Community Wildfire Protection Plan

Enterprise

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1   Introduction

In 2010, a Community Wildfire Protection Plan (CWPP) was developed for the Hamlet of Enterprise 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., Diamond Head Consulting Ltd and Timberline Natural Resource Group Ltd in cooperation with the Government of the Northwest Territories (GNWT) and Enterprise.

In 2018 the GNWT, Department of Environment and Natural Resources (ENR) updated the Enterprise 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

Enterprise, 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 the developed areas within Enterprise.

Stakeholders involved in the planning process included:
- Government of the Northwest Territories, Environment and Natural Resources
- Hamlet of Enterprise

Land status authority is varied and is represented by the following **(Map 1):**
- Commissioner
- Mixed
- Municipal
- Private
- Territorial

MAP-1
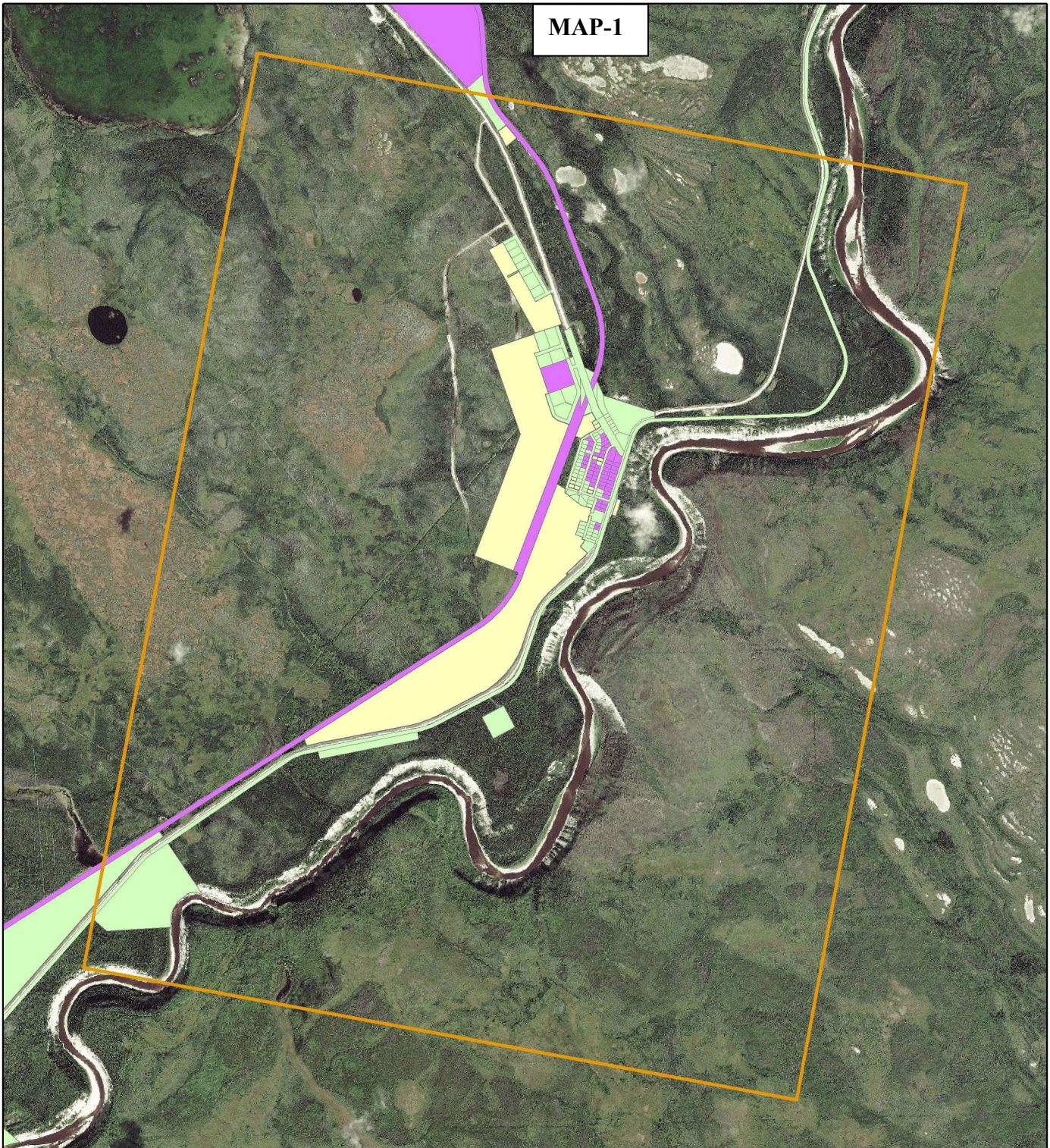
Enterprise
Land Status Authority

Land Ownership ☐ Enterprise Planning Area

■ Commissioner
■ Mixed
■ Municipal
■ Private
■ Territorial

1:41,000

0   375   750   1,500
Meters

N

Northwest
Territories Environment and Natural Resources

3 Hazard & Risk Assessment

In the original 2010 CWPP a hazard and risk assessment was undertaken to determine the potential impact wildfire could have on t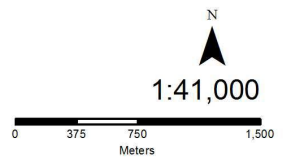he community. This was based on an analysis of the historical wildfire ignition sources, fire incidence and the wildland fire potential of the forest surrounding the community.

3.1 Wildfire Ignition Potential

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

Data within a 10 kilometers radius of Enterprise indicates that wildfire incidence is high. Fire incidence data shows a total of 8 wildfires in the planning area (**Map 2**). Predominant fire causes are lightning outside the settled areas. Several large wildfires greater than 10,000 ha have occurred over the past few years **within** the 10 kilometers buffer zone indicating the potential for landscape-level wildfire exists.

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 high and is naturally caused by lighting.

MAP-2

SS056-12
SS060-12
SS011-14
SS037-15
SS076-14
SS040-11
SS102-17
SS023-15
SS096-13
SS049-16
SS026-15
SS025-15
SS024-15
SS077-14
SS053-11
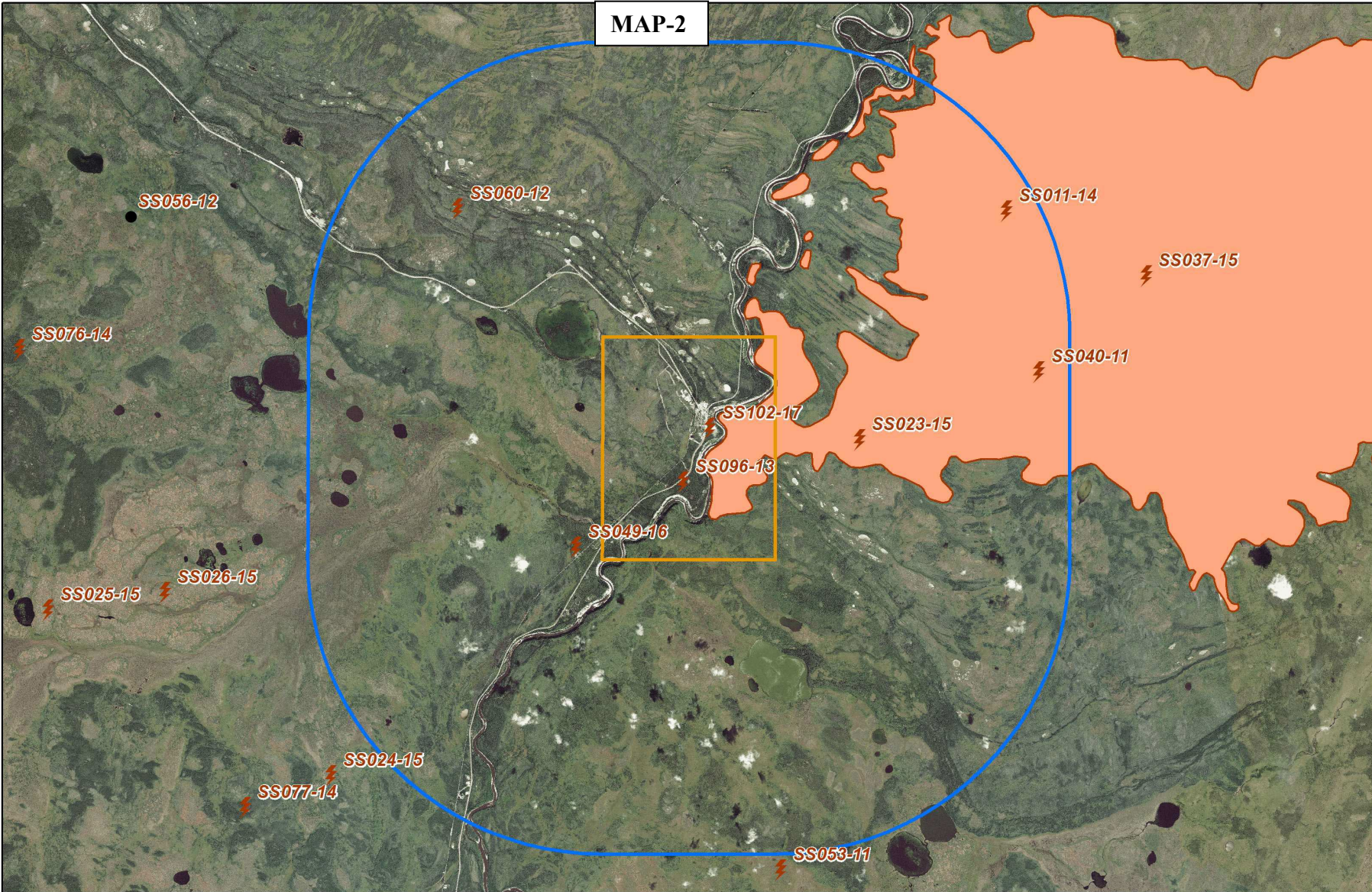
Enterprise
Ten Year Fire History

Enterprise 10km Buffer
Enterprise Planning Area
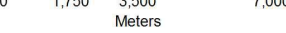Large Fire History

Human Caused
Lightning
Unknown

1:172,000

0   1,750   3,500   7,000
Meters

N

Northwest Territories Environment and Natural Resources

3.2   Wildfire Behaviour Potential

3.2.1   Forest Fuel Types
Analysis of the forest fuels surrounding Enterprise were completed in 2010. The overall area is dominated with boreal spruce (C-2) and deciduous fuel types while the Enterprise town site area is mainly non-fuel (NF) and cured-grass (O1), and deciduous fuel types with boreal spruce (C-2) fuels along the south perimeter of town.

The area northwest of the rail line consists of boreal spruce (C-2), deciduous (D-1), and cured-grass (O1) fuel types. Each of these fuel types can present hazard to interface structures based on fuel moisture conditions and time of year.

The potential for intense landscape-level wildfire exists in the areas surrounding Enterprise with the highest potential along the south and west perimeter of the townsite in C-2 fuel types.

3.3   FireSmart Hazard Assessments

FireSmart hazard assessments (P.I.P., 2003) of developed areas and adjacent fuels were completed in 2017 and indicated that many developments within Enterprise are still at threat from wildfire. 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 (WUI) hazards within the planning area and to help set priorities for mitigative options.

FireSmart hazard for each of the development areas is discussed below.

Table 2: FireSmart Hazard Assessments

Developed Area	Structure/ Site Hazard
Enterprise Town site	Low to Moderate
South Area	Moderate to High
Proposed Research Area	High

Enterprise Town site Area

FireSmart hazard for the Enterprise town site area is Low to Moderate with some west perimeter areas and south rural structures at High hazard based on proximity to C-2 fuels. Some structures are FireSmart but the majorities require Zone 1a and Zone 1 improvements. Exterior structure materials are primarily asphalt shingle or metal roofing and wood or vinyl siding. Access roads are all-weather loop and dead-end. The highest wildfire threat is to structures backing onto C-2 fuels on the southwest perimeter of the townsite area and south of the townsite on the west-side of Highway 1.

Enterprise South Area

This area between the burrow pit and southern homes has been where a majority of FireSmart effort has been implemented. The reduction in fuels is significant but requires more attention. Continue to Thin Prune Clean (TPC) to ensure 3 meters crown spacing and limb all branches up 2 meters. Homeowners in this area need to ensure they have Zone 1a (up to 1.5metres around their homes) completed and improve on their Zone 1, 10 meters area.

Research Area (MAP 3)

The community in cooperation with ENR and FP Innovations has agreed to develop this area as research plots. Currently a plan is being drafted to develop the grid to design various FireSmart layouts. The plots will have different designs that will show different levels of FireSmart Thin Prune Clean (TPC) and will show how these designs will reduce the risk of wildfire. The benefit of implementing FireSmart in this area will greatly reduce the potential of a wildfire entering the community from the south and provide valuable data and information to ENR for other communities.

MAP-3

Enterprise CWPP 40x40m Research Plots
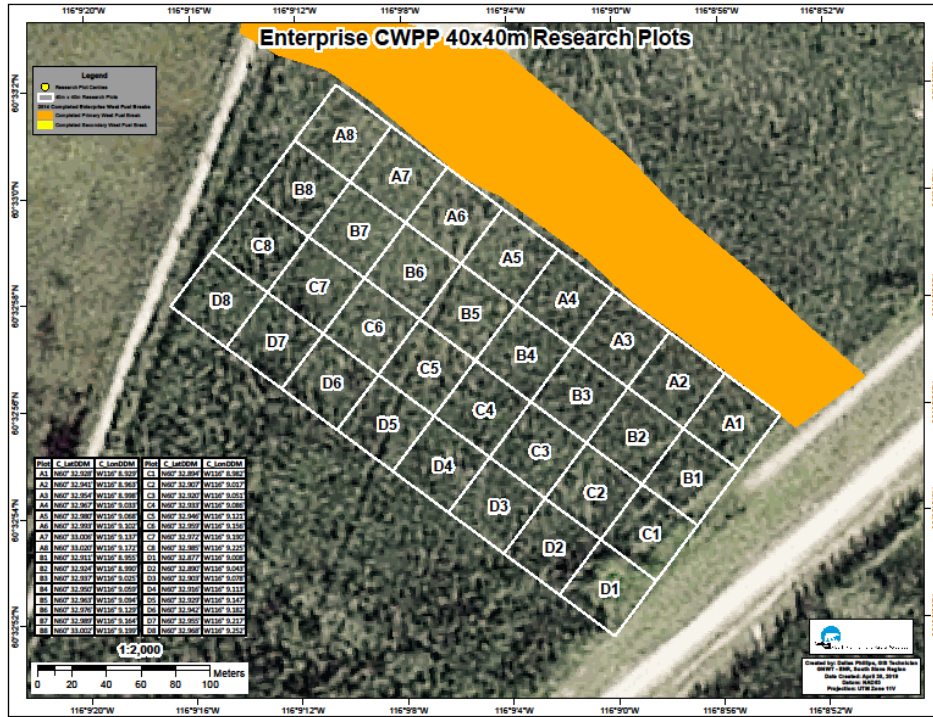
FireSmart hazard is high on the south-west-perimeter of the main town site and around rural structures south of the main town site.

Enterprise CWPP Research Plots UAS Inspection
West End Looking East

N 60° 33.0475'
W 116° 09.3410'
2019-05-08 12:58:40

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.
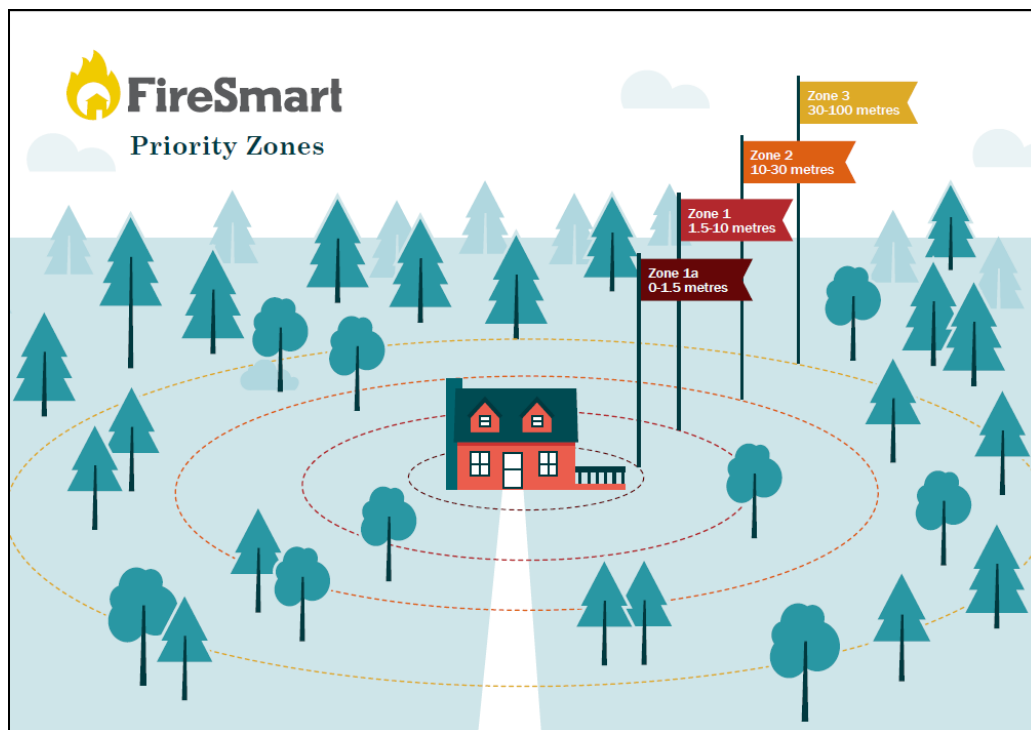
Figure 1– Interface Priority Zones (PIP, 2017)

4.1   Existing Vegetation Management

In 2017 Enterprise was recognized as the first FireSmart Community in the NWT https://www.cbc.ca/news/canada/north/enterprise-firesmart-nwt-1.4165459. The community has invested in implementing recommendations from their CWPP. Vegetation management has occurred in the form of fuels removal on fireguards and fuels reduction immediately adjacent to structures **(Map 4 & Table 3).**

Table 3: Existing Vegetation Management Areas

Name	Area (ha)	Year	Agency	Comments
West Cat Guard	15.9	2014	ENR	Will require maintenance
South/West Guard	18.4	2014	ENR	Will require maintenance
Fuel treatments 1	3.3	2010/2017	Enterprise	Originally started in 2010. Redone in 2017.
Fuel treatment 2	6.2	2011/2018	Enterprise	Originally started in 2011. Redone in 2018.

Enterprise Fuel Treatment 2017

MAP-4

2014
18.4 ha

2014
15.9 ha

0.2 ha

3.2 ha

1.6 ha

2011
6.2 ha

2010
3.3 ha

7.2 ha

29.8 ha

1.3 ha

1.4 ha
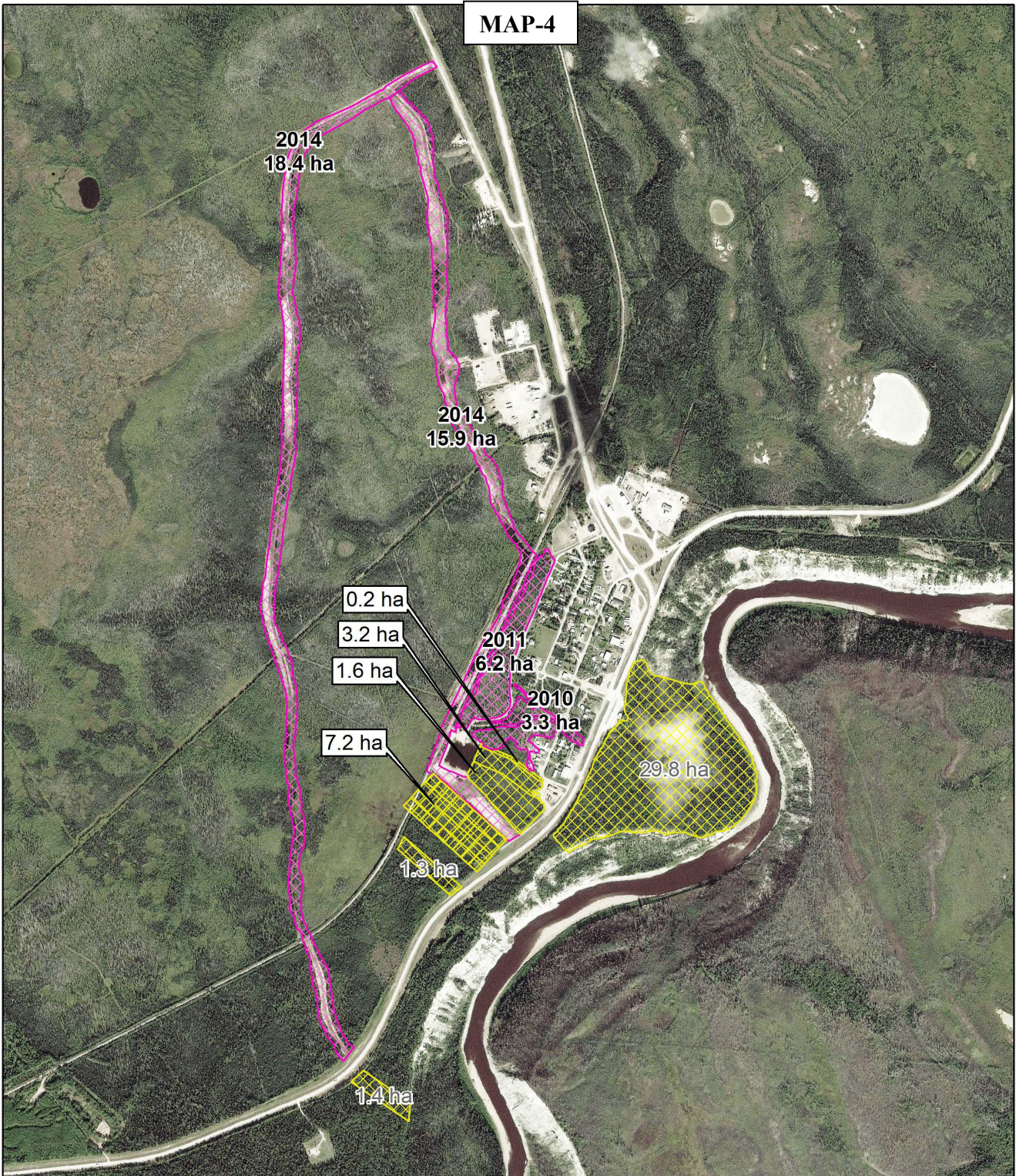
**Enterprise
Fuel Modifications**

Completed and Proposed

Fuel Modifications

Completed

In Progress

Proposed

N

1:18,000

0   125   250   500
Meters

Northwest Territories Environment and Natural Resources

Fireguards were completed along the west and north perimeters of the hamlet in 2014 by the GNWT ENR Department **(Map 4 & Table 3).** These guards will require maintenance in the future.

Fuels reduction was conducted during 2018 along the west perimeter of the main townsite to thin black spruce and remove willow for a 15-20 meters wide strip. These areas should be widened and require final brush disposal from the 2018 work.

4.2   Proposed Vegetation Management

4.2.1   Zone 1a (0-1.5m) and Zone 1 (1.5m – 10m)

FireSmart 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 1.5m of structures.
- Use noncombustible materials in this critical zone of 1.5m 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.

FireSmart Zone 1 vegetation management options include:
- Removal of flammable forest vegetation within 10m of structures.
- Removal of all coniferous ladder fuels (limbs) to a minimum height of 2m 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 10m 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 (10m-30m) - Zone 3 (30m- 100m)

Zone 2-3 fuels management is recommended for areas surrounding and along the north and east perimeters of the Hamlet to reduce the threat of wildfire in C-2 fuels to perimeter structures (Table 4 and Map 4). 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: Proposed Fuel Management Areas

Treatment Area	Area (Ha)	Proposed Fuel Modification Standards	Land Status Authority
Southeast of Burrow pit Area	5.00	A series of areas identified North of the research area could be Thin Pruned and Cleaned (TPC)	Hamlet of Enterprise
Proposed Control Line (South of Highway 1)	1.4	Dozer Guard that would go from Highway 1 to the River bank	Hamlet of Enterprise
Proposed Highway South Fuel Treatment Area	7.2	Research Area	Hamlet of Enterprise GNWT /FPI
South of research Area	1.3	Area has been identified for TPC but research area grid is being developed first.	Hamlet of Enterprise
Proposed East Fuel Treatment Area	29.80	Harvest training area and Proposed workshop to introduce harvesting and equipment to NWT	Hamlet of Enterprise GNWT
Total	44.7		

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 effectiveness. Maintenance should be the responsibility of the land manager or landowner.

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, 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, metal, and roll-roof asphalt. The most common siding materials are wood/vinyl with scattered log and hardi-plank.

Structures are typically elevated above-ground on pilings and many are not skirted allowing wildfire access to the underside of structures.

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 with primarily all-weather loop road and dead-end access.

5.2.2   Water Supply
Enterprise does not have municipal hydrant water-supply. All development areas rely on water-tender supply from the local fire department for structure protection activities. The borrow pit is available for emergency water supply.

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 lines from the NTPC power generation plant.

Gas
Heating fuel is primarily provided by heating oil with scattered propane tanks.

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 Environment and Natural Resources 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 meters) and Zone 1 (1.5-10 meters) defensible space surrounding the home, by:

- Clearing vegetation and combustible material down to mineral soil within 1.5 meters of structures.
- Using noncombustible materials in this critical zone of 1.5 meters 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 meters 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 meters) and Zone 3 (30-100 meters) 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
- Applying for FireSmart Community Recognition.
- 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.

Recommendation 5: Public education on acceptable FireSmart Zone 1a and Zone 1 standards is recommended for all Enterprise 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. Enterprise has been working closely with ENR and MACA to improve their community's preparedness and training for wildfire.

Interagency stakeholders within the planning area include:
- Hamlet of Enterprise
- Enterprise Volunteer Fire Department
- GNWT

Cross-training for Enterprise Volunteer Fire Department members 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 6: Enterprise Volunteer Fire Department and GNWT MACA & ENR should continue to 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.

In 2016 Enterprise completed an Emergency planning workshop with MACA and completed the Hamlet of Enterprise Emergency Plan.

Enterprise 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 7: Develop a Community Wildfire Pre-Plan for Enterprise 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.	Hamlet of Enterprise
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.	Hamlet of Enterprise
Maintenance	**Recommendation 3:** Ensure that all existing fuel modification projects are inspected on a regular basis and maintained as necessary to ensure effectiveness. Maintenance should be the responsibility of the land manager or landowner.	GNWT Hamlet of Enterprise

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.	Hamlet of Enterprise 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 Enterprise residents.	Hamlet of Enterprise GNWT

Interagency Cooperation & Cross-Training

Issue	Recommendation	Responsible Agency
Cross-Training	**Recommendation 6:** Enterprise Volunteer Fire Department members and GNWT should continue to 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	Hamlet of Enterprise GNWT

Emergency Planning

Issue	Recommendation	Responsible Agency
Community Wildfire Pre- Planning	**Recommendation 7:** Develop a Community Wildfire Pre-Plan for Enterprise to provide greater operational detail to emergency responders during a wildland/urban interface incident.	GNWT Hamlet of Enterprise