Wildfire Mitigation Strategy

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Executive Summary

The Summer Village of Jarvis Bay is located on the southeastern shore of Sylvan Lake, within Red Deer County, approximately 25 km northwest of Red Deer, Alberta. The summer village lies within the dry mixedwood natural sub-region of Alberta, being surrounded by deciduous forests and agricultural lands. The purpose of the Summer Village of Jarvis Bay Wildfire Mitigation Strategy is to develop recommendations to mitigate wildfire risks. To achieve this purpose the Wildfire Mitigation Strategy encompasses several objectives including the:

- Assessment of wildfire risks and hazards
- Development of strategies to help mitigate identified risks and hazards
- Development of strategies to educate the community about FireSmart
- Assurance of the effectiveness for procedures and practices managing fire risks and hazards (i.e. bylaw review)

The process to develop the mitigation strategy included communication with stakeholders and consideration of various disciplines. General meetings occurred with the Association of Summer Villages of Alberta to discuss the scope of plans for 25 villages. After completion of meetings, each village Chief Administration Officer was notified and consulted. Field assessments then commenced to gather data on a variety of different community attributes. Fire Department and village councils were engaged to further develop plans to suit the individual village and the surrounding area. Recommendations to Jarvis Bay were made based on a **LOW** wildfire risk. Recommendations to Jarvis Bay are:

Vegetation Management Recommendations

Priority	Urgency	Recommendation	Frequency
High	High	**1. Recommendation Action:** Property owners mow and maintain grass, debris, and other combustible materials. Prune conifer trees 2 meters from the ground within (Priority Zone 1 and/or Zone 2 depending where property line ends). **Project Lead:** Property owners **Benefits:** Protecting property by removing points of ignition.	Annually/ When needed
High	High	**2. Recommendation Action:** Summer Village supply a debris disposal service to assist residents with Zone 1 and Zone 2 treatments on private property **Project Lead:** Summer Village Council **Benefits:** Encourages residents to clear flammable debris from property	Semi-annually

Development Recommendations

Priority	Urgency	Recommendation	Frequency
High	Low	**3. Recommendation Action:** Develop second entrance for residents west of Highway 20 along Jarvis Bay Drive. **Project Lead:** Summer Village Council **Benefits:** Alternate access/exit if primary access is blocked off.	One Time
Moderate	Moderate	**4. Recommendation Action:** Meet with local Fire Department to discuss issues with access/egress in a disaster situation **Project Lead:** Summer Village Council **Benefits:** Fire department gains better understanding of the unique layout and issues of Birchcliff	Annually
Moderate	Moderate	**5. Recommendation Action:** Summer Village acquire standard, metal, high visibility signage for each individual lot **Project Lead:** Summer Village Council **Benefits:** Faster response times because of ease of identifying lots	One Time

Education Recommendations

High	Moderate	**6. Recommendation Action:** The Summer Village educates and encourages public engagement with FireSmart using newsletters, websites, and open house meetings. **Project Lead:** Summer Village Council **Benefits:** Community Education and involvement.	Annually
Moderate	Moderate	**7. Recommendation Action:** The Summer Village identifies a willing community leader to work with the community on FireSmart initiatives. This will lead to community recognition by FireSmart Canada. **Project Lead:** Summer Village Council **Benefits:** Community involvement and ownership of FireSmart; more resources for council to utilize.	One Time

Legislation Recommendations

Priority	Urgency	Recommendation	Frequency
Low	Low	**8. Recommendation Action:** The Summer Village amends the Fire Ban bylaw to include specific dimensions for fire pit sizes as well as incorporate a fire hazards section. **Project Lead:** Summer Village Council **Benefits:** Empowers the village to control hazards to the community; describes to landowners what is and is not a fire hazard on private property.	One Time

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Definitions

AESRD – Alberta Environment and Sustainable Resource Development

ASVA – Association of Summer Villages of Alberta

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

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

CFFBP – Canadian Forest Fire Behaviour Prediction System

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

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

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

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

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

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

FRIAA – Forest Resource Improvement Association of Alberta

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

Head Fire Intensity (HFI) – The energy that a fire generates. HFI is separated into six classes, one being low fire behaviour and six being extreme fire behaviour. See Table 2 for more information.

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

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

Stand(s) – A group of trees.

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

Zone 1 – The area extending 0 to 10 meters from a structure.

Zone 2 – The area beyond Zone 1 that begins at 10 meters from a structure and extends to 30 meters from the structure.

The objectives of the Wildfire Mitigation Strategy are:

- **Identify wildfire risks and hazards**
- **Develop strategies to help mitigate risks and hazards**
- **Educate community about FireSmart**
- **Develop strategies to help the continuing education about FireSmart**
- **Ensure procedures and practices are effective for managing fire risks and hazards (i.e. bylaw review)**

1.0 Introduction

The purpose of the Summer Village of Jarvis Bay Wildfire Mitigation Strategy is to identify the susceptibility of the summer village to wildfire and provide recommendations based on the assessment of current wildfire risks and hazards within the summer village and adjacent areas. To complement the Wildfire Mitigation Strategy an additional document, the Wildfire Community Assessment, was produced. The Wildfire Community Assessment serves as a strategic document to assist emergency responders from Sylvan Lake Fire Department during an incident within Jarvis Bay. The Jarvis Bay Wildfire Community Assessment, without maps, is included in Appendix III. The full Community Assessment, including maps, is provided as a separate document for distribution to emergency response agencies.

The process to produce the Wildfire Mitigation Strategy and the Wildfire Community Assessment includes speaking with stakeholders and addressing multiple disciplines. The beginning of the process started with general meetings with the Association of Summer Villages of Alberta (ASVA) to discuss the scope of plans for 25 villages. When the general meetings were completed, each village Chief Administration Officer was notified and consulted. Field assessments then commenced and gathered data on many different community attributes that are vital to the development of both documents. Attributes considered in the field assessments include:

- Community and landscape descriptions
- Forest fuel types
- Values at risk: standard, critical, dangerous goods, and special values
- Access
- Presence of utilities
- Emergency response characteristics
- Existing Fuel management schemes

Data from field assessments was analyzed and the results incorporated into developing the Wildfire Mitigation Strategy. Completed plans were sent to the Jarvis Bay council for review.

Note to Council: Revisions, *if necessary, will be made based on the council review. A final draft will be submitted back to council for public and stakeholder review and comments.*

The development of the Wildfire Mitigation Strategy and Community Assessment was made possible by a FireSmart grant received by the ASVA. Jarvis Bay, in collaboration with the ASVA, applied for the FireSmart grant which is distributed by the Forest Resource Improvement Association of Alberta. This grant was awarded to the ASVA to assess risks and hazards associated with wildfire/urban interface situations. The Wildfire Mitigation Strategy and Wildfire Community Assessment are the products of this grant.

2.0 Planning Area and Stakeholders

The Summer Village of Jarvis Bay is located on the southeastern shore of Sylvan Lake, within Red Deer County, approximately 25 km northwest of Red Deer, Alberta (Figure 1). The planning area includes the village, Map 1, and adjacent lands up to 2 km from Jarvis Bay's borders, Map 2.

Knowledge and assistance about the planning area was provided by several stakeholders. Key stakeholders involved in the planning are:

- The Summer Village of Jarvis Bay
- The residents of Jarvis Bay
- Sylvan Lake Fire Department
- Association of Summer Villages of Alberta (ASVA)
- Jarvis Bay Provincial Park

The Summer Village of Jarvis Bay is responsible for reviewing the Wildfire Mitigation Strategy, considering recommendations, approving the plan, and implementing strategies. ASVA administered the project reporting and the funding. In addition ASVA acted as liaison and set up stakeholder meetings. Sylvan Lake Fire Department provided local knowledge, strategies, and tactics for fire suppression. Currently, Sylvan Lake Fire Department is responsible for structural and wildland fire suppression within Jarvis Bay.

Figure 1 General Location of Jarvis Bay

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Map 1. Land Ownership

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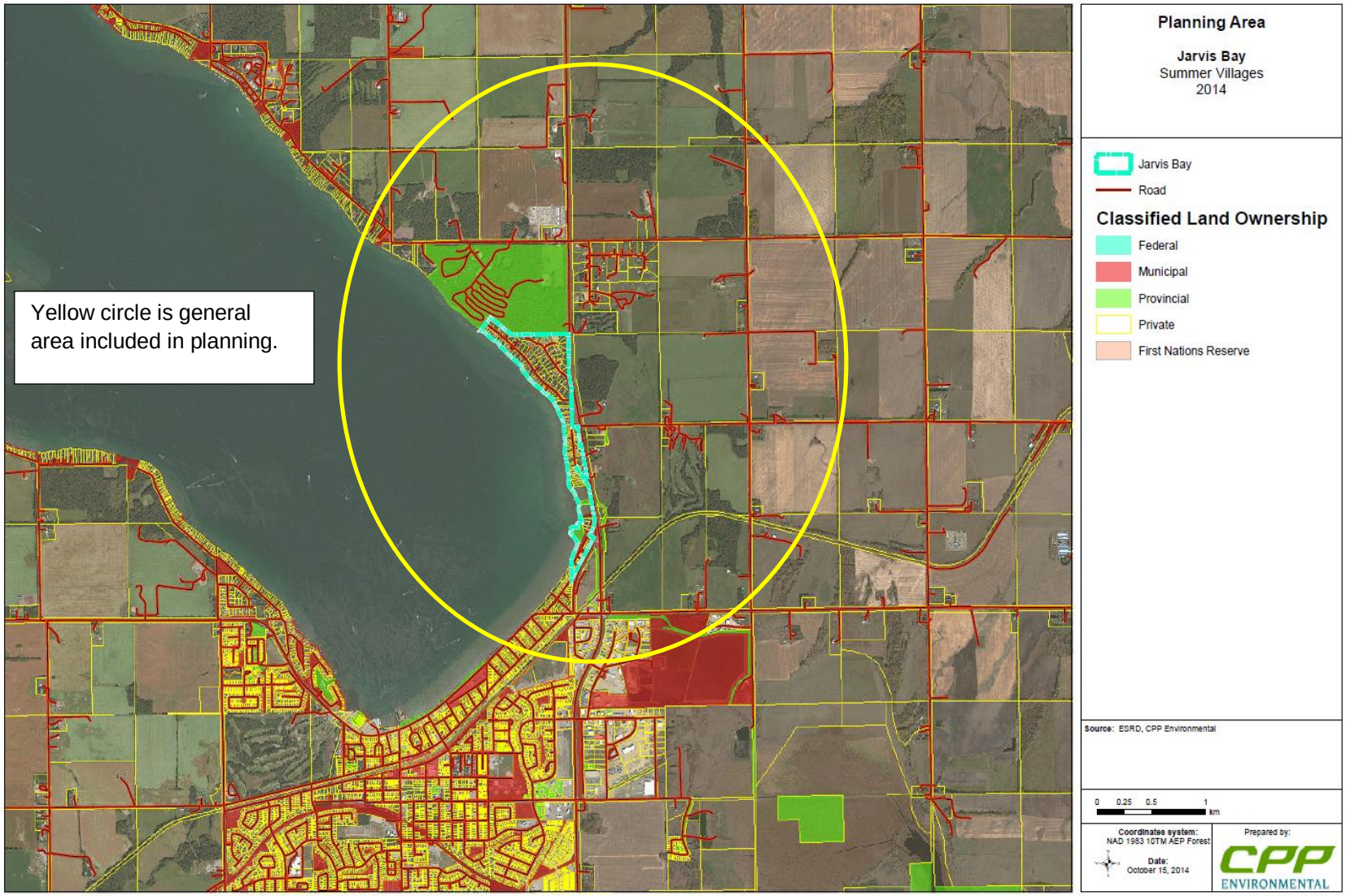


Map 2. Planning Area

3.0 Fire Hazard and Risk Assessment

In order to quantify fire hazard and minimize bias, a community wildfire risk assessment tool that assigns a fire hazard to rate a community was used. The risk assessment gives two fire hazard ratings: inherent and residual risk. The inherent risk evaluates the current state of the community, whereas the residual risk demonstrates a change in fire hazard with the implementation of recommendations and the community proactively participating in FireSmart. The risk assessment is included in Appendix I. In section 3.0, the risks and hazards for Jarvis Bay and surrounding areas are identified and described. Recommendations are then discussed in section 4.0 with a summary of recommendations in section 5.0.

3.1 Wildfire Incidence

Grass and field fires are the most common type of wildfire in the Sylvan Lake area. The cause of wildfire is almost exclusively human induced; however, lightning has started fires in the area. The average number of wildfires per year is highly variable and dependent on ignition sources, time of year, and fuel types.[1]

Note: Individual summer villages do not keep record of fire occurrence.

3.2 Wildfire Behaviour Potential

3.2.1 Urban Fuel Types

The different materials used to build houses, and the condition of those materials will affect fire behaviour. Building materials within Jarvis Bay are a mix of vinyl or wood siding and roofing is a mix of asphalt shingles or wooden shakes. Asphalt shingles and treated wooden shakes are fire resistant while vinyl siding, wood siding and untreated wooden shakes are not. Vinyl will melt when subjected to heat, exposing flammable materials underneath. Wood siding offers very little fire resistance; however logs or heavy timber exteriors are more fire resistant when compared to wooden siding. Untreated wooden shakes burn easily when exposed to radiant heat or direct contact of firebrands (embers).[2]

3.2.2 Wildland Fuel Types

Identifying wildland fuel types is important in understanding the overall threat of wildland/urban interface fires. The susceptibility of different fuels to fire vary depending on the season. Both grass and leafless deciduous fuels are most susceptible to fire in the spring and fall. “Grass” fuels are identified when an area has mostly grass that has not been mowed or maintained. “Leafless deciduous” fuels are identified when an area has mostly aspen or poplar trees. “Coniferous” fuels are identified when an area has mostly spruce or pine trees and are susceptible to fire in the spring, summer and fall. “Mixedwood” fuels are identified when an area consists of a mixture of deciduous and coniferous trees. Like conifer, mixedwood fuels are susceptible to fire in the spring, summer and fall; however, susceptibility in the summer depends on the ratio of coniferous to deciduous trees.

Jarvis Bay is separated into two sections, the south and the north. The southern portion is generally immature to mature aspen with the understory consisting of shrubs, Figure 2. The southern portion is separated, from the northern portion of Jarvis Bay, by a small patch of grass and rushes (Figure 3) and land that is cleared for development. Deciduous patches are found throughout the northern portion of Jarvis bay, consisting of an understory of shrubs. The Jarvis Bay Provincial Park borders to the

[1] Correspondence with Sylvan Lake Fire Chief – December 9, 2014
[2] FireSmart Protecting Your Community From Wildfire – 2003

north and is approximately 84 hectares (212 acres). The provincial park consists mainly of immature to mature aspen.

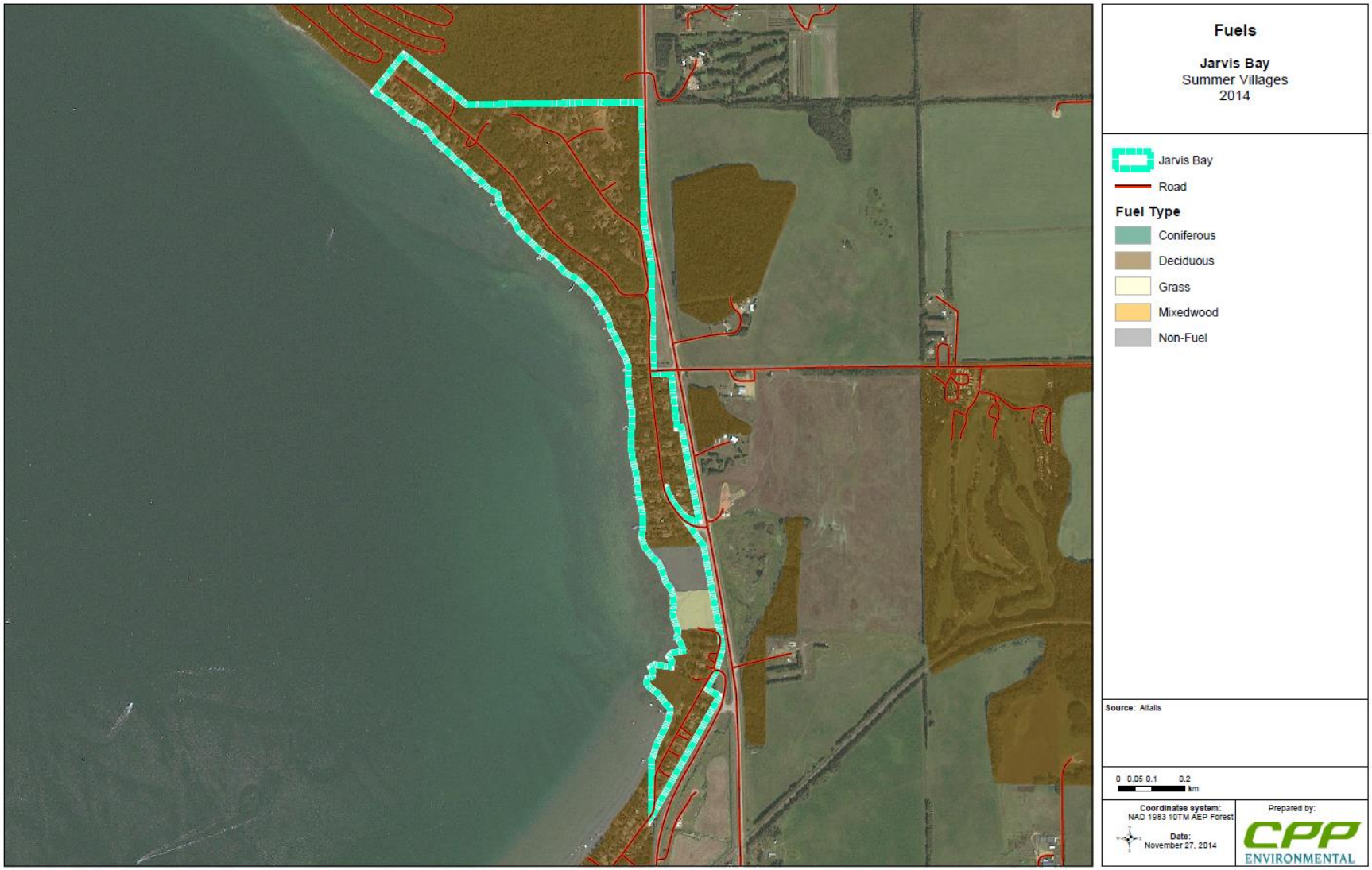
Deciduous fuels (D1) are distributed throughout the community and surrounding areas

Figure 2. Deciduous fuel type

Grass fuels (O1) are within a small patch between the northern section of Jarvis Bay and the southern section.

Figure 3. Grass fuel type

Ground-truthing and satellite imagery were both used to identify forest fuel types in accordance with the Canadian Forest Fire Behaviour Prediction System (CFFBP). Satellite imagery from Google, Bing, and/or ESRI was analyzed and confirmed by ground-truthing to generate a better visual of Jarvis Bay's forest fuel types. Map 3 illustrates the fuel types within Jarvis Bay.



Map 3. Fuel types

3.2.3 Fire Weather Analysis

Weather has a large influence on fire behaviour. Weather trends such as temperature, relative humidity, precipitation, and prevailing wind direction are important in understanding seasonal wildfire potential within, and surrounding Birchcliff. To determine impacts of weather on fire behaviour this section focuses on cross-over days, precipitation, and prevailing winds. A cross-over occurs when the value of the RH is equal to, or lower than, the value of the temperature and is an indicator of potential extreme fire behaviour. Precipitation is the collective measurement of snowfall and rainfall. Prevailing wind is the general seasonal direction the wind comes from. Wind affects the direction of spread and the speed of a wildfire.

Weather data was acquired from Environment Canada's website for the Red Deer A weather station (Climate ID 3025480), located near Springbrook, Alberta 21 km southeast of Jarvis Bay. Weather data was analyzed using records between March 1 and October 31, over a five year period from 2009 through 2013 and is summarized in Table 1.

Note: Although spring and fall weather conditions are generally more hazardous, it is still possible for fire to occur during the summer.

Table 1: Red Deer A, Springbrook, Alberta (Climate ID 3025480) (March - October, 2009 - 2013)

Season	Month	Mean Temp (°C)	Max Mean Temp (°C)	Min Mean Temp (°C)	Average Low RH (%)	Average Crossover days/year	Average Precipitation (mm)
Spring	March	-5	0	-10	45	0	21
	April	3	8	-3	34	1	31
	May	10	16	3	30	4	58
Summer	June	14	19	8	36	1	101
	July	16	22	10	49	0	108
	August	16	22	9	47	1	61
Fall	September	12	20	4	38	4	23
	October	3	8	-3	49	0	19

Figure 4 depicts that May and September have the highest average number of cross-over days per year. Cross-over days are an indicator of the potential for extreme fire behaviour.

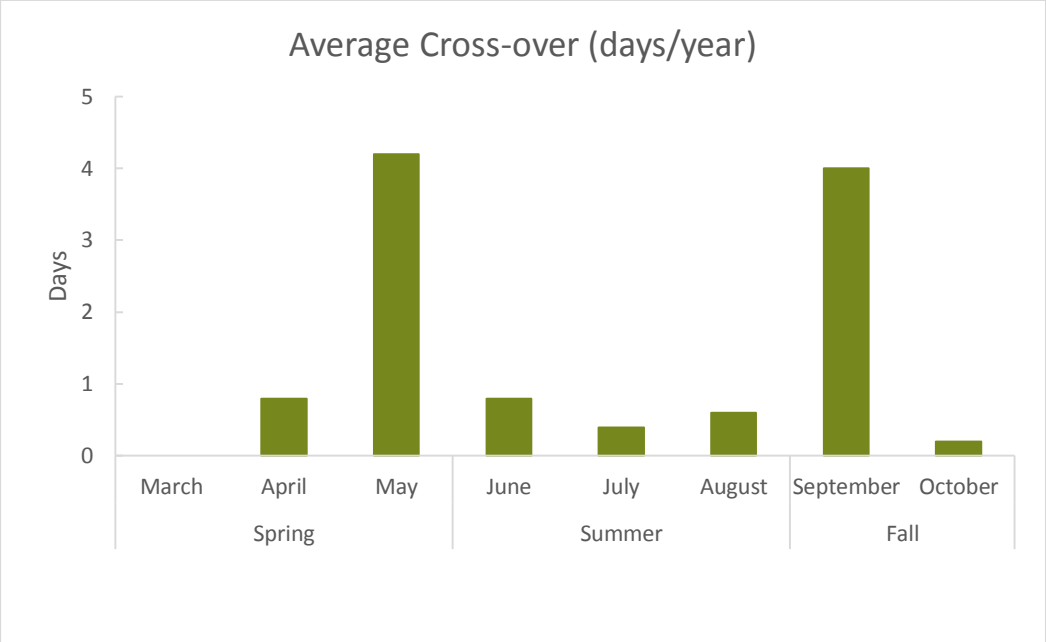


Figure 4. Average cross-over (days/year)

Figure 5 shows that on average, summer months have a higher amount of precipitation. Precipitation affects the moisture content of fine fuels, which influences wildfire behaviour.

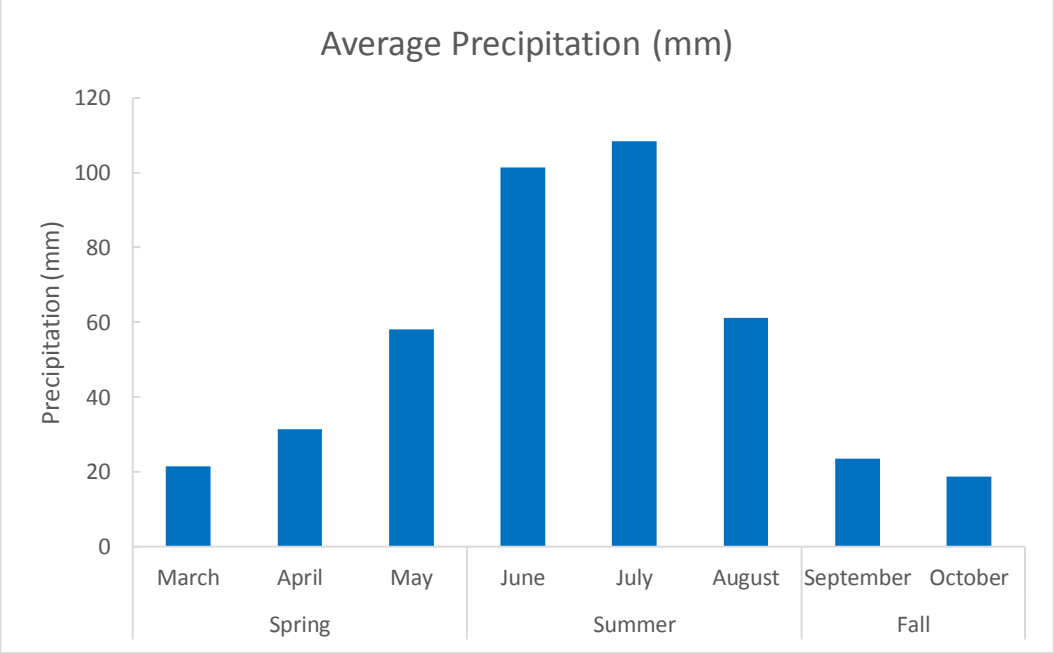


Figure 5. Average precipitation (mm)

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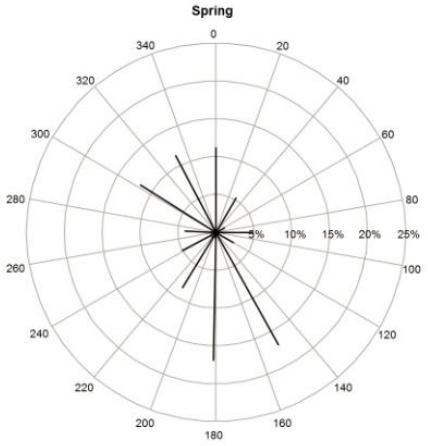


Figure 6. Spring prevailing wind

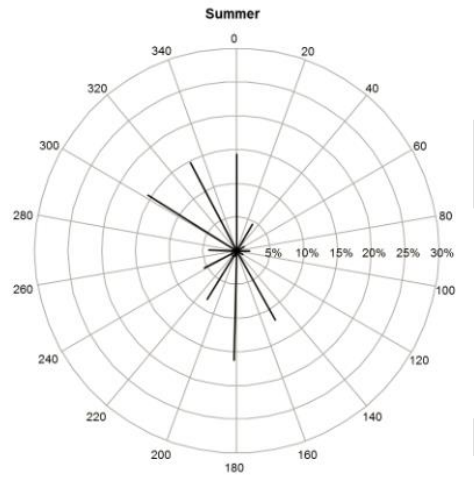


Figure 7. Summer prevailing wind

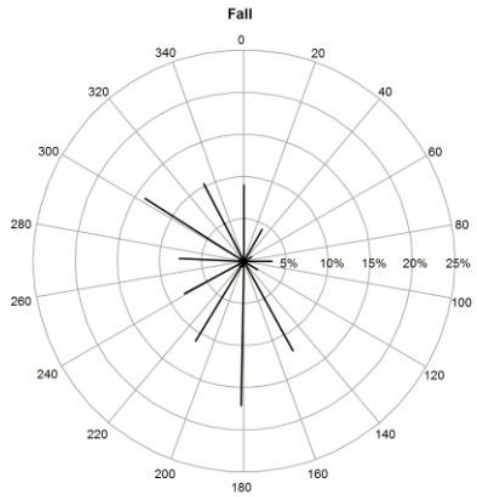


Figure 8. Fall prevailing wind

Spring Winds

The seasonal direction changes of the wind will have an impact on predicted fire behaviour within and around the Summer Village of Jarvis Bay. Figure 6 shows that during the spring (March – May) prevailing winds are generally out of the south, southeast. These winds will pose little risk of fire spread due to the proximity to Sylvan Lake, the Town of Sylvan Lake and sparseness of continuous fuels to the south. The winds would influence fire spread exiting the community within the deciduous fuels that border to the north

Summer Winds

Figure 7 shows that during the summer (June – August) wind generally come out of the northwest with some less prevailing winds coming from the south southeast. Northwesterly winds will influence fire spread entering the community within the deciduous fuels to the north. Fire spread exiting the community to the south would not be a concern due to the proximity to both Sylvan Lake and the Town of Sylvan Lake to the south.

Fall Winds

Figure 8 shows that during the fall (September – November) wind generally come from the south and northwest. Southern winds will not be a concern due to the proximity to both Sylvan Lake and the Town of Sylvan Lake to the south. The winds would influence fire spread exiting the community within the deciduous fuels bordering to the north. Northwesterly winds in the fall would influence fire spread entering the community through deciduous fuels in the north.

3.2.4 Wildfire Behaviour Potential

Two important aspects when considering wildfire behaviour concerns are: Head Fire Intensity and Rate of Spread. These are important because they help determine the difficulty to control a wildfire. Head Fire Intensity (HFI) is the predicted energy output of the fire front (or head)[3]. Rate of Spread (ROS) is how fast a fire will spread in meters per minute (m/min). Table 2 defines the six different HFI classes according to the CFFBP System. HFI of 1 and 2 are colour coded the same for the purpose of this assessment because a fire with a HFI of 1 or 2 has a minimal spread rate and low intensity. In general, spring and fall tend to have a higher HFI class, ranging between 3 and 6. This is due to potentially dryer conditions, less precipitation, wind direction and speed, cured fine fuels, and a higher amount of available fuel to burn. However, coniferous fuels have significant HFI and ROS throughout the fire season due to physiology making it combustible during dry weather conditions.

Table 2. Head Fire Intensity Class Description

Head Fire Intensity	Fire Behaviour
1	Smouldering ground or creeping surface fire, low intensity
2	Low vigour surface fire
3	Moderately vigorous surface fire
4	Highly vigorous surface fire, may be torching trees or intermittent crown fire
5	Extremely vigorous surface fire or crown fire
6	Large disastrous fire

[3] Natural Resources Canada, Canadian Wildland Fire Information System – Accessed July 31, 2014

Table 3 illustrates the effects of different wind speeds (0, 25, 50 km/h) on predicted HFI and ROS for spring/fall and summer for each fuel type within Jarvis Bay. It was assumed that in the summer, grass would be less than 50% cured and deciduous trees would have leaves on; there is no fuel category for these fuel types in the CFFBP system. A Fine Fuel Moisture Code (FFMC) of 92 was assumed to acquire the initial spread index (ISI) for the different wind speeds. Grass was assumed to be 100% cured in the spring and fall. The BUI_0 was used to estimate HFI/ROS, as suggested by the CFFBP System. These numbers were then applied to the CFFBP System to predict the HFI class and the ROS in meters per minute (ROS m/min).

Table 3. Head Fire Intensity and Rate of Spread for Extreme Conditions

		Wind 0 km/h		Wind 25 km/h		Wind 50 km/h	
Fuel type	**Fire Behaviour**	Spring/Fall	Summer	Spring/Fall	Summer	Spring/Fall	Summer
Grass (O1b)	HFI	3	1	5 - 6	1	6	1
	ROS (m/min)	13	0	71	0	179	0
Deciduous (D1)	HFI	2	1	3	1	5	1
	ROS (m/min)	1	0	6	0	19	0

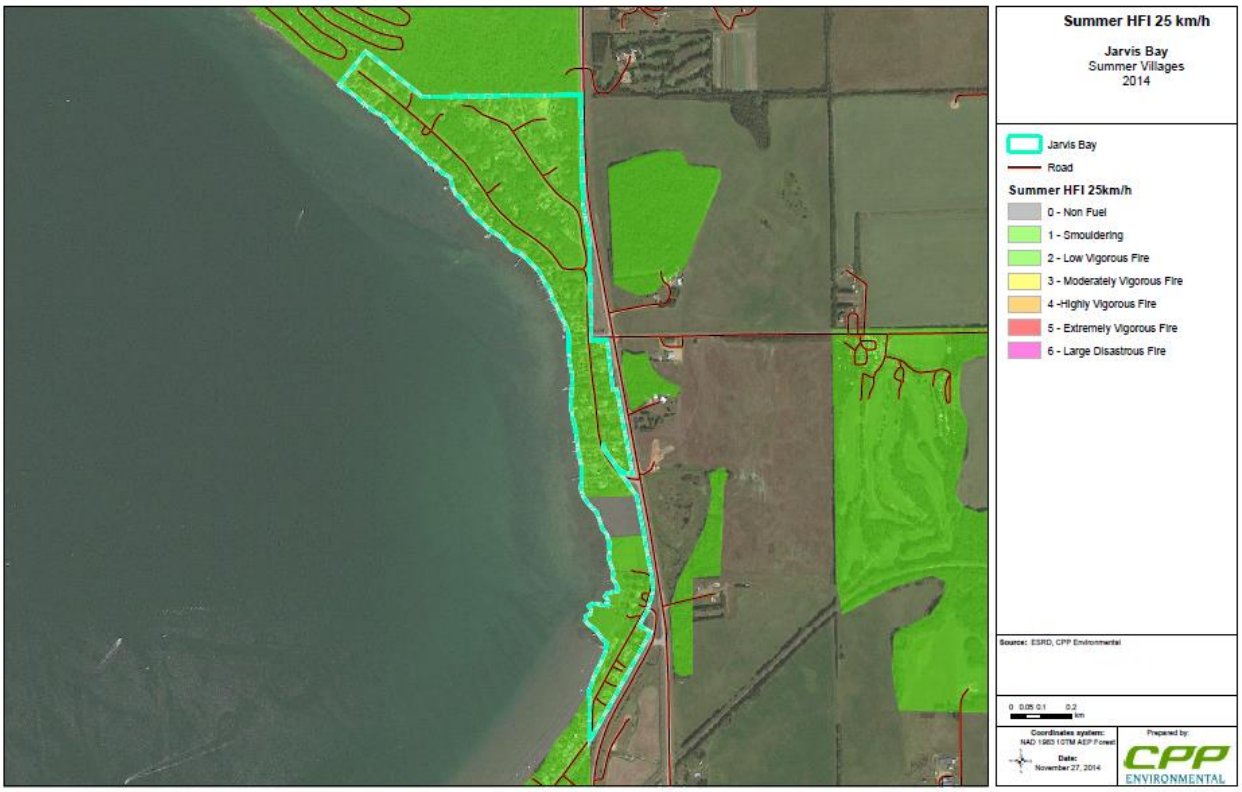
Maps are provided to demonstrate wildfire hazard on both a planning area scale and a landscape scale. Maps 4 through 9 are based on the values in Table 3 to indicate the potential HFI hazards for fuel types within Jarvis Bay. To easily interpret the maps, the legends are colour coded to match the HFI classes described in Table 2.

Note: Table 3, and the Maps generated using Table 3, should only be used as guidelines with an understanding of the assumptions being made

Map 4. Spring/fall HFI during 0 km/h winds

Map 5. Summer HFI during 0 km/h winds

Map 6. Spring/fall HFI during 25 km/h winds



Map 7. Summer HFI during 25 km/h winds

Map 8. Spring/fall HFI during 50 km/h winds

Map 9. Summer HFI during 50 km/h winds

3.3 Existing Barriers to Fire Spread

A fire barrier is an area that cannot burn, or burns slowly, which emergency responders may use as a staging point, anchor point, safety zone, or evacuation route. In this document fire barriers will be separated into two categories: anthropogenic (man-made) and natural.

Anthropogenic Barriers
Highway 20 (Figure 9)
Jarvis Bay Drive (Figure 9)
Natural Barriers
Sylvan Lake

Figure 9. Barriers to spread in Jarvis Bay

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3.4 Values at Risk

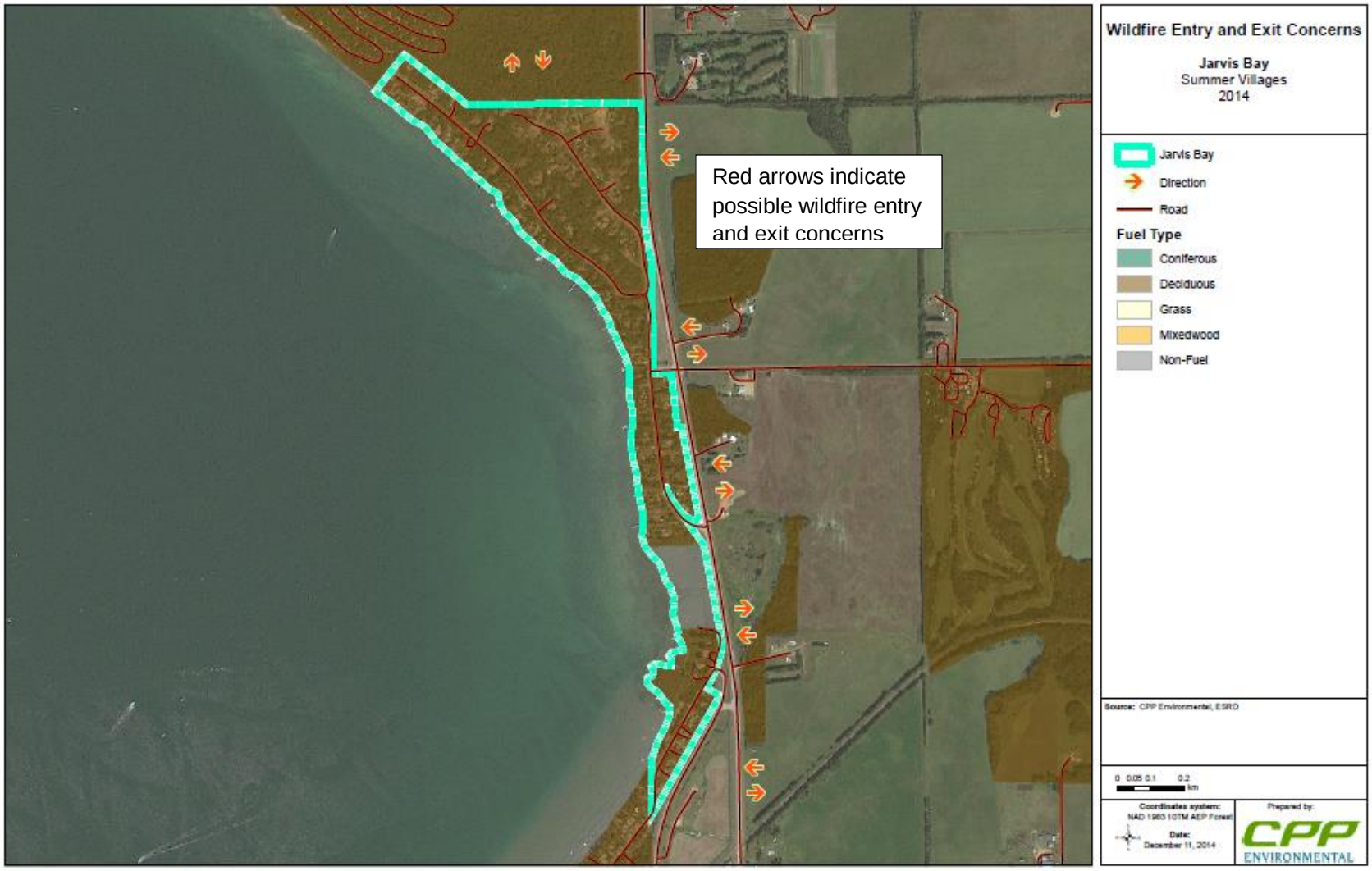
Values at Risk is a term that encompasses four broad types of values: standard, critical, dangerous goods, and special values. Standard values are considered to be homes and other common structures found in communities. Critical values are the infrastructures that are vital to the wellbeing of those who reside in the planning area. Dangerous goods values are anything which may pose a safety threat to emergency responders or the public. Special values consist of areas that have natural, cultural, historical, or emotional importance to a community. [4]

Values at Risk	Description
Standard	134 residences
Critical	None identified
Dangerous Goods	None identified
Special	None identified

3.5 Community Wildfire Concerns

The following are general wildfire concerns identified within Jarvis Bay. These areas are important identifiers of potential liabilities to the community. Wildfire entry and exit points were determined by analyzing fuel types and continuity while looking at potential ignition sources. Since human caused fires are the major source of ignition in Red Deer County, areas with high traffic and close to continuous fuels were identified as possible ignition sources. Map 10 shows potential entry and exit points for wildfire.

[4] Guidebook for Community Protection – February 2013



Map 10. Wildfire entry and exit concerns

4.0 FireSmart Activities

Hazard Rating: LOW

Jarvis Bay has a **LOW** hazard rating based on the risk and hazard assessment[5] (Appendix I). The intent of the FireSmart Activities section is to make recommendations considering wildfire incidence, wildfire behaviour potential, existing barriers to fire spread and values at risk (Section 3.0). The Risk Assessment Tool is applied to demonstrate the effectiveness of the recommendations in reducing wildfire threat. Recommendations will be separated according to wildland/urban interface disciplines. These disciplines, as identified by the FireSmart Guidebook for Community Protection (2013), are:

1. Vegetation Management
2. Development
3. Education
4. Legislation
5. Inter-Agency Cooperation and Cross-Training
6. Emergency Planning

A summary of recommendations is included in section 5.0.

4.1 Vegetation Management

Vegetation management recommendations are separated into three categories: residential, community, and county areas. Although these recommendations are separated, coordination and cooperation between all parties will improve the effectiveness and efficiency of FireSmart activities.

4.1.1 Existing Vegetation Management

The ditches and community areas in Jarvis Bay well maintained. This maintenance keeps the power lines clear of vegetation and is sufficient to prevent unnecessary ignition potentials.

4.1.2 Proposed Vegetation Management

4.1.2.1 Residential

Recommendation 1

Implement Zone 1 and Zone 2 FireSmart treatment areas on all private property within the summer village.

Managing fuel by mowing grass, removing organic debris, and other combustible materials on private property is essential to the FireSmart process. The area within a 10 meter radius of structures, which is known as Priority Zone 1[6], is important for fire suppression. Keeping Priority Zone 1 clear of flammable vegetation and debris reduces the risk of homes igniting during a wildfire, and increases defensibility of the structure. Zone 2 is the area extending from 10 meters to a 30 meter radius from a structure. Maintenance of priority Zone 2 acts to lower the intensity of a wildfire by reducing fuels. Residents should maintain Zone 2

[5] Input into hazard assessment criteria included AESRD, Municipalities, and rural fire departments

[6] FireSmart Protecting Your Community from Wildfire – 2003

if it lies on their property. However, if Zone 2 is on the owner's property and extends into a riparian zone, vegetation should not be modified, reduced, or removed[7] within the riparian zone.

To assist residents with Zone 1 and Zone 2 treatments on private property it is recommended that the summer village offer a vegetation debris disposal service. This service would encourage property cleanup of wildfire hazards by supplying a means for property owners to dispose flammable debris. A disposal program is a simple initiative that illustrates the importance of FireSmart and the dedication of the summer village to achieve a FireSmart community.

> **Recommendation 2**
>
> *Summer Village offer a debris disposal program to assist residents with Zone 1 and Zone 2 treatments*

4.1.2.2 Community

No community vegetation management recommendations.

4.1.2.3 County

No county vegetation recommendations.

4.2 Development

Water availability is adequate for Jarvis Bay. Sylvan Lake Fire Department, which is the primary responder in Jarvis Bay, uses water tenders to suppress fires in the area. Water tenders are filled with the 400+ fire hydrants located in the Town of Sylvan Lake.

> **Recommendation 3**
>
> *Develop second access/egress for residents along Jarvis Bay Drive in the community that residents can use as an escape route during an emergency*

The southern portion of Jarvis Bay has two access/exit points, which will provide ease of accessibility in times of emergency. This is not the case in the northern portion of the community. Highway 20 provides the only access/egress point. Although Jarvis Bay's roads and turnarounds are suitable for two way traffic and for emergency response vehicles to turnaround without back up maneuvers, only having one access poses an evacuation hazard. It is recommended that Jarvis Bay establish a secondary access into the community. A secondary access will be a long-term process for Jarvis Bay, but will help to mitigate against problems associated with only one access point. It is recommended that Jarvis Bay meet with the local Fire Department to discuss access issues and other possible limitations to safe access/egress.

> **Recommendation 4**
>
> *Meet with local fire department to discuss public safety issues*

Signage in Jarvis Bay varies between lots. It is recommended that each individual lot has a standard metal sign displaying the lot number and is clearly displayed. Good signage will shorten response times by emergency

> **Recommendation 5**
>
> *Village acquire high visible, standard signage for each lot*

[7] Fisheries Act and/or Public Lands Act authority is required within riparian zones and the bed and shore of waterbodies prior to any disturbance to the vegetation or land.

personnel. Figure 10 is an example of lot signage that Jarvis Bay may wish to imitate.

Figure 10. Example of lot signage

4.3 Public Education

Proper public education will increase resident's understanding of recommendations created for wildfire mitigation. Newsletters, websites, and open house meetings are all important in the distribution of FireSmart information. The objectives of FireSmart must be highlighted and explained in the distribution medium to increase the success of resident education and engagement.

Recommendation 6

Summer Village educates residents on FireSmart through information distribution

Information distributed should include, but not be limited to, three fuel management approaches: fuel removal, reduction, and/or conversion. Zone 1, the area within a 10 m radius from structures, should be highlighted as the main priority area for Jarvis Bay. This should have priority as maintenance of the area will reduce the risk of fire ignition and increase the defensibility of the structure.

The council of Jarvis Bay should ensure the distribution and availability of FireSmart information in the spring and summer so that it is available during the seasons when property owners will most likely conduct vegetation management. Public notices should only be done with seasonal relevance; there should not be notices in the winter. Once the council establishes FireSmart procedures within Jarvis Bay, word of mouth and public involvement will assist the education process. The goal of education is to develop engaged and dedicated landowners to create a community with a FireSmart culture.

Recommendation 7

Summer Village work towards becoming certified by FireSmart Canada as a FireSmart community

To assist the education process Jarvis Bay should consider becoming a part of the FireSmart Canada Community Recognition Program (FCCRP)[8]. This process

[8] FireSmart Canada, *FireSmart Community Champion Workshops* – Accessed August 14, 2014

has already started with the Wildfire Mitigation Strategy and Community Assessment documents. A member of council, employee or a community leader of Jarvis Bay would attend a Local FireSmart Representative workshop to learn how to acquire and maintain FCCRP for Jarvis Bay. Having a community leader take on this responsibility will increase the success of the implementation of recommendations on private property.

4.4 Legislation

The "Burning and Fire Pit Bylaw" (bylaw 119-12) has very descriptive sections on fire pits and cost recovery. The "Fire Pits" section describes the materials that fire pits can be constructed from as well as the responsibilities of persons in charge. It does not explain the dimensions of a fire pit (i.e. a maximum diameter). It is recommended that the bylaw be revised to included specific dimensions of fire pits. The "Cost Recovery" section and "Schedule A" describe how the costs associated with extinguishing a fire will be charged back to the person responsible. This is important to clarify to residents that negligence is not tolerated.

Recommendation 8

Revise bylaw to include specific dimensions of fire containers and consolidate a section on fire hazards

Other sections in the Burning and Fire Pit Bylaw support a FireSmart community. However, there is no section that includes fire hazards. It is recommended that a fire hazards section be adopted or created to include in the existing bylaw. This section should describe certain fire hazards and the community's right to order removal, and if there is no compliance, remove said fire hazards. This will ensure the Jarvis Bay's ability to remove hazards that affect the entire community.

4.5 Interagency Cooperation, Cross-Training, and Capabilities

Interagency cooperation is important for effective fire suppression. Mutual aid agreements, that are updated frequently, will ensure that during an emergency situation the incident command team will be able to acquire the appropriate resources.

Adjacent Municipality	Mutual Aid Agreement
Lacombe County	Yes
County of Stettler No. 6	Yes
Kneehill County	Yes
Mountain View County	Yes
Clearwater County	Yes

The Sylvan Lake Fire Department is the primary responder to fires within Jarvis Bay and operates under Red Deer County. Although Bentley is within Lacombe County, next to Sylvan, is the closest to fire department to Jarvis Bay.

	Sylvan Lake Fire Department	Bentley Fire Department
Resource	**Quantity**	**Quantity**
Personnel	35	17
Engine	3	2
Water Tender	1	1
Rescue Unit	1	1
Utility Vehicle	1	1
Bush Truck	1	0
Squad Truck	2	0

4.6 Emergency Planning

The Summer Village of Jarvis Bay Emergency Management Plan is updated annually.

5.0 Summary of Recommendations

The risk assessment tool concludes that if the suggested recommendations are implemented the fire hazard rating score will drop from 168 to 136. The risk assessment tool is included in Appendix I.

5.1 Vegetation Management Recommendations

Priority	Urgency	Recommendation	Frequency
High	High	1. **Recommendation Action:** Property owners mow and maintain grass, debris, and other combustible materials. Prune conifer trees 2 meters from the ground within (Priority Zone 1 and/or Zone 2 depending where property line ends). **Project Lead:** Property owners **Benefits:** Protecting property by removing points of ignition.	Annually/ When needed
High	High	2. **Recommendation Action:** Summer Village supply a debris disposal service to assist residents with Zone 1 and Zone 2 treatments on private property **Project Lead:** Summer Village Council **Benefits:** Encourages residents to clear flammable debris from property	Semi-annually

5.2 Development Recommendations

Priority	Urgency	Recommendation	Frequency
High	Low	3. **Recommendation Action:** Develop second entrance for residents west of Highway 20 along Jarvis Bay Drive. **Project Lead:** Summer Village Council **Benefits:** Alternate access/exit if primary access is blocked off.	One Time
Moderate	Moderate	4. **Recommendation Action:** Meet with local Fire Department to discuss issues with access/egress in a disaster situation **Project Lead:** Summer Village Council **Benefits:** Fire department gains better understanding of the unique layout and issues of Birchcliff	Annually

Moderate	Moderate	**5. Recommendation Action:** Summer Village acquire standard, metal, high visibility signage for each individual lot **Project Lead:** Summer Village Council **Benefits:** Faster response times because of ease of identifying lots	One Time

5.3 Education Recommendations

High	Moderate	**6. Recommendation Action:** The Summer Village educates and encourages public engagement with FireSmart using newsletters, websites, and open house meetings. **Project Lead:** Summer Village Council **Benefits:** Community Education and involvement.	Annually
Moderate	Moderate	**7. Recommendation Action:** The Summer Village identifies a willing community leader to work with the community on FireSmart initiatives. This will lead to community recognition by FireSmart Canada. **Project Lead:** Summer Village Council **Benefits:** Community involvement and ownership of FireSmart; more resources for council to utilize.	One Time

5.4 Legislation Recommendations

Low	Low	**8. Recommendation Action:** The Summer Village amends the Fire Ban bylaw to include specific dimensions for fire pit sizes as well as incorporate a fire hazards section. **Project Lead:** Summer Village Council **Benefits:** Empowers the village to control hazards to the community; describes to landowners what is and is not a fire hazard on private property.	One Time

Appendices

Appendix I – Risk Assessment

Note: Input into hazard assessment criteria included AESRD, Municipalities, and rural fire departments.

Wildfire Risk Assessment For Rural Communities							
COMMUNITY:		Jarvis Bay	INHERENT		STRATEGIES TO OBTAIN RESIDUAL RISK	RESIDUAL	
			Rating	Scores		Rating	Scores
ACCESS TO SAFE ZONES	A	Lake	0 or 3	0	No Change	0 or 3	0
	B	Large Non-Fuel Surface	0 or 3	0		0 or 3	0
	C	Cleared Area (Vegetation Maintained)	0 or 3	0		0 or 3	0
	D	County Road	0 or 3	0		0 or 3	0
	E	Subdivision Road	0 or 3	0		0 or 3	0
			/15	0		/15	0
NUMBER OF HOMES	A	0 to 30	1		No Change	1	
	B	31 to 60	2			2	
	C	61 to 90	3			3	
	D	91 to 120	4			4	
	E	> 120	5	5		5	5
			/5	5		/5	5
ECONOMIC RISK	Average Property Value:				No Change		
	A	$0 - $300 000	1			1	
	B	$300 001 - $500 000	2			2	
	C	$500 001 - $750 000	3			3	
	D	> $750 000	4	4		4	4
		Avg Home Cost: $ 1 092 172					
			/4	4		/4	4
VALUES AT RISK	Presence of:				No Change		
	A	Critical Infrastructure	0 or 3	0		0 or 3	0
	B	Dangerous Goods Infrastructure	0 or 3	0		0 or 3	0
	C	Special Values	0 or 3	0		0 or 3	0
			/9	0		/9	0
POLITICAL RISK	A	Local media involvement and no structural impact to Emergency Services or programs	1		Adopt or create a section in the Fire bylaw to address the fire pit dimensions.	1	1
	B	Local media involvement and internal structural changes to Emergency Services or programs	2	2		2	
	C	Regional media involvement, lack of public confidence, and external changes to Emergency Services or county	3			3	
			/3	2		/3	1

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DEFENSIBILITY OF COMMUNITY	DENSITY OF STRUCTUR	A	< 20 m between homes	3	2	No Change	3	2
		B	21 - 40 m between homes	2			2	
		C	41 - 100 m between homes	1			1	
		D	> 100m between homes	0			0	
				/3	2		/3	2
	BARRIERS TO FIRE SPREAD	A	East w/ Barrier within 200m	0 or 2	0	No Change	0 or 2	0
		B	West w/ Barrier within 200m	0 or 4	0		0 or 4	0
		C	South w/ Barrier within 200m	0 or 4	0		0 or 4	0
		D	North w/ Barrier within 200m	0 or 2	2		0 or 2	2
				/12	2		/12	2
	FOREST FUEL PATCH SIZE	A	No forest patch present within community	0	1	No Change	0	1
		B	Patch 0.1 - 0.9 ha within community boundary	1			1	
		C	Patch 1 - 2.9 ha within community boundary	3			3	
		D	Patch > 3 ha within community boundary	5			5	
				/5	1		/5	1
	RESIDENTIAL FIRESMART	A	0-20 %	4	1	Community buy into Firesmart and residents start treating their land.	4	0
		B	21-40 %	3			3	
		C	41-60 %	2			2	
		D	61-80 %	1			1	
		E	81-100 %	0			0	
				/4	1		/4	0
	FUEL MAIN-TENANCE	A	Utility ROW maintenance	0 or 1	0	No Change	0 or 1	0
		B	Fuel maintenance required - other agency	0 or 1	0		0 or 1	0
		C	Fuel maintenance required - municipality	0 or 1	0		0 or 1	0
				/3	0		/3	0
	ACCESS	A	Road width is equal to or greater than 7 m	0 or 1	1	Develop a secondary access into the northern portion of the community. Develop individual lot signage.	0 or 1	1
		B	Loop turnarounds/ cul-de-sacs are suitable for large fire apparatus without back-up maneuvers	0 or 1	0		0 or 1	0
		C	2 or more means of egress	0 or 1	1		0 or 1	0
		D	Standard visible lot signage	0 or 1	1		0 or 1	0
				/4	3		/4	1
	SUPPRESSION CAPABILITY	A	Responding Fire Department has proper equipment for bush fires	0 or 1	0	No Change	0 or 1	0
		B	Fire fighters have basic wildfire fighting training	0 or 1	0		0 or 1	0
		C	Mutual Aid Agreements are present	0 or 1	0		0 or 1	0
		D	Within an adequate distance to firestation and water supply	0 or 1	1		0 or 1	1
				/4	1		/5	1
				TOTAL:	21		TOTAL:	17

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Wildfire Risk Assessment For Rural Communities

				INHERENT		STRATEGIES TO OBTAIN RESIDUAL RISK	RESIDUAL	
COMMUNITY:			Jarvis Bay	Rating	Scores		Rating	Scores
LIKELIHOOD OF OCCURRENCE	FUEL TYPES	A	D Fuels - Deciduous	0 or 1	1	No Change	0 or 1	1
		B	O Fuels - Grasses	0 or 2	2		0 or 2	2
		C	M Fuels - Mixedwood	0 or 3	0		0 or 3	0
		D	C Fuels - Patchy conifer	0 or 2	0		0 or 2	0
		E	C Fuels - Conifer	0 or 4	0		0 or 4	0
				/10	3		/10	3
	SLOPE & FUEL TYPE		VAR on or within 100 m of the top crest of a sustained slope Fuel Type: N/A Slope % : N/A	0 to 6	0	No Change	0 to 6	0
				/6	0		/6	0
	FUEL STRUCTURE – DEAD & DOWN	A	Absent- No dead or down material	0		No Change	0	
		B	Scattered- 3-5m separating logs, branches &	1	1		1	1
		C	Abundant-Continuous logs, branches & twigs	3			3	
				/3	1		/3	1
	FUEL STRUCTURE – LADDER FUEL	A	Absent- <25% of trees have ladder fuels	0	0	No Change	0	0
		B	Scattered- 25% - 75% of trees have ladder fuels	3			3	
		C	Abundant- > 75% of trees have ladder fuels	5			5	
				/5	0		/5	0
	PRESENT LANDSCAPE IGNITION SOURCES	A	Recreation (Presence)	0 or 1	0	No Change	0 or 1	0
		B	Overhead Utility Line adjacent to forest	0 or 1	0		0 or 1	0
		C	< 1 km from primary/secondary roadway	0 or 1	1		0 or 1	1
		D	< 1km from railway	0 or 1	0		0 or 1	0
				/4	1		/4	1
	RESIDENTIAL BURNING TYPES	A	Incinerator Fires	0 or 1	1	No Change	0 or 1	1
		B	Open Fires	0 or 1	0		0 or 1	0
		C	Backyard Fire Pits - Standard Design	0 or 1	1		0 or 1	1
				/3	2		/3	2
	PROBABILITY OF EXTREME FIRE BEHAVIOR	A	Avg # of crossover days > 25 per year	4		No Change	4	
		B	Avg # of crossover days < 25 per year	3			3	
		C	Avg # of crossover days < 20 per year	2			2	
		D	Avg # of crossover days < 10 per year	1	1		1	1
				/4	1		/4	1
	Consequence x Likelihood = INHERENT RISK		168	TOTAL:	8		TOTAL:	8
	Consequence x Likelihood = RESIDUAL RISK		136					

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		Wildfire Risk Matrix																	
		Likelihood																	
		1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35
Consequence	3	3	9	15	21	27	33	39	45	51	57	63	69	75	81	87	93	99	105
	6	6	18	30	42	54	66	78	90	102	114	126	138	150	162	174	186	198	210
	9	9	27	45	63	81	99	117	135	153	171	189	207	225	243	261	279	297	315
	12	12	36	60	84	108	132	156	180	204	228	252	276	300	324	348	372	396	420
	15	15	45	75	105	135	165	195	225	255	285	315	345	375	405	435	465	495	525
	18	18	54	90	126	162	198	234	270	306	342	378	414	450	486	522	558	594	630
	21	21	63	105	147	189	231	273	315	357	399	441	483	525	567	609	651	693	735
	24	24	72	120	168	216	264	312	360	408	456	504	552	600	648	696	744	792	840
	27	27	81	135	189	243	297	351	405	459	513	567	621	675	729	783	837	891	945
	30	30	90	150	210	270	330	390	450	510	570	630	690	750	810	870	930	990	1050
	33	33	99	165	231	297	363	429	495	561	627	693	759	825	891	957	1023	1089	1155
	36	36	108	180	252	324	396	468	540	612	684	756	828	900	972	1044	1116	1188	1260
	39	39	117	195	273	351	429	507	585	663	741	819	897	975	1053	1131	1209	1287	1365
	42	42	126	210	294	378	462	546	630	714	798	882	966	1050	1134	1218	1302	1386	1470
	45	45	135	225	315	405	495	585	675	765	855	945	1035	1125	1215	1305	1395	1485	1575
	48	48	144	240	336	432	528	624	720	816	912	1008	1104	1200	1296	1392	1488	1584	1680
	51	51	153	255	357	459	561	663	765	867	969	1071	1173	1275	1377	1479	1581	1683	1785
	54	54	162	270	378	486	594	702	810	918	1026	1134	1242	1350	1458	1566	1674	1782	1890
	57	57	171	285	399	513	627	741	855	969	1083	1197	1311	1425	1539	1653	1767	1881	1995
	60	60	180	300	420	540	660	780	900	1020	1140	1260	1380	1500	1620	1740	1860	1980	2100
	63	63	189	315	441	567	693	819	945	1071	1197	1323	1449	1575	1701	1827	1953	2079	2205
	66	66	198	330	462	594	726	858	990	1122	1254	1386	1518	1650	1782	1914	2046	2178	2310
	69	69	207	345	483	621	759	897	1035	1173	1311	1449	1587	1725	1863	2001	2139	2277	2415
	72	72	216	360	504	648	792	936	1080	1224	1368	1512	1656	1800	1944	2088	2232	2376	2520

Hazard Rating	
Low	
Moderate	
High	
Extreme	

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Appendix II – Landscape Wildfire Behaviour and Threat Assessment Maps

Note: Landscape maps are currently being developed and will be included in the second drafts.

Appendix III – Wildfire Community Assessment

The Summer Village of Jarvis Bay		
Assessment Date:	**Location:**	
8/27/2014 15:41	**ATS Land Location:**	**Lat/Long Coordinates:**
	39 1 W5	52.335889 114.073709
Emergency Contacts		
Wildfire Management Area (AESRD)	**Village Administration Office**	**County Office**
	1 403 887 2822	1 403 350 2150
Rocky Mountain House 1-403-845-8266	**Utilities Owner (Power)**	**Utilities Owner (Gas)**
	Fortis 310 4300	Direct Energy 866 420 3174 and Fortis 310 4300
Risk Assessment Rating:	**Low**	
General Description of Community:	1. Community separated into two sections, north and south. Both accessible from Hwy 20 2. 134 residences within community 3. 20 - 40 m between homes 4. Community structures: a. Siding generally vinyl or wood b. Roofing generally asphalt, some wood shakes 5. Burning Types: a. Backyard Fire Pits Allowed b. Open Fires Not permitted c. Incinerator Fires Allowed	
Forest Fuel Type(s):	1. Leafless Deciduous (D1); Grass (O1) a. Deciduous distributed throughout the community b. Grass in small patch along Hwy 20 separating village 2. Season of highest Fire Risk (based on fuel types): Spring and fall	
Values at Risk	Presence of: 1. Critical Values: No 2. Dangerous Goods Values: No 3. Special Values: No	
Landscape Description:	1. General Description: Jarvis Bay Provincial Park borders to the north. Jarvis Bay Dr to the south. Hwy 20 to the east. Shores of Sylvan Lake to the west 2. Fire breaks located: Hwy 20; Jarvis Bay Drive; Sylvan Lake 3. Adjacent Communities: a. Town of Sylvan Lake to the south b. Jarvis Bay Provincial Park to the north	

<table>
<tr><td>Community Access Road:</td><td>Width:</td><td>6.5 m</td><td>Total Length:</td><td>2 km</td></tr>
<tr><td>Private Driveway:</td><td>Average Width:</td><td>4 m</td><td>Average Length:</td><td>15 m</td></tr>
<tr><td>Utilities Present in Community (power, pipeline)</td><td colspan="4">1. Powerlines present
Vegetation underneath powerlines maintained
2. Natural gas distribution lines present</td></tr>
<tr><td>Emergency Response and Wildfire Suppression Description:</td><td colspan="4">Emergency Response:
1. Sylvan Lake Fire Department
5 km south of Jarvis Bay
2. Bentley Fire Department
17 km north of Jarvis Bay
Community Access:
1. TWO means of access/egress into the community.
2. Access road width IS suitable for accommodating safe access/ egress by residents and emergency responders.
3. Loop turnarounds ARE suitable for large fire apparatus without back up maneuvers.
4. Ditches ARE suitable for two-way travel in most cases; steep in places.
Water Supply:
1. Water tenders
Water tenders reload from Sylvan Lake fire hydrants (400+ in town)
Wildfire Suppression:
1. Expected difficulty to control in high wildfire hazard (based on Head Fire Intensity)
a. Spring: HFI 3: Moderately vigorous surface fire, Rate of spread: 1.5 - 3.0 m/min.
b. Summer: HFI 1: Smouldering ground or creeping surface fire, minimal spread rates
c. Fall: HFI 3: Moderately vigorous surface fire, Rate of spread: 1.5 - 3.0 m/min.</td></tr>
<tr><td rowspan="2">Completed Residential Fuel Management:</td><td colspan="4">Residential FireSmart Treatment Completed:
Yes</td></tr>
<tr><td colspan="4">Treatment Details:
Residences are very well maintained. Very few if any houses need vegetation management beyond what has been done.</td></tr>
</table>

Completed Municipal Fuel Management:	**Municipal FireSmart Treatment Completed:** **No**
	Treatment Details: Ditches and community areas are very well maintained. There is very little forested area within community.
1. REVIEW DATE:	**August 27, 2014**
2. REVIEWED BY:	**Ryan Archibald (CPP Environmental)**
3. NEXT REVIEW:	**August 27, 2017**
4. ASSIGNED TO:	**Chief Administration Officer**