Regional District of Central Kootenay Area D and Kaslo Community Wildfire Protection Plan Update - 2016

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I certify that I have reviewed this document and I have determined that this work has been done to standards acceptable of a Registered Professional Forester.		I certify that I have reviewed this document and I have determined that this work has been done to standards acceptable of a Registered Professional Forester.	

ACKNOWLEDGEMENTS

The authors would like to thank the staff of the Regional District of Central Kootenay (RDCK), particularly: Nora Hannon, Wildfire Mitigation Coordinator, for her assistance in the development of the plan. Thanks also to Aimee Watson, Electoral Area D Director; Andrew Bellerby, Regional Fire Chief and General Manager of Emergency Services; Kaslo Mayor and Council, Kaslo Fire Chief Doug Yee; Kaslo CAO Neil Smith, and other Village of Kaslo and Regional District staff for their input and support.

In addition, the authors would like to thank, for their cooperation, input and insight, Ministry of Forests, Lands, Natural Resource Operations and Rural Development staff including Tara DeCourcy, District Manager Selkirk Resource District; Garth Wiggill, Director/Strategic Initiatives Kootenay Boundary Region; and Curt Nixon, Tenures Forester as well as BC Wildfire Service Southeast Fire Centre Fuels Management Specialist Mike Morrow. This report would not be possible without the Strategic Wildfire Prevention Initiative (SPWI) Program and funding from the Union of British Columbia Municipalities (UBCM).

EXECUTIVE SUMMARY

The Community Wildfire Protection Plan (CWPP) Program was created in British Columbia (BC) as a response to the devastating 2003 wildfire in Kelowna. As an integral part of the Strategic Wildfire Prevention Initiative, managed and funded through the Union of British Columbia Municipalities, CWPPs aim to develop strategic recommendations to assist in improving safety and to reduce the risk of damage to property from wildfires. In 2008, Community Wildfire Protection Plans were completed for Regional District of Central Kootenay (RDCK) Fire Protection Areas within Electoral Area D and Kaslo to help guide the Regional District in wildfire risk reduction and mitigation activities. This document intends to update the applicable 2008 CWPPs (collectively referred to as the 2008 CWPP) and the threat of wildfire within and around the municipality. This 2016 CWPP Update reflects changes in Area D and Kaslo communities and current conditions using the current provincially accepted standard methodology and baseline data for hazard and threat analysis. This CWPP Update also examines the effectiveness of completed work, identifies opportunities for improvement within existing programs, and describes future initiatives. Significantly, the RDCK is engaging in collaborative planning and implementation of wildfire risk reduction activities within the Wildland Urban Interface (WUI) with local licensees, First Nations, and adjacent jurisdictions. This landscape level approach is reflected in the Plan.

Wildfire management requires a multi-faceted approach for greatest efficacy and risk reduction. Five key areas where changes can be made to address community wildfire risk are identified in this CWPP Update and include: Communication and Education; Structure Protection; Planning and Development; Emergency Preparedness; and Vegetation/Fuel Management. A total of 47 prioritized wildfire mitigation recommendations are made in this Plan and summarized below. While it is recognized that the RDCK will not likely have the resources required to act upon all recommendations, it is recommended that the Regional District review and identify resource requirements and develop a timeframe for implementation of recommendations as available funding and resources allow.

Item	Priority	Recommendation	Estimated Cost ($)
Communication and Education			
Objective: To improve public understanding of fire risk and personal responsibility by increasing resident awareness of the wildfire threat in their community and to establish a sense of homeowner responsibility.			
1.	High	• Establish a school education program to engage youth in wildfire management. Consult ABCFP, BCWS (the zone) and RDCK Fire Service to facilitate and recruit volunteer teachers and experts to help with curriculum development to be delivered in elementary and/or secondary schools. Educational programming can be done in conjunction with any currently running fire prevention education programs.	$5,000
2.	High	• Make summaries of this report and associated maps publicly available through webpage, social media, and public FireSmart meetings. Add fire threat spatial data to the interactive web-mapping tool to allow residents to find their property and the associated threat of wildfire.	Within current operating costs
3.	Moderate	• Participate in the National Wildfire Community Preparedness day, typically in May each year.	$2,500

Item	Priority	Recommendation	Estimated Cost ($)
4.	High	• Expand door-to-door FireSmart assessment and/or Home Partner Program within the Area D and Kaslo interface in order to educate residents and to quantify the level of risk in the interface.	$20,000
Objective: To enhance the awareness of elected officials and stakeholders regarding the resources required to reduce fire risk.			
5	High	• Develop regional development permit standards and align local government bylaws.	$30,000
6.	High	• Provide a group voice to the Building and Safety Standards Branch and other provincial entities,	Within current operating costs
7.	High	• Develop a coordinated approach to fuel management and hazard reduction within and adjacent to the Area D and Kaslo Study Area by coordinating with stakeholders including conservation organizations, communities, forest licensees, Ministry of Transportation and Infrastructure and utility companies, to aid in the establishment of FireSmart activities and large, landscape-level fuel breaks or compliment current or proposed fuel treatment areas.	$25,000
Structure Protection and Planning			
Objective: Enhance protection of critical infrastructure from wildfire.			
8.	High	• Complete a fire flow / water vulnerability assessment for each water system and identify and map all alternative water sources (reservoirs, streams, lakes, etc.). Identify which areas may have insufficient or unreliable water supplies and provide recommendations to reduce vulnerability in Area D and Kaslo. Explore collaboration with other agencies including Columbia Basin Trust, Ministry of Environment, Ministry of Transportation and Infrastructure and Interior Health Authority.	$20,000
9.	High	• Complete a vulnerability assessment of all critical infrastructure (not only RDCK and Village of Kaslo critical infrastructure) including water infrastructure in interface areas with FireSmart recommendations.	$20,000
10.	High	• Develop alternative, back-up water sources for fire protection, including determining the suitability of the MacDonald Creek water reservoir, and the establishment of standpipes as required.	Based on assessments
11.	High	• Complete a detailed review of back-up power source options for all critical infrastructure and upgrade as required.	Review: $20,000 Upgrade: Based on review
12.	High	• Complete more detailed hazard assessments and developing, in collaboration with other available government funding, response plans for stabilization and rehabilitation of burn areas in watersheds that are vulnerable to post-wildfire debris flows and floods.	$25,000
Objective: Encourage private homeowners to voluntarily adopt FireSmart principles on their properties.			

Item	Priority	Recommendation	Estimated Cost ($)
13.	High	• Support homeowners with professionals to provide the Home Partners Program or WUI Site and Structure Hazard Assessments for interface homes and provide information to homeowners on specific steps that they can take to reduce fire hazards on their property. Homeowners should npot be charged for these assessments.	$160 per house
Local Government Policy			
Objective: To reduce wildfire hazard on private land and increase FireSmart compliance.			
14.	High	• Complete OCP review and implement and / or strengthen zoning to expand reach of the existing.	Within current operating costs
15.	High	• Develop Wildfire Hazard Development Permit (DP) Areas for major retrofits / renovations or new builds (building permits), collecting bonds to be returned upon evidence of completing development and landscaping according to wildfire hazard assessment. Review District of North Vancouver and Kelowna DP processes, with particular attention to implementation, enforcement, affordability and associated liabilities. Explore proactive incentives, such as tax reductions and reduced building permit fees.	$25,000
16.	High	• Obtain legal advice regarding the Building Act, specifically regarding the temporarily unrestricted matters and local government authority to set exterior building materials requirements. Use local government authority to mandate FireSmart construction materials beyond BC Building Code in wildfire hazard development permit area, as allowed.	$10,000
17.	High	• Develop a landscaping standard to be applied in interface / DP areas. The standard should list flammable non-compliant vegetation, non-flammable drought and pest resistant alternatives, and tips on landscape design to reduce maintenance, watering requirements, and reduce wildfire hazard. Include meeting landscaping standard as a requirement of Development Permit. Review District of North Vancouver and Kelowna DP processes, with particular attention to implementation, enforcement, affordability and associated liabilities. Explore proactive incentives, such as tax reductions and reduced building permit fees.	Within current operating costs
18.	High	• Proactively enforce wildfire covenants requiring owners to maintain their properties hazard free on all properties in Development Permit areas. Enforcement will serve to minimize fuel risks on problematic private properties that have allowed hazardous accumulation of fuels and provide improved protection to adjacent lands.	Budget required for additional bylaw enforcement capacity
19.	High	• Develop a landscaping standard to be applied in interface / DP areas to ensure that developers leave building set backs on private land so that there is a minimum of 10 m distance between buildings and forest interface.	Within current operating costs
20.	High	• Consider developing an outdoor burning bylaw specifying requirements for and limitations to outdoor burning and, in conjunction with the Fire Chief, implement the bylaw at times of high fire danger when provincial bans are not in place. The bylaw should consider effective and efficient enforcement measures and powers.	Develop bylaw within current operating costs Budget required for additional bylaw enforcement capacity

Item	Priority	Recommendation	Estimated Cost ($)
21.	Moderate	• Work with the Building and Safety Standards Branch to provide input into the Building Code revisions that would apply within the interface to prevent the spread of wildfire.	Within current operating costs
Emergency Response and Planning			
Objective: To improve structural and wildfire equipment and training available to RDCK Fire and Rescue.			
22.	High	• Conduct annual mutual aid training with MFLNRORD and BCWS including completion of a mock wildfire simulation in coordination with BCWS and safety training specific to wildland fire and risks inherent with natural areas. As part of the training, conduct annual reviews to ensure PPE and wildland equipment resources are complete, in working order, and the crews are well versed in their set-up and use. Wildfire training should be in compliance with Office of the Fire Commissioner standards.	Within current operating costs
23.	High	• Ensure RDCK Wildfire Mitigation Coordinator act as liaison between the RDCK Collaborative Planning Group and the Emergency Preparedness Committee for Area D and Kaslo. Coordination and information sharing are crucial to the development of a community well prepared for wildfire.	Within current operating budget.
24.	Moderate	• Review and clarify SPU request procedures with RDCK fire Chiefs and ensure robust SPP115 training for fire fighters.	Within current operating budget.
25.	Moderate	• Develop Regional Service to fund additional SPUs and maintain existing SPUs.	$50,000 (Annually)
26.	Moderate	• Explore opportunities to collaborate with BCWS and within RDCK fire service to coordinate discount volumes of hose for interface fires, reducing costs and logistics to local fire departments	Within current operating costs
27.	High	• Explore opportunities to ensure a duty officer is in place in each Fire Protection Area to provide coverage for periods of high or extreme hazard.	To be determined based on current rates.
28.	Moderate	• Conduct fire preplan assessment for key interface areas in Kaslo and Area D. Other jurisdictions have completed assessments that prioritize fire department-specific variables, such as distance to hydrants, response time from nearest fire station, etc. to produce local risk ratings.	$5,000
Emergency Response Evacuation and Access			
Objective: To improve access and egress to neighbourhoods at risk and natural areas within RDCK.			
29.	High	• Develop a Total Access Plan to create, map and inventory trail and road network in natural areas for suppression planning, identification of areas with insufficient access and to aid in strategic planning. Fire threat mapping from this CWPP should be included. The plan should be updated every five years, or more regularly, as needed to incorporate additions or changes.	$8,000 + updating costs
30.	High	• Require that all new interface developments have access for evacuation and sufficient capacity for emergency vehicles.	Within current operating costs
31.	Moderate	• Facilitate completion of emergency planning zones for interface neighbourhoods with limited access	Within current operating costs

Fuel Management			
Objective: Reduce wildfire threat on public lands through fuel management.			
32.	High	• Proceed with detailed assessment, prescription development and treatment of hazardous fuel units identified in this CWPP. Collaboration with licensees may facilitate larger projects.	UBCM SWPI, CBT, FES BC Funding / local government Funding as available
33.	High	• Prioritize Areas of Interest across Electoral Areas with updated CWPPs to ensure effective and objective treatment	Within current operating costs
Objective: Maintain treated areas under an acceptable level of wildfire fire threat (moderate).			
34.	Moderate	• As treatments are implemented, complete monitoring within 10 years of treatment (subject to site conditions) and maintenance every 15-20 years (subject to prescription and site conditions) on previously treated areas. Treated areas should be assessed by a Registered Professional Forester, specific to actions required in order to maintain treated areas in a moderate or lower hazard.	UBCM SWPI, CBT, FES BC Funding / local government Funding as available

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1.0 INTRODUCTION

The Community Wildfire Protection Plan (CWPP) Program was created in British Columbia (BC) to aid communities in developing plans to assist in improving safety and to reduce the risk of damage to property. The Program was developed in response to recommendations from the "Firestorm 2003 Provincial Review" (Filmon, 2003).

The Regional District of Central Kootenay, Electoral Area D (Area D) and the Village of Kaslo retained Cathro Consulting Ltd and B.A. Blackwell and Associates Ltd to complete an update to the 2008 Community Wildfire Protection Plan for the Village of Kaslo, completed by B.A. Blackwell and Associates Ltd. This is the only formal CWPP previously completed in Area D that overlaps with the current Area of Interest.

Since 2008, considerable new development in the Wildland Urban Interface (WUI) has occurred. These areas either were not previously assessed for hazard, or the hazard and associated threat has increased due to the location and siting of the new development in relation to the assessment polygons. This CWPP update provides a reassessment of the level of risk with respect to changes in Area D and Kaslo communities and reflects the current conditions. In addition, methods for assessing wildfire threat have evolved since 2008. This update uses the provincially accepted standard methodology and baseline data for hazard and threat analysis.

Specifically, the objectives of this update are to:

- Summarize implemented recommendations from the 2008 CWPP;
- Summarize wildfire risk mitigative actions implemented by the RDCK that may be outside the recommendations of the 2008 CWPP;
- Provide the RDCK with an updated threat assessment;
- Prioritize mitigative action recommendations to address communication and education, structure protection, emergency response, and fuel management;
- Provide a prioritized maintenance schedule for the areas that have been treated; and,
- Provide a current document that highlights best practices for smoke management and safe prescribed burning practices, as well as explores alternative avenues for reducing woody debris on fuel treatment areas.

This CWPP update will provide the RDCK with a framework that can be used to identify methods and guide future actions to mitigate fire risk in the community. The scope of this project included three distinct phases:

I. Assessment of fire threat to spatially identify those areas of electoral Area D and Kaslo most vulnerable or at highest risk of fire;

II. Consultation with representatives from RDCK's staff, Fire Departments, Ministry of Forests, Lands and Natural Resource Operations (MFLNRORD), BC Wildfire Service (BCWS), Union of British Columbia Municipalities (UBCM), residents, stakeholder Groups and First Nations to assist with defining the objectives for wildfire protection, and to develop the mitigation strategy alternatives that would best meet the needs of Area D and Kaslo.

III. Development of the Plan which outlines measures to mitigate the identified risk through communication and education programs, structure protection, emergency response and management of forestlands adjacent to the community.

1.1 GOALS AND OBJECTIVES OF THE PLAN

This is an update to the 2008 Community Wildfire Protection Plan completed within the RDCK Area D (2008 Village of Kaslo, Argenta, Cooper Creek, Lardeau and Ainsworth CWPP's) and accounts for changes to forest fuel types due to forest growth, forest health, windthrow, forest harvesting, forest fires and new developments. This project has been undertaken with funds from the Strategic Wildfire Prevention Initiative (SWPI), administered through the Union of BC Municipalities (UBCM). The broad goals of this project are to restore and maintain landscapes, create fire adapted communities, and promote safe, effective and efficient wildfire response.

These objectives are achieved by creating an action plan that focuses on these fundamental components of a CWPP:

1) Communication and Education, as well as training;
2) Structure Protection;
3) Planning and Development;
4) Emergency Response; and,
5) Vegetation (Fuels) Management.

The CWPP update was developed in seven general phases:

1) Background research - general community characteristics, such as demographic and economic profiles, critical infrastructure, environmental and cultural values, fire weather, fire history, relevant legislation and land jurisdiction.
2) Initial GIS analyses – updating fuel typing, creating threat polygons for Area D, assigning initial threat based upon fuel type, aspect, slope, and proximity to structure.
3) Field work - site visits to the area allow for 1) meetings with RDCK staff; 2) fuel type verification; 3) completing hazard assessment forms, 4) ground-truthing initial threat ratings, and 5) identification of site specific issues.
4) Consultation – meetings and consultation with MFLNRORD District staff and RDCK Fire Department representatives, residents, stakeholders and First Nations.
5) Secondary GIS analyses – final fuel type updating and threat rating based upon field ground-truthing and results of hazard assessment forms.
6) Report and map development - identification of RDCK challenges and successes, identification of measures to mitigate risks, and recommendations for action.
7) Report review - by Village of Kaslo and RDCK staff as well as representatives from the Selkirk Resource District, and BCWS. (The Ktunaxa First Nation did not express an interest in reviewing the draft. Note, that

all identified First Nations must be consulted during detailed assessment and prescription development for any fuel treatments and prior to any fuel treatments proceeding.)

Detailed methodology on the threat analysis can be found in Appendix 2. Reducing the level of wildfire risk to the RDCK Area D and the Village of Kaslo is the main focus of the CWPP. This document makes specific recommendations (planning tools) on how risk can be reduced by making changes to these five elements.

In order to protect the significant ecological, cultural and economic values of the surrounding forests the Village of Kaslo and the RDCK has made progress at implementing recommendations from the 2008 CWPP. The Village of Kaslo and the RDCK has shown provincial leadership in many aspects of wildfire mitigation activities, acknowledging the deep connection that residents in this electoral area have to forest industry jobs, various recreational uses (mountain biking trails, rock climbing, etc.), aesthetic values and important ecosystem values such as water.

This document intends to acknowledge work completed, assess progress to implementation of recommendations in the 2008 CWPP, offer improvements to currently existing programs, and recognize opportunities for improvements and new initiatives. A summary of the most pertinent recommendations implemented can be found throughout the document in the relevant sections, with highlights summarized in Section 2.3. A comprehensive table of recommendations and implementation status can be found in Appendix 4.

This CWPP is consistent wit the Selkirk Resource District Kootenay Lake Fire Management Plan completed for the Southeast Fire Zone.

2.0 COMMUNITY DESCRIPTION

The RDCK Area D Study Area is situated in the Selkirk Resource District (Ministry of Forests, Lands and Natural Resource Operations) and the South East Fire Region and is shown in Map 1. This Study Area is the WUI and includes a 2 km buffer around all residences and critical infrastructure based on density criteria described below.

The Study Area uses the Provincial Strategic Threat Analysis (PSTA) data package and the British Columbia Wildfire Service (BCWS)-defined Wildland Urban Interface (WUI) Area. The PSTA WUI Area is based on structure density, with a buffer established to meet the SWPI program density criteria of more than 6 structures per hectare. The total Study Area for this 2016 CWPP Update is 45,962 hectares.

The Study Area also includes the Joint Responsibility Area developed to ensure that fire hazard mitigation works are undertaken in cooperation between the RDCK, the Village of Kaslo.

The Study Area and this Joint Responsibility Area use the Provincial Strategic Threat Analysis (PSTA) data package and the British Columbia Wildfire Service (BCWS)-defined Wildland Urban Interface (WUI) Area. The PSTA WUI Area is based on structure density, with a buffer established to meet the SWPI program density criteria of more than 6 structures per hectare. This joint study area between Village of Kaslo and RDCK Area D, envelops the Municipality of Kaslo Including the Aerodrome, and the southern slope of Mount Buchannan (Map 1). This Joint Responsibility area contains a number of proposed treatment units (See Table 10)

Area D and Kaslo measures 5,786 km^2 and is the largest electoral area in the Regional District of Central Kootenays. The population of Kaslo in 2011 was 1031. Following a 6.1% reduction between 2016 and 2011 (BC Stats, 2016) the population of Kaslo was 986 and included approximately 469 occupied dwellings.

The Village of Kaslo is located on the west shore of Kootenay Lake, at the junction of Hwy 31 (to Meadow Creek) and Hwy 31A (to New Denver) with an elevation of 591m. Kaslo is the main commercial centre of RDCK Electoral Area D as well as the largest Electoral Area in the Regional District of Central Kootenay. The southern border is south of Coffee Creek and extends north to Gerrard, at the southern end of Trout Lake. To the west is South Fork and the western border is at Retallack. To the east are the communities of Argenta, Johnson's Landing and Birchdale and the Purcell Wilderness Conservancy Provincial Park. Most communities are located along the shores of Kootenay Lake or in the Lardeau Valley, and include Poplar Creek, Howser, Meadow Creek, Cooper Creek, Argenta, Johnson's Landing, Birchdale, Lardeau, Schroeder Creek, Shutty Bench, South Fork, Retallack, Mirror Lake, Woodbury Village, and Ainsworth, South Fork and Retallack.

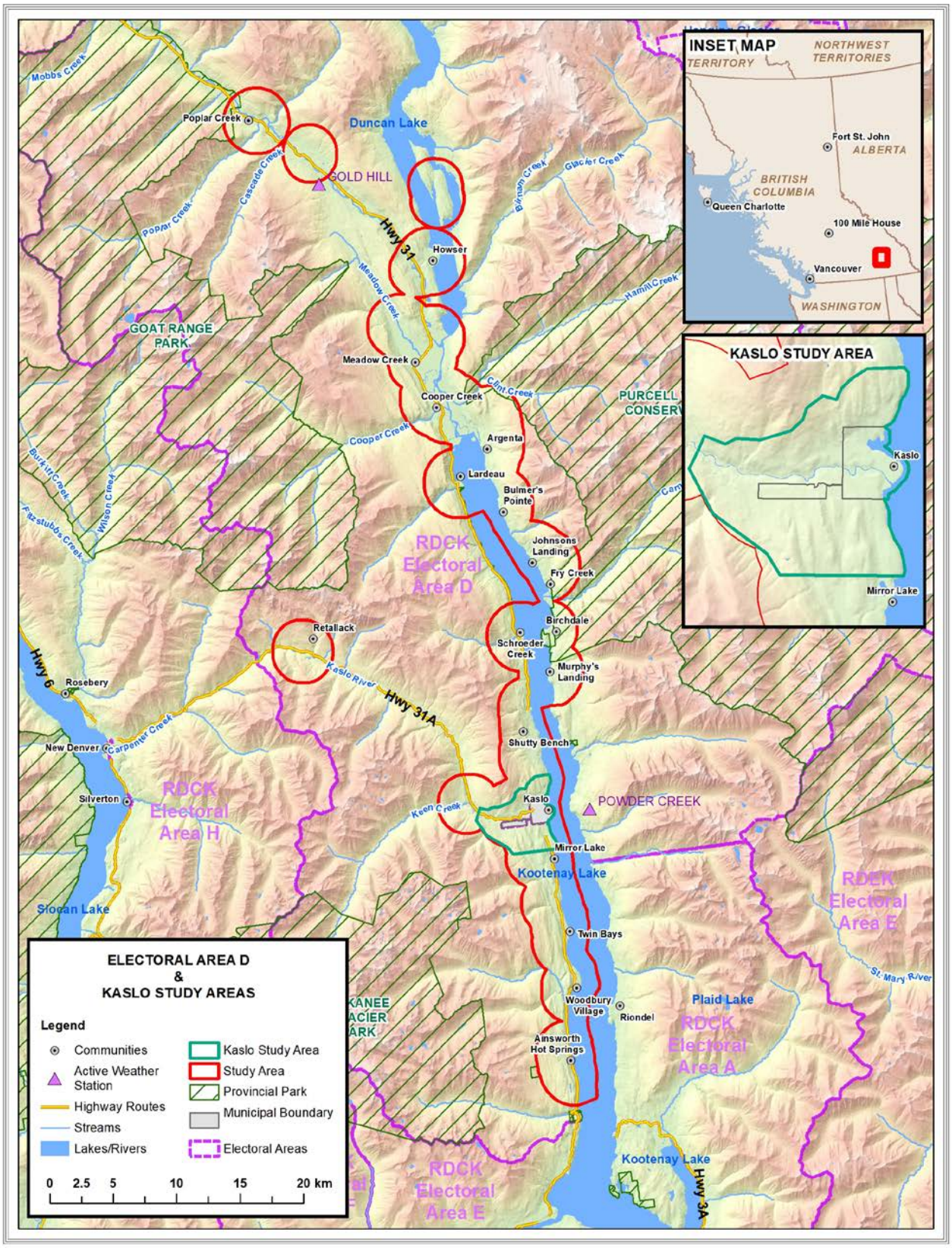
Traditionally, the economy of Area D and Kaslo has been primarily based upon forestry, mining and agriculture. While these still provide employment, other sectors such as wood products manufacturing, hotel and food services, outdoor recreation, retail trade, health and social services, and educational services also contribute to the economy. Due to the scenery and opportunities for recreational activity in the area, tourism has become a new and important sector within the economy of this area.

Area D and Kaslo is accessed primarily by three routes. Highway 31 connects Area D and Kaslo to Trout Lake to the north, and to Balfour to the south. Highway 31A connects Area D and Kaslo to New Denver to the west. There is a small airport in Kaslo, but commercial flights operate from the Castlegar Regional Airport, approximately a 1.5 to 2.5 hour drive from most parts of Area D and Kaslo.

The RDCK has one water system in Area D at Woodbury Village. The source is surface water from Kootenay Lake. The Woodbury system does not have approved fire hydrants; however, residents do have their own fire-fighting equipment and protocol for the area for which they use the system's standpipes to meet fire suppression demands. The RDCK also owns a water system in MacDonald Creek, but this is no longer operational.

Kaslo owns and operates Village of Kaslo water system in Kemp Creek. The source is surface water from Kemp Creek, with back up from the Kaslo River. The water is pumped to a treatment plant at the top of Victoria Street that feeds hydrants and residents using gravity feed.

There are numerous community water systems in Mirror Lake, Lardeau, Argenta, Johnson's Landing, Lardeau and elsewhere. Hydrants are non-existent in the rural portion of the Study Area. However, some rural properties have standpipes with fire hose and capacity to fight domestic house fires.



Map 1. RDCK Electoral Area D and Village of Kaslo Study Area.

The forest within and surrounding the Study Area is largely mixed coniferous second growth, resulting from early fires and forest management. Typical of the interior temperate rainforest, this forest is characterized on wet sites by dense western red cedar and western hemlock and on dry sites by Douglas fir, western larch and lodgepole pine. Several decades of fire suppression have resulted in patches of overstocked, high hazard forest.

2.1 LOCAL GOVERNMENT DESCRIPTION

Incorporated in 1965, the RDCK is a local government that serves an estimated population of 60,000 residents. The RDCK consists of 11 electoral areas and nine member municipalities: Castlegar, Creston, Kaslo, Nakusp, Nelson, New Denver, Salmo, Silverton and Slocan.

The Village of Kaslo Council is comprised of a Mayor and four Councillors who hold office for four-year terms. Kaslo's Community Charter, Section 116, designates The Mayor to be head of Council as well as the Chief Executive officer of the Village of Kaslo. The Mayor and Council are responsible for establishing and executing policies maintaining the administrative duties of civic business within Kaslo under the Local Government Act.

The RDCK, like all local governments, is granted its powers by the provincial government and is governed primarily by two provincial pieces of legislation – the Local Government Act and the Community Charter – as well as numerous other supplementary enactments.

The RDCK is governed by a board consisting of two types of directors: RDCK and Municipal. RDCK Directors are elected directly by rural area voters, and serve four-year terms. The RDCK Board consists of eleven electoral Area Directors. Municipal Directors are first elected to a municipal council, and are then appointed by their council to the Regional District Board for a one-year term. The RDCK Board consists of nine municipal directors. The Board selects its own chair and vice-chair[1].

The RDCK provides approximately 160 services to taxpayers. The choice of services is determined by the regional board but only with the approval of the electors. The scope of services therefore varies with each regional district.

There are five First Nation groups within the Kootenay Lake Timber Supply Area (TSA) – the Lower Kootenay Indian Band, Shuswap Indian Band, Ktunaxa Nation Council, Okanagan Nation Alliance, and Shuswap Nation Tribal Council. The Lower Kootenay Indian Band and the Shuswap Indian Band have Forest and Range Agreements with the Province (Snetzinger, 2010).

2.2 CRITICAL INFRASTRUCTURE

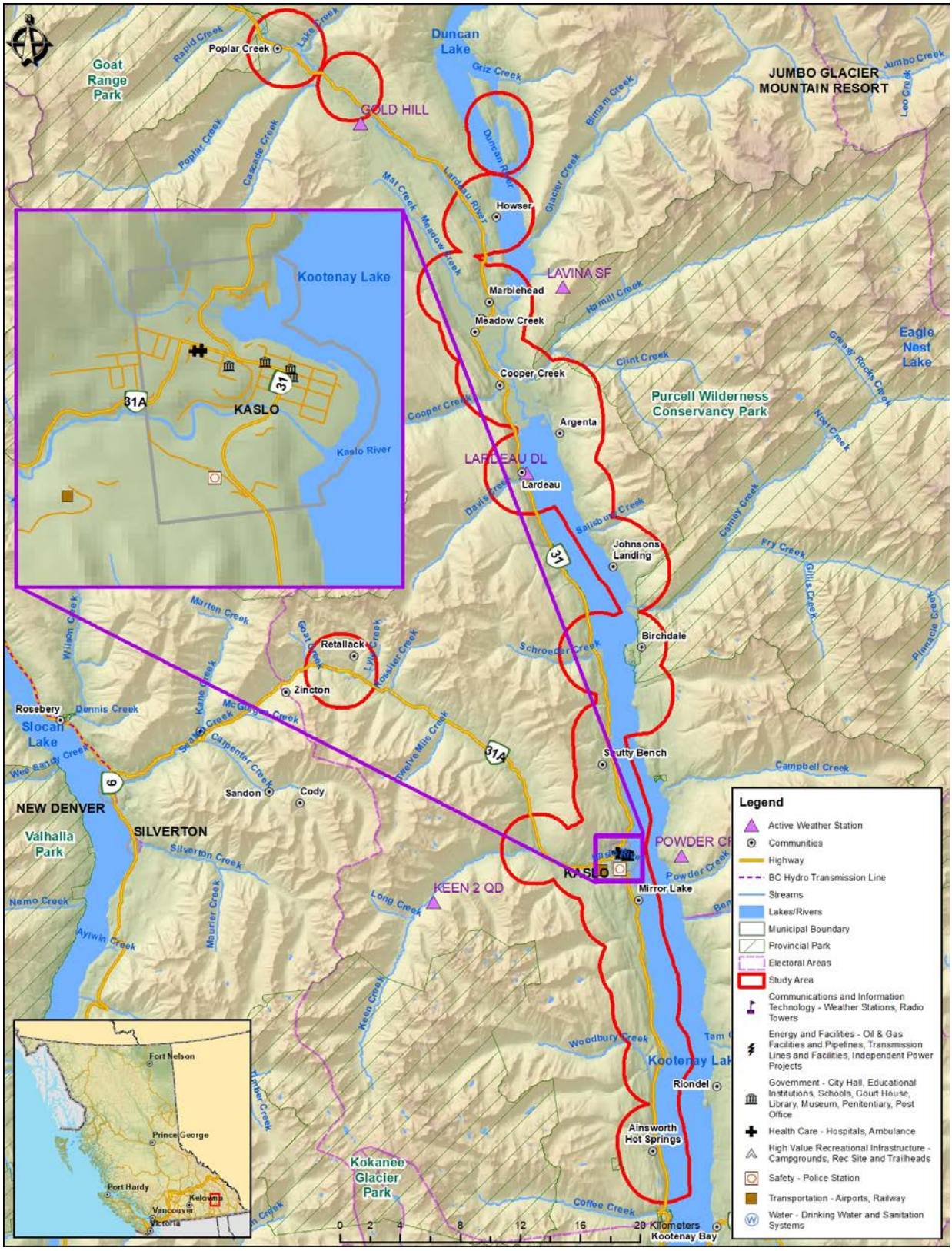
Protection of infrastructure during a wildfire event is important to ensure that emergency response is as effective as possible, to ensure coordinated evacuation can occur if necessary, and essential services in Area D can be maintained and/or restored quickly. Critical infrastructure includes emergency and medical services, water, electrical service, transportation, major water infrastructure, and communications infrastructure. The RDCK maintains a database of the critical infrastructure within Area D; the locations are shown on Map 2 below. Many

[1] http://www.rdck.ca/EN/main/government/welcome.html

other physical structures, systems, and facilities are extremely valuable to the RDCK and are required for the healthy, efficient functioning of the economy and the RDCK.

Emergency services available to Kaslo and Area D include: an RCMP facility in Kaslo (detachment, telecommunications and radio workshop), 911 dispatch service (police, ambulance or fire), Fire Hall, Victorian Health Centre (Kaslo), a BC ambulance service station (Kaslo), a primary Emergency Operations Centre and the Kaslo airport and associated services. The regional EOC established by Central Kootenay Emergency Management in Nelson and operated by the RDCK is used in times of significant emergency or disaster, when an Incident Commander requires more resources or an emergency is more widespread.

Electrical service for most of Area D and Kaslo is received through a network of wood pole transmission and underground distribution infrastructure supplied by BC Hydro and Fortis BC. Neighbourhoods with small, street-side wooden poles to connect homes are particularly vulnerable to fire.



Map 2. Critical structures within the Study Area.

2.2.1 EMERGENCY PREPAREDNESS

The RDCK Fire Services and Emergency Management, Kaslo Volunteer Fire Department, Balfour Volunteer Fire Department, First Responders, Victorian Health Centre in Kaslo, Kaslo RCMP, B.C. Ambulance and groups such as Kaslo Search and Rescue are critical to emergency response service in Area D and Kaslo. However, in the event of a localized emergency within Kaslo and Area D, other adjacent jurisdictions with health care and emergency response facilities may also be able to provide emergency response. Fire Departments, BC Wildfire Service, and RCMP provide the foundation for incident response during a large fire event and therefore must be prepared to deal with large and complex situations. The Regional Emergency Operation Centre is another key piece of infrastructure that will be integral in coordinating response efforts.

Emergency response for a wildland fire in the event of a large-scale emergency is dependent to a large degree on electrical and water service within the Study Area.

The RDCK manages one water system within Area D at Woodbury Village. Water for firefighting in Kaslo is sourced from the Village of Kaslo water system in Kemp Creek. Water supply in much of the rural area of Area D and Kaslo is limited. Nearby rivers and lakes could provide a source of water for firefighting but the infrastructure for this is not currently in place. Fire fighters are set up for drafting from static sources such as rivers and lakes providing there is access for tenders.

A large fire has the potential to impact electrical service by causing a disruption in network distribution through direct or indirect means. For example, heat from the flames or fallen trees associated with a fire event may cause power outages. Consideration must be given to protecting this critical service and providing power back up at key facilities to ensure that the emergency response functions are reliable. Additionally, the loss of this utility would greatly hinder recovery efforts. Electrical service is less critical where water supply is gravity fed.

2.3 PAST WILDFIRE RELATED PROJECTS

The RDCK in collaboration with the Village of Kaslo has been active with respect to community wildfire planning and has implemented, or is in the process of implementing, many of the 2008 CWPP's recommendations and/or other initiatives. A complete list of the status of the recommendations from 2008 can be found in Appendix 4. Much of this 2008 work is still ongoing and has been cross-referenced to the current recommendations in this CWPP Update.

Fuel treatments have been completed on approximately 87.7ha of high priority land in the Study Area (Map 9). Within Kaslo Administrative Boundary, approximately 32.8 ha of land has been treated within the municipal boundary, leaving 54.9 ha of previously treated land within RDCK Area D. The majority of the RDCK area D treated land was completed around the communities of Argenta, Cooper Creek, Lardeau and Kaslo.

The UBCM/SWPI and the Job Opportunities Program (JOP) have funded much of this work. These treatments have reduced the risk profile of Area D and Kaslo but will require additional treatments to maintain effectiveness (see Map 9 and Section 7.5.3 for more details). As an outcome of this CWPP update, the RDCK is working with the Village of Kaslo and other stakeholders to plan and implement a fuel treatment program at the landscape level.

In the area of emergency preparedness and emergency response, numerous initiatives have either been completed, planned or are in progress. Emergency response coordination between the RDCK and BCWS has been

formalized through the implementation of the provincial mutual aid agreement. The local authority is responsible for state of local emergencies and evacuations. The RDCK operates a Regional Emergency Operations Centre and supports the Village of Kaslo locally. The structure for establishing and operating the EOC is outlined in the RDCK's recently developed Emergency Management Procedures.

In the area of communications and education, the RDCK is working with BC Parks, Village of Kaslo, forest licensees, MFLNRORD and other stakeholders to develop an effective set of tools to educate and communicate the principles of FireSmart to the public. Consequently, some specific outreach tools recommended in the 2008 CWPPs are no longer considered to be effective by the RDCK. The RDCK website provides links to BCWS resources, including open burning guidelines and restrictions, and fire prevention resources including FireSmart resources and the FireSmart homeowner's manual. The website also provides links to homeowner services including the FireSmart home assessment and the Community FireSmart recognition program.

The RDCK has improved its ability to provide emergency notification to the public through a Web Blocker on the website that directs users to critical emergency information prior to allowing access to other website information. Additionally, the RDCK uses the Emergency Alerts system to residents in the event of an evacuation. Signage regarding current fire danger has been posted in in Kaslo at the Kaslo River bridge. Additionally, an effective line of communication exists between BCWS and RDCK Fire Departments through the Zone 4 BC Fire Chiefs Association, Central Kootenay Fire Chiefs Association and individual meetings between Fire Halls and Regional Staff. Communications include daily fire weather updates from the BCWS.

The RDCK has also made progress in the area of structure protection. The RDCK has also acquired multiple SPUs to assist in the protection of rural/ interface homes.

3.0 FOREST, FUEL AND PAST WILDFIRE INFORMATION

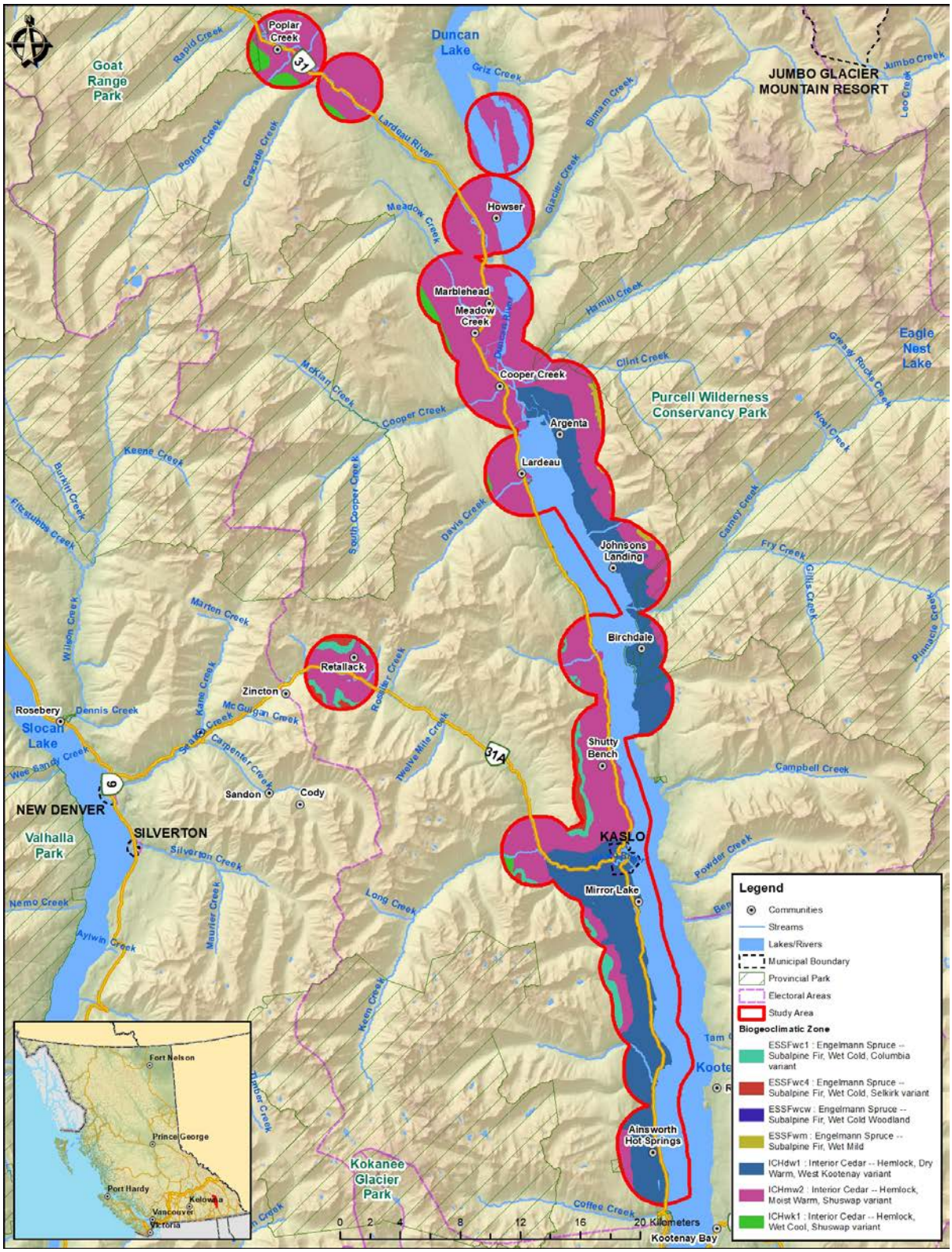
The forests of the region are some of the most ecologically diverse in the province. Fires are common, and are attributable to humans and lightning. The following section discusses the ecosystem classification, the timber harvesting land base, forest health, the wildfire history and fire weather of Area D and Kaslo.

3.1 BIOGEOCLIMATIC INFORMATION

The Biogeoclimatic Ecosystem Classification (BEC) system describes zones by vegetation, soils, and climate. Regional subzones are derived from relative precipitation and temperature. Area D and Kaslo is in the ecologically diverse West Kootenay Region. The natural forest succession in this region provides for a mosaic of successional stages and species composition. See Table 1 for a breakdown of Area D and Kaslo by BEC zone, as well as Map 3 for the spatial distribution of these Zones in Area D and Kaslo.

Table 1. Biogeoclimatic Zones and Natural Disturbance Types in the Study Area.

Biogeoclimatic Zone	Natural Disturbance Type	Area (ha)	Percent (%)
ESSFwc1 : Engelmann Spruce -- Subalpine Fir, Wet Cold, Columbia variant	NDT1	1,129	2%
ESSFwc4 : Engelmann Spruce -- Subalpine Fir, Wet Cold, Selkirk variant	NDT1	511	1%
ESSFwcw : Engelmann Spruce -- Subalpine Fir, Wet Cold Woodland	NDT1	1	<1%
ESSFwm : Engelmann Spruce -- Subalpine Fir, Wet Mild	NDT1	258	1%
ICHdw1 : Interior Cedar -- Hemlock, Dry Warm, West Kootenay variant	NDT3	16,851	36%
ICHmw2 : Interior Cedar -- Hemlock, Moist Warm, Shuswap variant	NDT2	26,461	58%
ICHwk1 : Interior Cedar -- Hemlock, Wet Cool, Shuswap variant	NDT1	752	2%
TOTAL		**45,963**	**100%**



Map 3. Biogeoclimatic Zones for the Study Area.

By far, the largest amount of area lies within the ICH mw2. The majority of Area D and Kaslo is in the NDT2 – ecosystems with infrequent stand-initiating fires, and fires of mixed severity are also common in the ICHmw2. These are forest ecosystems that experience frequent wildfires of various sizes, with the largest fires in the province often occurring in this NDT. The mean return interval for this NDT is approximately 150 years in the ESSF and ICH units (Province of British Columbia, 1995). Douglas fir occurs through this NDT in the ICH, and in combination with western larch, is an important component of structural diversity during and after forest harvesting operations.

The ICH dw is an ecosystem typified by hot, moist summers and very mild winters. Major growth limiting factors include moisture on dry sites and frost on some low elevation sites. Climax forest stands are composed of western red cedar and western hemlock. Seral stands are mixed with Douglas-fir, paper birch, western larch and white pine, and provide important habitat for ungulate winter range. This is the most diverse subzone in the province in terms of tree species, containing 14 commercial species. In this area, fire-origin stands composed of Douglas fir and larch are common, many of these stands originating from burning during mining activity at the turn of the century (Braumandl & Curran, 1992).

BEC zones have been used to classify the Province into five Natural Disturbance Types (NDTs). NDTs have influenced the vegetation dynamics and ecological functions and pathways that determine many of the characteristics of our natural systems. The physical and temporal patterns, structural complexity, vegetation communities, and other resultant attributes should be used to help design fuel treatments, and where possible, to help ensure that treatments are ecologically and socially acceptable (Province of British Columbia, 1995).

3.2 TIMBER HARVESTING LAND BASE

There are many resources associated with the timber harvesting land base of Area D and Kaslo. There are multiple values associated with the land base, including recreation and tourism, wildlife habitat, drinking water supplies, and many others.

Area D and Kaslo is in the Kootenay Lake Timber Supply Area, administered by the Selkirk Natural Resource District. The current Allowable Annual Cut (AAC) is 640,000 cubic meters per year. The last Timber Supply Review (TSR) was completed in 2010. The TSR determined that the land base contributing to harvesting is 199,282 hectares, removing parks and protected areas, old growth management areas, inoperable areas, uneconomic areas, low timber productivity areas, problem forest types, caribou no-harvest habitat, sensitive terrain areas, riparian areas, roads and trails, railways and transmission lines from ‘forested areas’ (Snetsinger, 2010).

There are several forest licensees operating within Area D and Kaslo: Cooper Creek Cedar, Kalesnikoff Lumber, Kaslo and District Community Forest Society, BC Timber Sales and two Woodlot Licensees.

Fuel reduction treatments are not anticipated to have a measurable effect on the timber harvesting land base. Typically, forest stands identified for fuels treatments are highly constrained for conventional logging, and are often in undesirable or uneconomic stand types. The opportunity exists to work with local licensees on commercial thinning projects that meet fuels management objectives. This has been explored with local licensees

such as the Kaslo Community Forest Society. See Section 7.0 (Recommendations) for opportunities to build relationships with forest industry licensees.

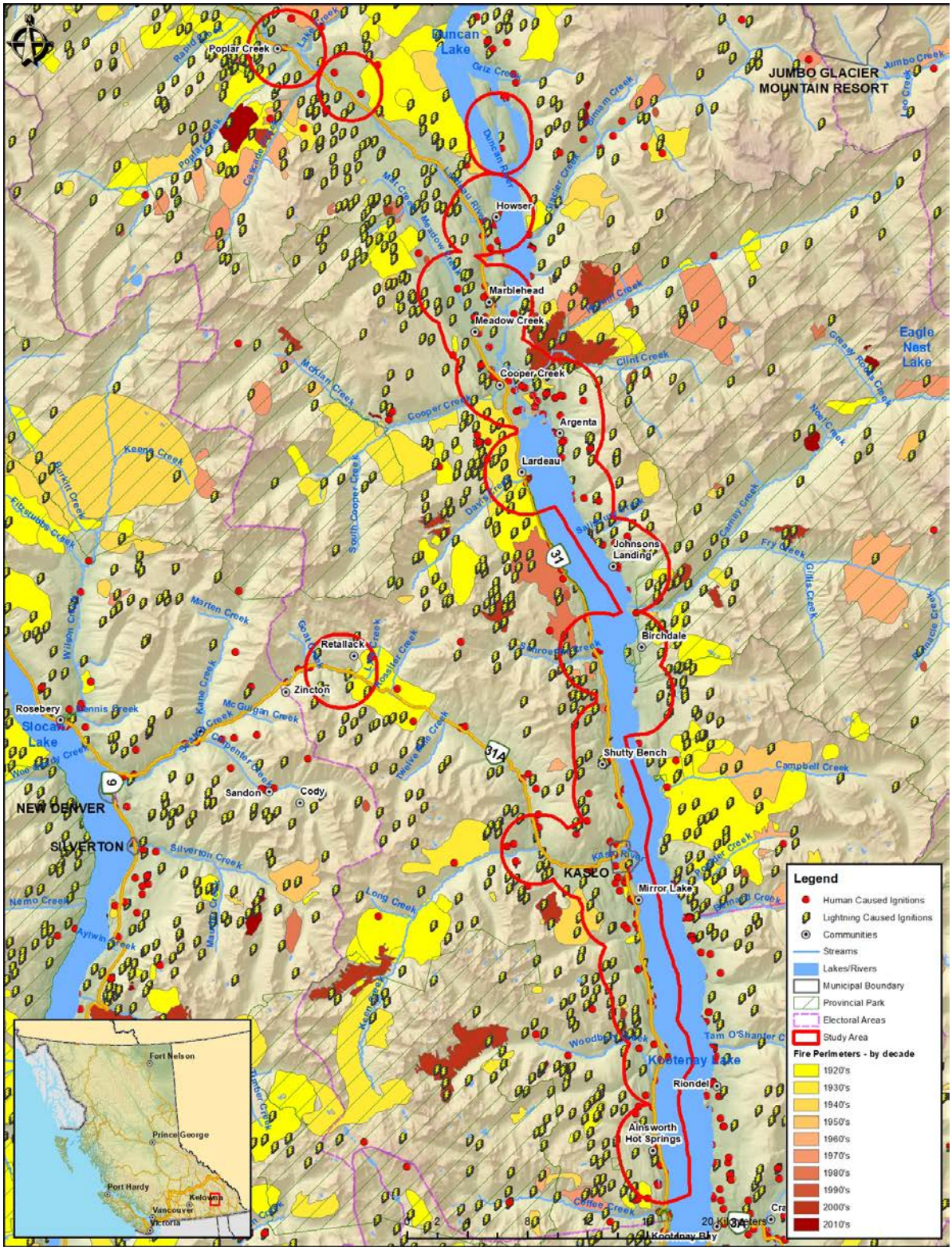
3.3 IMPORTANT FOREST HEALTH ISSUES

One of the most prevalent forest health issues in the Kootenay Lake Timber Supply Area are bark beetles; primarily mountain pine beetle and western balsam bark beetle, and to a lesser degree, Douglas-fir beetle, and spruce beetle. The 2016 Aerial Overview Survey (Maclauchlan & Buxton, 2016) found that the mountain pine beetle infestations are increasing, as are Douglas fir beetle populations, while western balsam bark beetle and spruce beetle infestations have remained steady. Aspen serpentine leaf miner is significant and is the most widespread damaging agent of deciduous trees in the TSA with widespread defoliation reported around Nelson. The birch leaf miner continues to affect paper birch trees. Other damaging agents noted are larch needle blight (in scattered small pockets), wildfire, drought mortality (mixed Douglas-fir-lodgepole pine plantations), flooding, and windthrow.

Climate change is anticipated to have largely negative impacts to forest health, especially within the interface areas. Tree stress caused by drought and greater windthrow are expected to allow insect populations to increase in weakened mature stands. This is particularly the case with Douglas-fir beetle, western balsam beetle, spruce beetle and western hemlock looper. Immature stands may see increases of spruce leader weevil, white pine blister rust, stem rusts of lodgepole pine, foliar diseases of lodgepole pine and larch, and Armillaria root disease. Lodgepole pine stands in particular are at elevated risk of insect and disease impacts with climate change (Holt, Utzig, Pinnell and Pearce, 2012).

3.4 LOCAL WILDFIRE HISTORY/STARTS AND FIRE WEATHER

Area D and Kaslo lies in a fire-dominated ecosystem. This is evidenced by the number and size of historical fires in the area. Fire perimeters and fire ignition points provided in the PSTA data package were reviewed for this Plan. This data show that many large fires burned in the earlier part of the last century. Most (54% on average) fire ignition points are attributed to lightning, with the remainder due to human cause.



Map 4. Fire history for the Study Area.

The Canadian Forestry Service developed the Canadian Forest Fire Danger Rating System (CFFDRS) to assess fire danger and potential fire behaviour. A network of fire weather stations during the fire season are maintained by the Ministry of Forests, Lands and Natural Resource Operations (MFLNRORD) and are used to determine fire danger, represented by Fire Danger Classes, on forestlands within a community. The information can be obtained from the MFLNRORD British Columbia Wildfire Service (BCWS) and is most commonly utilized by municipalities and regional districts to monitor fire weather, and to determine hazard ratings, associated with bans and closures.

Fire Danger Classes provide a relative index of how easy it is to ignite a fire and how difficult control is likely to be. The BC *Wildfire Act* [BC 2004] and *Wildfire Regulation* [BC Reg. 38/2005], which specify responsibilities and obligations with respect to fire use, prevention, control and rehabilitation, and restrict high-risk activities based on these classes. Fire Danger Classes are defined as follows:

- **Class 1 (Very Low)**: Fires are likely to be self-extinguishing and new ignitions are unlikely. Any existing fires are limited to smoldering in deep, drier layers.
- **Class 2 (Low)**: Creeping or gentle surface fires. Ground crews easily contain fires with pumps and hand tools.
- **Class 3 (Moderate)**: Moderate to vigorous surface fires with intermittent crown involvement. They are challenging for ground crews to handle; heavy equipment (bulldozers, tanker trucks, and aircraft) are often required to contain these fires.
- **Class 4 (High)**: High-intensity fires with partial to full crown involvement. Head fire conditions are beyond the ability of ground crews; air attack with retardant is required to effectively attack the fire's head.
- **Class 5 (Extreme)**: Fires with fast spreading, high-intensity crown fire. These fires are very difficult to control. Suppression actions are limited to flanks, with only indirect actions possible against the fire's head.

It is important for the development of appropriate prevention programs that the average exposure to periods of high fire danger is determined. 'High fire danger' is considered as Danger Class ratings of 4 (High) and 5 (Extreme). Danger class days were summarized from two weather stations to provide an indication of the fire weather in Area D and Kaslo. The fire danger in Area D and Kaslo can vary from year to year and from season to season. Considering fire danger varies from year to year, historical weather data provides information on the number and distribution of days when Area D and Kaslo is typically subject to high fire danger conditions. This is useful information in assessing fire risk.

The fire weather data for the Gold Hill weather station show that on average (from 2003 to 2012), moderate, high and extreme fire danger days are prevalent in July and August. Average danger class days for each month of the fire season (May – September) are shown in Figure 1. The location of the Gold Hill weather station is illustrated in Map 1.

The wind rose data is compiled hourly by the MFLNRORD This data provides an estimate of prevailing wind directions and wind speed in the area of the weather station. For the Gold Hill weather station, the prevailing

wind direction is from the south and southwest (Figure 2). The wind rose indicates that the majority of winds are less than 7 km/hr, with a small percentage of the prevailing winds that are between 7 and 11.9 km/hr.

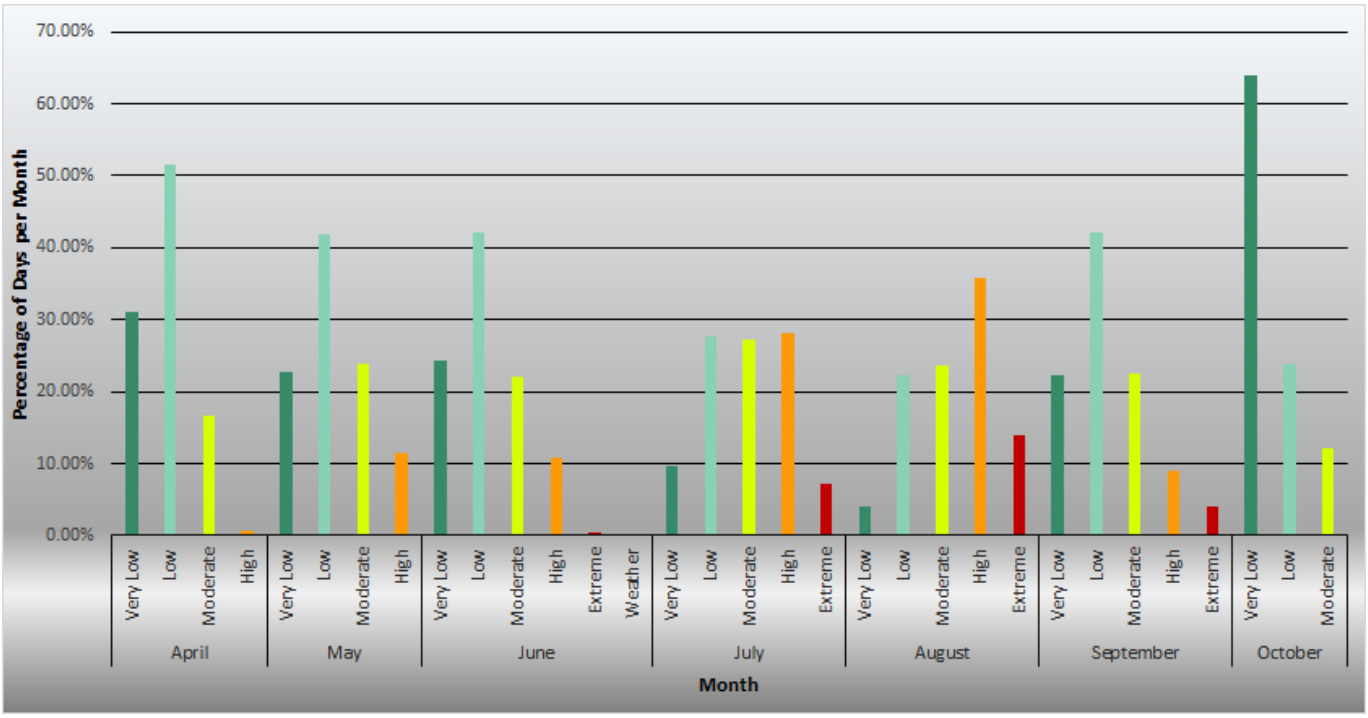


Figure 1. Average Fire Danger Class days per month (April to October) from 2003 - 2012 in RDCK Area D and Kaslo recorded at the Gold Hill weather station.

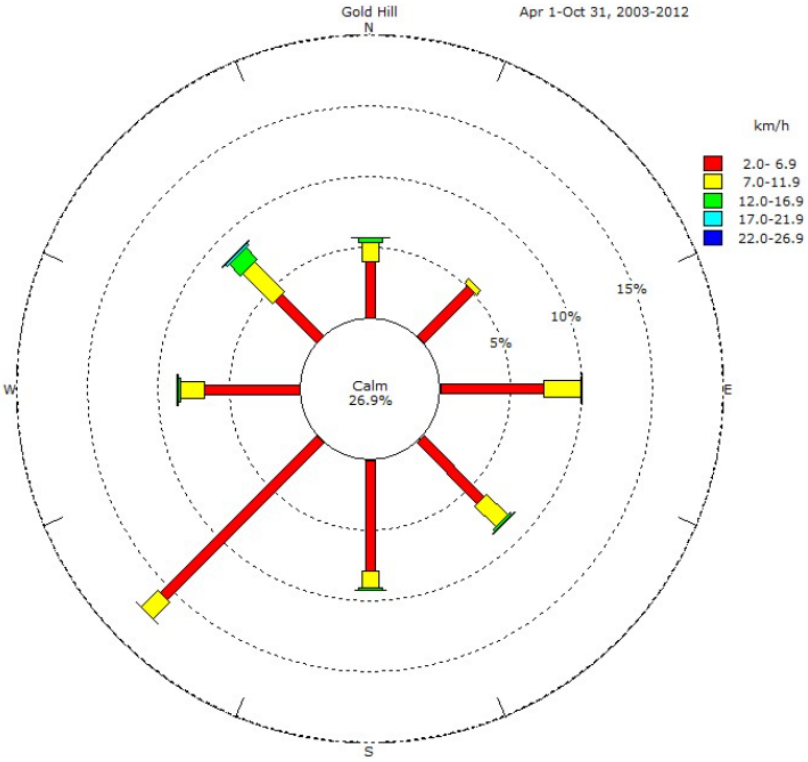


Figure 2. Wind rose data for Gold Hill weather station, hourly data from 2003-2012.

The fire weather data for the Powder Creek weather station show that on average (from 2003 to 2012), moderate, high and extreme fire danger days are prevalent in July, August and September. Average danger class days for each month of the fire season (April - October) are shown in 3. The location of the Powder Creek weather station is illustrated in Map 1.

The wind rose data is compiled hourly by the MFLNRORD This data provides an estimate of prevailing wind directions and wind speed in the area of the weather station. For the Powder Creek weather station, the prevailing wind direction is from the south, north and northeast (Figure 4). The wind rose indicates that the majority of winds are less than 16 km/hr, with a small percentage of the prevailing winds that are between 16 and 22 km/hr.

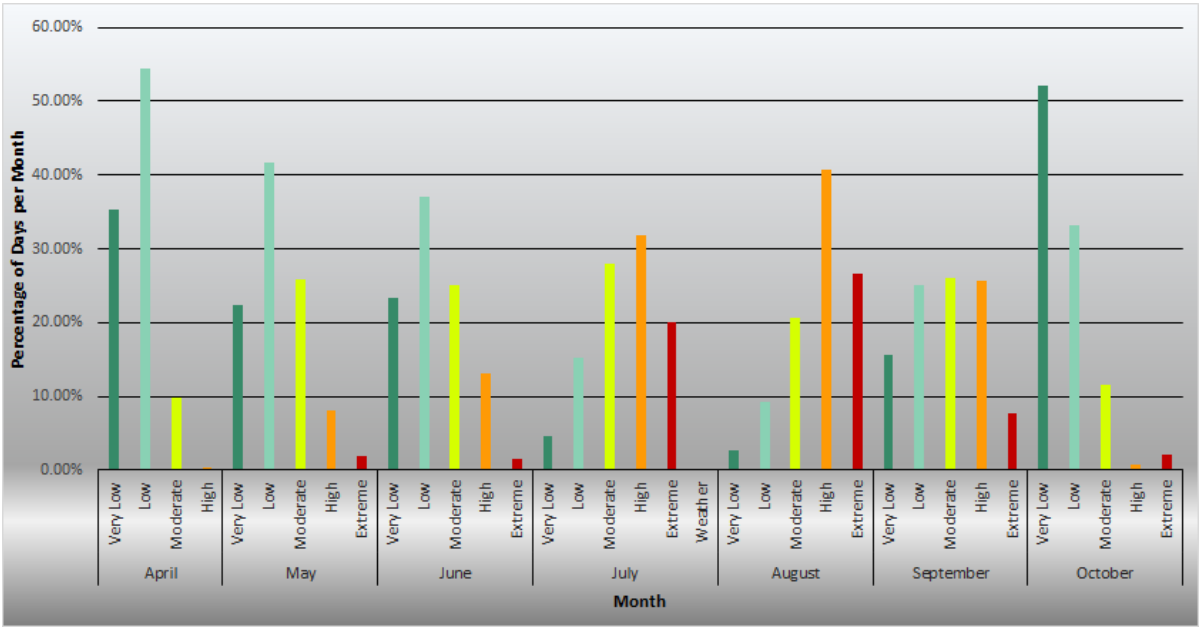


Figure 3. Average Fire Danger Class days per month (April to October) from 2003 - 2012 in RDCK Area D and Kaslo recorded at the Powder Creek weather station.

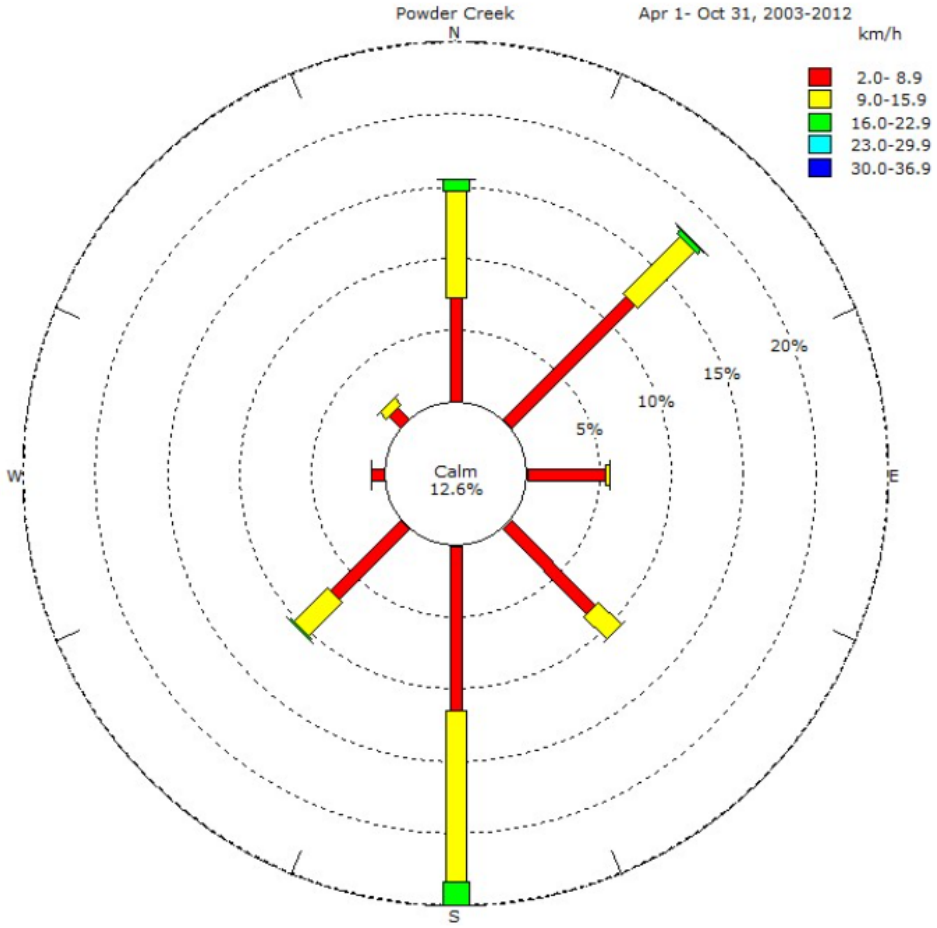


Figure 4. Wind rose data for Powder Creek weather station, hourly data from 2003-2012.

4.0 LOCAL ISSUES, VALUES AND SUPPORT

As with many places in BC, there are numerous overlapping values and resources on the landscape. Residents of Area D and Kaslo demand to be involved in ensuring these values are maintained. To meet this requirement, this plan has been developed with considerable engagement across the community. This includes consultation with resource professionals, local government staff, resident associations, water user groups, forest licensees and MFLNRORD staff. This approach to engagement is consistent with community expectations and, when matched at the prescription development and treatment implementation phases, has resulted in broad public support for wildfire hazard reduction work.

Within the scope of this CWPP and associated Study Area, land jurisdictions include the Purcell Wilderness Conservancy Provincial Park, Davis Creek Provincial Park and Goat Range Provincial Park. These are guided by higher-level plans such as the Kootenay Boundary Higher Level Plan (see Section 5.2).

4.1 RESOURCE ISSUES AND OPERATIONAL CONSTRAINTS

There are many resource values in the Study Area that are outlined in the Kootenay Boundary Higher Level Plan. This plan is the guiding document for other plans for the area, including the RDCK Official Community Plans and licensee Forest Stewardship Plans. Within the Study Area potential fuel management activities are constrained mainly by steep and difficult terrain, the need to accommodate a wide range of recreational users and the requirement for multi-agency coordination of fuel treatments occurring within the Joint Responsibility Area. An Interface Working Group comprised of senior staff from the RDCK, City of Nelson and BC Parks is committed to the coordinated planning and implementation of wildfire management activities at the landscape level in the West Arm. The RDCK is working to establish a similar collaborative initiative with Kaslo and Area D.

4.2 ENVIRONMENTAL AND CULTURAL VALUES

Area D and Kaslo and surrounding areas provide a range of outdoor activities for tourists and residents. Cultural values within Area D and Kaslo are in the traditional lands of local First Nations, comprising fish bearing habitat, hunting grounds, archaeological sites, and sites of cultural significance.

4.2.1 ENVIRONMENTAL VALUES OVERVIEW

The Conservation Data Centre (CDC), which is part of the Environmental Stewardship Division in the Ministry of Environment, is the repository for information related to plants, animals and ecosystems at risk in BC. The CDC database was used to identify species and ecosystems at risk within Area D and Kaslo. The CDC keeps two classes of data: non-sensitive occurrences for which species and ecosystems at risk and their locations are available, and masked sensitive occurrences where only generalized location information is available.

Within Area D and Kaslo there are no sensitive masked occurrences, and seven publicly available species at risk including three terrestrial plant and animal species, three aquatic species and one palustrine species. A list of these species is provided in Appendix 3. The Painted Turtle is a notable palustrine species at risk occupying herbaceous wetland habitats and is not likely to be impacted by fire hazard mitigation activities. Site level, operational plans must determine through consultation with the CDC and a biologist or qualified professional if fuel management or other wildfire mitigation activities will impact these occurrences. All future fuel treatment activities and those associated with recommendations made in this plan should consider the presence of, and impact upon, potentially affected species. Additionally, all site level operational plans should consult the most recent data available to ensure that any new occurrences or relevant masked occurrences are known and considered in the operational plan to mitigate any potential impacts on species at risk.

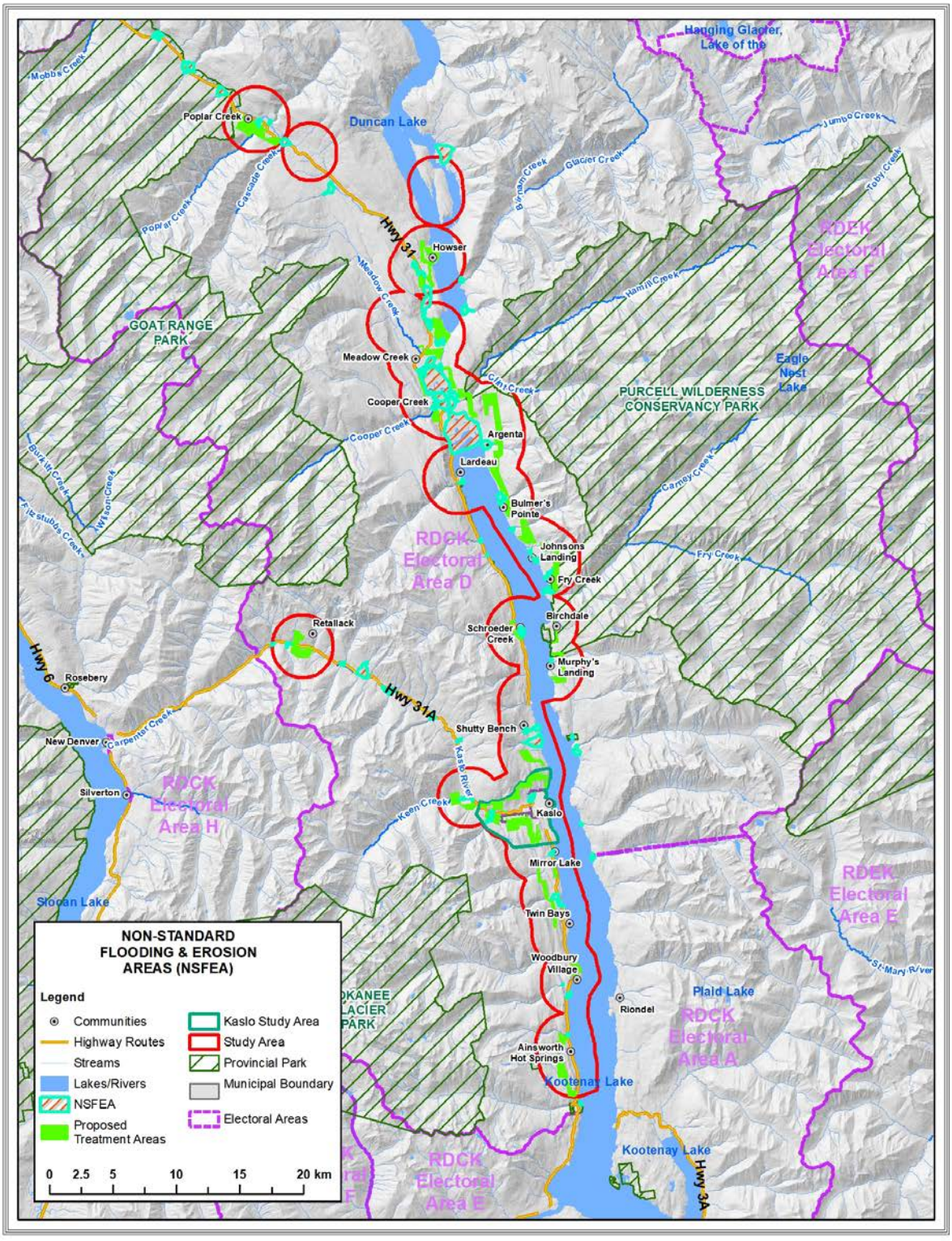
In the event of a wildfire burning a large area of the watersheds within the Study Area, potential for vulnerability to post-wildfire debris flows and floods exists where creeks drain steep slopes and in particular, in rural areas in the Study Area that are built on the alluvial fans of these creeks (Jordan, 2016). Extensive research by MFLNRORD elsewhere in the RDCK has found that the likelihood of debris flows and other landslides in susceptible terrain are significantly increased following severe wildfire in the snow-dominated environment of the southern interior of BC (Jordan, 2015). Specifically, numerous debris flow incidents have occurred in the West Kootenays following 2003 and 2007 wildfires including Sitkum Creek southwest of the Study Area (Jordan, 2015). MFLNRORD routinely conducts post-wildfire risk analyses where large wildfires have occurred above inhabited areas or in community

watersheds (Hope et al., 2015). Post wildfire risk analysis reports are posted on the RDCK's website under Post-Emergency Hazard Reports[2].

Water quality is not likely to be significantly impacted by a wildfire in the study area, according to research conducted elsewhere in the RDCK (Jordan, 2016). Based on a watershed-scale study of three post-wildfire study sites in southeastern BC near Nelson, Slocan and Trail, effects on water quality were found to be minimal (Jordan, 2012).

The RDCK should consider completing more detailed hazard assessments and developing response plans for these sub-drainages. It was noted in the 2008 CWPPs that the water supply in all RDCK Area D and Kaslo Fire Protection Areas is vulnerable to watershed disturbance and recommendations for stabilization and rehabilitation of burn areas were provided. While floodplains and non-standard flood and erosion areas as well as potential slide hazard areas are identified on the RDCK's Central Kootenay Web Map and have been identified in the Flood Management Bylaw (Bylaw No. 2080, 2009[3]) this does not specifically address watershed vulnerability to wildfire disturbance.

[2] http://www.rdck.ca/EN/main/services/emergency-management/geotechnical-hazards.html
[3] http://www.rdck.ca/assets/Government/Bylaws/Land~Use-Planning/2080_Floodplain-2.pdf



Map 5. Creek drainages within and above the Study Area, including some creeks potentially at risk of debris flow post-wildfire.

4.2.2 CULTURAL HERITAGE VALUES OVERVIEW

There are five first nation groups within the Kootenay Lake TSA – the Lower Kootenay Indian Band, Shuswap Indian Band, Ktunaxa Nation Council, Okanagan Nation Alliance, and Shuswap Nation Tribal Council. The Lower Kootenay Indian Band and the Shuswap Indian Band have Forest and Range Agreements with the Province. The Ktunaxa Nation is currently involved in the BC Commission Treaty process.

Archaeological sites in BC are protected by the *Heritage Conservation Act* (HCA), which applies on both private and public lands. Archaeological remains in the Province of British Columbia are protected from disturbance, intentional and inadvertent, by the Heritage Conservation Act (HCA). Archaeological sites that pre-date 1846 are automatic[4]ally protected under the Heritage Conservation Act whether on public or private land. Sites that are of an unknown age that have a likely probability of dating prior to 1846 (e.g., lithic scatters) as well as Aboriginal pictographs, petroglyphs, and burials (which are likely not as old but are still considered to have historical or archaeological value) are also automatically protected. Under the HCA, protected sites may not be damaged, altered or moved in any way without a permit. It is a Best Practice that cultural heritage resources such as culturally modified tree (CMT) sites be inventoried and considered in both operational and strategic planning.

Prior to stand modification for fire hazard reduction, and depending on treatment location, preliminary reconnaissance surveys may be undertaken to ensure that cultural heritage features are not inadvertently damaged or destroyed. Pile burning and the use of machinery have the potential to damage artifacts that may be buried in the upper soil horizons. Above ground archeological resources may include features such as Culturally Modified Trees, which could be damaged or accidentally harvested during fire hazard reduction activities. Prior and during fuel management prescription development the professional forester will request archaeological site records for the specific area and if either cultural or archaeological values are identified then prior to operational fuel treatment activities commencing, the project supervisor must commission a reconnaissance survey (or if required) an Archaeological Impact Assessments. Due to site sensitivity, the locations of archaeological sites may not be made publicly available. The RDCK should apply for direct access to Remote Access to Archaeological Data (RAAD), which will allow the RDCK to look up or track any archeological sites in the area[5].

First Nations consultation for treatments on Crown Land would be required with all identified First Nations at the detailed assessment and prescription stage before any future fuel management treatments proceed and as directed by the Selkirk Resource District.

4.3 COMMUNITY SUPPORT

RDCK staff and community members have widespread awareness of the threats posed by wildfire and the importance of hazard mitigation activities. Broad community engagement played a key role in developing this CWPP. The following consultation was undertaken to ensure community support:

Table 2.Consultations undertaken during the development of the CWPP update.

[4] Snetsinger, 2010.

[5] https://www.for.gov.bc.ca/archaeology/accessing_archaeological_data/obtaining_access.htm

Group	Activity	Outcome
Meeting with Woodlot Manager	December 7, 2016, discussion with Peter McAllister about collaboration on a Treatment Area to the South and West of Kaslo within the Woodlot Mr. McAllister manages.	Agreement to work together on a priority area adjacent to the Municipal boundary, once the Plan is complete
Public Meeting #1	October 2016 Johnsons Landing public presentation on proposed treatment units to date, discussing FireSmart, community level planning around public and crown land fuel management	Community involvement in Proposed Treatment Unit modifications.
Public Meeting #2	June 3, 2017 Public Presentation to Meadow Creek community on local Proposed Treatment Units, FireSmart principles, and the structure of the CWPP for Area D, and fuel modification objectives.	Comments received and incorporated into the CWPP
Public Meeting #3	June 14 2017, Presentation to Kaslo District Community Forest, covering Kaslo Study Area and surrounding Proposed Treatment Units.	Comments received and incorporated into the CWPP. Shared understanding of project scope and time lines, invitation to further collaborate on technical sessions on collaboration with logging practices and fuel reduction methods.
Public Meeting #4	July 2, 2017, Murphy Creek presentation to discuss the risks to the community regarding evacuation, fuel loads adjacent to community, FireSmart on private lands, and possibility of a proposed treatment unit surrounding community.	Public inquiries on FireSmart principles and how to execute them. A community scale plan was developed to help then community identify and mitigate wildfire. See Appendix 5. See Recommendations #11, #24, #31
Interview: Fire Chief Doug Yee of Kaslo Volunteer Fire Dept.	July 3, 2017. Discussion Kaslo's Volunteer Fire Dept., and their obligations, challenges, and capacity to respond to wildfire within the Kaslo Fire Protection Area and the surrounding unincorporated municipalities.	Comments received and incorporated into the CWPP
Public Meeting #5	July 8, 2017. Birchdale public meeting and individual landowner discussion on the risks surrounding the community, the obstacles to forming a community level water sprinkler system, FireSmart principles, and individual methods to preventing fire for each landowner.	Comments received and incorporated into the final CWPP
Public Meeting #6	July 24, 2017. Public presentation to the community of Argenta.	Comments received and incorporated into the final CWPP. Argenta residents created a local level plan with objectives to mitigate wildfire. See Appendix 5. See Recommendations #11, #24, #31

Group	Activity	Outcome
Public Meeting #7	July 25, 2017. Public presentation to the community of Meadow Creek.	Comments received and incorporated into the final CWPP.
Presentation to Kaslo Village Council	Presentation of Kaslo Study Area and proposed treatment units surrounding Kaslo, as well as possible infrastructure establishments including Helipads, water reservoirs etc.	Shared understanding of project scope and time lines, invitation extended to further information sessions when the draft plan is ready to be reviewed.
Consultation with community members of Argenta	September 24, 2017. Discussion surrounding proposed firefighting strategies, fire breaks, fire crew access and water source mapping.	Comments received and incorporated into the final CWPP. See Appendix 5. See Recommendations #11, #24, #31
Public Meeting #8	November 21, 2017. Public presentation to the community of Ainsworth.	Comments received and incorporated into the final CWPP.
RDCK Board of Directors	January 2018. CWPP presented to the RDCK Board of Directors for review and approval	Formal RDCK Board of Directors endorsement of the CWPP prior to submission to UBCM for approval.

Combined, these various engagement opportunities have generated a shared understanding of the CWPP objectives, project timelines and expected outcomes among local government, stakeholders, residents and land managers.

4.4 KEY CONTACT, PARTNERSHIP AND FUNDING OPPORTUNITIES

There are key funding opportunities, partnership opportunities and key contacts that are specific to the RDCK Area D and Kaslo. These are summarized in Table 3.

Table 3. Funding sources, partnership opportunities and key contacts for the RDCK

Partnership Organization	Key Contact	Partnership Opportunity
Union of BC Municipalities, Strategic Wildfire Protection Initiative	Peter Ronald, Programs Officer pronald@ubcm.ca http://www.ubcm.ca/EN/main/funding/lgps/strategic-wildfire-prevention.html	SWPI provides direct funding to local governments for development of CWPPs, Fuel Modification Prescriptions, Operational Treatments and Demonstration Projects
Forest Enhancement Society of BC (FESBC)	Gord Pratt, Operations Manager gpratt@fesbc.ca	FESBC provides funding through the Forest Enhancement Program (FEP) to local governments and licensees to prevent and mitigate wildfire impacts and/or improve wildlife habitat and damaged forests.
Columbia Basin Trust (CBT)	Tim Hicks, Senior Manager, Delivery of Benefits	CBT has provided 50% of local government funding for RDCK and City of Nelson SWPI projects

Additionally, there are other sources of funding or support that may become available.

- **Provincial Government**
    - BC Parks – Goat Range Provincial Park, Kokanee Provincial Park, Davis Creek Provincial Park and the Purcell Wilderness Conservancy Area adjacent to Area D pose significant wildfire threat to Area D and Kaslo. In addition, these parks are at risk from fires starting within Area D and Kaslo. The RDCK may wish to explore partnerships with BC Parks.
    - Other Crown land areas that are not currently high threat may increase with time, as these areas revegetate and recover from previous large-scale forest fires and the mountain pine beetle outbreak (SWPI and FEP funding are applicable).
- **Utility companies** – Right of way clearing and fuel hazard should be discussed with BC Hydro, Fortis BC. These companies should be encouraged to maintain rights of way in a low hazard state (frequent brushing, with brushed material removed prior to curing).
- **Forestry Licensees** – BCTS-Kootenay, Cooper Creek Cedar, Kalesnikoff, Kaslo Community Forest. Partnership opportunities may exist for commercial harvest of hazardous areas that may not qualify under the SWPI program (i.e., too far from infrastructure, but which may still pose a spotting risk to the community or could be leveraged into a landscape level fuel break.

5.0 EXISTING PLANS AND BYLAWS

To ensure consistency among plan documents, a review was conducted of existing plans that may impact or be impacted by this CWPP. These include: the Selkirk Resource District Fire Management Plan; higher level plans such as the Kootenay Boundary Higher Level Plan; and the Kootenay Lake and Lardeau Valley portion of Electoral Area D and Kaslo Official Community Plans as well as bylaws therein that pertain to or affect wildfire hazard mitigation.

5.1 FIRE MANAGEMENT PLANS

The Selkirk Resource District Kootenay Lake Fire Management Plan (FMP) (MFLNRORD, 2016) identifies values at risk on the landscape and prioritizes broad categories of values as 'themes' for categorizing response through the Resource Strategic Wildfire Allocation Protocol (RSWAP). The four themes are 1) Human Life and Safety, 2) Property and Critical Infrastructure, 3) High Environmental and Cultural Values, and 4) Other resource values (timber, rangelands, etc.). The organization of values is intended to provide the information needed to make appropriate fire response decisions in complex emergency situations. The Selkirk Resource District FMP was reviewed and this CWPP Update is consistent with the FMP prioritization framework.

The development of FMPs is the responsibility of each MFLNRORD Resource District. The FMPs recognize the importance of CWPP-defined risk areas and fuel management recommendations within communities, which can augment other treatments on a landscape scale. The Selkirk Resource District FMP has some linkages to the RDCK's 2008 CWPP. Additionally, the strategic direction presented in the District-wide FMP planning processes must be considered for future fuel treatments, as these FMPs and, specifically, landscape level fuel breaks and fuel treatments, are further developed and made available publicly and through consultations with the Resource District.

5.2 HIGHER LEVEL PLANS

KOOTENAY BOUNDARY HIGHER LEVEL PLAN

Area D and Kaslo fall within the Kootenay Boundary Higher Level Plan (KBHLP). Kaslo and Area D are within the Kootenay Lake Resource Management Zone within which are defined Biodiversity Emphasis areas, Old and Mature forests, green up requirements, Grizzly bear habitat and connectivity corridors, consumptive use streams, enhanced resource development zones for timber, fire-maintained ecosystems, visuals, and social and economic stability. It must be noted that many of the KBHLP objectives have been replaced with other legislation such as Government Actions Regulation (GAR) for special management of certain forest values including caribou habitat. The remaining objectives not provided special management under other legislation are carried forward in the KBHLP. The fire-maintained ecosystem provision in the KBHLP allows the possibility to restore and maintain the ecological integrity of fire-maintained ecosystems, providing for treatments that will restore shrubland, open range, open forest, and managed forest ecosystem components in NDT4. However, there are no NDT4 ecosystems in Area D and Kaslo, most ecosystems are classified as NDT3.

AREA D AND KASLO OFFICIAL COMMUNITY PLANS

The Kootenay Lake and Lardeau Valley portion of Electoral Area D and Kaslo Official Community Plans (Regional District Central Kootenay, 2010, Village of Kaslo, 2011) recognizes wildfire as a significant threat to residences in interface areas, and recognizes the need to balance natural beauty and the reduction of wildfire hazard. Kaslo OCP Section 6.2.3 states Village Council "will identify wildfire hazard reduction standards for new residential development in wildland/urban interface areas." Section 14, Hazards Lands and Fire Management, sets out Fire Management Policies aimed at fire hazard assessment and risk reduction. Section 14, paragraph 8 "Encourages the development of a community wildfire interface plan in recognition of the areas isolation and susceptibility to forest fire risk"[6].

OTHER

All forest licensees in Area D and Kaslo have Forest Stewardship Plans (FSPs), that detail how each licensee will achieve Forest and Range Practices Act objectives, as well as those in the KBHLP.

5.3 RELEVANT LEGISLATION, PLANS, BYLAWS AND POLICIES

LOCAL GOVERNMENT

The RDCK does not have burning bylaws. Within specified areas of the RDCK development permits are required to ensure that new development is consistent with the applicable OCP. However, the RDCK does not have development permit areas for wildfire hazard.

Local policies and guidelines and relevant bylaws include:

[6] http://www.rdck.ca/assets/Government/Bylaws/Land~Use-Planning/1996_Kootenay%20Lake%20Lardeau%20Valley%20OCP.pdf

- The RDCK Emergency Management Regulatory Bylaw No. 2210, 2011[7], which was enacted to establish and maintain an emergency management framework for the Regional District Area D and the Village of Kaslo and the Central Kootenay Emergency Management Plan (described below).
- Bylaw No. 2170, 2010[8], which provides for the operation and regulation of Volunteer Fire Departments for fire protection services, including, but not limited to limits of service and scope of the respective RDCK fire departments.
- The Water Bylaw No. 2470, 2015[9] which applies to all water service areas of the RDCK including setting out ownership, responsibility and access to water systems including fire hydrants and standpipes.

The Central Kootenay Emergency Management Plan describes the organization, roles, procedure and other higher level factors in managing emergencies. The potential emergencies and disasters are characterized in Annex B. 'Fire - Urban and Rural' is ranked the most likely hazard, and 'Wildfire' is rated third. In terms of severity, wildfire is ranked highest.

The RDCK also has Emergency Management Procedures (Regional District Central Kootenay, 2018) that coordinate the response to, and recovery from, an emergency or disaster. Recommended actions are suggested for the different types of emergencies. An interface fire should be managed using unified command between the BC Wildfire Service and the local fire departments. If no fire department covers the area involved in a wildfire within the interface, the RDCK Emergency Operations Centre will handle the response in coordination with the BC Wildfire Service. If the interface fire occurs outside of a Fire Protection Area, BC Wildfire Service will request assistance from the office of the Fire Commissioner, the local authority and local area fire departments. The Central Kootenay Emergency Program supports the affected local authority and stakeholders in all wildfire interface incidents. The local authority is responsible for any Declaration of Local State of Emergency and associated Evacuation Alerts and Orders.

RELEVANT PROVINCIAL LEGISLATION:

- **Wildfire Act and Wildfire Regulation** – dedicated to wildfire management in BC. Key objective of the legislation is to specify responsibilities and obligations with respect to fire use, prevention, control and rehabilitation.

- **Forest and Range Practices Act and Forest Planning and Practices Regulation** – operational planning, forest practices and resource protection. This legislation provides the power to authorize the destruction or damage of Crown timber for wildfire hazard reduction purposes. The Regulation stipulates minimum forest practices to protect resources.

- **Park Act** – gives power to prohibit or control the use of fire within Parks.

[7] http://www.rdck.ca/assets/Government/Bylaws/Emergency~Services/Bylaw%202210-Emergency_Bylaw.pdf
[8] http://www.rdck.ca/assets/Government/Bylaws/Fire/Bylaw%202170%20Fire%20Dept%20CONS.pdf
[9] http://www.rdck.ca/assets/Government/Bylaws/Water/2470-Water.pdf

- **Environmental Management Act** – governs waste emissions, including particulate matter (smoke). The Open Burning Smoke Control Regulation regulates open burning including favorable conditions for smoke dispersion.
- **Emergency Program Management Regulation** – provides the guiding principles to the Provincial Emergency Program by identifying roles and responsibilities, and has the responsibility to identify potential emergencies and disasters, and the requirement to provide advice and assistance in the event of emergency.
- Other (Hydro and Power Authority Act, Special Accounts Appropriation and Control Act, Annual Rent Regulation)

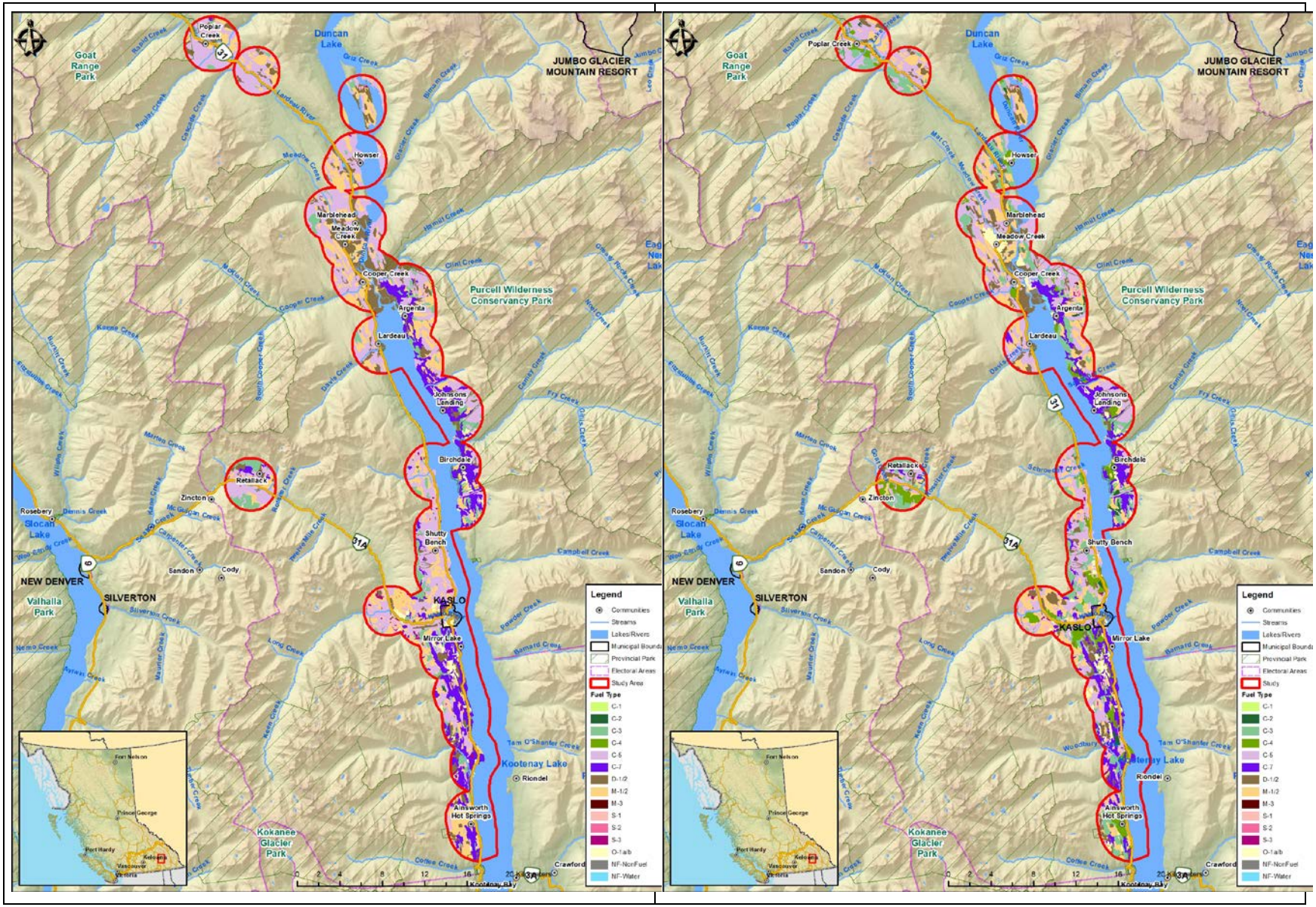
6.0 WILDFIRE BEHAVIOUR AND WUI THREAT ASSESSMENT

As part of the field assessment completed for this CWPP, the wildfire threat was determined surrounding or within the community area by establishing fuel types based on the Canadian Forest Fire Danger Rating System, CFFDRS classification system, and by completing Wildland Urban Interface Threat Assessments.

6.1 LOCAL FUEL TYPE SUMMARY

The Canadian Forest Fire Behaviour Prediction (FBP) System outlines five major fuel groups and 16 fuel types based on characteristic fire behaviour under defined conditions (Forestry Canada Fire Danger Group, 1992).

The initial starting point for Study Area fuel typing is the 2015 Provincial Strategic Threat Analysis (PSTA), which is based on the FBP fuel typing system. PSTA data is limited by the accuracy and availability of information within the Vegetation Resource Inventory (VRI) provincial data; confidence in fuel type provincial fuel type data is low on private land. For the above reasons, fuel types from the PSTA data have been updated using orthophotographs of Area D and Kaslo and with field fuel type verification as illustrated in Map 6 A and B.



Map 6 A and B. Unverified fuel types (PSTA Fuel Types) and the field verified fuel types (CWPP Fuel Type)

Overall, fuel types designated in the PSTA dataset were notably different from the corrected fuel typing, and extensive field and photo interpretation validation was required prior to spatial analysis. Table 4 summarizes the fuel types by general fire behaviour and total area for the Study Area.

Table 4. The fuel types occurring within the Study Area.

Fuel Type	Description	Wildfire Behaviour Under High Wildfire Danger Level	Area (ha) in Study Area	Percent of Study Area
C-2	Plantations older than 20 years. High density with high canopy and low crowns.	Almost always crown fire, high to very high fire intensity and rate of spread.	232	1%
C-3	Fully stocked, mature forest, crowns separated from ground	Surface and crown fire, low to very high fire intensity and rate of spread	4,957	11
C-4	Dense pole-sapling forest, heavy dead and down, dead woody fuel, vertical crown fuel continuity	Almost always crown fire, high to very high fire intensity and rate of spread.	2,460	5%
C-5	Well-stocked mature forest, crowns separated from ground	Low to moderately fast spreading, low to moderate intensity surface fire.	10,551	23%
C-7	Open, mature forest.	Surface fire spread, torching of individual trees, rarely crowning (usually limited to slopes > 30%), moderate to high intensity and rate of spread	4,104	9%
D-1/2	Moderately well-stocked deciduous stands (D1 leafless or D2 green)	Always a surface fire, low to moderate rate of spread and fire intensity	3,820	8%
M-1/2	Moderately well-stocked mixed stand of conifer and deciduous species, low to moderate dead, down woody fuels, crowns nearly to ground (M1 – leafless, M2 – in leaf)	Surface, torching and crowning, moderate to very high intensity and spread rate (depending on slope and percent conifer and season (in leaf vs leafless)	6,219	14%
M-3/4	Moderately well stocked mixed stands of conifer and deciduous species, where the conifer species may be dead, in varying percentage. Not typically used In BC except as red-phase MPB-attacked pine stand. M4 (leafless) not used in BC (Perrakis and Eade, 2015)	Rapid spreading, high to very high fire intensity and rate of spread (M3)	7	0%
O1a/b	Shrub type with volatile species, matted or standing grass	Rapid spreading, intense surface fire	1,365	3%

Fuel Type	Description	Wildfire Behaviour Under High Wildfire Danger Level	Area (ha) in Study Area	Percent of Study Area
S1/S2/S3	Continuous and uncompacted slash type with large fuel loads and deep slash depth. Varies depending on species composition of slash.	Ranges from surface fire, low to moderate intensity to moderate to high rate of spread and high to very high intensity surface fire.	552	1%
W	Water	N/A	11,095	24%
NF	Non-fuel	N/A	601	1%
		Total	**45,962**	**100%**

The most abundant fuel type in Area D and Kaslo is C-5. There are also large tracts of mixed forest (M-1/2), in this case being partly attributed to stands with a western larch component. Western larch is a deciduous conifer, and for the purposes of fire behaviour, is considered less flammable than evergreen conifers due to higher moisture content of leaves that are produced each spring. The next most abundant fuel type is C-5. The minimal presence of some M-3/4 indicates mountain pine beetle-killed stands with deciduous regeneration. Much of the deciduous species component in this region is paper birch, a more flammable species than other deciduous species of the area such as trembling aspen.

Developed areas have been accurately identified as non-fuel areas, as they do not fit into the classification system that is only appropriate to classify forested lands. The assignation of non-fuel should not be interpreted as areas representing low, or no hazard, as planted landscaping and other vegetation, planted and naturally regenerating, on private lands and within a developed matrix may present extreme hazard. This is particularly relevant, as planted landscaping on private lands can present a considerable hazard in interface areas.

6.2 THE WILDLAND URBAN INTERFACE

The Wildland Urban Interface (WUI) is generally defined as the place where the forest meets the community. There are different WUI conditions, which are variations on 'perimeter interface' and 'intermix'. A perimeter interface condition is generally where there is a clean transition from urban development to forest lands. Smaller, more isolated developments that are embedded within the forest are referred to as intermixed areas. An example of interface and intermixed areas is illustrated in Figure 3.

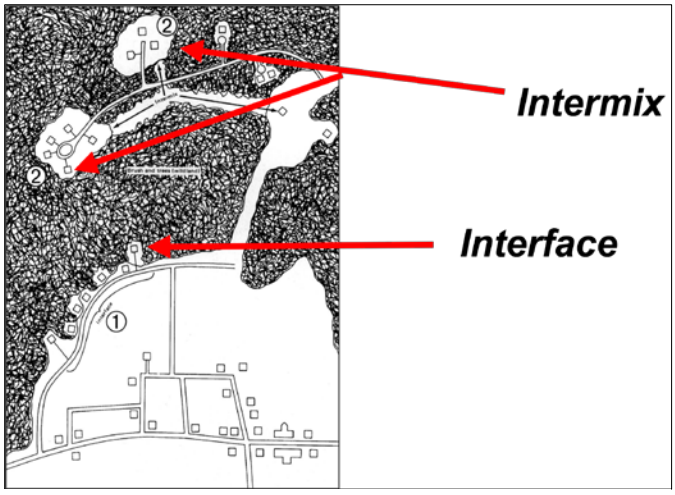


Figure 3. Illustration of intermix and interface areas.

In interface and intermixed communities, fire has the ability to spread from the forest into the community or from the community out into the forest. Although these

two scenarios are quite different, they are of equal importance when considering interface fire risk. Regardless of which scenario occurs, there will be consequences for the community and this will have an impact on the way in which the community plans and prepares for interface fires.

6.2.1 VULNERABILITY OF THE WILDLAND URBAN INTERFACE TO FIRE

Fires spreading into the WUI from the forest can impact homes in two distinct ways:

1. From sparks or burning embers carried by the wind, or convection that starts new fires beyond the zone of direct ignition (main advancing fire front), and alight on vulnerable construction materials or adjacent flammable landscaping (*i.e.* roofing, siding, decks, juniper, etc.) (Figure 4).

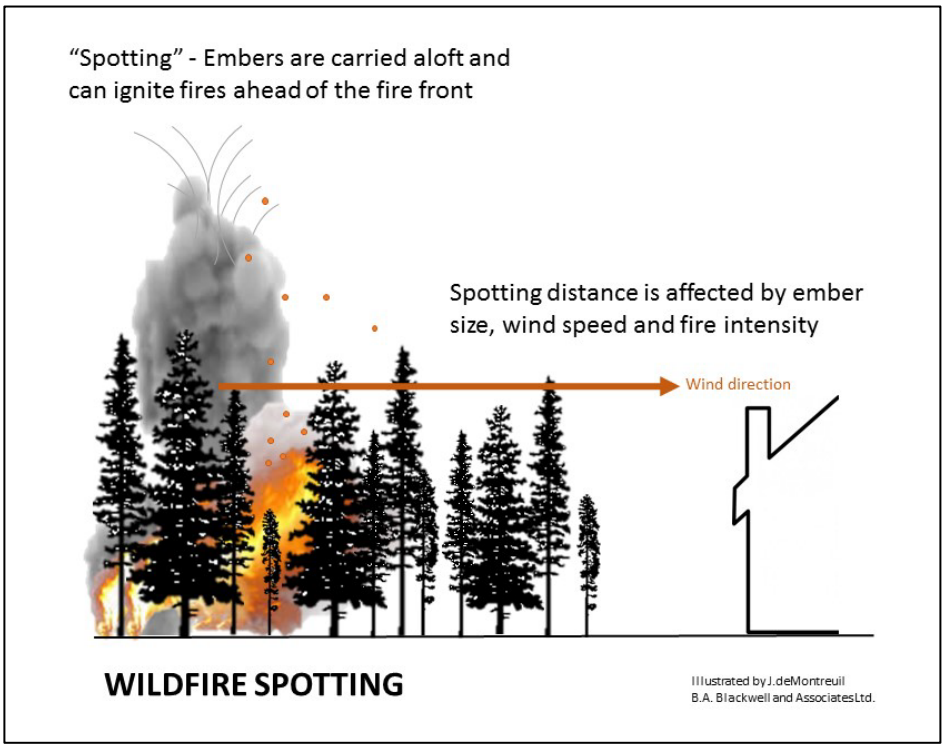


Figure 4. How homes in the interface are impacted by wildfire through 'spotting'.

2. From direct flame contact, convective heating, conductive heating or radiant heating along the edge of a burning fire front (burning forest), or through structure-to-structure contact. Fire can ignite a vulnerable structure when the structure is in close proximity (within 10 meters of the flame) to either the forest edge or a burning house.

6.3 WUI THREAT ASSESSMENTS

WUI threat assessments were completed predominantly during the early part of the field season of 2016 and 2017, from March to July, in conjunction with verification of fuel types. WUI Threat Assessments were completed in the interface areas of Area D and Kaslo, in order to support development of priority treatment areas, and in order to confidently ascribe threat to polygons which may not have been visited or plotted, but which have similar fuel, topographic, and proximity to structure characteristics to those that were. To assess risk on treated and untreated polygons, the *Provincial WUI Wildfire Threat Rating Worksheets* (worksheet) were used, as required by

UBCM[10] in addition to professional judgment. The worksheet provides point ratings for four components that contribute to wildfire risk. These components include fuels, weather, topography and structural values at risk. The original WUI threat plot forms have been submitted as a separate document.

A total of 68 WUI threat plots were completed in Area D and Kaslo. The data collected and field observations recorded from the plots and field stops inform much of this document. Area D and Kaslo overall has 'high' fire behaviour threat class ratings, and a range of WUI threat ratings, as shown in Table 5 below.

Table 5. Wildland Urban Interface Threat Assessments completed in the Study Area.

Plot Number	General Location	Fire Behaviour Score	Fire Behaviour Class	WUI Threat Score	WUI Threat Class
ARG-1	Argenta – Bulmers Creek	113	High	14	Moderate
ARG-2	Argenta – Bulmers Creek	116	High	14	Moderate
ARG-3	Argenta – Bulmers Creek	140	High	14	Moderate
ARG-4	Argenta	125	High	11	Low
ARG-5	Argenta	123	High	22	Moderate
ARG-6	Argenta	124	High	20	Moderate
ARG-7	Argenta	137	High	40	Extreme
ARG-8	Argenta	142	High	42	Extreme
AW-1	Ainsworth – Highway 31	120	High	14	Moderate
AW-2	Ainsworth	125	High	23	Moderate
AW-3	Ainsworth - Coffee Creek FSR	125	High	14	Moderate
AW-4	Ainsworth – Coffee Creek FSR	123	High	33	High
BD-1	Birchdale	143	High	35	High
BD-2	Birchdale	151	Extreme	25	Moderate
BD-3	Birchdale	143	High	35	High

[10] http://www.ubcm.ca/assets/Funding~Programs/LGPS/SWPI/Resources/swpi-WUI-WTA-Guide-2012-Update.pdf

Plot Number	General Location	Fire Behaviour Score	Fire Behaviour Class	WUI Threat Score	WUI Threat Class
BJE-1	Bjerkness Creek FSR	122	High	35	High
CF-1	Cooper Face FSR	132	High	14	Moderate
DUNC-1	Duncan Island	122	High	25	Moderate
DUNC-2	Duncan Dam Viewpoint Rd.	144	High	35	High
DUNC-3	Duncan FSR Mainline	118	High	27	High
HOW-1	Howser – Glayco Rec Site	111	High	30	High
HOW-2	Howser – Glayco Rec Site	137	High	28	High
HM-1	Hamill Creek - Duncan Lake Rd	133	High	33	High
HM-2	Hamill Creek - Argenta Rd	117	High	33	High
JL-1	Johnson's Landing – Kootenay Joe FSR	138	High	14	Moderate
JL-2	Jonshon's Landing – Kootenay Joe FSR	137	High	23	Moderate
JL-3	Johnson's Landing – Argenta Rd	113	High	25	Moderate
JL-4	Johnson's Landing – Argenta Rd	114	High	25	Moderate
KAS-1	Kaslo – Back Rd	130	High	32	High
KAS-2	Kaslo – Back Rd	130	High	32	Extreme
KAS-3	Kaslo – Back Rd	133	High	32	High
KAS-4	Kaslo – Transfer Station Rd	125	High	30	High
KAS-5	Kaslo – Airport	106	High	40	Extreme
KAS-6	Kaslo – Highway 31	138	High	28	High
KAS-7	Kaslo - Keen Creek	107	High	22	Moderate
KAS-8	Kaslo - Airport	127	High	40	Extreme

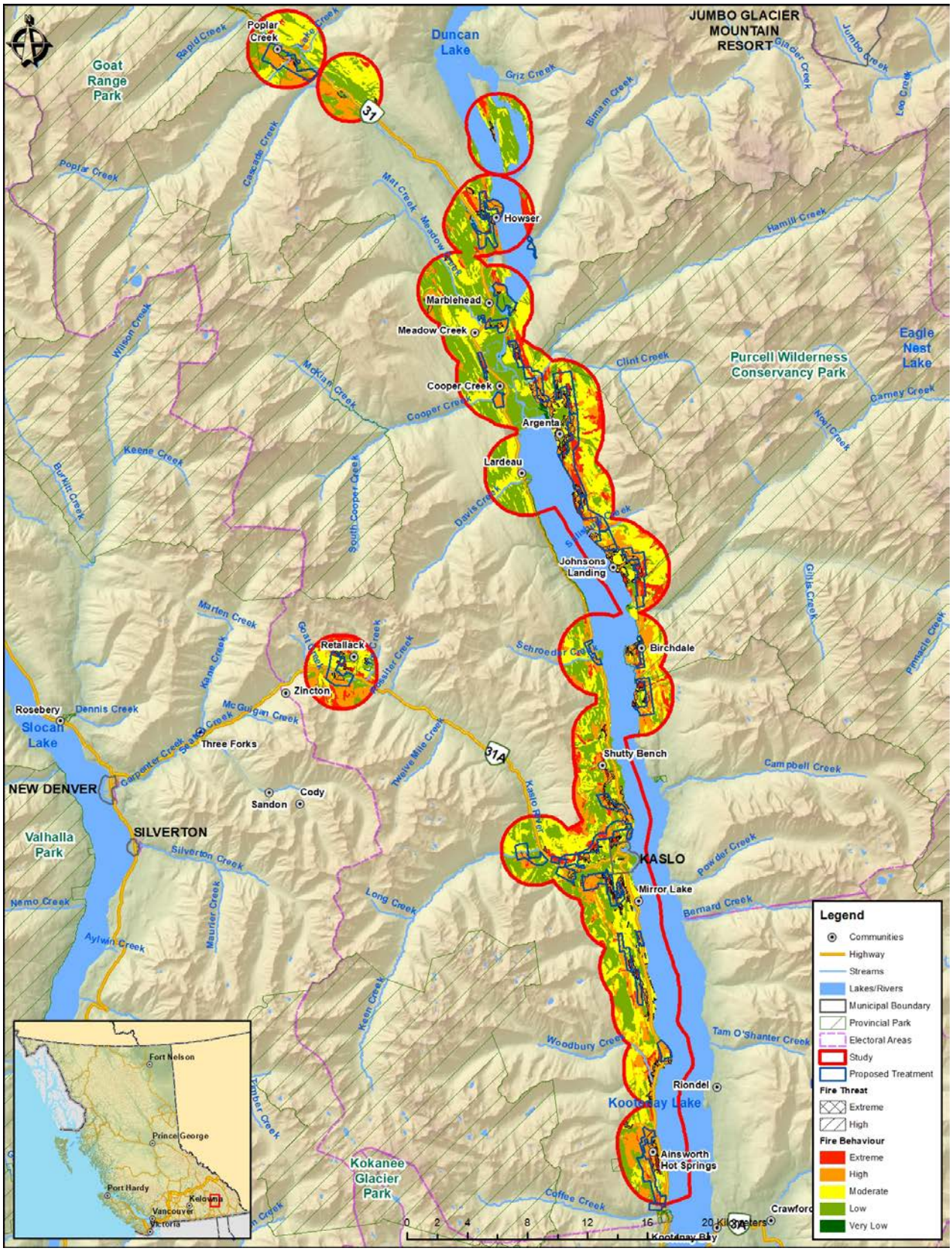
Plot Number	General Location	Fire Behaviour Score	Fire Behaviour Class	WUI Threat Score	WUI Threat Class
KAS-9	Kaslo - Mud Road	129	High	40	Extreme
KAS-10	Kaslo - Transfer Station	116	High	16	Moderate
KAS-11	Kaslo - Mud Road	120	High	35	High
KAS-12	Kaslo - Bjerkness Rd	123	High	21	Moderate
KAS-13	Kaslo - Buchanen Access Trail West	133	High	19	Moderate
MC-1	Meadow Creek – Jewitt School	115	High	40	Extreme
MC-2	Meadow Creek – East of Hamill Creek Timber Products	85	Moderate	14	Moderate
MC-3	Meadow Creek – Block Rd	113	High	38	High
MC-4	Meadow Creek – Highway 31	131	High	25	Moderate
ML-1	Mirror Lake	126	High	25	Moderate
MUC-1	Murphy Creek – Murphy FSR	135	High	14	Moderate
MUC-2	Murphy Creek – Murphy FSR	124	High	33	High
POP-1	Poplar Creek – Highway 31	109	High	30	High
POP-2	Poplar Creek – Highway 31	125	High	33	Moderate
POP-3	Poplar Creek – Highway 31	141	High	20	Moderate
POP-4	Poplar Creek – Cascade Creek FSR	157	Extreme	11	Low
RET-1	Retallack – Whitewater Creek FSR	119	High	25	Moderate
RET-2	Retallack – Robb Creek FSR	118	High	35	High
SA-1	Salisbury FSR	138	High	14	Moderate
SA-2	Salisbury FSR	110	High	14	Moderate

Plot Number	General Location	Fire Behaviour Score	Fire Behaviour Class	WUI Threat Score	WUI Threat Class
SA-3	Salisbury FSR	110	High	33	High
SA-4	Johnson's Landing – Argenta Rd	102	High	38	High
SB-1	Shutty Bench – Branch 7 FSR	121	High	25	Moderate
SB-2	Shutty Bench – Milford Creek FSR	129	High	38	High
SB-3	Shutty Bench – Milford Creek FSR	139	High	23	Moderate
SC-1	Schroder Creek – West of Highway 31	107	High	38	High
WB-1	Woodbury - Water tank	138	High	43	Extreme
WB-2	Woodbury -Water tank	109	High	23	Moderate
WB-3	Woodbury – Woodbury /Fletcher FSR	117	High	23	Moderate
WB-4	Woodbury – Woodbury /Fletcher FSR	130	High	14	Moderate
WB-5	Woodbury – West of Highway 31	116	High	14	Moderate
WB-6	Woodbury – Thompson Road	161	Extreme	30	High

6.3.1 STUDY AREA THREAT RATING

There are two main components of the threat rating system: the wildfire behaviour threat class (fuels, weather and topography sub-components) and the WUI threat class (structural sub-component). The map below shows the Fire Behaviour and Fire Threat (WUI Threat class), determined as a result of a spatial data analysis (for methodology, see Appendix 2).

The result of the analysis shows large tracts of landscape that have high or extreme fire behavior potential. Areas of high or extreme WUI threat are limited to those areas that have a high or extreme fire behavior rating, *and* are in close proximity to homes. Some areas proposed for fuels modification extend beyond the WUI threat areas, in order to establish landscape-level breaks.



Map 6. Fire Threat and Fire Behaviour for the Study Area.

7.0 RECOMMENDATIONS AND ACTION PLAN

The following recommendations and action plans provide recommendations on how to implement the CWPP. The recommendations discussed in this section include: Communication and Education; Structure Protection; Emergency Preparedness; Planning and Development; and Vegetation/Fuel Management.

7.1 COMMUNICATION AND EDUCATION

Awareness and understanding support the adoption of tools to reduce fire risk. In communities where the dangers of wildfire are understood there is increased support and interest in reducing fire risk. The establishment of tools to reduce fire risk is one of the keystones to building a FireSmart community. A more detailed discussion of nationally accepted FireSmart principles is provided in Appendix 1. Without the support of the community, the efforts of public officials, fire departments, and others to reduce wildfire will be hindered. In many communities there is generally a lack of understanding about interface fire and the simple steps that can be taken to minimize risk. Additionally, public perception of fire is often underdeveloped due to public confidence and reliance on local and provincial fire rescue services.

Based on the consultation completed during development of this Plan, it is evident that the RDCK has a good level of awareness of fire risk in the interface in Area D and Kaslo; however, field observations highlighted the need to further educate the community on what private landowners can do to contribute to a FireSmart community. The Communication and Education objectives for Area D and Kaslo are:

- To improve public understanding of fire risk and personal responsibility by increasing resident awareness of the wildfire threat in their community and to establish a sense of homeowner/landowner responsibility; and
- To enhance the awareness of elected officials, protection staff and stakeholders about the resources required to mitigate fire risk.

The two principal goals for RDCK Area D and Kaslo to enhance wildfire related Communication and Education should be to:

- Reduce human caused fire ignitions; and
- Reduce fire risk on private property and critical infrastructure.

Communicating effectively is the key aspect of education. Communication materials must be audience specific, and delivered in a format and through mediums that reach the target audience. Audiences should include home and landowners, school students, local businesses, elected officials, District staff, local utilities, and forest tenure holders. Education and communication messages should be simple yet comprehensive. A basic level of background information is required to enable a solid understanding of fire risk issues and the level of complexity and detail of the message should be specific to the target audience.

The RDCK has undertaken some public education and FireSmart and fire prevention initiatives in the community. In 2015 to 2018 Queens Bay continues to receive Community FireSmart Recognition through FireSmart Canada. In Area D Woodbury and the Kaslo Backroad are working towards receiving Community FireSmart Recognition.

FireSmart resources are also provided on the Regional District's website. These initiatives can be expanded upon and/or adapted to further enhance wildfire preparedness and education. The RDCK Fire Service should consider providing or expanding fire education programs in schools to include wildfire prevention and preparedness education to be presented annually. Programming could include volunteer/advocacy work from professional foresters, wildland firefighters or prevention officers, and District staff. RDCK should consider holding a wildland specific Fire Prevention Week or Day, or similarly formatted event, in the spring prior to the wildfire season. Timely educational materials to increase preparedness would be most effective immediately prior to the fire season.

Provincial funding for fuel management is only provided for public lands. It is important for homeowners to understand what they can do to reduce the risk of wildfire damage to their property or adjacent residences. In particular, property owners need to be aware of their responsibility to implement FireSmart mitigation measures on their properties and also understand how their contributions benefit community wildfire safety.

FireSmart information material is readily available and simple for municipalities to disseminate. It provides concise and easy-to-use guidance that allows homeowners to evaluate their homes and take measures to reduce fire risk. However, the information needs to be supported by locally relevant information that illustrates the vulnerability of individual houses to wildfire. As per the 2008 CWPP, educational material should be made available to all private landowners.

Bringing organizations together to address wildfire issues that overlap physical, jurisdictional or organizational boundaries is a good way to help develop interagency structures and mechanisms to reduce wildfire risk. Engagement of various stakeholders can help with identifying valuable information about the landscape and also help provide unique and local solutions to reducing wildfire risk. The RDCK should consider strengthening the effectiveness of the West Arm Interface Steering Committee to coordinate wildfire risk reduction efforts across the Regional District including in Kaslo and the north end of Kootenay Lake. Coordination of fuel management activities with forest licensees could significantly aid in the establishment of large, landscape-level fuel breaks or compliment current or proposed fuel treatment areas.

Table 6. Summary of Recommendations for Communication and Education.

Communication and Education			
Item	**Priority**	**Recommendation**	**Estimated Cost ($)**
Objective: To improve public understanding of fire risk and personal responsibility by increasing resident awareness of the wildfire threat in their community and to establish a sense of homeowner responsibility.			

Communication and Education			
Item	**Priority**	**Recommendation**	**Estimated Cost ($)**
1.	High	• Establish a school education program to engage youth in wildfire management. Consult ABCFP, BCWS (the zone) and RDCK Fire Service to facilitate and recruit volunteer teachers and experts to help with curriculum development to be delivered in elementary and/or secondary schools. Educational programming can be done in conjunction with any currently running fire prevention education programs.	$5,000
2.	High	• Make summaries of this report and associated maps publicly available through webpage, social media, and public FireSmart meetings. Add fire threat spatial data to the interactive web-mapping tool to allow residents to find their property and the associated threat of wildfire.	Within current operating costs
3.	Moderate	• Participate in the National Wildfire Community Preparedness day, typically in May each year.	$2,500
4.	High	Expand door-to-door FireSmart assessment and/or Home Partner Program within the Area D and Kaslo interface in order to educate residents and to quantify the level of risk in the interface.	$20,000
Objective: To enhance the awareness of elected officials and stakeholders regarding the resources required to reduce fire risk.			
5	High	• Develop regional development permit standards and align local government bylaws.	$30,000
6.	High	• Provide a group voice to the Building and Safety Standards Branch and other provincial entities,	Within current operating costs
7.	High	• Develop a coordinated approach to fuel management and hazard reduction within and adjacent to the Area D and Kaslo Study Area by coordinating with stakeholders including conservation organizations, communities, forest licensees, Ministry of Transportation and Infrastructure and utility companies, to aid in the establishment of FireSmart activities and large, landscape-level fuel breaks or compliment current or proposed fuel treatment areas.	$25,000

7.2 STRUCTURE PROTECTION AND PLANNING

Establishing a FireSmart community will reduce losses and impacts related to wildfire. For this Plan two classes of structures were considered: critical infrastructure and residential / commercial infrastructure. Critical infrastructure provides important services that may be required during a wildfire event or may require additional considerations or protection. As outlined in Appendix 1, FireSmart principles are important when reducing wildfire risk to both classes of structure and are reflected in the recommendations. The structure protection objectives for RDCK are to:

- Enhance protection of critical infrastructure from wildfire; and
- Encourage private homeowners to voluntarily adopt FireSmart principles on their properties.

The two main avenues for implementing FireSmart include:

- Change the vegetation type, density and setback from the structure; and
- Change the structure (where feasible) to reduce vulnerability to fire and reduce the potential for fire to spread to or from a structure.

Critical infrastructure is important to consider when planning for a wildfire event. The use of construction materials, building design and landscaping must be considered for all structures when completing upgrades or establishing new infrastructure. Additionally, vegetation setbacks around critical infrastructure should be compliant with FireSmart recommendations.

Detailed FireSmart assessments were not completed for critical infrastructure. The RDCK Fire departments in Area D should consult with District staff to systematically assess critical infrastructure in interface areas and to provide FireSmart recommendations based on their findings.

As noted in the 2008 CWPP, water is a critical suppression resource that is dependent on water service. This recommendation is still valid and implementation is ongoing. Other recommendations include: installing reservoir or hydrant systems in areas of poor water availability, identifying and mapping alternative water sources where feasible and ensuring new developments have sufficient water service and hydrant coverage. District staff and Fire Departments in Area D and Kaslo should review hydrant coverage and locations. Improving water availability in identified areas and mapping alternative water sources is ongoing and should continue.

A full assessment of the water availability and vulnerability of water sources was not possible under the scope of this report. Back-up power sources should be installed for all critical infrastructure to ensure the RDCK can continue to operate at an acceptable level during a wildfire event in Area D and Kaslo. The RDCK should complete a Fire Flow / Water Supply Vulnerability Assessment for each water system in Area D and Kaslo to identify those areas that may have insufficient or unreliable water supplies.

Table 6. Summary of Recommendations for Protection of Critical Infrastructure.

Structure Protection and Planning			
Item	**Priority**	**Recommendation**	**Estimated Cost ($)**
Objective: Enhance protection of critical infrastructure from wildfire.			
8.	High	• Complete a fire flow / water vulnerability assessment for each water system and identify and map all alternative water sources (reservoirs, streams, lakes, etc.). Identify which areas may have insufficient or unreliable water supplies and provide recommendations to reduce vulnerability in Area D and Kaslo. Explore collaboration with other agencies including Columbia Basin Trust, Ministry of Environment, Ministry of Transportation and Infrastructure and Interior Health Authority.	$20,000
9.	High	• Complete a vulnerability assessment of all critical infrastructure (not only RDCK and Village of Kaslo critical infrastructure) including water infrastructure in interface areas with FireSmart recommendations.	$20,000
10.	High	• Develop alternative, back-up water sources for fire protection, including determining the suitability of the MacDonald Creek water reservoir, and the establishment of standpipes as required.	Based on assessments
11.	High	• Complete a detailed review of back-up power source options for all critical infrastructure and upgrade as required.	Review: $20,000 Upgrade: Based on review
12.	High	• Complete more detailed hazard assessments and developing, in collaboration with other available government funding, response plans for stabilization and rehabilitation of burn areas in watersheds that are vulnerable to post-wildfire debris flows and floods.	$25,000

7.2.1 WILDLAND URBAN INTERFACE SITE AND STRUCTURE ASSESSMENTS

Another way to encourage change is through education and increased awareness of fire hazard on private property using tools such as the Home Partners Program or the FireSmart Home Assessment. The reduction of wildfire hazards on private lands generally depends on the homeowner. This includes choices in exterior building materials, setbacks from forest edges and landscaping. In other jurisdictions, notably Colorado Springs, Colorado[11] and Whistler, BC, programs to increase awareness of fire hazard and spur homeowner action have been implemented successfully. In these jurisdictions, fire hazard assessments were completed for homes in the Wildland Urban Interface. The results of the assessments were shared with the homeowner / property owner at the time of assessment. The results of the hazard assessments were compiled into a geo-spatial database and

[11] http://gis.coloradosprings.gov/Html5Viewer/?viewer=wildfiremitigation.

made available to the public. Each home and property owner could look up to see the hazard of their property, as well as their neighbours' (Figure 5). This database may be useful for the Fire Departments in Area D and Kaslo in targeting educational efforts, triage assessments and as an aid in suppression planning.

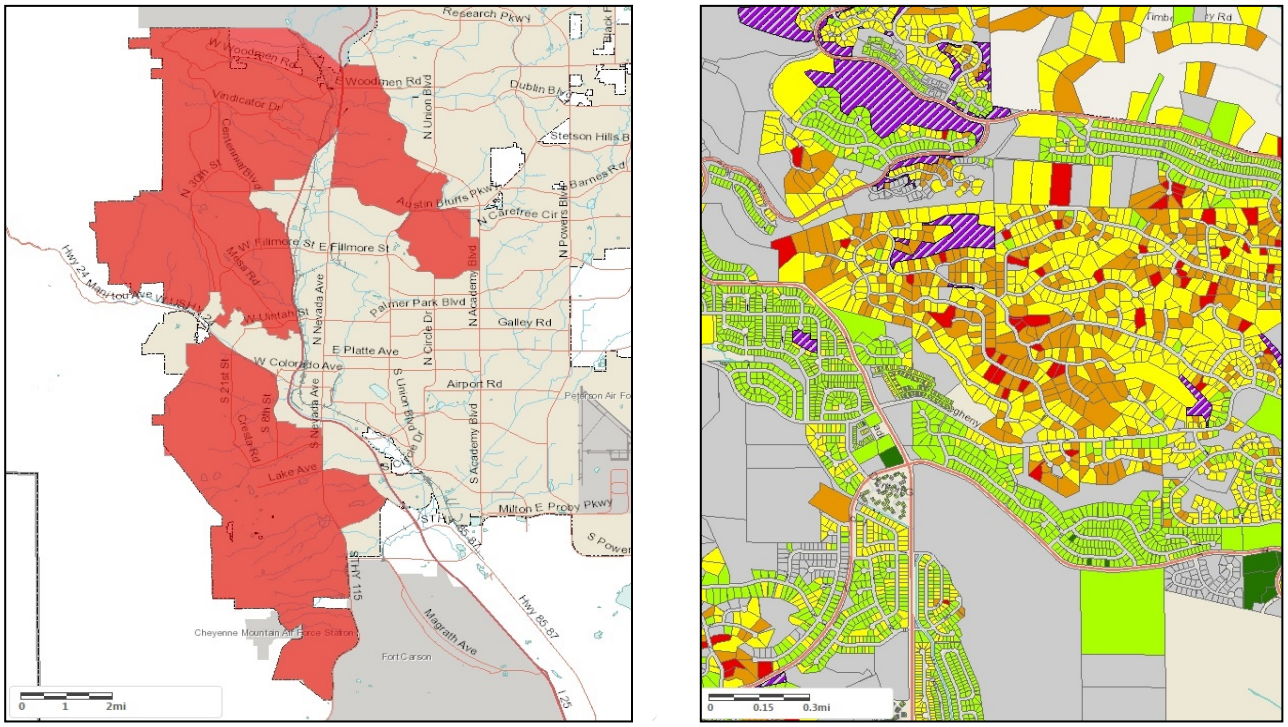


Figure 5. Screen captures of Colorado Springs, Colorado public internet mapping service.

The left figure displays the WUI area in red in which fire hazard assessments were completed. The right figure displays a neighbourhood within the WUI area and the fire hazard for each individual property. In these diagrams red is extreme, orange is very high, yellow is high, bright green is moderate and dark green is low risk.

RDCK and the Village of Kaslo should consider developing a similar fire hazard assessment program (according to Section 6.2.3 of the Kaslo OCP). Individual properties within an established Wildfire Development Permit (DP) Area should be assessed using the Home Partners Program or a FireSmart site and structure assessment form. The results and opportunities for hazard mitigation could be provided to the property owner/resident. The Central Kootenay Web Map could then make available to the public the fire hazard results by property. Property owners could then request a re-assessment upon completion of various mitigative actions and updates posted periodically on the mapping site.

This program could be combined with other initiatives, such as free yard waste drop-off at transfer stations and a scheduled garden debris-burning weekend. This could also include distribution of additional educational materials, such as FireSmart landscaping design and FireSmart plant selection information. The program will be most effective if it evaluates hazard, as well as provides property owners the information they need to effectively reduce the hazard and methods to dispose of materials removed.

This program could come at considerable cost to the RDCK and the Village of Kaslo. This work needs to be done to a professional standard, but opportunities for savings may include options such as using a student or work experience program participant to complete the assessments, retaining a consultant, and/or involve volunteer fire departments to complete the work, or targeting the program to the highest priority (highest threat) neighbourhoods and expanding as resources allow.

The recently launched SWPI FireSmart Grant Program provided funding of up to $10,000 to undertake FireSmart planning activities for private lands; however; at the time of report development, applications for this program are no longer being accepted. According to UBCM[12], as of 2017 this funding has been discontinued. RDCK should stay up to date on all UBCM/SWPI funding initiatives, in order to leverage FireSmart funding for this and other FireSmart programs, if funding again becomes available.

Table 7. Summary of Recommendations for Structure Protection and Planning.

Structure Protection and Planning			
Item	**Priority**	**Recommendation**	**Estimated Cost ($)**
Objective: Encourage private homeowners to voluntarily adopt FireSmart principles on their properties.			
13.	High	• Support homeowners with professionals to provide the Home Partners Program or WUI Site and Structure Hazard Assessments for interface homes and provide information to homeowners on specific steps that they can take to reduce fire hazards on their property. Homeowners should npot be charged for these assessments.	$160 per house

7.3 PLANNING AND DEVELOPMENT

Local government policy and bylaws are tools available to mitigate wildfire risk to the RDCK and the Village of Kaslo. All levels of government (municipal, regional district, provincial, and federal) and individual landowners need to work together to successfully reduce their risk. Local and regional governments can educate the public on the associated risks, and show leadership to help reduce that risk to the RDCK and the individual community members, their homes and properties, and other values at risk.

7.3.1 WILDFIRE HAZARD DEVELOPMENT PERMIT AREA

A development permit should be developed to address the risk of interface wildfire. Using the threat mapping from the CWPP, a Wildfire Hazard Development Permit Area could be defined. Within this area, guidelines could be developed for building materials. The scope of guidelines could be expanded to include landscaping and

[12] http://www.ubcm.ca/assets/Funding~Programs/LGPS/SWPI/Applications2017/swpi-2017-March-summary-changes.pdf

building siting to strengthen this permit process. A DPA has been identified for Kaslo and is shown in Map 8. This DPA includes all Municipal and private land within the Kaslo Municipal boundary excluding the aerodrome.

The wildfire hazard development permit process can most effectively advance the objective of developing FireSmart communities through the following strategies:

- Increasing the number of homes and properties in the interface that are FireSmart compliant (building materials, design and landscaping) and are thus less vulnerable to ignition through radiant heat or ember spotting. This can be achieved by extending the reach and scope of the Development Permit;
- Ensure that future development is completed with public safety and property protection in mind (road network facilitates suppression and emergency vehicles and public evacuation in the case of wildfire, water availability is sufficient for suppression activities, sufficient setbacks from forested edge and top of slope).
- Ensure that natural lands turned over to RDCK and adjacent to new development are a moderate threat rating or lower; and,
- Ensure that the natural lands turned over to RDCK are accessible to fire crews, as well as for future maintenance activities to keep the areas at a moderate or lower threat rating.

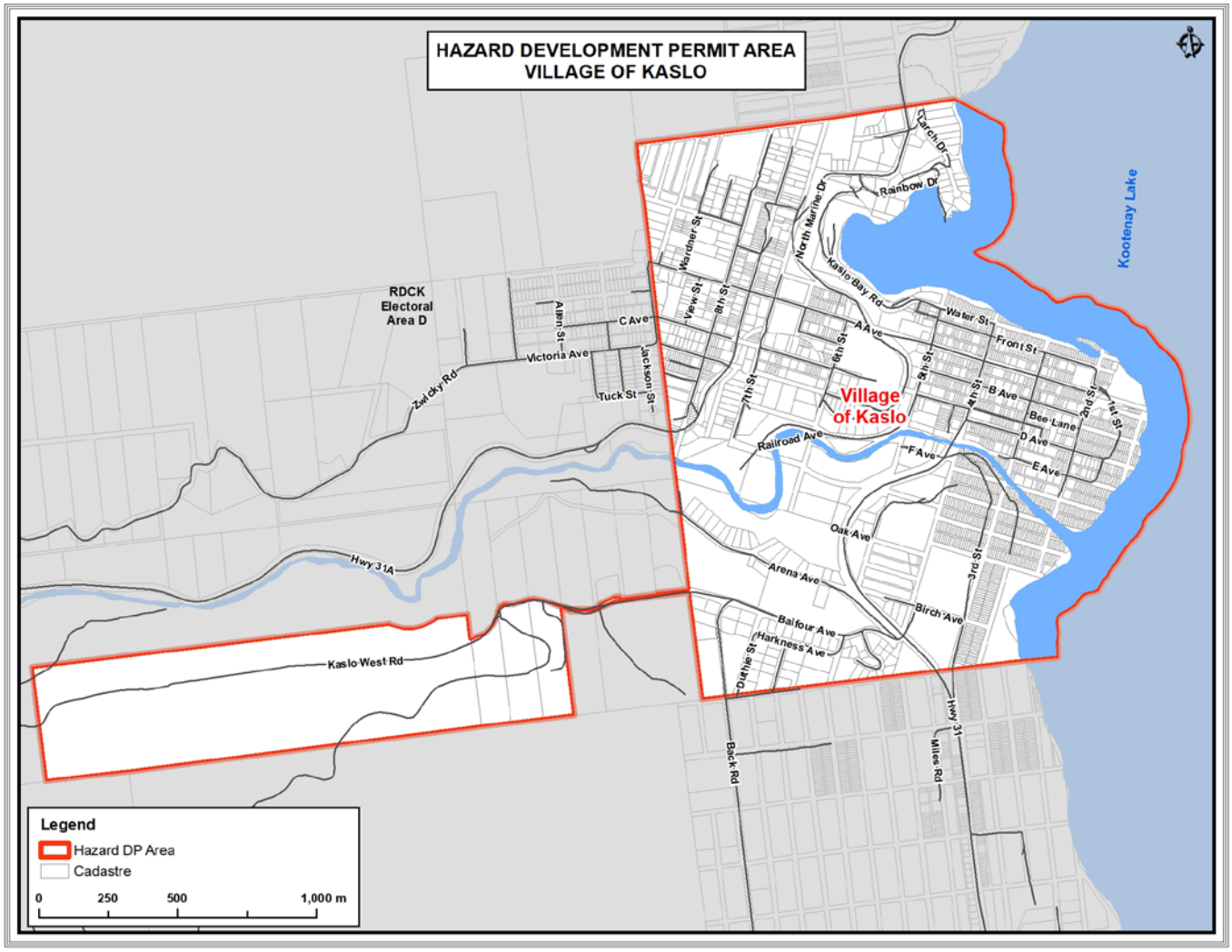
A review of other jurisdictions' successfully implemented DP processes suggests that DPs can be used effectively to gradually phase in FireSmart practices on private land, both in sub-division and individual lot re-development phase. The District of North Vancouver has a robust Wildfire Hazard Development Permit process, which could serve as a model for opportunities to improve current practices for RDCK. Within the Wildfire Hazard DP area in the District of North Vancouver, DPs are triggered at the building permit phase. Bonds collected by the District of North Vancouver are not returned to the homeowner or developer until a Qualified Professional (QP) has provided a post-development inspection sign off and photographs to ensure that recommendations regarding landscaping, setbacks, and building materials were met. Through this process, the new lots and existing housing stock within the District of North Vancouver is rapidly converting to meeting FireSmart standards in both building materials and landscaping.

Section 5 of the Building Act provides local governments the authority to set local building bylaws for unrestricted and temporarily unrestricted matters, such as exterior design and finish of buildings in relation to wildfire hazard and within a development permit area. Until revisions of the Building Code to include requirements specific to prevention of wildfire spread are completed, local governments have the ability to set exterior requirements within the development permit area.[13] It is recommended that the RDCK seek legal advice regarding the Building Act and to mandate and enforce within the Development Permit process that exterior building materials are FireSmart compliant to the extent legally possible. It is also recommended that RDCK work with the Building and

[13] Building and Safety Standards Branch. 2016. Bulletin No. BA 16-01 Building Act Information Bulletin: Update for Local Governments.

Safety Standards Branch to provide input into the Building Code revisions that would apply within the development permit areas to prevent the spread of wildfire.

Many landscaping designs include highly flammable vegetation such as cedar hedging. This increases fire hazard on private properties and immediately adjacent to homes (priority zone 1). The RDCK should consider developing a landscaping standard to be applied within the DP area to all new properties and upon existing properties when building permits are requested for new builds, retrofits or major renovations. If enforcement is not possible with currently available resources, the RDCK should consider requiring a bond and post-development sign-off from a Qualified Professional to reduce enforcement costs. As an alternative, education and incentives for homeowners to plan and implement FireSmart landscaping should be considered.



Map 7. Hazard Development Permit Areas for the Village of Kaslo

Table 8. Summary of Recommendations for Local Government Policy

Local Government Policy			
Item	**Priority**	**Recommendation**	**Estimated Cost ($)**
Objective: To reduce wildfire hazard on private land and increase FireSmart compliance.			
14.	High	• Complete OCP review and implement and / or strengthen zoning to expand reach of the existing.	Within current operating costs
15.	High	• Develop Wildfire Hazard Development Permit (DP) Areas for major retrofits / renovations or new builds (building permits), collecting bonds to be returned upon evidence of completing development and landscaping according to wildfire hazard assessment. Review District of North Vancouver and Kelowna DP processes, with particular attention to implementation, enforcement, affordability and associated liabilities. Explore proactive incentives, such as tax reductions and reduced building permit fees.	$25,000
16.	High	• Obtain legal advice regarding the Building Act, specifically regarding the temporarily unrestricted matters and local government authority to set exterior building materials requirements. Use local government authority to mandate FireSmart construction materials beyond BC Building Code in wildfire hazard development permit area, as allowed.	$10,000
17.	High	• Develop a landscaping standard to be applied in interface / DP areas. The standard should list flammable non-compliant vegetation, non-flammable drought and pest resistant alternatives, and tips on landscape design to reduce maintenance, watering requirements, and reduce wildfire hazard. Include meeting landscaping standard as a requirement of Development Permit. Review District of North Vancouver and Kelowna DP processes, with particular attention to implementation, enforcement, affordability and associated liabilities. Explore proactive incentives, such as tax reductions and reduced building permit fees.	Within current operating costs
18.	High	• Proactively enforce wildfire covenants requiring owners to maintain their properties hazard free on all properties in Development Permit areas. Enforcement will serve to minimize fuel risks on problematic private properties that have allowed hazardous accumulation of fuels and provide improved protection to adjacent lands.	Budget required for additional bylaw enforcement capacity
19.	High	• Develop a landscaping standard to be applied in interface / DP areas to ensure that developers leave building set backs on private land so that there is a minimum of 10 m distance between buildings and forest interface.	Within current operating costs

Local Government Policy			
20.	High	• Consider developing an outdoor burning bylaw specifying requirements for and limitations to outdoor burning and, in conjunction with the Fire Chief, implement the bylaw at times of high fire danger when provincial bans are not in place. The bylaw should consider effective and efficient enforcement measures and powers.	Develop bylaw within current operating costs Budget required for additional bylaw enforcement capacity
21.	Moderate	• Work with the Building and Safety Standards Branch to provide input into the Building Code revisions that would apply within the interface to prevent the spread of wildfire.	Within current operating costs

7.4 EMERGENCY PREPAREDNESS AND RESPONSE

The RDCK Fire Service has one fire department in Area D and Kaslo. The Kaslo and Area Volunteer Fire Department (KVFD) has a Fire Protection Area from Loki Lease Lots, north to Shutty Bench, West to South Fork including the Village of Kaslo. The KVFD and the Balfour Volunteer Fire Department have a mutual fire response area from Woodbury south to Coffee Creek. First responders from KVFD travel from Coffee Creek in the South to Retallack in the west, and as far north as Johnson's Landing.

The Fire Department in Area D and Kaslo is well trained, highly organized and able to provide high quality emergency and public safety services to RDCK and surrounding area. As the department is well organized, the main objectives for recommendations in regards to Emergency Preparedness are to provide additional resources to increase the level of training and equipment for department fire fighters to utilize in an interface fire situation. There are 400 firefighters within the RDCK Fire Service and 20 in KVFD. All firefighters within the RDCK fire service are volunteer with the exception of a career Regional Chief and Deputy Chief.

The RDCK Fire Departments in Area D respond to approximately 20-25 calls per year relating to structure and wildland fire. Annually, 60% of call-outs are first responder, motor vehicle incidents, technical rescue and regional hazardous materials calls[14]. Kootenay Boundary Fire Rescue provides fire dispatch to all RDCK Fire departments in the region. The 20-25 call-outs in 2016 is characteristic of an average year in Area D and Kaslo. The total number of wildfire or brush-related call outs is included within these call-outs. Statistics for call-outs are on an increasing trend, but this is attributed to population growth within the community.

In addition to response to structural fires, the KVFD provides wildland fire, first responder, motor vehicle incidents and technical rescue response. Kaslo Search and Rescue also provides response to motor vehicle incidents and technical rescue response. The RDCK has automatic aid agreements in place with all RDCK Fire Departments. A mutual aid agreement is in place between KVFD and Balfour Harrop Fire Department. The RDCK responds to

[14] 2015 statistics provided by the RDCK Emergency Program

wildfires within Fire Protection Areas. The provincial mutual aid agreement provides for assistance from the BCWS on larger incidents. Under this agreement, the RDCK may be requested to assist the BCWS outside of RDCK Fire Protection Areas.

The majority of training for the RDCK and Kaslo Fire Service focuses on structural firefighting but does include annual wildland interface training as part of the training curriculum. Some RDCK Fire Service members participate in EOC training, which involves multiple agencies. There has been some recent cross-training with MFLNRORD BCWS (usually conducted annually at the start of each fire season). All RDCK Fire Service members should, at a minimum, have SPPWFF level 1 training. The RDCK should coordinate annual cross-training events with the BCWFS, for example a joint wildfire simulation exercise. This could be completed in cooperation with other area Fire Departments (RDCK) to further strengthen regional emergency response training.

The RDCK and Kaslo Fire Services own numerous emergency response vehicles. The Kaslo Fire Department has four emergency response vehicles (two engines, one tender, and one command vehicle). A structural protection unit (SPU) is also located at the Kaslo Fire Department. This unit is a wildland fire trailer outfitted with high volume portable pump, hoses and sprinklers.

The RDCK owns three Structural Protection Units (SPUs). The UBCM owns four complete SPUs, each equipped to protect 30 to 35 structures. The UBCM SPUs are deployed by the Office of the Fire Commissioner and are placed strategically across the province during the fire season based on fire weather conditions and fire potential. The RDCK SPUs can be deployed regionally at the request of a fire department the Office of the Fire Commissioner, the BCWS and the local authority. When the RDCK owned SPUs are not used, they may be utilized by fire departments for training exercises. SPUs can be useful tools in the protection of rural / interface homes in the event of a wildfire. The RDCK should stay up to date on the request process for a UBCM-owned SPU in the event of a wildfire where SPUs would be an effective structural protection tool.

Emergency preparedness and response is managed regionally through cooperation with the Regional District of Central Kootenay and member communities as set out in Figure 6.[15] The Central Kootenay Emergency Management Plan 2018 details the program structure, jurisdictional boundaries, guiding principles, and the overall planning and response to emergencies including risk assessments, mitigation, response and response levels, and recovery. The identification of a regional EOC facility is outlined in this document. The RDCK is grouped operationally with the RDCK Electoral Areas E, F and Nelson, Kaslo and Area D and Kaslo, Area I and J Fire Services sharing an Emergency Program Coordinator with each service having a dedicated Emergency Preparedness Committee. This report recommends that the RDCK utilize this existing structure, and ensure the Wildfire Mitigation Coordinator liaises between the Emergency Preparedness Committee and any collaborative interface planning efforts.

[15] Excerpt from Emergency Program Management Plan for the Regional District of Central Kootenay, June 2012 (revised April, 2016)

Figure 6. Central Kootenay Emergency Management Structure

Many homes could benefit from preplan assessments to ensure accessibility and safety for firefighters. Fire triage is an important tool used by fire suppression crews to improve the potential for structures to survive a fire event. The process involves determining which houses have the greatest likelihood of surviving a wildfire and therefore should be prioritized for additional protective measures such as setting sprinklers or spraying retardant. Triage assessments are dependent on five main factors that include: firefighter safety, structure design and material, fuels around the structure, fire behavior, and available resources. Conducting assessments of housing in the WUI prior to a fire can assist in suppression efforts. The assessments can also be used to educate homeowners as to what protection they might receive during a fire event and what changes they can make to improve the probability of their home surviving a fire event. See Section 7.2.1 for details regarding WUI wildfire hazard assessments and associated recommendations.

Table 9. Summary of Recommendations for Emergency Response and Planning

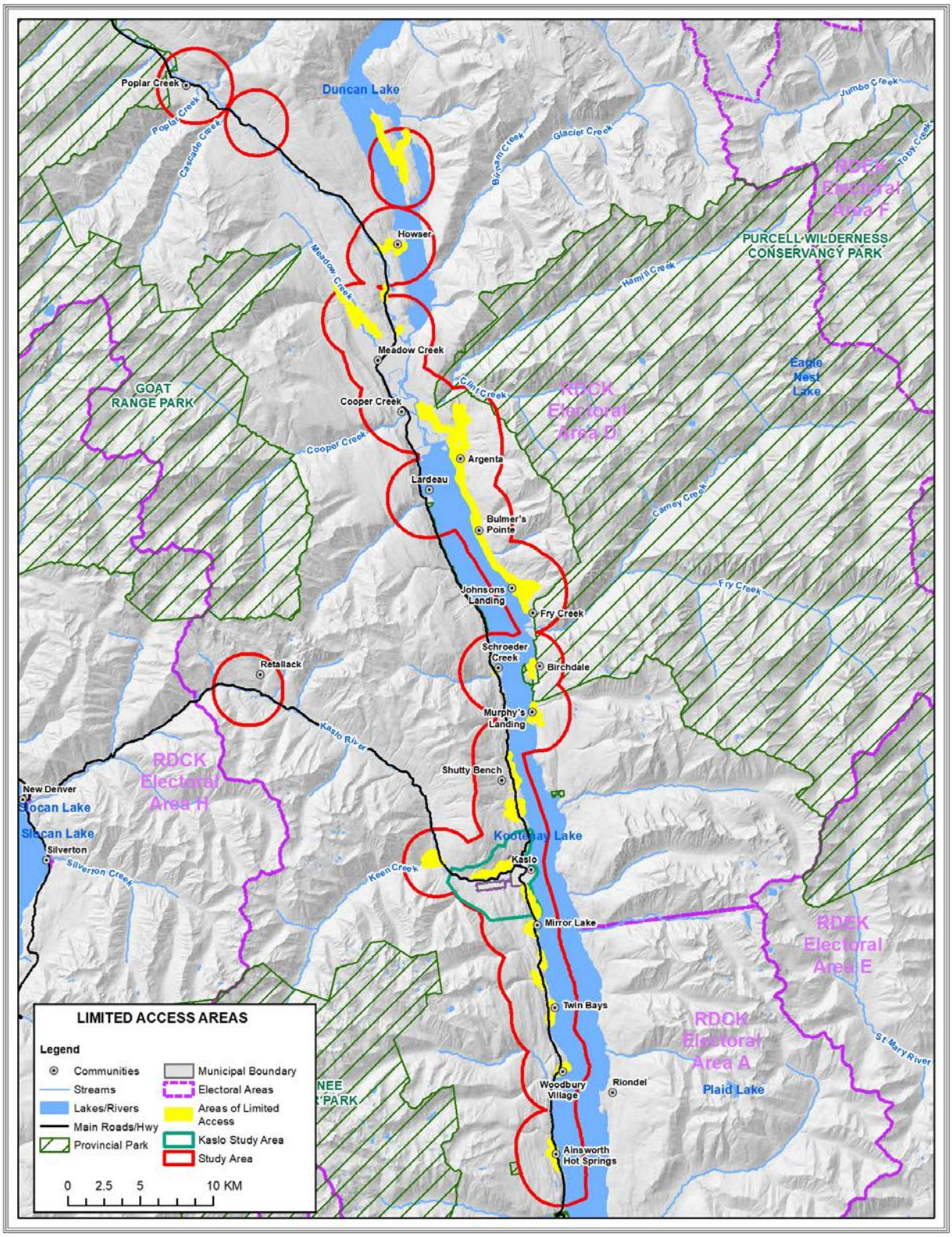
Emergency Response and Planning			
Item	**Priority**	**Recommendation**	**Estimated Cost ($)**
Objective: To improve structural and wildfire equipment and training available to RDCK Fire and Rescue.			
22.	High	• Conduct annual mutual aid training with MFLNRORD and BCWS including completion of a mock wildfire simulation in coordination with BCWS and safety training specific to wildland fire and risks inherent with natural areas. As part of the training, conduct annual reviews to ensure PPE and wildland equipment resources are complete, in working order, and the crews are well versed in their set-up and use. Wildfire training should be in compliance with Office of the Fire Commissioner standards.	Within current operating costs
23.	High	• Ensure RDCK Wildfire Mitigation Coordinator act as liaison between the RDCK Collaborative Planning Group and the Emergency Preparedness Committee for Area D and Kaslo. Coordination and information sharing are crucial to the development of a community well prepared for wildfire.	Within current operating budget.
24.	Moderate	• Review and clarify SPU request procedures with RDCK fire Chiefs and ensure robust SPP115 training for fire fighters.	Within current operating budget.
25.	Moderate	• Develop Regional Service to fund additional SPUs and maintain existing SPUs.	$50,000 (Annually)
26.	Moderate	• Explore opportunities to collaborate with BCWS and within RDCK fire service to coordinate discount volumes of hose for interface fires, reducing costs and logistics to local fire departments	Within current operating costs
27.	High	• Explore opportunities to ensure a duty officer is in place in each Fire Protection Area to provide coverage for periods of high or extreme hazard.	To be determined based on current rates.

Emergency Response and Planning			
Item	**Priority**	**Recommendation**	**Estimated Cost ($)**
28.	Moderate	• Conduct fire preplan assessment for key interface areas in Kaslo and Area D. Other jurisdictions have completed assessments that prioritize fire department-specific variables, such as distance to hydrants, response time from nearest fire station, etc. to produce local risk ratings.	$5,000

7.4.1 EVACUATION AND ACCESS

Road networks in a community serve several purposes including providing access for emergency vehicles, providing evacuation routes for residents, and creating fuel breaks. Access and evacuation during a wildfire emergency often must happen simultaneously and road networks should have the capacity to handle both. Access throughout Area D and Kaslo is variable and many areas have limited access for evacuation and capacity for emergency vehicles (Map 8).

There are communities within Area D and Kaslo that are accessed by cul-de-sac or dead-end roads; these neighbourhoods are of particular concern for fire suppression, emergency response, and evacuation and were identified in the 2008 CWPP. Identified areas of concern have been updated from the 2008 CWPP, and are displayed below in a map adapted from the 2008 CWPP map. These areas should be reviewed for secondary access options where possible.



Map 8. Areas that have limited access or egress in the event of emergency.

Emergency access and evacuation planning is of particular importance in the event of a wildfire event or other large-scale emergency. An evacuation plan should:

- Map and identify safe zones, marshaling points and aerial evacuation locations;
- Plan traffic control and accident management;
- Identify volunteers that can assist during and/or after evacuation;
- Create an education/communication strategy to deliver emergency evacuation procedures to residents.

Recreation trails built to support ATVs can provide access for ground crews and act as fuel breaks for ground fires, particularly in natural areas. Strategic recreational trail development to a standard that supports ATVs can be used by local fire departments to access interface area. Gates can minimize access by unauthorized users.

The creation of a map book or spatial file that displays the trail network available for the District to access during an emergency or for fire suppression planning must accompany any fire access trail building activities. In order to effectively use the trails as crew access or as fuel breaks during suppression efforts, The District should develop a Parks Access Plan, or Total Access Plan. This plan should be made available to Fire Halls in Area D and Kaslo, and the BCWS in the event that they are aiding suppression efforts on an interface fire in Area D and Kaslo. The plan should include maps and spatial data, identify the type of access available for each access route, identify those trails that are gated or have barriers, and provide information as to how to unlock / remove barriers. The plan should also identify those natural areas where access is insufficient. Access assessment should consider land ownership, proximity of values at risk, wildfire threat, opportunities for use as fuel break / control lines, and requirements for future maintenance activities such as operational access for fuel treatments and other hazard reduction activities.

In addition to providing the safest, quickest, and easiest access routes for emergency crews, a Total Access Plan would minimize the need for using machinery or motorized access in an otherwise undisturbed area. This would reduce the risk of soil disturbance and other environmental damage, as well as reduce rehabilitation costs.

Table 11. Summary of Recommendations for Emergency Evacuation and Access.

Emergency Response (Evacuation and Access)			
Item	**Priority**	**Recommendation**	**Estimated Cost ($)**
Objective: To improve access and egress to neighbourhoods at risk and natural areas within RDCK.			
29.	High	• Develop a Total Access Plan to create, map and inventory trail and road network in natural areas for suppression planning, identification of areas with insufficient access and to aid in strategic planning. Fire threat mapping from this CWPP should be included. The plan should be updated every five years, or more regularly, as needed to incorporate additions or changes.	$8,000 + updating
30.	High	• Require that all new interface developments have access for evacuation and sufficient capacity for emergency vehicles.	Within current operating costs

Emergency Response (Evacuation and Access)			
31.	Moderate	• Facilitate completion of emergency evacuation plans for interface neighbourhoods with limited access	Within current operating costs

7.5 FUEL MANAGEMENT

Fuel management, also referred to as vegetation management or fuel treatment, is a key element of a FireSmart approach. The RDCK has completed extensive fuel management activities within and adjacent to Area D and Kaslo (see Map 9). To complement the work completed to-date and to further reduce the wildfire risk in Area D and Kaslo, the objectives for fuel management are to:

- Reduce wildfire threat on Provincial Crown and Municipal public lands through shovel-ready fuel management projects;
- Establish landscape-level fuel breaks to enhance community protection; and,
- Establish a long-term monitoring program and maintenance schedule for those areas that have been treated.

These objectives will enhance protection to homes and critical infrastructure by proactively reducing fire behaviour.

Fuel treatments are designed to reduce the possibility of uncontrollable crown fire through the reduction of surface fuels and ladder fuels and the creation of crown separation. This varies by ecosystem type, forest fuel type, fire weather, slope and other variables. While fuel management can be an effective method of reducing fire behaviour it does not stop wildfire. The effectiveness of fuel modification must be supported by other key CWPP elements.

Fuel management can be undertaken with minimal negative or even a positive impact on the aesthetic, recreational and ecological quality of the surrounding forest and does not necessarily mean removing most or all of the trees. The focus for fuel modification in the interface is not to stop fire but to ensure that fire intensity is low enough that wildfire can be fought on the ground. For example, FireSmart activities around a home may prevent structure ignition due to direct flame contact. The ability of the home to survive the fire would come down to whether construction materials can withstand an ember shower.

One of the constraints with fuel management is lack of funding. Funds from UBCM are available only for fuel modification on Crown lands. The best approach to mitigate fuels on private lands is to promote FireSmart. A FireSmart approach to fuel management improves defensible space around structures and reduces the likelihood that a house fire could spread to adjacent forests.

When considering fuel management to reduce fire risk, the following steps should be followed:

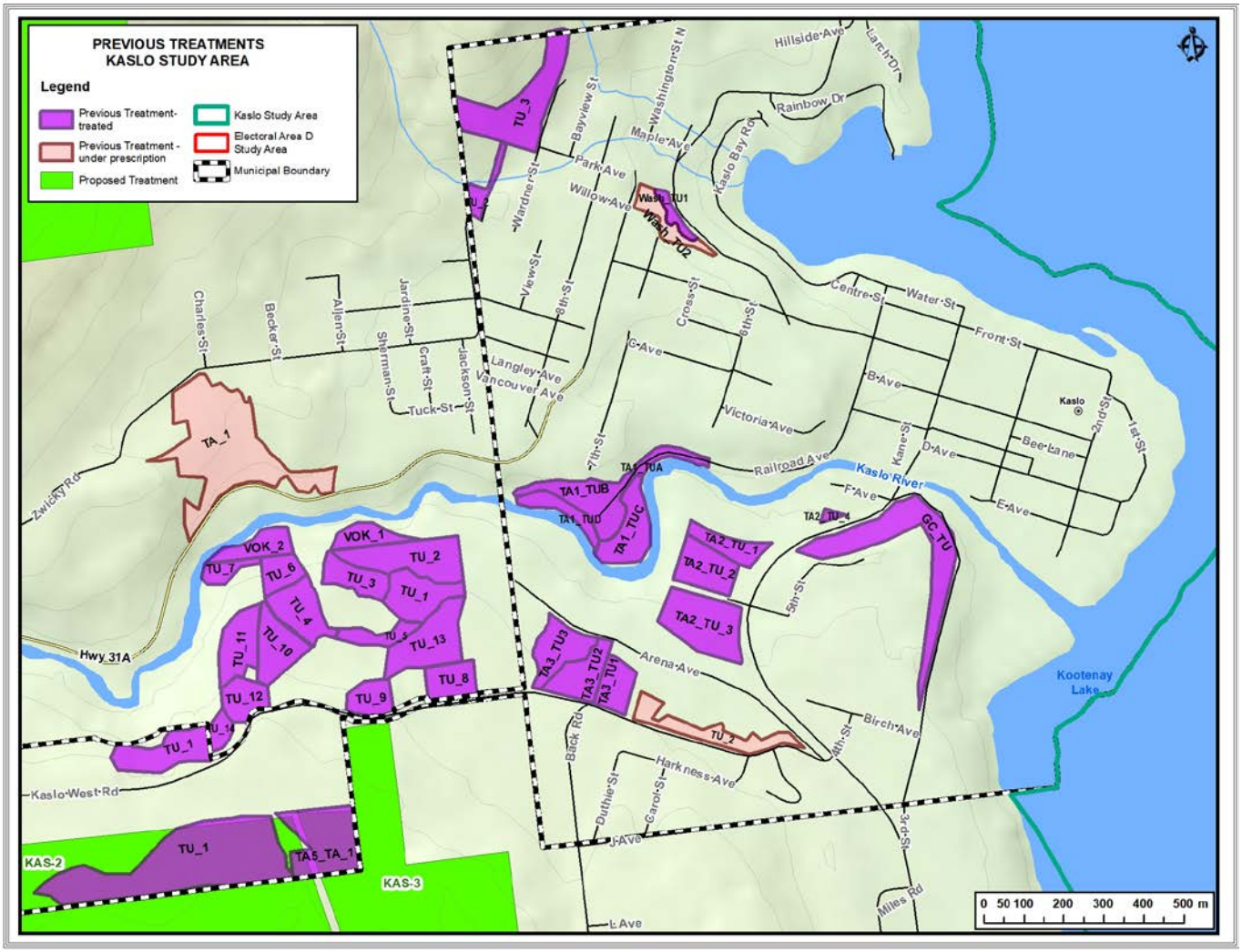
- A qualified professional forester must develop the prescriptions;

- Collaboration with licensees and MFLNRORD to ensure that all harvesting and road building within the WUI reduces wildfire risk;
- Public consultation should be conducted during the process to ensure community support;
- Treatment implementation must weigh the most financially and ecologically beneficial methods of fulfilling the prescriptions goals;
- Pre- and post-treatment plots should be established to monitor treatment effectiveness; and
- A long-term maintenance program should be in place or developed to ensure that the fuel treatment is maintained in a functional state.

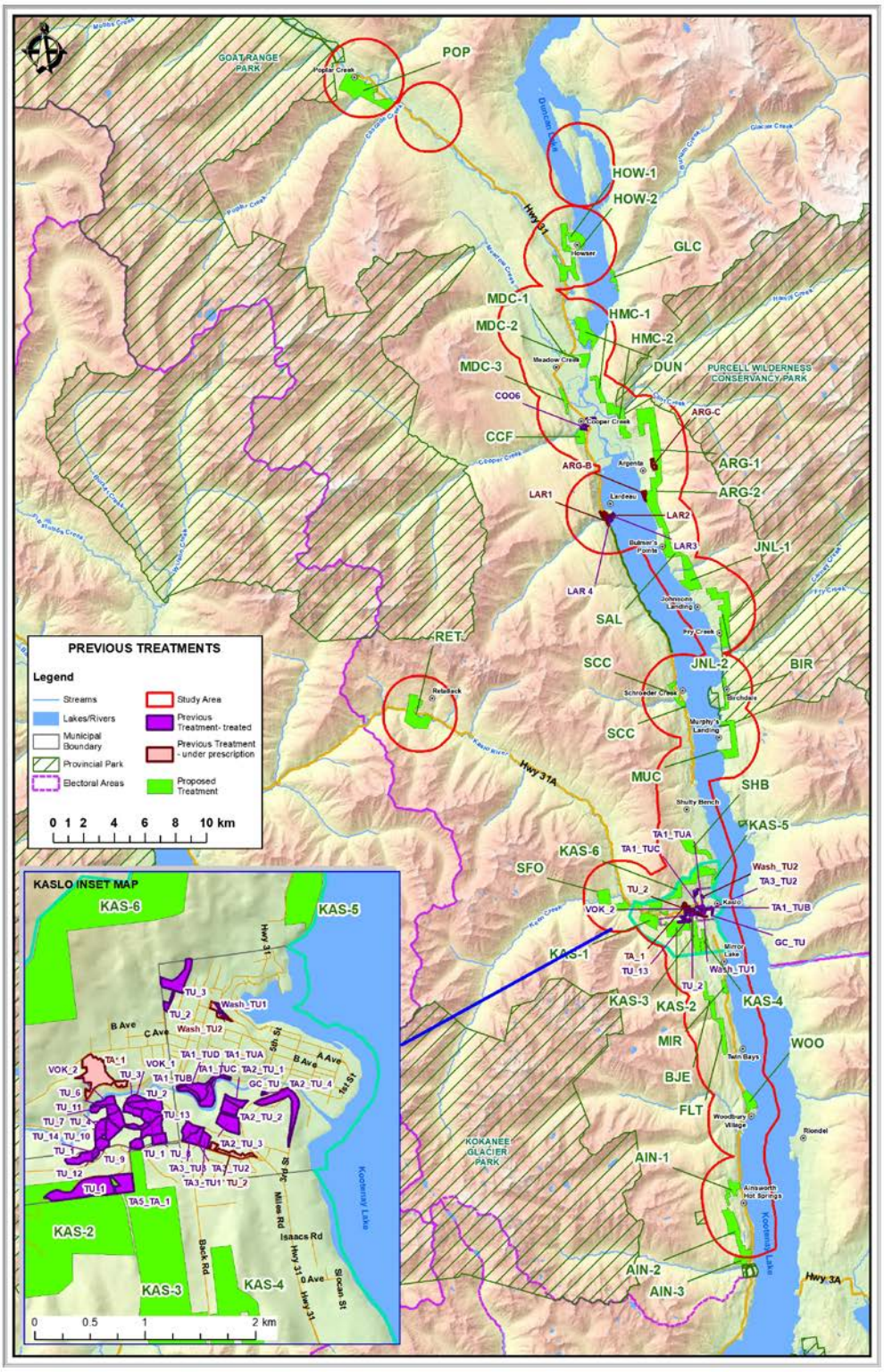
Based on recommendations from the 2008 CWPP, fuel treatments activities were completed on some of the high priority and moderate priority polygons within Area D and Kaslo. The total area treated within Area D and Kaslo since 2008 is approximately 128 hectares. Ongoing maintenance of these treated areas is required to ensure they continue to function as effective fuel treatments.

Proposed projects to reduce the wildfire hazard to Area D and Kaslo through fuel modification are summarized in Section 7.5.2. To assess risk, the *Provincial WUI Wildfire Threat Rating Worksheets* (worksheet) were used, as required by UBCM[16], in addition to professional judgment (WUI summaries are provided as a separate document). The worksheet provides point ratings for four components that contribute to wildfire risk. These components include fuels, weather, topography and structural values at risk.

[16] http://www.ubcm.ca/assets/Funding~Programs/LGPS/Current~LGPS~Programs/SWPI/Resources/swpi-WUI-WTA-Guide-(2012-Update).pdf



Map 9. Previous fuels treatment projects undertaken within the Kaslo Study Area.



Map 10. Previous fuels treatment projects undertaken within the RDCK Area D Study Area.

7.5.1 BURNING AND SMOKE MANAGEMENT

Prescribed fire, when used properly and in appropriate circumstances, is an extremely important, and effective, tool for mitigating hazard and reducing fuels. Air curtain burners, piling and burning, and prescribed broadcast burning are methods of fuel reduction/debris management that should be considered during fuel reduction activities and, when implemented properly, can be completed with low emissions and little impact on air quality: much less smoke and particulates than is released in a wildfire.

SMOKE MANAGEMENT

Smoke management is integral to the success of any burning operation. Site, or area specific, smoke management plans should be in place to ensure that emissions are minimized and are operations are compliant with all relevant legislation such as the Operational Burning and Smoke Control Regulation. Strategies to minimize impacts of smoke include:

- Burn under acceptable venting, wind and weather conditions only;
- Light a test pile before burning to ensure that local conditions match published venting conditions;
- Practice concurrent burning, also called hot-fed piles (piling and burning at the same time to achieve a moderate level of fuel compaction and a good mixture of small and large diameter wood);
- Utilize tools, such as leaf blowers, to maintain a hotter fire with more complete combustion;
- Stop burns immediately should venting, weather, or wind conditions become undesirable;
- Utilize trained and knowledgeable personnel;
- Time burns when the least amount of people will be impacted (e.g. during school holidays); and
- Notify the public and offer alternatives for those with serious health concerns.

Burning completed by knowledgeable and competent personnel, guided by a smoke management plan, and directed by an experienced professional can often be completed with minimal impacts to public health or air quality.

AIR CURTAIN BURNERS

Air curtain burners are wood incinerators. By providing high-velocity air to wood waste in either an earthen or metal fire box, wood waste is able to be burned with more complete combustion and less smoke emissions. Air curtain burners require a flat and wide location; forest fuels must be yarded to a road and/or transported to the burner location.

PILE BURNING

Pile burning is an effective use of fire in locations where access is limited, making chipping or fuel removal impossible or too costly. Smoke management and control during pile burning has improved in recent years and there are a number of strategies that can be employed to reduce smoke emissions to an acceptable level. They

include: checking local venting indices prior to burning; lighting a small test pile to check venting prior to starting larger operations; burning concurrently (lighting small piles and continually adding to the pile throughout the day, rather than accumulating large piles to burn); adding oxygen through the use of leaf blowers, or similar hand-held devices to encourage more complete combustion.

Prescribed burning is just one method of woody debris management and fuel reduction and can be used in combination with other methods, such as chipping, mulching, or scattering fuels, in the same treatment unit to further reduce emissions. The utilization of woody fuels commercially should be considered in all projects. For example, chips can be used as biofuel. Local market demand for these products will dictate the availability of commercial utilization for fuels treatment projects.

7.5.2 LIST OF PRIORITY TREATMENT AREAS

Wildfire threat must be reduced throughout the Wildland Urban Interface by ensuring that road building and harvesting does not increase the level of risk. Additionally, proactive fuel management treatments are recommended to mitigate wildfire threat in the WUI. To prioritize this threat reduction, 35 priority treatment areas are recommended for initial fuel management activities (31 high priority and 4 moderate priority) totaling 4,190 ha. These are detailed in **Error! Reference source not found.** below. These new treatment polygons represent areas of predominantly high, to extreme fire behaviour threat that are close to values at risk. These proposed treatment areas are priority areas of interest for focused mitigation activities; however, the implementation of fuel management activities is subject to detailed prior assessment.

Funding opportunities are currently limited to Crown Provincial, Regional District, or Municipal land. As such, priority treatment areas were limited to Crown land that is eligible for current funding opportunities. The Five-Mile Creek polygon is recommended for critical water infrastructure protection. Recommended treatment types are thinning such as conifer understory and overstory, surface fuel reduction, pruning, removal of dead trees, and removal of surface fuels. Some of the polygons identified for treatment are eligible for UBCM funding.

A number of these proposed treatment areas fall within an area of shared responsibility between RDCK Area D and Kaslo as indicated with an asterisk in 10 below and are included in both CWPP Updates. Two of the proposed treatment areas fall outside of the study area (Map 12), they have been included in Table 10 as they are considered important from field analysis and public consultation.

Site-specific operational challenges exist in almost all treatment areas. Debris disposal and management are constrained by access limitations that pose challenges to implementation and increase operational costs. Many polygons are located on steep slopes that may not easily be accessible by machinery and pose limits to manual labour. Private land often surrounds or isolates proposed treatment areas. Additionally, proximity to structures will impact the possibility of using pile burning as a cost-effective method of debris disposal; pile burning must comply with the Open Burning Smoke Control Regulations that sets out minimum distances from institutions and residences.

Table 10. List of Priority Treatment Areas.

Treatment Polygon	WUI Threat Plot (Wildfire Behaviour Threat Score)	Priority	Fuel Type	Area (ha)	Recommended Treatment Type
AIN-1 Ainsworth North	AW-2 (High)	HIGH	C-4	73.9	• Prune trees to 3 m • Remove CWD and partially downed trees. • Thin dense patches to 40% crown closure • Remove dense understory of shade tolerant trees • Unit surrounds Cemetery • Good road and trail access for crews throughout unit.
AIN-2 Ainsworth South	AW-3 (High)	HIGH	C-5	177.2	• Prune trees to 3 m • Remove CWD and partially downed trees. • Thin dense patches to 40% crown closure • Remove dense understory of shade tolerant trees • Develop mosaic of C-4, C-7 depending on aspect, and C-2 regenerating cutblocks. • Collaborate with Licensee
AIN-3 Ainsworth South-Outside AOI	Outside AOI	HIGH	C-5	41.9	• Prune trees to 3 m • Remove CWD and partially downed trees. • Thin dense patches to 40% crown closure • Remove dense understory of shade tolerant trees • Develop mosaic of C-4, C-7 depending on aspect, and C-2 regenerating cutblocks. • Collaborate with Licensee

ARG-1 Argenta North	ARG-7(High), ARG-8(High)	HIGH	C-4	232	• Thin dense patches to 40% crown closure • Prune trees to 3 m; • Reduce woody surface fuels; • Consult with local residents and woodlot to the east
ARG-2 Argenta South	SA-4 (High) ARG-1 (High) ARG-2 (High) ARG-3 (High) ARG-4 (High) ARG-5 (High) ARG-6 (High)	HIGH	C-4 with bands of C-7 to the East, C-3 along the road, with strips of C-5	324.8	• Thin dense patches to 40% crown closure • Prune trees to 3 m; • Reduce woody surface fuels • East (uphill) bench from road is C-7, remove CWD, downed pine and shade tolerant understory • Mid bench is C-5, Collaborate with licensee to develop prescriptions to remove merchantable timber • Lower Bench along road, is C-3, Collaborate with licensee to develop prescriptions to remove merchantable timber
BIR Birchdale	BD-2 (Extreme), BD-3 (High)	HIGH	C-4	48.2	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Consider working with BC parks to facilitate trail network from the north from Fry Creek. • Extremely high dead pine CWD treatment, partially elevated and down. • Understory of shade tolerant species to be removed
BJE Bjerkness – Fletcher Creek	BJE-1 (High)	HIGH		85.4	• Prune trees to 3 m • Remove CWD and partially downed trees. • Thin dense patches to 40% crown closure • Remove dense understory of shade tolerant trees • Consult Kaslo Community Forest. Treatment in within KDCFS Land Base

CCF Cooper Creek / Cooper Face	CF-1 (High)	HIGH	C-4 with C-2 plantation	55.0	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Contains 20 year old plantation in NE corner, collaborate with Licensee. • Remainder is a 40-50 year old plantation,
DUN Duncan Lake	DUNC-2 (High) DUNC-3 (High)	HIGH	C-4 with patches of C-5 at the south end	170.0	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Collaborate with licensee to develop prescriptions to remove merchantable timber • Collaborate with BC Hydro to increase treatment efficacy. • Remove suppressed understory predominantly of Cw and Hw.
FLT Fletcher Creek	WB-3 (High) WB-4 (High) WB-6 (Extreme)	HIGH	C-4	75.3	• Prune trees to 3 m • Remove CWD and partially downed trees. Densest in the South of the unit. • Thin dense patches to 40% crown closure • Remove dense understory of shade tolerant trees especially the north end of the unit
GLC Glacier Creek (REC site) – Outside AOI	Outside AOI	MODER-ATE	C-5 with patches of C-4	29.2	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Collaborate with licensee to develop prescriptions to remove merchantable timber • Collaborate with RDCK Parks to increase effectiveness of treatment
HMC-1 Hamill Creek North	ARG-7 (High)	MODER-ATE	C-5	64.6	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Consider collaboration with licensee to remove small diameter merchantable logs

HMC-2 Hamill Creek South	ARG-6 (High)	MODER-ATE	C-5 with C7 areas	142.0	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Consider collaboration with licensee to remove small diameter merchantable logs • Treatment area contains 5 helipad sites with foot trail access to these sites. Helipads were noted through consultation process with local citizens.
HOW-1 Howser North (REC Site)	HOW-1 (High)	HIGH	C-4	129.0	• Thin dense patches to 40% crown closure • Prune trees to 3 m; • Reduce woody surface fuels; • Collaborate with BC Parks to increase effectiveness of treatment / road location • Collaborate with licensee to develop prescriptions to remove merchantable timber • Remove suppressed understory predominantly of Cw and Hw.
HOW-2 Howser South	HOW-2 (High)	HIGH	C-4	147.4	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Collaborate with licensee to develop prescriptions to remove merchantable timber
JNL-1 Johnsons Landing north	JL-3 (High), JL-4 (High)	HIGH	C-7 with C-4 patches	122.4	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Collaborate with licensee to develop prescriptions to remove merchantable timber. Treatment are is entirely within Kaslo and District Community Forest chart area

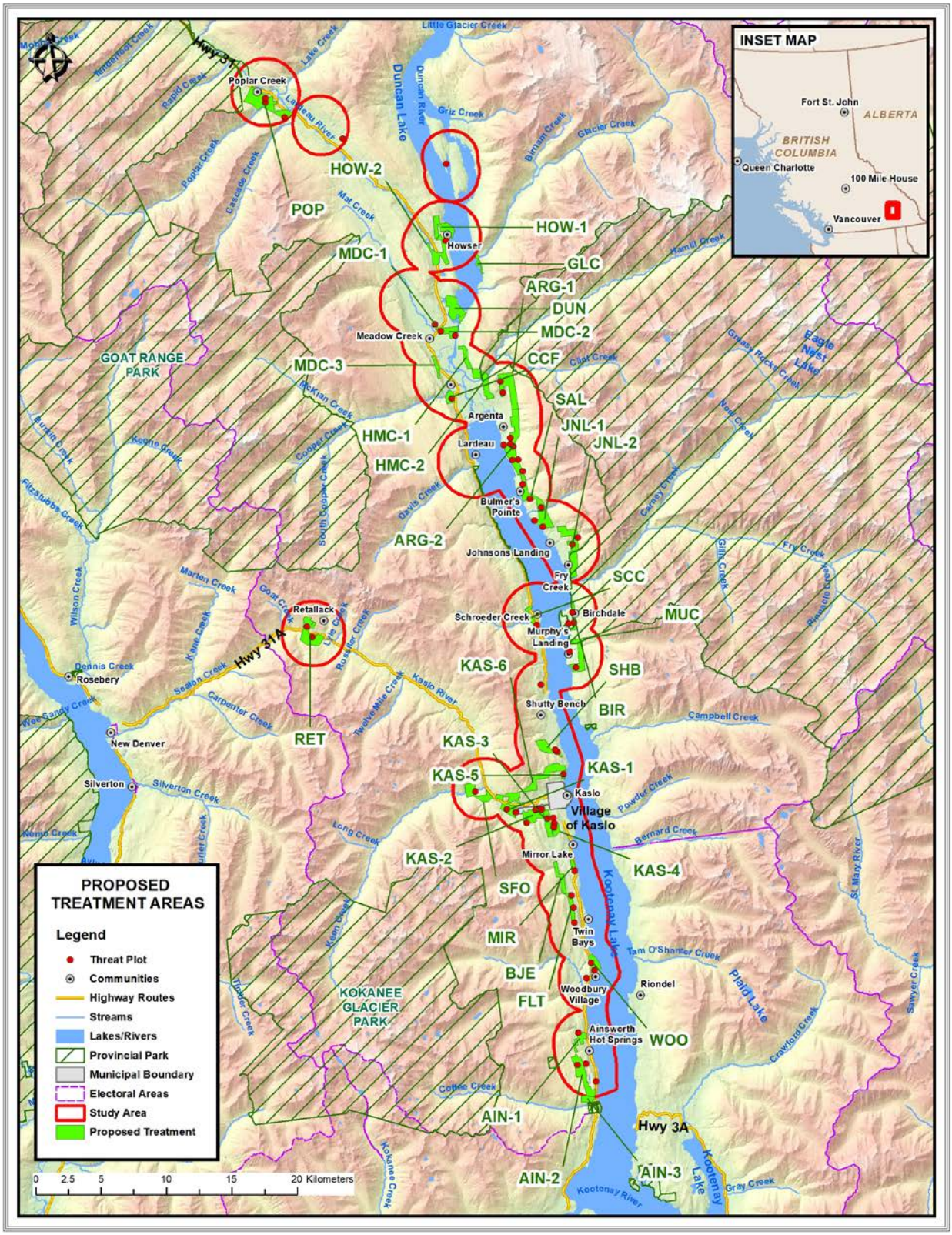
JNL-2 Johnsons Landing South	JL-1 (High), JL-2 (High)	HIGH	C-4 with C-7	255.2	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Collaborate with licensee to develop prescriptions to remove merchantable timber • Heavy CWD removal • Walk in access to south end or collaboration with local landowners for access.
*KAS-1 Kaslo – Kemp Creek	KAS-4 (High) KAS-10 (High)	HIGH	C-4	85.8	• Prune trees to 3 m • Thin dense patches to 40% crown closure • Consider collaboration with licensee to remove small diameter merchantable logs • Remove dense understory of shade tolerant trees • Collaborate with Village to maximize treatment surrounding water treatment plant • Lots of road access throughout unit • Patches of C-2 blocks that need thinning
*KAS-2 Kaslo Airport	KAS-5 (High) KAS-8 (High) KAS-12 (High) KAS-9 (High)	HIGH	C-3 with large patches of C-4	132.1	• Prune trees to 3 m • Thin dense patches to 40% crown closure • Consider collaboration with licensee to remove small diameter merchantable logs • Remove dense understory of shade tolerant trees, Areas up to 5000 stems per ha in places.
*KAS-3 Kaslo – Backroad West	KAS-11 (High)	HIGH	C-4 with patches of C-5	97.7	• Prune trees to 3 m • Thin dense patches to 40% crown closure • Consider collaboration with licensee to remove small diameter merchantable logs • Remove dense understory of shade tolerant trees • C-5 in drier areas, focus on CWD removal

*KAS-4 Kaslo - Backroad East	KAS-1 (High) KAS-2 (High) KAS-3 (High)	HIGH	C-4	48.5	• Prune trees to 3 m • Thin dense patches to 40% crown closure • Consider collaboration with Woodlot licensee to remove small diameter merchantable logs • Remove dense understory of shade tolerant trees
*KAS-5 North of Marina	KAS-6 (High)	HIGH	C-4	17.3	• Consult local bike and trail clubs for effects on bike trail. • Prune trees to 3 m • Thin dense patches to 40% crown closure • Remove dense understory of shade tolerant trees • Remove CWD and partially elevated dead pine
*KAS-6 Mount Buchanan	KAS-12 (High)	HIGH	C-5 with C-4, C-3 and M-2	270.5	• Confirm location and install multiple helipad locations and water sources for quick access by fire crews. • Some part so the Buchanan access trail can be graded for ATV access from the west and south. • Prune trees to 3 m • Remove CWD and partially downed trees. • Thin dense patches to 40% crown closure • Remove dense understory of shade tolerant trees
MDC-1 Meadow Creek North Jewitt Elementary	MC-1 (High)	HIGH	C-4	11.1	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Collaborate with licensee to develop prescriptions to remove merchantable timber

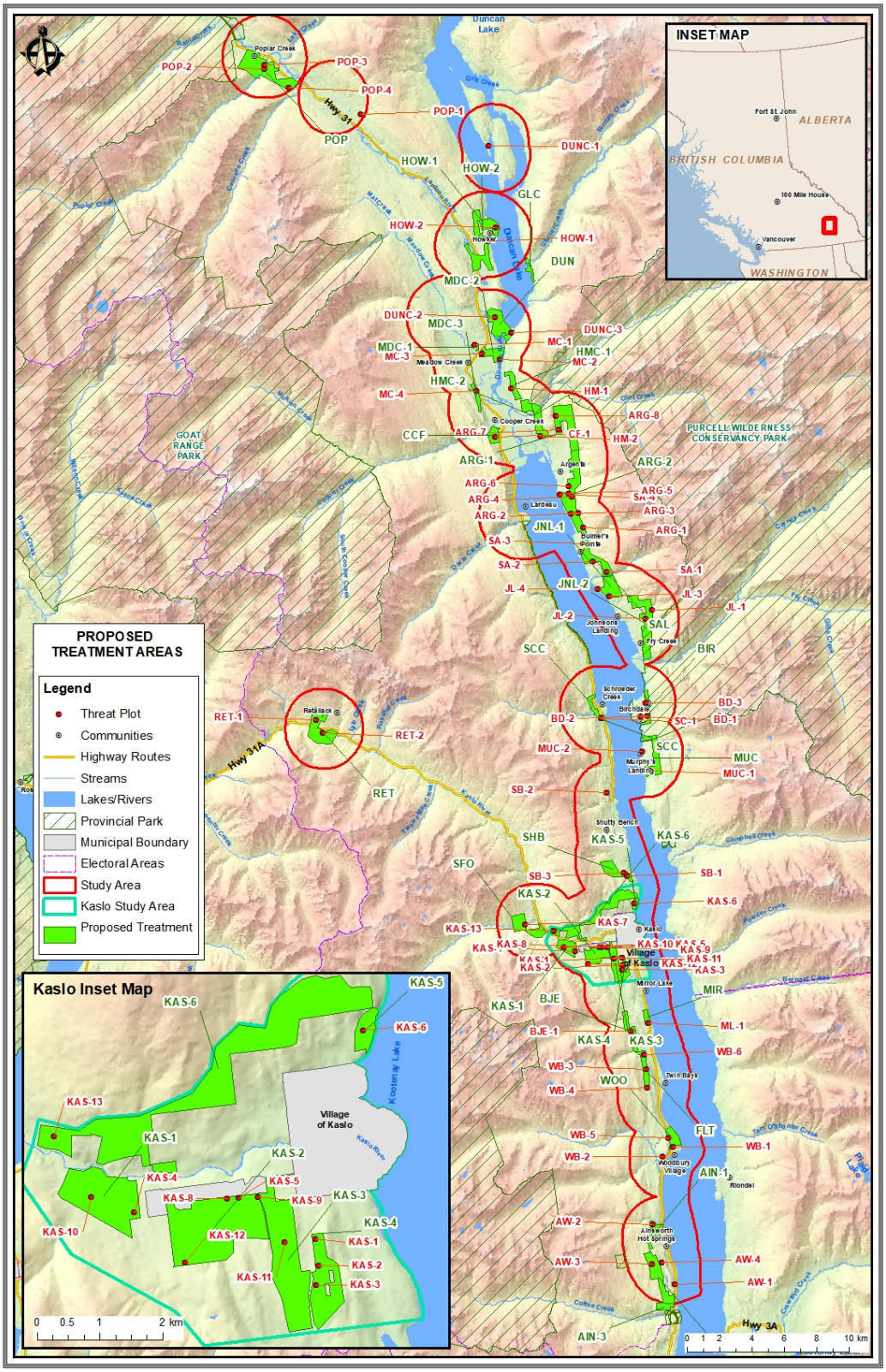
MDC-2 Meadow Creek North	MC-2 (Moderate MC-3 (High)	HIGH	C-3	90.9	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Collaborate with licensee to develop prescriptions to remove merchantable timber • Remove suppressed understory predominantly of Cw and Hw.
MDC-3 Meadow Creek South	MC-4 (High)	HIGH	C-4	38.4	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Collaborate with licensee to develop prescriptions to remove merchantable timber
MIR Mirror Lake	ML-1 (High)	HIGH	C-4	27.0	• Prune trees to 3 m • Remove CWD and partially downed trees. • Thin dense patches to 40% crown closure • Remove dense understory of shade tolerant trees • Consult BC Hydro as access to this treatment would be best from transmission line
MUC Murphy Creek	MUC-1 (High)	HIGH	C-2 with C-5 and C-7	144.8	• Prune trees to 3 m; in C-5 • Reduce woody surface fuels; • Thin dense patches to 40% crown closure in C-7 areas • Understory of shade tolerant species to be removed in C-7 and C-5 areas • C-2 stand must be thinned
POP Poplar Creek	POP-2 (High) POP-3 (High) POP-4 (Extreme)	High	C-4 with areas of C-5	328.3	• Thin dense patches to 40% crown closure • Prune trees to 3 m; • Reduce woody surface fuels; • Remove 2,000 stems/ha of understory in C-4 areas • Pruning and CWD treatment in C-5 areas • Collaborate with licensee to develop prescriptions to remove merchantable timber

RET Retallack	RET-1 (High) RET-2(High)	HIGH	C-5 with C-4	211.5	• Prune trees to 3 m; in C-5 • Reduce woody surface fuels; • Thin dense patches to 40% crown closure in C-5 areas • Understory of shade tolerant species to be removed in C-4 and C-5 areas
SAL Salisbury Creek	SA-1 (High) SA-2 (High) SA-3 (High)	HIGH	C-7 with C-4	137.6	• Thin dense patches to 40% crown closure; • Prune trees to 3 m; • Reduce woody surface fuels, heavy to the South • Collaborate with licensee to develop prescriptions to remove merchantable timber • Remove understory: <500st/ha in C-7 areas, 1,000-1,500 in C4 areas • Small C-2 openings need thinning
SCC Schroeder Creek	SC-1 (High)	HIGH	C-4	49.4	• Prune trees to 3 m; • Reduce woody surface fuels; • Thin dense patches to 40% crown closure • Consider collaboration with licensee to remove small diameter merchantable logs
SHB Shutty Bench	SB-1 (High) SB-3 (High)	HIGH	C-4	102.3	• Prune trees to 3 m; • Reduce woody surface fuels; lots of partial elevated CWD • Thin dense patches to 40% crown closure • Consider collaboration with licensee to remove small diameter merchantable logs • Protect the quad trail access throughout unit especially at south • Patches of C-2 need thinning • Remove dense understory of shade tolerant trees

WOO Woodbury	WB-1 (High) WB-5 (High)	HIGH	C-4	73.9	• Prune trees to 3 m • Remove CWD and partially downed trees. • Thin dense patches to 40% crown closure • Remove dense understory of shade tolerant trees • Road and trail access throughout unit • Consult RDCK regarding access in and around water reservoir
TOTAL AREA				**4,189.5**	



Map 11. Location of proposed treatment areas in the Study Area.



Map 11: Location of proposed treatment areas and the associated WUI Threat Plots within the Study Area.

7.5.3 MAINTENANCE OF EXISTING TREATMENT AREAS

The RDCK has shown leadership in completing fuel management projects within Area D and Kaslo to reduce the associated hazard. These activities started with the completion of the Village of Kaslo CWPP in 2008 and with fuel treatments starting in 2009. Since then, fuel treatments have been completed on approximately 128ha of land. These polygons are in various states of hazard and some of them will require additional fuel management activities in order to maintain or to achieve moderate threat ratings. Furthermore, maintenance is recommended for all future treatments based on polygon ecosystem and productivity.

Based on 2016 and 2017 field visits of representative existing treatments, no maintenance is required until approximately 15-20 years from date of treatment, with the exception of a localized blowdown area as indicated in Table 11 below. This generalized schedule (for previously treated areas and future treatment areas) should be confirmed by reviewing the maintenance schedule in the original treatments prescriptions. Additionally, the maintenance schedule is subject to inspection of all existing treatment units within 10 years of treatment. Areas that have experienced significant blowdown should be maintained as soon as possible provided funding is available. Currently, only minor blowdown has been observed in three treatment units, while recent windstorm blowdown in Balfour is recommended for treatment within 4 years (by 2020) as funding allows. The treatment field verified areas are indicated in Table 11 below. Where the site was not field verified, recommendations are extrapolated from existing field verifications and informed by year of treatment and site productivity.

Maintenance activities may include such tasks as removing blowdown debris and brushing to remove regenerating conifers and woody shrub species.

Table 11. Estimated maintenance schedule for previously treated polygons within the Study Area.

Treatment Unit Name	Community	Year	Area (ha)	Field Verified (Y/N)	Priority for Main-tenance	Target Timeline	Comment
Cooper Creek 005	TREATED	11.1	2011	Y	Low	2021 (Inspection)	Prescription fully implemented. Minor blowdown observed
Cooper Creek 006	TREATED	9.8	2011	Y	Low	2021 (Inspection)	Prescription fully implemented. Minor blowdown observed
Cooper Creek 007	TREATED	2.4	2011	Y	Low	2021 (Inspection)	Prescription fully implemented. Minor blowdown observed
Lardeau 1	TREATED	2017	4.1	Y	Low	2027 (Inspection)	Prescription fully implemented. Minor blowdown observed

Treatment Unit Name	Community	Year	Area (ha)	Field Verified (Y/N)	Priority for Main-tenance	Target Timeline	Comment
Lardeau 2	TREATED	2017	8.3	Y	Low	2027 (Inspection)	Prescription fully implemented. Minor blowdown observed
Lardeau 3	TREATED	2011	6.2	Y	Low	2021 (Inspection)	Prescription fully implemented. Minor blowdown observed
Lardeau 4	TREATED	2011	6.4	Y	Low	2021 (Inspection)	Prescription fully implemented. Minor blowdown observed
Argenta A	Argenta	2017	3.5	Y	Low	2027 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2014	9.8	Y	Low	2021 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2014	6.2	Y	Low	2021 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2014	6.4	Y	Low	2021 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2014	3.1	Y	Low	2021 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2009	0.5	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	3.7	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	0.3	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2009	1.6	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	0.5	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	1.9	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2009	0.8	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed

Treatment Unit Name	Community	Year	Area (ha)	Field Verified (Y/N)	Priority for Main-tenance	Target Timeline	Comment
Kaslo	TREATED	2009	2.5	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	1.5	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2009	0.9	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2011	1.0	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2011	1.3	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2009	1.5	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	1.7	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	7.1	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	1.6	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2009	1.1	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	1.5	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	0.7	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2009	1.0	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	0.9	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	1.5	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2009	1.5	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed

Treatment Unit Name	Community	Year	Area (ha)	Field Verified (Y/N)	Priority for Main-tenance	Target Timeline	Comment
Kaslo	TREATED	2011	1.0	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2011	2.2	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2009	2.3	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	0.8	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	1.0	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown
Kaslo	TREATED	2009	0.8	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Kaslo	TREATED	2009	0.5	Y	Low	2019 (Inspection)	Prescription fully implemented. Minor blowdown observed
Total Area			**87.7**				

Table 12. Summary of Fuel Management Recommendations.

Fuel Management			
Item	**Priority**	**Recommendation**	**Estimated Cost ($)**
Objective: Reduce wildfire threat on private and public lands through fuel management.			
32.	High	• Proceed with detailed assessment, prescription development and treatment of hazardous fuel units identified in this CWPP. Collaboration with BCTS, and other licensees and BC Parks may facilitate larger projects.	UBCM SWPI Funding/Municipal Funding as available
33.	High	• Prioritize Areas of Interest across Electoral Areas with updated CWPPs to ensure effective and objective treatment	Within current operating costs
Objective: Maintain treated areas under an acceptable level of wildfire fire threat (moderate).			

Fuel Management			
Item	**Priority**	**Recommendation**	**Estimated Cost ($)**
34.	Moderate	• As treatments are implemented, complete monitoring within 10 years of treatment (subject to site conditions) and maintenance every 15-20 years (subject to prescription and site conditions) on previously treated areas. Treated areas should be assessed by a Registered Professional Forester, specific to actions required in order to maintain treated areas in a moderate or lower hazard.	UBCM SWPI Funding/ Municipal Funding

8.0 CONCLUSIONS

This 2016 update to the 2008 CWPP reflects existing RDCK priorities and the current provincial standard methodology and baseline data for hazard and threat analysis. This CWPP Update takes into account the considerable new development that has occurred in the WUI and provides an assessment or reassessment of the hazard associated with these development changes, as well as other changes in the community. Specifically, it accounts for changes to forest fuel types due to forest growth, forest health (i.e., mountain pine beetle impacts), windthrow, forest harvesting, and forest fires, in addition to new developments.

Another significant change since 2008 is the formation of the Interface Working Group with the RDCK, the City of Nelson and BC Parks to collaboratively plan and implement fire hazard mitigation works. RDCK Electoral Area D and Kaslo should work to join this Collaborative Group.

The 2008 CWPP Study Area was defined by a 2 km buffer around Fire Protection Areas within the RDCK whereas this 2016 CWPP Update is focused on the PSTA WUI and associated density criteria and municipal and critical infrastructure. As a result, the area under study is reduced and more focused in this Update.

In addition, methods for assessing wildfire threat have evolved since 2008. This update uses the provincially accepted standard methodology and new BC Provincial Strategic Threat Analysis baseline data for hazard and threat analysis. Due to the PSTA updates, altered Study Area and changes in the RDCK, 18200 ha have now been identified as hazardous fuels. Categroy C-5 fuel type was included in this analysis as our Threat Class for the vast majority of C-5 fuel types stands was “High” based on WUI threat plot analysis (See Table 5 and Table 10).

The RDCK and the Village of Kaslo have made significant progress at implementing recommendations from the 2008 CWPP and has shown provincial leadership in many aspects of wildfire mitigation activities.

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APPENDIX 1 – FIRESMART

One of the most important areas with respect to forest fire ignition and the damages associated with a wildfire is the zone adjacent to buildings and homes. *FireSmart, Protecting Your Community from Wildfire*[17] is a guide developed by Partners in Protection that provides practical tools and information on how to reduce the risk of loss from interface fires. The FireSmart website can be visited at: https://www.firesmartcanada.ca/resources-library/protecting-your-community-from-wildfire

Wildfire is often considered an external threat to residences; however, in many cases fire can originate as a house fire and spread into the interface. In both cases, fire coming from the forest to a building or spreading from a building to the forest, home owners and businesses can take steps to reduce the probability of this occurring. There are two main avenues to FireSmart a home: 1) change the vegetation type, density, and setback from the building (fuel treatments and landscaping) and 2) change the structure to reduce vulnerability to fire and the potential for fire to spread to or from a building.

FIRESMART BUILDING MATERIALS AND DESIGN

An important consideration in protecting the WUI zone from fire is ensuring that homes can withstand an interface fire event. Often, it is a burning ember traveling some distance and landing on vulnerable housing materials (spotting), rather than direct flame contact (vegetation to house) or radiative heat that ignites a structure. Alternatively, the convective or radiant heating produced by one structure may ignite an adjacent structure if it is in close proximity. Structure protection is focused on ensuring that building materials and construction standards are appropriate to protect individual homes from interface fire. Materials and construction standards used in roofing, exterior siding, window and door glazing, eaves, vents, openings, balconies, decks, and porches are primary considerations in developing FireSmart neighbourhoods. Housing built using appropriate construction techniques and materials are less likely to be impacted by interface fires.

While many BC communities established to date were built without significant consideration with regard to interface fire, there are still ways to reduce home vulnerability. Changes to roofing materials, siding, and decking can be achieved over the long-term through changes in bylaws and building codes.

The FireSmart approach has been adopted by a wide range of governments and is a recognized template for reducing and managing fire risk in the wildland urban interface. The most important components of the FireSmart approach are the adoption of the hazard assessment systems for wildfire, site and structure hazard assessment, and the proposed solutions outlined for vegetation management, structure protection, and infrastructure. Where fire risk is moderate or greater, at a minimum, the FireSmart principles should be applied to new subdivision and structure developments and, wherever possible, the principles should be integrated into existing subdivisions and built up areas when renovations occur or landscaping is changed.

[17] For further information regarding the FireSmart program see *www.pep.bc.ca/hazard_preparedness/FireSmart-BC4.pdf*

The following link accesses an excellent four-minute video demonstrating the importance of FireSmart building practices during a simulated ember shower: http://www.youtube.com/watch?v=_Vh4cQdH26g.

Roofing Material:

Roofing material is one of the most important characteristics influencing a home's vulnerability to fire. Roofing materials that can be ignited by burning embers increases the probability of fire related damage to a home during an interface fire event.

In many communities, there is no fire vulnerability standard for roofing material. Homes are often constructed with unrated materials that are considered a major hazard during a large fire event. In addition to the vulnerability of roofing materials, adjacent vegetation may be in contact with roofs, or roof surfaces may be covered with litter fall from adjacent trees. This increases the hazard by increasing the ignitable surfaces and potentially enabling direct flame contact between vegetation and structures.

Building Exterior - Siding Material:

Building exteriors constructed of vinyl or wood are considered the second highest contributor to structural hazard after roofing material. These materials are vulnerable to direct flame or may ignite when sufficiently heated by nearby burning fuels. Winds caused by convection will transport burning embers, which may lodge against siding materials. Brick, stucco, or heavy timber materials offer much better resistance to fire. While wood may not be the best choice for use in the WUI, other values from economic and environmental perspectives must also be considered. It is significantly cheaper than many other materials, supplies a great deal of employment in BC, and is a renewable resource. New treatments and paints are now available for wood, which increase its resistance to fire and they should be considered for use.

Balconies and Decking:

Open balconies and decks increase fire vulnerability through their ability to trap rising heat, by permitting the entry of sparks and embers, and by enabling fire access to these areas. Closing these structures off limits ember access to these areas and reduces fire vulnerability.

Combustible Materials:

Combustible materials stored within 10 m of residences are also considered a significant issue. Woodpiles, propane tanks and other flammable materials adjacent to the home provide fuel and ignitable surfaces for embers. Locating these fuels away from structures helps to reduce structural fire hazards and makes it easier and safer for suppression crews to protect a house.

FIRESMART TREATMENTS

One effective method of reducing how easily fire can move to and from a home is by altering the vegetation around the home. The following information regarding fuel treatments is based on the FireSmart Manual (Partners in Protection 2002).

Priority Zone 1 is a 10 m fuel free zone around structures. This ensures that direct flame contact with the building cannot occur and reduces the potential for radiative heat to ignite the building. While creating this zone is not always possible, landscaping choices should reflect the use of less flammable vegetation such as deciduous

bushes, herbs and other species with low flammability. Coniferous vegetation such as juniper or cedar bushes and hedges should be avoided, as these are highly flammable. Any vegetation in this zone should be widely spaced and well setback from the house.

Priority Zone 2 extends from 10 to 30 m from the structure. In this zone, trees should be widely spaced 5 to 10 m apart, depending on size and species. Tree crowns should not touch or overlap. Deciduous trees have much lower volatility than coniferous trees, so where possible deciduous trees should be preferred for retention or planting. Trees in this area should be pruned as high as possible (without compromising tree health), especially where long limbs extend towards buildings. This helps to prevent a fire on the ground from moving up into the crown of the tree or spreading to a structure. Any downed wood or other flammable material should also be cleaned up in this zone to reduce the ability of fire to move along the ground.

Priority Zone 3 extends from 30 to 100 m from the home. The main threat posed by trees in this zone is spotting, the transmission of fire through embers carried aloft and deposited on the building or adjacent flammable vegetation. To reduce this threat, cleanup of surface fuels as well as pruning and spacing of trees should be completed in this zone (Partners in Protection).

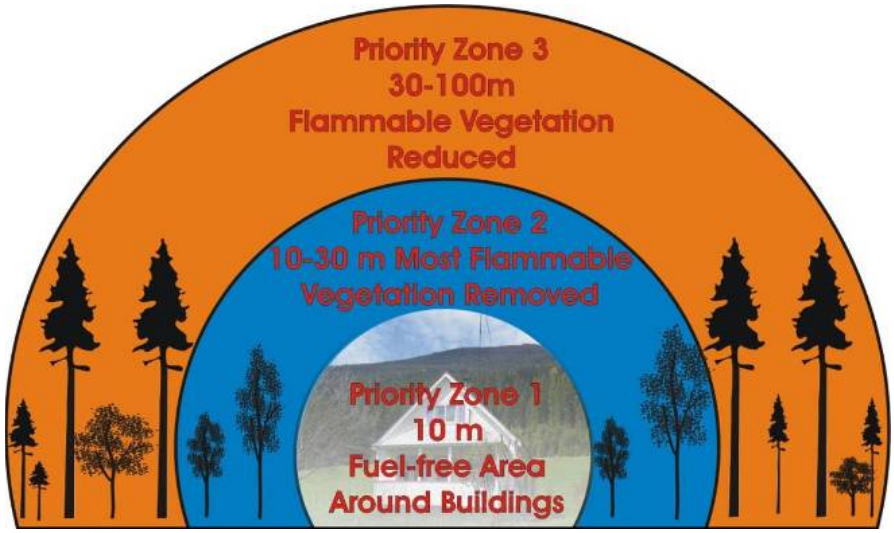

Figure 7. Illustration of FireSmart zones.

APPENDIX 2 – FIRE THREAT METHODOLOGY

As part of the CWPP process, spatial data submissions are required to meet the defined standards in the Program and Application Guide. As part of the program, proponents completing a CWPP or CWPP update are provided with the Provincial Strategic Threat Analysis (PSTA) dataset. This dataset includes:

- Current Fire Points
- Current Fire Polygons
- Fuel Type
- Historical Fire Points
- Historical Fire Polygons
- Mountain pine beetle polygons
- PSTA Head Fire Intensity
- PSTA Historical Fire Density
- PSTA Spotting Impact
- PSTA Threat Rating
- Structure Density
- Structures (sometimes not included)
- Wildland Urban Interface Buffer Area

The required components for the spatial data submission are detailed in the Program and Application Guide Spatial Appendix – these include:

- AOI
- Fire Threat
- Fuel Type
- Photo Location
- Proposed Treatment
- Structures
- Threat Plot
- Wildland Urban Interface

The provided PSTA data does not necessarily transfer directly into the geodatabase for submission, and several PSTA feature classes require extensive updating or correction. In addition, the Fire Threat determined in the PSTA is fundamentally different than the Fire Threat feature class that must be submitted in the spatial data package. The Fire Threat in the PSTA is based on provincial scale inputs - fire density; spotting impact; and head fire intensity, while the spatial submission Fire Threat is based on the components of the Wildland Urban Interface Threat Assessment Worksheet. For the scope of this project, completion of WUI Threat Assessment plots on the entire AOI (Study Area) is not possible, and therefore an analytical model has been built to assume Fire Threat based on spatially explicit variables that correspond to the WUI Threat Assessment worksheet.

FIELD DATA COLLECTION

The primary goals of field data collection are to confirm or correct the provincial fuel type, complete WUI Threat Assessment Plots, and assess other features of interest to the development of the CWPP. This was accomplished by traversing as much of Area D and Kaslo as possible (within time, budget and access constraints). Threat Assessment plots were completed on the latest version (2013) form, and as per the Wildland Urban Interface Threat Assessment Guide.

For clarity, the final threat ratings for Area D and Kaslo were determined through the completion of the following methodological steps:

1. Updated fuel-typing using orthophotography and field verification.
2. Updated structural data using critical infrastructure data provided by the client and orthophotography.
3. Completed fieldwork to ground-truth fuel typing and threat ratings (completed 68 WUI threat plots and, and hundreds of field stops within the Area D and Kaslo Study Area).
4. Threat assessment analysis using field data collected and rating results of WUI threat plots – see next section.

SPATIAL ANALYSIS

Not all attributes on the WUI Threat Assessment form can be determined using a GIS analysis on a landscape/polygon level. To emulate as closely as possible the threat categorization that would be determined using the Threat Assessment form, the variables in Table 13 were used as the basis for building the analytical model. The features chosen are those that are spatially explicit, available from existing and reliable spatial data or field data, and able to be confidently extrapolated to large polygons.

Table 13. WUI Threat Sheet attributes used in the spatial analysis.

WUI Threat Sheet Attribute	Used in analysis?	Explanation
Fuel		
1. Duff depth and Moisture Regime	No	Many of these attributes assumed by using 'fuel type' as a component of the Fire Threat analysis. Most of these components are not easily extrapolated to a landscape or polygon scale, or the data available to estimate over large areas (VRI) is unreliable.
2. Surface Fuel continuity	No	
3. Vegetation Fuel Composition	No	
4. Fine Woody Debris Continuity	No	
5. Large Woody Debris Continuity	No	
6. Live and Dead Coniferous Crown Closure	No	
7. Live Deciduous Crown Closure	No	
8. Live and Dead Conifer Crown Base height	No	

WUI Threat Sheet Attribute	Used in analysis?	Explanation
9. Live and Dead suppressed and Understory Conifers	No	
10. Forest health	No	
11. Continuous forest/slash cover within 2km	No	
Weather		
12. BEC Zone	Yes	Although included, these are broad classifications, meaning most polygons in Area D and Kaslo will have the same value
13. Historical Fire Weather Occurrence	Yes	
Topography		
14. Aspect	Yes	
15. Slope	Yes	Elevation model was used to determine slope.
16. Terrain	No	
17. Landscape/topographic Limitations to Wildfire Spread	No	
Structural		
18. Position of Structure/Community on slope	No	Too difficult to quantify – this is a relative value.
19. Type of development	No	Too difficult to analyze spatially.
20. Position of assessment area relative to values	Yes	Only distance to structures is used in this analysis. Being above, below or sidehill is too difficult to analyze spatially.

The field data was used to correct the fuel type polygon attributes provided in the PSTA. This corrected fuel type layer was then used as part of the spatial analysis process. The other components were developed using spatial data (BEC zone, fire history zone) or spatial analysis (aspect, slope). A scoring system was developed to categorize resultant polygons as having relatively low, moderate, high or extreme Fire Threat, or Low, Moderate, High or

Extreme WUI Threat. Table 14 below summarizes the components and scores to determine the Fire Behaviour Threat.

Table 14. Components of Fire Threat Analysis

Attribute	Indicator	Score
Fuel Type	C-1	35
	C-2	
	C-3	
	C-4	
	M-3/4,>50% dead fir	
	C-7	20
	M-1/2, >50% conifer	
	M-3/4, <50% dead fir	
	C-5	5
	C-6	
	M-1/2, <50% conifer	
	O-1a/b	10
	S-1	
	S-2	
	S-3	
	D-1/2	0
	W	0
	N	0
Weather - BEC Zone	AT, irrigated	1
	CWH, CDF, MH	3
	ICH, SBS, ESSF	7
	IDF, MS, SBPS, CWHsds1 & ds2, BWBS, SWB	10
	PP, BG	15
Historical Fire Occurrence Zone	G5, R1, R2, G6, V5, R9, V9, V3, R5, R8, V7	1
	G3, G8, R3, R4, V6, G1, G9, V8	5
	G7, C5, G4, C4, V1, C1, N6	8

Attribute	Indicator	Score
	K1, K5, K3, C2, C3, N5, K6, N4, K7, N2	10
	N7, K4	15
Slope	<16	1
	16-29 (max N slopes)	5
	30-44	10
	45-54	12
	>55	15
Aspect (>15% slope)	North	0
	East	5
	<16% slope, all aspect	10
	West	12
	South	15

These attributes were combined to produce polygons with a final Fire Behaviour Threat Score. To determine the Wildland Urban Interface Score, only the distance to structures was used. Buffer distances were established as per the WUI Threat Assessment worksheet (<200, 200-500 and >500) for polygons that have a 'high' or 'extreme' Fire Behaviour Threat score. Polygons with structures within 200m were rated as 'extreme', within 500m were rated as 'high', within 2km are 'moderate', and distances over that were rated 'low'.

There are obvious limitations in this method, most notably that not all components of the threat assessment worksheet are scalable to a GIS model, generalizing the Fire Behaviour Threat score. The WUI Threat Score is greatly simplified, as determining the position of structures on a slope, the type of development and the relative position are difficult in an automated GIS process. Structures are considered, but there is no consideration for structure type (also not included on threat assessment worksheet). This method uses the best available information to produce accurate and useable threat assessment across Area D and Kaslo in a format that is required by the UBCM SWPI program.

APPENDIX 3 – SPECIES AT RISK INFORMATION

Table 15. Publicly available occurrences of Blue, Red and Yellow listed species in Area D and Kaslo[18]

Common Name	Scientific Name	Category	BC List	Habitat
Blunt-sepaled Starwort	*Acipenser transmontanus pop. 1*	Vertebrate Animal	Red	RIVERINE: Big River; Moderate Gradient; Low Gradient;Medium River; Pool; LACUSTRINE: Deep Water
Heterocodon	*Anemone piperi*	Vascular Plant	Red	TERRESTRIAL
Monardella	*Chrysemys picta pop. 2*	Vertebrate Animal	Blue	LACUSTRINE: Shallow Water PALUSTRINE: Herbaceous Wetland
Painted Turtle - Intermountain - Rocky Mountain Population	*Eleocharis parvula*	Vascular Plant	Yellow	RIVERINE; FLOODPLAIN
Spurless Touch-me-not	*Glycyrrhiza lepidota*	Vascular Plant	Blue	LACUSTRINE: Riparian
Western Screech-owl, Macfarlanei Subspecies	*Plestiodon skiltonianus*	Vertebrate Animal	Blue	TERRESTRIAL: ROCK OUTCROP, COARSE TALUS/BOULDERS, GRASSLAND/HERBACEOUS, FOREST NEEDLELEAF
Western Skink	*Scrophularia lanceolata*	Vascular Plant	Blue	TERRESTRIAL: Roadside

[18] Data current as of September 28, 2017.

APPENDIX 4 – PREVIOUS CWPP RECOMMENDATIONS

This 2016 CWPP Update relates to the 2008 CWPP for the Village of Kaslo[19], with a 2008 Study Area of 2,978 ha that overlaps with this current CWPP Study Area. In 2008, CWPP's were also written for Lardeau, Cooper Creek, Ainsworth and Argenta. Relevant information from these documents is included.

Since 2008, the Village of Kaslo has implemented some of these CWPP recommendations. The previous recommendations and progress to date are summarized below. In some cases, the recommendations have been fully achieved. In other cases, these recommendations have been partially met, or met in a limited way. Some of the recommendations that are not fully achieved are cross-referenced to the recommendations and Action Plan in this CWPP update (see Section 7.0).

Some of the previous recommendations are paraphrased and agency names and stakeholders or partners originally referred to may have subsequently changed. These changes have been acknowledged in the reported progress as/if applicable.

For full recommendation text, see the 2008 Village of Kaslo Community Wildfire Protection Plan (Part 4 Action Plan).

[19] http://www.rdck.ca/assets/Services/Emergency~Management/Documents/RDCK_CWPP_Part2_Kaslo_Village.pdf

Recommendation		Progress
Communication and Education		
#1	The community should consider developing a communication plan to outline the purpose, methods and desired results of communication and education in the Village. The plan should cover the principles of fire risk to the community, fire behaviour, spotting, structure protection and vegetation management. Educational information and communication tools need to be stakeholder specific. To establish effective communication within target groups, the plan should identify spokespersons who can best establish communication ties with target audiences and provide the educational information required. (Corresponds to recommendation #1 in Kaslo FPA CWPP)	The RDCK has not developed a communication plan, but rather sends out sporadic updates and press releases (consider increasing frequency of public safety and fire information messages).
#2	The community should investigate working with local developers to construct a FireSmart show home to be used as a tool to educate and communicate the principles of FireSmart to the public. The demonstration home would be built to FireSmart standards using recommended materials for interface communities. Additionally, vegetation adjacent to the home would be managed to guidelines outlined in the FireSmart program. (Corresponds to recommendation #2 in Kaslo FPA CWPP)	The RDCK has not achieved this recommendation and no longer considers this approach to be an effective outreach tool. The RDCK is working with BC Parks, City of Nelson, forest licensees, MFLNRORD and other stakeholders to develop an effective set of tools to educate and communicate the principles of FireSmart to the public.
#3	Kaslo should consider applying for UBCM funding to carry out the identified fuel treatment pilot project adjacent to Kaslo JV Humphries School that will strategically mitigate fuel hazard within the treatment area. This pilot project will provide a tool to demonstrate the principles of fuel hazard reduction treatments to the public and contribute to fire risk reduction within the Village. (Corresponds to recommendation #3 in Kaslo FPA CWPP)	
#4	The standard for website information about fire should include an outline of community fire risks and proactive steps individual homeowners can take to make their homes safer within the community. Other information, such as fire danger and FireSmart principles, and a Home Hazard Assessment can also be maintained on the local website. A section should be included to provide information on campfire bans and wildfire hazard ratings to educate visitors and provide information to local residents. (Corresponds to recommendation #4 in Kaslo FPA CWPP)	The RDCK has some information on its website to inform residents of fire risks and proactive steps individual homeowners can take to make their homes safer within the Fire Protection Area. Current fire danger ratings are not included. A RDCK Web Blocker is in place in the event of any kind of fire event directing residents to click on and receive emergency information prior to accessing other information. The RDCK website has links to FireSmart Canada and the FireSmart homeowners' manual posted on their websites. The RDCK EOC circulates Emergency Alerts to residents on a routine basis.

Recommendation		Progress
#5	The RDCK should access local newspapers or community bulletins to deliver FireSmart educational materials or mail materials to residents as was done in 2004 (Corresponds to recommendation #5 in Kaslo FPA CWPP)	The RDCK has not achieved this recommendation and no longer considers this approach to be an effective outreach tool. The RDCK is working with BC Parks, Village of Kaslo, forest licensees, MFLNRORD and other stakeholders to develop an effective set of tools to educate and communicate the principles of FireSmart to the public.
#6	The RDCK should investigate creating a central phone number accessible to the public with messages updating fire bans and fire danger rating. (Corresponds to recommendation #7 and #16 in Kaslo FPA CWPP)	The RDCK is working with MFLNRORD and BCWS to determine how best to provide the public with messages updating fire bans and fire danger rating.
#7	The RDCK should establish communications with the MOFR for daily updates during the fire season. This information should be relayed to individual Fire Departments and to the homes of the Fire Chiefs and Deputy Chiefs. (Corresponds to recommendation #7 and #16 in Kaslo FPA CWPP)	RDCK (BC Zone 4) Fire Chiefs receive daily BCWS fire weather updates.
#8	Fire halls should be assessed to ensure that they meet or exceed FireSmart recommendations. Additionally, fire halls should have emergency power backup and be equipped with sufficient resources to act as alternate incident command posts. Alternatively, sub-regional caches could be provided with incident command centre equipment. (Corresponds to recommendation #28 in Kaslo FPA CWPP)	The RDCK has not formally completed these assessments, and is carried forward in this revised CWPP. See Recommendation 10, Table 7.
#9	Signage consisting of current fire danger, campfire bans and general warnings regarding fire safety should be posted at all major entrances to the community or surrounding fire protection area and updated with current fire information as required. (Corresponds to recommendation #6 in Kaslo FPA CWPP)	This has been completed in most communities in Area D and Kaslo, and is ongoing
#10	The Regional District should consider developing a campfire ban bylaw and, in conjunction with the Fire Chief, implement the ban at times of high fire danger when provincial bans are not in place. The bylaw should consider effective and efficient enforcement measures and powers.	The RDCK does not have burning bylaws. The RDCK advises residents in municipalities to check with city halls regarding municipal bylaws, restrictions and permits and has posted links to relevant provincial guidelines (air quality control legislation, BCWS open burning restrictions and fire bans). See recommendation 21, Table 9.

Recommendation		Progress
#11	The Fire Department and the Regional District should work with the Regional Chamber of Commerce to educate the local business community, particularly businesses that depend on forest use (i.e., tourism and recreation) on FireSmart preparation and planning. Public education programs should be enhanced by: 1) integrating a unit of "FireSmart" and wildfire safety into the local elementary school curriculum, promoting the principles of community wildfire protection at a young age in order to improve awareness over time. This unit could be part of a general emergency preparedness teaching program; 2) creating a "FireSmart" sticker program where Fire Department members attend residences and certify them as meeting "FireSmart" guidelines. (Corresponds to recommendation #8 in Kaslo FPA CWPP)	The RDCK has not achieved this recommendation and no longer considers this approach to be an effective outreach tool. The RDCK is working with BC Parks, City of Nelson, forest licensees, MFLNRORD and other stakeholders to develop an effective set of tools to educate and communicate the principles of FireSmart to the public, including local businesses.
Structure Protection		
#12	Many homes and businesses are built immediately adjacent to the forest edge. In these neighbourhoods, trees and vegetation are often in direct contact with homes. The Regional District should consider incorporating building setbacks into bylaw with a minimum distance of 10 m when buildings border the forest interface. (Corresponds to recommendation #10 in Kaslo FPA CWPP)	The RDCK does not have a Development Permit Area. Discussions are ongoing on how best to achieve this recommendation. See recommendation 16, Table 9.
#13	It is recommended that the RDCK conduct detailed FireSmart assessments of homes and businesses to further communicate and promote fire risk reduction on private property. The Wildfire Risk Management System developed for individual Fire Protection Areas indicates that many areas of the Regional District are at high risk from wildfire. (Corresponds to recommendation #9 in Kaslo FPA CWPP)	Queens Bay has achieved Community FireSmart Recognition in 2015. The Heddle Road community in Area F is under development. This has not been completed in other communities in Area D and Kaslo, and is ongoing. See recommendation 14, Table 8.
#14	The RDCK should investigate the policy tools available for reducing wildfire risk within the municipality. These include voluntary fire risk reduction for landowners, bylaws for building materials and subdivision establishment, covenants for vegetation set-backs, delineation of Wildfire Development Permit areas, incentives such as exclusion from a fire protection tax and education. Specifically, the community should investigate a process to create and/or review and revise existing bylaws to be consistent with the development of a FireSmart community. Consideration should be given to the creation of a Wildfire Bylaw that mandates sprinkler protection, providing for good access for emergency response, and specifies fuel management on both public and private property. (Corresponds to recommendation #11 in Kaslo FPA CWPP)	Queens Bay has achieved Community FireSmart Recognition in 2015. The Heddle Road community in Area F is under development. This has not been completed in other communities in Area D and Kaslo, and is ongoing. The recommended policy tools have not all specifically been addressed and are consolidated in the current CWPP recommendations (see recommendation 14, Table 8.and recommendations 16 to 20, and 22, Table 9).

Recommendation		Progress
#15	The RDCK should consider requiring roofing materials that are fire retardant with a Class A and Class B rating within new subdivisions. While it is recognized that wholesale changes to existing roofing materials within the community are not practical, a long-term replacement standard that is phased in over the roof rotation period would significantly reduce the vulnerability of the community. The RDCK should consider obtaining legal advice regarding the implementation of building requirements that are more restrictive than the BC Building Code. While restrictions to rated roofing are not supported in the Code at this time, there are several communities who have or are undergoing various processes (e.g., lobbying, legal opinion, declaration of hazard by Fire Chief) to enact roofing bylaws within their Wildfire Development Permit areas. (Corresponds to recommendation #12 in Kaslo FPA CWPP)	The RDCK does not have a Development Permit Area and has not considered requiring roofing materials that are fire retardant with a Class A and Class B rating within new subdivisions. Discussions are ongoing on how best to achieve this recommendation. See recommendation 17, Table 9).
#16	The RDCK should consider working with the Building Policy Branch to create a structure that would enable the municipality to better address wildland urban interface protection considerations for buildings. (Corresponds to recommendation #13 in Kaslo FPA CWPP)	The RDCK does not have a Development Permit Area and has not pursued other mechanisms to enable the municipality to better address wildland urban interface protection considerations for buildings. Discussions are ongoing on how best to achieve this recommendation. See recommendation 21, Table 9).
#17	The RDCK should consider lobbying the province to identify and document hazardous fuel types on crown lands that are not within 2 km of the boundary of the community but that are within 5 km of residential areas that could be impacted by a wildland urban interface fire. Effort should be directed at encouraging the province to initiate a fuel treatment program for these lands. This may include coordinating lobbying initiatives with other local governments from within the Regional District. (Corresponds to recommendation #33 in Kaslo FPA CWPP)	The RDCK has been successful in achieving funding to revise the 2008 CWPP and identify and document hazardous fuel types on crown lands that are not simply within 2 km of the boundary of the community but that are within a broader landscape that could be impacted by a wildland urban interface fire. As an outcome of this CWPP update the RDCK is working with BC Parks, the City of Nelson and other stakeholders to initiate a fuel treatment program for these lands at the landscape level.
#18	Access constraints to residences should be addressed. Homeowners should be made aware of access constraints that may prevent the Fire Department from attending a wildland fire that could threaten their property. (Corresponds to recommendation #14 in Kaslo FPA CWPP)	The RDCK has identified access issues in this CWPP update. See Section 7.4.1. Work on this is ongoing on. See recommendations 31-33, Table 11.
#19	Subdivision design plans should be reviewed by the Fire Department to ensure suitable access routes exist, hydrant accessibility is adequate where applicable, and that interface fire related issues are addressed. (Corresponds to recommendation #15 in Kaslo FPA CWPP)	The RDCK does not require that subdivision design plans be reviewed by the Fire Department Work on this is ongoing on. See recommendation 32, Table 11.

Recommendation		Progress
#20	As Fire Department officials can only request rather than force an illegal fire to be extinguished, the Regional District should consider enacting a mechanism such as a 'fee for service charge' or developing a policy to enforce regional bylaws if Fire Departments are called out to attend illegal burning. The issue of illegal fires is considered significant in the uncontrolled areas of the Regional District and requires action.	When a burn ban is in place, the RDCK can extinguish the fire and request that Compliance and Enforcement issue a fine to the person responsible. Under the Fire Services Act, the RDCK can extinguish a fire that is threatening life and structures. With other forms of illegal fires such as burning garbage, the RDCK can request that Compliance and Enforcement issue a fine to the person responsible.
#21	Given the wildfire risk profile of the Fire Protection Area, an emergency sprinkler kit capable of protecting 30 to 50 homes should be purchased and maintained in the RDCK. Fire rescue personnel, or a designate of the department, should be trained to mobilize and set up the equipment efficiently and effectively during a fire event. (Corresponds to recommendation #27 in Kaslo FPA CWPP)	The RDCK has one type 2 structural protection unit and three type 3 structural protection units. Further work required. See recommendation 27, Table 10. Since the development of the 2008 Kaslo FPA CWPP, the RDCK has acquired 4 Structural Protection Units that can be utilized in emergency events. Kaslo Fire Department has one of these units and has members trained to operate the unit.
Emergency Response		
#22	Consideration should be given to developing a regional initial attack crew as other regional districts such as Metro Vancouver and the Capital Regional District have done. The location of this crew should be determined in consultation with communities and fire chiefs. The crew could consist of seasonal and permanent staff. Permanent staff could be trained to offer S100 and S215 training to fire departments as well as providing support such as community education and communication during the non-wildfire season.	The RDCK has trained its members to Wildland Fire Fighter Structure Protection Program standards, delivered by the Office of the Fire Commissioner. This includes SPP-115 structural protection training. The result is a region wide roster of trained fire fighters. Further work required. See recommendation 25, Table 10.
#23	A formal communication structure should be established with the MOFR so that information regarding fires in the region is communicated in a timely manner to the communities and fire departments adjacent to active fires. This might be best achieved through joint cooperation with the RDCK, the communities, Fire Protection Areas and the MOFR. (Corresponds to recommendation #16 in Kaslo FPA CWPP)	Fire Weather is currently communicated by BCWS. Some but not all information regarding wildfires is also shared. Additional work required. See recommendation 24, Table 10.

Recommendation		Progress
#24	Consideration should be given to developing community evacuation plans in each Fire Protection Area. Appropriate evacuation routes should be mapped, considering Disaster Response Routes (DRR). Major evacuation routes should be signed and communicated to the public. The plan should identify loop roads and ensure access has sufficient width for two-way traffic. In addition, alternative emergency responder access should be considered. (Corresponds to recommendation #17 in Kaslo FPA CWPP)	Harrop Procter has a community evacuation plan in place. Additional work required. See recommendations 31 and 33, Table 11.
#25	The Regional District should consider providing an accurate and detailed set of maps to all Fire Protection Area Fire Departments. Maps should provide details related to access and evacuation routes, water supply, subdivision layout and the fire risk mapping developed as part of this project. Periodic updates to the mapping will be required in areas of the Regional District where development is active. (Corresponds to recommendation #22 in Kaslo FPA CWPP)	Most of these maps have been provided including water supply, subdivision layout and evacuation routes. Fire risk mapping has not yet been provided (see recommendation 31, Table 11).
#26	During a large wildfire it is possible that critical infrastructure within the community could be severely impacted by smoke. It is recommended that contingency plans be developed in the event that smoke causes evacuation of the community's incident command centres. The RDCK should co-operate with Provincial and municipal governments to identify alternate incident command locations and a mobile facility in the event that the community or Fire Protection Area is evacuated. (Corresponds to recommendation #21 in Kaslo FPA CWPP)	These alternate incident command locations have not been identified. The RDCK is working with BC Parks, Village of Kaslo, forest licensees, MFLNRORD and other stakeholders to consider such issues as contingency plans and alternate incident command locations.
#27	New subdivisions should be developed with access points that are suitable for evacuation and the movement of emergency response equipment. The number of access points and their capacity should be determined during subdivision design and be based on threshold densities of houses and vehicles within the subdivisions. (Corresponds to recommendation #19 in Kaslo FPA CWPP)	This has not been completed. The RDCK has limited jurisdiction over subdivisions developed with access points suitable for evacuation and the movement of emergency response equipment. Additional work required. See recommendations 30-33, Table 11.
#28	Where forested lands abut new subdivisions, consideration should be given to requiring roadways to be placed adjacent to those lands. If forested lands surround the subdivision, ring roads should be part of the subdivisions design. These roads both improve access to the interface for emergency vehicles and provide a fuel break between the Wildland and the subdivision. (Corresponds to recommendation #18 and #20 in Kaslo FPA CWPP)	This has not been completed. Additional work required. See recommendations 31-33, Table 11.

Recommendation		Progress
#29	The RDCK should consider conducting a review of critical water infrastructure to determine whether water flow and pressure will be adequate in an interface fire emergency. The review should consider water supply, water delivery volumes/pressure, pumping capacity and vulnerability of reservoirs. (Corresponds to recommendation #22 in Kaslo FPA CWPP)	This has not been completed. See recommendation 9 and 10, Table 7.
#30	The RDCK should review the safety of current water fill locations and procedures related to water transportation to ensure that tendering is safe and as efficient as feasible.	This has not been completed. See recommendations 10-11, Table 7.
#31	The RDCK should consider establishing standpipes at safe locations adjacent to bridges and other water access points. Gravity fill tanks or permanent pumps should be established in strategic locations where tendering distances and return times are prohibitive.	This has not been completed. See recommendations 9, Table 7.
#32	Given the values at risk identified in this plan, it is recommended that, during periods of high and extreme fire danger (danger class V), individual Fire Protection Areas work with adjacent municipalities, the RDCK and the MOFR to maintain a local helicopter with a bucket on standby within 30 minutes of each community.	This has not been achieved. The RDCK is working with BC Parks, City of Nelson, forest licensees, MFLNRORD and other stakeholders to ensure preparedness for periods of high or extreme hazard.
#33	Given the values at risk identified in this plan, it is recommended that, during periods of high and extreme fire danger (danger class V and IV), individual Fire Protection Areas work with adjacent municipalities, the RDCK and the MOFR to maintain a local helicopter with a bucket on standby within 30 minutes of each community (Corresponds to recommendation #23 in Kaslo FPA CWPP)	This has not been achieved. The RDCK is working with BC Parks, City of Nelson, forest licensees, MFLNRORD and other stakeholders to ensure preparedness for periods of high or extreme hazard.
Training/Equipment		
#34	The following training should be maintained/considered: 1) Continue the S-100 course training on an annual basis; 2) Regional Parks outside staff should be trained in the S-100 course; 3) A review of the S-215 course instruction should be given on a yearly basis; 4) The S-215 course instruction should be given to senior fire officers on an ongoing basis; and, 5) Incident Command System training should be given to all rural Fire Chiefs. Funding for proper training and compensation for members who wish to take S100 or S215 should be provided by the RDCK (Corresponds to recommendation #24 in Kaslo FPA CWPP)	WFF SPP and S-100 are mandatory training. The SPP 115 training is offered through the Office of the Fire Commissioner. ICS 100 training is mandatory for all fire service personnel. ICS 200 through ICS 400 training is offered regionally. Further work required. See recommendation 25, Table 10.

Recommendation		Progress
#35	Fire Departments should meet with the MOFR prior to the fire season to review the Incident Command System structure in the event of a major wildland fire. It may be most effective for this to occur at a regional level, these agencies should work in conjunction with Regional District staff to establish clear command structures and lines of communication with MOFR to ensure efficient operations during wildfire events. This should include designated radio channels and operating procedures. (Corresponds to recommendation #25 in Kaslo FPA CWPP)	An effective line of communication exists between BCWS and RDCK Fire Departments through the Zone 4 BC Fire Chiefs Association, Central Kootenay Fire Chiefs Association and individual meetings between Fire Halls and Regional Staff.
#36	The RDCK and Fire Departments should consider reviewing existing inventory of interface fire fighting equipment to ensure that items such as large volume fire hose, portable pumps and firefighter personal protection (PPE) are adequate to resource the interface area. Fire Department personnel should have correct personal protective equipment and wildland fire fighting tools. Hoses, pumps and other equipment should be compatible with MOFR wildland fire fighting equipment. (Corresponds to recommendation #26 in Kaslo FPA CWPP)	This is happening on an ongoing basis. See recommendation 28, Table 10 regarding opportunities for obtaining discount volumes of hose for interface fires.
#37	The RDCK should consider working with Kaslo Fire Protection Area and adjacent municipalities to coordinate the creation of sub-regional mobile caches of wildland fire fighting equipment. This would reduce the cost of purchasing and maintaining the cache and provide additional resources in the event of a wildfire. (Corresponds to recommendation #28 in Kaslo FPA CWPP)	This is in place throughout the RDCK with four Structural Protection Units in Beasley (Type 2), Kaslo, Pass Creek and Canyon / Lister Fire Halls (Type 3). See recommendation 27, Table 10.
#38	The Regional District should consider retaining a contract fire fighting crew of 20 fire fighters to assist MOFR crews in initial attack and fire containment during periods of high and extreme hazard. These resources could be made available as needed throughout the district for both fire fighting and fuel hazard mitigation.	Currently the RDCK is responsible for fire fighting in Fire Protection Areas. BCWS retains contract crews. See recommendation 29 for duty officers, Table 10.
#39	The Regional District should consider retaining a contract fire fighting crew of 20 fire fighters to assist MOFR crews in initial attack and fire containment during periods of high and extreme hazard. These resources could be made available as needed throughout the district for both fire fighting and fuel hazard mitigation.	Currently the RDCK is responsible for fire fighting in Fire Protection Areas. BCWS retains contract crews. See recommendation 29 for duty officers, Table 10.
Vegetation (Fuel) Management		

Recommendation		Progress
#40	The RDCK should investigate the potential for fuel management programs. A number of high hazard areas immediately adjacent to or embedded in the community have been identified as part of the wildfire risk assessment. These high hazard areas should be the focus of a progressive thinning program that is implemented over the next five to ten years. Thinning should be focused on priority 1 and 2 areas identified in Map 7 of the respective CWPPs A qualified professional (RPF), with a sound understanding of fire behaviour and fire suppression, should develop treatment prescriptions. Any treatments that take place on sloped sites must be prescribed with consideration given to slope stability. Where slope stability may be an issue, a Professional Geotechnical Engineer should review the treatment prescription. The RDCK should also investigate the potential for working with private land owners to address hazardous fuels on private land. (Corresponds to recommendation #29 in Kaslo FPA CWPP)	To date 87.6 ha have been treated on areas identified in the 2008 CWPP as priority 1 and 2 areas (see Table 13). Fuel Management Prescriptions have been developed for additional priority 1 and 2 areas and are pending funding for implementation. This work is ongoing. See Table 12 for a summary of areas identified for treatment at the landscape level in Area D and Kaslo.
#41	The mountain pine beetle has the potential to cause significant changes in fuels and fire risk over the next decade and beyond. Where applicable, fuel treatment strategies should target removal of beetle susceptible lodgepole pine. The RDCK should consider working with the province and private land owners to monitor and quantify changes in fire risk associated with the mountain pine beetle outbreak. (Corresponds to recommendation #30 in Kaslo FPA CWPP)	To date 87.6 ha have been treated on areas identified in the 2008 CWPP as priority 1 and 2 areas including stands with mountain pine beetle (see Table 13). Fuel Management Prescriptions have been developed for additional areas affected by MPB and are pending funding for implementation. This work is ongoing. See Table 12 for a summary of areas identified for treatment at the landscape level in Area D and Kaslo.
#42	The Provincial government and the UBCM have funding programs specifically to address wildfire hazard and the wildfire hazard associated with Mountain Pine Beetle on Crown and Municipal Lands. The RDCK should consider applying for UBCM funding to carry out fuel treatments that will strategically mitigate fuel hazard within the 2 km of the Fire Protection Area. The priority 1 treatment area identified in the respective CWPPs would be the focus for funding. (Corresponds to recommendation #31 and #35 in Kaslo FPA CWPP)	To date 159.8 ha have been treated on areas identified in the 2008 CWPP as priority 1 and 2 areas including stands with mountain pine beetle (see Table 13). Fuel Management Prescriptions have been developed for additional areas affected by MPB and are pending funding for implementation. This work is ongoing. See Table 12 for a summary of areas identified for treatment at the landscape level in Area D and Kaslo.
#43	The RDCK should investigate the potential for additional funding options, such as a cogeneration plant, composting program or a minimal increase in property taxes, which could be used to encourage and aid property owners with fuel mitigation and to facilitate treatments on public lands. Efficiencies may be gained if this is coordinated at a Regional level and shared with RDCK municipalities. (Corresponds to recommendation #32 in Kaslo FPA CWPP)	The RDCK has made some progress on this. A Biomass Feasibility Study for Area D and Kaslo was completed in May 2011, identifying the amount of biomass available, including from interface treatment areas, and summarizing potential markets. Further work is required.

Recommendation		Progress
#44	The RDCK should investigate the potential for working with the Ministry of Transportation and Highways to maintain major roadways as fuel breaks through communities. This would be achieved by thinning the understory and raising the height to live crown on either side of the roadway to a depth of 50 m.	Limited progress has been made. See recommendation 7, Table 6 for a summary of the proposed approach to the collaborative approach identified in this CWPP update.
#45	The RDCK should investigate the potential for partnering with residents to promote treatment of public lands adjacent private property. Private land owners could be encouraged to not only clean their own yards of debris and brush but also to be responsible for the removal of debris and brush from public lands immediately adjacent to them to a depth of 20 meters. Removal of material could be coordinated with a spring yard waste pickup program. (Corresponds to recommendation #34 and #38 in Kaslo FPA CWPP)	Limited progress has been made to date. See recommendation 14, Table 8.
#46	The RDCK should work with FortisBC to ensure that transmission infrastructure within the Fire Protection Area can be maintained and managed during a wildfire event. Maintaining the transmission corridor to a fuelbreak standard will provide the community with a more reliable power supply that is less likely to fail during a fire event and will reduce the probability of fire spreading into the community. The RDCK should work with FortisBC to ensure that the right-of-way vegetation management strategy includes consultation with the community and the fire department so that wood waste accumulations do not contribute to unacceptable fuel loading or diminish the ability of the right-of-way to act as a fuel break.	Limited progress has been made to date. See recommendation 7, Table 6 for a summary of the proposed approach to the collaborative approach identified in this CWPP update
#47	The RDCK should prioritize the development of a fuelbreak network that builds on existing breaks such as the FortisBC Transmission Corridors and major roads running through the Fire Protection Areas.	To date 87.6 ha have been treated on areas identified in the 2008 CWPP as priority 1 and 2 areas (see Table 13). Fuel Management Prescriptions have been developed for additional priority 1 and 2 areas and are pending funding for implementation. This landscape level approach is the focus of work for the revised CWPP.
Wildfire Rehabilitation Planning		

Recommendation		Progress
#48	Individual Fire Protection Areas should develop plans for post fire rehabilitation that considers the procurement of seed, seedlings and materials required to regenerate an extensive burn area (1,000-5,000 ha). The opportunity to conduct meaningful rehabilitation post fire will be limited to a short fall season (September to November). The focus of initial rehabilitation efforts should be on slope stabilization and infrastructure protection. These issues should form the foundation of an action plan that lays out the necessary steps to stabilize and rehabilitate the burn area. (Corresponds to recommendation #40 in Kaslo FPA CWPP)	Limited progress has been made to date. See recommendation 13, Table 7 regarding completing detailed hazard assessments and developing response plans for stabilization and rehabilitation of burn areas in watersheds that are vulnerable to post-wildfire debris flows and floods.

APPENDIX 5 – SAMPLE COMMUNITY SCALE PLANS

As a result of public consultation during the process, some communities have developed community scale wildfire strategies that identify community-based priorities for reducing wildfire risks. The following two community scale plans are provided as examples and are not formal elements of this CWPP.

MURPHY CREEK LANDING: SUMMARY OF COMMUNITY WILDFIRE PROTECTION PLAN MEETING

Prepared by: John Cathro, RPF

July 19, 2017

PURPOSE

On Sunday July 1, at the request of Ross Lake, John Cathro and Mark Elder spoke at the Murphy Creek Landing Strata Council AGM and then conducted Wildland Urban Interface Threat Assessments in order to understand the level of risk from wildfire to the community. Ross and Derek provided a brief tour of the community in order to inform discussions.

The purpose of this document is to summarize the:

1. Discussion at the July 1 Murphy Creek Landing AGM;
2. Results of field assessments conducted that day; and
3. Options for next steps to reduce the risk of wildfire to the community

1. COMMUNITY DISCUSSION

John and Mark met with several community members and discussed:

- The most important activity for all residents, especially in isolated communities like Murphy Creek landing, is to FireSmart homes, outbuildings and critical infrastructure;
- A Community Wildfire Protection Plan update is being completed for Area E, funded by

UBCM, Area D and Columbia Basin Trust. One of the main outcomes is to identify priority areas of interest on Crown land where forests can be thinned to reduce the risk of wildfires to communities. The CWPP update for Area D will be completed in fall 2017.

- Based on observations, the wildfire risk is high, based on the forest condition, proximity of forests t the community and the fact that the community is boat access.

2. FIELD VISIT RESULTS

John and Mark spent most of 2 hours assessing the wildfire threat using WUI Threat Assessments worksheets. The following map provides an overview of the site visit.

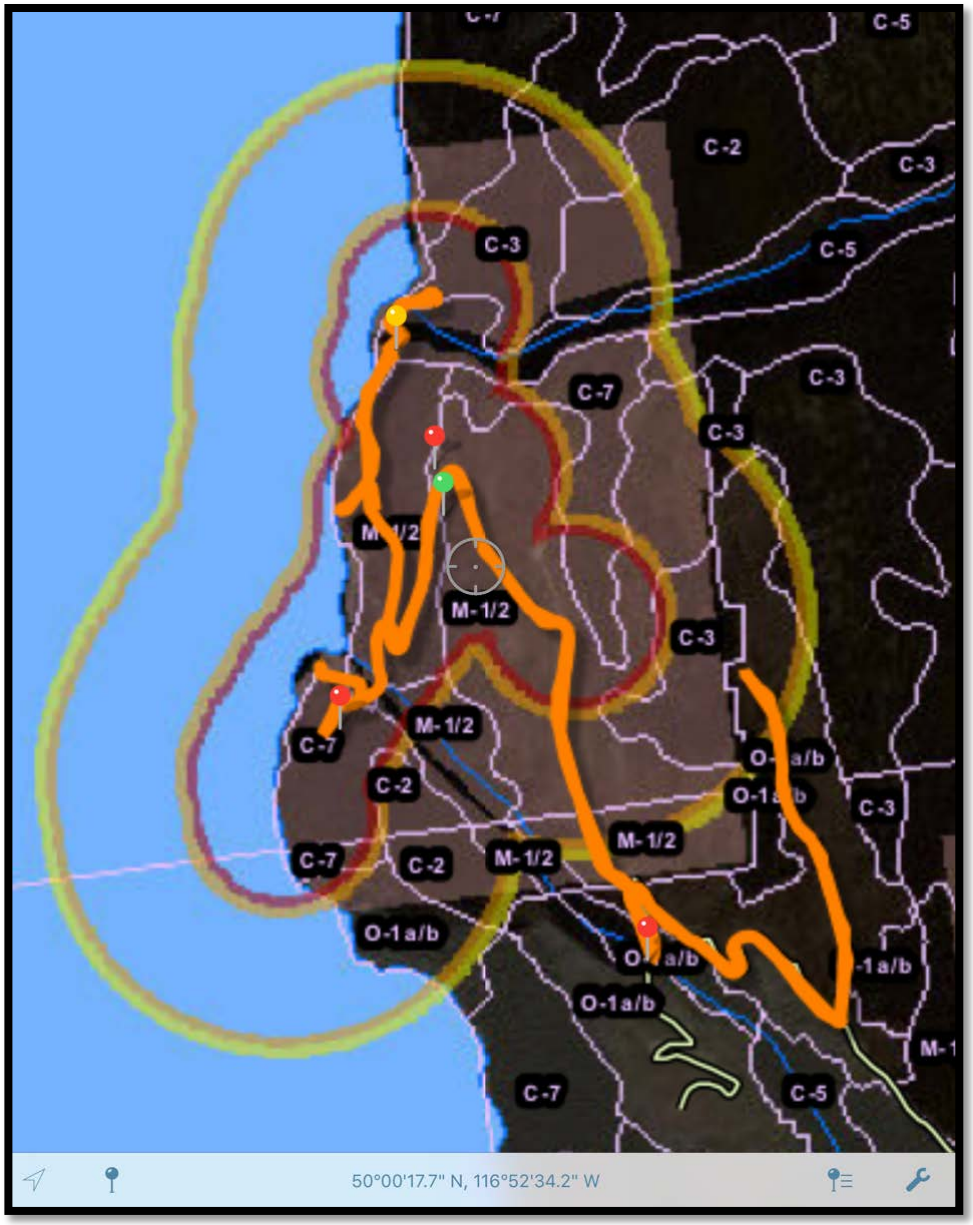

Figure 1. Map of Murphy Creek Landing. Private land is shaded in light yellow. Alphanumeric codes (C-3) are unverified Provincial Strategic Threat Analysis polygons. Three WUI Threat Assessments were completed and pinned in red. Roads were GPS'd and shown in orange. Derek's property was visited and pinned in yellow. A very good example of a shaded fuel break with reduced fuel loads is pinned in green.

WUI THREAT ASSESSMENTS

Each of the three WUI Threat Assessments rates the Wildfire Behaviour Class as High. This considers forest fuels, historic wildfire occurrence, topography and ecological site conditions. This High rating is particularly significant given the fact that access to and from the community is by private boat.

The following photos show the forest conditions at these sites:

Figure 2. Young forest on Crown land south of private land. Dense young coniferous forests have high fuel loads and can contribute to high to extreme fire intensity.

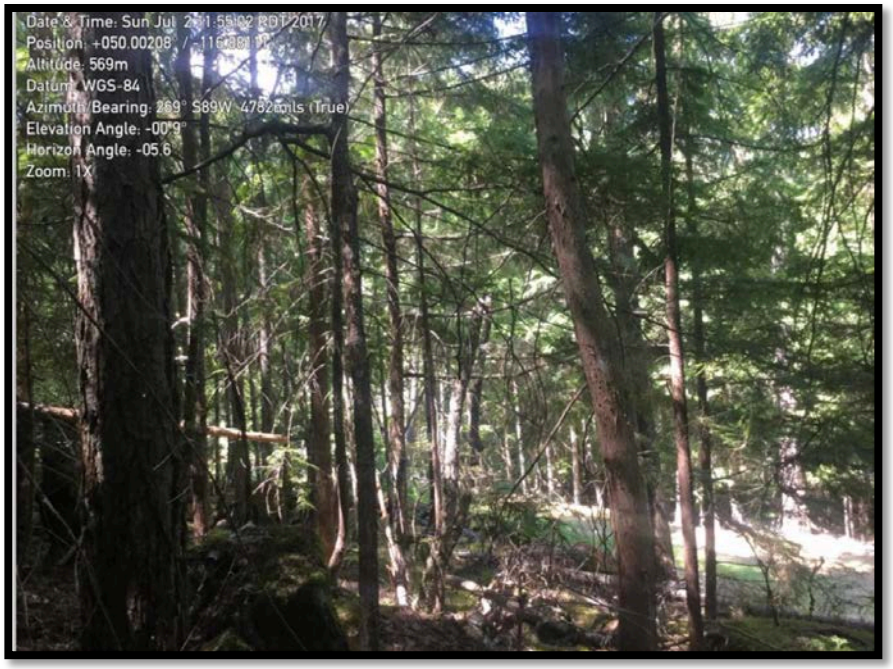

Figure 3. Dense forest on private land south of Murphy Creek. Dense cedar hemlock forests have very high fuel loads and can contribute to high to extreme fire intensity.

3. Options for Reducing the Risk from Wildfire

In addition to FireSmarting houses and infrastructure, the following options should be considered

WATER AND SPRINKLERS

Murphy Creek Landing has lots of water, and this should be around all residences and critical infrastructure. Several good examples of were observed on the tour, s shown in the following photos.

Figure 4. Water system. Excellent example of a water system designed to get water to sprinklers. All of these features are available locally.

Figure 5. Cedar Shake roof with sprinkler. While the sprinkler does some insurance against wildfire, the proximity of this wooden roof to the forest is high risk. Remember that sprinklers only work hen there is water pressure, and are therefore not a satisfactory mitigation measure.

FUEL MODIFICATION

The green pin on the map shows the approximate location of a forest stand that has been thinned and is good example of what can be achieved

Figure 6. Resilient Interface Forest. This selectively harvested stand is a model of what residents should emulate around their houses. Large, healthy, fire resistant Douglas fir, Larch, ponderosa pine and deciduous trees are retained. Surface fuel is removed**.**

NEXT STEPS

The CWPP for Area D will be submitted for review and approval in the fall of 2017. This CWPP will identify a priority area of interest on Crown land east and south of the community. The RDCK will guide implementation of the CWPP in the coming months and years

ARGENTA WILDFIRE PROTECTION PLANNING

Prepared by: Rik Valentine, Argenta Community Member

Sept. 23, 2017 version

CONTEXT

Argenta is perched along bench land above Kootenay Lake, with most houses built in the forest or beside it. Above, 5500 vertical feet of steep mountainside are forested up to the alpine with almost no access by road or otherwise. The fuel loading is very heavy on this slope with significant Pine and Fir beetle kill and very few water sources to be found except along the bench below. Summer thunder and lightning storms are relatively common and are often accompanied by strong winds. There is only one public road into Argenta which could be cut off by fire being pushed in by the strong south winds we often experience coming up the lake.

Intent

This is a review of basic points that we feel should be included in a fire plan for the community of Argenta including the area from the Hamill Creek to Bulmer Creek. The plan should be based on a landscape level approach, whether or not there is public funding for mitigation of fire hazard. This outline emphasizes fire hazard reduction on crown land and collective action we can take to reduce fire hazard. Although less emphasized here, FireSmart treatment of home sites is the other key piece of fire hazard reduction.

We have identified five basic areas of planning: Access, Treatment/Fuel Management, Evacuation, Firefighting Strategy/Response and planning in view of future logging development or inclusion of the Argenta Face in a park.

ACCESS

Given the fuel loads and steep terrain, when the fire hazard is high or extreme a quick response to a fire start is important, preferably before daytime heating begins. Aircraft are useful for holding a situation with retardant or bucketing, if available, but aircraft don't put a fire out - ground crews do. For this, access is obviously important.

- Rebuild Woodlot 491 water bars to allow fire crew access (quite a cheap fix). There is no vehicle access over the road as presently deactivated, except by ATV (and even that is hampered).
- Identify, map, build, and maintain heli landing spots for firefighting access and as possible evacuation sites. Dick B. has already tabled a plan for access to the northwest end of Argenta. There are some old beetle heli-logging landings on the Argenta Face that could be rebuilt. Map/develop others where there is no other access; avoid wooden cribbing for landing pads, which will degrade.
- Build an ATV access trail above Argenta that would allow a quick response to a fire, as proposed in 2010 by Rik V, and already GPS located. It would follow the contour from the end of Woodlot 491 spur 2 to Argenta creek and pass by a spring along the way. Negotiate private land access to the trail for maintenance and for emergency use. Maintain to ATV w/ trailer standard. Thinning along this strip of exposed mineral soil would also provide a control line allowing for use of back fire.
- Foot trail system: plan and build small trails providing access by foot to water sources and other areas as identified. These trails would facilitate use of a pump or gravity water bag and speed up hose laying. Large areas immediately above and south of Argenta currently have no access.

TREATMENT/FUEL MANAGEMENT

We suggest addressing these in two categories:

1) PRIVATE LANDS IN ARGENTA

Household FireSmarting should be encouraged but is separate to this discussion. Previous work in community meetings could be dusted off. Some items include:

- Purchase a portable community chipper for use in Argenta, possibly to be shared with other

communities in the Lardeau Valley?

- Volunteer crew to do FireSmart assessment evaluations of home sites and prioritize recommendations for house owners
- Volunteer work party to help install basic protections (permanent sprinklers), hang tarps, move woodpiles, etc. especially for older people unable to do it themselves.
- Arrange tests of shared water lines with all sprinklers going at once to see whether line capacity is sufficient for all and if not, figure what might be done to improve the chances for all.
- Arrange discounted group purchase of hoses, sprinklers, standpipes, sprinkler stands, etc. at Ace Building in Kaslo and/or at Nelson Farmer's Supply.
- Investigate/facilitate fire proofing treatment of wood siding

2) PUBLIC LANDS

- Firebreaks: How much protection do we want and need? Stop rank 2 or 3 ground fire? Stop a running crown fire? Access is important to control spot fires in the early stage.
- Construction of firebreaks could potentially be coordinated with logging operators - move this to logging discussion?
- Plan for critical area firebreaks that would be designed for use as control lines for implementing an emergency backfire.
- Fuel reduction treatment should be done in the areas adjacent to the community initially in a perimeter zone, where possible, of 1 km beyond private land and eventually in a band of 2 km to the south, the objective of the Regional District of Central Kootenay for interface fire hazard mitigation.
- In immature forest types thinning and removal of young cedar, hemlock and brush should be the priority.
- In mature forest types the approach depends on stand type, whether fir, larch dominant, spruce balsam, lodgepole pine, deciduous, even aged or mixed age.
- Consider where backfire could be used, plan with geography, and in coordination with stand thinning. Creating a narrow mineral ground strip, coupled with access for water delivery, is optimum for fire control.

EVACUATION

- A community evacuation committee exists. They update the evacuation plan and "pod list" of contacts usually yearly.
- Given that there is only one public road in and out of Argenta, an alternative, emergency evacuation route should be designated and maintained. The best option is the waterline road through the north end of the land co-op, coming out at the turtle nesting area
- South of Seamarks emergency evacuation would be by water or helicopter.
- Emergency heli landing spots in addition to Valentine's field should be identified; permission for use obtained and the sites should be mapped. The RDCK should be apprised.

FIREFIGHTING STRATEGY/RESPONSE

The BC Wildfire Service has excellent crews and resources but weather conditions can challenge their timely availability on both the provincial and local levels. When storm cycles produce a multitude of lightning starts they can be forced to prioritize in favour of more visible population centres and greater numbers of values at risk. We are at the end of the road. Climate change seems to be worsening the situation as evidenced by the 2017 provincial state of emergency.

Argenta has a volunteer crew that trains and practices annually, and a fairly well stocked shed of equipment geared to wildfire response in steep terrain. Our scope is limited but has proven to be effective, particularly in early response.

- Continue practice and training efforts with our local fire crew. Special focus on response strategy for larger scenarios. Continue to maintain and update equipment.
- Update our current mapping, organized by civic address, which identifies fire protection resources at each house site in Argenta - stand pipe locations/diameters, hose types available, hose connection options, fire tool caches, roads, buildings. Identify buildings with sprinklers already installed on roof, and those buildings without protection.
- Make a master map locating all water sources (potential pump sites), high volume stand pipes, all 4x4 roads, skid roads and trails along with property lots and house sites, civic addresses. Explore creating this map in digital format that could be made available to the authorities for emergency response.
- Scoop out key spring and creek sources that could provide enough volume to enable pumping. There are some water sources on the divide with Clint creek (springs, ditchline seepage), and there are springs between Argenta and Bulmer Creeks

AT THE HOUSEHOLD LEVEL

- Small tanks could be installed prior to the fire season, and the purchase of small high pressure pumps organized. Lined pits may be cheaper with higher storage volume.
- Volume pump(s) to boost domestic water line capacity? (a lot of shared domestic water lines have a big pressure differential – those at the bottom of the line could quickly drain the lines leaving house sites at higher elevations without water

PLANNING FOR FIRE MITIGATION – PARK SCENARIO, LOGGING OPERATIONS SCENARIO

If Argenta and the hillside forest cover is to survive in something resembling the present form, high fire hazard areas adjacent to Argenta require mitigation no matter whether in a park or a logging operation area.

PARK SCENARIO

If the crown lands adjacent to Argenta become part of a park, Parks management must give high priority to fire protection for the community, given the rapidly accelerating climate change. Effective fire protection would still require active intervention. The management plan should include detailed planning for fire response, evacuation and interface and fuel treatment, i.e. the same items that require action if the area is subject to logging operations. These would include:

- Fuel reduction treatments in areas adjacent to the community
- Construction of access trails and heli landing sites, as outlined earlier, so as to allow rapid early response while fires are in early stages
- Controlled fall burning of diseased, windthrown and mature timber stands, in something resembling a 'natural' sequence. (Keeping in mind that there is no longer a 'natural' environment on the face given the long history of our controlling fires and the rapid climate change driven by human activities.)

LOGGING OPERATIONS SCENARIO

- Any future logging roads should be laid out with fire protection as a priority i.e. to act as fire breaks. The roads should provide access to the whole Bulmer face area (total chance plan), avoiding road layout designed only to cherry pick prime timber.
- Any new access roads should be gated during the fire season with the Fire Warden and several key members of the Fire Suppression crew having keys to the gate.
- Fir larch stands could be logged leaving a minimum of 15-20 stems per hectare of mature fire resilient species as seed sources, marking only prime trees. Block size should be less than 5 hectares so as to limit the extent of even aged stands. These blocks would lower the stand height in relation to surrounding timber and improve the chance of stopping running crown fires.
- Partial logging in mature stands of fir and larch leaving about 30% of mature trees is another fire hazard reduction option. This would reduce the chance of crown fires while providing shade to limit understory brush growth.
- In stands of pure lodgepole pine and mature spruce balsam there may not be any fire resilient trees to leave. In these forest types cutblock size should be less than 5 hectares so as limit the extent of even aged stands. Planting in these blocks, depending on elevation limitations, could include a mix of more fire resilient species.
- Long-term stand tending of cutblocks in the 2 km adjacency area next to the community should be a priority to reduce fire hazard. This could include thinning and promotion of uneven aged stands.