

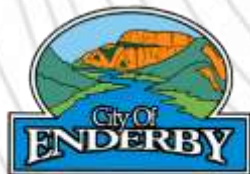
# Enderby Community Wildfire Protection Plan

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Forsite Project [1024-4]

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# Acknowledgements

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- Kurt Inglis – Planner – City of Enderby
- Tate Bengston – Chief Administrative Officer – City of Enderby
- Clifford Vetter – Fire Chief – Enderby Fire Department

## Executive Summary

In the spring of 2018, Forsite Consultants Ltd. was retained by the City of Enderby to update the Community Wildfire Protection Plan (CWPP) for Enderby and surrounding area. The Community Wildfire Protection Plan (CWPP) is a process to develop planning and administrative tools to help local governments respond to wildfire risk. This plan was updated using the new Strategic Wildfire Prevention Initiative (SWPI 2017) program templates and associated planning tools.

The Enderby CWPP project area has large tracts of private land which are ineligible for fire hazard mitigation funding. While no fuel management actions were prescribed due to this ineligibility, both FireSmart education and planning for private land and emergency management considerations such as evacuation and agency coordination could benefit the City of Enderby.

The unprecedented 2017 wildfire season has also demonstrated the need for community emergency management planning. The City of Enderby's updated CWPP is an important step in community preparedness and hazard identification in the wildland urban interface.



# Summary of CWPP Recommendations

**Table 1: Summary of CWPP Recommendations**

	Objective/Priority	Recommendation/ Next Steps	Responsibility/Funding Source
Section 5: Risk Management and Mitigation Factors	1. Increase FireSmart awareness throughout the plan area by developing a broad FireSmart Implementation Plan.	The City of Enderby should seek additional funding when available to support a broad engagement strategy regarding FireSmart standards and activities on a yearly basis. <sup>1</sup>  The designation of a community FireSmart champion within the Enderby Fire Department will support a broader FireSmart engagement strategy within the community	City of Enderby/ Strategic Wildfire Prevention Initiative (SWPI), Forest Enhancement Society of British Columbia (FESBC), and/or Community Resilience Investment Fund (CRIP)
	2. Increase community awareness by communication with key stakeholders.	Capture this objective in FireSmart Implementation Strategy (see above). May include items such as community mail outs for private landowners, FireSmart community days, and local advertising such as a FireSmart section on the City of Enderby website. This will include City of Enderby staff, private landowners, woodlot tenure holders, and other community members.	City of Enderby/ Strategic Wildfire Prevention Initiative (SWPI), Forest Enhancement Society of British Columbia (FESBC), and/or Community Resilience Investment Fund (CRIP)

<sup>1</sup> A 2018 FireSmart grant was retained for the City of Enderby which will be used to develop a FireSmart Implementation Plan.

	Objective/Priority	Recommendation/ Next Steps	Responsibility/Funding Source
	3. Monitor forest conditions in community and surrounding area for fuel management opportunities and hazard mitigation.	Monitor surrounding area for forest health issues including wind throw, bark beetles, and other pathogens as hazard in the project area may change.  Monitor policy changes that may allow alternate funding opportunities for fire hazard mitigation in areas currently unavailable for funding, such as private land.	City of Enderby/ FESBC/ CRIP
	4. Develop Fire Smart building and development standards relating to exterior building materials and landscaping for new developments	Review regulatory tools associated with subdivision, rezoning and development permits, e.g. registration of covenants, development massing and detailed building design guidelines, can be used to influence development so as to reduce overall hazards within the city.	City of Enderby
	5. Work alongside Splantsin to update their CWPP with specific attention to fuel management and fire hazard mitigation.	Contribute information and input to Splantsin CWPP renewal where fitting.  Continue to cultivate relationship of emergency management co operations and discussion of shared risk with Splantsin band council and staff.	City of Enderby, Splantsin
Section 6: Wildfire Response	6. Increase wildfire training within local department through cross training exercises with BC Wildfire	Fire department to contact BC Wildfire for potential training opportunities. This may include discussions surrounding communications and potential areas of vulnerability, and mock wildfire exercises.	Enderby Fire Department

	Objective/Priority	Recommendation/ Next Steps	Responsibility/Funding Source
	7. Assess evacuation concerns within the project area with particular emphasis on one way in/one way out routes	Emergency Operations Center Planning Section and Enderby Fire Department review and, where necessary, revise evacuation protocols based on risk.	City of Enderby/UBCM,CRIP
	8. Collaborate with North Okanagan Regional District to apply for available funding for connection of Gunter Ellison and Glenmary Roads	Engage with NORD to discuss wildfire risks associated with one way egress along Gunter Ellison road, and options to address this risk. Monitor funding opportunities to eliminate one way out access/egress.	City of Enderby, North Okanagan Regional District/ UBCM, CRIP
	9. Identify water resources within the Shuswap Fire Protection District where water scarcity is a concern for fire suppression	Emergency Operations Center Planning Section and Enderby Fire Department to identify areas within Shuswap Fire Protection District with water supply vulnerabilities and identify mitigating solutions	City of Enderby/Enderby Fire Department/CRIP

# Contents

Acknowledgements .....	i
Executive Summary .....	ii
Summary of CWPP Recommendations .....	iii
Contents .....	vi
List of Tables .....	vii
<b>1 Introduction .....</b>	<b>1</b>
<b>1.1 Purpose .....</b>	<b>1</b>
<b>1.2 CWPP Planning Process .....</b>	<b>1</b>
<b>2 Local Area Description .....</b>	<b>2</b>
2.1 CWPP Area of Interest .....	2
2.2 Community Description .....	2
2.3 Past Wildfires, Evacuations and Impacts .....	2
2.4 Current Community Engagement .....	3
2.5 Linkages to other plans and policies .....	3
2.5.1 Local Authority Emergency Plan .....	3
2.5.2 Affiliated CWPPs .....	3
2.5.3 Local Government and First Nations Plans and Policies .....	5
2.5.4 Higher Level Plans and Relevant Legislation .....	5
2.5.5 Ministry or Industry Plans .....	5
<b>3 Values at Risk .....</b>	<b>5</b>
3.1 Human Life and Safety .....	5
3.2 Critical Infrastructure .....	7
3.2.1 Electrical Power .....	7
3.2.2 Communications, Pipelines, and Municipal Buildings .....	7
3.2.3 Water and Sewage .....	8
3.3 High Environmental and Cultural Values .....	8
3.3.1 Drinking Water Supply Area and Community Watersheds .....	8
3.3.2 Cultural Values .....	8
3.3.3 High Environmental Values .....	9
3.4 Other Resource Values .....	9
3.5 Hazardous Values .....	9
<b>4 Wildfire Threat and Risk .....</b>	<b>10</b>
4.1 Landscape Wildfires Impacting the City of Enderby Project Area .....	13
4.2 Local Wildfires Ignited Within the City of Enderby AOI .....	14
4.3 Other Forest Values .....	15
4.4 Fire Regime .....	16
4.5 Fire Weather Rating .....	17
4.6 Climate Change .....	18
4.7 Climate Change Impacts on fuel Management / Wildfire Threat Reduction Activities in the Enderby Area .....	19
4.8 Provincial Strategic Threat Analysis .....	19
4.9 Spotting Impact .....	20
4.10 Head Fire Intensity .....	20
4.11 Fire History .....	21
4.12 Local Wildfire Threat Assessment .....	21
4.13 Proximity of Fuel to the Community .....	22
<b>5 Risk Management and Mitigation Factors .....</b>	<b>25</b>

5.1	Fuel Management .....	25
5.2	Wildfire Threat Reduction Options.....	25
5.2.1	Forest Fuel Modification .....	26
5.3	FireSmart Planning and Activities .....	27
5.3.1	FireSmart Goals and Objectives .....	27
5.3.2	FireSmart Landscaping .....	27
5.3.3	FireSmart Construction .....	28
5.3.4	Key Aspects of FireSmart for Local Community .....	28
5.3.5	Identify Priority Areas within the Area of Interest for FireSmart .....	29
5.4	Community Communication and Education.....	29
5.5	Other Prevention Measures .....	29
5.6	Summary of Recommendations .....	30
<b>6</b>	<b>SECTION 6: Wildfire Response Resources .....</b>	<b>32</b>
6.1	Local Government and First Nation Firefighting Resources .....	32
6.1.1	Fire Departments and Equipment .....	32
6.1.2	Water Availability for Wildfire Suppression .....	32
6.1.3	Access and Evacuation .....	32
6.1.4	Training .....	33
6.2	Structure Protection .....	33
<b>6.3</b>	<b>Summary of Recommendations .....</b>	<b>33</b>

## List of Figures

Figure 1	Typical forest ecosystem along the Enderby Cliffs Provincial Park trail .....	10
Figure 2	Enderby Cliffs (taken from the opposite or southwest corner of the AOI). .....	11
Figure 3	Drier Douglas-fir forests in Woodlot with shrub herb dominated surface cover .....	12
Figure 4	Typical patch cut with light surface fuels, deciduous brush and a stumping treatment. ....	12
Figure 5	Western Red Cedar dominated clumps in seepage areas with shallow litter surface cover .....	13
Figure 6	Steep eastern aspect in the northwest corner of AOI poses the highest wildfire threat. ....	14

## List of Tables

Table 1:	Summary of CWPP Recommendations .....	iii
Table 2:	City of Enderby Area Fire Weather Data Summary (2008-2017).....	17
Table 3:	Predicted Impacts of Climate Change on Climate Variables and Forests in B.C. during the 21 <sup>st</sup> Century .....	18
Table 4:	Head fire Intensity Classes and Associated Fire Behaviour .....	20
Table 5:	Fuel Type Categories and Crown Fire Spot Potential .....	22
Table 6:	Recommended Fire Smart Wildfire Threat Reduction Guidelines for Each Wildfire Behaviour Threat Class .....	25
Table 7:	Fire Smart Practices and Activities .....	29
Table 8:	Summary of Section 5 Recommendations .....	30
Table 9:	Summary of Wildfire Response Recommendations .....	33



# 1 Introduction

The wildfire risk to communities within southern B.C. has been well documented. Since the Okanagan Park wildfires of 2003, and subsequent busy fire seasons in 2009 and 2017, significant effort has been undertaken to increase awareness of these risks among municipalities. The Community Wildfire Protection Plan (CWPP) is a process to develop planning and administrative tools to help local governments respond to this wildfire risk. Forsite Consultants Ltd. was retained in the fall of 2017 to assist the City of Enderby in updating their CWPP, the results of which are reported here.

The City of Enderby has a previous CWPP written in 2009; CWPP's are intended to be updated every five years. A large portion of the area of interest surrounding the municipality is private land, and this will remain an obstacle to operational fuel management treatments. The significant impacts of the unprecedented 2017 wildfire season has demonstrated the need for emergency management planning going forward. The initiation of Enderby's CWPP planning process is an important step in the identification of hazards and risks in the wildland urban interface that will support further emergency management planning and other responses to the identified risks.

## 1.1 PURPOSE

The purpose of this CWPP is to identify the wildfire risks within the area of intent (AOI), to describe the potential threat to human life, property, and critical infrastructure, and to recommend treatment options to reduce wildfire risk. This plan will need to be renewed as the land, resources, and communities needs within the AOI change, and is recommended this occur after 5 years. This plan provides an assessment of the risk areas within the AOI.

The CWPP planning process will provide the community with a detailed framework to inform the implementation of specific actions that will:

1. Reduce likelihood of a wildfire impacting the community
2. Reduce impacts and losses to property and critical infrastructure
3. Reduce negative economic and social impacts to the community

## 1.2 CWPP PLANNING PROCESS

The Enderby CWPP was created by the City of Enderby in collaboration with Forsite Consultants Ltd. The City of Enderby council and staff consulted with planners, fuel management specialists, British Columbia Wildfire Service (BCWS), and relevant staff from the North Okanagan Regional District. The planning process was implemented in the following phases:

- Project initiation – January 2018
- Project research and spatial information acquisition – March 2018
- Field work and assessments - April 2018
- Public Open House – May 2018
- CWPP Completion – July 2018

Following the open house, members of the public had opportunity to comment at the meeting, or the two week time frame following the event. The final CWPP was developed incorporating input from the public and city staff following the public Open House.

## 2 Local Area Description

The Provincial Strategic Threat Analysis (PSTA) data provided by BC Wildfire Service (BCWS) was used to determine wildfire hazard for the area of interest, albeit augmented by field verification. For a full description of the PSTA data, see Section 4. Other relevant spatial data for the AOI was secured from the DataBC website or provided by the City of Enderby, North Okanagan Regional District, or BCWS.

### 2.1 CWPP AREA OF INTEREST

The AOI for this CWPP is the City of Enderby and immediately surrounding lands (Map 1). The AOI is intended to cover the Wildland Urban Interface (WUI): the area within 2 km of a community with a minimum density of 6 structures per square km. The AOI followed a 2 km buffer from the municipality of the City of Enderby boundary, covering an area of 3,693 hectares. The AOI is comprised of a variety of land users, including but not limited to: municipalities, agriculture, ranching and grazing, recreation, private and crown tenure woodlots, provincial parks, and Indian Reserve (IR) lands.

### 2.2 COMMUNITY DESCRIPTION

The AOI is comprised of the following communities:

- The City of Enderby (population 2,964)
- Splantsin (population 390)

Established in 1905, Enderby lies on the western edge of the Shuswap River. The primary industries in the area are forestry, agriculture and tourism, with a substantial portion of the land base converted to agricultural development. All of the AOI is the traditional territory of Splantsin and a portion of the AOI falls on one of the Splantsin IR's. Enderby experienced a population growth of 1.1 % from 2011 to 2016 (Census Canada). The AOI has a community health center. It also has a volunteer Fire Hall with approximately 27 members that serves an area of 8,066 ha. The main service hub for Enderby is Salmon Arm, 25 km to the North, which has a small airport, hospital, and other emergency services. Enderby is part of the Vernon BCWS fire zone within in the Kamloops Fire Center, with the nearest BC wildfire service crews located at the Salmon Arm rappel base. Existing evacuation and egress routes from the City of Enderby are:

- Highway 97 A
- Highway 97 B
- Canyon Road
- Back Enderby Road
- Enderby-Grindrod Road
- Trinity Valley Road
- Glenmary Road

While much of the valley bottom has been converted to agricultural land, a substantial component of the surrounding area is forested. These areas are primarily privately held and crown woodlots with varied historical harvesting. The vast majority of the AOI is private land.

The main area of future development for Enderby is an areas called “the Knoll”. This 83 hectare area has a neighborhood plan that provides a planning framework for future growth. This area is intended to be developed into a mix of single family housing, neighbourhood commercial, parkland and trail networks, and other uses. There are no wildfire management planning principles currently incorporated into the neighborhood plan.

### 2.3 PAST WILDFIRES, EVACUATIONS AND IMPACTS

There has been 8 recorded wildfires in the AOI from 1933 to 2016, totaling 79.4 hectares. Only 25.6 hectares have burned since 2010. While there have been no direct fire impacts such as evacuations within Enderby, several large fires in the area that have

indirectly impacted the AOI are the Silver Creek fire of 1998 and the Okanagan Park fire of 2003. Heavy valley smoke during busy fire seasons can significantly impact air quality in the area. The potential for busy fire seasons within the heavily populated Okanagan valley, south of the AOI, can impact availability of resources.

## 2.4 CURRENT COMMUNITY ENGAGEMENT

The City of Enderby has a previous CWPP completed in 2009. Part of the current AOI encompasses one of Splitsin IR, which also has a CWPP from 2009 completed through a separate planning process. A small amount of fuel management treatment has been completed within the plan area, and FireSmart engagement by private landowners appears to be minimal. Fuel hazard reduction treatments were implemented in 2006 on approximately 5 hectares adjacent to the Johnston Reservoir at 1500 Johnston Avenue.

## 2.5 LINKAGES TO OTHER PLANS AND POLICIES

### 2.5.1 LOCAL AUTHORITY EMERGENCY PLAN

The City of Enderby Emergency Plan is intended to provide an overview of the Emergency Response Program for a range of emergencies that might occur. The plan does not cover the procedures for every hazard in detail, but rather provides a structured response to emergency need.

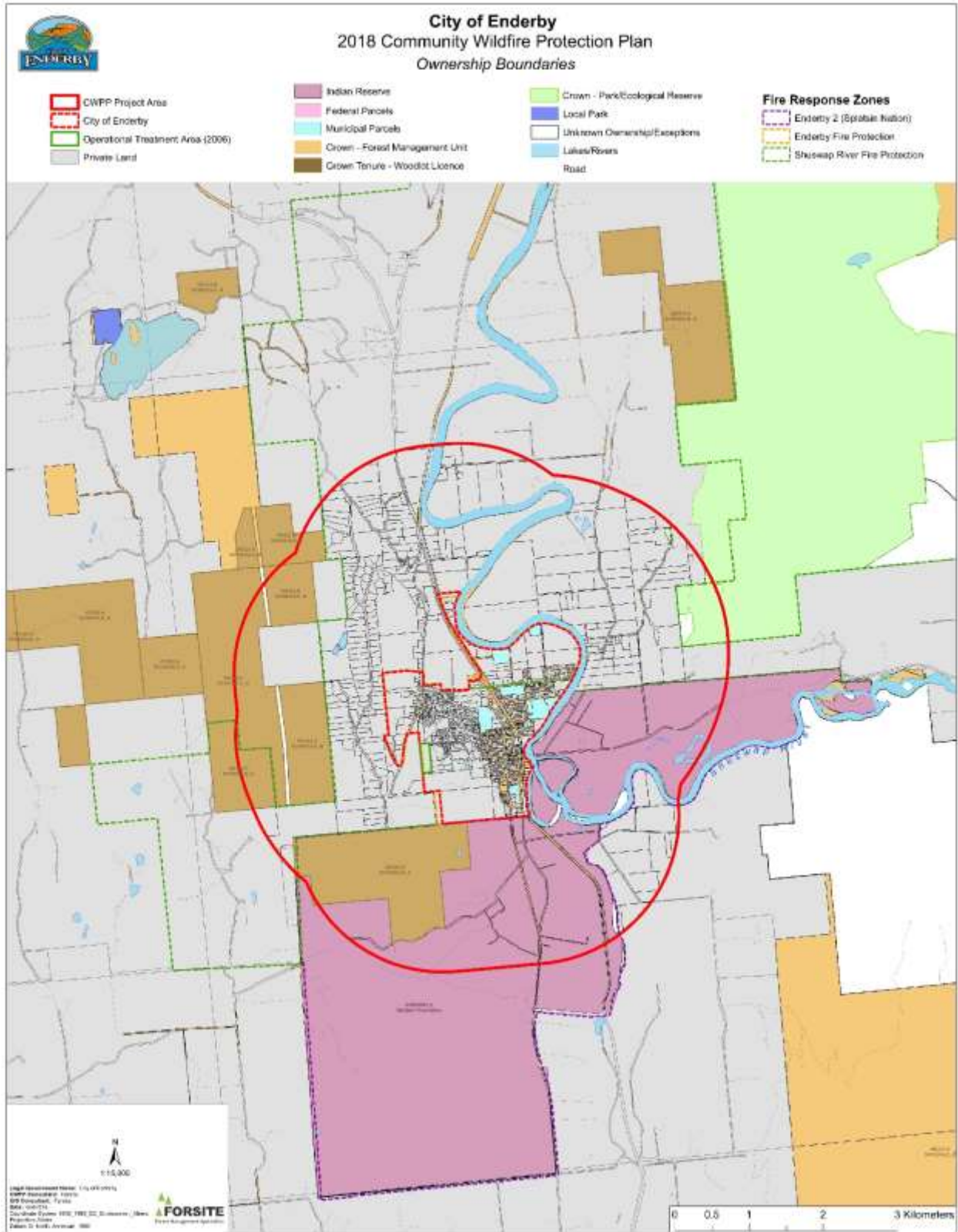
The plan:

- Defines emergency response goals
- Establishes components of the British Columbia Emergency Management System (BCEMS) such as the Emergency Operations Center (EOC)
- Evacuation procedures
- Response protocols

Other emergency response protocols, such as evacuations from a wildfire incident, may be administered by BCWS under the legal authority of the Wildfire Act. In most circumstances, evacuation from a wildfire event will be administered by the local government under the advice of BCWS. The legal authority for a local government to evacuate an area rests within the Emergency Program Act (1993). Evacuation considerations are located within the Emergency Plan. The City of Enderby Emergency plan has designated City Hall as the local EOC, with alternate locations at the Enderby Curling Rink and Drill Hall.

### 2.5.1 AFFILIATED CWPPS

The North Okanagan Regional District has a 2008 CWPP intended as a high level planning tool for wildfire risk in areas outside of designated municipalities. Enderby had a CWPP completed in 2009. In addition to significant changes in the SWPI CWPP requirements, CWPPs are intended to be updated every five years. Splitsin also completed a CWPP in 2009; this plan has relevant and important identification of wildfire risk within Splitsin land. There is wildfire risk that has not been addressed within this area south of the City of Enderby, and this CWPP has highlighted these issues. Refer to the Splitsin CWPP for further information regarding Wildfire Risk in IR 1 and 2, recommended treatments, and landscape level fuel breaks. Due to overlapping areas within the Enderby CWPP and Splitsin land, the City and Enderby should continue to work alongside Splitsin to update their CWPP and collaborate on wildfire hazard mitigation.



Map 1: Area of Interest (AOI)

## 2.5.2 LOCAL GOVERNMENT AND FIRST NATIONS PLANS AND POLICIES

The AOI is within the North Okanagan Regional District (NORD). Emergency planning coordination may take place between NORD and the City of Enderby in the case of a large scale wildfire event in the area. The NORD Electoral Area “F” Community Plan (2016) has designated areas of high wildfire concern (see Appendix 1) that require any development within these areas to be assessed by a Forest Professional, with specific fuel hazard reduction and building protection measures being put in place. Other regional documents for this area include:

- Splatsin Comprehensive Community Plan (2013)
- Official Community Plan (2014)
- Knoll Neighbourhood Plan (2014)
- North Okanagan Regional District Electoral Area “F” Official Community Plan Schedule “A”(2016)

## 2.5.3 HIGHER LEVEL PLANS AND RELEVANT LEGISLATION

The following higher level plans are relevant to wildfire protection planning.

- Enderby Cliffs Provincial Park – the park is within the project area, but does not have a management plan in place at this time.
- British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires (2016)
- Okanagan Land and Resource Management Plan (2001)- Section AIR 3-1 to 3-3 and CCI 4-1 to 4-9

## 2.5.4 MINISTRY OR INDUSTRY PLANS

There are no forest industry licensees with tenure within the project area. Relevant plans include:

- Type 4 Silviculture Strategy in the Okanagan TSA (2013)
- Woodlot License Plans – there are a number of woodlots within the AOI. Under the Forest Act, industrial activities such as forest harvesting undertaken on these woodlots must conduct fire hazard abatement. What level to which these lands should be managed for fuel hazard reduction is to the discretion of the tenure holder.

# 3 Values at Risk

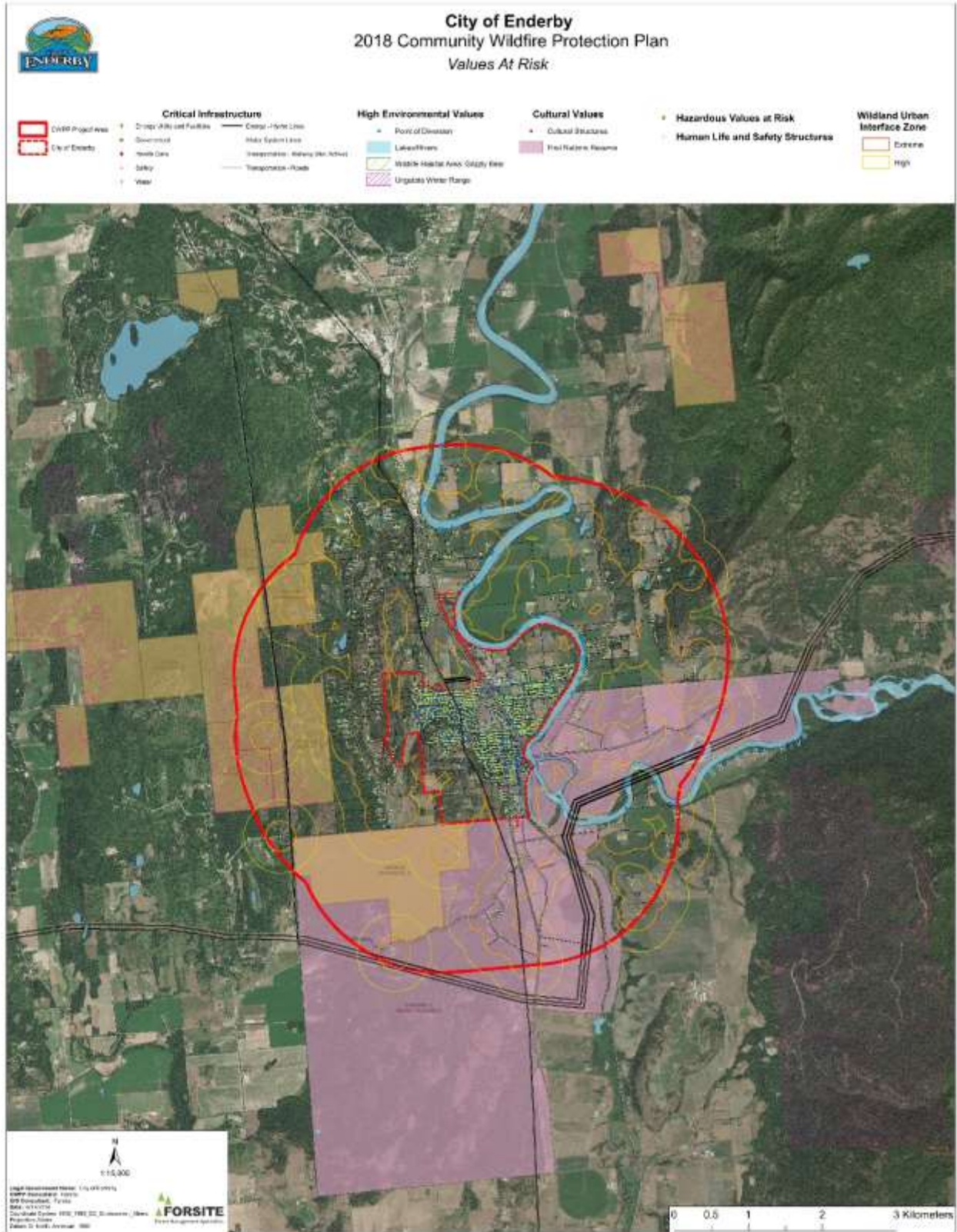
The intent of this section is to introduce the extent to which wildfire has the potential to impact values within a community.

## 3.1 HUMAN LIFE AND SAFETY

The intent of this sub-section is to clearly identify and understand where people and structures are located within the AOI in order to effectively determine the wildfire risk and identify mitigation activities. While the most concentrated distribution of structures are within the municipality of Enderby, the majority of the study area is large tracts of private land with dispersed structures throughout.

Critical Infrastructure information was provided by the City of Enderby, while remaining structure density was completed using GIS-based review using satellite imagery. Address points were provided by NORD, and were subsequently corrected to accurately reflect actual structure locations. This corrected information can be seen on Map 2.

There are several areas that may have large concentrations of people during the summer including Belvedere Park, Barnes Park, Riverside Park, Tuey Park and the Starlight Drive-In. Enderby Cliffs Provincial Park trails are used heavily during snow free seasons by hikers; see Section 4 for a detailed descriptions of hazards in this area.



Map 2: Values at Risk

## 3.2 CRITICAL INFRASTRUCTURE

The intent of this sub-section is to clearly identify and understand where critical infrastructure is located within the WUI in order to effectively determine the wildfire risk and identify mitigation activities. The following infrastructure has been identified by the City of Enderby, in addition to infrastructure that falls within the Resource Strategic Wildfire Allocation Protocol (RSWAP) categories as defined by BCWS:

- Enderby City Hall (designated Emergency Operations Center) – 619 Cliff Avenue
- Enderby Health Center - 703 3rd Avenue
- Enderby Fire Hall – 1500 Evergreen Street
- Splatsin Health Center – 5775 Old Vernon Road
- Splatsin Community Center – 5767 Old Vernon Road
- AL Fortune High School - 500 Bass Avenue
- MV Beattie Elementary School - 1308 Sicamous Street
- Enderby Preschool Society - 102 Meadow Crescent
- Enderby Seniors Centre - 1101 George Street
- BC Ambulance Service - 715 3rd Avenue
- Drill Hall - 208 George Street
- Splatsin Teaching Centre - 2730 Canyon Road
- Shihya Elementary School - 5361 Jackpine Road
- Enderby Arena - 1605 Kate Street
- Enderby Memorial Terrace - 708 Granville Avenue
- Parkview Place - 707 3rd Avenue
- Granville Getaway Adult Geriatric Day Program - 712 Granville Avenue
- Public Works Yard at 2308 McGowan Street

### 3.2.1 ELECTRICAL POWER

The following Fortis BC and BC Hydro electrical infrastructure lies within the project area:

- Transmission Lines to Salmon Arm, Vernon, and Ashton Creek
- Distribution lines
- Enderby Substation - Highway 97 A
- Ashton Creek Substation - Power Station Access Road
- Fortis BC Station - 1000 High Street

Both Fortis and BC Hydro have independent emergency management protocols. Emergency contact information for threats to these services during a wildfire event is available to the EOC.

### 3.2.2 COMMUNICATIONS, PIPELINES, AND MUNICIPAL BUILDINGS

There are two BCWS repeaters within the area, both belong to MFLNRORD radio operations; SilverStar repeater to the south, and Vella repeater to the north. Vella repeater will no longer be operational for this plan area as of 2019. In the event that a repeater is lost during a wildfire, MFLNRORD radio operations can set up a temporary repeater for emergency communication. There is a cell tower located within Enderby Cliffs Provincial Park; cellular coverage is relatively consistent throughout the plan area. Municipal buildings include Enderby City Hall at 619 Cliff Avenue, and the Splatsin Band Office located at 5775 Old Vernon Road.

### 3.2.3 WATER AND SEWAGE

This information has been identified by Enderby as critical areas or sites of water infrastructure:

- Pump Station – Regent Avenue
- Lower Reservoir - 155 Francis Drive
- Water Treatment Plant - 700 Railway Street
- Drinking water intake east of Water Treatment Plant
- Shuswap Well – Enderby Mabel Lake Road
- Wastewater Treatment Plant – 2808 McGowan Street
- Upper Reservoir – 1500 Johnston Avenue (also Johnston Park)
- Water Booster Sites at Cliff Avenue and Francis Drive
- Storm Sewer Lift Station - Regent
- Sanitary Sewer Lift Stations – McGowan St, Brickyard Rd, Meadow Cr., Kildonan Ave, Kate St., Peacher Cr., and Red Rock Cr.

Other water and sanitary values such as hydrants can be seen in Map 2: Values at Risk. Enderby has access to a mobile generator that can be used to power water resources if electrical power is compromised.

## 3.3 HIGH ENVIRONMENTAL AND CULTURAL VALUES

The intent of this sub-section is to clearly identify and understand where high environmental and cultural values are located within the WUI in order to effectively determine wildfire risk and identify mitigation activities.

### 3.3.1 DRINKING WATER SUPPLY AREA AND COMMUNITY WATERSHEDS

The Shuswap River supplies many water users within the project area, with over 130 water licenses that draw water from tributary systems downstream of Mabel Lake<sup>2</sup>. The Shuswap River originates in the Monashee mountain range, and subsequently flows through both Sugar Lake and Mabel Lake before passing through the valley within which the City of Enderby is located. While the upper reaches of this watershed have little development and high water quality, the human activity within the valley bottom has created an increased turbidity and sedimentation<sup>3</sup>. A large wildfire event in the heavily forested upper reaches could potentially have impacts such as increased sedimentation, water temperature, and higher peak flows coming into the City of Enderby (through the centre of the AOI). However, within the valley bottom adjacent to the study area, the agricultural land base surrounding the river is unlikely to support a high intensity wildfire that will have an appreciable or longterm impact on this water source.

### 3.3.2 CULTURAL VALUES

Cultural values within the project area include the following:

- Splantsin Community Center
- Enderby Museum

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<sup>2</sup>[http://a100.gov.bc.ca/appsdata/acat/documents/r30096/information\\_1341942849601\\_f88df3854a7b671770daece24202acac4c734bb9635997564eb21189c2fbd959.pdf](http://a100.gov.bc.ca/appsdata/acat/documents/r30096/information_1341942849601_f88df3854a7b671770daece24202acac4c734bb9635997564eb21189c2fbd959.pdf)

<sup>3</sup> [http://www.rdno.ca/docs/120203\\_shuswap\\_tech\\_assess\\_text.pdf](http://www.rdno.ca/docs/120203_shuswap_tech_assess_text.pdf)



There is First Nations traditional territory across the project area with evidence of the traditional and ongoing use of the land and its resources. Related to this, fuel management activities on crown land resulting from this plan should consider these values. First Nations with traditional territory or aboriginal interests within the area including the City of Enderby could include the following:

- Splitsin Indian Band
- Neskonlith Indian Band
- Secwepemc RFA
- Lower Similkameen Indian Band
- Okanagan Nation Alliance
- Upper Nicola Indian Band
- Penticton Indian Band
- Adams Lake Indian Band
- Little Shuswap Indian Band<sup>4</sup>

### 3.3.3 HIGH ENVIRONMENTAL VALUES

There is a conditional timber harvest zone to conserve Grizzly Bear habitat in the project area, established through a provincial Government Action Regulation (GAR) order. There is also ungulate winter range present in project area. Shuswap River is an important fish bearing water body for salmonid species and the river and adjacent riparian zones should be considered a high environmental value<sup>5</sup>.

## 3.4 OTHER RESOURCE VALUES

There is a large portion of the area designated as Woodlots. This is high commercial value timber including Douglas-Fir and Western Red Cedar. While not within the AOI, the surrounding valleys also contribute significantly to the timber harvesting land base and could influence wildfire at a landscape level coming into the AOI or alternatively could be at risk during a wildfire event that spreads from the AOI.

The agricultural land base supports a large number of range animals including cattle which may be a challenging to evacuate in an emergency. Evacuation of agricultural animals is coordinated by local government, and resources and contact information are available from the EOC in an emergency event. Landowners with animals within the project area should be encouraged to register for a Premises ID with the BC government. A Premises ID identifies parcels of land with animals on site for emergency management purposes<sup>6</sup>.

## 3.5 HAZARDOUS VALUES

Facilities within the AOI that may have hazardous values on site include:

- North Enderby Timber - 6261 Highway 97A
- Okanagan Fertilizer - 603 Vernon Street,
- Sure Crop Feeds - 6863 Highway 97A.
- GTI Petroleum - 1701 George Street
- Shell Gas Station - 700 George Street
- Esso Station - 5655 BC 97A

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<sup>4</sup> <https://www2.gov.bc.ca/gov/content/data/geographic-data-services/land-use/consultative-areas-database>

<sup>5</sup> [http://www.rdno.ca/docs/120203\\_shuswap\\_tech\\_assess\\_text.pdf](http://www.rdno.ca/docs/120203_shuswap_tech_assess_text.pdf)

<sup>6</sup> [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/food-safety/bcpid\\_faq.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/food-safety/bcpid_faq.pdf)

## 4 Wildfire Threat and Risk

No specific fuel treatment units were identified for treatment within the Enderby CWPP. Wildfire threat does exist within the AOI, but is primarily restricted to private land, adjacent land under other jurisdiction, or outside the AOI. Private land wildfire threat challenges are not assessed completely within a CWPP but are discussed in general terms only, due to funding criteria being limited or not applicable on private land. Private land challenges will be discussed under the FireSmart section.

There are four areas of forested crown land within the CWPP project boundary that were assessed using field verification. While these areas do have varying degrees of wildfire risk, ultimately the mixed deciduous forest fuel type and topography do not result in a high wildfire hazard. The areas are as follows:

### 1. Enderby Cliffs Provincial Park

The Enderby Cliffs are a very unique feature in the north Okanagan/Shuswap area. The sheer cliffs attract a large number of tourists, hikers, and local outdoor enthusiasts to climb the trail into the park. The trail area of the park is mostly located in a previously harvested area dominated by second growth conifers and deciduous trees. The Paper Birch that used to dominate the site after harvesting have been overtopped by the Douglas-fir and Western Red Cedar trees and are starting to fall out of the stand. Significant root rot activity in the area is causing an increasing surface fuel load in isolated patches, and is allowing for deciduous trees to maintain a presence. The overall wildfire threat on the lower trail system is moderate. A wildfire start in this area, which could be likely due to high recreational traffic along the trail, would be very slow to develop and initial attack success would likely be very high.



*Figure 1: Typical forest ecosystem along the Enderby Cliffs Provincial Park trail*

As the trail winds higher into the cliff area, the site dries out and Douglas-fir with a pine grass understory begins to dominate the site. This drier and more fire prone ecosystem is located at a higher elevation, and not in wildland urban interface areas. The southern end of the park is a steep south aspect hillside with a combination of open lightly grass covered rock with seams of Douglas-fir in between, with a small number of farm buildings at its foot beside managed fields. There is no trail access into this area, minimizing the potential for human caused wildfire starts. While very dry and hot, the surface fuels are thin and patchy, suggesting that the aggressive downslope wildfire spread required to impact the structures at the bottom of the hill is very unlikely.



**Figure 2: Enderby Cliffs (taken from the opposite or southwest corner of the AOI).**

## **2. City Reservoir off Johnston Avenue**

The Johnston Avenue water reservoir and parkland, located on a knob (“the knoll”) due west of downtown Enderby is a unique ecosystem with a mature Douglas-fir-Ponderosa Pine stand with a high crown base height, overtopping a predominately herb and brush surface cover. The plant community is indicative of ample water at certain times of the year, while the pines suggest very dry conditions during the summer months. The heavy shrub layer, denser on the flat and north aspects will greatly reduce surface dryness and wildfire spread even in the driest periods. Fuel removal was conducted here in 2006.

## **3. Woodlot # 0324**

This tenure is located at the height of land along the western boundary of the AOI. The crown portion of the woodlot is immediately above residential structures at the north end of Gunther Ellison Road, which is also a one way egress subdivision of large forested lots. The woodlot is dominated by Douglas-fir ecosystems with shrub and herb surface cover, and pinegrass in patches on the driest sites. There are also significant patches of pure cedar, cedar-Douglas-fir mixes, and paper birch dominated clumps. Root rot is also an issue in this area. Timber harvesting over the past decade has focused on small patch cuts with stumping treatment spread throughout the crown land. The harvesting has broken up the conifer continuity, with most blocks having a low to moderate surface fuel load. Regular firewood cutting has reduced the surface fuel loads created by wind throw along the new block openings.



*Figure 3: Drier Douglas-fir forests in Woodlot with shrub herb dominated surface cover.*



*Figure 4: Typical patch cut with light surface fuels, deciduous brush and a stumping treatment.*



*Figure 5: Western Red Cedar dominated clumps in seepage areas with shallow litter surface cover.*

#### 4. Splatsin Woodlot #0338

The crown portion of the Splatsin Woodlot covers most of the forested land adjacent to the southwest corner of the City of Enderby, north of Canyon Road. The woodlot has not seen any recent timber harvesting and is dominated by Douglas-fir and a mixed conifer/deciduous forest. The drier sites are located on the western and eastern edges of the woodlot where aggressive wildfire behavior could occur under dry summer weather conditions. The central portion will exhibit much lower fire intensities due to the deciduous forest mix. This woodlot, although adjacent to the City of Enderby, is not technically included in this CWPP as Splatsin intends to manage it under their own planning process.

### 4.1 LANDSCAPE WILDFIRES IMPACTING THE CITY OF ENDERBY PROJECT AREA

In B.C., while wildfires have the ability to spread in any direction, landscape level wildfires mainly spread most aggressively with the prevailing winds. Unsettled weather conditions that create cumulus clouds and thunderstorms can lead to very erratic, short term wildfire spread in multiple directions at once. Topography and available fuels can also play a significant role in direction of spread and wildfire intensity. Predominant south wind patterns suggest that wildfires main direction of spread and highest intensity spread is to the north, with a local topography influence. With a northerly direction of spread along the Canyon Road, on the Splatsin IR or even further south could directly impact the southern and western perimeter of the City of Enderby. A wildfire initiated in this area will mostly threaten any forest and structures to the north of the ignition area. The forest land on the Splatsin IR and adjacent woodlot on the south end of the community poses the highest wildfire threat. This Douglas-fir dominated ecosystem has a crown closure suitable for crown wildfires to develop and maintain themselves in patches. There are breaks where deciduous trees dominate the forest, mostly paper birch, black cottonwood, and trembling aspen stands which will not support aggressive wildfire behavior and will act as fuel breaks under most weather conditions. The forest cover is continuous in this area with the only openings being open grassland. The driest areas are on the north side of Canyon Road in the southwest corner of the AOI. The forested land connects with woodlot #0324, located along the western edge of the AOI at the local height of land. This woodlot is dominated by Douglas-fir and western red cedar clumps, deciduous stands in the wetter areas, and a mix of conifer and deciduous throughout the remaining area as discussed above. Small patch

cuts in the conifer types have significantly reduced the crown continuity. The surface vegetation is dominated by deciduous shrubs and herbs in a majority of the Douglas-fir and mixed forest types, suggesting low intensity surface fire spread over much of the area. Pine grass is present but limited to the driest knobs. Root rot is very prevalent throughout the woodlot, leading to higher than average surface fuel loads in small patches. Much of the surface fuel loading is significantly decayed, reducing its contribution to fire intensity and overall wildfire threat. The birch downed debris, the most common large woody debris is almost all significantly decayed. The highest wildfire threat areas include cut block perimeters, mostly on the northern edge, with coniferous wind throw and slash resulting from the harvesting activities. These high wildfire threat areas are mostly 0.2-0.5 hectares in size.

The land south of Canyon Road (within the Splatstin IR) is drier with more continuous dry-belt Douglas-fir and a slightly higher wildfire threat concern. Two high voltage hydro transmission lines cross this area, complicating wildfire suppression challenges but also represent a modified fuel condition and also act as an access corridors for vehicles. The wildfire threat to the City of Enderby is largely limited to this area, with the remaining the surrounding land being cultivated and managed for crops that will be low in flammability and will act as fuel breaks throughout the summer months.

#### 4.2 LOCAL WILDFIRE POTENTIAL WITHIN THE CITY OF ENDERBY AOI

The potential for wildfires to establish themselves within the City of Enderby AOI and quickly threaten the local forests and structures is of equal concern to landscape wildfires impacting the community. This is most likely to occur on private land due to accidental ignition by residents or recreationists from smoking, yard cleanup, firewood cutting or any other activity that could involve fire or a suitable heat source. The driest most continuous forest in the area is located on the steep eastern aspect immediately above (west of) the community. Residential lots are located along the bottom and top of this hillside with slopes exceeding 60% in between. The steep slope is dominated by Douglas-fir with varying heights of crown base and pinegrass which is in a cured state for a majority of the wildfire season. Summer winds would be expected to push wildfires up hill and northwards, leaving the homes and adjacent structures in the northwest of the AOI, along Gunther Ellison Road, at highest risk to wildfire impacts.



**Figure 6: Steep eastern aspect in the northwest corner of AOI poses the highest wildfire threat.**

The City of Enderby's water reservoir on the southwest portion of the developed area is located on a drier knob within a forested ecosystem. The Douglas-fir/Ponderosa Pine dominated site has a deciduous dominated shrub and herb layer with minor pinegrass, which moderates the wildfire threat in the area.

The trailhead and western perimeter of the Enderby Cliffs Provincial Park is located on the eastern edge of the AOI. The first three kilometers of the park access trail are located in a mixed conifer deciduous forest with only moderate wildfire threats. Previous timber harvesting around the 1950s and 60s and root rot has allowed for a significant paper birch component to moderate the local wildfire threat. The birch is being overtopped and is falling out of the stand, allowing conifers to dominate over time. The southern aspects of the park are very dry, steep sites with open rock and patches of low crown Douglas-fir. There is no access into this part of the park due to the very difficult terrain and private land in the valley bottom. A small number of farm houses and support structures are located along the park perimeter at the base of the hill.

### 4.3 OTHER FOREST VALUES

Forest fuel management treatments can have direct impacts on a number of forest resource values such as ecosystems or wildlife. It is important to note that forest fuel management activities are intended to protect and enhance other forest values by limiting or reducing the impact of wildfires on the landscape. The concept of protecting forest values by drawing a line on a map and not allowing forest management activities within that area to support or enhance a specific forest value does not provide for effective forest fuel management activities. Continuing to conduct wildfire suppression activities, but no other forest management, is not a successful long term strategy for protecting forest values. This is especially true in areas of continuous coniferous forest cover.

Recent wildfire history shows that wildfires that establish themselves in a high wildfire threat areas, e.g. dense coniferous stands that are capable of supporting active candling crown fire behavior, cannot be successfully contained under dry and hot conditions and tend to burn the entire timber type (Morrow, personal observation). This causes a significant loss or elimination of the forest values being managed for within the wildfire area.

Forest fuel management on a landscape scale is designed to break up high wildfire threat stands to reduce the losses of entire timber types or ecosystems, thus reducing the wildfire impacts on other forest values. To protect large areas of coniferous forests, they need to be broken up to provide wildfire suppression opportunities to minimize wildfire impacts.

All fuel management and harvesting activities must respect the eleven Forest and Range Practices (FRPA) Act identified resource values. In addition, the input from the local community must also be considered. The forest values and management strategies most directly impacted by forest fuel management activities include:

- Old Growth Management Areas – OGMA's attributes can be retained and enhanced while conducting properly planned and conducted forest fuel management activities. This is not a common practice at this time but will be necessary to reduce the wildfire threats on a landscape scale.
- Ungulate Winter Range – partial cut activities and long term controlled access, strategically placed, within a designated UWR area can have significant wildfire threat reduction benefits while only impacting (potentially enhancing) a portion of the area.
- Visual Quality Objectives – forest fuel management activities visual impacts can be minimized through partial cut activities and hand treatments when sensitive sites are being treated.
- Recreational Opportunities – forest fuel management activities can enhance recreational opportunities by creating controlled access into presently inaccessible areas and providing roads and trails for multiple uses, to form the backbone of a trail and recreational area and create wildfire suppression opportunities.

- Access Management – forest fuel management activities provide wildfire suppression opportunities through faster, more efficient access and egress, tie points for wildfire suppression activities, fuel breaks and burn off locations. This access often requires tight controls, seasonal closures and extensive public education to minimize impacts on other forest values.

#### 4.4 FIRE REGIME

The City of Enderby is dominated by the Interior Douglas Fir (IDF) biogeoclimatic zone. The IDF zone is characterized by a warm, dry climatic region and a relatively long growing season in which moisture deficits are common (Land Management Handbook 23). The Enderby area is in the IDfMw1 variant, a moist, warm regime where a diverse, well developed shrub and herb layer dominates. This low flammability surface cover puts this area at lower end of the wildfire volatility range for lower elevation southern B.C. forest ecosystems. This ecosystem is identified within the Natural Disturbance Type (NDT) 4 fire regime, ecosystems that historically have had frequent stand-maintaining fires.

As summarized from the Biodiversity Guidebook<sup>7</sup> this NDT includes grassland, shrub land, and forested communities that normally experience frequent low-intensity fires. On grasslands, these fires limit encroachment by most woody trees and shrubs. Late seral and climax grasslands and shrub lands are typically restricted to droughty sites that occur at low elevations or on steep south-facing slopes or fire-prone areas.

Less arid sites are characterized by forests of large, old trees with thick fire-resistant bark. Patches of less fire-resistant species develop in areas that have escaped low-intensity surface fires. The varied intensity and frequency of fires across the landscape has created a natural mosaic of mostly uneven-aged forests interspersed with grassy and shrubby openings.

Low elevation grasslands and open forests were more widespread throughout the Bunchgrass and Ponderosa Pine biogeoclimatic zones and drier elements of the Interior Douglas-fir biogeoclimatic zone before European settlement. Some of the open forests and grasslands were maintained in a “fire-climax” state by periodic lightning-caused fires and aboriginal use of fire. Recent human activities have altered fire regimes in much of this NDT, fostering litter accumulation and forest encroachment in some grasslands, and changing canopy composition and density in some forested areas. An increase in fire activity in the late 19th and early 20th centuries likely increased the extent of these ecosystems, but fire suppression during the last six decades has had the opposite effect.

The ponderosa pine and Interior Douglas-fir biogeoclimatic zones have a history of periodic surface fires that consumed woody fuels, rejuvenated most herb and shrub species while selecting against others, thinned the younger stands, and raised the height to the live tree crowns. Fire was historically responsible for maintaining the vegetative species composition and forest stand structure, and also for regulating coarse woody debris loading.

While this regime of fire maintenance would normally be easy to duplicate in a managed forest, the situation is complicated by several decades of fire exclusion, which has caused many ponderosa pine and interior Douglas-fir stands to fill in with young conifers. This has resulted in fuel accumulations, increased probability of crown instead of surface fires, loss of understory forage, and insect and disease damage.

Surface fire return intervals for the PP and IDF biogeoclimatic zones historically ranged from 4 to 50 years; stand-initiating crown fires were rare in the PP and occurred at intervals ranging from at least 150 to 250 years or more in the IDF.

Much of the area within this NDT is rangeland (forested and un-forested land used for grazing). Grasslands and dry open forests provide permanent range (areas that produce substantial livestock forage throughout most or all successional stages) due to the abundance of forage. Areas that succeed to closed forests are used as transitory range, because there is negligible livestock

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<sup>7</sup> <https://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/biodiv/chap2c.htm#ndt>



forage except during a brief period following stand-initiating fires or timber harvesting. Many sites support livestock grazing and logging together. Recommendations for rangelands and recommendations for forested areas both apply in these areas.

The natural biodiversity in this NDT has been significantly affected by unregulated livestock grazing during the initial period of European settlement. Introduced weeds became established on many sites and spread to other areas after natural or human disturbances. Non-native forage plants have been deliberately established in some areas for a variety of reasons. As well, a number of human influences have eliminated shrubs and trees from some areas and reduced their abundance and size elsewhere to the detriment of wildlife species that rely on them for forage, protective cover, and breeding. Livestock and wildlife grazing have also reduced residual cover—living and dead vegetation that persists over-winter and provides protective and breeding cover during critical periods in the following spring before new growth takes over this function. Conventional range management practices in this NDT have not re-created all of the important attributes required to restore natural biodiversity.

Fire exclusion policies have moderately altered the local forest ecosystems in the Enderby area as described above. Fire exclusion allows regeneration to occur without interruption, increasing the stand density, ladder fuels and surface fuel loadings, creating significant changes in the ecosystem and the wildfire behavior. This also allows for conifer encroachment onto grasslands and moisture and nutrient stress in trees due to higher competition.

Being on the wet end of the IOF biogeoclimatic zone there is higher forest fuel accumulation to burn if or when a wildfire starts due to the good growing sites found in this area. Wildfire intensity and spread to threaten structures will be limited to the most extreme, long term weather conditions where the herb and shrub layer is cured. This weather does occur in the Enderby area, but is usually limited to short periods in the middle of the summer.

#### 4.5 FIRE WEATHER RATING

The wildfire danger rating within the AOI will vary throughout the fire season based on the fuels present, the moisture content of fuels, and fire weather conditions. Wildfire suppression challenges and threats to local structures can occur when an ignition occurs during high or extreme wildfire conditions, as represented by Fire Danger Rating. A general indication of the likelihood of wildfire threat to the community can be assessed by reviewing the level and frequency of high and extreme fire danger ratings typically experienced in the local area during the fire season. Data from the Salmon Arm weather station for the last ten years was collected and summarized below.

**Table 2: City of Enderby Area Fire Weather Data Summary (2008-2017)**

Wx Station	Moderate Fire Danger Days (Range)	High Fire Danger Average Days (Range)	Extreme Fire Danger Average Days (Range)	High and Extreme Fire Danger Average Days (Range)
Salmon Arm	53 (35-70)	45.2 (32-57)	39.5 (14-94)	84.7 (47-128)

The City of Enderby area fire weather data suggests that there are consistent and significant fire weather conditions in the area. The fire weather is concentrated in the July, August and September months as expected. The Salmon Arm weather station, also located in the IDfMw1 biogeoclimatic zone variant, hit the highest High and Extreme fire danger days in both 2009 and 2017. Weather is only one component of the overall fire danger, in wetter ecosystems there is quite a lag between fire weather and actual fire danger as the weather can be hot and dry but it will take an extended period of these days to dry out the fuels to a point where they become volatile. The drying period is quite long in this ecosystem, suggesting the fire weather data slightly overestimates overall wildfire threats.

## 4.6 CLIMATE CHANGE

In May 2013 the concentration of carbon dioxide in the atmosphere reached 400 parts per million, the highest since three million years ago (Rising Seas, National Geographic, 2013). This rise in greenhouse gases is expected to contribute to rising global temperatures and changes in weather patterns, moisture distribution and plant ecosystems. One of the main concerns relating to plant ecosystems is the expected rapid change in weather conditions. Plants will have to migrate to more suitable habitat in short periods of time. This will be very difficult for large plants with heavy seeds and narrow geographic ranges. The weather is expected to change faster than many plants can adapt. This could impact the conifer species in the Enderby AOI. The pine beetle epidemic that swept through most pine stands in B.C. is an ideal example of climate induced impacts on forest health in B.C.

**Table 3: Predicted Impacts of Climate Change on Climate Variables and Forests in B.C. during the 21<sup>st</sup> Century**

Expected Impact of Climate Change on Climatic Variables in B.C.
1 to 4 C increase in surface air temperature with winter temperatures most affected
10 to 20% increase in annual precipitation with less snowfall and more rainfall
Reduced snow depth and an increase in the length of the growing season
Increasing the risk of summer drought and decreasing soil moisture
More thunderstorm activity
Predicted Impacts of Climate Change on B.C. Forests
Increase in frequency and severity of forest damaging events including forest fires
Higher than present tree line and northward migration of tree line
Major expansions of grasslands and shrub lands
Disappearance of wetlands, shrinking lakes and changing hydrology
Increase in incidents of insects, disease outbreaks and spread of invasive species
New assemblages of species occurring in time and space
Overall loss of biodiversity
Changes in disturbance regimes and forest productivity
Forest migration into previously treeless landscapes
Reduced access for winter logging

(Sources: *Expected Impacts of Climate Change: Dery and Jackson 2006; Predicted impacts of Climate Change on Forests: Ohlson et al; Hebda 2006; Gov't of B.C. 200c; Spittlehouse 2005. Copied from BC Forest Professional May-June 2008*)

The impacts of climate change on the IDF biogeoclimatic zones are likely to be:

- The biogeoclimatic zones that we know of today may also be shifted upwards in elevation and further north.
- Severe moisture stress and insect infestations. This may lead to increasing tree mortality on the lower slopes and drier areas dominated by Douglas-fir.
- Climate change occurring at a rate faster than the forest can adapt, creating potentially catastrophic conditions. This could include high mortality of the present forest cover in a short period of time.
- Longer and more severe fire seasons.
- Expanding grasslands and low elevation conifer mortality.
- Increased wildfire starts from increased thunderstorm activity.
- Less available water for wildfire suppression activities.
- Stress on riparian area deciduous trees due to changing hydrology.
- Loss/alteration of lakeshore habitat.
- Changes in mule deer winter range.
- Additional stress on Species at Risk Act listed species.

- Less opportunity to utilize heavy equipment on frozen ground for fuel management and timber harvesting to minimize site impacts.

These impacts are likely to be felt slower, or at a lower intensity, in the wetter end of these ecosystems, where Enderby is located.

#### 4.7 CLIMATE CHANGE IMPACTS ON FUEL MANAGEMENT / WILDFIRE THREAT REDUCTION ACTIVITIES IN THE ENDERBY AREA

1. The protection and enhancement of riparian/wetland areas must be a priority for any forest related activities in the Enderby area.
2. Tree mortality in the lower Douglas-fir stands can be expected to increase.
3. All fuel management activities must be designed to ensure stand resiliency, in part through partial retention of all available tree species and size classes when feasible.
4. Management for mule deer winter range should be conducted outside the presently identified winter range. This suggests more partial cut/select harvest type activities.
5. Forest stands being managed specifically for wildfire threat reduction to communities and infrastructure are to be treated to reach the moderate or lower wildfire threat goal while retaining biodiversity, stand resiliency and other forest values.
6. Develop access into and create wildfire suppression openings within areas of continuous conifer stands regardless of other forest management strategies in place.

**MAP 3: Fire Regime, Ecology and Climate Change can be found in Appendix 3 and includes the following info:**

- CWPP boundary with updated WUI
- NDT TYPE
- Forest Health (e.g. MPB)
- Major harvesting patterns, completed fuel treatments or ecological projects
- Historical Fire Perimeters

#### 4.8 PROVINCIAL STRATEGIC THREAT ANALYSIS

The PSTA data supplied by the provincial government is a worthwhile reference tool for the Enderby AOI wildfire threat assessment. The historical wildfire timing, shape and size, and structure layers are valuable. The PSTA fuel type data does not consistently reflect the forest ecosystems present or have a direct relationship to the wildfire threats posed by specific polygons. The lack of suitable fuel types for dense western red cedar stands, older slash fuels and high crown base Douglas-fir stands makes the fuel typing data an inconsistent assessment tool. The fuel typing data does not follow the recent disturbance patterns and is not necessarily a useful tool at the operational level.

**MAP(s) 4: Provincial Strategic Threat Analysis can be found in Appendix 3 and includes the following info on two maps:**

- Threat Rating
- Spotting Impact
- Head Fire Intensity
- Historical Fire Density

### 4.9 SPOTTING IMPACT

Spotting impacts are most severe in multi-layered mature conifer types with lower crown base heights or ladder fuels that allow for consistent candling and crowning activity. The dead and down pine component can also play a significant role as much of this dry debris is partly elevated, increasing flame heights and leading to potential long distance spotting from bark platelets which are ignited and carried forward on the wind. The bark spotting concern is greater in lodgepole pine types where the bark is looser and thinner than in the ponderosa pines which have much thicker and heavier bark that does not carry as well. The high wildfire threat areas are best identified on the wildfire threat assessment map. Spotting potential is greatest downwind of candling and crowning forests.

### 4.10 HEAD FIRE INTENSITY

**Table 4: Head fire Intensity Classes and Associated Fire Behaviour**

PSTA - HFI Class	Fire Intensity kW/m	Fire Intensity Class <sup>8</sup>	Flame Length (meters) <sup>9</sup>	Likely Fire Behavior <sup>10</sup>
1	0.01 – 1,000	2	< 1.8	Smoldering surface fire
2	1,000.01 – 2,000	3	1.8 to 2.5	Moderate vigour surface fire
3	2,000.01 – 4,000	4	2.5-3.5	Vigorous surface fire
4	4,000.01 – 6,000	5	3.5 to 4.2	Vigorous surface fire with occasional torching
5	6,000.01 – 10,000	5	4.2 to 5.3	Vigorous surface fire with intermittent crowning
6	10,000.01 – 18,000	6	12.3 to 18.2	Highly vigorous surface fire with torching and/or continuous crown fire
7	18,000.01 – 30,000	6	18.2 to 25.6	Extremely vigorous surface fire and continuous crown fire
8	30,000.01 – 60,000	6	>25.611	Extremely vigorous surface fire and continuous crown fire, and aggressive fire behaviour
9	60,000.01 – 100,000	6	>25.6	Blowup or conflagration, extreme and aggressive fire behaviour
10	≥ 100,000	6	>25.6	Blowup or conflagration, extreme and aggressive fire behaviour

<sup>8</sup> Head fire intensity should be classified by intensity class not fire rank. Fire rank is a visual description of conifer fires for air operations.

<sup>9</sup> For calculating Flame Length, Bryam (1959) was used for surface fire (<10 000 kW/m) and Thomas (1963) was used for crown fire situations (>10 000 kW/m).

<sup>10</sup> These characteristic will be different in open and closed forest fuel.

<sup>11</sup> With HFI over 30 000 kW/m the function of the equation are stretched beyond the expectation of the equation, fire is under the influence too many other factors.

Head fire intensity (HFI) is a function of rate of spread and fuel consumed. It is a very good indicator for wildfire suppression failure, candling and crowning potential, rate of spread and overall wildfire threat. The head fire intensity based on fuel type will be consistently underestimated in fuel types that do not recognize heavier than 'normal' surface fuel loads (dead and down pine and old fires). Head fire intensity will likely be overestimated in the older slash types found in the woodlot on the west edge of the AOI. Head fire intensity is maximized when wind and slope align. This suggests the aspects with a southerly component with their drier fuels and predominant southern valley winds will develop the highest head fire intensities in this area. The very steep slope east of the woodlot and between the homes on the ridge and the valley bottom will also potentially display very high head fire intensities due to the steep slope encouraging high rates of spread and winds that will blow across the slope.

#### 4.11 FIRE HISTORY

The fire history in the Enderby AOI provides an interesting indicator of wildfire suppression impacts in the area. A majority of the significant local wildfires occurred in the 1920s to 1950s when numerous landscape type wildfires dominated the local forest ecosystems. Much of this wildfire activity may be attributed to limited wildfire suppression and First Nations traditional burning practices. The Enderby valley bottom has only experienced minor 'nuisance fires' through recorded history, likely due to the long history of farming and cultivation in the valley that persists today. The lack of recent wildfire activity suggests a wildfire exclusion policy common throughout B.C. it also suggests timber types less prone to wildfire ignition and spread, tied to the wetter ecosystem and deciduous forest cover in the Enderby area.

**MAP 5: Fire History can be found in Appendix 3 and includes the following info:**

- CWPP boundary with updated WUI
- PSTA Human and Lightning Fire starts maps with fire perimeters
- Include local fire incident history if relevant
- Other Relevant info such as WUI, structures, or VAR

#### 4.12 LOCAL WILDFIRE THREAT ASSESSMENT

The wildfire threat assessment process used for the City of Enderby Wildfire Protection Plan followed the 2012 Wildland Urban Interface Wildfire Threat Assessments in B.C. process. The threat worksheet used for the field assessments is a provincial form designed to quantify wildfire threats over all the forest ecosystems found in B.C. The worksheet is very effective in quantifying wildfire threats in the wildland urban interface in the Enderby area forest ecosystems. Nineteen worksheets were completed on crown land, within the Area of Interest and along its perimeter. The worksheet is used to quantify wildfire threats based on the forest fuels available (Wildfire Behaviour Threat Score) and the proximity to structures (Wildland Urban Interface Wildfire Threat Score). The wildfire threat assessment worksheet was designed to quantify high and extreme wildfire behaviour polygons to identify the wildfire highest threat areas and allow for prioritizing areas for treatment and project funding through the Strategic Wildfire Prevention Initiative (SWPI) or other future sources. A change in the 2017 funding criteria allows for areas not rated as high and extreme to be funding eligible, with reasonable rationale. This will allow for better continuity in treatments as lower scoring areas can be included so fewer gaps exist.

An attempt was made to quantify wildfire threats on B.C. Crown or Municipal Crown land within the first 200 meters of private land with structures throughout the Area of Interest. This was achieved in a majority of locations through the worksheet process. Outside of the immediate Wildland Urban Interface (WUI) area, the forest ecosystems were sampled to attempt to quantify wildfire threats in all the fuel complexes found in the Enderby area. The most common fuel complexes sampled included;

- Mature Douglas-fir with high base crown height and well developed shrub-herb surface cover,
- Douglas-fir with understory Western Red Cedar,
- Pure Western Red Cedar stands,

- Harvesting slash of 5-10 years old,
- Mixed conifer and deciduous ecosystems

**Fuel Type Verification**

From the 2017 CWPP Guide:

The following table shows the fire behavior potential of the FBP fuel types grouped into 4 categories based on their relevance to a wildfire threat assessment.

**Table 5: Fuel Type Categories and Crown Fire Spot Potential**

Fuel Type Categories	Fuel Type - Crown Fire/ Spot Potential
1: C1, C2, C4, M3-M4 (>50% C/DF)	High
2: C3, C7, M3-M4 (<50% C/DF) M1-M2 >50% Conifer	Moderate
3: C5, C6, O1a/b, S1- S31 M1-M2 (26-49% Conifer)	Low
4: D1, D2, M1-M2 (<26% Conifer)	Very Low

The CFFDRS fuel typing system was never intended for use as a determination of wildfire threat or risk as described in the 2017 CWPP Guide. The biggest challenge is that there are no fuel types within the CFFDRS that accurately reflects many of the forest ecosystems found in B.C. The CFFDRS is inadequate for the Fuel Type Verification use described in the 2017 CWPP Guide.

The fuel typing provided in the provincial data is the best product available and has been reproduced as provided. The fuel type data does not account for the full range of fuel types in the Enderby area. The data is a very coarse overview and not suitable for addressing ecosystems at the scale required for a CWPP. For example, Woodlot #0324 on the western perimeter of the AOI has a series of patch cuts with standing timber ( Map 6, Appendix 3), that is represented by the PSTA data as a slash type. This does not accurately reflect the wildfire threat in this area. There are no fuel treatment units planned for this area so a detailed analysis and modification of the fuel types was not deemed necessary.

The polygon size and shapes on the crown land and Splitsin IR between Enderby and Canyon Road do not accurately reflect the mixed timber, Douglas-fir and open grassland ecosystems they are supposed to identify. Similarly, the private land on the northern end of the AOI, which dominates the area, is identified in the DSTA data as open grasslands, but is actually dominated by open Douglas-fir stands mixed with structures.

**4.13 PROXIMITY OF FUEL TO THE COMMUNITY**

From the 2017 CWPP Guide;

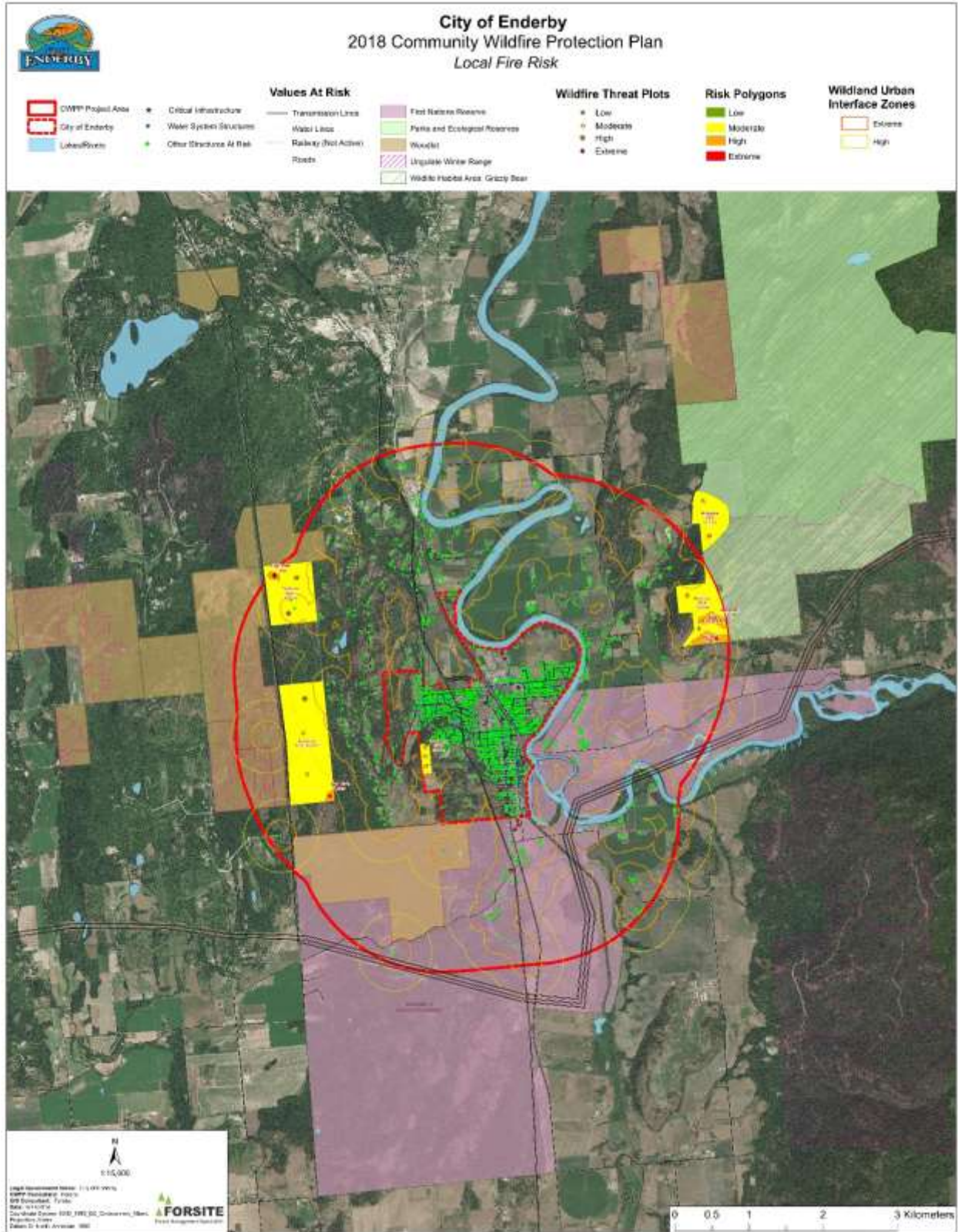
Fuel closest to the community usually represents the highest hazard. The recommended approach is to treat fuels to achieve a desired level of hazard reduction, from the value or structure outward, ensuring mitigation continuity. Untreated areas between treatment areas and the value or structure may allow a wildfire to build in intensity and rate of spread, which can increase the risk to the value. To capture the importance of fuel proximity in the local wildfire threat assessment, the WUI is weighted more heavily from the value or structure outwards. Fuels adjacent to the values and/or structures at risk receive the highest rating followed by progressively lower ratings moving out.

The 2012 wildfire threat assessment process identifies two WUI Threat Classes to be included on the map. The extreme WUI Threat Class extends to two hundred meters from structure points. The high WUI Threat Class extends from 200 to 500 meters from the structure points.

Wildland Urban Interface forest fuel management activities should always target from the values being protected outwards as the first priority. Continuous treatment, from 1) the Fire Smart treatment immediately around structures/values to 2) the forest fuel management activities on crown land provides the most effective wildfire threat reduction. The private landowner plays a big part in this process. Conducting forest fuel management activities on crown land can only be effective if the private land around the structure has Fire Smart principles applied to it. The larger the untreated gap between the treated forest and the structure, the less effective the overall threat reduction work and the less defensible the value. Large areas of forested crown land within the Enderby AOI are limited to two woodlots on the southern and western perimeter and a small portion of the Enderby Cliffs Provincial Park. There are large private land lots and Splitsin IR parcels mixed in with the crown timber.

In general, fuel management treatments on forested land should be a minimum of two tree lengths in width to allow for proper danger tree management. The actual width of the treatment will be very site specific. The main considerations are economics, topography, treatment capacity, wildfire threat, continuity of forest fuels, intensity of treatment and number of structures being protected. Treatments may also be conducted in phases such that the first 100 meters along the private land perimeter is completed in the first pass to provide as many areas as possible with some wildfire threat reduction, then further widening the treatments over time as capacity and funding allow.

Landscape level fuel treatments are most effective when they create access into and break the continuity of coniferous dominated forest land. The type and intensity of the fuel break is highly variable and very site specific. The style and intensity of the treatment often depends significantly on the other forest values being managed for in the area. Low intensity treatments over large areas can often be the most effective wildfire threat reduction treatment as it minimizes the impacts on other forest values, compared to high intensity treatments. It also provides the most options for wildfire suppression.



Map 7: Local Wildfire Threat



## 5 Risk Management and Mitigation Factors

The intent of this section is to outline the strategies the community can put into practice to reduce the risk and the impact of a wildfire. Risk mitigation choices can vary by community, fuel type, ecology, hazard, terrain factors, land ownership, unique local risk factors, Local Government and First Nation capacity, and/or public acceptance.

### 5.1 FUEL MANAGEMENT

The intent of this section is to identify and prioritize logical treatment units for future prescription development and operational fuel treatments within the highest wildfire threat areas.

The wildfire threat assessment work in the City of Enderby AOI did not determine any proposed fuel Crown land. Four areas of crown timber as described in Section 4 do have some risk, the fire hazard is not high enough to justify designating these areas as potential fuel treatment areas. The vast majority of the wildfire threat occurs on the Splatsin IR south of town and on private property.

### 5.2 WILDFIRE THREAT REDUCTION OPTIONS

Reducing the wildfire threat to existing communities, homes, and to future developments can be a very complex planning process. All plans or prescriptions for wildfire threat reduction must be site specific, aesthetically pleasing, economically feasible and environmentally sensitive.

The objective of wildfire threat reduction efforts should not be to stop all fires, which is not realistic or achievable. The objectives should be to:

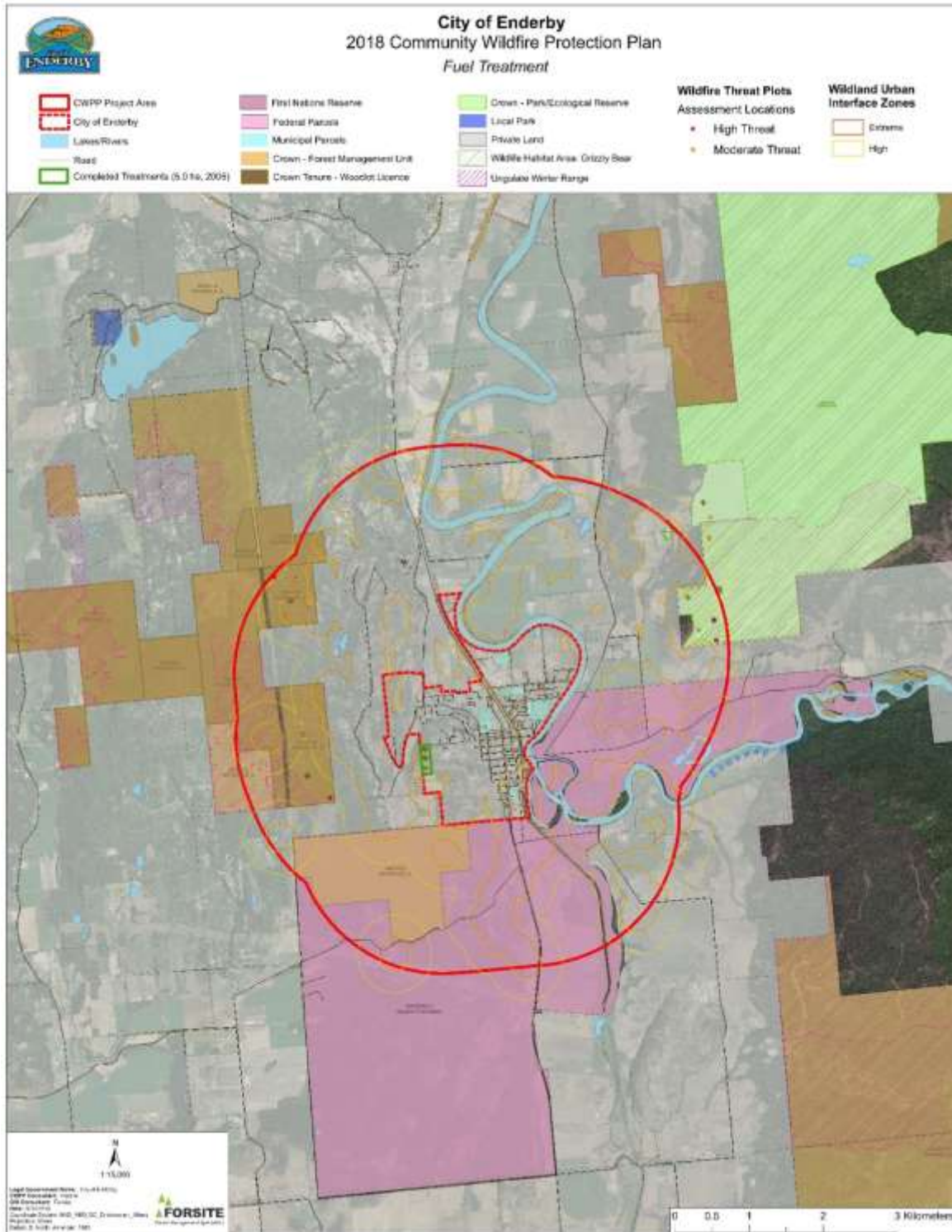
- Alter wildfire behaviour on the forested land adjacent to developments, through forest fuel management, to greatly reduce the potential for house and structure losses,
- Create safe access for wildland fire crews to more efficiently and effectively control wildfires, and
- Construct and maintain houses that are designed to withstand a wildfire.

**Table 6: Recommended Fire Smart Wildfire Threat Reduction Guidelines for Each Wildfire Behaviour Threat Class**

Wildfire Behaviour Threat Class	Forest Fuel Description	Wildfire Behaviour	Maximum Fire Intensity Rank	Wildfire Threat Reduction Requirements
Low	None	Smoldering	1	None
Moderate	Grass/Sage, fuel reduced forested areas, Deciduous forest - Surface Fuels Only	Surface Fires	2 - 3	Priority Zone 1 and 2 (as required)
High	Conifers dominated stands and Surface Fuels	Candling/Crown Fires	4 - 5	Priority Zone 1 and 2 and 3 (as required)
Extreme	Continuous, Dense Conifers and Surface Fuels	Aggressive Crown Fires	4 - 6	Priority Zone 1, 2 and 3 (as required)

### 5.2.1 FOREST FUEL MODIFICATION

See Appendix 4 for detailed information on forest fuel modification.



Map 8: Fuel Treatment Map

## 5.3 FIRESMART PLANNING AND ACTIVITIES

The intent of this section is to

- summarize the current level of FireSmart that has been completed, or is under implementation,
- to identify areas that are FireSmart, or have received FireSmart recognition through the FireSmart Canada Recognition Program, and
- identify possible future FireSmart activities within the AOI.

In 2018, the City of Enderby received a SWPI grant to implement a FireSmart planning process. This would involve the development of a framework for implementing FireSmart activities throughout the community. The planning process would involve analyzing the City's current contextual framework undertaking public consultation, and exploring FireSmart best practices in order to outline a phased approach to implementing FireSmart activities.

### 5.3.1 FIRESMART GOALS AND OBJECTIVES

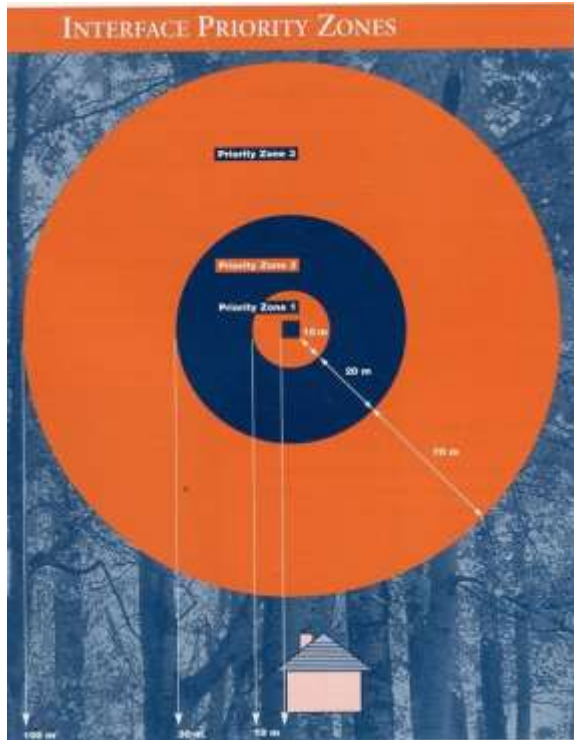
Fire Smart goals should include the implementation of Fire Smart principles on all private lots with structures adjacent to forested land or all larger lots on the western edge of the community. The valley bottom and older portions of Enderby have very limited wildfire threat issues and are relatively Fire Smart in their present condition with little or no native forest vegetation present. The homes on the larger and steeper lots on the western edge of Enderby require a Fire Smart focus due to their proximity to forested land, the larger size of many of the lots and the slopes present.

### 5.3.2 FIRESMART LANDSCAPING

Separating homes and other structures from the forest environment involves establishing Fire Smart landscaping around the structure so a wildfire cannot spread directly up to the structure. Direct radiant and convective heat can ignite structures. Creating a barrier between the structure and the combustible material will greatly increase structure survivability in the event of a local wildfire. FireSmart landscaping can include a wide variety of plants and surface covers, as long as they do not support combustion. FireSmart landscaping is referred to as Priority Zone One in the Fire Smart manual and is discussed in detail in Chapter 3 of that publication.

A minimum of 10 meters of Fire Smart landscaping from the structure to unmanaged forested land is recommended. This distance should be increased with increasing slopes and the extent of the wildfire threat in the adjacent forest. For example, a 10 meter buffer would likely be sufficient on flat ground adjacent to an unmanaged field of matted grass. The distance should be increased greatly, or combined with other treatments in an area of continuous, dense, tall coniferous trees on a steep (greater than 20%) slope. Fire Smart landscaping alone is suitable for structures adjacent to Low and Moderate (relatively flat ground) Wildfire Behaviour Threat Class areas as identified on the maps attached to this report.

FireSmart landscaping alone is not enough to increase house survivability in the areas identified as high and extreme wildfire behaviour threat class areas in this report. The high and extreme wildfire behaviour threat class areas will need much wider FireSmart landscaping or some other type of forest fuel modification on the adjacent forest lands.



**Figure 7: Fire Smart Priority Zones**

### 5.3.3 FIRESMART CONSTRUCTION

Building construction materials and design are outside the scope of this report but are discussed in detail in the Fire Smart manual, Chapter 3. Improving structure survivability through forest fuel management has two key components; one, separating the structures from the forest with Fire Smart landscaping, and two, reducing or modifying the forest fuels in the surrounding forest to reduce the wildfire behaviour.

A key component to the reduction of risks to life, limb and property from wildfire within the City of Enderby is that future development incorporates wildfire hazards and risk considerations. There are several tools available to local government that may be used as part of a comprehensive strategy to reduce wildfire interface threats and risks.

Regulatory tools associated with subdivision, rezoning and development permits, e.g. registration of covenants, development massing and detailed building design guidelines, can be used to influence development so as to reduce overall hazards within the city.

### 5.3.4 KEY ASPECTS OF FIRESMART FOR LOCAL COMMUNITY

The intent of this sub-section is to provide a summary of FireSmart activities that can be used to measure current level of implementation and to recommend next steps. There are many different ways that members of the community and stakeholders can provide options to mitigate the risk (FireSmart, 2003).

**Table 7: Fire Smart Practices and Activities**

Topic	FireSmart Examples
Communication, Education & Partnerships	<ul style="list-style-type: none"> <li>• Host a FireSmart day</li> <li>• Undertake FireSmart Local Representative or Community Champion training</li> <li>• Apply for FireSmart Community Recognition</li> <li>• Form a FireSmart committee</li> <li>• Encourage homeowners and/or neighborhoods to undertake FireSmart site assessments and area assessments through FireSmart Canada (grants are available)</li> <li>• Distribute FireSmart brochure</li> </ul>
Vegetation management	<ul style="list-style-type: none"> <li>• Provide access to a chipper/dumpster or safe burning location for debris drop-off from pruning or thinning on private properties</li> <li>• Promote deciduous or low flammability fuel breaks in green belt areas</li> </ul>
Planning & Development	<ul style="list-style-type: none"> <li>• Consider wildfire prevention and suppression training for community members</li> <li>• Develop a community wildfire response system for dealing with small fires initiated within the valley</li> </ul>
Increasing local capacity	<ul style="list-style-type: none"> <li>• Provide sprinkler kits (at cost, or subsidized) to residents</li> <li>• Cross-train to include structural fire and wildfire training</li> </ul>

### 5.3.5 IDENTIFY PRIORITY AREAS WITHIN THE AREA OF INTEREST FOR FIRESMART

Due to the forest fuel, weather and topographical features in the area, the western edge of the community should be focused on for Fire Smart activities. This would be a multi-year ongoing process.

## 5.4 COMMUNITY COMMUNICATION AND EDUCATION

The intent of this section is to describe the key steps required to build engagement and support within the community for the CWPP in a concise format. This includes education on fire prevention practices, outreach and community programs.

The CWPP and associated maps will be provided to local interested community members. The City of Enderby should continue to apply for yearly funding to advance FireSmart community outreach including demonstrations, FireSmart community days, and the recommendations in Table 5.6. The City of Enderby has received a 2018 FireSmart grant which will be used to develop a broad FireSmart implementation strategy for the project area.

## 5.5 OTHER PREVENTION MEASURES

This intent of this section is to identify local actions and strategies that reduce the threat of wildfire ignitions.

Fire prevention can be achieved through communication and education initiatives. Danger Class rating signs along main access roads, public communication, industrial work restrictions and fire bans are examples of public fire prevention measures (CWPP Guide, 2016). The designation of a Community FireSmart champion within the local fire department can be an effective tool to

act as a liaison between the FireSmart program and the community. Due to involvement with emergency management, community knowledge and fire suppression capabilities, Fire Department members are effective community champions for this purpose. <https://www.firesmartcanada.ca/firesmart-communities/firesmart-community-champion-workshops/>

## 5.6 SUMMARY OF RECOMMENDATIONS

**Table 8: Summary of Section 5 Recommendations**

	Objective/Priority	Recommendation/ Next Steps	Responsibility/Funding Source
Section 5: Risk Management and Mitigation Factors	1. Increase FireSmart awareness throughout the plan area by developing a broad FireSmart Implementation Plan.	The City of Enderby should seek additional funding when available to support a broad engagement strategy regarding FireSmart standards and activities on a yearly basis. <sup>12</sup>  The designation of a community FireSmart champion within the Enderby Fire Department will support a broader FireSmart engagement strategy within the community	City of Enderby/ Strategic Wildfire Prevention Initiative (SWPI), Forest Enhancement Society of British Columbia (FESBC), and/or Community Resilience Investment Fund (CRIP)
	2. Increase community awareness by communication with key stakeholders.	Capture this objective in FireSmart Implementation Plan (see above). May include items such as community mail outs for private landowners, FireSmart community days, and local advertising such as a FireSmart section on the City of Enderby website. This will include City of Enderby staff, private landowners, woodlot tenure holders, and other community members.	City of Enderby/ Strategic Wildfire Prevention Initiative (SWPI), Forest Enhancement Society of British Columbia (FESBC), and/or Community Resilience Investment Fund (CRIP)
	3. Monitor forest conditions in community and surrounding area for fuel management	Monitor surrounding area for forest health issues including wind throw, bark beetles, and other pathogens as hazard in the project area may change.	City of Enderby/ FESBC/ CRIP

<sup>12</sup> A 2018 FireSmart grant was retained for the City of Enderby which will be used to develop a FireSmart Implementation Plan.

	Objective/Priority	Recommendation/ Next Steps	Responsibility/Funding Source
	opportunities and hazard mitigation.	Monitor policy changes that may allow alternate funding opportunities for fire hazard mitigation in areas currently unavailable for funding, such as private land.	
	4. Develop Fire Smart Building Standards relating to exterior building materials and landscaping for new developments	Review regulatory tools associated with subdivision, rezoning and development permits, e.g. registration of covenants, development massing and detailed building design guidelines, can be used to influence development so as to reduce overall hazards within the city.	City of Enderby
	5. Work alongside Splatsin to update their CWPP with specific attention to fuel management and fire hazard mitigation.	Contribute information and input to Splatsin CWPP renewal where fitting.  Continue to cultivate relationship of emergency management co operations and discussion of shared risk with Splatsin band council and staff.	City of Enderby, Splatsin

## 6 SECTION 6: Wildfire Response Resources

The intent of this section is to provide a high level overview of the resources that are available to local governments in the case of a wildfire.

Interface fires are complex incidents that typically involve both wildland and structural fires. During times when many fires are burning in the Province and threatening multiple communities at the same time, resource requests can exceed the resources available. In B.C. these resources are deployed according to [BC Provincial Co-ordination Plan for Wildfire Revised July 2016](#) (CWPP Guide 2016).

### 6.1 LOCAL GOVERNMENT AND FIRST NATION FIREFIGHTING RESOURCES

The intent of this sub-section is to identify implications of wildfire that impact firefighting efforts (eg. loss of electrical power and water pressure and supply), the contingencies that have been put in place, and any recommended measures that would help to make community firefighting more effective. Include a high level summary of mutual aid agreements.

#### 6.1.1 FIRE DEPARTMENTS AND EQUIPMENT

The City of Enderby has a volunteer fire department that serves Enderby, part of Area F of the Regional District of North Okanagan (the Shuswap River Fire Protection District), and Splatins. The Enderby Volunteer Fire Department has 2 engines, 3 tenders (2 with pumping capabilities), and one rescue truck. Department members are equipped with wildland firefighting coveralls, boots, gloves, and glasses, and the hall is equipped with water back packs and forestry hose. The City of Enderby and Splatins meet annually regarding emergency management in the area.

#### 6.1.2 WATER AVAILABILITY FOR WILDFIRE SUPPRESSION

Within Enderby City limits, all developed areas within the community have access to hydrants for firefighting purposes. The core of the community of Grindrod also has access to hydrants for fighting purposes. Within the rural areas of the Shuswap River Fire Protection District, access to hydrants is not available and the Enderby Volunteer Fire Department relies on the tendering of water, which can be supplied by neighbouring departments. There are multiple points along the Shuswap River where the Department can access water in order to minimize tendering times. There are several neighbourhoods, including along Glenmary Road, where turn-around time from hydrant locations is over 40 minutes. This should be identified as a suppression gap in these areas where tender access from adjacent department may be required. In areas throughout the Shuswap River Fire District, the identification of alternate water sources in isolated areas can assist in identifying resources for emergency management.

#### 6.1.3 ACCESS AND EVACUATION

A number of properties in the rural areas of the Shuswap Fire Protection District have steep driveways which creates access challenges for the fire apparatus. To mitigate this, the Department will stage at the base of the steep driveways and pump up.

Enderby-Mabel Lake Road (once past Ashton Creek) and Gunter Ellison Road are both one-way/one-way out corridors which creates the potential for access issues in the case of emergency response or evacuation. While the majority of Enderby-Mabel Lake Road is outside the project area, this road within a heavily forested landscape could create issues for evacuation, and could be identified within an alternate planning mechanism as a wildfire threat. Gunter Ellison road is the primary evacuation route for several rural properties. During a wildfire event in the area, this road may present evacuation challenges due to continuous forest fuels along the length of the road, as well as significant fuels south and southwest of the road system. While on private land, albeit with an easement already in place, a connection from Gunter-Ellison Road north to nearby Glenmary Road would provide an alternate access route for the residences and acreages in this portion of the AOI. During a wildfire event, protection of Gunter-Ellison Road as a key evacuation route should be of high priority.



### 6.1.4 TRAINING

The Enderby Fire department volunteers engage in S-100 training yearly. Through collaboration with BC Wildfire Service, the department could benefit from further cross training exercises in wildland fire.

## 6.2 STRUCTURE PROTECTION

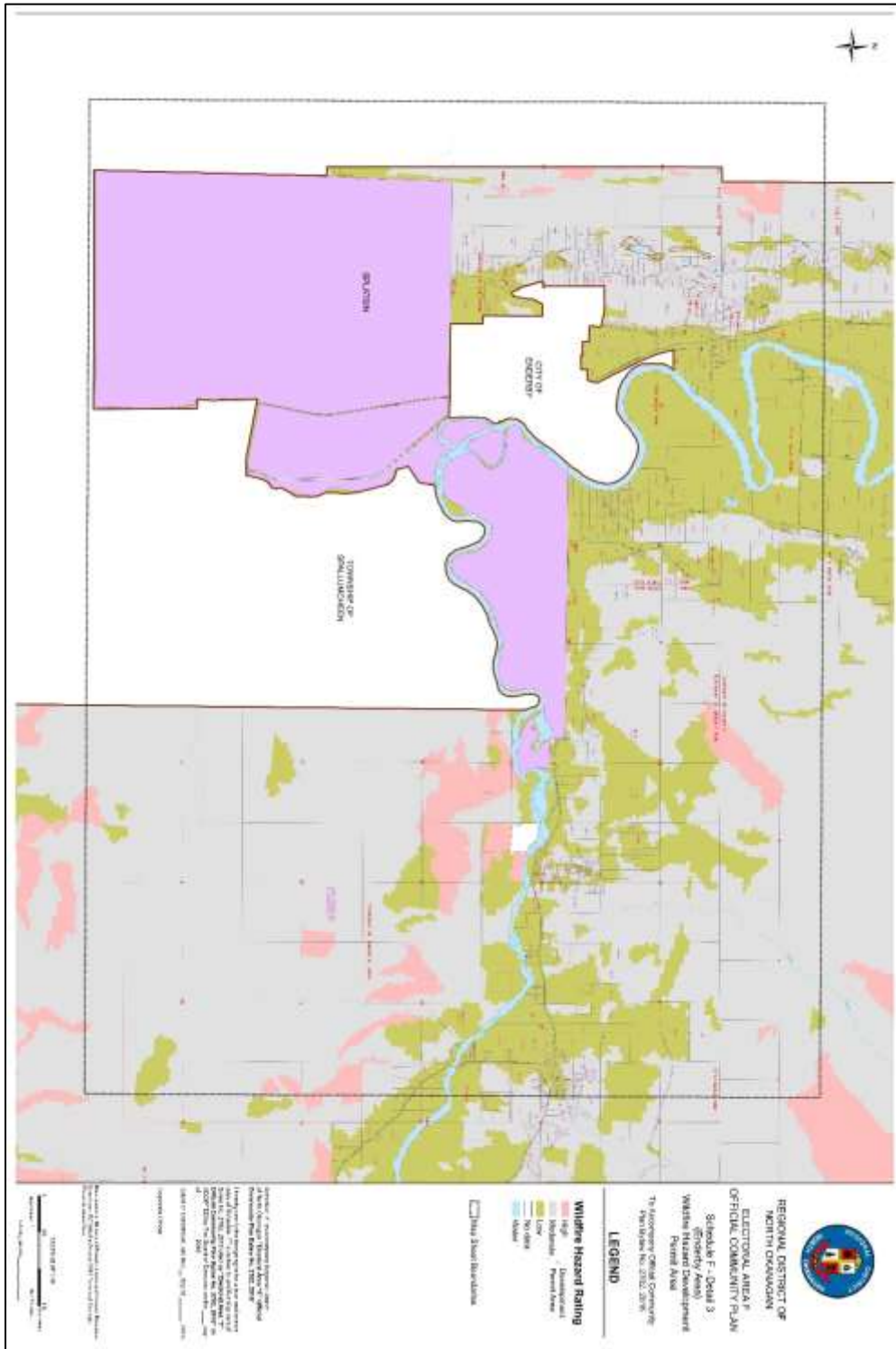
Enderby does not have a Structure Protection Unit. All fire departments within the North Okanagan Regional District have a mutual aid agreement which allows for resource sharing. In the event of a wildfire, Enderby will usually request a SPU from Armstrong or another adjacent department. This will delay any structure protection ability of the department, however, during a wildfire events the department may be able to request BC wildfire to access their structure protection units.

### 6.3 SUMMARY OF RECOMMENDATIONS

**Table 9: Summary of Wildfire Response Recommendations**

	Objective/Priority	Recommendation/ Next Steps	Responsibility/Funding Source
Section 6: Wildfire Response	6. Increase wildfire training within local department through cross training exercises with BC Wildfire	Fire department to contact BC Wildfire for potential training opportunities. This may include discussions surrounding communications and potential areas of vulnerability, and mock wildfire exercises.	Enderby Fire Department
	7. Assess evacuation concerns within the project area with particular emphasis on one way in/one way out routes	Emergency Operations Center Planning Section and Enderby Fire Department review and, where necessary, revise evacuation protocols based on risk.	City of Enderby/UBCM/CRIP
	8. Collaborate with North Okanagan Regional District to apply for available funding for connection of Gunter Ellison and Glenmary Roads	Emergency Operations Center Planning Section and Enderby Fire Department to identify areas within Shuswap Fire Protection District with water supply vulnerabilities and identify mitigating solutions	City of Enderby/Enderby Fire Department/CRIP
	9. Identify water resources within the Shuswap Fire Protection District where water scarcity is a concern for fire suppression	Emergency Operations Center Planning Section and Enderby Fire Department to identify areas within Shuswap Fire Protection District with water supply vulnerabilities and identify mitigating solutions	City of Enderby/Enderby Fire Department

# Appendix 1: Regional District of North Okanagan Wildfire Hazard Permit Development Area



## Appendix 2: Wildfire Behavior Threat Plot Cards and Pictures

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E1

WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET					
Plot #	E1				
Location	Enderby				
Owner	B. Mottan				
Address	30104118				
Address	N 50 34.615' W 119 5.935'				
Plot Area	1.4				
Land Use					
Site Type					
WILDLAND					
Plot	A	B	C	D	E
1 Fuel Load and Moisture Regime (m)	1-12	2-12	3-12	4-12	5-12
2 Fuel Type/Structure (m)	1-12	2-12	3-12	4-12	5-12
3 Vegetation and Obstruction	1-12	2-12	3-12	4-12	5-12
4 Fire Spread Rate (m/Min)	1-12	2-12	3-12	4-12	5-12
5 Fire Spread Rate (m/Min)	1-12	2-12	3-12	4-12	5-12
6 Fire Spread Rate (m/Min)	1-12	2-12	3-12	4-12	5-12
7 Fire Spread Rate (m/Min)	1-12	2-12	3-12	4-12	5-12
8 Fire Spread Rate (m/Min)	1-12	2-12	3-12	4-12	5-12
9 Fire Spread Rate (m/Min)	1-12	2-12	3-12	4-12	5-12
10 Fire Spread Rate (m/Min)	1-12	2-12	3-12	4-12	5-12
11 Fire Spread Rate (m/Min)	1-12	2-12	3-12	4-12	5-12
Subtotal					3.5
WILDLAND					
Plot	A	B	C	D	E
12 Vegetation Type	1-12	2-12	3-12	4-12	5-12
13 Vegetation Type	1-12	2-12	3-12	4-12	5-12
Subtotal					3.5
TOPOGRAPHY					
Plot	A	B	C	D	E
14 Slope (m)	1-12	2-12	3-12	4-12	5-12
15 Wind	1-12	2-12	3-12	4-12	5-12
16 Fuel Type	1-12	2-12	3-12	4-12	5-12
Subtotal					3.5
FUEL, WEATHER AND TOPOGRAPHY					
Plot	A	B	C	D	E
17 Fuel, Weather and Topography	1-12	2-12	3-12	4-12	5-12
18 Fuel, Weather and Topography	1-12	2-12	3-12	4-12	5-12
19 Fuel, Weather and Topography	1-12	2-12	3-12	4-12	5-12
Subtotal					3.5
** Please consult the attached copy of the Wildfire Threat Assessment Worksheet for a detailed explanation of the plot types.					
Wildfire Behavior Threat Class (m) explanation:					
Low	1-12				
Medium	13-24				
High	25-36				
Very High	37-48				
Wildfire Behavior Threat Class (m) explanation:					
Low	1-12				
Medium	13-24				
High	25-36				
Very High	37-48				

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E1



Picture E1-1 @ 90 degrees



Picture E1-2 @ 180 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E2

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Pre-treatment  Post-treatment

Parcel: **E2** Community: **Enderby**

Owner: **B. Morrow** Property Location Street Name: **Trinity Hills Drive**

Date: **30/04/18** UTM: **N 50° 34' 40" W 119° 5' 23"**

Plot: **0 + 4** Lot Number: **18** Area: **17.15** Area (Acres): **0.40** Parcel Page

Factor	A	B	C	D	E
1. Soil Type and Moisture Regime (10)	10	2-3 Dry Soil 10	1-10 Dry Soil 10	1-10 Dry Soil 10	1-10 Dry Soil 10
2. Slope (10)	10	10-20	1-10	1-10	10
3. Vegetation Fuel Characteristics	Very Low, High Fuel Load, Low Extensibility (10)	Low, Moderate Fuel Load	High, High Fuel Load	High, High Fuel Load	High, High Fuel Load
4. Air Windy Days (10)	1-10 average	1-10 average	1-10 average	1-10 average	1-10 average
5. Long Windy Days (10)	1-10 average	1-10 average	1-10 average	1-10 average	1-10 average
6. Wind and Fuel Conditions (10)	1-10	1-10	1-10	1-10	1-10
7. Fire Behavior (10)	1-10	1-10	1-10	1-10	1-10
8. Fire Spread (10)	1-10	1-10	1-10	1-10	1-10
9. Fire and Fuel Suppression and Extinguishing (10)	1-10	1-10	1-10	1-10	1-10
10. Fire Risk (10)	1-10	1-10	1-10	1-10	1-10
11. Cumulative Fire Risk (10)	1-10	1-10	1-10	1-10	1-10

Sub Total: **58** / 100

Weather	A	B	C	D	E
12. Temperature (10)	1-10	1-10	1-10	1-10	1-10
13. Humidity (10)	1-10	1-10	1-10	1-10	1-10

Sub Total: **15** / 20

Topography	A	B	C	D	E
14. Aspect (10)	1-10	1-10	1-10	1-10	1-10
15. Slope (10)	1-10	1-10	1-10	1-10	1-10
16. Views (10)	1-10	1-10	1-10	1-10	1-10
17. Landform Features (10)	1-10	1-10	1-10	1-10	1-10

Sub Total: **33** / 40

**FUEL WEATHER AND TOPOGRAPHY** **100** / 100

Element	A	B	C	D	E
18. Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
19. Fuel Type (10)	1-10	1-10	1-10	1-10	1-10
20. Fuel Moisture (10)	1-10	1-10	1-10	1-10	1-10

**WILDLAND URBAN INTERFACE WILDFIRE THREAT SCORE** **100** / 100

**TOTAL WILDFIRE THREAT SCORE** **100** / 100

Wildfire Behavior Threat Class (check applicable class)

Low  1-10

Medium  11-20

High  21-30

Extreme  31-40

Wildfire Risk Exposure Threat Class (check applicable class)

Low  1-10

Medium  11-20

High  21-30

Extreme  31-40

DATE: 30/04/18

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E2



Picture E2-1 @90 degrees



Picture E2-2 @180 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E3

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**

Worksheet:  Pre-treatment  No treatment

File: **E3** Community: **Enderby**

Author: **B. Morgan** Geographic Location/Sheet Name: **French Cliffs Park**

Date: **30/04/18** WSEEN: **N 50° 34' 28" W 119° 5' 6" 30**

Phone: **0 1 24** Land Ownership:  Public  Private  Other (Specify): **Provincial Parks**

Field	A	B	C	D	E
1. Wetland and Wetland Buffer (L)	0	1-15 Dry Stand Area	16-30 Dry Stand Area	31-45 Dry Stand Area	46-60 Dry Stand Area
2. Buffer Zone (L)	0	1-15	16-30	31-45	46-60
3. Vegetation Fuel Density (L)	0	1-15 High Fuel Density	16-30 High Fuel Density	31-45 High Fuel Density	46-60 High Fuel Density
4. Fire Hazard Potential (L)	0	1-15	16-30	31-45	46-60
5. Slope (L)	0	1-15	16-30	31-45	46-60
6. Wind Speed (L)	0	1-15	16-30	31-45	46-60
7. Urban Density (L)	0	1-15	16-30	31-45	46-60
8. Urban Density (L)	0	1-15	16-30	31-45	46-60
9. Urban Density (L)	0	1-15	16-30	31-45	46-60
10. Urban Density (L)	0	1-15	16-30	31-45	46-60
11. Urban Density (L)	0	1-15	16-30	31-45	46-60
<b>Sub Total</b> <b>23</b>					
<b>Weather</b>					
12. Regional Wind (L)	0	1-15	16-30	31-45	46-60
13. Regional Wind (L)	0	1-15	16-30	31-45	46-60
<b>Sub Total</b> <b>15</b>					
<b>Topography</b>					
14. Slope (L)	0	1-15	16-30	31-45	46-60
15. Slope (L)	0	1-15	16-30	31-45	46-60
16. Slope (L)	0	1-15	16-30	31-45	46-60
17. Slope (L)	0	1-15	16-30	31-45	46-60
<b>Sub Total</b> <b>23</b>					
<b>FIRE, WEATHER AND TOPOGRAPHY</b>					
<b>WILDFIRE THREAT INDEX</b>					
18. Fire Hazard Potential (L)	0	1-15	16-30	31-45	46-60
19. Fire Hazard Potential (L)	0	1-15	16-30	31-45	46-60
20. Fire Hazard Potential (L)	0	1-15	16-30	31-45	46-60
<b>Sub Total</b> <b>16</b>					
<b>WILDLAND URBAN INTERFACE WILDFIRE THREAT INDEX</b>					
<b>TOTAL WILDFIRE THREAT INDEX</b> <b>39</b>					

**Wildfire Behavior Threat Class (check each class)**

Low 0-15  
Moderate 16-30  
High 31-45  
Extreme >45

**Wildland Urban Interface Threat Class (check each class)**

Low 0-15  
Moderate 16-30  
High 31-45  
Extreme >45

Last Updated: January 14, 2013

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E3



Picture E3-1 @360 degrees



Picture E3-2 @180 degrees



City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E4

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Pre-treatment  Post-treatment

Name: E4 Community: Enderby

Owner: B. Morrison Geographic Location/Client Name: Woodlot

Site: 30104/118 MSN: N 50° 32' 835 W 119° 10.422

Block: 4 Lot: 4 Land Ownership:  Owner  Lease  Other (Specify): Sch R Woodlot

Factor	A	B	C	D	E
1. Soil Types and Moisture Regime (See)	Soil 1	Soil 2	Soil 3	Soil 4	Soil 5
2. Fuel Type Category (See)	1	2	3	4	5
3. Vegetation Condition	1	2	3	4	5
4. Shrub Density Category (1-5) (See)	1	2	3	4	5
5. Tree Density Category (1-5) (See)	1	2	3	4	5
6. Deadwood Category (1-5) (See)	1	2	3	4	5
7. Firebreak Category (1-5) (See)	1	2	3	4	5
8. Firebreak Condition (1-5) (See)	1	2	3	4	5
9. Firebreak Material (1-5) (See)	1	2	3	4	5
10. Fuel Load Category (1-5) (See)	1	2	3	4	5
11. Fuel Load Condition (1-5) (See)	1	2	3	4	5
12. Fuel Load Material (1-5) (See)	1	2	3	4	5
13. Topography	1	2	3	4	5
14. Slope (1-5) (See)	1	2	3	4	5
15. Aspect (1-5) (See)	1	2	3	4	5
16. Wind	1	2	3	4	5
17. Fuel Load Category (1-5) (See)	1	2	3	4	5
<b>FUEL, WEATHER AND TOPOGRAPHY</b>					
18. Fuel Load Category (1-5) (See)	1	2	3	4	5
19. Fuel Load Condition (1-5) (See)	1	2	3	4	5
20. Fuel Load Material (1-5) (See)	1	2	3	4	5
<b>WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT</b>					
<b>TOTAL WILDFIRE THREAT SCORE</b>					

Wildfire Behavior Threat Class (See table below)

Low	0-40	<input type="checkbox"/>
Medium	41-60	<input checked="" type="checkbox"/>
High	61-80	<input type="checkbox"/>
Extreme	> 80	<input type="checkbox"/>

Wildland-Urban Interface Threat Class (See table below)

Low	0-10	<input type="checkbox"/>
Medium	11-20	<input checked="" type="checkbox"/>
High	21-30	<input type="checkbox"/>
Extreme	> 30	<input type="checkbox"/>

Last Updated: January 31, 2013

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E4



Picture E4-1 @180 degrees



Picture E4-2 @180 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E5

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Pre-treatment  Post-treatment

Sheet # **E5** Community **Enderby**

Address **R. Morrow** Geographic Location/Street Name **Woodlot #**

Date **2018/04/18** URSID # **N56°57'180 W 119° 0' 512**

Phone **6-4-4** Land Use  Forest  In Use  Other  **Sched. B Woodlot**

Fuel	LEVELS				
	A	B	C	D	E
1 Fuel Type and Moisture Regime (Fuel)	1-2	2-3	3-4	4-5	5-6
2 Fuel Moisture (% wet)	4-5	3-4	2-3	1-2	0
3 Vegetation Fuel Availability	High Fuel Availability	Med. Fuel Availability	Low Fuel Availability	Very Low Fuel Availability	Minimal Fuel Availability
4 Fuel Moisture Content (1% dry) (% wet)	<1 coverage	<2 coverage	<3 coverage	<4 coverage	<5 coverage
5 Large Woody Debris Coverage (100) (% wet)	<1 coverage	<2 coverage	<3 coverage	<4 coverage	<5 coverage
6 Live and Dead Fuel Load (100) (% wet)	<1	1	2	3	4
7 Live and Dead Fuel Load (100) (% wet)	<1	1	2	3	4
8 Live and Dead Fuel Load (100) (% wet)	<1	1	2	3	4
9 Live and Dead Fuel Load (100) (% wet)	<1	1	2	3	4
10 Fuel Moisture (100) (% wet)	<1	1	2	3	4
11 Fuel Moisture (100) (% wet)	<1	1	2	3	4
12 Fuel Moisture (100) (% wet)	<1	1	2	3	4
13 Fuel Moisture (100) (% wet)	<1	1	2	3	4
14 Fuel Moisture (100) (% wet)	<1	1	2	3	4
15 Fuel Moisture (100) (% wet)	<1	1	2	3	4
16 Fuel Moisture (100) (% wet)	<1	1	2	3	4
17 Fuel Moisture (100) (% wet)	<1	1	2	3	4
Sub Total	28				
18 Fuel Moisture (100) (% wet)	28				
19 Fuel Moisture (100) (% wet)	28				
20 Fuel Moisture (100) (% wet)	28				
21 Fuel Moisture (100) (% wet)	28				
22 Fuel Moisture (100) (% wet)	28				
23 Fuel Moisture (100) (% wet)	28				
24 Fuel Moisture (100) (% wet)	28				
25 Fuel Moisture (100) (% wet)	28				
26 Fuel Moisture (100) (% wet)	28				
27 Fuel Moisture (100) (% wet)	28				
28 Fuel Moisture (100) (% wet)	28				
29 Fuel Moisture (100) (% wet)	28				
30 Fuel Moisture (100) (% wet)	28				
31 Fuel Moisture (100) (% wet)	28				
32 Fuel Moisture (100) (% wet)	28				
33 Fuel Moisture (100) (% wet)	28				
34 Fuel Moisture (100) (% wet)	28				
35 Fuel Moisture (100) (% wet)	28				
36 Fuel Moisture (100) (% wet)	28				
37 Fuel Moisture (100) (% wet)	28				
38 Fuel Moisture (100) (% wet)	28				
39 Fuel Moisture (100) (% wet)	28				
40 Fuel Moisture (100) (% wet)	28				
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79 Fuel Moisture (100) (% wet)	28				
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95 Fuel Moisture (100) (% wet)	28				
96 Fuel Moisture (100) (% wet)	28				
97 Fuel Moisture (100) (% wet)	28				
98 Fuel Moisture (100) (% wet)	28				
99 Fuel Moisture (100) (% wet)	28				
100 Fuel Moisture (100) (% wet)	28				

**FUEL, WEATHER AND TOPOGRAPHY**  Pre-treatment  Post-treatment

18 Fuel Moisture (100) (% wet)

19 Fuel Moisture (100) (% wet)

20 Fuel Moisture (100) (% wet)

21 Fuel Moisture (100) (% wet)

22 Fuel Moisture (100) (% wet)

23 Fuel Moisture (100) (% wet)

24 Fuel Moisture (100) (% wet)

25 Fuel Moisture (100) (% wet)

26 Fuel Moisture (100) (% wet)

27 Fuel Moisture (100) (% wet)

28 Fuel Moisture (100) (% wet)

29 Fuel Moisture (100) (% wet)

30 Fuel Moisture (100) (% wet)

31 Fuel Moisture (100) (% wet)

32 Fuel Moisture (100) (% wet)

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41 Fuel Moisture (100) (% wet)

42 Fuel Moisture (100) (% wet)

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78 Fuel Moisture (100) (% wet)

79 Fuel Moisture (100) (% wet)

80 Fuel Moisture (100) (% wet)

81 Fuel Moisture (100) (% wet)

82 Fuel Moisture (100) (% wet)

83 Fuel Moisture (100) (% wet)

84 Fuel Moisture (100) (% wet)

85 Fuel Moisture (100) (% wet)

86 Fuel Moisture (100) (% wet)

87 Fuel Moisture (100) (% wet)

88 Fuel Moisture (100) (% wet)

89 Fuel Moisture (100) (% wet)

90 Fuel Moisture (100) (% wet)

91 Fuel Moisture (100) (% wet)

92 Fuel Moisture (100) (% wet)

93 Fuel Moisture (100) (% wet)

94 Fuel Moisture (100) (% wet)

95 Fuel Moisture (100) (% wet)

96 Fuel Moisture (100) (% wet)

97 Fuel Moisture (100) (% wet)

98 Fuel Moisture (100) (% wet)

99 Fuel Moisture (100) (% wet)

100 Fuel Moisture (100) (% wet)

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E5



Picture E5-1 @360 degrees



Picture E5-2 @180 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E6

**WEDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**

Job #: **E6** Community: **Enderby**

Address: **B. Moraw** Geographic Location (Street Name): **Widdell #**

Date: **30/04/18** UTM: **N 50° 32' 418 W 114° 10' 617**

Phone: **604-444-4444** Landmarks:  Home  Street  Other (Specify): **school B. widdell**

Factor	A	B	C	D	E
1 Fuel Type and Moisture Regime (1-5)	1-2	3-4	5-6	7-8	9-10
2 Fuel Continuity (0-5)	0-1	2-3	4-5	6-7	8-9
3 Vegetation Fuel Composition	Non-flammable (e.g., concrete)	Flammable (e.g., wood)	Highly flammable (e.g., oil)	Very flammable (e.g., gas)	Extremely flammable (e.g., propane)
4 Fuel Moisture Content (1-5) (1-5 wet)	1-2	3-4	5-6	7-8	9-10
5 Fuel Moisture Content (1-5) (1-5 wet)	1-2	3-4	5-6	7-8	9-10
6 Structural Conditions (Open Class: 0-5)	0-1	2-3	4-5	6-7	8-9
7 Structural Conditions (Closed Class: 0-5)	0-1	2-3	4-5	6-7	8-9
8 Structural Conditions (Open Class: 0-5)	0-1	2-3	4-5	6-7	8-9
9 Structural Conditions (Closed Class: 0-5)	0-1	2-3	4-5	6-7	8-9
10 Fuel Moisture (1-5) (1-5 wet)	1-2	3-4	5-6	7-8	9-10
11 Continuous Fuel Load (1-5) (1-5 wet)	1-2	3-4	5-6	7-8	9-10
<b>Sub Total</b>					<b>38</b>
<b>Weather</b>					
12 Temperature (1-5)	1-2	3-4	5-6	7-8	9-10
13 Humidity (1-5)	1-2	3-4	5-6	7-8	9-10
14 Wind Speed (1-5)	1-2	3-4	5-6	7-8	9-10
15 Wind Direction (1-5)	1-2	3-4	5-6	7-8	9-10
<b>Sub Total</b>					<b>15</b>
<b>Topography</b>					
16 Aspect (1-5)	1-2	3-4	5-6	7-8	9-10
17 Slope (1-5)	1-2	3-4	5-6	7-8	9-10
18 Elevation (1-5)	1-2	3-4	5-6	7-8	9-10
19 Landform (1-5)	1-2	3-4	5-6	7-8	9-10
<b>Sub Total</b>					<b>25</b>
<b>FUEL, WEATHER AND TOPOGRAPHY</b>					
<b>WEDLAND URBAN INTERFACE WILDFIRE THREAT SCORE</b>					
20 Fuel, Weather and Topography (1-5)	1-2	3-4	5-6	7-8	9-10
21 Fuel, Weather and Topography (1-5)	1-2	3-4	5-6	7-8	9-10
<b>Sub Total</b>					<b>16</b>
<b>WILDFIRE BEHAVIOR THREAT CLASS (1-5)</b>					
22 Fuel, Weather and Topography (1-5)	1-2	3-4	5-6	7-8	9-10
<b>Sub Total</b>					<b>4</b>
<b>WILDFIRE BEHAVIOR THREAT CLASS (1-5)</b>					
23 Fuel, Weather and Topography (1-5)	1-2	3-4	5-6	7-8	9-10
<b>Sub Total</b>					<b>4</b>

**Wildfire Behavior Threat Class (1-5)**

**Wildland Urban Interface Threat Class (1-5)**

Low: 1-2  
Moderate: 3-4  
High: 5-6  
Extreme: 7-8

Low: 1-2  
Moderate: 3-4  
High: 5-6  
Extreme: 7-8

and updated January 31, 2011

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E6



Picture E6-1 @180 degrees



Picture E6-2 @360 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E7

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Pre-treatment  Post-treatment

Plot # **E7** Community **Enderby**  
Assessor **B. Mellan** Assessor's Location (Street Name) **Waldlot #**  
Date **30/04/18** WGS84 **N 50° 33.018' W 119° 10.553'**  
Plots **4** Land Use/Use  Forest  Other (Specify) **Subst. B Wood**

Plot	A	B	C	D	E
1 Fuel Type and Moisture Content	1-1	2-1 2-2 2-3	3-1 3-2 3-3	4-1 4-2 4-3	5-1 5-2 5-3
2 Fuel Moisture Content	1-1	2-1 2-2 2-3	3-1 3-2 3-3	4-1 4-2 4-3	5-1 5-2 5-3
3 Vegetative Fuel Composition	Non-woody Highly flammable Highly volatile	Non-woody Flammable Highly volatile	Non-woody Flammable Highly volatile	Non-woody Flammable Highly volatile	Non-woody Flammable Highly volatile
4 Fuel Moisture Content	1-1 1-2 1-3	2-1 2-2 2-3	3-1 3-2 3-3	4-1 4-2 4-3	5-1 5-2 5-3
5 Fuel Moisture Content	1-1 1-2 1-3	2-1 2-2 2-3	3-1 3-2 3-3	4-1 4-2 4-3	5-1 5-2 5-3
6 Fuel Moisture Content	1-1 1-2 1-3	2-1 2-2 2-3	3-1 3-2 3-3	4-1 4-2 4-3	5-1 5-2 5-3
7 Fuel Moisture Content	1-1 1-2 1-3	2-1 2-2 2-3	3-1 3-2 3-3	4-1 4-2 4-3	5-1 5-2 5-3
8 Fuel Moisture Content	1-1 1-2 1-3	2-1 2-2 2-3	3-1 3-2 3-3	4-1 4-2 4-3	5-1 5-2 5-3
9 Fuel Moisture Content	1-1 1-2 1-3	2-1 2-2 2-3	3-1 3-2 3-3	4-1 4-2 4-3	5-1 5-2 5-3
10 Fuel Moisture Content	1-1 1-2 1-3	2-1 2-2 2-3	3-1 3-2 3-3	4-1 4-2 4-3	5-1 5-2 5-3
11 Fuel Moisture Content	1-1 1-2 1-3	2-1 2-2 2-3	3-1 3-2 3-3	4-1 4-2 4-3	5-1 5-2 5-3
Sub Total <b>140/100</b>					
12 Fuel Moisture Content	A1, A2, A3	B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, B11, B12, B13, B14, B15, B16, B17, B18, B19, B20, B21, B22, B23, B24, B25, B26, B27, B28, B29, B30, B31, B32, B33, B34, B35, B36, B37, B38, B39, B40, B41, B42, B43, B44, B45, B46, B47, B48, B49, B50, B51, B52, B53, B54, B55, B56, B57, B58, B59, B60, B61, B62, B63, B64, B65, B66, B67, B68, B69, B70, B71, B72, B73, B74, B75, B76, B77, B78, B79, B80, B81, B82, B83, B84, B85, B86, B87, B88, B89, B90, B91, B92, B93, B94, B95, B96, B97, B98, B99, B100	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36, D37, D38, D39, D40, D41, D42, D43, D44, D45, D46, D47, D48, D49, D50, D51, D52, D53, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D64, D65, D66, D67, D68, D69, D70, D71, D72, D73, D74, D75, D76, D77, D78, D79, D80, D81, D82, D83, D84, D85, D86, D87, D88, D89, D90, D91, D92, D93, D94, D95, D96, D97, D98, D99, D100	E1, E2, E3, E4, E5, E6, E7, E8, E9, E10, E11, E12, E13, E14, E15, E16, E17, E18, E19, E20, E21, E22, E23, E24, E25, E26, E27, E28, E29, E30, E31, E32, E33, E34, E35, E36, E37, E38, E39, E40, E41, E42, E43, E44, E45, E46, E47, E48, E49, E50, E51, E52, E53, E54, E55, E56, E57, E58, E59, E60, E61, E62, E63, E64, E65, E66, E67, E68, E69, E70, E71, E72, E73, E74, E75, E76, E77, E78, E79, E80, E81, E82, E83, E84, E85, E86, E87, E88, E89, E90, E91, E92, E93, E94, E95, E96, E97, E98, E99, E100
Sub Total <b>20/30</b>					
13 Fuel Moisture Content	A1, A2, A3	B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, B11, B12, B13, B14, B15, B16, B17, B18, B19, B20, B21, B22, B23, B24, B25, B26, B27, B28, B29, B30, B31, B32, B33, B34, B35, B36, B37, B38, B39, B40, B41, B42, B43, B44, B45, B46, B47, B48, B49, B50, B51, B52, B53, B54, B55, B56, B57, B58, B59, B60, B61, B62, B63, B64, B65, B66, B67, B68, B69, B70, B71, B72, B73, B74, B75, B76, B77, B78, B79, B80, B81, B82, B83, B84, B85, B86, B87, B88, B89, B90, B91, B92, B93, B94, B95, B96, B97, B98, B99, B100	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36, D37, D38, D39, D40, D41, D42, D43, D44, D45, D46, D47, D48, D49, D50, D51, D52, D53, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D64, D65, D66, D67, D68, D69, D70, D71, D72, D73, D74, D75, D76, D77, D78, D79, D80, D81, D82, D83, D84, D85, D86, D87, D88, D89, D90, D91, D92, D93, D94, D95, D96, D97, D98, D99, D100	E1, E2, E3, E4, E5, E6, E7, E8, E9, E10, E11, E12, E13, E14, E15, E16, E17, E18, E19, E20, E21, E22, E23, E24, E25, E26, E27, E28, E29, E30, E31, E32, E33, E34, E35, E36, E37, E38, E39, E40, E41, E42, E43, E44, E45, E46, E47, E48, E49, E50, E51, E52, E53, E54, E55, E56, E57, E58, E59, E60, E61, E62, E63, E64, E65, E66, E67, E68, E69, E70, E71, E72, E73, E74, E75, E76, E77, E78, E79, E80, E81, E82, E83, E84, E85, E86, E87, E88, E89, E90, E91, E92, E93, E94, E95, E96, E97, E98, E99, E100
Sub Total <b>25/30</b>					
<b>WILDLAND URBAN INTERFACE WILDFIRE THREAT SCORE</b> <b>16/30</b>					
<b>TOTAL WILDFIRE THREAT SCORE</b> <b>10/100</b>					
Percent City of Enderby Score <b>16/30</b>					
Percent City of Enderby Score <b>10/100</b>					
Wildfire Behaviour Threat Classification (pre-treatment)					
Wildfire Behavior Threat Classification (post-treatment)					
Date <b>30/04/18</b>					

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E7



Picture E7-1 @180 degrees



Picture E7-2 @360 degrees



City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E8

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Pre-treatment  Post-treatment

Map # E8 Community Enderby

Address B. Marlow Longitude (decimal) W 119° 10' 49.7"

Site # 30164118 UTM Zone N 50° 53.693 W 119° 10.497

Parcel # 0104 Land Ownership  Public  Other (specify) School & Woodlot

Factor	A	B	C	D	E
1. Fuel Load and Structure Proximity (100m)	0	1-2 Dry Fuel Load	3-10 Dry Fuel Load	11-20 Dry Fuel Load	>20 Dry Fuel Load
2. Fuel Type (100m)	0	10-40	41-60	61-80	81-100
3. Vegetation Fuel Characteristics	0 No. No. Fuel, Impervious Cover, Low可燃性 Fuel	10-20 No. No. Fuel, Impervious Cover	21-40 No. No. Fuel, Impervious Cover	41-60 No. No. Fuel, Impervious Cover	61-100 No. No. Fuel, Impervious Cover
4. Air Moisture Ratio (100m) (100m)	<1 Coverage	1-10 Coverage	11-20 Coverage	21-30 Coverage	>30 Coverage
5. Long Windy Days (100m) (100m)	<1 Coverage	1-10 Coverage	11-20 Coverage	21-30 Coverage	>30 Coverage
6. Wind and Fuel Orientation (100m)	0	1-10	11-20	21-30	>30
7. Wind Direction (100m)	0	1-10	11-20	21-30	>30
8. Fire and Fuel Orientation (100m)	0	1-10	11-20	21-30	>30
9. Fire and Fuel Orientation (100m)	0	1-10	11-20	21-30	>30
10. Fuel Load (100m)	0	1-10	11-20	21-30	>30
11. Fuel Load (100m)	0	1-10	11-20	21-30	>30
12. Fuel Load (100m)	0	1-10	11-20	21-30	>30
13. Fuel Load (100m)	0	1-10	11-20	21-30	>30
14. Fuel Load (100m)	0	1-10	11-20	21-30	>30
15. Fuel Load (100m)	0	1-10	11-20	21-30	>30
16. Fuel Load (100m)	0	1-10	11-20	21-30	>30
17. Fuel Load (100m)	0	1-10	11-20	21-30	>30
18. Fuel Load (100m)	0	1-10	11-20	21-30	>30
19. Fuel Load (100m)	0	1-10	11-20	21-30	>30
20. Fuel Load (100m)	0	1-10	11-20	21-30	>30
21. Fuel Load (100m)	0	1-10	11-20	21-30	>30
22. Fuel Load (100m)	0	1-10	11-20	21-30	>30
23. Fuel Load (100m)	0	1-10	11-20	21-30	>30
24. Fuel Load (100m)	0	1-10	11-20	21-30	>30
25. Fuel Load (100m)	0	1-10	11-20	21-30	>30
26. Fuel Load (100m)	0	1-10	11-20	21-30	>30
27. Fuel Load (100m)	0	1-10	11-20	21-30	>30
28. Fuel Load (100m)	0	1-10	11-20	21-30	>30
29. Fuel Load (100m)	0	1-10	11-20	21-30	>30
30. Fuel Load (100m)	0	1-10	11-20	21-30	>30
31. Fuel Load (100m)	0	1-10	11-20	21-30	>30
32. Fuel Load (100m)	0	1-10	11-20	21-30	>30
33. Fuel Load (100m)	0	1-10	11-20	21-30	>30
34. Fuel Load (100m)	0	1-10	11-20	21-30	>30
35. Fuel Load (100m)	0	1-10	11-20	21-30	>30
36. Fuel Load (100m)	0	1-10	11-20	21-30	>30
37. Fuel Load (100m)	0	1-10	11-20	21-30	>30
38. Fuel Load (100m)	0	1-10	11-20	21-30	>30
39. Fuel Load (100m)	0	1-10	11-20	21-30	>30
40. Fuel Load (100m)	0	1-10	11-20	21-30	>30
41. Fuel Load (100m)	0	1-10	11-20	21-30	>30
42. Fuel Load (100m)	0	1-10	11-20	21-30	>30
43. Fuel Load (100m)	0	1-10	11-20	21-30	>30
44. Fuel Load (100m)	0	1-10	11-20	21-30	>30
45. Fuel Load (100m)	0	1-10	11-20	21-30	>30
46. Fuel Load (100m)	0	1-10	11-20	21-30	>30
47. Fuel Load (100m)	0	1-10	11-20	21-30	>30
48. Fuel Load (100m)	0	1-10	11-20	21-30	>30
49. Fuel Load (100m)	0	1-10	11-20	21-30	>30
50. Fuel Load (100m)	0	1-10	11-20	21-30	>30
51. Fuel Load (100m)	0	1-10	11-20	21-30	>30
52. Fuel Load (100m)	0	1-10	11-20	21-30	>30
53. Fuel Load (100m)	0	1-10	11-20	21-30	>30
54. Fuel Load (100m)	0	1-10	11-20	21-30	>30
55. Fuel Load (100m)	0	1-10	11-20	21-30	>30
56. Fuel Load (100m)	0	1-10	11-20	21-30	>30
57. Fuel Load (100m)	0	1-10	11-20	21-30	>30
58. Fuel Load (100m)	0	1-10	11-20	21-30	>30
59. Fuel Load (100m)	0	1-10	11-20	21-30	>30
60. Fuel Load (100m)	0	1-10	11-20	21-30	>30
61. Fuel Load (100m)	0	1-10	11-20	21-30	>30
62. Fuel Load (100m)	0	1-10	11-20	21-30	>30
63. Fuel Load (100m)	0	1-10	11-20	21-30	>30
64. Fuel Load (100m)	0	1-10	11-20	21-30	>30
65. Fuel Load (100m)	0	1-10	11-20	21-30	>30
66. Fuel Load (100m)	0	1-10	11-20	21-30	>30
67. Fuel Load (100m)	0	1-10	11-20	21-30	>30
68. Fuel Load (100m)	0	1-10	11-20	21-30	>30
69. Fuel Load (100m)	0	1-10	11-20	21-30	>30
70. Fuel Load (100m)	0	1-10	11-20	21-30	>30
71. Fuel Load (100m)	0	1-10	11-20	21-30	>30
72. Fuel Load (100m)	0	1-10	11-20	21-30	>30
73. Fuel Load (100m)	0	1-10	11-20	21-30	>30
74. Fuel Load (100m)	0	1-10	11-20	21-30	>30
75. Fuel Load (100m)	0	1-10	11-20	21-30	>30
76. Fuel Load (100m)	0	1-10	11-20	21-30	>30
77. Fuel Load (100m)	0	1-10	11-20	21-30	>30
78. Fuel Load (100m)	0	1-10	11-20	21-30	>30
79. Fuel Load (100m)	0	1-10	11-20	21-30	>30
80. Fuel Load (100m)	0	1-10	11-20	21-30	>30
81. Fuel Load (100m)	0	1-10	11-20	21-30	>30
82. Fuel Load (100m)	0	1-10	11-20	21-30	>30
83. Fuel Load (100m)	0	1-10	11-20	21-30	>30
84. Fuel Load (100m)	0	1-10	11-20	21-30	>30
85. Fuel Load (100m)	0	1-10	11-20	21-30	>30
86. Fuel Load (100m)	0	1-10	11-20	21-30	>30
87. Fuel Load (100m)	0	1-10	11-20	21-30	>30
88. Fuel Load (100m)	0	1-10	11-20	21-30	>30
89. Fuel Load (100m)	0	1-10	11-20	21-30	>30
90. Fuel Load (100m)	0	1-10	11-20	21-30	>30
91. Fuel Load (100m)	0	1-10	11-20	21-30	>30
92. Fuel Load (100m)	0	1-10	11-20	21-30	>30
93. Fuel Load (100m)	0	1-10	11-20	21-30	>30
94. Fuel Load (100m)	0	1-10	11-20	21-30	>30
95. Fuel Load (100m)	0	1-10	11-20	21-30	>30
96. Fuel Load (100m)	0	1-10	11-20	21-30	>30
97. Fuel Load (100m)	0	1-10	11-20	21-30	>30
98. Fuel Load (100m)	0	1-10	11-20	21-30	>30
99. Fuel Load (100m)	0	1-10	11-20	21-30	>30
100. Fuel Load (100m)	0	1-10	11-20	21-30	>30

**FUEL WEATHER AND TOPOGRAPHY** Sub-Total 78 (78) (78)

**WILDLAND URBAN INTERFACE WILDFIRE THREAT SCORE** 94 (94) (94)

**TOTAL WILDFIRE THREAT SCORE** 94 (94) (94)

Wildfire Behaviour Threat Class (check appropriate class)

Low  0-49

Medium  50-99

High  100-149

Extreme  150+

Wildland-Urban Interface Threat Class (check appropriate class)

Low  0-19

Medium  20-39

High  40-59

Extreme  60+

Issued January 26, 2011

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E8



Picture E8-1 @270 degrees



Picture E8-2 @360 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E9

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Pre-treatment  Post-treatment

Place: E9 Community: Enderby

Address: R. Marsan Geographic Location/Parcel Name: Woodlot #

Date: 30/04/2018 UTM Zone: N 50° 33' 13" W: 119° 10' 728

Parcel: 0-4 Land Ownership:  Street  Private  Other (Specify): Street B Woodlot

Factor	A	B	C	D	E
1. Soil Type and Moisture Regime (10)	1-10	1-15	1-15	1-15	1-15
2. Surface Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
3. Vegetation Fuel Characteristic (10)	1-10	1-10	1-10	1-10	1-10
4. Area Under Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
5. Large Woody Debris (10)	1-10	1-10	1-10	1-10	1-10
6. Dead and Dead Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
7. Live Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
8. Live Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
9. Live Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
10. Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
11. Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
<b>Subtotal</b>	<b>26 / 100</b>				
12. Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
13. Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
<b>Subtotal</b>	<b>20 / 100</b>				
14. Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
15. Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
16. Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
17. Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
<b>Subtotal</b>	<b>20 / 100</b>				
<b>TOTAL WILDFIRE THREAT SCORE</b>	<b>66 / 100</b>				

**FULL WEATHER AND TOPOGRAPHY**  No Fuel  Fuel

18. Fuel Load (10)

19. Fuel Load (10)

20. Fuel Load (10)

**WILDFIRE BEHAVIOR THREAT CLASS (check applicable box)**

Low  Moderate  High  Extreme

**WILDFIRE URBAN INTERFACE THREAT CLASS (check applicable box)**

Low  Moderate  High  Extreme

Revised (March 2011)

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E9



Picture E9-1 @360 degrees



Picture E9-2 @180 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E10

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**

Job # E10 Community Enderby

Address B. Morrow Occupant/Owner/Event Name Woodlot #

Date 30/6/18 Location N 50° 33' 62" W/ICP 10.5% 2

Phone 0 8 4 4 Land Use Res  Ag  Ind  School  Woodlot

Factor	A	B	C	D	E
1 Fuel Depth and Moisture (10)	1-12	1-12	13-18	19-24	25-30
2 Fuel Load Continuity (10)	1-2	3-4	5-6	7-8	9-10
3 Vegetation Fuel Characteristics (10)	Very Dry, Shrub, Grass, Low (10-15) (10)	Shrub, Grass (10)	Grass, Low (10)	Grass, High (10)	High, Shrub, Grass (10)
4 Fuel Moisture Continuity (1-10) (10)	1-10	1-10	1-10	1-10	1-10
5 Large Woody Fuel Continuity (1-10) (10)	1-10	1-10	1-10	1-10	1-10
6 Live and Dead Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
7 Live and Dead Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
8 Live and Dead Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
9 Live and Dead Fuel Load (10)	1-10	1-10	1-10	1-10	1-10
10 Fuel Moisture Continuity (1-10) (10)	1-10	1-10	1-10	1-10	1-10
11 Fuel Moisture Continuity (1-10) (10)	1-10	1-10	1-10	1-10	1-10

**Sub Total 50**

Weather	A	B	C	D	E
12 Relative Humidity (10)	1-10	1-10	1-10	1-10	1-10
13 Wind Speed (10)	1-10	1-10	1-10	1-10	1-10

**Sub Total 15**

Topography	A	B	C	D	E
14 Aspect (10)	1-10	1-10	1-10	1-10	1-10
15 Slope (10)	1-10	1-10	1-10	1-10	1-10
16 Aspect (10)	1-10	1-10	1-10	1-10	1-10
17 Aspect (10)	1-10	1-10	1-10	1-10	1-10

**Sub Total 20**

**WILDLAND WEATHER AND TOPOGRAPHY WILDFIRE THREAT SCORE 20**

Structural	A	B	C	D	E
18 Fuel Load Continuity (10)	1-10	1-10	1-10	1-10	1-10
19 Fuel Load Continuity (10)	1-10	1-10	1-10	1-10	1-10
20 Fuel Load Continuity (10)	1-10	1-10	1-10	1-10	1-10

**Sub Total 16**

**WILDLAND WEATHER AND TOPOGRAPHY WILDFIRE THREAT SCORE 16**

**TOTAL WILDFIRE THREAT SCORE 101**

Wildfire Behaviour Threat Class (10-15 applicable)

Low 0-10  Moderate 11-20  High 21-30  Extreme >30

Wildfire Urban Interface Threat Class (10-15 applicable)

Low 0-10  Moderate 11-20  High 21-30  Extreme >30

July 2018 (2018) (2018)

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E10



Picture E10-1 @180 degrees



Picture E10-2 @90 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E11



Picture E11-1 @180 degrees



Picture E11-2 @360 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E12

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**

Parcel: F12 Location: Enderby

Owner: B. Morrow Geographic Location/Street Name: Wheatfield #

Area: 30104118 UTM: N 50° 24.775' W 119° 10.865'

Phone: 604-454-4444 Land Ownership:  Crown  Private  Other (Specify):

Factor	A	B	C	D	E
1. Soil Depth and Moisture Regain Rate	1-12	13-24	25-36	37-48	49-60
2. Surface Fuel Continuity (0-100%)	0-25	26-50	51-75	76-100	100
3. Vegetation Fuel Composition	Highly flammable (e.g., Live Resinous Conifers)	Flammable (e.g., Deciduous Conifers)	Low flammable (e.g., Deciduous Broadleaf)	Non-flammable (e.g., Deciduous Broadleaf)	Highly non-flammable (e.g., Deciduous Broadleaf)
4. Fine Woody Debris Continuity (0-100%) (0-land)	<1 coverage	1-10 coverage	11-20 coverage	21-30 coverage	>30 coverage
5. Large Woody Debris Continuity (0-100%) (0-land)	<1 coverage	1-10 coverage	11-20 coverage	21-30 coverage	>30 coverage
6. Live and Dead Coniferous Crown Closure (%)	<10	11-20	21-30	31-40	>40
7. Live and Dead Coniferous Crown Closure (%)	<10	11-20	21-30	31-40	>40
8. Live and Dead Coniferous Crown Closure (%)	<10	11-20	21-30	31-40	>40
9. Live and Dead Coniferous Crown Closure (%)	<10	11-20	21-30	31-40	>40
10. Live and Dead Coniferous Crown Closure (%)	<10	11-20	21-30	31-40	>40
11. Unprotected Fuel Load (kg/ha)	0-10	11-20	21-30	31-40	>40
Sub Total: <b>47</b>					
12. Aspect (0-180 deg)	0-45	46-90	91-135	136-180	180-360
13. Slope (%)	0-10	11-20	21-30	31-40	>40
14. Terrain	Flat	Slight	Steep	Very steep	Extremely steep
15. Landcover/Topography (Continuity in Wildfire Ignition)	<10% fuel load	11-20% fuel load	21-30% fuel load	31-40% fuel load	>40% fuel load
Sub Total: <b>16</b>					
<b>FUEL, WEATHER AND TOPOGRAPHY</b>					
Sub Total: <b>63</b>					
<b>WILDFIRE HAZARD (TOTAL SCORE)</b>					
16. Proximity to Road/Highway	0-100m	101-200m	201-300m	301-400m	>400m
17. Open Development	0-10%	11-20%	21-30%	31-40%	>40%
18. Proximity of Residential Area Relative to Values	0-100m	101-200m	201-300m	301-400m	>400m
Sub Total: <b>16</b>					
<b>WILDFIRE RISK (TOTAL SCORE)</b>					
Sub Total: <b>79</b>					

**Wildfire Behaviour Threat Class (check applicable box)**

Low  0-10  
 Moderate  11-20  
 High  21-30  
 Extreme  >30

**Wildland-Urban Interface Threat Class (check applicable box)**

Low  0-10  
 Moderate  11-20  
 High  21-30  
 Extreme  >30

2018/07/12 January 04, 2018



City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E12



Picture E12-1 @180 degrees



Picture E12-2 @90 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E13

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**

Project: **E13** Community: **Enderby**

Location: **R. Morrison** Agency: **Woodlot #**

Date: **01/05/18** Address: **N 50° 34' 47.0" W 119° 10' 53.6"**

Parcel: **C/O 104** Land Ownership:  Crown  Private  Other (Specify): **Sched B Woodlot**

Event	A	B	C	D	E
1. Soil Moisture and Relative Humidity	L-2	L-3	L-4	L-5	L-6
2. Surface Area (Density) (A score)	1-5	6-10	11-15	16-20	21-25
3. Vegetation Fuel Characteristics	1	2	3	4	5
4. Fuel Moisture Content (1-4) (A score)	1	2	3	4	5
5. Large Woody Debris (1-4) (A score)	1	2	3	4	5
6. Live and Dead Canopy (1-4) (A score)	1	2	3	4	5
7. Live Canopy (1-4) (A score)	1	2	3	4	5
8. Live and Dead Canopy (1-4) (A score)	1	2	3	4	5
9. Live and Dead Canopy (1-4) (A score)	1	2	3	4	5
10. Fuel Load (1-4) (A score)	1	2	3	4	5
11. Canopy Openness (1-4) (A score)	1	2	3	4	5
Sub Total: <b>67</b>					
<b>Weather</b>					
12. Temperature (A score)	1	2	3	4	5
13. Relative Humidity (A score)	1	2	3	4	5
Sub Total: <b>20</b>					
<b>Topography</b>					
14. Aspect (A score)	1	2	3	4	5
15. Slope (%) (A score)	1	2	3	4	5
16. Wind (A score)	1	2	3	4	5
17. Landscape/Topography (A score)	1	2	3	4	5
Sub Total: <b>20</b>					
<b>FUEL WEATHER AND TOPOGRAPHY</b>					
Sub Total: <b>107</b>					
<b>WILDLAND URBAN INTERFACE WILDFIRE THREAT SCORE</b>					
Sub Total: <b>163</b>					
TOTAL WILDFIRE THREAT SCORE: <b>123</b>					

**Wildfire Behaviour Threat Class (check applicable box)**

Low  Moderate  High  Extreme

**Wildland-Urban Interface Threat Class (check applicable box)**

Low  Moderate  High  Extreme

12/22/2017 Revised 10, 2011

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E13



Picture E13-1 @180 degrees



Picture E13-2 @270 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E14

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Pre-treatment  Post-treatment

Plan: E14 Community: Enderby  
 Location: B. Morrison Geographic location (Street Name): Woodlot #  
 Date: 01/05/18 Address: N 50° 34.500 W 119° 10.690  
 Parcel #: 0-4 Land Ownership:  Local  Provincial  Other (specify):

Factor	Rating				
	A	B	C	D	E
1 Fuel Type and Moisture Regime Class	1-2	3-4	5-6	7-8	9-10
2 Fuel Age (Seasonal) (0-100%)	1	2	3	4	5
3 Vegetation Fuel Deposits	None, Single Fuel, Low Fuel Density	Single Fuel, Moderate Density	Single Fuel, High Density	Multiple Fuels, High Density	Multiple Fuels, Very High Density
4 Fuel Moisture Content (0-100%) (0-100%)	<10%	10-20%	20-30%	30-40%	>40%
5 Large Woody Debris (0-100%) (0-100%)	<10%	10-20%	20-30%	30-40%	>40%
6 Fire and Fuel Conditions (0-100%) (0-100%)	1	2	3	4	5
7 Site Structure (0-100%) (0-100%)	1	2	3	4	5
8 Site and Fuel Condition (0-100%) (0-100%)	1	2	3	4	5
9 Fire and Fuel Exposure and Adjacency (0-100%) (0-100%)	1	2	3	4	5
10 Access Route (0-100%) (0-100%)	1	2	3	4	5
11 Containment (0-100%) (0-100%)	1	2	3	4	5
<b>Weighted Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
12 Weighted Score	1	2	3	4	5
13 Overall Wildfire Exposure (0-100%) (0-100%)	1	2	3	4	5
<b>Topography</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
14 Aspect (0-100%) (0-100%)	1	2	3	4	5
15 Slope (%)	1	2	3	4	5
16 Wind	1	2	3	4	5
17 Landscape Fragmentation (0-100%) (0-100%)	1	2	3	4	5
<b>FUEL, WEATHER AND TOPOGRAPHY</b>	<b>WILDFIRE EXPOSURE THREAT SCORE</b>				
<b>Structural</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
18 Position of Structure (0-100%) (0-100%)	1	2	3	4	5
19 Type of Development (0-100%) (0-100%)	1	2	3	4	5
20 Position of Structure (0-100%) (0-100%)	1	2	3	4	5
<b>Wildfire Behaviour Threat</b> (Check all that apply)	<b>Wildland Urban Interface Threat</b> (Check all that apply)				
Low	Low				
Medium	Medium				
High	High				
Extreme	Extreme				

Wildfire Behaviour Threat (Check all that apply):  
 Low  Medium  High  Extreme

Wildland Urban Interface Threat (Check all that apply):  
 Low  Medium  High  Extreme

Final Score: **10/5** (Total Score: **16/20**)

Last Updated: January 14, 2017

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E14



Picture E14-1 @360 degrees



Picture E14-2 @270 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E15

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Pre-treatment  Post-treatment

Parcel: E15 Community: Enderby

Address: B. Morgan Unique parcel/owner name: Woodlot #

Date: 01/05/19 Address: N 56° 34' 52.7" W 119° 16' 57.0"

Notes: 0 = 4 Landowner: R. Lane Phone: 1111 Other parcels:

Factor	A	B	C	D	E
1. Soil Depth and Moisture Regain Rate	1-12	1-12 Soil depth 10-12"	1-12 Soil depth 12-18"	1-12 Soil depth 18-24"	1-12 Soil depth 24-30"
2. Surface Area Continuity (0-100%)	1-2	3-6	7-10	11-14	15-20
3. Vegetation Fuel Characteristics	None, dead, minimal fuel, low to moderate threat	None, moderate fuel	Light, low to moderate fuel	Medium, moderate fuel	Significant, moderate to high fuel
4. Fuel Moisture Content (0-100%)	11-12 average	10-11 average	9-10 average	8-9 average	7-8 average
5. Large Woody Debris (0-100%)	11-12 average	10-11 average	9-10 average	8-9 average	7-8 average
6. Live and Dead Canopies (0-100%)	11-12	10-11	9-10	8-9	7-8
7. Live and Dead Canopies (0-100%)	11-12	10-11	9-10	8-9	7-8
8. Live and Dead Canopies (0-100%)	11-12	10-11	9-10	8-9	7-8
9. Live and Dead Canopies (0-100%)	11-12	10-11	9-10	8-9	7-8
10. Fuel Moisture Content (0-100%)	11-12	10-11	9-10	8-9	7-8
11. Fuel Moisture Content (0-100%)	11-12	10-11	9-10	8-9	7-8
12. Fuel Moisture Content (0-100%)	11-12	10-11	9-10	8-9	7-8

**Weather** Sub total: 30 (100%)

Factor	A	B	C	D	E
13. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
14. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
15. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
16. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
17. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
18. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
19. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
20. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8

**Topography** Sub total: 20 (100%)

Factor	A	B	C	D	E
21. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
22. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
23. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
24. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
25. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
26. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
27. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
28. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
29. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
30. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8

**Fuel, Weather and Topography** Sub total: 70 (100%)

Factor	A	B	C	D	E
31. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
32. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
33. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
34. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
35. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
36. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
37. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
38. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
39. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8
40. Aspect (0-100%)	11-12	10-11	9-10	8-9	7-8

**Wildfire Behavior Threat Class (0-100%)**

Low: 0-5  Moderate: 6-15  High: 16-25  Extreme: 26-35

**Wildland Urban Interface Threat Class (0-100%)**

Low: 0-5  Moderate: 6-15  High: 16-25  Extreme: 26-35

Jan DeWitt, January 2019

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E15



Picture E15-1 @180 degrees



Picture E15-2 @360 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E16

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  For treatment  Not treated

Site # E16 Community Enderby  
 Address 8 Morrow Geographic Location/Street Name Woodlot #  
 Date 01/05/18 UTM N 50° 34.475' W 114° 10.463'  
 Parcel 0 \* 4 Land Ownership  Public  Private  Other (specify)

Factor	A	B	C	D	E
1. Soil Depth and Moisture Regime (m)	1-1.5	2-3.5	4-4.5	5-6	7-8
2. Surface Fuel Continuity (m)	0-2	3-4	5-6	7-8	9
3. Vegetation Fuel Characteristics	Very low, grassland, low fuel continuity	Low, brushland	Medium, conifer forest	High, forest	Very high, forest
4. Fire Spread Rate (km/hr) (10-m)	<1	1-2	3-4	5-6	7-8
5. Long Wind Speed (km/hr) (10-m)	<1	1-2	3-4	5-6	7-8
6. Fire and Fuel Conditions (km/hr) (10-m)	<1	1-2	3-4	5-6	7-8
7. Fire Exclusion (km/hr) (10-m)	<1	1-2	3-4	5-6	7-8
8. Fire and Fuel Conditions (km/hr) (10-m)	<1	1-2	3-4	5-6	7-8
9. Fire and Fuel Conditions (km/hr) (10-m)	<1	1-2	3-4	5-6	7-8
10. Road Width (m) (10-m)	<1	1-2	3-4	5-6	7-8
11. Continuous Access Road (km/hr) (10-m)	<1	1-2	3-4	5-6	7-8

**Weather** Sub Total 10 **100%**

Weather	A	B	C	D	E
12. Dominant Wind	0-10 km/hr	11-20 km/hr	21-30 km/hr	31-40 km/hr	41-50 km/hr
13. Relative Humidity	0-20%	21-30%	31-40%	41-50%	51-60%

**Topography** Sub Total 10 **100%**

Topography	A	B	C	D	E
14. Slope (10-m)	0-10%	11-20%	21-30%	31-40%	41-50%
15. Aspect (10-m)	0-10%	11-20%	21-30%	31-40%	41-50%
16. Trees	0-10%	11-20%	21-30%	31-40%	41-50%
17. Landscape Topography	0-10%	11-20%	21-30%	31-40%	41-50%

**FUEL, WEATHER AND TOPOGRAPHY** Sub Total 30 **100%**

Structural	A	B	C	D	E
18. Fuel Load (kg/m²)	0-100	101-200	201-300	301-400	401-500
19. Fuel Type	0-10%	11-20%	21-30%	31-40%	41-50%
20. Fuel Moisture	0-10%	11-20%	21-30%	31-40%	41-50%

**WILDLAND URBAN INTERFACE WILDFIRE THREAT INDEX** Sub Total 96 **100%**

**WILDLAND URBAN INTERFACE WILDFIRE THREAT INDEX** Sub Total 96 **100%**

Wildfire Risk Level Threat Class (first applicable level)  
 Low 0-10  
 Moderate 11-20  
 High 21-30  
 Extreme 31-50

Wildland-Urban Interface Threat Class (first applicable level)  
 Low 0-10  
 Moderate 11-20  
 High 21-30  
 Extreme 31-50

1st Edition, January 14, 2010



City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E16



Picture E16-1 @180 degrees



Picture E16-2 @180 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E17

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Pre-treatment  Post-treatment

Plot: **E17** Community: **Enderby**

Address: **R. Morrow** Emergency Location/Street Name: **Woodcroft #**

Date: **01/05/18** UTM: **N 50° 34.202' W 119° 10.478'**

Parcel: **010 \* 4** Land Ownership:  Owner  Lessee  Other (Specify)

Fuel	CEWS				
	A	B	C	D	E
1 Fuel Type and Moisture Regime (Fuel)	2	3-4	5-6	7-8	9-10
2 Fuel Load (kg/ha)	1	2	3	4	5
3 Fuel Moisture Content	1	2	3	4	5
4 Fuel Structure (Fuel Type)	1	2	3	4	5
5 Fuel Arrangement (Fuel Type)	1	2	3	4	5
6 Fuel Continuity (Fuel Type)	1	2	3	4	5
7 Fuel Arrangement (Fuel Type)	1	2	3	4	5
8 Fuel Structure (Fuel Type)	1	2	3	4	5
9 Fuel Continuity (Fuel Type)	1	2	3	4	5
10 Fuel Structure (Fuel Type)	1	2	3	4	5
11 Fuel Continuity (Fuel Type)	1	2	3	4	5
12 Fuel Structure (Fuel Type)	1	2	3	4	5
13 Fuel Continuity (Fuel Type)	1	2	3	4	5
14 Fuel Structure (Fuel Type)	1	2	3	4	5
15 Fuel Continuity (Fuel Type)	1	2	3	4	5
16 Fuel Structure (Fuel Type)	1	2	3	4	5
17 Fuel Continuity (Fuel Type)	1	2	3	4	5
18 Fuel Structure (Fuel Type)	1	2	3	4	5
19 Fuel Continuity (Fuel Type)	1	2	3	4	5
20 Fuel Structure (Fuel Type)	1	2	3	4	5
21 Fuel Continuity (Fuel Type)	1	2	3	4	5
22 Fuel Structure (Fuel Type)	1	2	3	4	5
23 Fuel Continuity (Fuel Type)	1	2	3	4	5
24 Fuel Structure (Fuel Type)	1	2	3	4	5
25 Fuel Continuity (Fuel Type)	1	2	3	4	5
26 Fuel Structure (Fuel Type)	1	2	3	4	5
27 Fuel Continuity (Fuel Type)	1	2	3	4	5
28 Fuel Structure (Fuel Type)	1	2	3	4	5
29 Fuel Continuity (Fuel Type)	1	2	3	4	5
30 Fuel Structure (Fuel Type)	1	2	3	4	5
31 Fuel Continuity (Fuel Type)	1	2	3	4	5
32 Fuel Structure (Fuel Type)	1	2	3	4	5
33 Fuel Continuity (Fuel Type)	1	2	3	4	5
34 Fuel Structure (Fuel Type)	1	2	3	4	5
35 Fuel Continuity (Fuel Type)	1	2	3	4	5
36 Fuel Structure (Fuel Type)	1	2	3	4	5
37 Fuel Continuity (Fuel Type)	1	2	3	4	5
38 Fuel Structure (Fuel Type)	1	2	3	4	5
39 Fuel Continuity (Fuel Type)	1	2	3	4	5
40 Fuel Structure (Fuel Type)	1	2	3	4	5
41 Fuel Continuity (Fuel Type)	1	2	3	4	5
42 Fuel Structure (Fuel Type)	1	2	3	4	5
43 Fuel Continuity (Fuel Type)	1	2	3	4	5
44 Fuel Structure (Fuel Type)	1	2	3	4	5
45 Fuel Continuity (Fuel Type)	1	2	3	4	5
46 Fuel Structure (Fuel Type)	1	2	3	4	5
47 Fuel Continuity (Fuel Type)	1	2	3	4	5
48 Fuel Structure (Fuel Type)	1	2	3	4	5
49 Fuel Continuity (Fuel Type)	1	2	3	4	5
50 Fuel Structure (Fuel Type)	1	2	3	4	5
51 Fuel Continuity (Fuel Type)	1	2	3	4	5
52 Fuel Structure (Fuel Type)	1	2	3	4	5
53 Fuel Continuity (Fuel Type)	1	2	3	4	5
54 Fuel Structure (Fuel Type)	1	2	3	4	5
55 Fuel Continuity (Fuel Type)	1	2	3	4	5
56 Fuel Structure (Fuel Type)	1	2	3	4	5
57 Fuel Continuity (Fuel Type)	1	2	3	4	5
58 Fuel Structure (Fuel Type)	1	2	3	4	5
59 Fuel Continuity (Fuel Type)	1	2	3	4	5
60 Fuel Structure (Fuel Type)	1	2	3	4	5
61 Fuel Continuity (Fuel Type)	1	2	3	4	5
62 Fuel Structure (Fuel Type)	1	2	3	4	5
63 Fuel Continuity (Fuel Type)	1	2	3	4	5
64 Fuel Structure (Fuel Type)	1	2	3	4	5
65 Fuel Continuity (Fuel Type)	1	2	3	4	5
66 Fuel Structure (Fuel Type)	1	2	3	4	5
67 Fuel Continuity (Fuel Type)	1	2	3	4	5
68 Fuel Structure (Fuel Type)	1	2	3	4	5
69 Fuel Continuity (Fuel Type)	1	2	3	4	5
70 Fuel Structure (Fuel Type)	1	2	3	4	5
71 Fuel Continuity (Fuel Type)	1	2	3	4	5
72 Fuel Structure (Fuel Type)	1	2	3	4	5
73 Fuel Continuity (Fuel Type)	1	2	3	4	5
74 Fuel Structure (Fuel Type)	1	2	3	4	5
75 Fuel Continuity (Fuel Type)	1	2	3	4	5
76 Fuel Structure (Fuel Type)	1	2	3	4	5
77 Fuel Continuity (Fuel Type)	1	2	3	4	5
78 Fuel Structure (Fuel Type)	1	2	3	4	5
79 Fuel Continuity (Fuel Type)	1	2	3	4	5
80 Fuel Structure (Fuel Type)	1	2	3	4	5
81 Fuel Continuity (Fuel Type)	1	2	3	4	5
82 Fuel Structure (Fuel Type)	1	2	3	4	5
83 Fuel Continuity (Fuel Type)	1	2	3	4	5
84 Fuel Structure (Fuel Type)	1	2	3	4	5
85 Fuel Continuity (Fuel Type)	1	2	3	4	5
86 Fuel Structure (Fuel Type)	1	2	3	4	5
87 Fuel Continuity (Fuel Type)	1	2	3	4	5
88 Fuel Structure (Fuel Type)	1	2	3	4	5
89 Fuel Continuity (Fuel Type)	1	2	3	4	5
90 Fuel Structure (Fuel Type)	1	2	3	4	5
91 Fuel Continuity (Fuel Type)	1	2	3	4	5
92 Fuel Structure (Fuel Type)	1	2	3	4	5
93 Fuel Continuity (Fuel Type)	1	2	3	4	5
94 Fuel Structure (Fuel Type)	1	2	3	4	5
95 Fuel Continuity (Fuel Type)	1	2	3	4	5
96 Fuel Structure (Fuel Type)	1	2	3	4	5
97 Fuel Continuity (Fuel Type)	1	2	3	4	5
98 Fuel Structure (Fuel Type)	1	2	3	4	5
99 Fuel Continuity (Fuel Type)	1	2	3	4	5
100 Fuel Structure (Fuel Type)	1	2	3	4	5

**FUEL WEATHER AND TOPOGRAPHY**  Pre-treatment  Post-treatment

Structure	WILDFIRE HAZARD THREAT INDEX				
	A	B	C	D	E
16 Fuel Type and Moisture Regime (Fuel)	1	2	3	4	5
17 Fuel Load (kg/ha)	1	2	3	4	5
18 Fuel Moisture Content	1	2	3	4	5
19 Fuel Structure (Fuel Type)	1	2	3	4	5
20 Fuel Arrangement (Fuel Type)	1	2	3	4	5
21 Fuel Continuity (Fuel Type)	1	2	3	4	5
22 Fuel Structure (Fuel Type)	1	2	3	4	5
23 Fuel Continuity (Fuel Type)	1	2	3	4	5
24 Fuel Structure (Fuel Type)	1	2	3	4	5
25 Fuel Continuity (Fuel Type)	1	2	3	4	5
26 Fuel Structure (Fuel Type)	1	2	3	4	5
27 Fuel Continuity (Fuel Type)	1	2	3	4	5
28 Fuel Structure (Fuel Type)	1	2	3	4	5
29 Fuel Continuity (Fuel Type)	1	2	3	4	5
30 Fuel Structure (Fuel Type)	1	2	3	4	5
31 Fuel Continuity (Fuel Type)	1	2	3	4	5
32 Fuel Structure (Fuel Type)	1	2	3	4	5
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98 Fuel Structure (Fuel Type)	1	2	3	4	5
99 Fuel Continuity (Fuel Type)	1	2	3	4	5
100 Fuel Structure (Fuel Type)	1	2	3	4	5

**Wildfire Behaviour Threat Class (check applicable)**

Low:  1-2

Medium:  3-4

High:  5-6

Critical:  7-8

**Wildland Urban Interface Threat Class (check applicable)**

Low:  1-2

Medium:  3-4

High:  5-6

Critical:  7-8

1/27/2018, January 24, 2018

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E17



Picture E17-1 @90 degrees



Picture E17-2 @360 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E18

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Pre-treatment  Post-treatment

File # E18 Community Enderby

Owner B. McLean Geographic Location/Description Boxcar site

Area 165118 Address N 56<sup>th</sup> St SW 11409.335

Parcel 6 x 4 Land Ownership  Crown  Private  Other (Specify) Municipal

Factor	A	B	C	D	E
1. Soil Type and Moisture Regime (10)	10	1-9 (Dry to Very Dry)	1-10 (Mo. to Very Mo.)	10-15 (Dry to Very Dry)	1-10 (Dry to Very Dry)
2. Surface Area Category (10)	10	10-15	15-20	15-20	10
3. Vegetation Fuel Characteristics (10)	10 (No. trees, shrubs, etc., low flammability)	10 (No. trees, shrubs, etc., low flammability)	10 (No. trees, shrubs, etc., low flammability)	10 (No. trees, shrubs, etc., low flammability)	10 (No. trees, shrubs, etc., low flammability)
4. Soil Moisture Capacity (1-10) (10)	10 (change)	10 (change)	10 (change)	10 (change)	10 (change)
5. Soil Moisture Capacity (1-10) (10)	10 (change)	10 (change)	10 (change)	10 (change)	10 (change)
6. Soil Moisture Capacity (1-10) (10)	10	10	10	10	10
7. Soil Moisture Capacity (1-10) (10)	10	10	10	10	10
8. Soil Moisture Capacity (1-10) (10)	10	10	10	10	10
9. Soil Moisture Capacity (1-10) (10)	10	10	10	10	10
10. Fuel Moisture Capacity (1-10) (10)	10	10	10	10	10
11. Fuel Moisture Capacity (1-10) (10)	10	10	10	10	10
Sub Total					10
<b>Weather</b>					<b>10</b>
12. Precipitation (10)	10	10	10	10	10
13. Relative Humidity (10)	10	10	10	10	10
Sub Total					10
<b>Transparency</b>					<b>10</b>
14. Visibility (1-10) (10)	10	10	10	10	10
15. Wind (10)	10	10	10	10	10
16. Snow (10)	10	10	10	10	10
17. Landcover (10)	10	10	10	10	10
Sub Total					10
<b>FUEL WEATHER AND TOPOGRAPHY</b>					<b>10</b>
<b>WILDLAND URBAN INTERFACE THREAT SCORE</b>					<b>10</b>
18. Proximity to Wildland (10)	10	10	10	10	10
19. Age of Development (10)	10	10	10	10	10
20. Proximity to Fuel Source (10)	10	10	10	10	10
Sub Total					10
<b>WILDLAND URBAN INTERFACE THREAT SCORE</b>					<b>10</b>

Prepared only for local use only

\*\* Provided by historical comparison only of Wildfire Threat Assessment Score to a 10 for untreated subject

**Wildfire Behaviour Threat Class (check applicable)**

Low 1-10

Medium 11-20

High 21-30

Critical 31-40

**Wildland Urban Interface Threat Class (check applicable)**

Low 1-10

Medium 11-20

High 21-30

Critical 31-40

10/12/2018, Version 14, 2017

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E18



Picture E18-1 @360 degrees



Picture E18-2 @90 degrees

City of Enderby Pre-treatment Wildfire Threat Assessment Worksheet E19

**WILDLAND URBAN INTERFACE WILDFIRE THREAT ASSESSMENT WORKSHEET**  Worksheet  Worksheet

File # E19 Community Enderby

Address B. Merrett Map Grid Location/Name Reservoir Site

Date 01/05/18 Location N 50° 37' 13" W 119° 49' 37"

Phone 0-4-4 Land Ownership  Town  State  Other (Specify) Municipal

Factor	A	B	C	D	E
1 Soil Depth and Moisture Regime (m)	0-27	27-54 Dry Soil Reg	54-81 Dry Soil Reg	81-108 Dry Soil Reg	108-135 Dry Soil Reg
2 Under Soil Conductivity (m-s/cm)	<10	10-40	40-60	60-80	80
3 Riparian/Soil Characteristics	High Water Table, High Soil Moisture, Low Salinity	Soils, Riparian Soils	Soils, Riparian Soils	Soils, Riparian Soils	Soils, Riparian Soils
4 Area Shrub Cover (m <sup>2</sup> )	<10%	10-20%	20-30%	30-40%	40-50%
5 Edge Shrub Cover (m <sup>2</sup> )	<10%	10-20%	20-30%	30-40%	40-50%
6 Live and Dead Shrub Cover (m <sup>2</sup> )	<10%	10-20%	20-30%	30-40%	40-50%
7 Live and Dead Shrub Cover (m <sup>2</sup> )	<10%	10-20%	20-30%	30-40%	40-50%
8 Live and Dead Shrub Cover (m <sup>2</sup> )	<10%	10-20%	20-30%	30-40%	40-50%
9 Live and Dead Shrub Cover (m <sup>2</sup> )	<10%	10-20%	20-30%	30-40%	40-50%
10 Live and Dead Shrub Cover (m <sup>2</sup> )	<10%	10-20%	20-30%	30-40%	40-50%
11 Live and Dead Shrub Cover (m <sup>2</sup> )	<10%	10-20%	20-30%	30-40%	40-50%
Sub Total					70
Weighted					70
12 Riparian Zone	A: Riparian	100-120 m	120-150 m	150-180 m	180-200 m
13 Riparian Width	0-10 m	10-20 m	20-30 m	30-40 m	40-50 m
Sub Total					20
TOTAL WILDFIRE THREAT SCORE					90
WILDFIRE THREAT RISK					70
TOTAL WILDFIRE THREAT SCORE					105

**FUEL WEATHER AND TOPOGRAPHY**

Factor	A	B	C	D	E
14 Fuel Load (m <sup>3</sup> /ha)	Low	Low	Low	Low	Low
15 Fuel Type	Low	Low	Low	Low	Low
16 Fuel Type	Low	Low	Low	Low	Low
17 Fuel Type	Low	Low	Low	Low	Low
Sub Total					14
TOTAL WILDFIRE THREAT SCORE					86

**WILDFIRE BEHAVIOR THREAT CLASS (SEE APPENDIX C)**

Low 0-10  
Moderate 10-30  
High 30-50  
Extreme >50

**WILDFIRE URBAN INTERFACE THREAT CLASS (SEE APPENDIX C)**

Low 0-10  
Moderate 10-30  
High 30-50  
Extreme >50

10/12/2018 10:30 AM

City of Enderby Pre-treatment Wildfire Threat Assessment Pictures Plot E19

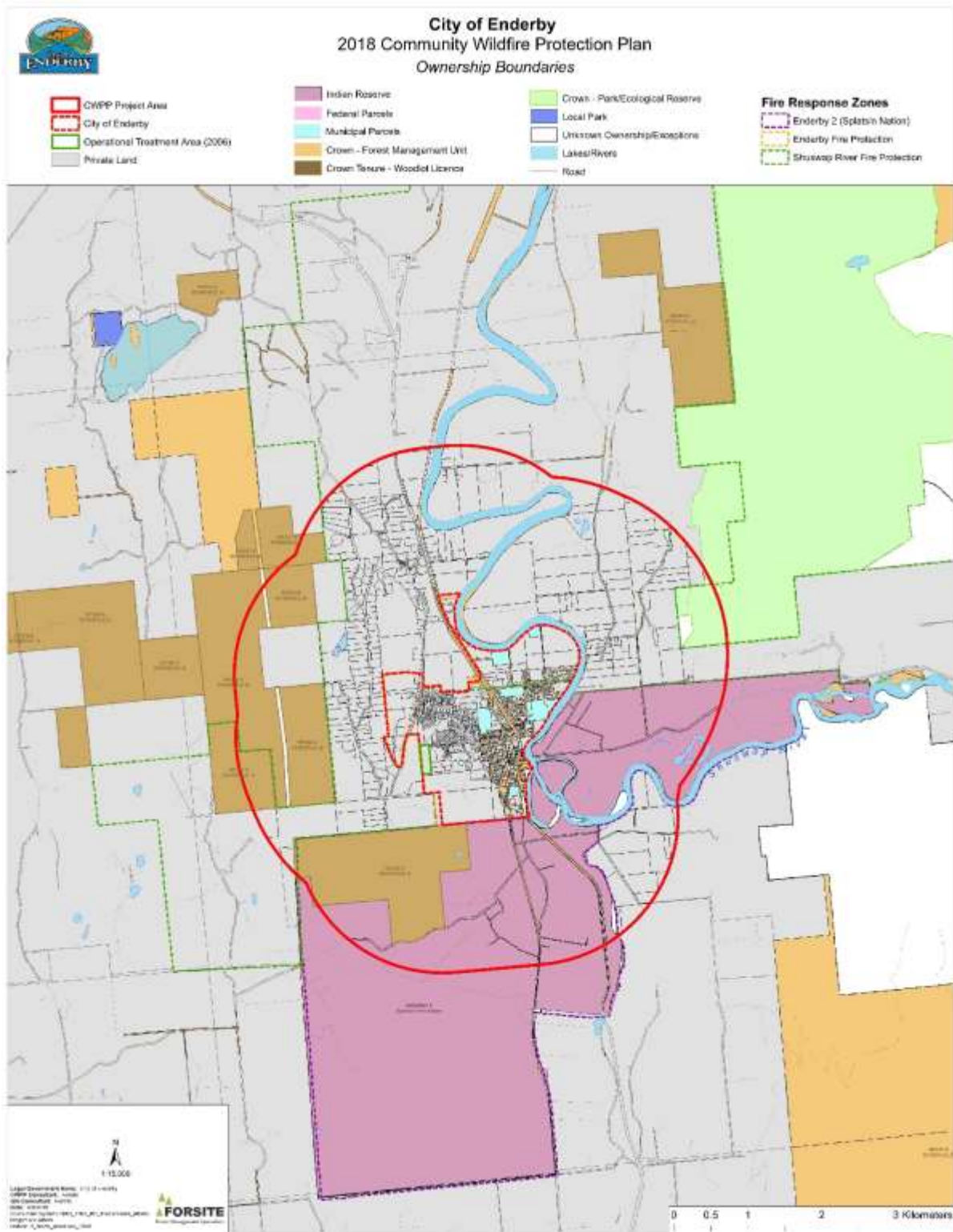


Picture E19-1 @360 degrees

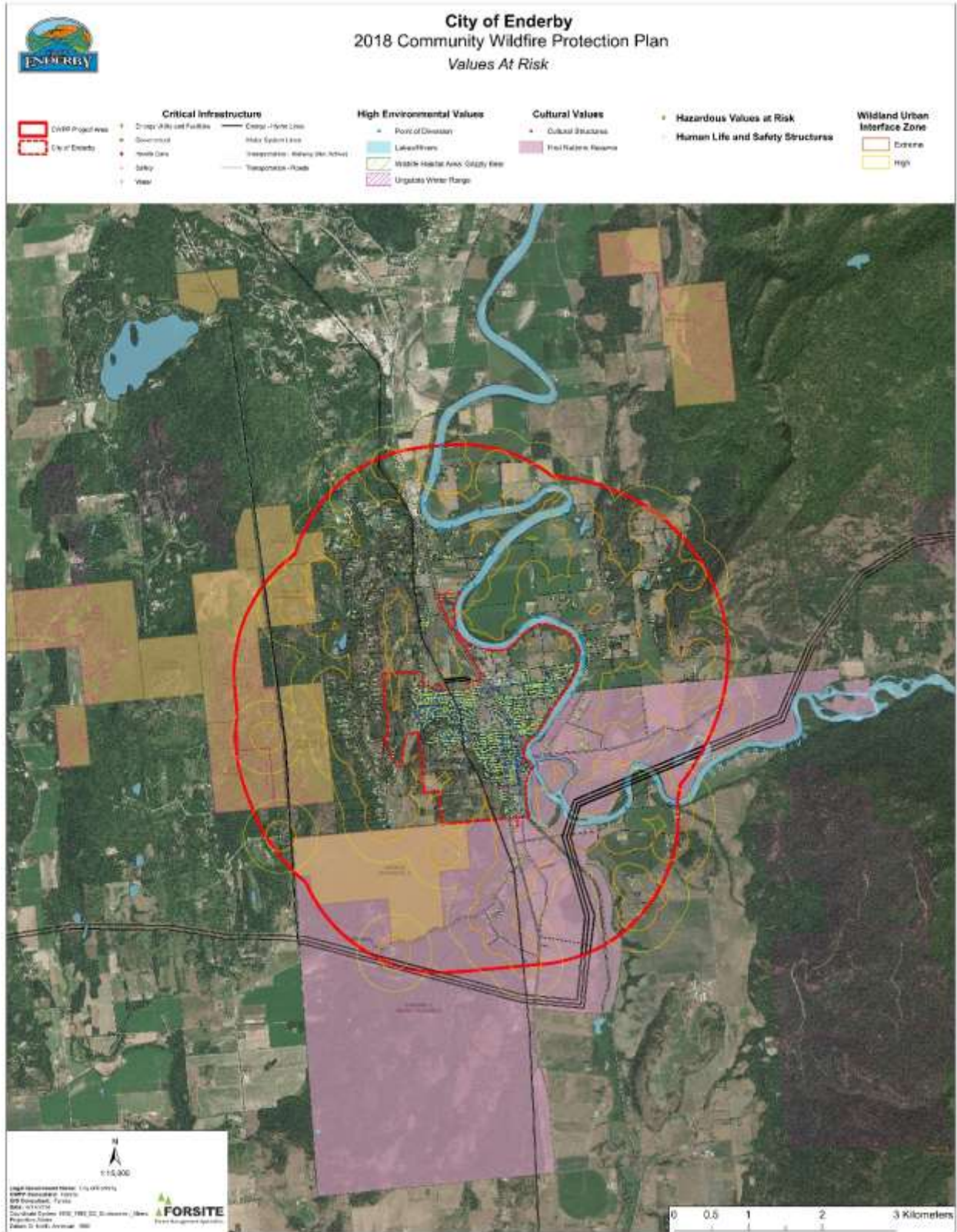


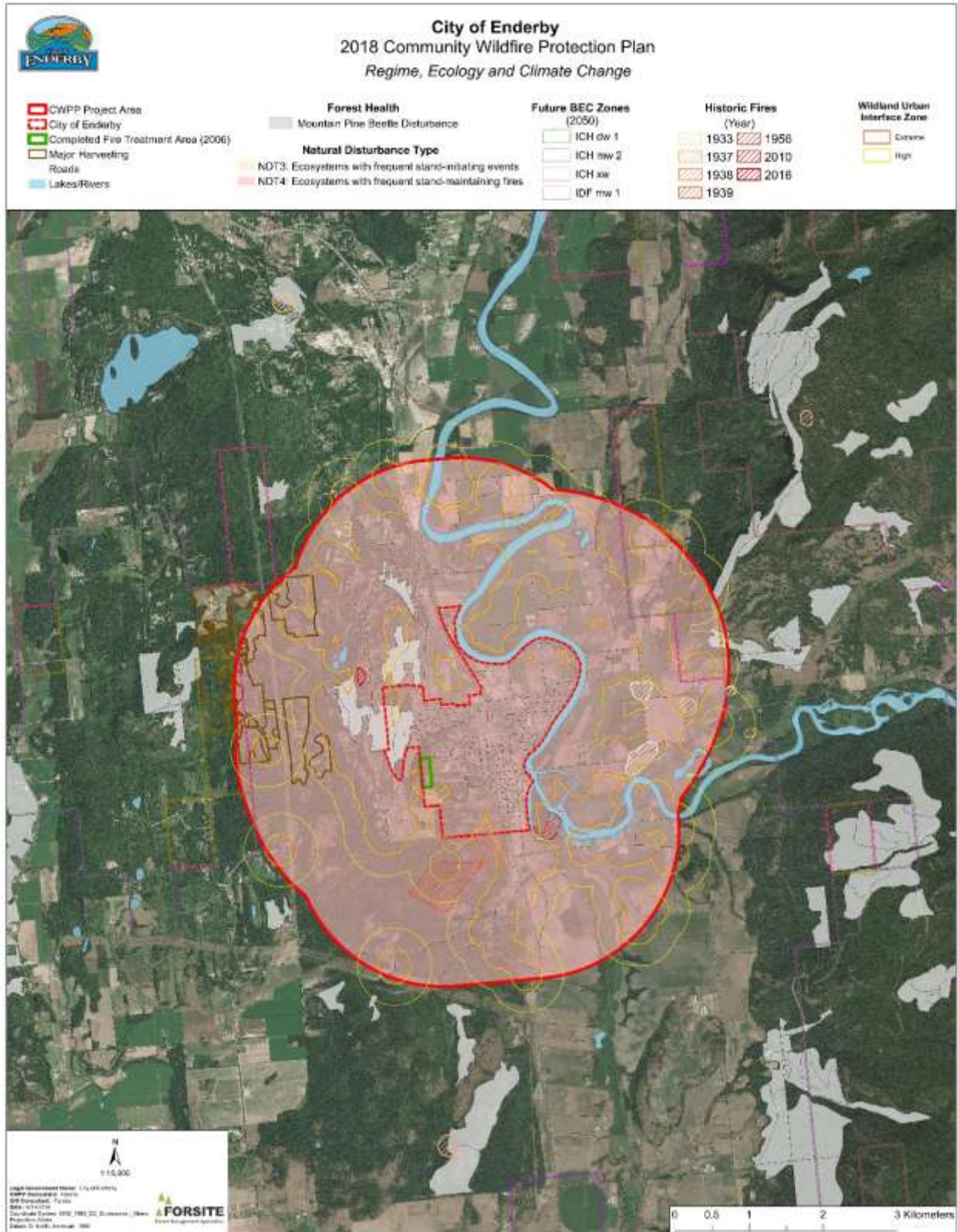
Picture E19-2 @180 degrees

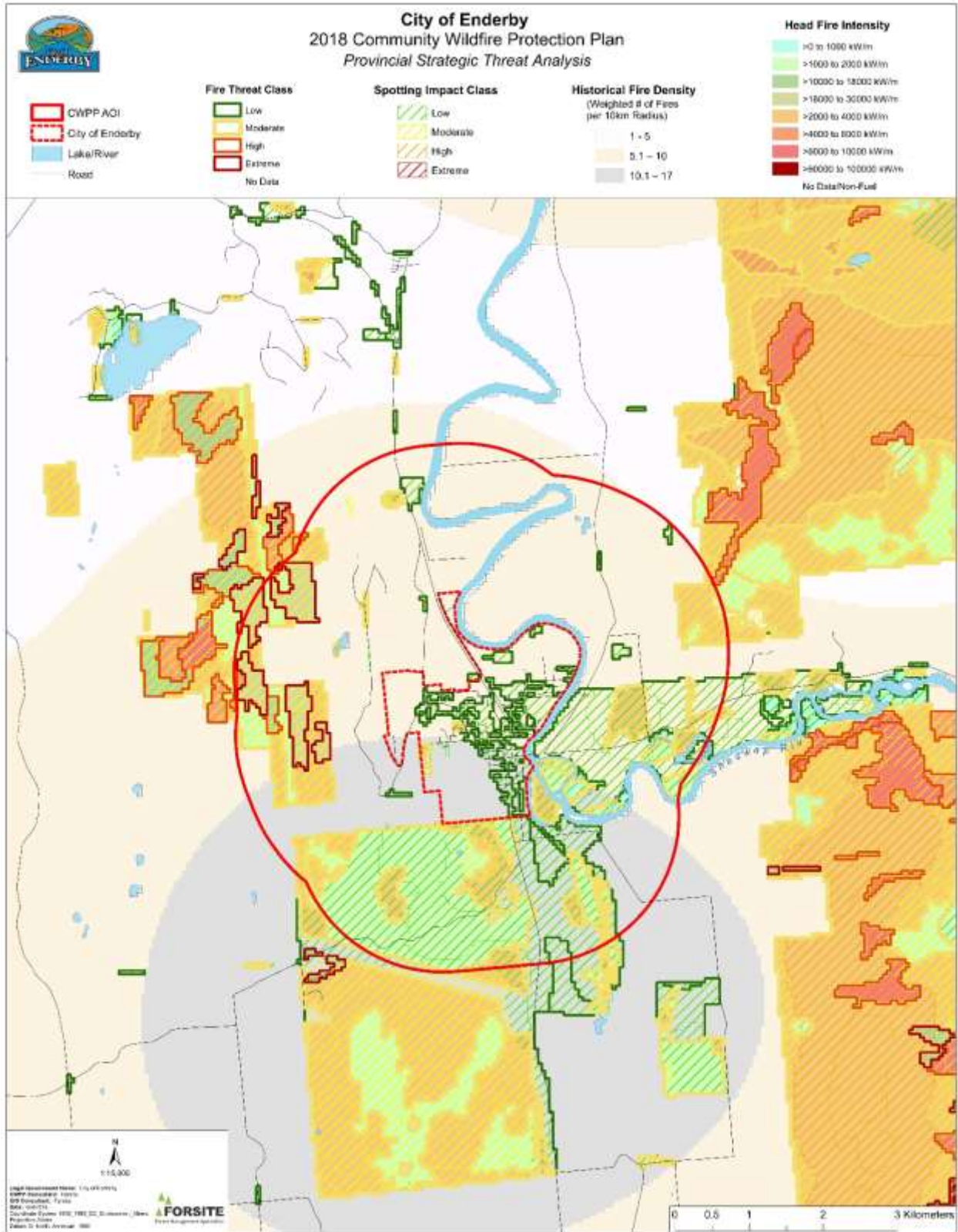
### Appendix Three: CWPP Maps

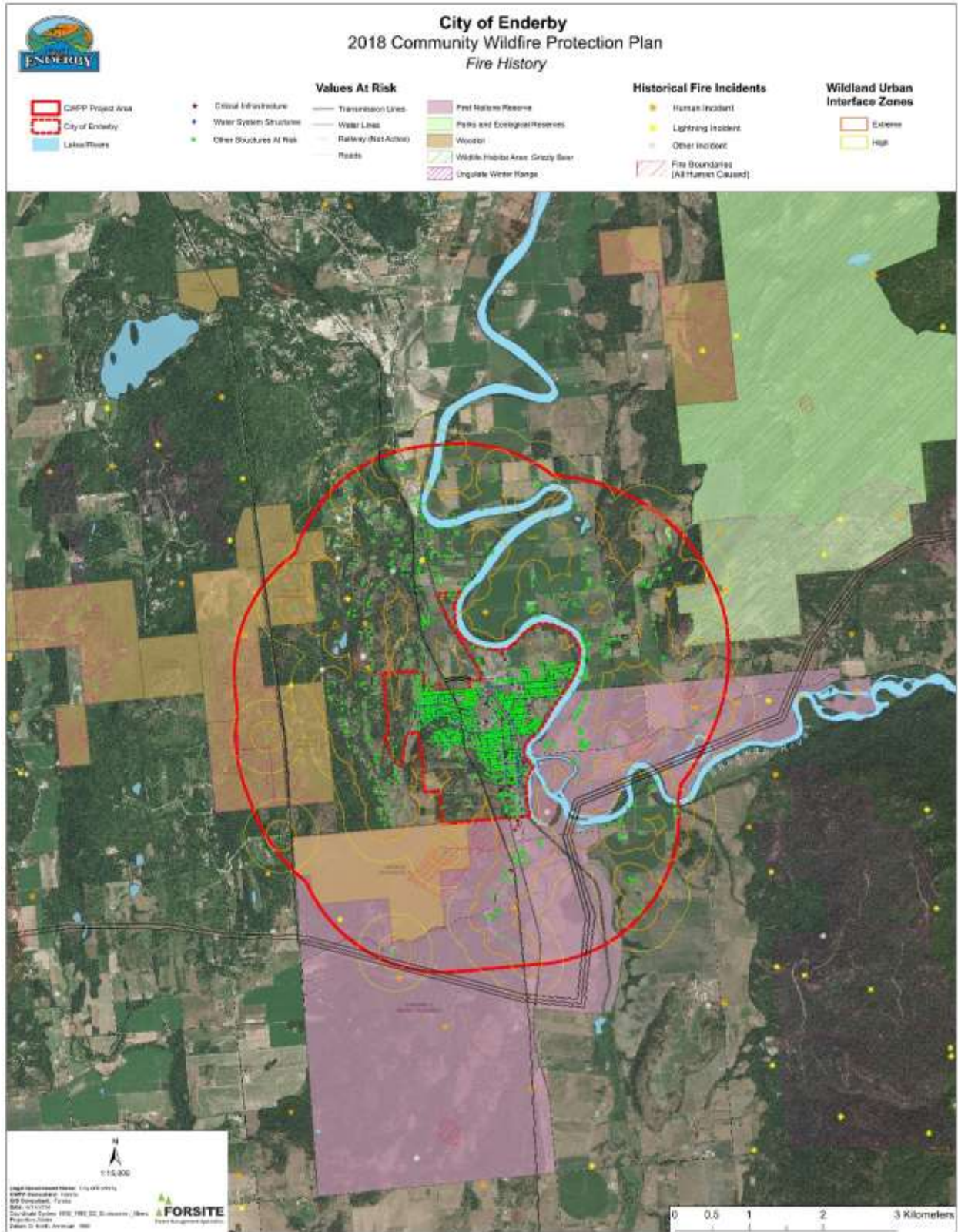


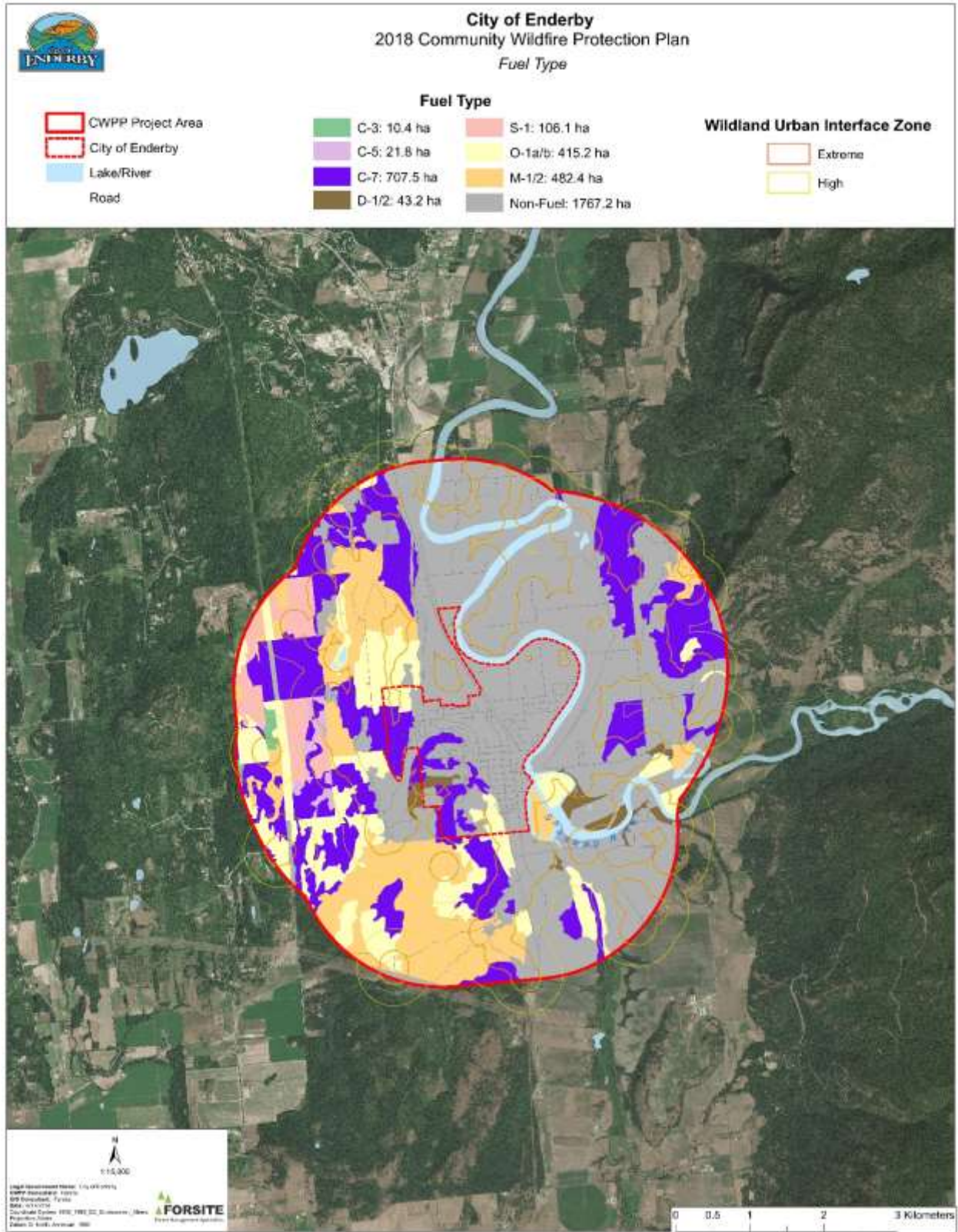


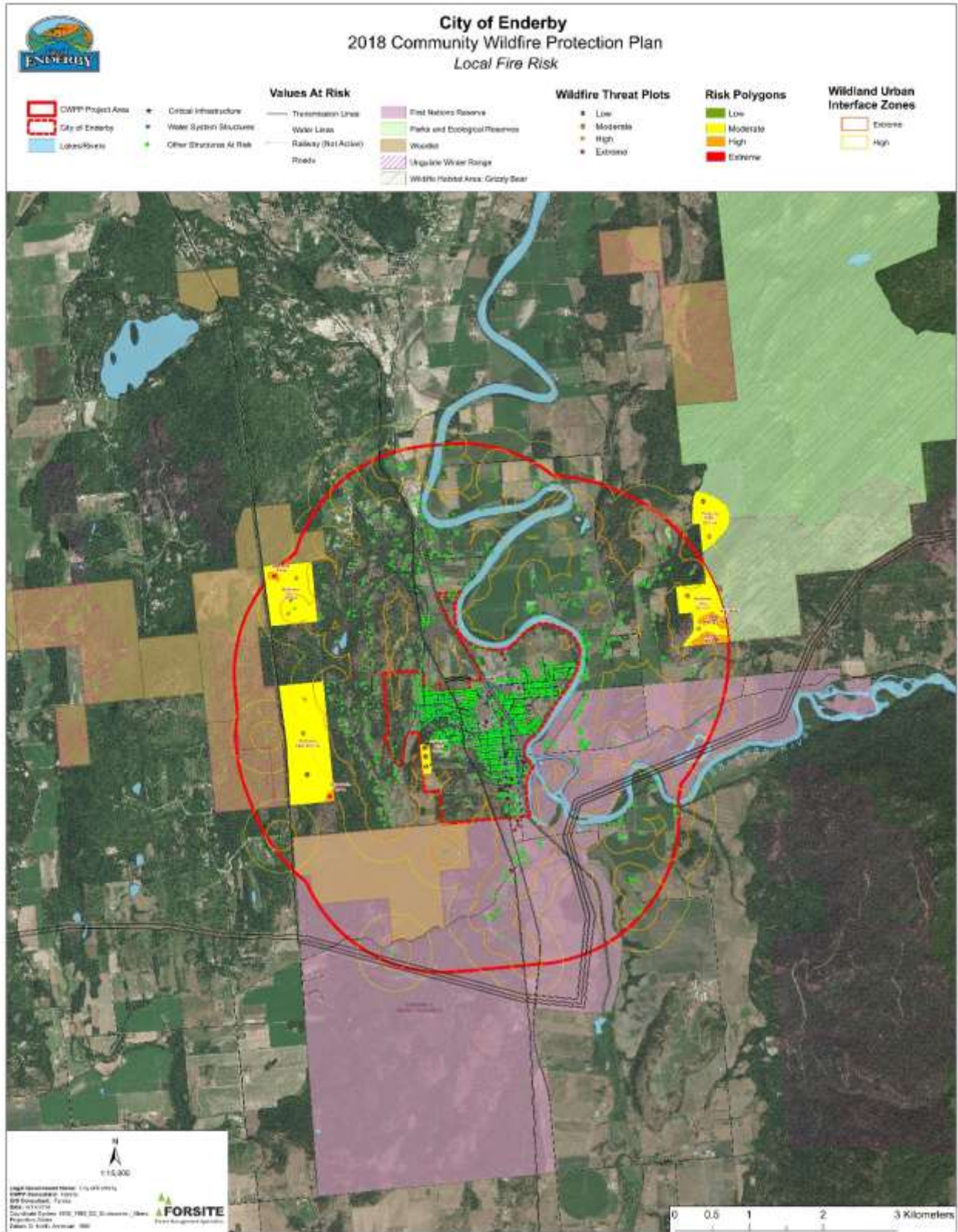


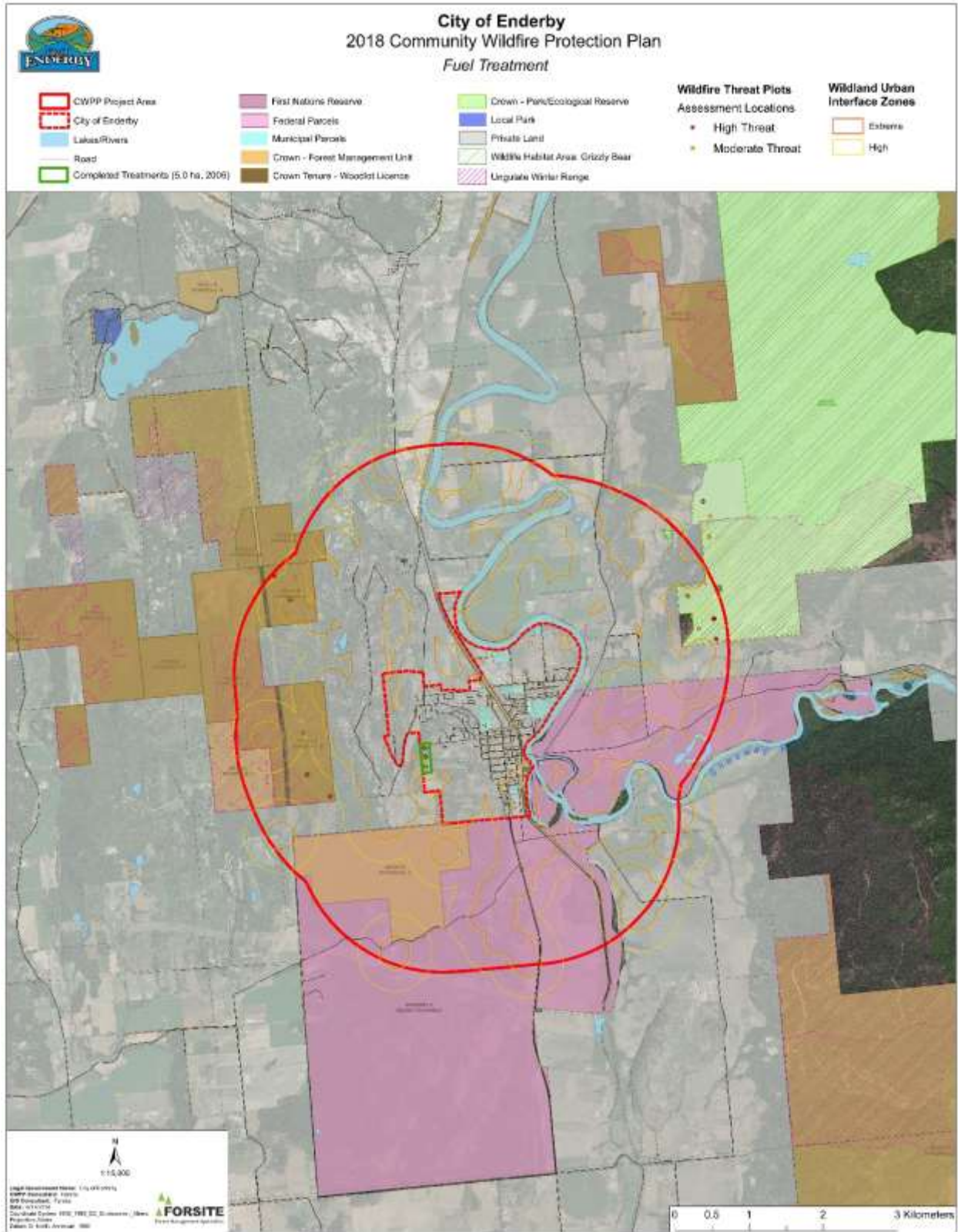












## Appendix 4: Forest Fuel Modification

Wildfire behaviour is based on three factors.

1. Forest Fuel – the woody material available to burn, configuration and continuity
2. Weather – daytime temperature, the amount of drying and wind
3. Topography – the lay of the land, slope, aspect and terrain

Of these three factors, only the forest fuels are within our control. Reducing the volume and continuity of the forest fuels can reduce the intensity, maximum behaviour and the rate of spread of a wildfire, thus reducing the wildfire threat. The objectives for forest fuel management should be:

- a) Reducing the crown fire potential,
- b) Reducing the surface fire intensity,
- c) Improving wildland fire suppression opportunities through better access, better site lines and fewer danger trees,
- d) Maintaining bio-diversity and wildlife habitat, and
- e) Minimizing site impacts during fuel management activities.

Other important benefits include better firefighter safety and greater effectiveness of aerial wildfire suppression resources.

There are two basic approaches to wildfire threat reduction or forest fuel management. The chosen method will depend on numerous site-specific factors.

### TIMBER HARVESTING/ MECHANICAL FUEL MANAGEMENT TREATMENTS

Timber harvesting in interface areas can be a very effective management tool. In large areas of commercially viable forest, a form of timber harvesting to remove a portion of the stand is the most logical option. The wildfire threat reduction work can be self-funding and a valuable resource gets properly utilized. The intensity and method of harvesting will depend on the topography, trees species, forest health, wildfire threat, community acceptance and a variety of other site-specific factors. Clear-cut harvesting, while usually not a very popular option for any community, may be the only solution in pure pine, Douglas-fir or spruce forest stands decimated by bark beetles, wildfires or other mortality causing event.

Where necessary, a form of partial or selective harvesting is better accepted. Removal of targeted tree species, based on forest health, wind firmness, diameter limits and a wide assortment of other factors is a common practice.

Harvesting for fuel management, or wildfire threat reduction, is significantly different from conventional commercial harvesting. The emphasis should be directed towards the final product left behind in the forest, not necessarily the timber removed from the site. This can result in additional costs. The post-harvest fuel loading standards, where cleanup is required above and beyond the standard harvesting opening can also significantly increase costs.

### HAND CREW FOREST FUEL MANAGEMENT

In immature, inaccessible, steep, highly visible, sensitive and small patches of forestland where harvesting is not an option, wildfire threat reduction efforts can be completed without timber extraction. Treatments can be carried out by hand, with equipment or a combination of the two. These treatments are rarely self-funded and require a funding source for completion. Treatments can vary in cost from \$2800 to \$8500 per hectare. Hand crew treatments are effectively an understory treatment where the main canopy stays in place but the suppressed and poorly formed understory conifers are removed, the crown base



height is raised through pruning and surface fuels are reduced. These treatments are often not as effective as harvesting activities and usually need to be wider to provide a similar amount of wildfire threat reduction.

Reducing the amount and configuration of the forest fuels consists of five basic activities.

- **Danger Tree Removal**

Dead and dangerous trees that will add significantly to the future surface fuel loading should be targeted for removal. Dead trees that can reach private land or access roads must be removed before fuel management activities commence. Retention of high value wildlife trees must be considered.

- **Spacing or Thinning**

Spacing, thinning or tree removal involves the reduction of the number of stems and associated branches and needles within the forest canopy. There are a number of different techniques. The spacing treatment necessary is dependent on many factors including; tree species, forest health, age of the stand, stand structure and other factors. Spacing treatments must be designed on a site-specific basis. In some cases, small scale forest harvesting may be the best method to space the area and cover the costs of the treatment. Any forest harvesting in interface areas must be well planned and supervised.

Spacing activities in multi-layered stands involves the removal of the weakest trees on site. These trees have usually been outcompeted, damaged or suffered forest health issues and are falling out of the stand. Caution must be taken to ensure the multi-aged characteristics of the stand are maintained. This is often referred to as 'spacing from below', or forest health style spacing. This usually increases the crown base height and creates a healthier, more vigorous forest. In relatively even aged stands, spacing the trees so the crowns are separated by a set average distance is a reasonable treatment option. This inter-crown distance should be increased on slopes. This spacing distance is also dependent on crown base height and the amount of surface fuel remaining after the site treatment.

- **Pruning**

Pruning involves the removal of the lower live and dead branches of coniferous tree species to separate the crown fuels from the surface fuels. By raising the Crown Base Height (CBH) within the stand, it will be more difficult for a surface fire to spread upwards into the tree canopy where it will spread quickly, greatly increase the wildfire intensity and create ember showers, or spotting, onto adjacent structures. The required height of the pruning is variable depending on; canopy closure, tree species, topography and amount of surface fuels remaining after the site treatment.

One commonly used convention for pruning is a three meter crown base height. This is based as much on the crew's reach as on crown fire initiation concerns. Again, there is no one prescription to manage all situations. Pruning must take into account the tree height and amount of live crown. The tree must be left a certain portion of its live crown to remain healthy and vigorous.

- **Surface Fuel Reduction**

Surface fuel reduction involves the collection of the accumulated felled, spaced and pruned material, and sometimes additional downed and dead material that will contribute to wildfire spread. Collection of the fine (small diameter) fuels is the priority as these fuels dry out quickly, ignite easily and are the main contributor to surface fire spread on most sites. Surface fuel treatments are often considered the most important component of any fuel modification activities and the most expensive. Overly aggressive surface fuel clean up can cause serious environmental impacts including erosion, introduction of noxious weeds and loss of wildlife habitat. Coarse woody debris, large stems, are

an important part of soil development and wildlife habitat and must always be considered when conducting surface fuel treatments.

- Debris Removal

A fuel management project is not complete until the created debris is removed from the site. This can be accomplished through open burning, chipping and spreading or removal from the site. Open burning is almost always the least expensive option and necessary on steep sites with poor access but is discouraged close to communities due to air quality issues. Removing the debris from the site is far most costly but done properly creates a wood product for use.

Hand crew techniques should only be employed on the forested land adjacent to homes or new developments in all High and Extreme wildfire behaviour threat class areas to reduce the wildfire threat. Landscape level treatments should be mechanized operations.

No one prescription will solve all wildfire threat problems. All prescriptions must be site specific and developed by an experienced individual.

## OTHER FACTORS TO CONSIDER WHEN CONDUCTING FUEL MANAGEMENT

The 'All Things Considered' approach is necessary when conducting any forest management activity. Fuel management is no exception. Fuel management plans and prescriptions must address other forest values that could be impacted by the planned treatments. The eleven FRPA resource values need to be respected.

A widely spaced and pruned forest will not support crown fires. Implications of Wildfire Threat Reduction Work



*Figure 7: A widely spaced and pruned forest will not support crown fires.*

Reducing wildfire threats through the reduction of the forest fuels sounds simple enough, but forest fuel treatments can have a wide range of implications. Fuel treatments can have both positive and negative effects on wildfire threats.

Mechanized timber harvesting as a stand-alone treatment can be very effective in reducing crown fires but usually results in a significant increase in finer surface fuels composed of needles, limbs and tops. This surface debris can increase surface fire intensity.

Hand crew treatments of dead and danger tree removal, spacing, pruning and surface fuel removal techniques can create lower fuel loaded, more open forest stand. Open forest stands:

- allow more light to reach the surface, often drying out the site or allowing more grass, herb and shrub growth, creating heavier, more continuous surface fuels
- can lengthen the fire season on the site by allowing the site to dry up faster and stay dry longer,
- allow more wind to move through the stand and along the surface, possibly increasing the rate of spread of surface fires, and
- Often have lower relative humidity in the summer months from the increased sunlight and temperatures.

The positive effects of wildfire threat reduction through forest fuel reduction include;

- lower probability of crown fires due to the more open forest canopy and higher crown base height,
- lower intensity surface fires from the reduced forest fuels,
- easier and safer access for wildland firefighters, and
- More effective aerial fire control efforts with air tankers.

In general, properly planned and implemented forest fuel reduction work reduces the crown fire potential and overall intensity of wildfires within the treatment area. This will increase the fire resilience of the trees in the stand and of adjacent homes and structures. Forest fuel reduction work can also increase the dryness on the site, and allow more wind to reach the surface, creating conditions for fast moving, low intensity wildfires to spread.

## EFFECTIVENESS OF HAND FUEL MANAGEMENT TREATMENTS

Hand crew treatments are usually the preferred fuel management option, compared to mechanized harvesting and treatments, immediately adjacent to structures because of:

- Better visuals and aesthetics,
- Limited impact on recreational opportunities and established trails,
- Less overall site impacts and soil disturbance, minimizing noxious weed potential impacts, and
- Better protection of wildlife habitat, biodiversity and water resources.

Hand crew completed fuel management treatments usually consist of a combination of danger tree removal, spacing, pruning and surface fuel removal, at varying intensities. The main forest canopy is often kept in place. Much of the work on Crown land is often restricted by merchantable timber utilization standards, where only live trees below the utilization standards can be cut and removed.

This type of treatment can be very effective for small fires that start in the community or within the treatment area. Good visuals, reduced danger trees and ladder fuels can allow safe, fast, aggressive wildfire suppression action within the managed area. Initial attack success can be far higher under these circumstances. Hand crew treatments can be less effective in a landscape level wildfire event that sweeps into the treatment area from the unmanaged forestland. A well-developed Rank 5 or 6 wildfire (continuous crown fire) that spreads into a hand treatment area surrounding a community, May easily spread

quickly and aggressively through all or a portion of the hand treated fuel management treatment area, providing only minimal safety to the community. The aggressiveness of the treatment will also need to determine the width of the treatment. A lower intensity treatment will have to be wider than a more aggressive treatment to be as effective.

Hand crew fuel management treatments are most effective when supported by forest harvesting along the treatment area perimeter. If the harvesting can reduce the wildfire intensity significantly before the wildfire enters the hand treatment areas, the effectiveness of the hand treatments is significantly increased.