

# **Whati**

## **Community Wildfire Protection Plan**



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



**January 2012**

**Stew Walkinshaw, R.P.F.**

**MONTANE**  
Forest Management Ltd.

Canmore, AB.

Phone: (403) 678-7054      Email: [montane@shaw.ca](mailto:montane@shaw.ca)

# Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
<b>2</b>	<b>Planning Area .....</b>	<b>1</b>
<b>3</b>	<b>Hazard &amp; Risk Assessment .....</b>	<b>3</b>
3.1	Wildfire Ignition Potential	
3.2	Wildfire Behaviour Potential	
3.3	FireSmart Hazard Assessments	
<b>4</b>	<b>Vegetation Management Options .....</b>	<b>10</b>
4.1	Existing Vegetation Management	
4.2	Proposed Vegetation Management	
4.3	Vegetation Management Maintenance	
<b>5</b>	<b>Development Options .....</b>	<b>14</b>
5.1	Structural Options	
5.2	Infrastructure Options	
<b>6</b>	<b>Public Education Options .....</b>	<b>16</b>
<b>7</b>	<b>Interagency Cooperation and Cross-Training Options .....</b>	<b>17</b>
<b>8</b>	<b>Emergency Planning Options .....</b>	<b>18</b>
<b>9</b>	<b>Implementation Plan .....</b>	<b>19</b>

# 1 Introduction

The Whati 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 Whati and a two-kilometre buffer surrounding the community (Map 1).

Stakeholders consulted with in the planning process included:


- Janice Ziemann, Forest Officer                      GNWT ENR North Slave Region
- Larry Baran, SAO    Community Govt. of Whati

All lands are within the Tli Cho Land Claim Settlement. Land status authority is represented by the following (Map 1):

- Commissioner (GNWT MACA)
- Municipal
- Private
- GNWT Crown lands (GNWT ENR)




# Map 1 - Planning Area Whati

 Community Boundary

 Roads

 Cabin Sites

## Land Status Authority

 Commissioner

 Federal

 Indian Affairs Branch

 Mixed

 Municipal

 Private

Lac  
LaMartre

Whati

Airport



1:18,000

**MONTANE**  
Forest Management Ltd.



### 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 6 wildfires were discovered within a 10 kilometre radius of the community, 100% were lightning-caused (Table 1). One large wildfire in 2004 burned the island in Lac LaMartre to the northwest of Whati (Map 2).

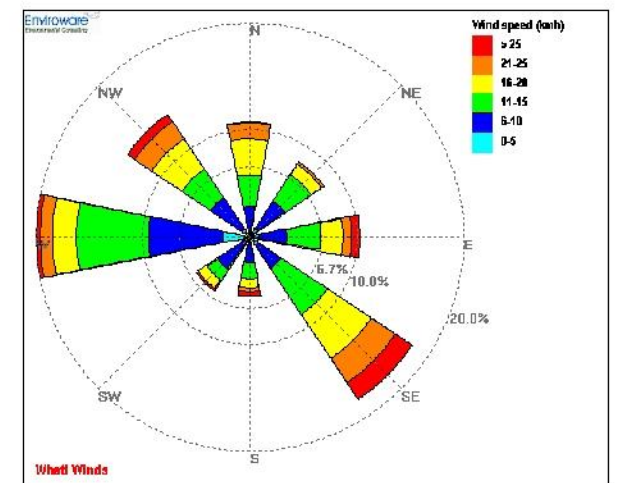
*Table 1: Fire Incidence by Cause (2002 – 2011)*

General Cause	Number of Fires	Percent of Total
Human-Caused	0	0
Lightning-Caused	6	100
<b>Totals</b>	<b>6</b>	<b>100</b>

**The risk of wildfire in the planning area exists and primarily occurs as a result of lightning.**

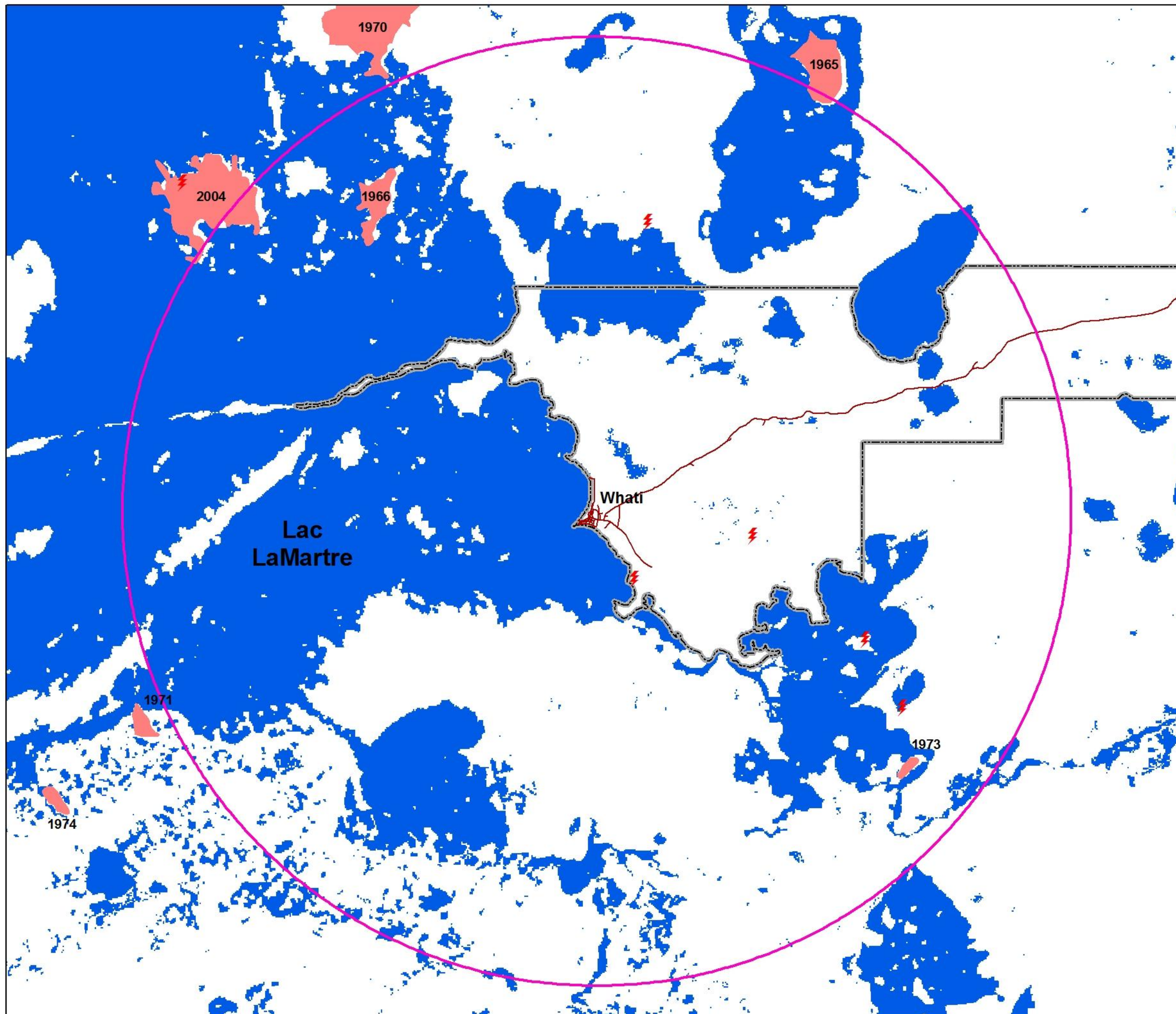
## Map 2 - Wildfire Incidence Whati

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



1:80,000

**MONTANE**  
Forest Management Ltd.



## 3.2 Wildfire Behaviour Potential

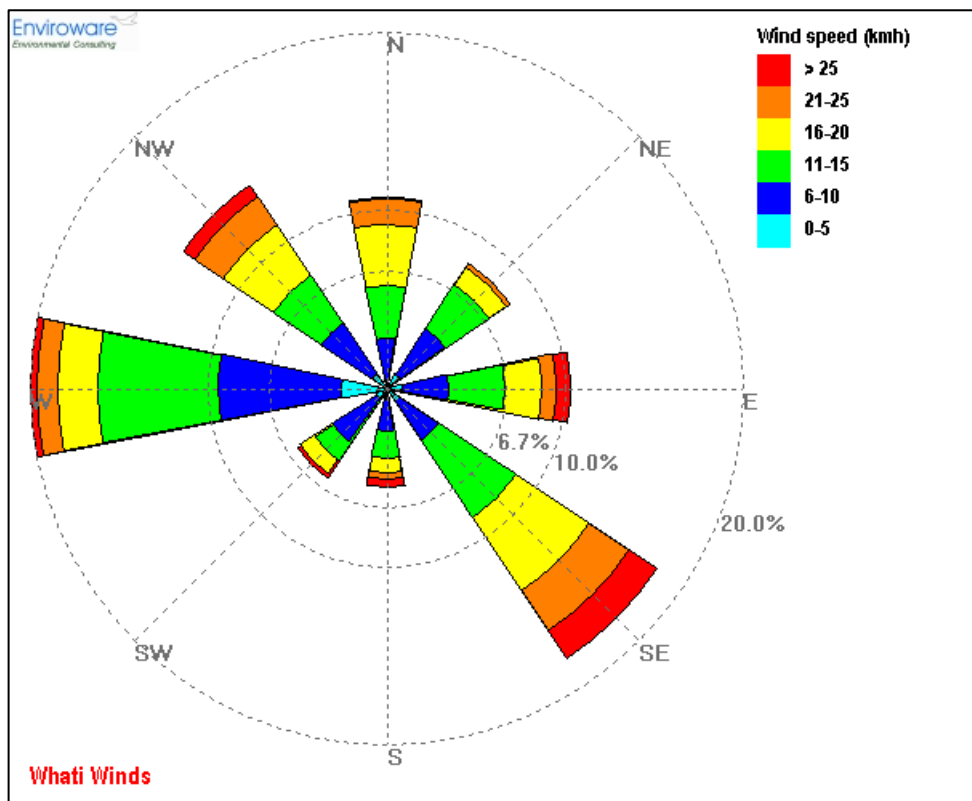
### 3.2.1 Wildland Fuel Types

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

The planning area is dominated with spruce-lichen woodland (C-1) fuels with patches of boreal spruce (C-2) and mixedwood (M-1/M-2) that could present wildfire threat to development.

### 3.2.2 Fire Weather Analysis

Fire weather data from the Whati weather station was used to determine the predominant wind directions during the fire season. The predominant and strongest wind directions are from the west and southeast (Figure 1).



*Figure 1 – Whati Windrose*

**Wildland fuel types and fire weather data indicates that the potential for landscape-level wildfire spread towards Whati is minimal.**

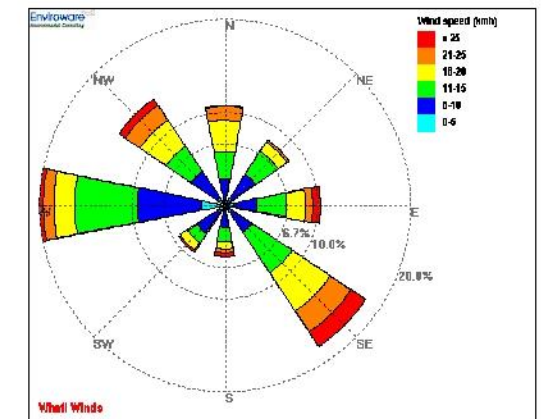


# Map 3 - FBP Fuel Types Whati

- Community Boundary
- Roads
- Cabin Sites

## 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)



1:70,000

**MONTANE**  
Forest Management Ltd.



### 3.3 FireSmart Hazard Assessments

FireSmart hazard assessments (Partners in Protection, 2003) were conducted on development areas and adjacent wildland fuel types within the planning area. New residential perimeter development on the east-side of Whati are at the highest threat to wildfire (Table 2 & Map 4).

*Table 2: FireSmart Hazard Assessments*

Development Area	Structure/Site Hazard (0 – 30m)
Whati West	Low
Whati East	High
Airport	Low

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

#### Whati West

FireSmart hazard for Whati West is rated as **LOW**. Fuels primarily consist of non-fuel and cured-grass with adequate defensible space from coniferous fuels. Exterior structure materials are primarily asphalt shingle/metal roofing and wood or log siding. Access roads are all-weather loop design.



#### Whati East

FireSmart hazard for Whati East is rated as **HIGH**. Fuels primarily consist of boreal spruce (C-2) and mixedwood (M-1/M-2) with inadequate defensible space between the residential structures and coniferous fuel types. Exterior structure materials are primarily asphalt shingle/metal roofing and hardiplank siding. Access roads are all-weather loop design.



### **Airport**

FireSmart hazard for the Airport is rated as **LOW**. Fuels primarily consist of non-fuel and cured grass with significant defensible space between the terminal and wildland fuels. Exterior structure materials are metal roofing and wood siding.







**The highest wildfire threat for Whati exists in the eastern residential area at the interface with the coniferous forest fuels.**

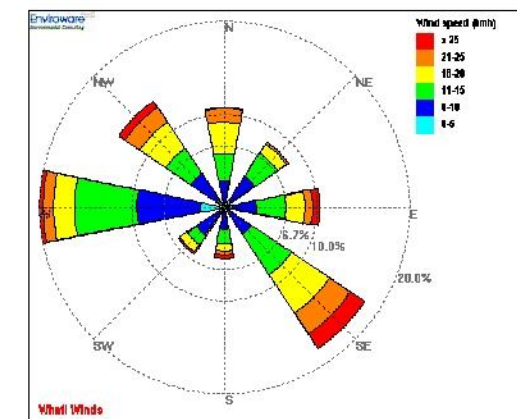


# Map 4 - FireSmart Hazard Whati

-  Community Boundary
-  Roads
-  Cabin Sites

## FireSmart Hazard

-  Low
-  Moderate
-  High
-  Extreme



1:13,000

**MONTANE**  
Forest Management Ltd.



## 4 Vegetation Management Options

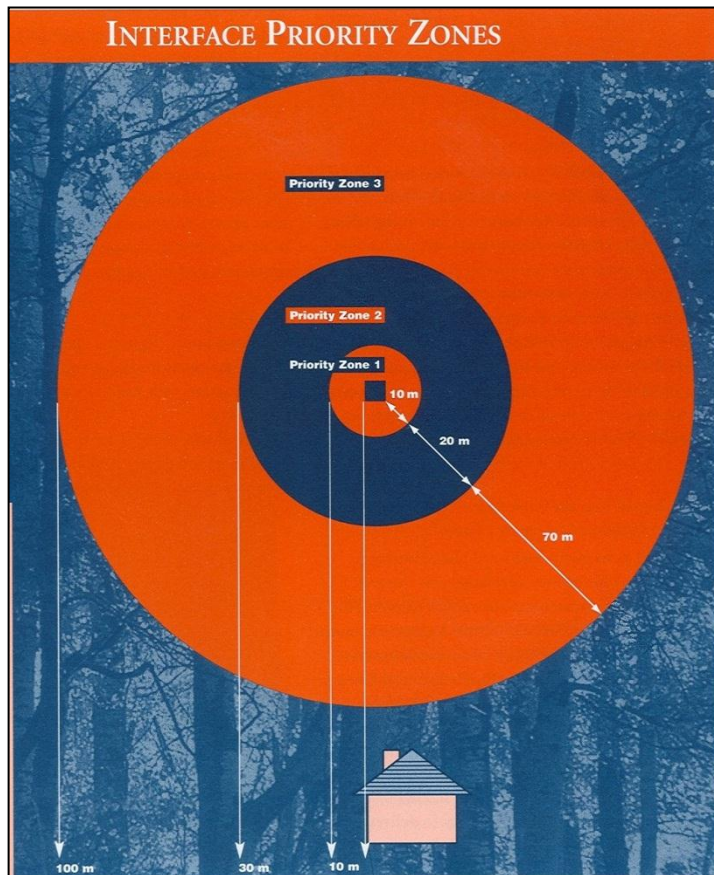
The goal of vegetation management is to create a fuel-reduced buffer between structures and flammable wildland vegetation to reduce the intensity and rate of spread of wildfire approaching or leaving the development. Vegetation management options are proposed at the appropriate scale, based on hazard 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”* (Partners in Protection 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

40 metre wide fuelbreaks were constructed by ENR on the north and east sides of Whati during the winter of 2010/11 (Table 3 & Map 5).

*Table 3: Existing Vegetation Management Areas*

Name	Area (ha)	Year Established	Agency	Comments
North Fuelbreak	1.4	2010	GNWT ENR	
East Fuelbreak	3.1	2010	GNWT ENR	

## 4.2 Proposed Vegetation Management

### 4.2.1 Zone 1

Zone 1 vegetation management is **inadequate** for many of the residential structures in East Whati, with a lack of defensible space from native grass and spruce 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* (Partners in Protection 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 NorthEast	13.7	<ul style="list-style-type: none"><li>▪ Fuels Reduction by spacing spruce to 2-3 m crown spacing for a minimum of 100m from structures</li><li>▪ Remove all dead standing and dead &amp; down coniferous and deciduous</li><li>▪ Remove willow shrub cover</li><li>▪ Retain deciduous overstory stems</li><li>▪ Prune limbs to 2 metres</li><li>▪ Dispose of debris by piling and burning onsite or use as biomass or other product</li></ul>	<ul style="list-style-type: none"><li>▪ GNWT ENR</li><li>▪ Tli Cho Govt.</li><li>▪ Municipal</li></ul>
FM2 SouthEast	8.8	<ul style="list-style-type: none"><li>▪ Fuels Reduction by spacing spruce to 2-3 m crown spacing</li><li>▪ Remove all dead standing and dead &amp; down coniferous and deciduous</li><li>▪ Remove willow shrub cover</li><li>▪ Retain deciduous overstory stems</li><li>▪ Prune limbs to 2 metres</li><li>▪ Dispose of debris by piling and burning onsite or use as biomass or other product</li></ul>	<ul style="list-style-type: none"><li>▪ GNWT ENR</li><li>▪ Tli Cho Govt.</li><li>▪ Municipal</li></ul>
<b>Total</b>	<b>22.5</b>		

**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.

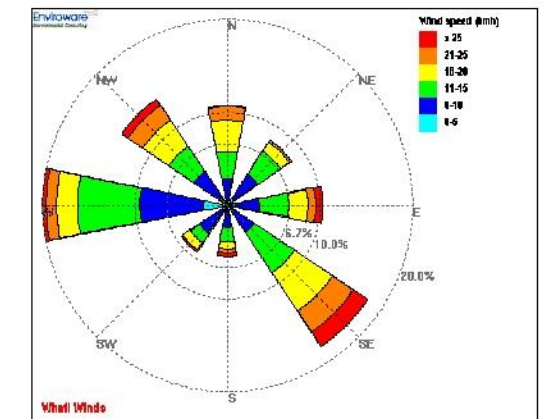
#### 4.3 Vegetation Management Maintenance

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.

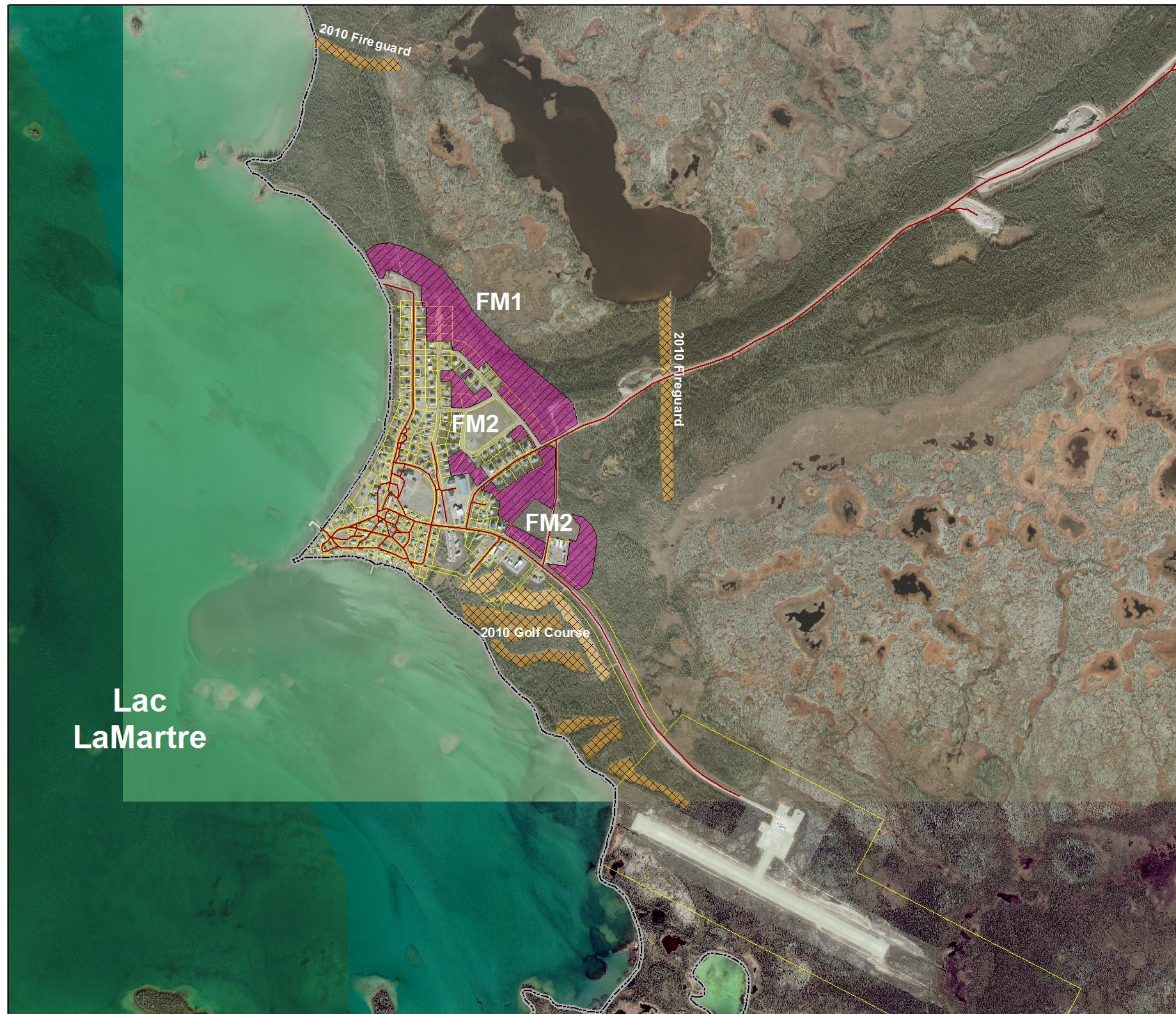


# Map 5 - Fuel Modification Whati



1:14,000

**MONTANE**  
Forest Management Ltd.





## 5. Development 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 on newer structures and combustible wood and log on older structures.

Many structures have combustible debris piles (firewood, lumber, etc) immediately adjacent to the structure, increasing the threat of wildfire to the structure. 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. Access roads are all-weather loop and dead-end design. There is no summer road access to the community.

### **5.2.2 Water Supply**

Whati 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 heating fuel. 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 NWTPC generation plant.

#### **Heating Fuel**

Heating fuel is provided by 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](http://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 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:

- Community Government of Whati
- 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 Whati Fire Department is presently not active therefore cross-training would not be effective at this time. Should the fire department become active, 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:** Should the fire department become active, the 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 Whati Emergency Measures Plan is used to provide authority and direction during an emergency. This plan is scheduled for updating in the near future.

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
<b>Zone 1</b>	<b>Recommendation 1:</b> Encourage residents to establish adequate Zone 1 defensible space around their structures.	Comm. Govt. of Whati GNWT MACA
<b>Zone 2-3</b>	<b>Recommendation 2:</b> 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 Tli Cho Govt. Comm. Govt. of Whati
<b>Maintenance</b>	<b>Recommendation 3:</b> 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 Tli Cho Govt. Comm. Govt. of Whati

### Development

Issue	Recommendation	Responsible Agency
<b>FireSmart Development Planning</b>	<b>Recommendation 4:</b> 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 Comm. Govt. of Whati

### Public Education

Issue	Recommendation	Responsible Agency
<b>Public Education Priorities</b>	<b>Recommendation 5:</b> Public education on acceptable FireSmart Zone 1 standards is recommended for all residents.	GNWT ENR & MACA Comm. Govt. of Whati



## Interagency Cooperation & Cross-Training

Issue	Recommendation	Responsible Agency
<b>FireSmart Committee</b>	<b>Recommendation 6:</b> Develop a FireSmart Committee, consisting of all relevant stakeholders, to coordinate and lead the FireSmart program for the area.	GNWT ENR & MACA Comm. Govt. of Whati
<b>Cross-Training</b>	<b>Recommendation 7:</b> Should the fire department become active, the 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"> <li>▪ Wildland Firefighter</li> <li>▪ Structure and Site Preparation Workshop (S-115)</li> <li>▪ Fire Operations in the Wildland/Urban Interface (S-215)</li> <li>▪ Incident Command System (I-100 to I-400) as applicable</li> </ul>	GNWT MACA & ENR Comm. Govt. of Whati

## Emergency Planning

Issue	Recommendation	Responsible Agency
<b>Community Wildfire Pre- Planning</b>	<b>Recommendation 8:</b> 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 Comm. Govt. of Whati