

Community Wildfire Protection Plan

Nahanni Butte



Government of
Northwest Territories

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1 Introduction

In 2011, a Community Wildfire Protection Plan (CWPP) was developed for Nahanni Butte to address the hazard and the risk to the community from wildfire. The 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 Montane Forest Management Ltd. in cooperation with the Government of the Northwest Territories (GNWT) and Nahanni Butte.

In 2018 the GNWT, Department of Environment and Natural Resources (ENR) updated Nahanni Butte's 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

Nahanni Butte, 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 two kilometres of the developed areas in Nahanni Butte (Map 1).

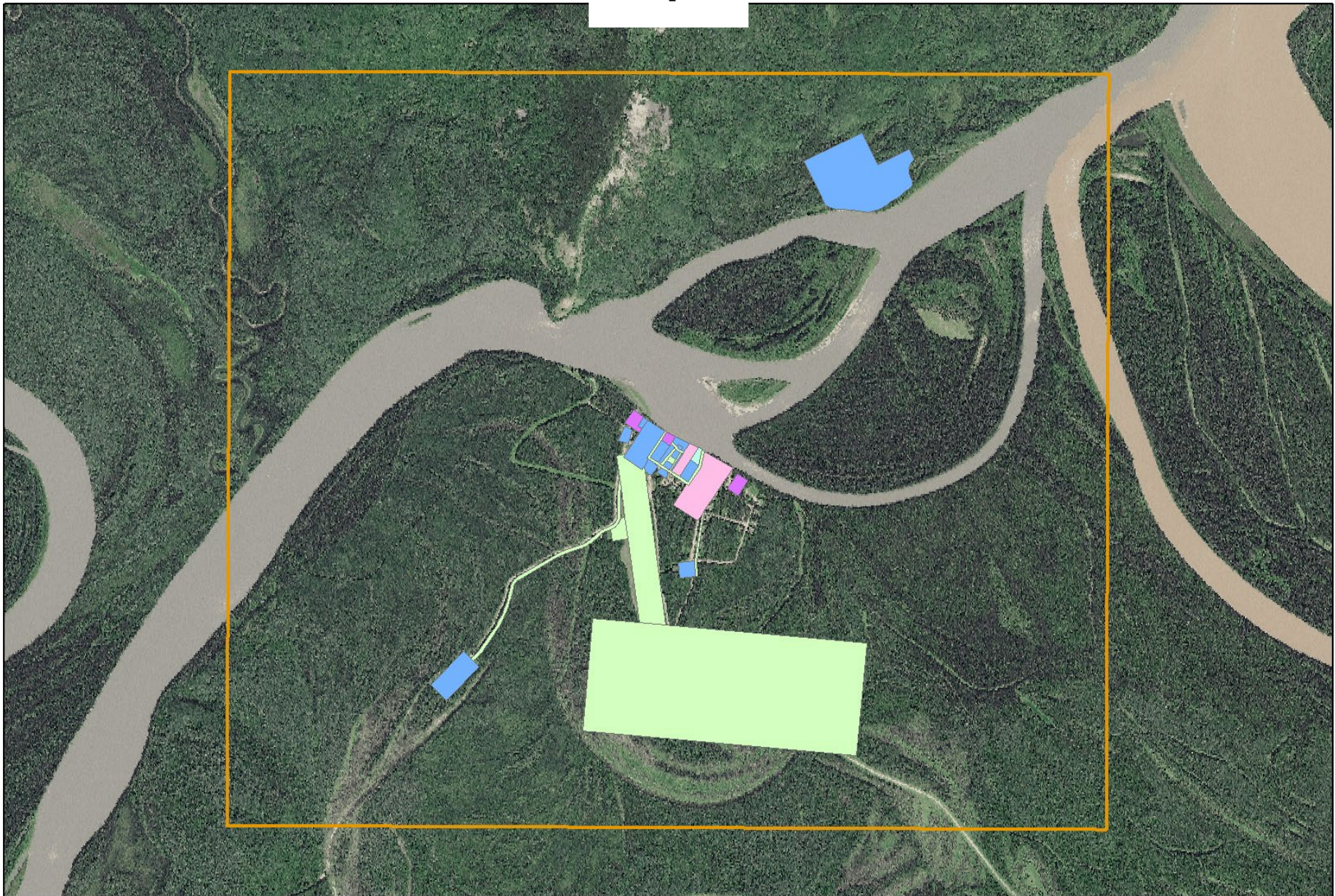
Stakeholders involved in the planning process included:

- Government of the Northwest Territories, Environment and Natural Resources
- Nahane Deh Dene Band

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

- Commissioner
- Indian Affairs Branch
- Mixed
- Private
- Territorial

Map 1



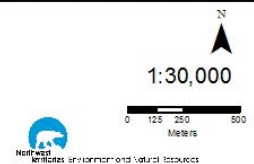
Nahanni Butte Land Status Authority

Land Ownership

- Commissioner
- Indian Affairs Branch

- Mixed
- Private
- Territorial

Planning Area



3 Hazard & Risk Assessment

In the original 2011 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 wildland 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 eight year period from 2009 to 2018.

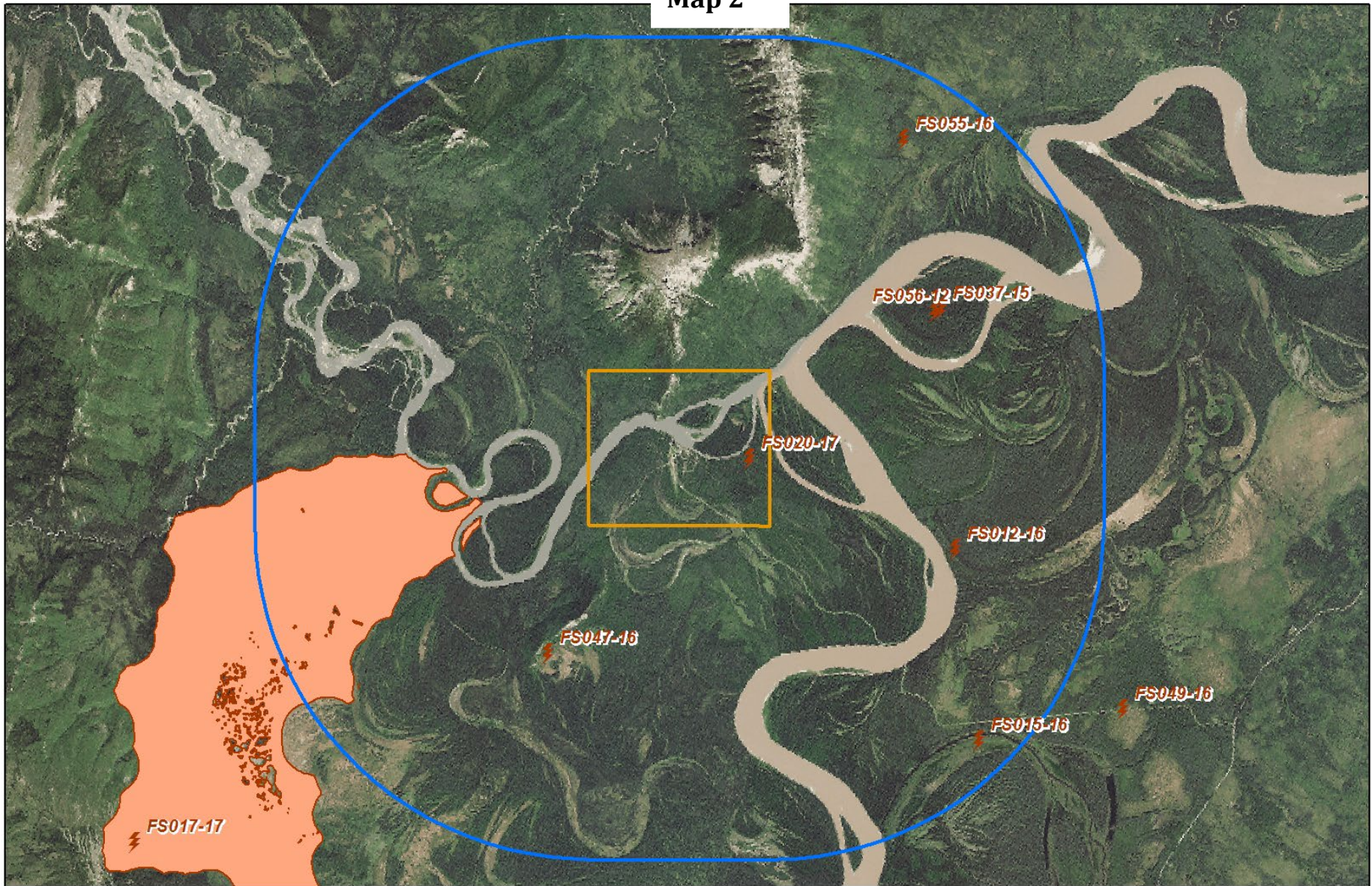
Data within a 10 kilometre (km) radius of the planning area boundary indicates that wildfire incidence is low. Fire incidence data indicates that 8 wildfires occurred within the planning area since 2009 (Map 2), and they were all caused by lightning. The largest fire was located 5km west of Nahanni Butte in 2017 (FS017-17), and it burned a total of 8200ha.

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







General Cause	Number of Fires	Percent of Total
Human-Caused	0	0
Lightning-Caused	8	100
Totals	8	100

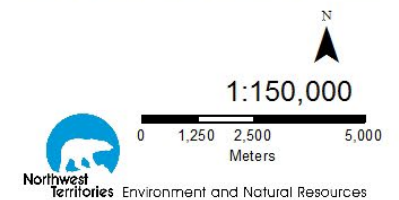
Wildfire incidence in the planning area is Low and is predominantly lightning-caused.

Map 2



Nahanni Butte Ten Year Fire History

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



3.2 Wildfire Behaviour Potential

3.2.1 Forest Fuel Types

Fire Behaviour Prediction (FBP) fuel types (Taylor, 1997) were used to analyze the forest fuel types and fire behaviour potential within and adjacent to Nahanni Butte.

The planning area is dominated with deciduous (D-1) overstory with a moderately dense spruce understory with pockets of scattered mixed wood (M-1) and spruce-lichen woodland (C-1) fuel types. Fuel types within the town site area include mainly cured-grass (O1), non-fuel (NF), and deciduous (D-1) with spruce understory. The spruce understory could present wildfire hazard to structures on High and Extreme hazard days.

Wildland fuel type data indicates a Low potential for intense landscape-level wildfire exists in D-1 and M-1 fuels surrounding Nahanni Butte.

3.3 FireSmart Hazard Assessments

FireSmart hazard assessments (P.I.P., 2003) were conducted on developments and adjacent forest fuel types within the planning area. The FireSmart hazard assessment process evaluates wildland and structural fuel types, structural features, and topography within and adjacent to the development area to consistently quantify the wildland/urban interface hazards within the planning area and to help set priorities for mitigative options.

Section 3.2 identified a Low potential for intense landscape-level wildfire in the lands surrounding Nahanni Butte.

FireSmart hazard for Nahanni Butte is predominantly Low to Moderate. Fuel types include non-fuel (NF), cured-grass O1), deciduous (D-1) with a moderately dense spruce understory, mixed wood (M-1) and isolated patches of boreal spruce (C-2).

Exterior structure materials are primarily asphalt shingle or metal roofing and wood, log, metal or hardi-plank siding. Access roads are all-weather loop design. The highest wildfire threat is to dwellings in the new development on the east perimeter of town.



Nahanni Butte 2017

The threat of significant structure loss from wildfire in Nahanni Butte is predominantly Low to Moderate.

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.

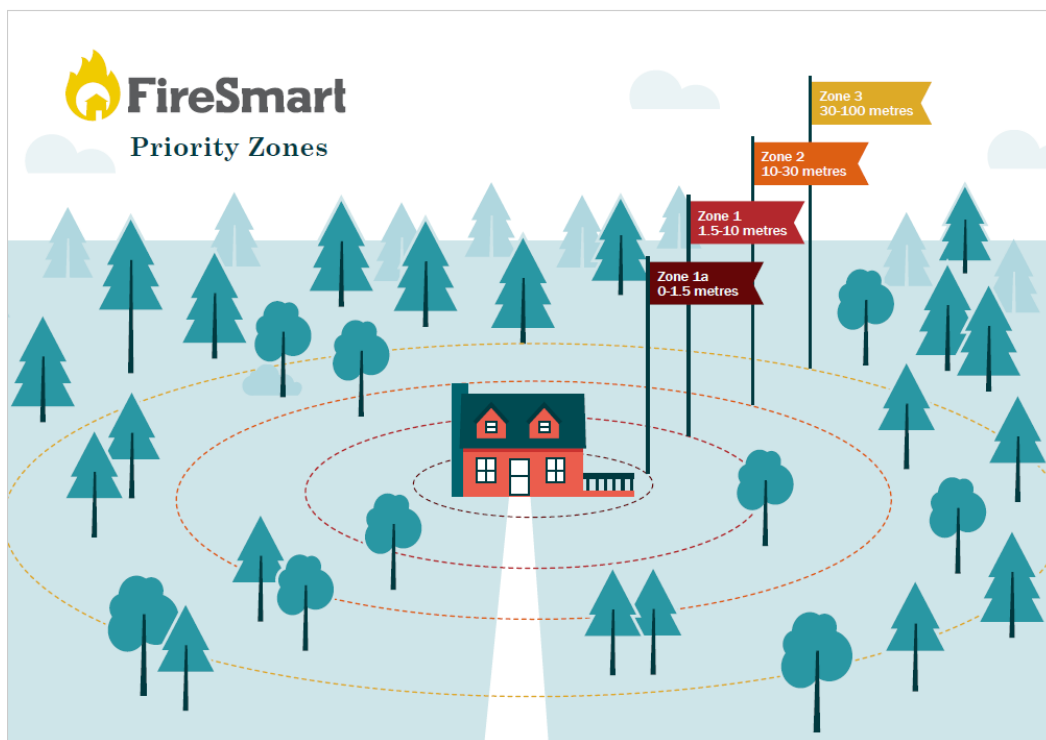


Figure 1– FireSmart Priority Zones (FireSmart Canada 2017)

4.1 Existing Vegetation Management

Fuels removal projects have been completed in the planning area by ENR (Map 3 & Table 3).

Table 3: Existing Vegetation Management Areas

Name	Area (ha)	Year	Agency	Comments
West-Side Fireguard	7.3	1990's	GNWT	
East-Side Fireguard	2.7	2017	GNWT	Requires completion work

Fireguards were constructed in the 1990's on the west-side and in 2010 on the east-side of Nahanni Butte. The 1990's west-side fireguard was cleared to a minimum width of 30 metres and is still effective. In 2017, the east-side fireguard was expanded to approximately 40 metres in width and still requires organics removal, and debris disposal.



West-Side Fireguard



East-Side Fireguard

4.2 Proposed Vegetation Management

4.2.1 Zones 1a (0-1.5 metres)

Zone 1a vegetation management is **inadequate** for many of structures due to encroachment of native grass fuels.

FireSmart Zone 1a vegetation management options include:

- Creating a noncombustible zone around structures by clearing vegetation and combustible material down to mineral soil within of structures.
- Use 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 zone and any that are present should be properly mitigated.

4.2.2 Zone 1(1.5-10m)

Zone 1 vegetation management is predominantly **adequate** throughout area except for scattered structures lack of adequate Zone 1 defensible space from native grass fuels (O1).

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.



the
with

For more information on FireSmart Zone 1a and 1 standards refer to the FireSmart Canada website at this link: <https://www.firesmartcanada.ca/>.

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

4.2.3 Zone 2-3 (10-30m and 30-100m)

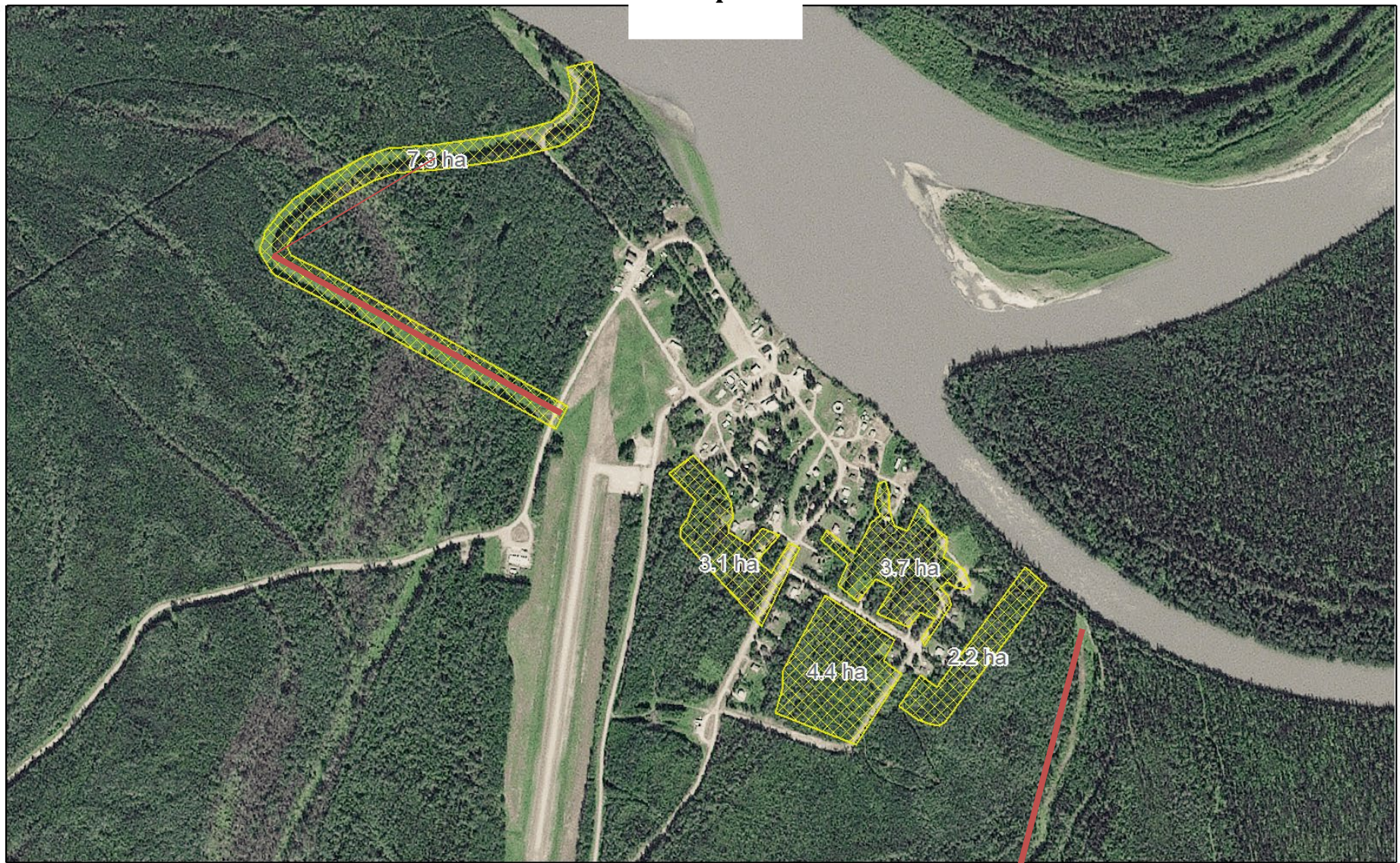
Zone 2-3 fuels management is recommended for areas on the east and south perimeters of the community to reduce the threat of wildfire in D-1/M-1 fuels inside the fireguard to perimeter structures (Table 4 & Map 3). Proposed fuels management areas are conceptual at this time and will require detailed 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
1	3.8	<ul style="list-style-type: none"> ▪ Dispose of all debris from past and present fuels removal by burning 	<ul style="list-style-type: none"> ▪ Nahanni Butte
2	13.4	<ul style="list-style-type: none"> ▪ Fuels reduction to space understory spruce to minimum of 2 metre crown spacing for a minimum of 75 metres width behind homes ▪ Remove all dead standing and down coniferous and deciduous (willow) stems and brush ▪ Retain overstory spruce and deciduous stems ▪ Prune residual spruce limbs to 2 metres ▪ Dispose of all debris by burning 	<ul style="list-style-type: none"> ▪ Nahanni Butte
3	3.3	<ul style="list-style-type: none"> ▪ Fuels reduction to space understory spruce to minimum of 2 metre crown spacing ▪ Remove all dead standing and down coniferous and deciduous (willow) stems and brush ▪ Retain overstory spruce and deciduous stems ▪ Prune residual spruce limbs to 2 metres ▪ Dispose of all debris by burning 	<ul style="list-style-type: none"> ▪ Nahanni Butte
Total	16.3		

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.

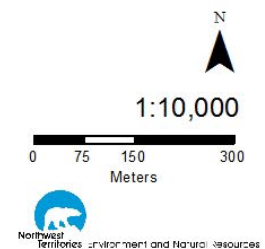
Map 3



**Nahanni Butte
Fuel Modifications**
Completed and Proposed

Fuel Modifications

-  Completed
-  In Progress
-  Proposed



4.3 Vegetation Management Maintenance

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

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 regular inspections of their fuel modification project areas and complete maintenance as required.

Recommendation 3: 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 fuel break 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, structure siting with respect to steeper forested slopes, 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 and common siding materials are wood, log, metal with hardi-plank on the newer structures.



Several newer structures are elevated above ground on pilings with open undersides, increasing the threat of wildfire entry underneath the structure.

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 adequate for an interface community with primarily all-weather loop road access. Nahanni Butte only has winter-road access at this time requiring the need for early consideration of evacuation.

5.2.2 Water Supply

Nahanni Butte does not have municipal hydrant water-supply. All development areas rely on water-tender supply from the local fire department for structure protection activities. Individual dwellings have cisterns that are tender-supplied from the central water plant.

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 a diesel-powered generator station with above-ground distribution lines.

Heating Fuel

Heating fuel is provided by truck delivery and stored in bulk at a tank far

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 6: Public education on acceptable FireSmart Zone 1a and Zone 1 standards is recommended for all Nahanni Butte residents.

7 Inter-Agency Cooperation & 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:

- Nahà Dehé Dene Band
- 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.

Nahanni Butte does not currently have an active Fire Department in the community. They have a fire truck, and a fire hall, but do not have an active Fire Department. Upon speaking to the Band Office, the secretary confirmed that they are working on establishing an active Fire Department very soon.

In the event that an active Fire Department is established, cross-training for Nahanni Butte 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: Nahanni Butte Public Works and the GNWT should partner on cross-training initiatives to ensure emergency responders are cross-trained to the following:

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.

At present Nahanni Butte 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 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 Nahanni Butte to provide greater operational detail to emergency responders during a wildland/urban interface incident.

9 Recommendations Summary

Vegetation Management

Issue	Recommendation	Responsible Agency
Zone 1a and Zone 1	Recommendation 1: Encourage residents to establish adequate Zone 1a and Zone 1 defensible space around their structures.	Nahæâ Dehé Dene Band
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.	Nahæâ Dehé Dene Band
Maintenance	Recommendation 3: Residents and Land Managers/Owners should be educated and encouraged to maintain their properties throughout the fire season to reduce the threat of wildfire to their structures.	Nahæâ Dehé Dene Band

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.	Nahæâ Dehé Dene Band 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 Nahanni Butte residents.	GNWT Nahæâ Dehé Dene Band

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.	Nahà Dehé Dene Band GNWT
Cross-Training	Recommendation 7: Nahanni Butte 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 	Nahà Dehé Dene Band GNWT

Emergency Planning

Issue	Recommendation	Responsible Agency
Community Wildfire Pre- Planning	Recommendation 8: Develop a Community Wildfire Pre-Plan for Nahanni Butte to provide greater operational detail to emergency responders during a wildland/urban interface incident.	Nahà Dehé Dene Band GNWT