# Husula Highlands

## FIRESMART COMMUNITY ASSESSMENT REPORT

Prepared for

REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

&

HUSULA HIGHLANDS FIRESMART BOARD

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## Acknowledgments

A number of Husula Highlands residents have contributed a significant amount of time and energy to this FireSmart project. Even before this project was initiated and made possible by the Regional District of Okanagan-Shuswap, a core group of concerned residents had formed the Husula Neighbourhood Fire Watch group. The existence of this group made the initiation of the FireSmart Community Recognition process much easier. The author thanks all the residents who participated in the community FireSmart event, as well as the guest speakers from the Penticton Indian Band, RDOS, Penticton Fire Department, and RCMP who provided their time and expertise to make the event a success. Mark Woods, Community Services Manager with the RDOS, has been a strong supporter of wildfire management initiatives in the region and his efforts on behalf of residents are greatly appreciated. Special acknowledgement goes to the following Husula Highlands residents for their commitment and effort to helping to make their neighbourhood a FireSmart Community:

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# Table of Contents

## List of Tables



## List of Figures

# 1.0 Introduction

The FireSmart Canada Community Recognition Program is designed to provide an effective management approach for preserving wildland living aesthetics while reducing community ignition potential during a wildland-urban interface (WUI) fire. The program can be tailored for adoption by any community and/or neighborhood association that is committed to ensuring its citizens maximum preparation for wildland fire. The following Community Assessment Report (CAR) is intended to be a resource for residents of Husula Highlands for carrying out the recommendations and actions contained in the Husula Highlands FireSmart Community Plan (FCP).

Both the CAR and FCP have been developed by a trained Local FireSmart Representative (LFR), in conjunction with the Husula Highlands FireSmart Board. Funding for the Husula Highlands FireSmart project was provided by the Union of BC Municipalities (UBCM) Strategic Wildfire Prevention Initiative in the form of a FireSmart Planning Grant to the Regional District of Okanagan-Similkameen (RDOS). The grant enabled the RDOS to retain the services of Davies Wildfire Management Inc. to manage the project, in collaboration with the Husula Highlands FireSmart Board.


*FIGURE 1 Prior to the Husula FireSmart project, a group of concerned and motivated residents took the initiative to form their own 'Husula Neighbourhood Firewatch' group and installed signage at the beginning of the Max Lake road.*

Prior to the start of this project, a small group of concerned and motivated residents of Husula Highlands had formed their own ‘firewatch’ group. Stemming from a growing concern for wildfire safety in their neighbourhood, the firewatch group compiled email and phone lists and even installed their own fire prevention signage on the Max Lake road on the western edge of Husula. The work of the firewatch group helped to get this FireSmart project off the ground sooner and their efforts should be commended.

Community assessments were carried out in May-June 2017 by Andrew Low, RPF and John Davies, RPF. Sample site assessments on four properties were also conducted on June 22 with three residents of Ryan Road and one resident of Forsyth Drive.

## 2.0 Definition of the Ignition Zone

Husula Highlands (Husula) is situated in a wildfire environment. The wildland areas surrounding the community are typical of ecosystems that have developed with historically frequent low intensity fires. With the advent of modern forest protection policies, the typical fire cycle has been interrupted, contributing to a host of cascading ecological effects, including a buildup of forest fuels.

Wildfires have and will continue to occur in the Okanagan – attempting to eradicate fire has proven to be an impossible strategy. The variables in a wildfire scenario are when the fire will occur, and where. This assessment report addresses the wildfire- related characteristics of Husula and examines the area's exposure to wildfire as it relates to home ignition potential. The assessment does not focus on specific homes, but examines the entire community.

A house ignites during a wildfire because of its relationship with everything in its surrounding ignition zone - the house and its immediate surroundings. To avoid a home ignition, a homeowner must eliminate the wildfire's potential relationship with their house. This can be accomplished by interrupting the natural path a fire takes. Changing a fire's path by clearing the ignition zone is an action that can prevent home loss. To accomplish this, flammable items such as excessive vegetation and flammable debris must be removed from the area immediately around the structure to prevent direct flame contact with the house. Reducing the volume of live and dead vegetation will affect the intensity of the wildfire as it nears the home.

Included in this assessment are observations made while visiting Husula. The assessment addresses the ease with which home ignitions can occur under severe wildfire conditions and how these ignitions might be avoided within the ignition zones of affected residents. Husula residents can reduce the risk of structure loss during a wildfire by taking actions within their ignition zones. This zone principally determines the potential for home ignitions during a wildland fire; it includes a house and its immediate surroundings within 100 m (Figure 2). Given the extent of this zone, the ignition zones of several homes sometimes overlap, and often spill over onto adjacent public or community land.

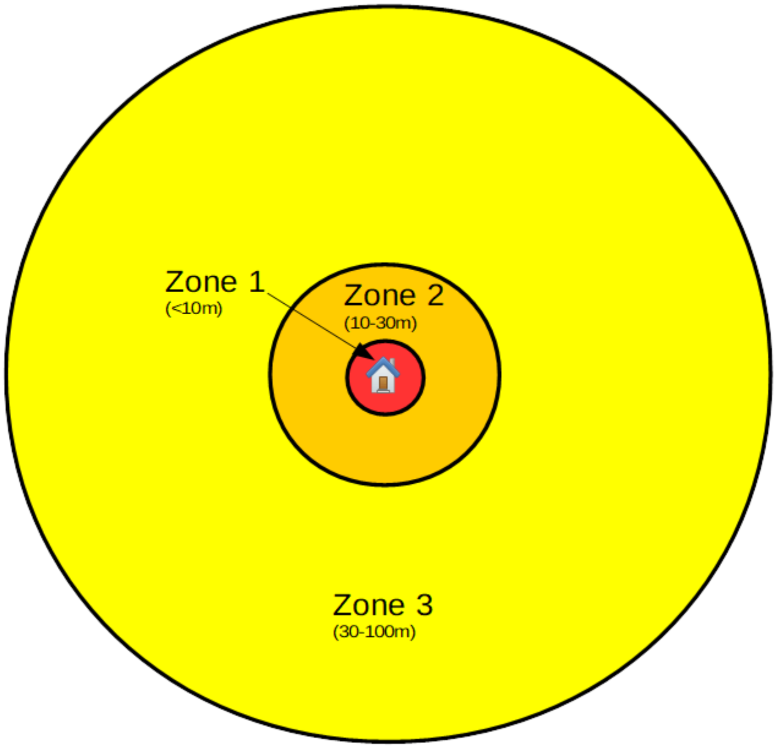



*FIGURE 2 FireSmart Canada utilizes the concept of three priority zones surrounding a home to help residents prioritize their hazard reduction efforts. A home's immediate surroundings (Zone 1) is of immediate concern to the homeowner and should targeted aggressively to reduce ignition hazards to the home.*

The results of the assessment indicate that wildfire behaviour and subsequent losses will be dominated by the residential characteristics of this area. The good news is that residents will be able to substantially reduce their exposure to loss by addressing neighbourhood vulnerabilities. Relatively small investments of time and effort will reap great rewards in wildfire safety.

## 3.0 Description of the Fire Environment

Wildland fire behaviour is influenced by the interaction of three broad environmental factors: fuel, weather and topography. Collectively, these factors describe the fire environment and determine the intensity and rate of spread of a wildland fire. A working knowledge of the factors that characterize the fire environment is helpful to building an awareness of hazard mitigation at the site level.

### 3.1 Fuels

In the context of wildland fire, fuel refers to the organic matter involved in combustion. When referring to the wildland-urban interface, structures, vehicles and other improvements become a component of the fuel complex. An awareness of the fuel conditions around the home will help residents properly assess and mitigate fuel hazards.

In Canada, wildland fuels are classified into 16 fuel types within the Canadian Forest Fire Behaviour Prediction (FBP) System. The FBP system is informed by the Canadian Forest Fire Danger Rating System (CFFDRS), which is the primary tool to obtain predictive wildfire management intelligence used by agencies across Canada.

### 3.1.1 Fuel layers

The structure and arrangement of fuels are described in terms of their horizontal and vertical continuity within three broad layers of the fuel complex – ground fuels, surface fuels and canopy (or aerial) fuels (Figure 3). Ground fuels occupy the *duff layer* and the uppermost portions of the soil mineral horizon. In general terms, the duff layer is comprised of decomposing organic material and is found beneath the litter layer and above the uppermost soil mineral horizon (A-horizon). The constituents of the duff layer lack identifiable form due to decomposition (as opposed to the *litter layer*, which is composed of identifiable material).

The surface fuel layer begins above the duff layer and extends 2 m vertically. Surface fuels are characterized by the litter layer (leaves, needles, twigs, cones etc.) as well as plants and dead woody material up to a height of 2m. In some cases, surface fuels may act as *ladder fuels* that can carry fire from the surface fuel layer into the canopy layer.

Canopy fuels are the portions of shrubs and trees that extend from 2 m above the duff layer, upwards to the top of the fuel complex. Certain tree species, such as several spruce species (*Picea sp.)* are characterized by branches extending down to the forest floor, whereby these lower branches act as ladder fuels. Other species, particularly those found in drier, fire-maintained ecosystems, such as Ponderosa pine, lack these ladder fuels and form a distinct separation between the surface fuel layer and canopy fuel layer.

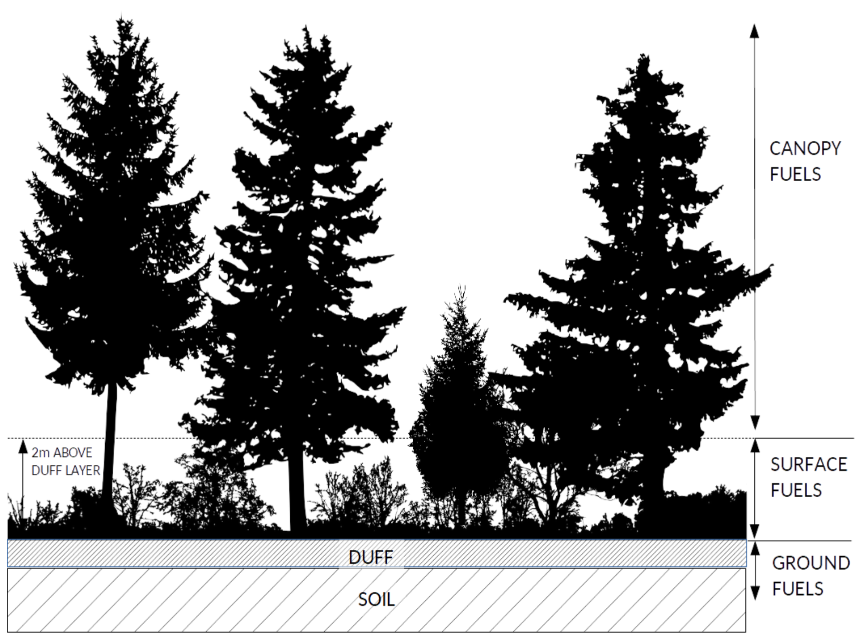



*FIGURE 3 Wildland fuels can be described within three broad fuel layers: Ground fuels, surface fuels (to a height of 2 m above the duff layer), and canopy fuels. Canopy fuels are also referred to as aerial fuels.*

### 3.1.2 Fuel size

Wildland fuel can be further described in terms of relative size – so called *fine fuels* and *coarse* or heavy fuels. Fine fuels include leaves and conifer needles, grasses, herbs, bark flakes, lichen, twigs etc. Large branches, downed logs and other large woody material are considered coarse or heavy fuels. Fine fuels have a higher surface area/volume ratio than coarse fuels, and this characteristic influences the rate of drying and ease of ignition.

With a higher surface area/volume ratio than coarse fuels, fine fuels are more readily influenced by changes in environmental conditions (e.g. relative humidity, wind, precipitation etc.). Dead fine fuels react to changes in environmental conditions at a relatively faster rate than green (i.e. live) fine fuels.

When available to burn, fine fuels ignite more easily and spread fire faster than coarser fuels. This characteristic makes fine fuels particularly susceptible to ignition from embers. For any given fuel, the more there is and the more continuous it is, the faster the fire spreads and the higher the intensities. Finally, fine fuels take a shorter time to burn out than coarser fuels.

## 3.2 Weather

Weather conditions affect the moisture content of wildland fuels and influence the rate of spread and intensity of a wildland fire. Weather is the most dynamic element of fire environment and the most challenging to assess and forecast.

### 3.2.1 Wind

Wind speed and direction influences the rate and direction of spread of a wildland fire. The application of wind on open flame has the effect of tilting the flame away from the wind, and, in the case of wildland fire, placing the flame into closer proximity (or contact) with downwind fuels, and contributing to fire spread. Wind can also contribute to a preheating effect on fuels immediately downwind from open flame.

Wind can also hasten the drying process of exposed fuel, with the rate of drying being a function of the surface area/volume ratio. Having a relatively higher surface area/volume ratio, fine fuel moisture content is affected to a greater degree by wind when compared to coarse fuel.

### 3.2.2 Precipitation and relative humidity

The effect of moisture, in the form of precipitation or atmospheric moisture, on wildland fuel is dependent on the size and state of the fuel. The moisture content of dead fine fuel is highly reactive to changes in relative humidity, precipitation and wind. Fine fuels require less precipitation to reach saturation than do coarse fuels, and in turn dry out at a faster rate.

The moisture content of wildland fuel is constantly seeking to equalize with the moisture content of the surrounding air. This effect is most pronounced with dead fuel. When the relative humidity is high, dead fine fuels will readily absorb moisture *from* the air and conversely, when the relative humidity is low, dead fine fuels will readily give up moisture *to* the air.

### 3.3 Topography

In the context of the fire environment, topography refers to the shape and features of the landscape. Of primary importance for an understanding of fire behaviour is slope. When all other factors are equal, a fire will spread faster up a slope than it would across flat ground. When a fire burns on a slope, the upslope fuel particles are closer to the flame compared to the downslope fuels. As well, hot air rising along the slope tilts the flame uphill, further increasing the ease of ignition of upslope fuels. A pre-heating effect on upslope fuels also contributes to faster upslope fire spread.

Topography influences fire behavior principally by the steepness of the slope. However, the configuration of the terrain such as narrow draws, saddles and so forth can also influence fire spread and intensity. Slope aspect (i.e. the cardinal direction that a slope faces) determines the amount and quality of solar radiation that a slope will receive, which in turn influences plant growing conditions and drying rates.

### 3.4 Husula Fire Environment

Husula is situated in a fire environment characterized by fuel, weather and topographical factors that are conducive to the type of fire behaviour that could lead to home losses in the event of a WUI fire. An awareness of these conditions is key to focusing on the critical elements of hazard mitigation at the site level.

#### 3.4.1 C7 Fuel type

In Husula, the FBP fuel type is C7 – Ponderosa Pine – Douglas-fir. The C7 fuel type is characterized by relatively open (<50% canopy closure), uneven-aged stands of Ponderosa pine (*Pinus ponderosa)* and Douglas-fir (*Pseudotsuga menziesii).* Generally, surface fuels are characterized by perennial grasses, herbs, and scattered shrubs. In the absence of periodic fire (or other maintenance), needle litter tends to build up and persist for some time. Duff layers are relatively shallow – typically less than 3 cm.

#### 3.4.2 Climate and weather

The climatic conditions of the southern interior of British Columbia are broadly characterized by warm, dry summers and cool winters. The south Okanagan is classified as a cold semi-arid climate. Not surprisingly, July - August is the period with lowest average relative humidity and highest daily average temperatures. What may be surprising to people not familiar with the southern interior climate is that June is normally the month with the highest average precipitation amounts (Figure 4).

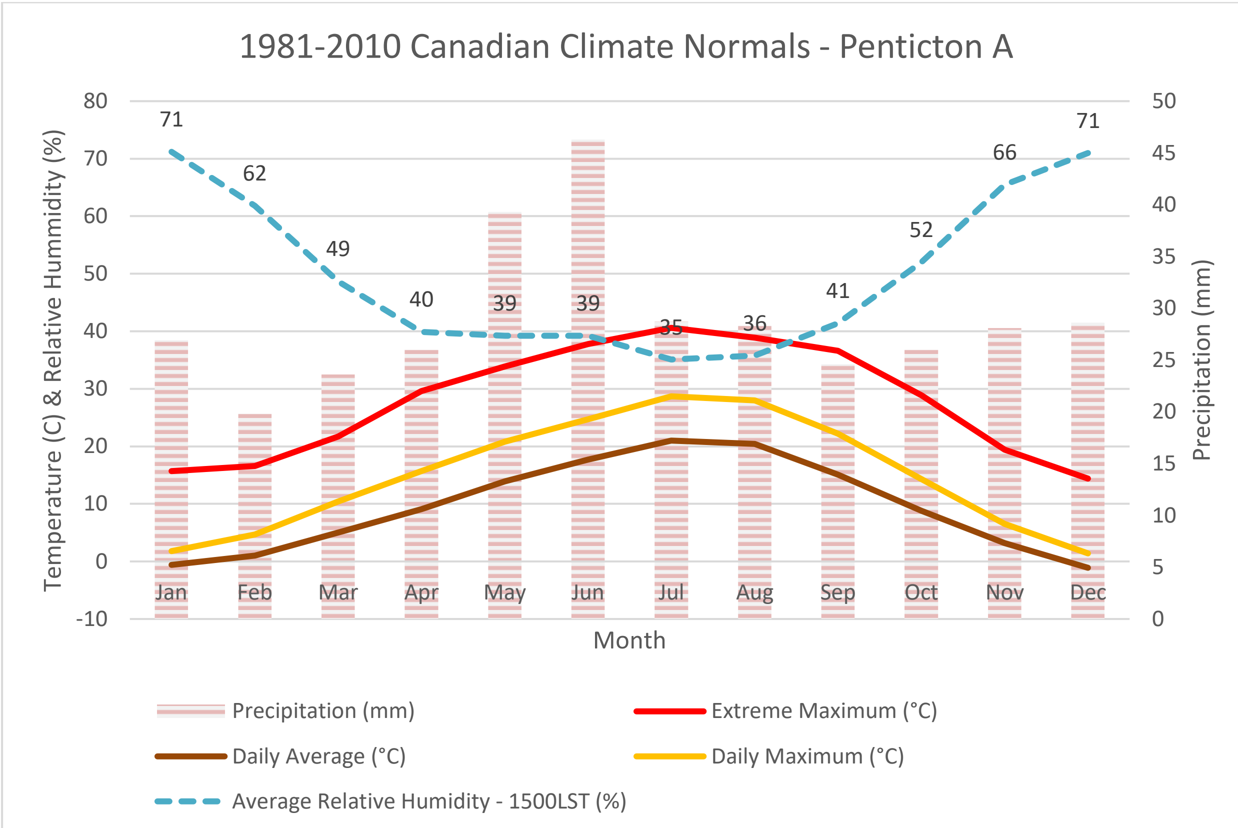



*FIGURE 4 Canadian climate normals (1981-2010) for the Environment Canada Penticton 'A' weather station at the Penticton regional airport. July and August experience the lowest average relative humidity and highest temperatures. Important to note that the Penticton area routinely experiences relative humidity values well below the average values, on a diurnal pattern.*

As illustrated in Figure 4, the information presented for relative humidity is the average daily 1500 LST observation. The published climate normals data does not include extreme minimum observations of relative humidity and it is important to bear in mind that summer minimum relative humidity observations occasionally fall below the average, sometimes to extremely low percentages. Relative humidity in the teens or even lower do occur in the Okanagan during the peak fire season. Occasions when the temperature value is higher than the relative humidity value are critical fire weather conditions that can lead to fast-spreading, intense wildfire behaviour. For example, an ambient air temperature of 30°C and a relative humidity of 25% (an example of a condition known as *cross-over*) can contribute to a greater ease of ignition in fine fuels, faster rate of spread and higher fire intensity. The most frequent wind direction at the Penticton airport is from the north (Table 1). Local topography will influence wind direction and speed at the microscale, and for this reason Table 1 data is provided for information only.

*TABLE 1 Wind station data (1981-2010) for the Environment Canada Penticton A weather station at the Penticton regional airport. For the purposes of characterizing the Husula fire environment, of interest is the predominant wind direction (blowing from the North) during fire season. Maximum wind speeds and directions are much more variable but provide a sense of the potential wind effects in the area.*

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean of hourly wind speed (km/h) | 14 | 12 | 11 | 10 | 9 | 9 | 9 | 9 | 9 | 11 | 15 | 15 |
| Most frequent direction | S | S | S | N | N | N | N | N | N | N | S | S |
| Maximum hourly speed (km/h) | 65 | 72 | 68 | 64 | 68 | 61 | 67 | 74 | 60 | 80 | 80 | 84 |
| Direction of maximum hourly wind speed | S | S | S | S | SW | SE | N | SW | S | S | S | S |
| Maximum gust speed (km/h) | 85 | 93 | 113 | 121 | 97 | 81 | 109 | 89 | 97 | 101 | 97 | 113 |
| Direction of maximum gust | S | N | NW | W | S | S | N | N | N | S | S | NW |

### 3.4.3 Topography

Husula is situated on a broad north-south ridge on the lower southern base of Mount Nkwala (Figure 5). Husula lies above Max Lake (also known as Madeline Lake) to the west and the neighbourhood of West Bench to the east (Figure 6). During northerly winds Mount Nkwala likely creates lee-side turbulence (i.e. eddying), leading to variable or erratic local wind conditions. During calm, warm, and sunny conditions, the predominant southerly aspect of Husula creates upslope winds during daytime heating.

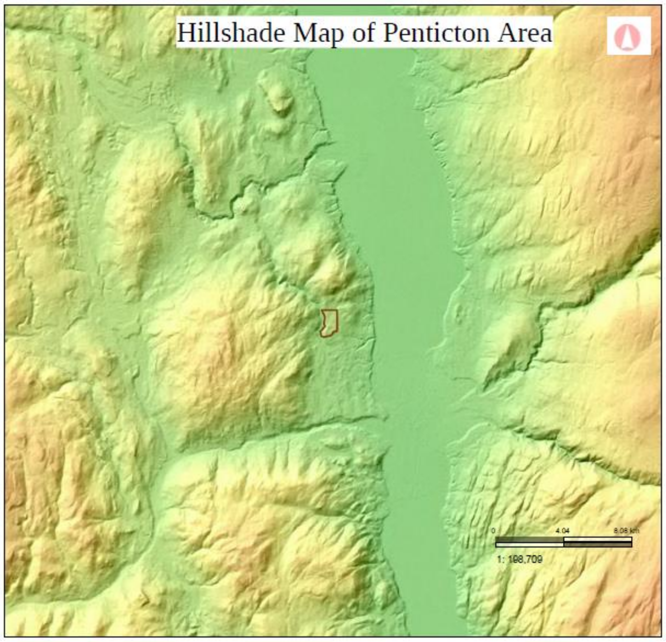



*FIGURE 5 Hillshade map of the Penticton area, with the Husula project area outlined.*


*FIGURE 6 Composite Google Earth 3D image depicting the general topography of Husula. Approximate perspective is looking north along the broad ridge upon which Husula is situated, with Mount Nkwala pictured in the upper left.*

## 4.0 Site Description

The Husula FireSmart project area is approximately 50 ha and includes 67 homes in an established wooded suburban neighbourhood (Figure 7). The majority of homes in the project area were constructed in the late 1970s and early 1980s, with infill occurring at various points through the late 1980s and 1990s. Lot sizes are relatively large compared to modern suburban developments and this feature has resulted in a home density of 1.3 homes per hectare in the project area.

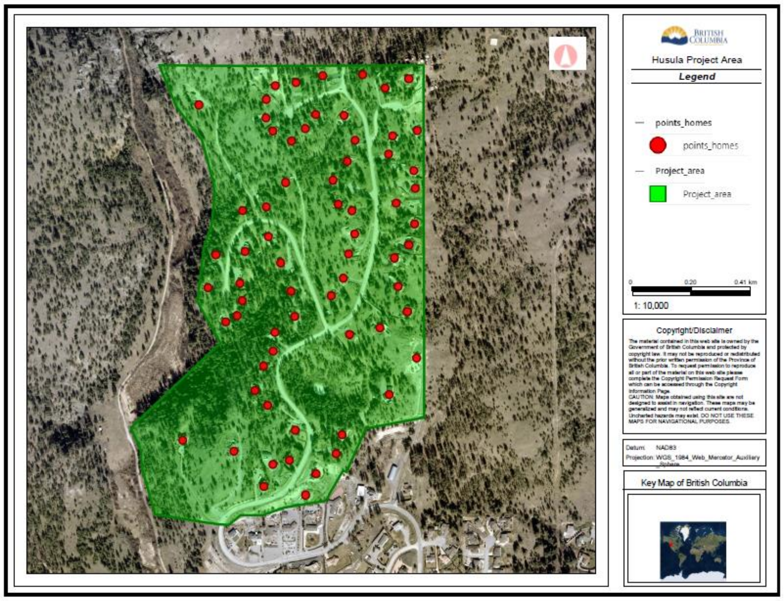



*Figure 7: The Husula FireSmart project area is approximately 50 ha and includes 67 homes. See Appendix 3.*

## 4.1 Ecology

The ecological classification of the area is defined as the Ponderosa Pine biogeoclimatic zone, specifically the Okanagan Very Hot Dry Ponderosa Pine Variant (PPxh1). The natural disturbance pattern of the PPxh1 and adjacent Interior Douglas-Fir and Bunchgrass zones (See Appendix 3) has been characterized by historically *frequent stand maintaining fires* prior to the fire-return interval being interrupted by contemporary forest management and fire suppression policies. Stand maintaining fires are typically low intensity surface burns that consume understory fuels while retaining a healthy green overstory. These frequent fires kept ladder fuels to a minimum and typically resulted in an open, park-like stand structure.

In the absence of periodic low intensity fire in the area, small trees that would have typically been fire-killed have become established, forming thickets and creating ladder fuels and resulting in relatively higher tree densities. Fine fuels, most notably dead Ponderosa pine needles, have accumulated at the base of mature trees, resulting in higher fine fuel loading that could produce fire intensity great enough to result in lethal scorching of trees whose thick bark would have otherwise protected the vital phloem and cambial tissues.

## 4.2 Land Status

The land within the Husula project area is residential private property. The project area is part of a 160ha tract of (primarily) residential private land that is bordered on all sides by the Penticton 1 Reserve of the Penticton Indian Band (See Appendix 3). This situation provides opportunities for Husula (as represented by the Regional District of Okanagan-Similkameen) to partner with the Penticton Indian Band on fuels management funding opportunities that are mutually beneficial to both communities.

Husula is not administered by the City of Penticton, rather, it is within the local government jurisdiction of the Regional District of Okanagan-Similkameen (though Husula is covered by a protection agreement between RDOS and Penticton for the provision of fire protection services).

## 4.3 Fire History

Fire history data from the provincial government indicates that the Penticton area around Husula has been visited by fire numerous times since modern fire record-keeping began in the early 1900s. The area experienced frequent low-intensity natural and anthropogenic fires prior to modern fire suppression policies. At the landscape scale, a number of large fires have occurred in the surrounding area, the most recently significant being the 1994 Garnet fire east of Penticton. The immediate Husula area has two fires greater than 3 ha on record, dating to 1962 and 1970, respectively (Figure 8).

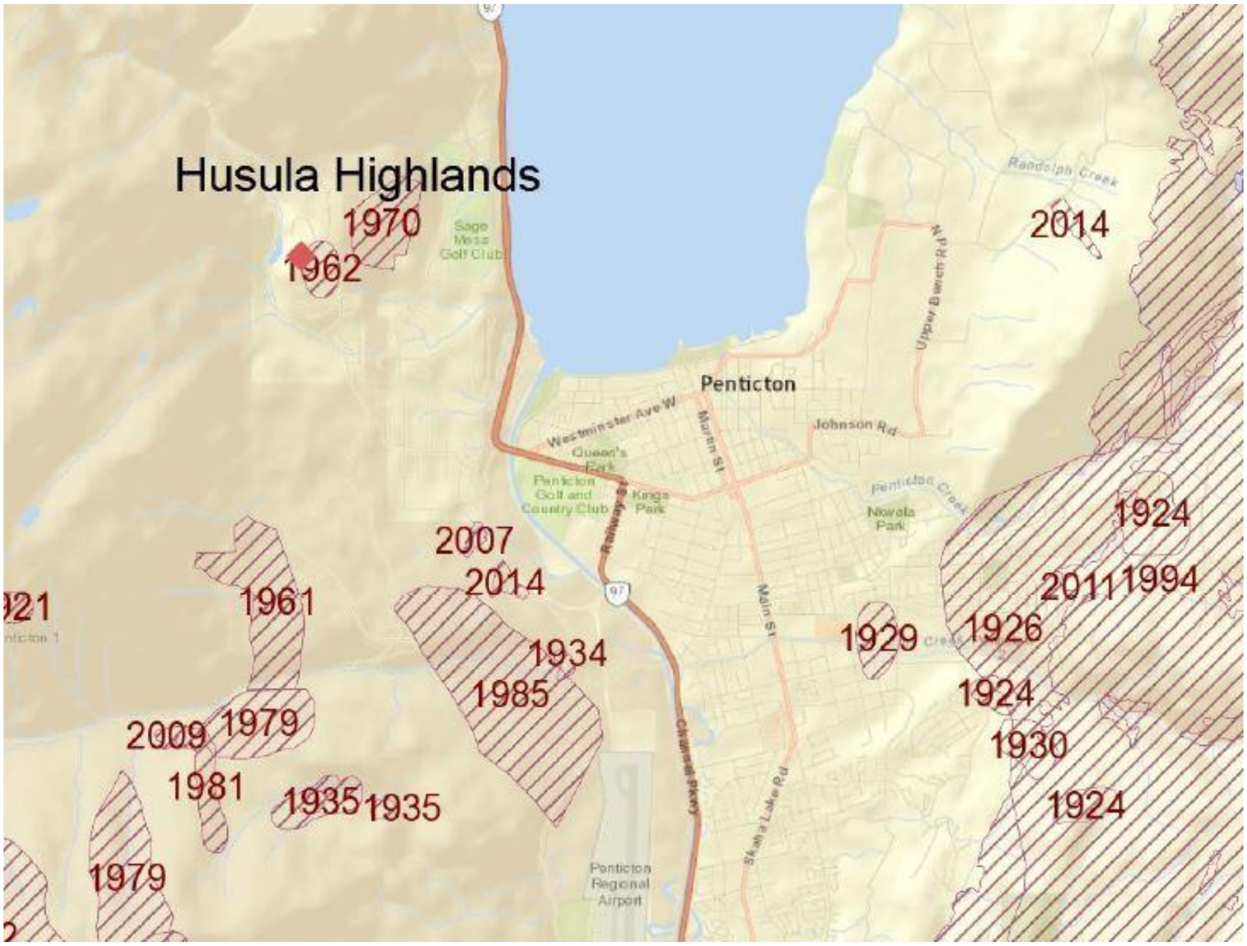



*FIGURE 8 Historic fire perimeters (greater than 3ha) dating back to the early 1900s, as recorded in the BC Wildfire Service fire history database. The most recently significant fire was the 1994 Garnet Fire on the eastern edge of Penticton. See Appendix 3.*

### 4.3.1 Past wildfires near Husula

The modern provincial dataset for detailed fire information, including fire cause, dates to the 1950s. This dataset shows a total of 76 wildfires occurring within two kilometers of the approximate Husula project area between 1950 and 2017. Of these fires, eight are recorded as lightning-caused and 68 as person-caused. The dataset indicates an approximate average of one fire per year within two kilometers of Husula, with the most fires in a single year (10 person-caused fires) occurring in 1960.

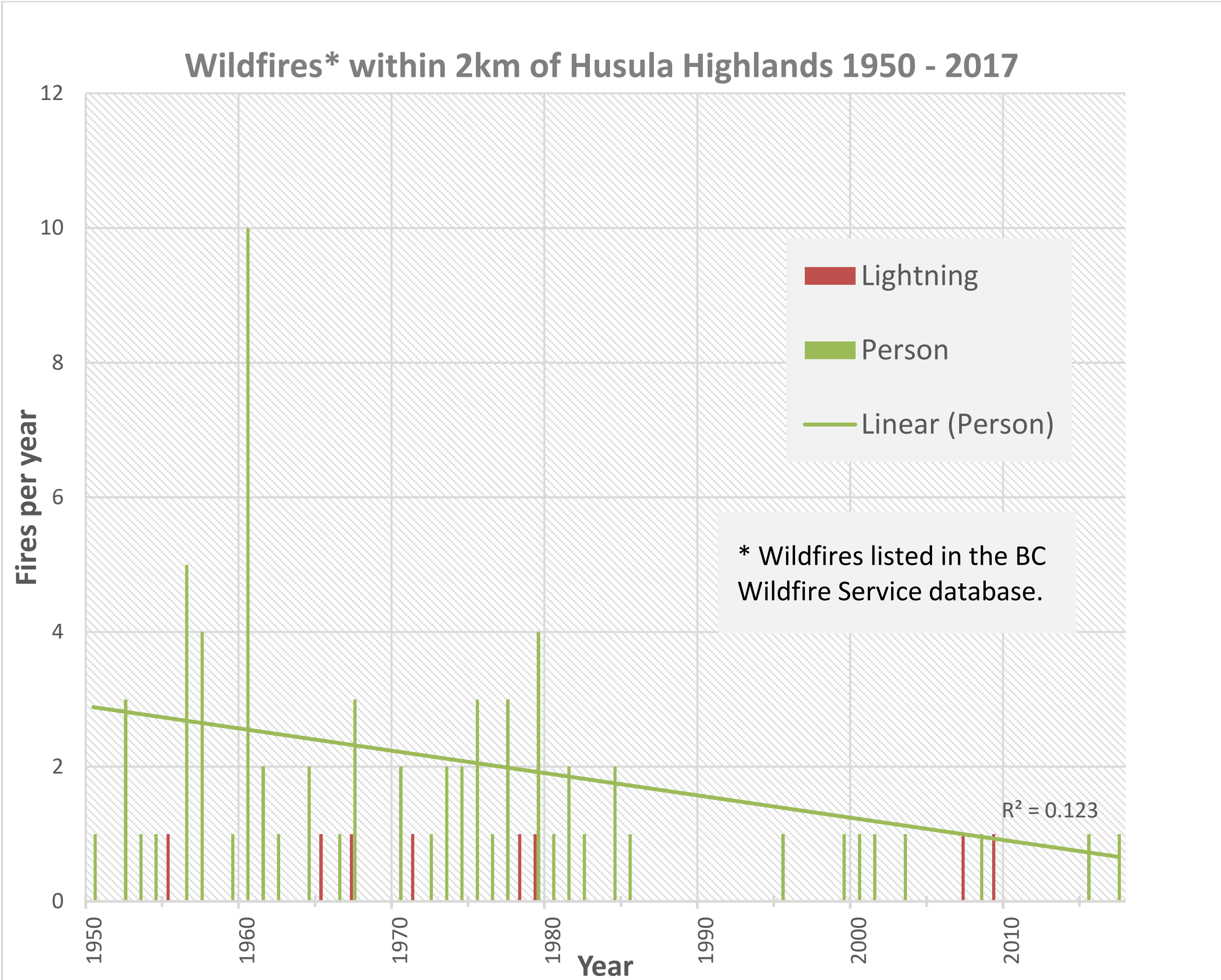



*FIGURE 9 Wildfires that have occurred within 2km of Husula, from 1950 to 2017, as recorded in the BC Wildfire Service fire history database. During this period, the occurrence of person-caused fires shows a gradually decreasing trend.*

Interestingly, the trend from 1950 to 2017 is a decrease in the occurrence of person-caused fires within two kilometers of Husula, with a notable reduction beginning in the mid-1980s (Figure 9). This period corresponds with the initial stages of development and residential occupation of the Husula area and the decrease in wildfire occurrence may be attributed to increased fire prevention, detection and/or protection, however further analysis of the factors influencing this trend would be needed to definitively point to a cause. The trend may simply be attributable to fewer wildfires being fought by the BC Wildfire Service (BCWS) and instead being suppressed by either the Penticton Fire Department or the Penticton Indian Band volunteer fire department and ultimately not being reflected in the provincial wildfire dataset.

### 4.3.2 Westwood Drive WUI fire, 2017

The most recent scare for residents of Husula came on July 20, 2017 with the Westwood Drive fire, which occurred firmly within the WUI. Remarkably, fire department and BCWS responders were able to limit the fire size to 0.5 ha and no structures were destroyed. There was, however, roof damage to two nearby homes and an evacuation of approximately 40 residences.

The two damaged roofs both had cedar shakes which ignited due to embers from the wildfire. In this particular incident firefighting resources were able to contain the fire and save the two homes, however, the outcome could very easily have been significantly different. A different combination of fuel and weather conditions could have created more severe burning conditions. Additionally, firefighting resources could have already been committed to other emergencies, which may have delayed a response. The Westwood Drive fire highlights the need for homeowners to assess their properties and make them FireSmart so that the survival of homes in the WUI is not solely dependent on a fast and aggressive response from fire services.

## 5.0 Assessment Process

An initial reconnaissance of the project area was conducted May 1, 2017 by the author to gain familiarity with the neighbourhood in the context of FireSmart guidelines. The assessment process follows the three-phased approach of the FireSmart Canada Community Recognition Program (FCCRP).

A letter was mailed out to all addresses in the Husula project area, inviting them to the initial FireSmart community meeting, held on May 10, 2017 at West Bench Elementary School. The meeting was an opportunity to learn about the FireSmart Communities Program and explain the community recognition process. The Husula FireSmart Board was formed during the meeting, and this process was made easy as a core group of residents had already formed into a firewatch group prior to the start of the FireSmart project.

A more in-depth landscape assessment was conducted on June 22, 2017. At that time, four Structure and Site Hazard Assessments were completed with homeowners who had been solicited by the Board. This was an opportunity to ground truth some of the big picture perceptions of the landscape assessment while also establishing some baseline data points that residents could refer to.

The Husula FireSmart event was held on the evening of June 22, 2017 in the cul-de-sac of Forsyth Place. The event was attended by approximately 60 people, with guest speakers from the Penticton Indian Band, Penticton Fire Department, RDOS, and RCMP. Light refreshments were provided at the event, along with short presentations on the FireSmart program, WUI response, and evacuation processes. A demonstration of the Structure and Site Hazard Assessment was conducted by the author and included and Q&A session and discussion regarding next steps.

# 6.0 Observations and Issues

The following observations were noted during the community wildfire hazard assessment. See Appendix 1 to view the entire community wildfire hazard assessment form and notations.

## 6.1 Roof assemblies

A home's roof is the largest surface most exposed to embers during a wildfire. Homes with a flammable wood shake roof have a much higher probability of igniting during a wildfire compared to non-wood roofing systems. In Husula, a mix of roofing materials are in use, the most common being composite shingles (i.e. asphalt shingles), while a smaller percentage have metal roofs or torch-on roofing systems. At least one home was noted as having a wood shake roof. A wood shake roof is not recommended in a WUI area.

Most of the roofs observed had some amount of Ponderosa pine needle litter accumulation on the roof surface. The fire-resistant properties of a rated roof are reduced when flammable accumulations are present. Areas dominated by a Ponderosa pine overstory, such as Husula, will likely always have some amount of needle litter present on roofs, especially after periodic wind events. The key problem areas that should be attended to are accumulations that occur at a roof to wall joint (e.g. where a dormer meets the roof), in the rain gutters or in or near any opening in the roof (vent, skylight etc.). Inspecting and cleaning debris accumulations in the spring, prior to the start of the summer fire season is a recommended practice.

## 6.2 Building exteriors

Risk factors associated with the exterior surface of a structure are less dependent on the characteristics of the exterior cladding system (i.e. stucco vs. cement board vs. vinyl siding etc.) and more dependent on the likelihood of direct flame contact and/or ember accumulation on the structure. Accumulated fuel along an exterior wall can negate the fire-resistant advantages that any particular exterior cladding system provides, should the fuel ignite.

This is especially important when assessing features that are attached to a home, such as decks and porches. Decks are often used for dry storage of a variety of materials, including firewood, building materials, outdoor furniture etc. Should these stored materials ignite, the deck above is likely to ignite as well, most likely leading to the ignition and subsequent destruction of the home.

Decks that extend out over a slope require careful assessment. A fuel-laden slope leading up towards a deck could result in direct flame contact or ember accumulation on the deck or stored material under the deck. The underside of the deck may also trap heat from a fire coming upslope towards the structure, further contributing to increased ease of ignition.

When boards are used for the decking surface, any gaps between boards should be viewed as avenues for organic debris to fall through and accumulate underneath the deck. These gaps can also permit embers to fall through and ignite accumulated debris under the deck, likely resulting in the ignition of the deck and the house.

If combustible material is going to be stored under a deck, this area should be sheathed in 12 mm exterior-grade plywood or screened with 3 mm non-corrosive metal screening to prevent embers from entering the space and igniting the stored material. Areas underneath deck boards should be assessed for debris accumulations and cleaned out as needed. When a deck extends out over a slope, fuel mitigation efforts need to be extended further down the slope. FireSmart Canada has developed a guideline for expanding the treatment area on slopes below a structure, as illustrated in Figure 10.

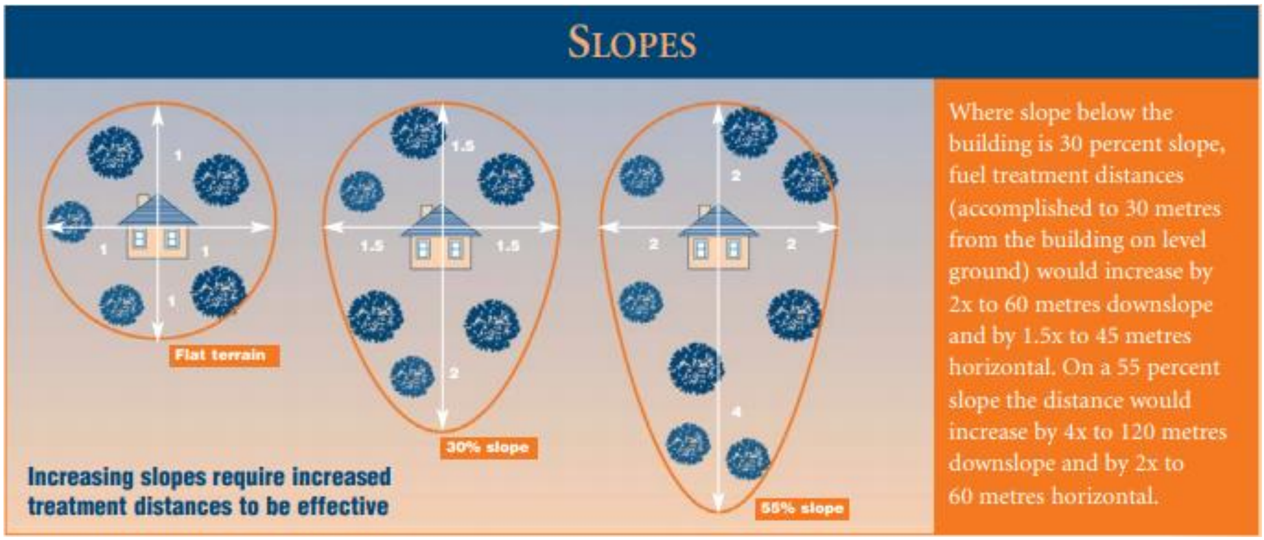



*FIGURE 10 FireSmart Canada recommends expanding the treatment areas downslope from a home to account for the increased rate of spread and associated fire intensity of a fire spreading upslope towards the house (Figure reproduced from the Protecting Your Community from Wildfire manual published by FireSmart Canada and Partners in Protection).*

### 6.3 Vegetation

Vegetation is assessed in three concentric zones around a home (Figure 2), with Zone 1 being the area occupying the first 10 m around the structure. The quantity and condition of canopy, ladder and surface fuels are the key factors assessed.

In Husula, Ponderosa pine and Douglas-fir are the dominant canopy fuels across all zones. Most homes observed had one or more mature Ponderosa pines established within Zone 1 or at least Zone 2. Separated or continuous conifer trees within Zone 1 represent a hazard, when assessed using the Structure and Site Hazard Assessment form from FireSmart Canada. In this case the author disagrees with the assessment form when assessing *occasional well-spaced and pruned Ponderosa pines* occupying Zone 1.

It is recognized that the structure and site hazard assessment form is a national assessment tool that can't possibly consider all variations in overstory composition and tree morphology that could be found across all WUI areas in Canada, while still being a simple and accessible tool for homeowners to use. One drawback of this simplified approach to conifers in Zone 1 is that homeowners may feel obligated to remove one or more well-spaced and pruned conifers (as are common with Ponderosa pines in Husula) because this factor contributes 30 points to their overall hazard rating, which places the structure into the 'High' hazard level even if all other factors score zero. This type of tree removal most often requires a tree service provider, at considerable expense.

A more nuanced view of well-spaced and pruned conifers in Zone 1 is taken by the author, in the hope that the hazard mitigation efforts (and expense) of homeowners can be better targeted towards more prescient hazard factors.

To be clear, *this proviso applies only to well-spaced and pruned conifers that won't readily support torching* (i.e. a tree burning completely from bottom to top). Conifers with ladder fuels that connect surface fuels with canopy fuels, such as various ornamental and native spruce, *present a very real hazard when occupying space in Zone 1 and should be considered for removal*. It should also be reiterated that mature Ponderosa pine can produce a considerable amount of needle litter, and this characteristic may in fact be a more significant hazard (fortunately, one that is easier and significantly less costly to mitigate).

One vegetation feature that is very popular and pervasive in landscaping (including examples in Husula) is the use of arborvitaes (cedar) and juniper shrubs and hedges (Figure 11). The presence of these conifers in Zone 1 needs to be carefully considered, as they are extremely volatile from a fire behaviour standpoint. Having a cedar or juniper shrub growing up against a house could very well be the source of a home ignition in the very likely event that these plants combust during a wildfire. A long cedar hedge that leads up to a house can be viewed as a veritable wick of fuel waiting for a wildfire to light it.

*FIGURE 11 Several homes in Husula are characterized by the presence of volatile vegetation, such as cedar and juniper shrubs, in Zone 1. A wood fence abutting the home can provide a pathway for home ignition should the fence ignite. An unrated wood shake roof offers no fire-resistance.*

Another popular, low maintenance landscaping strategy that unfortunately presents a home ignition hazard is the use of bark mulch as a ground cover. Husula has several examples of bark mulch used in landscaping – and in some cases, this is presenting a hazard to the home. During the hot summer months, bark mulch will dry out and become extremely receptive to ember ignition and conducive to persistent surface fire spread. Bark mulch should be viewed as a fuel bed that can effectively transport fire throughout its extent. Homeowners should consider any flammable connections between a bark mulch bed and the house (e.g. wood siding, wood stairs etc.) as a pathway for direct flame contact that could result in the ignition of the home.

Beyond Zone 1, Zones 2 and 3 trend towards the natural vegetation community of the PPxh1, as it's described in section 4.1. However, in many cases, one home's Zone 2 or 3 may be an adjacent home's Zone 1. This common characteristic of WUI areas reinforces the view that many individual FireSmart efforts can increase the overall wildfire resilience of the entire neighbourhood.

## 6.4 Nearby combustibles

In the context of the structure and site hazard assessment, *nearby combustibles* refer to non-vegetative fuel, such as firewood, wood fences, sheds etc. In Husula, the most commonly observed fuels in this category were firewood stacked within 10 m (or directly adjacent to) of the structure and wood fences. Firewood stacked against the house, in a carport or under an open deck space, during the summer, is a bad combination. A stack of firewood has ample gaps and surface area where embers could deposit and ignite, and if the stack is situated too close to the house, ignition of the structure is likely. Avoid this possibility during the summer by storing firewood well away from the home (a minimum of 10 m), so that if the firewood stack does ignite during a wildfire, the house won't follow suit. If firewood is stored in a woodshed within 10 m of the house, and the shed can't be relocated further away from the house, the woodshed should be retrofitted to prevent embers from entering the shed and igniting the firewood. This retrofit can be accomplished through a combination of 12 mm exterior-grade plywood sheathing and 3 mm non-corrosive screening, and still provide adequate airflow to season the stored firewood.

Wood fences, particularly those that attach to the house, can provide a pathway for fire to potentially ignite the house. Where a wood fence is within 10 m of a house, the entire fence should be assessed for locations where the fence intersects any fine fuel beds, such as bark mulch, natural grasses etc. For example, a wood fence with a bark mulch bed up against it is susceptible to embers igniting the bark mulch and in turn igniting the fence. As well, a wood fence that backs onto natural grasses could ignite from a low-intensity surface fire moving through the grass. In either case, the length of the fence could burn, including the portion where the fence attaches to the house, potentially leading to ignition of the structure. One strategy that can help to maintain the privacy of a wood fence while also lowering the chance of a connected fence from igniting the house, is to install a metal gate at or near the fence-house junction.

Even innocuous items commonly found around the outside of a home may act as combustibles that could ignite the structure. Flammable patio furniture (particularly seat cushions), sisal doormats and rugs, or even a corn broom leaning against the house are all potential fuels that could ignite from ember accumulation.

### 6.5 Wildfire Preparedness

The Husula FireSmart Board has been extremely motivated and proactive with their concerns around wildfire preparedness in their neighbourhood. One common characteristic among proactive neighbourhood groups with a concern for wildfire safety and preparedness has been a recognition of the value of information sharing. To this end, the Husula FireSmart Board has developed a neighbourhood contact list for sharing periodic information, including a newsletter.

#### 6.5.1 Automated emergency telephone messaging

Recognizing that a wildfire may occur and develop quickly in the Husula fire environment, the Husula FireSmart Board has also investigated the use of third party automated telephone system that can quickly call a phone list and provide an audio or SMS text message pertaining to an urgent wildfire situation. This system is not affiliated with any local government or provincial agency service.

Husula is not the only neighbourhood to take an active interest in automated telephone messaging capabilities in the context of community safety. There are obvious benefits to having a ‘reverse 911’ system for disseminating critical emergency instructions. However, this capability should not be left up to individual neighbourhoods to source, set up and operate. Similarly, given the multi-jurisdictional nature of 911 operations in the province, this topic is bigger than any one local government to pursue. Provincial leadership is required to develop an effective reverse 911 system that enables rapid and resilient dissemination of emergency instructions to affected residents during an emergency.

## 7.0 Recommendations

The FireSmart Canada Community Recognition Program seeks to create a resilient balance between residential safety and the natural aesthetics that are attractive to living in the WUI. Homeowners already balance their decisions about fire protection measures against their desire for certain flammable components on their properties. It is important for them to understand the implications of the choices they are making. These choices directly relate to the ignition potential of their home ignition zones during a wildfire.

Homeowners, and the community, must focus attention on the home and surrounding area and eliminate a wildfire’s potential relationship with the house. This can be accomplished by disconnecting the house from high and/or low-intensity fire that could occur around it, and by being conscious of the devastating effects of wind-driven embers.

The following recommendations are intended to guide homeowners in focusing their efforts to reduce fuel hazards on their property and reduce the likelihood of a home ignition:

- Substantially reduce or eliminate the amount of cedar and juniper shrubs and hedges in yards, especially within 10 m of a structure. A cedar or juniper shrub/hedge should never be grown directly against the home.
- Replace bark mulch with a non-flammable ground cover where it adjoins the home or intersects with a wood structure attached to the home.
- Remove flammable material from under deck spaces. If the space under a deck is to be unsheathed or unscreened, the space must be free of any material that could ignite via ember or direct flame contact.
- Remove accumulated debris from the roof and gutters prior to the start of fire season each spring, at minimum. Remove accumulated debris from decks, porches and stairs.
- Place firewood and other combustibles a minimum of 10 m from the home, or store these in such a way as to eliminate the chance of embers igniting them.
- Carefully assess the ignition potential of wood fences, especially those that are connected to the house. Consider a metal gate or fence panel to eliminate connectivity between the house and a susceptible wood fence.

## 8.0 Successful FireSmart Mitigations

When adequately prepared according to FireSmart guidelines a house can likely withstand a wildfire without the intervention of the fire service. Furthermore, a house and its surrounding community can be both FireSmart and compatible with the area’s ecosystem. The FireSmart Communities Program is designed to enable communities to achieve a high level of protection against wildfire loss while maintaining a sustainable ecosystem balance.

Other than the replacement of an unrated wood roof or replacing a flammable deck, most FireSmart hazard mitigations around the home are inexpensive and straightforward. In many ways, hazard mitigation and spring yardwork go together and can be scheduled as such. Most often it is the little things that a homeowner attends to that can make a big difference in whether their home will survive during a WUI fire. The following are good examples of small steps that homeowners in Husula have put in place to make their neighbourhood more resilient to wildfire:

### 8.1 Fire-Resistant Roofing

Replacing a roof is one of the single-most expensive FireSmart improvements. Fortunately, Husula is an example of a community where almost all the observed roofs consisted of some type of rated roofing system (Figure 12).

Additionally, it is apparent that numerous properties maintain a high degree of roof cleanliness, which is an important practice in a WUI area dominated by litter-producing Ponderosa pine trees, such as Husula. The combination of a rated roof that is free of fuel accumulations is a big step to improving the survivability of a home during a wildfire event.

*FIGURE 12 A rated roofing system, such as this metal roof, provides fire-resistance to embers. Any modern roofing system that has a fire-resistance rating can provide this protection. During a wildfire, particularly a high-intensity wind-driven fire, a tremendous amount of embers can be cast into the air, producing an ember shower or ember blizzard.*

## 8.2 Landscaping

Several examples of effective landscaping decisions and practices can be found in Husula. Residents of Husula can look to several examples where their neighbours have established less-flammable vegetation and landscaping solutions in their respective Zone 1 areas. A green lawn and no flammable vegetation up against the house is one such example (Figure 13). The example in Figure 13 also illustrates the issue of mature well-spaced and pruned Ponderosa pine trees occupying Zone 1 space, as previously described in Section 6.3. In this specific example, the few Ponderosa pines that are situated in Zone 1 are pruned (naturally and manually), are spaced so that the tree crowns aren't touching adjacent crowns, and have green lawn on the surface below the trees. The likelihood of these trees candling or carrying fire through the crowns and impacting the house is minimal.

An additional benefit that is illustrated in Figure 13 is the shading that the tree canopy provides to the understory. This shade effect can help to retain moisture in the soil and understory vegetation, when compared to sites exposed to full sun throughout the day. This feature is similar to that known in wildfire management planning as a *shaded fuelbreak* and can have the effect of reducing or limiting fire intensity as fire approaches the fuelbreak.

*FIGURE 13 An example of good defensible space and low-hazard landscaping solutions in Husula. This combination of a green lawn surrounding the home, as well as no flammable vegetation up against the house, help to significantly lower this home's ignition potential. Although this property does have conifer trees within Zone 1, these trees are well-spaced and pruned and have little chance of candling.*

## 8.3 Community Involvement

Husula is good example of a neighbourhood that is willing to get involved in identifying and reducing the risks posed to them by wildfire. From the outset of this FireSmart project, there was no shortage of people willing to volunteer their time to the effort. The Husula FireSmart Board has become active in meeting regularly and have even produced their own periodic newsletter for the neighbourhood. The Board has developed a contact list to facilitate communication amongst neighbours and this will continue to benefit the neighbourhood in maintaining community momentum behind the FireSmart program.

*FIGURE 14 Husula is a prime example of a community with residents who are willing to volunteer their time to pursue the FireSmart project, as illustrated in this photo from the June 22 FireSmart event.*

## 9.0 Next Steps

The Husula FireSmart Board was quickly established at the beginning of this project and the goal from the outset has been to pursue FireSmart Community recognition status. As the Local FireSmart Representative retained to complete this project on behalf of the neighbourhood and the RDOS, the author has prepared all deliverables needed for application.

In addition to this assessment report, the author has drafted the initial FireSmart Community Plan for Husula. This plan is intended to be the first iteration of the annual operating plan for the Husula FireSmart Board as they strive to maintain their community recognition. Subsequent annual FireSmart Community Plans will be drafted by the Husula FireSmart Board, with the initial template providing a solid starting point.

To ensure initial and ongoing community recognition, the following standards have been incorporated into the Husula FireSmart Community Plan:

- Support the Husula FireSmart Board in their goal to maintain the Husula FireSmart Community Plan and ongoing recognition status.
- Continue to work with the Local FireSmart Representative or enlist the assistance of a WUI specialist to complete a FireSmart Community Plan which identifies agreed-upon, achievable local solutions.
- Invest a minimum of $2.00 annually per capita in its local FireSmart Events and activities (work done by municipal employees or volunteers, using municipal or other equipment, can be included, as can provincial/territorial grants dedicated to that purpose).
- Hold a FireSmart Event (e.g. FireSmart Day) each year that is dedicated to a local FireSmart project.
- Submit an application form or annual renewal application form with supporting information to FireSmart Canada. This application or renewal process documents continuing participation in the FireSmart Communities Program with respect to the above criteria.

## 10.0 Signature of Local FireSmart Representative

| | |
|---|---|
| Signed: | 01/24/2018<br>Date: |
| Andrew K. Low, RPF<br>Davies Wildfire Management Inc.<br>andy@davieswildfire.com | |

# APPENDIX 1:

Community Wildfire Hazard Assessment Form for Husula, May 2, 2017

This Community Wildfire Hazard Assessment form provides a written evaluation of the overall community wildfire hazard – the prevailing condition of structures, adjacent vegetation and other factors affecting the FireSmart status of a small community or neighbourhood. This hazard is based on the **hazard factors** and **FireSmart recommended guidelines** found in **FireSmart: Protecting Your Community from Wildfire** (Partners in Protection, 2003) and will assist the Local FireSmart Representative in preparing the FireSmart Community Assessment Report. **NOTE: Mitigation comments refer to the degree to which the overall community complies or fails to comply with FireSmart recommended guidelines with respect to each hazard factor**

| | | |
|---|---|---|
| **Community Name: Husula Highlands (RDOS)** | | **Date: 05/02/2017** |
| **Assessor Name: Andy Low, RPF** | | **Accompanying Community Member(s):** |
| **Hazard Factor** | **Ref** | **Mitigation Comments** |
| **1. Roof Assemblies** | | |
| a. Type of roofs<br>ULC rated (metal, tile, asphalt, rated wood shakes) unrated (unrated wood shakes) | 2-5<br>3-21 | Husula Highlands community (Husula) has a mix of roofing materials in use. Roofing materials observed include ULC rated materials (metal and asphalt) as well as a small percentage of unrated wood shake roofs. Although one of the most expensive methods of mitigating home ignition potential, the use of unrated roofing materials present one of the most significant risks to the survivability of a home. |
| b. Roof cleanliness and condition<br>* *Debris accumulation on roofs/in gutters; curled damaged or missing roofing material; or any gaps that will allow ember entry or fire impingement beneath the roof covering* | 2-6 | Most roofs observed had some amount of accumulated combustible debris, primarily consisting of Ponderosa pine (*Pinus Ponderosa*) needle litter. The fire resistance of most roofing materials is reduced when accumulated debris burns on the roof surface. Gutter accumulations were not able to be observed, but given the presence of debris on roofs, there is an assumption that some amount of combustible debris accumulation exists within gutters. |
| **2. Building Exteriors** | | |
| 2.1 Materials | | |
| a. Siding, deck and eaves | 2-7<br>2-8<br>2-9 | A broad range of siding materials were observed. Several homes overlooking Max Lake have wood decks that extend out over the slope. These stilted decks can allow fire to get under overhangs and ignite the building. This risk is further increased if there is an accumulation of combustible debris or material under the deck and immediately downslope from the deck. Eave conditions were not observed. |
| b. Window and door glazing (single pane, sealed double pane) | 2-10 | Window construction can be difficult to assess at the community level. However, given the age and characteristics of the homes in the community, it can be assumed that most windows are tempered or double pane, which provide at least moderate protection. Regarding windows, focus vegetation management or removal within 10m of windows and glass doors, paying particular attention to fuels that could impinge on large picture windows. |
| c. Ember Accumulator Features (scarce to abundant)<br>* *Structural features such as open eaves, gutters, unscreened soffits and vents, roof valleys and unsheathed crawlspaces and under-deck areas* | | Moderate to abundant. Most exposure is attributed to under-deck areas. For under-deck areas, remove combustible accumulations that could that could be ignited by embers. If able to do so, enclose or at minimum screen, ember accumulator features. Screening should consist of corrosion-resistant, 3mm non-combustible wire mesh. |
| d. Nearby Combustibles – firewood, fences, outbuildings | 2-11 | Various examples of nearby combustibles such as firewood and wood fences. During fire season, store firewood at least 10m from the building. If firewood pile is downslope from the building, increase the distance away from the building. When choosing fencing options that adjoin the building, consider the flammability of the fencing. |

| Hazard Factor | Ref | Mitigation Comments |
|---|---|---|
| **3. Vegetation** | | |
| 3.1 **PZ-1:** Vegetation - 0 - 10m from structure **Page Reference 3-5** | | |
| a. Overstory forest vegetation (treated vs. untreated) | 2-14 | Overstory in the PZ-1 is primarily Ponderosa pine with a Douglas-fir component. Fuel type and continuity is not conducive to crown fire in PZ-1. |
| b. Ladder fuels (treated vs untreated) | 2-17 | Majority of ladder fuels are attributed to immature Douglas-fir in the understory. Scattered examples of dense pockets of immature Douglas-fir were observed. |
| c. Surface fuels - includes landscaping mulches and flammable plants (treated vs untreated) | 2-16 | Bark mulch is being used on some properties for landscaping ground cover; in some cases, immediately adjacent to buildings. Coniferous ornamental plants (e.g. juniper; cedar; and cypress) are also in place, occasionally found immediately adjacent to buildings. Bark mulch is a receptive fuel bed for ember ignition, when available to burn. In general, ornamental conifers are highly flammable, due to volatile compounds, as well as a form and structure conducive to ignition and flaming combustion. |
| 3.2 **PZ-2:** Vegetation - 10 - 30m from structures **Page Reference 3-9** | | |
| a. Forest vegetation (overstory) treated vs untreated | 2-14 | Primarily Ponderosa pine with a Douglas-fir component. Fuel type and continuity is not conducive to continuous crown fire in PZ-2. |
| b. Ladder fuels treated vs untreated | 2-17 | Majority of ladder fuels are attributed to immature Douglas-fir in the understory. Scattered examples of dense pockets of immature Douglas-fir were observed. |
| c. Surface fuels treated vs untreated | 2-16 | PZ-2 transitions to native plants (e.g. Bluebunch wheatgrass, pinegrass, and arrow-leaved balsamroot). Ponderosa pine needle litter accumulations present. Examples of landscaping extending from PZ-1 to PZ-2. |
| 3.3 **PZ-3:** Vegetation - 30 - 100m from structures **Page Reference 3-13** Provide mitigation comments on the prevailing PZ3 fuel type | | |
| a. Light fuel - deciduous – grass, shrubs | 2-16 | PZ-2 transitions to native plants (e.g. Bluebunch wheatgrass, pinegrass, and arrow-leaved balsamroot). Ponderosa pine needle litter accumulations present. |

| Hazard Factor | Ref | Mitigation Comments |
|---|---|---|
| b. Moderate fuel - mixed wood – light to moderate surface and ladder fuels, shrubs | 2-17 | Scattered. Mainly understory Douglas-fir and occasional deciduous shrubs, such as Douglas maple and saskatoon. |
| c. Heavy fuel - coniferous - moderate to heavy surface and ladder fuels, shrubs | 2-14 | The fuel type in the Husula PZ-3 is generally not characterized by heavy fuel accumulations. C7 fuel types tend to be characterized by an open stand structure. |
| d. Logging slash, dead/down fuel accumulations | 2-16 | No slash or significant dead/down fuel accumulations observed. |
| e. Diseased forest – without foliage vs with foliage | | No significant forest health factors observed. |
| f. Fuel islands <u>within</u> community - treated vs untreated | | Husula can be described as an intermix area, and thus portions of the PZ-3 could be described as fuel islands. |
| **4. Topography** | | |
| 4.1 Slope (within 100m of structures) | | |
| a. Slope - Flat or < 10 %, 10 – 30% or >30% | 2-19 | Husula is situated along a broad ridge, with buildings located either on the ridge or on or near the slope break. In some cases, buildings are located at the top of slopes >30%. |
| 4.2 Buildings setback on slopes >30 %, position on slope. Provide mitigation comments on items a – c as applicable | | |
| a. Setback from top of slope > 10m, or bottom of slope – valley bottom.<br>b. Buildings located mid-slope<br>c. Setback from top of slope <10m, or upper slope | 2-12 | Majority of buildings are situated at or near the top of slopes. Setbacks vary with some being <10m and some >10m. Buildings near the end of Ryan Rd are considered mid-slope, with similar setbacks. |

| Hazard Factor | Ref | Mitigation Comments |
|---|---|---|
| **5. Infrastructure – Access / Egress, Roads, Driveways and Signage** | | |
| 5.1 Access Routes – Road Layout To FireSmart Recommended Guideline? | | |
| a. Single Road or Looped Road | 3-28 | Husula is accessed by Forsyth Drive, which is a no-thru road. Four roads branch off from Forsyth, each ending in cul-de-sacs (Ryan Road, Ponderosa Place, Forsyth Place and Tyrone Place). |
| 5.2 Roads- width, grade, curves, bridges and turnarounds | | |
| a. To FireSmart Recommended Guideline? | 3-30 | Husula roads are paved. Cul-de-sac turnarounds are appropriate. Road widths and curves are appropriate. |
| 5.4 Fire Service Access / Driveways - Grade, Width/Length, Turnarounds | | |
| a. To FireSmart Recommended Guideline? | 3-30 | Most driveways are 10-30m in length from the paved road to the building. A small number of properties have considerably longer driveways of 100-250m in length, with tight turnarounds. Shorter driveways consist of paved and gravel construction, while the longer driveways are either gravel or dirt. |
| 5.5 Street Signs / House Numbers | | |
| a. To FireSmart Recommended Guideline? | 3-30 | All streets have signage. Most properties have house numbers displayed on green vertical address signs. House numbers are well displayed. |
| **6. Fire Suppression - Water Supply, Fire Service, Homeowner Capability** | | |
| 6.1 Water Supply | | |
| a. Fire Service water supply – hydrants, static source, tender or no water supply | 3-32 | Husula is serviced with 13 hydrants, as per RDOS mapping. |
| 6.2 Fire Service | | |
| a. Fire Service < 10 minutes or > 10 minutes, no fire service | 2-25 | Fire protection for Husula is provided by contract with the City of Penticton. Normal driving time from Fire Station 201 to the end of Tyrone Pl (furthest point in Husula) is 11min. In an emergency, the normal response time would be within 10min. |
| 6.3 Homeowners Suppression Equipment | | |
| a. Shovel, grubbing tool, water supply, sprinklers, roof-top access ladder | 3-28 | Limited to typical garden tools and equipment. |

| Hazard Factor | Ref | Mitigation Comments |
|---|---|---|
| **7. Fire Ignition and Prevention – Utilities, Chimneys, Burn Barrel / Fire Pit, Ignition Potential** | | |
| 7.1 Utilities | | |
| a. To FireSmart Recommended Guideline? | 2-24 | Overhead powerlines on wood poles service the area. Vegetation clearance appears to be adequate. There is no natural gas service in Husula. One 100ga propane tank was observed with no concerns noted. |
| 7.2 Chimneys, Burn Barrel / Fire Pit | | |
| a. To FireSmart Recommended Guideline? | 2-22 | Fire protection matters for Husula are covered under Bylaw 1209. As per 1209, chimneys must be cleaned of accumulated debris and pose no fire danger. |
| 7.3 Ignition Potential - Provide mitigation comments on items a – d as applicable | | |
| a. Topographic features adversely affect fire behaviour<br>b. Elevated probability of human or natural ignitions<br>c. Periodic exposure to extreme fire weather or winds<br>d. Other | 2-21 | a. Homes are situated on the upper 1/3 slope. As slope position cannot be changed, ensure that hazards are mitigated on slopes below buildings.<br>b. The Max Lake area below and west of Husula is accessible to public. Numerous trails connect to Forsyth Drive. Residents have already put up signage reminding users of wildfire risks, with some positive results. Public education on interface risks for non-resident users of the area could be beneficial.<br>c. Lower elevation areas of the South Okanagan experience elevated fire weather conditions through much of the summer. The rural Penticton area also experiences a spring grass fire window prior to green-up. Hot and windy conditions are characteristic of the region during fire season and have influenced past WUI fire incidents in the past in the region. |

**General Comments:**

- **Prior to the initiation of the Husula Highlands FireSmart project, a concerned group of residents formed a community fire watch group to discuss the WUI risks in their neighbourhood. The group had meetings and shared information and observations amongst themselves and engaged with local officials.**
- **The group worked to install wildfire warning signs on the road to Max Lake, with good effect.**
- **There are some good examples of proactive steps that have already been taken to reduce home ignition probability (e.g. fire resistive landscaping and vegetation management).**
- **The fuel type and forest condition in the community is not conducive to extensive crown fire behaviour. Moderate to vigorous surface fire with occasional torching is more likely in this fuel type.**

May 2, 2017

## APPENDIX 2:

Structure and Site Hazard Assessment Form

# STRUCTURE AND SITE HAZARD ASSESSMENT FORM

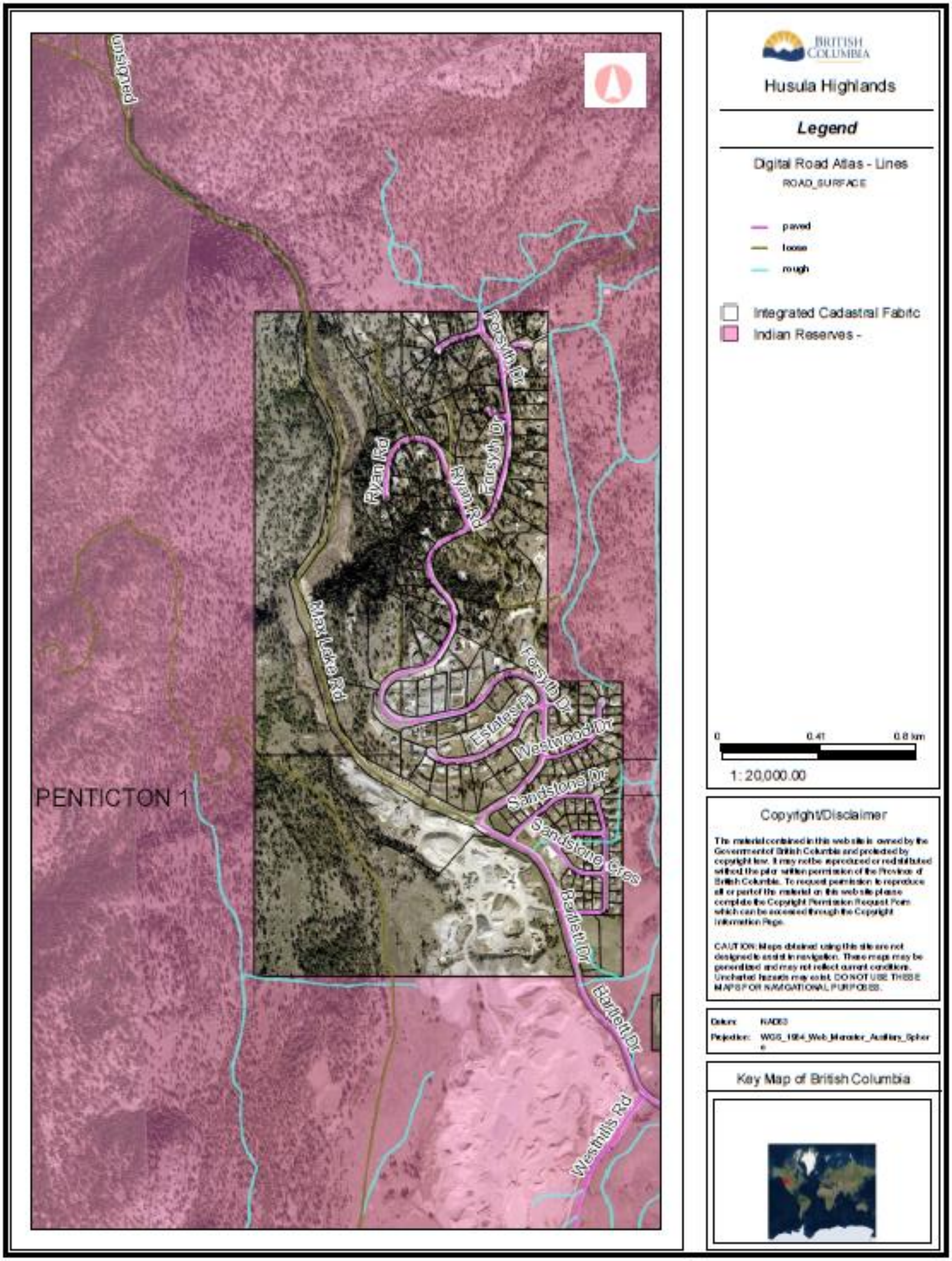
| Factor | Page reference | Characteristics and point ratings | | | | | Score |
|---|---|---|---|---|---|---|---|
| 1 **Roofing material** | 2-5 | Metal, tile, asphalt, ULC-rated shakes or non-combustible material | | | Unrated wood shakes | | |
| | | 0 | | | 30 | | |
| 2 **Roof cleanliness** | 2-6 | No combustible material | Scattered combustible material, <1 cm in depth | | Clogged gutter, combustible material ≥1 cm in depth | | |
| | | 0 | 2 | | 3 | | |
| 3 **Building exterior** | 2-7 | Non-combustible stucco or metal siding | Log, heavy timbers | | Wood or vinyl siding or wood shake | | |
| | | 0 | 1 | | 6 | | |
| 4 **Eaves, vents and openings** | 2-8 | Closed eaves, vents screened with 3 mm mesh and accessible | Closed eaves, vents not screened with 3 mm mesh | | Open eaves, vents not screened, debris accumulation | | |
| | | 0 | 1 | | 6 | | |
| 5 **Balcony, deck or porch** | 2-9 | None, or fire-resistant material sheathed in | Combustible material, sheathed in | | Combustible material, not sheathed in | | |
| | | 0 | 2 | | 6 | | |
| 6 **Window and door glazing** | 2-10 | Tempered | Double Pane | | Single Pane | | |
| | | | Small/medium | Large | Small/medium | Large | |
| | | 0 | 1 | 2 | 2 | 4 | |
| 7 **Location of nearby combustibles** | 2-11 | None or >10 metres from structure | | | <10 metres from structure | | |
| | | 0 | | | 5 | | |
| 8 **Setback from edge of slope** | 2-12 | Adequate | | | Inadequate | | |
| | | 0 | | | 6 | | |
| 9 **Forest vegetation (overstory)** | 2-14 | Deciduous | Mixed wood | | Coniferous | | |
| | | | | | Separated | Continuous | |
| <10 metres | | 0 | 30 | | 30 | 30 | |
| 10 - 30 metres | | 0 | 10 | | 10 | 30 | |
| 10 **Surface vegetation** | 2-15 | Lawn or non-combustible material | Wild grass or shrubs | | Dead and down woody material | | |
| | | | | | Scattered | Abundant | |
| <10 metres | | 0 | 30 | | 30 | 30 | |
| 10 - 30 metres | | 0 | 5 | | 5 | 30 | |
| 11 **Ladder fuels** | 2-17 | Absent | Scattered | | Abundant | | |
| 10 - 30 metres | | 0 | 5 | | 10 | | |
| | | | | | **Total Score for Factors 1 – 11** | | |
| | | | | | **Structure and Site Hazard Level** | | |

**Hazard Level** Low <21 points Moderate 21-29 points High 30-35 points Extreme >35 points

PARTNERS IN PROTECTION

# APPENDIX 3:

Selected project maps



unsigned
Ryan Rd
Ryan Rd
Forsyth Dr
Forsyth Dr
Forsyth Dr
Max Lake Rd
Estates Pl
Westwood Dr
Sandstone Dr
Sandstone Cres
Bartlett Dr
Bartlett Dr
Westhills Rd
PENTICTON 1
British Columbia
Husula Highlands
Legend
Digital Road Atlas - Lines
ROAD_SURFACE
paved
loose
rough
Integrated Cadastral Fabric
Indian Reserves -
0
0.41
0.8 km
1:20,000.00
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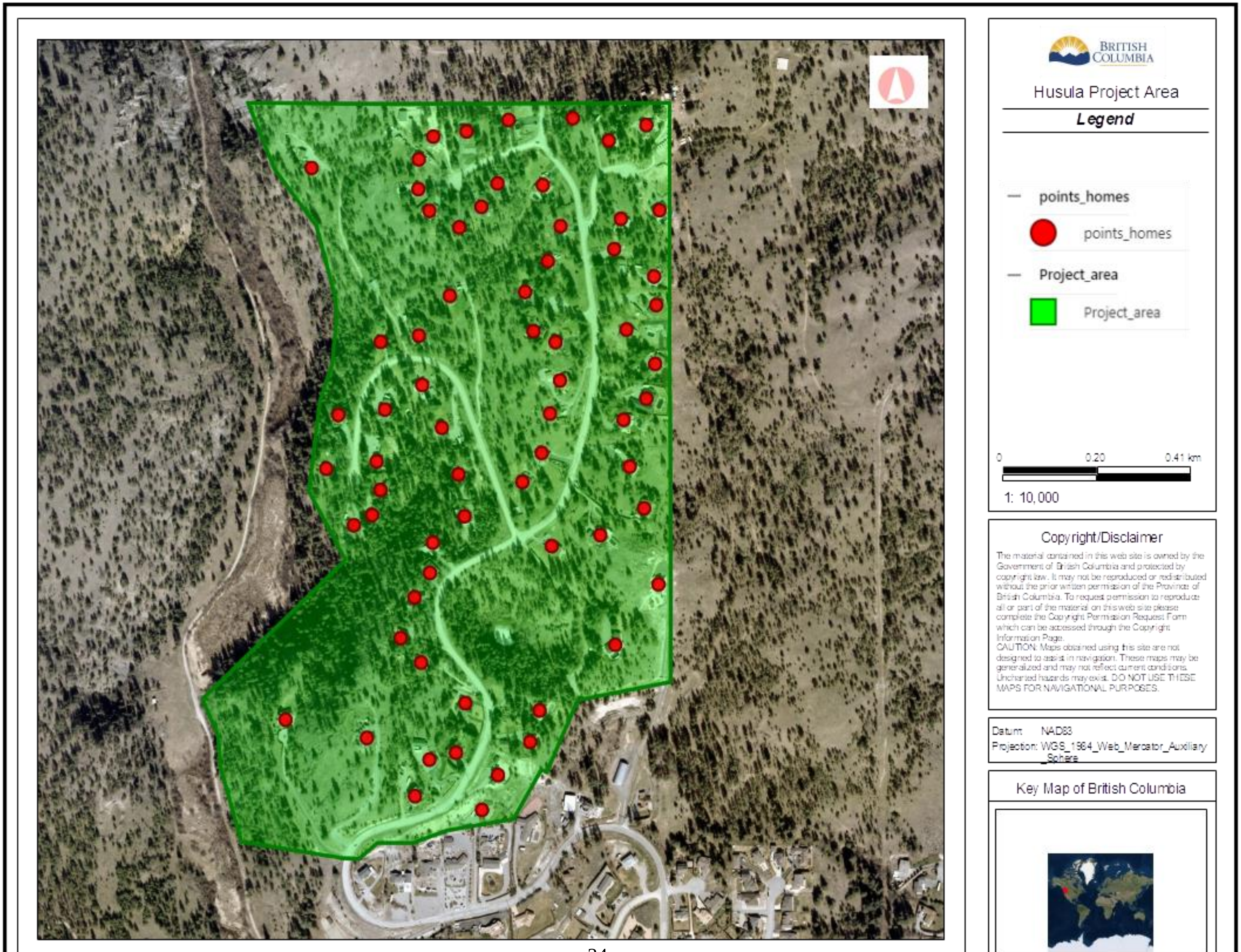
CAUTION: Maps obtained using this site are not designed to assist in navigation. These maps may be generalized and may not reflect current conditions. Uncharted hazards may exist. DO NOT USE THESE MAPS FOR NAVIGATIONAL PURPOSES.
Datum: NAD83
Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere
Key Map of British Columbia


BRITISH COLUMBIA
Husula Project Area
Legend
points_homes
points_homes
Project_area
Project_area
0
0.20
0.41 km
1: 10,000
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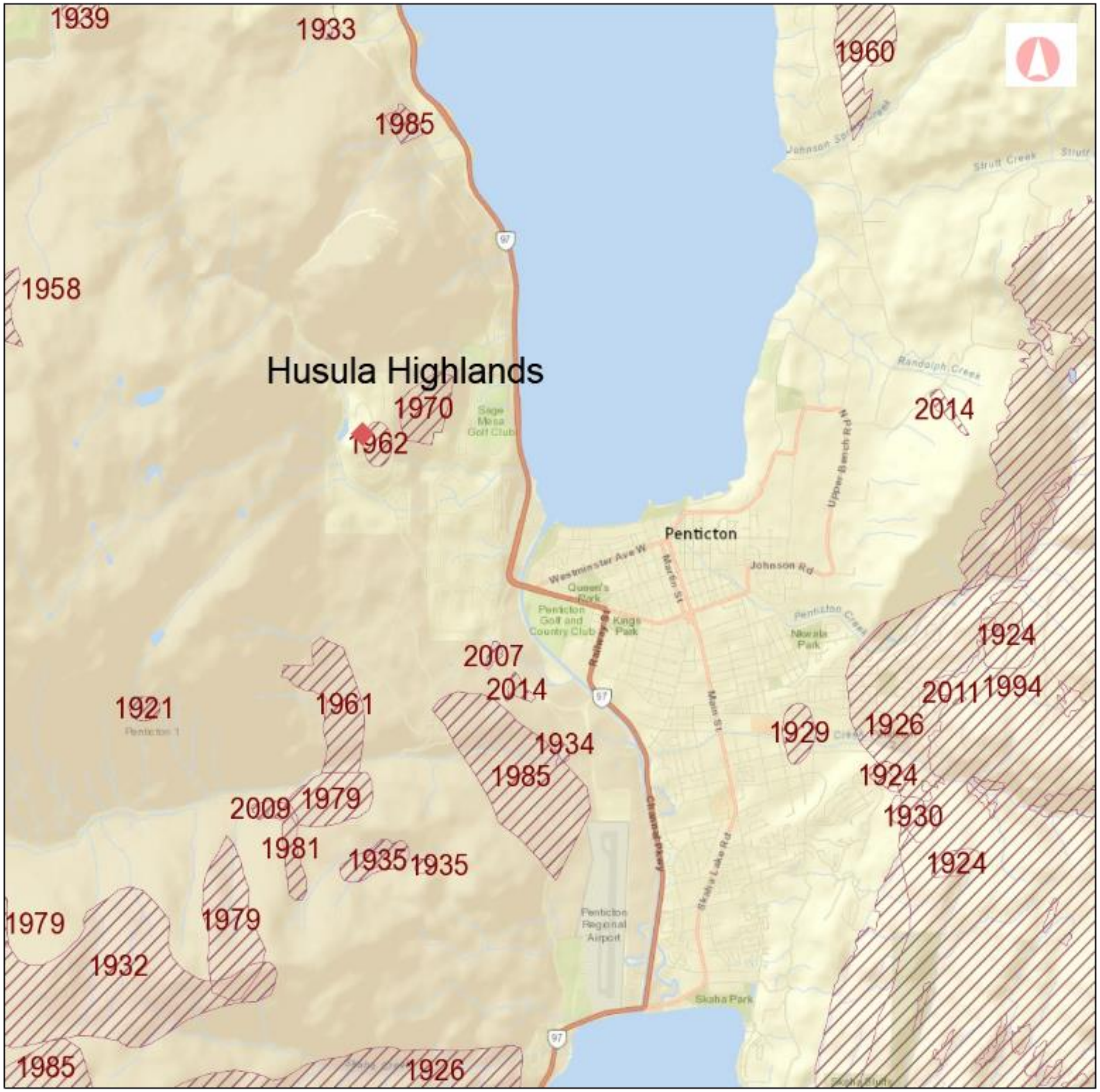
Datum: NAD83
Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere
Key Map of British Columbia






**Historical Fires in Penticton Area > 3ha**

*Legend*

BC Wildfire Fire Perimeters - Historical

0 2.03 4.06 km

1: 100,000

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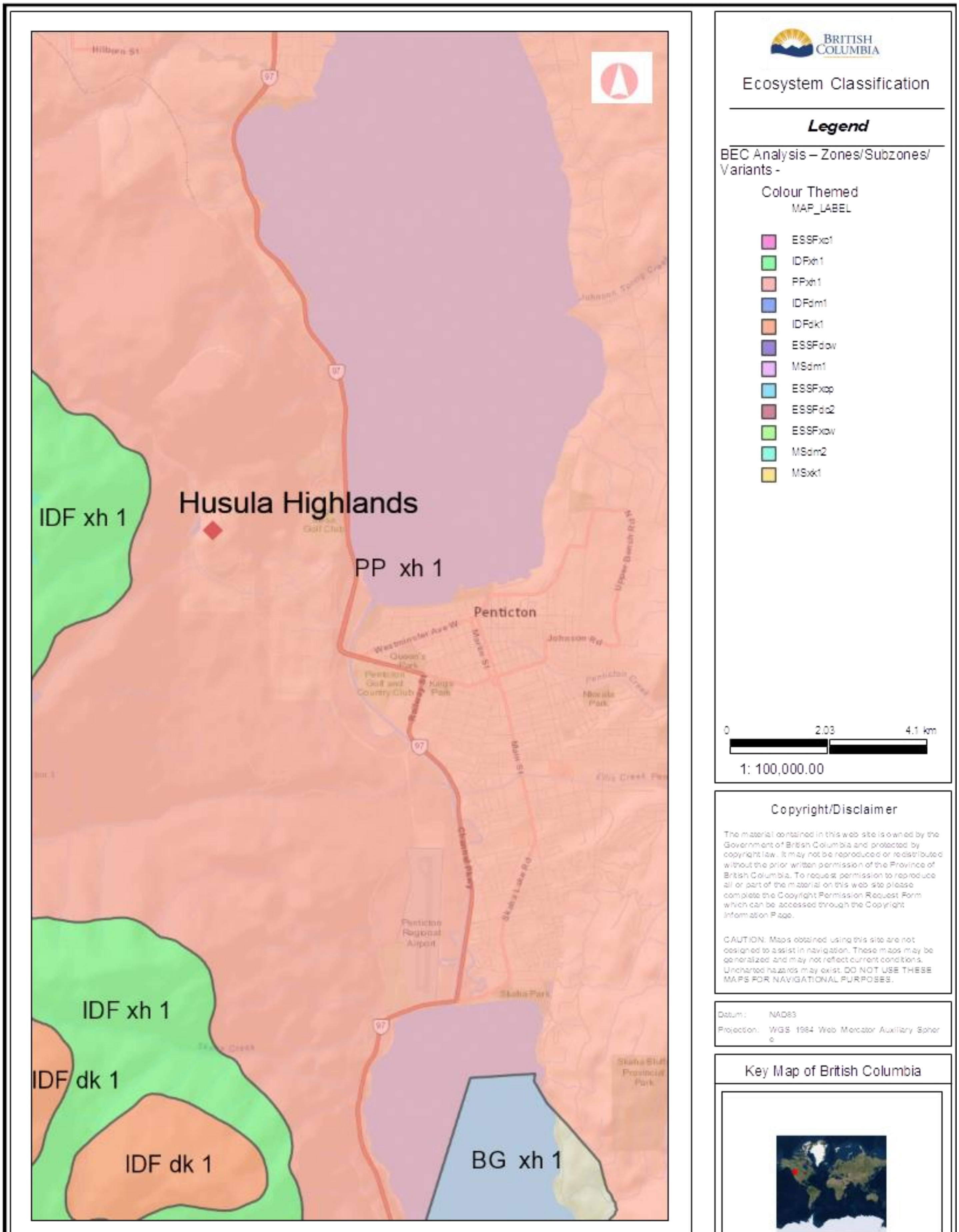
Datum: NAD83
Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere


Husula Highlands
IDF xh 1
PP xh 1
Penticton
IDF xh 1
IDF dk 1
IDF dk 1
BG xh 1
BRITISH COLUMBIA
Ecosystem Classification
Legend
BEC Analysis – Zones/Subzones/ Variants -
Colour Themed
MAP_LABEL
ESSFxc1
IDFxh1
PPxh1
IDFdm1
IDFdk1
ESSFdcw
MSdm1
ESSFxcp
ESSFdc2
ESSFxcw
MSdm2
MSxk1
0
2.03
4.1 km
1: 100,000.00
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