



# Botanie

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## FIRESMART COMMUNITY ASSESSMENT REPORT

Prepared for  
Thompson Nicola Regional District

October 2019

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## Summary of Recommendations – Abbreviated

The FireSmart program provides detailed guidelines and recommendations to reduce home ignition potential during a wildfire. The recommendations made in this report must be considered *in addition* to those contained in the FireSmart *Protecting Your Community from Wildfire* manual. The following summary of recommendations is taken from Section 7 of this report, where additional detail and rationale is provided. These recommendations are specific for the community of Botanie, but can be applied to any community with similar characteristics.

### Recommendations for Botanie

1. Reduce the amount of highly combustible plants used in landscaping, such as cedar and juniper shrubs and hedges within Zone 1 (<10m from the home). Refer to the *FireSmart Landscaping Guide* for recommended vegetation and landscaping materials
2. If conifers are retained in Zone 1, consider the following:
  - a. Remove all ladder fuels (i.e. low-lying branches) within 2m reach of the ground
  - b. Remove all branches in contact with the home
  - c. Increase spacing between conifers – preferably to 3m
3. Remove or store appropriately all combustibles in Zone 1 – including personal items such as trailers, recreational vehicles, tools, building materials, etc.
4. Apply FireSmart principles to any outbuilding within 15m of a structure
5. Remove firewood stacks from Zone 1 during times of wildfire threat
6. Zone 2 (10-30m) and Zone 3 (30-100m) should focus on the removal of ladder fuels and increasing horizontal continuity of combustible vegetation (i.e. conifers)
7. Fuels located on crown land within 100m of a resident’s home should be assessed by a qualified professional to determine next course of action
8. When away for lengths of time during high wildfire threat, consider items such as rattan door mats, flammable patio furniture, children’s toys, trash cans, BBQs, etc. as combustibles and store away
9. Create a local FireSmart Board and Community Plan to maintain awareness and community participation

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## 1.0 Introduction

The FireSmart approach 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 the 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 Botanie for carrying out the recommendations and actions.

The CAR was developed by a trained Local FireSmart Representative (LFR). This assessment addresses the wildfire-related characteristics of Botanie. It examines the area's exposure to wildfire as it relates to ignition potential. The assessment does not focus on the specific homes, but examines the community as a whole.

Funding for the Thompson Nicola Regional District – Botanie – FireSmart project was provided through the Community Resiliency Investment program and was provided by the Union of BC Municipalities. The grant enabled the regional district to retain the services of Frontline Operations Group to conduct the project.

Community assessment was carried out on September 5, 2019 by Brittany Seibert, LFR.

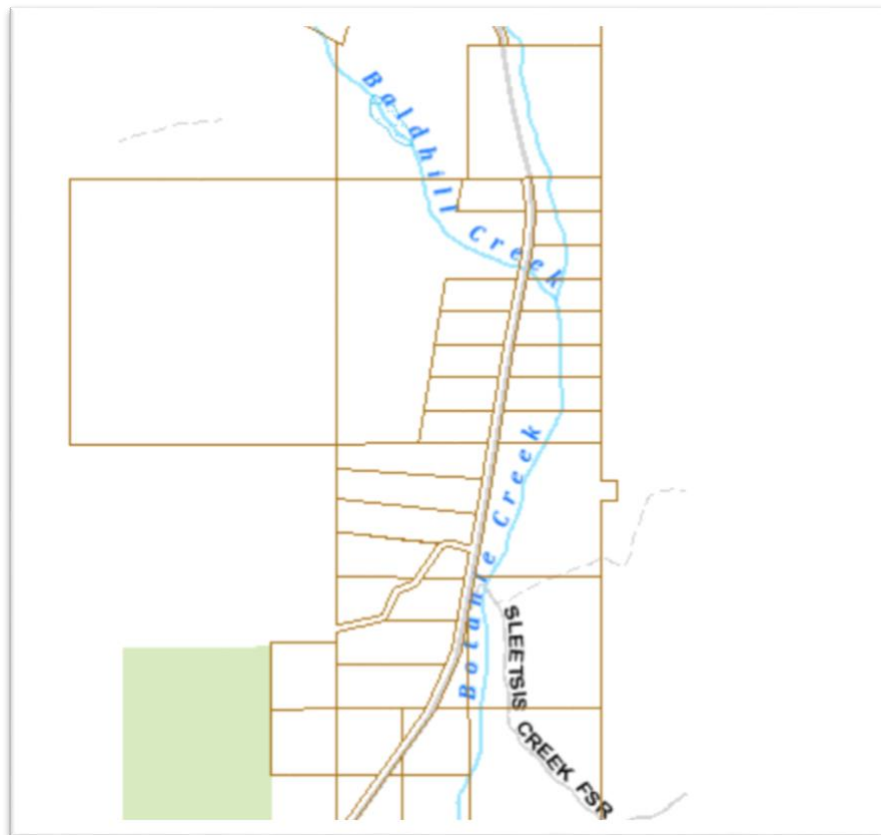


Figure 1 Botanie Community

## 2.0 Definition of Ignition Zone

Botanie is located in a wildfire environment. The wildland areas surrounding the community are typical ecosystems that have developed, historically, from frequent low intensity fires. With the introduction of modern forest protection policies, the typical fire cycle has been interrupted thus contributing to a host of cascading ecological effects including the buildup of forest fuels.

Wildfires will happen in the Thompson Nicola region – exclusion from wildfire is not a choice. In 2017 the province of British Columbia was subjected to one of the worst fire seasons in its history. Over 1.2 million hectares were burnt and roughly 65,000 residents were evacuated. The Thompson Nicola region alone saw one of the most devastating fires of that year, Elephant Hill. The fire discovered on July 6, 2017 continued to burn for another 76 days and consumed over 190,000 hectares. Over the course of the fire, over 120 homes were destroyed.

A house burns because of its relationship with everything in its surrounding home ignition. 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 by clearing fuel from the home ignition. To accomplish this, flammable items such as excessive vegetation and flammable debris must be removed from the areas surrounding the structure. This will prevent ignition of fuel sources in proximity of the structure and prevent direct contact of flames with the home. Reducing the volume of fuels and reducing its ability to move vertically will affect the intensity of the wildfire as it nears the home.

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

The results of the assessment indicate that wildfire behavior 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 community vulnerabilities. Relatively small investments of time and effort will reap great rewards in wildfire safety.



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

### 3.0 Description of the Fire Environment

Wildland fire behavior 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 for 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. In Canada, wildland fuels are classified into 16 fuel types within the Canadian Forest Fire Behavior 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.

When dealing with the wildland-interface environment fuel can extend beyond the surrounding vegetation. Fuels can include a structure's composition, neighboring buildings, vehicles and other combustible materials found around the home – see section 6.3

##### 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 components 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 2m 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 2m 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.

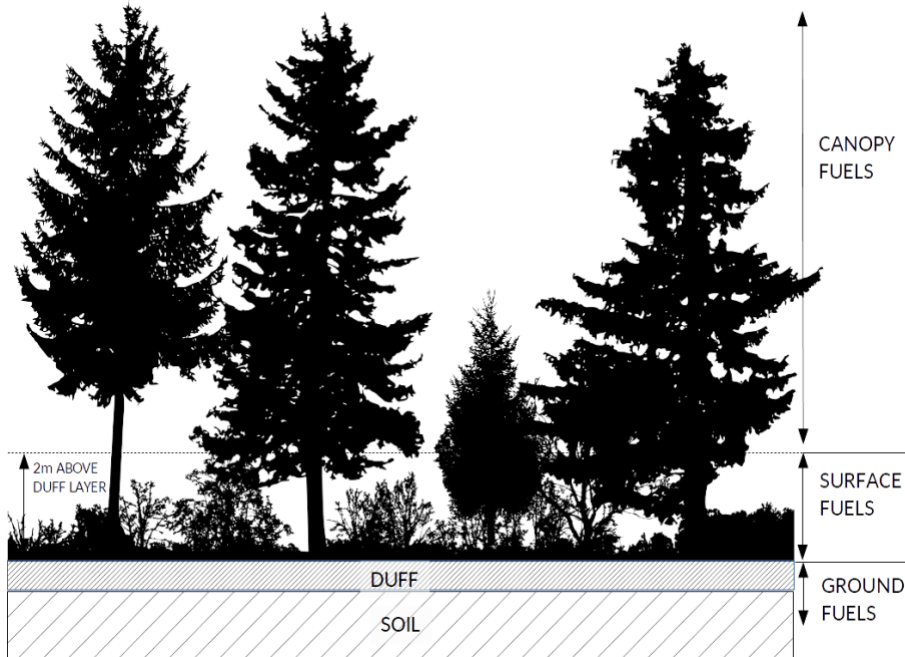


Figure 3 Wildland fuels can be described within three broad fuel layers: Ground fuels, surface fuels (to a height of 2m above the duff layer), and canopy fuels. Canopy fuels are also referred to as aerial fuels

### 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 to volume ratio than coarse fuels, and this characteristic influences the rate of drying and ease of ignition.

With a higher surface area to volume ratio than coarse fuels, fine fuels are more readily influenced by changes in environmental conditions (e.g. relative humidity, wind, precipitation etc.). As well, 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 firebrands (or embers). Additionally, fine fuels are more susceptible to becoming firebrands – mobile ignition sources – as they are lighter and more easily made airborne. Finally, fine fuels take a shorter time to burn out than coarser fuels.

For any given fuel, the more there is and the more continuous it is, the higher the intensity of the fire will be and the faster the fire will spread.

### 3.2 Weather

Weather condition 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 the fire environment and the most challenging to assess and forecast. There are four main components of weather to consider when discussing wildland fire behavior: wind, temperature, relative humidity and precipitation.

#### 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 thus contributing to fire spread.

Wind can also contribute to a preheating effect on fuel immediately downwind from open flame. Wind hastens the drying process of exposed fuel, with the rate of drying being a function of the surface to volume ratio. Having a relatively higher surface area to volume ratio, fine fuel moisture content is affected to a greater degree by wind when compared to coarse fuel.

Lastly, wind can also influence the ignition of a new wildland fire through its contribution to spotting. Ignited fine fuels – that have become airborne through rising thermal air – can be carried by wind over the course of large distances. These firebrands result in the ignition of new fuels cultivating in new fires.

#### 3.2.2 Temperature and Relative Humidity

Temperature and relative humidity have a close and inverse relationship – as temperature increases, relative humidity decreases. This is because relative humidity is the percent of water vapor in the air compared to what would be present if it were saturated. As air is heated through increasing temperatures, its ability to hold more moisture also increases. However, without the introduction of more moisture the percentage decreases.

$$rH = \frac{\text{Amount of moisture currently in the air}}{\text{Amount of moisture air can hold}} \times 100$$

The moisture content of wildland fuel is constantly seeking to equalize with moisture content of the surrounding air. This effect is most pronounced in 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.

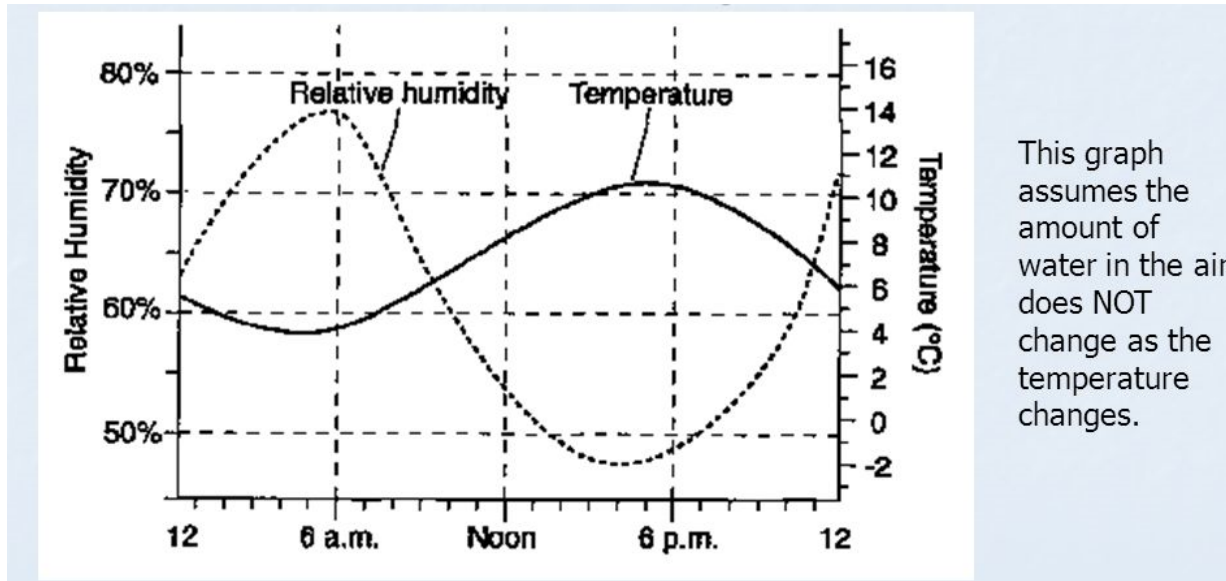


Figure 4 shows the relationship between temperature and relative humidity, as temperatures increase and the overall water content in the air does not change, relative humidity decreases. This affects fire behavior through the increased drying of fuels

### 3.2.3 Precipitation

The effect of 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 coarse fuels, and in turn, dry out at a faster rate.

Precipitation's arrival in the form of thunderstorms can inadvertently increase fire behavior, even if for short time. Thunderstorms can generate large influxes in wind through in and out flows, and downdrafts which have adverse effects on fire behavior.

### 3.3 Topography

In the context of the fire environment, topography refers to the shape and features of the landscape. Of all the topography factors in fire behavior, the primary importance for an understanding of fire behavior 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. This pre-heating effect on upslope fuels contributes to fast upslope fire spread. As well, hot air rising along the slope tilts the flame uphill which further increasing the ease of ignition of upslope fuels.

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.

## 4.0 Site Description

Botanie is located approximately 12km north of Lytton, BC. It is located along the Botanie Creek Rd. It is bordered by Botanie Lake to the north, Lytton to the south and Botanie Creek to the east.

It includes an estimated <20 homes, many with outbuildings located on each property. The community is accessed from the south from Lytton, BC from the junction of Botanie Creek Rd. and Lytton-Lillooet Highway (HWY 12). Road access and egress to the north may be possible from Highway 12 to the Luluwissin Creek FSR to the Botanie Creek Rd.

All structures feature a variety of ember accumulator features such as complex roof shapes, deck configurations and open (unsheathed) deck constructions and open carports. Lots are of varying sizes with moderately large distances between homes (30-100m). Most natural vegetation on the properties has been retained with some additions of planted trees, hedges and ornamental plants.

### 4.1 Fuel Type

Classifying fuel complexes in BC according to the FBP fuel types is an imperfect process, given the diversity of ecosystems in the province in comparison to the rest of Canada. When considering FBP fuel types for a particular fuel complex, the actual species composition is of less importance than the overall stand structure characteristics. The FBP fuel types referenced below specify. Certain species not found in BC (e.g. red pine and eastern white pine, etc.), however the overall structural characteristics of the fuel types share similarities with the Botanie site conditions. Herein lies the challenge of classifying certain BC forest types into a handful of FBP fuel types. In the Botanie area, the most appropriate FBP fuel types are:

#### 4.1.1 C3 Fuel Type\*

This fuel type is characterized by pure, fully stocked (1000–2000 stems/ha) jack pine (*Pinus banksiana* Lamb.) or lodgepole pine (*Pinus contorta* Dougl. ex Loud.) stands that have matured at least to the stage of complete crown closure. The base of live crown is well above the ground. Dead surface fuels are light and scattered. Ground cover is feather moss (*Pleurozium schreberi*) over a moderately deep (approximately 10 cm), compacted organic layer. A sparse conifer understory may be present.

#### 4.1.2 C7 Fuel Type\*

This fuel type is characterized by uneven-aged stands of ponderosa pine (*Pinus ponderosa* Laws.) and Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco) in various proportions. Western larch (*Larix occidentalis* Nutt.) and lodgepole pine (*Pinus contorta* Dougl. ex Loud.) may be significant stand components on some sites and at some elevations. Stands are open, with occasional clumpy thickets of multi-aged Douglas-fir and/or larch as a discontinuous understory. Canopy closure is less than 50% overall, although thickets are closed and often dense. Woody surface fuel accumulations are light and scattered. Except within Douglas-fir thickets, the forest floor is dominated by perennial grasses, herbs, and scattered shrubs. Within tree thickets, needle litter is the predominant surface fuel. Duff layers are nonexistent to shallow (<3 cm).

#### 4.1.3 M2 Fuel Type\*

This fuel type (and its "leafless" counterpart, M1) is characterized by stand mixtures consisting of the following coniferous and deciduous tree species in varying proportions: black spruce (*Picea mariana* (Mill.) B.S.P.), white spruce (*Picea glauca* (Moench) Voss), balsam fir (*Abies balsamea* (L.) Mill.), subalpine fir (*Abies lasiocarpa*(Hook.) Nutt.), trembling aspen (*Populus tremuloides* Michx.), and white birch (*Betula papyrifera* Marsh.). On any specific site, individual species can be present or absent from the mixture. In addition to the diversity in species composition, stands exhibit wide variability in structure and development, but are generally confined to moderately well-drained upland sites. M2, the second phase of seasonal variation in flammability, occurs during the summer. The rate of spread is weighted according to the proportion (expressed as a percentage) of softwood and hardwood components. In the summer, when the deciduous overstory and understory are in leaf, fire spread is greatly reduced, with maximum spread rates only one-fifth that of spring or fall fires under similar burning conditions.

*\*Excerpts from the CFFDRs FBP*

#### 4.2 Fire Weather

The climatic conditions of the southern and central region of the Thompson-Nicola can be broadly characterized by warm, dry summers and cool winters. Its neighboring community, Lytton (198m), is known for its hot summers, and short, mild winters. Botanie Lake, however, is located at approximately 1000m is it can be assumed that the community would see on average cooler climatic conditions.

#### 4.3 Topography

Botanie community is located along the bottom of a narrow valley – Botanie Valley. It is unlikely that slope will play a direct role on home ignition within the community as slopes will carry growing fire up and away from the community. It will play an indirect role through the potential of increased fire behavior – due to slope – and the creation of firebrands. These firebrands may be carried into the community, igniting fuel sources.

The valley's topography is likely to have an influence on wind speeds and directions which will greatly affect a wildfire's growth.



Figure 5 Satellite imagery of Botanie



Figure 6 Contour map of Botanie

#### 4.4 Human Ignition Potential

There is an existent human ignition potential within the Botanie community. Some of the more likely scenarios including burning on private land – such as a campfire or burn pile. There is also risk of an ignition resulting from off road vehicle use.

#### 5.0 Assessment Process

The Botanie community was assessed by Local FireSmart Representative, Brittany Seibert, during her visit on September 5, 2019. The community and adjacent vegetation within a least a 100m radius was assessed and observations were recorded using the *FCCRP Community Hazard Assessment Form* (see Appendix 2). The assessment process noted a number of attributes that contribute both negatively and positively towards the risk of property damage/loss due to a wildfire event.

As part of the FireSmart project – funded by the TNRD – a FireSmart public talk was given on the same day at a local resident’s house in the Botanie community. The objective of the talk was to educate home owners on the use of the *FireSmart Site and Structure Hazard Assessment Form* to help identify and prioritize hazards as they relate to wildland fire and their homes. The invitation was open to all members of the community. It was advertised through the TRND’s Facebook page as well as through verbal communication from community champions. There were 17 residents in attendance.

## 6.0 Observations and Issues

The following observations were noted during the community wildfire hazard assessment. See Appendix 2 to view the entire community wildfire hazard assessment form and notations.

### 6.1 Roof Assemblies

A home's roof is the largest surface that is the 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 a non-wood roofing system. Many of the homes and structures in the Botanie community were difficult to assess due to the distance between the home and the road, and the dense vegetation between the two. However, homes that were visible were seen to have fire-rate roofing materials (mainly asphalt shingles). Several roofs did appear to be in good condition with no accumulation of combustible debris but there were some that were not to FireSmart standards. Clean roofs will mitigate the potential of burning debris that may challenge a roof's fire resistance and reduce the chance of igniting another fuel source.



*Figure 7 Combustible debris that ignites on a roof poses a risk of challenging a roof's fire resistance. As well, it has the risk to ignite other fuel sources (i.e. on the ground below) resulting in the spread of wildfire around a home.*

### 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 (e.g. 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 (figure 8). The removal of fuel accumulations along any exterior

wall should be of much greater concern than the actual composition of the wall itself.



*Figure 8 The presence of nearby combustible debris (such as wood pallets, ladders, building materials etc.) and combustible plants pose a high risk to ignition of a building's exterior.*

### 6.3 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, vehicles etc. Outbuildings are of particular concern if they are located within 15m (45ft) of the home. Outbuildings pose a threat to the ignition of a home because they are able to sustain extreme radiant heat for over longer periods of time. As well, the additional risk of firebrand production poses a risk to any nearby structure. Any outbuilding that is located within 15m (45ft) should have FireSmart principles applied to mitigate its potential to ignite.

Firewood was a common characteristic within the Botanie community. While several properties demonstrated proper FireSmart mitigations by placing firewood stack away from structures, many properties were seen with firewood stack within close proximity and often abutting structures or other fuel sources. Firewood has a high risk of ignition and like outbuildings, maintains extreme radiant heat while burning. This burning fuel source can provide direct flame contact and contribute to firebrand creation.



*Figure 9 Firewood is high risk hazard to have near the home. Should it become ignited during a wildfire event, it has the potential to create firebrands and sustain high radiant heat which has the potential to ignite the nearby home. The photo on the left has high exposure to ignition and is within close proximity of other fuel sources (i.e. machinery, buildings, surround vegetation including the aerial fuels). The photo on the right has reduced the risk by creating a partial enclosure for the wood stack and locating it away from the home.*

Direct flame contact is often thought of as the primary factor in home ignition and subsequent loss. However, recently it has become more apparent that ignition from a firebrand is the most likely scenario. Because of this, innocuous items commonly found around the outside of a home may act as combustibles that could ignite the home. Flammable patio furniture (particularly seat cushions), sisal doormats and mats, or even a corn broom leaning against the house are all potential fuels that could ignite from ember accumulation.

## 6.4 Vegetation

Vegetation is assessed in three concentric zones around a home (Figure 2), with Priority Zone 1 (PZ-1) being the area occupying the first 10m (30ft) around the structure. More recently Zone 1a (PZ-1a), known as the *non-combustible zone*, has been added to distinguish the importance of the first 1.5m (4.5ft) from a structure. The quantity and condition of canopy, ladder and surface fuels are the key factors assessed.

In Botanie there are several conifer tree species found throughout the community as the fuel type changes from the south to the north. Pondarosa pine and Douglas Fir are the most prevalent in the south, with Douglas fir predominantly found in the middle and Cedar and several deciduous species joining the mix in the north.

Deciduous species are the recommended vegetation to be planted within the PZ-1(a) as they are naturally resistive to intense wildland fire behavior. This is because the species lacks the ladder fuels for vertical fire growth, maintains a higher moisture content within its leaves, and has smooth, tight bark that makes it difficult for fire to climb.

Conifer species can pose a significant risk when found within the PZ-1(a). They tend to offer easily accessible ladder fuels for wildland fire to reach the canopy and create large amounts of needle litter



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sustaining surface fire. However, in the case of the Botanie community, many of the conifer species pose a lower risk to vertical fire growth or sustained crown fires. All three species mentioned – Ponderosa pine, Douglas fir, and Cedar – have evolved characteristics that make them more resilient in a wildfire environment. One main feature is the ability to sluff low-lying branches, creating a distance between ground and aerial fuels. Depending on the area within the community, the conifer stands may need little to no intervention while other areas may require removal of ladder fuels and increased spacing between stems.



*Figure 10 The photo on the left shows an area within the community with good vertical and horizontal spacing which would keep fire intensities low. The photo on the right shows a different area within the community where vegetation densities are increased and ignition of aerial fuels – and subsequently high fire intensities – is a possibility.*

Cedar and Juniper shrubs and hedges, on the other hand, are problematic from a home ignition perspective. These species are rich in organic volatile compounds and terpenes making them easily ignitable. They are also often found abutting the home making the structure increasing susceptible to ignition and loss.

The Botanie community contains lots of varying sizes. Overall though, most homes in the Botanie community are well spaced. There is still potential that the homes may have overlapping zones – particularly in Zones 2 (10-30m) or 3 (30-100). This is a common characteristic of higher-density WUI areas and it reinforces the view that many individual FireSmart efforts can increase the overall wildfire resilience of the entire neighborhood. Unfortunately, the same holds true when one (or more) homes aren't FireSmart and pose a threat to adjacent homes that are.

It is likely within this community that a priority zone (up to 100m away from the home) may fall onto crown land. Potentially there may be steps that can be taken by the community to request for fuel management within these zones. However, it is important for home owners to know and understand that by applying FireSmart principles to Zones 1a (0-1.5m) and Zones 1 (1.5-10m) alone can increase a home's survival from a wildfire event up to 90%. Therefore, homeowners should start their fuel management efforts directly at the home working their way outwards.

## 7.0 Recommendations

FireSmart seeks to create a sustainable balance that will allow communities to live safely while maintaining environmental harmony in a wildland urban interface (WUI) setting. Homeowners already balance their decisions about fire protection measures against their desire for certain flammable components on the properties. It is important for them to understand the implications of the choices they're making. These traces directly relate to the ignitability of their home ignition zones during a wildfire.

A home owner/community must focus attention on the home and surrounding area and eliminate the fires 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 section of this report provides recommendations for consideration by the Botanie community and the Thompson Nicola regional district. These recommendations concern wildfire safety issues that were identified as priorities during the assessment:

- Removal of conifers and combustible plants within the Non-Combustible (0-1.5m) and Zone 1 (1.5-10m) will significantly reduce the fire hazard rating for structures and properties within the community.
  - Should the home owner choose to keep conifers within Zone 1 it is strongly recommended that low-lying branches and pine needle debris are removed. "Low-lying" refers to any branches that are within 2m of reach from the ground. Homeowners should also ensure to remove any branches in contact with the home itself and consider the increasing the spacing of conifers to 3m. This will reduce the transference of fire from ground to aerial fuels.
- Personal items such as trailers/RVs, recreational vehicles, tools, building materials, etc. are all considered combustible and should be stored appropriately or removed from Zone 1 (>10m from home).
- Neighboring buildings such as sheds or detached garages located within 15m of the home should also be considered as a fuel source. It is highly recommended that FireSmart mitigations are applied to them to prevent ignition.
- Homes with firewood stacks are reminded during wildfire season to have wood stacked a min. of 10m away from the structure. Firewood may be moved closer to the home during times of low wildfire threat. Homeowners should however note that wildfire seasons begun to shift and have demonstrated earlier and later peak burning periods each calendar year. Attention should be given to changing conditions during the shoulder months.
- When fire weather is severe and the home is unoccupied for a length of time, homeowners should remember not to leave flammable items outside. This includes rattan doormats, flammable patio furniture, children's toys and trash cans.

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- Zone 2 (10-30m) and Zone 3 (30-100m) should focus on reducing ladder fuels and increasing horizontal continuity between conifers. This will reduce the likelihood of fire transference through the crown and will help to keep fire along the ground with lower burning intensities.
  - Fuels located in a priority zone (up to 100m away from a home) that falls onto crown land should be assessed by a qualified professional to determine the next course of action.

It is recommended that the community come together to create FireSmart Community Plan regardless of the community's intention to seek FireSmart Community Recognition status. A FireSmart Community Plan is generally a simple action plan, comprised of at least three agreed-upon, doable action items that will improve a community's wildfire readiness. The Community Plan can be modified with the passage of time and renewed with each new wildfire season.

### 8.0 Successful FireSmart Mitigations

When adequately prepared, a house can likely withstand a wildfire without the intervention of the fire service. Further, 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 even as a sustainable ecosystem balance is maintained.

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 small 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 within the Thompson Nicola Regional District have put in place that make their homes – and subsequently their community – more resilient to wildfire:

#### 8.1 Fire-Resistant Roofing

Replacing a roof is one of the single-most expensive FireSmart improvements. The combination of a rate roof that is free of fuel accumulations is a big step to improving the survivability of a home during wildfire event.



*Figure 11 Fire-rated roofing material is proven to be highly resilient against home ignition during a wildfire event. Roof design can also contribute to mitigation of debris accumulation by minimizing valleys and pinch point where debris can be captured*

## 8.2 Landscaping

Simple landscaping changes to one's respective Zone 1 can make all the difference in preventing home ignition. Replacing bark mulch with rock, replacing conifers with deciduous, and utilizing low flammable plants within gardens are all great steps one can make towards increasing their home's resiliency. Maintaining a green lawn is the best standard however, a mowed lawn is still a fire-resistant lawn – grasses shorter than 10cm are less likely to burn intensely. Removal of dead leaves and pine needle litter will also help to reduce fuel sources within the yard.



*Figure 12 This home demonstrates several FireSmart landscaping attributes. The gravel provides a non-combustible surface creating a break from direct flame contact to the home. Conifers have been removed up to 10m away and ladder fuels have been cleared. Leafy, deciduous plants are the preferred vegetation to be found in zone 1.*

## 9.0 Next Steps

After reviewing the contents of this assessment and its recommendations, it is up to the Botanie community to determine whether or not they will implement the recommendations. The recommendations and FireSmart guidelines noted above are proven and time-tested to be effective in reducing the risk of wildfire losses. It is believed that there is great potential for the community and its residents to work together to reduce the wildfire threat quickly and substantially by acting to mitigate priority issues.

Should the Botanie community wish to seek FireSmart Community recognition status it is encouraged for them to contact the Local FireSmart Representative and to also create a FireSmart Board. A FireSmart Board is a multi-disciplinary group of volunteer representatives of the neighborhood or community who are responsible for driving the FireSmart initiative in their community and ensuring the recognition criteria are met.

If the report and the recommendations are accepted and recognition will be sought, the Botanie FireSmart Board will create agreed-upon, area-specific solutions to the FireSmart Community Assessment Report recommendations to prepare a FireSmart Community Plan in cooperation with their Local FireSmart representative and local fire agency personnel who may be acting as advisers.

If Botanie seeks to achieve the national recognition as a FireSmart Community, the following standards should be incorporated into its FireSmart Community Plan:

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- Sponsor a local FireSmart Board that maintains the FireSmart Community program and 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 agree-upon, achievable local solutions
- Invest a minimum of \$2.00 annually per capita in its local FireSmart Events and activities and activities (work done by municipal employees or volunteers\*, using municipal or other equipment, can be included, as can provincial/territorial grants dedicate 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.

\* Volunteer hours are calculated at a rate of \$21 per hour or at the rate of service being voluntarily given

10.0 Signature of Local FireSmart Representative

Signed:	Date signed:	
<i>Brittany Seibert</i>	October 25, 2019	Brittany Seibert, LFR Frontline Operations Group, Ltd. Brittany@frontlineops.ca

## APPENDIX 1: Resources

- FireSmart Canada

<https://www.firesmartcanada.ca>

- FireSmart British Columbia

<https://firesmartbc.ca>

- FireSmart Begins at Home Assessment

<https://firesmartbc.ca/wp-content/uploads/2019/07/FireSmart-Home-Assessment.pdf>

- FireSmart Canada Community Recognition Program (FCCRP)

<https://firesmartbc.ca/resource/how-to-apply-for-the-firesmart-canada-community-recognition-program-fccrp/>

<https://firesmartbc.ca/wp-content/uploads/2019/01/FCCRP-Application-Form-1.pdf>

- FireSmart Guide to Landscaping

<https://www.firesmartcanada.ca/mdocs-posts/firesmart-guide-to-landscaping/>

## APPENDIX 2: Community Wildfire Hazard Assessment form



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**

<b>Community Name: Botanie</b>		<b>Date: (mm/dd/yyyy) September 5, 2019</b>
<b>Assessor Name: Brittany Seibert</b>		<b>Accompanying Community Member(s):</b>
Hazard Factor	Ref	Mitigation Comments
<b>1. Roof Assemblies</b>		
a. Type of roofs ULC rated (metal, tile, asphalt, rated wood shakes) unrated (unrated wood shakes)	2-5 3-21	All roofs seen are fire-rated; Difficult to assess all roofs within community due to the distance of homes from the road and the dense vegetation in between.
b. Roof cleanliness and condition <i>* 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</i>	2-6	Most roofs that were assessed were free and clear of debris; some roofs did have accumulation of combustible debris and were also in older/aging condition
<b>2. Building Exteriors</b>		
<b>2.1 Materials</b>		
a. Siding, deck and eaves	2-7 2-8 2-9	Homes were a mixture for rated and non-rated siding. Homes were seen to have decks of different composition and designs. Eaves were unable to be assessed.
b. Window and door glazings (singlepane, sealed doublepane)	2-10	It is assumed all homes have double paned windows and some outbuildings are likely to have single paned



<p>c. Ember Accumulator Features (scarce to abundant)</p> <p><i>* Structural features such as open eaves, gutters, unscreened soffits and vents, roof valleys and unsheathed crawlspaces and under-deck areas</i></p>		<p>All structures have a variety of ember accumulator features including roof shapes, deck configurations, open and unsheathed deck construction and gutters</p>
<p>d. Nearby Combustibles – firewood, fences, outbuildings</p>	<p>2-11</p>	<p>Firewood was seen within community as well as propane tanks. Outbuildings were common as well as other combustibles (ie vehicles, yard tools, trailers, etc)</p>

Hazard Factor	Ref	Mitigation Comments
<b>3. Vegetation</b>		
<b>3.1 PZ-1: Vegetation - 0 - 10m from structure Page Reference 3-5</b>		
a. Overstory forest vegetation (treated vs. untreated)	2-14	Most homes did not have overstory within the non-combustible zone, however most homes did have conifer trees within the 10m. It is unlikely fire will be able to reach the canopy in several parts of the community due to the maturity of the tree stand (douglas fir) = no ladder fuels; however, the fuel type heading north changes and vertical fire growth becomes mores available
b. Ladder fuels (treated vs untreated)	2-17	Hard assess Zone 1 for several homes; There were homes within the community seen with combustible plants within 0-1.5m of the home that would allow for vertical fire growth (i.e. cedar/juniper hedges).
c. Surface fuels -includes landscaping mulches and flammable plants (treated vs untreated)	2-16	Lawns seen appear to be well maintained and watered, several homes seen with organic dirt layer around homes - pine cones main tree litter on the ground
<b>3.2 PZ-2: Vegetation - 10 - 30m from structures Page Reference 3-9</b>		
a. Forest vegetation (overstory) treated vs untreated	2-14	Continuous and separated conifer
b. Ladder fuels treated vs untreated	2-17	Low lying branches or juvenile/immature trees in combination with tall grasses
c. Surface fuels treated vs untreated	2-16	Grass, sparse vegetation, deciduous brush
<b>3.3 PZ-3: Vegetation - 30 - 100m from structures Page Reference 3-13 Provide mitigation comments on the prevailing PZ3 fuel type</b>		
a. Light fuel -deciduous–grass, shrubs	2-16	Grass, sparse vegetation, deciduous brush

Hazard Factor	Ref	Mitigation Comments
b. Moderate fuel - mixed wood – light to moderate surface and ladder fuels, shrubs	2-17	N/A
c. Heavy fuel - coniferous - moderate to heavy surface and ladder fuels, shrubs	2-14	Forest stand changes through community from south to north. South is C7 fuel types (both dense and separated), C3 through the middle and beginning of M2 at the north end of the community
d. Logging slash, dead/down fuel accumulations	2-16	N/A
e. Diseased forest – without foliage vs with foliage		Fire from 2014 to the south of the community
f. Fuel islands within community - treated vs untreated		N/A
<b>4. Topography</b>		
<b>4.1 Slope (within 100m of structures)</b>		
a. Slope - Flat or < 10 %, 10 – 30% or >30%	2-19	10-30% (depending location within community)
<b>4.2 Buildings setback on slopes &gt;30 %, position on slope Provide mitigation comments on items a – c as applicable</b>		
a. Setback from top of slope > 10m, or bottom of slope – valley bottom. b. Buildings located mid-slope c. Setback from top of slope <10m, or upper slope	2-12	Valley bottom

Hazard Factor	Ref	Mitigation Comments
<b>5. Infrastructure - Access / Egress, Roads, Driveways and Signage</b>		
5.1 Access Routes – Road Layout To FireSmart Recommended Guideline?		
a. Single Road or Looped Road	3-28	Single road
5.2 Roads- width, grade, curves, bridges and turnarounds		
a. To FireSmart Recommended Guideline?	3-30	N/A
5.4 Fire Service Access / Driveways - Grade, Width/Length, Turnarounds		
a. To FireSmart Recommended Guideline?	3-30	N/A
5.5 Street Signs / House Numbers		
a. To FireSmart Recommended Guideline?	3-30	N/A
<b>6. Fire Suppression - Water Supply, Fire Service, Homeowner Capability</b>		
6.1 Water Supply		
a. Fire Service water supply – hydrants, static source, tender or no water supply	3-32	Most of community, no water source seen. Creek runs along road to the east and lake is located well to the north of community
6.2 Fire Service		
a. Fire Service < 10 minutes or > 10 minutes, no fire service	2-25	No FD, BCWS Unit crew in Lytton < 20min
6.3 Homeowners Suppression Equipment		
a. Shovel, grubbing tool, water supply, sprinklers, roof-top access ladder	3-28	Basic suppression tools such as shovels; may have access to machinery and operators.

Hazard Factor	Ref	Mitigation Comments
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7. Fire Ignition and Prevention - Utilities, Chimneys, Burn Barrel / Fire Pit, Ignition Potential		
7.1 Utilities		
a. To FireSmart Recommended Guideline?	2-24	N/A
7.2 Chimneys, Burn Barrel / Fire Pit		
a. To FireSmart Recommended Guideline?	2-22	N/A
7.3 Ignition Potential Provide mitigation comments on items a – d as applicable		
a. Topographic features adversely affect fire behaviour b. Elevated probability of human or natural ignitions c. Periodic exposure to extreme fire weather or winds d. Other	2-21	Valley winds likely to be key to fire behaviour Previous fires = exposure area, fires in 2009, 2014, 2016 = evacuations
<b>General Comments</b>		

