

Wekweeti Community Wildfire Protection Plan



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



With federal support through Natural Resources Canada's Regional Adaptation Collaborative Program



Natural Resources
Canada

Ressources naturelles
Canada

Canada

March 2012

Stew Walkinshaw, R.P.F.

MONTANE
Forest Management Ltd.

Canmore, AB.

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

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	9
	4.1 Existing Vegetation Management	
	4.2 Proposed Vegetation Management	
	4.3 Vegetation Management Maintenance	
5	Development Options	11
	5.1 Structural Options	
	5.2 Infrastructure Options	
6	Public Education Options	13
7	Interagency Cooperation and Cross-Training Options	14
8	Emergency Planning Options	15
9	Implementation Plan	16

1 Introduction

The Wekweeti 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 Wekweeti 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
- Grace Angel, SAO Community Govt. of Wekweeti

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

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


Map 1 - Planning Area Wekweeti

 Community Boundary

 Roads

 Cabin Sites

Land Status Authority

 Commissioner

 Federal

 Indian Affairs Branch

 Mixed

 Municipal

 Private

Wekweeti

Airport

Snare
Lake



1:50,000

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 four wildfires were discovered within a 10 kilometre radius of the community (Table 1), all were lightning-caused. Three were contained at a maximum of 0.2 ha and the fourth was contained at 145 ha. None of the fires created a threat to development in Wekweeti (Map 2).

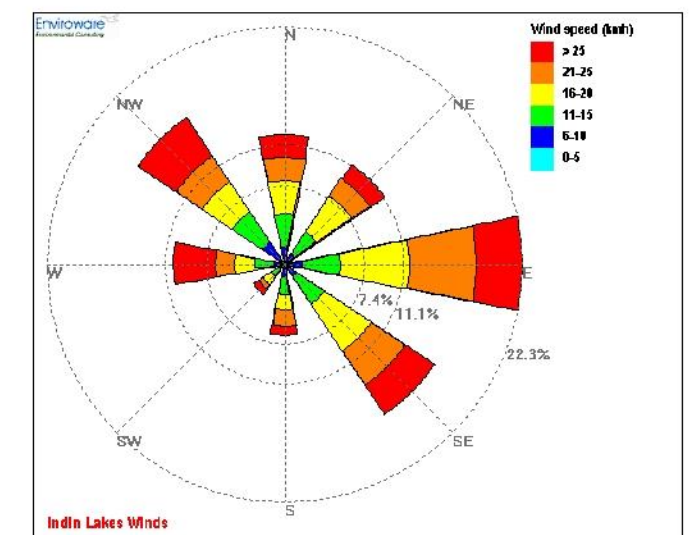
Table 1: Fire Incidence by Cause (2002 – 2011)

General Cause	Number of Fires	Percent of Total
Human-Caused	0	0
Lightning-Caused	4	100
Totals	4	100

The risk of wildfire in the planning area is low based on fire incidence data.

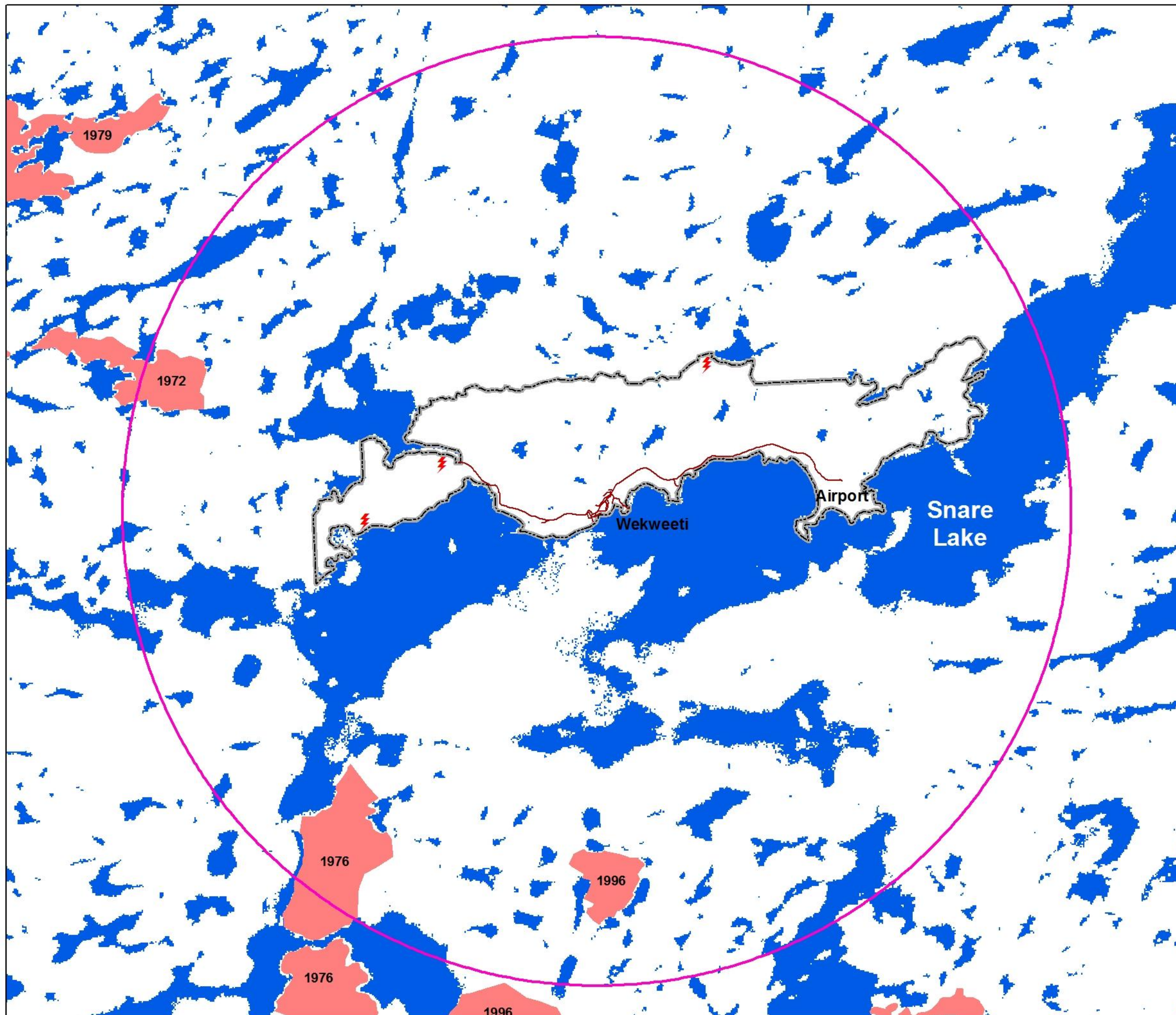
Map 2 - Wildfire Incidence Wekweeti

-  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 Wekweeti (Map 3).

The planning area is dominated with open density spruce-lichen woodland (C-1) and boreal spruce (C-2) fuels with patches of deciduous (D-1), cured-grass (O1), and non-fuel (NF) fuels.

3.2.2 Fire Weather Analysis

Fire weather data from the Indin Lakes weather station was used to determine the predominant wind directions during the fire season. The predominant and strongest wind directions are from the east/southeast and the northwest (Figure 1).

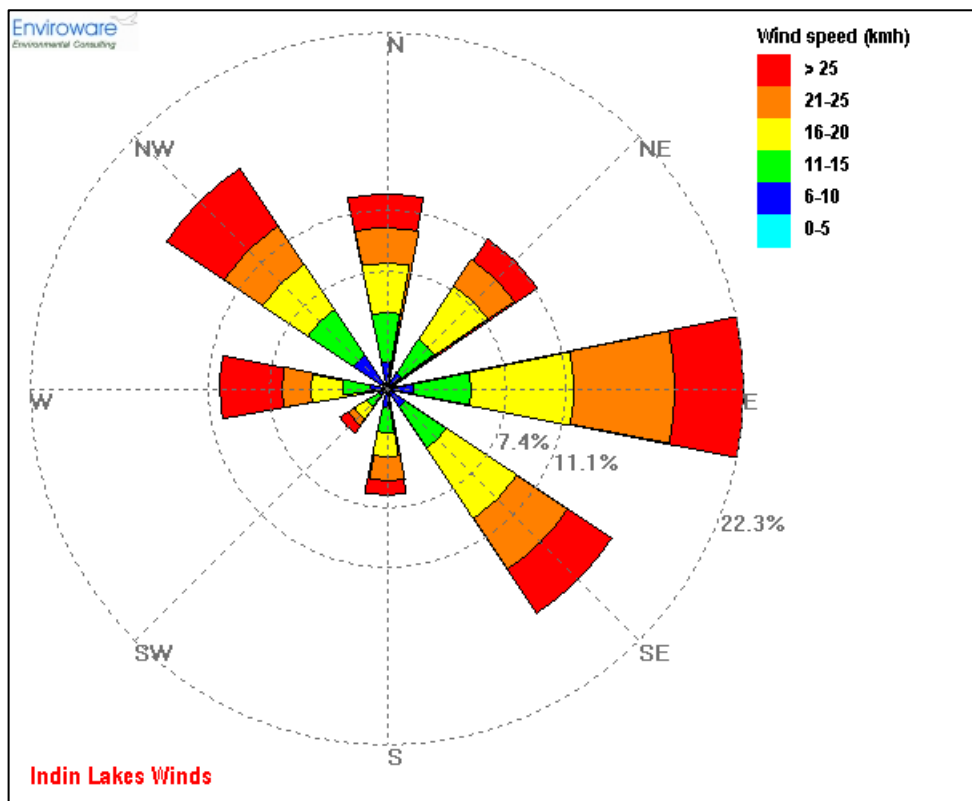


Figure 1 – Indin Lakes Windrose

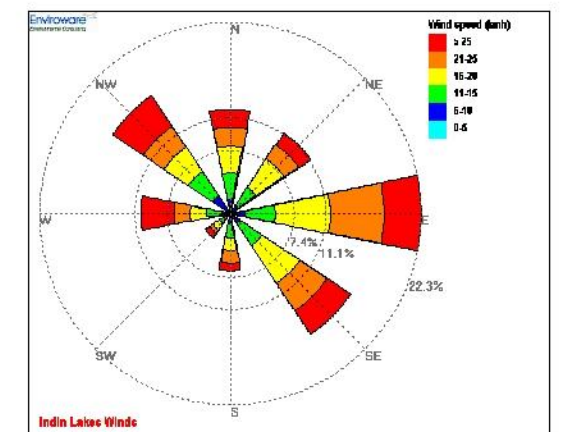
Wildland fuel types and fire weather data indicates that the potential for landscape-level wildfire spread towards Wekweeti is low.

Map 3 - FBP Fuel Types Wekweeti

- 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)



1:25,000

MONTANE
Forest Management Ltd.

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. All development within Wekweeti is at minimal threat to wildfire (Table 2 & Map 4).

Table 2: FireSmart Hazard Assessments

Development Area	Structure/Site Hazard (0 – 30m)
Wekweeti	Low
Airport	Low

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

Wekweeti

FireSmart hazard for Wekweeti is rated as **LOW**. Fuels immediately adjacent primarily consist of non-fuel, cured-grass, deciduous, and open-density spruce (C-1). Some structures have inadequate defensible space from cured-grass resulting in increased threat. Exterior structure materials are primarily asphalt shingle/metal roofing and hardiplank siding on newer structures and wood or log siding on older structures. Access roads are all-weather loop and dead-end design.



Airport





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

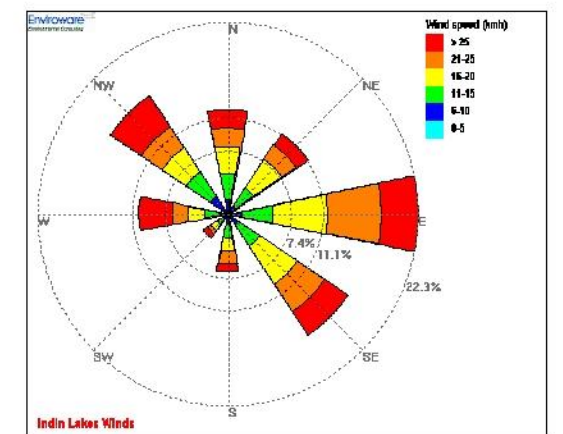
The FireSmart threat for Wekweeti is Low based on fuel types adjacent to structures, exterior structural materials and fire incidence data, with the highest threat being from cured-grass fuels adjacent to homes.

Map 4 - FireSmart Hazard Wekweeti

-  Community Boundary
-  Roads
-  Cabin Sites

FireSmart Hazard

-  Low
-  Moderate
-  High
-  Extreme



1:25,000

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”* (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.

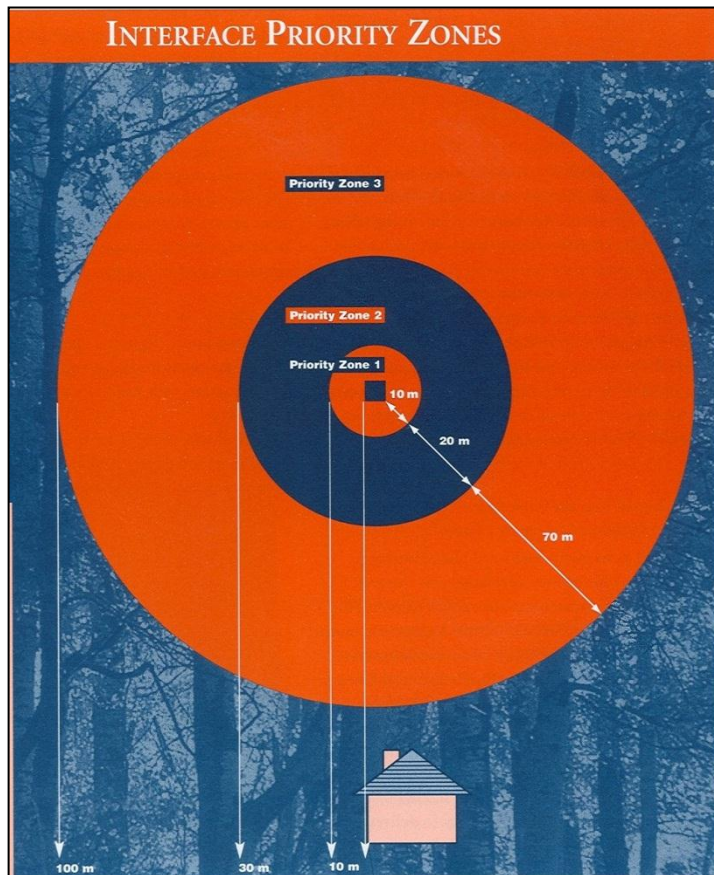


Figure 3 – Interface Priority Zones (PIP, 2003)

4.1 Existing Vegetation Management

There are no existing fuel modification areas around Wekweeti.

4.2 Proposed Vegetation Management

4.2.1 Zone 1

Zone 1 vegetation management is adequate for the majority of structures however some have a lack of defensible space from native grass 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

There are no recommended Zone 2-3 fuel modification areas based on the wildfire threat to the community.

4.3 Vegetation Management Maintenance

FireSmart Zone 1 fuel modification maintenance is an ongoing process. Residents should be educated and encouraged to maintain their properties regularly throughout the fire season to reduce the threat of wildfire to their structures.

Recommendation 2: Residents should be educated and encouraged to maintain their properties regularly throughout the fire season to reduce the threat of wildfire to their structures.

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 3: 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.

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

Wekweeti 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 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 4: 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 Wekweeti
- GNWT Environment and Natural Resources (ENR)
- GNWT Municipal and Community Affairs (MACA)

Recommendation 5: Develop a FireSmart Committee, consisting of all relevant stakeholders, to coordinate and lead the FireSmart program for the area.

The Wekweeti Fire Department presently only has two firefighters 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 6: 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

Wekweeti presently does not have an Emergency Measures Plan nor does it 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 7: 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.	Comm. Govt. of Wekweeti GNWT MACA
Maintenance	Recommendation 2: Residents should be educated and encouraged to maintain their properties regularly throughout the fire season to reduce the threat of wildfire to their structures.	GNWT ENR & MACA Comm. Govt. of Wekweeti

Development

Issue	Recommendation	Responsible Agency
FireSmart Development Planning	Recommendation 3: 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 Wekweeti

Public Education

Issue	Recommendation	Responsible Agency
Public Education Priorities	Recommendation 4: Public education on acceptable FireSmart Zone 1 standards is recommended for all residents.	GNWT ENR & MACA Comm. Govt. of Wekweeti

Interagency Cooperation & Cross-Training

Issue	Recommendation	Responsible Agency
FireSmart Committee	Recommendation 5: 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 Wekweeti
Cross-Training	Recommendation 6: 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"> 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 Comm. Govt. of Wekweeti

Emergency Planning

Issue	Recommendation	Responsible Agency
Community Wildfire Pre- Planning	Recommendation 7: 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 Wekweeti