

Appendix A



MUNICIPAL DISTRICT
BONNYVILLE NO. 87

Wildfire Mitigation Strategy

FRIAA Project Grant Agreement FFP-19-07

Prepared for: M.D. of Bonnyville No. 87

February 2020

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ACKNOWLEDGEMENTS



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The *Guidebook for Community Protection* (Alberta Environment and Sustainable Resource Development, 2013), and *FireSmart: Protecting your Community from Wildfire* (Partners in Protection, 2013) were utilized in the development and writing of this document.

This FireSmart Plan was prepared with involvement from key stakeholders via a FireSmart Committee and through project support outside of the committee. Representative include:

- Dwayne Ethier (Regional Fire Authority, Regional Training and Fire Prevention Officer, M.D. of Bonnyville)
- Clifton McKay (Wildfire Technologist, Alberta Agriculture and Forestry)
- James Couse (Forest Officer, Alberta Agriculture and Forestry)
- Curtis Scott (ATCO)
- Calvin Sikstrom (Marie Lake FireSmart Committee)
- Andy Gesner (FRIAA Representative)



EXECUTIVE SUMMARY



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The **Wildfire Mitigation Strategy** (WMS) and **Wildfire Preparedness Guides** (WPG) for the M.D. of Bonnyville were developed as part of a FRIAA FireSmart project grant (FFP-19-07). These documents were developed using data and information collected from the M.D. of Bonnyville **Wildfire Hazard and Risk Assessment** (WHRA) (FFP-18-17, December 2018). The WMS is used to develop and implement recommendations based on hazards and risks identified in the WHRA to provide a proactive approach to reduce impacts of a potential wildfire event. The Wildfire Preparedness Guides include all emergency response information necessary for wildfire response. These can be found in **Appendix 3**.

The WHRA identified 4 high-hazard communities within the M.D. of Bonnyville which include the Hamlet of Ardmore, Crane Lake, Evergreen Estates, and Marie Lake. These communities, along with the Summer Village of Pelican Narrows, are the focus of this document due to the high hazard rating and concern from emergency response services.

This project also includes the establishment of a FireSmart Committee made up of various stakeholders within the Municipal District. Three FireSmart Committee meetings were held, giving stakeholders opportunity to provide input and feedback into the mitigation strategies and preparedness guides. The FireSmart Committee was crucial in the development of this document.

Thirty-nine recommendations are being made to the M.D. of Bonnyville including some community-specific recommendations. The mitigation strategies are separated based on the 7 Wildfire-Urban Interface (WUI) FireSmart disciplines:

- Public Education
- Development
- Vegetation Management
- Legislation
- Inter-Agency Cooperation
- Cross Training
- Emergency Planning

A summary of the recommendations for the communities in focus and the Municipal District are listed in **Tables 1 and 2**. Refer to *Section 4* and *Section 5* of this document for more details on the mitigation strategies.

Table 1: Summary of Recommendations for the Focus Communities

Type	Recommendation
Development (Access)	Pelican Narrows <ul style="list-style-type: none"> • Completion of secondary access/egress repair.
	Marie Lake <ul style="list-style-type: none"> • Residential woody debris disposal. • Create lake access for emergency vehicles. • Add a gate on lake access trail for use only in emergency situations.
Vegetation Management	Ardmore <ul style="list-style-type: none"> • Application of vegetation maintenance in the Ignition Zones surrounding structures including: <ul style="list-style-type: none"> - Vegetation maintenance in the Non-combustible Zone and Zones 1 and 2. - Managing vegetation along fence lines on the west perimeter of the community. - Decrease flammable materials the Non-combustible Zone and Zone 1. - Clear all vegetation surrounding flammable items. - Landscaping with fire resistant vegetation.
	Marie Lake <ul style="list-style-type: none"> • Fuel modification in forested stands between cul-de-sacs. • Inspect and conduct maintenance (if necessary) in areas of previous fuel modification every 5 years. • Additional vegetation management including:

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Type	Recommendation
	<ul style="list-style-type: none"> - pruning of low hanging branches, - removal of suppressed trees, standing dead (except for wildlife trees) and clusters of small conifers, - removal of dead and downed woody debris in mixedwood stand between RR 23 and RR 22A, and - reducing fuel load in mixedwood stands east of RR 22A (removal of dead and downed, thinning, pruning).
	<p>Crane Lake:</p> <ul style="list-style-type: none"> • Inspect and conduct maintenance (if necessary) in areas of previous fuel modification every 5 years. • Fuel modification in mixedwood stands south/southeast of Crane Lake East M.D. Park. • Additional fuel modification in stands on west end of Crane Lake. • Ensure campground fire pits are in accordance to Bylaw No. 1668 (<3 m from combustible materials). Maintain a 1.5 debris-free radius surrounding pits (e.g. dead leaves, vegetation).
	<p>Evergreen Estates:</p> <ul style="list-style-type: none"> • Fuel modification in the conifer stands west of the community. • Application of vegetation maintenance in the Ignition Zones surrounding structures including: <ul style="list-style-type: none"> - Vegetation maintenance in the Non-combustible Zone and Zones 1 and 2. - Decrease flammable materials the Non-combustible Zone and Zone 1. - Clear all vegetation surrounding flammable items. - Landscaping with fire resistant vegetation.
Vegetation Management / Education	<p>Pelican Narrows:</p> <ul style="list-style-type: none"> • Develop demonstration areas within the community to: <ul style="list-style-type: none"> - provide FireSmart educational opportunities for residents, and - decrease fuel loads in areas with over-mature conifer and abundant ladder fuels and dead and downed materials

Table 2: Summary of Recommendations for the M.D. of Bonnyville

Type	Recommendation
Education	<ul style="list-style-type: none"> • Educate and encourage community member involvement with FireSmart activities, especially during high-fire season. Distribute information regarding FireSmart Ignition Zones. • Educate the public on the importance, benefits, and development of a 72 h Preparedness Plan. Refer residents to the Government of Canada Emergency Preparedness website (getprepared.gc.ca).
	<ul style="list-style-type: none"> • Promote residents to use the “Alberta Emergency Alert” and “Alberta Wildfire” apps.
	<ul style="list-style-type: none"> • Adoption of the Home Partners FireSmart Canada Program. This will allow for FireSmart hazard assessments to be performed by qualified personnel on residential homes throughout the M.D.
	<ul style="list-style-type: none"> • Develop demonstration areas within communities to provide FireSmart educational opportunities to residents. • Encourage communities and subdivisions to work towards becoming Recognized FireSmart Communities.

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Type	Recommendation
Development	<ul style="list-style-type: none"> • Develop and implement Best Management Practices for road maintenance, upgrades, and new construction to ensure suitable access for emergency services. • Review private driveway access standards for new developments. • Certification for water access options in rural areas. • Standardized subdivision signs at community entrances. • Standardized property signage (in subdivisions and hamlets). • Align development standards for building materials with FireSmart principles. • Clearance of flammable debris surrounding fuel tanks.
Vegetation Management	<ul style="list-style-type: none"> • Promote regular maintenance of vegetation in the Ignition Zones surrounding structures. • Provide debris disposal options for residents.
Legislation	<ul style="list-style-type: none"> • Revision of Land Use Development Permit bylaws and conditions to include FireSmart principles.
Inter-Agency Cooperation	<ul style="list-style-type: none"> • Coordinate a pre-season meeting with other agencies to discuss the upcoming wildfire season.
Cross-Training	<ul style="list-style-type: none"> • Create and conduct desktop scenarios to test and understand protocols during wildfire emergencies. • Participate in joint wildfire exercises with Mutual Aid Partners. • Fire members to be cross-trained and up to date with necessary certifications. • Perform water shuttle exercises within communities that are near water bodies.
Emergency Planning	<ul style="list-style-type: none"> • Review and test out the ERP regarding wildfire emergencies. • Conduct emergency exercises for emergency operations.

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1 Introduction

A Wildfire Mitigation Strategy (WMS) is designed to assist communities in identifying their level of susceptibility to wildfire and to provide recommendations on how to mitigate against wildfire based on the risks and hazards within the community and surrounding area. The Wildfire Preparedness Guides (WPG) (**Appendix 3**) compliment the Mitigation Strategy to serve as strategic documents to assist emergency responders from the M.D. of Bonnyville during an incident within the Municipal District. These two documents will aid the M.D. in reducing fire behaviour potential, fire occurrence risk, and exposure of values at risk to fire as well as increasing the fire suppression capabilities.

In 2018, a Wildfire Hazard and Risk Assessment (WHRA) was completed for the M.D. of Bonnyville. Data was gathered from communities throughout the M.D.; data collected included community attributes which determine the hazards and risks of a wildfire threatening the wildland-urban interface. Attributes considered in the field assessments included:

- Forest fuel types
- Values at risk (standard, critical, dangerous goods, and special values)
- Access
- Presence of utilities and ignition sources
- Emergency response characteristics
- Existing fuel management schemes

The data from the WHRA was then used to develop the WMS, its recommendations, and the WPGs. The process to construct the WMS and WPGs was strategic and involved input from various stakeholders. Discussing the perceived risks and hazards with participating stakeholders was carried out with the intent to generate support for the implementation of recommendations.

During the duration of this project, three deliverables were developed for the M.D. of Bonnyville: the organization of a FireSmart Committee, Wildfire Mitigation Strategies, and Wildfire Preparedness Guides based on the four high-risk communities identified in the 2018 Wildfire Hazard and Risk Assessment.

2 Objectives

Objectives for this project included:

- Establishing a FireSmart Committee to provide knowledge and expertise on wildfire response and prevention
- Developing and prioritizing FireSmart mitigation measures to reduce the threat of wildfire on the planning area based on the seven wildland-urban interface disciplines
- To continue and support ongoing mitigation measures within current FireSmart Communities
- Developing strategies to encourage public education around FireSmart
- Recommendation of changes in municipal Planning and Development policies and bylaws for effective management of wildfire risks and hazards

FireSmart Committee

A FireSmart Committee, comprised of key stakeholders who are involved in the community and the overall safety of the community, was established in the initial stages of the project. Involvement of each stakeholder



throughout the planning process was significant in developing a plan that was tailored to the people, landscape, and values of the M.D. of Bonnyville. The diverse expertise and backgrounds were crucial for providing historical fire information, expertise in wildfire management, and feedback on the overall FireSmart Plan. FireSmart Committee meetings were set up to provide an opportunity for members to voice concerns and provide input through the development of the FireSmart Plan.

During the development of this report, the FireSmart Committee included the following representatives:

- Dwayne Ethier (Bonnyville Regional Fire Authority, Fire Prevention and Training Officer)
- Clifton McKay (Alberta Agriculture and Forestry, Lac La Biche)
- James Couse (Alberta Agriculture and Forestry, Lac La Biche)
- Curtis Scott (ATCO)
- Calvin Sikstrom (FireSmart Committee, Marie Lake)

The FireSmart Committee and CPP Environmental met on three separate occasions. A summary of the FireSmart Committee meetings is outlined in **Table 3**.

Table 3: FireSmart Committee Meetings Summary

FireSmart Committee Meetings	Date	Location	In Attendance	Agenda Topics
Meeting #1	12/06/19	Bonnyville Fire Hall	Dwayne Ethier (M.D. of Bonnyville) Clifton McKay (AAF) James Couse (AAF) Curtis Scott (ATCO) Calvin Sikstrom (Marie Lake) Annette Bugnet (CPP)	<ul style="list-style-type: none"> • Review the first draft of the WMS/WPGs. Feedback provided. • Discussion of recommendations. • Establish next steps.
Meeting #2	12/19/19	Bonnyville Fire Hall	Dwayne Ethier (M.D. of Bonnyville) Clifton McKay (AAF) James Couse (AAF) Curtis Scott (ATCO) Calvin Sikstrom (Marie Lake) Annette Bugnet (CPP)	<ul style="list-style-type: none"> • Review the edits in the second draft of the WMS. Feedback provided. • Discussion of the overall layout of the WPGs and the specific information in each section.
Meeting #3	01/24/20	Bonnyville Fire Hall	Dwayne Ethier (M.D. of Bonnyville) Dan Heney (M.D. of Bonnyville) Clifton McKay (AAF) James Couse (AAF) Calvin Sikstrom (Marie Lake) Annette Bugnet (CPP)	<ul style="list-style-type: none"> • Review the final WMS/WPGs. Feedback provided. • Discussion of final steps for project wrap up.

Wildfire Mitigation Strategies

Wildfire Mitigation Strategies are recommended actions that can alter the potential or behaviour of a wildfire; they could ultimately reduce potential impacts of a wildfire event and improve wildfire response. Mitigation strategies may include vegetation management, development opportunities, educational sessions, and community engagement activities. Mitigation strategies for the planning area have been compiled and are identified in *Section 4* and *Section 5*.

Recommendations are based on the seven wildland-urban interface disciplines while considering values at risk, wildfire behaviour potential, wildfire incidence, and firefighting capabilities. The seven disciplines, which are detailed in the *FireSmart Guidebook for Community Protection* (Government of Alberta, 2013), include:



1. **Education** – enhances awareness and opportunities for prevention and mitigation
2. **Development** – land use factors to enhance community protection
3. **Vegetation Management** – removal, reduction, and conservation of hazardous fuels including ecological and environmental consideration
4. **Legislation** – Fire bylaw, land use bylaw, restricted covenants, etc.
5. **Inter-agency Cooperation** – mutual aid agreements, required for managing all stages of a wildfire emergency
6. **Cross-Training** – required for seamless teamwork during a wildfire emergency with mutual aid partners
7. **Emergency Planning** – ensures human life is preserved as priority in wildfire emergencies with Emergency Response Plans

Wildfire Preparedness Guides

A Wildfire Preparedness Guide (WPG) serves as strategic documents that will assist emergency responders during wildfire incidents within a community. Four WPGs were developed for the high-risk communities identified in the WHRA. The Wildfire Preparedness Guides can be found in **Appendix 3**.

It is important to distinguish that FireSmart principles and strategies are not intended to “fireproof” an area and that low risk does not mean “no risk”.

3 Planning Area and Stakeholders

3.1 Planning Area

The Municipal District of Bonnyville No. 87 is located approximately 240 km northeast of Edmonton, Alberta and has an area of 6,064km². The planning area includes the whole M.D. of Bonnyville while also focusing on the 4 high-priority communities and the adjacent lands 600 m from the community borders. Refer to **Appendix 1** for the Overview and Topography Maps and **Appendix 2** for the Community Maps.

The planning area is located both inside and outside of the Forest Protection Area (FPA) of Alberta; it also lies within the Dry Mixedwood and Central Mixedwood Subregions of Alberta. The planning area is predominantly grass and agricultural fuels with large patches of deciduous fuels throughout the M.D. Mixedwood and conifer stands make up much of the northern part of the M.D. in the FPA. Forest fuels on the land are highly fragmented. The natural terrain varies from level or gently rolling with a few areas with significant slope.

The landscape is a mosaic of multiple land uses including industrial uses, agricultural uses, transportation, recreation, and rural residences. The M.D. of Bonnyville owns and operates 11 campgrounds and parks within the municipal boundaries. These include:

- Chicken Hill Lake M.D. Park
- Cold Lake M.D. Campground
- Crane Lake East M.D. Park
- Crane Lake West M.D. Park
- Ethel Lake Municipal Park
- Wolf Lake M.D. Park
- Minnie Lake M.D. Park East
- Minnie Lake M.D. Park West
- Pelican Point M.D. Park
- Vezeau Beach M.D. Park
- Muriel Lake M.D. Park

Four communities were identified as high-risk during the 2018 Community Risk Assessments within the M.D. of Bonnyville. These communities include the Hamlet of Ardmore, Crane Lake, Evergreen Estates, and Marie Lake. The locations of these communities can be seen in **Table 4** and **Figure 1**.



Table 4: List of High-Risk Communities within the M.D. of Bonnyville

Community	Legal Land Description
Hamlet of Ardmore	SW 01-062-04 W4
Crane Lake	S 04-064-04 W4 N 32-063-04 W4 SW 05-064-04 W4
Evergreen Estates	SW 19-061-06 W4
Marie Lake	SE 21-065-02 W4

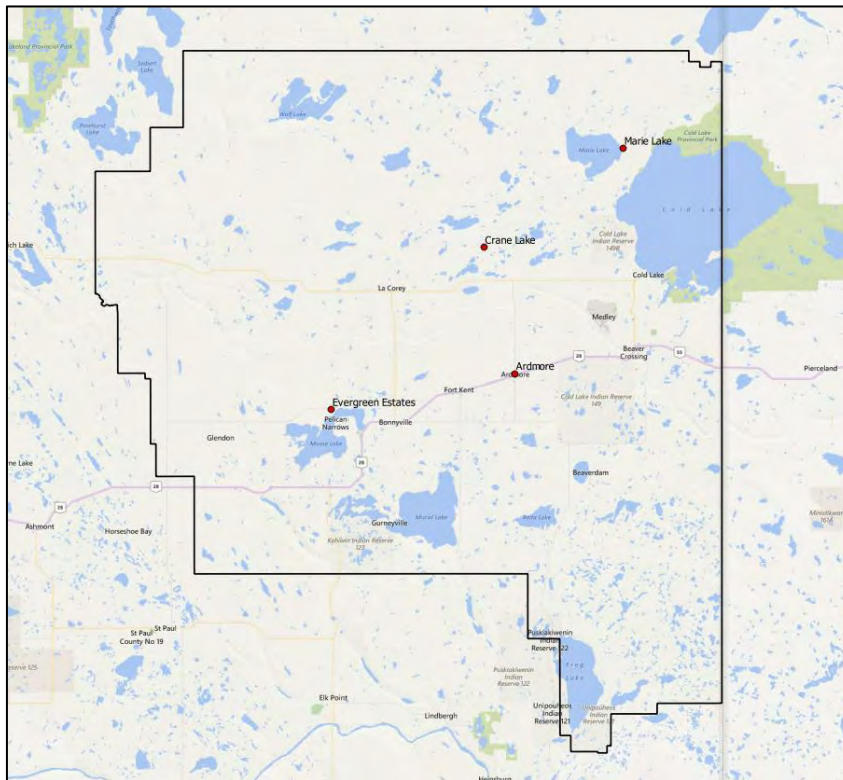


Figure 1: Location of High-Priority Communities based on the 2018 Wildfire Hazard and Risk Assessment, M.D. of Bonnyville

3.2 Stakeholders

The M.D. of Bonnyville has numerous stakeholders with various roles and contributions to the M.D. These stakeholders include:

- M.D. of Bonnyville
- Town of Bonnyville
- Alberta Agriculture and Forestry
- ATCO
- Marie Lake FireSmart Committee
- Crane Lake Community Group
- CNRL
- ESSO
- Husky
- Summer Villages of Pelican Narrows and Bonnyville Beach

Multiple stakeholders were involved in the development of this document to ensure the WMS and WPGs are as valuable and effective as possible.



4 Mitigation Strategies – Focus Communities

The Wildfire Hazard and Risk Assessment (WHRA) completed in 2018 identified the landscape wildfire risk in a total of 49 communities and sub-divisions within the M.D. of Bonnyville. Each community received an inherent risk score which incorporated the likelihood of wildfire occurrence and the defensibility of the community. With the ability to then compare the wildfire risk between the rural communities, the communities that were rated “high-risk” included the Hamlet of Ardmore, Crane Lake, Evergreen Estates, and Marie Lake. The Summer Village of Pelican Narrows was also highlighted as an area of concern for emergency services.

Common concerns identified in the Wildfire Hazard and Risk Assessment for the communities in focus include, but are not limited to:

- Conifer or mixedwood fuels
- Abundant dead and downed fuels, ladder fuels
- Vegetation on right of ways
- Narrow roads and/or single means of egress
- Ignition sources (railway, highways, recreation)
- Large fuel patches within the community

Below is a summary of the focus communities including community-specific recommendations. Recommendations are based on the 7 wildland-urban interface disciplines. Further discussion of the seven disciplines can be found in *Section 5*.

4.1 Ardmore

Ardmore, although listed as a high-priority community in the WHRA, isn't currently of significant concern for emergency services. It ranked as a high-priority community in 2018 due to a high density of residences, numerous values at risk throughout the community, lack of FireSmart principles applied to private properties, recreational and anthropogenic activity, and ignition sources within the community. If there was a wildfire approaching the community, it would most likely be a spring or fall season, single day fire run with minimal threat to the community. Due to this, and the available resources within the hamlet, Ardmore currently isn't of high concern to emergency services.

The primary mitigation focus in the Hamlet of Ardmore would be to increase FireSmart awareness; this includes encouraging residents to incorporate FireSmart principles on private properties, particularly those on the west side of the community adjacent to the deciduous forest and grassed area. This would involve the application of FireSmart principles within the Non-combustible Zone and Home Ignition Zones 1 and 2 including, but not limited to:

- Vegetation maintenance in the Non-combustible Zone (0 – 1.5 m) and Zones 1 and 2 (1.5 – 30 m)
- Managing vegetation along the fence lines on the west perimeter of the community
- Decreasing the amount of flammable materials in the Non-combustible Zone and Zone 1 (1.5 – 10 m)
- Landscaping with fire resistant vegetation
- Clearing any vegetation surrounding flammable items (e.g. propane tanks)
- Raising awareness about high-fire seasons and how to mitigate fire ignition sources



4.1.1 Recommendations for Ardmore

Recommendation 4.1a	Vegetation Management	<p><i>Application of FireSmart principles by homeowners on private properties including:</i></p> <ul style="list-style-type: none"> • <i>Vegetation maintenance in the Non-combustible Zone and Zones 1 and 2</i> • <i>Managing vegetation along fence lines on the west perimeter of the community</i> • <i>Decreasing flammable materials in the Non-combustible Zone and Zone 1</i> • <i>Clear all vegetation surrounding flammable items</i> • <i>Landscaping with fire resistant vegetation</i>
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4.2 Crane Lake

Crane Lake had the highest hazard rating out of the 49 communities assessed in 2018. The main contributors to the hazard rating included the high density of structures, lack of access to safe zones, large conifer patches and abundant ladder fuels within the community, and the topography.

The interior of Crane Lake consists of private lands; therefore, the primary focus within the community would be for residents to apply FireSmart principles within the Non-combustible Zone and Home Ignition Zones 1 and 2 of private properties.

Directly east of the community is Crane Lake East M.D. Park campground; it is well maintained with pruned trees and cleared brush. Crane Lake West M.D. Park campground is centrally located within the community. The campgrounds are a potential ignition risk due to unattended campfires. Although minimal work would currently need to be done within the campgrounds, potential mitigation measures may include:

- Ensure fire pits, especially along the residential edge of the trees, are in accordance to Bylaw No. 1668 (minimum of 3 m clearance from combustible materials). Maintain a 1.5 m debris-free radius (e.g. dead leaves, vegetation) surrounding the pit.
- In Crane Lake East M.D. Park, complete fuel modification in the mixedwood stands south/southeast of the campground, tying it off to the road allowance. This would decrease fuel load from the conifer stand and the abundance of ladder fuels adjacent to the campground and community.
- Ensuring all branches are pruned >2 m from the ground.

In 2015 - 2017, Crane Lake had 8.8 ha of vegetation modification completed by Alberta Agriculture and Forestry (AAF). The work was performed in conifer stands west of the community to decrease the wildfire hazard entering the community. This included the thinning and pruning of conifer stands and the removal of dead and downed woody debris. Locations of previous vegetation modification can be found in in **Appendix 4**. These areas were re-visited in the fall of 2019. Although there was minor blowdown in the treatment areas, there were no significant issues. It is noted that maintenance should be scheduled for 2020/2021 (i.e. a 5-year maintenance schedule) to maintain the work that has been completed. Additional fuel modification adjacent to these areas is proposed to increase protection on the west end of the community. Locations of recommended vegetation modification can be found in **Appendix 5**.



4.2.1 Recommendations for Crane Lake

Recommendation 4.2a	<i>Vegetation Management</i>	<i>Ensure firepits along west edge of campground abide to Bylaw No. 1668. Clearance of flammable debris around firepits (e.g. dead leaves in fall).</i>
Recommendation 4.2b	<i>Vegetation Management</i>	<i>Fuel modification in mixedwood stands south/southeast of campground.</i>
Recommendation 4.2c	<i>Vegetation Management</i>	<i>Ensure all previous fuel modification projects are inspected on a regular basis and maintained as necessary (e.g. 5-year inspection/maintenance).</i>
Recommendation 4.2d	<i>Vegetation Management</i>	<i>Additional vegetation modification in coniferous/mixedwood stands on the west end of Crane Lake.</i>

4.3 Evergreen Estates

Evergreen Estates is situated east of Moose Lake Provincial Park in an area containing predominantly coniferous stands. Within the community, FireSmart education is recommended for community members and the application of FireSmart principles within private properties is highly encouraged. Fuel modification would also be beneficial within conifer stands in the Provincial Park west of the community. A map of these recommendations can be found in **Appendix 5**.

4.3.1 Recommendation for Evergreen Estates

Recommendation 4.3a	<i>Vegetation Management</i>	<i>Reduce fuel load in the conifer stands west of the community.</i>
Recommendation 4.3b	<i>Vegetation Management</i>	<p><i>Application of FireSmart principles by homeowners on private properties including:</i></p> <ul style="list-style-type: none"> <i>• Vegetation maintenance in the Non-combustible Zone and Zones 1 and 2</i> <i>• Decreasing flammable materials in the Non-combustible Zone and Zone 1</i> <i>• Clear all vegetation surrounding flammable items</i> <i>• Landscaping with fire resistant vegetation</i>

4.4 Marie Lake

Marie Lake became a FireSmart Community in 2017 with FireSmart principles applied in selected areas since 2016. Since then, multiple work events have been held to increase hazard reduction and wildfire mitigation within the community. Vegetation modification was completed in 2017/2018 with assistance from AAF on the north and south edges of the community. The community was revisited in the fall of 2019; observations from the site visit include the following potential improvements to the treated area:



- Ensure large, over mature trees, prone to candling and causing spotting, are pruned in the modified area south of the community.
- Clumps of small, immature white spruce and leaning/suppressed trees, prone to candling and spotting, could be further thinned.
- Prune drooping branches (<2 m from the ground).
- Fuel modification (removal of dead and downed, pruning, and thinning) in the forest patches between the community cul-de-sacs to reduce the fuel load within the community boundary.
- Residents of the community prefer the forested patch west of range road 22A remain untouched as it acts as a noise barrier, it cuts down on dust, and it maintains privacy. Although standing timber could be left, removal of dead and downed materials within this patch would decrease the overall hazard.
- Completion of vegetation modification in the forested patch east of range road 22A. This could include pruning, thinning, and the removal of dead and downed material, decreasing the fuel load. This would decrease fire activity approaching the community allowing fire control at that point. A map of this recommendation can be found in **Appendix 5**.
- Further fuel modification (reducing the amount of dead and downed materials) in the northern end of the community. The fuel modification could also be completed closer to residential properties.
- Although there is access to the lake through private lots, there is no lake access for emergency vehicles. Lake access for fire engines would allow for water refill near the community, decreasing refill time. This could be achieved by upgrading a previous access trail south of the community to a condition adequate for emergency service vehicle use.
- An alternative lake access, such as an access road, is a concern for community members as this could increase lake access for public use. Placing a locked gate at the entrance would mitigate public use while maintaining lake access for emergency vehicles.

Historically, woody debris disposal in the Marie Lake area has been an ongoing concern; with no available options for private property owners to dispose woody debris, dumping of debris has occurred in various locations surrounding the community. Introducing a woody debris disposal near the community would allow for proper, contained disposal of woody debris. The M.D. could then dispose of the piles by burning, mulching, etc. on a yearly basis reducing potential hazards in the area.

Maintenance of previously modified areas should be scheduled for 2022/2023 (i.e. a 5-year maintenance schedule) to maintain the work that has been completed. Continuing the application of FireSmart principles on private properties is also encouraged.

4.4.1 Recommendations for Marie Lake

Recommendation 4.4a	Vegetation Management	<i>Additional vegetation management including:</i> - disposal of brush piles in treated areas - management (removal, pruning, or thinning) of over mature, suppressed trees, standing dead (except for wildlife trees), low-hanging branches, and clusters of small conifers
Recommendation 4.4b	Vegetation Management	Fuel modification in stands east and west of range road 22A.
Recommendation 4.4c	Vegetation Management	Fuel modification in forest patches between community cul-de-sacs.



Recommendation 4.4d	Vegetation Management	Ensure all previous fuel modification projects are inspected on a regular basis and maintained as necessary (i.e. 5-year inspection/maintenance).
Recommendation 4.4e	Development	Residential woody debris disposal.
Recommendation 4.4f	Development (Access)	Create lake access for emergency vehicles.
Recommendation 4.4g	Development (Access)	Add a gate on lake access for emergency vehicle use only.

4.5 Pelican Narrows

Although it did not rank as a high-priority community, the Summer Village of Pelican Narrows was identified as a concern from emergency services due to narrow roads, single egress, a high density of residences, and large patches of mixedwood fuels, ladder fuels, and dead and downed materials within the community.

A FireSmart Committee was formed a few years ago in response to wildfire concerns. As a Summer Village, Pelican Narrows is responsible for actions within the community including FireSmart fuel modification and the application of FireSmart principles.

Pelican Narrows currently has one means of egress; the entrance on the north end of the community has been flooded out for a significant amount of time. If an emergency arose, the current egress would quickly become congested increasing evacuee risk and making it difficult for emergency vehicles to work efficiently. Repairing the second access/egress would allow for a more efficient and safe evacuation. In some instances, residents prefer not to have multiple accesses to a community. If this is an issue, a gate could be installed to minimize public use but still provide access in emergency situations. The M.D. is currently in the process of fixing the second egress.

When visited in the fall of 2019, areas were identified within the community that could benefit from fuel modification. They include patches of mixedwood stands and significant dead and downed woody debris located between residential properties and roads, increasing the fire hazard within the community. These areas could be used as fire breaks or demonstration projects for residents.

4.5.1 Recommendations for Pelican Narrows

Recommendation 4.5a	Development (Access)	Finish repairing the secondary access/egress.
Recommendation 4.5b	Education / Vegetation Management	Develop demonstration areas within the community to: <ul style="list-style-type: none"> - provide FireSmart educational opportunities for residents - reduce ladder fuels, dead and downed materials, and the density of conifer and mixedwood stands within the community



5 Mitigation Strategies – Municipality Wide

This section focuses on mitigation strategies that can be applied to the entire Municipal District including the communities in focus. Recommendations are based on wildland-urban interface (WUI) disciplines while considering values at risk, wildfire behaviour potential, wildfire incidence, and firefighting capabilities. The WUI disciplines, as identified by the FireSmart Guidebook for Community Protection (2013), are:

1. Public Education
2. Development
3. Vegetation management
4. Legislation
5. Inter-Agency Cooperation
6. Cross-Training
7. Emergency Planning

5.1 Education

Proper public education will increase resident knowledge of FireSmart principles and recommendations created for wildfire mitigation. Providing the public with knowledge of FireSmart practices will raise awareness and provide tools for individuals to use throughout their community. Through platforms such as social media, open houses, rural newsletters, and local school presentations/events, FireSmart objectives should be highlighted, explained, and/or demonstrated in a way to increase success of resident education and engagement.

5.1.1 Information

Recommendation 5.1a	<i>M.D. of Bonnyville</i>	<i>Educate and encourage community member involvement in FireSmart activities including distribution of information regarding FireSmart Ignition Zones, primarily during high-fire season.</i>
Recommendation 5.1b	<i>M.D. of Bonnyville</i>	<i>Educate residents on the development and advantages of having a 72 h Preparedness Plan. Refer residents to the Government of Canada Emergency Preparedness website (getprepared.gc.ca).</i>

Since most wildfires in the M.D. are caused by anthropogenic activities, it is recommended that the M.D. of Bonnyville develops an educational program that focuses on fire prevention and fire safety, especially during high-fire season. Information distributed should include, but not be limited to, the reduction and removal of combustible materials in the Non-combustible Zone and Home Ignition Zones 1 and 2 (**Figure 2**).

Emergency preparedness is essential when it comes to keeping individuals and families safe in emergencies. Educating residents on the development of a 72 h Preparedness Plan will allow individuals and their families to have personalized plans and, if necessary, to be self-sufficient for a minimum of 72h if emergency services are unavailable.

5.1.2 Distribution

The M.D. of Bonnyville should ensure availability of FireSmart information in the spring and summer when vegetation management will most likely occur, and distribution should be done with seasonal relevance. Once FireSmart procedures are established, public involvement and word of mouth will assist the delivery of information.



5.1.3 Educational Resources Implementation

Recommendation 5.1c	<i>M.D. of Bonnyville</i>	<i>Promote residences to use the “Alberta Emergency Alert” and “Alberta Wildfire” apps.</i>
Recommendation 5.1d	<i>M.D. of Bonnyville</i>	<i>Adoption of the Home Partners Program through FireSmart Canada. Have identified and trained personnel perform FireSmart Structure and Site Hazard Assessments and provide wildfire mitigation techniques to M.D. residents (by request).</i>
Recommendation 5.1e	<i>M.D. of Bonnyville</i>	<i>Develop demonstration areas within communities to provide FireSmart educational opportunities for residents.</i>
Recommendation 5.1f	<i>M.D. of Bonnyville</i>	<i>Encourage neighborhood leaders to become Community Champions, leading communities to become a Recognized FireSmart Community.</i>

The Alberta Emergency Alert app is used to raise community member awareness on up-to-date emergencies that may be of concern. The Alberta Wildfire app tracks wildfires within the Forest Protection Area (FPA) of Alberta; this app is useful for residents who live within, or adjacent to, the FPA to stay informed of the status of any nearby wildfires. These simple tools are valuable in quickly distributing emergency information to a widespread audience.

The Home Partners Program through FireSmart Canada helps to engage homeowners in wildfire mitigation activities by offering a professional home assessment with property-specific recommendations. Having local fire service professionals trained and qualified in this program will accurately evaluate a home and property for wildfire exposure while engaging the homeowner in their unique risk and ways to reduce it. (FireSmart Canada, Home Partners Program)

A lack of understanding about FireSmart principles, how to apply the principles, and the perception of the visual change to the landscape can deter residents to engage in FireSmart activities. Providing local demonstrations within communities will show residents the various FireSmart applications that can be carried out; this will allow residents to see the work involved and the changes, and to demonstrate that the changes aren't as dramatic as community members may imagine them to be. Locations, such as Pelican Narrows which have substantial mixedwood stands, ladder fuels, and dead and downed material, would be ideal for demonstration projects.

Citizen involvement is the cornerstone of the FireSmart Canada Community Recognition Program (FCCRP) (FireSmart Canada, Community Recognition Program). Becoming a Recognized FireSmart Community gets community members involved in recognizing and reducing wildfire hazards, resulting in increased community protection. Having a participating neighborhood leader serve in the role of Community Champion helps community members be engaged in the program and gain valuable FireSmart knowledge.



5.2 Development

Infrastructure affects a community’s resilience to wildfire. The M.D. of Bonnyville’s Planning and Development Department oversees functions related to road maintenance and other land use planning matters. Current aspects to consider for possible improvements to further mitigate wildfire risks include:

- Access
- Water availability
- Signage
- Utilities
- Staging Areas

5.2.1 Access

Recommendation 5.2a	<i>M.D. of Bonnyville</i>	<i>Develop and implement Best Management Practices for road construction to ensure suitable access for emergency services.</i>
Recommendation 5.2b	<i>M.D. of Bonnyville</i>	<i>Review the driveway access standards for all new development.</i>

Having acceptable access within a community is important during an emergency response for both responders and community members. Access that is limited or restricted could lead to increased emergency response times, increased hazard for residents at risk, and increased risk of incidents happening during an emergency response. Although many of the newer developments in the M.D. of Bonnyville have wide roads (>7 m), large turnarounds, and more than one access/egress, many of the older communities lack one or more of these aspects.

It is recommended that the M.D. of Bonnyville develops and implements Best Management Practices for road construction to ensure suitable access for emergency services. The Best Management Practices may include:

- Enhancement of driving surface widths or pull outs
- Installation of “No Parking” signage on roads critical for evacuation
- Installation of designated evacuation route signs

Many private driveways throughout the M.D. would not accommodate an emergency vehicle due to either width or encroaching/overhanging vegetation. The review and application of driveway access standards to new developments would ensure suitable access to residential properties in the event of an emergency.

5.2.2 Water Availability

Recommendation 5.2c	<i>M.D. of Bonnyville</i>	<i>Consider certification for water access options (i.e. dry hydrants, cisterns, tanker shuttle system) in rural areas.</i>
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Although there are no hydrants located directly within the subdivisions, there are hydrants located in communities throughout the Municipal District including Fort Kent, Ardmore, the Town of Bonnyville, and Glendon. Water-filling stations are located in Fort Kent, Ardmore, and the Town of Bonnyville. La Corey and Iron River have access to 400BBL water storage tanks.

A main concern for wildfire emergency response includes rural access to water sources for emergency vehicles. Many roads in rural areas, including access roads to water sources, are not able to support larger



vehicles necessary for wildfire response. Currently, response vehicles return to their designated locations to refill tankers and engines during response situations. Poor road conditions, especially during wet seasons and snowmelt, delay or limit access to valuable accessible drafting locations. The ability to use water sources throughout communities would decrease the turnaround time for tank refill if an incident is a significant distance from a refill station or hydrant.

5.2.3 Signage

Recommendation 5.2d	<i>M.D. of Bonnyville</i>	<i>Place standardized community/subdivision signs at the entrances of each community.</i>
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Recommendation 5.2e	<i>M.D. of Bonnyville</i>	<i>Ensure the use of standardized lot signs within communities including subdivisions and hamlets. Educate residents on the replacement strategy of damaged/worn/missing residential signage.</i>
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Road signage throughout the M.D. is in good standing. There is clear road signage for all roads and communities have rural address signs at all entrances. The M.D. may benefit from entrance signs indicating the names and layout of each community. These signs would help improve response efficiency when arriving to a community.

It is advertised on the Municipal District website to contact the M.D. office for sign replacement. This is important as response times to specific locations depend on visible signage. Most of the communities have standardized residential signage although some, including Ardmore and Crane Lake, need improvements due to missing/non-standardized signage.

5.2.4 Utilities

Single, secondary, and three phase power lines are present throughout the M.D. of Bonnyville, including overhead and underground power lines. Secondary lines are prominent in the rural subdivisions; although these lines conduct less voltage compared to the other distribution lines, wildfires can result from these lines under the right conditions. ATCO owns and oversees the maintenance along the distribution right of ways within the M.D.; this includes a 3-year vegetation maintenance schedule for powerlines and a 5-year maintenance schedule for transmission lines. ATCO and AAF also do also yearly line inspections throughout the M.D. of Bonnyville with maintenance completed as necessary.

5.2.5 Staging Areas

Staging areas are for the purpose of fire services to setup and run operations. They are determined on a case-by-case basis and consider key elements such as fire location and direction of burn. Criteria for selecting staging locations include proximity to the community, a large enough area to accommodate equipment, and ground terrain/solidity to support fire trucks and emergency vehicles.

Staging areas have been identified in the WPG in **Appendix 3**. These locations should be confirmed they are still safe at the time of the incident.

5.2.6 Building Materials

Recommendation 5.2f	<i>M.D. of Bonnyville</i>	<i>Integrate FireSmart principles into the approval process for all developments located in the WUI. Align development standards with the FireSmart – Protecting Your Community from Wildfire publication.</i>
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Structural characteristics of a home can significantly reduce the spread of wildfire to structures within a community. Roofing and siding materials affect how the structure withstands heat and ember transfer. They are the two most important features when minimizing structure fire in the WUI. Proper construction of eaves, vents, and openings will limit how easily flammable debris may accumulate. Open balconies, porches and decks may allow embers to get trapped, allowing entry to the structure. Addressing adequate structural options at the planning and development stages will help minimize the interface hazard in these high-risk communities.

5.2.7 Storage of Flammable Materials

Recommendation 5.2g	<i>M.D. of Bonnyville</i>	<i>Ensure fuel tanks on private properties have a 3 m radius that is free of flammable materials.</i>
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Residential fuel tanks, such as large propane tanks, are found in communities throughout the M.D. of Bonnyville. Fuel tanks should be located a minimum of 10 m from structures. This may not be feasible in all cases but at a minimum, all fuel tanks should be free of vegetation and flammable debris within a 3 m radius. This will minimize risk and increase safety for residents and emergency responders during an incident.

5.3 Vegetation Management

Recommendation 5.3a	<i>M.D. of Bonnyville</i>	<i>Provide education and tools to landowners for the assessment and voluntary reduction of fuels within the Non-combustible Zone and Home Ignition Zones 1 and 2 on private property.</i>
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Recommendation 5.3b	<i>M.D. of Bonnyville</i>	<i>Provide methods to assist private landowners with debris disposal from FireSmart vegetation management on private lands.</i>
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Vegetation management includes four FireSmart Home Ignition Zones: the Non-combustible Zone and Zones 1, 2, and 3 (**Figure 2**). Application of vegetation management within the four Home Ignition Zones will reduce hazards and improve the defensibility of a structure or area. Information for residents can be found in the FireSmart Begins at Home Manual.

Vegetation should *not* be modified, reduced, or removed if considered within a riparian zone or other sensitive areas. Riparian areas are ecologically, socially, and economically important and should not be treated with FireSmart prescriptions.

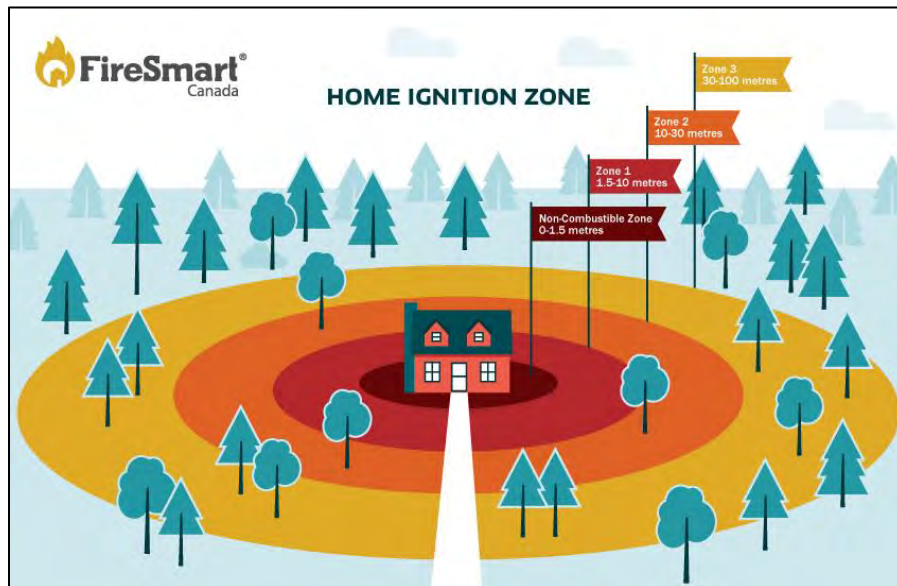


Figure 2: FireSmart Home Ignition Zones (Retrieved from https://firesmartcanada.ca/wp-content/uploads/2019/10/FS_Home-Ignition-Zone-Poster.pdf)

The Non-combustible Zone includes the 0 to 1.5 m around your home and is considered the most critical area. Keeping this zone clear of flammable vegetation and debris reduces the risk of wind-blown embers igniting materials near your home. This Zone is essential to the FireSmart process.

Zone 1 includes a radius of 1.5 to 10 m around your home. Keeping this area clear of flammable vegetation and debris can reduce the risk of the fire moving towards your home and increases the defensibility of the structure.

Zone 2 is the 10 to 30 m surrounding your home. Maintenance of Zone 2 aids in lowering the intensity and the rate of spread of a wildfire. If Zone 2 is on the owner’s property and interferes with a riparian zone, vegetation should not be modified, reduced, or removed.

Zone 3 extends beyond the 30 m radius. Zone 3 modification will influence how a wildfire approaches your home and reduces the intensity of a wildfire. Fuel modification here could be necessary if there are high hazard levels due to heavy continuous forest vegetation and steep topography that are not reduced sufficiently by fuel management in Zone 2. This zone will typically apply to the community or M.D.

Table 5 identifies fuel management practices that can be applied by residents within the four Home Ignition Zones to reduce wildfire hazards on private properties.

Table 5: Home Ignition Zone Fuel Management

Non-Combustible Zone & Zone 1	Zones 2 & 3
Mow grass (10 cm or less)	Thinning understory
Remove ground litter and downed trees	Pruning lower branches (within 2 m from the ground)
Remove over mature, dead, and dying trees	<i>Zones 2 & 3 are effective when conifer trees are present</i>
Thin and/or prune existing vegetation Remove piled debris	



The communities of Birch Ridge, Crane Lake, and Marie Lake have had previous vegetation modification completed by AAF. This fuel modification was done in areas with an increased hazard due to fuel density, composition, and proximity to the community. Ensuring that previous fuel modification is maintained will provide continuous community protection.

Locations of previous fuel modification in Birch Ridge, Crane Lake, and Marie Lake implemented by AAF can be found in **Appendix 4**.

5.4 Legislation

5.4.1 Fire Permit Bylaw

The Fire Services Bylaw (Bylaw No. 1668) has descriptive sections on open fires and fire permits. The Fire Services Bylaw outlines the definition of an “acceptable fire pit”, the procedure and timeframe for obtaining a fire permit, and the responsibilities of the persons in charge.

5.4.2 Development Bylaw

Recommendation 5.4a	<i>M.D. of Bonnyville</i>	<i>Consider the revision of the current Municipal District of Bonnyville statutory planning documents and apply recommended FireSmart principles to development permits for rural residents in WUI communities.</i>
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Development standards play a significant role in reducing the potential impact a wildfire will have on a community (FireSmart Canada, Home Development Guide). Incorporating FireSmart building designs into Land Use Bylaws and Development Permit approvals may reduce the risk of structural damage from wildfire to homes in the wildland-urban interface as well as minimize the spread of wildfire between structures. These can include, but would not be limited to, setback distances of structures from forest edges, restrictions on construction materials, standards for private access (to accommodate firefighting apparatuses), water supply in new developments, vegetation management, etc.

The M.D. of Bonnyville Land Use Bylaw No. 1667 (LUB) (M.D. of Bonnyville, 2017) regulates the use and development of land and buildings within the M.D. It divides the M.D. into land use districts and establishes design and development regulations with respect to each district. It is within the LUB that FireSmart planning and development regulations can be achieved. The current LUB has no specific reference to FireSmart development standards.

5.5 Inter-Agency Cooperation

Recommendation 5.5a	<i>M.D. of Bonnyville</i>	<i>Coordinate a pre-fire season meeting with other agencies and stakeholders to discuss the upcoming wildfire season.</i>
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A successful community FireSmart program requires engagement and strong partnerships. Elected officials, community planners, developers, government, industry and residents all have an important role to play (FireSmart Canada, 2019). The Bonnyville Regional Fire Authority, which provides emergency services to the M.D. and Town of Bonnyville through the municipal bylaw, has multiple mutual aid partners.



Mutual Aid Partners include:

- County of Vermilion River
- City of Cold Lake
- County of Lac La Biche
- County of St. Paul
- Alberta Agriculture and Forestry
- Husky Oil
- Imperial Oil (Contract)
- CNRL Wolf Lake (Contract)
- Kehiwin Cree Nation #123
- Elizabeth Metis Settlement
- Cold Lake First Nations #149

When mutual aid agreements are in place, there is an understanding that additional resources of personnel and equipment are identified and are available. Annual reviews provide the opportunity for fire protection officials to discuss and review any changes or updates.

5.6 Cross Training

Recommendation 5.6a	<i>M.D. of Bonnyville</i>	<i>Create desktop scenarios to test out and understand protocols during wildfire emergencies.</i>
Recommendation 5.6b	<i>M.D. of Bonnyville</i>	<i>Participate in joint wildfire exercises with mutual aid partners. Use these exercises to test the WPGs.</i>
Recommendation 5.6c	<i>M.D. of Bonnyville</i>	<i>Employed and volunteer members with any of the 7 fire stations in the M.D. of Bonnyville should be cross-trained and certified to the following minimum standards:</i> <ul style="list-style-type: none"> - <i>Structure Protection Training</i> - <i>Sprinkler Deployment Workshop</i> - <i>Wildfire Orientation/Wildland Firefighter NFPA 1051 Level 1</i> - <i>Incident Command system I-100 and I-200 (where applicable)</i>
Recommendation 5.6d	<i>M.D. of Bonnyville</i>	<i>Perform water shuttle exercises within communities that are in close proximity to water bodies.</i>

The M.D. of Bonnyville has 7 Fire Stations that respond to wildland fires in the study area. Fire halls are located in the Town of Bonnyville, Ardmore, Glendon, Goodridge, Fort Kent, La Corey, and Iron River. Mutual Aid Agreements provide M.D. of Bonnyville with the ability to request additional resources. Collaborating on emergency response scenarios with the M.D. of Bonnyville fire crews and mutual aid partners will benefit all parties by illustrating key differences in strategies, tactics, and equipment.

Since many subdivisions within the M.D. are located near waterbodies, becoming proficient in accessing and drawing from these water sources (where feasible) could cut down on refill times during wildfire response. Having the M.D. fire departments perform water shuttle exercises would allow for increased efficiency when water sources are available.



5.7 Emergency Planning

Recommendation 5.7a	<i>M.D. of Bonnyville</i>	<i>Review and test the Emergency/Wildfire Response Plan annually to provide the most current information</i>
Recommendation 5.7b	<i>M.D. of Bonnyville</i>	<i>Conduct an annual emergency exercise for the M.D. emergency operations centre using wildfire as the emergency.</i>

Emergency planning is an essential part of any disaster planning. The M.D. of Bonnyville’s Emergency Management Plan is currently in the process of being updated.

6 Summary of Recommendations

Each of the recommendations is ordered upon urgency and effort to assist each of the communities in making a working plan. Urgency and effort levels were set using the following criteria:

Urgency is a measure of timeliness and is rated as high, moderate, or low. The rates of timeliness mean:

High	The recommendation is critical and should be commenced as soon as possible.
Moderate	Recommendation is important and may be worked on as a staged approach to program improvement.
Low	The recommendation may be completed as resources become available.

Effort is a measure of resources required over a period of time and is rated as high, moderate, or low. The rates of resources mean:

High	Requires direct project funding (for contracted services), possibly a multi-year project, preferably managed through dedicated resources for the term of the project, involves significant external stakeholder involvement.
Moderate	May require direct project funding (for contracted services), generally completed within one business year, managed with assigned resources and possibly involves external stakeholder input.
Low	Generally, will not require direct project funding, managed through existing resources as routine business, often can be completed within one or two business quarters and generally does not involve external stakeholders.

Note: The following tables contain the recommendations, indicating their respective urgency and level of effort required for implementation.



6.1 Summary of Recommendations – Focus Communities

Vegetation Management

Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Community Section
High	Low	4.1a. Recommendation Regular maintenance of vegetation in the Home Ignition Non-combustible Zone, Zone 1 and Zone 2.	Property Owners	Decrease fire hazards	Annually / When Needed	Ardmore 4.1
Moderate	Moderate	4.2a. Recommendation Ensure campground fire pits abide by Bylaw No. 1668 (<3 m from combustible materials). Clearance of flammable materials around pits.	M.D. of Bonnyville	Decrease fire hazards	Annually / When Needed	Crane Lake 4.2
Moderate	Moderate	4.2b. Recommendation Fuel modification in mixedwood stands south/southeast of Crane Lake East M.D. Park.	M.D. of Bonnyville	Decrease fire hazards	One time	Crane Lake 4.2
Low	Low	4.2c. Recommendation Inspections and maintenance of previous fuel modification sites.	M.D. of Bonnyville	Decrease fire hazards	Every 5 years	Crane Lake 4.2
Low	Moderate	4.2d. Recommendation Additional vegetation modification in coniferous/mixedwood stands on the west end of Crane Lake.	M.D. of Bonnyville / Alberta Agriculture and Forestry	Decrease fire hazards	One time with maintenance	Crane Lake 4.2
Moderate	Moderate	4.3a. Recommendation Reduce fuel load in conifer stands west of the community (in Provincial Park).	M.D. of Bonnyville / Alberta Agriculture and Forestry	Decrease fire hazards	One time with maintenance	Evergreen Estates 4.3
High	Low	4.3b. Recommendation Regular maintenance of vegetation in the Home Ignition Non-combustible Zone, Zone 1 and Zone 2.	Property Owners	Decrease fire hazards	Annually / When Needed	Evergreen Estates 4.3
Moderate	Moderate	4.4a. Recommendation Additional work in modified areas around Marie Lake.	M.D. of Bonnyville / Marie Lake / Alberta Agriculture and Forestry	Decrease fire hazards	One Time	Marie Lake 4.4



Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Community Section
Moderate	Moderate	4.4b. Recommendation Reduce fuel load in forested patch east of range road 22A. Reduce woody debris in forested patch west of range road 22A.	M.D. of Bonnyville / Marie Lake / Alberta Agriculture and Forestry	Decrease fire hazards	One time with maintenance	Marie Lake 4.4
Moderate	Moderate	4.4c. Recommendation Fuel modification in forest patches between cul-de-sacs.	Marie Lake / M.D. of Bonnyville	Decrease fire hazards	One time with maintenance	Marie Lake 4.4
Low	Low	4.4d. Recommendation Inspection and maintenance of previous fuel modification.	M.D. of Bonnyville / Marie Lake / Alberta Agriculture and Forestry	Keep hazards minimized	5-year maintenance	Marie Lake 4.4

Development

Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Section
Moderate	Moderate	4.4e. Recommendation Residential woody debris disposal.	M.D. of Bonnyville	Hazard reduction	One time, annual disposal	Marie Lake 4.4
Moderate	Moderate	4.4f. Recommendation Create lake access for wildfire emergency vehicles.	M.D. of Bonnyville	Reduce public access while maintaining emergency access	One time	Marie Lake 4.4
Moderate	Moderate	4.4g. Recommendation Add gate on emergency access road.	M.D. of Bonnyville	Increase water accessibility	One time	Marie Lake 4.4
Moderate	High	4.5a. Recommendation Completion of secondary access/egress repair.	M.D. of Bonnyville	Reduce evacuation times and increasing access / safety	One time	Pelican Narrows 4.5

Public Education / Vegetation Management

Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Section
Moderate	Moderate	4.5b. Develop a demonstration area within communities to provide FireSmart educational opportunities for residents and reduce fuel load in stands within community.	M.D. of Bonnyville / Pelican Narrows	Homeowner awareness of actions and attainable outcomes. Decrease fire hazards.	Annually	Pelican Narrows 4.5



6.2 Summary of Recommendations – Municipality Wide

Public Education

Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Section
High	Moderate	5.1a. Recommendation Educate and encourage community member involvement with FireSmart activities, especially during high-fire season. Involvement can be through social media, open houses, rural newsletters, or through local school events. Distribute information regarding FireSmart Ignition Zones.	M.D. of Bonnyville / Regional Fire Authority	Increase community education and involvement. Engage homeowners in the mitigation of hazards on private properties.	Annually during high-fire season	5.1.1
Moderate	Moderate	5.1b. Recommendation Educate residents on the development and advantages of having a 72h Preparedness Plan (getprepared.gc.ca).	M.D. of Bonnyville / Regional Fire Authority	Increase emergency preparedness of residents.	Annually during high-fire season	5.1.1
Moderate	Moderate	5.1c. Recommendation Promote residents to use the “Alberta Emergency Alert” App and “Alberta Wildfire” App for up to date information on wildfire emergencies.	M.D. of Bonnyville / Regional Fire Authority	Reduce flammable fuels nearest to the structure	Annually	5.1.3
Moderate	Moderate	5.1d. Recommendation Adoption of the Home Partners FireSmart Canada program; hazard assessments of residential homes (on request).	M.D. of Bonnyville / Regional Fire Authority	Community alertness if emergencies arise	Annually	5.1.3
Moderate	Moderate	5.1e. Recommendation Develop demonstration areas within communities to provide FireSmart educations opportunities.	M.D. of Bonnyville / Regional Fire Authority	Increase community education and involvement. Reduce fire hazard in community.	Annually	5.1.3
Moderate	Moderate	5.1e. Recommendation Encourage communities and subdivisions to work towards becoming Recognized FireSmart Communities.	M.D. of Bonnyville / Regional Fire Authority	Increase community education and involvement while increasing community protection.	Annually	5.1.3



Development

Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Section
Moderate	Moderate	5.2a. Recommendation Develop and implement Best Management Practices for road maintenance to ensure suitable access for emergency services.	M.D. of Bonnyville / Regional Fire Authority	Improve road conditions for emergency response vehicles which will improve response times	One time	5.2.1
Moderate	Moderate	5.2b. Recommendation Review driveway access standards for new developments	M.D. of Bonnyville / Regional Fire Authority	Easier navigation for emergency vehicle access	One time	5.2.1
Moderate	Moderate	5.2c. Recommendation Certification for water access options in rural areas.	M.D. of Bonnyville / Regional Fire Authority	Water accessibility	One time	5.2.2
Moderate	Moderate	5.2d. Recommendation Standardized subdivision signs at community entrances.	M.D. of Bonnyville	Simple recognition of location and community layout	One time	5.2.3
Moderate	Moderate	5.2e. Recommendation Standardized property signage.	M.D. of Bonnyville	Simple recognition of house ID	As needed	5.2.3
Moderate	Moderate	5.2f. Recommendation Align development standards for building materials with FireSmart principles.	M.D. of Bonnyville / Regional Fire Authority	Reducing interface hazards	One time	5.2.6
Moderate	Moderate	5.2g. Recommendation Clearance of flammable debris surrounding fuel tanks.	M.D. of Bonnyville / Property Owners	Increasing safety by reducing flammable hazards.	Annually	5.2.7

Vegetation Management

Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Section
High	Low	5.3a. Recommendation Regular maintenance of vegetation in the Home Ignition Non-combustible Zone, Zone 1 and Zone 2.	Property Owners	Decrease fire hazards	Annually / When Needed	5.3
Moderate	Moderate	5.3b. Recommendation Debris disposal options for residents.	M.D. of Bonnyville	Decrease fire hazards/prevent dumping of woody debris	One time	5.3



Legislation

Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Section
Moderate	High	5.4a. Recommendation Revision of Land Use Development Permit bylaws and conditions to include FireSmart principles.	M.D. of Bonnyville / Regional Fire Authority	Reduce structural impact and spread of wildfire	One Time	5.4.2

Inter-Agency Cooperation

Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Section
Moderate	Low	5.5a. Recommendation Coordinate a pre-season meeting with other agencies to discuss the upcoming wildfire season.	Bonnyville Regional Fire Authority	Improve and maintain mutual aid agreements	Annually	5.5

Cross-Training

Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Section
Moderate	Low	5.6a. Recommendation Create desktop scenarios to test out and understand protocols during wildfire emergencies (example: Wildfire CDs).	Bonnyville Regional Fire Authority	Increase fire preparedness for the season	Annually	5.6
Moderate	Low	5.6b. Recommendation Participate in joint wildfire exercises with Mutual Aid Partners	Bonnyville Regional Fire Authority	Increase fire preparedness for the season	Annually	5.6
Moderate	Low	6c. Recommendation M.D. of Bonnyville Fire members to be cross-trained and up to date in necessary certifications.	Bonnyville Regional Fire Authority	Increase preparedness	Annually	5.6
Moderate	Moderate	6d. Recommendation Perform water shuttle exercises within communities that are in close proximity to water bodies.	Bonnyville Regional Fire Authority	Increase preparedness	Annually	5.6

Emergency Planning

Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Section
Low	Moderate	5.7a. Recommendation Review and test out the Emergency/Wildfire Response Plan.	M.D. of Bonnyville / Alberta Agriculture and Forestry	Improve Emergency Preparedness	Annually	5.7



Urgency	Effort	Recommendation	Project Lead	Benefits	Frequency	Section
Low	Moderate	7b. Recommendation Conduct emergency exercises for emergency operations.	Bonnyville Regional Fire Authority	Improve Emergency Preparedness	Annually	5.7



7 References

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- FireSmart Canada. Home Partners Program. Retrieved from https://livefiresmart.ca/wp-content/uploads/FireSmart_Home-Partner-Program.pdf
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- Municipal District of Bonnyville No. 87. 2017. Land Use Bylaw No. 1667. Retrieved from <http://M.D..bonnyville.ab.ca/DocumentCenter/View/86/Bylaw-1667---Land-Use-Updated-November-14-2018>
- Natural Regions Committee. (2006). *Natural Regions and Subregions of Alberta*. Compiled by D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub. No. T/852
- Partners in Protection. 2003. *FireSmart: Protecting your Community from Wildfire, Second Edition*.



8 Glossary

Barriers to Spread – A fire barrier is an area that cannot burn, or burns slowly, which emergency responders may use as a staging point, anchor point, safety zone, or evacuation route.

Buildup Index (BUI) – Total amount of fuel available for combustion.

Combustible Material – Materials that must be heated at temperatures above normal, between 37.8°C and 93.3 °C (100°F and 200 °F), before they will ignite.

Coniferous – Plants that do not shed leaves in the fall. In this report coniferous is synonymous with spruce or pine trees.

Continuous Fuels – Patches of forest or grass fuels that do not have any barriers to spread. These areas may have the ability to support fire over longer distances.

Crossover – Occurs when the value of the RH is equal to, or lower than, the value of the temperature and is an indicator of potential extreme fire behaviour.

Cured or Curing – Dried or drying grass. Grass cures in the fall and remains cured until green up in the spring.

Deciduous – Plants that shed leaves in the fall. In this report deciduous is synonymous with aspen or poplar trees.

Drafting Water – The use of suction to move water from a vessel or body of water below the intake of the suction tank.

Dry Hydrant – A fire hydrant that is not pressurized. A dry hydrant is a pipe that goes out to a water body so that a pumper truck can draw water from water body.

Fine Fuel Moisture Code (FFMC) – A numerical indicator of the ease of ignition of litter and other cured fine fuels such as small twigs, needles and grasses.

Fire Behaviour – The manner in which fuel ignites, flame develops, fire spreads and exhibits other related phenomena.

Fire Hazard – A material, substance or action that may cause a wildfire.

FireSmart – Actions taken to minimize the unwanted effects of wildfire.

Fire Resistant – Material that is designed to resist burning and withstand heat.

Fire Weather Index (FWI) – This is a numeric rating of fire intensity. It is suitable as a general index of fire danger throughout the forested areas of Canada.

Flammable – Materials that will burn or catch on fire easily at normal temperatures; below 37.8°C or 100°F

Flank Fire – A fire that is burning at an angle approximately 90° to the wind.

Fuels – Combustible materials. In this report fuels tends to describe trees, plant debris (such as dead branches, leaves, etc.) but may also include man made materials.

Head Fire Intensity (HFI) – The energy that a fire generates. HFI is separated into six classes, one being low fire behaviour and six being extreme fire behaviour. See **table below** for more information:



Head Fire Intensity Class Description & Firefighting Methods		
Head Fire Intensity	Fire Behaviour	Firefighting Methods
1	Very low vigour, smouldering ground or creeping surface fire, low intensity	Self-extinguishing unless high drought code and/or build-up index values prevail, in which case mop-up is generally extensive.
2	Low vigour surface fire	Direct attack by firefighters with hand tools and water is possible. Constructed fireguard should hold.
3	Moderately vigorous surface fire	Hand-constructed fireguards are likely to be challenged. Heavy equipment is generally successful in controlling such fires. Indirect attack suggested.
4	Highly vigorous surface fire, may be torching trees or intermittent crown fire	Control efforts at the fire's head may fail. Indirect attack only by firefighting personnel.
5	Very high vigorous surface fire or crown fire	Very difficult to control. Suppression action must be restricted to the fire's flanks. Indirect attack with aerial ignition may be effective.
6	Extreme disastrous fire	Suppression actions should not be attempted until burning conditions improve.

Heat Transfer – Exchange of thermal energy, between physical systems depending on the temperature and pressure by dissipating heat.

Conduction: when heat (energy) is transferred through solid matter.

Convection: when heat (energy) is transferred between objects that are in physical contact.

Radiation: When heat (energy) is transferred from warmer surfaces to cooler surroundings. (E.g. The heat from the sun)

Incinerator Fires – Burning of household waste in an approved container with proper screening and venting.

Intensity – Measures of energy output. Amount of energy released during a fire.

Ladder Fuels – Fuels that provide a vertical continuity between surface fuels and crown fuels. (E.g. tall grasses, shrubs, branches)

Mixedwood – A mixture of both coniferous and deciduous trees, typically spruce and aspen.

Mutual Aid Agreement – Allows municipalities to prepare for emergency events that exceed their local resource capabilities.

Ninetieth Percentile (90th) – A measure of statistical distribution. The 90th percentile is the value for which 90% of the data points are smaller and 10% are bigger.

Prevailing Winds – The predominant winds in that area.

Rate of Spread (ROS) – The distance a fire will spread in a given period, measured in meters per minute.



Relative Humidity (RH) – It is the ratio of moisture in the air (water vapor) to the amount that the air can hold at the same temperature and pressure if it were saturated.

Riparian Zone – An area of land adjacent to a stream, lake, or wetland that contains vegetation that, due to the presence of water, is distinctly different from the vegetation of adjacent upland areas.

Risk – The probability of an undesirable event occurring.

Severity – A loss or change in organic matter both above and below ground.

Spotting – when a fire creates embers that travel through the air and can ignite fuels or structures.

Staging Area – An area that can be utilized to pre-position equipment and personnel during an incident.

Stand(s) – A group of trees that are similar in size, species, and understory.

Stakeholder – The range of groups and individuals who have a formal or informal stake in planning and management decisions.

Wildland/Urban Interface – The area where buildings are adjacent to, or within, forests, grasslands, scrublands, or other wildland vegetation.



9 Appendices



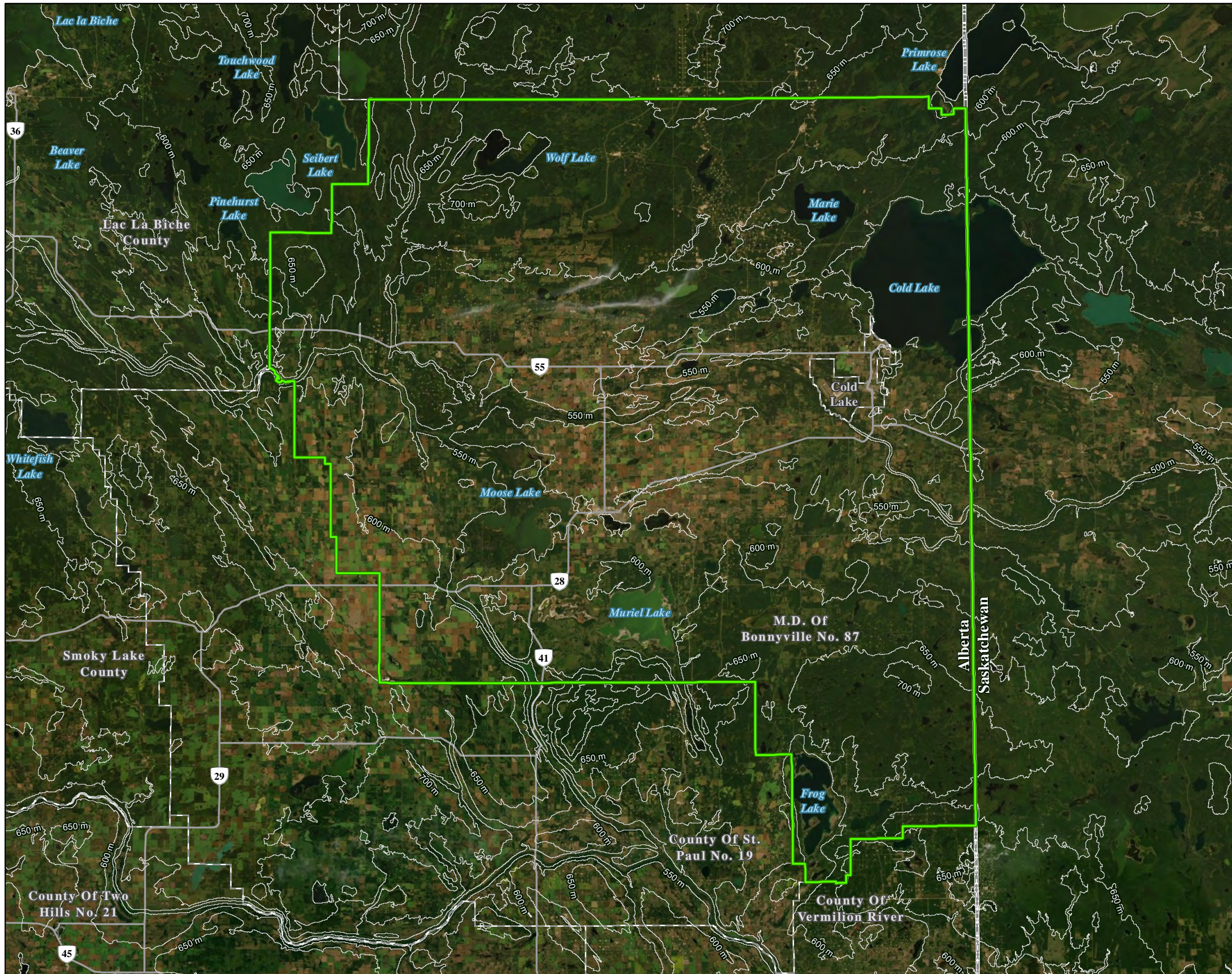
Appendix 1: Overview and Topography Maps



Wildfire Mitigation Strategy

Appendix 1 Topography

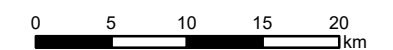
- Contour (50 m)
- Planning Area



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 Imagery Acquisition Date: Apr 21, 2010 - May 13, 2015
 Coordinate System: NAD 1983 UTM Zone 12N



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Date: December 16, 2019

Prepared by: R. Ok







Appendix 2: Maps of Focus Communities



**MUNICIPAL DISTRICT
BONNYVILLE NO. 87**
Wildfire Mitigation Strategy

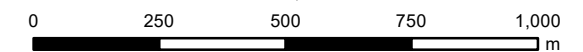
Appendix 2
Community
Ardmore

-  Community Boundary
-  Community Boundary Buffer (600 m)

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and Tarin
Imagery Acquisition Date: Spring 2018
Coordinate System: NAD 1983 UTM Zone 12N



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Date: January 8, 2020
Prepared by: R. Ok





Wildfire Mitigation Strategy

Appendix 2
Community
Crane Lake

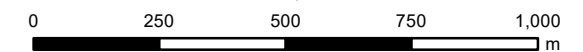
-  Community Boundary
-  Community Boundary Buffer (600 m)



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Date: January 8, 2020
 Prepared by: R. Ok



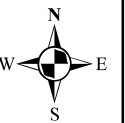


**MUNICIPAL DISTRICT
BONNYVILLE NO. 87**
Wildfire Mitigation Strategy

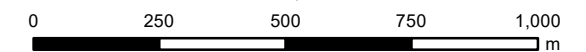
**Appendix 2
Community
Evergreen Estates**

- Community Boundary
- Community Boundary Buffer (600 m)

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Prepared by: R. Ok





Wildfire Mitigation Strategy

Appendix 2
Community
Marie Lake

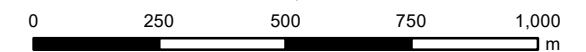
-  Community Boundary
-  Community Boundary Buffer (600 m)



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Coordinate System: NAD 1983 UTM Zone 12N



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Date: January 8, 2020
Prepared by: R. Ok





MUNICIPAL DISTRICT
BONNYVILLE NO. 87

Wildfire Mitigation Strategy

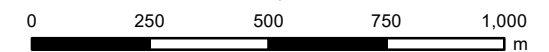
Appendix 2 Community Pelican Narrows

- Community Boundary
- Community Boundary Buffer (600 m)

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Coordinate System: NAD 1983 UTM Zone 12N



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Prepared by: R. Ok





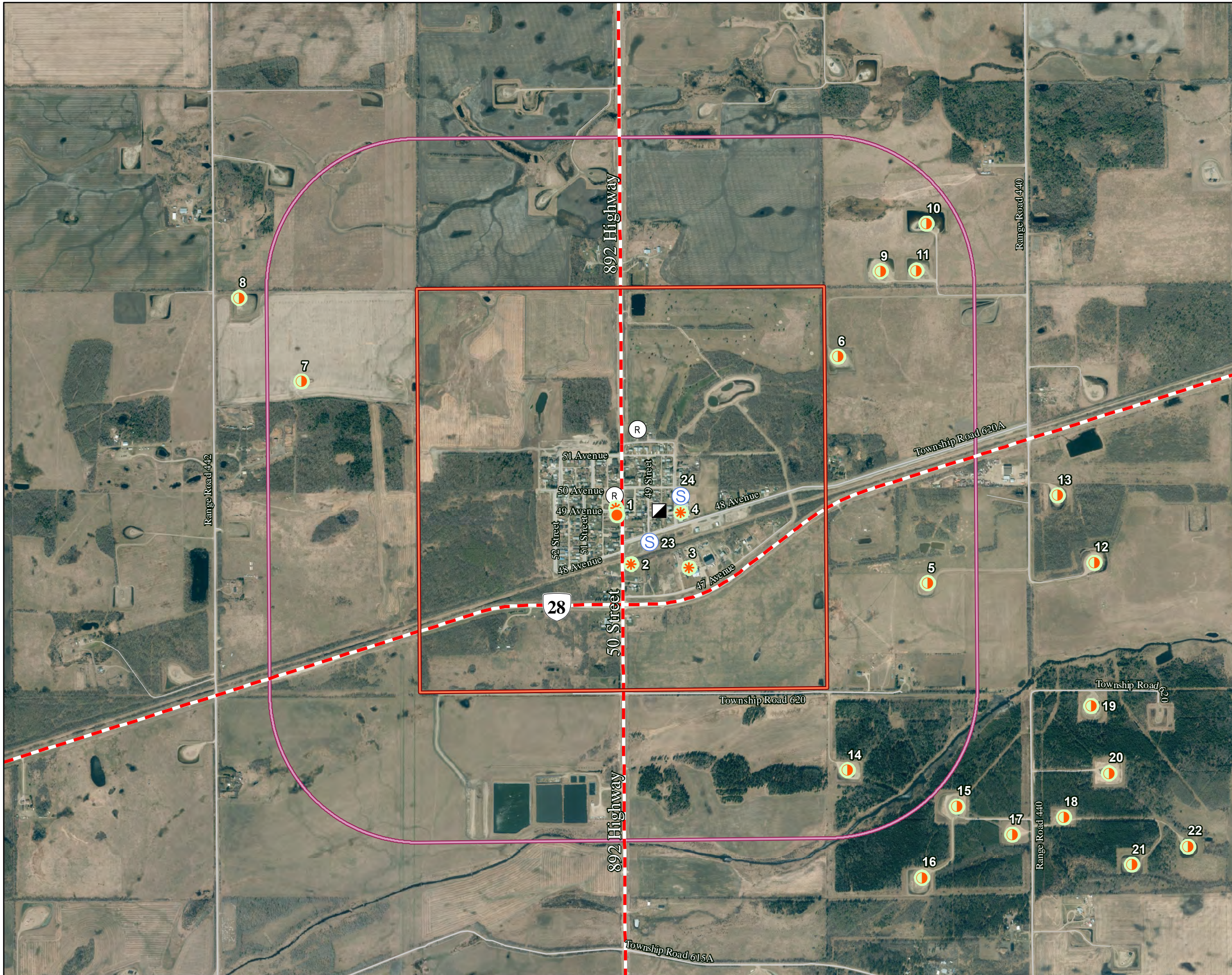
Appendix 3: Wildfire Preparedness Guides and Operations Maps



Wildfire Mitigation Strategy

Operations Ardmore

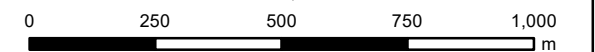
- Critical Value at Risk
- Dangerous Value at Risk
- Standard Value at Risk
- Emergency Operations Centre
- Safe Refuge Area
- Staging Area
- Evacuation Route
- Community Boundary
- Community Boundary Buffer (600 m)



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Wildfire Preparedness Guide

Ardmore

Updated February 2020

Key Contacts

Municipality			
Dispatch Centre	24h	780-826-7446	
Chief Administrative Officer Luc Mercier	Office Cell Email	780-826-3171 Ext. 9200 780-826-3171 Ext. 9200 lmercier@md.bonnyville.ab.ca	
Regional Fire Chief / Regional DEM Jay Melvin	Office Cell Email	780-826-4755 780-207-0327 jay.melvin@brfa.ca	
Regional Deputy Chief Dan Heney	Office Cell Email	780-826-4755 780-207-0326 dan.heney@brfa.ca	
Lac La Biche Agriculture and Forestry			
Fire Centre Duty Officer	Office Cell Email	780-623-5388 780-623-5245 Labiche.wfops@gov.ab.ca	
Utilities			
Alberta One Call	Emergency	1-800-242-3447	
North East Gas Co-Op Ltd	Phone	780-826-4002	
ATCO Gas	Emergency	1-800-511-3447	
ATCO Electric	Emergency	1-800-668-5506	
EDGE Hotline	Emergency	1-800-272-9600	
RCMP			
Emergency/Search and Rescue		911	
Detachment Phone (Regular Hours)		1-780-826-3358	

Values at Risk

Critical Values

Description	Label #	Latitude	Longitude
Fire Department (EOC)	-	54.33263	-110.47796
Nursing Home	1	54.33276	-110.48062
School	4	54.33257	-110.47662
Communication Tower	2	54.33072	-110.47970
Communication Tower	3	54.33058	-110.47617

Dangerous Values

Description	Label #
Various oil wells surrounding community (see map)	5-22

Staging Areas

Location	Label #	Latitude	Longitude
Empty Lot	23	54.33152	-110.47858
School Parking Lot	24	54.33315	-110.47662

Water Supply

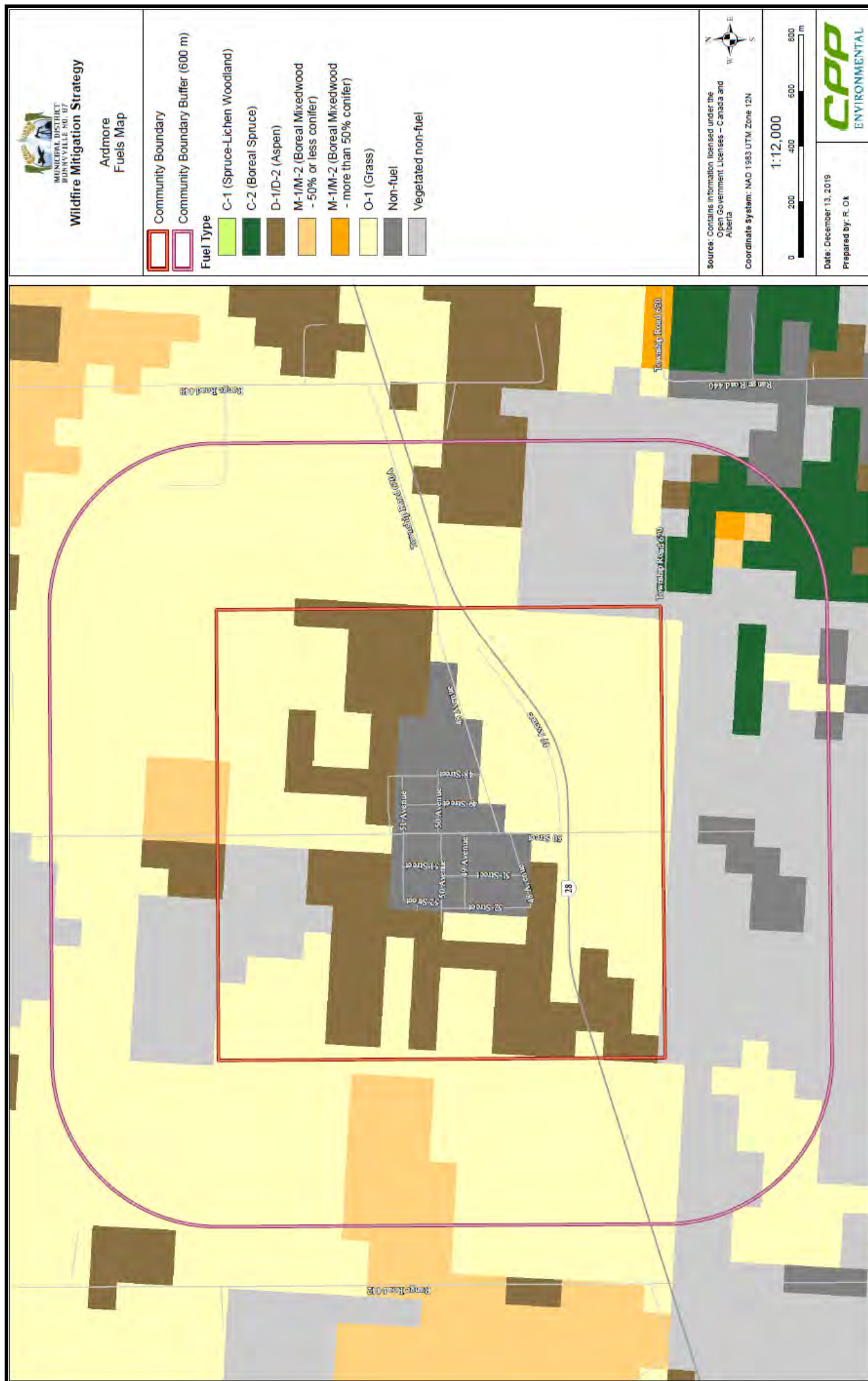
Hydrants are available throughout the Hamlet. The water for the hydrants is sourced from Cold Lake. There is a water station within Ardmore also sourced from Cold Lake.

Communications

Talk Group # (Range assigned by AFRCS)	Description (Radio)
1501	Ardmore/Fort Kent
1503	MUTUAL AID 1
1504	MUTUAL AID 2
1505	MUTUAL AID 3
770.18125 MHz	Simplex-1
770.23125 MHz	Simplex-2
770.43125 MHz	Simplex-3
770.48125 MHz	Simplex-4
770.68125 MHz	Simplex-5

Initial Response Resources

Location	Firefighters	Equipment	Quantity
Bonnyville	33	Structure Pumps	2
		Wildland Pumper	1
		Aerial Ladder, 500gal Class B Foam	1
		Tandem Axle Tanker	1
		Heavy Rescue	1
		Light Rescue/Wildfire Rapid	1
Ardmore	17	Structure / Wildfire Pumper	1
Fort Kent	11	Structure / Wildfire Pumper	1
Goodridge	31	Structure / Wildfire Pumper	1
		Single Axle Tanker	1
		Heavy Rescue	1
Glendon	23	Structure / Wildfire Pumper	1
		Single Axle Tanker	1
		Light Rescue / Wildfire Rapid	1
Iron River	22	Tandem Axle Tanker	1
		Rapid Response Wildland Unit	1
La Corey	15	Pumper	1
		Single Axle Tanker	2
Cold Lake	50	Pumper	2
		Single Axle Tanker	1



Evacuation Protocol

Resident Evacuation

Incident Commander (IC) will advise the Director of Emergency Management (DEM) when a fire is threatening the community. Evacuation level will be determined by the following trigger points:

- If a wildfire is immediately threatening the community, evacuation order.
- If a nearby multiday fire is causing smoke issues, evacuation order for elderly and infirm, evacuation alert for the community.

Evacuation Routes

- North or south on Highway 892.
- East or west on Highway 28.

Emergency Assembly / Safe Refuge Areas

- If required, temporary assembly and housing will be established in the Town of Bonnyville.

Responder Evacuation

- Responder evacuation will be determined by the Incident Commander.

Escape Routes / Safety Zones

- Safety Zones are to be used as a last resort. Evacuation away from the threatened area should be the primary goal. Safe refuge areas are identified on the operations map and should be confirmed they are still safe at the time of the incident.

Functional Roles

Evacuation

Hamlet of Ardmore / EOC Director to determine the evacuation alert or order. RCMP to complete evacuation.

Wildfire Suppression

Ardmore Fire Department

Structure/Non Structure Fire:

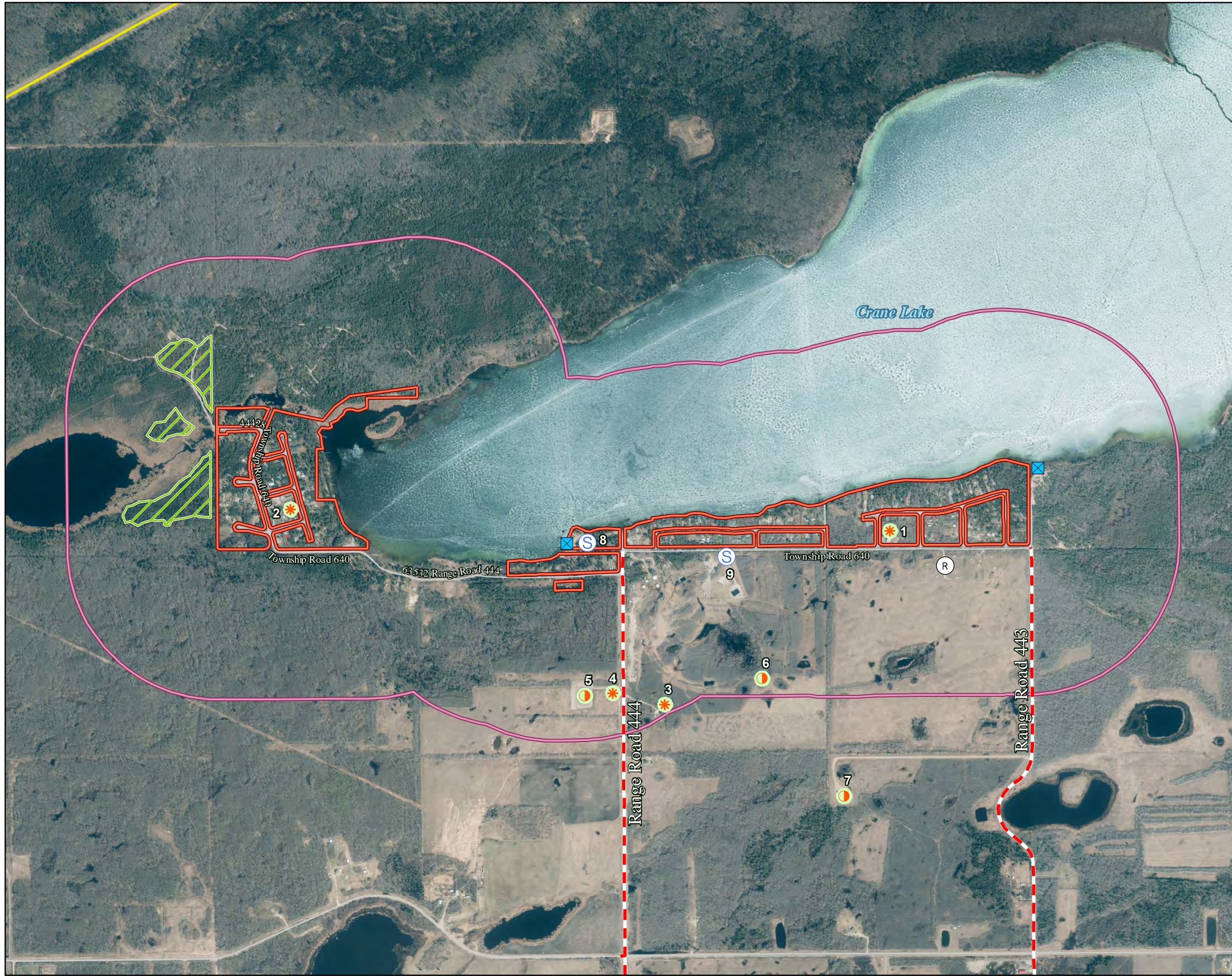
Ardmore Fire Department



Wildfire Mitigation Strategy

Operations Crane Lake

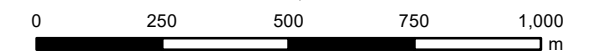
- Critical Value at Risk
- Dangerous Value at Risk
- Safe Refuge Area
- Staging Area
- Water Source
- Evacuation Route
- Powerline
- Community Boundary
- Community Boundary Buffer (600 m)
- Previous Fuel Modification



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Date: January 8, 2020
 Prepared by: R. Ok



Wildfire Preparedness Guide

Crane Lake

Updated February 2020

Key Contacts

Municipality			
Dispatch Centre	24h	780-826-7446	
Chief Administrative Officer Luc Mercier	Office Cell Email	780-826-3171 Ext. 9200 780-826-3171 Ext. 9200 lmercier@md.bonnyville.ab.ca	
Regional Fire Chief / Regional DEM Jay Melvin	Office Cell Email	780-826-4755 780-207-0327 jay.melvin@brfa.ca	
Regional Deputy Chief Dan Heney	Office Cell Email	780-826-4755 780-207-0326 dan.heney@brfa.ca	
Lac La Biche Agriculture and Forestry			
Fire Centre Duty Officer	Office Cell Email	780-623-5388 780-623-5245 Labiche.wfops@gov.ab.ca	

Utilities			
Alberta One Call	Emergency	1-800-242-3447	
North East Gas Co-Op Ltd	Phone	780-826-4002	
ATCO Gas	Emergency	1-800-511-3447	
ATCO Electric	Emergency	1-800-668-5506	
EDGE Hotline	Emergency	1-800-272-9600	

RCMP		
Emergency/Search and Rescue	911	
Detachment Phone (Regular Hours)	1-780-826-3358	

Values at Risk

Critical Values

Description	Label #	Latitude	Longitude
Communication Tower	1	54.50128	-110.54384
Communication Tower	2	54.50220	-110.58079
Communication Tower	3	54.49512	-110.55776
Communication Tower	4	54.49550	-110.56099

Dangerous Values

Description	Label #	Latitude	Longitude
Oil Well	5	54.49543	-110.56268
Oil Well	6	54.49601	-110.55177
Oil Well	7	54.49179	-110.54678

Staging Areas

Location	Label #	Latitude	Longitude
West Campground Parking Lot	8	54.50097	-110.56317
Large Residential Parking Lot	9	54.50039	-110.55391

Water Supply

See Operations Map for drafting locations. There are also hydrants in the hamlets of Fort Kent and Ardmore.

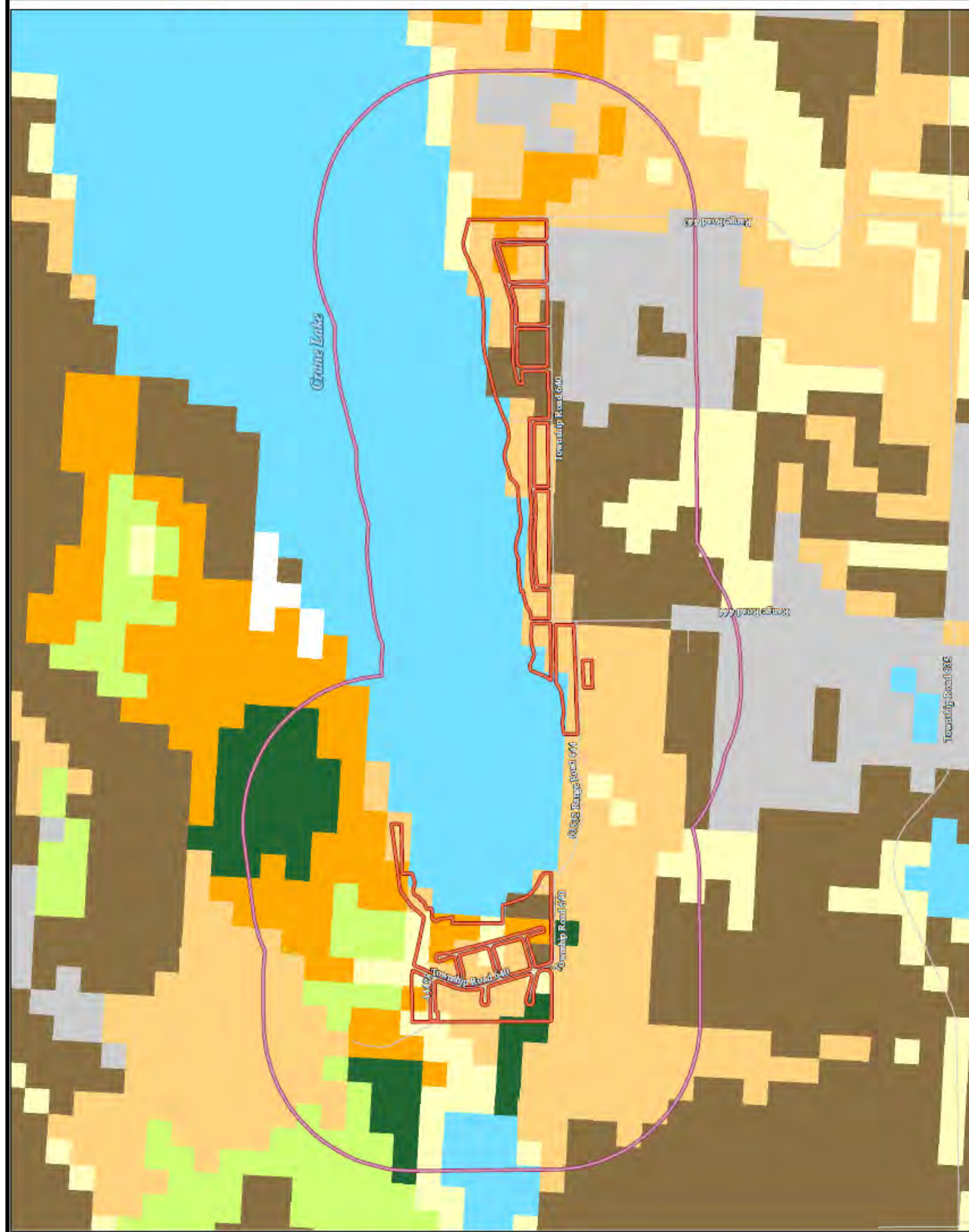
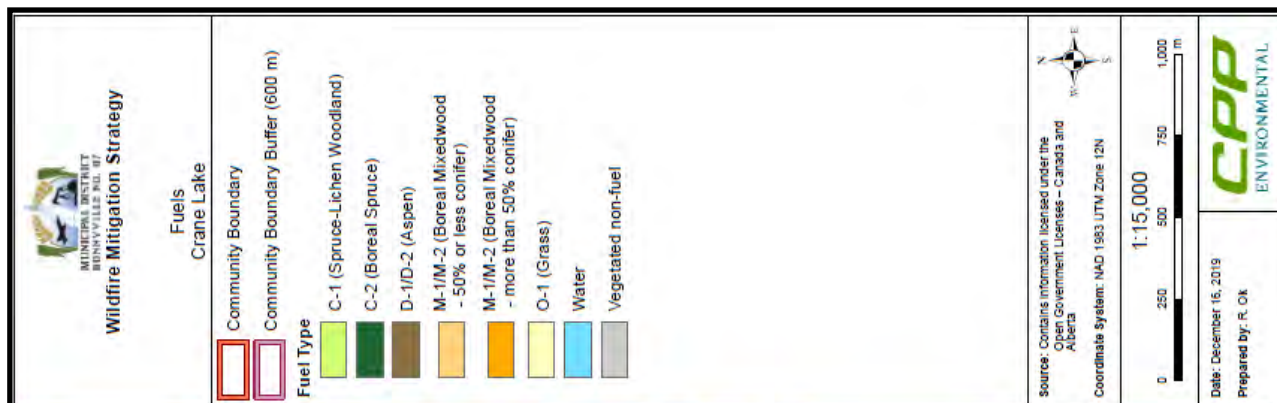
Communications

Lac La Biche Forest Area Dispatch
FireNet Channel 240
Frequency: TX 157.845MHz, RX 152.585MHz

Talk Group # (Range assigned by AFRRCS)	Description (Radio)
1499	Iron River / La Corey
5238	WFMA NE (Lac La Biche)
1503	MUTUAL AID 1
1504	MUTUAL AID 2
1505	MUTUAL AID 3
770.18125 MHz	Simplex-1
770.23125 MHz	Simplex-2
770.43125 MHz	Simplex-3
770.48125 MHz	Simplex-4
770.68125 MHz	Simplex-5

Initial Response Resources

Location	Firefighters	Equipment	Quantity
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		Heavy Rescue	1
		Light Rescue/Wildfire Rapid	1
Ardmore	17	Structure / Wildfire Pumper	1
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Goodridge	31	Structure / Wildfire Pumper	1
		Single Axle Tanker	1
		Heavy Rescue	1
Glendon	23	Structure / Wildfire Pumper	1
		Single Axle Tanker	1
		Light Rescue / Wildfire Rapid	1
Iron River	22	Tandem Axle Tanker	1
		Rapid Response Wildland Unit	1
La Corey	15	Pumper	1
		Single Axle Tanker	2
Cold Lake	50	Pumper	2
		Single Axle Tanker	1



Evacuation Protocol

AAF IC will advise the DO when a fire is threatening the Community; DO will advise the Municipal Disaster Services Authority. Alert status will be determined by the Evacuation Trigger Points.

- When a wildfire is discovered and initial attack has failed to contain the fire start within the primary containment lines, the IC will give a strategic evacuation notification
- If a wildfire occurs within the second containment line, or is immediately threatened, the IC may be required to do a tactical evacuation and give immediate notification
- If a wildfire approaches the community from a distance of greater than 10 kilometers, the Evacuation Alert will be based on local weather conditions and fire behavior

Evacuation Routes

- All roads within the subdivision can be used as evacuation routes. Specific routes will be designated by the local RCMP at the time.
- Highway 55 is the main evacuation route out of the area

Emergency Assembly/ Safe Refuge Areas

- If required, temporary assembly and housing will be established in the Town of Bonnyville

Responder Evacuation

- Responder evacuation will be determined by the Incident Commander

Escape Routes/Safety Zones

- Potentials are identified on the attached map

Wildfire Operations

Consider the use of FireSmart treated areas. Sprinkler lines may be added to these areas or air tanker drops could make these areas more resilient to wildfire.

In case of power outage or issue with natural gas, the contacts can be found under the key contacts section of the plan.

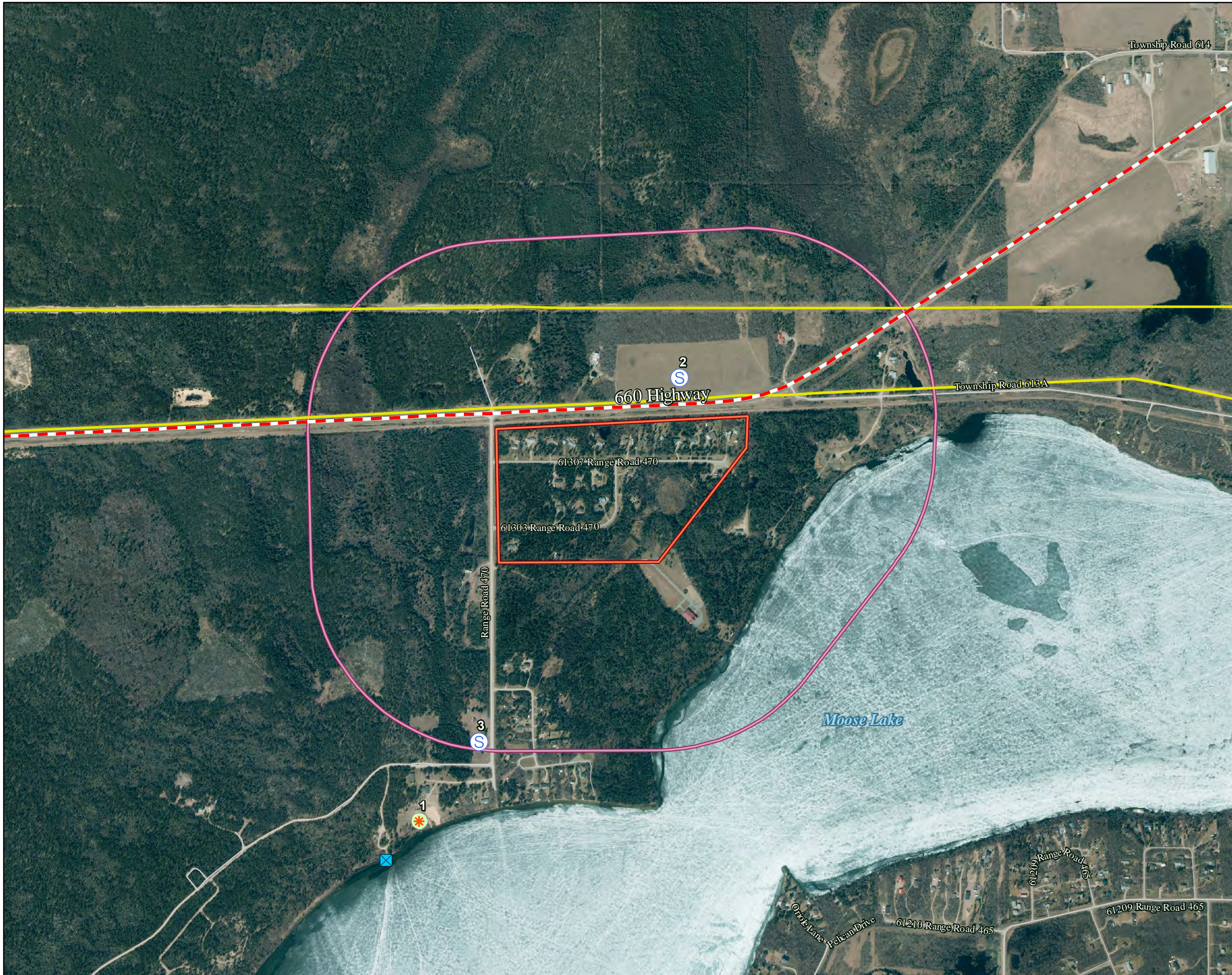
Refer to the M.D. of Bonnyville Mutual Aid Fire Control Plan for areas of responsibility and the mutual aid resource sharing process.

Functional Roles

Evacuation
Bonnyville Regional Fire Authority








Wildfire Suppression
Alberta Agriculture and Forestry

Structure/Non Structure Fire
Iron River / La Corey Fire Department



Wildfire Mitigation Strategy

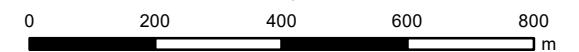
Operations
Evergreen Estates

-  Critical Value at Risk
-  Staging Area
-  Water Source
-  Evacuation Route
-  Powerline
-  Community Boundary
-  Community Boundary Buffer (600 m)

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 Prepared by: R. Ok



Wildfire Preparedness Guide

Evergreen Estates

Updated February 2020

Key Contacts

Municipality		
Dispatch Centre	24h	780-826-7446
Chief Administrative Officer Luc Mercier		
Office	780-826-3171 Ext. 9200	
Cell	780-826-3171 Ext. 9200	
Email	lmercier@md.bonnyville.ab.ca	
Regional Fire Chief / Regional DEM Jay Melvin		
Office	780-826-4755	
Cell	780-207-0327	
Email	jay.melvin@brfa.ca	
Regional Deputy Chief Dan Heney		
Office	780-826-4755	
Cell	780-207-0326	
Email	dan.heney@brfa.ca	
Lac La Biche Agriculture and Forestry		
Fire Centre		
Duty Officer	Office	780-623-5388
	Cell	780-623-5245
	Email	Labiche.wfops@gov.ab.ca
Utilities		
Alberta One Call	Emergency	1-800-242-3447
North East Gas Co-Op Ltd	Phone	780-826-4002
ATCO Gas	Emergency	1-800-511-3447
ATCO Electric	Emergency	1-800-668-5506
EDGE Hotline	Emergency	1-800-272-9600
RCMP		
Emergency/Search and Rescue		911
Detachment Phone (Regular Hours)		1-780-826-3358

Values at Risk

Critical Values

Description	Label #	Latitude	Longitude
Communication Tower	1	54.27505	-110.90885

Staging Areas

Location	Label #	Latitude	Longitude
Private Lot	2	54.28774	-110.89601
Campground Parking Lot	3	54.27730	-110.90589

Water Supply

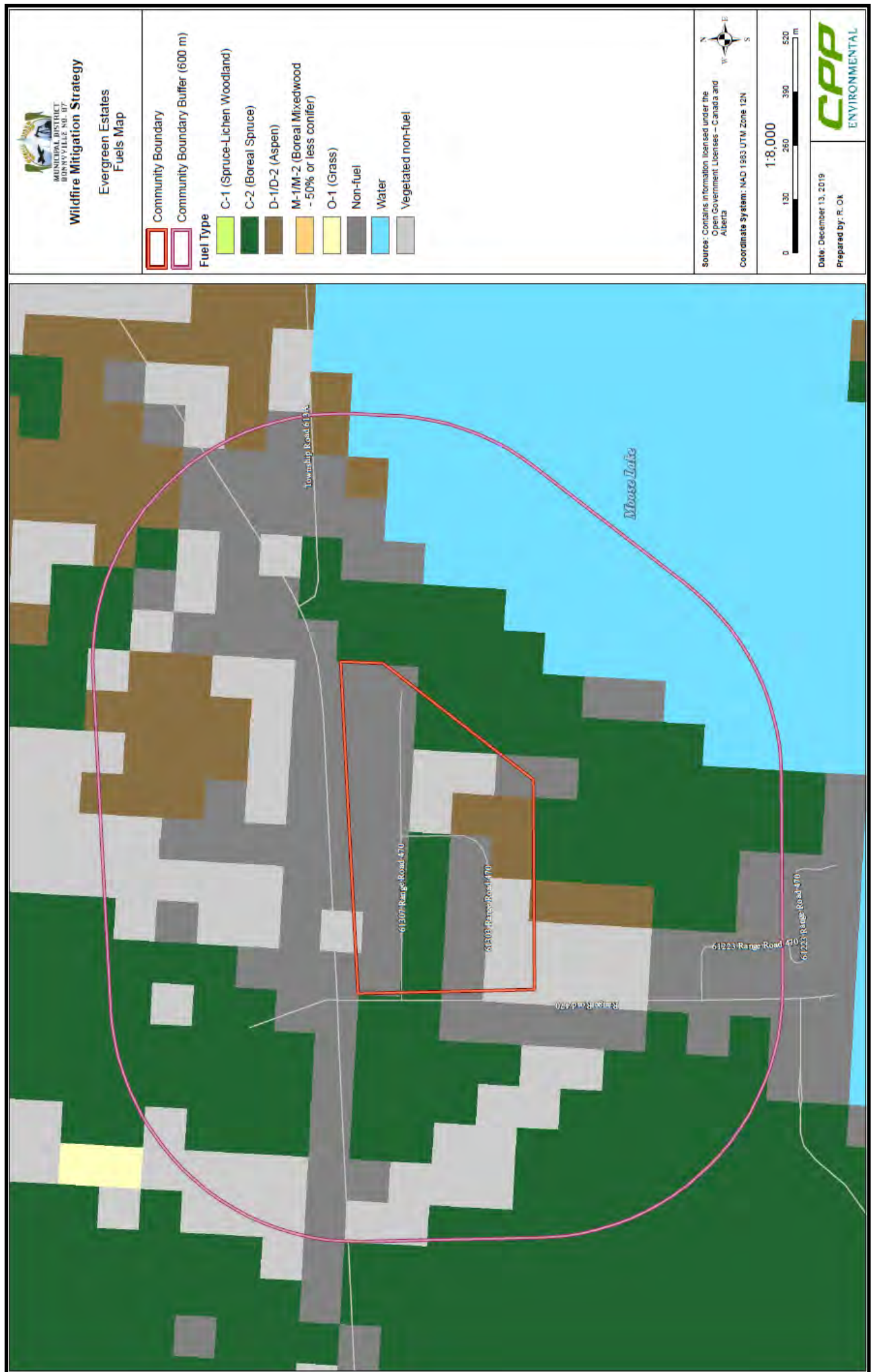
See Operations Map for drafting location. The town of Bonnyville is also in close proximity for hydrant use.

Communications

Talk Group # (Range assigned by AFRRCS)	Description (Radio)
1500	Bonnyville
1503	MUTUAL AID 1
1504	MUTUAL AID 2
1505	MUTUAL AID 3
770.18125 MHz	Simplex-1
770.23125 MHz	Simplex-2
770.43125 MHz	Simplex-3
770.48125 MHz	Simplex-4
770.68125 MHz	Simplex-5

Initial Response Resources

Location	Firefighters	Equipment	Quantity
Bonnyville	33	Structure Pumps	2
		Wildland Pumper	1
		Aerial Ladder, 500gal Class B Foam	1
		Tandem Axle Tanker	1
		Heavy Rescue	1
		Light Rescue/Wildfire Rapid	1
Ardmore	17	Structure / Wildfire Pumper	1
Fort Kent	11	Structure / Wildfire Pumper	1
Goodridge	31	Structure / Wildfire Pumper	1
		Single Axle Tanker	1
		Heavy Rescue	1
Glendon	23	Structure / Wildfire Pumper	1
		Single Axle Tanker	1
		Light Rescue / Wildfire Rapid	1
Iron River	22	Tandem Axle Tanker	1
		Rapid Response Wildland Unit	1
La Corey	15	Pumper	1
		Single Axle Tanker	2
Cold Lake	50	Pumper	2
		Single Axle Tanker	1



Evacuation Protocol

Resident Evacuation

Incident Commander (IC) will advise the Director of Emergency Management (DEM) when a fire is threatening the community. Evacuation level will be determined by the following trigger points:

- If a wildfire is immediately threatening the community, evacuation order.
- If a nearby multiday fire is causing smoke issues, evacuation order for elderly and infirm, evacuation alert for the community.

Evacuation Routes

- North on Range Road 70 to Highway 660.

Emergency Assembly / Safe Refuge Areas

- If required, temporary assembly and housing will be established in the Town of Bonnyville.

Responder Evacuation

- Responder evacuation will be determined by the Incident Commander.

Escape Routes / Safety Zones

- Safety areas in the community are minimal due to continuous vegetation. Due to this and the single egress, consider evacuation away from the threatened area should be the primary goal.

Functional Roles

Evacuation

Bonnyville Regional Fire Authority

Wildfire Suppression

Bonnyville Regional Fire Authority







Structure/Non Structure Fire

Bonnyville Regional Fire Authority



Wildfire Mitigation Strategy

**Operations
Marie Lake**

-  Dangerous Value at Risk
-  Staging Area
-  Evacuation Route
-  Community Boundary
-  Community Boundary Buffer (600 m)
-  Previous Fuel Modification



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Date: January 8, 2020
 Prepared by: R. Ok



Wildfire Preparedness Guide

Marie Lake

Updated February 2020

Key Contacts

Municipality			
Dispatch Centre	24h	780-826-7446	
Chief Administrative Officer Luc Mercier	Office Cell Email	780-826-3171 Ext. 9200 780-826-3171 Ext. 9200 lmercier@md.bonnyville.ab.ca	
Regional Fire Chief / Regional DEM Jay Melvin	Office Cell Email	780-826-4755 780-207-0327 jay.melvin@brfa.ca	
Regional Deputy Chief Dan Heney	Office Cell Email	780-826-4755 780-207-0326 dan.heney@brfa.ca	
Lac La Biche Agriculture and Forestry			
Fire Centre Duty Officer	Office Cell Email	780-623-5388 780-623-5245 Labiche.wfops@gov.ab.ca	
Utilities			
Alberta One Call	Emergency	1-800-242-3447	
North East Gas Co-Op Ltd	Phone	780-826-4002	
ATCO Gas	Emergency	1-800-511-3447	
ATCO Electric	Emergency	1-800-668-5506	
EDGE Hotline	Emergency	1-800-272-9600	
RCMP			
Emergency/Search and Rescue	911		
Detachment Phone (Regular Hours)	1-780-826-3358		

Values at Risk

Dangerous Values

Description	Label #	Latitude	Longitude
Oil Wells	1	54.63019	-110.21573

Staging Areas

Location	Label #	Latitude	Longitude
RR23, North End	2	54.63530	-110.23184
RR23, South End	3	54.63065	-110.23203

Water Supply

There are no adequate water supplies or drafting locations within the community. English Bay Provincial Park and the Marie Lake Camping Society could be used for potential drafting locations. Cold Lake is available for hydrant use.

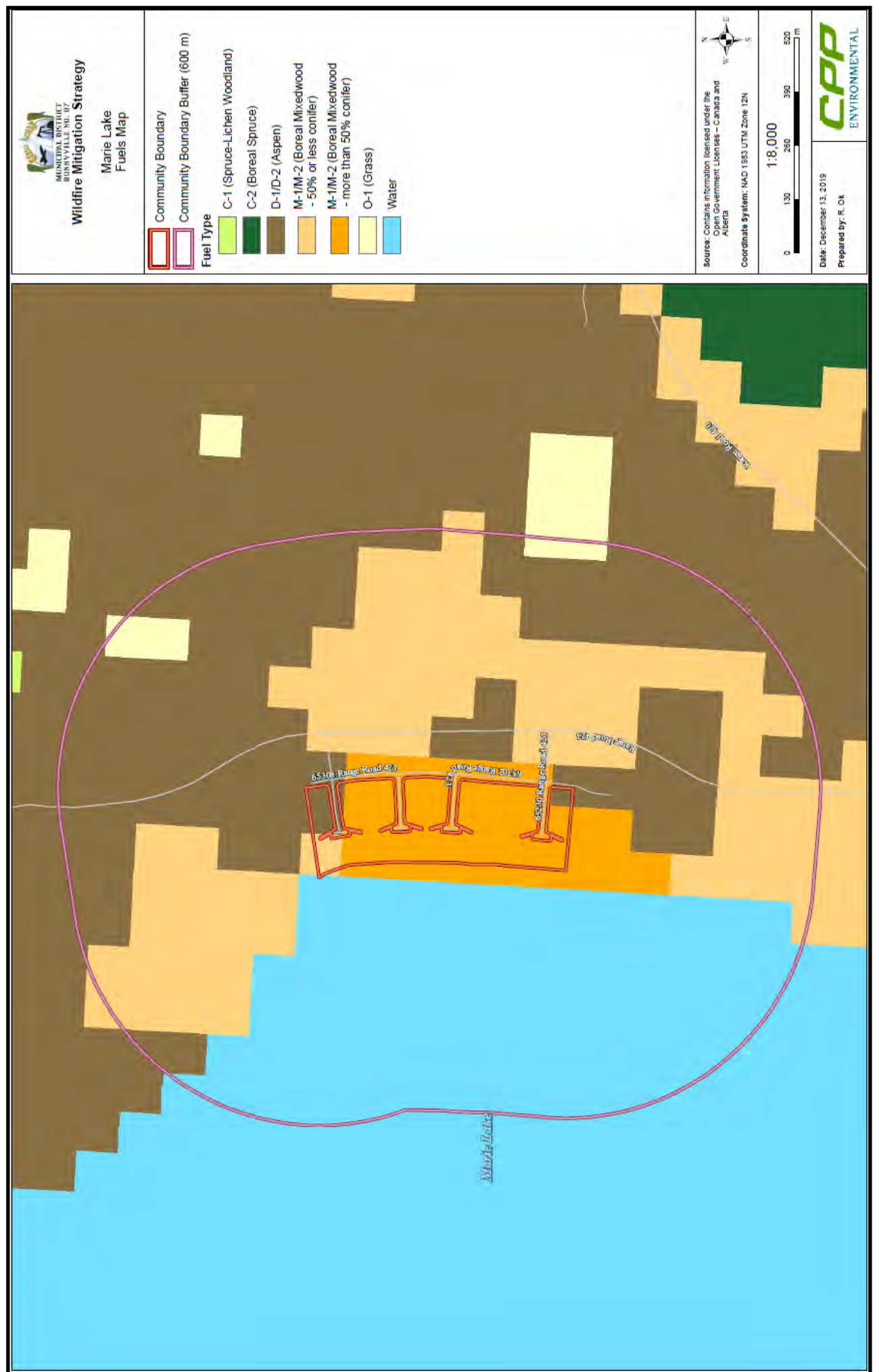
Communications

Lac La Biche Forest Area Dispatch
FireNet Channel 240
Frequency: TX 157.845MHz, RX 152.585MHz

Talk Group # (Range assigned by AFRRCS)	Description (Radio)
1499	Iron River / La Corey
5238	WFMA NE (Lac La Biche)
1503	MUTUAL AID 1
1504	MUTUAL AID 2
1505	MUTUAL AID 3
770.18125 MHz	Simplex-1
770.23125 MHz	Simplex-2
770.43125 MHz	Simplex-3
770.48125 MHz	Simplex-4
770.68125 MHz	Simplex-5

Initial Response Resources

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		Heavy Rescue	1
		Light Rescue/Wildfire Rapid	1
Ardmore	17	Structure / Wildfire Pumper	1
Fort Kent	11	Structure / Wildfire Pumper	1
Goodridge	31	Structure / Wildfire Pumper	1
		Single Axle Tanker	1
		Heavy Rescue	1
Glendon	23	Structure / Wildfire Pumper	1
		Single Axle Tanker	1
		Light Rescue / Wildfire Rapid	1
Iron River	22	Tandem Axle Tanker	1
		Rapid Response Wildland Unit	1
La Corey	15	Pumper	1
		Single Axle Tanker	2
Cold Lake	50	Pumper	2
		Single Axle Tanker	1



Evacuation Protocol

AAF IC will advise the DO when a fire is threatening the Community; DO will advise the Municipal Disaster Services Authority. Alert status will be determined by the Evacuation Trigger Points.

- When a wildfire is discovered and initial attack has failed to contain the fire start within the primary containment lines, the IC will give a strategic evacuation notification
- If a wildfire occurs within the second containment line, or is immediately threatened, the IC may be required to do a tactical evacuation and give immediate notification
- If a wildfire approaches the community from a distance of greater than 10 kilometers, the Evacuation Alert will be based on local weather conditions and fire behavior

Evacuation Routes

- All roads within the subdivision can be used as evacuation routes. Specific routes will be designated by the local RCMP at the time.
- Highway 897 is the main evacuation route out of the area

Emergency Assembly/ Safe Refuge Areas

- If required, temporary assembly and housing will be established in Cold Lake

Responder Evacuation

- Responder evacuation will be determined by the Incident Commander

Escape Routes/Safety Zones

- Potentials are identified on the attached map

Wildfire Operations

Consider the use of FireSmart treated areas. Sprinkler lines may be added to these areas or air tanker drops could make these areas more resilient to wildfire.

In case of power outage or issue with natural gas, the contacts can be found under the key contacts section of the plan.

Refer to the M.D. of Bonnyville Mutual Aid Fire Control Plan for areas of responsibility and the mutual aid resource sharing process.

Functional Roles

Evacuation

Bonnyville Regional Fire Authority

Wildfire Suppression

Alberta Agriculture and Forestry

Structure/Non Structure Fire

Bonnyville Regional Fire Authority



Appendix 4: Previous Fuel Modification, Alberta Agriculture and Forestry



Marie Lake FireSmart

0 80 160 320 Meters

1:3,500

 2017/18 Completed Dead/Down Removal

 2016/17 Completed Thinning/Pruning

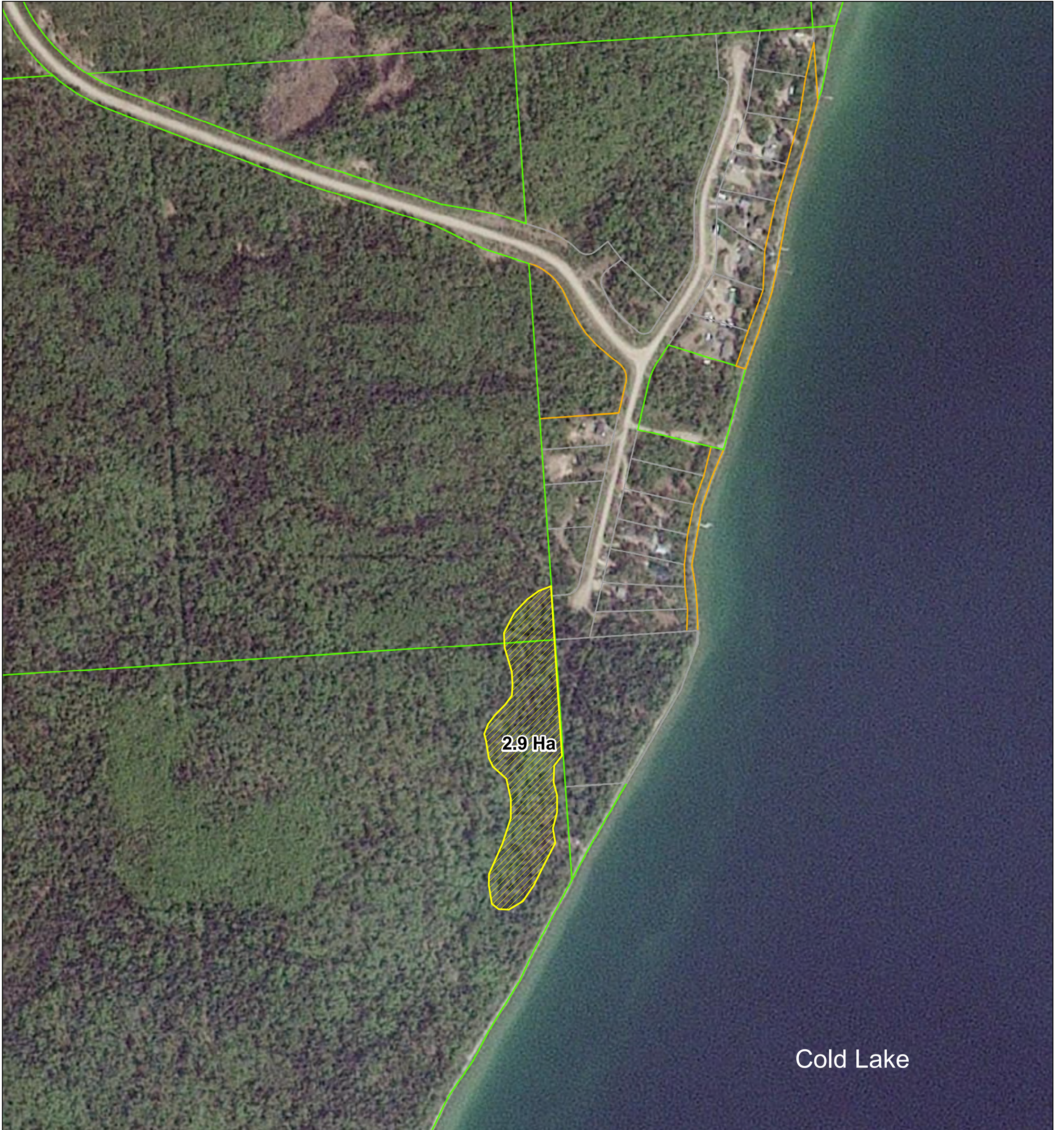
 Federal

 Municipal

 Provincial

 Private





Birch Ridge FireSmart

0 80 160 320 Meters

1:3,500

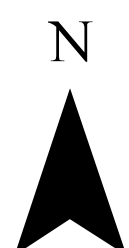
 2017/18 Completed Thinning/Pruning

 Federal

 Municipal

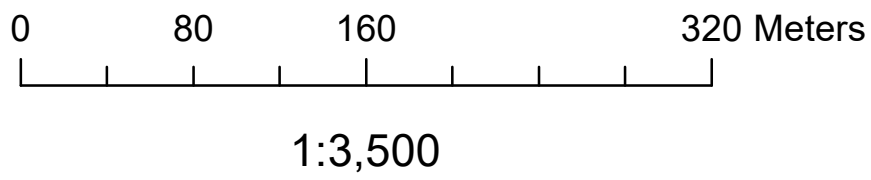
 Provincial






 Private





Crane Lake FireSmart



-  Completed Thinning/Pruning
-  Federal
-  Municipal
-  Provincial
-  Private



RGE-04 MER-4






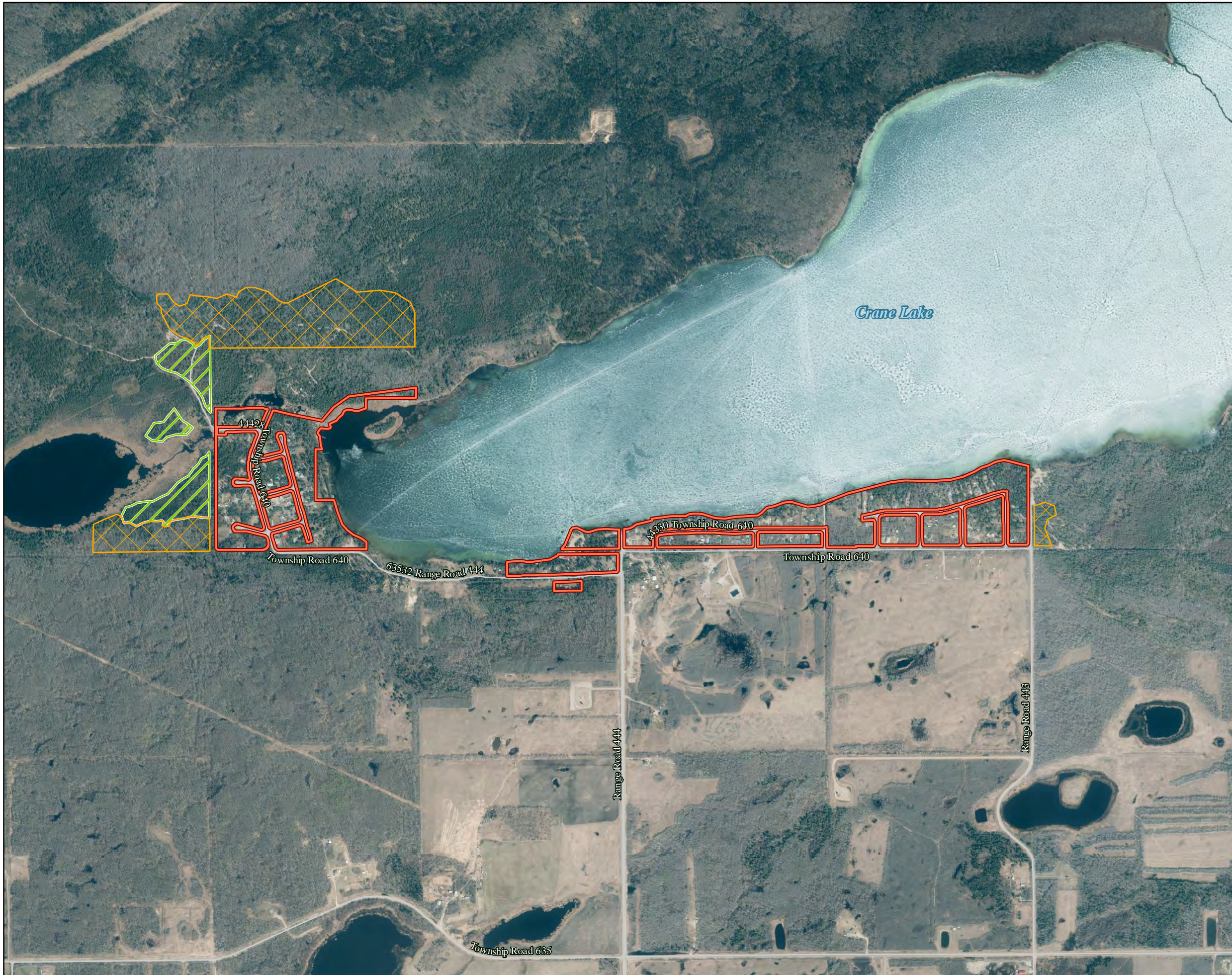
Appendix 5: Recommended Fuel Modification



Wildfire Mitigation Strategy

Appendix 5 Recommended Fuel Modifications Crane Lake

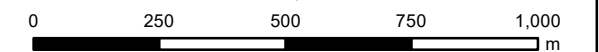
-  Community Boundary
-  Previous Fuel Modification
- Recommended Fuel Modification**
 -  Thinning, Pruning, Removal of Dead Material and Woody Debris (27.78 ha)



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 Prepared by: R. Ok





Wildfire Mitigation Strategy

Appendix 5
Recommended Fuel Modifications
Evergreen Estates

Community Boundary

Recommended Fuel Modification

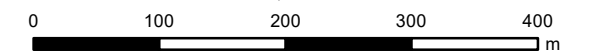
Thinning, Pruning, Removal of Dead Material and Woody Debris (2.18 ha)



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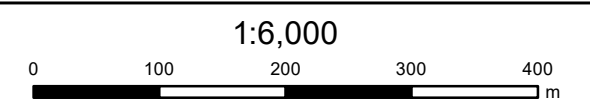
Wildfire Mitigation Strategy

Appendix 5
Recommended Fuel Modifications
Marie Lake

-  Community Boundary
-  Previous Fuel Modification
- Recommended Fuel Modification**
 -  Pruning, Removal of Dead Material and Woody Debris (2.20 ha)
 -  Removal of Dead Material and Woody Debris (10.63 ha)
 -  Thinning, Pruning, Removal of Dead Material and Woody Debris (18.80 ha)



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 Prepared by: R. Ok





Wildfire Mitigation Strategy

Appendix 5 Recommended Fuel Modifications Pelican Narrows

Community Boundary

Recommended Fuel Modification

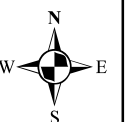
Pruning, Removal of Dead Material and Woody Debris (0.88 ha)



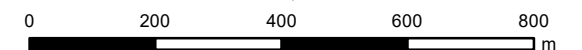
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Coordinate System: NAD 1983 UTM Zone 12N



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Date: January 31, 2020

Prepared by: R. Ok

