



Heffley Creek

FIRESMART COMMUNITY ASSESSMENT REPORT

Prepared for
Thompson Nicola Regional District

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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 Heffley Creek but could be applied to any community with similar characteristics.

Recommendations for Heffley Creek

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. For homes choosing not to remove conifers from Zone 1, it is recommended to:
 - 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 spacing 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 Heffley Creek 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 Heffley Creek. 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 – Heffley Creek – 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 July 23, 2019 by Brittany Seibert, LFR.

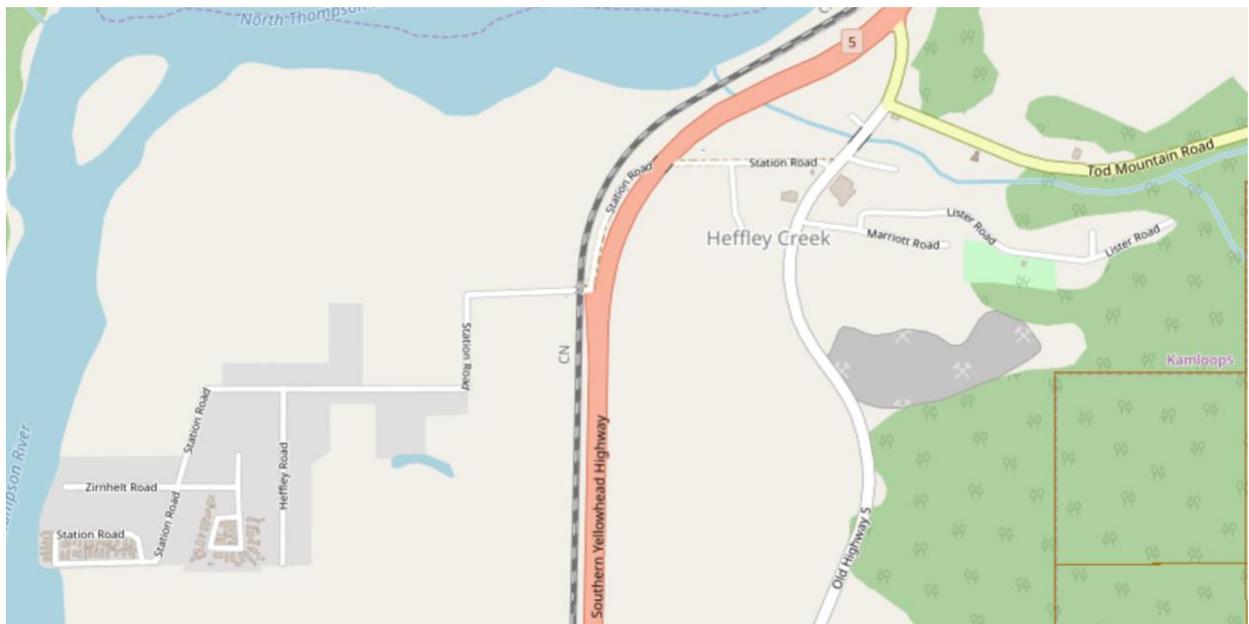


Figure 1 Heffley Creek Community

2.0 Definition of Ignition Zone

Heffley Creek 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 Heffley Creek. 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. Heffley Creek 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.

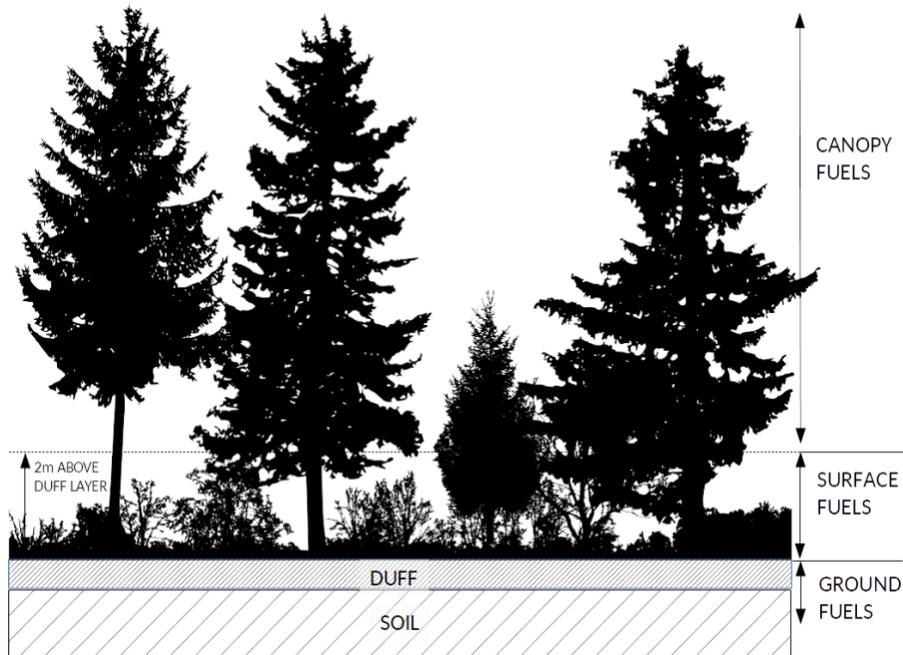


Figure 3 Wildland fuels can be described within three broad fuel layers: Ground fuels, surface fuels (to a height of 2m above the duff layer), and canopy fuels. Canopy fuels are also referred to as aerial fuels

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 over percentage decreases.

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

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.

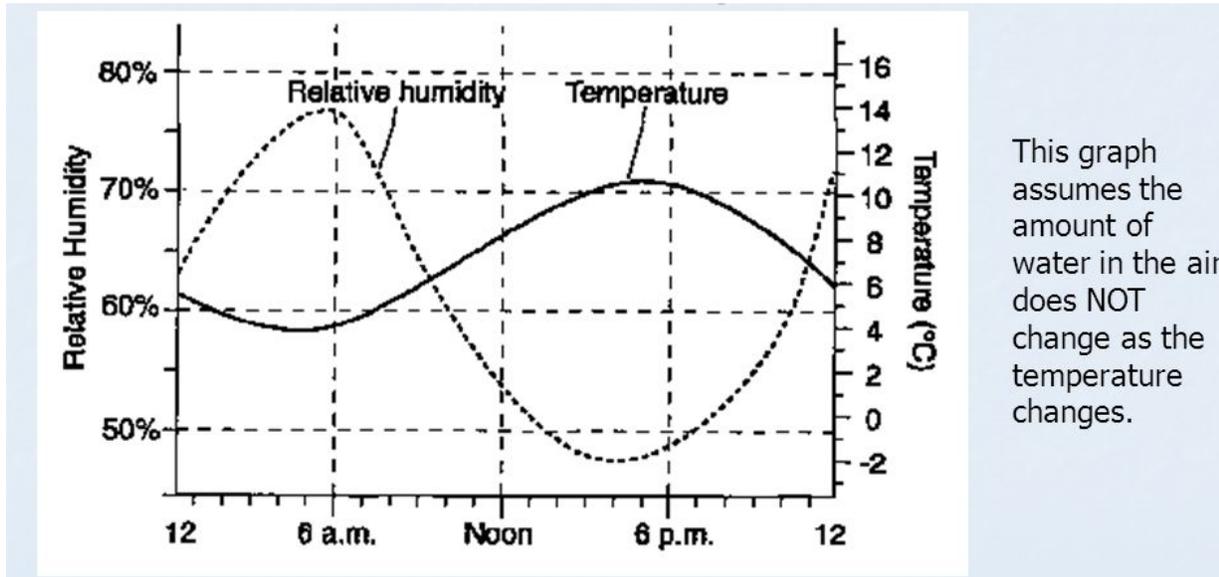


Figure 4 shows the relationship between temperature and relative humidity, as temperatures increase and the overall water content in the air does not change, relative humidity decreases. This affects fire behavior through the increased drying of fuels

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

Heffley Creek is located approximately 25km north of Kamloops, BC along the Yellowhead Highway (HWY 5). It is bordered by the Thompson River to the west, Heffley Lake community to the east, Rayleigh community to the south and Vinsulla community to the north.

It includes an estimated <120 homes, many with outbuildings located on each property. The community is split by the Yellowhead HWY – half of the community located to the west and the other to the east. Road access to the neighborhood located to the east is accessed from both the south and north junctions of Old HWY 5 and Yellowhead Hwy. Secondary access and egress could be taken via Tod Mountain rd. to the Knouff Lake Rd. The neighborhood to the west is accessed only from Station Rd, found within the community.

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 but are mostly standard size and configuration with homes are separated from each other by 10-20m. Some natural vegetation on the properties has been retained with significant additions of planted trees, hedges and ornamental plants.

4.1 Fuel Type

Classifying fuel complexes in BC according 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 Heffley Creek site conditions. Herein lies the challenge of classifying certain BC forest types into a handful of FBP fuels types. In the Heffley Creek area, the most appropriate FBP fuel types are:

4.1.1 C7 Fuel Type*

The C7 Fuel type is characterized by relatively open (<50% canopy closure), uneven-aged stands of Ponderosa pine and Douglas fir (*Pseudotsuga menziesii*). Generally, surface fuels are characterized by perennial grasses, herbs, and scatter 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 3cm.

4.1.2 O1 Fuel Type*

The O1 fuel type is characterized by continuous grass cover, with no more than occasional trees or shrub clumps that do not appreciably affect fire behavior. Two subtype designations are available for grasslands; one for the matted grass condition common after snowmelt or in the spring (O1-a) and the other for standing dead grass common in late summer to early fall (O1-b). The proportion of cured or

dead material in grasslands has a pronounced effect on fire spread there and must be estimated with care.

** 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. Heffley Creek is located in a semi-arid climate, with the July to August period having the lowest average relative humidity and highest daily average temperatures.

4.3 Topography

Heffley Creek is located to the east of the Thompson River on the valley bottom. There is potential that local topography will affect wildland fire behavior effect on valley winds. It is more likely, however, that weather and fuel type will play a larger role in fire behavior for this community.



Figure 5 Satellite imagery of the Heffley Creek community

Figure 6 Contour map of the Heffley Creek community



4.4 Human Ignition Potential

There is an existent human ignition potential within the Heffley Creek community. Some of the more likely scenarios include burning on private land – campfires or agricultural – and ignition sources resulting from motorists on the Yellowhead Highway (HWY 5). Major highways increase the risk of wildfire ignition from the increased risk of motor vehicle accidents, which may result in fire, and an increased risk of ignition sources thrown from vehicles (i.e. cigarette butts).

There is also risk of an ignition resulting from the railway that runs through the west portion of the community. Sparks thrown from passing railcars have in past been the cause of wildfire ignitions in the province.

5.0 Assessment Process

The Heffley Creek community was assessed by Local FireSmart Representative, Brittany Seibert, during her visit on July 23, 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.

The assessment was done in conjunction with Heffley Lake, however due to the distance between the communities and vast difference in fuel and topography a separate *FCCRP Community Hazard Assessment and Community Assessment Report* was completed.

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 Heffley Lake 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 members of both communities and was advertised through the TRND’s Facebook page as well as the Heffley Holler. There were 5 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. Homes in the Heffley Creek community were seen to have fire-rate roofing materials (mainly asphalt shingles). Roofs appeared to be in good condition with no accumulation of combustible debris. 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.

Other structures seen on individual properties (such as sheds) were seen to have wood roofs. There is a

cause for concern as there is potential for outlying structures to become a fuel source that can create embers or sustain enough radiant heat for home ignition. See section 6.3 for further detail

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 7). The removal of fuel accumulations along any exterior wall should be of much greater concern than the actual composition of the wall itself.



Figure 7 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. Vinyl siding was the predominant building exterior within the community. This material is highly susceptible to melting and sluffing from extreme radiant heat.

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 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 long periods of time. There is an additional risk of

firebrand production which poses a risk to any nearby structures or fuel sources. Any outbuilding that is located within 15m (45ft) should have FireSmart principles applied to mitigate potential ignition.



Figure 8 Ignition of outbuildings with 15m of a home pose a significant risk to home ignition due to prolonged exposure to extreme radiant heat

While not a prevalent characteristic within the community, there were still some homes that featured firewood stacks. Firewood is a serious fire danger as it can ignite easily during a wildfire event and burn intensely. Often firewood is located near the principal building and is often responsible for igniting interface buildings during a wildfire. It is recommended that firewood be stacked a min. 10m away from the home during the wildfire season. A pre-caution to shoulder months as wildfire seasons have shown signs in recent years of burning earlier and later through the calendar year.

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 regards to vegetation.

In Heffley Creek Pondarosa pine and Douglas fir are the predominant native tree. Several other species were seen within the PZ-1(a) including various deciduous, spruce, cedar and juniper shrubs and hedges. 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

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that makes it difficult for fire to climb.

Conifer species, particularly spruce, pose a significant risk when found within the PZ-1(a). They offer easily accessible ladder fuels for wildland fire to reach the canopy and create large amounts of needle litter sustaining surface fire. Cedar and Juniper shrubs and hedges are also problematic from a home ignition perspective. These species are rich in organic volatile compounds and terpenes making them easily ignitable.



Figure 9 Cedar and Juniper shrubs and hedges contain volatile compounds and terpenes that make them easily ignitable



Figure 10 Continuous ladder fuels supports increased fire behavior through candling and crown fires

Most homes in the Heffley Creek community have overlapping zones. In many cases, one home's Zone 1

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is the adjacent home's Zone 1. 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.

With this knowledge in mind it is easy to recognize that Zone 2 (10-30m) and Zone 3 (30-100m) for several structures within the community encompass neighboring properties. However, for homes located on the perimeter of the community these zones encompass the natural surrounding vegetation – which potentially may also fall onto public land. The highest density of conifer vegetation was seen along Lister Rd. and Tod Mountain Rd.



Figure 11 Increased conifer density – Ponderosa pine and Douglas fir - within the Heffley Creek community is located mainly along Lister Rd. (pictured) and Tod Mountain Rd.

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 Heffley Creek community and the Thompson Nicola regional district. These recommendations concern wildfire safety issues that were identified as priorities during the assessment:

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- Removal of conifers and combustible plants within the Non-Combustible (Zone 1a) and Zone 1 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 and take on the inherent risk associated with it, 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 spacing of other nearby conifers. It is recommended to space conifers a min. of 3m apart.
- 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.
- 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 on crown land within 100m of a resident’s home, particularly along Tod Mountain Rd. and Lister Rd., should be assessed by a qualified professional to determine the next course of action.
- 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.

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 rated roof that is free of fuel accumulations is a big step to improving the survivability of a home during wildfire event.



Figure 12 Fire rated roofing materials - asphalt, metal or clay - in combination with being free of debris provide increased resiliency against ignition from a wildfire

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 13 Concrete driveway, walkway and gravel help to disconnect the home from potential direct flame contact. Grass is kept green and at low growth therefore reducing the likelihood of intense burning. All other vegetation is kept 10m away from the structure.

9.0 Next Steps

After reviewing the contents of this assessment and its recommendations, it is up to the Heffley Creek 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 Heffley Creek 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 Heffley Creek 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 Heffley Creek seeks to achieve the national recognition as a FireSmart Community, the following standards should be incorporated into its FireSmart Community Plan:

HEFFLEY CREEK FIRESMART COMMUNITY ASSESSMENT REPORT

- 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:	
	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**

Community Name: Heffley Creek		Date: (mm/dd/yyyy) July 23, 2019
Assessor Name: Brittany Seibert		Accompanying Community Member(s):
Hazard Factor	Ref	Mitigation Comments
1. Roof Assemblies		
a. Type of roofs ULC rated (metal, tile, asphalt, rated wood shakes) unrated (unrated wood shakes)	2-5 3-21	All homes are seen with fire-rated roofs, with predominantly asphalt shingles. Most outbuildings (sheds, etc) had fire-rated roofs however there were some seen with wood roofs.
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	Observable roofs appear to be clean and free of debris. Roofs appear to be well taken care of and in good condition
2. Building Exteriors		
2.1 Materials		
a. Siding, deck and eaves	2-7 2-8 2-9	Majority of homes feature a combustible siding exterior, mainly vinyl siding. One log home was observed and one home had wood siding. Several homes featured a deck of various sizing, coverings and screening. Homes appear to have closed eaves however most homes were observed from the road and made it difficult to assess
b. Window and door glazings (single pane, sealed double pane)	2-10	Assumption is that windows are double paned due to the year-round residential homes

<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>Decks configuration would be the primary contributor to ember accumulation, most homes have simple roofs designs however few were witnessed to have pinch points and valleys for ember and debris accumulation</p>
<p>d. Nearby Combustibles – firewood, fences, outbuildings</p>	<p>2-11</p>	<p>Very few homes seen with firewood stacks, reminder to have all firewood away from homes during wildfire season. Most homes had outbuildings (sheds, garages) composed of variety of materials (combustible and non-combustible)</p>

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	Most overstory vegetation within 10m of home were deciduous. Homes with conifer overstories saw a mixed of ponderosa pine, douglas fir and the occasional spruce. Spruce trees had ladder fuel flush to the ground while the pine and fir were min. 1m off the ground. Recommend removal of spruce and removal of low-lying branches of pine and fir up to 2m from ground
b. Ladder fuels (treated vs untreated)	2-17	Ladder fuels seen included low-lying branches of conifer trees within 10m of home and homes with juniper/cedar hedges/shrubs within the non-combustible zone (0-1.5m).
c. Surface fuels - includes landscaping mulches and flammable plants (treated vs untreated)	2-16	95% of lawns were maintain with grasses kept below 15cm. Several homes seen with combustible bushes against home. Bark mulch seen in gardens
3.2 PZ-2: Vegetation - 10 - 30m from structures Page Reference 3-9		
a. Forest vegetation (overstory) treated vs untreated	2-14	Several homes have untreated overstory within 10-30m from the structure. This is mainly due to homes backing onto forest/crown land. Mixture of various deciduous trees, as well as the local ponderosa and douglas fir and some planted spruce.
b. Ladder fuels treated vs untreated	2-17	Native species (Pondersa and Douglas fir) were not seen to have much in regards to ladder fuels. Natural shedding of lower branches has allowed for distance between surface fuels and aerial fuels. Planted species – spruce – contain low lying branches that are flush to the ground. Several cedar and juniper species were also seen as “fence line” along properties.
c. Surface fuels treated vs untreated	2-16	Sparse grasses and leafy shrubs
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	Sparse grasses within tree line, with increased fuel load in open grassy areas. Sage brushes seen in O1 fuel type intermixed within C7. Agricultural land also hosts abundance of surface fuels. Fuel loads and flammability dependant on time of year

Hazard Factor	Ref	Mitigation Comments
b. Moderate fuel - mixed wood – light to moderate surface and ladder fuels, shrubs	2-17	C7 and O1 fuel type throughout community.
c. Heavy fuel - coniferous - moderate to heavy surface and ladder fuels, shrubs	2-14	N/A. Heffley Creek proper shows mainly O1 and sparse C7 fuel type. Fires are most likely to be flashy and quick moving along the ground. Occasional candling may occur if long grasses are able to reach low-lying branches
d. Logging slash, dead/down fuel accumulations	2-16	N/A
e. Diseased forest – without foliage vs with foliage		Evidence of beetle kill? Trees are grey/dead (needles have fallen off). Class 3&4 tree
f. Fuel islands <u>within</u> community - treated vs untreated		Conifers within community are untreated but have excellent horizontal continuity between other conifer vegetation. Some homes however have poor horizontal continuity between the structure and the tree as branches are in direct contact with the home
4. Topography		
4.1 Slope (within 100m of structures)		
a. Slope - Flat or < 10 %, 10 – 30% or >30%	2-19	Flat/Rolling
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. b. Buildings located mid-slope c. Setback from top of slope <10m, or upper slope	2-12	N/A

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	Community on East side of HWY 5: Two access/egress points to HWY 5, and one access/egress towards Heffley Lake/Sun Peaks and Knouff Lake. Residential roads are single with only one access/egress point. Community on West side of HWY 5: One access/egress point to HWY 5 and residential roads single dead ends
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
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	Hydrants are located within community
6.2 Fire Service		
a. Fire Service < 10 minutes or > 10 minutes, no fire service	2-25	No FD seen within the community. BCWS crews located in Kamloops (approx. 20min).
6.3 Homeowners Suppression Equipment		
a. Shovel, grubbing tool, water supply, sprinklers, roof-top access ladder	3-28	Homeowners are likely to have access to basic suppression tools such as shovels. Water would be limited to garden hose. Potential for community members to have access to machinery and operator.

Hazard Factor	Ref	Mitigation Comments
7. Fire Ignition and Prevention - Utilities, Chimneys, Burn Barrel / Fire Pit, Ignition Potential		
7.1 Utilities		
a. ToFireSmartRecommended Guideline?	2-24	N/A
7.2 Chimneys, Burn Barrel / Fire Pit		
a. ToFireSmartRecommended 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	Dry, arid environment prone to easily ignitable fine surface fuels (ie: grasses) Year-round residents, agricultural fields = potential for burning (burn piles, fields, etc) Exposure to vehicles from HWY and tourists heading to Heffley Lake and Sun Peaks Railway through community on West side of HWY; HWY ould act as a fuel break for East side of HWY

General Comments

C7 and O1 fuel types evolved to withstand frequent fires. Presentation of fuels type demonstrates area as a wildfire prone environment