



Community Wildfire Protection Plan

Fort Resolution



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1 Introduction

In 2011, a Community Wildfire Protection Plan (CWPP) was developed for the Hamlet of Fort Resolution 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 Montane Forest Management Ltd in cooperation with the Government of the Northwest Territories (GNWT) and Fort Resolution.

In 2018 the GNWT, Environment and Natural Resources (ENR) updated the Fort Resolution 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

Fort Resolution, 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 of Fort Resolution.

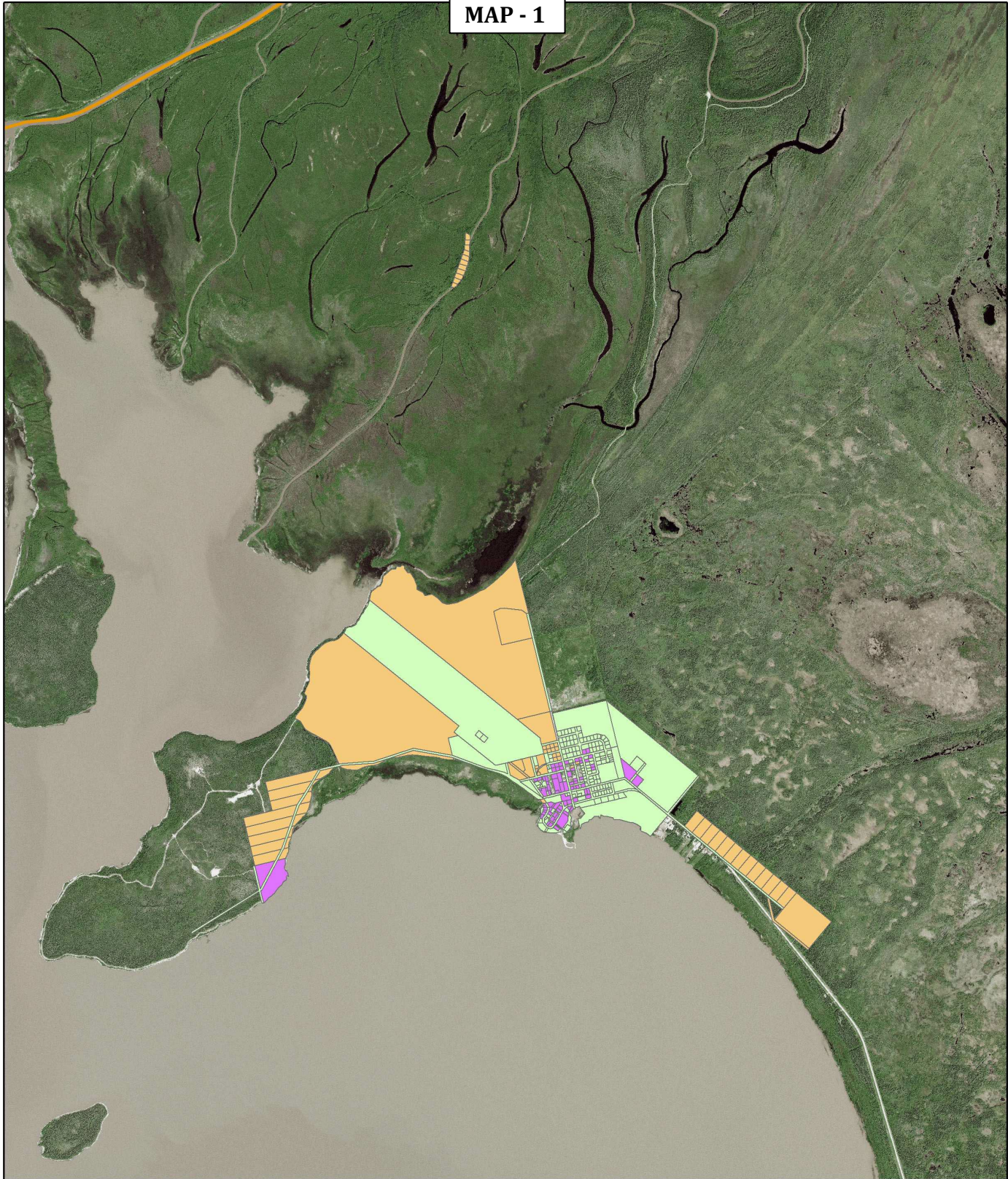
Stakeholders involved with the planning process included:

- Government of the Northwest Territories, Environment and Natural Resources
- Deninu Ku'e First Nation

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

- Commissioner
- Municipal
- Private
- Territorial


MAP - 1




Fort Resolution Land Status Authority

- Land Ownership**
- Commissioner
 - Municipal
 - Private
 - Territorial
- Planning Area**


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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 GNWT Environment and Natural Resources (ENR) for the period from 2009 to 2018.

Data within a 10 kilometre radius of Fort Resolution indicates that wildfire incidence is high. Fire incidence data shows a total of 16 wildfires in the planning area (**Map 2**). Predominant fire causes are recreation and residents near the settled areas and lightning outside the settled areas. Several large wildfires greater than 10,000 ha have occurred over the past twenty years just outside the 10 kilometre 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	7	43.7%
Lightning-Caused	9	56.3%
Totals	16	100%

Wildfire incidence in the planning area is high and is predominantly recreation and resident-caused in settled areas and lightning in unsettled areas.



Fort Resolution Ten Year Fire History

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

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3.2 Wildfire Behaviour Potential

3.2.1 Forest Fuel Types

Analysis of the forest fuels surrounding Fort Resolution and Little Buffalo River Village were completed in 2011. The overall area is dominated with boreal spruce (C-2) and deciduous fuel types while the Fort Resolution townsite area is mainly non-fuel (NF) and cured-grass (O1), and deciduous fuel types with boreal spruce (C-2) fuels along the east perimeter of town. The Little Buffalo River Village area 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 Fort Resolution and Little Buffalo River Village with the highest potential along the south and west perimeter of the town site in C-2 fuel types.

3.3 FireSmart Hazard Assessments

FireSmart hazard assessments (P.I.P., 2003) were conducted on developments and adjacent wildland fuel types within Fort Resolution and Little Buffalo River Village. 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.

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

Table 2: FireSmart Hazard Assessments

Development Area	Structure/Site Hazard (0 - 30m)
Ft. Resolution Townsite Area	
North-End	Low-Moderate
South-End	High-Extreme
Little Buffalo River Village Area	
West-End	Low-Moderate
East-End	High-Extreme
Det'an Cho (Eagle) Tourist Camp	High
Cabin Sites	Moderate

Ft. Resolution Townsite Area

FireSmart hazard for the Ft. Resolution townsite area is **Low-Moderate** with some east perimeter areas and south rural structures at **High-Extreme** hazard based on proximity to C-2 fuels. 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/M-1 fuels on the east perimeter of the townsite area and south of the townsite on the west-side of Highway 6.



Little Buffalo River Village Area

Development consists of the main village area, the Det'an Cho Tourist Camp, and two cabin sites. FireSmart hazard for the main village is **Low-Moderate** on the west-end and High-Extreme on the east-end due to C-2 fuel types. FireSmart hazard for the Det'an Cho Tourist Camp is High due to surrounding C-2/M-1 fuels. FireSmart hazard for the two cabin sites is Moderate due to inadequate Zone 1 defensible space from cured-grass fuels. Exterior structure materials are primarily asphalt shingle or roll-roof roofing and wood or log siding.



FireSmart hazard is High to Extreme on the east-perimeter of the main townsite and around rural structures south of the townsite, west of Highway 6. FireSmart hazard for Little Buffalo River Village is Extreme for the east-end of the village and High for the Det'an Cho Tourist Camp.

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.

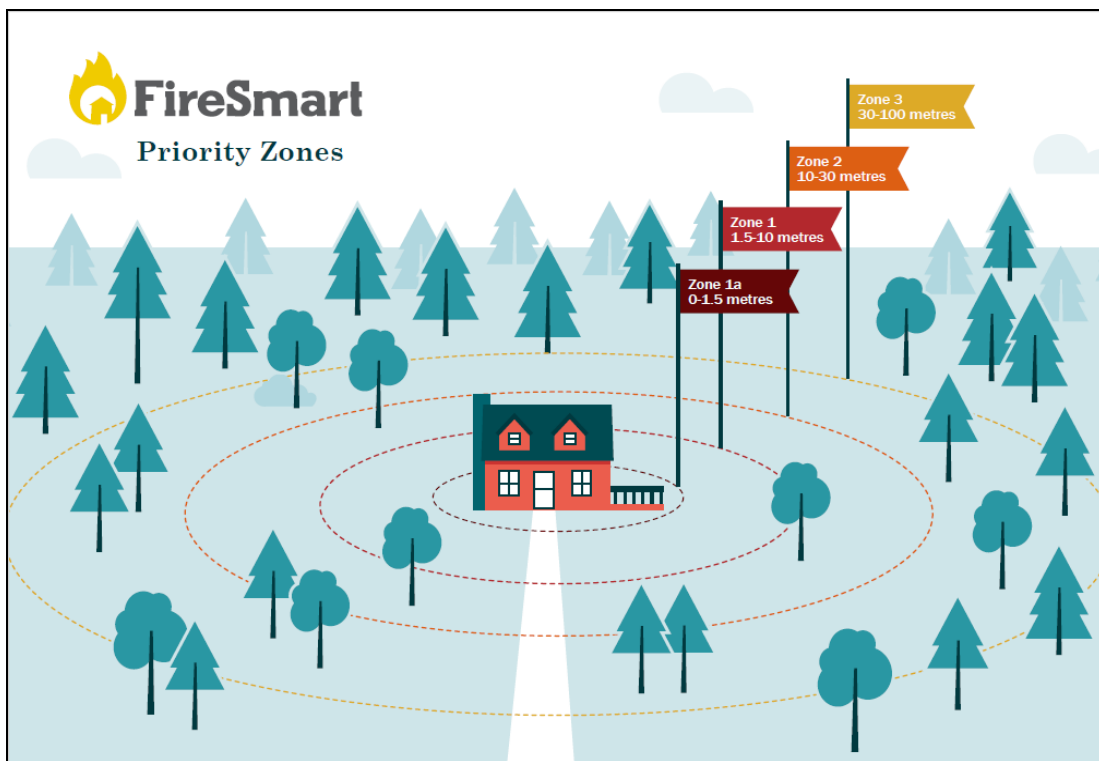


Figure 1– Interface Priority Zones (PIP, 2017)

4.1 Existing Vegetation Management

Vegetation management has occurred in the form of fuels removal on fireguards and fuels reduction immediately adjacent to structures (**Map 3 & Table 3**).

Table 3: Existing Vegetation Management Areas

Name	Area (ha)	Year	Agency	Comments
North & East Fireguards	18.2	1990's	GNWT	Old fireguards need maintenance to ensure effectiveness
East-Perimeter Fuels Reduction	4.3	2009/10	Hamlet of Fort Resolution	Requires debris disposal from 2010 ops and widening to minimum 75 metres width
Fuels reduction along northwest section of airstrip	0.5	2009	Hamlet of Fort Resolution	Thinning & pruning
Fuels reduction north of community	0.1	2009	Hamlet of Fort Resolution	Thinning & pruning
Fuels reduction northwest of community	0.4	2009	Hamlet of Fort Resolution	Thinning & pruning
Fuels reduction northeast of community	1.4	2010	Hamlet of Fort Resolution	Thinning & pruning
Fuels reduction southeast of community	0.5	2012	Hamlet of Fort Resolution	Thinning & pruning
Fuels reduction west of community	0.3	2012	Hamlet of Fort Resolution	Thinning & pruning
Fuel-break south (between Great Slave Lake & Highway #6)	0.4	2017	GNWT	Fire crews conducted maintenance of existing fuel-break
ENR Firebase	0.4	2018	GNWT	Ongoing



Fireguards were completed along the east and north perimeters of the Hamlet in the 1990's by the GNWT ENR Department (Map 3 & Table 3). These guards are overgrown and require maintenance to restore their effectiveness.

Fuels reduction was conducted during the winter of 2009/10 along the east-perimeter of the main townsite to thin black spruce and remove willow for a 15-20 metre wide strip. These areas should be widened to a minimum of 75 metres in width and require final brush disposal from the 2009/10 work.



GNWT ENR has completed fuels reduction work around the Fort Resolution firebase and is maintaining as necessary.

4.2 Proposed Vegetation Management

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

Fire Smart Zone 1a vegetation management is predominantly adequate throughout the main townsite area except for structures with lack of adequate Zone 1 defensible space along the east-perimeter and south of the Hamlet along Highway 6. Several structures in Little Buffalo River Village area require additional Zone 1 defensible space.

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.
- 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 & 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.

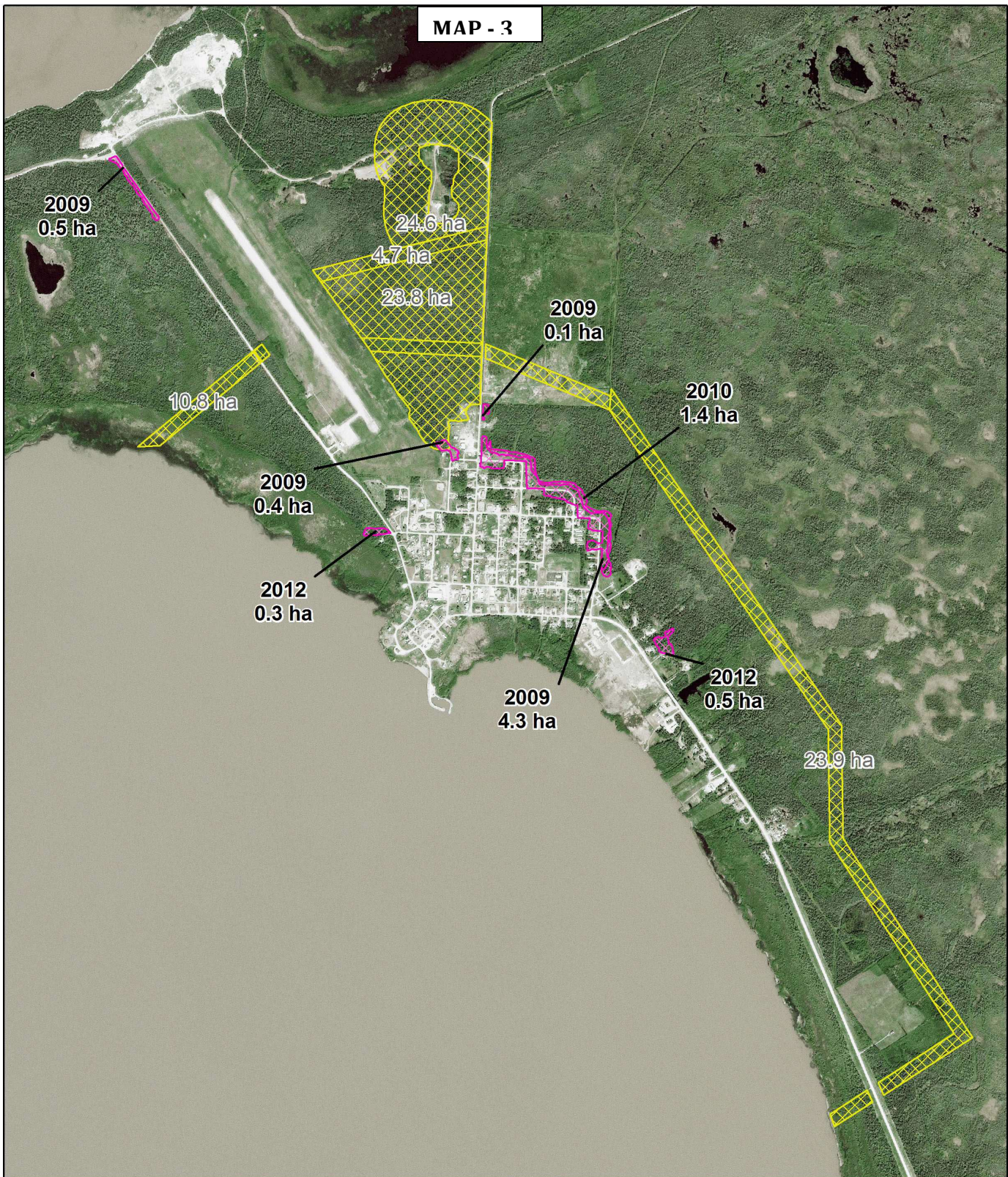
Table 4: Vegetation Management Areas

Name	Area (Ha)	Type	Land Status Authority
Existing fuel-breaks (1990s)	23.9	Fuels removal to mineral soil to maintain existing fuel-breaks to minimum 60m width	Hamlet of Fort Resolution
Extension of existing fuel-breaks north of	4.7	Fuels removal to mineral soil to extend existing fuel-breaks to minimum 60m width.	Hamlet of Fort Resolution


community to airstrip			
Fuel-break from Great Slave Lake to airstrip	10.8	Fuels removal to mineral soil to minimum 60m width	Hamlet of Fort Resolution
Fuels reduction between community and landfill	23.8	Fuels reduction and crown spacing by way of mulching	Hamlet of Fort Resolution
Fuels reduction in the vicinity of landfill	24.6	Fuels reduction and crown spacing by way of mulching	Hamlet of Fort Resolution
Total	87.8		

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




**Fort Resolution
Fuel Modifications**
Completed and Proposed

- Fuel Modifications**
-  Completed
 -  In Progress
 -  Proposed

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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 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, metal, and roll-roof asphalt with scattered wood-shake roofs and 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

Fort Resolution does not have municipal hydrant water-supply. All development areas rely on water-tender supply from the local fire department 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 lines.

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 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 Fort Resolution 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:

- Deninu Ku'e First Nation
- Fort Resolution Métis Council
- Hamlet of Fort Resolution
- GNWT

Cross-training for Fort Resolution 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: Fort Resolution Fire Department and 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 Fort Resolution 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 Fort Resolution 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 Fort Resolution
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 Fort Resolution
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.	Hamlet of Fort Resolution

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 Fort Resolution 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 Fort Resolution residents.	Hamlet of Fort Resolution GNWT

Interagency Cooperation & Cross-Training

Issue	Recommendation	Responsible Agency
Cross-Training	<p>Recommendation 6: Fort Resolution Fire Department members and GNWT should partner on cross-training initiatives to ensure emergency responders are cross-trained to the following:</p> <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 	Hamlet of Fort Resolution GNWT

Emergency Planning

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