

Community Wildfire Protection Plan

Tsiigehtchic



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1 Introduction

In 2009, a Community Wildfire Protection Plan (CWPP) was developed for the Charter Community of Tsiigehtchic to address the hazard and the risk to the community from wildfire. That CWPP was developed to provide practical and operational wildland /urban interface (WUI) risk mitigation strategies to reduce the threat from wildfire to the community.

The original CWPP was developed by Valhalla Consulting Inc., Arctic Response Canada Ltd and Timberline Natural Resource Group Ltd in cooperation with the Government of the Northwest Territories (GNWT) and Tsiigehtchic.

In 2018 the GNWT, Department of Environment and Natural Resources (ENR) updated the Tsiigehtchic CWPP by using the most recent information, science and expertise available. This included using standardized FireSmart assessment protocols and mitigative measures were developed based on the 7 disciplines of FireSmart.

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

The update included:

- The FireSmart mitigation efforts completed around the community
- The change in hazard around the community.
- New recommendations or modification to existing recommendations

Tsiigehtchic, in cooperation with ENR, implemented some of the original recommendations, but there is still work to do.

The update includes recommendations to assist in setting priorities to reduce the threat from wildfire. It is important to note that while implementing these recommendations will reduce the threat from wildfire to structures, it will never completely remove the threat.

This plan should be reviewed regularly to ensure that it remains a priority to the community and its residents.

2 Planning Area and Stakeholders

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

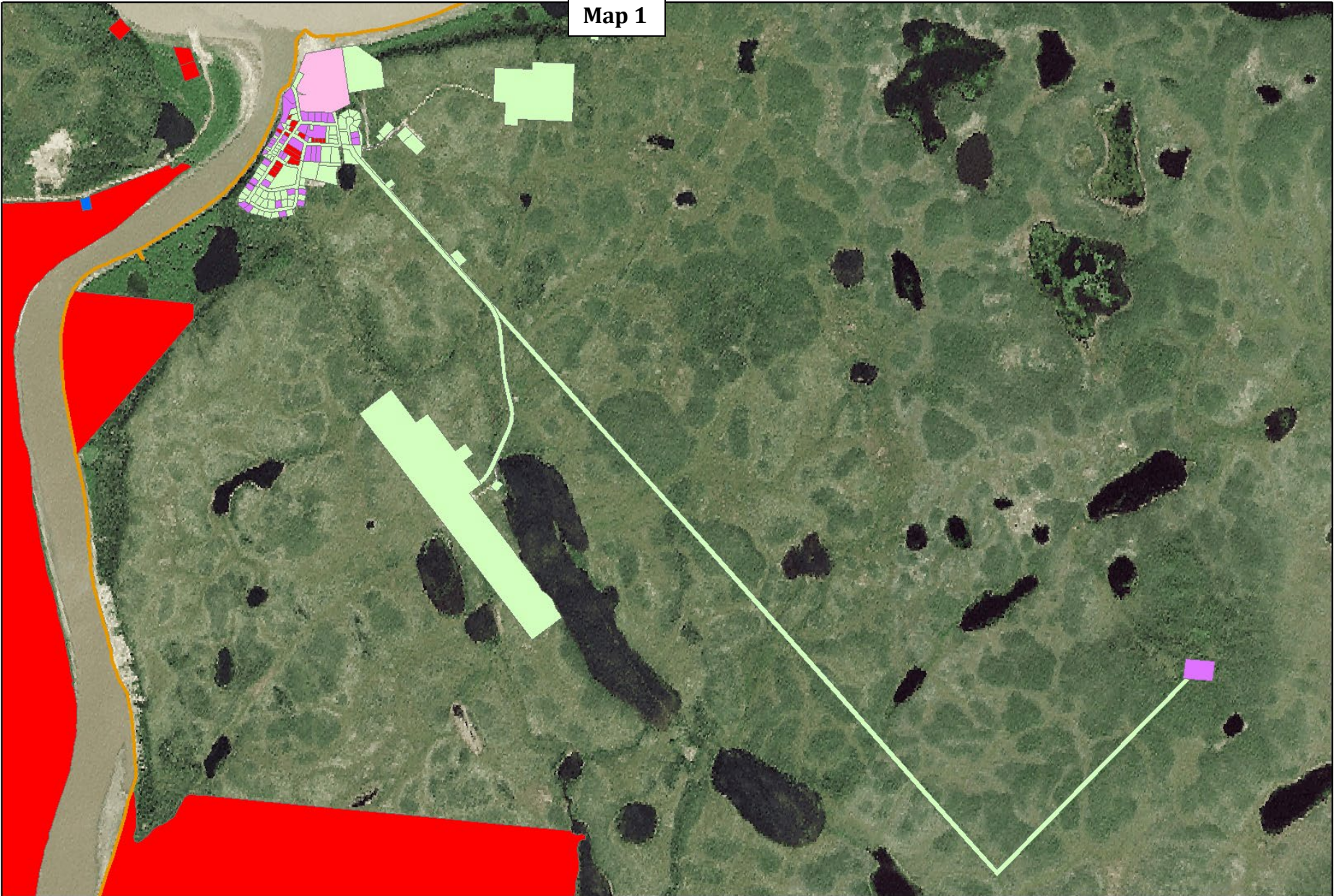
Stakeholders involved in the planning process included:

- Government of the Northwest Territories, Environment and Natural Resources
- Gwichya Gwich'in Renewable Resource Council

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

- Commissioner
- Gwich'in
- Mixed
- Private
- Territorial

Map 1



Tsiigehtchic Land Status Authority

- | | | |
|----------------|-------------|---------------|
| Land Ownership | Mixed | Planning Area |
| Commissioner | Private | |
| Gwichin | Territorial | |

N

1:30,000

Northwest Territories Environmental and Natural Issues

3 Hazard & Risk Assessment

In the original 2009 CWPP a hazard and risk assessment was undertaken to determine the potential impact wildfire could have on the community. This was based on an analysis of the historical wildfire ignition sources, fire incidence and the fire potential of the forest surrounding the community.

3.1 Wildfire Ignition Potential

The assessment of recent fire incidence was completed using historical fire data from ENR for the ten-year period from 2009 to 2018.

Fire incidence data indicates that 1 wildfire was discovered within a 10 kilometre radius of the community, 100% human-caused. (Table 1 & Map 2)

Table 1: Fire Incidence by Cause (2009- 2018)







General Cause	Number of Fires	Percent of Total
Human-Caused	1	100
Lightning-Caused	0	
Totals	1	100

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


Map 2



Tsiigehtchic Ten Year Fire History


-  Planning Area 10km Buffer
-  Planning Area
-  Large Fire History
-  Human Caused
-  Lightning
-  Unknown

Northwest Territories Environment and Natural Resources



0 2,500 5,000 10,000
Meters

1:250,000



3.2 Wildfire Behaviour Potential

3.2.1 Forest Fuel Types

Analysis of the forest fuels surrounding Tsiigehtchic were completed in 2009 and indicated the main fuels to be mainly spruce-lichen woodland, with patches of deciduous, mixed wood and grasslands. The forest fuels have not changed significantly since that time. Fire Behaviour Prediction (FBP) fuel types were used to analyze the fuel types and fire behaviour potential within and adjacent to Tsiigehtchic.

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.

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

3.3 FireSmart Hazard Assessments

FireSmart hazard assessments of developed areas and adjacent forest fuels were completed and indicated that all development in Tsiigehtchic are at a Low hazard. 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)

Table 2: FireSmart Hazard Assessments

Development Area	Structure/Site Hazard (0 - 30m)
Tsiigehtchic Community	Low - Moderate
Southwest Residential Area	High

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

Tsiigehtchic 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 mixed wood 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.

FireSmart hazard is High for the Tsiigehtchic southwest residential area and Low-Moderate for the remainder of the community.

4 Vegetation Management Options

The goal of vegetation management is to create a clear space between the community and the forest to reduce the intensity and rate of spread of wildfire approaching or leaving the community. 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 (remove trees)
- Fuel reduction (thin and prune trees)
- Species conversion (plant less flammable trees)

Complete descriptions of the methods included in each of the above options are included in the link:

<https://www.firesmartcanada.ca/mdocs-posts/firesmart-priority-zones-2017/>

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

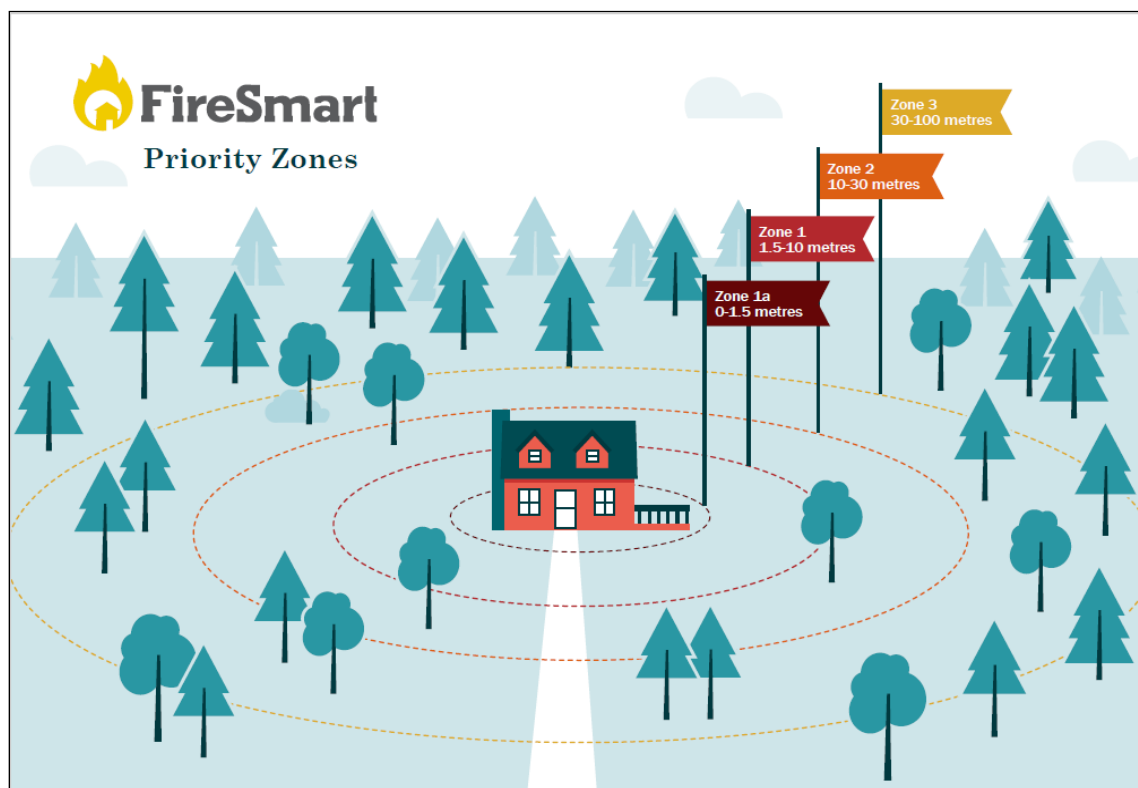


Figure 1– Interface Priority Zones (PIP, 2017)

4.1 Existing Vegetation Management

The south fuel breaks, constructed in 2010, have been significantly overgrown and some no longer act as adequate fuel breaks for the community (Table 3 & Map 3). A portion of the south fuel break was maintained in the winter of 2010. It requires some maintenance and additional work.

Table 3: Existing Vegetation Management Areas

Name	Area (ha)	Year Established	Agency	Comments
South Fuelbreak1	2.4	2010	GNWT	Review and do maintenance when required
South Fuelbreak2	16.7	2010	GNWT	Originally done in 2010. Need to be redone.



Existing Fuel Break

4.2 Proposed Vegetation Management

4.2.1 Zone 1a and 1

Zone 1a 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 1a vegetation options include:



- Creating a noncombustible zone around structures by clearing vegetation and combustible material down to mineral soil within 1.5 metres of structures.
- Use noncombustible materials in this critical zone of 1.5 metres directly adjacent to your home such as gravel, bricks or concrete.
- Wood shrubs, trees or tree branches should be avoided in this zone and any that are present should be properly mitigated.

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 1a and 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 3) 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
West Residential	3.9	<ul style="list-style-type: none"> ▪ Fuels Reduction by Thin, Prune and Clean ▪ Remove 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"> ▪ Tsiigehtchic
Ballpark Residential	3.1	<ul style="list-style-type: none"> ▪ Fuels Reduction by Thin, Prune and Clean ▪ Remove a minimum of 50% of spruce to achieve 	<ul style="list-style-type: none"> ▪ Tsiigehtchic

		<ul style="list-style-type: none"> 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 	
NE Fuel Break Extension	1.6	<ul style="list-style-type: none"> ▪ New fuel break ▪ 20m wide to tie into existing Fuel break 	<ul style="list-style-type: none"> ▪ Tsiigehtchic
2010 Fuel Break South	16.7	<ul style="list-style-type: none"> ▪ Fuel break ▪ Widen to 20 metres in areas ▪ Requires to be clean up and maintained 	<ul style="list-style-type: none"> ▪ Tsiigehtchic ▪ Tsiigehtchic
Total	25.3		

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.

Map 3

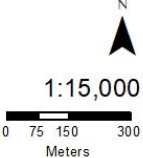


Tsiigehtchic Fuel Modifications

Completed and Proposed

Fuel Modifications

- Completed
- In Progress
- Proposed



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.

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 within the community.

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

Tsiigehtchic 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 NTPC generation plant.

Heating Fuel

Heating fuel is provided by diesel tank supply.

6 Public Education Options

Public education plays a key role in promoting and implementing FireSmart principles and projects. Residents, landowners, municipal administration, and elected officials all need to be aware of the risk of wildfires 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: <https://www.enr.gov.nt.ca/en/services/be-firesmart> 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 target audiences in the planning area.

Homeowners

Homeowners can increase resiliency of homes and make them less vulnerable to wildfire by development and maintenance of the FireSmart Non-Combustible Zone 1a (0-1.5 metres) and Zone 1 (1.5-10 metres) defensible space surrounding the home, by:

- Clearing vegetation and combustible material down to mineral soil within 1.5 metres of structures.
- Using noncombustible materials in this critical zone of 1.5 metres directly adjacent to your home such as gravel, bricks or concrete.
- Woody shrubs, trees or tree branches should be avoided in this area and any that are present should be properly mitigated
- Storing firewood and other combustible materials more than 10 metres away from the home
- Keeping roof and eaves clear of leaves and other combustible debris
- Creating propane and fuel-tank FireSmart defensible space
- Creating a non-combustible zone for underneath and around any trailers/vehicles and mitigate sheds and other structures to the same standards as those of your home
- If possible and/or applicable maintain Zone 2 (10-30 metres) and Zone 3 (30-100 metres) recommendations, and work with neighbors in any overlapping Priority Zones.

Communities

Communities can reduce wildfire risk and adopting FireSmart principles by:

- Holding a FireSmart Wildfire Community Preparedness Day or workshop.
- Using local government websites, social media and newsletters to promote FireSmart principles.
- Asking ENR staff what educational and/or promotional resources they have available, such as: wildfire information pamphlets, posters, educational resources, videos etc.
- Applying for the FireSmart Community Recognition Program. For more information visit: www.firesmartcanada.ca/firesmart-communities/firesmart-canada-community-recognition-program/.

Recommendation 5: Public education on acceptable FireSmart Zone 1a and Zone 1 standards is recommended for all Tsiigehtchic 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 Tsiigehtchic
- GNWT

Recommendation 6: Coordinate with the established emergency management committee to determine what will be required during a wildfire emergency. All relevant stakeholders should understand the FireSmart program and help to promote mitigation.

The Tsiigehtchic Fire Department has an active fire department with approximately 7 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-131, or equivalent)

Wildland/Urban Interface Fire

- Structure and Site Preparation Workshop (S-115)

Incident Command System

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

Recommendation 7: The Tsiigehtchic Fire Department and the GNWT 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)
- Incident Command System (I-100 to I-300) as applicable

8 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 an interface fire are of paramount importance. The Tsiigehtchic 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).

ENR attended an emergency planning workshop in Tsiigehtchic in early 2018.

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 Recommendations Summary

Vegetation Management

Issue	Recommendation	Responsible Agency
Zone 1	Recommendation 1: Encourage residents to establish adequate Zone 1 defensible space around their structures.	Tsiigehtchic
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.	Tsiigehtchic
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.	Tsiigehtchic

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.	Tsiigehtchic GNWT

Public Education

Issue	Recommendation	Responsible Agency
Public Education Priorities	Recommendation 5: Public education on acceptable FireSmart Zone 1a and Zone 1 standards is recommended for all Tsiigehtchic residents.	Tsiigehtchic GNWT

Interagency Cooperation & Cross-Training

Issue	Recommendation	Responsible Agency
Interagency Cooperation	Recommendation 6: Coordinate with the established emergency management committee to determine what will be required during a wildfire emergency. All relevant stakeholders should understand the FireSmart program and help to promote mitigation.	Tsiigehtchic GNWT
Cross-Training	Recommendation 7: The Tsiigehtchic Fire Department, Public works and the GNWT should partner on cross-training initiatives to ensure emergency responders are cross-trained to the following: <ul style="list-style-type: none"> ▪ Wildland Firefighter ▪ Structure and Site Preparation Workshop (S-115) ▪ Incident Command System (I-100 to I-300) as applicable 	Tsiigehtchic GNWT

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.	Tsiigehtchic GNWT