moisture conditions, and specific weather events. It is suggested that land managers provide periodic inspections of their fuel modification project areas and complete maintenance as required. It is projected that fuel modification maintenance will be required at least each five-year period.

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.

Map 5 - Fuel Modification Fort McPherson



-  Community Boundary
-  Roads
-  Remote Structure Site
-  Existing Fuel Modification
-  Proposed Fuel Modification
-  Fuel Removal/Clear
-  Fuel Reduce/Thin



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5. Development and Legislation Options

Consideration of wildfire at the planning stage of new development is encouraged to ensure that wildfire hazard and appropriate mitigation measures are developed and implemented prior to development.

New developments may overlap or conflict with existing fuel modification resulting in a reduction in fuelbreak effectiveness and an increase in wildfire threat to the new or existing development in the area.

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.

5.1 Structural Options

Structural characteristics that contribute to a structure's ability to withstand wildfire ignition include type of roofing and siding 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.



Siding materials vary between non-combustible hardi-plank and metal to combustible wood, log, and vinyl.

Open decks and undersides are common.

5.2 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 design and cul-de-sacs have adequate turnaround dimensions for fire apparatus.

5.2.2 Water Supply

Fort McPherson does not have municipal hydrant water-supply. All development areas rely on water-tender supply for structure protection activities. Each home is equipped with an in-house water tank.

5.2.3 Franchised Utilities

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

Electrical Power

Power distribution and residential service is provided through above-ground powerlines from the NWTFC generation plant.

Heating Fuel

Heating fuel is provided by diesel tank supply.

6. Public Education Options

Public education is a large part of the solution to success. Residents, landowners, municipal administration, and elected officials all need to be aware of the issues related to *FireSmart* development and the solutions to minimizing the risk and need to become a partner in implementation of the solutions in their communities. If stakeholders understand the issues relating to wildland/urban interface hazard they will be more likely to take action on their own property or to support actions taken by other authorities.

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.

Key Messages

FireSmart hazard assessments identified the need for the following key messages to residents.

- Development and maintenance of FireSmart Zone 1 defensible space surrounding the home, including:
 - Grass and brush maintenance
 - Firewood and combustibles storage



Recommendation 5: Public education on acceptable FireSmart Zone 1 standards is recommended for all residents.

7. Inter-Agency Cooperation and Cross-Training Options

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

Interagency stakeholders within the planning area include:

- Hamlet of Fort McPherson
- GNWT Environment and Natural Resources (ENR)
- GNWT Municipal and Community Affairs (MACA)

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

The Fort McPherson Fire Department has an active fire department with approximately 10 members. Cross-training for fire department members and ENR wildfire suppression personnel should include basic wildfire, wildland/urban interface fire, and incident command system training courses.

The following cross-training courses are available.

Wildland Fire

- Wildland Firefighter (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 Fort McPherson 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

8. Emergency Planning Options

The Fort McPherson Emergency Measures Plan is used to provide authority and direction during an emergency.

At present the community 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. A suggested pre-plan outline is as follows:

- Planning Area Jurisdictional Authority
- Values at risk (life, structures, infrastructure)
- Fire operations plan (strategies/tactics, water sources, equipment, communications plan)

Recommendation 8: Develop a Community Wildfire Pre-Plan for the community to provide greater operational detail to emergency responders during a wildland/urban interface incident.

9 Implementation Plan

The goal of the implementation plan is to identify the responsible stakeholders for each of the recommendations and set timelines for commencement and completion based on priorities and funding availability.

Vegetation Management

Issue	Recommendation	Responsible Agency
Zone 1	Recommendation 1: Encourage residents to establish adequate Zone 1 defensible space around their structures.	Hamlet of Ft. McPherson GNWT MACA
Zone 2-3	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.	GNWT ENR & MACA
Maintenance	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.	GNWT ENR & MACA

Development

Issue	Recommendation	Responsible Agency
FireSmart Development Planning	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.	GNWT MACA Hamlet of Ft. McPherson

Public Education

Issue	Recommendation	Responsible Agency
Public Education Priorities	Recommendation 5: Public education on acceptable FireSmart Zone 1 standards is recommended for all residents.	GNWT ENR & MACA Hamlet of Ft. McPherson

Interagency Cooperation & Cross-Training

Issue	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.	GNWT ENR & MACA Hamlet of Ft. McPherson
	Recommendation 7: The Fort McPherson Fire Department and GNWT MACA & ENR should partner on cross-training initiatives to ensure emergency responders are cross-trained to the following minimum standards: <ul style="list-style-type: none"> ▪ 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 	GNWT MACA & ENR Hamlet of Ft. McPherson

Emergency Planning

Issue	Recommendation	Responsible Agency
Community Wildfire Pre- Planning	Recommendation 8: Develop a Community Wildfire Pre-Plan for the community to provide greater operational detail to emergency responders during a wildland/urban interface incident.	GNWT ENR & MACA Hamlet of Ft. McPherson