Paul Lake (west)

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 Paul Lake (west) but could be applied to communities with similar characteristics.

Recommendations for Paul Lake (west)

1. Remove conifers and combustible plants from Zone 1 (<10m from home) if possible. If conifers are retained the following actions are recommended
    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 3m
    d. Remove all needle litter on the ground

2. Remove or store appropriately all combustibles in Zone 1 – including personal items such as trailers, recreational vehicles, tools, building materials, etc.

3. Apply FireSmart principles to any outbuilding within 15m of a structure

4. Removal of ladder fuels and increase conifer spacing within Zone 2 (10-30m) and Zone 3 (30-100m).

5. Zones (up to 100m from a home) that fall onto crown land should be assessed by a qualified professional to determine course of action

6. Remove firewood stacks from Zone 1 during times of wildfire threat

7. When away for lengths of time when wildfire threat is high, consider items such as rattan door mats, flammable patio furniture, children's toys, trash cans, BBQs, etc. as combustibles and store away

8. 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 and 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 Paul Lake (west) 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 Paul Lake (west). 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 – Paul Lake (west) – FireSmart project was provided by the 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 31, 2019 by Brittany Seibert, LFR.

Figure 1 Paul Lake (west) community

2.0 Definition of Ignition Zone

Paul Lake (west) 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 devasting 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 Paul Lake (west). 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. Paul Lake (west) 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 agg*ressively 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.

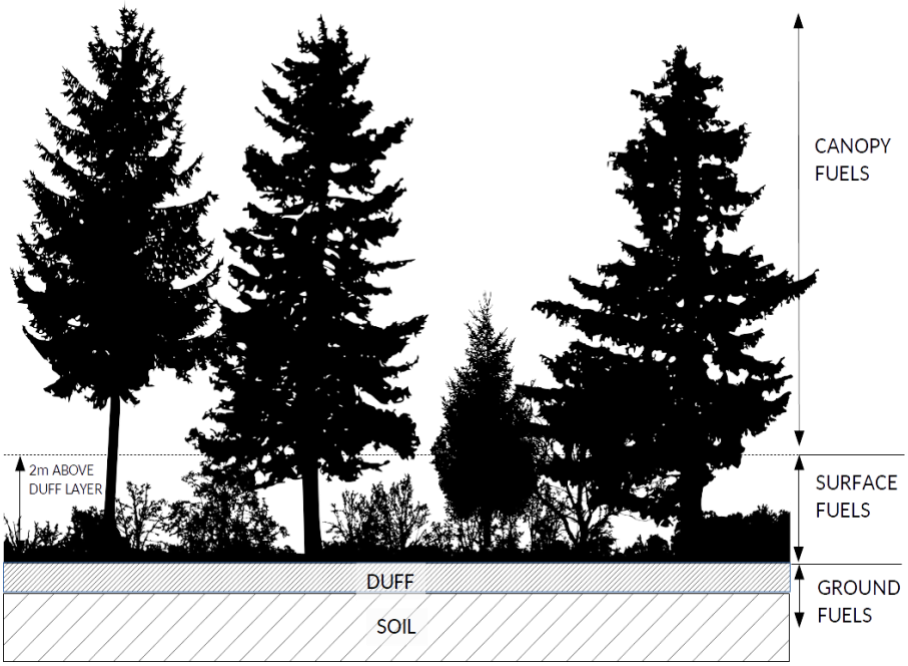

Figure 3 Wildland fuels can be described within three broad fuel layers: Ground fuels, surface fuels (to a height of 2m above the duff layer), and canopy fuels. Canopy fuels are also referred to as aerial fuels

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 course 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.

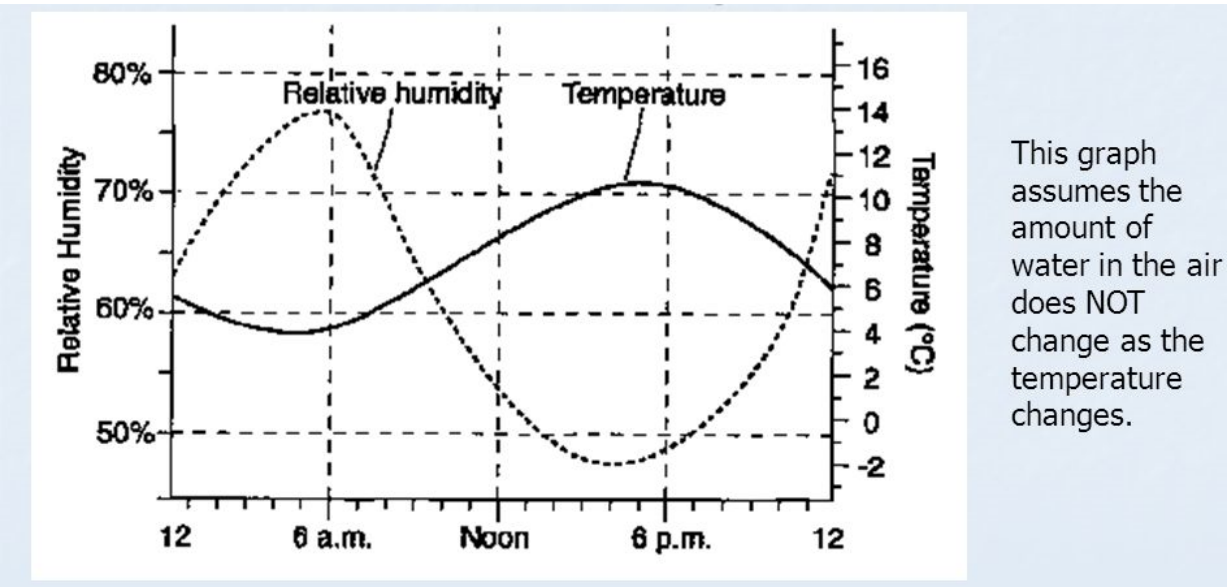

Figure 4 shows the relationship between temperature and relative humidity, as temperatures increase and the overall water content in the air does not change, relative humidity decreases. This affects fire behavior through the increased drying of fuels

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 course 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

Paul Lake (west) is a community located on the southwestern shore of Paul Lake, which is located approximately 20km northeast of Kamloops, BC. The community is bordered by the lake to the north, Paul Lake Provincial Park to the north and east, and Harper Mountain (Ski Resort) to the south.

It includes an ~100 homes, including a strata community of ~20 townhomes located in the west of the community. The Paul Lake Provincial Group Campground contains 90 sites for seasonal campers. There is a single access and egress point for the community from Pinantan Pritchard Rd. along Paul Lake Rd. Harper mountain road could be utilized as an escape route for safety zones but should be noted that it is a dead-end road.

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 some 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 Paul Lake (west) site conditions. Herein lies the challenge of classifying certain BC forest types into a handful of FBP fuels types. In the Paul Lake (west) area, the most appropriate FBP fuel types are:

4.1.1 C5 Fuel Type*

This fuel type is characterized by mature stands of red pine (*Pinus resinosa* Ait.) and eastern white pine (*Pinus strobus* L.) in various proportions, sometimes with small components of white spruce (*Picea glauca* (Moench) Voss) and old white birch (*Betula papyrifera*Marsh.) or aspen (*Populus* spp.). The understory is of moderate density, usually red maple (*Acer rubrum* L.) or balsam fir (*Abies balsamea* (L.) Mill.). A shrub layer, usually beaked hazel (*Corylus cornuta* Marsh.), may be present in moderate proportions. The ground surface cover is a combination of herbs and pine litter. The organic layer is usually 5–10 cm deep.

4.1.2 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 tens to build up and persist for some time. Duff layers are relatively shallow – typically less than 3cm.

**Excerpt from the CFFDRS FBP*

4.2 Fire Weather

There is very little information regarding the climatic zone of Paul Lake. However, the climatic conditions of the southern and central region of the Thompson-Nicola can be broadly characterized by warm, dry summers and cool winters. Paul Lake may also have a microclimate (i.e. increased rh values) due to the proximity of the community to the lake.

4.3 Topography

Paul Lake (west) is located on the south-west shoreline of Paul Lake. The lake itself is situation on the valley bottom, with steep slopes to south and north (30%). Paul Lake (west) is built into the bottom of the slope. Topography is likely to influence local winds and encourage fire growth up slope away from the community. However, the surrounding slopes (particularly slope to the immediately south) will increase fire behavior. This increase may result in firebrand production that may travel down or cross slope ignition homes within the community.

Figure 5 Paul Lake community (encircled in red) located at the base of a north facing slope.

Figure 6 Contour map of Paul Lake (west)

4.4 Human Ignition Potential

There are ample opportunities for human ignitions within the community. There is a high number of vacation homes within the community that are likely to have campfires on private property. As well, a provincial recreational site is located on the east side of the community and a provincial campground to the west. Allowance of fires within the campgrounds are permitted, it is unknown if the recreational site allows for campfires. Poor management of campfires can quickly lead to ignition of nearby fuel sources and a subsequent wildfire.

The community itself is characterized by the close proximity of properties to each other and the proximity of homes to the forest stand. Should a structure fire occur it likely that the fire would be transfer easily from property to neighboring property or vegetation. This ease of transference could likely result in a wildfire event.

5.0 Assessment Process

The Paul Lake (west) community was assessed by Local FireSmart Representative, Brittany Seibert, during her visit on July 31, 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 the East Paul Lake community, 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 East Paul 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 through Community Champions including Diane Carlson. There were 10 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 Paul Lake (west) community were seen to have fire-rate roofing materials. Roofs, however, were seen in various states of condition and seen with accumulation of combustible debris (likely due to heavy presence of overstory in PZ-1a and PZ-1). 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.

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 Juniper and Cedar shrubs and hedges within Zone 1a (0-1.5m) and conifers – Douglas fir – located in Zone 1 (1.5-10m) pose an increased risk to home ignition due to the ability of easy ignition and ability to sustain high-intense 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 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.

Figure 8 Firewood and propane tanks should be relocated 10m away from the home - particularly during times of increased threat of wildfire. Firewood has the ability to sustain high-intense heat while propane tanks may explode under extreme radiant heat.

Firewood is a serious fire danger as it will ignite and burn intensely during a wildfire event. 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 stack a min. 10m away from the home during the wildfire season. A pre-caution to shoulder months as wildfire seasons has shown signs in recent years of burning earlier and later through the calendar year.

Propane tanks pose a similar, if not a bigger, threat to home ignition during a wildfire event. Propane tanks surrounded by dense concentrations of vegetation are potential bombs. When the wildland fuels near the tanks burn during an interface fire, the internal pressure of the tank can cause the tank to vent through a relief valve. This will create an intense fire that could ignite nearby combustibles. Propane tanks should be checked regularly to ensure relief are functional. Failure of a relief valve can result in a boiling liquid vapor explosion, which can be catastrophic to both surrounding structures and responding personnel.

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 firebrands is the most likely scenario. Because of this, innocuous items commonly found around the outside of a home may act as a combustible that could ignite the home. Flammable patio furniture (particularly seat cushions), sisal doormats and rats, 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 Paul Lake (west) the predominant native tree species is Douglas Fir and Cedar. Several other species were seen within the PZ-1(a) including various deciduous, Ponderosa pine, 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 that makes it difficult for fire to climb.

Conifer species, particularly those with low-lying branches, 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. Slope can also play a role in ladder fuels and rising slope allows for higher branches to come into closer contact with the ground. 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 Conifer density abuts private property, often within 10m of the home. With the added element of slope, fire behavior in this fuel type could be detrimental to housing loss

Most homes in the Paul Lake (west) community have overlapping zones. In many cases, one home's Zone 1 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.

Figure 10 Homes in the Paul Lake (west) community are within close proximity to one another. This highlights the importance of community efforts to FireSmart individual properties. Non-FireSmarted properties have an increased risk of ignition which poses a major threat to ignition of nearby homes.

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 Paul Lake (west) community concerning 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 (2m) and pine needle debris are removed. Homeowners should also ensure to remove any branches in contact with the home itself and consider the increasing the spacing between conifers to at least 3m.

- 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 recommended that they also have FireSmart mitigations done to and around them to prevent ignition.

- Fuel reduction in Zone 2 (10-30m) and Zone 3 (30-100m) should see trees spaced 3m apart and low-lying branches cut to above 2m. should see trees spaced 3m apart – particularly along the southern slopes of Paul Lake Rd. This will reduce the likelihood of fire transference through the crown and will help to keep fire along the ground with lower burning intensities.

    - Priority zones (up to 100m away from the home) that fall onto crown land should be assessed by a qualified professional to determine the next course of action.

Figure 11 Picture on the left is an example of fuel load mitigations that have occurred within the community. Ladder fuels have been removed and tree spacing has been maintained. Picture on the right is an example of the untreated fuel type seen throughout the community

- 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 during times when wildfire threat is low. A caution to shoulder as wildfire seasons have begun to shift and demonstrate various peak burning periods each calendar year.

- When fire weather is severe and the home is unoccupied, 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 rate 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 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 13 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 Paul Lake (west) 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 Paul Lake (west) 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 Paul Lake (west) 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.

Assuming Paul Lake (west) seeks to achieve the national recognition as a FireSmart Community, it will integrate the following standards into its FireSmart Community Plan:

- 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:	
Brittany Seibert	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: Paul Lake		**Date: (mm/dd/yyyy): July 31, 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 seen had fire-rated roofing with a mixture of materials between asphalt and metal roofs
b. Roof cleanliness and condition * *Debris accumulation on roofs / in gutters; curled damaged or missing roofing material; or any gaps that will allow ember entry or fire impingement beneath the roof covering*	2-6	Structures along the south shore of the lake are seen with debris (needles) on the roofs, most likely due to heavy overstory
2. Building Exteriors		
2.1 Materials		
a. Siding, deck and eaves	2-7 2-8 2-9	Majority of structures are seen to have decks that are on the second story in the front of the structure and run flush to the ground in the back (due to slope). Majority of the structures (if not all) seen have unrated exteriors of vinyl or wood (there is a possibility of new structures being built with hardy board).
b. Window and door glazings (single pane, sealed double pane)	2-10	While the community has year-round residents, there is a high volume of seasonal/recreation homes. Condition of buildings vary and it is expected that windows range from single to tempered glass

c. Ember Accumulator Features (scarce to abundant) * *Structural features such as open eaves, gutters, unscreened soffits and vents, roof valleys and unsheathed crawlspaces and under-deck areas*		Decks and roofs are likely to be the primary ember accumulator not only from their design but also due to the heavy over story and abundant fuel around the community
d. Nearby Combustibles – firewood, fences, outbuildings	2-11	Majority of structures are seen with firewood stacked within the 10m zone and several with it stacked within the non-combustible zone. Due to tight compactness of property lines, sheds and other homes are also taken into consideration as nearby combustibles

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	Heavy conifer overstory of Douglas fir to the south of the lake. Community residence (Deerwood) on the west shore of the lake also contains conifer overstory however the conifer species are greatly spaced out
b. Ladder fuels (treated vs untreated)	2-17	Homes and structures back directly into forested vegetation on the south shore of the lack. Forest stand is assessed as C5 fuel type. Deerwood residence on the west shore seen to have combustible shrubs with non-combustible zone and within 10m of homes
c. Surface fuels - includes landscaping mulches and flammable plants (treated vs untreated)	2-16	Deerwood residence has well maintained yards with grasses well-watered and kept below 15cm of growth. Surface fuels along the south shore are sparse due to dense structure locations and slope aspect (North).
3.2 **PZ-2:** Vegetation - 10 - 30m from structures **Page Reference 3-9**		
a. Forest vegetation (overstory) treated vs untreated	2-14	C5 fuel type. Heavy conifer fuel load mainly of Douglas fir with the presence of Cedar
b. Ladder fuels treated vs untreated	2-17	Forest stand is seen to be of C5 fuel type. Forest line to the west near Deerwood has been treated with ladder fuel removed and horizontal spacing increased
c. Surface fuels treated vs untreated	2-16	South shore line mainly twigs, branches, debris from trees (thick duff layer); Some pocket of grasses to the west
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	Small pocket of grass to the west, C5 surface fuels mainly twigs, fallen branches, debris from trees, downed logs, etc.

Hazard Factor	Ref	Mitigation Comments
b. Moderate fuel - mixed wood – light to moderate surface and ladder fuels, shrubs	2-17	Immature trees, low lying branches and downed trees primary fuel load for ladder fuels
c. Heavy fuel - coniferous - moderate to heavy surface and ladder fuels, shrubs	2-14	Heavy continuity of conifer horizontally to the south. Pockets of ladder fuels increase the vertical continuity.
d. Logging slash, dead/down fuel accumulations	2-16	N/A
e. Diseased forest – without foliage vs with foliage		N/A
f. Fuel islands within community - treated vs untreated		N/A
4. Topography		
4.1 Slope (within 100m of structures)		
a. Slope - Flat or < 10 %, 10 – 30% or >30%	2-19	>30% to the south; flat to the west
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	Homes along the south shore located at the base of the slope

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	Single road; Road leads to Harper Mt. which could be used as a safety zone in extreme cases. No-thru 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
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	Lake main water source
6.2 Fire Service		
a. Fire Service < 10 minutes or > 10 minutes, no fire service	2-25	No official FD; BCWS located in Kamloops for forest fire response
6.3 Homeowners Suppression Equipment		
a. Shovel, grubbing tool, water supply, sprinklers, roof-top access ladder	3-28	Year-round residents more likely to have basic suppression tools over vacation home owners

Hazard Factor	Ref	Mitigation Comments
7. Fire Ignition and Prevention – Utilities, Chimneys, Burn Barrel / Fire Pit, Ignition Potential		
7.1 Utilities		
a. To FireSmart Recommended Guideline?	2-24	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	Due to structures being built along the bottom of slope, slope is unlikely to be main characteristic of fire threat. Valley winds, heavy fuels loads (including structure density) are more likely to be the more influential characteristics. Human ignition is of high probability due to potential of campfires on private property in heavily vegetative areas. Recreation site located to the east of residential area; fire pits unknown

General Comments