

Regional District of Central Kootenay Area H South Community Wildfire Protection Plan

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This Community Wildfire Protection Plan was prepared following the Strategic Wildfire Prevention Initiative 2017 Community Wildfire Protection Plan Template, January 23, 2018 version.

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Executive Summary

In 2017, the Slocan Integral Forestry Cooperative (SIFCo) was retained by the Regional District of Central Kootenay (RDCK) - with support from the Village of New Denver, Silverton, and Slocan - to create a Community Wildfire Protection Plan for Electoral Area H. Due to the large geographic area, diverse ecosystems, and abundance of communities throughout the Slocan Valley, two CWPPs were developed: Area H North and Area H South.

The Area of Interest for this CWPP encompasses the Village of Slocan, and the communities of the Regional District Central Kootenay Electoral Area H South. Following the Strategic Wildfire Prevention Initiative 2017 Community Wildfire Protection Plan Template, January 23, 2018 version, and the 2013 Wildland Urban Interface Wildfire Threat Assessment Guide, wildfire threat was determined through a combination of field reconnaissance and spatial data analysis. Results from the wildfire threat analysis indicate that there is a high threat of wildfire throughout the South Slocan Valley.

Through a combination of strategically located fuel treatments, FireSmart activities, and emergency planning and preparedness, the wildfire risk facing the communities of Slocan and Area H South can be mitigated. Thirty-four recommendations included in this report aim to reduce the likelihood of a wildfire entering the community; reduce impacts and losses to property, critical infrastructure, and values; and reduce negative economic and social impacts to the community as a result of a wildfire.

Summary of CWPP Recommendations

Table 1: Summary of CWPP Recommendations

Number	Recommendation	Responsibility /Funding Source
Objective: To incorporate wildfire risks into local government policies, bylaws and plans		
1	<p>Ensure that existing and future planning documents, policies and bylaws consider wildfire risks, evacuation routes, and emergency response. This includes:</p> <ul style="list-style-type: none"> • Reviewing the OCP and bylaws to evaluate their effectiveness at mitigating wildfire risks. • Exploring the use of Development Permit Areas requiring FireSmart landscaping practices, fire resistant external construction materials, and vegetation/debris management in high fire hazard areas. • Exploring the use of a RDCK outdoor burning bylaw to restrict burning during high fire hazard. • Continuing current efforts to update and develop emergency planning documents - including emergency evacuation plans. 	RDCK, Village of Slokan, UBCM CRI Program
2	Consider undertaking additional landscape-level wildfire planning for areas outside of the WUI. A comprehensive landscape-level wildfire plan should complement existing CWPPs, evaluate wildfire threat, and identify strategic areas for fuel treatment outside of the WUI.	Forest licensees, FESBC, RDCK, BC Parks
3	Review progress on fire mitigation efforts and update wildfire planning documents and CWPPs every 7 years.	RDCK , UBCM CRI Program
Objective: To increase wildfire mitigation efficiency through collaborative efforts		
4	Establish a Wildfire Preparedness Working Group for the Slokan Valley. The group should work to identify wildfire related issues, resource deficiencies, and opportunities for improvement. Potential Working Group representatives may include the RDCK, fire departments, licensees (Interfor, Kalesnikoff, SIFCo, NACFOR, BCTS and Woodlots); utilities (BC Hydro and Fortis); municipalities (New Denver, Silverton, Slokan); and government agencies (BC Parks, BCWS, MOTI, and FWCP).	UBCM CRI Program ,RDCK, Village of Slokan, fire departments, forest licensees, utility companies, BC Parks, BCWS, MOTI
5	Coordinate wildfire risk mitigation efforts with other agencies, organizations, and across Electoral Area boundaries. Coordinate mitigation efforts around New Settlement, Playmor Junction, South Slokan, Valhalla Park, and along highway right-of-ways.	RDCK, utility companies, BC Parks

Objective: To increase the resiliency of values at risk and critical infrastructure to potential wildfire

damage		
6	Review, maintain and upgrade back-up power sources for critical infrastructure and emergency services. A review should identify any gaps in back-up power and recommend upgrades to existing power sources to meet potential extended outages.	UBCM CRI Program, Village of Slokan, RDCK, fire departments
7	Prioritize fuel management treatments that protect electrical power, communications, transportation and water critical infrastructure. Review, prioritize, and implement fuel management treatments in areas identified in Table 19.	RDCK, utility companies, forest licensees, FESBC, UBCM CRI Program
8	Coordinate with Fortis, BC Hydro, and MOTI to conduct vegetation management and danger tree removal along distribution lines, transmission lines, and right of ways. Explore utilizing existing right of ways as landscape-level fuel breaks through an ongoing fuel treatment program.	RDCK, Fortis BC, BC Hydro, MOTI, UBCM CRI Program
9	Complete FireSmart and vulnerability assessments of critical infrastructure. Undertake any necessary corrective actions to meet FireSmart standards for critical infrastructure, local government buildings, and emergency services infrastructure.	UBCM CRI Program , RDCK, fire departments, Village of Slokan
10	Identify areas likely to suffer post-fire terrain, water flow and stream channel stability issues. Create draft plans for post-fire stabilization work.	RDCK, forest licensees
Objective: To ensure values at risk are sufficiently considered during fuel management activities		
11	Carry out information sharing with First Nations during the fuel management prescription development process prior to any on the ground fuel management activities.	Forest licensees, RDCK, Village of Slokan, consultants preparing prescriptions, UBCM CRI Program, FESBC
12	Carry out consultation with local communities during fuel management prescription development to ensure local concerns are addressed and to cultivate social licence to operate in the WUI.	Forest licensees, RDCK, Village of Slokan, consultants preparing prescriptions, UBCM CRI Program, FESBC
13	Incorporate multiple objectives into fuel treatment projects when possible. Fuel management activities can address forest health concerns, enhance wildlife habitat, rehabilitate low value stands, and utilize low value fibre. Where feasible, wildfire threat reduction should be combined with biodiversity and habitat enhancement prescribed by a qualified professional.	Forest Licensees, RDCK, Village of Slokan, consultants preparing

		prescriptions, UBCM CRI Program, FESBC
Objective: To garner community support for wildfire mitigation efforts		
14	<p>Undertake education and outreach with the goal of obtaining community support to implement CWPP recommendations. Consider:</p> <ul style="list-style-type: none"> • Making summaries of this report and associated maps publicly available through web pages, social media, and public FireSmart meetings. This includes posting this CWPP on the RDCK¹ and SIFCo websites². • Integrating this CWPP into existing and proposed FireSmart education and outreach initiatives – at both local and regional levels. • Distribute a CWPP summary package to households through bulk mail or newspaper insert. • Adding wildfire threat spatial data to the RDCK interactive web-map - allowing residents to view the threat of wildfire adjacent to their property. • Creating a position based in the Slocan Valley to implement CWPP recommendations and FireSmart programs. 	RDCK, Village of Slocan, UBCM CRI Program, forest licensees
Objective: To reduce wildfire threat through fuel treatment		
15	<p>Work with licensees (BCTS, Interfor, Kalesnikoff Lumber, SIFCo, Woodlots) and other partners (BC Hydro, Fortis BC, MOTI, and FWCP) to implement fuel treatment as recommended in Table 19. Treatments should increase opportunities for fire suppression, including reducing fuel loads, improving firefighter access and treating areas that are continuous and anchored to strategic locations (such as water bodies, roads, or gravel pits) when possible. Consider funding streams provided by the CRI and Forest Enhancement Society of BC (FESBC).</p>	RDCK, Village of Slocan, forest licensees, utility companies, consultants preparing prescriptions, UBCM CRI Program, FESBC, CBT
16	<p>Continue to monitor previously treated areas and re-treat as required to maintain a moderate or low fire threat.</p>	Forest licensees, RDCK, UBCM CRI Program, FESBC
Objective: To reduce wildfire risk through FireSmart programs		
17	<p>Maintain FireSmart programs throughout Area H and municipalities. Coordinate activities between the RDCK and municipalities to reduce program costs and increase efficiencies.</p>	UBCM CRI Program, RDCK and Village of Slocan
18	<p>Review, select and implement activities from Table 20 as part of an ongoing FireSmart program. Activities include education and outreach, vegetation</p>	UBCM CRI Program, RDCK

¹ <http://www.rdck.ca/EN/main/services/emergency-management/community-wildfire-protection-plans.html>

² <https://www.sifco.ca/>

	management, incorporating FireSmart into community planning and development, and increasing local capacity to defend against interface fires.	and Village of Slocan
19	Explore rebate programs to create incentives for FireSmart on private land. Continue to advance proposal that public funds should be invested in fuel management on private land that forms part of a strategic, landscape level fuel break.	UBCM CRI Program, RDCK and Village of Slocan
20	Maintain sufficient signage at high-use recreational areas and completed fuel treatment sites. Signage should include fire danger ratings, information on fire prevention, emergency contact information, and evacuation procedures on trails. Explore opportunities to work with other agencies to maintain and increase fire prevention signage at trailheads, forestry roads, along the highway, and within communities.	RDCK, Village of Slocan, BCWS, MOTI, BC Parks, Rec Sites and Trails BC, community and recreation groups, UBCM CRI Program
21	Coordinate trail development and maintenance with wildfire mitigation efforts in high-risk areas. Information regarding trail development should be shared with response agencies and incorporated into evacuation and emergency response plans.	RDCK, Village of Slocan, BCWS, BC Parks, Rec Sites and Trails BC, community and recreation groups, UBCM CRI Program
Objective: To improve the efficiency of emergency evacuation, preparedness, and response		
22	Work with the Village of Slocan and Improvement Districts to conduct a water availability assessment that considers: <ul style="list-style-type: none"> • An assessment of water sources, access points, and hydrants/standpipes for fire suppression needs. • A vulnerability assessment of water sources particularly to summer drought conditions and reliance on electrical power. • The identification of settlement areas that may have insufficient or unreliable water supplies. 	Village of Slocan, RDCK, Improvement Districts, fire departments
23	Continue to identify and map alternate water sources for fire suppression. Create designated access points to natural water sources and ensure access points are clear and usable in the event of an emergency. If necessary, seek emergency access permission from landowners. Develop additional alternate and backup water sources as necessary.	RDCK, Village of Slocan, fire departments
24	Develop a detailed evacuation plan for the Village of Slocan and Area H South. A detailed evacuation plan should consider: <ul style="list-style-type: none"> • Maps of evacuation routes, safety zones, marshaling points, and Emergency Support Services Reception Centers. • Designating and communicating pre-determined primary and secondary evacuation routes. • A feasibility review of FSRs as alternate evacuation routes. 	RDCK, Village of Slocan, fire departments, UBCM CRI Program

	<ul style="list-style-type: none"> • Agreements and contact information with local transportation (busses, rotary-wing, and boats). • A communications and traffic control plan to be implemented in the event of an evacuation. • Information on residents who cannot self-evacuate, and current phone lists. • Collaboration with other agencies. This should include working with BC Parks to develop an evacuation plan for the west-side of Slocan Lake and other high-use recreational areas. • Communicating a summary of the plan and the administration framework of the evacuation process to residents to reduce confusion and delay when an evacuation is implemented. 	
25	<p>Explore opportunities to address emergency access and evacuation constraints throughout the AOI. This should include:</p> <ul style="list-style-type: none"> • Connecting dead-end roads and ensuring new developments consider emergency access and evacuation routes. • Communicating access constraints to homeowners and the implications on emergency response. • Exploring opportunities to coordinate with Fortis BC, BC Hydro, and Ministry of Transportation and Infrastructure to create/maintain fuel breaks adjacent to roads, highways, and bridges. 	RDCK, Village of Slocan, fire departments
26	<p>Continue to collect data on firefighting resources. Develop and maintain a wildfire suppression data set for use by BCWS and Fire Departments, including</p> <ul style="list-style-type: none"> • Firefighting resources • Current access roads and trails • Old overgrown roads • Access blockages (washouts, bridge failures) • LiDAR terrain data • Water access points • Critical infrastructure 	RDCK, Village of Slocan, fire departments, UBCM CRI Program
27	<p>Consider installing satellite internet service equipment with generator at fire halls to provide redundant backup communications abilities if conventional communications systems are impacted by wildfire activity.</p>	RDCK, Village of Slocan
28	<p>As part of a FireSmart program, encourage members of the public to develop personal evacuation plans. This may include:</p> <ul style="list-style-type: none"> • Registering with the RDCK's Emergency Notification System • Notifying friends and family of evacuations • Pre-identifying evacuation routes and accommodations outside of the valley • Ensuring vehicles are regularly fueled • Developing a readily available evacuation kit with cash, medication, food, water and other necessities 	UBCM CRI Program , RDCK, Village of Slocan, fire departments

Objective: To increase local capacity to respond to wildfires		
29	Incorporate volunteer firefighter recruitment into FireSmart education and outreach initiatives.	RDCK, Village of Slocan, fire departments, UBCM CRI Program
30	Explore funding opportunities to acquire community fire caddies (small trailer with water tank and pump) and water trucks where there are gaps in fire response coverage. Consider purchasing additional wildland specific firefighting equipment including two-stroke pumps (Wajax Mark 3 or similar) pump kits, and quick connect 1.5" wildland fire hose.	RDCK, Village of Slocan, fire departments, UBCM CRI Program
31	Encourage cross-training between the RDCK Fire Departments and the BCWS. Explore opportunities for: annual mock fire exercises, Fire Operations in the Wildland/Urban Interface (S-215) training, Structure and Site Preparation (S-115) training, ICS, communications, and after action reviews of past interface fires.	RDCK, Village of Slocan, fire departments, BCWS, UBCM CRI Program
32	Offer Basic Fire Suppression and Safety S-100 training for interested community members throughout Area H at a reduced rate or free of charge.	RDCK, Village of Slocan, fire departments, UBCM CRI Program
33	Maintain RDCK SPUs and continue to acquire additional units. Continue SPU deployment training for firefighters and monitor SPU needs.	RDCK
34	Explore opportunities to assist homeowners and community groups to develop their own sprinkler kits. Consider coordinating initiatives with other municipalities and electoral areas to increase cost effectiveness.	RDCK, Village of Slocan, fire departments, UBCM CRI Program

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Appendix 2 – Wildfire Threat Assessment Worksheets and Photos

Appendix 3 – FBP Fuel Type Change Rationale

Acronym Guide

AAC	Annual Allowable Cut
ALR	Agricultural Land Reserve
AOI	Area of Interest
BBC	Bonanza Biodiversity Corridor
BCTS	BC Timber Sales
BCWS	BC Wildfire Service
BEC	Biogeoclimatic Ecosystem Classification
CBT	Columbia Basin Trust
CFFDRS	Canadian Forest Fire Danger Rating System
CI	Critical Infrastructure
CRIP	Community Resiliency Investment Program
CWPP	Community Wildfire Protection Plan
DEM	Digital Elevation Model
ED	Euclidean Distance
EOC	Emergency Operation Centre
ESB	Emergency Services Building
ESSF	Engelmann Spruce Subalpine Fir
FBP	Canadian Forest Fire Behavior Prediction System
FESBC	Forest Enhancement Society of BC
FLNRORD	Forests, Lands, and Natural Resource Operations, and Rural Development
FPPR	Forest Planning and Practices Regulation
FRPA	Forest and Range Practices Act
FSP	Forest Stewardship Plans
FUS	Fire Underwriters Survey
FWCP	Fish and Wildlife Compensation Program
GAR	Government Actions Regulations

HFI	Head Fire Intensity
IA	Initial Attack
ICH	Interior Cedar Hemlock
ICS	Incident Command System
ISI	Initial Spread Index
KBHLP	The Kootenay Boundary Higher Level Plan
LLSWPP	Landscape Level Strategic Wildfire Protection Plan
NACFOR	Nakusp and Area Community Forest
NDT	Natural Disturbance Type
OCP	Official Community Plan
OFC	Office of the Fire Commissioner
OGMA	Old Growth Management Areas
PSTA	Provincial Strategic Threat Analysis
RDCK	Regional District of Central Kootenay
SIFCo	Slocan Integral Forestry Cooperative
SPP	Structural Protection Program
SPU	Structure Protection Unit
SWPI	Strategic Wildfire Prevention Initiative
TFL	Tree Farm Licence
TSA	Timber Supply Area
UBCM	Union of BC Municipalities
WDPA	Wildfire Development Permit Area
WTA	Wildfire Threat Assessment
WUI	Wildland Urban Interface

SECTION 1: Introduction

The 2017 and 2018 wildfire seasons were among the most devastating in British Columbia's history. In 2018, over 1.3 million hectares were burned - costing the province over \$350 million in direct suppression costs (Judd, 2018). Similarly, 2017 resulted in an estimated 1.2 million hectares burned and the displacement of roughly 65,000 people during the fire season (BC Wildfire Service, 2017). The unprecedented amount of fire activity resulted in a province-wide state of emergency lasting 70 days.

Both the 2017 and the 2018 fire seasons re-emphasized the need for communities to develop and implement Community Wildfire Protection Plans - a recommendation that first came to light in 2003. The 2003 fire season was extremely destructive - destroying over 334 houses and costing nearly \$700 million (Filmon, 2004). Firestorm 2003 – an extensive review of BC's wildfire preparedness, response, and planning process – was conducted shortly after the 2003 fire season. The Firestorm report highlighted the need for communities to undertake wildfire planning, prevention, and mitigation efforts.

In order to assist with such initiatives, Community Wildfire Protection Plans (CWPPs) have emerged as an important tool for communities wishing to reduce their wildfire risk. The purpose of a CWPP is to identify and evaluate high fire hazard areas, values at risk, and the possible consequences of a wildfire in and around the community. CWPPs also provide recommended actions to mitigate the fire hazard and reduce wildfire risk facing the community.

1.1 Purpose

In 2007, the Regional District of Central Kootenay (RDCK) retained B.A Blackwell and Associates to complete seven CWPPs for the communities of the Slokan Valley (including Crescent Valley, New Denver, Passmore, Silverton, Slokan, and Winlaw). Since the release of the 2008 reports, there have been significant changes to the landscape, the methods in which wildfire risk is assessed, and the CWPP reporting standards. In 2018, the process of updating the CWPPs for the Slokan Valley began. The Slokan Integral Forestry Cooperative (SIFCo) was retained on behalf of the RDCK to develop two new CWPPs– one for the North Slokan Valley (Electoral Area H North), and one for the South Slokan Valley (Electoral Area H South). The objectives of these reports are to:

1. To reassess the threat of wildfire facing the communities; including life, property, critical infrastructure, and high value areas.
2. To identify, evaluate, and recommend measures to effectively mitigate the risk of wildfire facing the communities.

The two complementary CWPPs for the Slokan Valley aim to facilitate a unified approach towards fire management and planning in the region. The recommendations made in the CWPPs intend to reduce the likelihood of a wildfire entering the community; reduce impacts and losses to property, critical infrastructure, and values; and reduce negative economic and social impacts to the community as a result of a wildfire (SWPI, 2018).

1.2 CWPP Planning Process

The CWPPs for Electoral Area H were developed using the Strategic Wildfire Prevention Initiative (SWPI) 2017 CWPP Template. CWPPs were developed in consultation with the RDCK, the Villages of New Denver, Silverton, and Slocan - following a six-stage planning process:

1.) Information Sharing

Community meetings were held in Silverton, Winlaw, and Slocan Park in the spring of 2018. During the meetings, community members were provided with a description of the CWPP process, the purpose of the CWPP update, and were invited to respond with questions, concerns, and feedback.

An open house display was set up at the Crescent Valley Fire Hall during the May 4, 2019 fire hall open house. The CWPP recommendations and FireSmart principles were discussed with interested community members.

Information packages were also sent to 17 First Nation groups³:

- Adams Lake Indian Band
- Akisqnuq First Nation
- Columbia Shuswap Regional District
- Ktunaxa Nation Council
- Lower Kootenay Band
- Lower Similkameen Indian Band
- Neskonlith Indian Band
- Okanagan Indian Band
- Okanagan Nation Alliance
- Osoyoos Indian Band
- Penticton Indian Band
- Shuswap Indian Band
- Splatsin First Nation
- St. Mary's Indian Band
- Tobacco Plains Indian Band
- Upper Nicola Indian Band
- Westbank First Nation

2.) Consultation with Stakeholders and Experts

In February 2018, meetings were held with the five fire departments located in the Slocan Valley. Fire chiefs were asked to provide information on firefighting resources and equipment, and express any concerns regarding wildfire risk in their local communities. Additional consultation with the RDCK, BC Wildfire Service (BCWS), municipalities, and local fire departments was on-going throughout the CWPP development.

3.) Review of Existing Plans, Reports and Spatial Data

Extensive background research set the context for the CWPP and study areas. Relevant plans, legislation, and reports were reviewed to ensure compatibility. Spatial data including the provincial fuel type data and Provincial Strategic Threat Analysis (PSTA) data were thoroughly reviewed. Spatial data pertaining to cultural, social, ecological, and economic values; as well as critical infrastructure data was also reviewed and updated as part of the CWPP development.

³ The AOI was assessed using the provincial Consultative Areas Database to determine First Nations with potential Aboriginal Interests in the area.

4.) Field Review and Site Assessments

Field assessments were conducted in the summer of 2018 and early spring of 2019. Two-hundred and forth seven Wildfire Threat Assessment plots were conducted throughout the entire Slocan Valley - primarily on high-threat areas determined by the PSTA data and local expertise.

5.) Local Wildfire Threat Calculation and Mitigation Strategy Development

Wildfire threat was determined following the 2013 Threat Assessment Process using a combination of field assessments and GIS analysis. Spatial analysis, stakeholder and expert consultation, and local knowledge were used to prioritize and recommend actions to mitigate the wildfire risk.

6.) CWPP Review and Finalization

A draft CWPP was reviewed by Regional District staff. Comments and feedback were considered and the CWPP draft was updated prior to finalization.

SECTION 2: Local Area Description

The Slocan Valley is located in the West Kootenay Region of BC. The valley is bordered by the Valhalla Mountain Range - to the west - and the Selkirk Mountain Range - to the east. In the center of the valley, Slocan Lake feeds into the Slocan River - which runs south into the Kootenay River. The incorporated Villages of New Denver, Silverton, and Slocan are the three municipalities in the valley and are located along the shore of Slocan Lake. Eighteen unincorporated communities are also found throughout the valley and form the RDCK's Electoral Area H.

Together, the three municipalities of New Denver, Silverton and Slocan and the rural communities of Area H form the Area of Interest (AOI) for the 2019 CWPPs for the Slocan Valley.

Area H is bordered by the RDCK Electoral Area D to the north east, Area F to the south east, Area I to the south, Area J to the south west, and Area K to the north-west.

2.1 CWPP Area of Interest

Due to the large geographic area, diversity of ecosystems, and abundance of communities throughout the Slocan Valley, two CWPPs were developed in 2019 - Area H North, and Area H South.

The area of interest for Area H South builds off the previously completed CWPP study areas - further expanded to include nearby communities in the region, new infrastructure development, and other high-value areas. The AOI was derived using a 2km buffer around communities with a minimum density of 6 structures per square kilometer. This buffer is known as the Wildland Urban Interface (WUI) and is defined as the area "where combustible wildland fuels are found adjacent to homes, farm structures, and other outbuildings" (Partners in Protection, 2003). The AOI was reviewed to ensure that the majority of community and domestic watersheds in the area were included in the CWPP.

The Area H South CWPP includes the Village of Slocan, and the unincorporated communities of Appledale, Brandon, Crescent Valley, Krestova, Lemon Creek, New Settlement, Passmore, Perry Siding, Playmor Junction, Slocan Park, South Slocan, Vallican, and Winlaw (Figure 1 – CWPP Area of Interest). The AOI encompasses a total area of 35,852 hectares - including municipal, regional, private, Crown land and provincial parks (Table 2).

Table 2: AOI Land Ownership/Status

Ownership/Status	Area (hectares)	Percent of total AOI
Crown Federal	11.1	< 1%
Crown Provincial (outside of parks)	22,174.5	62%
Crown Provincial Parks	1,542.5	4%
Municipal	136.6	< 1%
Private	10,932.6	30%
Water	1,142.5	3%
Total:	35,939.8	

2.2 Community Description

The Slokan Valley has a rich history dating back thousands of years. The Sinixt Nation and the Ktunaxa Nation were among the original inhabitants of the area, while European settlement of the valley did not occur until fairly recently (RDCK, 2009). The discovery of silver and lead ore deposits in the 1890's brought waves of settlers to the Kootenays; particularly to the Slokan Valley. In order to support the mining boom, railways, trails, and steam ships were constructed - connecting communities throughout the region. Doukhobors from Russia immigrated to the valley in the early 1900's focusing on agriculture and forestry. By 1910, mining in the valley had decreased substantially forcing many communities to also turn to forestry and agriculture. Evidence of the once prosperous mining towns that were unable to adapt remain as ghost towns throughout the valley. In the 1940's Japanese Canadians were forced by the government to live in internment camps located in Lemon Creek, Slokan, New Denver, Sandon, and Rosebery during World War Two. Once the war ended, some of the Japanese Canadians remained in the valley. The 1960's and 70's, brought on a wave of young immigrants from the United States looking to escape the Vietnam War. Today, the Slokan Valley is composed of a diversity of residents as a result of its rich and colourful history.

There are three municipalities located the Slokan Valley - New Denver, Silvertown, and Slokan - which provide services including: road and sidewalk services, water services, cemetery services, and parks and recreational facilities. Curbside solid waste services are available in New Denver and Slokan. The RDCK maintains waste transfer stations in Rosebery and Slokan, as well as recycling stations in all three villages, Winlaw and Crescent Valley.

The Village of Slokan is located at the southern end of Slokan Lake along Highway 6. It is the second largest municipality in the Slokan Valley, covering 0.92 km² with a population of roughly 272 residents (Stats Canada, 2016). Services in Slokan include a medical clinic and fire rescue services provided by the RDCK Slokan Volunteer Fire Department.

It is important to recognize the communities and essential services available in Area H north that may be relied upon in the event of a wildfire in the south Slokan Valley. Silvertown is located 28 km north of Slokan Village on Highway 6. The village is home to 195 residents and covers an approximate area of

0.63 km² (Stats Canada, 2016). The Village of New Denver is located 5km north of Silverton - at the intersection of Highway 6 and Highway 31A. The municipality is 1.4 km² in size and home to roughly 473 residents (Stats Canada, 2016). Wildfire threat assessments and recommendations for the Villages New Denver and Silverton are included in the 2019 CWPP for Area H North.

New Denver, Silverton, and Slocan are three of the nine member municipalities of the RDCK. The remaining unincorporated communities of the Slocan Valley are part of the RDCK Electoral Area H - one of the eleven electoral areas of the regional district. Area H covers 3,291 km² and is home to roughly 4,667 residents (Stats Canada, 2016). As the local government for Area H, the RDCK provides a number of services throughout the central Kootenays – servicing a population of nearly 60,000 people. Services provided by the RDCK can vary from a local to a regional level and are determined by the regional board with approval of the electors (RDCK, 2016). Services include emergency management, fire rescue, wildfire mitigation, waste and recycling, and water services.

Highway 6 runs down the center of the Slocan Valley and provides the main access route for the communities in the area. Outside of the AOI, the Village of Nakusp is located 15 km from Summit Lake - north on Highway 6. At the southern entrance to the valley - at Playmor Junction - Highway 6 continues east to Nelson (20 km), while Castlegar is located 22 km south on Highway 3A. The Slocan Valley can also be accessed by Highway 31A which connects New Denver to the Village of Kaslo (46 km east).

Forestry is a major economic driver in the Slocan Valley. The AOI is part of the Selkirk Natural Resource District, and located within parts of the Arrow Timber Supply Area (TSA) - which has an Annual Allowable Cut (AAC) of 500,000 m³ (Nicholls, 2017). The AOI includes licensee operating areas for Kalesnikoff Lumber Co Ltd. and BC Timber Sales (BCTS); as well as land not within the timber harvesting land base. There several area based forest tenures within the AOI including four woodlot licenses, and a Tree Farm Licence (TFL 3) held by International Forest Products (Interfor). The Slocan Integral Forestry Cooperative holds a community forest agreement K2R in the central valley and operates as an incorporated non-profit cooperative.

The valley is rich in arts, culture, and picturesque scenery – attracting tourists from the Pacific Northwest and from further afield. Visitors and locals alike enjoy the diversity of hiking, mountain biking, horseback riding, locally grown fruits and vegetables, and artisan crafts which can be found throughout the valley.

2.3 Past Wildfires, Evacuations and Impacts

There are records of several large wildfires throughout the valley - particularly near Summit Lake and the Village of Slocan in the early 1900's. Recent wildfires of note within the Slocan Valley include:

- 2007 Springer Creek Fire burned roughly 3,000 hectares along Highway 6 between Slocan and Enterprise Creek, 10 km south of Silverton. The fire resulted in an Evacuation Order and Alerts, closed Highway 6, and prompted the RDCK to declare a local state of emergency from August 1-6th.
- 2013 Perry Ridge Fire (64.5 hectares), 4.5 km west of Winlaw. On July 26, a tanker truck carrying aviation fuel to support firefighting efforts related to this fire rolled into Lemon Creek, spilling approximately 35,000 litres of Jet A1 fuel. The spill resulted in the evacuation of roughly 2,500 people. Evacuees were directed to Castlegar, Nelson and Slocan.

- 2014 Slocan Park Fire (90 hectares), 2 km north of Highway 6 near Slocan Park. The fire resulted in an Evacuation Alert for Slocan Park and Crescent Valley.
- 2015 Mt Aylwin Fire (roughly 5 hectares) near Silverton led to an Evacuation Alert for several homes between Enterprise Creek and Red Mountain Road.
- Although not within the Slocan Valley, the 2007 Arrow-Penstock fire near the community of Needles (Area K) damaged power infrastructure cutting-off electricity to the communities of Nakusp, New Denver, Silverton, and residents along Red Mountain Road and on the north side of Enterprise Creek Road. The power outage lasted approximately 1.5 days forcing communities to rely on back-up power generators.

The 2017 and 2018 wildfire seasons in the South East Fire Centre resulted in several interface fires prompting evacuations throughout the Kootenay region. However there were no major interface fires of note within the AOI.

2.4 Current Community Engagement

There have been several initiatives aimed at mitigating the risk of wildfire in the region including previous CWPP development, operational fuel management, and FireSmart programs. Many of these activities are the result of collaborative efforts between the RDCK; the municipalities of New Denver, Silverton, and Slocan; the BCWS, and SIFCo.

2008 CWPPs⁴

Previous CWPPs for the Slocan Valley were completed in 2008. The seven reports provided recommendations aimed at reducing the threat and consequence of wildfire in the villages of Silverton and Slocan; the communities of Crescent Valley, Passmore, and Winlaw; and the fire protection districts of New Denver/Silverton, and Slocan. Recommendations included reducing forest fuels in high-hazard areas, adopting a FireSmart program, and improving emergency response procedures and policies.

Fuel Treatment

Since the release of the 2008 CWPPs, roughly 644 hectares of forest have been treated within the valley, 247 hectares of which are within the Area H South AOI (see Table 3). Notable treatments include a 60 hectare prescribed burn completed in the spring of 2018 near Winlaw. The objective of the burn was to rejuvenate shrub, herb and grass layers, enhance winter habitat for mule deer and elk, create an open forest habitat, and reduce forest fuel loading. The joint efforts between SIFCo and the BCWS resulted in a successful prescribed burn, which will help facilitate future prescribed burn projects throughout the valley.

In the north Slocan Valley, a 216 hectare landscape-level fuel break was completed in 2018 around the communities of Silverton and Red Mountain - along Hewitt Mine Road. The 8 year-long project is an example of a continuous, landscape-level fuel break, strategically located to defend communities from an approaching wildfire.

⁴ <http://www.rdck.ca/EN/main/services/emergency-management/community-wildfire-protection-plans.html>

Previous habitat enhancement projects in the West Kootenays completed by the BC Fish and Wildlife Compensation Program (FWCP) historically included burning. There is an opportunity to work with the FWCP to plan future projects in order to meet habitat enhancement and wildfire hazard reduction objectives in the region.

Table 3: Area H South Completed Fuel Treatments

Year	Location	Treatment Area (hectares)	Treated By
2009	Winlaw	14.4	SIFCo
	Lemon Creek	35.3	SIFCo
2010	Slocan	14.0	RDCK
2013	Winlaw	9.9	SIFCo
2015	Winlaw	8.3	SIFCo
	Slocan	34.4	SIFCo
	Crescent Valley	14.6	RDCK
2017	Winlaw	61.4	SIFCo
	Lemon Creek	34.9	SIFCo
2018	Lemon Creek	9.0	SIFCo
2019	Slocan	10.1	SIFCo
TOTAL		246.5	

FireSmart

FireSmart is a national initiative intended to promote wildfire mitigation efforts within and near the wildland urban interface. Through the use of education and outreach, FireSmart provides homeowners and community members with the knowledge needed to reduce the fire hazard in their community. The 2008 CWPPs made a number of recommendations to establish FireSmart programs throughout the valley. The RDCK has adopted several of these recommendations with funding provided by the Union of BC Municipalities Community Resiliency Investment Program (CRI). Additional information regarding FireSmart initiatives are described in Section 5.2 - FireSmart Planning & Activities.

Other Community Engagement

In the summer of 2018, SIFCo and FLNRORD hosted a Wildfire and Climate Change conference in Nelson. Wildfire and climate change experts, as well as forest and emergency management professionals, explained how communities and individuals can participate in wildfire risk reduction. A “Call to Action” was developed providing the over 220 delegates in attendance with recommended actions to help address the wildfire risk in the Kootenay region.

Other community engagement initiatives in the valley include:

- The SIFCo webpage which promotes Fire Smart and wildfire principles and that hosts a series of videos, interviews and presentations in support of wildfire mitigation etc. www.sifco.ca
- The RDCK webpage which promote FireSmart and wildfire mitigation principles.
- The Wildfire Conference website that hosts a series of recorded presentations: www.kootenaywildfire.ca
- The RDCK's Emergency Alert Notification System which sends emergency notifications through text or voice call to registered individuals.
- Educational signage posted by SIFCo at completed fuel treatment sites throughout the valley.

Additional details on community engagement – including recommended actions – have been included in section 5.3 - Community Communication and Education; and Table 20 - Recommended FireSmart Practices and Activities.

2.5 Linkages to Other Plans and Policies

Effective wildfire response, prevention, and emergency planning requires collaboration between multiple agencies and partners. Interface fires can span several jurisdictions and cross political and administrative boundaries. In order to ensure compatibility with current plans, policies, and practices, existing documents were reviewed as part of the CWPP process. Relevant plans and policies have been summarized below for reference.

2.5.1 Local Authority Emergency Plan

The RDCK's 2016 Emergency Response and Recovery Plan outlines policies and procedures to be implemented in the event of an emergency⁵. The Emergency Response and Recovery Plan applies to all RDCK electoral areas and partnering municipalities – including the villages of Slocan, Silverton and New Denver. The plan contains several sections relevant to an interface fire, including:

- *Section 2:* Provides the structure for establishing an Emergency Operation Centre (EOC). The RDCK manages a two-tiered EOC system consisting of a Local Area Emergency Operations Centre (LAEOC), and a Regional Emergency Operations Centre (REOC). EOCs typically assist with coordinating multiple agencies, providing media releases, and managing evacuees.
- *Section 3.10:* Provides the following policies to be implemented in the event of an interface fire:
 - Interface fires will be managed using unified command with the BCWS and local fire departments.
 - The RDCK EOC will coordinate response of interface fire areas not covered by a fire department.
 - The need for evacuation will be determined with the BCWS and/or the Office of the Fire Commissioner.
 - The RDCK will support the evacuation of the public.
 - The RDCK will support evacuation of livestock with the Ministry of Agriculture.

⁵ RDCK. 2016. Emergency Response and Recovery Plan. Retrieved from <http://www.rdck.ca/EN/main/services/emergency-management.html>

- The RDCK will prepare evacuation documents, including the Local State of Emergency.
- *Section 4:* The RDCK will consider population density, evacuation routes, terrain, and urgency when formulating an evacuation plan. The RDCK has predetermined Emergency Support Services Reception Centres that will be activated based on:
 - Proximity to a localized emergency
 - Travel routes from a localized emergency
 - Safety of the area
 - Number of people evacuated

The RDCK Emergency Response and Recovery Plan also includes sections regarding critical infrastructure failure, structural/industrial fires, severe weather, utility failure, and recovery planning - all of which may become relevant in the event of an interface fire.

Currently, all RDCK emergency plans are being updated - including the 2016 Emergency Response and Recovery Plan. The RDCK intends to secure funding to update evacuation plans and create wildfire pre-plans (Personal Communication, RDCK Wildfire Mitigation Coordinator Nora Hannon 2018). Data pertaining to critical infrastructure, water sources, and evacuation routes is also currently being collected by the RDCK. This information can be integrated into the EOC web-map and is a valuable resource for emergency response efforts in the event of an interface fire or evacuation.

Recommendations intended to improve the efficiency of emergency evacuation, preparedness, and response have been included in Section 6.3 - Recommendations for Wildfire Response and Resources.

2.5.2 Affiliated CWPPs

Affiliated CWPPs include the recently updated CWPPs for RDCK Area D, F, K, and I – all of which border Area H. The RDCK is also currently updating the Area J CWPP.

The 2016 CWPP for Area I proposed fuel treatment along the Area I/H border, south-east of New Settlement. The identified treatment polygon IDs are “Sent-1” (131ha) and “Sent-2” (89ha) as outlined in the 2016 Area I CWPP (Cathro & Blackwell, 2016). The Sent-2 area is within RDCK Area H, and is also proposed for treatment in this CWPP.

The 2019 CWPP for Area H North contains information on firefighting resources, critical infrastructure, and recommendations to mitigate the fire risk in the north Slokan Valley. When planning FireSmart and fuel management activities, efforts should be coordinated between Area H North and South to improve operational efficiencies and reduce costs. It is recommended that all CWPPs be updated every 7 years.

2.5.3 Local Government and First Nation Plans and Policies

Regional or municipal government policies and First Nation government policies can be effective tools to mitigate wildfire risk in the community. The following relevant local government plans and policies have been summarized as part of the CWPP process. All the community plans reviewed have identified wildfire as a potential hazard threatening the community.

Village of Slocan Official Community Plan - Bylaw No. 616, 2011

The Village of Slocan Official Community Plan (OCP) identifies the importance of wildfire mitigation as outlined in the following sections:

- *Section 6.2.14:* Encourages FireSmart standards for new residential development in wildland urban interface areas.
- *Section 5.1.3:* Encourages public agencies and the public to minimize interface fire hazard.
- *Section 12.2.6:* States that it is a policy of council to participate with the RDCK and Electoral Area H in mutually beneficial, cost effective development of regional services - including emergency response and fire protection.

Additional Applicable Plans and Bylaws

- Village of Slocan Emergency Measures Bylaw No. 624, 2012: Enables the establishment and maintenance an emergency management organization to develop and implement emergency plans; to prepare for, respond to and recover from emergencies and disasters.
- Regional District of Central Kootenay Emergency Management Regulatory Bylaw No. 2210, 2011: Enables the establishment and maintenance of an emergency management framework for the RDCK.
- Regional District of Central Kootenay Emergency Program Management Plan: Provides details regarding emergency program structure, jurisdiction, mitigation and response.
- Regional District of Central Kootenay Fire Services Bylaw No. 2170, 2010: Provides for the operation and regulation of Volunteer Fire Departments for RDCK Fire Protection Services.
- Regional District of Central Kootenay Overall Automatic Aid Agreement Bylaw No. 2367, 2013: authorizes the RDCK to enter into an “Automatic Aid Agreement” to include all Regional District Fire Departments.
- Regional District of Central Kootenay Water Bylaw No. 2470, 2015: Regulates water use, ownership and access.
- Regional District of Central Kootenay Park Regulation Bylaw No. 2173, 2011: Regulates the use of parks within all electoral areas of the RDCK, and within all Regional Parks within municipal boundaries under the jurisdiction of the RDCK. Regulations include the lighting, fuelling or making use of fire within parks.

2.5.4 Higher Level Plans and Relevant Legislation

The Kootenay Boundary Higher Level Plan Order (KBHLPO)

The Kootenay Boundary Higher Level Plan Order establishes resource management zones and objectives in the region. The Slocan Valley is located within the Arrow Resource Management Zone. The KBHLPO contains legally binding objectives for biodiversity emphasis areas, old and mature forests, caribou, green-up, grizzly bear and connectivity corridors, consumptive use streams, fire maintained ecosystems, enhanced resource development zones, visuals, and social and economic stability.

Relevant Legislation and Regulations

The AOI encompasses a variety of land classifications and ownership. As communities plan to undertake wildfire mitigation actions, relevant legislation and regulations must be considered. The following list includes some of the main pieces of the legislation and regulations that may come into effect while planning to undertake fuel management and FireSmart activities:

- *Environmental Management Act and Open Burning Smoke Control Regulation*: Governs disposal of waste into the environment; sets regulations for open burning and smoke management.
- *Forest Act*: Establishes forms of tenure and authorizations that grant legal rights to harvest or damage Crown timber and to construct access roads, and establishes provisions for billing for Crown timber.
- *Forest and Range Practices Act and Forest Planning and Practices Regulation*: Governs and regulates forest practices on provincial Crown land. Provides for the protection of 11 resource values including: biodiversity, cultural heritage, fish/riparian, forage and associated plant communities, recreation, resource features, soils, timber, visual quality, water quality, and wildlife.
- *Forest and Range Practices Act and Woodlot Licence Planning and Practices Regulation*: Governs and regulates forest practices on provincial land within Woodlot Licences. Content similar to Forest Planning and Practices Regulation.
- *Government Actions Regulations (GAR)*: Provides for the establishment of land designations and identification of resource features that require special management, such as ungulate winter range, wildlife habitat areas, and critical habitat for fish. GAR orders within the AOI replace some of the objectives set by the KBHLPO - particularly those objectives for caribou and visual quality objectives. Some objectives set within FPPR have also been replaced by GAR orders, specifically regarding ungulate winter range.
- *Land Act*: Provides for the establishment of orders regarding the use and management of Crown resources and land.
- *Local Government Act*: Enables local governments to designate areas for protection from hazardous conditions, including the establishment of wildfire development permit areas (WDPA). Within these areas, requirements for the use of fire resistant building materials, fuel hazards mitigation, fire hydrant locations, and emergency access and evacuation can be established (Forest Practices Board, 2015).
- *Park Act*: Governs the protection, management, and use of parks; including the regulation of lighting, fuelling or making use of fire within parks.
- *Wildfire Act and Wildfire Regulation*: Governs the prevention and suppression of wildfires in the province. Provides obligations and responsibilities regarding fire use, prevention, control and rehabilitation.

2.5.5 Ministry or Industry Plans

Under the Forest and Range Practices Act, all forest licence and agreement holders must prepare a Forest Stewardship Plan (FSP) or a Woodlot Licence Plan. Kalesnikoff Lumber and SIFCo have WUI stocking standards in their approved FSPs which include reduced stocking densities and

deciduous/less-flammable preferred and acceptable species (Kalesnikoff Lumber, 2017; SIFCo, 2017). The Selkirk Resource District (SRD) has recently approved similar fire management / WUI stocking standards which can be used by any agreement holder in an operational plan.

The Selkirk Resource District has a Fire Management Plan in place and there are plans to update this document over the next several years.

Other relevant plans in the AOI include:

2017 Landscape Level Strategic Wildfire Protection Plan (LLSWPP)

SIFCo's recently developed Landscape Level Strategic Wildfire Protection Plan (LLSWPP) provides an innovative approach to wildfire management throughout Community Forest Agreement K2R on the east slopes of the Slocan valley. The 2017 LLSWPP utilised fire modelling technology (FlamMap 5) to examine potential fire behaviour and spread direction in the valley. Applying this information, the LLSWPP recommends locations for strategic landscape-level fuel breaks and fuel treatment sites within the WUI. The plan "identifies locations where it is desirable and feasible to create a strategic fuel break, considering: major fire path locations, vegetation and fuel types, terrain and slope, access (potential and existing), forestry staff local knowledge, and land ownership." The LLSWPP also includes a guide of the five main types of fuel treatment including: Wildland Urban Interface Fuel Management (Type 1); Post-Harvest Fuel Management (Type 2); Machine Based Interface Cleanup (Type 3); Fuel Management for Habitat Restoration and Ecosystem Resiliency (Type 4); and Wildland-Urban Interface Re-Treatment (Type 5). The LLSWPP complements the CWPPs for Area H North and South and should be referenced - along with the CWPPs - when planning fuel treatment in the WUI.

SIFCo 2007 Landscape Level Plan (LLP,) and 2011 Management Plan

The LLP contains maps of terrain stability, ecologically sensitive and protected areas, and economically inaccessible areas within the community forest K2R tenure area. The LLP was developed through a combination of aerial imagery interpretation, field work, and pre-existing map data sets. SIFCo's Management Plan identifies fire hazard reduction and fire interface sites as a priority for harvesting within the CFA.

2012 Valhalla Park Management Plan

Valhalla Park is located on the western shore of Slocan Lake. It encompasses most of the Valhalla Range of the Selkirk Mountains and covers a total of 50,060 hectares. No roads reach the park landbase. Access to the park is by water, or by forest road and then hiking trail. The management plan for the park recognises the importance of wildfire on the landscape and states that: "natural processes such as wildfire, disease and insect infestation must be incorporated into management for the park."

It is a high priority to develop a pro-active fire management plan for Valhalla Park. According to the park management plan, an appropriate fire management plan should:

- Prescribe conditions in which lightning caused fires can be allowed to burn in the park.
- Identify and protect recreational and scenic values.
- Encourage cooperation with communities and private property owners to ensure fire safe practices are followed within and near the park's boundaries.

- Encourage permitting agencies to require proposed developments adjacent to the park assess fire hazards and risks.
- Coordinate with appropriate agencies to set thresholds for the atmospheric conditions, the cumulative smoke level in the Slocan Valley, and the duration of smoke emissions from fires, and suppress fires in the park if thresholds are exceeded.
- Use ecologically acceptable methods of vegetation management and firefighting.
- Align with wildfire response directions on the Ministry of Environment’s Wildfire Response intranet page and be shared with wildfire responders.
- Allow burned areas to recover naturally.

The wildfire threat within Valhalla Park was not assessed as part of this CWPP. A large fire in the park has the potential to affect communities and residents of Area H, as well as recreational and backcountry users. Based on historical reports from the 1920’s, current high fuel loads, and observed fire behaviour in extreme fire weather conditions, a large fire in the park could affect communities on the east side of the lake. A comprehensive fire management plan for Valhalla Park would assess and mitigate the risk of a wildfire in the park, as well as a fire starting in the park and spreading to nearby values.

2.6 Recommendations for Wildfire Planning, Policies, and Coordination

Table 4 includes recommendations intended to incorporate wildfire risks into in local government policies and plans. Recommendations are also provided to increase the efficiency of wildfire mitigation efforts through coordination with multiple agencies, organizations, and stakeholders.

Table 4: Wildfire Planning, Policies, and Coordination Recommendations

Number	Recommendation
Objective: To incorporate wildfire risks into local government policies, bylaws and plans	
1	<p>Ensure that existing and future planning documents, policies and bylaws consider wildfire risks, evacuation routes, and emergency response. This includes:</p> <ul style="list-style-type: none"> • Reviewing the OCP and bylaws to evaluate their effectiveness at mitigating wildfire risks. • Exploring the use of Development Permit Areas requiring FireSmart landscaping practices, fire-resistant external construction materials, and vegetation/debris management in high fire hazard areas. • Exploring the use of a RDCK outdoor burning bylaw to restrict burning during high fire hazard. • Continuing current efforts to update and develop emergency planning documents - including emergency evacuation plans.
2	<p>Consider undertaking additional landscape-level wildfire planning for areas outside of the WUI. A comprehensive landscape-level wildfire plan should complement existing CWPPs, evaluate wildfire threat, and identify strategic areas for fuel treatment outside of the WUI.</p>
3	<p>Review progress on fire mitigation efforts and update wildfire planning documents and CWPPs every 7 years.</p>
Objective: To increase wildfire mitigation efficiency through collaborative efforts	
4	<p>Establish a Wildfire Preparedness Working Group for the Slocan Valley. The group should work to identify wildfire related issues, resource deficiencies, and opportunities for improvement. Potential Working Group representatives may include the RDCK, fire departments, licensees (Interfor, Kalesnikoff, SIFCo, NACFOR, BCTS and Woodlots); utilities (BC Hydro and Fortis); municipalities (New Denver, Silverton, Slocan); and government agencies (BC Parks, BCWS, MOTI, and FWCP).</p>
5	<p>Coordinate wildfire risk mitigation efforts with other agencies, organizations, and across Electoral Area boundaries. Coordinate mitigation efforts around New Settlement, Playmor Junction, South Slocan, Valhalla Park, and along highway right-of-ways.</p>

SECTION 3: Values at Risk

Values at risk (VAR) are human or natural resources including human life, property, critical infrastructure and high environmental and cultural values that may be impacted by wildfire and or by fuel treatments. In terms of wildfire response, the BCWS prioritizes the following values in descending order⁶:

1. Human Life and Safety

- Evacuation
- Emergency protection of occupied interface areas, evacuation travel corridors, and other occupied sites

2. Property

- Infrastructure or assets important to public health and safety
- Concentrated areas of residences and infrastructure facing imminent threat
- Dispersed residences and associated infrastructure facing imminent threat
- Communities or rural residences where threat is greater than 3 days away
- Other public infrastructure, including park facilities
- Infrastructure, installations or assets covered by client agreements
- Other private and commercial property

3. High Environmental Values or Cultural Values

- Community watersheds / drinking water catchment areas
- Critical habitat of known and identified species at risk

4. Resource Values

- Active resource extraction sites or timber harvesting and silviculture investment areas
- Timber covered by a client protection agreement
- Other commercially valuable timber
- Areas identified as a priority in BC Parks Fire Response Plans
- Other forest resource values
- Agricultural values

The following sections outline key values at risk within the AOI. VAR data was updated as part of the CWPP process and included in Appendix 1, Map 2 – Values at Risk.

⁶ Province of British Columbia. (2016). Provincial Coordination Plan for Wildland Urban Interface Fires. Victoria.

3.1 Human Life and Safety

In the event of an interface fire, the first priority is human life and safety - including the evacuation of at-risk areas. Safe egress requires coordination, planning, and time. Evacuation routes can be blocked by the fire itself, downed trees and power lines, and/or traffic congestion or accidents.

Most communities within the AOI are located along Highway 6. Population clusters can be divided into four general areas:

1. Village of Slocan and community of Brandon.
2. Lemon Creek / Perry Siding / Appledale / Winlaw. Significant population clusters occur on both sides of the Slocan River from Perry Siding to south of Winlaw.
3. Vallican / Passmore / Slocan Park. Significant population clusters occur on both sides of the Slocan River.
4. South Valley. This area contains most of the population of RDCK H, in smaller communities including Krestova, New Settlement, Crescent Valley, Playmor Junction and South Slocan.

To account for recent developments, structure data, structure density, and the WUI were all updated during the CWPP development.

Other high-use areas during the fire season include campgrounds, recreation sites, and tourism areas within the AOI. Notable areas include Springer Creek Campground (Slocan Village); Valhalla Park; Winlaw Regional and Nature Park; Cooley Lake Rec Site and Goose Creek Road (lookout); Crescent Valley Beach Regional Park; and the Slocan Valley Rail Trail - which provides 50 km of non-motorized recreation use between the Village of Slocan and South Slocan.

3.2 Critical Infrastructure

Emergency Management B.C. defines critical infrastructure as “any physical resources, service and information technology facilities, networks and assets which, if disrupted or destroyed, would have a serious impact on the operation of an organization, sector, region or government.”

Appendix 1, Map 2 (Values at Risk) shows the critical infrastructure in the AOI. Critical infrastructure is categorized into one or more of the following types:

- Electrical power;
- Communications;
- Transportation;
- Emergency services;
- Water and sewage; and
- Hazardous materials.

3.2.1 Electrical Power

Communities are serviced by overhead powerlines maintained by Fortis BC. The powerline system originates near the community of South Slocan and spans roughly 50 km to reach the Village of Slocan. Both local and remote fires have the ability to cause a power outage in the AOI. Current back-up power sources in the AOI include generators located at some water systems including Slocan and Slocan Park⁷ and at some private businesses and homes.

The majority of power poles in the AOI are woods, and are susceptible to damage from a wildfire and from strong-wind events. Downed power lines have the potential to ignite fires, block vehicle access and egress, and cut-off electricity to critical infrastructure in the AOI. Downed power lines can also threaten first responder safety and delay fire suppression efforts in the event that crews must wait until power lines are deactivated before engaging a fire.

BC Hydro maintains a 500 kv transmission line using metal lattice towers running through the AOI from South Slocan to the community of Needles in RDCK Area K.

3.2.2 Communications, Pipelines and Public Buildings

Rapid and effective initial attack relies on the public, industry, and aircraft to report wildfires as soon as possible. Depending on weather and fuel conditions, minor delays in wildfire reporting can result in initial attack failure.

Poor mobile phone coverage throughout the valley is a major concern for emergency response and wildfire reporting. It is not possible to report an observed wildfire from many locations. The limited mobile coverage is also susceptible to systems outage due to fire caused damage to cellular towers or power supplies to cellular towers.

Landline phone systems are supported by wooden poles, and may share poles with the electrical power distribution system. Landline communications can be cut by fire and wind damage.

Communications infrastructure in the AOI is shown in Appendix 1, Map 2 – Values at Risk.

Schools, arenas and halls can serve as potential evacuation centres in the event of an emergency. Within the AOI, these include – but are not limited to - W.E Graham Community School in the Village of Slocan; Winlaw Elementary School; Sentinel Secondary School, and Brent Kennedy Elementary School located in Crescent Valley. There are several halls in the area including the Silvery Slocan Social Centre (Legion Branch - 276), Krestova Hall, Passmore Community Hall, Slocan Park Community Hall, Winlaw Community Hall, and Vallican Whole Community Center.

The nearby communities of New Denver, Castlegar, and Nelson provide numerous options that could also serve as potential evacuation centres in the event of an emergency.

3.2.3 Emergency Services Infrastructure

Emergency service infrastructure in the Village of Slocan includes a fire hall that is home to the RDCK Slocan Volunteer Fire Department. The communities of Winlaw, Passmore, and Crescent Valley each

⁷ Personal Communications, Tim Hill, Village of Slocan Public Works; Gord Ihlen, Passmore Volunteer Fire Department.

have a fire hall and support a RDCK Volunteer Fire Department. The BC Ambulance Service maintains a station in Winlaw.

Outside of the AOI, there are several emergency services available in New Denver; including a RCMP detachment, BC Ambulance, and the Slocan Community Health Centre – which provides emergency and non-emergency medical services. The New Denver and Area Fire Department maintains fire halls in both New Denver and Silverton. For additional details on the emergency services and firefighting resources provided in the North Slocan Valley, refer to the 2019 CWPP for Area H North.

There are four RDCK fire departments operating outside of the AOI, relatively close to New Settlement, Crescent Valley and Playmor Junction. Nearby RDCK departments include Pass Creek, Tarry's, Beasley, and Blewett.

Interior Health medical centers are located in Castlegar and Nelson. A RCMP detachment and the West Kootenay Regional Airport in Castlegar provide additional services to the region that may be relied upon in an emergency.

3.2.4 Water and Sewage

The Village of Slocan water system relies on surface water from Gwillim Creek and membrane filtration at the water source. Planning is currently underway to upgrade the water system potentially using Slocan Lake as a new water source⁸.

The South Slocan water system - owned and operated by the RDCK - draws water from Watt's Brook with Smokey Creek as a secondary source to service 51 active connections (RDCK, 2016).

The many rural and semi-rural residences in the AOI draw their water from a diverse array of surface water and well intakes. Section 3.3.1 discusses this further. Generally, water systems that rely on surface water are susceptible to sediment intrusion. Water systems in Brandon, Slocan Park, Playmor, and Krestova are all maintained by their respective Improvement Districts. The Playmor water system relies on 2 wells and does not include a back-up power generator. The Krestova water system is for residential use only and draws water from a small lake using a gravity feed system. The Slocan Park water system relies on ground water pumped into a reservoir from which it supplies a gravity feed system.

Section 6.1.2 - Water Availability for Wildfire Suppression - provides additional details on the water systems in the AOI as they relate to fire response.

There are no sewage services provided in the AOI. Residents rely on septic tanks and field, or package sewage treatment plants for wastewater management (RDCK, 2009).

3.3 High Environmental, Cultural and Other Values

Wildfires can impact consumptive water sources, fish and wildlife resources, and cultural values. From a fire mitigation perspective, the protection of environmental and cultural values must be viewed through two separate lenses. The first is the objective to protect any identified values from potential

⁸ Personal Communications, Tim Hill, Village of Slocan Public Works.

damage and destruction caused by wildfire. The second is the equally important objective to ensure that fire mitigation efforts do not cause damage or destruction to some of the very elements that they seek to protect.

The Kootenay Boundary Higher Level Planning Order (KBHLPO), the *Forest and Range Practices Act* (FRPA), *Government Action Regulation* (GAR) orders and government approved Forest Stewardship Plans or Woodlot Licence Plans of forest licensees are the primary legal tools that govern the management of these resources on Crown land within the CWPP AOI. Formal amendments to existing plans or exemptions from orders or regulations may be required to facilitate fuel management. Consultation with First Nations and the local community should be undertaken during prescription development. Consideration should also be given to the following during prescription development (adapted from Morrow, Johnston, & Davies, 2013):

- Potential for wind throw
- Invasive plants introduction or spread
- Habitat protection
- Species at Risk and Sensitive Ecosystems
- Current and future forest health
- Climate change
- Archeological and cultural values
- Coarse woody debris
- Live/dead wildfire trees
- Terrain stability
- Access management
- Visual quality
- Drinking water
- Local community values/Social License
- Recreation and tourism values
- Trap lines

3.3.1 Drinking Water Supply Area and Community Watersheds

A severe wildfire within a community or domestic use watershed may not damage water diversion and management structures or critical infrastructure, but could still have significant impacts on drinking water, hydrology, and slope stability adjacent to the community. Wildfires can kill large areas of forest trees, and thus alter snow accumulation and melt patterns, peak flow levels and timing of flow in forested watersheds. Wildfires have the potential to damage soils, and may lead to high rates of erosion and sedimentation and landslides that can degrade water quality for many years. In worst case scenarios, a water supply may have to be abandoned (temporarily or permanently) or new water treatment infrastructure may need to be built to mitigate the damage.

Consumptive-use streams and watersheds are present throughout the valley. Table 5 lists the specific location and size of larger community and domestic watersheds.

Table 5: Community and Domestic Watersheds

Watershed	Location	Area (hectares)	Area Within AOI (hectares)
Airy Creek	49.528, -117.768	5,883.4	409.2
Airy-Cowie Face	49.545, -117.689	907.1	886.2
Arvid Creek	49.537, -117.597	567.8	276.7
Benninger Creek	49.618, -117.614	602.7	298.2
Bird Face	49.449, -117.497	86.5	86.5
Castlegar East Face	49.457, -117.55	760.7	760.7
Christian Creek	49.655, -117.48	388.5	369.5
Christian-Elliot Face	49.668, -117.488	529.6	519.3
Climax CWS	49.787, -117.452	207.9	203.3
Cowie Creek	49.528, -117.685	523.3	324.5
Cowie Face	49.528, -117.653	341.6	341.6
Crescent Valley North Face	49.501, -117.574	811.2	702.0
Dumont Creek	49.617, -117.519	736.5	698.4
Elliot Creek	49.672, -117.468	202.5	182.1
Ezra North Face	49.44, -117.548	1.6	1.6
Falls West Face	49.468, -117.515	58.2	58.2
Gander CWS	49.469, -117.63	760.6	282.8
Goose Creek	49.456, -117.685	3,180.4	428.6
Goose Face Part 1	49.424, -117.678	77.3	0.0
Goose Face Part 2	49.421, -117.628	45.5	45.5
Ground Creek	49.564, -117.615	178.0	150.5
Gwillim CWS	49.802, -117.631	7,824.1	284.2
Hird Creek	49.637, -117.609	1,271.9	349.3
Hird North Face	49.633, -117.569	767.7	749.5
Hird South Face	49.608, -117.58	160.5	160.5
Jacob Creek	49.498, -117.554	293.4	157.1
Jamie Creek	49.549, -117.629	131.1	124.3
Jerome Creek	49.667, -117.561	283.5	175.6
Jerome Face	49.675, -117.538	827.2	722.3
Langill Creek	49.468, -117.602	321.5	321.5
Langill Face	49.487, -117.608	1,020.4	962.2

Lemon Creek	49.704, -117.341	19,414.7	931.4
Lemon North Face	49.739, -117.451	2,288.7	2,212.6
Lemon South Face	49.689, -117.484	826.6	826.6
McDermid CWS	49.464, -117.656	829.3	58.0
McFayden Ck CWS	49.589, -117.67	581.8	286.4
McFayden Face	49.588, -117.641	801.6	767.2
Memphis Creek	49.812, -117.392	3.5	0.0
Mounce Face Part 1	49.429, -117.594	327.3	327.3
Mounce Face Part 2	49.441, -117.553	10.6	10.6
Mulvey Creek	49.759, -117.568	3,936.1	1,420.7
Mulvey Face	49.708, -117.514	1,494.6	1,424.8
Nathan Creek	49.6, -117.628	169.2	162.8
Norns East Face	49.421, -117.612	39.8	39.8
Norns East Face	49.419, -117.623	0.4	0.4
Norns West Face	49.446, -117.599	1,625.0	1,622.3
Pedro Creek	49.56, -117.562	1,705.4	341.3
Pedro Face	49.576, -117.599	829.2	784.1
Radcliffe Creek	49.526, -117.571	604.1	183.7
Rice Creek	49.653, -117.579	263.2	142.7
Rice-Jerome Face	49.654, -117.553	651.1	609.3
Rover CWS	49.44, -117.497	168.9	168.9
Slocan Park Face	49.518, -117.606	575.0	575.0
Smoky CWS	49.475, -117.527	185.4	185.4
Smoky-Watts Face	49.466, -117.539	380.0	380.0
Springer Creek	49.784, -117.386	4,701.8	625.3
Talbot Creek	49.581, -117.7	219.8	174.0
Talbot Face	49.572, -117.716	223.3	223.3
The Rivulet CWS	49.465, -117.536	10.4	10.4
Trozzo Creek	49.633, -117.457	2,713.2	530.0
Trozzo Face	49.642, -117.523	883.0	883.0
Vallican Face	49.567, -117.676	860.9	856.9
Varney Creek	49.616, -117.679	462.3	0.0
Watson Creek	49.608, -117.627	449.0	256.2
Watson Face	49.595, -117.605	125.4	125.4
Watts CWS	49.469, -117.539	31.8	31.8

Winlaw Creek	49.592, -117.489	4,006.2	576.7
Winlaw North Face	49.612, -117.551	188.3	188.3
Winlaw South Face	49.595, -117.562	555.3	555.3
Winstanley Creek	49.484, -117.557	246.7	246.7
Wolverton Creek	49.504, -117.672	1,521.0	411.6
Wolverton Face	49.506, -117.635	465.2	458.7
ZZ Creek (70934)	49.741, -117.565	338.1	159.1

3.3.2 Cultural Values

Cultural Heritage Resource

A Cultural Heritage Resource (CHR) is defined as an object, a site or a location that is the focus of a traditional use by an aboriginal people that is of continuing importance to that people, and not regulated under the Heritage Conservation Act (i.e. not archaeological resources or sites). CHRs include a First Nation's Aboriginal Interest(s) and Aboriginal rights, which are practices or traditions integral to a First Nation culture at the time of contact. Examples include fishing, hunting and gathering plants⁹.

The Consultative Areas Database indicates that there are 17 First Nations with aboriginal interests in the Slokan Valley. A request for information on cultural heritage resources and aboriginal interests was sent to First Nations during the CWPP planning process for both the North and South CWPPs. No cultural heritage resources were identified through the information sharing request.

There are no treaty lands within the AOI.

Additional information sharing with First Nations will be carried out during the fuel management prescription development process prior to any on the ground fuel management activities.

Archaeological Sites

Archaeological sites in BC dated from 1846 or earlier are protected by the *Heritage Conservation Act* (HCA). The provisions of the HCA apply to archaeological sites located on both public and private land. The Archaeology Branch of the FLNRORD administers the provisions of the HCA and is responsible for making final decisions concerning the management of archaeological resources. Archaeological site records will be requested during the prescription development phase prior to the commencement of operational fuel treatment. In the event that cultural or archaeological values are identified, a reconnaissance survey or an Archaeological Impact Assessments may be required.

3.3.3 High Environmental Values

Old Growth Management Areas (OGMAs) which were identified to maintain old forests and landscape level biodiversity are located throughout the AOI. Notable OGMAs in the AOI are located around the communities of Lemon Creek and Slokan Park (Appendix 1, Map 2- Values at Risk).

⁹ Bulletin: Woodlot Licences: Information Sharing and Consultation with First Nations. May 2016

No spatially located habitat areas have been designated within the AOI for the protection of recognized species at risk. Table 6 identifies recorded occurrences of Blue and Red listed species in the AOI. In the event of a wildfire and during fuel treatments, the presence of Blue and Red listed species should be considered and appropriate management activities undertaken to ensure their protection.

Table 6: Conservation Data Center occurrences of Blue and Red listed species in the AOI

Scientific Name	English Name	B.C Status
<i>Acipenser transmontanus pop. 2</i>	White Sturgeon (Columbia River population)	Red
<i>Ardea herodias herodias</i>	Great Blue Heron, Herodias Subspecies	Blue
<i>Cottus confusus</i>	Shorthead Sculpin	Blue
<i>Megascops kennicottii macfarlanei</i>	Western Screech-owl, Macfarlanei Subspecies	Blue
<i>Rhinichthys umatilla</i>	Umatilla Dace	Red
<i>Plestiodon skiltonianus</i>	Western Skink	Blue

Fuel treatments should consider potential implications on habitat and biodiversity. Combining wildfire threat reduction objectives with biodiversity and habitat enhancement objectives should be considered in consultation with a qualified professional during the fuel management prescription phase.

3.4 Other Values

The KBHLPO and FRPA recognize Visual Quality as a resource management objective. Both wildfires and fuel treatment have the ability to impact visual quality. Fuel management in areas with Retention or Partial Retention Visual Quality Objectives and in other highly visible areas should consider treatments such as partial cutting or thinning from below - when appropriate - to reduce impacts to visual quality.

3.5 Hazardous Values

Hazardous values include materials or substances that may pose a safety hazard to emergency responders and the public, or have the potential to exacerbate wildfire volatility. Hazardous values including fuelling centers, junkyards and landfill/transfer station sites are identified on Appendix 1, Map 2 – Values at Risk.

3.6 Recommendations to Protect Values at Risk

Recommendations made in Table 7 intend to mitigate potential damage to high value areas and critical infrastructure from both wildfires and fuel treatment. Recommendations related specifically to improving water availability for firefighting and structure protection are included in Section 6.3 - Wildfire Response and Resources Recommendations.

Table 7: Values at Risk Recommendations

Number	Recommendation
Objective: To increase the resiliency of values at risk and critical infrastructure to potential wildfire damage	
6	Review, maintain and upgrade back-up power sources for critical infrastructure and emergency services. A review should identify any gaps in back-up power and recommend upgrades to existing power sources to meet potential extended outages.
7	Prioritize fuel management treatments that protect electrical power, communications, transportation and water critical infrastructure. Review, prioritize, and implement fuel management treatments in areas identified in Table 19.
8	Coordinate with Fortis, BC Hydro, and MOTI to conduct vegetation management and danger tree removal along distribution lines, transmission lines, and right of ways. Explore utilizing existing right of ways as landscape-level fuel breaks through an ongoing fuel treatment program.
9	Complete FireSmart and vulnerability assessments of critical infrastructure. Undertake any necessary corrective actions to meet FireSmart standards for critical infrastructure, local government buildings, and emergency services infrastructure.
10	Identify areas likely to suffer post-fire terrain, water flow and stream channel stability issues. Create draft plans for post-fire stabilization work.
Objective: To ensure values at risk are sufficiently considered during fuel management activities	
11	Carry out additional information sharing with First Nations during the fuel management prescription development process prior to any on the ground fuel management activities.
12	Carry out consultation with local communities during fuel management prescription development to ensure local concerns are addressed and to cultivate social licence to operate in the WUI.
13	Incorporate multiple objectives into fuel treatment projects when possible. Fuel management activities can address forest health concerns, enhance wildlife habitat, rehabilitate low value stands, and utilize low value fibre. Combining wildfire threat reduction with biodiversity and habitat enhancement should be considered along with the consultation of a professional biologist (or qualified professional).

SECTION 4: PSTA and Local Wildfire Threat

Wildfire threat within the AOI has been analysed using two different methodologies - intended for two different purposes. The Provincial Strategic Threat Analysis (PSTA) (Section 4.2.1/Map 4) provides a general - provincial-scale - overview of approximate wildfire threat. It is intended to provide a strategic-level analysis of factors that contribute to wildfire threat but it is not intended to represent absolute, site-specific values. The PSTA was provided by the BCWS and is derived using spatial data and computer based modeling (BC Wildfire Service, 2017).

At the forest-stand level, the Local Wildfire Threat provides a more refined assessment of wildfire threat in the AOI and is based on local field-verified data. The Local Wildfire Threat was determined following the 2013 Wildfire Threat Classification process¹⁰. The final outcome of the Local Wildfire Threat process is a map of Wildfire Behaviour Threat Class and WUI Threat Class (Section 4.3.5/Map 7). The Local Wildfire Threat was used in conjunction with local expertise to select strategic locations for fuel treatment as recommended in Table 19 - Fuel Treatment Summary.

4.1 Fire Regime, Fire Danger Days and Climate Change

Wildfire is a natural process that plays an important role in forest succession and landscape dynamics. Disturbance and associated change are important factors in maintaining healthy landscape ecosystems. The ecological significance of wildfires on the landscape should be considered in order to develop effective and responsible management plans and prescriptions that protect both the community and environment.

4.1.1 Local Ecology and Fire Regime

The Biogeoclimatic Ecosystem Classification System (BEC) is used throughout the province to categorize ecosystems based on vegetation, soil, topography and climate. The BEC system enables resource professionals to make informed land management decisions that consider local ecological characteristics. The majority of the AOI is classified under the Interior Cedar Hemlock (ICH) BEC zone. Forested areas higher in elevation are within the Engelmann Spruce Subalpine Fir zone (ESSF) (Table 8).

The ICH is biologically diverse and the most productive zone in the interior of BC (Ketcheson, et al., 1991). Recurrent fires create a mosaic of climax and seral stands throughout the ICH (BC Ministry of Forests, 1992). Mixed stands of western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), western larch (*Larix occidentalis*) are common throughout the ICH. These forests are often referred to as the Kootenay Mix. Lodgepole Pine (*Pinus contorta*), Ponderosa Pine (*Pinus ponderosa*), grand fir (*Abies grandis*), and paper birch (*Betula papyrifera*) can also be found throughout the Slocan Valley. With the diversity of climate and soils throughout the ICH, there is substantial variability in vegetation among the various subzones. Drier sites are commonly associated with Douglas-fir and pine, while moist sites typically have a higher abundance of western redcedar and hemlock. Typical wildlife found throughout the ICH includes grizzly and black bear, deer,

¹⁰ Morrow, Bruce, Kelly Johnston, and John Davis. 2013. Wildland Urban interface Threat Assessments in B.C. Ministry of Forests, Lands and Natural Resource Operations.

moose, and elk (BC Ministry of Forests, 1992; Ketcheson, et.al, 1991). Recorded occurrences of Blue and Red listed species in the AOI has been provided in Section 3.3.3 - High Environmental Values.

The ICH Dry Warm, West Kootenay variant (ICH dw1) occupies the majority of the AOI (60.3%) - primarily along the lower slopes of the Slocan Valley. This subzone is characterized by “moist, warm springs; hot to very hot, dry summers; and mild, dry winters” (MacKillop & Ehman, 2016). A moderately shallow snowpack usually persists from January through March (MacKillop & Ehman, 2016). The “Kootenay Mix” is common on zonal sites within ICH dw1. Areas of fire originated lodgepole pine also occur, and Ponderosa Pine can be found on drier sites (MacKillop & Ehman, 2016).

Frequent stand-initiating events (NDT3) is the most common natural disturbance type in the AOI and is associated with the ICH dw1. These ecosystems historically experienced frequent wildfires that ranged in size from small spot fires to large fires covering thousands of hectares. The mean disturbance return interval is 150 years in the NDT3, ICH (BC Ministry of Forests, 1995). The ICH dw1 –in particular – has a broad range of fire regimes; from low intensity burns with a 20 year return interval to stand-replacing fires occurring on a 200-year return interval (MacKillop & Ehman, 2016). Traditional First Nations burning as well as burning for land clearing during the mining boom has created fire-initiated stands throughout the Slocan Valley (MacKillop & Ehman, 2016).

The ICH Moist Warm, Shuswap variant (ICH mw2) can be found throughout the Slocan Valley just above the ICH dw1 variant, and accounts for 25.5 % of the AOI. It is a highly productive zone with a diversity of tree species dominated by the “Kootenay Mix.” The average disturbance return interval is 200 years in the NDT2, ICH (BC Ministry of Forests, 1995) - this disturbance regime is referred to as a Natural Disturbance Type 2 regime (NDT 2). Extended post-fire regeneration periods within the ecosystem have created stands with uneven-aged tendencies (BC Ministry of Forests, 1995). Wildfires would typically range in size from 20 to 1,000 ha, with larger fires occurring after periods of extended drought. Wildfires would often leave pockets of unburnt fuel throughout the burned area as a result of terrain features or areas of high moisture content (BC Ministry of Forests, 1995).

The ICH Very Dry Warm (ICH xw) is found in low elevations within the southern portion of the AOI - from Vallican to Playmor Junction. This zone is associated with very hot, very dry summers; and mild, dry winters with low snowfall (MacKillop & Ehman, 2016). Douglas-fir and Ponderosa Pine are common, however red-cedar, grand-fir, and western white pine are also abundant (MacKillop & Ehman, 2016). The ICH xw is characterised by mixed-severity fire regimes, with low-severity fires occurring on warm aspects, and stand-replacing fires may have been more common on cool to neutral aspects. The natural disturbance regime for the ICH xw is frequent stand-maintaining fires (NDT 4).

A small proportion of the upper slopes in the AOI are within the ESSF Wet Hot, Columbia variant (ESSF wh1) and ESSF Wet Cold, Selkirk variant (ESSF wc4). The ESSF is found in higher elevations throughout the Slocan Valley – with The ESSF wh1 occurs above the ICH, and the ESSF wc4 occurs above the ESSF wh1 (MacKillop & Ehman, 2016). These ecosystems experience rare stand initiating disturbances (NDT 1) and wildfires are not a common occurrence. NDT1 stands are typically uneven-aged or multi-storied even-aged (BC Ministry of Forests, 1995). Infrequent disturbances typically affect individual or small groups of trees, creating small gaps in the forest for regeneration (BC Ministry of Forests, 1995). The mean disturbance return interval is 350 years in the ESSF NDT1 ecosystems (BC Ministry of Forests, 1995).

Table 8: AOI BEC Zone and NDT Summary

BEC Zone	Description	NDT	Description	Area (hectares)	Percent
ICH dw1	ICH Dry Warm, West Kootenay variant	3	Frequent stand-initiating events	20,784	58%
ICH mw2	ICH Moist Warm, Shuswap variant	2	Infrequent stand-initiating events	9,131	25%
ICH mw4	Moist Warm, Ymir variant	2	Infrequent stand-initiating events	83	< 1%
ICH mw5	Moist Warm, Granby variant	2	Infrequent stand-initiating events	145	< 1%
ICH xw	ICH Very Dry Warm	4	Frequent stand-maintaining fires	3,499	10%
ESSF wh1	ESSF Wet Hot, Columbia variant	1	Rare stand-initiating events	861	2%
ESSF wc4	ESSF Wet Cold, Selkirk variant	1	Rare stand-initiating events	269	1%
ESSF wh3	ESSF Wet Hot, Salmo variant	2	Infrequent stand-initiating events	28	< 1%
Water				1143	3%
TOTAL		-		35,941	100

Forest health agents - including insects and disease - can have a significant effect on forest structure, associated fire behaviour, and wildfire threat. Bark beetles are a current forest health concern throughout the Slocan Valley. Insect activity in general is expected to increase as an impact of climate change. The Forest Health Strategy for the Arrow Timber Supply Area (2017/2018) identifies Douglas-fir beetle (*Dendroctonus pseudotsugae*), spruce bark beetle (*Dendroctonus rufipennis*), mountain pine beetle (*Dendroctonus ponderosae*), western balsam bark beetle (*Dryocoetes confusus*) as having a “Very High” potential impact on forests. Aerial overview surveys from 2017 indicate an estimated 5,516 hectares of forests are currently affected by bark beetles in the Arrow TSA. Douglas-fir beetle and spruce bark beetle are of particular concern with infestations increasing throughout the Arrow TSA since 2016 (Christianson, 2018). Notable areas of significant Douglas-fir beetle attack in 2017 include Slocan Junction to Passmore – in the southern portion of the valley and the Red Mountain area south of Silverton. Douglas-fir beetle and spruce beetle outbreaks have been closely associated with windthrow events (Christianson, 2018). According to the Arrow TSA Forest Health Strategy “Prompt removal of spruce and Douglas-fir windthrow trees are imperative to avoid the buildup of these two bark beetles.” Fuel management activities can be coordinated to address blow down in Douglas-fir and spruce dominated stands with the objective of reducing both wildfire and beetle hazards. All fuel

management activities should consider - and aim to minimize - post-treatment wind throw potential; particularly in treatments that involve partial cutting or thinning.

Armillaria root disease (*Armillaria ostoyae*) and wildfire are considered as having a “Very High” potential impact on forest management within the Arrow TSA (Christianson, 2018). Other notable forest health agents in the area include birch decline, aspen leaf miner (*Phyllocristis populiella*), Dothistroma needle blight (*Dothistroma septosporum*) and larch needle blight (*Hypodermella laricis*) (Christianson, 2018; Maclauchaln & Buxton, 2016). Significant amounts of dead and downed timber and fine fuels (branches and upper crowns) associated with forest health agents can cause fuel loading, lead to further forest health outbreaks, and result in an increased wildfire threat around communities.

Larch dwarf mistletoe (*Arceuthobium laricis*) is active in many of the 100+ year old fire originated stands in the AOI, as was observed during the CWPP field surveys. Larch is a fire resilient and drought resistant tree species which regenerates well on burned areas, can grow exceptionally quickly in early years, and is a very desirable leave tree or regeneration choice in fuel management areas. Mistletoe is a plant that parasitizes larch trees, resulting in reduced vigor and tree growth which, over time, can lead to tree death, and increased dead, dry fuel loads. Mistletoe infections of young larch trees are especially damaging. Mistletoe spreads well from infected overstory larch trees to adjacent larch regeneration, which creates silvicultural challenges when using a mixture of overstory retention and regeneration in a silvicultural system designed to create fuel managed, fire and drought resilient stands. Latent dwarf mistletoe infections also may be activated by increased light to tree crowns, providing an additional factor for consideration in silviculture system choice.

White pine blister rust (*Cronartium ribicola*) is an introduced pathogen which has caused extensive mortality of western white pine in the AOI. The CWPP field surveys found that white pine is rarely a leading species in forests in the AOI, but is common as a minor stand component. The blister rust causes high mortality levels in white pine natural regeneration and death or partial crown death in mature trees, both leading to increased dry fuel loads. Mature white pine are resilient to low intensity fire, and the species can be a valuable component of silvicultural systems in fuel managed areas. Blister rust resistant white pine planting stock with a 65% survival rate (Christianson, 2018) is available, and should be part of the silvicultural species mix in low elevation fuel management areas.

4.1.2 Fire Weather Rating

The BC Wildfire Service operates roughly 260 weather stations throughout the province. These stations collect data regarding temperature, relative humidity, precipitation, wind speed, and wind direction in order to support the Canadian Forest Fire Danger Rating System (CFFDRS). The CFFDRS is a decision-aid that provides fire managers with information regarding potential for ignition, fire spread rates and fire intensity. The Fire Danger Rating is used to describe the risk of a wildfire occurring, and is updated daily during the fire season. The following description of the Fire Danger Ratings has been provided by the BC Wildfire Service¹¹:

- **Low:** Fires may start easily and spread quickly but there will be minimal involvement of deeper fuel layers or larger fuels.

¹¹ Fire Danger Class Rating Description from the BCWS webpage: <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/fire-danger>

- **Moderate:** Forest fuels are drying and there is an increased risk of surface fires starting. Carry out any forest activities with caution.
- **High:** Forest fuels are very dry and the fire risk is serious. New fires may start easily, burn vigorously, and challenge fire suppression efforts. Extreme caution must be used in any forest activities. Open burning and industrial activities may be restricted.
- **Extreme:** Extremely dry forest fuels and the fire risk is very serious. New fires will start easily, spread rapidly, and challenge fire suppression efforts. General forest activities may be restricted, including open burning, industrial activities and campfires.

Data from the BCWS Slocan and Smallwood weather stations was reviewed to assess the average Fire Danger during a typical summer (Table 9). Throughout the AOI, Fire Danger is higher during the months of July and August. In 2018, the Slocan weather station recorded 36 “High” and 13 “Extreme” danger class days. The Smallwood weather station, located 5.5 km north-east of South Slocan, is not within the AOI, however was included as an indication of fire weather in the south portion of the valley. The Smallwood station recorded 46 “High” and 14 “Extreme” danger class days in 2018.

Table 9: Average Number of High and Extreme Danger Class Rating Days per Year

Weather Station	Geographic Location	Elevation (meters)	Average Number of High Danger Class Days/Year	Average Number of Extreme Danger Class Days/Year
Slocan	3km north-east of the Village of Slocan	1,230	20.1	5.1
Smallwood	5.5km north-east of South Slocan	997	19.8	4.7

4.1.3 Climate Change

Climate change is predicted to have a significant effect on forest ecosystems and wildfire regimes throughout the province. 2050 climate change projections for the Kootenay Boundary Region include:¹²

- an increase in annual temperature by 1.2 °C to 2.8 °C,
- a 6% decrease in summertime precipitation, and
- a 24 day increase in frost free days.

The implications of these changes include a higher frequency and intensity of wildfires throughout the Kootenay Boundary Region and an increase in annual area burned (Utzig, Boulanger, & Holt, 2011). Longer and more intense wildfire seasons, with an increased number of high and extreme fire danger days, are also predicted throughout BC.

¹² Projections from the Pacific Climate Impacts Consortium, <http://www.plan2adapt.ca/tools/planners?pr=45&ts=8&toy=16>. Projected changes from 1961-1990 baseline. Precipitation and frost free days displayed as “ensemble mean” projections

Further effects of climate change include shifts in vegetation and BEC zones (Utzig, 2012) as well as the facilitation of forest health agents (Woods, et.al., 2010). Droughts, increased frequency of winter storms, severe weather events, and warmer temperatures associated with climate change are predicted to increase bark beetle infestations - including Douglas-fir beetle and mountain pine beetle (Woods, et. al., 2010). Dead and downed timber and fine fuels from insect outbreaks, and increased blow-down can dramatically increase the availability of forest fuels – as discussed in Section 4.1.1 - Local Ecology and Fire Regime.

Wildfire mitigation and forest management should consider how climate change may influence the success of fuel treatments and species survival. From 2010 to 2012, SIFCo participated in the West Kootenay Resilience and Climate Change research project. The objective of the project was to explore the potential implications of climate change for West Kootenay ecosystems, and to undertake an ecological vulnerability assessment for the West Kootenays using a range of climate change scenarios. As a result of this research, SIFCo included the following concepts into the Slocan Valley Strategic Landscape Level Wildfire Protection Plan – these concepts should be integrated into all fuel management activities in the Slocan Valley. Other forest management activities in the region should also consider these concepts – many of which can be implemented through the use of approved WUI Stocking Standards:

- Climate change will result in dramatic shifts in species composition and vegetation density over the next 60 years.
- Species currently at the edge of their ecological/climate niche (e.g. red cedar in much of the southern portions of the valley) will no longer establish and grow.
- Drought tolerant and fire resistant species (e.g. ponderosa pine) will become the most ecologically suitable species on many low elevation sites, and should be introduced as quickly as possible.
- Current forest density in the ICH subzones will not be supportable under coming moisture and temperature regimes. Forest density will be reduced by management (harvesting, thinning, fuel management) or by wildfire. As temperatures rise and summer moisture inputs decrease, wildfires will be more likely to be catastrophic events that degrade soil and water resources and negatively impact forest structure, composition and function.
- Retaining established large trees of fire resistant species in a reduced forest density/ fuel load environment to increase ecosystem resiliency. These trees will have the best chance of surviving the future drought stress and fire events, and will maintain forest ecosystem values.

The effects of climate change on wildfire frequency and intensity, wildfire season length, vegetation patterns, and biotic and abiotic disturbances will influence wildfire threat in the AOI. Current climate change projections highlight the importance of ongoing wildfire planning and prevention within the WUI.

4.2 Provincial Strategic Threat Analysis (PSTA)¹³

The PSTA is a high-level spatial estimate of the wildfire threat throughout BC. The PSTA utilizes vegetation cover data, historical fire occurrence data, topography, and historic weather data to evaluate the three conditions necessary for a wildfire to threaten a community (SWPI, 2018):

1. an ignition occurs (Fire History)
2. the resulting fire generates intensity (Head Fire Intensity) and spreads rapidly, and
3. the fire spreads into and/or transports embers into the community (Spotting Impact)

These PSTA components (spotting impact, head fire intensity, and historic fire density) are weighted to determine the overall PSTA threat rating.

4.2.1 PSTA Final Wildfire Threat Rating

The PSTA “Threat Rating” classifies the province into 10 classes. Polygons ranked as 7 or higher are considered as having a “High to Extreme” wildfire threat. 44.3% of the AOI included in the PSTA¹⁴ is classified as “High to Extreme” (Table 10). (Note: The PSTA threat rating and Table 10 exclude private land.)

Notable areas of high PSTA Threat are around the community of Krestova; however the wildfire threat throughout the entire valley is significant (Appendix 1, Map 4 - PSTA).

¹³ BC Wildfire Service. 2015. Provincial Strategic Threat Analysis 2015 Wildfire Threat Analysis Component.

¹⁴ Water, private managed forest land, and private lands were not included.

Table 10: Overall PSTA Threat Rating

PSTA Threat Rating	Area (hectares)	Percent
1-5	6,302	18%
6	6,917	19%
7	6,227	17%
8	1,676	5%
9	1,669	5%
10	941	3%
Water	1,129	3%
No Data - Private Land	11,082	31%
TOTAL	35,941	100 %

The PSTA rating is a valuable tool that provides a high-level overview of potential wildfire threat. For the purpose of this CWPP development, the PSTA threat rating was used to guide field assessments. High PSTA threat areas were a priority for field verification. Overall, the PSTA generally produced a fair representation of the actual fire threat in areas where WTA plots were located.

Limitations regarding the PSTA should be noted. Variations in understory fuel loads commonly observed in the AOI are generally not well modelled in the FBP fuel types used in the PSTA calculation (refer to Section 4.3.1 – Fuel Type Verification for details). Assumptions and inaccuracies associated with the underlying data used to determine the PSTA can significantly influence threat ratings.

4.2.2 Spotting Impact

During a wildfire, “spotting” occurs when embers and firebrands carried by air currents, ignite fuels outside of the main fire perimeter. Depending on weather and fuel conditions, spotting can occur up to several kilometers away from the head of a fire. Spotting poses a significant challenge to fire suppression effort as fuel breaks and containment lines can be compromised by spotting embers. Spotting is a characteristic of extreme fire behaviour and ember showers associated with spotting are a main cause of structure loss during an interface fire.

The PSTA Spotting Impact layer estimates the threat of embers affecting a given point on the landscape based on surrounding fuel types. Areas of higher spotting impact are generally where C3 and C7 fuel types are more prevalent. Closed, mature fuel types, high fuel loading, and ladder fuels are more likely to support crown fires and result in a higher spotting potential. Wind speed and direction also have a significant effect on spotting which was not considered in the PSTA spotting impact determination. Due to the variability of wind throughout the AOI, actual spotting that occurs during a wildfire may vary substantially on any given day (see section 4.3.3 for details). Spotting impact in the AOI is shown in Appendix 1, Map 4.

4.2.3 Head Fire Intensity

Head Fire Intensity (HFI) represents the energy output of a flaming wildfire front; measured in kilowatts per meter (kW/m). High HFI values are related to faster spread rates, greater fuel consumption, and increasing suppression difficulties. Fire managers and firefighters often use fire intensity to predict suppression challenges and select appropriate control tactics. Fire behaviour advisories are issued to suppression crews when intensity values are predicted to be in excess of 4000 kW/m - at which point direct fire suppression will likely be challenged.

Table 11 describes the likely fire behaviour associated with various HFI values. The majority of the area assessed falls within the PSTA HFI Class 3 – with vigorous surface fire as a likely fire behaviour. Pockets of higher HFI class are located around Vallican, Krestova, Slocan Park, and the Village of Slocan (Appendix 1, Map 4).

Table 11: Head Fire Intensity Classes and Associated Fire Behavior (SWPI, 2018)

PSTA - HFI Class	Fire Intensity kW/m	Fire Intensity Class ¹⁵	Flame Length (meters) ¹⁶	Likely Fire Behaviour ¹⁷
1	0.01 – 1,000	2	< 1.8	Smouldering surface fire
2	1,000.01 – 2,000	3	1.8 to 2.5	Moderate vigour surface fire
3	2,000.01 – 4,000	4	2.5-3.5	Vigorous surface fire
4	4,000.01 – 6,000	5	3.5 to 4.2	Vigorous surface fire with occasional torching
5	6,000.01 – 10,000	5	4.2 to 5.3	Vigorous surface fire with intermittent crowning
6	10,000.01 – 18,000	6	12.3 to 18.2	Highly vigorous surface fire with torching and/or continuous crown fire
7	18,000.01 – 30,000	6	18.2 to 25.6	Extremely vigorous surface fire and continuous crown fire
8	30,000.01 – 60,000	6	>25.6 ¹⁸	Extremely vigorous surface fire and continuous crown fire, and aggressive fire behaviour
9	60,000.01 – 100,000	6	>25.6	Blowup or conflagration, extreme and aggressive fire behavior
10	≥ 100,000	6	>25.6	Blowup or conflagration, extreme and aggressive fire behaviour

NB: The descriptions in this table will vary by fuel type and should only be used as guidance for expected fire behaviour.

4.2.4 Fire History

The BCWS maintains historical records of fire starts, sizes and causes throughout the province. This data can be used to detect patterns in ignition locations and fire spread.

The PSTA Fire Density layer provides a spatial overview of the frequency of historical fire occurrences, shown as weighted fire density since 1950 within 10 km of a location. The layer considers fires greater than 4 ha, that is, fires where initial attack efforts have not been successful. Larger fires are given

¹⁵ Head fire intensity should be classified by intensity class not fire rank. Fire rank is a visual description of conifer fires for air operations.

¹⁶ For calculating Flame Length, Bryam (1959) was used for surface fire (<10 000 kW/m) and Thomas (1963) was used for crown fire situations (>10 000 kW/m).

¹⁷ These characteristic will be different in open and closed forest fuel.

¹⁸ With HFI over 30 000 kW/m the function of the equation are stretched beyond the expectation of the equation, fire is under the influence too many other factors.

more emphasis, as they have the highest impact on values. Appendix 1, Map 5 shows the PSTA historical fire density of both human and natural fires.

Historically, the proportion of human caused ignitions in the Southern Slocan Valley has been significant - accounting for roughly 58% of all starts. Over the last 10 years, however, the proportion of human caused fires has decreased – attributing to 19% of all starts. Generally, human caused ignitions are more likely to occur in high-use recreational areas. Increased recreation use and tourism in the valley has the potential to also increase the occurrence of human caused fires – highlighting the importance of education and outreach as part of a comprehensive FireSmart program (see Section 5.2 – FireSmart Planning Activities - for details and recommendations).

The BCWS maintains a very effective initial attack program which successfully contains 94% of all fires in the province by 10 am the following day¹⁹. Within the AOI, the majority of fires are contained under the 4 ha target set by the BCWS. In order to maintain high initial attack success in the WUI, fuel management activities should aim to create opportunities for efficient fire response. Firefighter access is a key factor in facilitating successful initial attack and suppression. Fuel treatments that create or improve access for firefighters should be considered during prescription development.

4.3 Local Wildfire Threat Assessment

Local Wildfire Threat (section 4.3.6) was determined following the 2013 Wildland Urban Interface Wildfire Threat Assessments Guide. Map 7 provides a spatial overview of forest polygons in the AOI which pose a threat to communities, high value areas, and critical infrastructure. The assessment was combined with local expertise of the area to determine suitable and strategic locations for proposed fuel treatment as described in Section 5.1 – Fuel Management. The 2013 process relies on WTA field plots and incorporates fuel hazard, topography, and values at risk in order to determine a wildfire behaviour threat and a wildland urban interface threat.

4.3.1 Fuel Type Verification

Extensive field sampling throughout the AOI was conducted in the summer of 2018. WTA plots were used to determine wildfire threat and to verify the provincial fuel type layer. The provincial fuel type layer uses the Vegetation Resources Inventory (VRI) data set and a fuel typing algorithm to classify the province into 17 fuel types consistent with the Canadian Forest Fire Behavior Prediction (FBP) System. The FBP system is used by fire managers, firefighters and fire behaviour specialists to estimate potential head fire spread rate, fuel consumption, and fire intensity based on fuel type, weather, topography, foliar moisture content, and type and duration of prediction inputs.

It should be noted that the VRI based *“FBP fuel typing process is inherently subjective, and the vegetation communities of BC frequently fall through the cracks between the FBP fuel types”* (Perrakis, Eade, & Hicks, 2017). Furthermore, *“some vegetation communities in B.C. are, at best, a poor match with any of the FBP fuel types. Uncertainty in fire behavior is probably associated with... mixed-conifer stands of the interior wet belt – species such as western white pine and western larch growing in multi-*

¹⁹ Fires Ranks 1-4. Provided by <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-response>

story canopies, usually associated with Douglas-fir, red cedar, lodgepole pine, or other species (Perrakis, Eade, & Hicks, 2017).”

Also note that some of the detailed names of the FBP fuel types are based on eastern and northern forests, where the initial fuel type and fire behaviour correlation work was done.

The field assessments found that – overall - the provincial fuel type layer provided a fair representation of the appropriate best-fit FBP fuel type; however understory fuel loading is not well represented by the 17 fuel types, particularly the C5 fuel type found throughout the valley.

Fuel type updates for this CWPP were therefor limited to recent cutblocks, fuel treatments, and development sites where the FBP fuel type has been clearly altered from a closed forested stand to a slash or open stand structure.

Table 12 explains the relationship between the various FBP fuel types and crown fire/spotting potential. Much of the AOI is classified as C7 fuel type (Ponderosa Pine-Douglas-Fir) – which is associated with moderate potential for crown fire and spotting. A full breakdown of the AOI by fuel type has been included in Table 13 and shown visually in Appendix 1, Map 6 – Fuel Type.

Table 12: Fuel Type Categories and Crown Fire Spot Potential (SWPI, 2018)

Fuel Type Categories	Fuel Type - Crown Fire/ Spot Potential
1: C1, C2, C4, M3-M4 (>50% C/DF)	High
2: C3, C7, M3-M4 (<50% C/DF) M1-M2 >50% Conifer	Moderate
3: C5, C6, O1a/b, S1- S3 ¹ M1-M2 (26-49% Conifer)	Low
4: D1, D2, M1-M2 (<26% Conifer)	Very Low

Table 13: FBP Fuel Types in the AOI per PSTA

FBP Fuel Type	Descriptor	Area Assessed (hectares)	Percent
C7	Ponderosa Pine– Douglas-Fir	10,469	29%
D-1/2	Aspen (Leafless/Green)	6,577	18%
C5	Red and White Pine	6,456	18%
M-1/2	Boreal Mixedwood (Leafless/Green)	5,050	14%
C3	Mature Jack or Lodgepole Pine	4,178	12%
O-1a/b	Grass	1,567	4%
S-1	Jack or Lodgepole Pine Slash	93	< 1%
S-3	Coastal Cedar-Hemlock-Douglas-Fir Slash	75	< 1%
C2	Boreal Spruce	45	< 1%
N	No Fuels	318	1%
W	Water	1,112	3%
TOTAL		35,940	100%
<small>Note: Discrepancy in water area compared to earlier tables is due to differences in interpretation of seasonally flooded areas in rivers.</small>			

4.3.2 Proximity of Fuel to the Community and Values

Typically, fuels closest to the community and critical infrastructure represent the highest hazard and should be a priority for treatment. Retained pockets of untreated fuels - between treatment areas, values or structures - should be avoided as they can provide an opportunity for an interface fire to build intensity within the WUI. In order to ensure continuity in fuel treatment, mitigation efforts should be implemented progressively outwards from the community or value.

The 2013 wildfire threat assessment process subdivides the WUI into 3 areas –the first 200 meters from values, 201 to 500 meters from values, and 501 to 2000 meters from values. These zones are slightly different than those used in the 2017 CWPP Template Risk Process. The 2013 zones were used to determine the WUI Wildfire Threat Score and have been described in Table 14.

Table 14: Interface Proximity Zones (adapted from the 2018 CRI template)

Proximity to Values <i>(based on 2013 WTA guide)</i>	Explanation
0-200m	This Zone is always located adjacent to the value at risk. Treatment would modify the wildfire behaviour near or adjacent to the value. Treatment effectiveness would be increased when the value is FireSmart.
201-500m	Treatment would affect wildfire behaviour approaching a value, as well as the wildfire’s ability to impact the value with short- to medium- range spotting; should also provide suppression opportunities near a value.
501-2,000m	Treatment would be effective in limiting long - range spotting but short-range spotting may fall short of the value and cause a new ignition that could affect a value.
>2,000m	This should form part of a landscape assessment and is generally not part of the zoning process. Treatment is relatively ineffective for threat mitigation to a value, unless used to form a part of a larger fuel break / treatment.

Ensuring continuity in fuel treatment throughout the WUI can be difficult due to a variety of factors, including land ownership, availability of funding, site-specific operational constraints, a lack of public support, and the challenge of balancing multiple values on the landscape. A combination of mitigation efforts including FireSmart, operational fuel treatment, and public education can help overcome some of these challenges.

These challenges are particularly common adjacent to the community, where much of the area containing fuels that pose a risk to values is private, municipal, or regional land. Within this area FireSmart activities should be a top priority. FireSmart can focus on reducing hazard directly adjacent to structures and can target high risk private land.

Despite the obstacles associated with WUI fuel treatment, the recently completed landscape level fire break near Silverton, which is 2 km long and from 0.5 to 1 km wide, demonstrates that a continuous fuel treatment around a populated area can be accomplished.

Proposed fuel treatment units described in Section 5.1 consider both the proximity of fuel to the community, as well as the need for treatment continuity throughout the WUI.

4.3.3 Fire Spread Patterns: Weather Related

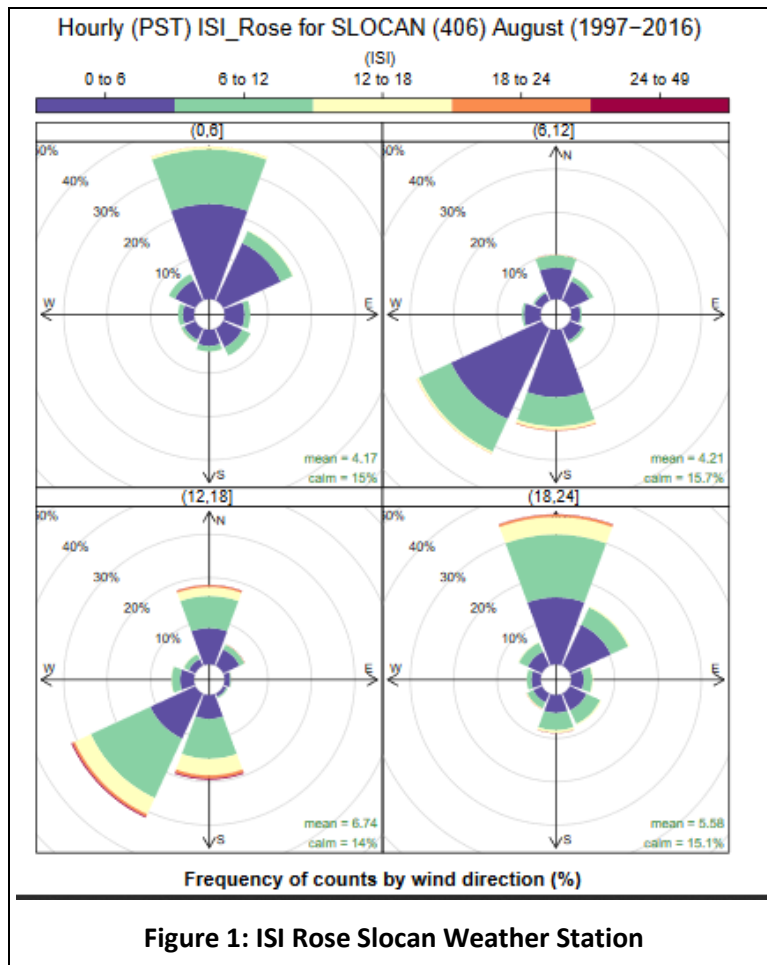
Wind has a significant effect on fire rate of spread, trajectory, and behaviour. Wildfire intensity, spotting, firefighter safety, and suppression success are all greatly influenced by wind speed and direction. While actual winds speed and direction are the parameters that matter during a wildfire, planning fire risk management should consider the most prevalent wind patterns during the fire season, and the most prevalent patterns during the times of day (mid to late afternoon) when fire behaviour is typically aggressive. Wildfires that occur upwind of a community pose a much more significant threat than fires that occur downwind.

General wind patterns in the area were assessed based on the BCWS weather data (ISI Roses) and local knowledge.

The BCWS ISI Roses provide an indication of predominant fire spread patterns during the peak burning period. The ISI (Initial Spread Index) is a numeric rating of expected fire spread rates determined by combining the effects of wind with fine fuel moisture. “Each rose shows the frequency of counts by wind direction with the frequency of the ISI values during that time period” (MFLNRO, 2017).

The August ISI Rose for the Slocan weather station (Figure 8) can be interpreted as follows:

- During peak burning times (12:00-18:00), prevailing winds are typically out of the south-west, indicating a fire spread pattern towards the north-east.
- In the late evening and into the night (18:00-24:00), prevailing winds are typically out of the north, indicating a fire spread pattern towards the south.



Considering the ISI rose and advice from local experts²⁰, a general north/north-east spread pattern can be expected for wind-driven fires in the main valley. It should be noted that local topography plays a strong role in fire spread pattern (as discussed in section 4.3.4) and can greatly influence local wind speed and direction. Numerous drainages in the AOI can channel and funnel winds, creating variations in surface wind patterns.

Thunderstorm events occur regularly, but not predictably, in the AOI during the fire season. High speed swirling winds and downdrafts from these storms interact with terrain and can blow in any direction, usually for brief periods. Thunderstorm winds and lightning can create unsafe working conditions in forest areas, and the strong winds can increase fire behaviour and spotting distance.

Downslope, evening winds are also a common occurrence. Since most of the communities in the AOI are located in the valley bottom and are bordered by west-facing slopes to the east, the potential for downslope (easterly) evening winds towards the community should not be overlooked.

Understanding local wind patterns in the area is particularly important for wildfire response. Shifting winds can compromise containment efforts and firefighter safety. Firefighters and emergency response personnel should remain vigilant and expect shifting winds throughout the Slocan Valley. As always, the time of day, local topography, and the effects on localized winds should be considered when developing suppression strategies and evacuation plans. The following generalizations should be considered during wildfire response and fuel management planning:

- Generally, southerly winds can be expected throughout the main valley.
- Upslope daytime winds and downslope evening winds are common.
- Topographical features can influence local winds significantly (i.e. potential funnelling and channeling of wind through drainages or chutes, ridge top winds and eddies).

Fire Spread Patterns described above are not part of the 2013 Wildfire Threat Assessment process and were not included in the Local Wildfire Threat Analysis for this CWPP (Section 4.3.5). Spread patterns, however, should still be considered when determining priority areas for fuel treatment and landscape level fire breaks.

4.3.4 Fire Spread Patterns: Terrain Related

The Slocan Valley is located in mountainous terrain, bordered by the Valhalla and Slocan Ranges. The general topographic pattern in the AOI is a 2 km wide area of flat valley bottom and moderate gradient lower slopes, which transition abruptly to steep mountainous hillsides.

The steep topography throughout Slocan Valley can have a significant effect on fire behaviour and spread patterns. Slope is an important factor in fire trajectory and rate of spread - with fires typically spreading faster up slope due to increased radiation and preheating of fuels. On steep slopes, flames bathe upslope fuels, leading to very rapid and unpredictable spread. Convection winds from active fires can carry spotting material upslope into areas preheated by the fire.

Slope aspect also plays a role in fire behaviour, with south and west facing slopes typically receiving more solar radiation, resulting in dryer fuels and increased fire activity.

²⁰ Personal Communications Jonathan Fox, BCWS

The relationship between weather and topography is particularly evident in steep terrain. Local topography can have a substantial effect on weather and winds; as described in section 4.3.3. One common summertime occurrence is upslope daytime winds which can further amplify spread rates up hill. Downslope evening winds – also common – can push fires towards populated areas in the valley bottom.

Inversions and thermal belts - which occur when cold air close to the ground is trapped by a layer of warmer air above – can also influence wildfire behaviour and fire response. A thermal belt occurs when the top of an inversion makes contact with valley walls or mountain slopes. Overnight thermal belt development can result in temperature and relative humidity reaching near daytime levels - leading to intense nighttime fire behaviour. Intense and erratic fire behaviour can also be expected when an inversion or thermal belt breaks – leading to increased wind activity. Inversions can further challenge fire response by trapping smoke in the valley, effectively grounding aircraft used in wildfire operations and limiting the ability to detect new fires and spot fires until conditions clear.

Operational constraints associated with steep slopes can significantly limit both fuel treatment and suppression efforts. Challenging access, equipment and aircraft limitations, and reduced firefighter productivity due to difficult terrain are common limitations on steep slopes. These limitations, combined with both rolling burning debris igniting fuels downslope of the main fire and increased upslope spread rates, make wildfire response on steep slopes exceptionally difficult.

Although this CWPP is not intended to assess post-wildfire hazards, it should also be noted that wildfires in steep terrain can increase the likelihood of flooding, debris flows, and landslides long after a wildfire has been extinguished.

Slope, aspect, and the position of values relative to the slope are components in the 2013 WUI WTA assessment process.

Slope Class

General fire behaviour implications of slope classes are summarized in Table 15. Slope classes shown are based on the 2013 WTA guide used in the Threat Assessment for this CWPP.

Table 15: Slope Percentage and Fire Behaviour Implications (adapted from the 2018 CRI Template)

Slope Percent Class <i>(based on 2013 WTA guide)</i>	Fire Behaviour Implications
<16%	Very little flame and fuel interaction caused by slope, normal rate of spread.
16-29%	Flame tilt begins to preheat fuel, increase rate of spread.
30-44%	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
45-54%	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>55%	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

Slope Position of the Value

Slope position of a value relates to the ability of a wildfire to gain momentum during an uphill run. Structures or values located in the upper 1/3 of a slope would be impacted by high preheating and faster rates of spread (Table 16). The majority of communities and structures within the AOI are located at the bottom of a slope, along the Slocan River. Watersheds and some recreational areas are located in steep terrain, which put these values at an increased risk. General fire behaviour implications of slope position to the value are summarized in Table 16.

Table 16: Slope Position of Value and Fire Behaviour Implications (SWPI, 2018)

Slope Position of Value	Fire Behaviour Implications
Bottom of Slope/ Valley Bottom	Impacted by normal rates of spread.
Mid Slope - Bench	Impacted by increase rates of spread. Position on a bench may reduce the preheating near the value. (Value is offset from the slope).
Mid slope – continuous	Impacted by fast rates of spread. No break in terrain features affected by preheating and flames bathing into the fuel ahead of the fire.
Upper 1/3 of slope	Impacted by extreme rates of spread. At risk to large continuous fire run, preheating and flames bathing into the fuel.

4.3.5 Local Wildfire Threat

The local wildfire threat provides a spatial overview of forest polygons that pose an increased threat to communities, high value areas, and critical infrastructure (Appendix 1, Map 7). The local wildfire threat differs from the PSTA in a number of ways. The PSTA provides a general, coarse scale threat calculated from spatial data and computer models. As mentioned in Section 4.3, the PSTA is not intended to represent absolute, site-specific values. The local wildfire threat, on the other hand, is based on field surveys (WTA Plots), as well as spatial data analysis – providing a more accurate localized threat at the forest stand level. The PSTA was used to inform areas of potentially high threat in order to conduct field assessments for the local wildfire threat.

There are two components to the local wildfire threat classification:

1. Wildfire Behaviour Threat Class
2. The Wildland Urban Interface Threat Class

4.3.5.1 Wildfire Behaviour Threat Class

The Wildfire Behaviour Threat represents the expected wildfire behaviour potential based on fuel, weather, and topography components.

A total of 108 field sample plots were measured in the Area H South CWPP AOI, using the procedures set out in Wildland Urban Interface Wildfire Threat Assessments in B.C. (Morrow, Johnson and Davies 2013). Wildfire Behaviour Threat Class was determined on each plot using the parameters and scoring shown in the table on the following page.

COMPONENT /Subcomponent	LEVELS				
Fuel	A	B	C	D	E
1 Duff Depth and Moisture Regime (cm)	1-<2 3	2-<5 Dry Zonal Wet 5 3 1	5-<10 Dry Zonal Wet 10 6 2	10-20 Dry Zonal Wet 12 8 4	>20 Dry Zonal Wet 15 10 5
2 Surface Fuels Continuity (% cover)	<20 0	20-40 2	41-60 3	61-80 4	>80 5
3 Vegetation Fuel Composition	Moss, Herbs, Irrigated Crops, Low Flammability Weeds 1	Herbs, Deciduous Shrubs 2	Lichen, Conifer Shrubs 3	Pinegrass, Juniper 4	Sagebrush, Bunchgrass, Antelope Brush, Scotch Broom 5
4 Fine Woody Debris Continuity (<=7cm) (% cover)	<1 coverage 1	Scattered, <10 coverage 5	10-25 coverage 7	>25 coverage, <10 cm deep 10	>25 coverage, >10 cm deep 15
5 Large Woody Debris Continuity (>7cm) (% cover)	<1 coverage 1	Scattered, <10 coverage 2	10-25 coverage 5	>25 coverage, not elevated 7	>25 coverage, partially elevated 10
6 Live and Dead Coniferous Crown Closure (%)	<20 2	20-40 5	41-60 10	61-80 15	>80 10
7 Live Deciduous Crown Closure (%)	>80 or <40% coniferous crown closure 0	61-80 2	41-60 3	20-40 4	<20 5
8 Live and Dead Conifer Crown Base Height (m)	5+ or <20% conifer crown closure 0	3-5 5	2-<3 7	1-<2 10	<1 15
9 Live and Dead Suppressed and Understorey Conifers (stems/ha)	0-500 2	501-1000 5	1001-2000 10	2001-4000 20	>4000 30
10 Forest Health (% of dominant and co-dominant stems)	Standing Dead and Partly Down <5 or <20 stems/ha 0	Standing Dead and Partly Down 5-25 5	Standing Dead and Partly Down >25-50 10	Standing Dead and Partly Down >50 - 75 20	Standing Dead and Partly Down >75 30
11 Continuous Forest/Slash Cover within 2km (%)	0-20 0	21-40 3	41-60 5	61-80 7	>80 10

Sub Total /155*

Weather	A	B	C	D	E
12 Biogeoclimatic Zone	AT, Irrigated 1	CWH, CDF, MH Dry Zonal Wet 5 3 1	ICH, SBS, ESSF Dry Zonal Wet 10 7 3	IDF, MS, SBPS, CWH ds1 & ds2, BWBS, SWB - Dry Zonal Wet 15 10 5	PP, BG 15
13 Historical Wildfire Occurrence (by WMB Fire 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	K1, K5, K3, C2, C3, N5, K6, N4, K7, N2 10	N7, K4, K2, N1 15

Sub Total /30

Topography	A	B	C	D	E
14 Aspects (>15% slope)	North 0	East 5	<16% slope all aspects 10	West 12	South 15
15 Slope (%)	<16 1	16-29 and max score for North slopes 5	30-44 10	45-54 12	>55 15
16 Terrain	Flat 1	Rolling 3	Sloped terrain, minor low relief draws 5	Consistent slope, deep draws or shallow gullies 7	Consistent slope, deep gullies 10
17 Landscape/ Topographic Limitations to Wildfire Spread	<5 ha isolated forest land 1	North and/or east aspects dominate, wildfire spread restricted from South and/or West 2	Mountainous terrain, broken topography, regular aspect and slope changes, multiple restrictions to wildfire spread large water bodies 5	Rolling terrain, minor water bodies, minimal aspect and slope changes, minor restrictions to wildfire spread 10	Continuous, consistent topography No restriction to wildfire spread 15

FUEL, WEATHER AND TOPOGRAPHY

**Sub Total /55
WILDFIRE BEHAVIOUR THREAT SCORE /240****

The local Wildfire Behaviour Threat Class was determined by extrapolating the threat assessments on the field survey plots to the larger AOI area based on vegetation cover (VRI) data.

The rationale for this approach was:

1. The Wildfire Behaviour Threat Fuel Subcomponent scores (1 through 11) account for 65% of the Wildfire Behaviour Threat score rating and are closely linked to vegetation cover characteristics. Vegetation cover data is available for the entire AOI.
2. The Wildfire Behaviour Threat Weather subcomponent scores (12 and 13) are uniform for the entire AOI area, and thus do not cause differences in Wildfire Behaviour Threat scores within the AOI.
3. The Wildfire Behaviour Threat Topography scores for aspect and slope (14 and 15) are intrinsically reflected in the vegetation cover data as significant changes in these variables generally result in changes in growing site conditions (soil depth, soil type, available moisture) that result in changes in vegetation cover.
4. The Wildfire Behaviour Threat Topography scores for Landscape (17) are consistent throughout the sampled area and the AOI, and do not cause significant differences in Wildfire Behaviour Threat scores within the AOI.
5. Ninety percent of the Wildfire Behaviour Threat Topography scores for Terrain (16) are either Rolling (3 points), Sloped Terrain (5 points) or Consistent Slope (7 points). The remaining 10% of scores are either Flat (1 point) or Consistent Slope - Gullied (10 points). The available digital elevation model from TRIM data is not precise enough to model the Terrain classes using GIS. The 4 point spread between Rolling and Consistent Slope that contains 90% of the data was not felt to be diagnostic of Wildfire Behaviour Threat scores. Modelling the Terrain score with an improved LiDAR based DEM should be considered in future CWPP iterations, but extrapolating Wildfire Behaviour Threat scores without a Terrain model was acceptable at this time.

11 of the 108 measured plots were located in areas where fuel management work had been carried out between 2009 and 2018. 7 out of the 11 plots found a Moderate Wildfire Behaviour Threat score. A plot in an area treated in 2009 produced a High Wildfire Behaviour Threat score due to blowdown and accumulated fuels. This is expected with the passage of time, and this area was already scheduled for maintenance treatment in 2019. Three plots near Winlaw also produced a High Wildfire Behaviour Threat score. The assessor noted that the fuel based threat on the area being assessed was low and had been reduced by treatment, but that the impacts of the weather and topography scores (steep south facing slope) pushed the area into an overall High Wildfire Behaviour Threat score. In general, the conditions in the fuel managed areas lead to a Moderate Wildfire Behaviour Threat score.

Enrico Fionda, Tom Bradley and Jesper Nielsen carried out a thorough analysis and discussion of the relationship between the field measured Wildfire Behaviour Threat scores and VRI data. Relationships between measured Wildfire Behaviour Threat scores and leading species, species groups, coniferous vs deciduous species, fuel type, stand age, crown closure, site index, and multiple combinations of these variables were explored.

The extrapolation process identified as providing the best fit to the measured data is as follows. The process uses the result from the first successful "if" statement and does not continue further into the list of possibilities.

1. If Private Land, no threat rating determined.
2. If surveyed right of way with constructed road, class as Moderate threat. The road rights of way generally contain vegetation cover with a moderate to high threat rating combined with a non-flammable road surface.
3. If logged area with post harvest fuel management or other identified fuel managed area (see Table 3), class as Moderate threat.
4. If other logged area, use PSTA Public Threat Rating updated for recent harvesting.
5. If non-forested area, use PSTA Public Threat Rating.
6. If cedar component of stand is $\geq 30\%$ of stocking, class as High threat.
7. If aspen and cottonwood deciduous component of stand is $\geq 30\%$ of stocking, class as Moderate threat.
8. Otherwise, class as High threat.

This extrapolation method resulted in a 79% correlation between measured and extrapolated Wildfire Behaviour Threat score in polygons within which the 108 field measurements had occurred.

The 21% of plots where the extrapolation resulted in a misclassification were as follows:

1. 3.5% were cases where field measured WBTC scores of 99 to 104 points (High) were classified as Moderate due to deciduous stocking. The upper threshold of Moderate is 95 points. This results in an underestimate of threat, but a small underestimate in minor number of cases with a clear reason for the misclassification.
2. 3.5% were cases where field measured WBTC scores of 96 to 100 points (High) in fuel managed areas were classified as Moderate. The upper threshold of Moderate is 95 points. These situations were discussed above. The analysis team felt that the magnitude of the underestimate was low, that the fuel management work on the sites had reduced threat significantly, and that in general the fuel management areas deserve a Moderate WBTC score.
3. 13% were cases where field measured WBTC scores of from 83 to 95 points (Moderate) were classified as a High. The lower threshold of High is 96 points. This results in an overestimate of threat levels, which can be addressed during prescription preparation stage and which is precautionary in nature.
4. 1% was a case where a field measured WBTC score of 150 points (Extreme) was classified as a High. The lower threshold of Extreme is 149 points. This results in an underestimate of threat, but as only one Extreme score was measured in the 105 plots, and as the score was only 1 point over the threshold, this misclassification is not significant.

Table 17 shows a summary of the extrapolated Wildfire Behaviour Threat in the AOI.

Table 17: Wildfire Behavior Threat

Wildfire Behavior Threat Class	Area (hectares)	Percent of AOI
No Data - Private Land	10,933	30%
Very Low - Water	1,143	3%
Low	520	1%
Moderate	3,692	10%
High	19,296	54%
Extreme	357	1%
Total	35,940	100%

The following provides a description of the Wildfire Behaviour Threat classes as outlined in the 2013 WUI Wildfire Threat Assessment Guide.

Fire Behaviour Threat Class Summary

- **Very Low:** These are lakes and water bodies that do not have any forest or grassland fuels. These areas cannot pose a wildfire threat and are not assessed.
- **Low:** This is developed and undeveloped land that will not support significant wildfire spread.
- **Moderate:** This is developed and undeveloped land that will support surface fires only. Homes and structures could be threatened.
- **High:** Landscapes or stands that: are forested with continuous surface fuels that will support regular candling, intermittent crown and/or continuous crown fires; often include steeper slopes, rough or broken terrain with generally southerly and/or westerly aspects; can include a high incidence of dead and downed conifers; are areas where fuel modification does not meet an established standard.
- **Extreme:** Consists of forested land with continuous surface fuels that will support intermittent or continuous crown fires. Polygons may also consist of continuous surface and coniferous crown fuels. The area is often one of steep slopes, difficult terrain and usually a southerly or westerly aspect.

4.3.5.2 Wildland Urban Interface Threat Class

“High or Extreme wildfire behaviour threat polygons can pose unacceptable wildfire threats when in close proximity to a community or development” (Morrow, Johnston, & Davies, 2013).

The WUI is defined as an area with combustible vegetation adjacent to homes and valuable Critical Infrastructure (CI). The Wildland Urban Interface Threat Class evaluates the threat of forested stands as they relate to values in the AOI. Per Morrow, Johnston, & Davies, the Wildland Urban Interface

Threat Class was only calculated for areas that have a Wildfire Behaviour Threat Class of High or Extreme.

A combination of the outcomes of two GIS analysis procedures were used to assess the WUI threat class.

The first GIS analysis procedure was used to estimate the Wildland Urban Interface Threat Class for High or Extreme wildfire behaviour threat polygons located in close proximity to a community or development(s).

The location of community or development was modelled based on structure density per square kilometer (km²). The updated structure location mapping prepared for the CWPP was analyzed with Zonal Statistics to create a 100 m square grid with a structure count per grid cell. A FocalSum analysis using a 10 x 10 cell window (i.e. 1 km²) was used to create a set of various structure density per km² raster data sets. A review of the structure density per km² outcomes selected the surface showing the area with greater than or equal to 40 structures/ km² as the best representation of community and development. The 40 structures/ km² polygon achieved a reasonable balance between including fairly densely to densely settled areas as community and development and excluding sparsely settled areas.

The following provides a description of the Wildland Urban Interface Threat classes around community and developments as outlined in the 2013 WUI Wildfire Threat Assessment Guide.

WUI Threat Classes

- **N/A:** Wildfire behaviour threat class is not high or extreme
- **Low:** The high or extreme wildfire behaviour threat class polygon is a sufficient distance away from any developments not to have a direct impact. The polygon is likely over two kilometers from any developments
- **Moderate:** The high or extreme wildfire behaviour threat class polygon is a sufficient distance away from any developments not to have a direct impact. The polygon is likely over five hundred meters from any developments.
- **High:** The high or extreme wildfire behaviour threat class polygon has the potential for a direct impact on a community or development. The polygon is within five hundred meters of a community or development(s).
- **Extreme:** The high or extreme wildfire behaviour threat class polygon has the potential for a direct impact on a community or development. The polygon is immediately adjacent to a community or development(s).

"Immediately adjacent to a community" is defined by SWPI (2018) as within 100 meters of the values at risk.

A set of fixed width buffers - 100 m, 500 m, 2000 m - were generated around the 40 structures/ km² based community and development areas.

High or extreme wildfire behaviour threat class polygons within or within 100 m of the community and development areas were classed as Extreme WUI Threat Class, and **are** shown on Map 7.

High or extreme wildfire behaviour threat class polygons from 100 to 500 m removed from the community and development areas were classed as High WUI Threat Class, and **are** shown on Map 7.

High or extreme wildfire behaviour threat class polygons more than 500m from the community and development areas received a Moderate or Low WUI threat class rating, and **are not** shown on Map 7.

The second GIS analysis procedure was used to identify WUI threats in relation to Critical Infrastructure value points and other values at risk points identified on Map 2. Spatial data inputs were a high resolution multispectral image, a digital elevation model (DEM), and a feature class of points showing both regular structures and Critical Infrastructure.

The model calculates a score for each of the three Structural assessments shown in the table below.

Structural	A	B	C	D	E
18 <i>Position of Structure/Community on Slope</i>	No Structures Values within 2 km 0	Bottom of slope, valley bottom 5	Mid-slope benchland, elevated valley, <16% slope 10	Mid-slope continuous, >15% slope 12	Upper 1/3 of Slope 15
19 <i>Type of Development</i>	No Structures Values within 2 km 0	Perimeter Interface, no inclusions 3	Perimeter Interface, with inclusions 5	Intermix > 1 structure/ha 8	Intermix <1 structure/ha Infrastructure 10
20 <i>Position of Assessment Area Relative to Values</i>	No Structures Values within 2 km 0	Above >500 200-500 <200 m 1 10 20	Sidehill >500 200-500 <200 m 1 12 25	Flat/Rolling >500 200-500 <200 m 1 12 25	Below >500 200-500 <200 m 1 15 30

WILDLAND URBAN INTERFACE WILDFIRE THREAT SCORE /55

The WUI Threat score for the Position of a Structure on a Slope was determined as follows:

- Slope classes of 0-16 and >16 percent were created from the DEM to differentiate between 18C and 18D.
- Contour lines were created and analysed to identify the elevation break points between the valley bottom and bottom of slope(18B), mid slope(18C/D), and upper third of slope(18E).
- Scores were assigned based on the contour values and slope.

The WUI Threat score for the Type of Development was determined as follows:

- Urban(19B/C) vs rural(19D/E) areas were differentiated by point structure density. The ArcMap Point Density tool was used to calculate the density of point features (structures) around each output raster cell. A 100 m radius neighbourhood was defined around each raster cell center, and the number of points that fall within the neighbourhood was totalled and divided by the area of the neighbourhood.

Gaming with the model was used to select a suitable density threshold. Locations with a point (structure) density > 4.2 were classed as being in an urban area. Structures that did not meet this threshold were classed as being in a Rural area.

- Within areas identified as Rural, Score 19E was assigned to areas with <= 1 structure per hectare. The remaining rural areas were assigned the score 19D.
- To differentiate between 19B and 19C in Urban areas, inclusions were identified. Inclusions are areas of unmodified forest that exist within urban areas. A red and near infrared band collected from the Sentinel 2 satellite was converted to a Normalized Differential Vegetation Index (NDVI). An NDVI threshold value was then identified to distinguish between inclusions and non

vegetated areas. A 25 meter buffer was created around the inclusion and this area was assigned the score 19C. The remaining urban area was then assigned the score 19B.

The WUI Threat score for the Position of Assessment Area Relative to Values was determined as follows:

- A Euclidean Distance (ED) surface was created based on location of critical infrastructure (CI), and categorized into <200 meters, 200-500 meters, and >500 meters classes.
- A digital elevation model (DEM) elevation raster, terrain slope raster, and ED raster were then combined into a single raster.
- Score 20D was calculated from the raster for areas with slopes < 16%.
- For other areas, elevation values from the DEM were then added to each CI point. A program loop was created for 200 CI points. The program loop created a 2 kilometer buffer around each point and clipped the DEM to this buffer. Each cell of the clipped DEM was compared to the CI's elevation and it was determined if the cell is above, below, or beside the CI. An appropriate score was then created for 20B, 20C, and 20E.

Review of the model outputs met the general expectation that areas with the highest WUI threat are in upper portions of slopes, rural, and located below critical infrastructure. In contrast, urbanized areas with no inclusions pose a minimal threat to the community.

The outcomes of the two analyses were combined to display on Map 7. Any area with a High or Extreme WUI Threat Class in either analysis is shown thusly on Map 7.

Table 18 shows a summary of the Wildland Urban Interface Threat Class. Areas with a High or Extreme Wildland Urban Interface Threat should be priorities for fuel treatment.

Table 18: WUI Threat

WUI Threat Class	Area (hectares)	Percent of AOI
Not Applicable	16,288	45%
Low	7,203	20%
Moderate	11,906	33%
High	382	1%
Extreme	161	<1%
Total	35,940	100%

SECTION 5: Risk Management and Mitigation Factors

Ongoing fuel management and FireSmart initiatives can help mitigate the wildfire risk throughout the Slocan Valley. Proposed activities aim to reduce the amount of high threat fuels near the community, reduce the susceptibility of values to wildfires, and reduce the occurrence of human caused fires through education and outreach.

5.1 Fuel Management

In wildland fire suppression, fire containment lines are constructed from an advantageous location - usually a barrier to fire spread - known as an anchor point. Anchor points prevent firefighters from being outflanked during progressive fireline construction. A similar concept can be applied to fuel treatments. Ensuring treatments are continuous and anchored into strategic locations (such water bodies, roads, or gravel pits) will increase their effectiveness in the event of a wildfire. Treated areas should not be expected to stop a running crown fire; however they can help reduce fire intensity and increase access and opportunities for first responders to action a wildfire in the WUI.

Locations for fuel treatment were identified and prioritized based on wildfire threat and operational feasibility. An overview of treatment areas has been provided below, while Table 19 (Fuel Treatment Summary) and Appendix 1, Map 8 (Fuel Treatment) provide additional site specific details for each proposed treatment unit.

The following types of potential fuel management treatments were considered during preparation of the CWPP.

5.1.1 Type 1 - Wildland Urban Interface Fuel Management

The Type 1 treatment method addresses dead and non-merchantable live fuels in a forest area to achieve fuel management goals. Most Type 1 work is carried out by hand crews. Machine piling of cut fuels is an option in gently sloped terrain.

A professional, site specific treatment prescription that considers local circumstances will be developed prior to treatment in each area. Generic Type 1 treatment parameters are listed below.

- Tree Removal
 - Overstory stems > 17.5 cm will be retained.
 - Understory conifers < 17.5 cm in diameter will be thinned to create a final stand density of 500 to 700 stems/ha, or approximately 4 m intertree spacing.
 - Understory leave tree spacing and density will vary depending on overstory tree distribution prior to treatment.
 - Small clumps of conifer regeneration < 17.5 cm in diameter will be retained for structural diversity and habitat values. Areas which provide a visual screen for part of the unit will be the first priority for clump location. Retained clumps may occupy up to 5% of the treatment Area. The clumps may not create a fire pathway within the treated unit, considering terrain, wind patterns and adjacent vegetation types/fuel types.
 - Deciduous trees and western yew will be to be retained as 'ghost trees' and do not count towards target density.
- Pruning
 - All retained conifer stems outside of retained clumps will be pruned to a height of 2.5 m or 1/3 of total height, whichever is less, to remove ladder fuels.

- Live branches and dead branches which retain needles and fine branches will be pruned.
- Fine Fuel Abatement
 - Reduce accumulations of fine surface fuels <7 cm diameter to approximately 0.5 kg/m² (5 tonnes per hectare).
 - Reduce accumulations of fuels 7 to 12 cm diameter to approximately 2.5 kg/ m² (25 tonnes per hectare).
 - Discontinuous areas of fine fuels up 10 m x 10 m in size may be left untreated to retain biodiversity values. Untreated fine fuel area may occupy up to 4% of the treatment area.
- Coarse Woody Debris
 - A minimum of 10 logs per ha of coarse woody debris, each >5 meters in length and >20 cm diameter, will be retained if present.
- Debris Disposal
 - Cut stems and other fuels will be disposed of by chipping or by piling and burning.
 - Burn piles will be a maximum of 5 meters in diameter and 5 meters high. Piles will be located away from retained trees.
 - All pile burning will be done in accordance with the Wildfire Act and Regulations.
- Smoke Management
 - Burning will be conducted in accordance with Ministry of Environment regulations.
- Safety
 - All will be carried out in compliance with applicable Worksafe BC regulations.
- Reserves
 - Riparian reserves will be established per regulations and will not be treated.
 - Slopes >60% may not be treated if terrain and site conditions create an unsafe workspace.
 - Additional reserves may be established based on site specific factors. Any additional reserves will be mapped and supported with a rationale.
- Revegetation
 - Disturbed areas from machine traffic will be seeded with an appropriate revegetation seed mix of Canada #1 grade seed within 18 months of disturbance.
- Information Sharing
 - Information on planned activities will be shared with all holders of a government tenure or licence, First Nations per CAD database, and adjacent landowners a minimum of 30 days prior to work start.

5.1.2 Type 2 - Post-Harvest Fuel Management

This treatment method is used in areas that have been previously harvested to reduce fuel loads and initiate climate change adaptation using a merchantable understory removal / overstory retention approach. The harvest pass creates an open forest of established large trees of fire resistant species, per the SIFCo WUI stocking standards. Post harvest fuel assessment and abatement per the wildfire regulations will be carried out by licensee.

The Type 2 post harvest treatment completes the creation of a fuel managed area by removing sub-merchantable understory stems, ladder fuels, and fine fuels.

Type 2 treatment uses an excavator to pile concentrations of fine and medium fuels for disposal. Following the machine piling phase, the hand treatment crew will go through the unit to address remaining fuel loads.

A professional, site specific treatment prescription that considers local circumstances will be developed prior to treatment in each area. Generic Type 2 treatment parameters are listed below.

- Tree Removal
 - Overstory stems > 17.5 cm will be retained.
 - Understory conifers < 17.5 cm in diameter will be thinned to create a maximum final stand density of 500 to 700 stems/ha, or approximately 4 m intertree spacing. Poor quality understory stems with low live crown percentage, deformed stems, severe suppression and/or logging damage will not be retained.
 - Final understory leave tree spacing and density will vary depending on (a) overstory tree distribution prior to treatment and (b) existence of suitable understory leave trees.
 - Clumps of conifer regeneration < 17.5 cm in diameter may be retained for structural diversity and habitat values. Areas where no overstory harvest took place and areas which provide a visual screen from roads or trails will be the first priority for clump location. Retained clumps may occupy up to 15% of the treatment Area. The clumps may not create a fire pathway within the treated unit, considering terrain, wind patterns and adjacent vegetation types/fuel types.
 - Deciduous trees and western yew will be to be retained as 'ghost trees' and do not count towards target density.
- Fine Fuel Abatement
 - Reduce accumulations of fine surface fuels <7 cm diameter to approximately 0.5 kg/m² (5 tonnes per hectare).
 - Reduce accumulations of fuels 7 to 12 cm diameter to approximately 2.5 kg/ m² (25 tonnes per hectare).
 - Discontinuous areas of fine fuels up 10 m x 10 m in size may be left untreated to retain biodiversity values. Untreated fine fuel area may occupy up to 4% of the treatment area.
- Debris Disposal
 - Cut stems and other fuels will be disposed of by chipping or by piling and burning.
 - Burn piles will be a maximum of 5 meters in diameter and 5 meters high. Piles will be located away from retained trees.
 - Machine piling of fuels will be used in locations with slopes < 35% and stable soils that are suitable for machine travel.
 - All pile burning will be done in accordance with the Wildfire Act and Regulations.
- Reserves
 - Riparian reserves will be established per regulations and will not be treated.
 - Slopes >60% may not be treated if terrain and site conditions create an unsafe workspace.
- Coarse Woody Debris, Smoke Management, Safety, Revegetation and Information Sharing
 - Same targets and standards described under Type 1 treatments.

5.1.3 Type 3 - Machine Based Interface Cleanup

This treatment method is similar to Type 2 – Post-Harvest Fuel Management – but is carried out in interface areas where combinations of insect attack, root disease, blowdown and past high-grading have depleted the stock of merchantable timber to the point where no viable harvest volume remains.

Type 3 treatment uses an excavator to pile fine and medium fuels for disposal, or to mulch fuels in place using a mulching head. The machine access routes will create open strips in the treated area, but machine access will be constrained to limit impacts on stocking density and soil disturbance.

No Type 3 treatments are identified in this CWPP. Type 3 treatment areas may be identified during the prescription preparation process within the proposed treatment areas.

A professional, site specific treatment prescription that considers local circumstances will be developed prior to treatment in each area. Generic Type 3 treatment parameters are listed below.

- Tree Removal
 - Where present, overstory stems > 17.5 cm will be retained. Creation of machine access trails may require that some overstory stems be felled. This will be minimized as much as possible.
 - Understory conifers < 17.5 cm in diameter will be thinned to create a maximum final stand density of 400 to 700 stems/ha, or approximately 4 m intertree spacing. Poor quality stems with low live crown percentage, deformed stems, and/or severe suppression will not be retained.
 - Final understory leave tree spacing and density will vary depending on (a) overstory tree distribution prior to treatment and (b) existence of suitable understory leave trees.
 - Clumps of conifer regeneration < 17.5 cm in diameter may be retained for structural diversity and habitat values. Areas which provide a visual screen from roads or trails are the first priority for clump location. Retained clumps may occupy up to 25% of the treatment Area. The clumps may not create a fire pathway within the treated unit, considering terrain, wind patterns and adjacent vegetation types/fuel types.
 - Deciduous trees and western yew may be retained as 'ghost trees' and do not count towards target density.
- Fine Fuel Abatement
 - Reduce accumulations of fuels 7 to 12 cm diameter to approximately 4.0 kg/ m² (40 tonnes per hectare).
 - Discontinuous areas of fine fuels up 10 m x 10 m in size may be left untreated to retain biodiversity values. Untreated fine fuel area may occupy up to 4% of the treatment area.
- Debris Disposal
 - Fuels will be disposed of by chipping or by piling and burning.
 - Burn piles will be a maximum of 5 meters in diameter and 5 meters high. Piles will be located away from retained trees.
 - Machine piling of fuels will be used in locations with slopes < 35% and stable soils that are suitable for machine travel.
 - All pile burning will be done in accordance with the Wildfire Act and Regulations.
- Reserves
 - Riparian reserves will be established per regulations and will not be treated.
 - Slopes >60% may not be treated if terrain and site conditions create an unsafe workspace.
- Coarse Woody Debris, Smoke Management, Safety, Revegetation and Information Sharing
 - Same targets and standards described under Type 1 treatments.

5.1.4 Type 4 - Fuel Management for Habitat Restoration and Ecosystem Resiliency

The area of interest contains several isolated areas of dry site NDT 4 ecosystems on steep south facing slopes.

These areas have locally unique plant communities that are more commonly associated with the dry Interior Douglas Fir biogeoclimatic zone. Large ponderosa pine (Py) are common, and open pine forests with a fire adapted shrub/herb understory are the desired future condition. These areas are generally not part of the timber harvesting landbase.

From a climate change adaptation perspective, these units contain outposts of the biota that should thrive in surrounding areas as the climate warms. These areas are, however, currently being reduced and degraded by coniferous ingress. Further, if/when these areas burn under current fuel loads, the fire is highly likely to be intense, fast moving, and uncontrollable due to combinations of steep slopes,

upslope winds, high fine fuel loads, and generally dry conditions. A fire under current conditions will likely (a) kill many of the locally rare and ecologically valuable species on the site, which are not well adapted to extreme fire events, (b) kill many or all of the ecologically valuable leaf trees, and (c) transition from local to landscape scale.

The ecosystem and strategic fire management benefits of managing these areas with low intensity, frequent fires are significant. Reintroduction of fire will also improve and maintain ungulate range and forage values.

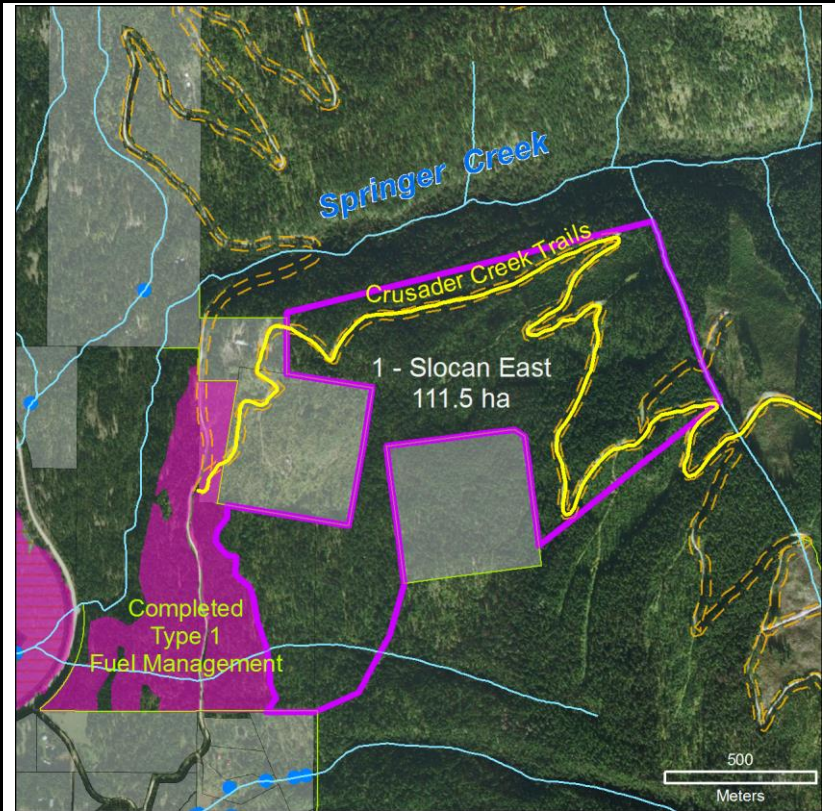
Type 4 treatments in these areas will be designed to facilitate the return of fire to the ecosystem. The treatment regime will include:

- Development of a professional treatment prescription prior to treatment
- Hand treatment as required to reduce fuel loads adjacent to the stems and above the rooting area of large leaf trees to reduce fire intensity, and soil and bark heating.
- Hand treatment to reduce the fuel loads in dense regeneration thickets to moderate fire intensity.
- Creation of very low fuel load fire breaks along the boundary of the burn area.
- Development of a professional burn plan.
- Reintroduction of fire, as well as post fire surveys and documentation (under separate funding in collaboration with the BC Wildfire Service).
- Machine piling and/or mulching of fuels and debris may be used to reduce fuel loads where required prior to burning where terrain conditions are suitable.

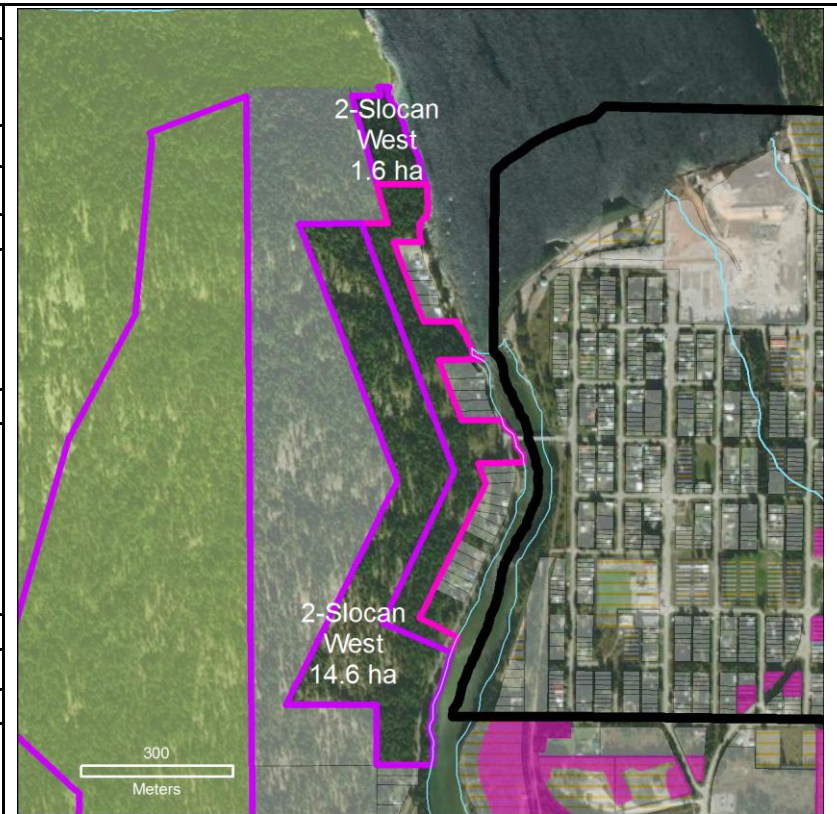
5.1.5 Summary of Proposed Fuel Treatment Units

Table 19: Summary of Proposed Fuel Treatment Units

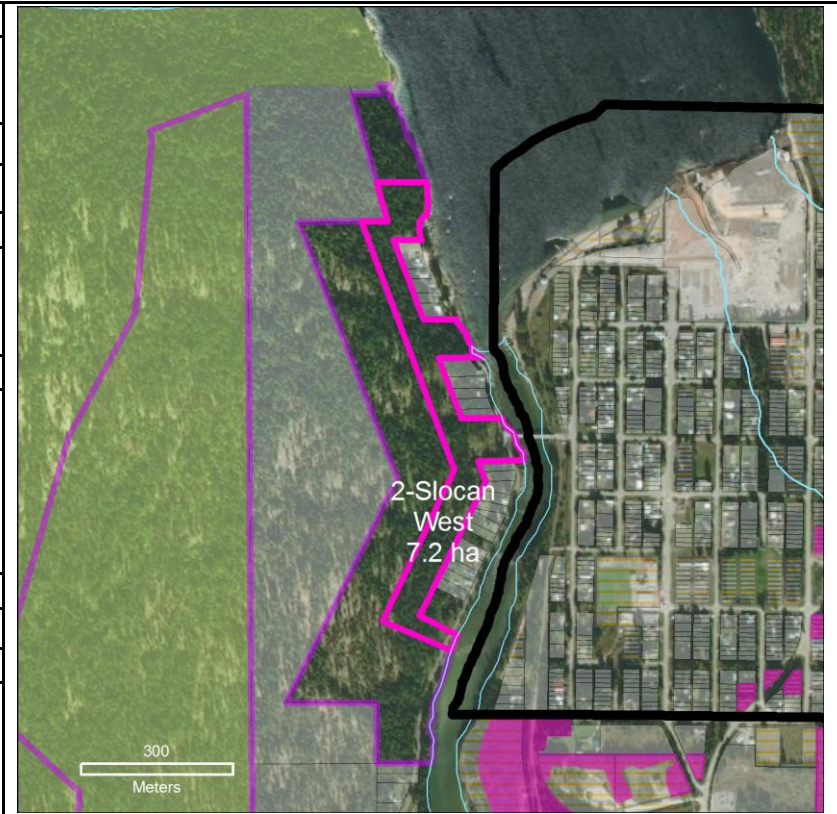
Treatment Unit	Treatment Type(s)	Total Area
1 - Slocan East	Primary Fuel Break. Estimate: 5% Type 1 WUI 95% Type 2 Post Harvest Fuel Management	111.5 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
CFA K2R	16% Extreme 55% High 29% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Large treatment unit located 1 km due east of Slocan in Springer Creek watershed. Is an area of dense coniferous forest on mostly conventionally operable terrain with excellent existing access. Unit is a strategic landscape level fuel break that improves suppression opportunities and reduces the likelihood of a wildfire expanding to landscape scale. Unit is adjacent to and expands on previous fuel management work to west, shown as pink on map. Unit takes advantage of topography (moderately sloped terrain adjacent to deep Springer Creek valley) and good access to enhance effectiveness of both fuel management work and potential fire suppression activities.		
Overlapping Values		
Domestic water supplies, visuals, recreation, ungulate winter range..		
Treatment Constraints		
North half of unit is within Springer Creek Community Watershed, which is a water source for the Village of Slocan. Previous private land and crown land timber harvesting may limit extent of treatment while previous harvest areas green up. Need to maintain forest canopy for water and visuals management. Crusader Creek snowmobile recreation trail tenure passes through area.		



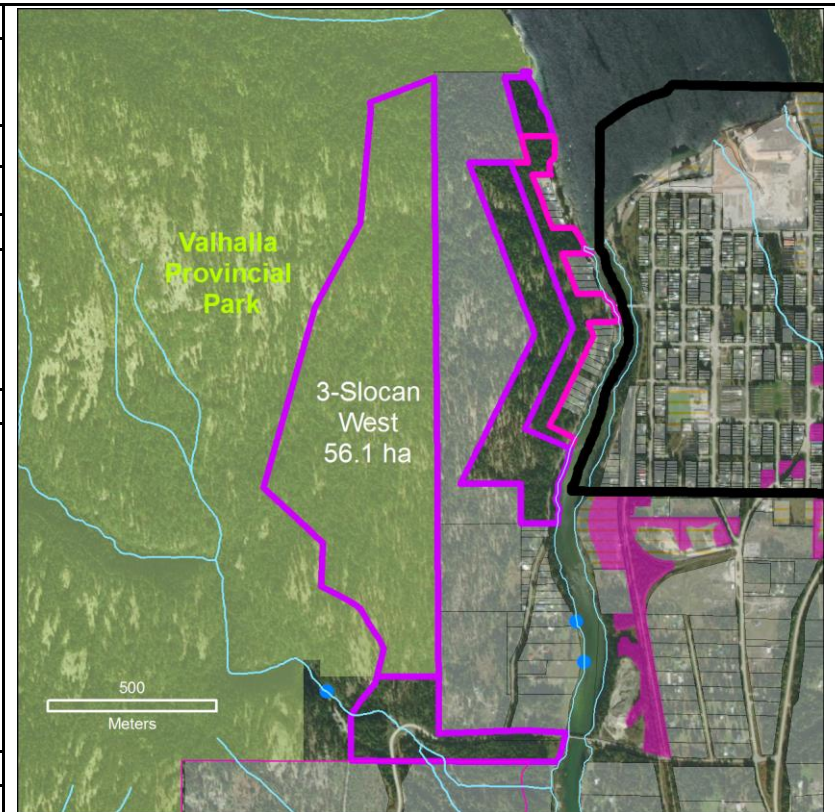
Treatment Unit	Treatment Type(s)	Total Area
2 - Slocan West	Primary Fuel Break.	14.6 ha
	100% Type 1 WUI	1.6 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	96% High 4% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Small treatment unit composed of two discrete polygons located 250 m due west of Slocan. An area of variable density, dry coniferous forest on rocky moderately steep sites. Treatment unit is designed to improve suppression opportunities and reduce chance of a high intensity fire close to and upwind of Slocan.		
Overlapping Values		
Visuals, recreation, ungulate winter range.		
Treatment Constraints		
Walk in access. Steep and rocky terrain in places. Need to maintain forest canopy for visual management.		



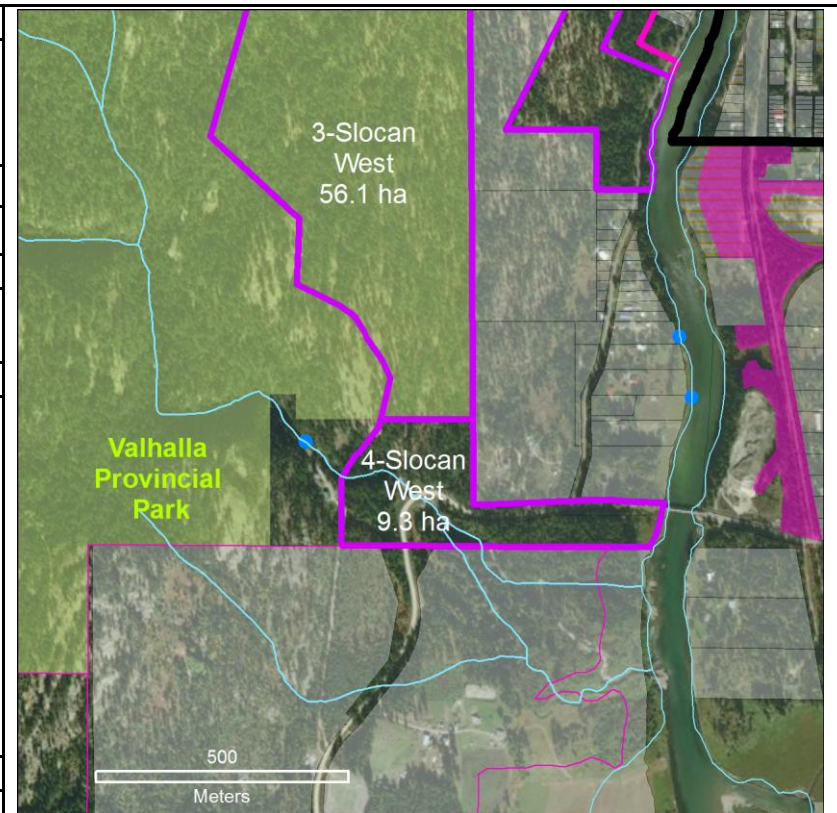
Treatment Unit	Treatment Type(s)	Total Area
2 - Slocan West	Interface Fuel Break. 100% Type 1 WUI	7.2 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	96% High 4% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Reduce risk of high intensity fire adjacent to residences.		
Treatment Rationale		
Small treatment area of variable density, dry coniferous forest on rocky moderately steep sites immediately adjacent to residences. Treatment unit is designed to improve suppression opportunities and reduce chance of a high intensity fire immediately adjacent to residences and close to and upwind of Slocan.		
Overlapping Values		
Visuals, recreation, ungulate winter range..		
Treatment Constraints		
Steep and rocky terrain in places. Need to maintain forest canopy for visuals management.		



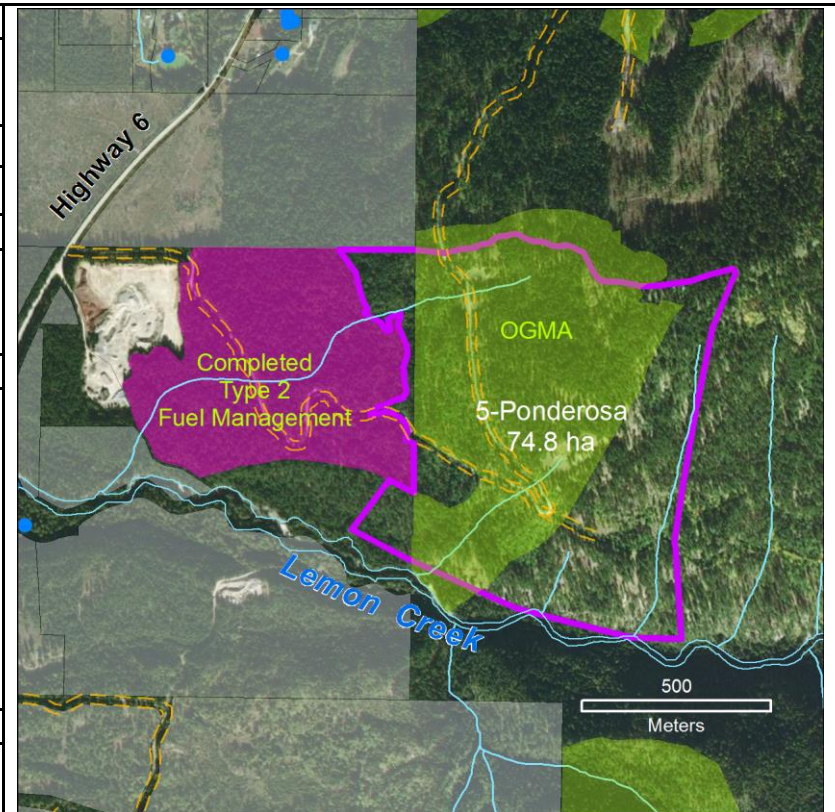
Treatment Unit	Treatment Type(s)	Total Area
3 - Slocan West	Primary Fuel Break. Treatment Type: To Be Determined	56.1 ha
Tenure	CWPP Threat Rating Summary in Unit	Priority
Provincial Park	92% High 8% Low	Moderate
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Large treatment area of variable density, dry coniferous forest on rocky moderately steep sites. Area is due west of, uphill of, and generally upwind of Slocan and is strategically significant. A high intensity wildfire in this location would likely subject Slocan to a high intensity ember shower. Moderate priority reflects fact that area is in a Provincial Park, rather than importance of treatment in relation to Slocan. Treatment unit is designed to improve suppression opportunities and reduce chance of a high intensity fire close to and upwind of Slocan.		
Overlapping Values		
Visuals, recreation. Class A Provincial Park.		
Treatment Constraints		
Currently no developed access. Class A Provincial Park. Treatment options, if any, will need to be developed in conjunction with BC Parks.		



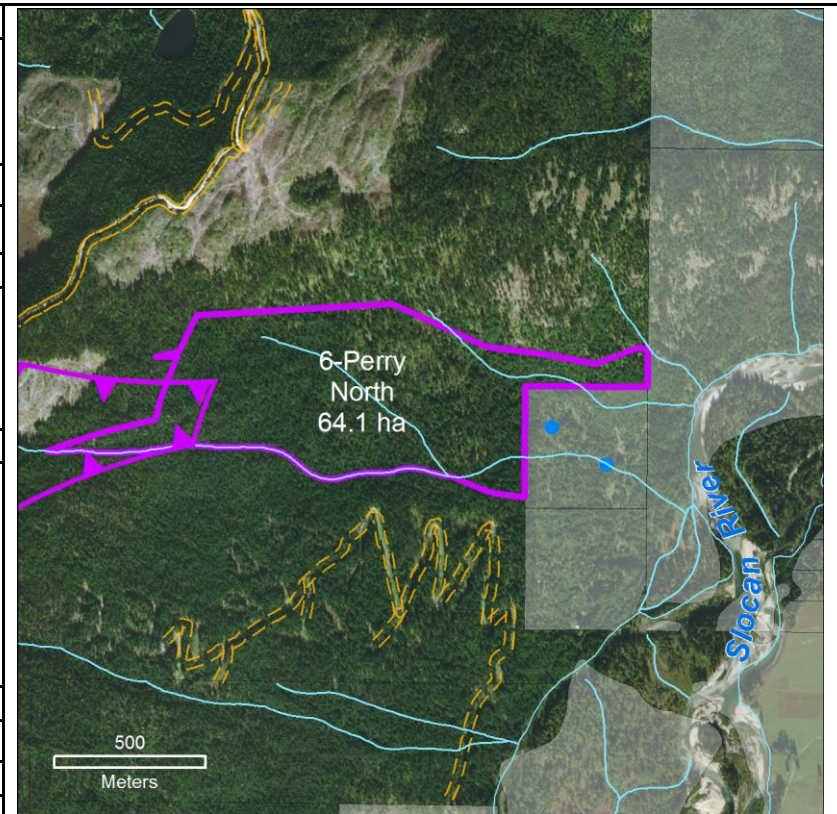
Treatment Unit	Treatment Type(s)	Total Area
4 - Slocan West	Primary Fuel Break. 50% Type 1 WUI 50% Type 2 Post Harvest Fuel Management	9.3 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	67% High 28% Moderate 4% Low	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Treatment Rationale		
<p>Small treatment area of mostly dense mixed coniferous and deciduous forest on flat to moderately steep sites. Contains portions of Gwillim Creek and Slocan River riparian management areas.</p> <p>Area is a small finger of crown land between Valhalla Provincial Park and private land. 50% of unit appears suitable for Type 2 treatment, but this may change when site level assessment determines full extent of riparian ecosystems. Excellent developed access.</p> <p>Treatment unit is designed to improve suppression opportunities and reduce chance of a high intensity fire close to Slocan. Treatment unit has greater strategic value as part of a larger treatment program that includes Treatment Unit 3 - Slocan in Valhalla Park.</p>		
Overlapping Values		
Riparian ecosystems, recreation, ungulate winter range.		
Treatment Constraints		
Riparian management and extent of deciduous stocking. Need to maintain forest canopy for visuals management.		



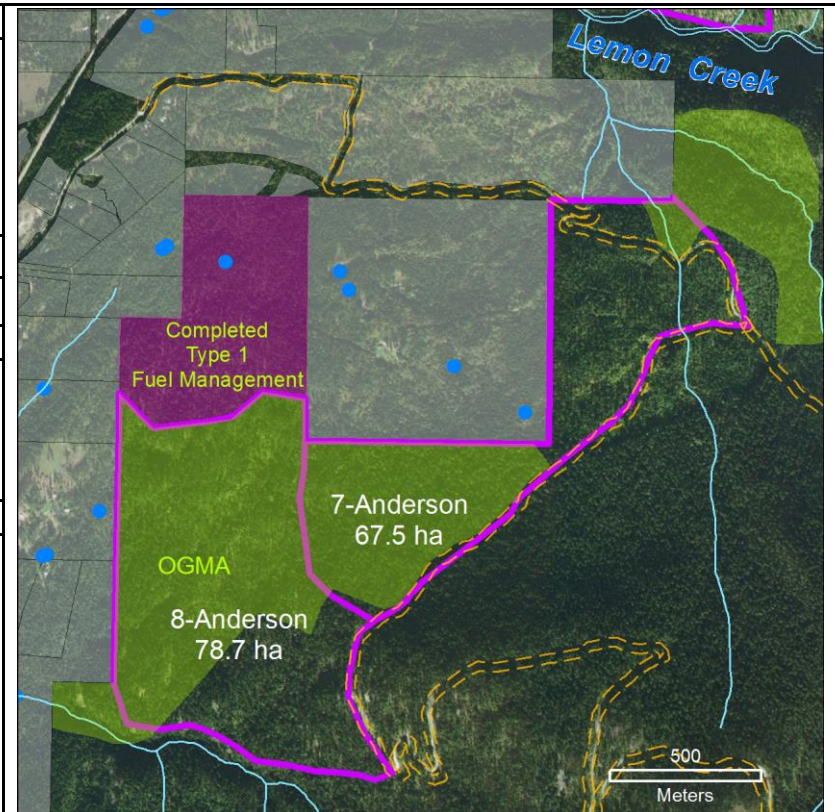
Treatment Unit	Treatment Type(s)	Total Area
5 - Ponderosa	Primary Fuel Break. Type 4 Ecosystem Restoration	74.8 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
CFA K2R and TSA	71% High 21% Moderate 8% Low	High
Treatment Objectives		
Conduct prescribed burn under suitable conditions to restore dry site habitat, provide ecological benefits, and to create residual stand and vegetation cover characteristics that will reduce the probability of a high intensity fire in the future.		
Treatment Rationale		
Large treatment area of variable density coniferous forest on steep, dry site. Most dense forest areas are the result of coniferous ingrowth following partial cut harvesting and/or fire suppression.		
Treatment unit is part of a strategic scale, landscape level fuel managed area. It extends from a low fuel (gravel pit) and a fuel managed (Type 2 Treatment) area to the west, and increases the area of good suppression opportunities and reduced fire behaviour.		
This strategic unit extends across an area that modeling shows is major fire movement path up the Lemon Creek drainage.		
Overlapping Values		
Domestic water intakes and fisheries values in Lemon Creek.		
Ungulate winter range and ungulate forage area.		
Old Growth Management Area (OGMA). The dry site Douglas-fir forest in the OGMA is expected to benefit from re-introduction of fire and reduction in vegetation density.		
Treatment Constraints		
Treatment is compatible with overlapping values.		



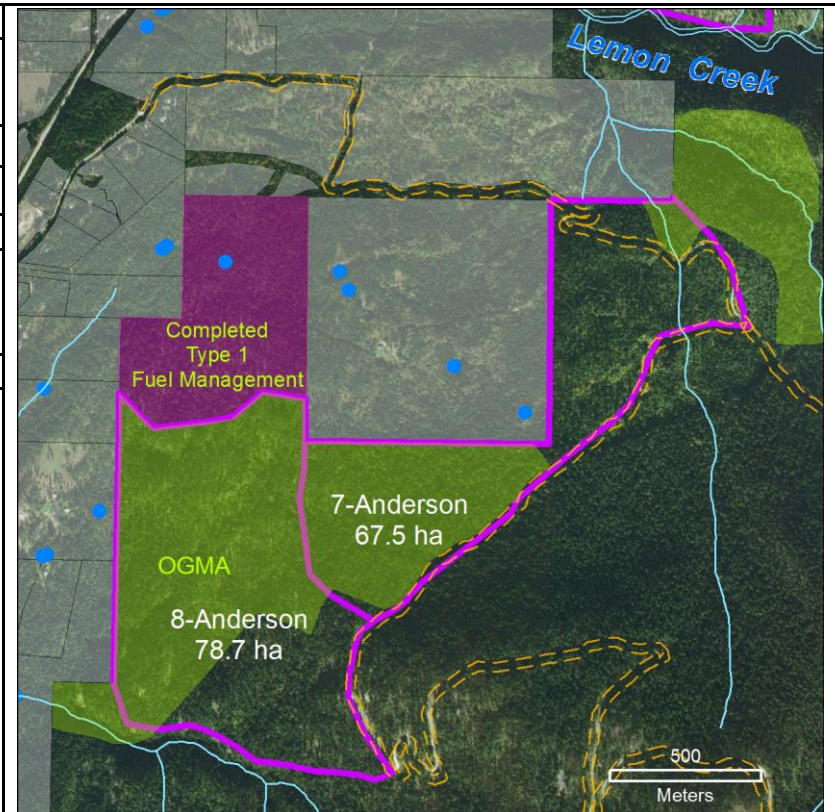
Treatment Unit	Treatment Type(s)	Total Area
6 - Perry North	Primary Fuel Break. 50% Type 1 WUI 50% Type 2 Post Harvest Fuel Management	64.1 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	100% High	Moderate
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Large treatment unit of dense coniferous forest on moderate slopes (70% of area) and moderately dense coniferous forests on steeper south facing slopes (30% of area). Treatment unit is a strategic, landscape scale unit designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of Perry Ridge. Access to area can be developed from timber harvesting road system to south.		
Overlapping Values		
Domestic watershed, visuals, ungulate winter range.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. Riparian management areas along domestic use streams.		



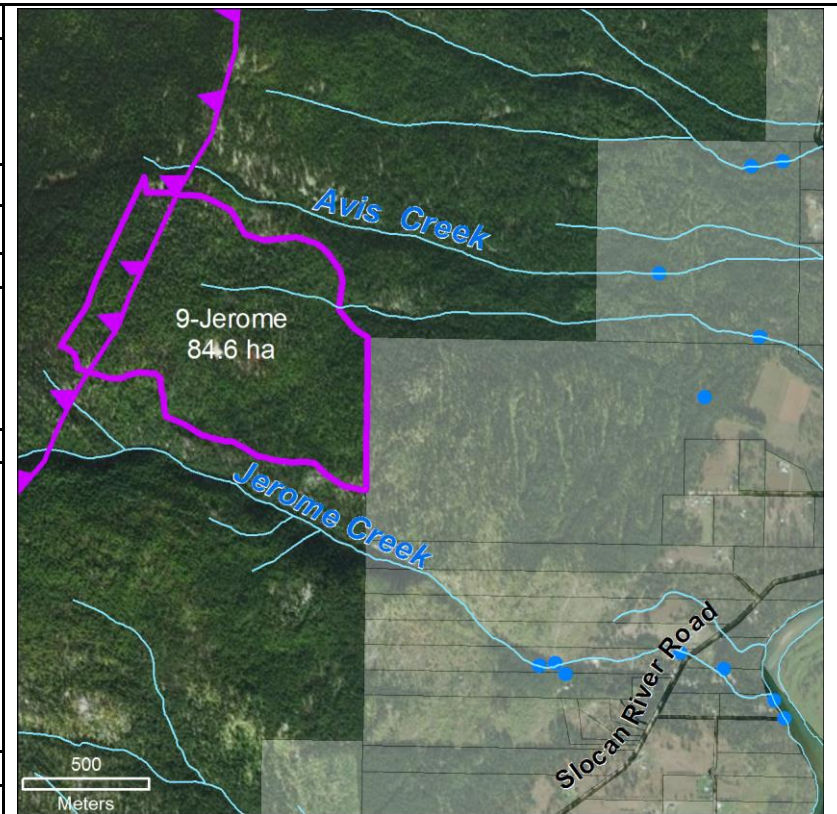
Treatment Unit	Treatment Type(s)	Total Area
7 - Anderson	Primary Fuel Break. 50% Type 1 WUI 25% Type 2 Post Harvest Fuel Management 25% Type 3 Machine Based Interface Cleanup	67.5 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
CFA K2R	63% High 37% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
A large treatment unit of dense coniferous forest on moderate slopes. When considered in conjunction with adjacent Anderson 8, forms a large strategic treatment unit that extends across an area that modeling shows is major fire movement path up the Lemon Creek drainage. Treatment unit is a strategic, landscape scale unit designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of the Slocan Valley into Lemon Creek. Unit takes advantage of topography (moderately sloped terrain on south shoulder of Lemon Creek valley) to cut a main fire movement corridor. Good access to area on Elliot FSR (partially obscured by east treatment unit boundary on map) will enhance effectiveness of both fuel management work and potential fire suppression activities		
Overlapping Values		
Domestic watershed, visuals, ungulate winter range. Old growth management area.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. No harvesting in OGMA, need to maintain large tree values in OGMA.		



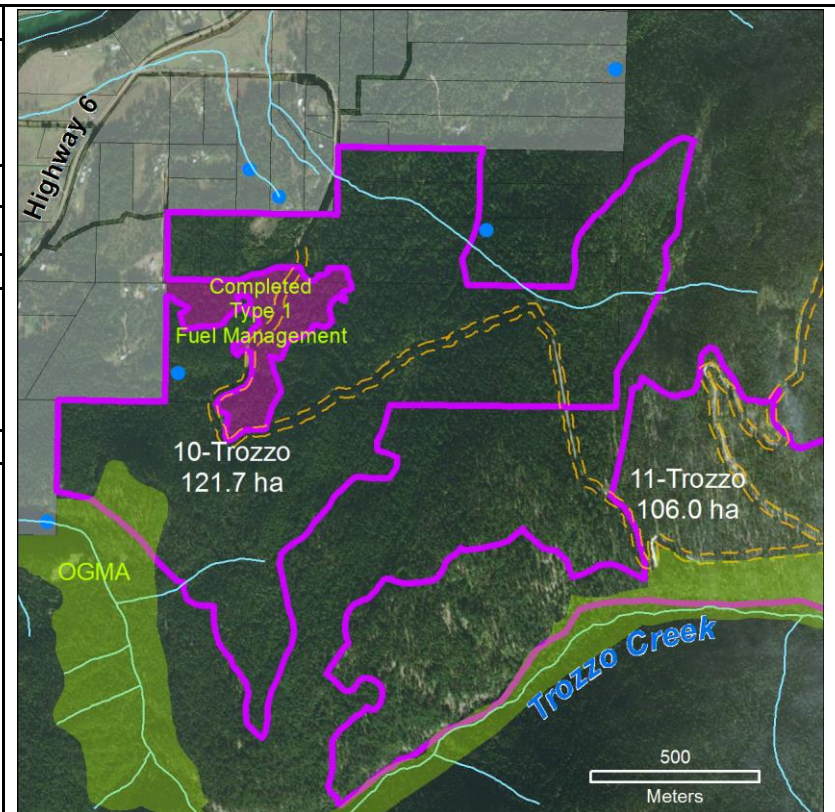
Treatment Unit	Treatment Type(s)	Total Area
8 - Anderson	Primary Fuel Break. Type 4 Ecosystem Restoration	78.7 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
CFA K2R	100% High	Moderate
Treatment Objectives		
Conduct prescribed burn under suitable conditions to restore dry site habitat, provide ecological benefits, and to create residual stand and vegetation cover characteristics that will reduce the probability of a high intensity fire in the future.		
Treatment Rationale		
<p>A large treatment unit of moderately dense to sparse coniferous forests on steep south and west facing slopes. Has suffered recent Douglas-fir beetle mortality resulting in reduced stand density and increased fuel loads.</p> <p>When considered in conjunction with adjacent Anderson 7, forms a large strategic treatment unit that extends across an area that modeling shows is major fire movement path up the Lemon Creek drainage.</p> <p>Treatment unit is a strategic, landscape scale level unit designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of the Slocan Valley into Lemon Creek.</p> <p>Unit takes advantage of topography (moderately sloped terrain on south shoulder of Lemon Creek valley) to cut a main fire movement corridor. Unit enhances value of previous investment in fuel management in adjacent treated area to north.</p> <p>Access for pre-burn treatments unit is walk in, or on old machine trails extending from private land to north. Access for establishing a black line fire break prior to main burn is excellent along Eliot FSR along top of unit.</p>		
Overlapping Values		
<p>Domestic watershed, visuals, ungulate winter range.</p> <p>Old Growth Management Area (OGMA). The dry site D-fir forest in the OGMA is expected to benefit from re-introduction of fire and reduction in vegetation density.</p>		
Treatment Constraints		
<p>Small domestic watershed. Burn intensity must be high enough to effect vegetation changes, but low enough to maintain water production values.</p> <p>Treatment is compatible with other overlapping values.</p>		



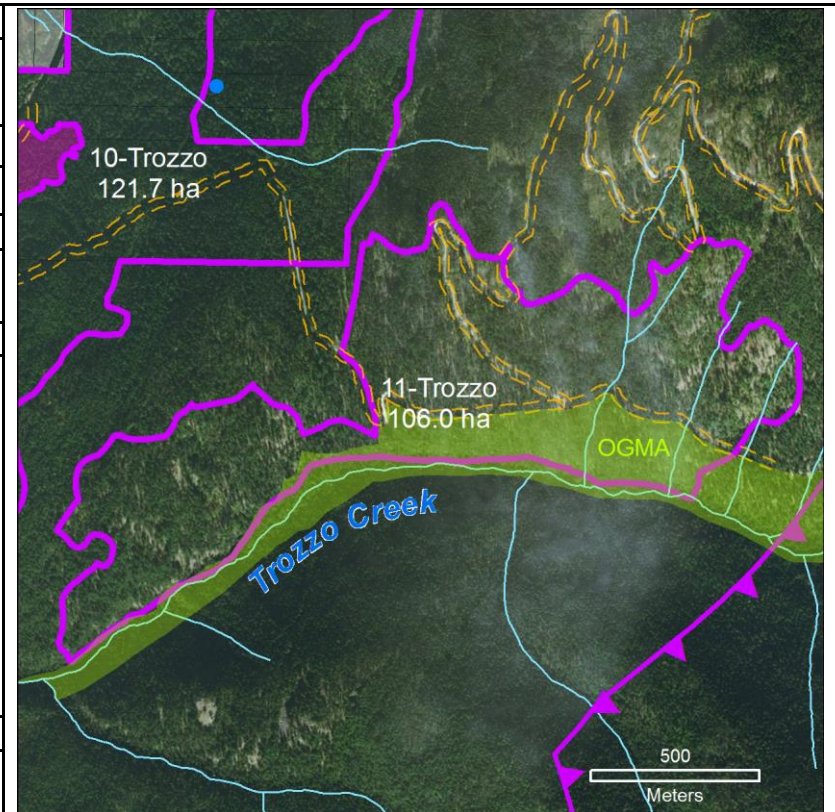
Treatment Unit	Treatment Type(s)	Total Area
9 - Jerome	Primary Fuel Break. 50% Type 1 WUI 50% Type 2 Post Harvest Fuel Management	64.1 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	100% High	Moderate
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Large treatment unit of dense coniferous forest on moderate slopes (70% of area) and moderately dense coniferous forests on steeper south facing slopes (30% of area). Treatment unit is a strategic, landscape scale unit designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of Perry Ridge. Access to area is via old logging road system across private land, and will require cooperation of adjacent private landowners. Moderate priority reflects access limitations.		
Overlapping Values		
Domestic watershed, visuals.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. Riparian management areas along domestic use streams.		



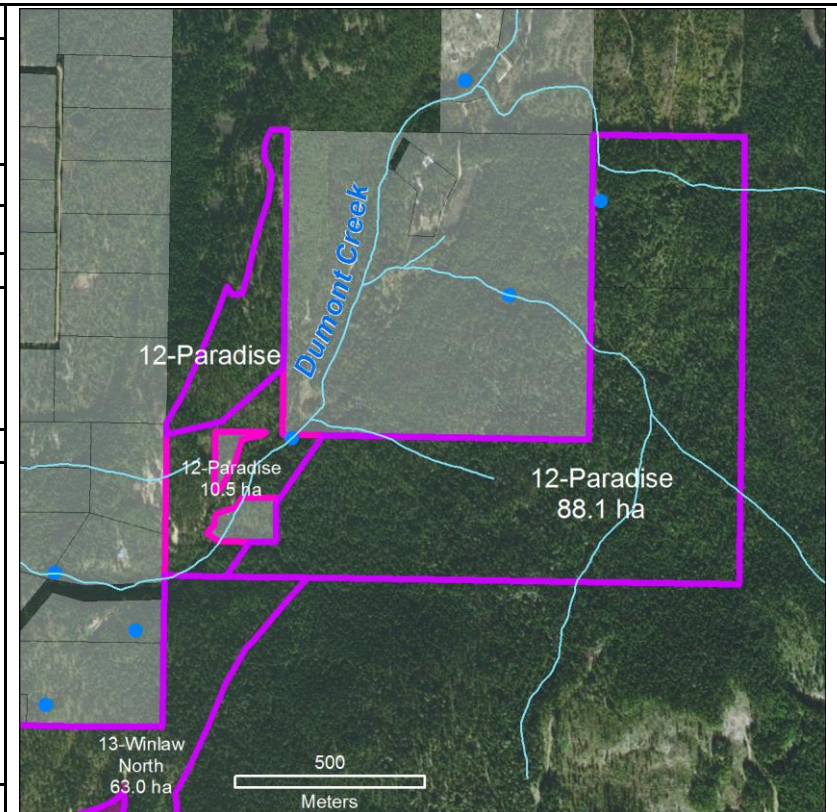
Treatment Unit	Treatment Type(s)	Total Area
10 - Trozzo	Primary Fuel Break. 50% Type 1 WUI 50% Type 2 Post Harvest Fuel Management	121.7 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
CFA K2R and TSA	97% High 3% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Large treatment unit of dense coniferous forest on moderate slopes (75% of area) and steep slopes (25% of area). Treatment unit is half of a two part strategic, landscape scale unit designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east Slokan valley face close to residences or into the Trozzo Creek valley. Strategic value is increased by proximity to treatment unit 12 Trozzo. Builds on previous and current investments. Prescription has been prepared and funding is in place for 33.5 ha of Type 1 treatment in central of unit. Unit surrounds previous 10.5 ha Type 1 treatment. Good access to area along existing Trozzo Forest Service Road. (Note: Area between units 11 and 12 is steep and inaccessible.)		
Overlapping Values		
Domestic watershed, visuals, ungulate winter range, old growth management area.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. No harvesting in OGMA, need to maintain large tree values in OGMA. Riparian reserves and setbacks near water intakes will be identified at prescription stage.		



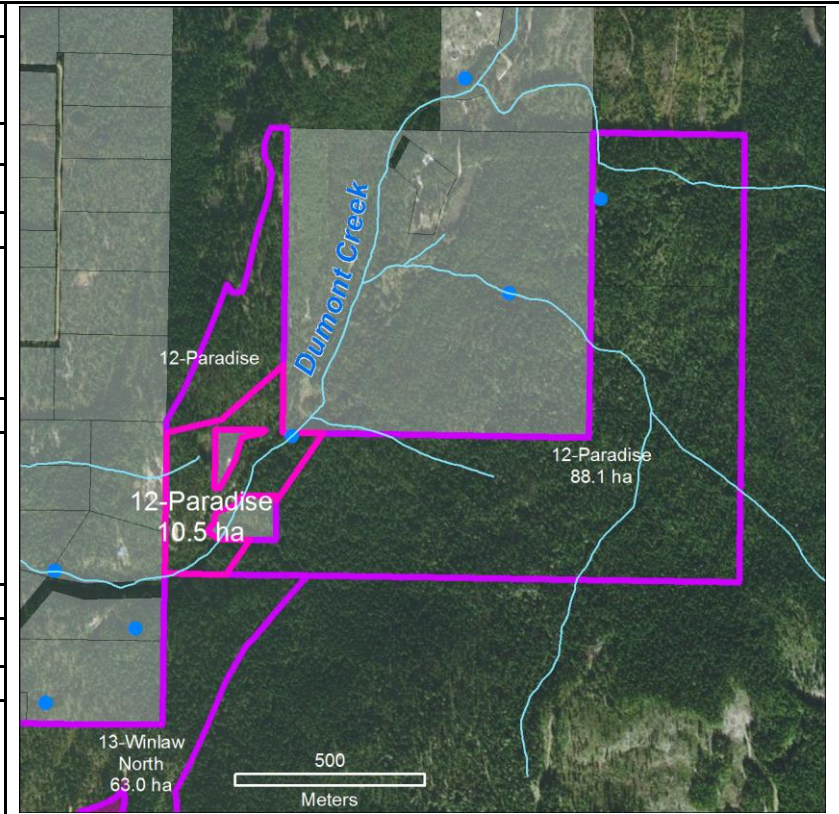
Treatment Unit	Treatment Type(s)	Total Area
11 - Trozzo	Primary Fuel Break. Type 4 Ecosystem Restoration	106.0 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
CFA K2R	1% Extreme 71% High 28% Moderate	High
Treatment Objectives		
Conduct prescribed burn to restore dry site habitat and to create residual stand characteristics that do not support high intensity fire.		
Treatment Rationale		
<p>Large treatment area of variable density coniferous forest on steep, dry site. Most dense forest areas are the result of coniferous ingrowth following partial cut harvesting and/or fire suppression.</p> <p>Treatment unit is half of a two part, strategic scale, landscape level fuel managed area in Trozzo Creek. It extends upslope and up-valley from Treatment Unit 11 Trozzo to the west, and increases the area of good suppression opportunities and reduced fire behavior.</p> <p>This strategic unit extends across an area that modeling shows is fire movement path up the Trozzo Creek drainage.</p> <p>(Note: Area between units 11 and 12 is steep and inaccessible.)</p>		
Overlapping Values		
<p>Domestic water intakes and fisheries values downstream in Trozzo Creek.</p> <p>Ungulate winter range and ungulate forage area.</p> <p>Old Growth Management Area (OGMA). The dry site D-fir forest in the OGMA is expected to benefit from re-introduction of fire and reduction in vegetation density.</p>		
Treatment Constraints		
Treatment is compatible with overlapping values.		



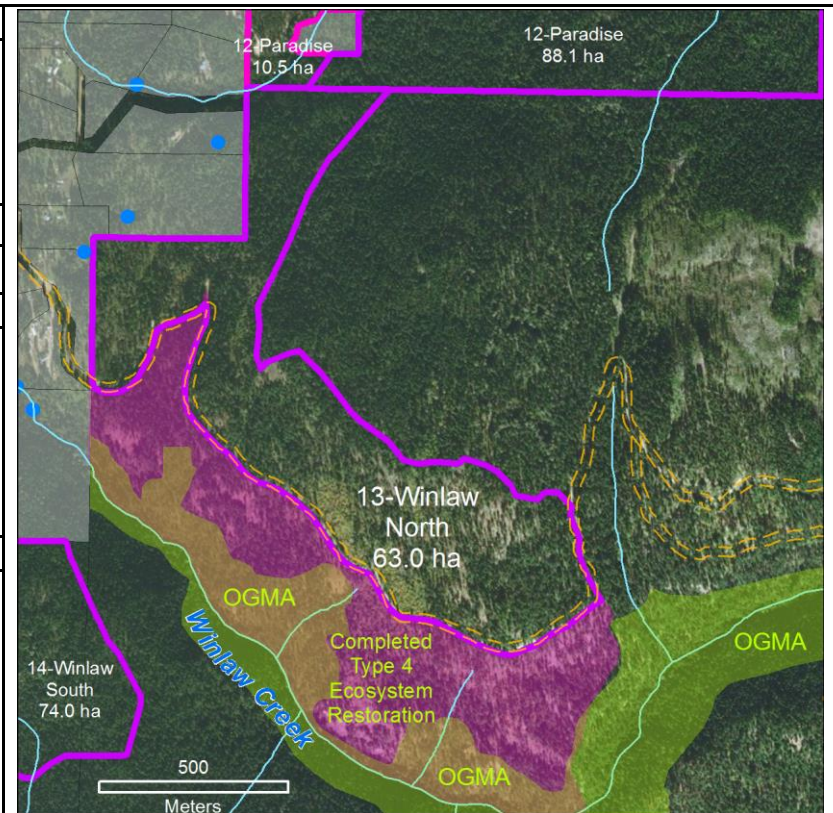
Treatment Unit	Treatment Type(s)	Total Area
12 - Paradise	Primary Fuel Break. 55% Type 1 WUI 45% Type 2 Post Harvest Fuel Management	88.1 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
CFA K2R	99% High 1% Low	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Large treatment unit of dense coniferous forest on moderate slopes. Treatment unit is part of a strategic, landscape scale fuel management area (12-Paradise Primary, 12-Paradise Interface and 13-Winlaw) designed to improve suppression opportunities and reduce the chance of a fire moving north from Winlaw Creek through Paradise Valley and developing into a landscape scale fire. This unit is in the center of a main fire movement path identified by fire behavior modeling. Access to area west of Dumont Creek is from public road along Dumont Creek. Access to area east of Dumont Creek can be developed from timber harvesting road system to south.		
Overlapping Values		
Domestic watershed, ungulate winter range.		
Treatment Constraints		
Need to maintain forest canopy for water management. Riparian management areas along domestic use streams.		



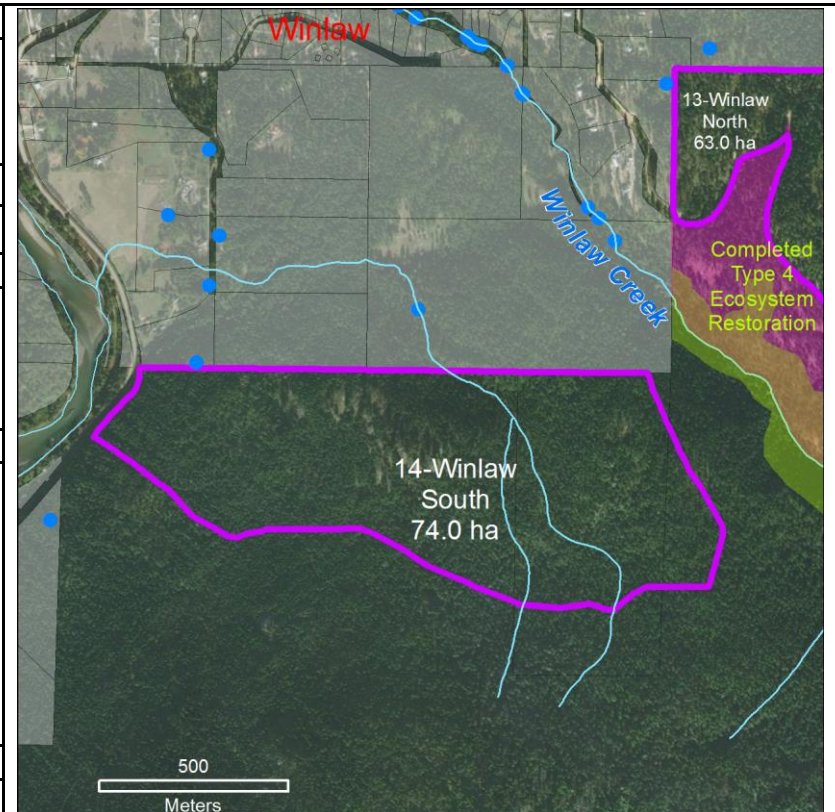
Treatment Unit	Treatment Type(s)	Total Area
12 - Paradise	Interface Fuel Break. 100% Type 1 WUI	10.5 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
CFA K2R	96% High 4% Low/Very Low	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Reduce risk of high intensity fire adjacent to residences.		
Improve opportunities for fire suppression around and evacuation of Paradise Valley.		
Treatment Rationale		
Small treatment area of dense forest (a) immediately adjacent to residences and (b) beside Paradise Valley Road, which is the only access and egress route for small community of Paradise Valley residents.		
Excellent site access from Paradise Valley Road, which runs beside Dumont Creek.		
Overlapping Values		
Domestic water resources.		
Treatment Constraints		
Treatment will be limited in deep central valley around Dumont Creek and associated riparian reserve.		



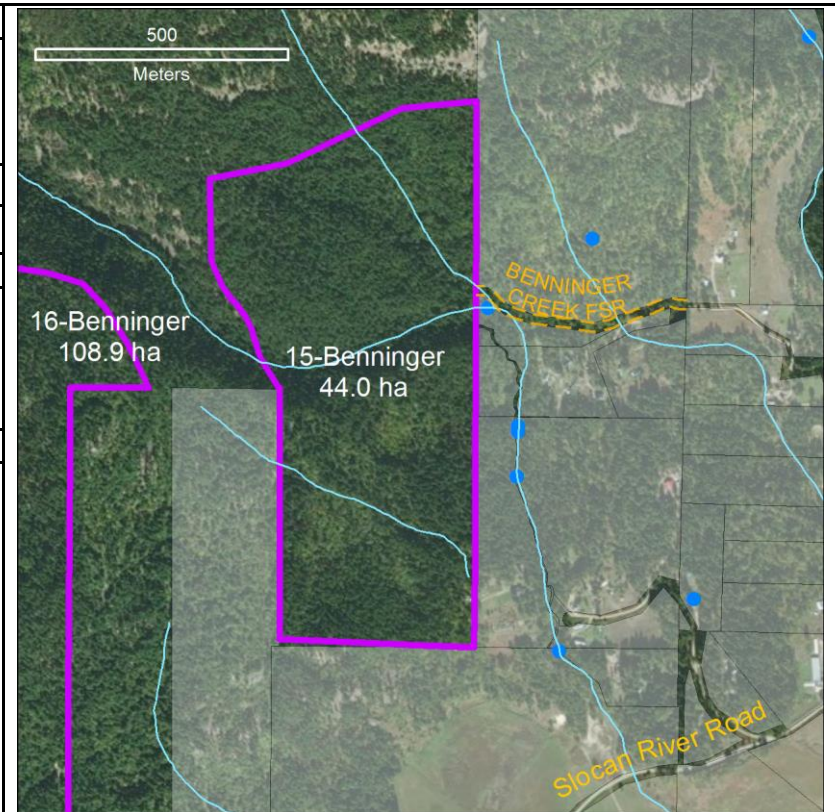
Treatment Unit	Treatment Type(s)	Total Area
13 - Winlaw North	Primary Fuel Break. 10% Type 1 WUI 40% Type 2 Post Harvest Fuel Management 50% Type 4 Ecosystem Restoration	63.0 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
Woodlot Licence	97% High 3% Moderate	Moderate
Treatment Objectives		
<p>Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.</p> <p>Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.</p> <p>Conduct prescribed burn to restore dry site habitat and to create residual stand characteristics that do not support high intensity fire.</p>		
Treatment Rationale		
<p>Large treatment unit of (a) dense to moderately dense coniferous forest on moderate slopes (west half of area) and (b) open coniferous forest and shrubs on steep dry south facing slopes (east half of area).</p> <p>West half of area suited to Type 1 and Type 2 treatments, east half of area suited to Type 4 treatment.</p> <p>Treatment unit is part of a two part strategic, landscape level unit (12-Paradise Primary, 12-Paradise Interface and 13-Winlaw) designed to improve suppression opportunities and reduce the chance of a fire moving north from Winlaw Creek and developing into a landscape scale fire. This unit is in the center of a main fire movement path identified by fire behavior modeling.</p> <p>Unit builds on value of previously treated Type 4 Ecosystem Restoration unit to south.</p> <p>Good access to area along existing Winlaw Creek Forest Service Road.</p>		
Overlapping Values		
Woodlot licence, domestic watershed, visuals, ungulate winter range, ungulate foraging area, woodlot licence.		
Treatment Constraints		
<p>Need to maintain forest canopy for water and visual management.</p> <p>Type 4 treatment is compatible with overlapping values.</p> <p>Treatment unit is within Woodlot Licence. Woodlot has control over whether or not treatment occurs and methods used. Woodlot may require assistance with costs to amend operational plans to facilitate fuel management if treatment moves forward.</p>		



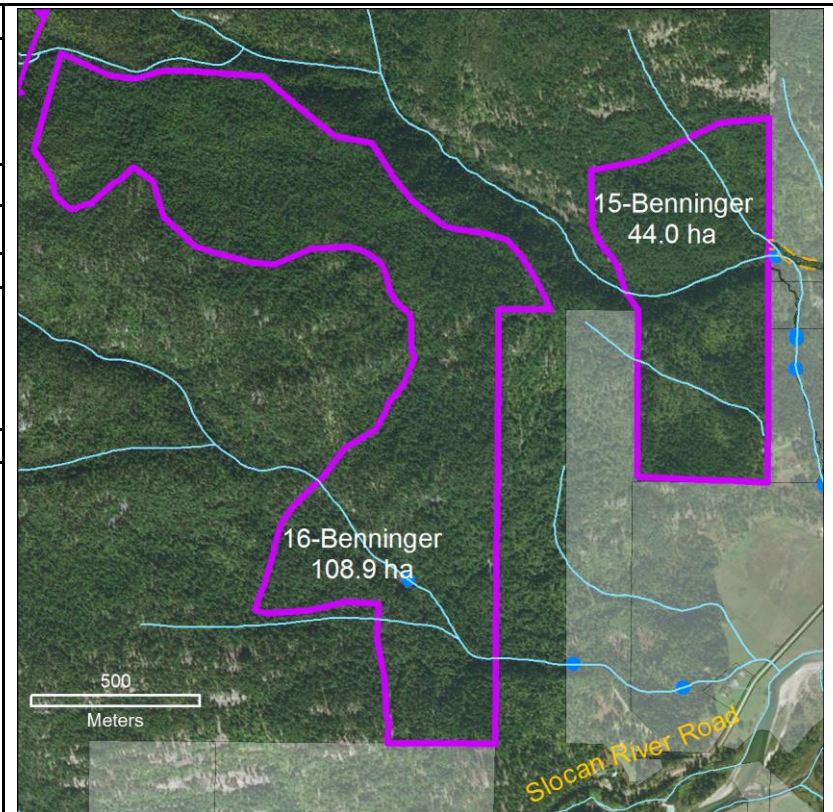
Treatment Unit	Treatment Type(s)	Total Area
14 - Winlaw South	Primary Fuel Break. 50% Type 1 WUI 50% Type 2 Post Harvest Fuel Management	74.0 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	100% High	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Large treatment unit of dense coniferous forest on moderate slopes (50% of area) and moderately dense coniferous forests on steep slopes (50% of area). Treatment unit is a strategic, landscape scale unit designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of Slocan Valley into the Winlaw Creek Watershed and into the community of Winlaw. Unit takes advantage of topography (treatable area on south shoulder of Winlaw Creek Valley) and is located in a main fire movement path identified by fire behavior modeling.		
Overlapping Values		
Domestic watershed, visuals, ungulate winter range.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. Riparian management areas along domestic use streams. Access to area is uncertain. Access across private land may not be available, and access across crown land may not be practical.		



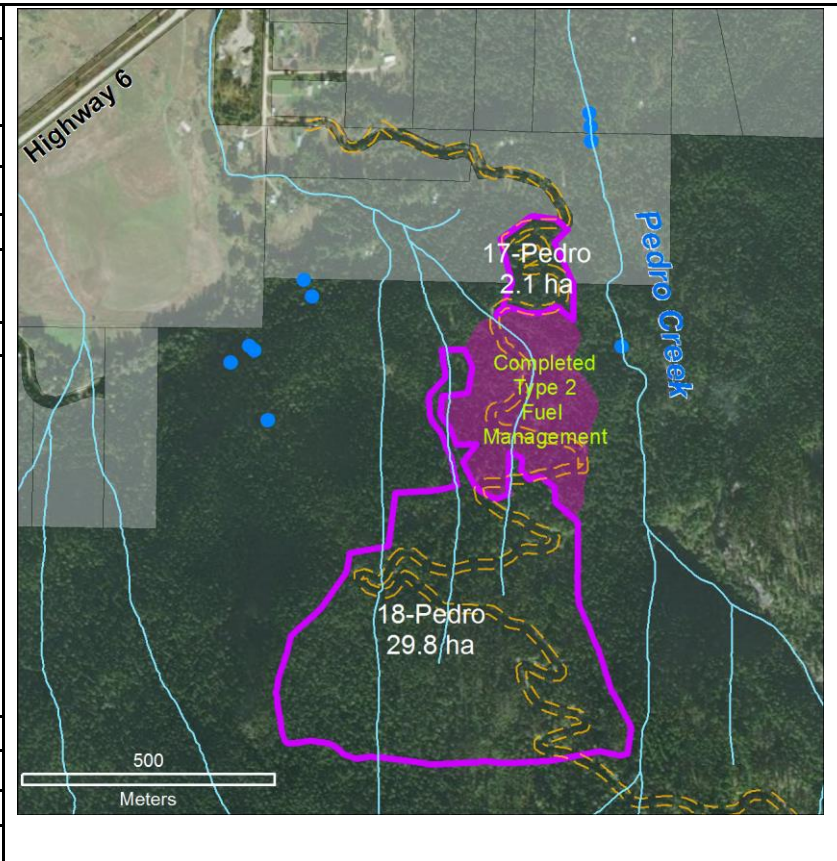
Treatment Unit	Treatment Type(s)	Total Area
15 - Benninger	Primary Fuel Break. 30% Type 1 WUI 70% Type 2 Post Harvest Fuel Management	44.0 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	99% High 1% Low	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Moderately sized treatment unit of dense to moderately dense coniferous forest on moderate slopes. In conjunction with unit 16-Benninger, unit forms a strategic, landscape scale treatment areas designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of Perry Ridge. Unit takes advantage of topography to create fuel managed area. Crown land portion of Perry Ridge lower slopes is dominated by steep terrain. This is one of the few large moderately sloped areas, and one of the few opportunities to create a strategic fuel managed area, on the east side of the ridge. Access to upper half of area is provided by the Benninger Creek FSR. Access to lower half of unit will require cooperation of adjacent private landowners.		
Overlapping Values		
Domestic watershed, visuals, ungulate winter range and ungulate foraging area.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. Deep central creek valley and associated riparian management area. Potential access limitations.		



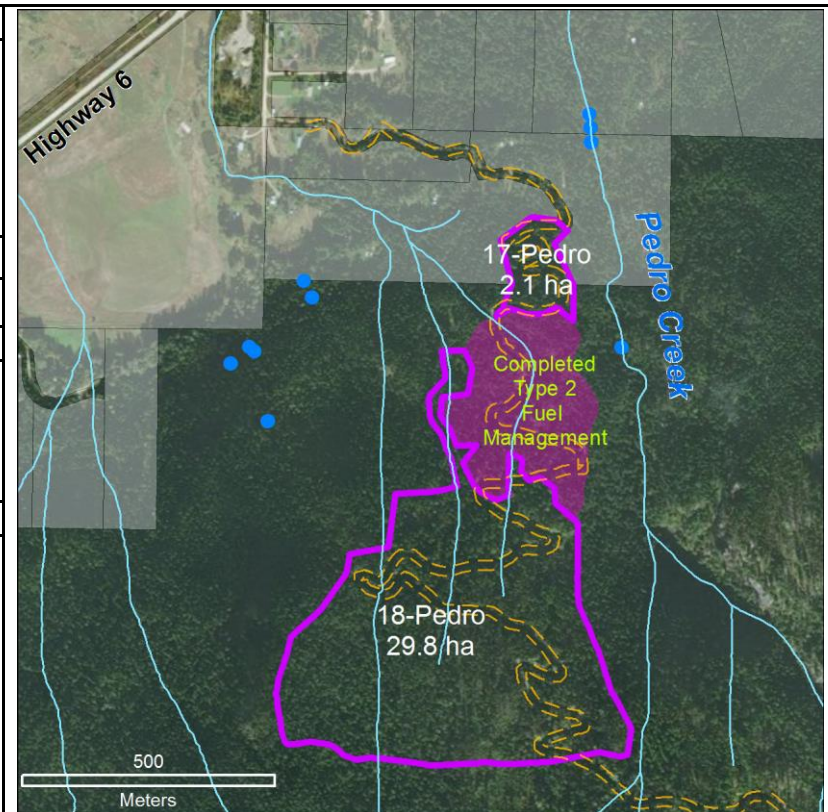
Treatment Unit	Treatment Type(s)	Total Area
16 - Benninger	Primary Fuel Break. 20% Type 1 WUI 80% Type 2 Post Harvest Fuel Management	108.9 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	99% High 1% Low	High
Treatment Objectives		
<p>Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.</p> <p>Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.</p>		
Treatment Rationale		
<p>Moderately sized treatment unit of dense to moderately dense coniferous forest on moderate slopes.</p> <p>In conjunction with unit 15-Benninger, unit forms a strategic, landscape scale treatment area designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of Perry Ridge.</p> <p>Unit takes advantage of topography to create fuel managed area. Crown land portion of Perry Ridge lower slopes is dominated by steep terrain. This is one of the few large moderately sloped areas, and one of the few opportunities to create a strategic fuel managed area on the east side of the ridge.</p> <p>Access to area is via old logging road system across private land and will require cooperation of adjacent private landowners.</p>		
Overlapping Values		
Domestic watershed, visuals, ungulate winter range and ungulate foraging area.		
Treatment Constraints		
<p>Need to maintain forest canopy for water and visual management.</p> <p>Riparian management areas along domestic use streams.</p> <p>Potential access limitations.</p>		



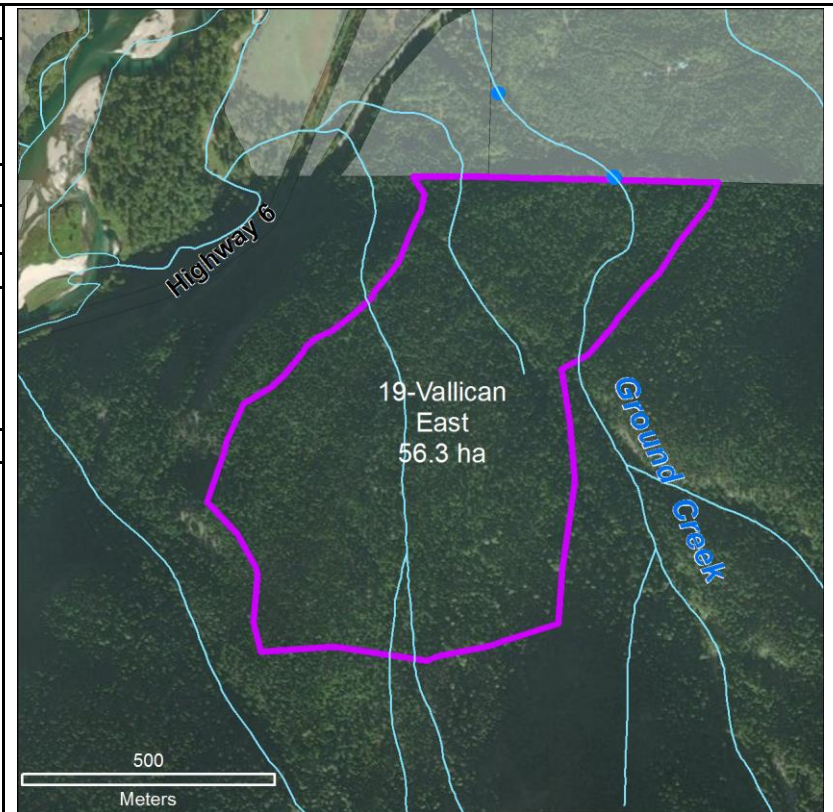
Treatment Unit	Treatment Type(s)	Total Area
17 - Pedro	Primary Fuel Break. Type 1 WUI	2.1 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
CFA K2R	100% High	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Treatment Rationale		
<p>Small treatment unit of dense coniferous forest on steep slopes adjacent to Pedro FSR. In conjunction with the previous treatment in the area and unit 18-Pedro, unit forms a strategic, landscape scale treatment area designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of the Slocan Valley.</p> <p>Unit takes advantage of topography to create fuel managed area. The treatment unit is on a wedge of moderately sloped land on the south side of the Pedro Creek Canyon, and is just north of another area of extremely steep and rocky slopes. This unit is the only treatable Crown land for 2.5 km north or south.</p> <p>Access to the area is excellent, using the Pedro FSR.</p>		
Overlapping Values		
Domestic watersheds, visuals.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management.		



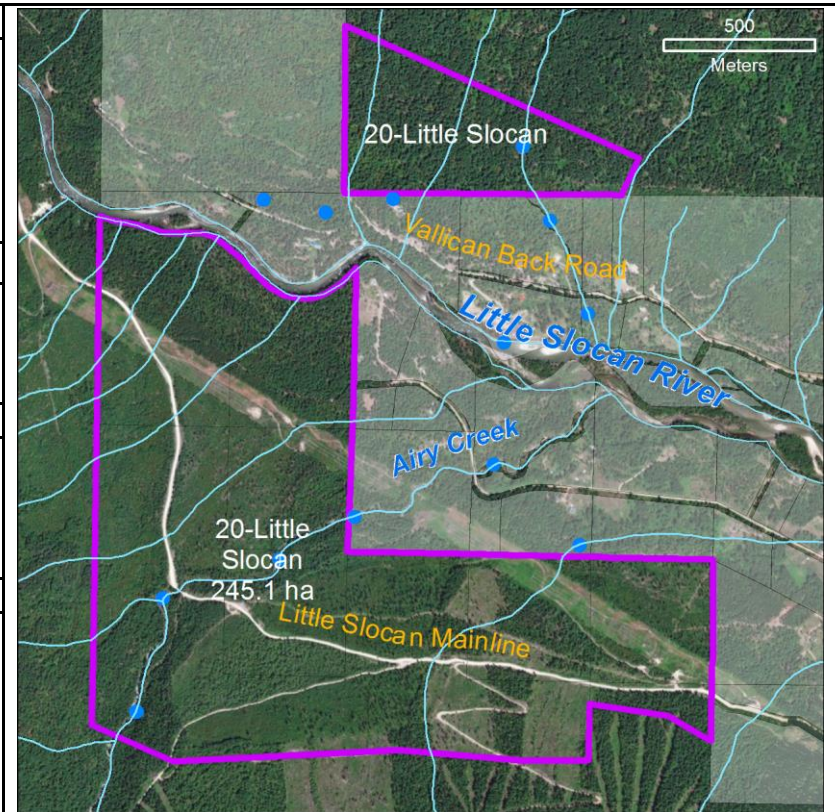
Treatment Unit	Treatment Type(s)	Total Area
18 - Pedro	Primary Fuel Break. 30% Type 1 WUI 35% Type 2 Post Harvest Fuel Management 35% Type 3 Machine Based Interface Cleanup	29.8 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
CFA K2R	100% High	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Mid sized treatment unit of dense coniferous forest on moderately steep slopes adjacent to Pedro FSR. In conjunction with the previous treatment in the area and unit 17-Pedro, unit forms a strategic, landscape scale treatment area designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of the Slocan Valley. Unit takes advantage of topography to create fuel managed area. The treatment unit is on a wedge of moderately sloped land on the south side of the Pedro Creek Canyon, and is just north of another area of extremely steep and rocky slopes. This unit is the only treatable Crown land for 2.5 km north or south. Access to the area is excellent, using the Pedro FSR.		
Overlapping Values		
Domestic watersheds, visuals.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management.		



Treatment Unit	Treatment Type(s)	Total Area
19 - Vallican East	Primary Fuel Break. 25% Type 1 WUI 75% Type 2 Post Harvest Fuel Management	56.3 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	100% High	Moderate
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Mid sized treatment unit of dense coniferous forest on moderate to steep slopes. Unit forms a strategic, landscape scale treatment area designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of the Slocan Valley. Unit takes advantage of topography to create fuel managed area. The treatment unit is on a patch of moderately sloped land bounded to the north and south by very steep and rocky slopes. Next potential treatment units are 8 km south and 2.5 km north. Access to area is via old logging road system across private land, and will require cooperation of adjacent private landowners. Moderate priority reflects access limitations.		
Overlapping Values		
Domestic watersheds, visuals.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. Riparian management areas along domestic use streams. Inclusion of steep terrain and steep sided, deep valley along Ground Creek. Potential access limitations.		

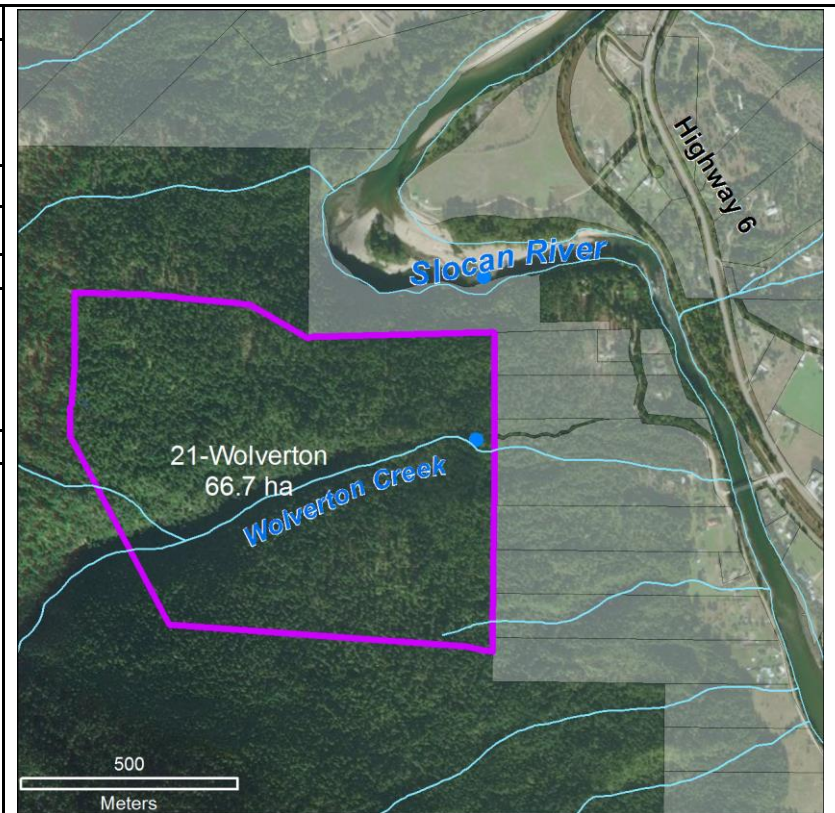


Treatment Unit	Treatment Type(s)	Total Area
20 - Little Slocan	Primary Fuel Break. 25% Type 1 WUI 40% Type 2 Post Harvest Fuel Management 25% To Be Determined 10% Existing Low Fuel Areas	245.1 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
33 ha TSA (north of river) 212 ha TFL 3 (south of river)	85% High 15% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
<p>A very large strategically placed treatment unit of varied coniferous forests and plantations on moderate slopes.</p> <p>Unit is located to improve suppression opportunities and reduce the chance of a landscape scale fire moving with prevailing wind patterns down the Little Slocan Valley towards Vallican, Passmore and Slocan Park.</p> <p>Unit takes advantage of topography to create fuel managed area. The treatment unit is on moderately sloped ground on both sides of the Little Slocan River, and is placed across a main fire movement path with few other barriers to fire movement.</p> <p>South unit builds on the existing 500 kv power line right of way and on extensive previous harvesting in the area. Some past harvesting will likely require additional treatment to reduce fuel loads, while other areas may be sufficiently fuel reduced in their current condition. This will be assessed during prescription preparation.</p> <p>Access to unit south of river is via established and maintained logging road system. Access to unit north of river is across private land, and will require cooperation of adjacent private landowners.</p>		
Overlapping Values		
Domestic watersheds, visuals, ungulate winter range, ungulate foraging areas.		
Treatment Constraints		

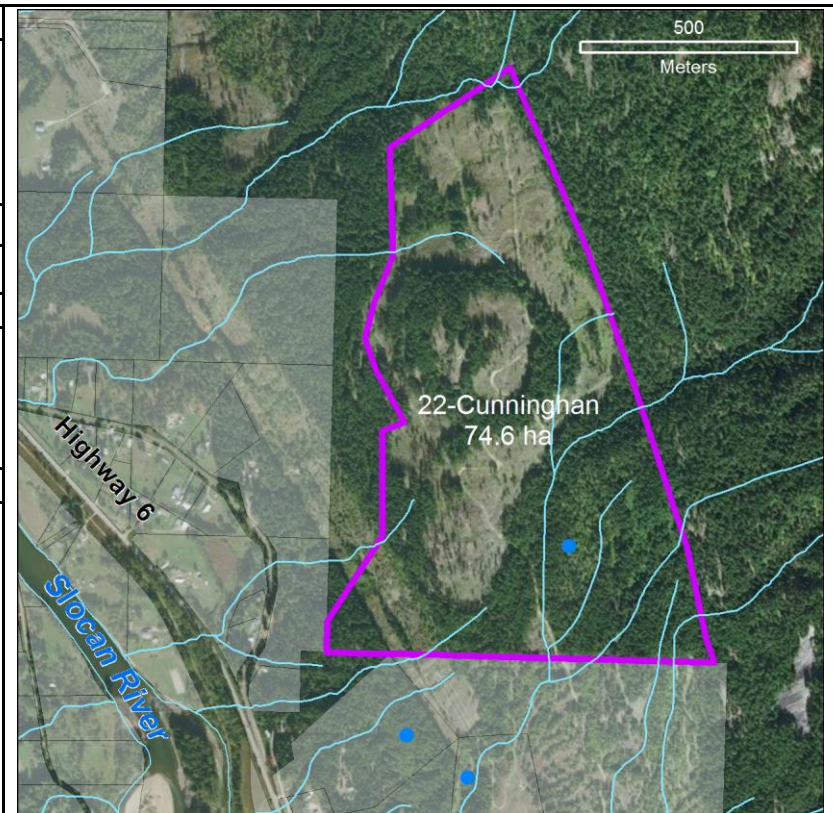


<p>Need to maintain forest canopy for water and visual management. Riparian management areas along domestic use streams and Little Slovan River. Steep sided, deep valley along Airy Creek. Potential access limitations.</p>	
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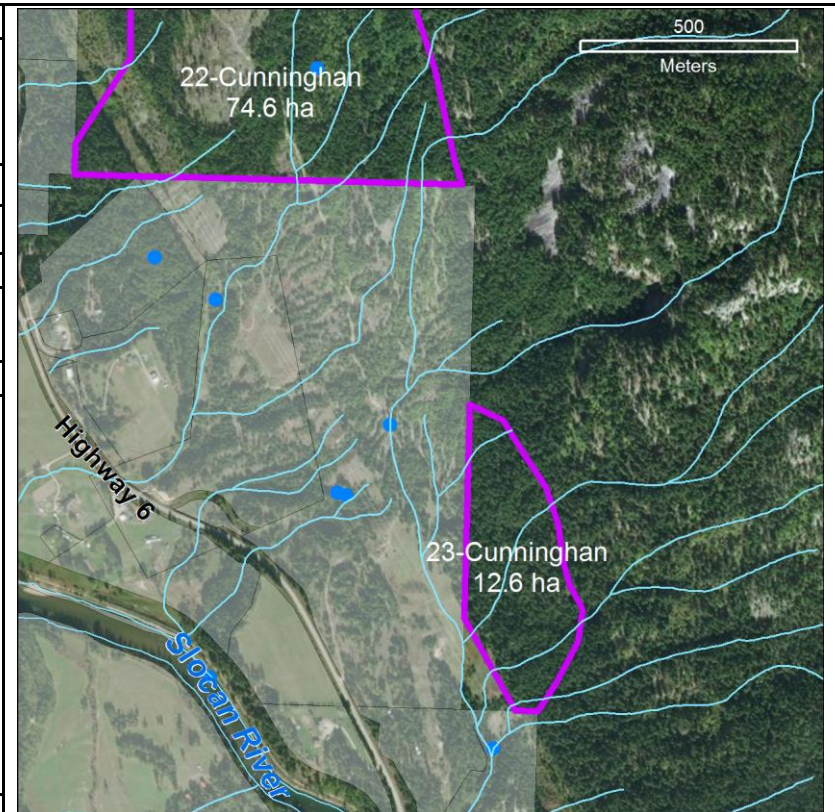
Treatment Unit	Treatment Type(s)	Total Area
21 - Wolverton	Primary Fuel Break. 40% Type 1 WUI 60% Type 2 Post Harvest Fuel Management	66.7 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	100% High	Moderate
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Large treatment unit of dense coniferous forest on moderate to steep slopes. Has suffered recent Douglas-fir beetle mortality resulting in reduced stand density and increased fuel loads. Unit forms a strategic, landscape scale treatment area designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the west side of the Slocan Valley. Unit takes advantage of topography to create fuel managed area. The treatment unit is on a patch of moderately sloped land bounded to the north and south by very steep and rocky slopes. Next potential crown land treatment units are 5 km to the north or south. Only access to area is across private land, and will require cooperation of adjacent private landowners. Moderate priority reflects access limitations.		
Overlapping Values		
Domestic watersheds, visuals, ungulate winter range.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. Riparian management areas along domestic use stream. Inclusion of steep terrain and steep sided, deep valley along Wolverton Creek. Access limitations.		



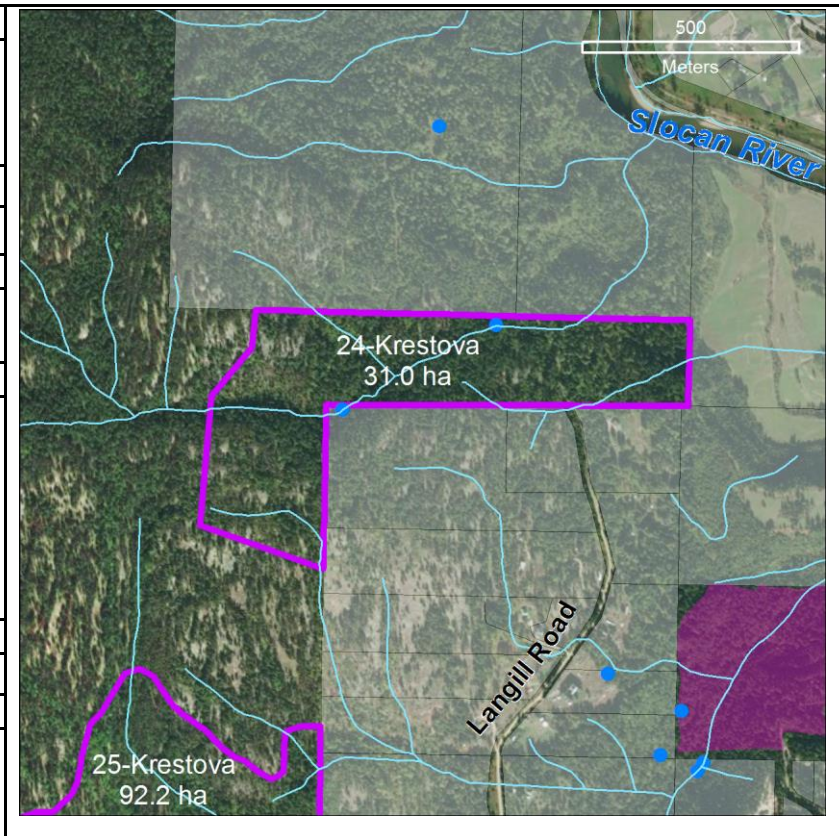
Treatment Unit	Treatment Type(s)	Total Area
22 - Cunningham	Primary Fuel Break. 25% Type 1 WUI 25% Type 2 Post Harvest Fuel Management 50% To Be Determined	74.6 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	100% High	Moderate
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
<p>Large treatment unit of varied coniferous forests and plantations on moderate slopes. Unit forms a strategic, landscape scale treatment area designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of the Slocan Valley.</p> <p>Unit takes advantage of topography to create fuel managed area. The treatment unit is on a patch of moderately sloped land bounded to the north and south by very steep and rocky slopes. Next potential crown land treatment unit is 8 km to the north.</p> <p>Much of unit was logged in 2010. Harvested area may require additional treatment to reduce fuel loads, or may be sufficiently fuel reduced in current condition. This will be assessed during prescription preparation.</p> <p>Only access to area is across private land, and will require cooperation of adjacent private landowners. Moderate priority reflects access limitations.</p>		
Overlapping Values		
Domestic watersheds, visuals, ungulate winter range.		
Treatment Constraints		
<p>Need to maintain forest canopy for water and visual management.</p> <p>Riparian management areas along domestic use stream.</p> <p>Inclusion of steep terrain and steep sided, deep valley along main creek in unit.</p> <p>Access limitations.</p>		



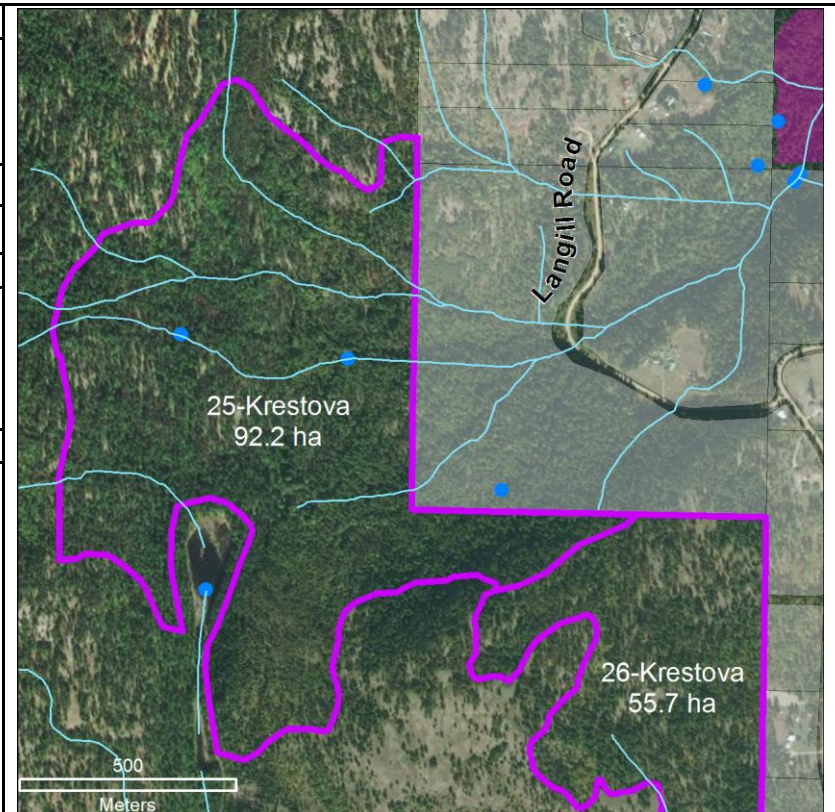
Treatment Unit	Treatment Type(s)	Total Area
23 - Cunningham	Primary Fuel Break. 20% Type 1 WUI 80% Type 2 Post Harvest Fuel Management	12.6 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	100% High	Moderate
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Treatment Rationale		
<p>Small treatment unit of dense coniferous forests moderate slopes.</p> <p>Unit is located to treat the moderately sloped crown land near Cunningham Road, in conjunction with unit 22 - Cunningham.</p> <p>In conjunction with 22 - Cunningham, unit forms a strategic, landscape scale treatment area designed to improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of the Slocan Valley.</p> <p>Unit takes advantage of topography to create fuel managed area. The treatment unit is on a patch of moderately sloped land bounded to the north and south by very steep and rocky slopes. Next potential crown land treatment unit is 8 km to the north.</p> <p>Only access to area is across private land, and will require cooperation of adjacent private landowners. Moderate priority reflects access limitations.</p>		
Overlapping Values		
Domestic watersheds, visuals, ungulate winter range.		
Treatment Constraints		
<p>Need to maintain forest canopy for water and visual management.</p> <p>Riparian management areas along domestic use stream.</p> <p>Access limitations.</p>		



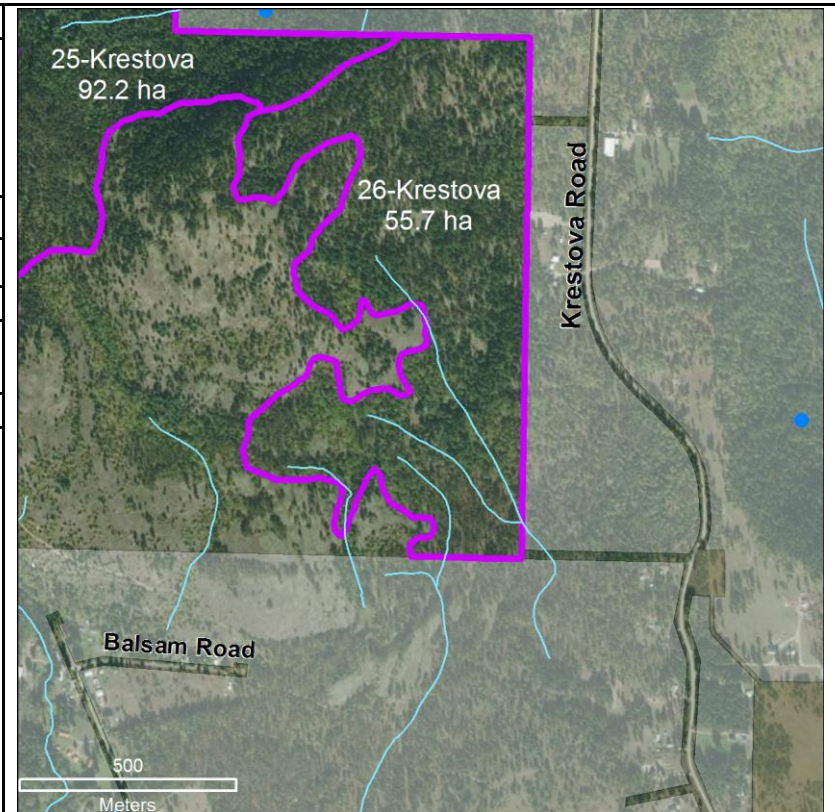
Treatment Unit	Treatment Type(s)	Total Area
24 - Krestova	Primary Fuel Break. 25% Type 1 WUI 75% Type 2 Post Harvest Fuel Management	31.0 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	80% High 20% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Treatment Rationale		
Mid sized treatment unit of dense to open coniferous forests on moderate slopes. Unit is located to treat a finger of forested crown land that extends between private land and between open rocky slopes with low fuel loads. Managing fuel loads in this area will improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of the Slocan Valley. Access to area is via legal right of way extending from end of Langill Road.		
Overlapping Values		
Domestic watersheds, visuals, ungulate winter range, ungulate foraging area.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. Riparian management areas along domestic use stream. Steep slopes along incised creek valleys.		



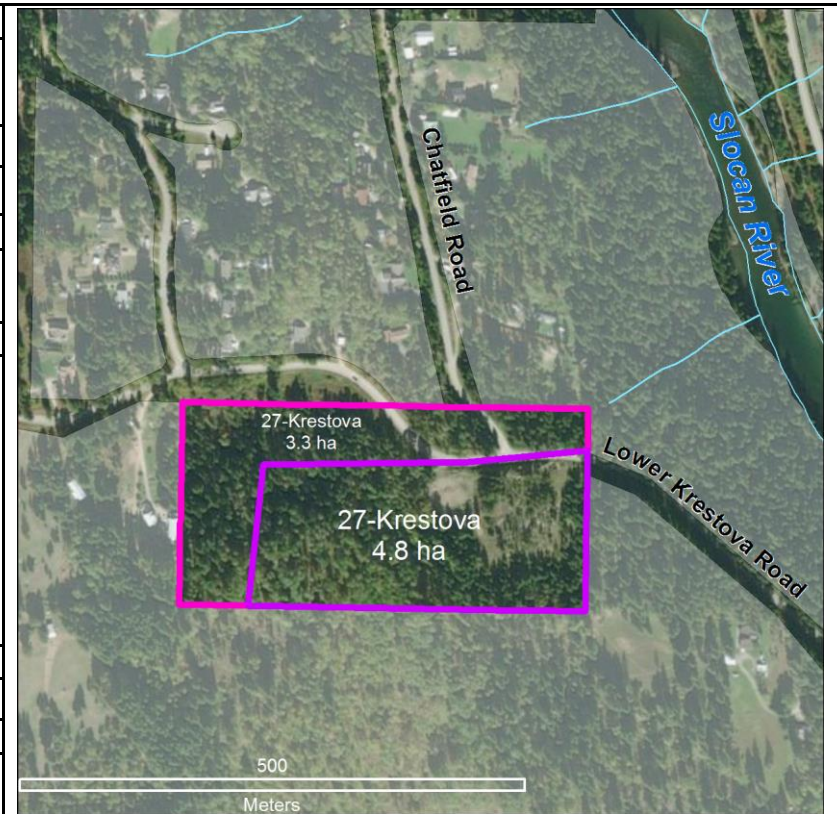
Treatment Unit	Treatment Type(s)	Total Area
25 - Krestova	Primary Fuel Break. 25% Type 1 WUI 75% Type 2 Post Harvest Fuel Management	92.2 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	91% High 9% Moderate	Moderate
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Mid sized treatment unit of dense to open coniferous forests on moderate slopes. Unit is located to treat a large patch of forested crown land between open rocky slopes with low fuel loads. Managing fuel loads in this area will improve suppression opportunities and reduce the chance of a landscape scale fire moving along the east side of the Slocan Valley and/or threatening Krestova (2.5 km south) with a high intensity ember shower. Unit works in conjunction with unit 26-Kresova to form a strategic, landscape scale treatment unit. Only access to area is across private land, and will require cooperation of adjacent private landowners. Moderate priority reflects access limitations.		
Overlapping Values		
Domestic watersheds, visuals, ungulate winter range, ungulate foraging area.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. Riparian management areas along domestic use stream. Steep slopes along incised creek valleys. Access limitations.		



Treatment Unit	Treatment Type(s)	Total Area
26 - Krestova	Primary Fuel Break. 60% Type 1 WUI or Type 3 Machine Based Cleanup 40% Type 2 Post Harvest Fuel Management	55.7 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	21% High 79% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Treatment Rationale		
<p>Mid sized treatment unit of open coniferous and some deciduous forests on rolling, rock based slopes. Area has suffered significant mountain pine beetle mortality. Unit is located to treat a patch of forested crown land between open rocky slopes with lower fuel loads that is close to values at risk. Managing fuel loads in this area will improve suppression opportunities and reduce the chance of a landscape scale fire and high intensity ember shower near to and upwind/upslope of Krestova. Densely populated portions of Krestova are within 1 km of treatment unit.</p> <p>Unit works in conjunction with unit 25-Kresova to form a strategic, landscape scale treatment unit.</p> <p>Area is accessible along two surveyed rights of way through crown land, neither of which contain a road at this time. Access across adjacent private land with cooperation of private landowners may be more practical.</p>		
Overlapping Values		
Visuals, ungulate winter range, ungulate foraging area.		
Treatment Constraints		
<p>Need to maintain forest canopy for visual management.</p> <p>Rocky terrain may limit machine based treatment options.</p> <p>Possible access limitations.</p>		



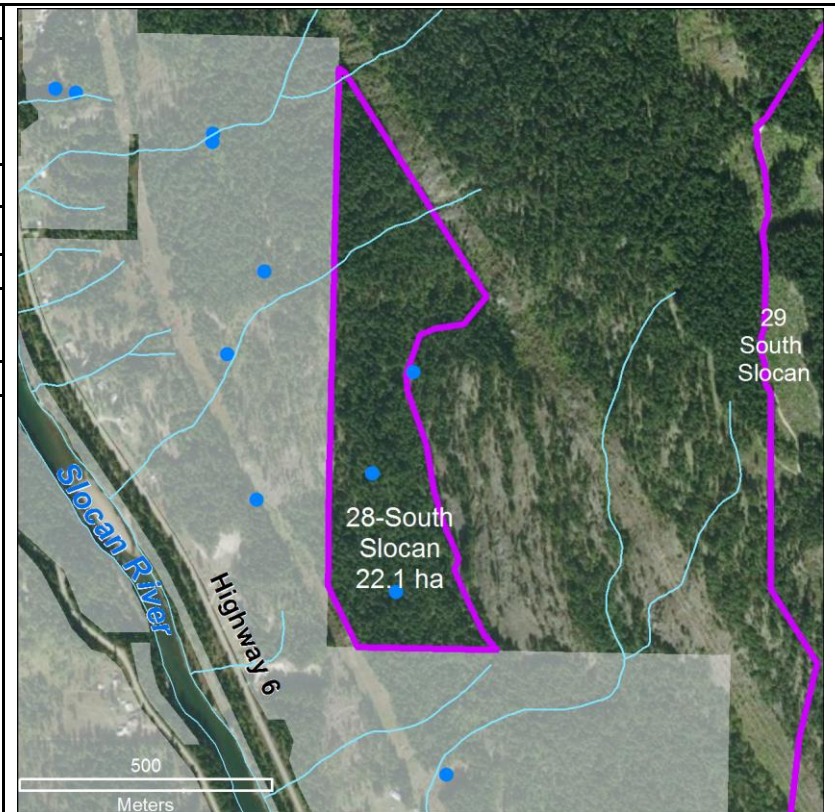
Treatment Unit	Treatment Type(s)	Total Area
27 - Krestova	Primary Fuel Break. Type 1 WUI	4.8 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	100% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Treatment Rationale		
<p>Small treatment unit on isolated patch of crown land surrounded by settlement. Vegetation cover is a mix of cleared area, deciduous forest and dense coniferous moderately steep slopes. Deciduous forest needs little treatment. Coniferous forest is a high priority for treatment to reduce risk of high intensity fire and ember shower within settled landscape.</p> <p>Treatment unit borders Lower Krestova Road, one of only two routes to access or evacuate the community of Krestova in event of a wildfire.</p> <p>Area is accessible along public roads.</p>		
Overlapping Values		
Visuals, ungulate winter range.		
Treatment Constraints		
Need to maintain forest canopy for visual management.		



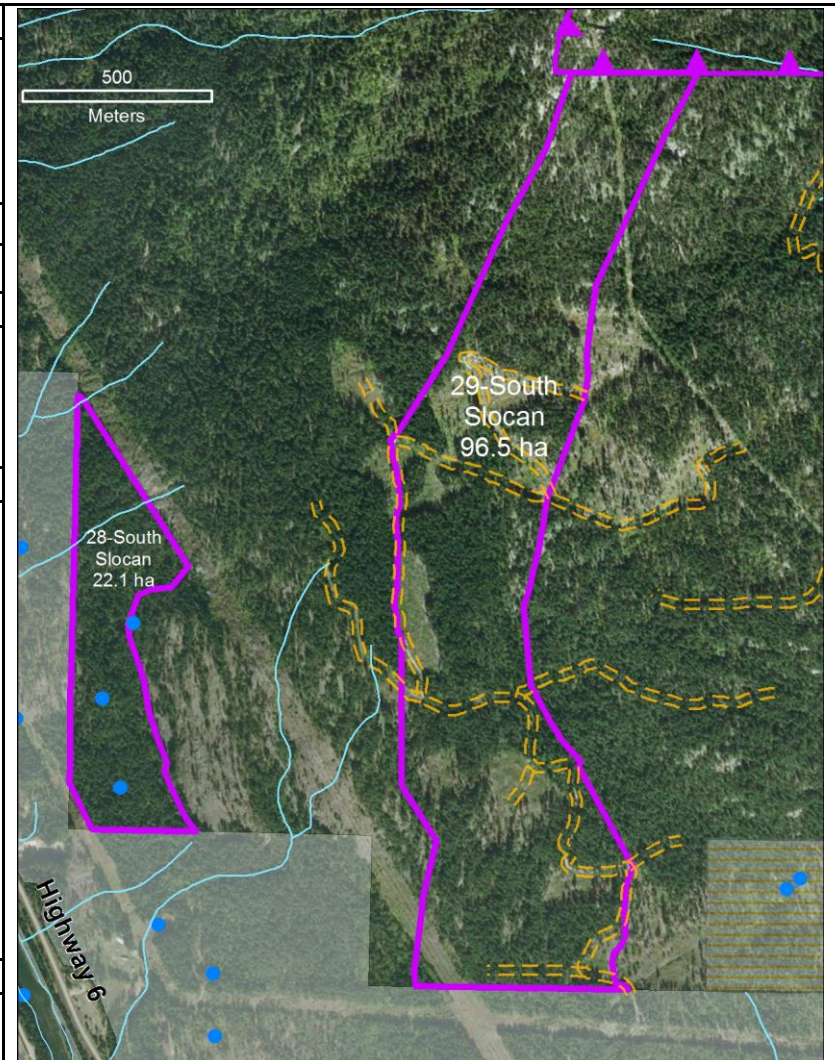
Treatment Unit	Treatment Type(s)	Total Area
27 - Krestova	Interface Fuel Break. Type 1 WUI	3.3 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	100% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Reduce risk of high intensity fire adjacent to residences.		
Treatment Rationale		
Small treatment unit on isolated patch of crown land surrounded by settlement. Treatment unit is directly adjacent to residences and main access routes. Vegetation cover is dense coniferous moderately steep slopes. High priority for treatment to improve suppression opportunities and reduce chance of a high intensity fire and ember shower immediately adjacent to residences Treatment unit borders Lower Krestova Road, one of only two routes to access or evacuate the community of Krestova in event of a wildfire. Area is accessible along public roads.		
Overlapping Values		
Visuals, ungulate winter range.		
Treatment Constraints		
Need to maintain forest canopy for visual management.		



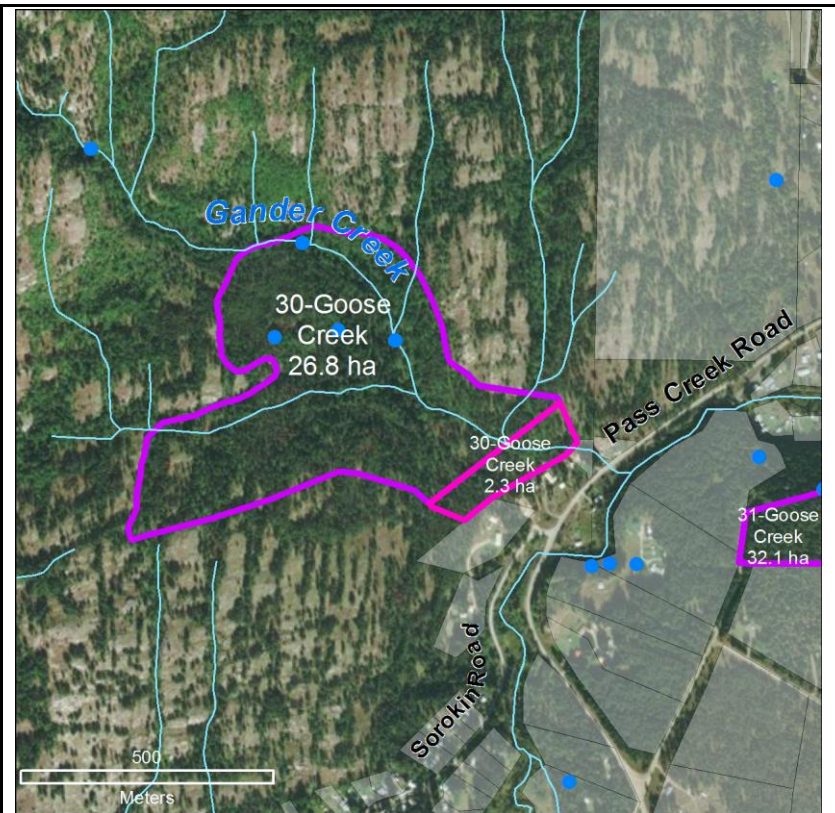
Treatment Unit	Treatment Type(s)	Total Area
28 - South Slocan	Primary Fuel Break. 20% Type 1 WUI 80% Type 2 Post Harvest Fuel Management	22.1 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	100% High	Moderate
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Treatment Rationale		
<p>Moderately sized treatment unit of dense coniferous forests on moderate slopes located between private land and steep, open rocky slopes.</p> <p>In conjunction with Units 22 - Cunningham, 23 - Cunningham and 29 - South Slocan, creates a strategic, landscape scale set of fuel managed areas designed to improve suppression opportunities and:</p> <p>(1) reduce the chance of a landscape scale fire moving along the east side of the Slocan Valley, and</p> <p>(2) reduce the chance of a landscape scale fire moving up and across the low ridge between the Slocan Valley and South Slocan and Bonnington, and threatening adjacent communities and infrastructure on the north side of the Kootenay River.</p> <p>Access to area is across private land, and will require cooperation of adjacent private landowners. Moderate priority reflects access limitations.</p>		
Overlapping Values		
Domestic watersheds, visuals, ungulate winter range and ungulate foraging area.		
Treatment Constraints		
<p>Need to maintain forest canopy for water and visual management.</p> <p>Riparian management areas along domestic use streams and springs.</p> <p>Access limitations.</p>		



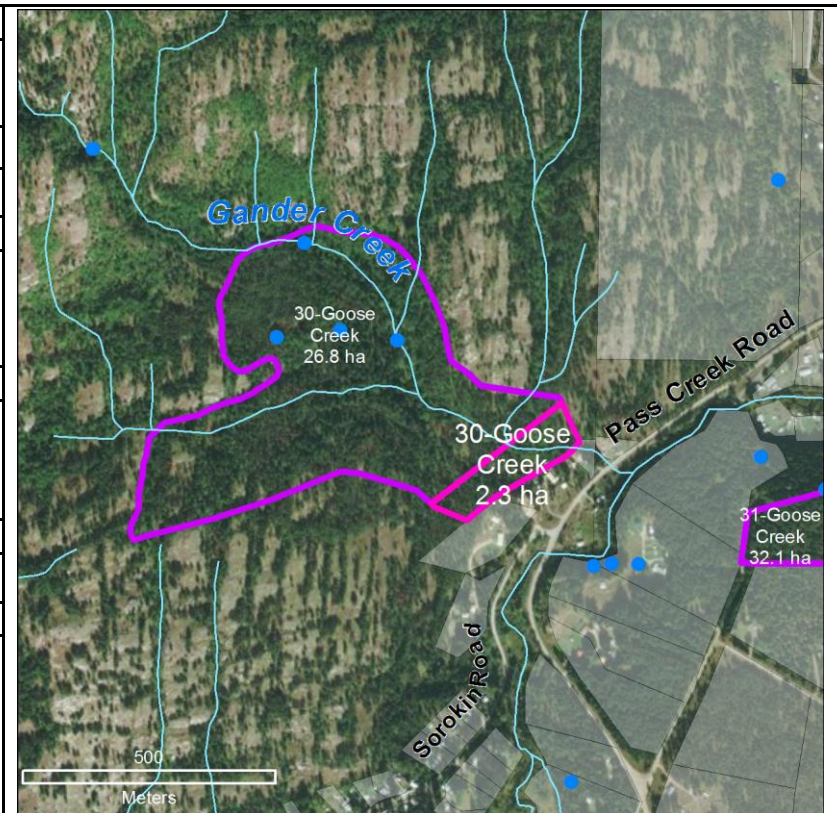
Treatment Unit	Treatment Type(s)	Total Area
29 - South Slocan	Primary Fuel Break. 30% Type 1 WUI 50% Type 2 Post Harvest Fuel Management 20% To Be Determined	96.5 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
Woodlot Licence and TSA	86% High 14% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Large strategically located treatment unit of varied coniferous forests and plantations on moderate slopes. Unit is the key component of a strategic, landscape scale fuel managed area created with Units 22 - Cunningham, 23 - Cunningham and 28 - South Slocan, which is designed to improve suppression opportunities and to reduce the chance of a landscape scale fire moving up and across the low ridge between the Slocan Valley and South Slocan and Bonnington, and threatening adjacent communities and infrastructure on the north side of the Kootenay River. Access to area is on existing forest harvesting road network. Unit builds on the existing 500 kv power line right of way, natural low fuel areas, and previous harvesting in the area. Some past harvesting will likely require additional treatment to reduce fuel loads, while other areas may be sufficiently fuel reduced in their current condition. This will be assessed during prescription preparation.		
Overlapping Values		
Woodlot licence, domestic watersheds, visuals, ungulate winter range and ungulate foraging area.		
Treatment Constraints		
Need to maintain forest canopy for water and visual management. Riparian management areas along domestic use streams and springs. Treatment unit is within Woodlot Licence. Woodlot has control over whether or not treatment occurs and methods used. Woodlot may require assistance with costs to amend operational plans to facilitate fuel management if treatment moves forward.		



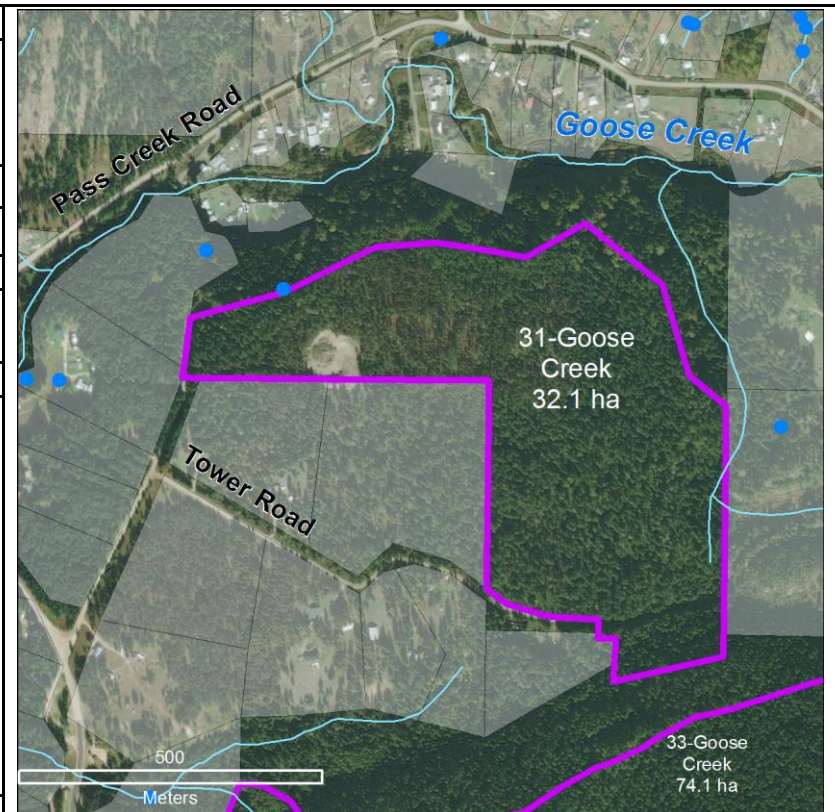
Treatment Unit	Treatment Type(s)	Total Area
30 - Goose Creek	Primary Fuel Break. Estimate: 25% Type 1 WUI 75% Type 2 Post Harvest Fuel Management	26.8 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	98% High 2% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Treatment Rationale		
<p>Mid sized treatment area of dense forest at base of open rocky slopes. Located beside Gander Creek north of Goose Creek and adjacent to residences. Represents a concentration of forest fuels with potential to support a high intensity fire event that would threaten adjacent community and which could result in aggressive fire spread in landscape.</p> <p>Area is located generally upwind of property values at risk. Terrain is generally operable.</p>		
Overlapping Values		
Domestic water supplies, visuals, recreation, ungulate winter range and ungulate foraging area..		
Treatment Constraints		
<p>Access to treatment for harvesting may require landowner co-operation to cross private land between Pass Ck Road and treatment unit.</p> <p>Domestic water intakes.</p> <p>Gander Creek and associated riparian reserve.</p> <p>Prescription process may identify unit as a 100% Type 1 WUI area.</p>		



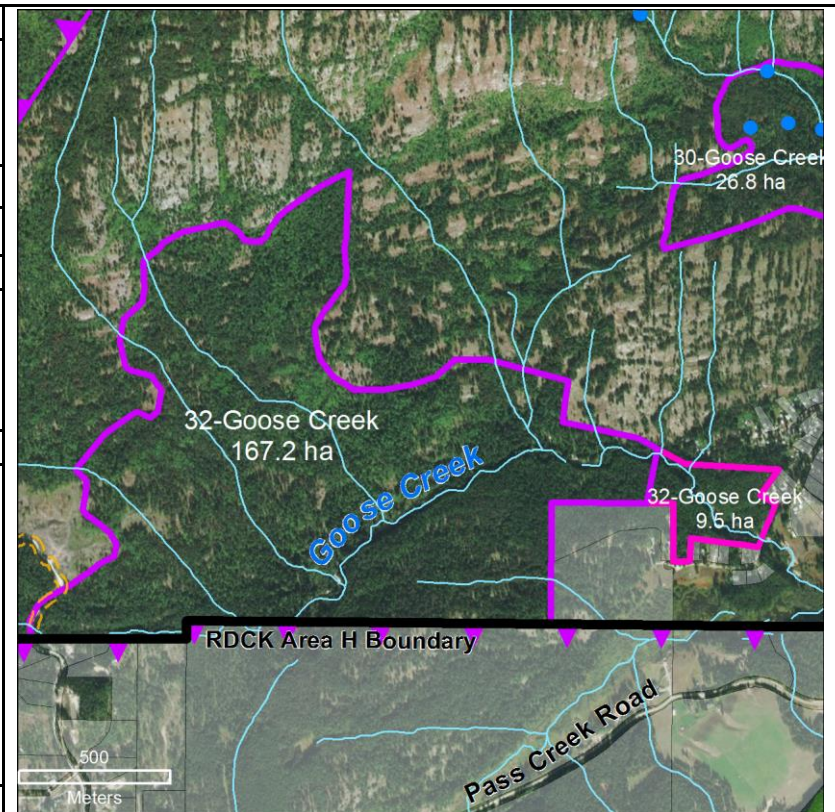
Treatment Unit	Treatment Type(s)	Total Area
30 - Goose Creek	Interface Fuel Break. 100% Type 1 WUI	2.3 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	96% High 4% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Reduce risk of high intensity fire adjacent to residences.		
Treatment Rationale		
Small treatment area of dense forest immediately adjacent to residences. Treatment unit is designed to improve suppression opportunities and reduce chance of a high intensity fire immediately adjacent to residences.		
Overlapping Values		
Recreation, ungulate winter range.		
Treatment Constraints		
Cost effective access will require co-operation from adjacent private land owners. Treatment will be limited in deep central valley around Gander Creek and associated riparian reserve.		



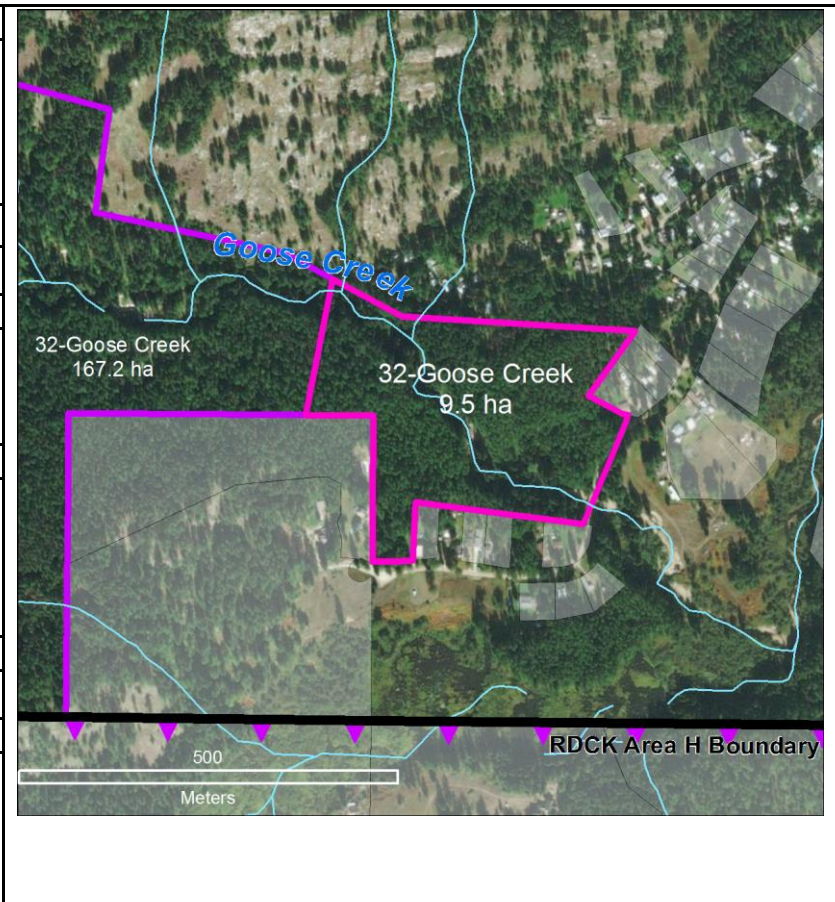
Treatment Unit	Treatment Type(s)	Total Area
31 - Goose Creek	Primary Fuel Break. Estimate: 10% Type 1 WUI 90% Type 2 Post Harvest Fuel Management	32.1 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	96% High 4% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Treatment Rationale		
<p>Mid sized treatment area of dense forest on flat, elevated plateau above Goose Creek valley. Extensive densely populated area immediately adjacent to north. Represents a concentration of forest fuels with potential to support a high intensity fire event that would threaten adjacent community.</p> <p>Area is located generally upwind of and above property values at risk, setting up potential for severe ember shower during a high intensity fire event.</p> <p>Reducing fire intensity in this unit will have strategic benefits and reduce wildfire risk to Krestova.</p> <p>Unit has additional strategic value when considered in conjunction with Unit 33 - Goose Creek, which is immediately adjacent to the south.</p> <p>Terrain is operable and access is excellent via public road.</p>		
Overlapping Values		
Domestic water supplies, visuals, recreation, ungulate winter range.		
Treatment Constraints		
Small domestic use watersheds and water intakes.		



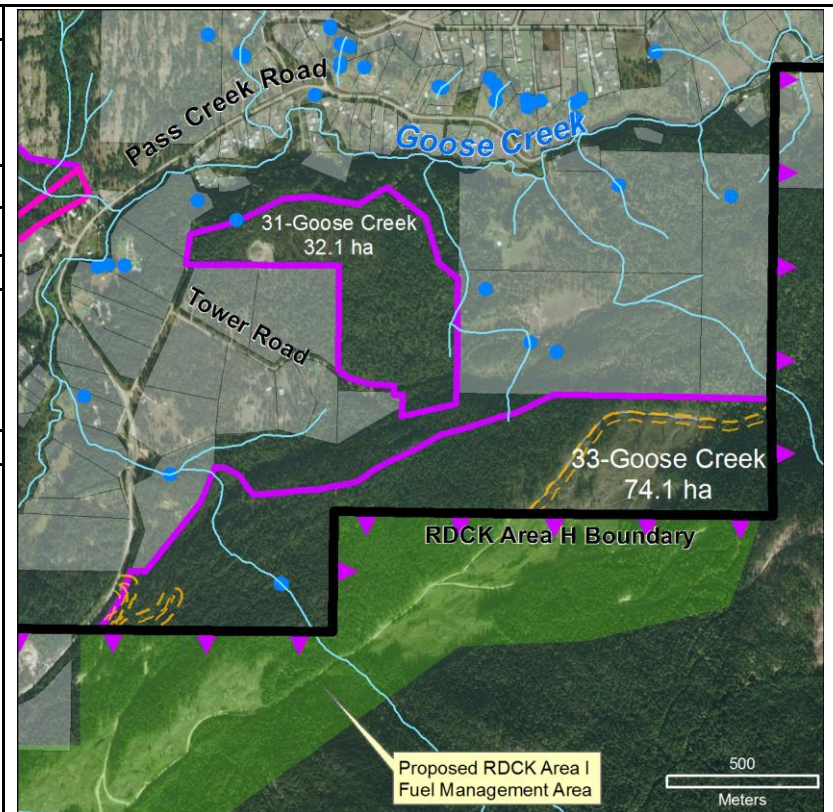
Treatment Unit	Treatment Type(s)	Total Area
32 - Goose Creek	Primary Fuel Break. Estimate: 50% Type 1 WUI 50% Type 2 Post Harvest Fuel Management	167.2 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	50% High 50% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
Large treatment area of dense coniferous and coniferous/deciduous mixed forest at base of open rocky slopes. Located north of and adjacent to Goose Creek and New Settlement. Area is a large concentration of forest fuels with potential to support a high intensity fire event that would threaten adjacent community and which could result in aggressive fire spread in landscape. Area is large enough to have strategic impact on fire behaviour and fire suppression opportunities in landscape, and is located generally upwind of property values at risk. Terrain is generally operable and area is accessible from Goose Creek Forest Service Road along west boundary of unit.		
Overlapping Values		
Visuals, recreation, domestic watershed, ungulate winter range, ungulate foraging area.		
Treatment Constraints		
Access to south east corner of treatment unit for harvesting may not be practical without cooperation of adjacent private landowners. Treatment will be limited in deep central valley around Goose Creek and associated riparian reserve.		



Treatment Unit	Treatment Type(s)	Total Area
32 - Goose Creek	Interface Fuel Break. Estimate: 25% Type 1 WUI 75% Type 2 Post Harvest Fuel Management	9.5 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	95% High 5% Moderate	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire.		
Reduce risk of high intensity fire adjacent to residences.		
Treatment Rationale		
Small treatment area of dense forest immediately adjacent to residences.		
Treatment unit is designed to improve suppression opportunities and reduce chance of a high intensity fire immediately adjacent to residences.		
Terrain is generally operable.		
Overlapping Values		
Recreation, domestic water supplies, ungulate winter range.		
Treatment Constraints		
Access for Type 2 treatment will require co-operation from adjacent private land owners.		
Treatment will be limited in deep central valley around Goose Creek and associated riparian reserve.		



Treatment Unit	Treatment Type(s)	Total Area
33 - Goose Creek	Primary Fuel Break. Estimate: 15% Type 1 WUI 85% Type 2 Post Harvest Fuel Management	74.1 ha
Forest Tenure	CWPP Threat Rating Summary in Unit	Priority
TSA	99% High 1% Extreme	High
Treatment Objectives		
Conduct fuel treatments to create residual stand characteristics that do not support active crown fire. Create an area where fire suppression crews and resources can work safely to suppress a wildfire, or which can be used as a firing line to back burn into an oncoming fire.		
Treatment Rationale		
<p>Large treatment area of dense conifer forest on moderately sloped to steep terrain above / south of Goose Creek valley. Extensive densely populated areas within 100 to 1000 meters to north. Area is a concentration of forest fuels with potential to support a high intensity fire event that would threaten adjacent community.</p> <p>Area is located generally upwind of and above property values at risk, setting up potential for severe ember shower during a high intensity fire event.</p> <p>Reducing fire intensity in this unit will have strategic benefits and reduce wildfire risk to Krestova and New Settlement.</p> <p>Unit has additional strategic value when considered in conjunction with Unit 31 - Goose Creek, which is immediately adjacent to the north, and with a large treatment unit to the south identified in the RDCK Area I CWPP. As a group, these units greatly increase the fire suppression options on the north east slopes of Sentinel Mountain and reduce wildfire risks to Krestova and New Settlement.</p> <p>Terrain is generally operable with some areas of steep slopes. Access is excellent on existing forest roads.</p>		
Overlapping Values		
Domestic water supplies, visuals, recreation, ungulate winter range.		
Treatment Constraints		
Areas of steep slopes, water resources, water intakes, and visual quality objectives.		



5.2 FireSmart Planning & Activities

FireSmart is a national initiative with the goal of encouraging communities and private landowners to live responsibly in wildfire prone areas. FireSmart aims to empower local governments and community members with the knowledge and support needed to reduce the wildfire hazard on their property. With a significant portion of the AOI considered private lands (30.5%), FireSmart is a proven, effective way to reduce the risk of wildfire throughout the community.

Current FireSmart Activities within the Slocan Valley

The RDCK manages a comprehensive FireSmart program which includes Area H and the villages of Silverton and Slocan. In 2018, the RDCK hired eight full-time, seasonal Wildfire Mitigation Specialists from June 1 – Nov 1. Mitigation Specialists conducted ongoing educational and outreach activities, collected critical infrastructure data, and provided free FireSmart assessments to residents on a voluntary basis. Mitigation Specialists were assigned sub-regional areas to support two FireSmart programs: the FireSmart Community Recognition Program, and the Home Partners Program. The Community Recognition Program helps community members to organize and reduce the risk of wildfire damage for their whole community. The Home Partner Protection Program intends to engage homeowners in voluntary wildfire mitigation activities through the use of professional home assessments with property-specific recommendations. In 2018 -as part of the Home Partners Protection Program - the RDCK completed 79 FireSmart Assessments in Area H. These assessments provided homeowners with a detailed work-plan outlining steps to mitigate the wildfire hazard on their property.

The RDCK FireSmart web page provides information on how community members can participate in both FireSmart Programs, register for free home assessments, and access FireSmart educational information.

Both the RDCK and the Village of Slocan intend to support ongoing FireSmart programs. The Villages of New Denver, Silverton, and Slocan have partnered to implement a joint FireSmart Program in 2019 - with the role of lead applicant assumed by the Village of Silverton. Both the RDCK and the municipalities have applied for FireSmart program funding available through the CRI program.

5.2.1 FireSmart Goals & Objectives

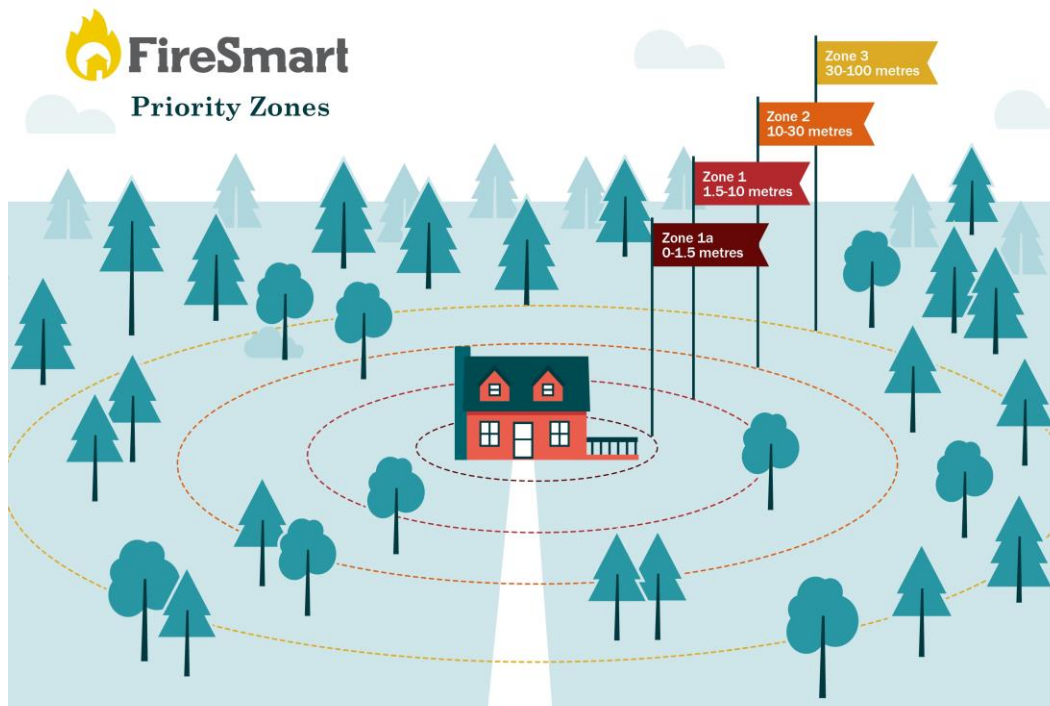
The 2016 Horse River wildfire in Fort McMurray, Alberta was the largest ever insured loss in Canada – destroying over 2,400 structures (Westhaver, 2016). A recent study has shown that properties which adopted FireSmart principles in Fort McMurray were more likely to survive the catastrophic wildfire (Westhaver, 2016). FireSmart focuses on reducing wildfire hazard within the Wildland Urban Interface, where wildland fuels are found adjacent to home and structures. A community that has adopted FireSmart principles has a number of advantages in the event of an interface fire, including:

1. Reduced likelihood of structure ignition and loss through radiant heat, direct flame contact, and ember transport
2. Reduced fire behaviour in the community

3. Improved first responder safety and suppression effectiveness through the creation of defensible spaces

Wildfires can damage structures in three ways: by direct flame, through radiant heat, and by sparks and embers landing on structures. All three of these can cause structures to ignite and burn. In order to mitigate these risks, property owners are encouraged to work from their property outwards using the following FireSmart zoning approach (Figure 13):

- **Zone 1a:** A minimum 1.5 metre non-combustible surface should extend around the entire home and any attachments, such as decks.
- **Zone 1:** Focus on reducing the susceptibility of the structure and a 10m buffer to wildfire. This should be a fire resistant zone. Actions include removing all materials that can easily ignite from a wildfire, using flame resistant building materials, cleaning out gutters, and using tempered double pane windows.
- **Zone 2:** Focus on reducing fuels 10-30m from structures. Actions include reducing ladder fuels and tree density, planting fire resistant species, and removing flammable materials. Thin and prune evergreen trees to reduce hazard in this area. Regularly clean up accumulations of fallen branches, dry grass and needles from on the ground to eliminate potential surface fuels.
- **Zone 3:** Focus on creating FireSmart landscapes and communities (30-100m from structures and values). Look for opportunities to create a fire break by creating space between trees and other potentially flammable vegetation. Actions include reducing ladder fuels and tree density through thinning and pruning, and encouraging neighbours to adopt FireSmart principles. These actions will help reduce the intensity of a wildfire.



Work with your neighbours in any overlapping priority zones!

<p>Zone 1a (0-1.5 metres)</p>	<p>Zone 1A is the noncombustible zone. Reduce the chance of wind-blown embers igniting materials near your home. A noncombustible surface should extend around the entire home and any attachments, such as decks. Creating a noncombustible surface can be as easy clearing vegetation and combustible material down to mineral soil. To add to your landscape design, use noncombustible materials such as gravel, brick, or concrete in this critical area adjacent to your home. Woody shrubs, trees or tree branches should be avoided in this zone, any that are present should be properly mitigated.</p>
<p>Zone 1 (1.5-10 metres)</p>	<p>Create a landscape that will not easily transmit fire to the home. A FireSmart yard includes making smart choices for your plants, shrubs, grass and mulch. Selecting fire-resistant plants and materials can increase the likelihood of your home surviving a wildfire. Plant a low density of fire-resistant plants and shrubs. Avoid having any woody debris, including mulch, as it provides potential places for fires to start. Storing items such as firewood piles, construction materials, patio furniture, tools and decorative pieces against or near a house is a major fire hazard. Move firewood piles, trailers/ recreational vehicles, storage sheds and other combustible structures out of this zone and into Zone 2. If unable to move, store firewood inside your mitigated garage, shed or other ember resistant structures, create a noncombustible zone underneath and for 1.5 metres around trailers/ vehicles and mitigate sheds and other structures to the same standards as those of your home.</p>
<p>Zone 2 (10-30 metres)</p>	<p>If your property extends out to this zone, thin and prune evergreen trees to reduce hazard in this area. Within 30 metres of your home, selectively remove evergreen trees to create at least 3 metres of horizontal space between the single or grouped tree crowns and remove all branches to a height of 2 metres from the ground on the remaining evergreen trees. If possible, pruning trees up to 100 metres from your home (Zone 3) is recommended. Regularly clean up accumulations of fallen branches, dry grass and needles from on the ground to eliminate potential surface fuels. Consider seeking the guidance of a forest professional with wildland fire knowledge on appropriate management options for this zone.</p>
<p>Zone 3 (30-100 metres)</p>	<p>Taking FireSmart actions in Zone 3 on your property will influence how a wildfire approaches your home. You can change the dynamics of wildfire behaviour by managing vegetation within this zone. Look for opportunities to create a fire break by creating space between trees and other potentially flammable vegetation. Thinning and pruning is effective here as well. These actions will help reduce the intensity of a wildfire. Consider seeking the guidance of a forest professional with wildland fire knowledge on appropriate management options for this zone.</p>

Figure 2: FireSmart Zoning Approach²¹

²¹ From <https://www.firesmartcanada.ca/mdocs-posts/firesmart-priority-zones-2017>

5.2.2 Key Aspects of FireSmart for Local Governments

Property owners, residents, businesses, and governments all have important roles in developing fire resilient communities. Table 20 provides recommended FireSmart activities that should be reviewed and implemented to mitigate the wildfire risk throughout the Slocan Valley. Activities include education and outreach, vegetation management, incorporating FireSmart into community planning and development, and increasing local capacity to defend against an interface fire. Recent changes to the CRI program funding allow for a wider range of eligible FireSmart activities - particularly on private land. In conjunction with FireSmart home assessments, the use of a rebate program should be explored to incentivise FireSmart activities on private property. Local governments should ensure that publicly owned buildings and spaces meet FireSmart standards which can then be used to demonstrate FireSmart principles.

Table 20: Recommended FireSmart Practices and Activities

Topic	Recommended FireSmart Practices and Activities	Priority
Communication, Education & Partnerships	Work with fire departments and BCWS to host FireSmart events. Events should emphasize FireSmart principles, emergency preparedness and evacuation, pre-fire-season readiness, and post-wildfire hazards.	High
	Develop FireSmart educational materials. This may include creating a school education module to inform youth about wildfire preparedness and prevention - can be in conjunction with current forestry, ecology or fire education programs.	High
	Utilize newsletters, social media, webpages, and radio to promote FireSmart principles and fire prevention. Provide local landscape companies and hardware stores with FireSmart landscaping and building guides; and outreach to Real Estate agents for new home owners.	High
	Work with local stakeholders and interest groups to undertake FireSmart activities. This might include coordinating fuel management opportunities in developed trail areas, and coordinating FireSmart activities and events with special interest groups throughout the AOI.	High
	Coordinate and share FireSmart/fuel management initiatives with forest licensees that operate in the Slocan Valley, including woodlot owners, SIFCo, NACFOR, Kalesnikoff, Interfor and BCTS.	High
	Hold FireSmart information sessions at local schools and community events. Work with the BCWS and fire departments to host joint information sessions. Include information on emergency evacuations and procedures.	High
	Continue the use of Wildfire Mitigation Specialists to implement FireSmart activities. Municipal FireSmart programs may consider hiring their own dedicated FireSmart coordinator to implement FireSmart/CWPP initiatives.	High
	Continue to encourage homeowners to undertake FireSmart site assessments and complete actions recommended.	High
	Ensure adequate signage at high-use recreation areas. Signs should include information on fire danger and prevention.	High

	Consider implementing a FireSmart sticker or lawn-sign program to recognize FireSmart properties, or create incentives for FireSmart activities on private property.	Low
	Encourage FireSmart Local Representative or Community Champion training for interested community members.	Moderate
	Apply for FireSmart Community Recognition.	Moderate
Vegetation management	Develop policies and practices for FireSmart maintenance of public spaces - such as parks and open spaces.	High
	Offer local rebate programs to home owners on private land that complete eligible FireSmart activities.	Moderate
	Use landscaping requirements in zoning and development permits to require fire resilient landscaping.	High
	Provide access to a chipper or dumpster for debris drop-off from pruning or thinning on private property. Consider integrating with existing events or planned FireSmart events.	High
	Conduct FireSmart assessments of public buildings and spaces and undertake necessary actions to meet FireSmart standards. Post educational signs and use as an example for FireSmart Programs.	High
Planning & Development	Develop policies and practices for FireSmart construction and maintenance of public buildings and lands.	High
	Consider wildfire prevention and suppression in the design of subdivisions (e.g. road widths, turning radius for emergency vehicles, and access and egress points). Consider joining dead-end roads in current areas with limited access and egress.	High
	Coordinate the review of new developments across multiple departments, including the fire department.	High
	Amend Official Community Plans, Comprehensive Community Plans and/or land use, engineering and public works bylaws to incorporate FireSmart policies.	High
	Consider the establishment of Development Permit Areas for Wildfire Hazard ²² . These areas could require FireSmart exterior finishing and building materials.	Moderate
	Develop a Local Community FireSmart Plan and Communication Strategy to guide FireSmart initiatives.	High
	Establish a community FireSmart board/planning table to guide FireSmart activities. Community Committees provide local knowledge and expertise.	High
Increasing local capacity	Increase cross-training between local Fire Departments and the BCWS.	High
	Develop and maintain Structural Protection Units (SPU), community fire	High

²² Refer to Changes for Local Governments under Section 5 of the Building Act: Appendix to Section B1 of the Building Act Guide (Revised February 2017) for information on the use of development permits for wildfire hazard.

	caddies and water trucks where there are gaps in fire department coverage.	
	Explore providing sprinkler kits to property owners (at cost or at a reduced rate), or provide resources for homeowners to develop their own “home sprinkler kits.”	High
	Explore opportunities to provide Basic Fire Suppression and Safety S-100 training to members of the public – at a reduced rate or free of charge.	Moderate

5.2.3 Identify Priority Areas within the Area of Interest for FireSmart

All communities within the Slocan Valley would benefit from ongoing FireSmart activities. Within the AOI, priority areas for FireSmart have been identified and described in Table 21 to provide a starting point for FireSmart programs. Due to the high fire risk throughout the AOI, FireSmart initiatives should not be limited to these locations.

Table 21: Summary of FireSmart Priority Areas

Geographic	Area ID	Recommended FireSmart Activities
Krestova	Residences throughout - particularly along dead end/difficult access roads including: <ul style="list-style-type: none"> ○ Langill Rd ○ Krestova Rd ○ Pine Rd ○ Voelkle Rd ○ Gander Rd ○ Lady Bird Rd 	Conduct FireSmart assessments. Distribute FireSmart educational materials. Distribute information on evacuation procedures and the challenges with steep and narrow driveways for emergency response. Coordinate yard a clean-up event and provide incentives for FireSmart on private property.
New Settlement	<ul style="list-style-type: none"> ○ Sorokin Rd ○ Reservoir Rd 	
Slocan Park	<ul style="list-style-type: none"> ○ Slocan Valley West Rd 	
Winlaw/ Lemon Creek	Residences throughout, particularly along dead end roads including: <ul style="list-style-type: none"> ○ Avis Rd ○ Paradise Valley Rd ○ Hoodikoff Rd 	

	<ul style="list-style-type: none"> ○ Cedar Creek Rd ○ Kazakoff Rd ○ Wishloff Rd ○ Rooster Rd 	
Passmore/ Vallican	<ul style="list-style-type: none"> ○ Upper Passmore Rd ○ Little Slocan South Rd ○ Toris Ln 	
Slocan Village and Area	Residences in Brandon, along Martin Rd, Springer Rd; and along the west side of the Slocan River.	
Recreation Sites Throughout the AOI	Springer Creek Campground (Slocan Village); Valhalla Park; Winlaw Regional and Nature Park; Cooley Lake Rec Site and Goose Creek Road (lookout); Crescent Valley Beach Regional Park; and the Slocan Valley Rail Trail	Work with stakeholders and agencies (BC Parks) to ensure adequate signage and to promote responsible campfire and recreational use.
Throughout the AOI	Publicly owned buildings and spaces throughout the AOI (ex. Fire halls, schools, community halls, green spaces)	Conduct FireSmart assessments and undertake necessary actions to meet FireSmart standards. Post educational signs and locations as an example of FireSmart properties.

5.3 Community Communication and Education

Effective wildfire mitigation – including the implementation of this CWPP – depends heavily on community support, buy-in, and social license to operate. Educated and informed communities are more likely to support and participate in wildfire mitigation efforts, including fuel management and FireSmart programs. The following recommendations intend to garner community support for the successful implementation of this CWPP.

- Make summaries of this report and associated maps publicly available through web pages, social media, and public FireSmart meetings. This includes posting this CWPP on the RDCK²³ and SIFCo websites²⁴.
- Integrate this CWPP into existing and proposed FireSmart education and outreach initiatives – at both local and regional levels.
- Distribute a CWPP summary package to households through bulk mail or newspaper insert.

²³ <http://www.rdck.ca/EN/main/services/emergency-management/community-wildfire-protection-plans.html>

²⁴ <https://www.sifco.ca/>

- Add wildfire threat spatial data to the RDCK interactive web-map - allowing residents to view the threat of wildfire adjacent to their property.
- Create a position based in the Slocan Valley to implement CWPP recommendations, FireSmart programs, and coordinate with RDCK Fire Mitigation Specialists.
- Engage in appropriate community engagement during fuel treatment prescription development.

Table 22 provides additional resources that can assist with the implementation of community education and outreach activities.

Table 22: Education and Outreach Resources

Resource	Description	Link
BC FireSmart	Information and resources regarding BC’s FireSmart Initiative. Includes training courses and FireSmart events.	https://firesmartbc.ca/
FireSmart Homeowners Manual	A guide for home owners to FireSmart their property.	https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/wildfire-management/prevention/prevention-home-community/bcws_homeowner_firesmart_manual.pdf https://www.firesmartcanada.ca/images/uploads/resources/Laura_Stewart_-_FS_HomeownersManual_Booklet-Jul2017.pdf
FireSmart Homeowners Checklist	A risk assessment for homeowners to evaluate their property’s wildfire risk.	https://www.firesmartcanada.ca/images/uploads/resources/FS_HomeownersAssessment_Booklet-Jul2017.pdf
FireSmart Guide to Landscaping	Recommends fire resistant trees and plants for landscaping purposes. This resource could be made available at local garden and hardware stores.	https://www.firesmartcanada.ca/images/uploads/resources/FireSmart-Guide-to-Lanscaping.pdf
FireSmart Home Development Guide	A FireSmart guide for new structure development or renovations. Includes information on fire resistant building materials.	https://www.firesmartcanada.ca/images/uploads/resources/FSCanada_HomeDevBooklet_5.5x8.5-V6-Mar20.pdf
FireSmart: Protecting your Community from Wildfire	An in-depth guide on how to mitigate wildfire risk throughout the community.	https://www.firesmartcanada.ca/images/uploads/resources/FireSmart-Protecting-Your-Community.pdf
Becoming a FireSmart Community Brochure	Provides information on the FireSmart Canada Community Recognition Program.	https://www.firesmartcanada.ca/images/uploads/resources/64120_FireSmart_Brch_Proof_3_hi_res.pdf
FireSmart Last Minute Checklist	A last–minute checklist for homeowners in the event of a wildfire.	https://www.firesmartcanada.ca/images/uploads/resources/FireSmartCanada_Wildfire_Evac_Checklist.pdf
FireSmart Canada	Information and resources regarding the FireSmart program.	https://www.firesmartcanada.ca/
FireSmart Lesser Slave Region, Education	Contains FireSmart educational material as well as pre-made programs for teachers.	https://www.livefiresmart.ca/education/

Resources		
BCWS Prevention Webpage and Resource List	Contains information and resources regarding FireSmart specific to BC.	https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/for-your-home-community https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/wildfire-management/prevention/prevention-home-community/bc_firesmart_program_resource_descriptions.pdf
RDCK FireSmart Webpage	Information on the RDCK FireSmart program including home evaluations.	http://www.rdck.ca/EN/main/services/emergency-management/firesmart.html
RDCK Emergency Management Web Page	Information on emergency preparedness, post-wildfire hazard reports, active wildfires, evacuation information, and Emergency Notification System registration.	https://rdck.ca/EN/main/services/emergency-management.html https://rdck.ca/EN/main/services/emergency-management/wildfires.html
SIFCo Fuel Management Operations	Information on forest fuel treatments types and landscape level wildfire planning.	https://www.sifco.ca/wui-management https://www.sifco.ca/video-gallery-2
Wildfire And Climate Change in the Kootenays Conference	Presentations from June 2018 on management approaches to improve wildfire and climate change adaptation and resiliency.	https://www.kootenaywildfire.ca/presentations-1
Government of Canada “Get Prepared” Website	Information on how to prepare for emergencies and evacuations.	https://www.getprepared.gc.ca/index-en.aspx
PrePared BC	Information on how to prepare for emergencies and evacuations.	https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/preparedbc

5.4 Other Prevention Measures

Hiking, camping, and mountain biking are popular recreational activities in the Slocan Valley. Ensuring trails and high-use recreation areas contain appropriate signage and campfire rings in designated areas can help mitigate the risk of human caused fires. Signs posting the Fire Danger Rating, information on fire prevention and what to do in the event of a wildfire should be maintained throughout the region -

particularly at trailheads, forestry roads and along the highway. Posting signage at completed fuel treatment sites should be ongoing with the goal of educating the public on fuel management treatments. Stakeholder groups, the BCWS, BC Parks, and local government can all work together to promote responsible outdoor recreation throughout the WUI.

5.5 Recommendations for Fire Risk Management and Mitigation

Table 23 provides recommendations with the objective of reducing wildfire risk through fuel management and FireSmart programs.

Table 23: Risk Management and Mitigation Recommendations

Number	Recommendation
Objective: To garner community support for wildfire mitigation efforts	
14	Undertake education and outreach with the goal of obtaining community support to implement CWPP recommendations. Consider: <ul style="list-style-type: none"> • Making summaries of this report and associated maps publicly available through web pages, social media, and public FireSmart meetings. This includes posting this CWPP on the RDCK²⁵ and SIFCo websites²⁶. • Integrating this CWPP into existing and proposed FireSmart education and outreach initiatives – at both local and regional levels. • Distribute a CWPP summary package to households through bulk mail or newspaper insert. • Adding wildfire threat spatial data to the RDCK interactive web-map - allowing residents to view the threat of wildfire adjacent to their property. • Creating a position based in the Slocan Valley to implement CWPP recommendations and FireSmart programs. •
Objective: To reduce wildfire threat through fuel treatment	
15	Work with licensees (BCTS, Interfor, Kalesnikoff Lumber, SIFCo, Woodlots) and other partners (BC Hydro, Fortis BC, MOTI, and FWCP) to implement fuel treatment as recommended in Table 19. Treatments should increase opportunities for fire suppression, including reducing fuel loads, improving firefighter access and treating areas that are continuous and anchored to strategic locations (such as water bodies, roads, or gravel pits) when possible. Consider funding streams provided by the CRI and Forest Enhancement Society of BC (FESBC).
16	Continue to monitor previously treated areas and re-treat as required to maintain a moderate or low fire threat.
Objective: To reduce wildfire risk through FireSmart programs	
17	Maintain FireSmart programs throughout Area H and municipalities. Coordinate activities between the RDCK and municipalities to reduce program costs and increase efficiencies.

²⁵ <http://www.rdck.ca/EN/main/services/emergency-management/community-wildfire-protection-plans.html>

²⁶ <https://www.sifco.ca/>

18	Review, select and implement activities from Table 20 as part of an ongoing FireSmart program. Activities include education and outreach, vegetation management, incorporating FireSmart into community planning and development, and increasing local capacity to defend against interface fires.
19	Explore rebate programs to create incentives for FireSmart on private land. Continue to advance proposal that public funds should be invested in fuel management on private land that forms part of a strategic, landscape level fuel break.
20	Maintain sufficient signage at high-use recreational areas and completed fuel treatment sites. Signage should include fire danger ratings, information on fire prevention, emergency contact information, and evacuation procedures on trails. Explore opportunities to work with other agencies to maintain and increase fire prevention signage at trailheads, forestry roads, along the highway, and within communities.
21	Coordinate trail development and maintenance with wildfire mitigation efforts in high-risk areas. Information regarding trail development should be shared with response agencies and incorporated into evacuation and emergency response plans.

SECTION 6: Wildfire Response Resources

Interface fires are complex, dynamic incidents that typically require the coordination of various resources from multiple agencies. The RDCK has undertaken a recent initiative to collect data on firefighting and emergency response resources. Continuing this initiative will facilitate efficient emergency response and coordination. The following sections describe the resources that are available to respond to an interface fire in the region. Section 6.2 provides recommendations to improve the efficiency of emergency evacuation, preparedness, and response and increase local capacity to respond to wildfires.

6.1 Local Government Firefighting Resources

The availability of firefighting resources can fluctuate significantly throughout the wildfire season depending on the demand for crews throughout the province. The BC Wildfire Service is responsible for responding to wildfires on Crown land and on private property outside of a municipal or regional fire protection area. The AOI is part of the South East Fire Centre, Arrow Fire Zone. The Shoreacres Fire Base – located near the junction of Highway 6 and Highway 3A - is home to seven, 3-person Initial Attack crews; and two, 20 person Unit Crews²⁷. The Shoreacres base is located in close proximity to many of the communities in the southern portion of the valley. The BCWS also maintains a seasonal fire base near the Nakusp Airport which is staffed based on fire hazard. The BCWS coordinates the staffing levels of fire crews throughout the province based on wildfire danger and fire activity. In B.C. these resources are deployed according to BC Provincial Co-ordination Plan for Wildfire²⁸.

The RDCK maintains a mobile command unit, 4 Structure Protection Units (SPUs) and 18 Fire Departments throughout the regional district. There are four RDCK volunteer fire departments situated throughout the AOI – located in the Village of Slocan, Winlaw, Passmore, and Crescent Valley (Appendix 1, Map 1). Outside of the AOI – in the north Slocan Valley - the New Denver and Area Fire Department services New Denver, Silverton, and Area H specified fire protection service area.

6.1.1 Fire Departments and Equipment

All RDCK volunteer fire departments are led by a Fire Chief and staffed by well-trained volunteer firefighters. Firefighting resources available to the four fire departments in the AOI have been described in Table 24:

²⁷ Personal Communications, Jonathan Fox, BCWS Wildfire Technician.

²⁸ https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf

Table 24: Fire Department Resources

Fire Department	Number of Volunteers	Equipment
Crescent Valley Volunteer Fire Department	18-20	<ul style="list-style-type: none"> • 1 tender (3,000gal), • 1 engine (750gal), • 1 wildland truck (250 gal) • 1 utility – high volume hydraulic supply pump
Passmore Volunteer Fire Department	27	<ul style="list-style-type: none"> • 1 tender (1,200 gal) • 1 engine (800 gal) • 1 wildland truck (350 gal)
Slocan Volunteer Fire Department	26	<ul style="list-style-type: none"> • 1 tender (1,000 gal) • 1 engine (1,000 gal) • 1 One Ton Rescue Truck • 2 Hydraulic Supply Pumps
Winlaw Volunteer Fire Department	20	<ul style="list-style-type: none"> • 1 tender (1500 gal), • 1 engine (1,000 gal), • 1 crew transport truck (500 gal)

Limited resources and training available to volunteer fire departments can pose a challenge for small communities. A lack of available volunteers in times of need has been identified as a common limitation facing wildfire response throughout the province and in the valley. Although solutions to this issue are limited, encouraging community members to volunteer can be incorporated into FireSmart education and outreach initiatives. Increasing firefighter remuneration is another strategy that the RDCK has explored to both better compensate volunteer firefighters and assist with firefighter recruitment and retention.

6.1.2 Water Availability for Wildfire Suppression

The Village of Slocan water system draws from Gwilym Creek and includes a 250,000 gal reservoir, back-up power generator, and 21 fire hydrants - however there is no hydrant access on the west side of river²⁹.

The South Slocan system is owned and operated by the RDCK and draws water from Watt's Brook and utilizes Smokey Creek as a secondary source. The system includes a 60,000 gal steel reservoir that holds raw water, and a 66,000 gal steel reservoir that holds treated water (RDCK, 2019). The South Slocan system supports some fire-fighting infrastructure including five hydrants and two standpipes; however the flow and storage capacity of the system is inadequate to provide reliable fire suppression

²⁹ Personal Communications, Tim Hill, Village of Slocan Public Works.

(RDCK, 2019). In 2014, the Fire Underwriters Survey reviewed the system and recognized it as having a dwelling protection grade based on available fire flows from one hydrant located near the old school house (RDCK, 2019). It should be noted that Watt's Brook provides limited flow and that the water system is nearing its capacity to meet local demand (RDCK, 2019).

Water infrastructure including hydrants, standpipes, buried water tanks, and pre-identified draft sites within the AOI have been summarized below³⁰. Hydrants throughout the AOI are not fire rated in terms of pressure and flow rates:

- **Village of Slocan:** 20 hydrants; 1 seasonal hydrant near Highway 6.
- **Lemon Creek:** 1 draft site located under Lemon Creek Bridge.
- **Winlaw:** 1 standpipe located downtown; 3 buried water tanks (estimated 15,000 gal) located at Jmaeff Rd (Perry Siding), Lois Ln, and along Slocan River Rd towards Passmore.
- **Passmore/Vallican:** 2 buried water tanks (Little Slocan South Rd, and near the Fire Hall); 3 draft sites (Passmore Bridge, Woykin Rd, and along Passmore Lower Rd).
- **Slocan Park:** 1 standpipe in town, 1 standpipe (Storbo Heights Rd); 4 draft sites (Slocan Park Bridge, Slocan Valley West Rd, near Kirby Rd); 1 buried water tank (2782 Highway 6 - private residence); 25,000 gal water reservoir part of the Slocan Park water system.
- **Poplar Ridge:** 2 hydrants; 7,000 gal cistern (approx.); diesel jockey pump.
- **Krestova:** Draft site at Goose Creek.
- **Crescent Valley/Playmor:** 5 hydrants, 1 jockey pump.
- **South Slocan:** 6 standpipes, 10 hydrants, and 3 privately owned standpipes.

Most of the communities in the AOI are adjacent to the Slocan River as well as numerous streams and natural water sources which can be used the event of a wildfire. Ensuring access to draft sites and natural water sources, however, can be challenging due to private land, public use, and fluctuating water levels. There is also limited water availability in some portions of the AOI— such as Krestova. In such areas, local Fire Departments must rely on hauling water, which can be a challenging and timely activity— making response difficult. This is particularly true on steep slopes such as upper Krestova Road.

A detailed review of water sources, access points, and hydrants/standpipes should be conducted to assess water source vulnerability and system capacity for fire suppression needs. This review should continue to map and designate access points to natural water sources with the goal of ensuring access points are clear and usable in the event of an emergency. Locating sites for additional access points and water tanks should be conducted and water tanks installed in areas of limited water availability or poor access. Creating additional access points to natural water sources should be explored throughout the valley. This may involve working with private land owners or other agencies to secure access to reliable water sources.

³⁰ Data provided by RDCK GIS Department, Web-map, the Crescent Valley, Winlaw, and Passmore VFDs.

6.1.3 Access, Evacuation and Transportation

Access and egress routes for many communities throughout the AOI are limited. The main or only evacuation route in many locations is Highway 6.

The major evacuation routes within the AOI include:

- Highway 6 (North) towards New Denver.
- Highway 6 (South) to the southern entrance to the valley - at Playmor Junction. Highway 6 continues east to Nelson (20 km) while Castlegar is located 22 km south on Highway 3A.
- Pass Creek Road provides an alternate route from Crescent Valley, New Settlement and Krestova to Castlegar (25 km).
- Along the west-side of the Slocan River, Perrys Back Road and Slocan River Road provide alternate access from Perry Siding to Winlaw (14 km) and Passmore (20 km).
- Outside of the AOI, Highway 31A connects New Denver to the Village of Kaslo (46 km east).

Areas with only one road access create a challenge for emergency response and evacuation, which is made worse by smoke, poor visibility and evacuee stress. Depending on the location of a fire, access and egress may be limited to one direction along major highways and roads.

Forest resource roads and/or secondary public roads may provide alternate transportation routes throughout the AOI in the event of highway closures. However, most such roads do not connect through to other locations. Any alternate routes using secondary roads should be carefully pre-planned, verified, and incorporated into a comprehensive evacuation plan. Alternate roads may only be suitable for 4x4 vehicles and be impassable with smaller cars or vans. Forest roads are also susceptible to unforeseen blockages due to fallen trees or other natural event. Non-motorized access options include trails throughout the valley such as the Slocan Rail Trail from the Village of Slocan to South Slocan. Boat access along Slocan Lake provides a potential evacuation option from the Village of Slocan.

Other access constraints and potential bottlenecks include limited access and dead end roads, numerous steep and narrow private driveways, and bridges. Notable access constraints and potential bottlenecks in the AOI include:

- **Winlaw/Lemon Creek:** Avis Rd, Paradise Valley Rd, Hoodikoff Rd, Cedar Creek Rd, Kazakoff Rd, Wishloff Rd, Rooster Rd.
- **Passmore:** Upper Passmore Rd, Little Slocan Rd, Toris Ln.
- **Slocan Park:** Slocan Valley West Rd.
- **Krestova:** Langill Rd, Krestova Rd, Pine Rd, Voelkle, Gander Rd, and Lady Bird Rd.
- **New Settlement:** Sorokin Rd, Reservoir Rd, and Pass Creek Rd.

There are also key bridges throughout the AOI including: Crescent Valley Bridge, Slocan Park Bridge, Passmore Bridge, Winlaw Bridge, Perry's Siding Bridge, Lemon Creek Bridge and two bridges in Slocan. Any traffic incident that blocked a bridge would stop all evacuation traffic.

Opportunities to address emergency access and evacuation constraints throughout the AOI should be explored, including connecting dead-end roads and ensuring new developments consider emergency access and evacuation routes. FireSmart programs should prioritize neighbourhoods with difficult access for both emergency response and evacuation purposes - as identified in Table 21. Information on evacuation procedures should be incorporated into FireSmart outreach activities.

An interface fire is a stressful, chaotic, and dynamic situation in which decisions made under pressure with limited information can have positive or dire consequences. Having a predetermined - yet adaptable - evacuation plan can help ensure that evacuations are effective and efficient.

The RDCK is currently exploring opportunities to develop detailed evacuation plans for a number of electoral areas. A detailed evacuation plan should include maps of evacuation routes, safety zones, marshaling points, and Emergency Support Services.

A local emergency communications plan can dramatically improve evacuation efficiency. Fire departments should maintain contact information for residents – particularly those who cannot self-evacuate. Community members should be encouraged to register with the RDCK’s Emergency Notification System – which sends emergency notifications through text or voice call to registered individuals. Residents should also be encouraged to develop personal evacuation plans which may include: notifying friends and family of evacuations, pre-identifying evacuation routes and accommodations, ensuring vehicles are regularly fueled, developing a readily available evacuation kit with cash, medication, food, water and other necessities. FireSmart initiatives should aim to educate the public on emergency preparedness and evacuation procedures. For additional educational resources, refer to Section 5.3 – Community Communication and Education.

6.1.4 Training

RDCK Fire Departments conduct weekly practice sessions and participates in wildland fire training including the SPP-WFF1 /S-100 (Basic Wildfire Suppression and Safety), and Incident Command System (ICS). A few members have Fire Operations in the Wildland/Urban Interface (S-215) training and experience.

The RDCK Emergency Response and Recovery Plan outlines a policy for coordination between the BC Wildfire Service, the local fire department and the RDCK Emergency Operations Centre (EOC) in the event of an interface fire. During an interface fire, a unified command structure (under the ICS) is adopted in which representatives from multiple agencies share the lead role as the “Incident Commander” – typically this includes the local fire department and the BC Wildfire Service.

When working under a unified command structure, clear lines of communication are essential to facilitate efficient coordination of resources and ensure first responder safety. During the 2016 Horse River Fire in Fort McMurray, provincial wildfire crews and municipal fire departments were operating on different radio frequencies. “At critical times when municipal and wildland firefighters were not physically working together on the ground, they could not directly communicate by radio to identify priorities or support each other” (MNP, 2017). Although both the structural and wildland fire crews were trained to use the ICS, a unified command structure was not established in a quick or efficient manner (MNP, 2017).

Similar communications shortcomings during past wildfire events were identified in discussion with volunteer fire personnel in the AOI. The past communications issues did not have material impacts; however they do highlight opportunities for improvement.

In order to prevent a similar situation, RDCK Fire Departments and the BCWS should participate in regular cross-training. Annual cross-training should include a review of the ICS system and communication protocols - including the establishment and maintenance of shared radio frequencies between the agencies. Currently, the BCWS conducts cross-training with local fire departments every 3 years. Fire departments in the Central Kootenays maintain a close working relationship through the Zone 4 (Kootenays) Fire Chief and Central Kootenay Fire Chief Association meetings.

Past wildfires, including local interface fires and recent catastrophic wildfires throughout the province, provide learning opportunities for both municipal and wildland crews. The 2016 Review of the Horse River Fire and the BC provincial review of the 2017 wildfire season are valuable resources that evaluate fire response efforts and identify areas for improvement. These documents should be reviewed and discussed in order identify training opportunities and prevent similar outcomes. Several online resources – such as the Wildfire Lessons Learned Center³¹ – provide additional, free-of charge; educational material for informal wildfire safety training that can be conducted in-house.

6.1.5 Communications Infrastructure Redundancy

The ability to communicate with other agencies and departments is critical to efficient deployment of resources during a wildfire incident and to ensure information and instructions issued to the public is as accurate as possible.

Communications infrastructure based on telephone land lines on wooden poles is vulnerable to disruption during a wildfire incident. Local wireless, tower based internet services are also directly vulnerable to disruption by wildfire, and/or by having power supply lines cut for a time period that exceeds backup power supply capabilities. Buried fibre optic cable is more robust, but may also be disrupted by wildfire.

Satellite based internet access and a computer can easily be powered by a portable generator and will not be disrupted by wildfire activity for as long as generator fuel is available. Satellite internet can be used for text based and voice over internet communication when other systems fail.

Installing satellite internet capability at local fire halls is recommended to provide a redundant / backup communications system should other communications system be disrupted by wildfire.

6.2 Structure Protection

Structure Protection Units (SPUs) are a critical resource during an interface fire. SPUs contain equipment (sprinklers and pumps) to increase humidity, wet roofs and areas surrounding structures in order to reduce potential damage from sparks, embers and approaching wildfires. There are several SPUs available in the event of an interface fire.

³¹ <https://www.wildfirelessons.net/home>

Currently the RDCK maintains four regional SPUs which can be staffed by RDCK firefighters trained as Structure Protection Specialists. The RDCK has three Type 2 units (capable of defending 20-30 structures) and one Type 3 unit.

Twenty-eight kilometers north of the Village of Slocan, The New Denver and Area Volunteer Fire Department has one Type 3 SPU capable of defending roughly 12 structures – although the SPU is not located within the CWPP AOI.

The UBCM along with the BCWS and the Office of the Fire Commissioner (OFC) operate a Structural Protection Program (SPP) and can dispatch SPUs throughout the province within 12 hours.

The RDCK should continue to acquire additional SPUs and train firefighters to utilise these resources. Homeowners and community groups may be interested in purchasing or assembling their own personal sprinkler kits if provided with guidance or incentives. This initiative could be incorporated into a FireSmart program and may help increase local capacity to defend against an interface fire.

6.3 Recommendations for Wildfire Response and Resources

The recommendations in Table 25 intend to improve the efficiency of emergency evacuation, preparedness, and response. Table 26 provides recommendations with the objective of increasing local capacity to respond to wildfires.

Table 25: Wildfire Response and Resources Recommendations (Evacuation, Preparedness, and Response

Number	Recommendation
Objective: To improve the efficiency of emergency evacuation, preparedness, and response	
22	Work with the Village of Slocan and Improvement Districts to conduct a water availability assessment that considers: <ul style="list-style-type: none"> • An assessment of water sources, access points, and hydrants/standpipes for fire suppression needs. • A vulnerability assessment of water sources particularly to summer drought conditions and reliance on electrical power. • The identification of settlement areas that may have insufficient or unreliable water supplies.
23	Continue to identify and map alternate water sources for fire suppression. Create designated access points to natural water sources and ensure access points are clear and usable in the event of an emergency. If necessary, seek emergency access permission from landowners. Develop additional alternate and backup water sources as necessary.
24	Develop a detailed evacuation plan for the Village of Slocan and Area H South. A detailed evacuation plan should consider: <ul style="list-style-type: none"> • Maps of evacuation routes, safety zones, marshaling points, and Emergency Support Services Reception Centers. • Designating and communicating pre-determined primary and secondary evacuation routes. • A feasibility review of FSRs as alternate evacuation routes. • Agreements and contact information with local transportation (busses, rotary-wing,

	<p>and boats).</p> <ul style="list-style-type: none"> • A communications and traffic control plan to be implemented in the event of an evacuation. • Information on residents who cannot self-evacuate, and current phone lists. • Collaboration with other agencies. This should include working with BC Parks to develop an evacuation plan for the west-side of Slocan Lake and other high-use recreational areas. • Communicating a summary of the plan and the administration framework of the evacuation process to residents to reduce confusion and delay when an evacuation is implemented.
25	<p>Explore opportunities to address emergency access and evacuation constraints throughout the AOI. This should include:</p> <ul style="list-style-type: none"> • Connecting dead-end roads and ensuring new developments consider emergency access and evacuation routes. • Communicating access constraints to homeowners and the implications on emergency response. • Exploring opportunities to coordinate with Fortis BC, BC Hydro, and Ministry of Transportation and Infrastructure to create/maintain fuel breaks adjacent to roads, highways, and bridges.
26	<p>Continue to collect data on firefighting resources. Develop and maintain a wildfire suppression data set for use by BCWS and Fire Departments, including</p> <ul style="list-style-type: none"> • Firefighting resources • Current access roads and trails • Old overgrown roads • Access blockages (washouts, bridge failures) • LiDAR terrain data • Water access points • Critical infrastructure
27	<p>Consider installing satellite internet service equipment with generator at fire halls to provide redundant backup communications abilities if conventional communications systems are impacted by wildfire activity.</p>
28	<p>As part of a FireSmart program, encourage members of the public to develop personal evacuation plans. This may include:</p> <ul style="list-style-type: none"> • Registering with the RDCK's Emergency Notification System • Notifying friends and family of evacuations • Pre-identifying evacuation routes and accommodations outside of the valley • Ensuring vehicles are regularly fueled • Developing a readily available evacuation kit with cash, medication, food, water and other necessities

Table 26: Wildfire Response and Resources Recommendations (Increasing Local Capacity)

Number	Recommendation
Objective: To increase local capacity to respond to wildfires	
29	Incorporate volunteer firefighter recruitment into FireSmart education and outreach initiatives.
30	Explore funding opportunities to acquire community fire caddies (small trailer with water tank and pump) and water trucks where there are gaps in fire response coverage. Consider purchasing additional wildland specific firefighting equipment including two-stroke pumps (Wajax Mark 3 or similar) pump kits, and quick connect 1.5" wildland fire hose.
31	Encourage cross-training between the RDCK Fire Departments and the BCWS. Explore opportunities for: annual mock fire exercises, Fire Operations in the Wildland/Urban Interface (S-215) training, Structure and Site Preparation (S-115) training, ICS, communications, and after action reviews of past interface fires.
32	Offer Basic Fire Suppression and Safety S-100 training for interested community members throughout Area H at a reduced rate or free of charge.
33	Maintain RDCK SPUs and continue to acquire additional units. Continue SPU deployment training for firefighters and monitor SPU needs.
34	Explore opportunities to assist homeowners and community groups to develop their own sprinkler kits. Consider coordinating initiatives with other municipalities and electoral areas to increase cost effectiveness.

SECTION 7: Works Cited

- Archer, CRM. (2009). *Cultural Heritage Resource Identification and Management in Forestry Developments: A Supplement to the FREP Protocol*.
- Alcock, J. (2007). *Arrow-Penstock Wildfire - N50229 Post-Wildfire Erosion Risk Analysis*. B.C. Ministry of Forests and Range.
- BC Ministry of Forests. (1995). *Biodiversity Guidebook*.
- BC Wildfire Service. (2017). *Provincial Strategic Threat Analysis: 2017 Update* .
- BC Wildfire Service. (2017). *Wildfire Season Summary*. Retrieved 01 2019, from BCWS: <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary>
- BC Wildfire Service. (n.d.). *FireSmart Homeowner's Manual*. Retrieved from https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/wildfire-management/prevention/prevention-home-community/bcws_homeowner_firesmart_manual.pdf
- Cathro, J., & Blackwell, B. (2016). *RDCK Area I CWPP*.
- Christianson, D. (2018). *Forest Health Strategy for the Arrow and Cascadia Timber Supply Areas 2017/2018*. BC Ministry of Forests, Lands, Natural Resource Operations, and Rural Development.
- Filmon, G. (2004). *Firestorm 2003 - Provincial Review*.
- Forest Practices Board. (2015). *Fuel Management in the Wildland Urban Interface - Update*. Forest Practices Board.
- Hill, T. (2019, January 16). Village of Slocan Public Works.
- Judd, A. (2018, 12). *Global BC's top news story of 2018: Another record-setting wildfire season*. Retrieved 01 2019, from Global BC News: <https://globalnews.ca/news/4805361/2018-record-setting-wildfire-season/>
- Kalesnikoff Lumber. (2017). *Forest Stewardship Plan #597 – Amendment 1* .
- Ketcheson, M., Braumandl, T., Meidinger, D., Utzig, G., Demarchi, D., & Wikeem, B. (1991). *Chapter 11: Interior Cedar-Hemlock Zone*. In: *Ecosystems of British*.
- MacKillop, D., & Ehman, A. (2016). *Land Management Handbook 70: A field guide to site classification and identification for southeast British Columbia: the south-central Columbia Mountains*. Victoria, BC: Government of British Columbia.
- Maclauchaln, L., & Buxton, K. (2016). *Overview of Forest Health Conditions in Southern British Columbia*. BC Ministry of Forests, Lands and Natural Resource Operations.
- Mahr, M. (2018). *High-Level Overview of the Bonanza Biodiversity Corridor*.
- Ministry of Forests, Lands and Natural Resource Operations. (2017). *Wildfire Threat Assessment Guide and Worksheets Sub-component and descriptor definitions* .

- MNP. (2017). *A Review of the 2016 Horse River Wildfire Alberta Agriculture and Forestry Preparedness and Response* . Edmonton.
- Morrow, B., Johnston, K., & Davies, J. (2013). *Wildland Urban Interface Wildfire Threat Assessments in B.C.*
- Nicholls, D. (2017). *Arrow Timber Supply Area Rationale for Allowable Annual Cut (AAC) Determination -November 16, 2017*. Forests, Lands, Natural Resource Operations and Rural Development.
- Partners in Protection. (2003). *FireSmart : protecting your community from wildfire*. Edmonton, AB: Partners in Protection.
- Perrakis, D. D., Eade, G., & Hicks, D. (2017). *British Columbia Wildfire Fuel Typing and Fuel Type Layer Description*.
- Province of British Columbia. (2016). *Provincial Coordination Plan for Wildland Urban Interface Fires* . Victoria.
- RDCK. (2009). *Slocan Lake North portion of Electoral Area 'H' Official Community Plan Bylaw 1967, 2009*. Nelson, BC: RDCK.
- RDCK. (2016, January 6). Retrieved from Regional District of Central Kootenay: <http://www.rdck.ca/en/main/government/welcome.html>
- RDCK. (2019, January). *RDCK Water Systems*. Retrieved from <http://www.rdck.ca/EN/main/services/water/rdck-water-systems>
- SIFCo. (2017). *Slocan Valley Strategic Landscape Level Wildfire Protection Plan Pilot Project* .
- Stats Canada. (2016). *2016 Census Profile: RDCK Area H*. Ottawa: Stats Canada.
- Stats Canada. (2016). *2016 Census Profile: Village of New Denver, RDCK*. Ottawa: Stats Canada.
- Stats Canada. (2016). *2016 Census Profile: Village of Silverton, RDCK*. Ottawa: Stats Canada.
- Stats Canada. (2016). *2016 Census Profile: Village of Slocan, RDCK*. Ottawa: Stats Canada.
- SWPI. (2018). *2017 Community Wildfire Protection Plan Template*. Strategic Wildfire Prevention Working Group.
- Utzig, G. (2012). *Ecosystem and Tree Species Bioclimate Envelope Modeling for the West Kootenays. Report #5* .
- Utzig, G., Boulanger , J., & Holt, R. (2011). *Climate Change and Area Burned: Projections for the West*. Report #4 from the West Kootenay Climate Vulnerability and Resilience Project.
- Village of New Denver. (2013, 01 11). *Village of New Denver*. Retrieved 11 15, 2018, from New Denver.ca: www.newdenver.ca
- Westhaver, A. (2016). *Why some homes survived: Learning from the Fort McMurray wildfire disaster*. Toronto: Institute for Catastrophic Loss Reduction.
- Woods, A., Heppner, D., Kope, H., Burleigh, J., & Maclauchlan, L. (2010). Forest health and climate change: A British Columbia perspective. *The Forestry Chronicle*, 86(4), 412-422.