Hay River

Community Wildfire Protection Plan

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

Northwest Territories Environment and Natural Resources

March 2011

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1 Introduction

The Hay River 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 Town of Hay River and the Hay River Dene Reserve.

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.

The Hay River 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 agencies 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 the Town of Hay River municipal boundary and the Hay River Dene Reserve, including a two-kilometre buffer surrounding these areas (Map 1).

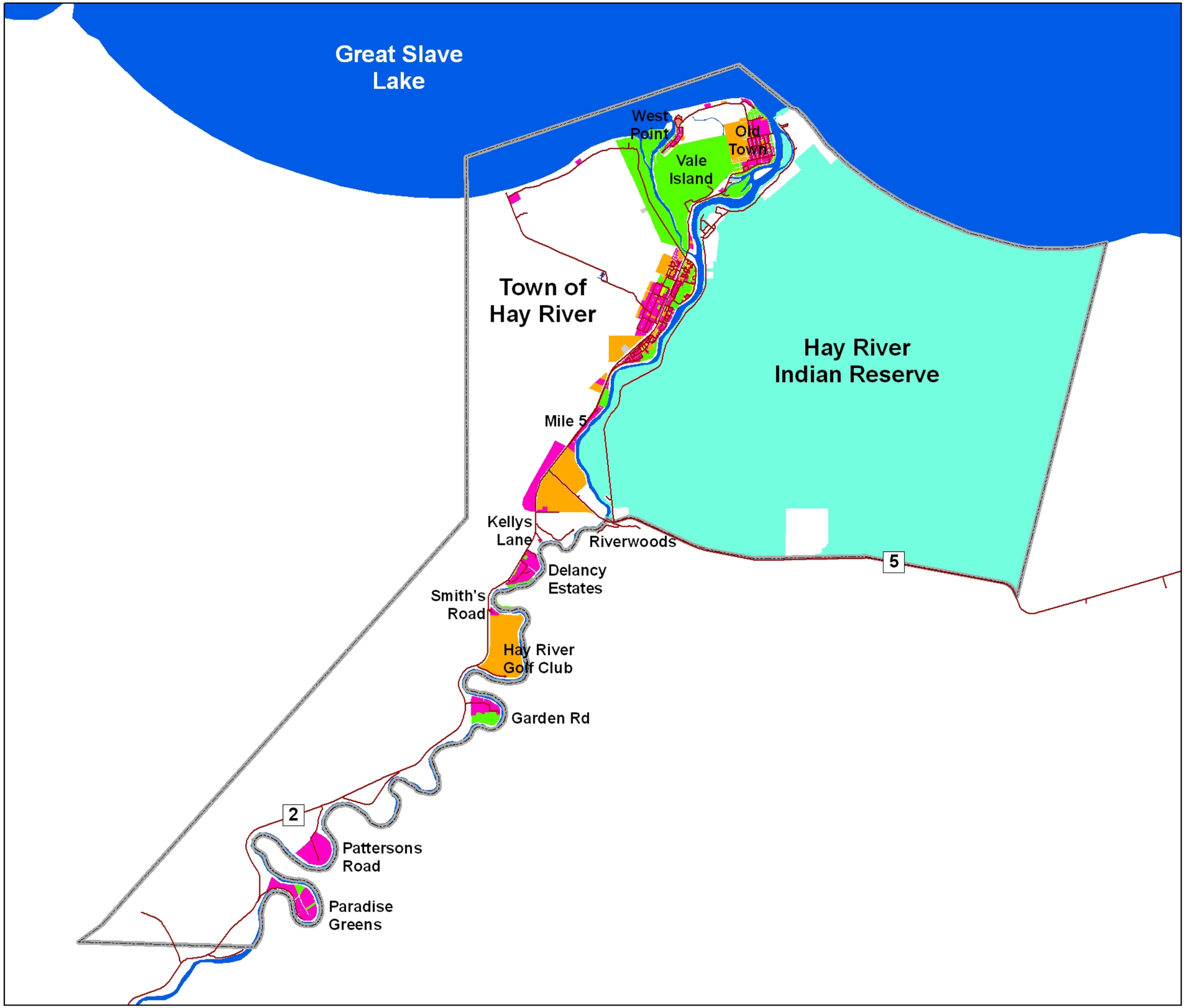
Stakeholders consulted with in the planning process included:

- Lyle Frollick, Fire Technician — GNWT ENR Hay River
- Terry Molenkamp, SAO — Town of Hay River
- Victoria St. Jean — K'atl'odeeche First Nation

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

- Commissioner (GNWT MACA)
- Federal
- Indian Affairs Branch
- Mixed
- Municipal
- Private
- Hay River Dene Indian Reserve
- GNWT Crown lands (GNWT ENR)

Map 1 - Planning Area
Hay River



Land Status Authority

- Commissioner
- Federal
- Indian Affairs Branch
- Mixed
- Municipal
- Private
- Hay River Indian Reserve

- Planning Area Boundary
- Roads

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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 twenty two-year period from 1988 to 2009.

Data within a 10 kilometre radius of the planning area boundary indicates that the risk of wildfire is High. Fire incidence data indicates that 30 wildfires were discovered (Map 2). 90% are human-caused with the predominant causes of resident and recreation and 10% were lighting-caused (Table 1).

Table 1: Fire Incidence by Cause (1988 – 2009)

General Cause	Number of Fires	Percent of Total
Human-Caused	27	90
Lightning-Caused	3	10
Totals	**30**	**100.0**

There were several large wildfires between 1960 and 1995, primarily lightning-caused, including the 1971 wildfire ignited near the Enterprise junction and burning under southerly winds on the northwest side of Highway 2 towards Hay River.

The risk of wildfire in the planning area is High and most frequently occurs in areas accessible to residents and recreating public.

Map 2 - Wildfire Incidence
Hay River

Great Slave Lake

1960HY-024
289 ha

1969HY-016
275 ha

1981HY-036
500 ha

1971HY-045
21,700 ha

10 KM Buffer Zone

1981HY-049
552,500 ha

1996HY-038
2000 ha

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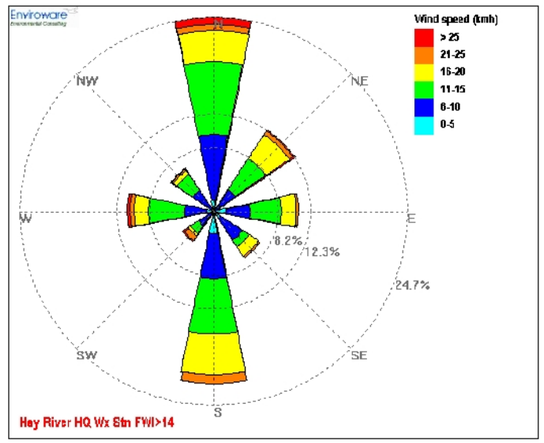
- Human-Caused Wildfire
- Lightning-Caused Wildfire
- Wildfire > 4 hectares
- Planning Area Boundary
- Roads



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3.2 Wildfire Behaviour Potential

3.2.1 Wildland Fuel Types

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

The planning area is dominated with boreal spruce (C-2) fuel types with the potential to support intense landscape-level wildfire (Map 3). The developed areas within the Town of Hay River are primarily non-fuel and cured-grass with patches of deciduous and mixedwood fuel types scattered throughout town. Fuel types within and adjacent to the Town of Hay River rural developments vary significantly and include boreal spruce (C-2), deciduous (D-1), mixedwood (M-1), and cured-grass (O1). Fuel types within and adjacent to the developed areas on the Hay River Indian Reserve are predominantly boreal spruce (C-2), deciduous (D-1), and cured-grass (O1). Each of these fuel types can present hazard to interface structures based on fuel moisture conditions and time of year.

3.2.2 Fire Weather Analysis

Fire weather data from the Hay River weather station was used to determine the predominant wind directions during the fire season. Data indicates that the predominant and strongest wind directions are from the north and south quadrants (Figure 1).

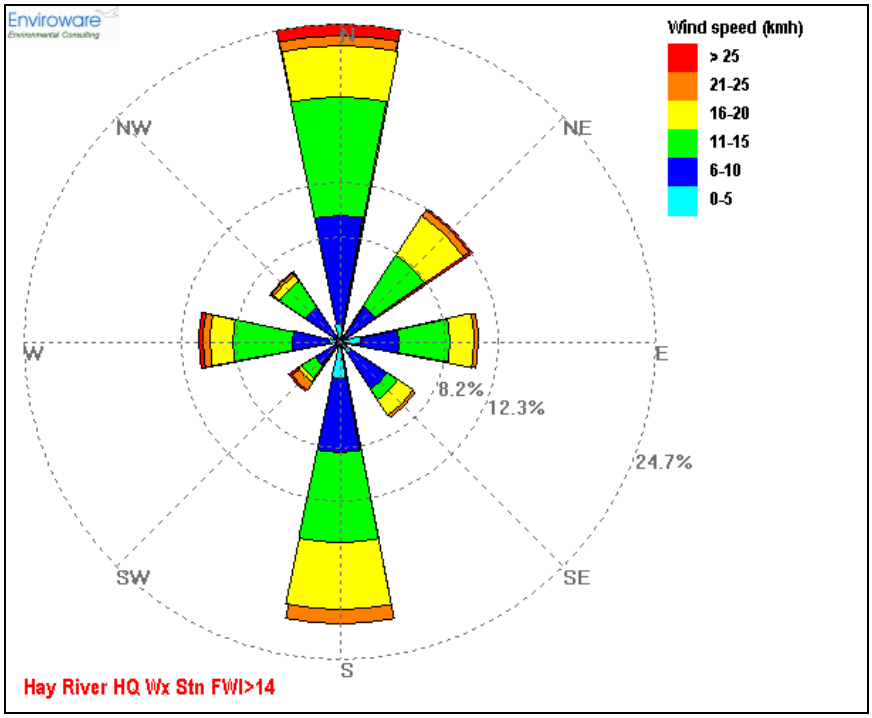

Figure 1 – Hay River Windrose

Wildland fuels and fire weather data indicates that the potential for high to extreme wildfire behaviour exists in the Hay River area.

Great Slave Lake

West Point

Old Town

Vale Island

Hay River IR Old North Settlement

Hay River IR Main Townsite

Town of Hay River

Hay River Indian Reserve

Mile 5

Kellys Lane

Riverwoods

Delancy Estates

Smith's Road

Hay River Golf Club

Garden Rd

Pattersons Road

Paradise Greens

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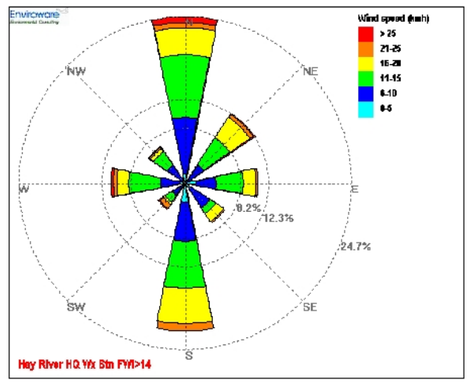
Map 3 - Fuel Types
Hay River

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)

- Planning Area Boundary
- Roads



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3.3 FireSmart Hazard Assessments

FireSmart hazard assessments (P.I.P., 2003) were conducted on developments and adjacent wildland 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.

Developments at the highest risk to wildfire include (Table 2):

1. Delancy Estates CR Subdivision
2. Kelly's Lane Rural
3. Riverwoods CR Subdivision
4. Hay River IR Main Townsite
5. Smith's Road Rural
6. West Point Reserve

Hazard factor's for each of the development zones is discussed below.

Table 2: FireSmart Hazard Assessments

Development Area	Structure/Site Hazard (0 – 30m)
Town of Hay River	
Paradise Greens	Moderate
Patterson's Road	Moderate
Garden Road	Moderate
Hay River Golf Club	Low
Smith's Road	Moderate - High
Delancy Estates	Extreme
Kelly's Lane	Extreme
Mile 5	Low
Main Townsite	Low - High
Old Town	Low
West Point	Low - Extreme
Hay River Indian Reserve	
Rural Developments	High - Extreme
Main Townsite	Moderate – High
Old North Settlement	Moderate
Riverwoods CR Subdivision	Extreme

Town of Hay River

Paradise Greens
FireSmart hazard for Paradise Greens is Moderate. Predominant fuel types include cured-grass (O1), deciduous (D-1), and non-fuel (NF) with the Hay River on the south, east, and north sides of the development. Exterior structure materials are primarily asphalt shingle and metal roofing and wood or vinyl siding. The main access road is an all-weather dead-end design. The highest wildfire threat is from wildfire starting within the development.

Patterson's Road
FireSmart hazard for Patterson's Road is Moderate. Predominant fuel types include cured-grass (O1), deciduous (D-1), non-fuel (NF), and boreal spruce (C-2) with the Hay River on the south, east, and west sides of the development. Exterior structure materials are primarily asphalt shingle and metal roofing and wood or log siding. The main access road is an all-weather dead-end design. The highest wildfire threat is from C-2 fuels within and to the north of the development.

Garden Road
FireSmart hazard for Garden Road is Moderate. Predominant fuel types include cured-grass (O1), deciduous (D-1), and boreal spruce (C-2) with the Hay River on the north, south, and east sides of the development. Exterior structure materials are primarily asphalt shingle roofing and wood or vinyl siding. The main access road is an all-weather dead-end design.

Hay River Golf Club
FireSmart hazard for Hay River Golf Club and RV Park is Low. Predominant fuel types include non-fuel (NF) on the golf course, boreal spruce (C-2) to the north and west with the Hay River to the south and east. Exterior structure materials are asphalt shingle roofing and log siding. The main access road is an all-weather dead-end design.

Smith's Road
FireSmart hazard for the three dwellings on Smith's Road ranges from Moderate to High. Predominant fuel types include boreal spruce (C-2) and deciduous (D-1) with the Hay River on the east and north sides. Exterior structure materials are asphalt shingle and metal roofing and wood or vinyl siding. The main access road is a narrow all-weather dead-end design that does not meet FireSmart access road standards.

Delancy Estates
FireSmart hazard for Delancy Estates country-residential subdivision is Extreme. Predominant fuel types include boreal spruce (C-2), deciduous (D-1), and cured-grass (O1) with the Hay River on the south and east sides of the development. Zone 1 defensible space from C-2 fuels is inadequate for many of the dwellings. Exterior structure materials are primarily asphalt shingle and metal roofing and wood, vinyl, or log siding. The main access road is an all-weather loop and dead-end design with adequate turn-arounds.

Kelly's Lane
FireSmart hazard for Kelly's Lane is Extreme. Predominant fuel types include boreal spruce (C-2), non-fuel (NF), deciduous (D-1), and cured-grass (O1) with the Hay River on the south side of the development. Exterior structure materials are asphalt shingle roofing and wood or vinyl siding. The main access road is a narrow all-weather dead-end design that does not meet FireSmart access road standards.

Mile 5
FireSmart hazard for Mile 5 development is Low. Predominant fuel types include cured-grass (O1), deciduous (D-1), and non-fuel (NF) with the Hay River on the east side of the development. Exterior structure materials are primarily asphalt shingle and roofing and wood or vinyl siding. The access roads are all-weather loop design.

Main Townsite
FireSmart hazard for the Main Townsite area ranges from Low to High based on proximity to perimeter fuels. Predominant fuel types include non-fuel (NF), cured-grass (O1), deciduous (D-1) within the developed areas, boreal spruce (C-2) on the west-perimeter, and the Hay River on the east perimeter. Exterior structure materials are primarily asphalt shingle with scattered wood-shake roofing and wood or vinyl with scattered stucco and metal siding. Access roads are all-weather loop and dead-end design meeting FireSmart standards.

Old Town

FireSmart hazard for Old Town is predominantly Low with scattered pockets of Moderate to Extreme. Predominant fuel types include non-fuel (NF), cured-grass (O1), deciduous (D-1), and boreal spruce (C-2) with the Hay River on the south and east sides. Homes on Lakeshore Drive are at Extreme hazard due to lack of Zone defensible space from C-2 fuels. Exterior structure materials are primarily asphalt shingle and metal roofing and wood or vinyl siding. Access roads are primarily all-weather loop design.

West Point

FireSmart hazard for West Point is predominantly Low with some structures at Extreme hazard along the east perimeter. Predominant fuel types include non-fuel (NF), cured-grass (O1), and boreal spruce (C-2) with the West-Channel of the Hay River on the west side and Great Slave Lake on the north side. Exterior structure materials are primarily asphalt shingle and metal roofing and wood or vinyl siding. Access roads are all-weather loop and dead-end design.

Riverwoods

Riverwoods is a new CR subdivision located on the south-side of Hwy 5 and east-side of the Hay River, just outside the Town of Hay River and Hay River IR boundaries. FireSmart hazard is Extreme. Predominant fuel types surrounding and within the subdivision are boreal spruce (C-2) and mixedwood (M-1). Exterior structure materials are asphalt shingle roofing and wood or vinyl siding. Access roads are all-weather loop and dead-end design.

Hay River Indian Reserve

Development on the Hay River Indian Reserve consists of several rural development sites scattered along Reserve Highway, the main townsite area, and the old north settlement area.

FireSmart hazard for the rural developments are generally High to Extreme due to proximity to C-2 fuel types and lack of adequate Zone 1-2 defensible space, Moderate to High for the main townsite area, and Moderate for the old north settlement area due lack of adequate Zone 1-2 defensible space from cured-grass fuels. Exterior structure materials are primarily asphalt shingle roofing and wood siding. The main access is the all-weather dead-end Reserve Highway with structure access consisting of all-weather loop and dead-end design.

ENR and Reserve Hwy South Rural

Treatment Centre and Cultural Institute

Main Townsite

Old North Settlement

FireSmart hazard is High/Extreme for several development areas within the planning area. The threat of structure loss to wildfire is significant particularly in the rural areas.

Map 4 - FireSmart Hazard Hay River

Great Slave Lake

Old Town

West Point

Vale Island

Hay River IR Old North Settlement

Hay River IR Main Townsite

Town of Hay River

Hay River Indian Reserve

Mile 5

Kellys Lane

Riverwoods

Delancy Estates

Smith's Road

Hay River Golf Club

Garden Rd

Pattersons Road

Paradise Greens

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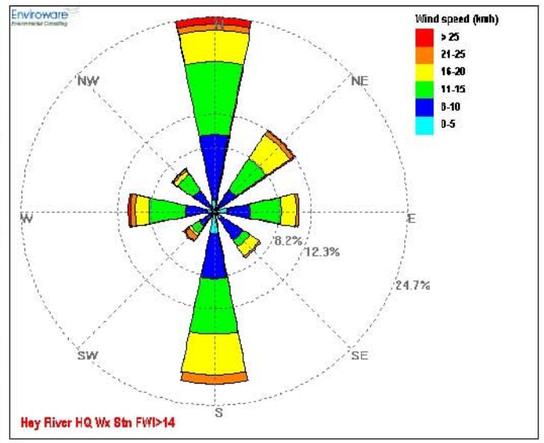
FireSmart Hazard

- Low
- Moderate
- High
- Extreme

Planning Area Boundary

Roads

Rural Structure Site



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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.

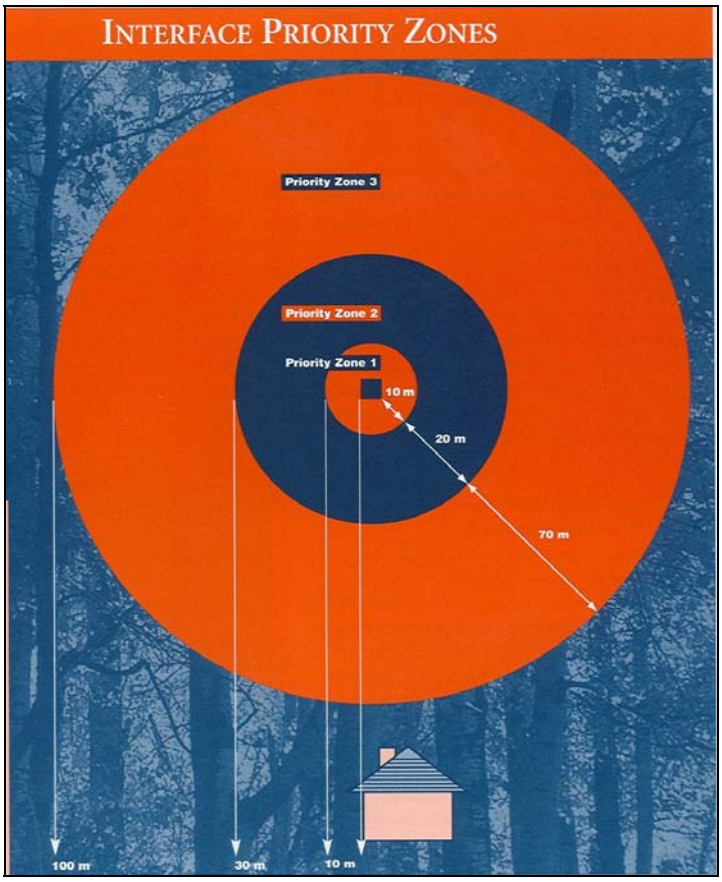

Figure 3 – Interface Priority Zones (PIP, 2003)

4.1 Existing Vegetation Management

Fuels removal and reduction projects have been completed within the planning area by the GNWT ENR Department (Map 5 & Table 3) and by the K'atl'odeeche First Nation.

Table 3: Existing Vegetation Management Areas

Name	Area (ha)	Year	Agency	Comments
Hay River North Fireguard	17.0	1980's	GNWT ENR	Maintain and extend
Hay River IR Fireguard	3.0	2010	K'atl'odeeche FN	Widen and extend to the North
Hay River IR Treatment Ctr	3.5	2010	K'atl'odeeche FN	

The Town of Hay River North Fireguard was originally constructed in the mid-1980's and has become overgrown with deciduous and coniferous re-growth. The existing fireguard requires maintenance in addition to extension to provide protection to the current and future Town of Hay River north boundary developments.

The Hay River IR fireguard was hand-cleared to approximately 25 metres in width during the winter of 2009/10 around the southeast perimeter of the main townsite. The guard needs to be extended and widened to ensure effectiveness in extreme fire behavior conditions.

Fuels reduction was completed around the K'atl'odeeche Treatment Centre and Cultural Institute in 2009/10. No further work is required at this time.

4.2 Proposed Vegetation Management

4.2.1 Zone 1

Zone 1 defensible space is lacking for many structures in the rural areas and country residential subdivisions in the Town of Hay River and on the Hay River Indian Reserve, increasing the threat of wildfire to structures in those areas.

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

Several priority areas are recommended for Zone 2-3 fuels management based on hazard and risk (Table 4 & Map 5). The intent is to establish fireguards around the development area perimeters as the first priority with fuels reduction inside the developed areas as subsequent priorities.

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.

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.

Table 4: Priority Fuel Modification Areas

Priority	Area (Ha)	Proposed Fuel Modification Standards	Land Status Authority
1 HRIR Fireguard	13.2	▪ Fuels removal to widen and extend existing fireguard to minimum 40m width ▪ Dispose of debris by piling and burning onsite	▪ Hay River IR ▪ GNWT ENR
2 Town Fireguard	34.2	▪ Fuels removal to maintain existing and extend fireguard to minimum 40m width ▪ Dispose of debris by piling and burning onsite	▪ GNWT ENR ▪ Commissioner
3 HRIR Townsite	13.4 18.0	▪ Fuels reduction to space Black spruce to 2-3m crown spacing for a minimum 100m wide behind main townsite area ▪ Remove all dead standing and dead & down coniferous and deciduous ▪ Retain deciduous overstory stems ▪ Prune limbs to 2 metres ▪ Dispose of debris by piling and burning onsite ▪ Fuels reduction to remove Black spruce understory within developed area ▪ Remove all dead standing and dead & down coniferous and deciduous ▪ Retain deciduous overstory stems ▪ Prune limbs to 2 metres ▪ Dispose of debris by piling and burning onsite	▪ Hay River IR ▪ GNWT ENR
4 Delancy Estates	4.1	▪ Fuels reduction to space spruce to 2-3m crown spacing for a minimum 150m wide ▪ Remove all dead standing and dead & down coniferous and deciduous ▪ Retain deciduous overstory stems ▪ Prune limbs to 2 metres ▪ Dispose of debris by piling and burning onsite	▪ GNWT ENR
5 Old Town	13.5	▪ Fuels reduction to space Spruce/Tamarack overstory and understory to 2-3 m crown spacing for a minimum 100m wide ▪ Remove all dead standing and dead & down coniferous and deciduous ▪ Retain deciduous overstory stems ▪ Prune limbs to 2 metres ▪ Dispose of debris by piling and burning onsite	▪ GNWT ENR ▪ Municipal
6 West Point	5.2	▪ Fuels reduction to space Spruce overstory and understory to 2-3 m crown spacing for a minimum 100m wide ▪ Remove all dead standing and dead & down coniferous and deciduous ▪ Retain deciduous overstory stems ▪ Prune limbs to 2 metres ▪ Dispose of debris by piling and burning onsite	▪ GNWT ENR
7 Dusty Acres	6.1	▪ Fuels reduction to space Black spruce understory ▪ Remove all dead standing and dead & down coniferous and deciduous ▪ Retain deciduous & coniferous overstory stems ▪ Prune limbs to 2 metres ▪ Dispose of debris by piling and burning onsite	▪ Commissioner ▪ Municipal
8 Riverwoods	26.9	▪ Fuels reduction to space Black spruce overstory and understory to 2-3 m crown spacing for a minimum 100m wide ▪ Remove all dead standing and dead & down coniferous and deciduous ▪ Retain deciduous overstory stems ▪ Prune limbs to 2 metres ▪ Dispose of debris by piling and burning onsite	▪ Unknown
9 Hay River Future Sub	15.6	▪ Fuels reduction to space Spruce overstory and understory to 2-3 m crown spacing for a minimum 100m wide ▪ Remove all dead standing and dead & down coniferous and deciduous ▪ Retain deciduous overstory stems ▪ Prune limbs to 2 metres ▪ Dispose of debris by piling and burning onsite	▪ GNWT ENR
Total	**150.2**		

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.

Map 5 - Fuel Modification
Hay River

Great Slave Lake

Town of Hay River

Hay River Indian Reserve

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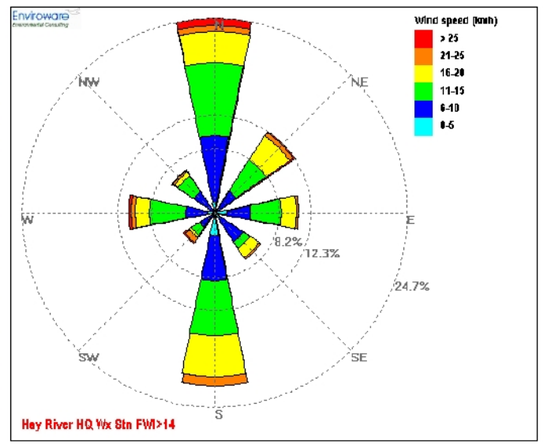
- Existing Fuel Modification
- Proposed Fuel Modification
- Fuel Removal/Clear
- Fuel Reduce/Thin
- Roads



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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 and metal. There are scattered dwellings in the Town of Hay River with combustible wood-shake roofing materials, putting these structures at higher risk to airborne firebrand ignition. The most common siding materials are combustible wood and vinyl with scattered structures with metal, stucco, log, and hardi-plank siding.

Several structures on the Hay River Indian Reserve have open undersides, increasing the threat of airborne firebrand 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 mainly adequate for an interface community. Most access roads are all weather loop or dead-end design with adequate turnaround dimensions for fire apparatus.

The access roads to Smith's Road and Kelly's Lane developments are narrow dead-end access which may create ingress and egress problems for residents and responders during a rapidly-moving wildfire.

5.2.2 Water Supply

The Town of Hay River main townsite is municipal hydrant-supplied and Old Town uses dry hydrants. The remainder of development areas in the Town of Hay River, the Hay River Indian Reserve, and Riverwoods CR subdivision have no dedicated fire suppression water-supply and would rely on water-tender supply for structure protection activities.

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 transmission and distribution lines. Some overhead distribution and service lines in the area are at risk to hazard trees which could result in wildfire ignition or downed lines during a wildfire resulting in a risk to emergency responders and a loss of power, and critical services, during the emergency.

Gas

Gas distribution is provided by natural gas, heating oil, propane. Most of the propane tanks have adequate defensible space from wildland fuels.

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 target audiences in the planning area.

- Development and maintenance of FireSmart defensible space surrounding the home, including:
  - Tree and grass clearance and maintenance
  - Firewood and combustibles storage
- Skirting of structure undersides to reduce the threat of wildfire entry underneath structures

Recommendation 5: Public education on acceptable FireSmart Zone 1 standards is recommended for all residents. Priority items include:

- Development and maintenance of FireSmart defensible space surrounding the home
- Skirting of structure undersides to reduce the threat of wildfire entry underneath structures

7. Legislation Options

Legislating *FireSmart* requirements can assist municipalities to achieve their FireSmart objectives. The Town of Hay River uses the General Plan (2008) and the Zoning Bylaw (2008) to control land use and development within the planning area.

7.1 Town of Hay River General Plan – Bylaw No. 1811 (2008)

The purpose of the General Plan is to guide decisions regarding the future development and redevelopment of the community. The General Plan ***does not*** recognize the threat of wildfire to community development.

Section 3.5 Opportunities and Constraints of the Natural Environment recognizes development constraints on poorly drained, flood-prone, permafrost, and shore lands but does not recognize lands at risk to wildfire as development constrained.

Recommendation 6: Lands at risk to wildfire, as per Section 3 of this plan, should be recognized as development-constrained in Section 3.5 of the Town of Hay River General Plan.

7.2 Town of Hay River Zoning & Building Bylaw No. 1812 (2008)

The purpose of the Zoning Bylaw is to facilitate the orderly, economic and convenient development of the Town of Hay River by controlling the development and use of land for the purpose of, among other things:

a. dividing the Town into zones;
d. regulating the construction and maintenance of buildings and structures;

The Zoning & Building Bylaw ***does not*** recognize FireSmart development standards. It is within the Zoning Bylaw that specific FireSmart development regulation can be achieved with respect to exterior structural materials. The following recommendations are offered to assist with future revisions to the Town of Hay River Zoning & Building Bylaw.

Recommendation 7: Revise the Town of Hay River Zoning & Building Bylaw to include the following:

a) All roofing materials on new, replacement, or retro-fitted residential, commercial, or accessory buildings shall have a minimum Class C U.L.C. fire rating or as determined by the Development Authority based on wildland/urban interface hazard.

b) All siding materials on new, replacement, or retro-fitted residential, commercial, or accessory buildings within 30 metres of high or extreme hazard combustible wildland fuels and as determined by the Development Authority shall be fire-resistant material including, but not limited to, stucco, metal, brick, cement shingles, concrete block, poured concrete, rock, or fibre-cement siding extending from ground level to roofline.

c) All new dwellings, accessory buildings, and commercial buildings with exposed undersides and/or raised decks and porches less than 2 metres from ground level shall be sheathed from the floor level to the ground level with fire-resistant material, to prohibit the entry of sparks and embers under the structure.

d) All new dwellings, accessory buildings, and commercial buildings shall establish and maintain FireSmart defensible space for a minimum of 10 metres or to lot boundary.

e) All above-ground propane tanks greater than or equal to 80 U.S. gallons (420 lbs) shall have a minimum of 3 metres clearance from combustible vegetation and materials.

8. 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:

- Town of Hay River
- K'atl'odeeche First Nation
- GNWT Environment and Natural Resources (ENR)
- GNWT Municipal and Community Affairs (MACA)

Recommendation 8: Develop a FireSmart Committee, consisting of all relevant stakeholders, to coordinate and lead the FireSmart program for the area.

Cross-training for Town of Hay River and K'atl'odeeche First Nation Fire Departments 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 9: The Town of Hay River and K'atl'odeeche First Nation Fire Departments 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

9. 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 the planning area 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 10: Develop a Community Wildfire Pre-Plan for the Hay River planning area to provide greater operational detail to emergency responders during a wildland/urban interface incident.

10 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.	Town of Hay River K'atl'odeeche First Nation
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.	GNWT ENR & MACA Town of Hay River K'atl'odeeche First Nation
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 ENR & MACA Town of Hay River K'atl'odeeche First Nation

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.	GNWT MACA Town of Hay River K'atl'odeeche First Nation

Public Education

Issue	Recommendation	Responsible Agency
Public Education Priorities	**Recommendation 5:** Public education on acceptable FireSmart Zone 1 standards is recommended for all residents. Priority items include: ▪ Development and maintenance of FireSmart defensible space surrounding the home ▪ Skirting of structure undersides to reduce the threat of wildfire entry underneath structures	GNWT ENR Town of Hay River K'atl'odeeche First Nation

Legislation

Issue	Recommendation	Responsible Agency
Town of Hay River General Plan	**Recommendation 6:** Lands at risk to wildfire, as per Section 3 of this plan, should be recognized as development-constrained in Section 3.5 of the Town of Hay River General Plan.	Town of Hay River
Town of Hay River Zoning & Building Bylaw	**Recommendation 7:** Revise the Town of Hay River Zoning & Building Bylaw to include regulation relating to the following: ▪ Roofing and siding materials ▪ Sheathing requirements ▪ Defensible space requirements ▪ Propane tank clearances	Town of Hay River

Interagency Cooperation & Cross-Training

Issue	Recommendation	Responsible Agency
FireSmart Committee	**Recommendation 8:** Develop a FireSmart Committee, consisting of all relevant stakeholders, to coordinate and lead the FireSmart program for the area.	GNWT ENR & MACA Town of Hay River K'atl'odeeche First Nation
Cross-Training	**Recommendation 9:** The Town of Hay River and K'atl'odeeche First Nation Fire Departments 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	GNWT MACA & ENR Town of Hay River K'atl'odeeche First Nation

Emergency Planning

Issue	Recommendation	Responsible Agency
Community Wildfire Pre- Planning	**Recommendation 10:** Develop a Community Wildfire Pre-Plan for the Hay River planning area to provide greater operational detail to emergency responders during a wildland/urban interface incident.	GNWT ENR & MACA Town of Hay River K'atl'odeeche First Nation