

Regional Municipality of Wood Buffalo Wildfire Mitigation Strategy



Prepared for:
Regional Municipality of Wood Buffalo FireSmart Committee



December 2017

Stew Walkinshaw, R.P.F.

MONTANE
Forest Management Ltd.

Canmore, AB.

Phone: (403) 678-7054 Email: montane@shaw.ca

Table of Contents

	Executive Summary	1
1	Introduction	8
2	Planning Area and Stakeholders	9
3	Hazard & Risk Assessment	11
	3.1 Conklin	
	3.2 Janvier	
	3.3 Anzac	
	3.4 Gregoire Lake Estates	
	3.5 Fort McMurray	
	3.6 Draper	
	3.7 Saprae Creek Estates	
	3.8 Fort McKay	
	3.9 Fort Chipewyan	
	3.10 Fort Fitzgerald	
4	Vegetation Management Options	46
	4.1 Priority Zone 1	
	4.2 Priority Zones 2-3	
	4.2.1 Conklin	
	4.2.2 Janvier	
	4.2.3 Anzac	
	4.2.4 Gregoire Lake Estates	
	4.2.5 Fort McMurray	
	4.2.6 Draper	
	4.2.7 Saprae Creek Estates	
	4.2.8 Fort McKay	
	4.2.9 Fort Chipewyan	
	4.2.10 Fort Fitzgerald	
	4.3 Vegetation Management Maintenance	
	4.4 Related Planning Documents	
	4.4.1 Alberta Forestry Wildfire Management Plans	
	4.4.2 RMWB Parks Master Plan & Urban Forest Strategy	

5	Development & Legislation Options	98
5.1	Structural Options	
5.2	Infrastructure Options	
5.2.1	Access	
5.2.2	Fire Suppression Water Supply	
5.2.3	Utilities	
5.2.4	Road and Address Signage	
5.2.5	Parks and Open Spaces	
5.3	Development Legislation & Policy Options	
5.3.1	RMWB Municipal Development Plan	
5.3.2	Area Structure Plans	
5.3.3	RMWB Land Use Bylaw	
5.3.4	RMWB Engineering Services Standards & Development Procedures	
5.3.5	RMWB Comprehensive Approach to Mitigating Risks of Natural Hazards	
5.3.6	Proposed FireSmart Development Revisions	
6	Public Education & Engagement Options	111
6.1	FireSmart Hazard Assessments	
6.2	Key Messages	
6.3	FireSmart Canada Community Recognition Program	
7	Interagency Cooperation and Cross-Training Options	114
7.1	Inter-Agency Cooperation	
7.2	Cross-Training	
8	Emergency Planning Options	114
8.1	RMWB Wildfire Response Plan	
8.2	Wildfire Preparedness Guides	
8.3	Structure Protection Equipment	
9	Implementation Plan	118
10	References	121
	Appendix I – Definitions	123

Executive Summary

The Regional Municipality of Wood Buffalo (RMWB) Wildfire Mitigation Strategy was developed to provide practical and operational wildland/urban interface risk mitigation strategies to reduce the threat of wildfire to development in the RMWB service areas using standardized wildfire hazard assessment protocols. FireSmart mitigation measures were developed based on the seven disciplines of wildland/urban interface approach and current research and knowledge in wildland/urban interface community protection.

The planning area includes lands within and surrounding the RMWB service areas.

- Conklin
- Janvier
- Anzac
- Gregoire Lake Estates
- Fort McMurray
- Draper
- Sapræ Creek Estates
- Fort McKay
- Fort Chipewyan
- Fort Fitzgerald

Hazard and Risk Assessment

Hazard and risk assessment uses wildfire incidence and wildfire behaviour potential to quantify overall wildfire threat at the community and landscape-levels and to determine priorities for FireSmart mitigation actions. Community-level refers to lands within the community boundary and landscape-level refers to lands extending approximately 2 kilometres out from the community boundary.

The following community and landscape-level wildfire behaviour potential levels for each of the RMWB service areas may be used to determine priorities for FireSmart mitigation options.

Service Area	Wildfire Behaviour Potential	
	Community-Level	Landscape-Level
Fort McKay	High-Extreme	High-Extreme
Fort Chipewyan	High-Extreme	High-Extreme
Fort Fitzgerald	High-Extreme	High-Extreme
Conklin	High-Extreme	Moderate
Fort McMurray	Moderate-High	Low
Anzac	Moderate	High-Extreme
Gregoire Lake Estates	Moderate	High-Extreme
Janvier	Moderate	Low
Draper	Low-Moderate	Low
Sapræ Creek Estates	Low-Moderate	Low

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 to reduce the threat of wildfire to developed areas however **they do not ensure structure survival under all hazard conditions**. FireSmart standards refer to three interface priority zones with vegetation management for interface structures recommended in Zones 1 (0-10m) and 2 (10-30m) at a minimum and in Zone 3 (30-100m+) based on hazard and risk.



Recommendation 1: Encourage residents to establish adequate FireSmart Priority Zone 1 clearance on their private or leased lands.

FireSmart Priority Zone 2-3 clearance from flammable wildland fuels is **inadequate** for many of the rural service area structures and for some of the Fort McMurray urban service area structures backing onto wildland forested areas such as the Birchwood/Conn Creek reserve.

Priority Zone 2-3 vegetation management has been completed before, during, and after the 2016 Horse River wildfire and new areas are proposed in each of the service areas based on the hazard and risk assessment.

Service Area	FireSmart Zone 2-3 Vegetation Management	
	Completed (Ha)	Proposed (Ha)
Conklin	389.9	174.1
Janvier	175.1	206.4
Anzac	163.7	34.5
Gregoire Lake Estates	18.1	6.5
Fort McMurray	326.7	133.8
Draper	12.8	8.4
Saprae Creek Estates	22.8	20.0
Fort McKay	102.0	44.6
Fort Chipewyan	46.1	157.0
Fort Fitzgerald	62.1	82.0
Totals	1319.3	867.3

Recommendation 2: Implement FireSmart Zone 2-3 vegetation management on Municipal and Provincial lands based on priority and available funding and encourage First Nations, residents, and lease holders to implement FireSmart Zone 2-3 vegetation management on lands under their control.

Landowners and land managers must provide periodic inspections of fuel modification areas and complete maintenance as required. Completed fuel reduction projects in Fort McMurray, Draper, Anzac, and Conklin currently require inspections and maintenance and dozer guards and fuelbreaks completed during the 2016 wildfire will require regular mowing and/or burning of native grass for a minimum of 30 metres from structures and/or back lot lines to maintain fuelbreak effectiveness.

Recommendation 3: Inspect and maintain all FireSmart vegetation management areas on a regular basis.

The Fort McMurray and Lac La Biche Forest Areas have developed landscape-level Wildfire Management Plans to identify management strategies to reduce the wildfire risk at a landscape-level. A range of risks with respect to wildfire were identified across the landscape and specific actions were identified to address risks that were classified as intolerable and/or where risk reduction measures are needed.

Recommendation 4: Implement the landscape-level risk reduction measures in the Fort McMurray and Lac La Biche wildfire management plans to reduce the threat of landscape-level wildfire to RMWB service areas.

The RMWB Parks Master Plan and Urban Forest Strategy are currently under development and will have an impact on wildfire threat within the RMWB service areas. The guiding principles of the project recognize FireSmart as a requirement in the plan development process. Coordination and implementation of parks master planning and urban forest strategies and development of an Urban Forest Management Plan **with reduction of wildfire behaviour potential as an objective** will reduce the threat of community-level wildfire within the Birchwood Trails/Conn Creek community reserve.

Recommendation 5: Implement the strategic-level RMWB Urban Forest Strategy and develop and implement an Urban Forest Management Plan for the Birchwood Trails/Conn Creek community reserve to reduce the threat of community-level wildfire to RMWB service areas.

Development & Legislation Options

Consideration of wildfire at the development planning stage is encouraged to ensure that wildfire hazard is identified and the appropriate mitigation measures are implemented prior to and/or during development.

Roofing materials in all service areas consist of primarily of ULC-rated asphalt shingle and metal with scattered combustible roofs. **Fort McMurray's Burton Place, Berard Crescent, Brosseau Crescent, Burns Place, Brett Drive, and Ball Place which have a significant number of structures with un-rated combustible wood-shake roofing materials** putting those structures at Extreme threat of airborne ember ignition from wildfire in the Birchwood Trails/Conn Creek reserve. Siding materials consist primarily of combustible wood or vinyl siding with scattered structures having combustible log or non-combustible stucco, fibre-cement, concrete, or metal siding. Combustible wooden decks and porches with open undersides are common throughout all service areas and wooden fencing up to the structure is common in Fort McMurray and scattered in Anzac and Fort McKay.

RMWB service areas that have only one access route in and out include Fort McKay, Draper, Sapræ Creek, Janvier, Anzac, and Fort Fitzgerald. The RMWB has made the development of the East Clearwater highway as a regional-level alternate egress and emergency evacuation route its highest priority mitigation requirement and has been considering alternative egress routes for each of the Service Areas.

Main access road standards throughout the urban and rural service areas are generally adequate. Driveway access to several lots in Draper are narrow, steep, and have poor surface cover making access to structures with fire apparatus and crews difficult and unsafe during wildfire conditions.

Road and address signage in Fort McMurray urban service area meets FireSmart recommended guidelines however the rural service areas do not.

Recommendation 6: Ensure that the following infrastructure options are improved to meet FireSmart recommended guidelines:

- Secondary access routes for all service areas where feasible
- Driveway access standards for all new developments
- Identification and development of dry-hydrant fire suppression water supply for Draper
- Danger tree removal along overhead powerlines
- Propane tank clearance from wildland fuels
- Road and address signage

Community parks and open spaces that are properly landscaped and maintained provide excellent fuelbreaks between hazardous wildland fuels and interface structures. The Syncrude Athletic Park, Fort McMurray Golf Club fairways, Abasand cemetery, several of the mowed grass buffers around the perimeter of developments in Fort McMurray, and the Anzac Recreation Centre Park are examples of the benefit of developing parks and open spaces on the perimeter of developed areas to act as fuelbreaks.

Recommendation 7: Include the planning and development of maintained parks and open spaces as fuelbreaks as a consideration in the RMWB development planning process.

Legislating *FireSmart* requirements for new development is an important step to creating FireSmart communities. The following documents were reviewed for current regulation and policies related to FireSmart development:

- RMWB Municipal Development Plan
- RMWB Area Structure Plans
- RMWB Land Use Bylaw
- RMWB Engineering Services Standards
- RMWB Comprehensive Approach to Mitigating Risks of Natural Hazards

Field inspection of many of the RMWB municipal park areas within the urban and rural service areas and review of Section 10 – Landscape and Park Development Standards of the *RMWB Engineering Services Standards* (RMWB, 2017) revealed items that conflict with FireSmart recommended guidelines.

Recommendation 8: Review and revise Section 10 – Landscape and Park Development Standards of the *RMWB Engineering Services Standards* to prohibit planting of evergreen trees and shrubs and the use of bark mulch/wood chips within 10 metres of any structures.

FireSmart standards are referred to in many of the documents however none currently regulate combustible exterior building materials, resulting in increased wildfire threat to structures.

Recommendation 9: Consider revision of the current RMWB statutory planning documents and provide input to Building Code revisions to meet FireSmart recommended guidelines.

Public Education & Engagement Options

Many of the structures within the RMWB service areas are at High-Extreme threat to wildfire due to inadequate structural options and Priority Zones 1-2 vegetation management on private lands. Residents, business owners, developers, and RMWB administration and elected officials all need to be aware of the FireSmart hazard and the solutions to minimizing the risk and become a partner in implementation of FireSmart solutions in their own backyards and communities.

Residents would benefit from a FireSmart Hazard Assessment of their home and property, conducted by a qualified individual, to identify those items that present wildfire threat and recommended methods to reduce that threat.

Recommendation 10: Identify and train RMWB Emergency Services urban and rural members to provide FireSmart Hazard Assessments and options to reduce the wildfire threat to those residents that request one.

Key messages are developed from field observations during the development of this Wildfire Mitigation Strategy and are recommended to educate residents on their priorities to reduce the threat of wildfire to their structures.

Recommendation 11: Develop and implement a focused long-term and repetitive FireSmart education program on FireSmart recommended guidelines for all RMWB stakeholders.

FireSmart Canada has initiated the FireSmart Community Recognition Program to motivate and engage residents to plan and take FireSmart actions in their “own backyards” to reduce wildfire losses from the “grassroots” level.

Recommendation 12: The RMWB should identify and train key personnel from urban and rural Emergency Services and Parks Services to act as Local FireSmart Representatives and to identify and work with the appropriate Community Champions within the RMWB service areas to work towards Recognized FireSmart Community status.

Interagency Cooperation & Cross-Training Options

Interagency cooperation and cross-training between all stakeholders is necessary to ensure cooperative and effective implementation of FireSmart mitigation options and to coordinate an effective multi-agency response to a wildland/urban interface fire.

Inter-agency cooperation between the RMWB and AB. Forestry occurs through the RMWB FireSmart Committee, the Mutual-Aid Wildfire Agreement, and through the training opportunities provided to each other and RMWB Emergency Services and Oil Sands fire departments hold mutual-aid agreements and work closely with each other.

The RMWB has offered and provided emergency management, wildfire, and wildland/urban interface cross-training to their staff has identified that additional wildland and wildland/urban interface training be provided to all urban and rural emergency services members.

Recommendation 13: The RMWB and AB. Forestry should identify cooperative training opportunities and provide support to each other for applicable cross-training related to emergency management, wildfire prevention, wildfire operations, and wildland/urban interface. RMWB personnel should be cross-trained and qualified based on their participation in the emergency management organization.

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 a wildland/urban interface fire are of paramount importance.

A review of the *RMWB Municipal Emergency Management Plan Part III – Appendix B Wildfire Response Plan* (RMWB, 2010) reveals that an update to include revisions to current situation is required.

Recommendation 14: Update the RMWB Wildfire Response Plan (2010) annually to provide most current information.

Wildfire Preparedness Guides (WFPG) have been developed and are updated regularly by AB. Forestry for each of the RMWB service areas and are provided to RMWB Emergency Services and RMWB Emergency Services has purchased two structure protection trailers that are currently stationed in Fort McMurray and Sapræ Creek with the intent of purchasing an additional three trailers for Anzac, Fort McKay, and Fort Chipewyan and possibly one for Conklin in the future.

Recommendation 15: Conduct regular wildland/urban interface table-top, functional, and/or field exercises between AB. Forestry, RMWB, and applicable mutual-aid partners to test recommendations in the Horse Creek Wildfire Post-Incident Assessments, the RMWB Municipal Emergency Plan, and/or the Wildfire Preparedness Guide(s).

1 Introduction

The Regional Municipality of Wood Buffalo (RMWB) Wildfire Mitigation Strategy was developed to provide practical and operational wildland/urban interface risk mitigation strategies to reduce the threat of wildfire to development in the RMWB service areas.

The project objectives include:

- Assess wildfire hazard and risk to development
- Based on interface hazard and risk, develop and prioritize FireSmart mitigative measures to reduce the threat of wildfire to development based on the seven disciplines of wildland/urban interface:
 1. Vegetation management
 2. Development
 3. Legislation
 4. Public education
 5. Inter-agency cooperation
 6. Cross-training
 7. Emergency planning

This Wildfire Mitigation Strategy (WFMS) was developed using standardized wildfire hazard assessment protocols and FireSmart mitigation measures were developed based on the seven disciplines of wildland/urban interface approach and current research and knowledge in wildland/urban interface community protection.

Ground and helicopter assessments were conducted by the author for Janvier, Conklin, Anzac, Gregoire Lake Estates, Fort McMurray, Draper, Sapræ Creek, and Fort McKay. Alberta Agriculture and Forestry (AAF) conducted field assessments and developed Wildfire Mitigation Strategies with vegetation management recommendations for Fort MacKay/McKay, Fort Chipewyan, and Fort Fitzgerald.

This Wildfire Mitigation Strategy compiles the findings and recommendations from each of the relevant strategies into one overall RMWB Wildfire Mitigation Strategy covering each of the RMWB service areas listed above.

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 lands within and surrounding the RMWB service areas (Map 1).

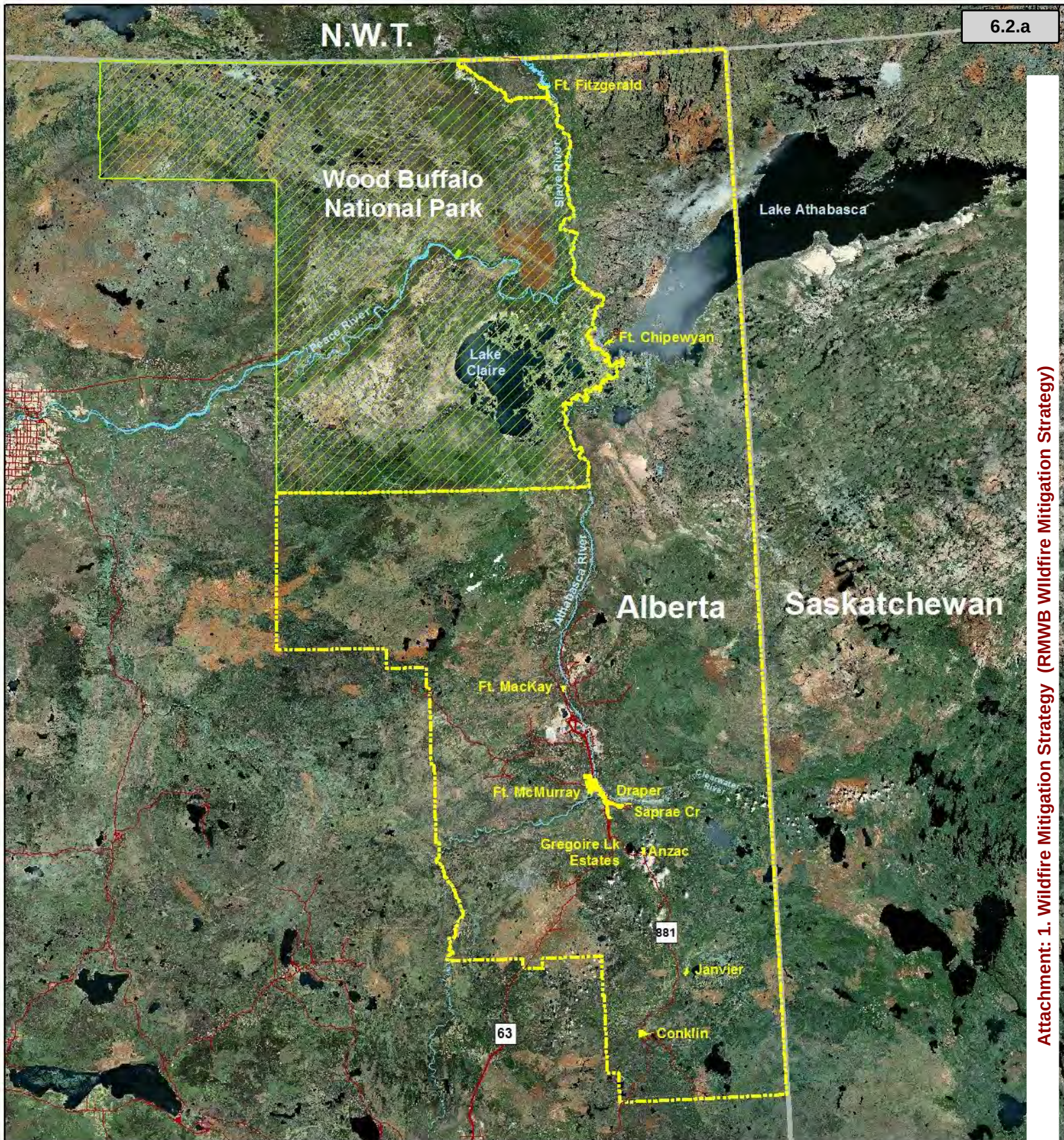
- Conklin
- Janvier
- Anzac
- Gregoire Lake Estates
- Fort McMurray
- Draper
- Saprae Creek Estates
- Fort McKay
- Fort Chipewyan
- Fort Fitzgerald

The planning area consists of private, municipal, provincial and first nation lands. Development authority rests with the RMWB within each of the service areas.

All lands within the rural service areas are within the Forest Protection Area and all lands within the Fort McMurray urban service area are excluded from the Forest Protection Area. Structural fire is the responsibility of RMWB Regional Emergency Services in each of the service areas and wildfire management is the jurisdiction of the Alberta government within the rural service areas and the Regional Municipality of Wood Buffalo within the Fort McMurray urban service area.

Stakeholders consulted with in the planning process included:

- Stephen Fudge, FireSmart Specialist, RMWB Recovery Task Force
- Hunter Langpap, Fire Prevention Officer, RMWB Regional Emergency Services
- Paul St.John, Wildfire Prevention Officer, AAF, Fort McMurray Forest Area
- Clifton McKay, Wildfire Technologist, AAF, Lac La Biche Forest Area



Map 1 - Planning Area

-  RMWB Boundary
-  RMWB Service Areas
-  Provincial/Territorial Border
-  Road

N



3 Hazard & Risk Assessment

Hazard and risk assessment uses wildfire incidence and wildfire behaviour potential to quantify overall wildfire threat at the community and landscape-levels and to determine priorities for FireSmart mitigation actions. Community-level refers to lands within the community boundary and landscape-level refers to lands extending approximately 2 kilometres out from the community boundary.

Wildfire incidence uses provincial historic wildfire data for a ten-year period (2007-2016) to determine number, location, and cause of wildfires to determine the risk of wildfire ignition.

Wildfire behaviour potential uses provincial weather data and wildland fuel types to analyze probable community and landscape-level wildfire behavior potential.

- Fire weather data for a twenty-year period (1997-2016) from the most representative weather station for each community is used to determine average number of “spread-event days” per year and the predominant wind direction and speed on those days. A “spread-event” day is defined as “a day when the fire actively spreads with high intensity” which corresponds to a Fire Weather Index value of 19 or higher (Podur & Wotton, 2011).
- Fuel types from the provincial Fire Behaviour Prediction (FBP) fuel grid and Alberta Vegetation Inventory (AVI2FBP) were used. New fuel type changes not reflected on the existing fuel type layers were added from satellite imagery analysis and field inspection.
- The Wildfire Threat Assessment tool from Alberta FireWeb was used to determine expected wildfire behaviour potential for each fuel type.

Wildfire Behaviour Potential for FBP Fuel Types

Wildfire Behaviour Potential	FBP Fuel Types
Low	Deciduous (D-1) without evergreen understory Vegetative Non-Fuel (VNF)
Moderate	Spruce-Lichen Woodland (C-1) Mixedwood ≤50% evergreen (M-1DC) Deciduous (D-1) with mod-hvy evergreen understory Native-grass (O-1) Slash (S-1/S-2) Fuel-Reduced (C-5/C-6)
High/Extreme	Boreal Spruce (C-2) Mature Pine (C-3) Immature Pine (C-4) Mixedwood >50% evergreen (M-1CD)

The following community and landscape-level wildfire behaviour potential levels for each of the RMWB service areas may be used to determine priorities for FireSmart mitigation options.

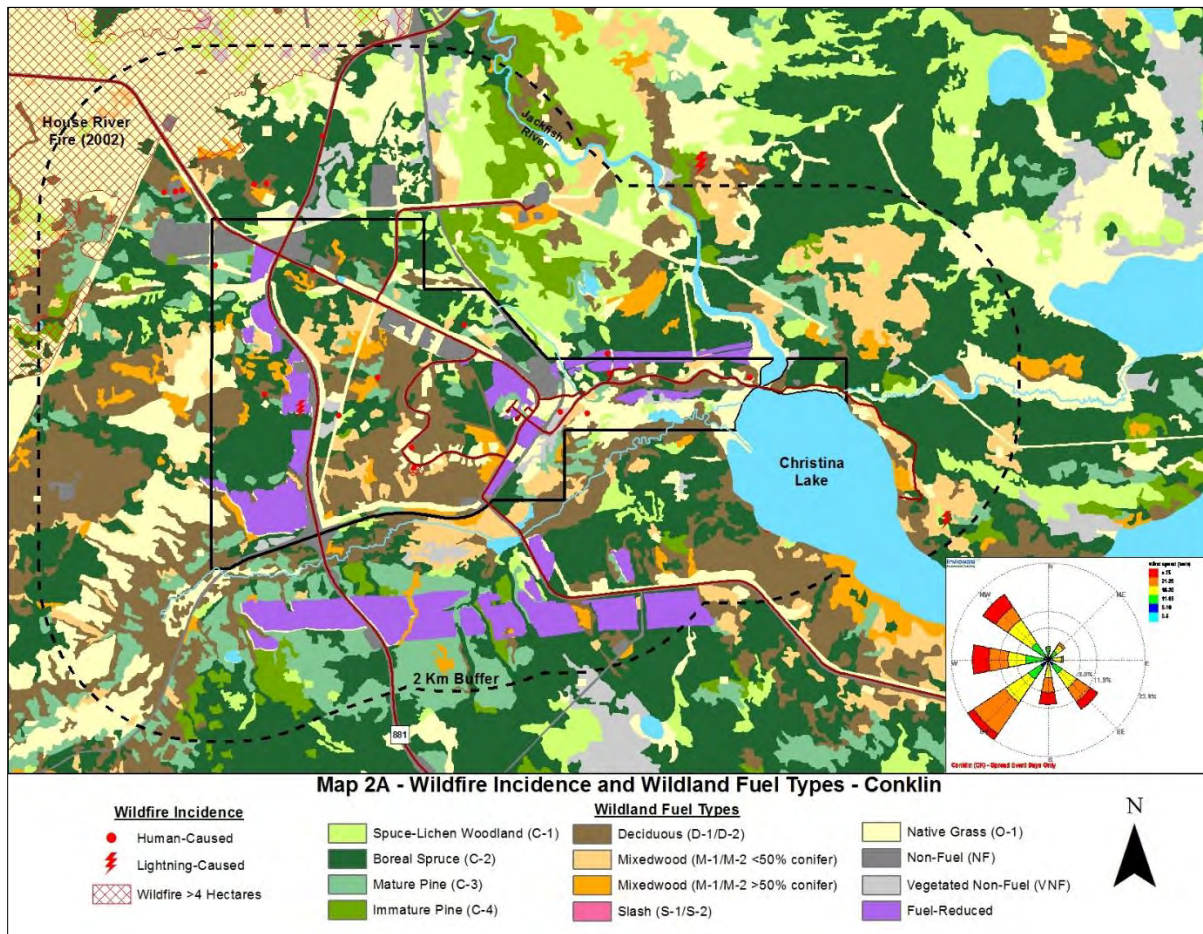
Community and Landscape-Level Wildfire Behaviour Potential

Service Area	Wildfire Behaviour Potential		Comments
	Community-Level	Landscape-Level	
Fort McKay	High-Extreme	High-Extreme	
Fort Chipewyan	High-Extreme	High-Extreme	
Fort Fitzgerald	High-Extreme	High-Extreme	
Conklin	High-Extreme	Moderate	2002 House River fire has reduced potential to the west
Fort McMurray	Moderate-High	Low	Landscape-level potential is Low from 2016 Horse Creek wildfire. Community-level hazard is from Birchwood/Conn Cr community reserve & isolated post-fire green islands
Anzac	Moderate	High-Extreme	High/Extreme landscape-level hazard from southwest only, 2016 Horse Creek wildfire has reduced landscape-level potential to the north and east
Gregoire Lake Estates	Moderate	High-Extreme	High/Extreme landscape-level hazard is from the western-quadrant, 2016 Horse Creek wildfire has reduced potential from the north and northwest
Janvier	Moderate	Low	Possible threat of wildfire to main access road from Hwy 811 to Janvier
Draper	Low-Moderate	Low	2016 Horse Creek wildfire has reduced most wildfire potential
Saprae Creek Estates	Low-Moderate	Low	2016 Horse Creek wildfire has reduced most wildfire potential

3.1 Conklin

Factor	Comments
Wildfire Incidence	Primarily human-caused within the 2km radius and lightning-caused outside
Fire Weather on Spread-Event Days	- Average 14 spread-event days/year - Predominant winds from the western quadrant
Predominant Landscape-Level Fuel Types  Landscape-Level Fuel Types looking Northeast	- Spruce/pine (C-2/C-3) and mixedwood (M-1) with native grass (O-1) to the NE and SE from 2002 House River fire - Significant landscape-level fuelbreaks established to the west and south of community  Landscape-Level Fuelbreak on South perimeter
Predominant Community-Level Fuel Types  Community-Level Fuel Types looking Northwest	Mixture of spruce/pine (C-2/C-3), mixedwood (M-1) and deciduous (D-1) with moderate to heavy spruce/fir understory and or dead/down, native grass (O-1), and fuel-reduced areas  Community-Level Fuelbreak on Northeast perimeter

Factor	Comments
Development Type	Rural-residential, government services, commercial, light industrial
Predominant Exterior Structure Materials Roofing Materials Siding Materials Decks/Porches	- Non-Combustible – Asphalt shingle/Metal - Combustible – Vinyl/Wood/Log - Combustible – Wood, not sheathed-in
Combustibles within 10 metres of Structure	Frequent - firewood, log/debris piles, outbuildings
Priority Zone 1-2 Clearance	Inadequate from grass and forest fuels for many, scattered lots have fuel-reduced forest fuels
Priority Zone 2-3 Clearance	- Adequate for many due to fuels reduction work - More work needed throughout community
 Priority Zones 1-3	 Priority Zones 1-3
Comments: - MODERATE threat of landscape-level wildfire approaching the community in spruce/pine fuels to the north and south, however landscape-level fuelbreaks to the south and community-level fuelbreaks to the north will assist with containment before reaching community - HIGH threat of community-level wildfire threatening structures from untreated spruce/pine fuel patches adjacent to structures - Main threat is from: - Lack of adequate Zones 1, 2, & 3 clearance between structures and grass, spruce/pine, and/or mixedwood fuels - Combustible siding and decking materials - Combustible materials within 10 metres of structures	



3.2 Janvier

Factor	Comments
Wildfire Incidence	Significant human-caused wildfires in native grass fuels within the 2km radius, several exceeding 4 ha, scattered lightning-caused outside the 2km radius
Fire Weather on Spread-Event Days	- Average 12 spread-event days/year - Predominant winds from the southwest
Predominant Landscape-Level Fuel Types 	Deciduous (D-1) with large spruce (C-2) patches to the south and northwest 
Predominant Community-Level Fuel Types 	Deciduous (D-1) with scattered patches of mixedwood (M-1) with moderate to heavy spruce/fir understory and black spruce (C-2) 

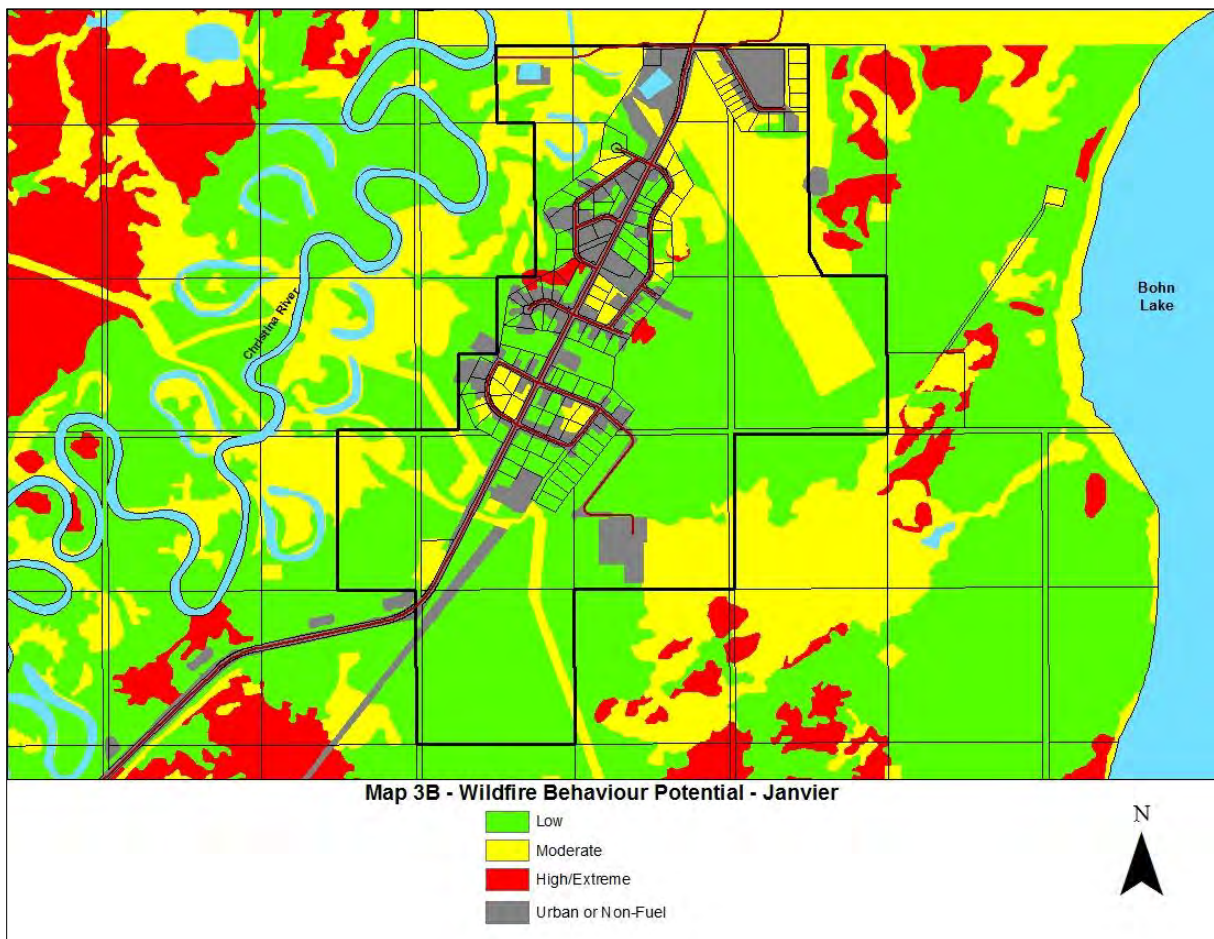
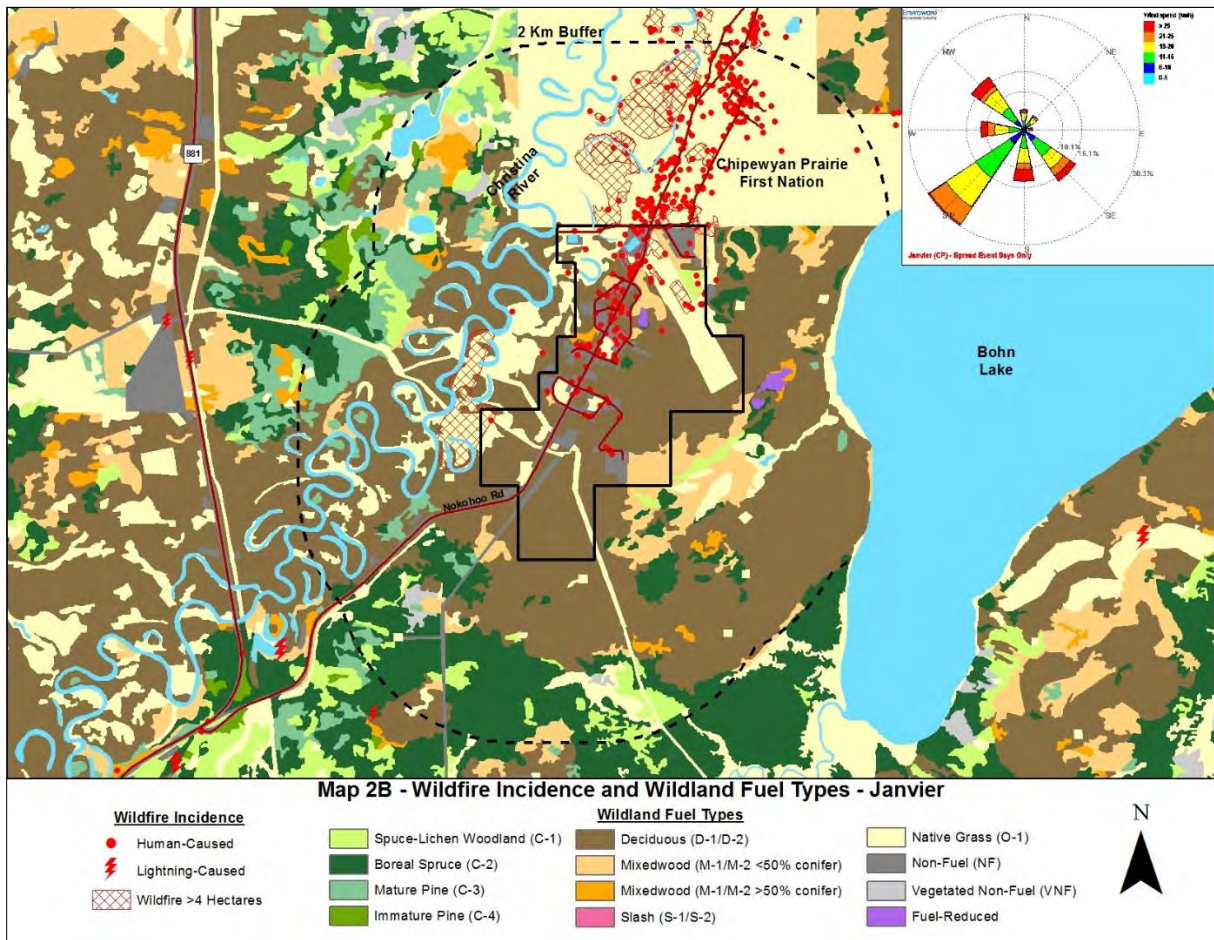
Landscape-Level Fuel Types looking Northwest

Landscape-Level Fuel Types looking South

Community-Level Fuel Types looking Northwest

Community-Level Fuel Types looking Northeast

Factor	Comments
Development Type	Rural-residential, government services
Predominant Exterior Structure Materials Roofing Materials Siding Materials Decks/Porches	- Non-Combustible – Asphalt shingle/Metal - Combustible – Vinyl/Wood/Log - Combustible – Wood, not sheathed-in
Combustibles within 10 metres of Structure	Scattered - Firewood, log/debris piles, outbuildings
Priority Zone 1-2 Clearance	Inadequate or marginal for some, several adequate
Priority Zone 2-3 Clearance	Some C-2 and M-1/D-1 with spruce/fir understory needing fuel reduction
 Priority Zones 1-3	 Priority Zones 1-3
Comments: - LOW threat of landscape-level wildfire threatening structures however access to Hwy 881 may be cut-off by wildfire in spruce fuels to the south of the community - MODERATE threat of community-level wildfire threatening structures in spring/fall cured-grass conditions - Main threat is from: - Lack of adequate Zones 1 & 2 clearance between structures and spruce/mixedwood and/or native grass fuels - Combustible siding and decking materials - Combustible materials within 10 metres of structures	



3.3 Anzac

Factor	Comments
Wildfire Incidence	Primarily human-caused within the 2km radius and lightning-caused outside
Fire Weather on Spread-Event Days	- Average 4 spread-event days/year - Predominant winds from the southwest and southeast
Predominant Landscape-Level Fuel Types 	- Non-fuel (NF) to the north, east, and south due to 2016 Horse River wildfire - Spruce/pine (C-2/C-3), mixedwood (M-1), and native grass (O-1) to the SW 
Predominant Community-Level Fuel Types 	- Mixedwood (M-1) and deciduous (D-1) with moderate to heavy spruce/fir understory with scattered spruce (C-2) patches - Fireguards built in 2016 are currently non-fuel (NF) but will eventually support native-grass (O-1) fuels 

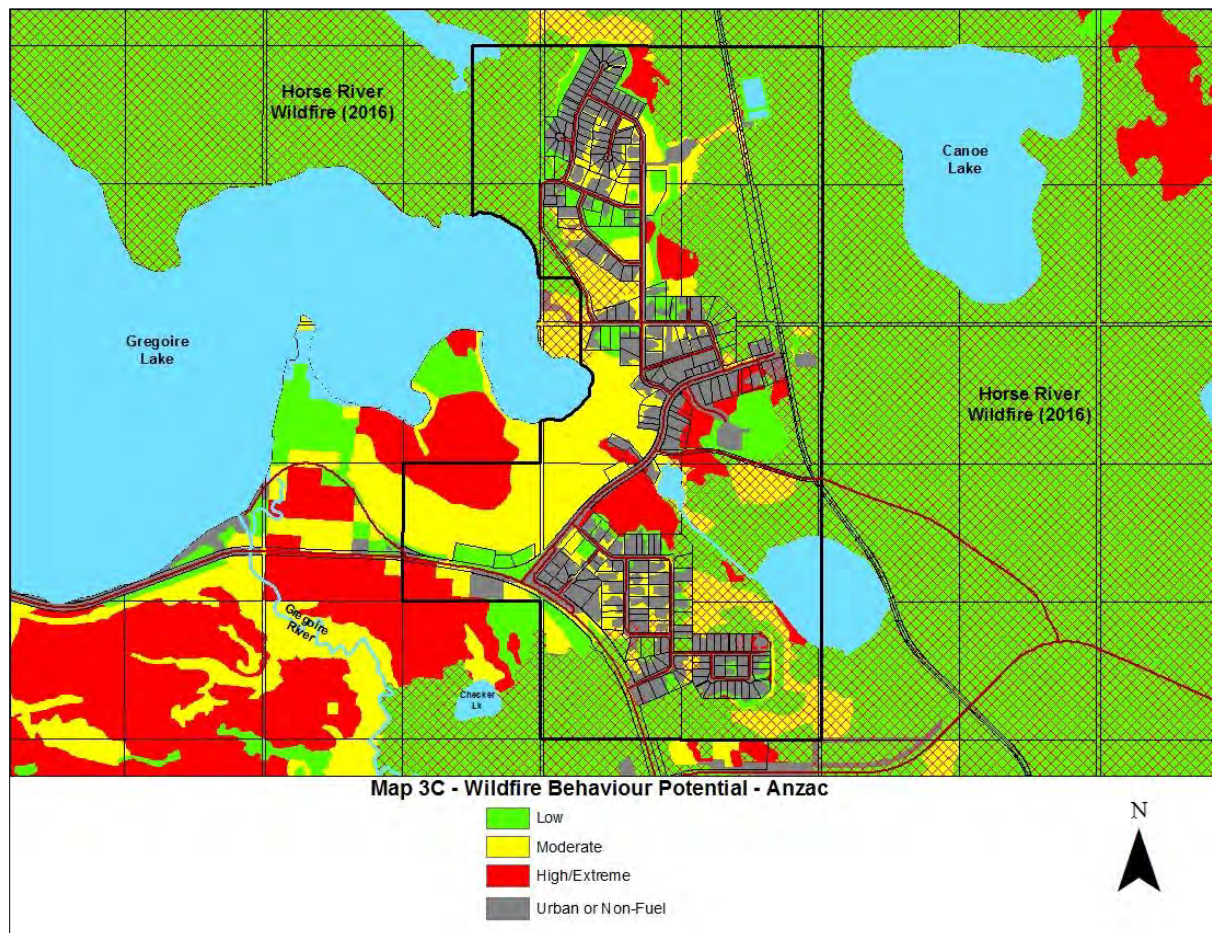
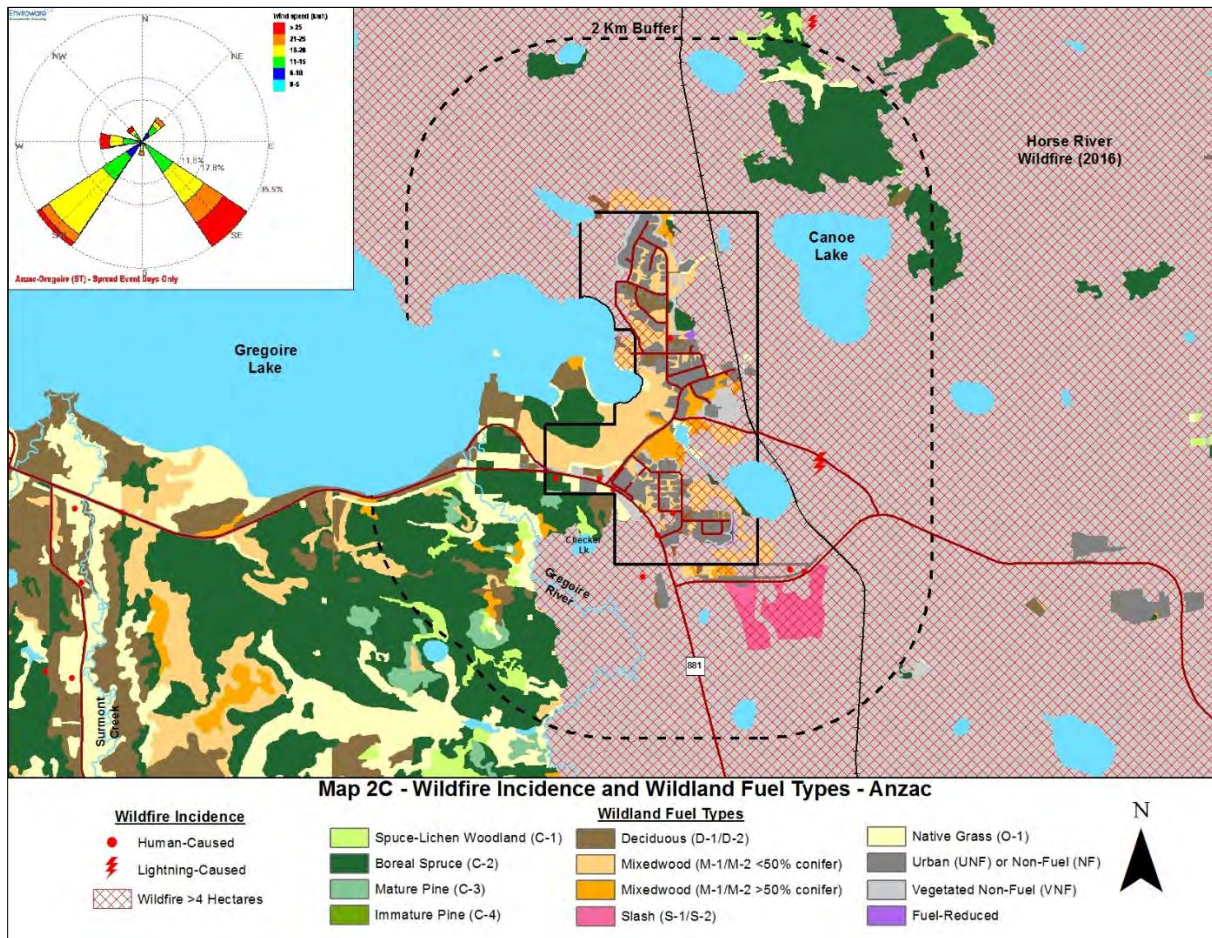
Landscape-Level Fuel Types looking South

Landscape-Level Fuel Types looking Southwest

Community-Level Fuel Types North Anzac

Community-Level Fuel Types South Anzac

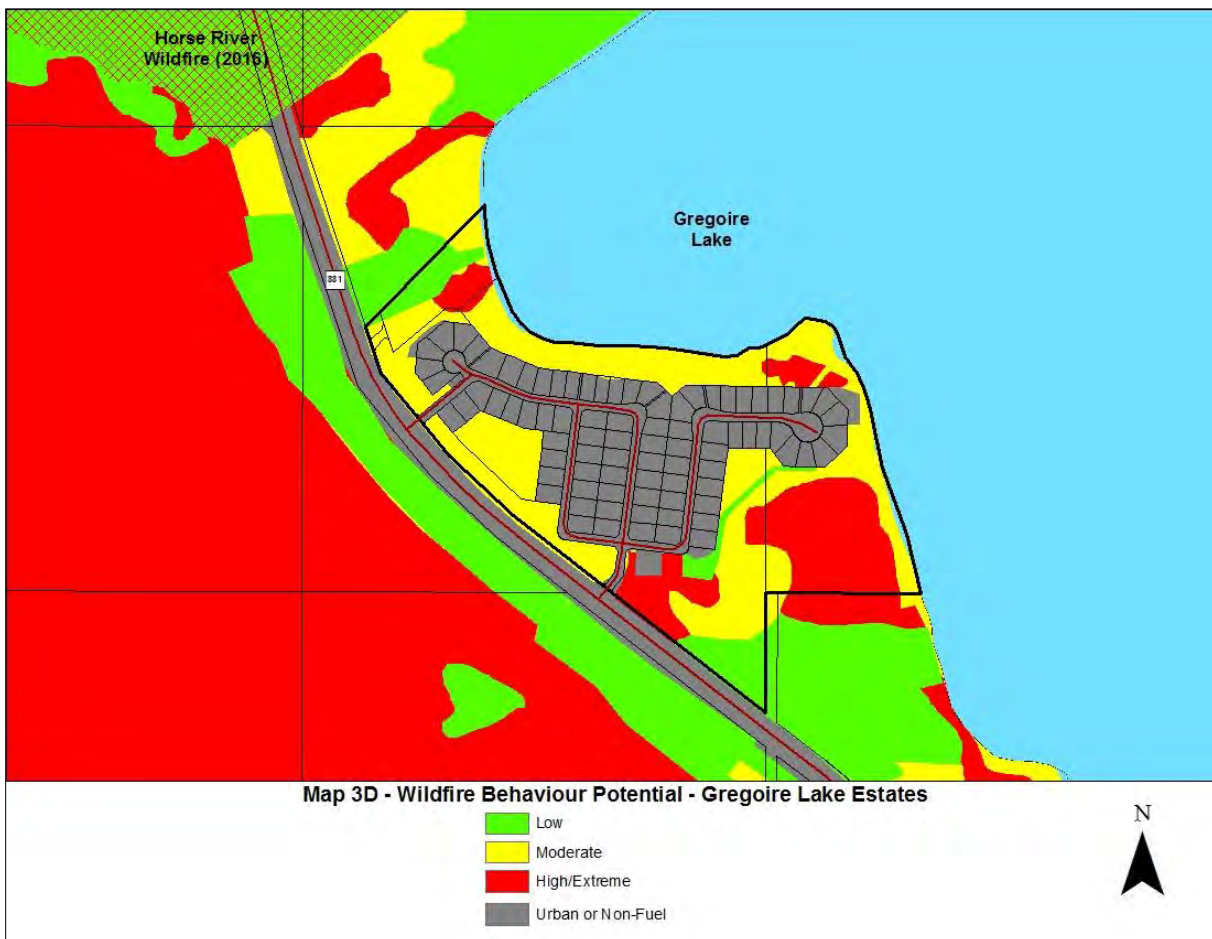
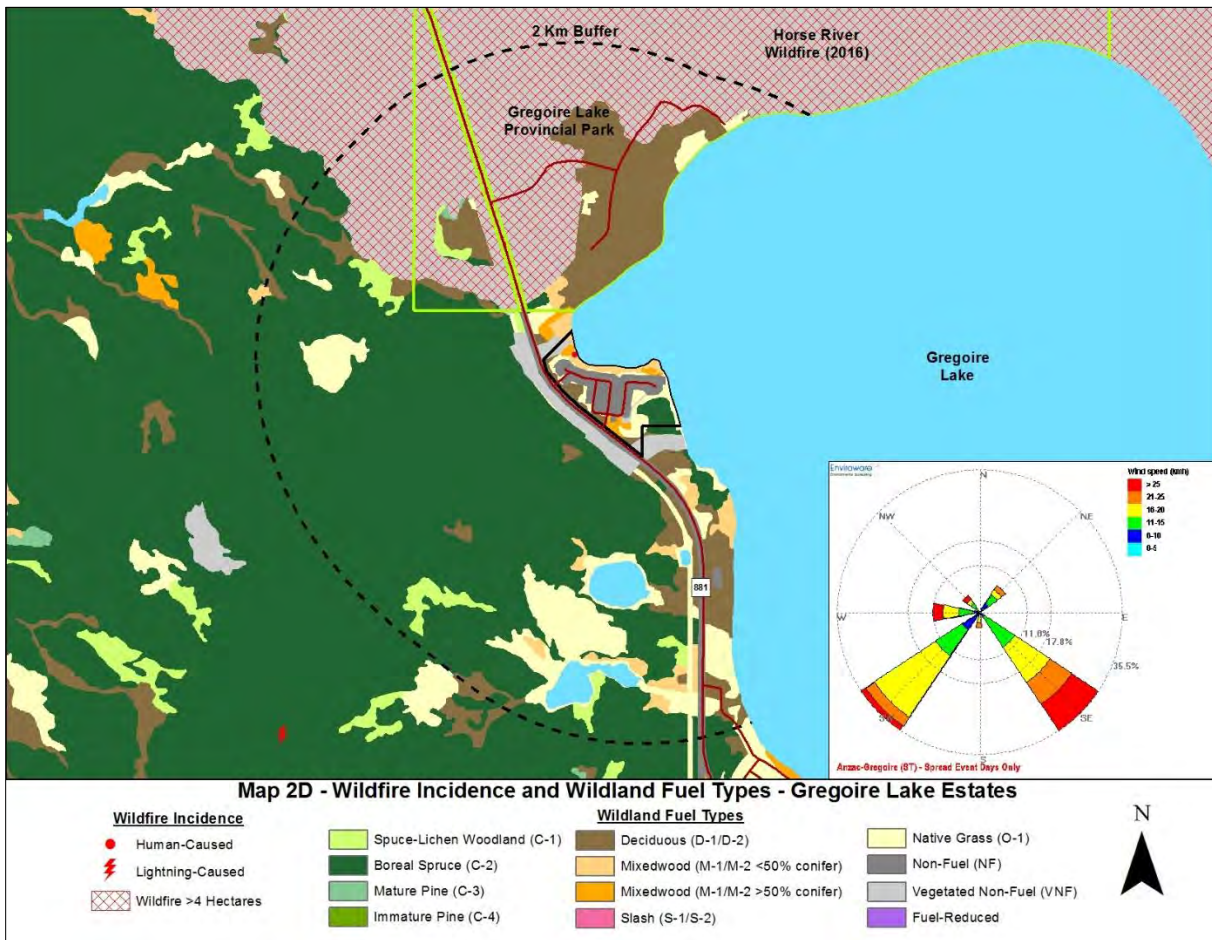
Factor	Comments
Development Type	Rural-residential, government services, commercial
Predominant Exterior Structure Materials Roofing Materials Siding Materials Decks/Porches	- Non-Combustible – Asphalt shingle/Metal - Combustible – Vinyl/Wood - Combustible – Wood, not sheathed-in
Combustibles within 10 metres of Structure	Scattered - firewood, debris piles, outbuildings
Priority Zone 1-2 Clearance	Adequate Zone 1 for most but inadequate Zone 2 for many
Priority Zone 2-3 Clearance	Inadequate for many inside the community where 2016 fire did not reach
 Priority Zones 1-3	 Priority Zones 1-3
Comments: - LOW threat of landscape-level wildfire threatening community from north, east, and south due to 2016 wildfire and MODERATE-HIGH threat from the southwest in spruce/pine fuels - MODERATE threat of community-level wildfire threatening structures from mixedwood and deciduous fuels with heavy spruce/fir understory next to structures - Main threat is from: - Lack of adequate Zones 2 & 3 clearance between structures and wildland fuels - Combustible siding and decking materials - Combustible materials within 10 metres of structures	



3.4 Gregoire Lake Estates

Factor	Comments
Wildfire Incidence	Scattered human-caused within the community and lightning-caused outside
Fire Weather on Spread-Event Days	- Average 4 spread-event days/year - Predominant winds from the southwest and southeast
Predominant Landscape-Level Fuel Types  Landscape-Level Fuel Types looking North	- Non-fuel (NF) to the north from the 2016 Horse River wildfire - Continuous spruce (C-2) to the west, northwest, and southwest  Landscape-Level Fuel Types looking West
Predominant Community-Level Fuel Types  Community-Level Fuel Types Looking Northwest	- Deciduous and mixedwood with moderate spruce/fir understory and large black spruce (C-2) patch in southeast corner of community - Fireguards built in 2016 are currently non-fuel (NF) but will eventually support native-grass (O-1) fuels  Community-Level Fuel Types Looking South

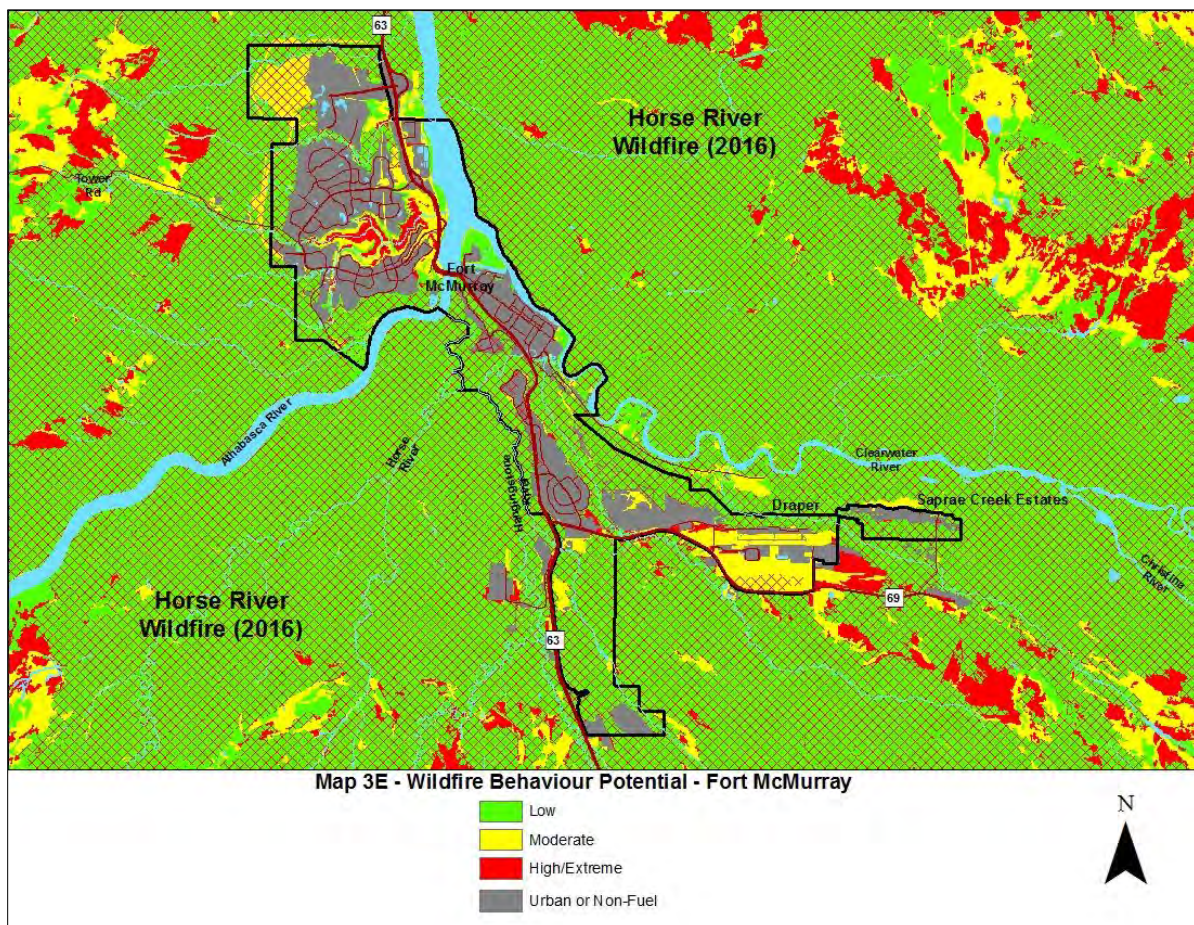
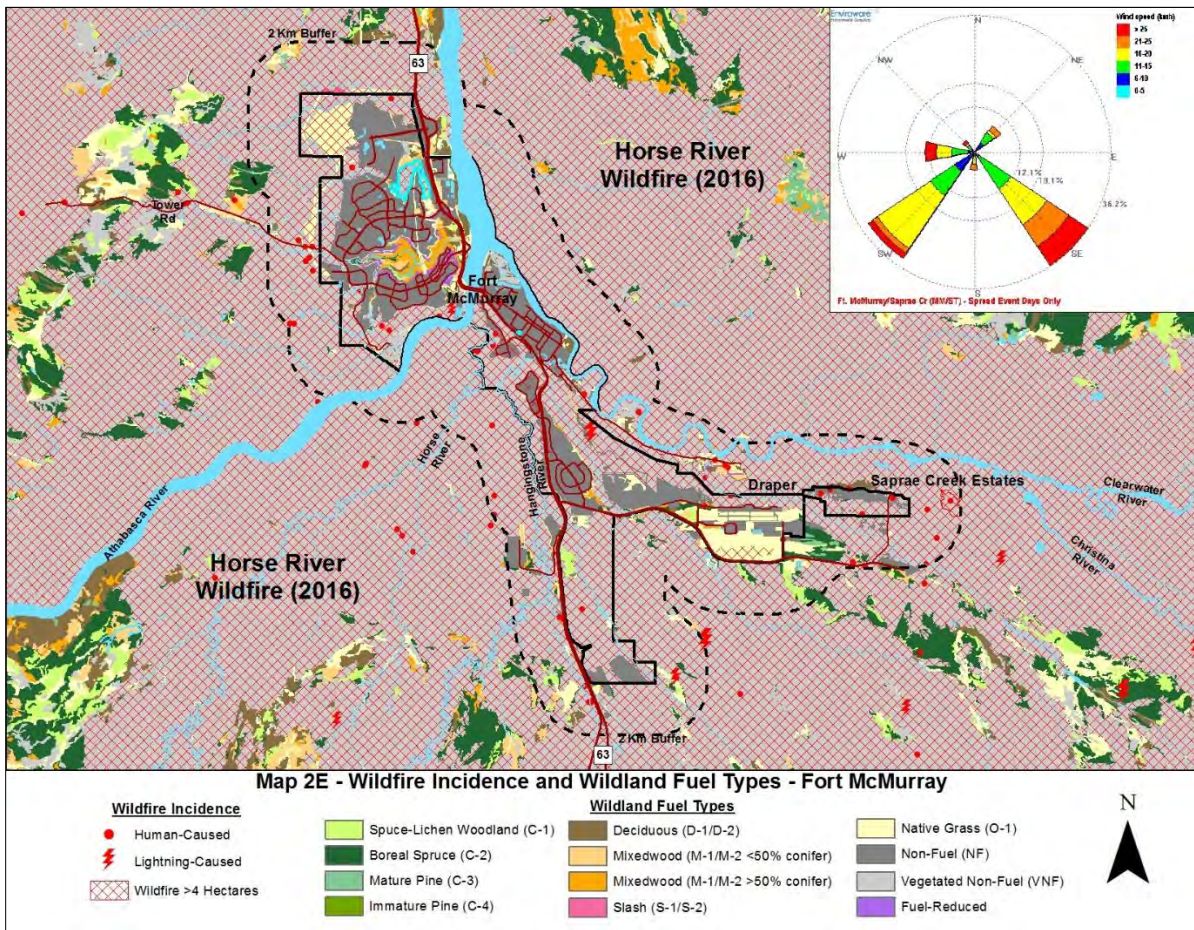
Factor	Comments
Development Type	Rural-residential
Predominant Exterior Structure Materials Roofing Materials Siding Materials Decks/Porches	- Non-Combustible – Asphalt shingle/Metal, Scattered Combustible – Wood shake - Combustible – Vinyl/Wood - Combustible – Wood, not sheathed-in
Combustibles within 10 metres of Structure	Frequent – firewood & lumber piles, outbuildings, combustible ornamental/bark mulch landscaping
Priority Zone 1-2 Clearance	Inadequate for some
Priority Zone 2-3 Clearance  Priority Zones 1-3	 Priority Zones 1-2
Comments: - LOW threat of landscape-level wildfire threatening community from the north due to 2016 wildfire and HIGH/EXTREME threat from the west, southwest, and northwest from continuous black spruce fuels west of Hwy 881 - MODERATE threat of community-level wildfire threatening structures from mixedwood and deciduous fuel types with moderate to heavy spruce/fir understory next to structures - Main threat is from: - Lack of adequate Zones 1, 2 & 3 clearance between structures and wildland fuels - Combustible siding and decking materials - Combustible materials within 10 metres of structures - Combustible ornamental landscaping	

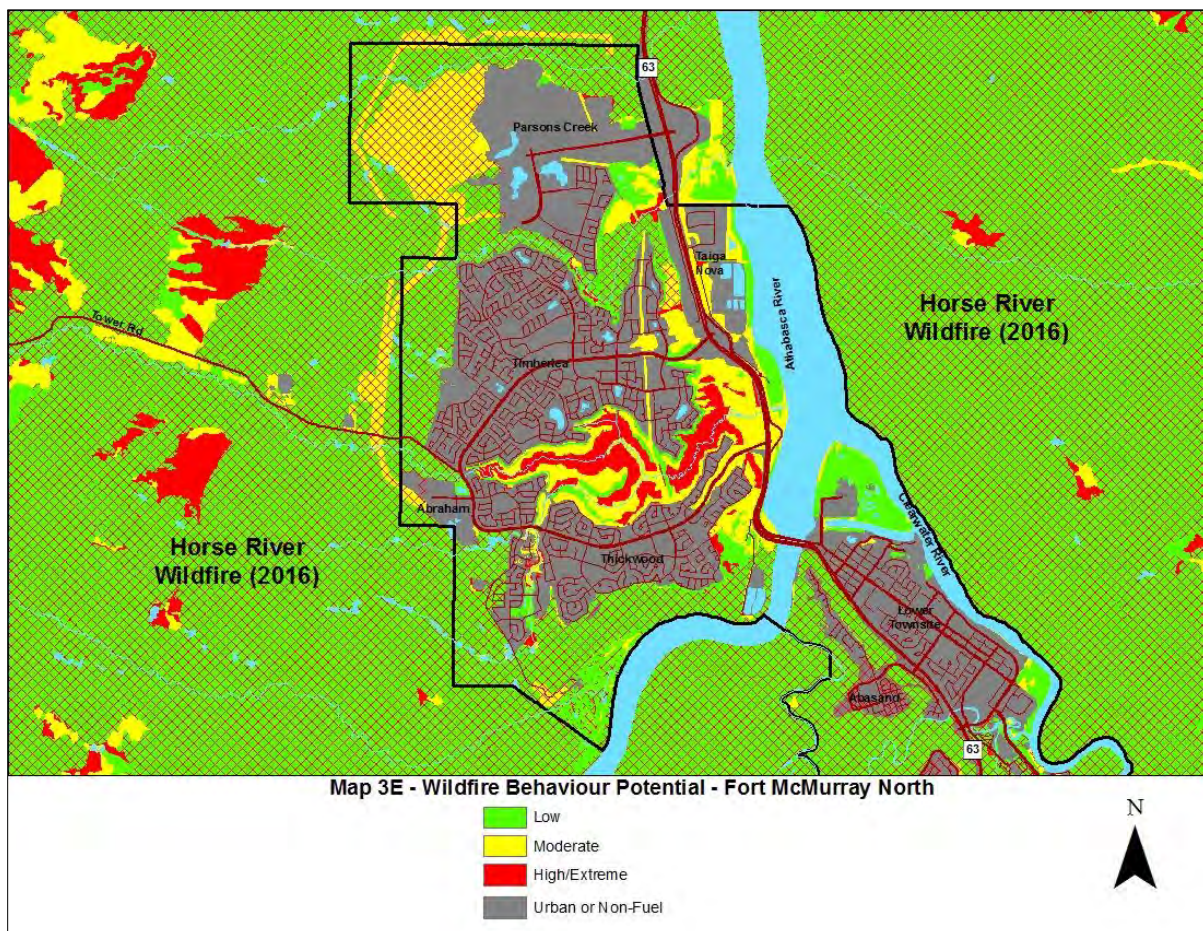
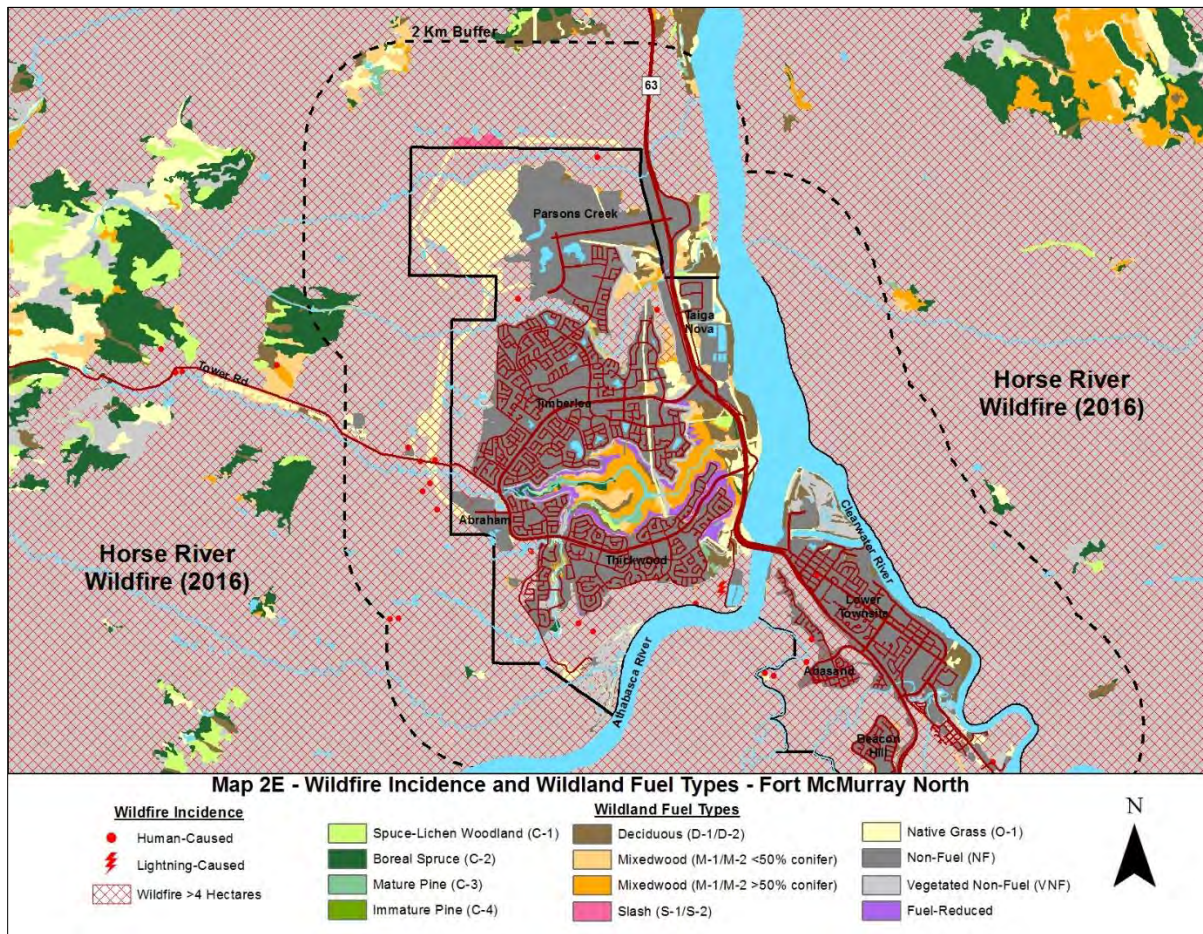


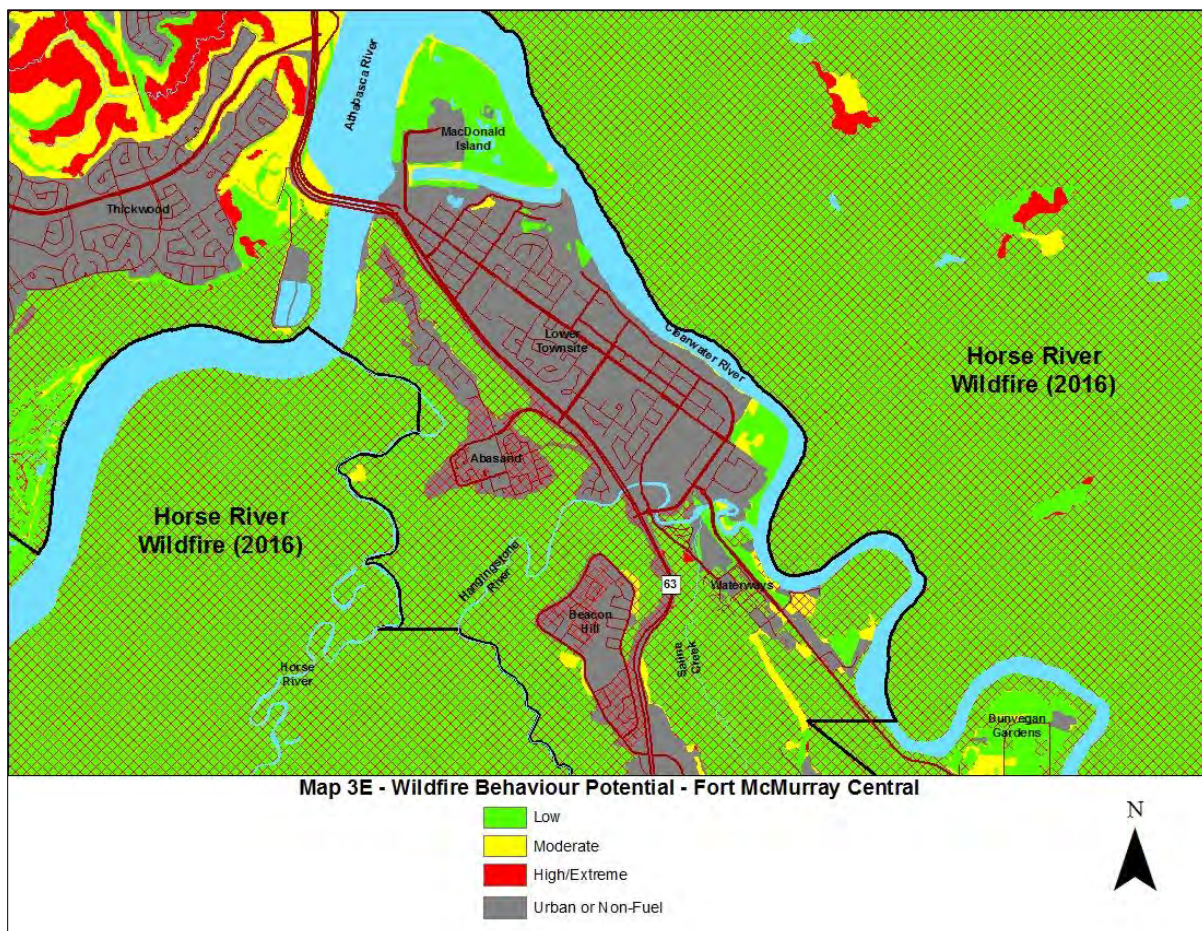
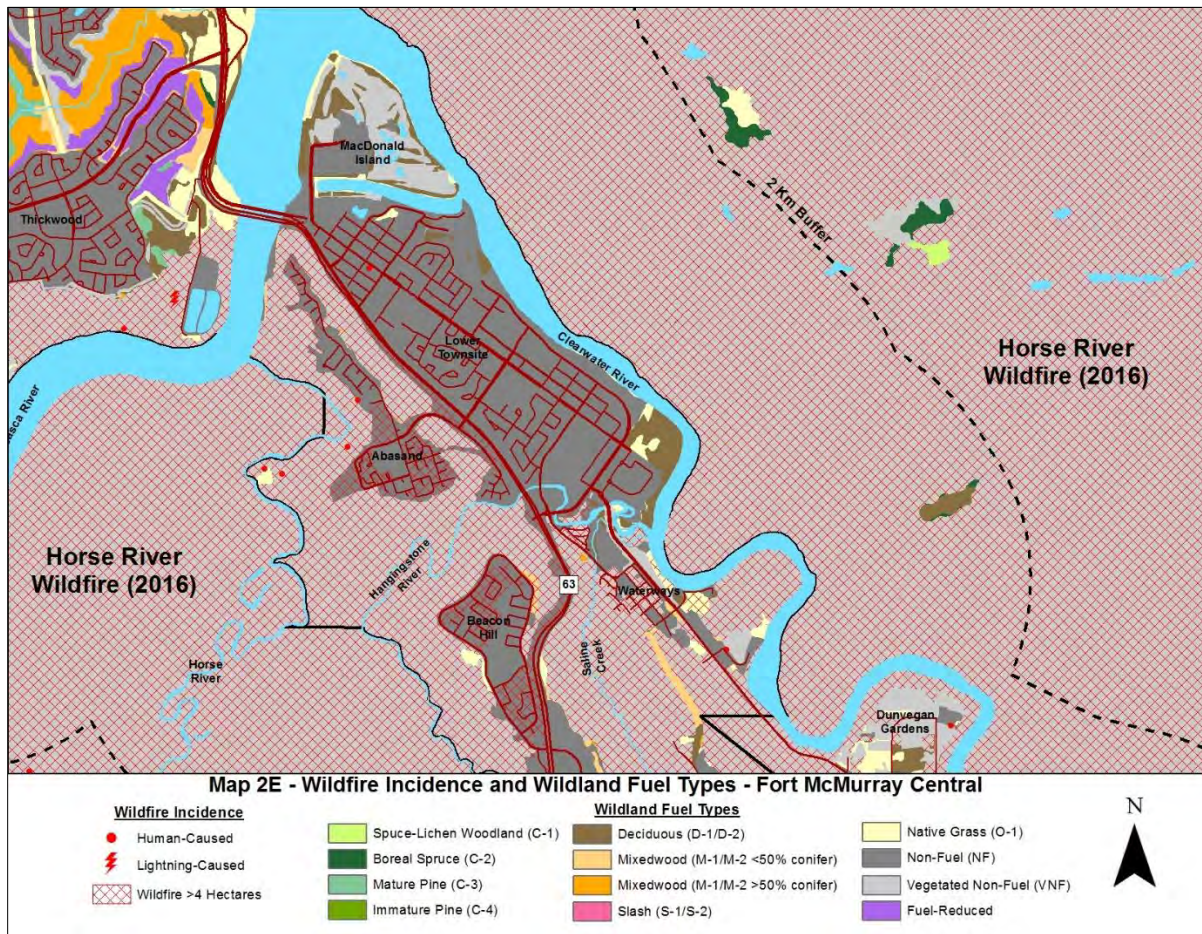
3.5 Fort McMurray

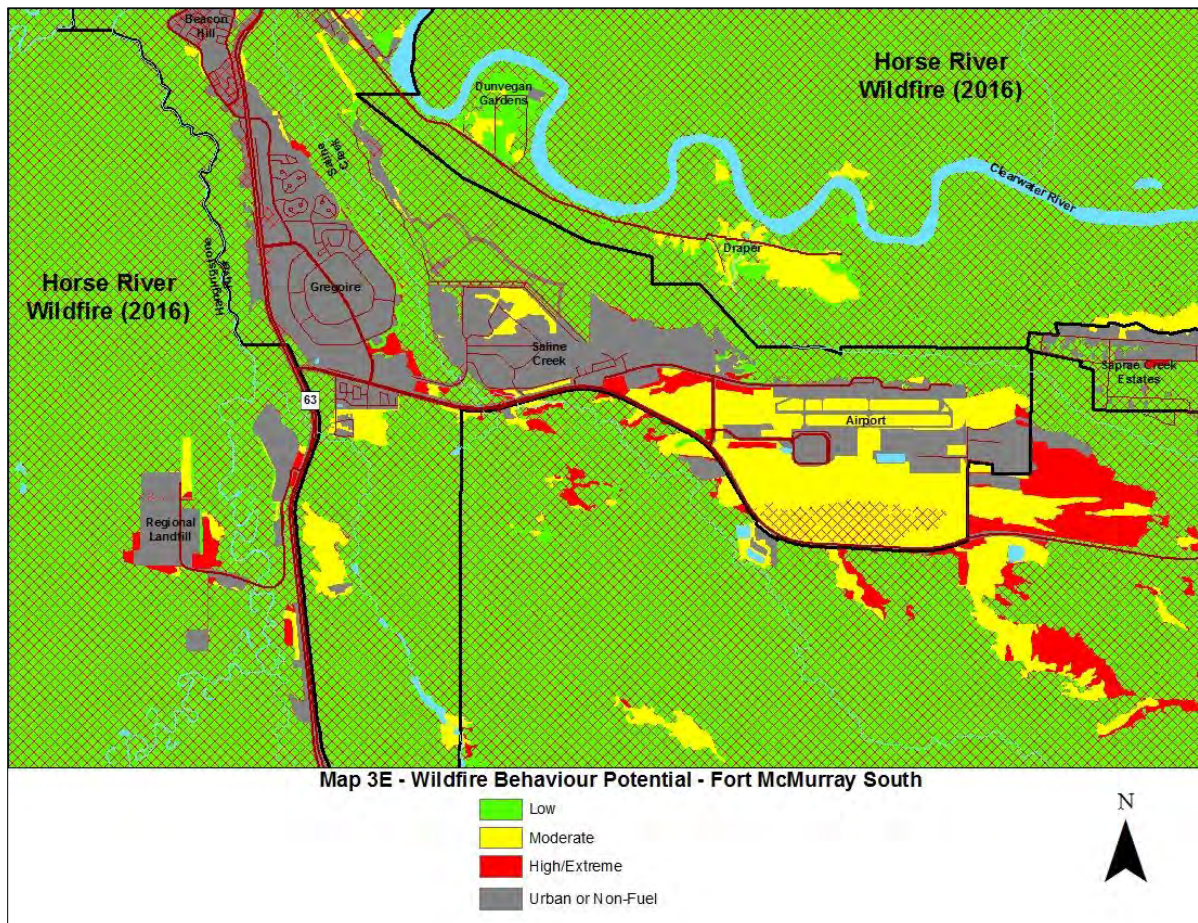
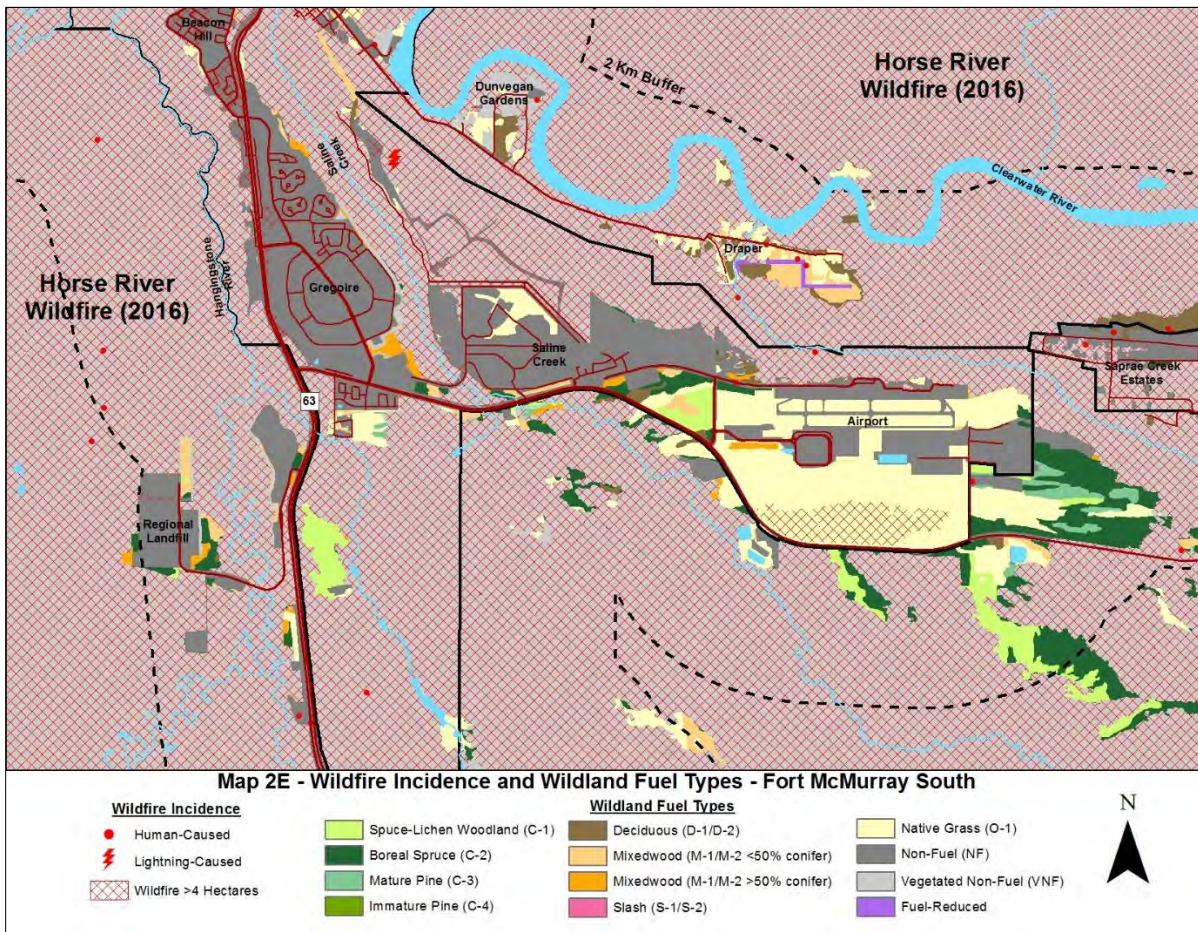
Factor	Comments
Wildfire Incidence	Significant human-caused and scattered lightning-caused wildfires within and surrounding the community
Fire Weather on Spread-Event Days	- Average 16 spread-event days/year - Predominant winds from the southeast and southwest
Predominant Landscape-Level Fuel Types  Landscape-Level Fuel Types Thickwood/Timberlea looking West	- The 2016 Horse River wildfire removed a majority of the hazardous wildland fuel types surrounding Fort McMurray - Scattered remaining patches of spruce (C-2) and mixedwood (M-1) fuels present LOW threat of landscape-level wildfire threatening development  Landscape-Level Fuel Types Gregoire looking Southeast
Predominant Community-Level Fuel Types  Birchwood Trails/Conn Creek looking East	- Scattered mixedwood (M-1) and deciduous (D-1) patches with light to heavy spruce/fir understory and dead & down - Birchwood Trails /Conn Creek reserve has heavy dead standing and down from spruce budworm mortality - fireguards built in 2016 and fuelbreaks completed in 2016/17 provide significant fuelbreaks to structures  Mixedwood Fuels Behind Gregoire looking Northwest

Factor	Comments
Development Type	Urban-residential, government services, commercial, and industrial
Predominant Exterior Structure Materials Roofing Materials Siding Materials Decks/Porches	- Non-Combustible – Asphalt shingle/Metal, Combustible – Wood shakes in some Timberlea neighbourhoods - Combustible – Vinyl/Wood, Scattered Non-Combustible – Stucco, Fibre-Cement, Brick/Concrete, Metal - Combustible – Wood, not sheathed-in
Combustibles within 10 metres of Structure	Frequent – wooden fences, outbuildings, firewood, combustible ornamental & bark mulch landscaping
Priority Zone 1-2 Clearance	Adequate for most
Priority Zone 2-3 Clearance	Adequate for most
 Priority Zones 1-3	 Priority Zones 1-2
Comments: - LOW threat of landscape-level wildfire threatening community due to 2016 Horse River wildfire - HIGH/EXTREME threat of community-level wildfire in Birchwood Trails/Conn Creek reserve threatening structures with combustible exterior features in Timberlea, Dickensfield, and Thickwood - LOW-MODERATE threat of community-level wildfire in isolated patches of mixedwood and deciduous with moderate-heavy spruce/fir understory threatening structures - Main threat is from: - Combustible exterior structure materials including roofing, siding and decking materials - Combustible materials within 10 metres of structures including fences and outbuildings - Combustible ornamental landscaping species and bark mulch	





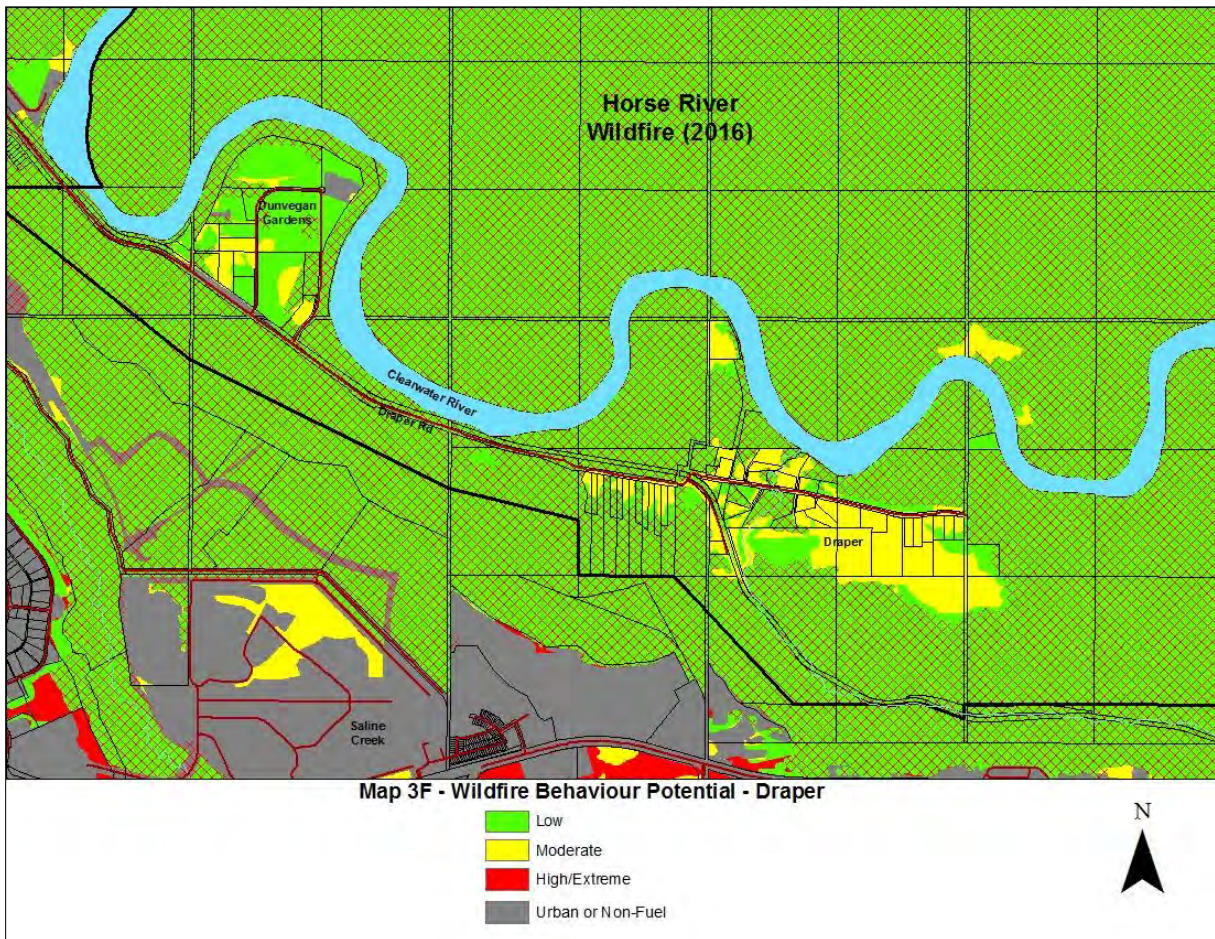
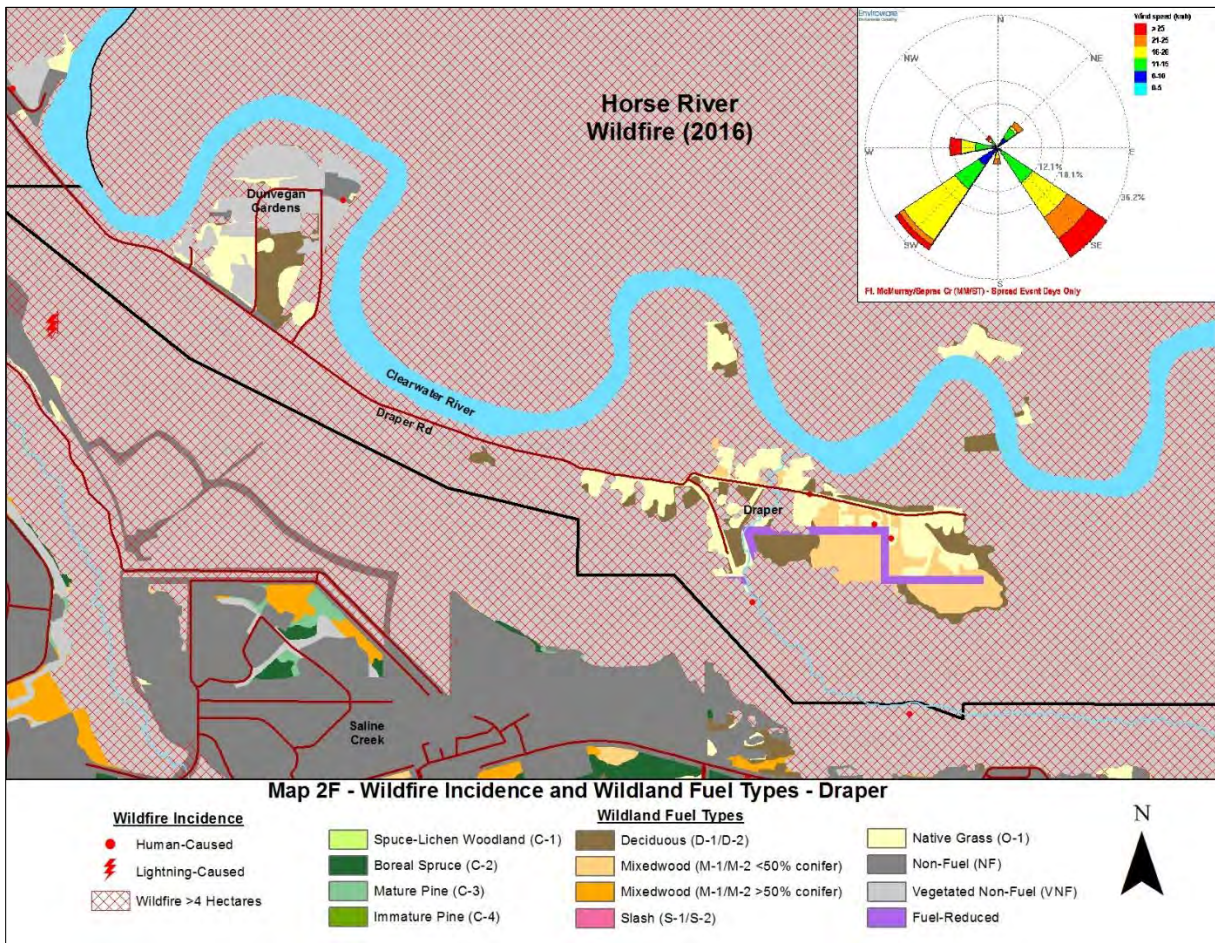




3.6 Draper

Factor	Comments
Wildfire Incidence	Scattered human-caused and lightning-caused wildfires within and surrounding
Fire Weather on Spread-Event Days	- Average 16 spread-event days/year - Predominant winds from the southeast and southwest
Predominant Landscape-Level Fuel Types  Landscape-Level Fuel Types looking Southeast	The 2016 Horse River wildfire removed a majority of the hazardous wildland fuel types surrounding Draper  Landscape-Level Fuel Types looking North
Predominant Community-Level Fuel Types  Community-Level Fuel Types looking Southeast	- Scattered mixedwood (M-1) and deciduous (D-1) patches with light to heavy spruce/fir understory and dead & down 2009 fuel reduction on Draper south-boundary provides some protection to structures  Community-Level Fuel Types looking Northeast

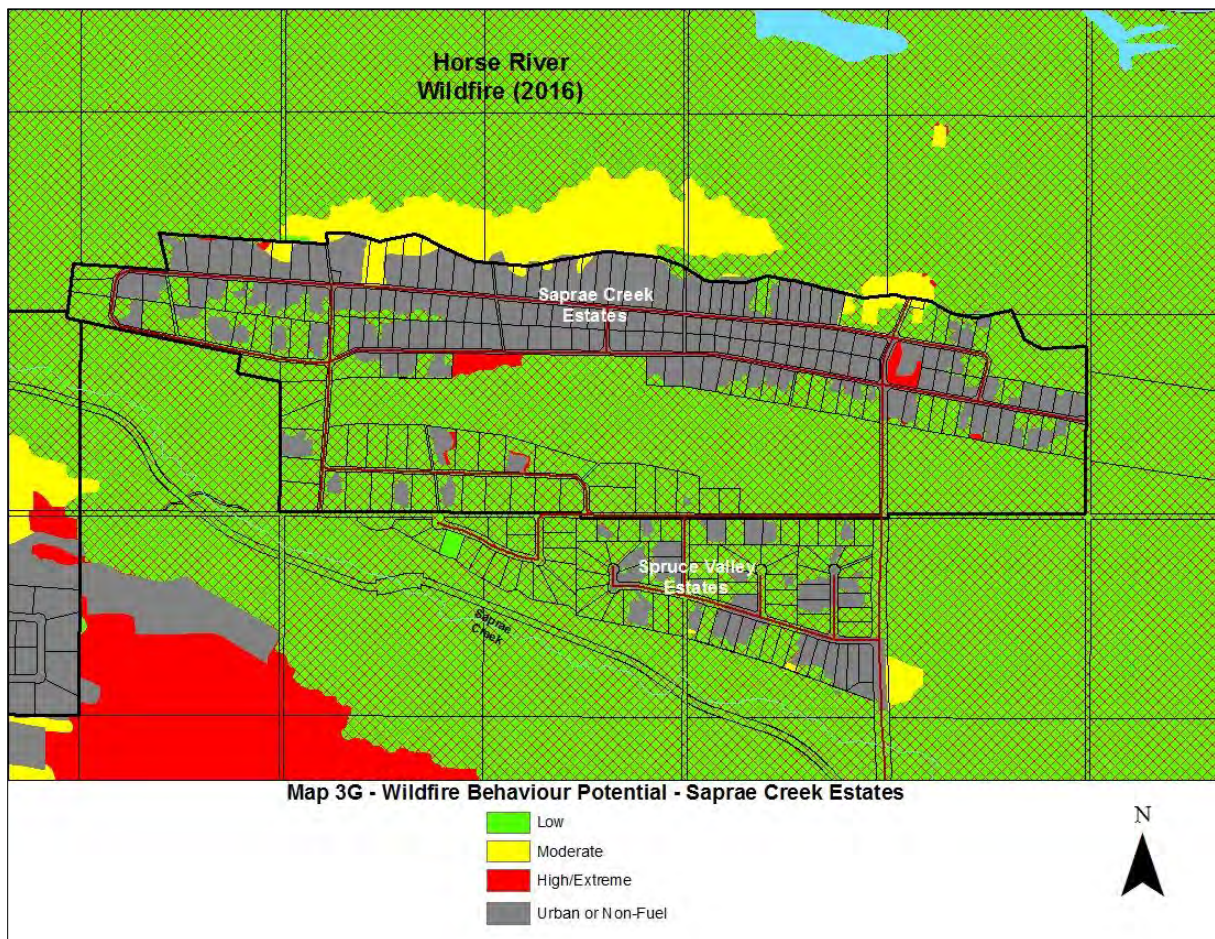
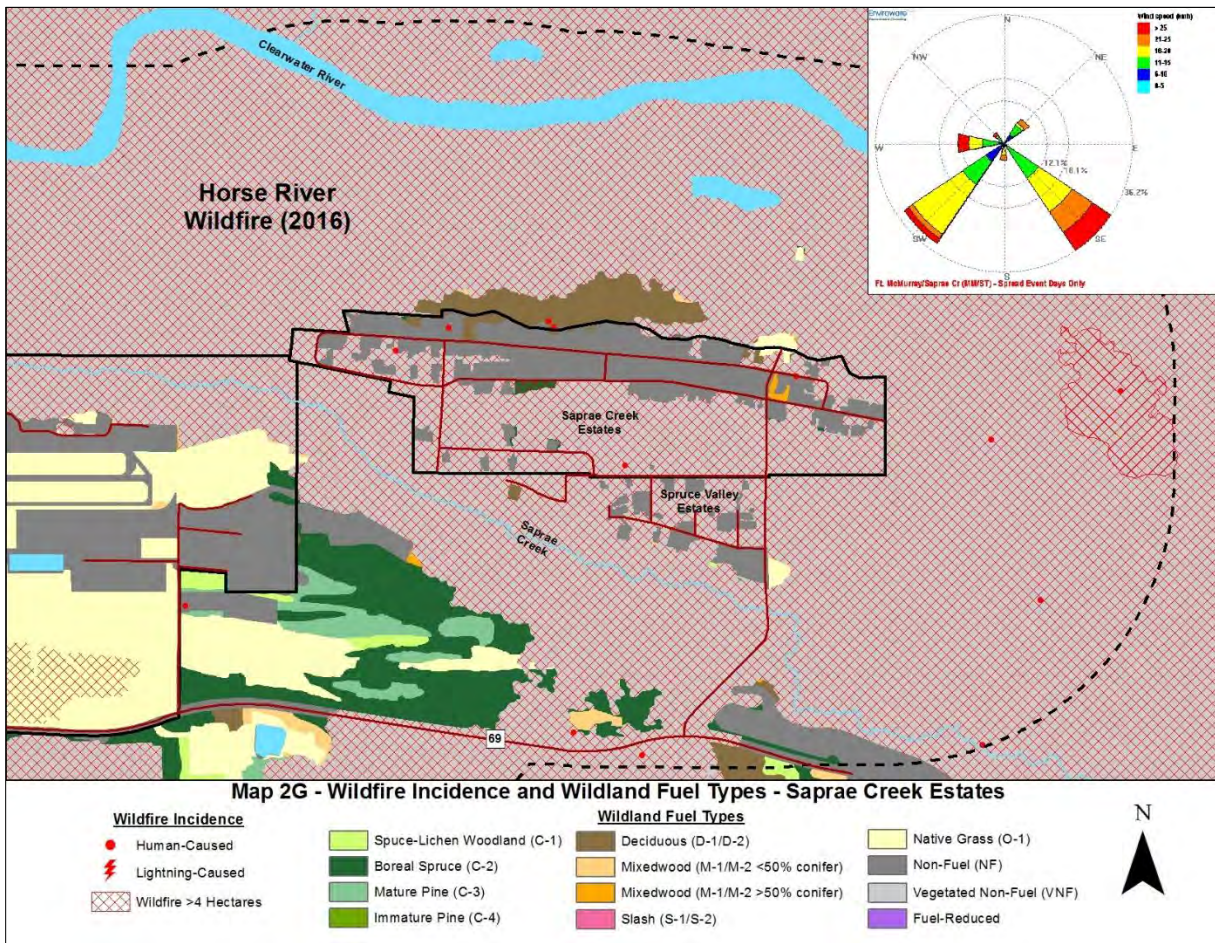
Factor	Comments
Development Type	Rural-residential and commercial
Predominant Exterior Structure Materials Roofing Materials Siding Materials Decks/Porches	- Non-Combustible – Asphalt shingle/Metal - Combustible – Vinyl/Wood, Scattered Non-Combustible – Stucco, Metal - Combustible – Wood, not sheathed-in
Combustibles within 10 metres of Structure	Frequent – firewood, lumber, log piles, outbuildings
Priority Zone 1-2 Clearance	Inadequate for many
Priority Zone 2-3 Clearance	Inadequate for most on south-side of Draper Rd and for many on north-side of Draper Rd
 Priority Zones 1-3	 Priority Zones 1-3
Comments: - LOW threat of landscape-level wildfire threatening community due to 2016 Horse River wildfire - LOW-MODERATE threat of community-level wildfire threatening structures from isolated patches of mixedwood and deciduous with moderate-heavy spruce/fir understory and dead/down - Main threat is from: - Lack of adequate Zones 1, 2 & 3 clearance between structures and wildland fuels - Combustible siding and decking materials - Combustible materials within 10 metres of structures	



3.7 Sapræ Creek Estates

Factor	Comments
Wildfire Incidence	Scattered human-caused and lightning-caused wildfires within and surrounding
Fire Weather on Spread-Event Days	- Average 16 spread-event days/year - Predominant winds from the southeast and southwest
Predominant Landscape-Level Fuel Types	- The 2016 Horse River wildfire removed a majority of the hazardous wildland fuel types surrounding Sapræ Creek - The cleared area for the new Vista Ridge golf course will act as a good fuelbreak from the east in the future
 Landscape-Level Fuel Types looking East	 Landscape-Level Fuel Types looking Southwest
Predominant Community-Level Fuel Types	Scattered mixedwood (M-1) and deciduous (D-1) patches with moderate to heavy spruce/fir understory and/or dead & down
 Community-Level Fuel Types looking Northwest	 Community-Level Fuel Types looking Southwest

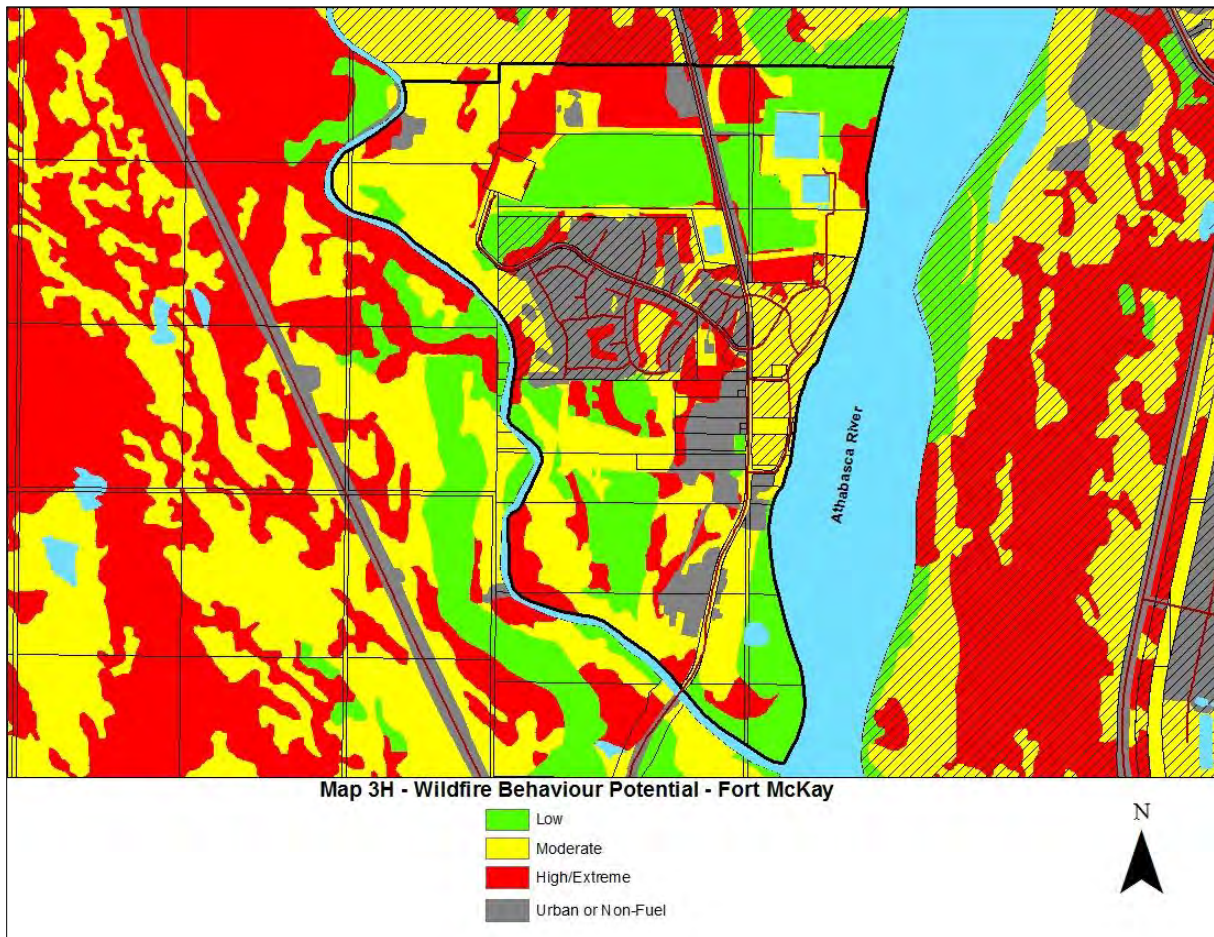
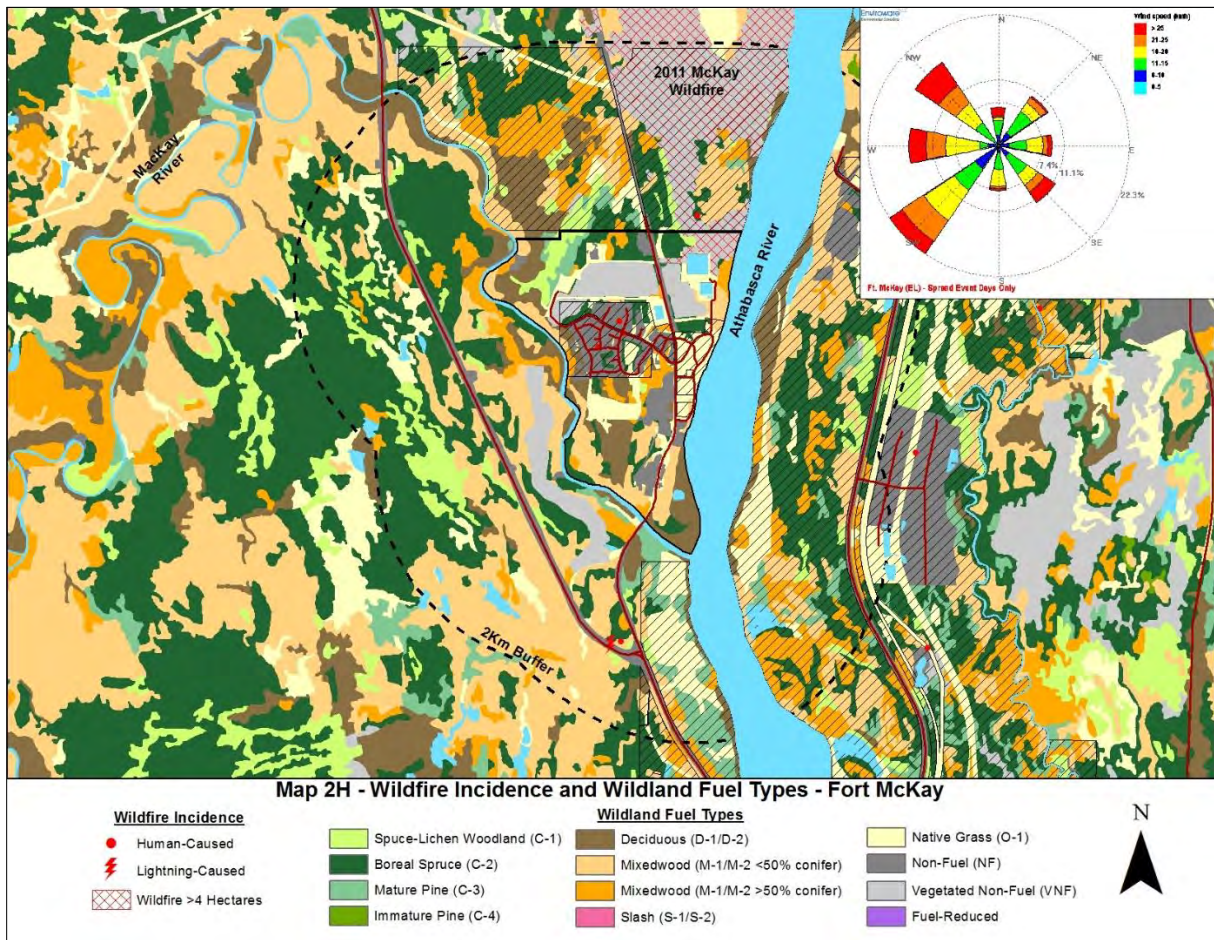
Factor	Comments
Development Type	Rural-residential and recreational
Predominant Exterior Structure Materials Roofing Materials Siding Materials Decks/Porches	- Non-Combustible – Asphalt shingle/Metal/Tile, Scattered Combustible – Wood shake - Combustible – Vinyl/Wood, Scattered Non-Combustible – Stucco, Fibre-Cement, Metal - Combustible – Wood, not sheathed-in
Combustibles within 10 metres of Structure	Frequent – firewood, lumber, outbuildings
Priority Zone 1-2 Clearance	Adequate for many, some Inadequate with minimal clearance
Priority Zone 2-3 Clearance  Priority Zones 1-3	Adequate for most, inadequate for several where wildfire did not remove fuels  Priority Zones 1-3
Comments: - LOW threat of landscape-level wildfire threatening community due to 2016 Horse River wildfire - LOW-MODERATE threat of community-level wildfire threatening structures from isolated patches of mixedwood and deciduous with moderate-heavy spruce/fir understory and dead/down threatening structures - Main threat is from: - Lack of adequate Zones 1 & 2 clearance between structures and wildland fuels - Combustible siding and decking materials - Combustible materials within 10 metres of structures - Combustible ornamental landscaping species and bark mulch	



3.8 Fort McKay

Factor	Comments
Wildfire Incidence	Scattered human-caused & lightning-caused within and surrounding the community
Fire Weather on Spread-Event Days	- Average 14 spread-event days/year - Predominant winds from the southwest, northwest, and west
Predominant Landscape-Level Fuel Types  Landscape-Level Fuel Types looking Northwest	- Significant spruce/pine (C-2/C-3) and mixedwood fuels surrounding the community in all directions 2016 firebreaks and 2011 McKay wildfire provide significant fuelbreaks from the north and west  Landscape-Level Fuel Types looking South
Predominant Community-Level Fuel Types  Community-Level Fuel Types	- Mixedwood (M-1) and deciduous (D-1) with moderate to heavy spruce/fir understory with scattered spruce/pine (C-2/C-3) patches - Fireguards built in 2016 are currently non-fuel (NF)  Community-Level Fuel Types

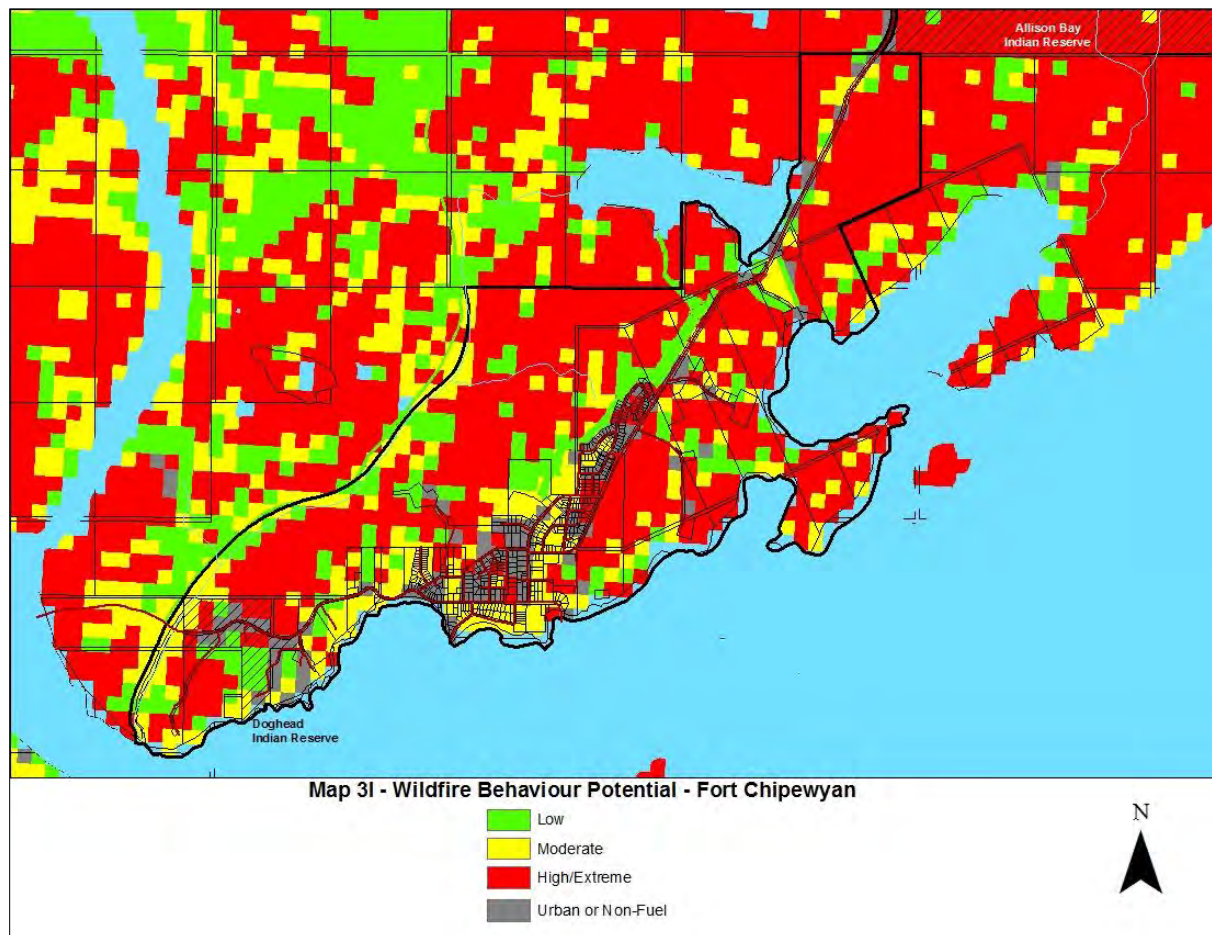
Factor	Comments
Development Type	Rural-residential, government services, commercial
Predominant Exterior Structure Materials Roofing Materials Siding Materials Decks/Porches	- Non-Combustible – Asphalt shingle/Metal - Combustible – Vinyl/Wood - Combustible – Wood, not sheathed-in
Combustibles within 10 metres of Structure	Scattered - debris piles, fences, outbuildings
Priority Zone 1-2 Clearance	Adequate Zone 1 for most but inadequate Zone 2 for many
Priority Zone 2-3 Clearance  Priority Zone 1	Inadequate for many  Priority Zones 1-3
Comments: - HIGH/EXTREME threat of landscape-level wildfire from west, south, and north – 2016 fireguards provide excellent fuelbreaks from the north and west - MODERATE threat of community-level wildfire threatening structures from scattered mixedwood and deciduous and with spruce/fir understory and/or dead/down next to structures - Main threat is from: - Lack of adequate Zones 2 & 3 clearance between structures and wildland fuels - Combustible siding and decking materials - Combustible materials within 10 metres of structures	



3.9 Fort Chipewyan

Factor	Comments
Wildfire Incidence	Scattered human-caused within and surrounding the community
Fire Weather on Spread-Event Days	- Average 20 spread-event days/year - Predominant winds from the southeast with scattered winds from all directions
Predominant Landscape-Level Fuel Types  Landscape-Level Fuel Types looking Southwest	- Significant spruce/pine (C-2/C-3) with cladonia moss and mixedwood fuels surrounding the community - Large stands of dead/dying dwarf-mistletoe infected Jack pine - The highest wildfire threat is from the north and northeast  Landscape-Level Fuel Types looking Northeast
Predominant Community-Level Fuel Types  Community-Level Fuel Types Looking West	- Spruce/pine (C-2/C-3) with cladonia lichen and native-grass (O-1) with scattered deciduous (D-1) - Fuelbreaks built in 2016 and planned for future implementation will reduce threat

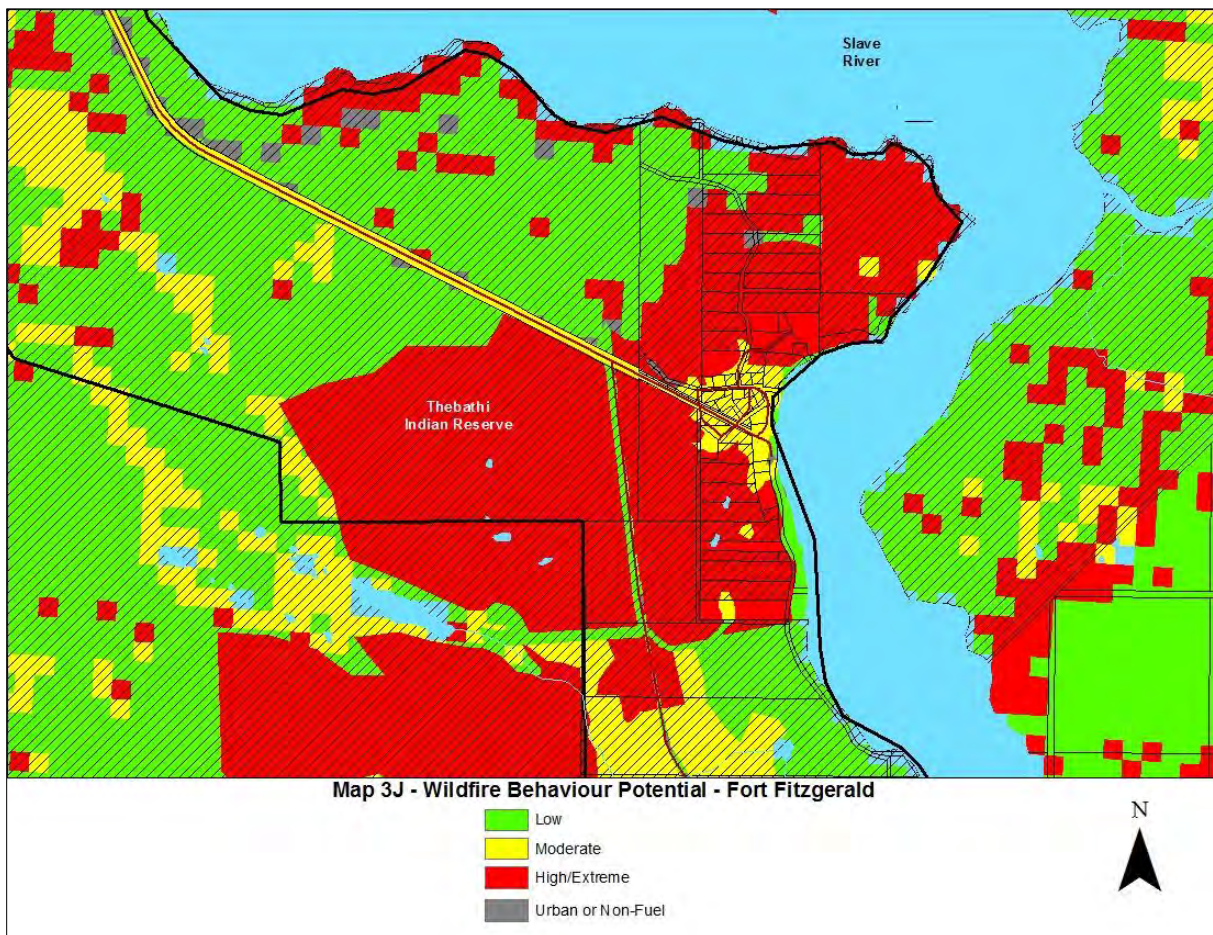
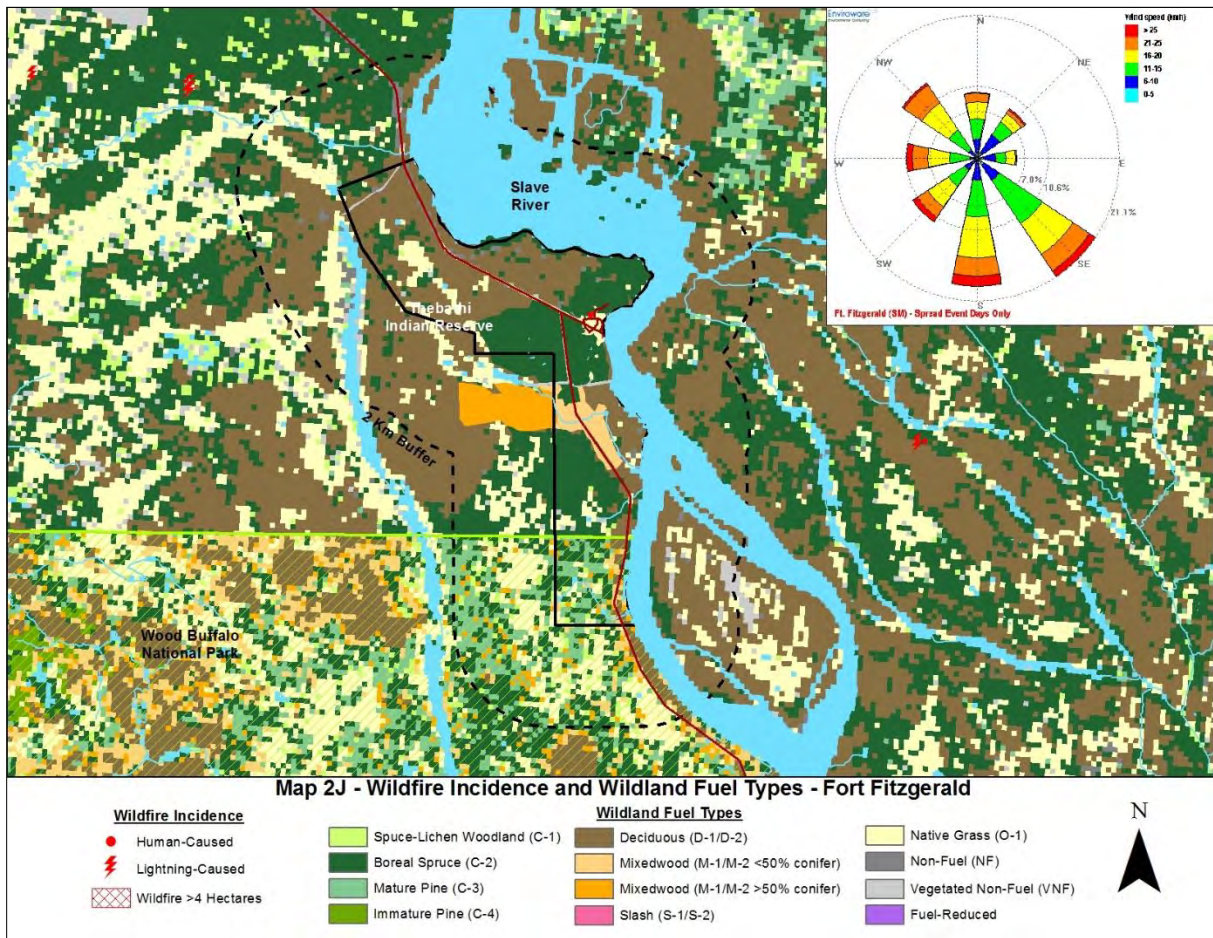
Factor	Comments
Development Type	Urban & rural-residential, government services, commercial, light industrial
Predominant Exterior Structure Materials Roofing Materials Siding Materials Decks/Porches	- Non-Combustible – Asphalt shingle/Metal - Combustible – Vinyl/Wood - Combustible – Wood, not sheathed-in
Combustibles within 10 metres of Structure	Frequent – firewood, debris piles, outbuildings
Priority Zone 1-2 Clearance	Inadequate clearance from spruce/pine and/or native-grass fuels for many
Priority Zone 2-3 Clearance  Priority Zones 1-3	Inadequate for many on the perimeter  Priority Zones 1-2
Comments: - HIGH/EXTREME threat of landscape-level wildfire threatening community – Planned fireguards will provide excellent fuelbreaks - HIGH/EXTREME threat of community-level wildfire threatening perimeter structures from spruce/pine (C-2/C-3) and native-grass (O-1) fuels next to structures - Main threat is from: - Lack of adequate Zones 1, 2 & 3 clearance between structures and wildland fuels - Combustible siding and decking materials - Combustible materials within 10 metres of structures	



3.10 Fort Fitzgerald

Factor	Comments
Wildfire Incidence	Several lightning-caused on the landscape with scattered human-caused within the community
Fire Weather on Spread-Event Days	- Average 36 spread-event days/year - Predominant winds from the southeast and south
Predominant Landscape-Level Fuel Types	- Significant deciduous (D-1) and spruce/pine (C-2/C-3) surrounding the community - The highest wildfire threat is from the south and north  Landscape-Level Fuel Types Looking Northwest
Predominant Community-Level Fuel Types	- Spruce/pine (C-2/C-3) fuels and native-grass (O-1) within and surrounding the community on the south, north, and west - Fuelbreaks built in 2016 and planned for future implementation will reduce threat  Community-Level Fuel Types Looking North

Factor	Comments
Development Type	Rural-residential, commercial
Predominant Exterior Structure Materials Roofing Materials Siding Materials Decks/Porches	- Non-Combustible – Asphalt shingle/Metal - Combustible – Vinyl/Wood - Combustible – Wood, not sheathed-in
Combustibles within 10 metres of Structure	Frequent – firewood, debris piles, outbuildings
Priority Zone 1-2 Clearance	Inadequate clearance from spruce/pine and/or native-grass fuels for a majority of structures
Priority Zone 2-3 Clearance	Inadequate clearance for a majority of structures  Priority Zones 1-3
Comments: - HIGH/EXTREME threat of landscape-level wildfire from the south and north – Planned and completed fireguards will provide excellent fuelbreaks - HIGH/EXTREME threat of community-level wildfire threatening perimeter structures from spruce/pine (C-2/C-3) and native-grass (O-1) fuels next to structures - Main threat is from: - Lack of adequate Zones 1, 2 & 3 clearance between structures and wildland fuels - Combustible siding and decking materials - Combustible materials within 10 metres of structures	



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 to reduce the threat of wildfire to developed areas however **they do not ensure structure survival under all hazard conditions.**

FireSmart standards refer to three interface priority zones with vegetation management for interface structures recommended in Zones 1 (0-10m) and 2 (10-30m) at a minimum and in Zone 3 (30-100m+) based on hazard and risk.



Interface Priority Zones

4.1 Priority Zone 1

Priority Zone 1 is the area extending from the structure a minimum of 10 metres in all directions and is separated into Priority Zone 1a and 1b. Priority Zone 1a is the non-combustible zone 1.5 metres out from the structure and any attachments such as decks or porches. Priority Zone 1b is the area from 1.5 metres out to 10 metres from the structure.

FireSmart recommended guidelines recommend **removal or conversion** of all combustible wildland fuels with the objective to **create an environment that will not support any wildfire** (PIP, 2003).

FireSmart **Priority Zone 1** vegetation management options to reduce the wildfire threat to structures may include:

- **Removal** of all flammable forest vegetation in the immediate area of the structure and **reduction** of flammable forest vegetation away from the immediate area of the structure
- **Pruning** of all limbs to a minimum height of 2 metres from ground level on residual evergreen trees
- **Establishment** of a non-combustible surface cover around the structure **including removal of flammable ornamental landscaping species and bark mulch**
- **Removal** of all dead and down forest vegetation
- **Removal** of all combustible material piles (firewood, lumber, etc.) within 10 metres of the structure
- **Use of non-combustible fencing material** or a minimum of 1.5 metre non-combustible break between combustible fences and structures
- Regular **maintenance** to ensure that all combustible needles and leaves are removed and annual grasses are mowed to less than 10 centimetres

Field inspection of the Fort McMurray urban service area revealed that Priority Zone 1 clearance from combustible wildland vegetation is mostly adequate however the following factors were inadequate:

- Clearance from flammable ornamental landscaping species and bark mulch
- Clearance from combustible material piles, outbuildings, and fences

Field inspection of the rural service areas revealed that there are many structures with excellent Priority Zone 1 clearance however there are several structures with the following inadequate factors:

- Lack of adequate clearance between structures and flammable forest and native-grass fuels
- Clearance from combustible material piles, outbuildings, and fences
- Use of combustible ornamental landscaping species and bark mulch within 10 metres of structures

Recommendation 1: Encourage residents to establish adequate FireSmart Priority Zone 1 clearance on their private or leased lands.



Adequate Priority Zone 1 Clearance – Rural Service Area



Adequate Priority Zone 1 Clearance – Urban Service Area



Inadequate Priority Zone 1 Clearance from Forest Fuels



Inadequate Priority Zone Clearance from Surface Fuels



Inadequate Priority Zone 1 from Ornamental Fuels



Inadequate Priority Zone 1 from Combustible Piles/Outbuildings

4.2 Priority Zones 2-3

Priority Zones 2-3 are the areas beginning 10 metres from the structure and extending to 30 metres (Zone 2) and 100 metres or farther (Zone 3). FireSmart guidelines recommend **reduction** of combustible wildland fuels in Zones 2 and 3, based on hazard and risk, with the objective to **create an environment that will only support fires of lower intensity and rate of spread** (PIP, 2003).

Structures in forested areas should treat Zone 2 (10-30m) at a minimum while those structures with High/Extreme hazard levels resulting from heavy continuous evergreen forest and/or steep topography should be treated in Zones 2 and 3 (10-100m).

FireSmart **Priority Zone 2-3** vegetation management options include:

- **Thinning and/or removal** of flammable forest vegetation
- **Pruning** of all limbs to a minimum height of 2 metres from ground level on residual evergreen trees
- **Removal** of all dead and down forest vegetation from the forest floor
- Regular **maintenance** to ensure that all flammable regrowth, dead and down and dead standing are removed

FireSmart **Priority Zone 2-3** clearance from flammable wildland fuels is **inadequate** for many of the rural service area structures and for some of the Fort McMurray urban service area structures backing onto wildland forested areas including the Birchwood/Conn Creek reserve.

Priority Zone 2-3 vegetation management has been completed in all of the service areas based on recommendations in previous FireSmart plans and as a result of fire suppression efforts to protect structures during the 2016 Horse River wildfire.

The 2016 Horse River wildfire impinged upon several of the completed fuel reduction units in Fort McMurray, Anzac and Draper and field observations indicate that some were successful in reducing fire intensity prior to reaching developed areas. **Factors such as direct fire suppression efforts and/or changes in weather conditions were not considered in this evaluation however reports from RMWB Emergency Services and AB. Forestry indicate that the reduction in fire intensity in some fuel reduction areas improved firefighter safety and provided better fire suppression success.**

Several of the completed areas require regular inspections and maintenance to maintain fuelbreak effectiveness including:

- Secondary thinning of evergreen stems
- Removal of evergreen re-growth and dead and down material
- Disposal of all debris piles
- Maintenance of native-grass and brush on 2016 dozer-guards and fuelbreaks

New FireSmart vegetation management areas are proposed for municipal, provincial, federal, and private lands in each of the RMWB service areas. Proposed areas were determined through field inspections, review of wildland fuels and satellite imagery data, and from the Wildfire Mitigation Strategies developed by Alberta Forestry for Fort McKay, Fort Chipewyan, and Fort Fitzgerald (AAF, 2016).

Proposed fuel modification areas in this report will require detailed fuel modification planning to identify fuels management prescription standards, unit boundaries, and operational constraints prior to implementation. **Proposed fuel modification areas may be revised or removed based on detailed field reconnaissance.**

Community and landscape-level wildfire behaviour potential provided in Section 3 of this report should be considered when determining priorities between communities for vegetation management projects.

Priorities within each community have been assigned to fuel modification areas based on hazard and risk. Priority A indicates higher priority than Priority B. Agencies may choose to implement lower priority areas before higher priority areas based on operational, social, or budgetary factors. Numbers following each priority letter (A1, A2) are based on fuel modification type, landowner, and/or proximity of units to each other and do not indicate priority in relation to each other.

Recommendation 2: Implement FireSmart Zone 2-3 vegetation management on Municipal and Provincial lands based on priority and available funding and encourage First Nations, residents, and lease holders to implement FireSmart Zone 2-3 vegetation management on lands under their control.

4.2.1 Conklin (Map 4A)

Completed Vegetation Management

Alberta Forestry and Alberta Pacific Forest Industries have completed several FireSmart vegetation management projects at the community and landscape-levels since 2006. Alberta Forestry performs regular annual maintenance on all of the blocks as required.

Type	Method	Total Area (Ha)
Fuel Removal	Harvest (AlPac)	194.8
Fuel Removal	Strip Mulch	111.6
Fuel Removal	Clear Mulch	15.2
Fuel Reduction	Thin/Prune/Clean	68.3
Total Area (Ha)		389.9



Thin/Prune/Clean Fuelbreak



Thin/Prune/Clean Fuelbreak



Landscape-Level Harvest Fuelbreak



Landscape-Level Strip Mulch Fuelbreak

Proposed Vegetation Management

Proposed fuel reduction areas include thin/prune/clean of evergreen overstory and understory in evergreen and mixedwood stands. Proposed fuel removal areas include mulch clearing of all wildland fuels for a minimum 50 metre width around facilities and along the waste water line to create containment lines.

Priority	Fuel Modification Type & Method	Approximate Area (Ha) by Landowner			Total Area (Ha)
		Municipal	Provincial	Private/Lease	
A1	Fuel Reduction – Thin/Prune/Clean	43.6			43.6
A2	Fuel Reduction – Thin/Prune/Clean	36.3			36.3
A3	Fuel Reduction – Thin/Prune Clean		6.2		6.2
A4	Fuel Reduction – Thin/Prune/Clean	16.2			16.2
A5	Fuel Reduction – Thin/Prune/Clean		1.4	4.4	5.8
B1	Fuel Removal – Mulch Clear		17.2		17.2
B2	Fuel Reduction – Thin/Prune/Clean		32.2		32.2
B3	Fuel Reduction – Dead/Down Removal	16.6			16.6
	Total Area (Ha)	112.7	57.0	4.4	174.1



Proposed Vegetation Management Area A1



Proposed Vegetation Management Area A2



Proposed Vegetation Management Area A3



Proposed Vegetation Management Area A4



Proposed Vegetation Management Area A5



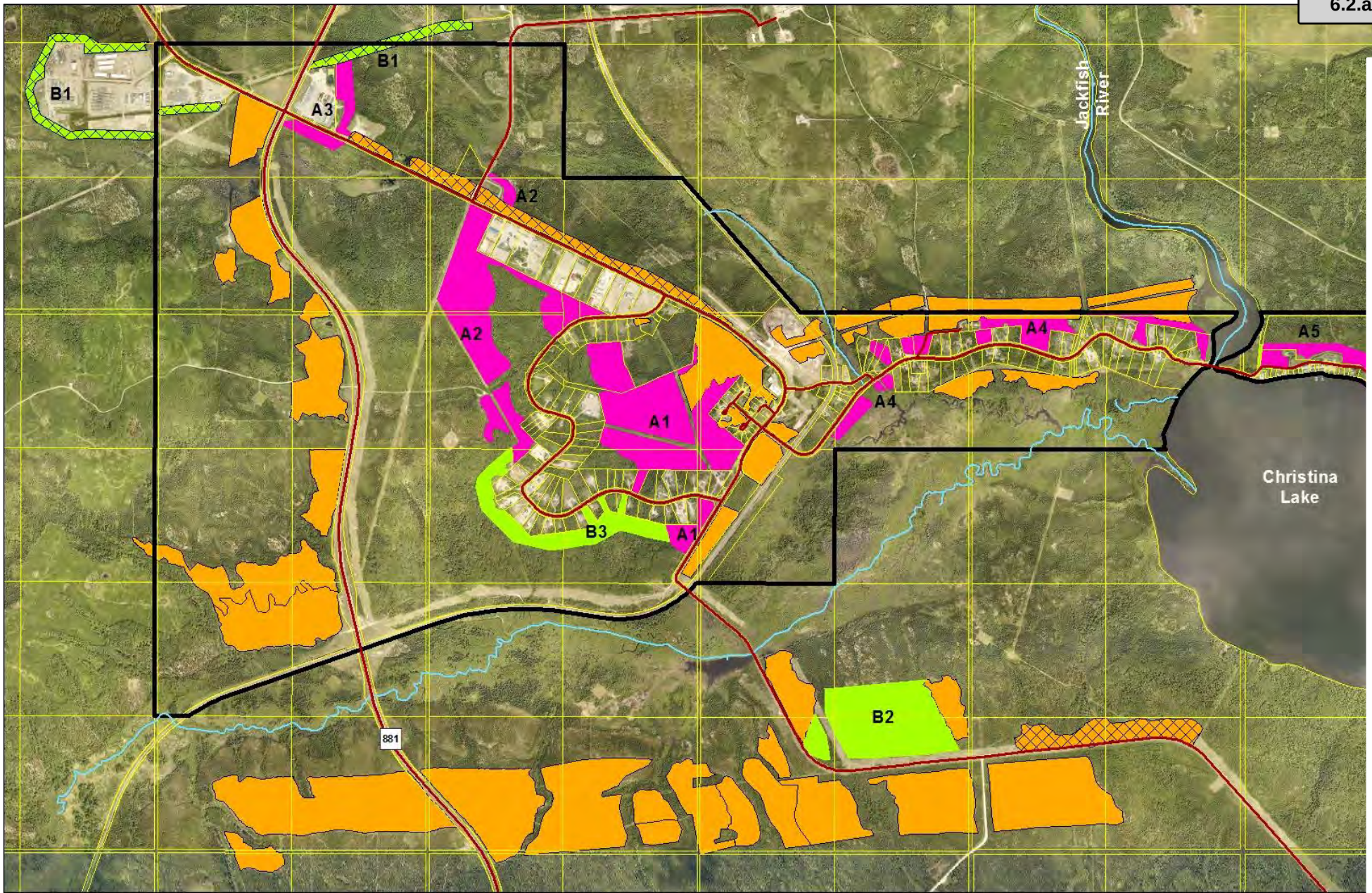
Proposed Vegetation Management Area B1



Proposed Vegetation Management Area B2



Proposed Vegetation Management Area B3



Map 4A - FireSmart Vegetation Management - Conklin

- | | |
|--|---|
| Proposed Priority A FuelMod | Fuel Reduction |
| Proposed Priority B FuelMod | Fuel Removal |
| Completed FuelMod | |

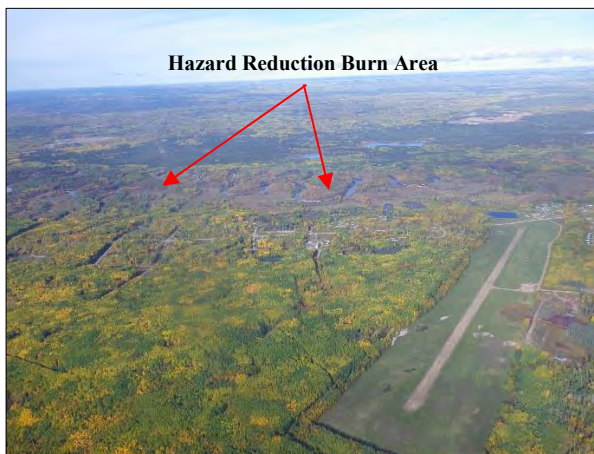


4.2.2 Janvier (Map 4B)

Completed Vegetation Management

Alberta Forestry has completed two FireSmart fuel reduction projects at the community and landscape-levels and performs annual hazard reduction burning in cured-grass fuels along the Christina River.

Type	Method	Total Area (Ha)
Fuel Removal	Hazard Reduction Burning	167.0
Fuel Reduction	Thin/Prune/Clean	8.1
Total Area (Ha)		175.1



Current Christina River Hazard Reduction Burn Area

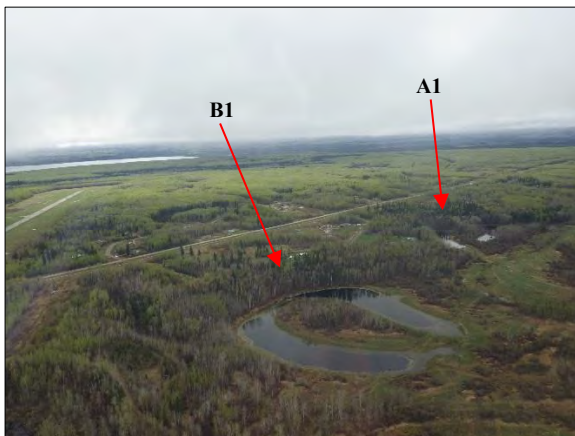


Thin/Prune/Clean Fuelbreak

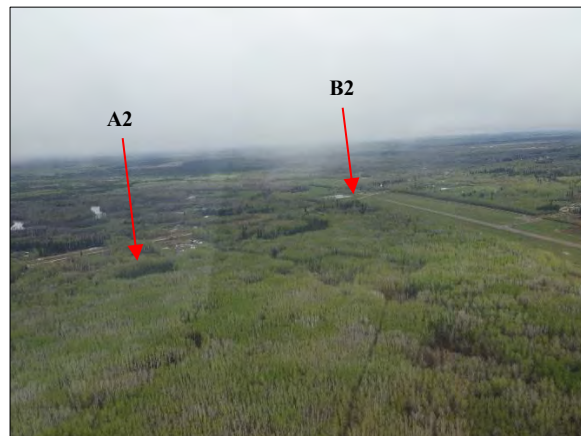
Proposed Vegetation Management

Proposed fuel reduction areas include thin/prune/clean of evergreen overstory and understory in evergreen and mixedwood stands on Municipal lands adjacent to structures and mulch thinning of evergreen trees along the south-end of Nokohoo Road near Highway 881 to reduce the threat of wildfire closing the egress from the community. The annual hazard reduction burning in cured-grass fuels along the Christina River should continue.

Priority	Fuel Modification Type & Method	Approximate Area (Ha) by Landowner			Total Area (Ha)
		Municipal	Provincial	Private/Lease	
	Fuel Removal – Hazard Reduction Burning		167.0		167.0
A1	Fuel Reduction – Thin/Prune/Clean	1.8			1.8
A2	Fuel Reduction – Thin/Prune/Clean	0.8			0.8
B1	Fuel Reduction – Thin/Prune/Clean	3.7			3.7
B2	Fuel Reduction – Thin/Prune/Clean	2.0			2.0
B3	Fuel Reduction – Mulch Thinning		31.1		31.1
	Total Area (Ha)	8.3	198.1		206.4



Proposed Vegetation Management Areas A1 & B1



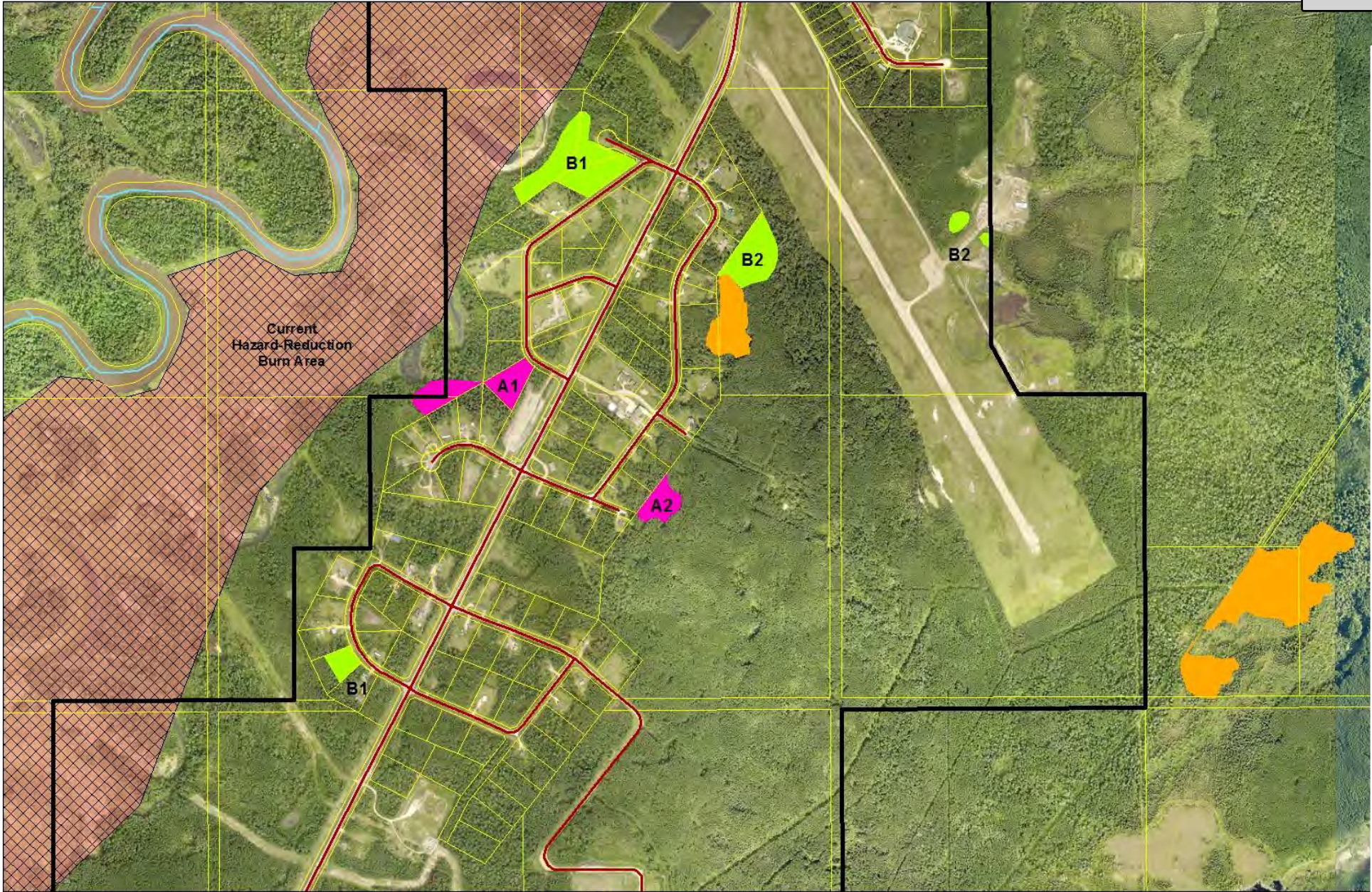
Proposed Vegetation Management Areas A2 & B2



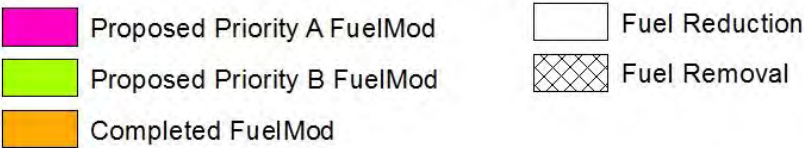
Proposed Vegetation Management Area B1



Proposed Vegetation Management Area B3



Map 4B - FireSmart Vegetation Management - Janvier





Map 4B - FireSmart Vegetation Management - Janvier

- Proposed Priority A FuelMod
- Proposed Priority B FuelMod
- Completed FuelMod

- Fuel Reduction
- Fuel Removal



4.2.3 Anzac (Map 4C)

Completed Vegetation Management

The RMWB has completed FireSmart vegetation management projects behind Cardinal Rd., Hopegood Dr., and Woodward Dr./Cres. in 2009 and 2010. Maintenance is required on these projects and debris pile disposal is required on the Cardinal Rd. project. Several dozer-guards were constructed within Anzac during the fire suppression activities of the 2016 Horse River fire. These fuelbreaks will require regular maintenance to control cured-grass hazard and maintain the effectiveness of the fuelbreaks.

The RMWB currently has several fuel modification units in progress (2017/18) that were proposed in the *RMWB Post-Fire Wildfire Hazard Assessment* (Walkinshaw, 2016).

Type	Method	Total Area (Ha)
Fuel Removal	Dozer-guard (2016 wildfire)	29.9
Fuel Reduction	Thin/Prune/Clean (2009-2017)	133.8
Total Area (Ha)		163.7



Dozer-guard (2016 Wildfire)



Dozer-guard (2016 Wildfire) & Thin/Prune/Clean (2009)



Thin/Prune/Clean (2009) – Debris Disposal Required



Thin/Prune/Clean (2009)

Proposed Vegetation Management

Proposed fuel reduction areas include thin/prune/clean of evergreen overstory and understory in primarily mixedwood post-fire “green-islands” adjacent to structures and fuel removal on the south-side of Hwy 881 to establish a fuelbreak between the community and hazardous evergreen fuels to the south.

Priority	Fuel Modification Type & Method	Approximate Area (Ha) by Landowner			Total Area (Ha)
		Municipal	Provincial	Private/Lease	
A1	Fuel Reduction – Thin/Prune/Clean	3.2	0.4		3.6
A2	Fuel Reduction – Thin/Prune/Clean	1.5			1.5
A3	Fuel Reduction – Thin/Prune/Clean	2.5			2.5
A4	Fuel Removal – Mulch Clear	2.4	4.8		7.2
B1	Fuel Reduction – Thin/Prune/Clean	3.2	10.4		13.6
B2	Fuel Reduction – Thin/Prune/Clean	0.6	5.5		6.1
	Total Area (Ha)	13.4	21.1		34.5



Proposed Vegetation Management Area A1



Proposed Vegetation Management Area A1



Proposed Vegetation Management Area A2



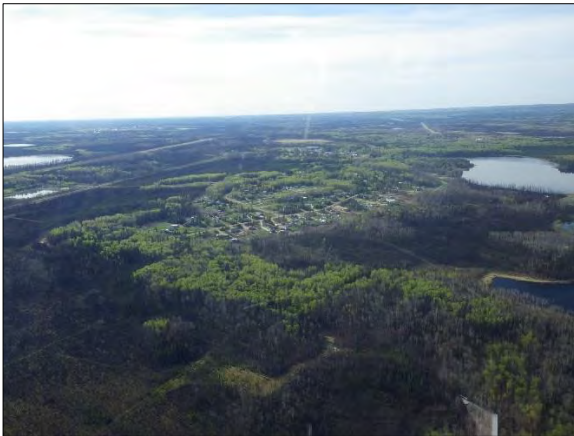
Proposed Vegetation Management Area A3



Proposed Vegetation Management Area A4



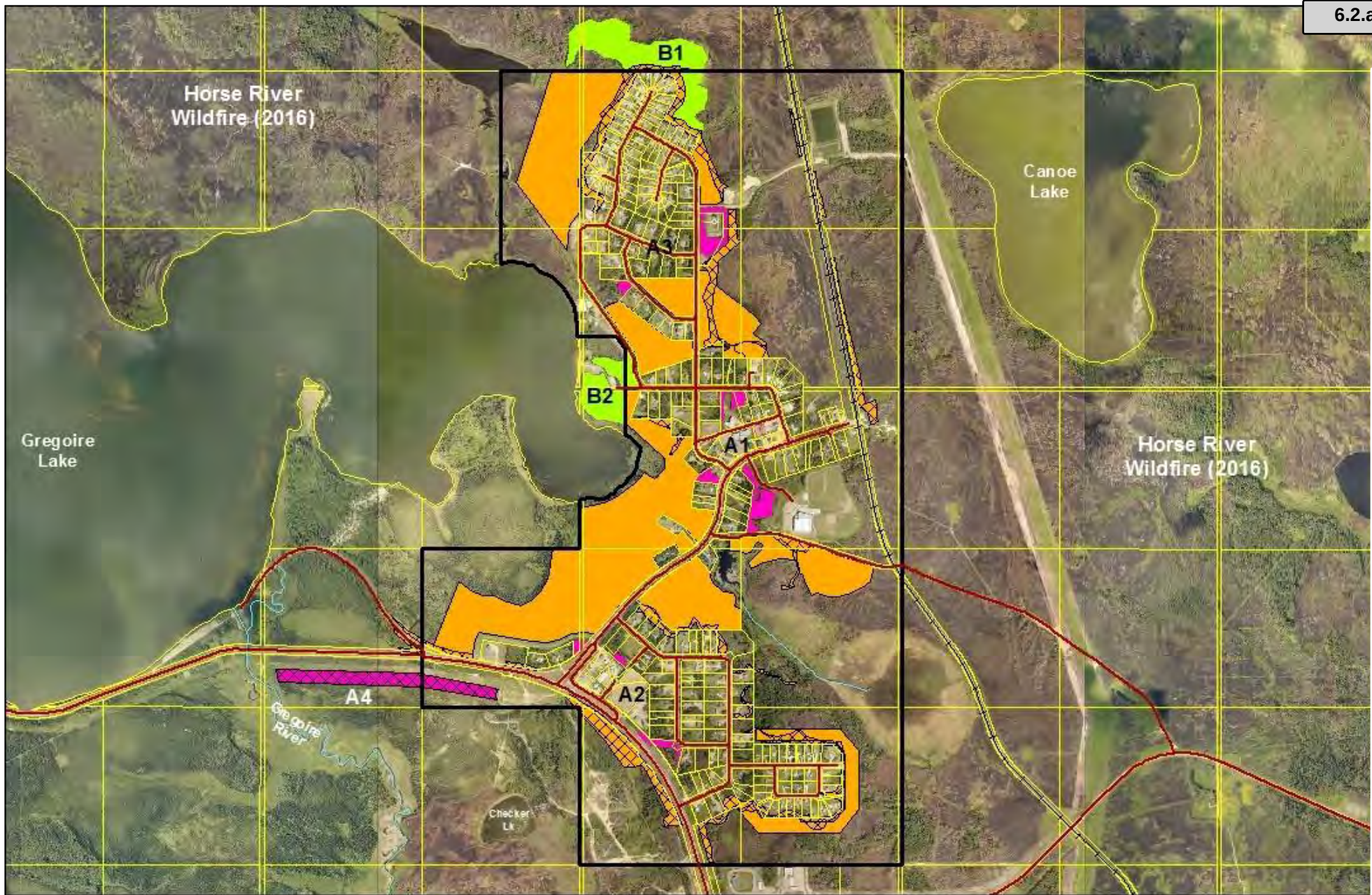
Proposed Vegetation Management Area B1



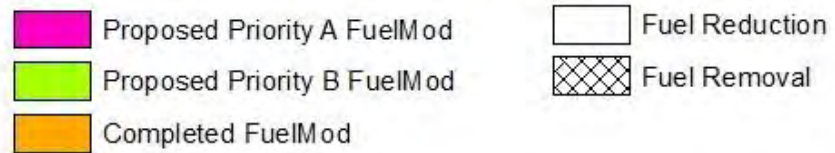
Proposed Vegetation Management Area B2



Proposed Vegetation Management Area B3



Map 4C - FireSmart Vegetation Management - Anzac



4.2.4 Gregoire Lake Estates (Map 4D)

Completed Vegetation Management

Dozer-guards were constructed on the north, south and west perimeters of Gregoire Lake Estates during the fire suppression activities of the 2016 Horse River wildfire. These fuelbreaks will require regular maintenance to control cured-grass hazard and maintain the effectiveness of the fuelbreaks.

Type	Method	Total Area (Ha)
Fuel Removal	Dozer-guard (2016 wildfire)	18.1
	Total Area (Ha)	18.1



Dozer-guard (2016 Wildfire)



Dozer-guard (2016 Wildfire)

Proposed Vegetation Management

Proposed fuel reduction areas include thin/prune/clean of evergreen overstory and understory in the black spruce (C-2) stand on the south-end of the community and in mixedwood stands within and adjacent to the community.

Priority	Fuel Modification Type & Method	Approximate Area (Ha) by Landowner			Total Area (Ha)
		Municipal	Provincial	Private/Lease	
A1	Fuel Reduction – Thin/Prune/Clean		4.5		4.5
A2	Fuel Reduction – Thin/Prune/Clean		0.9		0.9
B1	Fuel Reduction – Thin/Prune/Clean	0.7	0.4		1.1
	Total Area (Ha)	0.7	5.8		6.5



Proposed Vegetation Management Area A1



Proposed Vegetation Management Area A2



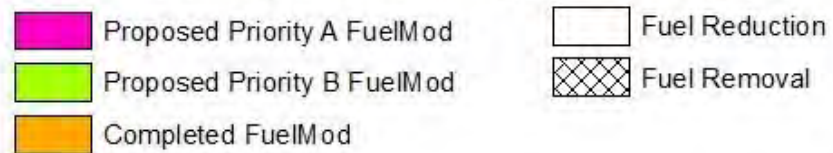
Proposed Vegetation Management Area B1



Proposed Vegetation Management Area B2



Map 4D - FireSmart Vegetation Management - Gregoire Lake Estates



4.2.5 Fort McMurray (Maps 4E)

Completed Vegetation Management

The RMWB and Alberta Forestry have completed several FireSmart vegetation management projects from 2000-2017 as proposed in earlier FireSmart plans (Walkinshaw, 1998 and 2010). All of the projects that were not burnt-over in the 2016 wildfire will require maintenance and second-pass thinning to maintain effectiveness. Several dozer-guards were constructed during the fire suppression activities of the 2016 Horse River wildfire and fuelbreaks were cleared based on recommendations in the *RMWB Post-Fire Wildfire Hazard Assessment* (Walkinshaw, 2016). All of these fuelbreaks will require grass maintenance for a minimum of 30 metres from back lot-line to control cured-grass hazard and maintain the effectiveness of these fuelbreaks.

Type	Method	Total Area (Ha)
Fuel Removal	Dozer-guard (2016 wildfire)	106.9
Fuel Removal	Clear Fuelbreaks	32.3
Fuel Removal	Hazard Reduction Burn	2.5
Fuel Reduction	Hazard Tree Clearing	42.2
Fuel Reduction	Thin/Prune/Clean (1990-2017)	142.8
	Total Area (Ha)	326.7



Dozer-guard (2016) & Thin/Prune/Clean – Birchwood Phase 2A (2017)



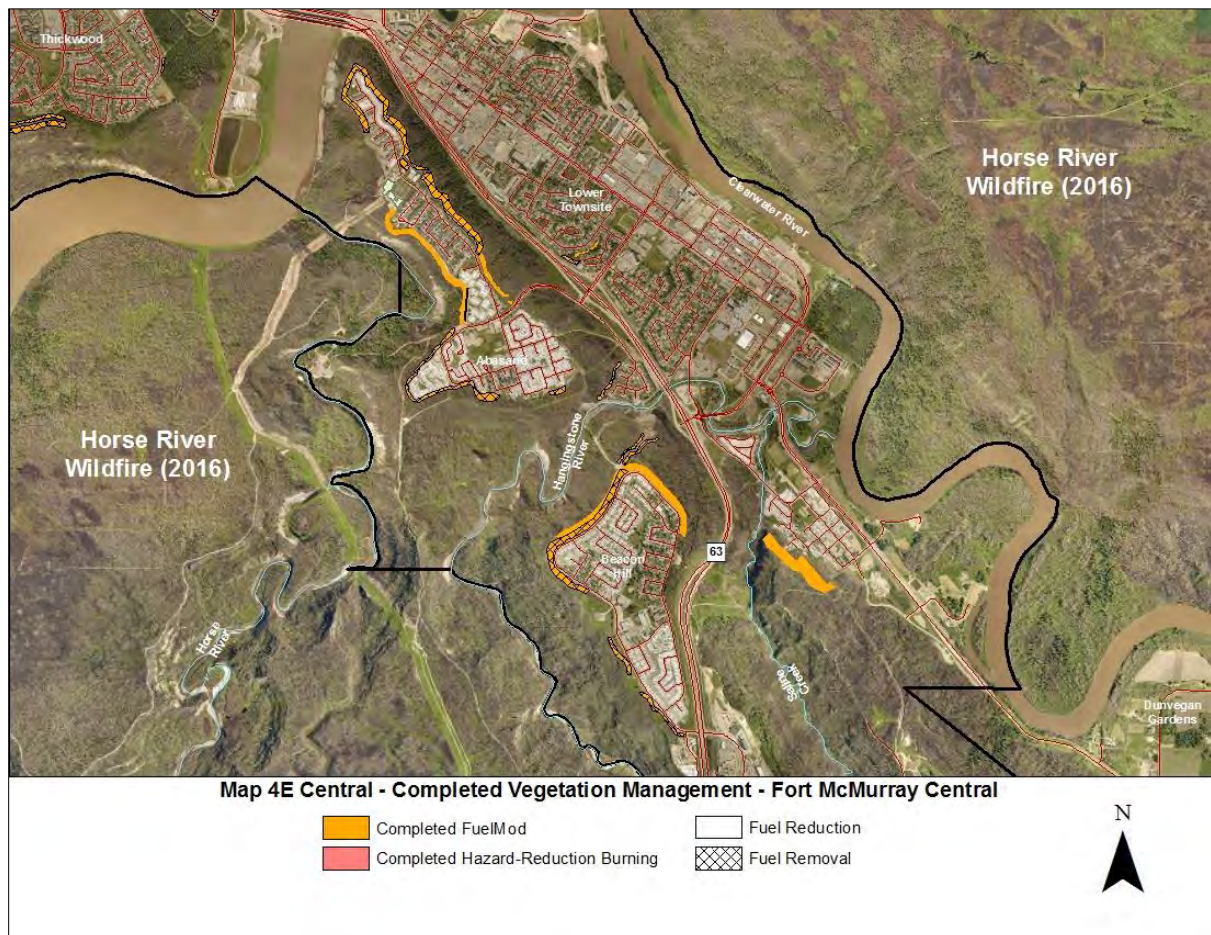
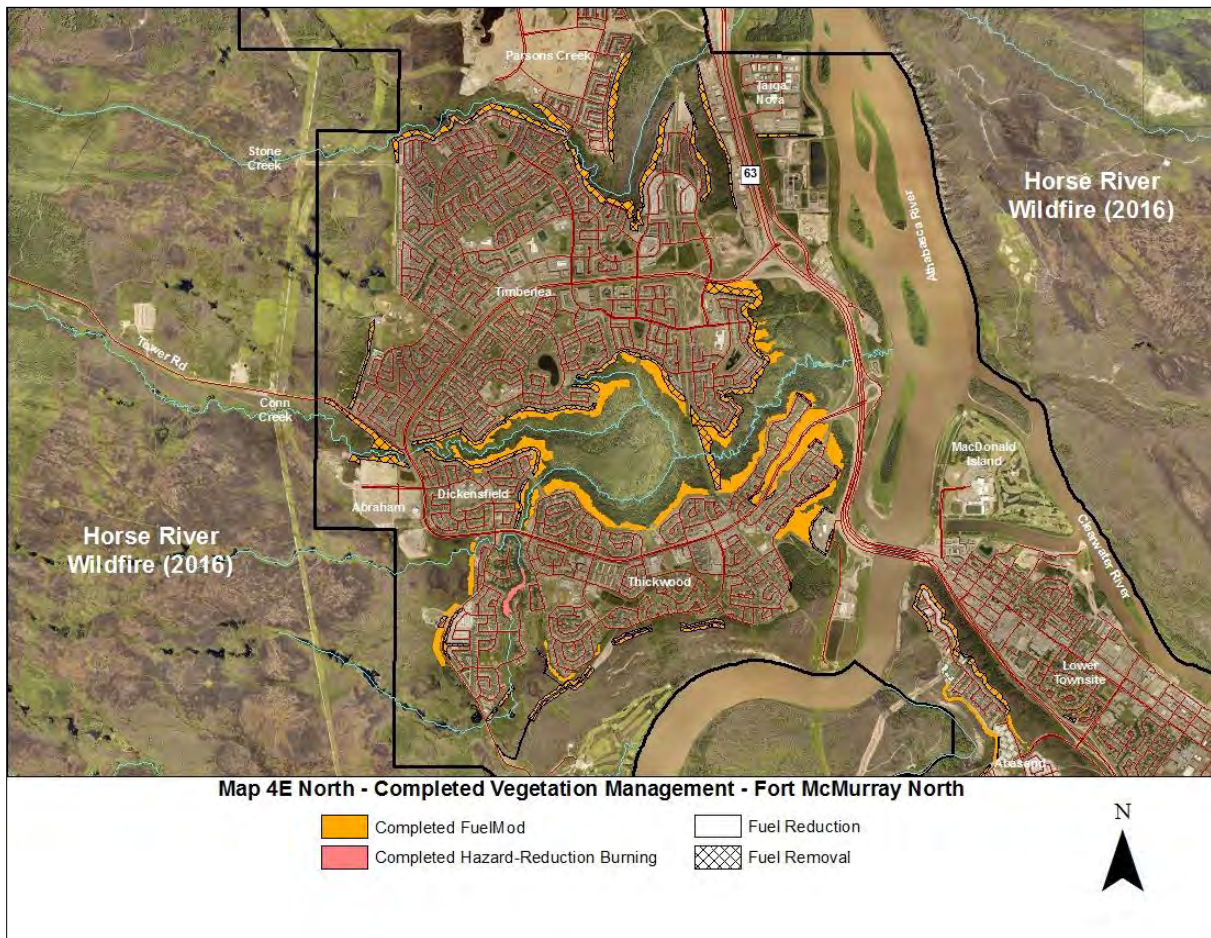
Hazard Reduction Burn – Wood Buffalo (2017)

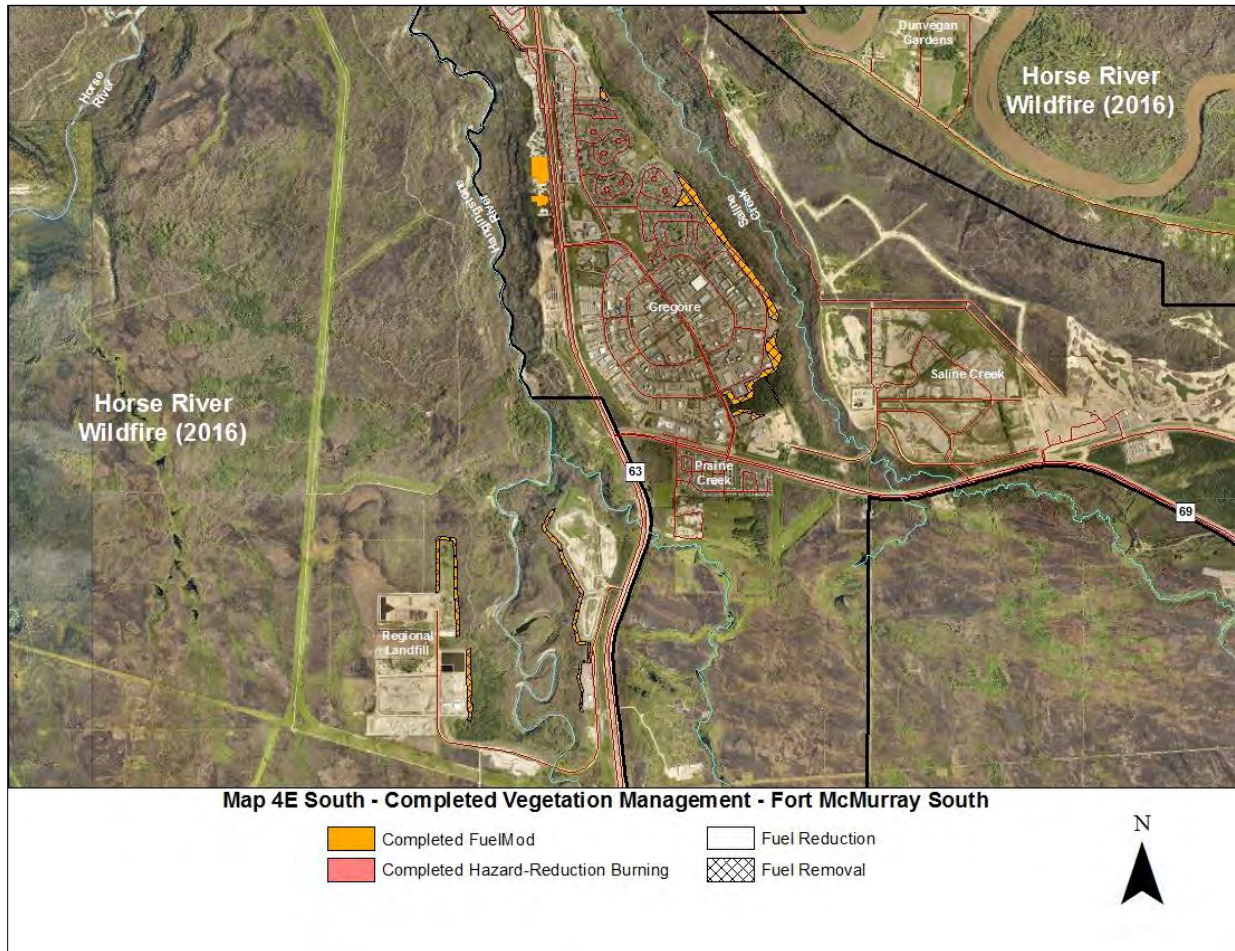


Thin/Prune/Clean – Beacon Hill (2011)



Thin/Prune/Clean – Birchwood Phase 2A (2017)





Proposed Vegetation Management

Proposed fuel reduction areas include thin/prune/clean of evergreen overstory and understory in primarily mixedwood post-fire “green-islands” adjacent to structures and fuel removal through hazard reduction burning and/or mowing of cured-grass fuels.

Harvesting of burnt trees immediately adjacent to developed areas is proposed to be completed immediately to remove the burnt trees from within 100 metres of developed areas in Beacon Hill, Abasand, and Wood Buffalo Estates. The intent is to reduce the eventual wildfire threat potential from blowdown of burnt trees mixed with re-growth of native grass, shrubs, and deciduous and evergreen trees that will regenerate over time. This project is given a Priority B rating due to the low wildfire threat at this time however early completion of this project is recommended to reduce the impact on early re-growth of deciduous species and in recognition of the higher cost of doing this project once the trees have blown down.

Priority	Fuel Modification Type & Method	Approximate Area (Ha) by Landowner			Total Area (Ha)
		Municipal	Provincial	Private/Lease	
A1	Fuel Reduction – Thin/Prune/Clean	8.0	0.6		8.6
A2	Fuel Reduction – Thin/Prune/Clean	26.0			26.0
A3	Fuel Reduction – Thin/Prune/Clean	2.7			2.7
A4	Fuel Reduction – Thin/Prune/Clean	1.3			1.3
A5	Fuel Reduction – Thin/Prune/Clean	0.2	32.0		32.2
A6	Fuel Reduction – Thin/Prune/Clean		3.2		3.2
B1	Fuel Removal – Harvest/Clean	29.1	5.0		34.1
B2	Fuel Reduction – Thin/Prune/Clean	2.9	0.3	0.9	4.1
B3	Fuel Removal – Burn/Mow	12.1			12.1
B5	Fuel Reduction – Thin/Prune/Clean	0.1	3.5	3.0	6.6
B6	Fuel Removal – Mulch/Clear		2.9		2.9
	Total Area (Ha)	82.4	47.5	3.9	133.8



Proposed Vegetation Management Area A1



Proposed Vegetation Management Area A2



Proposed Vegetation Management Area A3



Proposed Vegetation Management Area A4



Proposed Vegetation Management Area A5



Proposed Vegetation Management Area A5



Proposed Vegetation Management Area B1



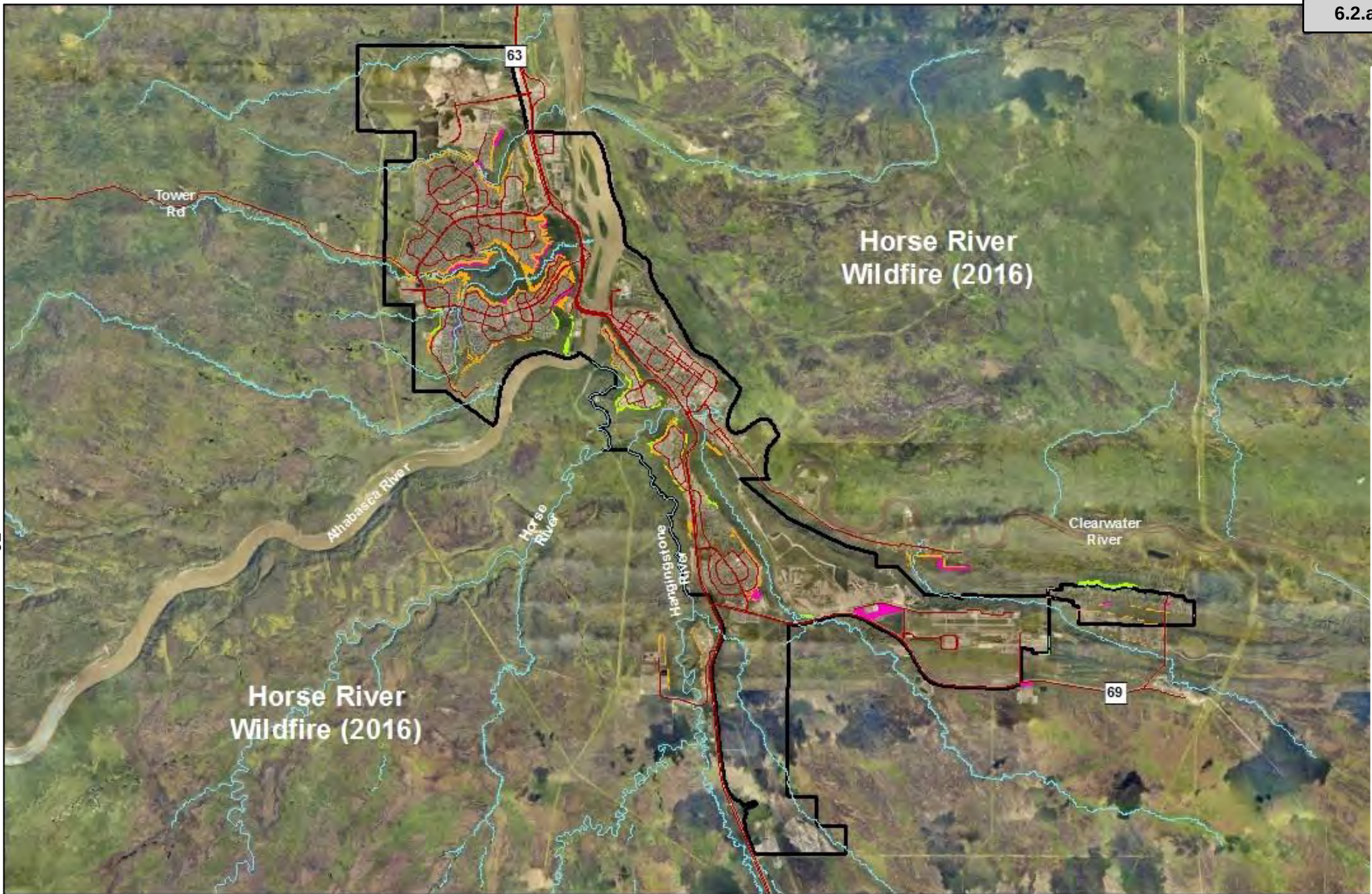
Proposed Vegetation Management Areas B2 & B3



Proposed Vegetation Management Area B5



Proposed Vegetation Management Area B6



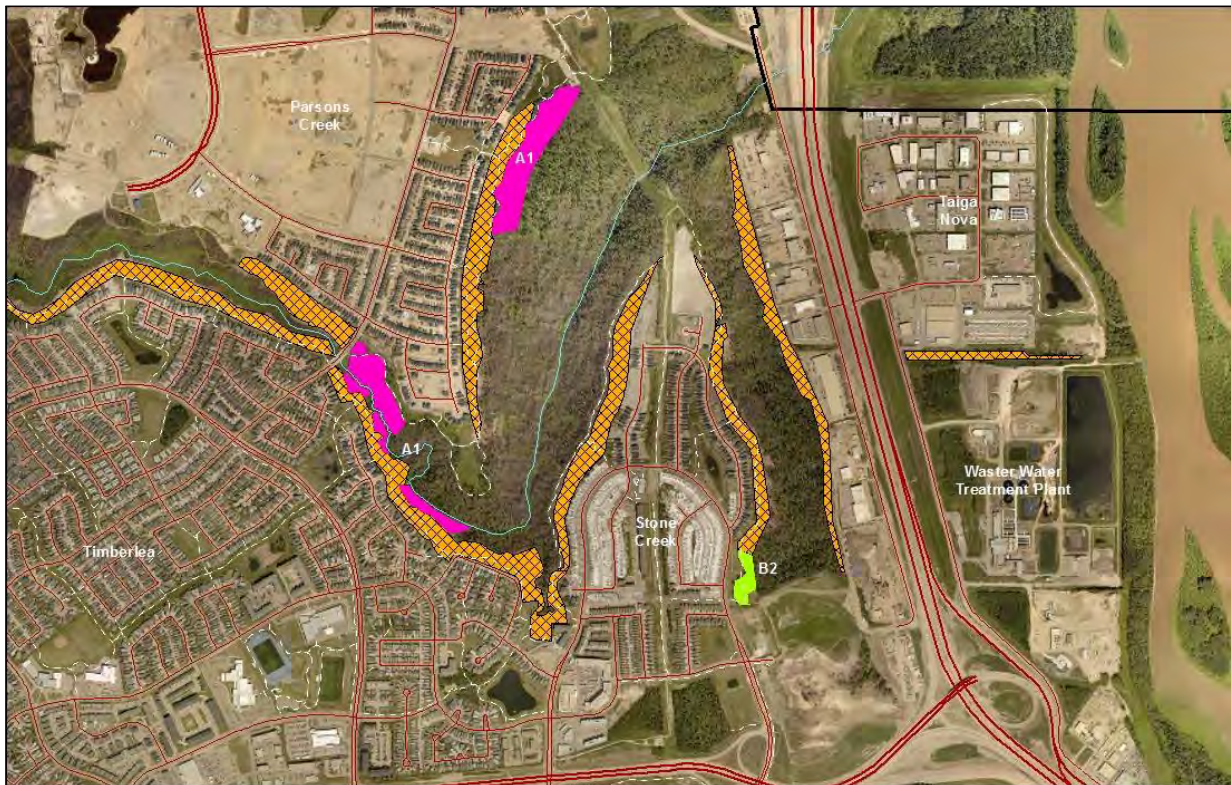
Horse River
Wildfire (2016)

Horse River
Wildfire (2016)

Map 4E - Proposed FireSmart Vegetation Management - Fort McMurray

- Proposed Priority A FuelMod
- Proposed Priority B FuelMod
- Completed FuelMod





Proposed FireSmart Vegetation Management - Stonecreek

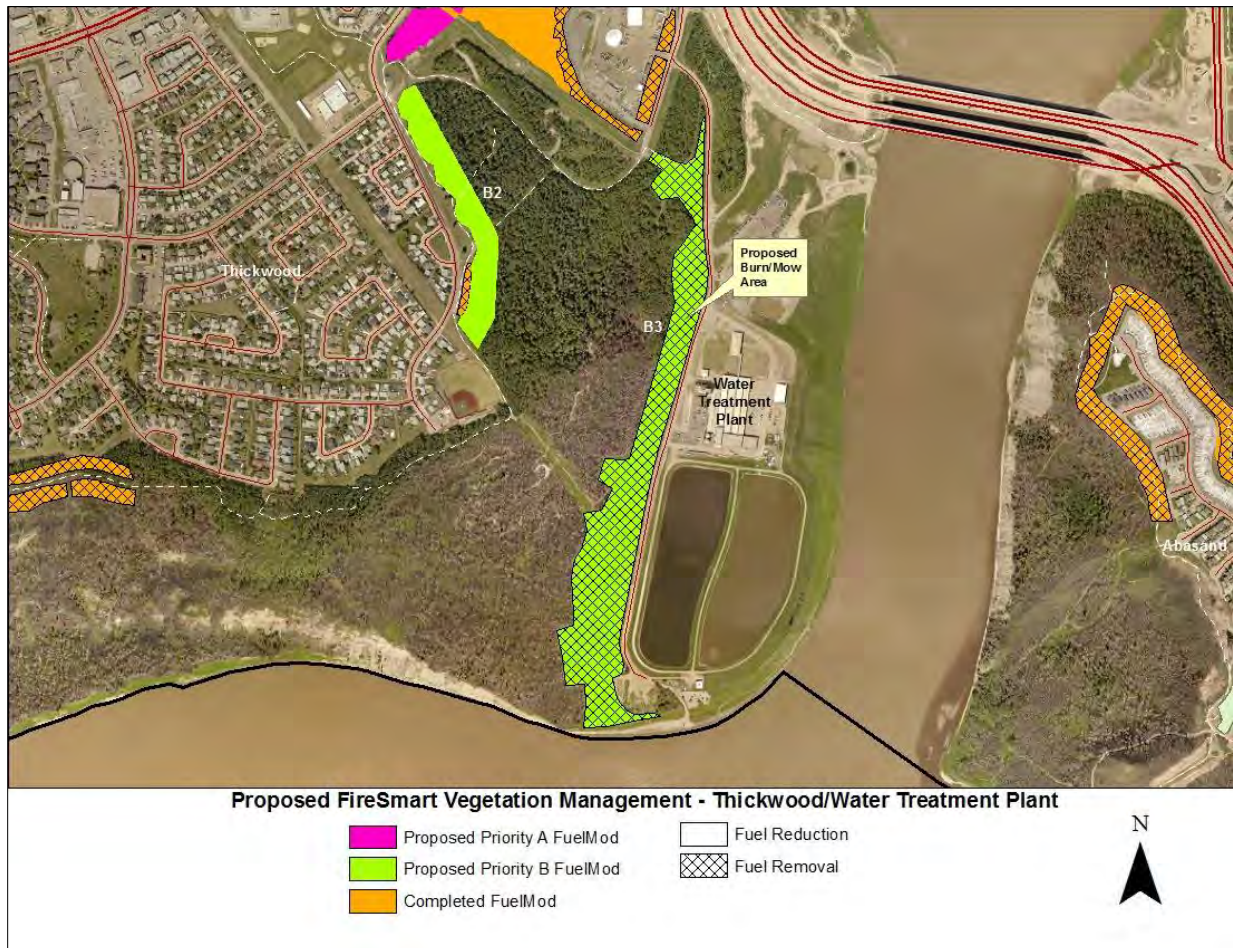
- | | |
|--|---|
| Proposed Priority A FuelMod | Fuel Reduction |
| Proposed Priority B FuelMod | Fuel Removal |
| Completed FuelMod | |

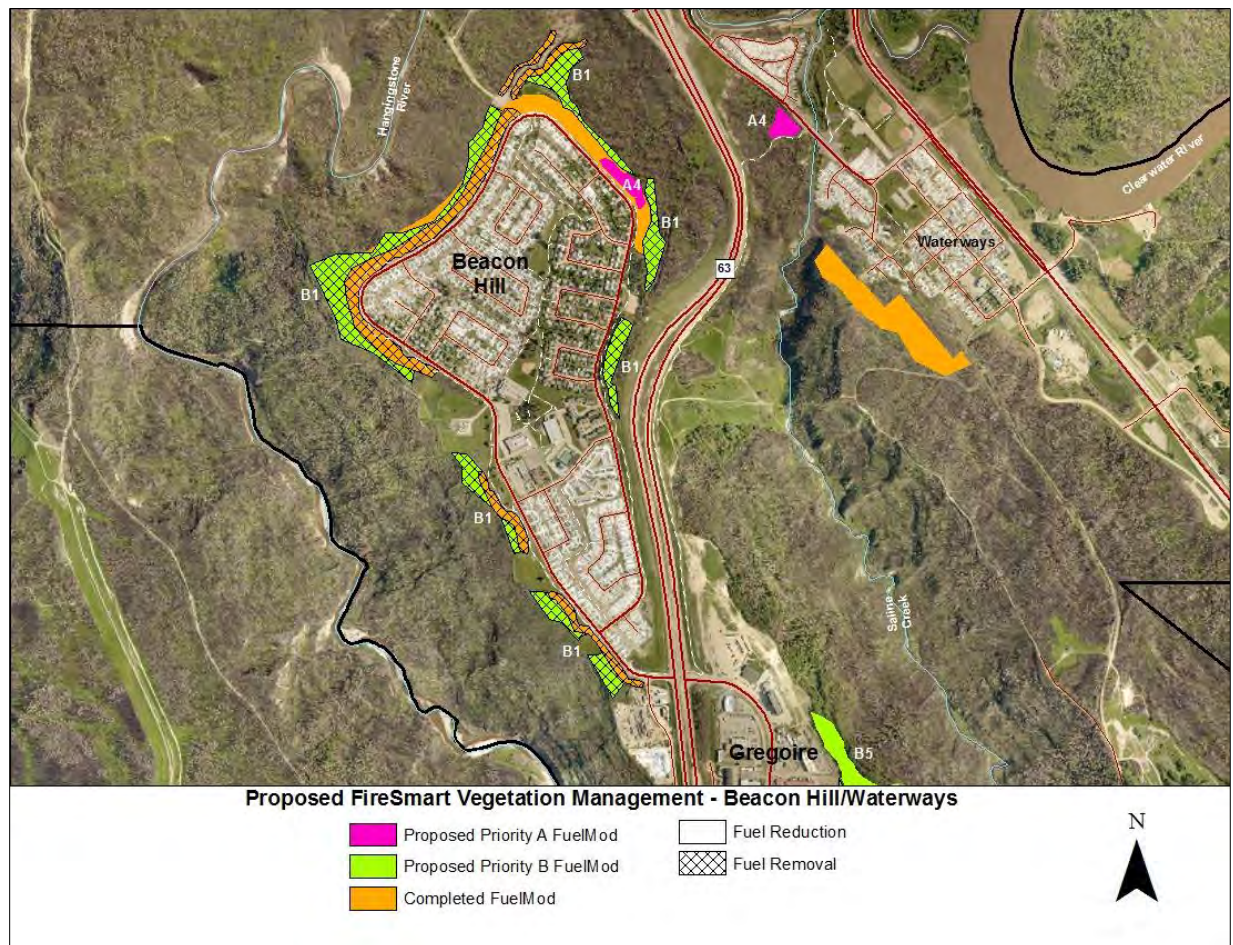
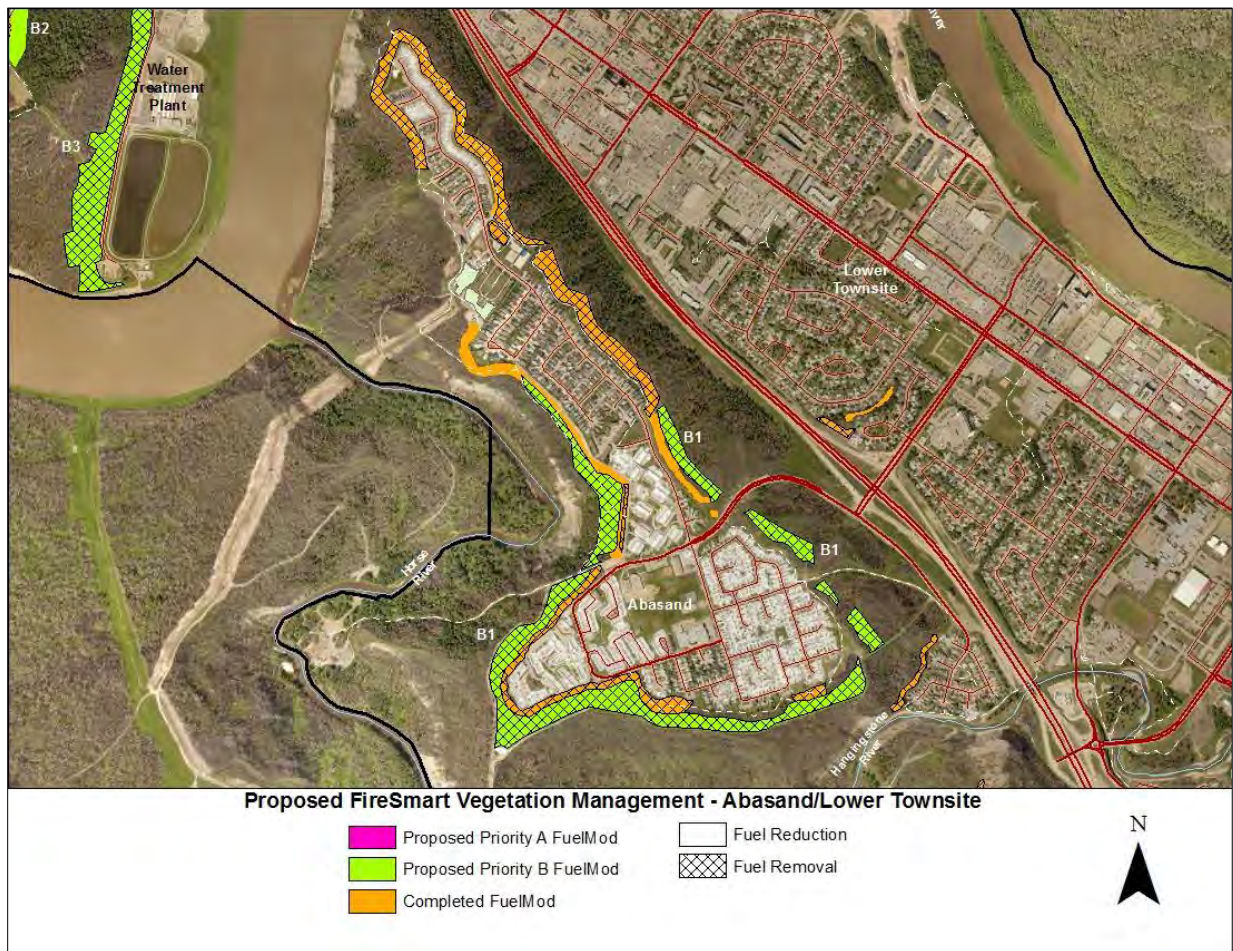


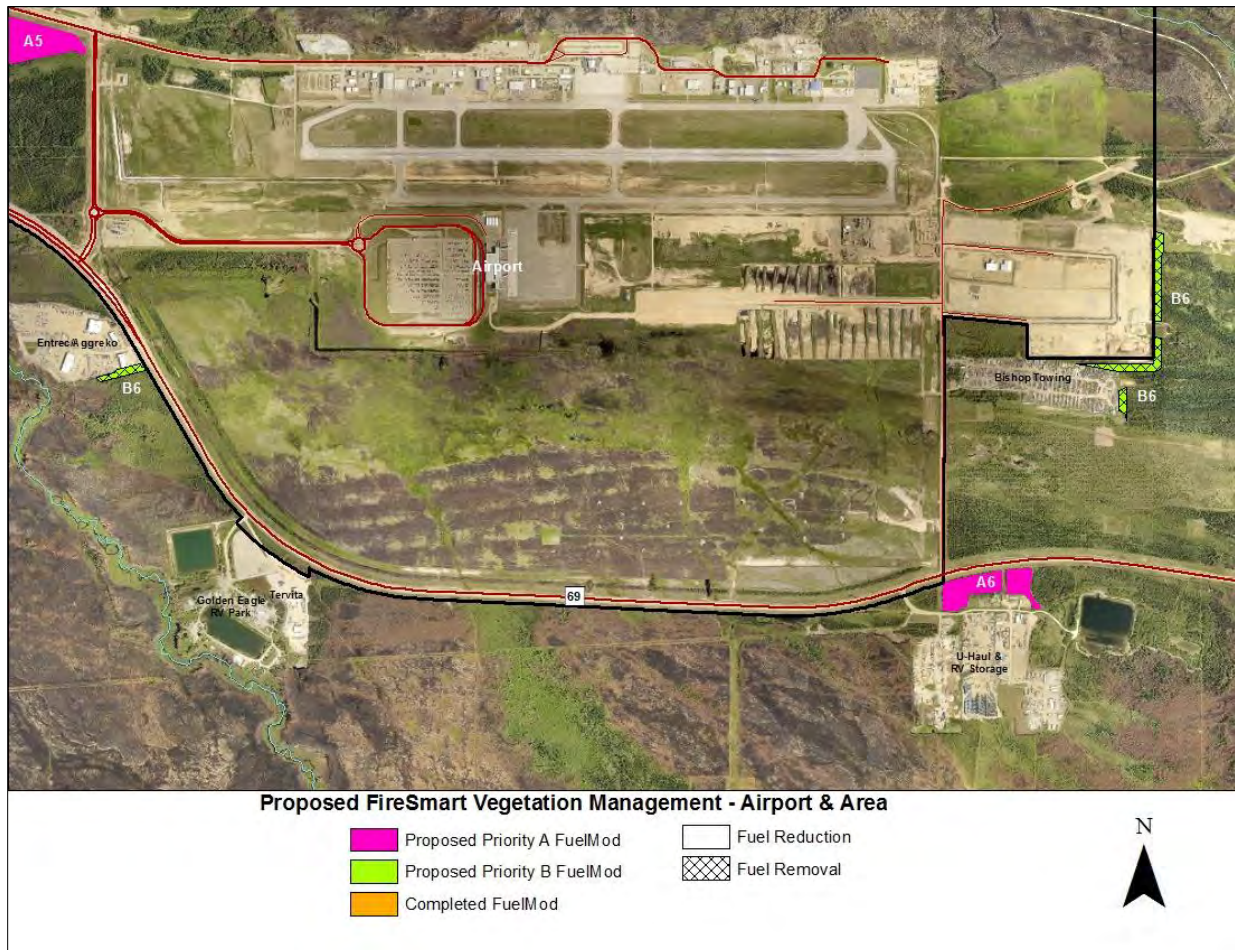
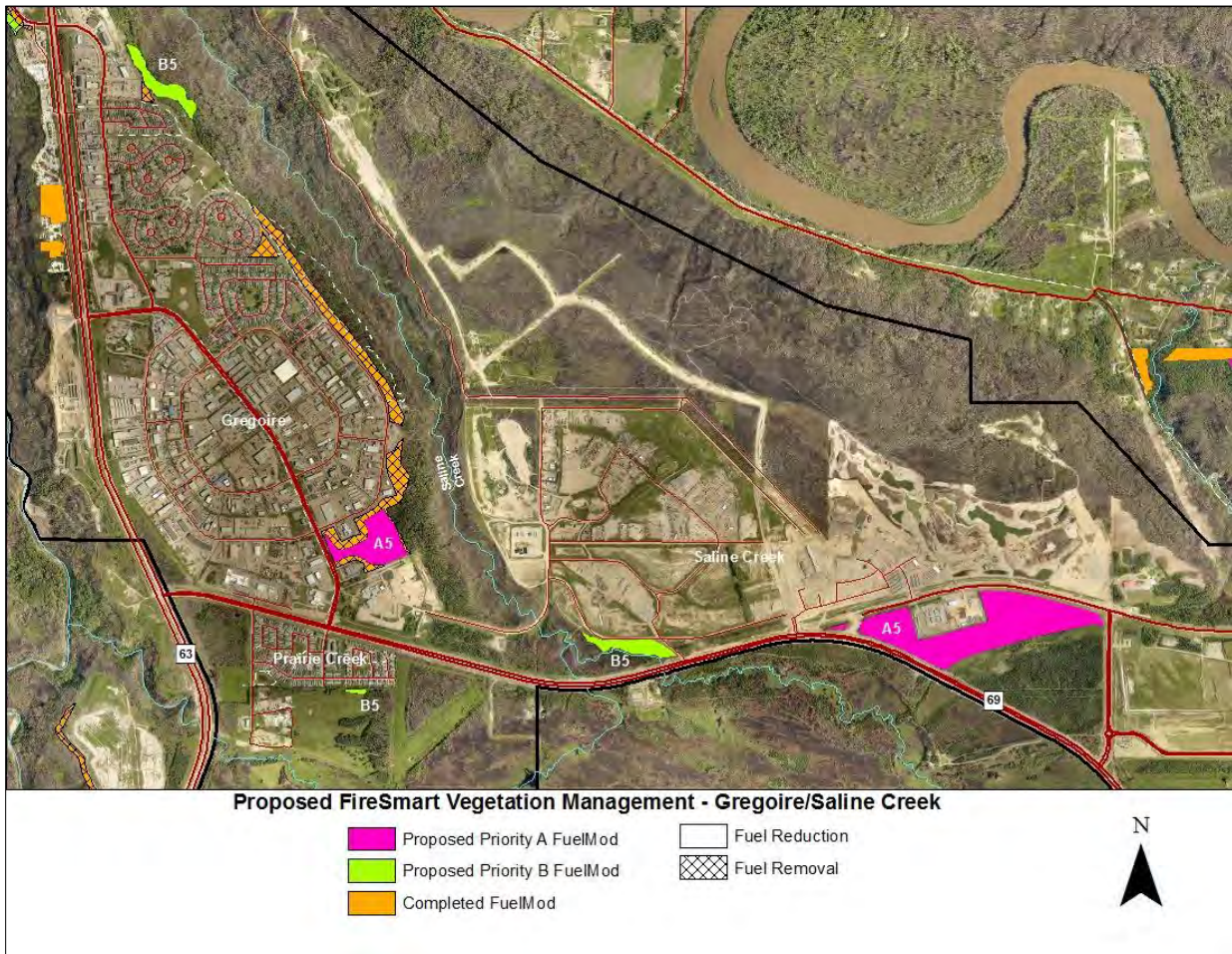
Proposed FireSmart Vegetation Management - Birchwood/Thickwood

- | | |
|--|---|
| Proposed Priority A FuelMod | Fuel Reduction |
| Proposed Priority B FuelMod | Fuel Removal |
| Completed FuelMod | |









4.2.6 Draper (Map 4F)

Completed Vegetation Management

The RMWB completed FireSmart vegetation management on a 50-metre wide strip behind the Draper Road properties from 2009 to 2011. Maintenance and second-pass thinning of evergreen overstory and understory is required on this area.

Type	Method	Total Area (Ha)
Fuel Reduction	Thin/Prune/Clean (2009-2011)	12.8
Total Area (Ha)		12.8



Draper 2011 Fuel Reduction Area



Draper 2011 Fuel Reduction Area – Maintenance Needed



Wildfire Impingement on Draper 2011 Fuel Reduction Area



Wildfire Impingement on Draper 2011 Fuel Reduction Area

Proposed Vegetation Management

Proposed fuel reduction includes thin/prune/clean of evergreen overstory and understory in the mixedwood post-fire “green-island” adjacent to Draper Road properties to widen the existing fuelbreak, treated in 2009 and 2011, to 100 metres in width.

Priority	Fuel Modification Type & Method	Approximate Area (Ha) by Landowner			Total Area (Ha)
		Municipal	Provincial	Private/Lease	
B8	Fuel Reduction – Thin/Prune/Clean		8.4		8.4
	Total Area (Ha)		8.4		8.4



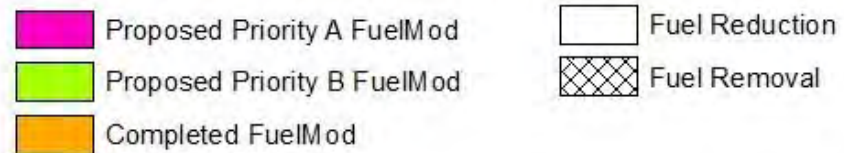
Proposed Vegetation Management Area B8



Proposed Vegetation Management Area B8



Map 4F - FireSmart Vegetation Management - Draper



4.2.7 Sapræ Creek Estates (Map 4G)

Completed Vegetation Management

The RMWB completed hazard-tree removal and reduction on burnt trees in areas adjacent to properties in Sapræ Creek and Spruce Valley Estates. One hazard-tree removal area on Community Lane is proposed for additional vegetation management to meet FireSmart recommended guidelines.

Type	Method	Total Area (Ha)
Fuel Removal	Mulch Clear/Thin (Hazard Tree 2017)	22.8
	Total Area (Ha)	22.8



Sapræ Creek/Spruce Valley Hazard Tree Fuel Removal



Community Lane Hazard Tree Fuel Reduction – Additional Vegetation Management Recommended



Sapræ Creek Hazard Tree Fuel Reduction – Mulch Thinned



Sapræ Creek Hazard Tree Fuel Removal – Mulch Cleared

Proposed Vegetation Management

Proposed fuel reduction areas include thin/prune/clean of evergreen overstory and understory in evergreen and mixedwood post-fire “green-islands” adjacent to structures and includes cleanup of debris left after the 2017 hazard-tree removal program.

Priority	Fuel Modification Type & Method	Approximate Area (Ha) by Landowner			Total Area (Ha)
		Municipal	Provincial	Private/Lease	
A7	Fuel Reduction – Thin/Prune/Clean	3.0			3.0
B7	Fuel Reduction – Thin/Prune/Clean	0.8	16.2		17.0
	Total Area (Ha)	3.8	16.2		20.0



Proposed Vegetation Management Area A7



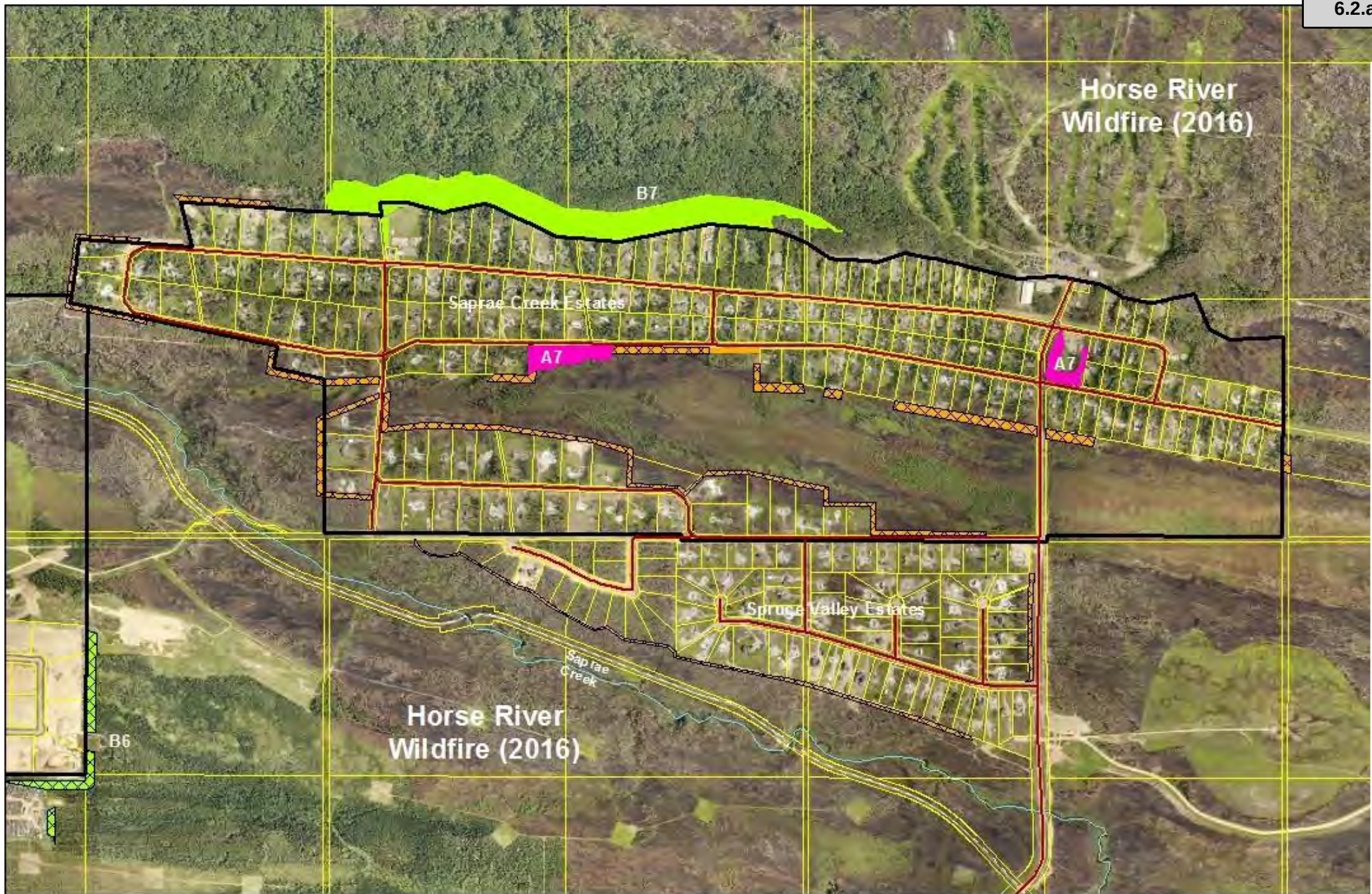
Proposed Vegetation Management Area A7



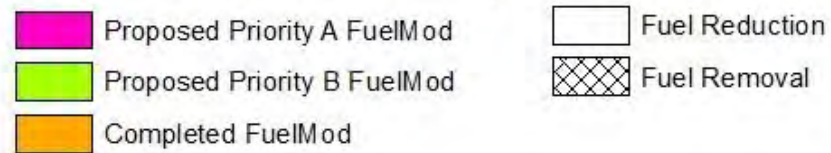
Proposed Vegetation Management Area B7



Proposed Vegetation Management Area B7



Map 4G - FireSmart Vegetation Management - Saprae Creek Estates



4.2.8 Fort McKay (Map 4H)

Completed Vegetation Management

The Fort MacKay First Nation cleared fireguards on the north and west sides of the community during the 2016 wildfire and Alberta Forestry has disposed of the debris on the North fireguard and will be burning the debris piles on the West fireguard during winter 2017/18. Regular inspection and maintenance of cured-grass will be required on these fuelbreaks to maintain effectiveness.

Type	Method	Total Area (Ha)
Fuel Removal	Fireguard Clearing (2016)	102.0
	Total Area (Ha)	102.0



2017 North Fireguard (FG1)



2017 West Fireguard (FG2) – Debris Disposal Required

Proposed Vegetation Management

Proposed fuel reduction areas include thin/prune/clean of evergreen overstory and understory in evergreen and mixedwood fuels adjacent to structures and community as proposed in the *Fort MacKay/McKay Wildfire Mitigation Strategy* (AAF, 2016) with some additions from recent field inspections.

Priority	Fuel Modification Type & Method	Approximate Area (Ha) by Landowner			Total Area (Ha)
		Municipal	Provincial	Indian Reserve	
A1	Fuel Reduction – Thin/Prune/Clean		14.5		14.5
Thin Treatment 2	Fuel Reduction – Thin/Prune/Clean		3.2	0.9	4.1
Thin Treatment 8	Fuel Reduction – Thin/Prune/Clean	2.9	3.0	15.2	21.1
B1	Fuel Reduction – Thin/Prune/Clean		2.0	2.9	4.9
	Total Area (Ha)	2.9	22.7	19.0	44.6

The revised Fort McKay Area Structure Plan may impact the boundaries of A1 and AB. Forestry is proposing the west block of B1 as a sprinkler deployment line due to the steep topography along the McKay River. These items will be addressed at the detailed prescription planning stage.



Proposed Vegetation Management Area A1



Proposed Vegetation Management Area A1



Proposed Vegetation Management Area TT2



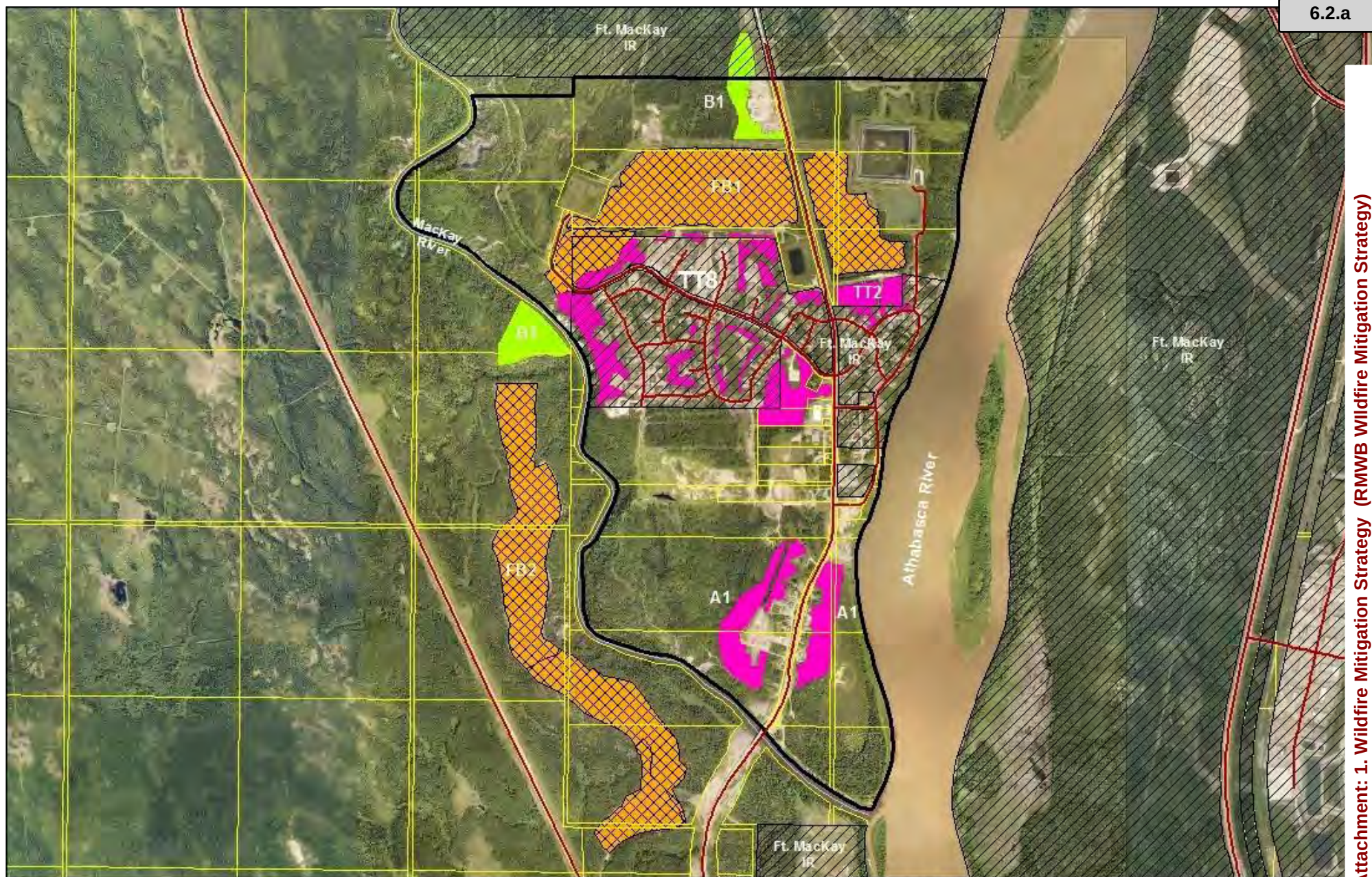
Proposed Vegetation Management Area TT8



Proposed Vegetation Management Area B1



Proposed Vegetation Management Area B1



N

4.2.9 Fort Chipewyan (Map 4I)

Completed Vegetation Management

Alberta Forestry completed several fuel removal and fuel reduction projects identified in the *Fort Chipewyan Regional Wildfire Mitigation Strategy* (AAF, 2016) on provincial, municipal, and first nation lands during the winter 2016/17.

Type	Method	Total Area (Ha)
Fuel Removal	Clear	42.6
Fuel Reduction	Thin/Prune/Clean	3.5
Total Area (Ha)		46.1



Completed Vegetation Management Areas FB3 & TP2



Completed Vegetation Management Area FB3



Completed Vegetation Management Areas FB7 & FB8



Completed Vegetation Management Area FB5 - Atco Electric Power Station

Proposed Vegetation Management

Proposed fuel reduction areas include thin/prune/clean of evergreen overstory and understory in evergreen and mixedwood fuels adjacent to structures and community and firebreak fuel removal as proposed in the *Fort Chipewyan Regional Wildfire Mitigation Strategy* (AAF, 2016) with some additions from recent imagery analysis. Additions will need ground-truthing at the detailed prescription stage to ensure accuracy.

Priority	Fuel Modification Type & Method	Approximate Area (Ha) by Landowner			Total Area (Ha)
		Municipal	Provincial	Indian Reserve	
Thin Prune 3	Fuel Reduction – Thin/Prune/Clean	58.7		3.2	61.9
Thin Prune 4	Fuel Reduction – Thin/Prune/Clean	41.8	1.3		43.1
Fuelbreak 10	Fuel Removal – Mulch Clear 30m	1.8			1.8
A1	Fuel Reduction – Thin/Prune/Clean	35.4			35.4
A2	Fuel Reduction – Thin/Prune/Clean	14.8			14.8
	Total Area (Ha)	152.5	1.3	3.2	157.0

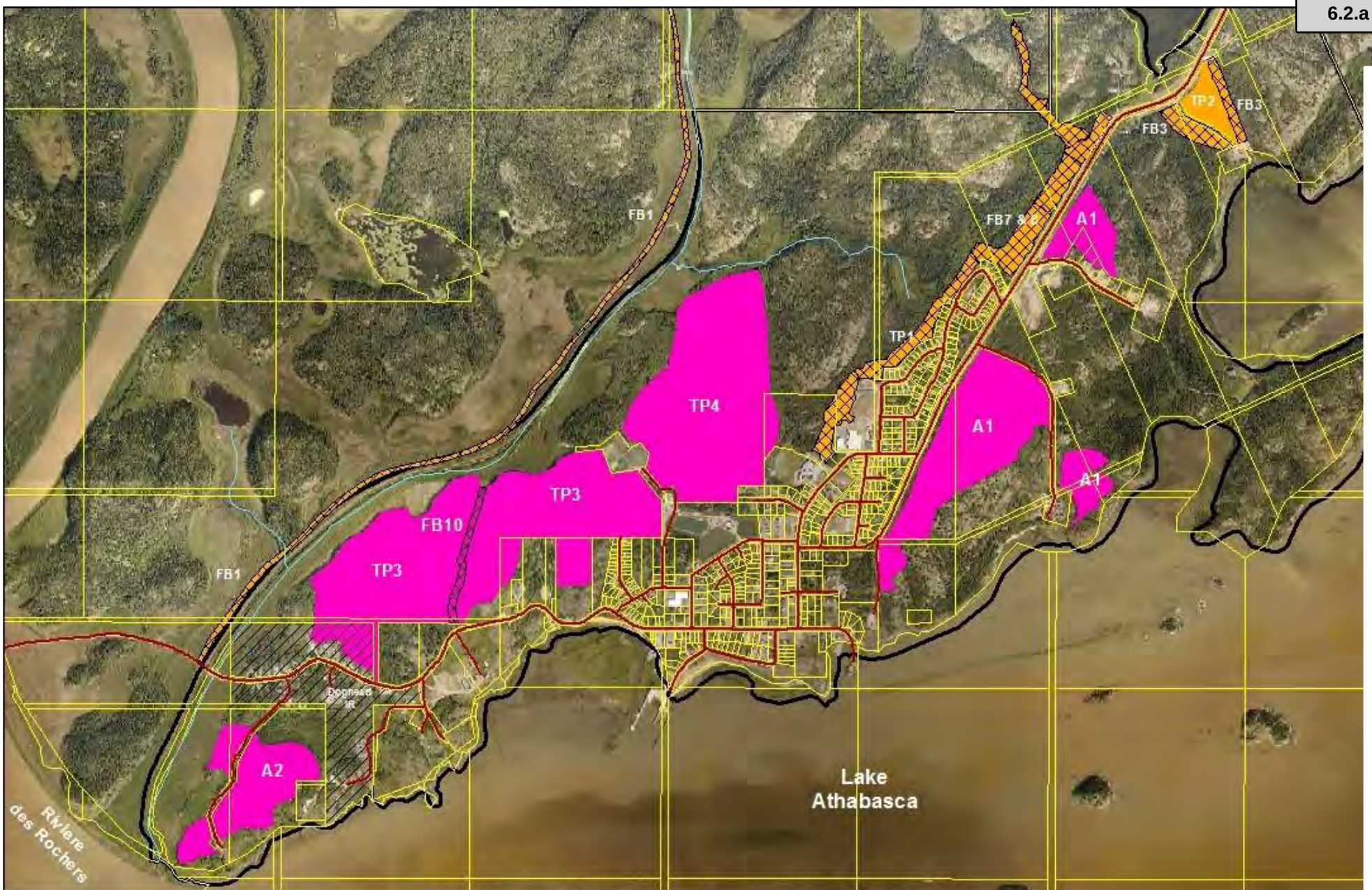


Map 4I - FireSmart Vegetation Management - Fort Chipewyan Region

- Proposed Priority A FuelMod
- Proposed Priority B FuelMod
- Completed FuelMod

N





Proposed FireSmart Vegetation Management - Fort Chipewyan

- | | |
|---|---|
| Proposed Priority A FuelMod | Fuel Reduction |
| Proposed Priority B FuelMod | Fuel Removal |
| Completed FuelMod | |



4.2.10 Fort Fitzgerald (Map 4J)

Completed Vegetation Management

Alberta Forestry completed several containment line mulching projects identified in the *Smith Regional Wildfire Mitigation Strategy* (AAF, 2016) during the winter 2016/17. Containment lines completed include FB1, FB2, FB6, FB13, FB14, and FB15.

Type	Method	Total Area (Ha)
Fuel Removal	Mulch Clear	62.1
	Total Area (Ha)	62.1



Completed Vegetation Management Area FB13



Completed Vegetation Management Areas FB1, 6, 14, & 15

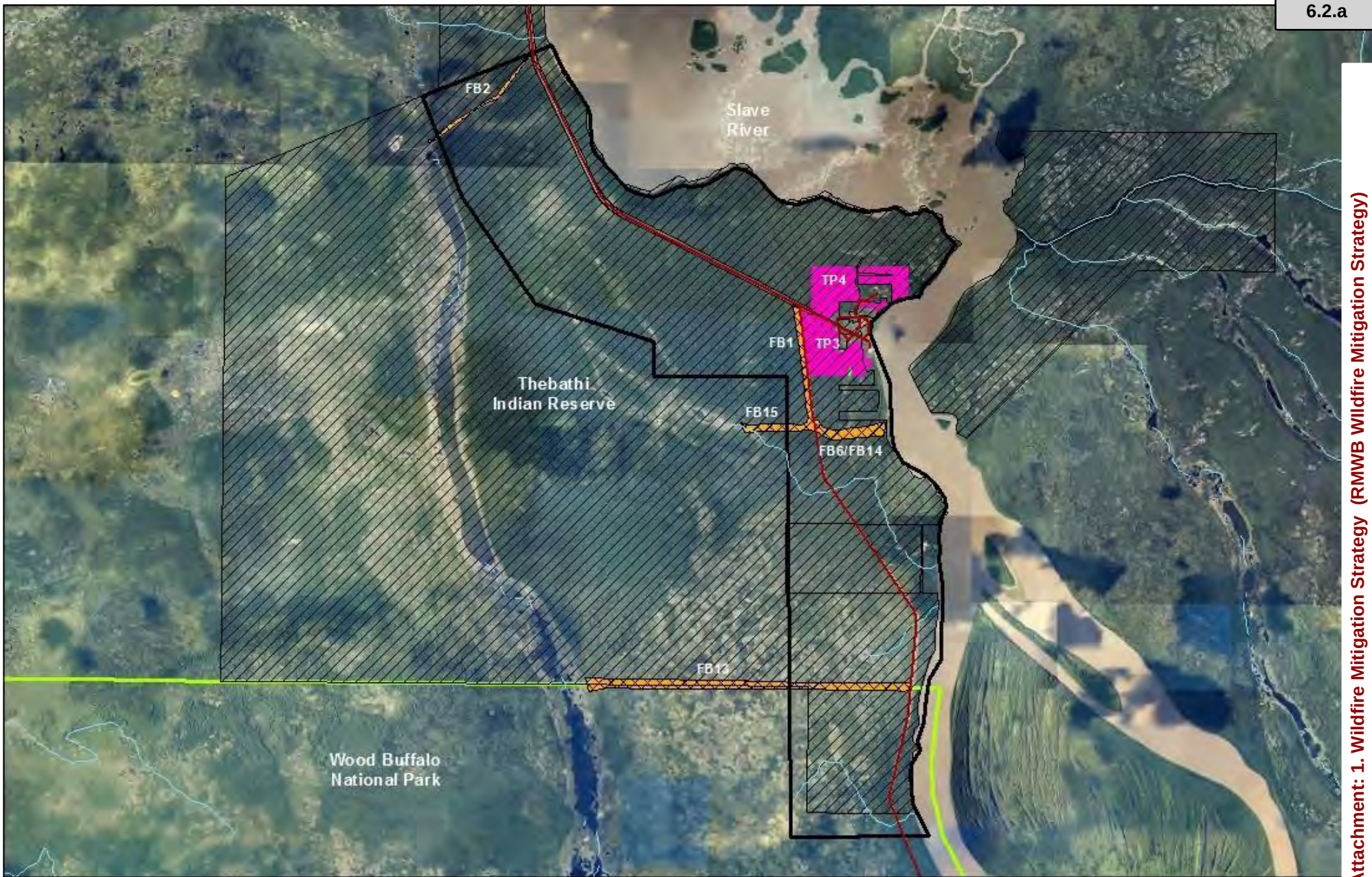
Proposed Vegetation Management

Proposed fuel reduction areas include thin/prune/clean of evergreen overstory and understory in evergreen and mixedwood fuels adjacent to structures and community as proposed in the *Smith Regional Wildfire Mitigation Strategy* (AAF, 2016) with some additions from recent imagery analysis. Additions will need ground-truthing prior to ensure accuracy.

Priority	Fuel Modification Type & Method	Approximate Area (Ha) by Landowner				Total Area (Ha)
		Muni	Prov	Federal	Indian Reserve	
Thin Prune 3	Fuel Reduction – Thin/Prune/Clean			1.5	36.0	37.5
Thin Prune 4	Fuel Reduction – Thin/Prune/Clean				44.5	44.5
	Total Area (Ha)			1.5	80.5	82.0



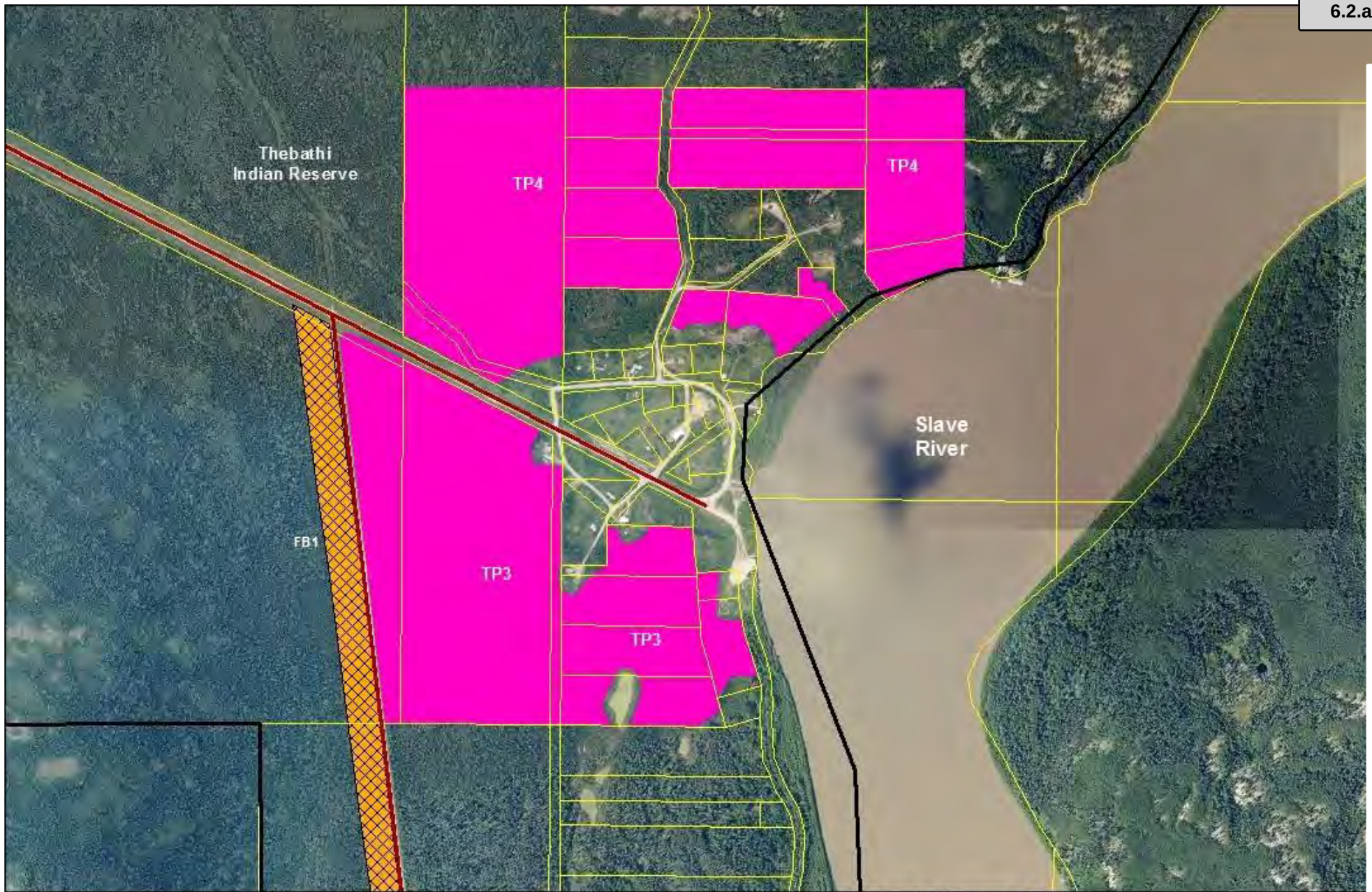
Proposed Vegetation Management Areas TP3 & TP4



Map 4J - FireSmart Vegetation Management - Fort Fitzgerald

- | | |
|---|---|
| Proposed Priority A FuelMod | Fuel Reduction |
| Proposed Priority B FuelMod | Fuel Removal |
| Completed FuelMod | |





Proposed FireSmart Vegetation Management - Fort Fitzgerald

- | | |
|---|--|
|  Proposed Priority A FuelMod |  Fuel Reduction |
|  Proposed Priority B FuelMod |  Fuel Removal |
|  Completed FuelMod | |



4.3 Vegetation Management Maintenance

Landowners and land managers must provide periodic inspections of fuel modification areas and complete maintenance as required. Fuel modification maintenance is required at various different timelines depending on several factors.

Priority Zone 1 (10 metres from structure) – must be maintained regularly throughout the fire season including:

- Watering and maintaining/mowing grass around all structures including outbuildings
- Cleaning of dead needles and leaves from roof, eaves troughs, and around/underneath structures
- Storage of combustible materials (firewood, lumber, etc.) a minimum of 10 metres from structures

Priority Zones 2-3 (10-100 metres from structure) – should be inspected and maintained as required including:

- Manage (mow/burn) native grasses a minimum of 30 metres from structures and/or lot lines
- Removal of dead and down and dead standing trees
- Thinning/removal of evergreen re-growth after original fuel reduction
- Conduct second-pass removal of evergreen overstory and understory in existing areas that do not meet FireSmart recommended guidelines

Completed fuel reduction projects in Fort McMurray, Draper, Anzac, and Conklin currently require inspections and maintenance.

Dozer guards and fuelbreaks completed during the 2016 wildfire will require regular mowing and/or burning of native grass for a minimum of 30 metres from structures and/or back lot lines to maintain fuelbreak effectiveness.

Recommendation 3: Inspect and maintain all FireSmart vegetation management areas on a regular basis.

4.4 Related Planning Documents

4.4.1 Alberta Forestry Wildfire Management Plans

The Fort McMurray and Lac La Biche Forest Areas have developed landscape-level Wildfire Management Plans to identify management strategies to reduce the wildfire risk at a landscape-level with the aim of achieving the following objectives:

- Improve decision making during wildfire events to increase effective and efficient use of resources;
- **Increase the level of preparedness for the protection of significant values at risk including human life and communities;**
- Mitigate ecological, social and economic loss, damage and/or disruption;
- Utilize a common planning standard across multiple jurisdictions to improve performance;
- Create building blocks for other planning initiatives; and,
- Create partnerships and increased awareness of wildfire and associated management practices.

A range of risks with respect to wildfire were identified across the landscape and specific actions were identified to address risks that were classified as Intolerable and/or where risk reduction measures are needed. These risk reduction measures can be grouped into four areas which include:

- Enhancing relationships with Indigenous communities, municipal, and industrial partners;
- Improving quantity and quality of intelligence used in planning and decision making;
- Developing landscape wildfire containment plans; and,
- Wildfire prevention messaging

The implementation of landscape-level wildfire management plans and risk reduction measures is encouraged to reduce the threat of landscape-level wildfire approaching RMWB communities and combined with the community-level recommendations provided in this Wildfire Mitigation Strategy will increase the protection of life and property.

Recommendation 4: Implement the landscape-level risk reduction measures in the Fort McMurray and Lac La Biche wildfire management plans to reduce the threat of landscape-level wildfire to RMWB service areas.

4.4.2 RMWB Parks Master Plan & Urban Forest Strategy

The RMWB Parks Master Plan and Urban Forest Strategy are currently under development and will have an impact on wildfire threat within the RMWB service areas. The guiding principles of the project recognize FireSmart as a requirement in the plan development process.

The hazard and risk assessment related to this Wildfire Mitigation Strategy identified that completed and proposed vegetation management along the perimeter of the Birchwood Trails/Conn Creek community reserve provide a fuelbreak that will significantly reduce the threat of wildfire to development along the perimeter. However, the forest health conditions within the centre of the reserve are overmature and unhealthy with significant dead standing and dead and down from multiple years of Spruce budworm infestation. There is a need for urban forest management planning and implementation to improve the long-term health and sustainability of the Birchwood Trails/Conn Creek community reserve while at the same time reducing the wildfire behaviour potential within the reserve.

Coordination and implementation of parks master planning and urban forest strategies and development of an Urban Forest Management Plan **with reduction of wildfire behaviour potential as an objective** will reduce the threat of community-level wildfire within the Birchwood Trails/Conn Creek community reserve.

Recommendation 5: Implement the strategic-level RMWB Urban Forest Strategy and develop and implement an Urban Forest Management Plan for the Birchwood Trails/Conn Creek community reserve to reduce the threat of community-level wildfire to RMWB service areas.

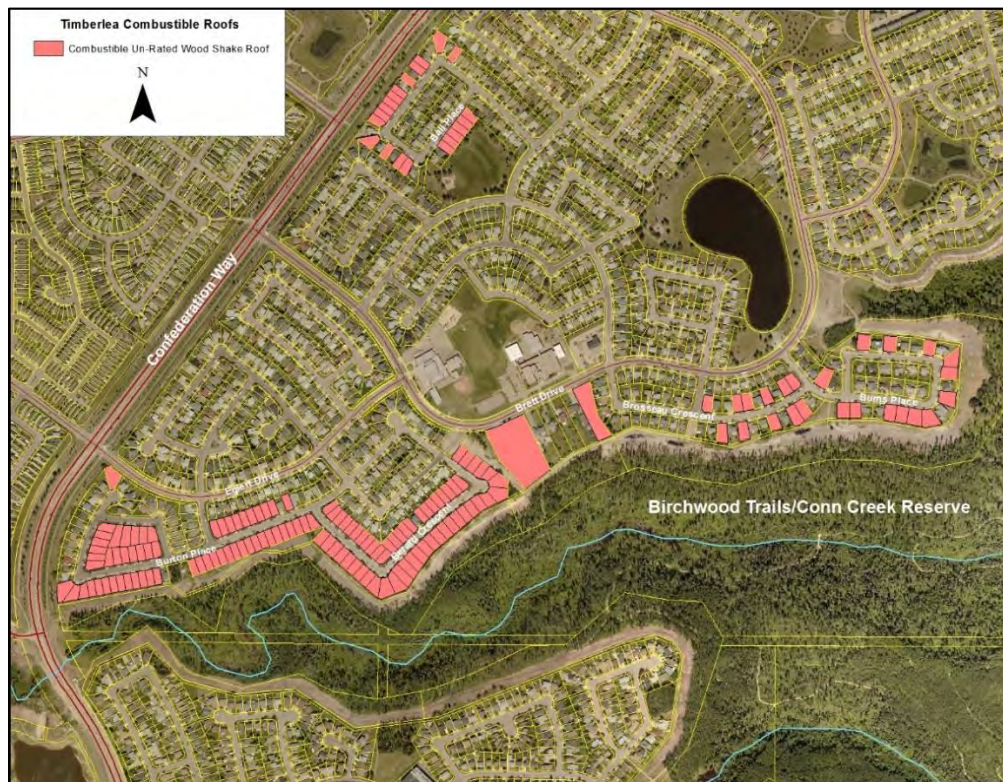
5. Development and Legislation Options

Consideration of wildfire at the development planning stage is encouraged to ensure that wildfire hazard is identified and the appropriate mitigation measures are implemented prior to and/or during development. FireSmart recommended guidelines for structural and infrastructure options may be implemented through resident education and engagement and through adoption of development legislation and policy that recognizes FireSmart principles for new and existing developments.

5.1 Structural Options

Structural characteristics that contribute to a structure's ability to withstand wildfire ignition include exterior roofing, siding, decking, and fencing materials and proper construction and maintenance of eaves, vents, and openings to reduce the threat of airborne ember ignition of the structure.

Roofing materials in all service areas consist of primarily of ULC-rated asphalt shingle and metal with scattered combustible roofs. **Fort McMurray's Burton Place, Berard Crescent, Brosseau Crescent, Burns Place, Brett Drive, and Ball Place have a significant number of structures with un-rated combustible wood-shake roofing materials** putting those structures at Extreme threat of airborne ember ignition from wildfire in the Birchwood Trails/Conn Creek reserve.



Combustible Wood-Shake Roofing Materials in Timberlea

Siding materials consist primarily of combustible wood or vinyl siding with scattered structures having combustible log or non-combustible stucco, fibre-cement, concrete, or metal siding.

Combustible wooden decks and porches with open undersides are common throughout all service areas and wooden fencing up to the structure is common in Fort McMurray and scattered in Anzac and Fort McKay.



New Combustible Un-Rated Wood Shake Roof – Fort McMurray



Common Exterior Materials – Fort McMurray



Common Exterior Materials – Rural Service Areas



Combustible Un-Skirted Decking

FireSmart recommended guidelines for structural options include:

FireSmart Recommended Guidelines for Structural Options

Feature	FireSmart Recommended Guidelines
Roofing	▪ Use only ULC-rated Class A, B, or C roofing materials ▪ Clear all overhanging branches or needles and combustible debris on roof surfaces or in gutters
Siding	▪ Use only fire-resistant materials extending from ground-level to the roofline
Decks/Porches	▪ Use non-combustible or fire-resistant materials ▪ Enclose undersides with fire-resistant sheathing ▪ Provide access to slotted-deck surface undersides to allow for regular debris removal
Fencing	▪ Use non-combustible materials ▪ If a wood fence is installed, ensure there is a minimum 1.5 metre non-combustible break between the combustible wood portion of the fence and the furthest projection of the structure

Recommendations for implementation of structural options are provided in Section 5.3 – Development Legislation and Policy Options and Section 6.1 – Public Education and Engagement Options.

5.2 Infrastructure Options

Infrastructure options include provision of adequate access standards, adequate and accessible fire suppression water supply, utility installation standards, and adequate road and address signage to increase resident and firefighter safety and facilitate a quicker and more effective response by firefighters and planning and development of parks and open spaces into community design to act as fuelbreaks between wildland fuels and structures.

The *Regional Municipality of Wood Buffalo Engineering Services Standards and Development Procedures* (RMWB, 2017) provide procedures and standards on the development of land and the construction of public and private infrastructure in the Municipality and new developments must conform with *NFPA 1141 – Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas* (NFPA, 2017).

5.2.1 Access

Interface communities with only one access route in and out face the risk of having wildfire block the access route. Fort McMurray and Fort McKay both rely on the Highway 63 corridor as the main route of ingress and egress from the region and this route has been blocked by wildfire several times in the past. Highway 881 serves as the secondary ingress and egress route.

RMWB service areas that have only one access route in and out include Fort McKay, Draper, Sapræ Creek, Janvier, Anzac, and Fort Fitzgerald. Fort Chipewyan has no road access during the summer season. Conklin has a secondary means of access to Highway 881 on the Harvest Black Gold road and Gregoire Lake Estates uses Highway 881 north or south. The RMWB has made the development of the East Clearwater highway as a regional-level alternate egress and emergency evacuation route its highest priority mitigation requirement and has been considering alternative egress routes for each of the Service Areas.



Proposed East Clearwater Highway



Draper Driveway Access Standards

Main access road standards throughout the urban and rural service areas are generally adequate consisting of all-weather loop and dead-end designs with adequate traveled surface width and turn-around dimensions for fire apparatus.

Driveway access to several lots in Draper are narrow, steep, and have poor surface cover making access to structures with fire apparatus and crews difficult and unsafe during wildfire conditions.

5.2.2 Fire Suppression Water Supply

All of the service areas have overhead fill stations at the water treatment plants. Pressurized fire-hydrant supply is provided in Fort McMurray and Fort Chipewyan and parts of Fort McKay, Anzac and Saprae Creek Estates. There is currently no pressurized fire-hydrant supply in Gregoire Lake Estates, Draper, Janvier, Fort Fitzgerald, and Conklin however rural service area water supply upgrades in 2017/18 include pressurized fire-hydrant installation/upgrades for Anzac, Conklin, Gregoire Lake Estates, and Saprae Creek Estates.

Section 3.1.3 of the draft Draper Area Structure Plan (RMWB, 2015) states that access points for dry hydrants along the Clearwater River shall be explored to provide firefighting water supply.

5.2.3 Utilities

Power distribution is provided by overhead and underground distribution and service lines and ATCO Electric provides regular inspection and tree-freeing services for their lines.

Heating fuel is primarily underground natural gas. Draper relies on propane and all structures have 500-1000 gallon propane tanks, some of which do not meet FireSmart recommended guidelines related to vegetation clearance surrounding the tank.

5.2.4 Road and Address Signage

Road and address signage meeting FireSmart recommended guidelines provides emergency responders with quicker response to values at risk during a wildfire. FireSmart recommended guidelines for road and address signage include:

- Signs should be clearly visible and legible from the road and use a consistent system of sequenced numbering
- Signs and posts should be built of non-combustible materials and mounted 2 metres above the surface of the road
- Letters, numbers, and symbols should be a minimum of 10 centimetres high, reflective, and contrast with the background color of the sign



Road Signage Meeting FireSmart Recommended Guidelines



Address Signage Meeting FireSmart Recommended Guidelines

Road and address signage in the Fort McMurray urban service area meets FireSmart recommended guidelines however the rural service areas do not.

- Road Signage – Signs meet FireSmart recommended guidelines but are installed on **combustible wood posts**
- Address Signage – not commonly posted, not standardized, does not meet FireSmart recommended guidelines/ NFPA 1141 standards



Rural Service Area Road Signage Not Meeting FireSmart Guidelines



Rural Service Area Address Signage Not Meeting FireSmart Guidelines

Recommendation 6: Ensure that the following infrastructure options are improved to meet FireSmart recommended guidelines:

- Secondary access routes for all service areas where feasible
- Driveway access standards for all new developments
- Identification and development of dry-hydrant fire suppression water supply for Draper
- Danger tree removal along overhead powerlines
- Propane tank clearance from wildland fuels
- Road and address signage

5.2.5 Parks and Open Spaces

Community parks and open spaces that are properly landscaped and maintained provide excellent fuelbreaks between hazardous wildland fuels and interface structures. Examples include athletic parks, golf courses, cemeteries, parking lots, and playgrounds.

The Syncrude Athletic Park, Fort McMurray Golf Club fairways, Abasand cemetery, several of the mowed grass buffers around the perimeter of developments in Fort McMurray, and the Anzac Recreation Centre Park are examples of the benefit of developing parks and open spaces on the perimeter of developed areas to act as fuelbreaks.



Syncrude Athletic Park Fuelbreak



Fort McMurray Golf Club Fairways



Abasand Cemetery



Anzac Recreation Centre Park

Recommendation 7: Include the planning and development of maintained parks and open spaces as fuelbreaks as a consideration in the RMWB development planning process.

Field inspection of many of the RMWB municipal park areas within the urban and rural service areas and review of Section 10 – Landscape and Park Development Standards of the *RMWB Engineering Services Standards* (RMWB, 2017) revealed:

- Grass/turf irrigation and maintenance on all parks visited is excellent and the maintained turf buffers in Beacon Hill, Thickwood, Dickensfield, and Timberlea provide excellent fuelbreaks
- Planting of flammable evergreen trees in clusters close to structures
- Section 10.4.9 Recommended Plant List in the Engineering Services Standards recommends several evergreen tree and shrub species including white spruce and balsam fir trees and juniper and mugho pine shrubs with no requirement on where they can be placed relative to structures
- Use of wood chips/bark mulch in many of the planting beds and tree wells close to structures
- Requirement of Section 10.7.4.1 of the Engineering Services Standards for the installation of wood-screen fencing between private property and public open-space lands creates higher wildfire threat



Flammable Landscaping Materials in Fort McMurray Park



Flammable Trees Planted in Fort McMurray Park Close to Homes

Recommended revisions to the RMWB Engineering Services Standards are provided in Section 5.3.4.

5.3 Development Legislation & Policy Options

Legislating FireSmart requirements for development is an important step to creating FireSmart communities. The following RMWB documents were reviewed relating to FireSmart regulation and policies:

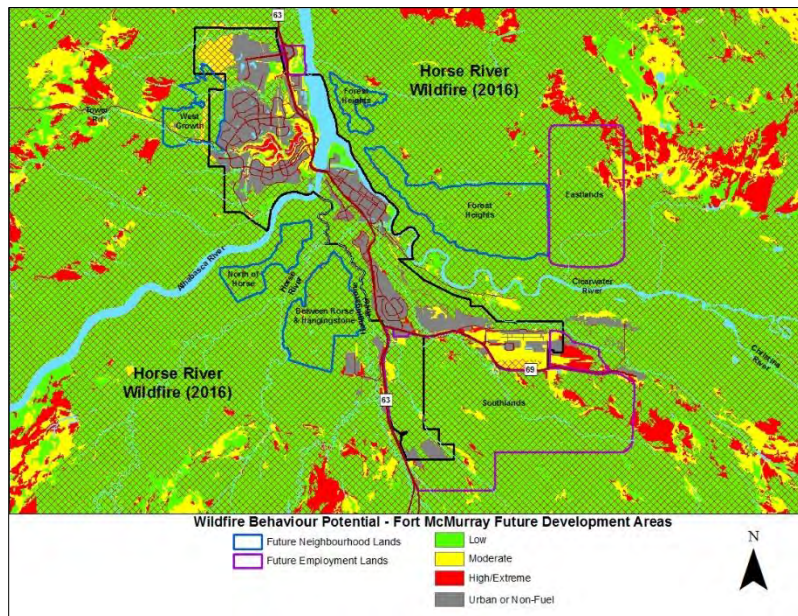
- RMWB Municipal Development Plan
- RMWB Area Structure Plans
- RMWB Land Use Bylaw
- RMWB Engineering Services Standards
- RMWB Comprehensive Approach to Mitigating Risks of Natural Hazards

5.3.1 RMWB Municipal Development Plan (MDP)

The MDP recognizes wildfire as common hazard in the provides two policy directions:

- Direction 1.4.2 recognizes that emergency preparedness and management is critical to safety and well-being of residents and protection of property in the event of wildfire including, where feasible, establishing a minimum of two access routes in rural communities and urban neighbourhoods.
- Direction 1.4.4 states that effective fire prevention for wildfires and structural fires can safeguard lives and property.
 - To protect against wildfires the Municipality will promote FireSmart communities designed in accordance with best practices.
 - Wildfire risks and fire service access are primary considerations in land use decisions.
 - Fire mitigation information will be provided to residents.

Future development areas are identified for the Fort McMurray urban service area and Anzac rural service area. Most areas identified were impacted by the 2016 Horse River wildfire and wildfire behaviour potential has been reduced for the short to mid-term. Unburned green-islands still exist and wildfire behaviour potential will increase in burned-over areas as vegetation re-establishes over time. This must be considered when future development areas are being considered.



Current Wildfire Behaviour Potential for Fort McMurray Future Development Areas

5.3.2 Area Structure Plans

Areas Structure Plans for Anzac, Janvier, Conklin, Draper (draft), Willow Lake (Gregoire Lake Estates), and several within Fort McMurray recognize wildfire as a development hazard and recommend incorporation of recommendations from *FireSmart – Protecting Your Community from Wildfire* (PIP, 2003) and/or the applicable FireSmart plan for the community.

5.3.3 RMWB Land Use Bylaw (LUB)

The current Land Use Bylaw has one regulation relating to FireSmart development. Section 90(1)(e) states that campground design and maintenance shall comply with wildland/urban interface recommendations provided in the FireSmart manual.

5.3.4 RMWB Engineering Services Standards and Development Procedures (ESS)

The ESS provide procedures, standards, and minimum requirements on the development of land and the construction of public and private infrastructure in the RMWB. Some of the ESS standards support FireSmart recommended guidelines while others conflict.

The following ESS standards **support** FireSmart recommended guidelines.

2.6.2 Wildfire Risk Assessment - requires the developer to prepare and submit a Wildfire Risk Assessment for all proposed developments adjacent to Moderate, High, or Extreme hazard areas and requires the developer to implement the Wildfire Risk Assessment recommendations as a condition of development approval.

4.2.3 Access Standards - requires that development access is designed in conformance with the requirements of NFPA 1141 Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas (NFPA, 2017) which meets FireSmart recommended guidelines.

7 and 9 Fire Suppression Water Supply – Sections 7.2.2 and 7.2.3 require that fire flows meet national and/or provincial standards and that fire-hydrants will be required for all urban developments and for rural developments where piped water distribution systems exist within the vicinity of the development and Section 7.9.1 details required hydrant locations. Section 9.4.4 requires that fire pumps be driven with diesel engines or electric motors with standby diesel generators.

8.2 Underground Utility Design Standards – states that for all urban and rural hamlet applications, power shall be underground and for isolated rural applications where the underground power installation may not be practical, above-ground power may be acceptable.

10.2.4 FireSmart – requires that all existing vegetation to remain inside or within 100 metres of the development shall receive treatment in accordance with the Wildfire Risk Assessment and/or FireSmart recommended guidelines.

The following standards from ESS Section 10 - Landscaping and Park Development Standards **conflict** with FireSmart recommended guidelines.

10.4.6 Mulch – states that there shall be 75mm of mulch placed in planting beds and tree wells covering the entire excavated area which increases the risk of wildfire ignition and threat to adjacent structures.

10.4.9 Recommended Plant List – recommends several flammable evergreen tree and shrub species including white spruce and balsam fir trees and juniper and mugho pine shrubs which increases wildfire threat to adjacent properties.

The following revisions to Section 10 of the Engineering Services Standards are provided for consideration.

Factor	Recommendation(s)
Use of Mulch in Planting Beds and Tree Wells	Remove the requirement to use mulch in all planting beds and tree wells that are within 10 metres of lot lines
Recommended Plant List	Review the recommended plant list and add a requirement that only fire-resistant trees and shrubs will planted within 10 metres of private lot lines and that evergreen trees (spruce/pine/fir) and shrubs (juniper/pine) will be widely spaced within 30 metres of private lot lines.

Recommendation 8: Review and revise Section 10 – Landscape and Park Development Standards of the *RMWB Engineering Services Standards* to prohibit planting of evergreen trees and shrubs and the use of bark mulch/wood chips within 10 metres of any structures.

5.3.5 RMWB Comprehensive Approach to Mitigating Risks of Natural Hazards

The RMWB Comprehensive Planning Branch conducted a desktop research exercise to determine how they can bring natural hazard mitigation and avoidance strategies into statutory plans and other planning documents. Although the research investigated all of the natural hazards that exist in the region, the findings reported focus mostly on the mitigation of risks from wildfire.

The process included a review of the RMWB statutory planning documents, including the Municipal Development Plan, Area Structure Plans and Area Redevelopment Plans, to determine whether they adequately address risks posed by wildfire, flooding, and other natural disasters. This analysis shows that while the existing statutory documents do include some policies to address natural hazards, the approach is not consistent or comprehensive and **it is important that the recommendations from the Municipality's Wildfire Mitigation Strategies be built into statutory documents so they hold more weight and are implemented in a comprehensive manner.**

The document provides a look at the strategies and specific tools for implementation that the RMWB can use to reduce the risk from natural hazards related to:

- Community and subdivision design
- Vegetation and fuel management
- Building materials and design
- Water supply and water quality management

The document provides tools for implementation including the provision of FireSmart requirements for subdivision design and exterior building materials and design in the RMWB Municipal Development Plan, Area Structure Plans, Land Use Bylaw, and building codes.

5.3.6 Proposed FireSmart Development Revisions

Proposed FireSmart development revisions for exterior building materials are provided below and when combined with the strategies provided in the “*Comprehensive Approach to Mitigating Risks of Natural Hazards*” (RMWB, 2016) will include that FireSmart recommended guidelines being implemented at the development design, construction, and retro-fit stage.

The RMWB Planning & Development and Regional Emergency Services departments should determine the best ways to implement these proposed revisions as well as those provided in the “*Comprehensive Approach to Mitigating Risk of Natural Hazards*”.

Factor	Proposed Revisions
Roofing Materials	All roofing materials on new, replacement, or retrofitted dwellings, accessory buildings and commercial buildings shall meet a minimum Class “C” U.L.C. rating or as specified by the Development Authority.
Siding Materials	All siding materials on new, replacement, or retrofitted dwellings, accessory buildings and commercial buildings within 50 metres of Moderate, High and Extreme wildfire behaviour potential class areas shall use fire-resistant materials extending from ground level to the roofline or as specified by the Development Authority.
Decking Materials	- All exterior deck materials on new, replacement, or retrofitted dwellings, accessory buildings and commercial buildings within 500 metres of Moderate, High and Extreme wildfire behaviour potential class areas shall use fire-resistant materials or as specified by the Development Authority. - All new dwellings, accessory buildings, and commercial buildings with exposed undersides and/or with raised decks and porches less than 2 metres from ground level shall be sheathed from the floor level to the ground level with non-combustible materials to prohibit the entry of sparks and embers under the structure. - All new dwellings, accessory buildings, and commercial buildings with exposed undersides and/or raised decks and porches more than 2 metres from ground level shall have and maintain a non-combustible surface cover underneath and for a minimum of 1.5 metres surrounding.
Fencing Materials	All fencing on new, replacement, or retro-fitted residential and commercial properties within 500 metres 2 kilometres of Moderate, High and Extreme wildfire behaviour potential class areas shall use non-combustible materials within 1.5 metres of the outermost projection of the structure.

Recommendation 9: Consider revision of the current RMWB statutory planning documents and provide input to Building Code revisions to meet FireSmart recommended guidelines.

6. Public Education & Engagement Options

Many of the structures within the RMWB service areas are at High-Extreme threat to wildfire due to inadequate structural options and Priority Zones 1-2 vegetation management on private lands. Residents, business owners, developers, and RMWB administration and elected officials all need to be aware of the FireSmart hazard and the solutions to minimizing the risk and become a partner in implementation of FireSmart solutions in their own backyards and communities.

6.1 FireSmart Hazard Assessments

Residents would benefit from a FireSmart Hazard Assessment of their home and property, from a qualified individual, to identify those items that present wildfire threat and recommended methods to reduce that threat. *FireSmart - Protecting Your Community from Wildfire* (PIP, 2003) and the *FireSmart Homeowners Manual* (AB. Forestry, 2017) both provide FireSmart Hazard Assessment templates that can be used.

FIRESMART SCORE CARD

Assess Your Risk from Wildfire

Answer the questions below to see what changes will make the greatest difference in reducing your home's risk from wildfire.

HOME / 10 metres		ZONE 1	
What type of roofing material do you have?	Metal, clay tile, asphalt shingle or ULC-rated shakes (may be affected by the condition of your roof)	0	
	Unrated wood shakes	30	
How clean is your roof?	No needles, leaves or other combustible materials	0	
	A scattering of needles and leaves	2	
	Clogged gutters and extensive leaves	3	

Recommendation 10: Identify and train RMWB Emergency Services urban and rural members to provide FireSmart Hazard Assessments and options to reduce the wildfire threat to those residents that request one.

6.2 Key Messages

The following key messages are developed from field observations during the development of this Wildfire Mitigation Strategy and are recommended to educate residents on their priorities to reduce the threat of wildfire to their structures.

- Use non-combustible roofing, siding, decking, and fencing materials for new structures or renovations of existing structures
- Skirt the undersides of your decks and porches to reduce the chances of fire getting underneath and ensure that decks greater than 2 metres from ground-level have a non-combustible surface cover underneath and surrounding for a minimum of 1.5 metres
- Priority Zones 1 and 2 are the most important areas for residents to conduct FireSmart vegetation management
 - Priority Zone 1 (0-10m from structure) should not support wildfire of any kind.
 - Have a non-combustible surface cover (irrigated/maintained lawn <10cm height, gravel)
 - Use fire-resistant trees and shrubs and remove flammable species such as spruce, juniper and cedar
 - Do not use bark mulch or wood chips for landscaping
 - Store all combustible materials and piles (firewood, debris, ATV's, petroleum products) greater than 10m from the structure
 - Remove ground litter and dead/down and dead standing trees annually
 - Priority Zone 2 (10-30m from structure) should only support wildfires of lower intensity and rate of spread.
 - Thin or remove the spruce, fir, and pine trees
 - Prune limbs or residual evergreen trees up to 2m from ground-level
 - Provide annual maintenance of grass, ground litter, and dead/down and dead standing trees
- Call RMWB Emergency Services to arrange for a FireSmart Hazard Assessment of your home and property
- Install address signage meeting FireSmart standards at the entrance to your property

Recommendation 11: Develop and implement a focused long-term and repetitive FireSmart education program on FireSmart recommended guidelines for all RMWB stakeholders.

6.3 FireSmart Canada Community Recognition Program

FireSmart Canada has initiated the FireSmart Community Recognition Program to motivate and engage residents to plan and take FireSmart actions in their “own backyards” to reduce wildfire losses from the “grassroots” level.



The program is driven through identification and training of key Municipal and wildland fire agency personnel to act as Local FireSmart Representatives to guide the process and community members to act as Community Champions to lead and implement the FireSmart Community Recognition Program within their community.

Recommendation 12: The RMWB should identify and train key personnel from urban and rural Emergency Services and Parks Services to act as Local FireSmart Representatives and to identify and work with the appropriate Community Champions within the RMWB service areas to work towards Recognized FireSmart Community status.

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 FireSmart mitigation options and to coordinate an effective multi-agency response to a wildland/urban interface fire.

7.1 Inter-Agency Cooperation

Inter-agency stakeholders within the planning area include:

- Regional Municipality of Wood Buffalo
- AB. Agriculture & Forestry – Fort McMurray and Lac La Biche Forest Areas
- Oil Sands Companies

The RMWB FireSmart Committee works collaboratively to identify funding sources, set mitigation priorities, and implement FireSmart activities throughout the RMWB and consists of representatives from:

- Regional Municipality of Wood Buffalo – Recovery, Emergency Services, Parks
- AB. Forestry – Fort McMurray and Lac La Biche



The RMWB and Alberta Forestry hold a Mutual-Aid Wildfire Agreement with each other for mutual-aid wildfire response and use it to assist each other regularly with response, prevention, and cross-training activities. RMWB Emergency Services Fire Prevention Officers have attended the Wildfire Prevention course and the Public Education Officer has attended the Wildfire Information Officer course at AB. Forestry's Hinton Training Centre (HTC), sponsored by AB. Forestry, and have found both to be very beneficial.

The RMWB holds mutual-aid agreements with oil sands operators that have fire departments.

7.2 Cross-Training

The RMWB has offered and provided emergency management, wildfire, and wildland/urban interface cross-training to their staff including:

- Incident Command System (ICS-100 to 400)
- Wildland Fire Fighter (NFPA 1051)
- Fire Operations in the Wildland/Urban Interface (S-215)

RMWB Emergency Services has identified that additional wildland and wildland/urban interface training is provided to all urban and rural emergency services members. Cross-training options may include:

Emergency Management:

- Introduction to ICS (I-100)
- Basic ICS (I-200)
- Intermediate ICS (I-300)
- Advanced ICS (I-400)
- ICS for Executives (I-402)
- Emergency Coordination Centre Workshop

Wildfire Prevention:

- Wildfire Prevention (HTC)
- Local FireSmart Representative Workshop (FireSmart Canada)

Wildfire Operations:

- Wildland Firefighter (NFPA 1051 Level I)
- Wildfire Information Officer (HTC)

Wildland/Urban Interface:

- Structure & Site Preparation/Sprinkler Workshop
- Fire Operations in the Wildland/Urban Interface (S-215)

Recommendation 13: The RMWB and AB. Forestry should identify cooperative training opportunities and provide support to each other for applicable cross-training related to emergency management, wildfire prevention, wildfire operations, and wildland/urban interface. RMWB personnel should be cross-trained and qualified based on their participation in the emergency management organization.

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 a wildland/urban interface fire are of paramount importance.

8.1 RMWB Wildfire Response Plan

The *RMWB Municipal Emergency Management Plan Part III – Appendix B Wildfire Response Plan* (RMWB, 2010) provides the coordination of activities involving various municipal departments at key stages each year in advance of and during the expected wildfire season. The primary focus of the Plan is to provide a guide for key municipal departments as they work together during a wildfire incident to protect life, property, and the environment and to mitigate potential and known risks associated with wildfires in close proximity to communities and work camps within the municipality.

A review of the 2010 Plan reveals that an update to include revisions to current situation is required.

Recommendation 14: Update the RMWB Wildfire Response Plan (2010) annually to provide most current information.

8.2 Wildfire Preparedness Guides

Wildfire Preparedness Guides (WFPG) provide emergency responders with detailed tactical information to protect values at risk from approaching wildfire. WFPG's have been developed and are updated regularly by AB. Forestry for all of the RMWB service areas and are provided to RMWB Emergency Services.

Exercises to test emergency plans for operational effectiveness are an excellent tool to ensure emergency management personnel and mutual-aid partners are familiar with the tools and tactics available.

Recommendation 15: Conduct regular wildland/urban interface table-top, functional, and/or field exercises between AB. Forestry, RMWB, and applicable mutual-aid partners to test recommendations in the Horse Creek Wildfire Post-Incident Assessments, the RMWB Municipal Emergency Plan, and/or the Wildfire Preparedness Guide(s).

8.3 Structure Protection Equipment

RMWB Emergency Services has purchased two structure protection trailers that are currently stationed in Fort McMurray and Sapræ Creek with the intent of purchasing an additional three trailers for Anzac, Fort McKay, and Fort Chipewyan and possibly one for Conklin in the future. This will provide adequate sprinkler quantities for the first 24-48 hours of a wildland/urban interface fire with excellent distribution throughout the RMWB.

RMWB Emergency Services also has a wildfire equipment trailer stocked with pumps, hose, and tools.



9 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

Item	Recommendation	Responsible Agency
Priority Zone 1	Recommendation 1: Encourage residents to establish adequate FireSmart Priority Zone 1 clearance from wildland fuels on their private or leased lands.	RMWB
Priority Zone 2-3	Recommendation 2: Implement FireSmart Zone 2-3 vegetation management on Municipal and Provincial lands based on priority and available funding and encourage First Nations, residents, and lease holders to implement FireSmart Zone 2-3 vegetation management on lands under their control.	RMWB AB. Forestry
Vegetation Mgt Maintenance	Recommendation 3: Inspect and maintain all FireSmart vegetation management areas on a regular basis.	RMWB AB. Forestry
Landscape-Level Wildfire Management	Recommendation 4: Implement the landscape-level risk reduction measures in the Fort McMurray and Lac La Biche wildfire management plans to reduce the threat of landscape-level wildfire to RMWB service areas.	AB. Forestry
Urban Forest Strategy and Management Planning	Recommendation 5: Implement the strategic-level RMWB Urban Forest Strategy and develop and implement an Urban Forest Management Plan for the Birchwood Trails/Conn Creek community reserve to reduce the threat of community-level wildfire to RMWB service areas.	RMWB

Development & Legislation

Item	Recommendation	Responsible Agency
Infrastructure	Recommendation 6: Ensure that the following infrastructure options are improved to meet FireSmart recommended guidelines: ▪ Secondary access routes for all service areas where feasible ▪ Driveway access standards for all new developments ▪ Identification and development of dry-hydrant fire suppression water supply for Draper ▪ Danger tree removal along overhead powerlines ▪ Propane tank clearance from wildland fuels ▪ Road and address signage	RMWB
Parks & Open Spaces	Recommendation 7: Include the planning and development of maintained parks and open spaces as fuelbreaks as a consideration in the RMWB development planning process.	RMWB
ESS Landscape & Park Development Standards	Recommendation 8: Review and revise Section 10 – Landscape and Park Development Standards of the <i>RMWB Engineering Services Standards</i> to prohibit planting of evergreen trees and shrubs and the use of bark mulch/wood chips within 10 metres of any structures.	RMWB
Development Legislation & Standards	Recommendation 9: Consider revision of the current RMWB statutory planning documents and provide input to Building Code revisions to meet FireSmart recommended guidelines.	RMWB

Public Education & Engagement

Item	Recommendation	Responsible Agency
FireSmart Hazard Assessments	Recommendation 10: Identify and train RMWB Emergency Services urban and rural members to provide FireSmart Hazard Assessments and options to reduce the wildfire threat to those residents that request one.	RMWB AB. Forestry
Public Education Program	Recommendation 11: Develop and implement a focused long-term and repetitive FireSmart education program on FireSmart recommended guidelines for all RMWB stakeholders.	RMWB
FireSmart Canada Community Recognition Program	Recommendation 12: The RMWB should identify and train key personnel from urban and rural Emergency Services and Parks Services to act as Local FireSmart Representatives and to identify and work with the appropriate Community Champions within the RMWB service areas to work towards Recognized FireSmart Community status.	RMWB AB. Forestry

Interagency Cooperation & Cross-Training

Item	Recommendation	Responsible Agency
Cross-Training	Recommendation 13: The RMWB and AB. Forestry should identify cooperative training opportunities and provide support to each other for applicable cross-training related to emergency management, wildfire prevention, wildfire operations, and wildland/urban interface. RMWB personnel should be cross-trained and qualified based on their participation in the emergency management organization.	RMWB AB. Forestry

Emergency Planning

Item	Recommendation	Responsible Agency
RMWB Wildfire Response Plan	Recommendation 14: Update the RMWB Wildfire Response Plan (2010) annually to provide most current information.	RMWB
Emergency Exercise	Recommendation 15: Conduct regular wildland/urban interface table-top, functional, and/or field exercises between AB. Forestry, RMWB, and applicable mutual-aid partners to test recommendations in the Horse Creek Wildfire Post-Incident Assessments, the RMWB Municipal Emergency Plan, and/or the Wildfire Preparedness Guide(s).	RMWB AB. Forestry AEMA

10 References

- AAF. 2016. Smith Regional Wildfire Mitigation Strategy. AB. Agriculture and Forestry Wildfire Prevention Section, Fort McMurray Forest Area, Fort McMurray, AB.
- AAF. 2016. Fort MacKay/McKay Wildfire Mitigation Strategy. AB. Agriculture and Forestry Wildfire Prevention Section, Fort McMurray Forest Area, Fort McMurray, AB.
- AAF. 2016. Fort Chipewyan Regional Wildfire Mitigation Strategy. AB. Agriculture and Forestry Wildfire Prevention Section, Fort McMurray Forest Area, Fort McMurray, AB.
- AESRD, 2014. Lac La Biche Wildfire Management Area Wildfire Plan. AB. Environment & Sustainable Resource Development, Lac La Biche, AB.
- Bereska, W., 2004. Conklin Community Zone FireSmart Plan. AB. Sustainable Resource Development, Lac La Biche, AB.
- Bereska, W., 2004. Janvier South (Chard) Community Zone FireSmart Plan. AB. Sustainable Resource Development, Lac La Biche, AB.
- Beverly, J.L. et.al., 2010. Assessing Exposure of the Built Environment to Potential Ignition Sources Generated from Vegetative Fuel. International Journal of Wildland Fire. Vol. 19, Issue 3, pp 299-313.
- CAL-FIRE, 2011. Wildland Urban Interface (WUI) Products. California Department of Forestry and Fire Protection, Office of the State Fire Marshal, Sacramento, CA.
- FLM Farms, 2002. Janvier Wildland/Urban Interface Plan. AB. Sustainable Resource Development, Lac La Biche, AB.
- KPMG. 2017. May 2016 Wood Buffalo Wildfire Post-Incident Assessment Report – Final Report May 2017. Alberta Emergency Management Agency, Edmonton, AB.
- MNP. 2017. A Review of the 2016 Horse River Wildfire. AB. Agriculture and Forestry, Edmonton, AB.
- NFPA, 2017. NFPA 1141 – Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas. National Fire Protection Association, Quincy, MA.
- NFPA, 2013. NFPA 1144 – Standard for Reducing Structure Ignition Hazards from Wildland Fire. National Fire Protection Association, Quincy, MA.
- PIP. 2017. FireSmart Home Development Guide. Partners in Protection and the Cooperators, Edmonton, AB.
- PIP. 2016. FireSmart Homeowner's Manual. Partners in Protection, Edmonton, AB.
- PIP. 2003. FireSmart – Protecting Your Community from Wildfire. Partners in Protection, Edmonton, AB.

Podur, J., Wotton, M. 2011. Defining Fire Spread Event Days for Fire-Growth Modelling. International Journal of Wildland Fire 2011, 20, Clayton, Australia.

RMWB, 2016. Comprehensive Approach to Mitigating Risks of Natural Hazards. RWMB Comprehensive Planning Branch, Planning and Development Dept., Fort McMurray, AB.

RMWB, 2016. Regional Municipality of Wood Buffalo Engineering Services Standards and Development Procedures includes Addendum #1 June 9, 2017. RMWB, Fort McMurray, AB.

RMWB, 2010. Regional Municipality of Wood Buffalo Municipal Emergency Plan Part III – Appendix “B” Wildfire Response Plan. RMWB, Fort McMurray, AB.

RMWB, 2011. Regional Municipality of Wood Buffalo Municipal Development Plan Bylaw No. 11/027. RMWB, Fort McMurray, AB.

RMWB, 2010. Regional Municipality of Wood Buffalo Land Use Bylaw 99/059 consolidated as of June 9, 2010. RMWB, Fort McMurray, AB.

Taylor, S.W.; Pike, R.G.; Alexander, M.E. 1997. Field Guide to the Canadian Forest Fire Behaviour Prediction (FBP) System. Canadian Forest Service, Edmonton, AB.

Walkinshaw, S. 2016. Regional Municipality of Wood Buffalo Post-Fire Wildfire Hazard Assessment. Regional Municipality of Wood Buffalo, Fort McMurray, AB.

Walkinshaw, S. 2010. Regional Municipality of Wood Buffalo Wildfire Mitigation Strategy. Regional Municipality of Wood Buffalo, Fort McMurray, AB.

Walkinshaw, S. 2007. Conklin Wildland/Urban Interface Plan Review. Alberta Sustainable Resource Development, Lac La Biche, AB.

Westhaver, A. 2017. Why Some Homes Survived: Learning from the Fort McMurray Wildland/Urban Interface Fire Disaster, ICLR Research Paper Series Number 56. Institute for Catastrophic Loss Reduction, Toronto, ON.

Appendix I - Definitions

Community-Level - lands within the community boundary.

FireSmart - a program aimed at reducing interface community losses to wildfire through development of fire-adapted communities using the seven-disciplines of wildland/urban interface approach.

Fuel Reduction – reduction of flammable vegetation through thinning, pruning, mowing/brushing, etc.

Fuel Removal – removal of all flammable vegetation and combustible debris through clearing, harvesting, burning, and/or moving.

Green-Islands – stands of forest that were unburnt after the 2016 wildfire.

Landscape-Level - lands extending approximately 2 kilometres out from the community boundary.

Wildfire Mitigation Strategy – a preventative plan outlining wildfire hazard and risk to community values and providing mitigative options to reduce the impact of wildfire to the community.

Wildfire Preparedness Guide – an operational guide to assist providing emergency responders with detailed tactical information to protect values at risk from approaching wildfire.