SQUAMISH - LILLOOET
REGIONAL DISTRICT

SLRD Electoral Area A

Community Wildfire Resiliency Plan

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Photo Credit: Sal DeMare

March 2023

SQUAMISH - LILLOOET
REGIONAL DISTRICT

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Acknowledgments

This plan was prepared by Tawnya Collins, R.P.F., Robin Strong, R.F.T, Matt Senger, R.B.T., and Ed Senger, R.P. Bio. Field data collection was provided by Robin Strong, and Matt Senger. Ed Senger completed the mapping and GIS analysis.

The SLRD would like to thank the northern St'át'imc communities of Xaxlí'p, Ts'kw'aylaxw, Tsal'alh, T'ít'q'et, Xwísten, and Sekw'el'was, as well as the Lillooet Tribal Council and St'át'imc Government Services for their valuable contributions in the development of this Community Wildfire Resilience Plan.

In addition, the authors would also like to thank and acknowledge the following individuals who were key participants in the Community FireSmart Resiliency Committee (CFRC) meetings, as well Lillooet Area Community Wildfire Roundtable sessions participants for their invaluable knowledge, participation and input into the development of the 2022 SLRD Electoral Area A Community Wildfire Resiliency Plan.

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Executive Summary

Resiliency is the ability to withstand and recover from adverse events. Within the wildfire context, resilient communities will be able to respond, absorb, adapt to and recover from wildfire events. Fire has always been part of the natural ecosystem and it is inevitable that wildfires, including those of an extreme event, will continue to occur within the region. As we enter a new era of climate change, it is not if a fire will happen, it is when. This plan has been developed to assist individuals, communities and organizations in becoming more wildfire resilient.

Fire on the land has been integral to the shaping the natural ecosystems we currently live in and enjoy, but the behaviour of wildfires in recent years has changed dramatically and is expected to continue to change in the years ahead. Wildfires are now becoming more threatening to human life, safety and community values. Wildfire seasons are starting earlier in the spring and continuing later into the fall; the fires themselves are becoming larger and more intense; and communities are seeing unprecedented impacts from wildfires including loss of human life, infrastructure, wildlife and their habitat, livestock and their grazing areas, and even entire communities themselves. For example, the three most impactful fire seasons to communities were recorded in 2017 (12,160 sq km), 2018 (13,550 sq km) and 2021 (8,700 sq km). In 2021, the Kamloops Fire Centre alone saw 455 wildfires burn 498,000 hectares of land, and across the province of BC approximately 1% of the entire land base was burned, creating devastating impacts (Government of BC, n.d.). During the 2021 wildfire season, a provincial state of emergency was declared on July 21, 2021, and remained in effect for 56 days until September 14, 2021 (Government of BC, n.d.). During the state of emergency, many communities in the southern interior were placed on evacuation alert and resulting evacuation orders, which led to challenges in finding available accommodations for all of the evacuees. These unprecedented impacts from the 2021 wildfire season emphasized the need for communities to take the steps to increase their preparedness level and overall resiliency in anticipation for challenging fire seasons that lie ahead.

The focus area of the Community Wildfire Resiliency Plan is the Wildland-Urban Interface (WUI) which is the area of land within 1 kilometre of a community and is where human development meets and intermixes with natural vegetation. There were six WUIs delineated within the SLRD Electoral A that encompass the communities of Gold Bridge, Bralorne, Tyaughton Lake, Gun Lake, Marshall Lake and Marshall Lake Road. Within these WUIs, the most common fuel types are those dominated by coniferous forest that varies across the landscape due to diverse topography, hydrological conditions, forest harvesting, wildfire history, human settlement, cattle grazing, and other factors. A wildfire risk analysis completed for the six WUI areas indicated that the majority of the area is categorized as moderate to high wildfire threat with pockets of extreme threat. These ratings were developed by analyzing the natural disturbance regime, fuel types, wildfire history, topography, and weather patterns in the WUI areas. Wildfire threat assessments were completed in the field which provided local threat attribute data leading to the development of proposed fuel treatment areas in efforts to mitigate the moderate – extreme threat levels within the WUI areas.

There are many values that are at risk during a wildfire event that require consideration, but first and foremost is the human life and the safety of all residents. Other important values that are considered during resiliency planning include homes where people live, community buildings where people gather, critical infrastructure that supports human life and safety (including energy sources, water and sewage systems, and communication towers), cultural and spiritual values, and the many species at risk. The Community Wildfire Resiliency Plan provides recommendations in efforts to minimize the effects to these values from a wildfire event. Processes that support these resiliency efforts include conducting home and critical infrastructure assessments, mitigating wildfire risks around homes and critical infrastructure, enhancing emergency planning, and developing and supporting neighbourhood FireSmart programs.

This plan is grounded in local knowledge through community participation and input received from the Community Wildfire Resiliency Committees (CFRCs) and the Lillooet & Area Community Wildfire Roundtable. These forums provided locally based information and challenges, as well as an opportunity to improve communication and create stronger connections between community members and

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responding agencies. Through the implementation of this plan, the SLRD Electoral Area A communities will be able to take further steps to prepare for wildfires and to be able to respond and recover from a wildfire event safely, quickly and effectively to emerge stronger and more resilient.

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Frequently Used Acronyms

AoI	Area of Interest
BCWS	British Columbia Wildfire Service
BEC	Biogeoclimatic Ecosystem Classification
CFFDRS	Canadian Forest Fire Danger Rating System
FCFS	FireSmart Community Funding & Supports
CI	Critical infrastructure
CIFFC	Canadian Interagency Forest Fire Centre
CRI	Community Resiliency Investment
CWPP	Community Wildfire Protection Plan
CWRP	Community Wildfire Resiliency Planning
DP	Development Permit
DPA	Development Permit Area
EMCR	Emergency Management and Climate Readiness
EPA	Emergency Program Act
FBP	Fire Behaviour Prediction System
FMP	Fire Management Plan
FSCNRP	FireSmart Canada Neighbourhood Recognition Program
FNESS	First Nations Emergency Services Society
HIZ	Home Ignition Zone (also see Structure Ignition Zone)
HRVA	Hazard Risk and Vulnerability Analysis
LRMP	Land and Resource Management Plan
MOF	Ministry of Forests
MOTI	Ministry of Transportation and Infrastructure
PSOE	Provincial State of Emergency
PSTA	Provincial Strategic Threat Assessment
OCP	Official Community Plan
OFC	Office of the Fire Commissioner
SOLE	State of Local Emergency
SWPI	Strategic Wildfire Prevention Initiative
SPU	Structure Protection Units
UBCM	Union of British Columbia Municipalities
VAR	Values at Risk
WRR	Wildfire Risk Reduction

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Summary of Recommended Activities

Section 5.1 FireSmart Coordination						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
1	Continue to employ a dedicated FireSmart Coordinator to oversee the FireSmart program within the SLRD. Access funding through the CRI program to hire a full-time FireSmart Coordinator.	To work with the SLRD Electoral Area A communities to implement identified wildfire resiliency objectives and goals.	Ongoing	High	SLRD Emergency Program	Continued funded FireSmart Coordinator role
Section 5.3 Local Level FireSmart Initiatives						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
2	Continue to encourage and support community-level CFRC committee meetings.	To provide an opportunity for collaboration between neighbourhoods and other organizations or communities, and to support neighbourhoods working towards FireSmart Canada Neighbourhood Recognition.	Ongoing	High	SLRD FireSmart Coordinator Neighbourhood Champions Local FireSmart Representatives	Funding to support meeting logistics

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3	Encourage and support individuals in the communities to become Neighbourhood Champions.	Identify key individuals within each community to work with the SLRD FireSmart Coordinator to implement initiatives in their local neighbourhoods.	Ongoing	High	SLRD FireSmart Coordinator Neighbourhood Champions	One Champion per neighbourhood
4	Complete neighbourhood wildfire assessments for all identified neighbourhoods.	Complete the Neighbourhood Wildfire Hazard Assessment Form to further identify risks within the identified neighbourhood areas.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator Qualified LFR	Completion of wildfire assessments for all identified neighbourhoods
5	Continue to offer Home Ignition Zone Assessments for all residences in the WUI areas.	Increase homeowner education about current wildfire risks and how to reduce them using the FireSmart principles.	Ongoing	High	SLRD FireSmart Coordinator Qualified LFR	Completion of HIZ assessments for all interested homeowners
6	Continue to work with the local Neighbourhood Champions to implement information/education sessions in the SLRD Area A communities.	Continued education and information distribution through events such as Community cleanup or FireSmart preparedness day and Local emergency preparedness days.	Ongoing	High	SLRD FireSmart Coordinator Community participants/Fire Departments/Fire Brigades/LFRs BC Wildfire Service	At least two community events held annually for the SLRD communities

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7	Support interested neighbourhoods in achieving recognition through the FireSmart Canada Neighbourhood Recognition Program.	SLRD FireSmart Coordinator to provide support to local Neighbourhood Champions with CFRC coordination, creating neighbourhood plans, hosting events and submitting documents to FireSmart Canada.	Short Term (Within 1 year)	Moderate	SLRD FireSmart Coordinator Neighbourhood Champions	Achieve one FireSmart Canada Neighbourhood recognition by 2024
8	Re-establish the rebate program.	Create an annual program that provides rebates to homeowners for completion of recommended FireSmart activities. This will provide an incentive for residents to reduce the wildfire risks on their properties.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator Qualified LFR	A fully funded rebate program for 2023/24 and future years.
Section 5.4 Education and Communication						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
9	Increased public messaging during the spring months and throughout the wildfire months.	Increased FireSmart and emergency preparedness public messaging reminding people of the importance of clearing hazards away from their recreational properties for upcoming wildfire seasons, and emergency preparedness.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator SLRD Fire Departments Neighbourhood Champions SLRD Communications Department	Increased messaging frequency and targeted topic selection to coincide with appropriate preparedness activities

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10	Develop a formal communication strategy for information distribution throughout the wildfire season.	Improved coordination of SLRD messaging resulting in increased awareness for residents and tourists in the SLRD. This includes defining audiences, identifying key messages, creating a plan for outreach methods, and developing a timeline for messaging.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator and Communications Department	Communication strategy/plan
11	Work with school districts to incorporate FireSmart BC educational materials, wildfire preparedness information and household emergency planning including home evacuation route plans into lesson planning or school events.	To increase FireSmart, emergency and household preparedness awareness for school-aged children. Ideal timing is in the spring and/or during fire prevention week in October.	Mid Term (1-3 years)	Moderate	SLRD FireSmart Coordinator SLRD Fire Departments School District Liaisons	Hold at least one information session in the school annually
12	Engage with local ranchers and farmers to determine the interest in developing a Farm and Ranch Wildfire Plan with a Local FireSmart Representative specializing in agriculture.	Assist farmers with information for wildfire preparedness planning, including completing a Farm and Ranch Wildfire Plan that includes developing an evacuation plan for livestock.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator Qualified LFR	Engage with ranchers and complete one Farm and Ranch Wildfire Plan in 2023/24
13	Engage with Rec Sites and Trails BC and BC Parks to establish signage and/or display boards for key locations such as trailheads and kiosks that contains critical emergency information that the public should be aware of during wildfire season.	To provide the public with key information regarding evacuation routes, protocols and contacts in the event of a wildfire.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator Rec Sites and Trails/BC Parks	Designate or create at least one dedicated location to display public information.

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14	Encourage BCWS to have more presence in and around the communities during active wildfire season, and to increase the number of fire ban signage (when applicable).	This will help to improve information exchange with tourists/visitors frequenting the back country, stronger enforcement of campfire bans, and increased presence for monitoring the area for fire starts.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator BCWS	Include this topic in an upcoming interagency meeting.
15	Continue to build upon successful FireSmart public education outreach initiatives that have been previously implemented.	Continued FireSmart and wildfire resiliency awareness through public events. Examples of successfully completed outreach activities are open houses, farmers market info booths, and virtual FireSmart seminars.	Ongoing	High	SLRD FireSmart Coordinator Community participants/Fire Departments/ Fire Brigades/LFRs BC Wildfire Service	Hold at least 2 public education outreach initiatives annually.
Section 5.5 Legislation, Planning and Development						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
16	Conduct Critical Infrastructure assessments for all critical infrastructure, including those outside the WUI areas, but within the AoI.	Complete all CI assessments and recommended mitigative actions.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator Qualified LFR	Complete CI assessments and recommendation
17	Review pertinent sections of the OCP and embed	The OCP is currently being updated for Area A, providing the opportunity to include FireSmart principles to strengthen requirements for wildfire	Mid Term (1-3 years)	High	SLRD FireSmart Coordinator	Inclusion of FireSmart principles in the

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	FireSmart principles where applicable.	resiliency during new home development, renovations, and/or landscaping. This could include researching the impacts and feasibility of strengthening development and landscaping requirements for new home builds and renovations to meet current FireSmart standards. The economic and environmental impacts of these requirements would be considered prior to implementation.			SLRD Planning Department	updated OCP for Area A
18	Expand the Wildfire Development Permit Area (DPA) to include the Marshall Lake Road and Marshall Lake areas.	To ensure that all identified SLRD Area A WUI areas are included in the DPA so wildfire development bylaws apply to all residents.	Mid Term (1-3 years)	Moderate	SLRD Planning Department	Inclusion of Marshall Lake and Marshall Lake Road WUIs in the DPA area
19	Conduct a review to assess the adequacy of water quantity for fire suppression activities within each SLRD community.	To understand the current capacity of community water systems (if present) in relation to fire suppression requirements to determine if improvements are needed.	Mid Term (1-3 years)	High	SLRD Planning Department SLRD Fire Chief	Report on community water system capacity for fire suppression.
20	Continue to include wildfire prevention and suppression considerations in the design of subdivisions (e.g., road widths, turning radius for emergency vehicles, and access and egress points).	Improved emergency response ability for new areas considered for development.	Ongoing	Moderate	SLRD Planning / SLRD Emergency Program	Updated bylaws and policies.

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21	That the SLRD engage with organizations such as MOF, MOECCS and post-secondary institutions to further investigate and understand climatic changes that may be occurring within the electoral area. This data would help inform a pre-emptive wildfire hazard and risk analysis that could be completed for community and domestic use watersheds.	To provide SLRD with predictive information to allow planners to proactively develop and implement a mitigation plan to address identified potential impacts that could occur as a result of a wildfire event. This information would assist in understanding the short and mid-term implications a wildfire could have on the integrity of a watershed, including but not limited to water quantity and quality, terrain stability, riparian and wildlife considerations.	Long Term (3-5 years)	Moderate	SLRD/MOF/MOECCS Post-secondary Institutions	Include this topic at an upcoming interagency or Lillooet Area Community Wildfire Roundtable meeting
Section 5.6 Interagency Cooperation						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
22	Provide honoraria when inviting members of Indigenous communities to participate in SLRD-led inter-agency meetings.	To encourage inclusion and provide compensation for participation.	Short Term (Within 1 year)	High	SLRD Emergency Program	Secure funding
23	That SLRD staff participate in Indigenous cultural safety awareness training.	To provide a deeper understanding of Indigenous history and culture and to foster more effective partnerships with local First Nations in emergency response and wildfire prevention.	Short Term (Within 1 year)	Moderate	SLRD Staff	Complete training

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24	Continue to organize/support/participate in inter-agency meetings and Lillooet Area Community Wildfire Roundtable LACWR) meetings with key emergency response organizations including, but not limited to DoL, BCWS, MOF, BC Hydro, MOTI, EMCR, BC Parks, Rec Sites and Trails BC, local First Nation organizations, and community fire departments.	Continued coordination and collaboration with organizations involved in wildfire response and preparedness initiatives within the electoral area.	Ongoing	High	SLRD FireSmart Coordinator SLRD Emergency Program	Participation in all LACWR meetings and secure funding to host two inter-agency meetings per year.
25	Collaborate and engage with organizations such as MOF, forest licensees and local woodlot owners to ensure that a coordinated approach to future wildfire resiliency measures are incorporated into any land-based activities proposed in WUI areas.	To create a consistent and coordinated approach to wildfire resiliency and fuel reduction initiatives on the land base within the WUI area around communities, including addressing potential excess fuel buildup in the WUI area around the communities.	Short Term (Within 1 year)	Moderate	SLRD FireSmart Coordinator Neighbourhood Champions and/or SLRD Area A Fire Department personnel	Complete an introductory meeting with identified stakeholders. Identify high-risk areas.
26	Engage with BC Parks and Rec Sites and Trails BC to explore options for fuel reduction opportunities along well used and travelled recreational trails in the Upper Bridge River Valley area, especially trails that are located in close proximity to the communities.	To explore collaborative opportunities for fuel reduction initiatives along potential fire ignition corridors. These features could also be considered for use as fuel breaks around communities.	Mid Term (1-3 years)	Moderate	SLRD FireSmart Coordinator Neighbourhood Champions and/or SLRD Area A Fire Department personnel	Complete an introductory meeting with identified stakeholders. Identify high-risk areas.

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Section 5.7 Emergency Planning						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
27	Update community Emergency Response Plans. Ensure each plan is specific to each community's needs and requirements. Increase the frequency of reviewing the plan with the community to annually or to a maximum of every two years.	To provide ongoing or updated emergency preparedness information to community members for emergency events.	Short Term (Within 1 year)	High	SLRD Emergency Program	Hold one meeting annually with each specific community to review and update the ERP.
28	Develop a comprehensive communication protocol for emergency events specific to each community's needs and communication infrastructure requirements.	To improve effective communication during emergency events.	Short Term (Within 1 year)	High	SLRD Communities SLRD Emergency Program	Communication Protocol
29	Support and encourage the development of communication liaisons – residents who can be a point of contact for a neighbourhood or community.	This will improve the flow of communications during wildfires between emergency response organizations and communities for remote areas that have limited cell service and internet access.	Mid Term	High	SLRD Emergency Program	Identification of 1 liaison per community.

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30	Review communication options for providing Marshall Lake residents with emergency alert systems.	To ensure that Marshall Lake residents receive emergency alert information in a timely manner.	Mid Term (1-3 years)	High	SLRD Emergency Program	Integrated emergency alert system for Marshall Lake residents
31	Provide support to local fire services personnel to carry out pre-wildfire season evacuation route inspections of all evacuation routes identified in the ERP.	To ensure that all identified evacuation routes are passable during an emergency event. This will involve coordination with other agencies responsible for the upkeep and maintenance of these routes if repairs are required.	Short Term (Within 1 year)	High	SLRD Emergency Program SLRD Fire Departments/Fire Brigades	Identify costs and secure funding to support and complete pre-wildfire season inspections
32	Develop and conduct various tabletop evacuation scenarios with SLRD communities.	That an all-hazard planning approach is taken to ensure that residents are functionally prepared for all types of emergency events and situations.	Mid Term (1-3 years)	Moderate to High	SLRD Emergency Program	Complete one tabletop evacuation scenario with the SLRD Area A communities by 2024-2025.
33	Install backup power systems/generators for all SLRD critical infrastructure assets, particularly the Bralorne and Gold Bridge water and sewer systems.	To ensure that critical services can continue to function even if the electrical grid system is compromised by a wildfire or other event.	Mid Term (1-3 years)	High	SLRD Planning/ SLRD Emergency Program	Secure funding

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34	Engage with and encourage SLRD Area A businesses and other organizations that own essential service infrastructure to also invest in backup power generators.	Backup power will provide business continuity during an emergency event even if the electrical system has been compromised. This is of particular importance during a shelter in place event due to the remote location of the communities.	Short Term (Within 1 year)	Moderate	SLRD FireSmart Coordinator SLRD Emergency Program	Hold one meeting with SLRD Area A businesses in 2023-2024.
35	Initiate the purchase of mobile fire suppression and SPU units and situate them in strategic locations in WUI areas that are not currently covered under fire protection services (Tyaughton Lake, Marshall Lake, Marshall Lake Road and Gun Lake north).	These units would be included in the SPU plan for the communities and provide additional first response suppression equipment available for use by local responders during a wildfire event.	Mid Term (1-3 years)	High	SLRD Emergency Program Local fire Departments / Brigades	Secure funding through CRI
36	Complete a Community Structure Protection Plan for each community and share with BCWS to facilitate rapid and coordinated deployment of SPU units in an emergency.	The Community Structure Protection Plan will play a crucial pre-organizational role for wildfire preparedness by ensuring that adequate SPU resources are identified, are available and strategic placements determined prior to a wildfire event.	Short Term (Within 1 year)	High	SLRD Regional Fire Chief Local fire Departments / Brigades	Report

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37	Review the current Fire Protection agreements to evaluate the option of including Gold Bridge, Gun Lake Road, Tyaughton Lake, Marshall Lake and Marshal Lake Road into the AoR of the Bralorne Volunteer Fire Department or the Gun Lake Fire Protection Society.	To provide additional emergency response capacity to communities who are currently located outside the local fire response AoR.	Long Term (3-5 years)	Moderate	SLRD Emergency Program SLRD Regional Fire Chief Local fire Departments / Brigades	Complete review of existing agreements to examine feasibility.
Section 5.8 Cross Training						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
38	Fund, support and provide additional emergency response training and education, including basic EOC and ICS training for local first responders, Neighbourhood Champions and interested community members.	To increase community awareness and knowledge about the standardized Incident Command Systems that are used during emergencies.	Short Term (Within 1 year)	Moderate	SLRD Emergency Program	Fund and coordinate training sessions.
39	Fund and assist coordinate training sessions for the local community fire services personnel, first responders and interested community members to practise and improve on basic fire suppression techniques and tactics including joint training sessions with BCWS.	Due to the remoteness of the communities and lengthy response times, it is imperative to have locally trained first responders to provide initial fire suppression response safely and effectively for interface fires.	Short Term (Within 1 year)	High	SLRD Regional Fire Chief in conjunction with BCWS and/or other qualified training facilitators Local Fire Departments / Brigades	Fund and assist coordination of training sessions

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40	That SLRD provide assistance to the volunteer fire departments to create and complete a training/recruitment plan for each established SLRD fire response entity.	To ensure that there is ongoing and sustained capacity within the communities for future local fire suppression and emergency response needs. The plan should identify the type of training required, costs and timelines for implementation. This plan should also integrate various FireSmart training initiatives.	Mid Term (1-3 years)	Moderate	SLRD Regional Fire Chief Local fire Departments / Brigades	Completed training and recruitment plan
Section 5.9 Vegetation Management						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
41	Create tenured vegetation disposal sites near each community in Area A.	This will provide alternatives to burning on private properties where there are small lots adjacent to wildland debris (e.g., Marshall Lake and Gun Lake) and discourage illegal dumping of vegetative debris.	Mid Term (1-3 years)	Moderate	SLRD Emergency Program and Environmental Services Department	Identify and designate appropriate vegetation disposal sites for each community.
42	Fund and coordinate a seasonal roadside chipping program for residents.	Participants would bring vegetative debris to the roadside for chipping by an arborist company and provide alternative options for debris disposal for local residents. This would further encourage residents to complete vegetation reduction in and around their properties.	Short Term (Within 1 year)	Moderate	SLRD Emergency Program SLRD FireSmart Coordinator	Secure funding and contractors

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43	Advocate to the UBCM for funds that provide free vegetation removal programs for residents located on high-risk properties.	Homeowners will be able to reduce their wildfire risk regardless of financial status, physical ability, remoteness, and other barriers.	Mid Term (1-3 years)	High	SLRD Emergency Program	Restore similar activities that were included in the past CRI Stream 3 program.
44	Develop an annual vegetation maintenance program to ensure that vegetation around all identified SLRD critical infrastructure (particularly in zone 1) is kept maintained throughout the wildfire season. Areas around other public buildings should also be considered for inclusion.	This will further reduce the possibility of a wildfire impacting critical infrastructure. A maintenance plan should identify the frequency and type of vegetation maintenance needed such as full removal, weed whacking, pruning, or watering. Implementation could be achieved through existing or new staff, including summer students.	Short Term (Within 1 year)	High	SLRD Emergency Program SLRD FireSmart Coordinator	Vegetation maintenance plan development
45	That the SLRD work with WRR program staff to complete fuel reduction treatments (forest fuel reduction and prescribed burning) for the proposed treatment areas identified in the SLRD Area A WUI Areas.	Reduction of high hazard fuels/vegetation adjacent to the communities.	Short Term (Within 1 year)	High	SLRD Emergency Program SLRD FireSmart Coordinator Cascades Natural Resource District WRR staff.	Identify priority areas and secure treatment funding.

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SECTION 1: Plan Overview and Structure

Wildfire is an integral part of British Columbia's ecosystems and landscapes, including areas where citizens settle and communities grow. Due to an increasing population and expanding rural development, more communities and developments in B.C. are situated in areas of potentially increased wildfire risk.

This Community Wildfire Resiliency Plan (CWRP) builds off the 2018 Squamish-Lillooet Regional District Community Wildfire Protection Plan (CWPP) to determine the level of and resulting steps to manage wildfire risk within and surrounding the communities of Bralorne, Gold Bridge, Gun Lake, Tyaughton Lake, Marshall Lake and Marshall Lake Road. The plan also provides background information and links to supplementary information required to ensure that factors contributing to wildfire risk are well understood. The recommendations and Best Management Practices (BMP) included in this plan are considered relevant for a general timeframe of 5 years unless changes and improvements to FireSmart initiatives, fuel reduction efforts, community development, community involvement and/or wildfire events alter the needs and resiliency of the local area, which may prompt updating components of this Community Wildfire Resiliency Plan.

The Community Wildfire Resiliency Plan is organized into the following major sections:

Section 1 Introduction: introduces the purpose of a CWRP and the plan development process

Section 2 Local Area Description: defines the Area of Interest (AoI) for the CWRP; provides a description of the community (or communities) within the AoI, a description of the Wildland Urban Interface (WUI) areas and identifies linkages to other plans that warrant consideration in this planning process

Section 3 Values at Risk: identifies values within identified WUI's and the extent to which wildfire has the potential to impact those values

Section 4 Wildfire Risk Analysis: describes the process that was undertaken to identify and summarize the fuel hazard and other factors that contribute to the wildfire threat within the WUI's

Section 5 Recommendations for Mitigating Wildfire Risk: outlines the strategies that can be implemented to help reduce the risk and the impact of a wildfire:

> 5.1 FireSmart Planning and Activities: summarizes the current level of FireSmart implementation and identifies priority areas for future FireSmart activities
>
> 5.9 Vegetation Management and Forest Fuel Reduction: identifies and prioritizes forest fuel reduction treatments. This section also includes other preventative measures that identify local actions and strategies that can further reduce the threat of wildfires

Section 6 Community Wildfire Resiliency Plan monitoring and updates.

1.1 Plan Goals

The purpose of the Community Wildfire Resiliency Plan is to:

1) to assist the Squamish-Lillooet Regional District in identifying priority wildfire risks to the Electoral A communities,

2) describe potential consequences from the impacts of wildfire, and

3) provide mitigation recommendations based on current information that should be considered for implementation to reduce the identified risks.

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Specifically, the CWRP will:

- Delineate the community Wildland Urban Interface (WUI) areas around habited areas at risk of wildfire, including the locations of homes and essential community infrastructure
- Identify the threat to human life, property and critical infrastructure within this area
- Determine wildfire risk throughout the WUI Area
- Provide wildfire community resiliency recommendations and Best Management Practices (BMP) using current information and science
- Identify recommendations to reduce the identified threats. The CWRP planning process will provide a detailed framework to guide the implementation of specific actions that will result in:
    1. Reduced likelihood of a wildfire entering the community
    2. Increased community wildfire preparedness
    3. Reduced impacts and losses to property and critical infrastructure
    4. Reduced negative economic and social impacts to the community
- Identify priority areas within the WUI for fuel reduction treatments, develop a Treatment Plan and provide recommendations to further support and enhance the community's efforts to be FireSmart. The recommendations are based on the seven (7) FireSmart disciplines to increase community resilience in the event of a wildfire.

1.2 Plan Development Summary

The Squamish-Lillooet Regional District contracted Landscope Consulting Corporation in 2021 to develop a CWRP for both Electoral Areas A and B. This plan and recommendations therein are applicable to Electoral Area A communities.

The following key steps were undertaken during the development of the CWRP:

Phase 1 – Initial planning, preparation and information gathering;

Phase 2 – Information gathering from regionally based Community Wildfire Roundtables

Phase 3 – Creation and facilitation of a local, community-based Community FireSmart Resiliency Committee (CFRC) groups. There were several CFRC meetings held, including larger and smaller groups. The full list of participants and meeting dates can be found in Appendix 1.

Phase 4 – Field and office data collection;

The data collection for the structure inventory and 74 wildfire threat assessment plots was completed between August 2022 and November 2022.

Phase 5 – Development of the draft Community Wildfire Resiliency Plan document, maps and spatial data files;

Phase 6 – Proposed treatment area information was provided to First Nation organizations in December 2022 for review and feedback.

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Phase 7 – Review of completed draft CWRP document by SLRD, and revisions completed;

Phase 8 – Submission of completed CWRP document and supporting files

The declaration of the COVID-19 pandemic and resulting implementation of the BC Public Health orders/restrictions in efforts to manage the virus outbreak occurred in March 2020 and continued into 2022. The Public Health Orders/restrictions required specific safety protocols to be in place, including the restriction of all non-essential travel, limiting the size of groups/gatherings and increasing personal protection measures such as sanitizing all common surfaces/equipment, wearing masks and maintaining a minimum 2m/6ft distance wherever possible. Offices were closed and administrative staff were encouraged to work from home whenever possible. This created challenges for information gathering as well delaying the original completion date of field work. In addition, the 2021 wildfires and atmospheric flooding events created additional challenges and unanticipated delays.

1.3 Linkage to CWPP's/CWRP's

2018 Community Wildfire Protection Plan

Bruce Morrow Forest Consulting completed a Community Wildfire Protection Plan for the SLRD Electoral A in November 2018. Local information, proposed treatment areas and recommendations from the 2018 plan have been integrated where applicable.

2021 Community Wildfire Resiliency Plans

B.A. Blackwell completed the Community Wildfire Resiliency Plans for the adjoining SLRD Electoral areas C & D in March 2022.

1.4 Linkage to Other Plans

The intent of this section is to identify the sources and linkages to other planning documents to minimize duplication, while still identifying the relevance of other plans, legal requirements, objectives, strategies and policies that will influence the development of the CWRP.

Table 1: Key Plans and Relationship to CWRP

Plan Type	Description and Relationship to CWRP	Links
Community Plans		
Existing Bylaw 608 – Upper Bridge River Valley Official Community Plan, Bylaw No. 608, 1996 (Consolidated June 2018) SLRD Electoral Area A Official	Existing Bylaw 608 – Upper Bridge River Valley Official Community Plan, Bylaw No. 608, 1996 (Consolidated June 2018) The purpose of an Official Community Plan (OCP) is to provide direction for land use and development within a given area. The Upper Bridge River Valley OCP contains objectives, policies, and land use designations adopted by the Squamish-Lillooet Regional District Board of Directors that are often implemented on a long-term basis, generally over a 10-15 year period.	Electoral Area A Official Community Plan Review and Update | Squamish-Lillooet Regional District (slrd.bc.ca)

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Community Plan Update (2022)	At the time of drafting this plan, a comprehensive review and update is underway for the Area A OCP . This includes expansion of the plan area to include all of Electoral Area A (and renaming to the plan to the "SLRD Area A Official Community Plan"). Key areas identified as high priority by respondents during engagement to date include: • Hazard planning, including fuel management activities; • Resource management and environmental protection; • Parks, trails and outdoor recreation.	CP608 (Consolidated June 2018).pdf (slrd.bc.ca)
Existing Bylaw 608 – Upper Bridge River Valley Official Community Plan, Bylaw No. 608, 1996 (Consolidated June 2018) DPA 3: Wildfire Protection Development Permit Area	Any property owner requiring a building permit in the SLRD Electoral Area A must apply for and adhere to the wildfire mitigation measures provided in Development Permit Area 3 for Wildfire Protection. DPA 3 guidelines detail measures that must be in place prior to constructing or developing, which includes guidelines for building location plans, landscaping, fire-resistant building material. The plan contains policies addressing wildfire protection as it applies to comprehensively planned developments, public facilities, open space planning, and transportation. Some exemptions are in place for minor redevelopment or renovations, where a covenant is already registered on title requiring compliance with Wildfire Protection DPA guidelines, where a Temporary Use Permit has been issued by the Board, or where otherwise exempted by the building inspector. The Community Wildfire Resiliency Plan Area of Interest includes SLRD Area A's Wildfire Protection DPA delineation.	CP608 (Consolidated June 2018).pdf (slrd.bc.ca) Wildfire Protection Permit Guide.pdf (slrd.bc.ca)
SLRD Fire Services Review	The Fire Services Review examines the operational status and readiness of each service with emphasis on apparatus, fire halls, small equipment, response criteria, training, safety and service-specific regulatory compliance. The Fire Services Review also evaluates the overall management and the effectiveness of legislative and regulatory structures, both at the Regional District level and within the respective fire departments. The review provides recommendations for bylaws, policies, agreements, OH&S program, standard operating guidelines and more.	In Progress
Emergency Plans		
SLRD All-Hazards Emergency Response Plan	The All-Hazards Plan (AHP) for the Squamish-Lillooet Regional District (SLRD) forms part of the Comprehensive Emergency Management Plan (CEMP). This plan is a strategic document to be used by staff to help guide and create resiliency within the communities when disaster consequences cannot be avoided.	SLRD All-Hazards Plan v1.0 with Annexes.pdf

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SLRD Community Risk Assessment	The purpose of a Community Risk Assessment (CRA) is to consider all known hazards that may trigger a risk event and impact communities of the SLRD, identify what would trigger a risk event to occur, and determine what the potential impact would be if the risk event did occur. The CRA identifies Wildland interface fires as having a moderate to severe risk and the HRVA identifies interface fires as having a high to very high likely hood of probability with a high to very high consequence rating.	Community Risk Assessment (slrd.bc.ca)
Community Emergency Plans (2018) • Bralorne and Gold Bridge • Tyaughton Lake Area • Gun Lake Area • Marshall Lake Area	The community emergency plans detail critical infrastructure, response capabilities, hazards and risks, evacuation routes, including muster points, evacuation protocols and a community action plan that includes a review every three years, for each individual community.	Community Emergency Plans | Squamish-Lillooet Regional District (slrd.bc.ca)
FireSmart Plans		
FireSmart Community Plans	FireSmart Neighbourhood Wildfire Assessments, Critical Infrastructure Assessments and Home Ignition Zone assessments. These plans have not been fully completed yet for the SLRD Area A communities.	In progress
Higher Level Plans		
Lillooet and Resource Management Plan (LLRMP) – Non-Legal	The Lillooet Land and Resource Management Plan (LLRMP) is a non-legal plan introduced in 2002 that incorporates the Lillooet Timber Supply Area (TSA). There are 28 First Nations with asserted territory within the plan area. Sections of the Plan have been selected for Government Action Regulation (GAR) Orders, including those for wildlife and at-risk species management, as well proposed protected areas becoming designated provincial Parks.	Lillooet Land & Resource Management Plan - Province of British Columbia (gov.bc.ca)
Lillooet Timber Supply Review and Analysis – In progress (Public Discussion Paper August 2022)	The British Columbia Ministry of Forests regularly reviews the timber supply for all timber supply areas (TSA) and tree farm licences (TFL) in the province. This review examines the impacts of current legal requirements and demonstrated forest management practices on the timber supply, economy, environment, and social conditions of the local area and province. Variances to stocking standards in WUI areas can be recognized during the analysis.	15ts_pdp_2022.pdf (gov.bc.ca)

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Nxekmenlhkálha Iti Tmícwa (St'át'imc Preliminary Draft Land Use Plan)	In March 2004, the St'át'imc Land and Resource Authority completed the Nxekmenlhkálha Iti Tmícwa (St'át'imc Preliminary Draft Land Use Plan) for the St'át'imc Territory. The land use plan follows the St'át'imc Vision and Principles through an ecosystem-based planning process that focuses on what to leave behind on the land to sustain ecology and St'át'imc culture. The St'át'imc Chiefs Council advised government agencies and resource users in the St'át'imc Territory that all plans, tenures and activities are to comply with the Nxekmenlhkálha Iti Tmícwa. This CWRP will be consistent with the St'át'imc Vision and Principles and management objectives for the Land Designations and Protection Areas presented in the Nxekmenlhkálha Iti Tmícwa, where they apply.	part1.qxd (libraries.coop)
Parks, Recreation and Trail Plans	Parks and recreation plans guide the management of parks and open spaces. Trail planning may be incorporated into these plans or developed as stand-alone planning. Vegetation management objectives in rec site areas and along trails areas should be aligned with wildfire risk reduction measures and that trail planning and development can support wildfire risk reduction strategies wherever possible (control lines, emergency access, etc.). The plans incorporate wildfire risk reduction messaging and initiatives into the overall management objectives and strategies for the park.	s-chilcotin-mtns-big-creek-2019.pdf (bcparks.ca)
Species At Risk Wildlife Habitat Areas	To identify and include specific considerations for SAR or species of concerns when considering wildfire reduction measures. Include pertinent habitat considerations for SAR species into all wildfire reduction operational treatment projects. The following wildlife and species at risk require inclusion in the planning process: Grizzly Bear – Wildlife Habitat Area (WHA) 3-221 overlaps with several WUI areas Proposed WHA 3-201 for Western Screech Owl overlaps with the Gold Bridge WUI White Bark Pine Several fish bearing streams	Species at Risk Act (justice.gc.ca).

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Other Plans		
Wildfire Risk Reduction Program	Fuel management planning and treatment activities focusing on provincial Crown land located around communities, which includes the use of prescribed fire. Risk reduction activities target provincially identified critical infrastructure, beginning with critical response infrastructure such as government-owned radio repeaters, weather stations and airtanker bases. Eligible operational projects funded by the CRI Crown Land WRR category will be contracted via BC Bid to help to increase community resiliency to wildfire, increase ecosystem resiliency and to support local contractors in communities across the province.	crown_land_wildfire_risk_reduction_planning_guide_2020_2021.pdf (gov.bc.ca)
BC Wildfire Risk Management Plan	The Wildfire Risk Management Plans are developed by a landscape unit (i.e., Timber Supply area, Natural Resource District or Natural Resource Region) and will have protocols and strategies for managing wildfire risk in given landscape units.	Ministry of Forests District Office
Climate Action and Sustainability Plan	Climate action, sustainability, or resiliency plans address actions to reduce greenhouse gas emissions, improve air and water quality, and implement a range of social, environmental, and economic issues that are critical to long-term health, vibrancy, and well-being of a community. Actions of climate plans and CWRPs can be aligned to achieve multiple and mutual goals, such as increasing green infrastructure projects.	toen160222.pdf (gov.bc.ca) ClimateBC_Map (climatewna.com) Data Portal | Pacific Climate Impacts Consortium cpas_2021.pdf (gov.bc.ca)
Forest Stewardship Plans	A forest stewardship plan (FSP) is a map-based, landscape-level plan of potential forest development activities that are intended to take place in the plan area. Forest agreement holders must prepare, and have approved by government, a forest stewardship plan before harvesting or road-building activities can begin. The forest stewardship plan has a term of five years and may be renewed for additional terms. Licensees in the general area include Aspen Planers, Interwest Timber and BCTS (Kamloops Business Area)	Forest Stewardship Plans - Province of British Columbia (gov.bc.ca)
Woodlot License Holders	Woodlot W0361 and W0366 overlap the Tyaughton Lake WUI area and woodlot W1503 overlaps the Gold Bridge WUI area. All of these woodlots are located in strategic areas for larger scale fuel modification projects and/or fuel breaks for the communities. For any future operational plans, Woodlot licence holders should consider wildfire reduction planning	

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	components, such as reduced volumes or densities in key areas, increased inter crop tree spacing, reduction of ladder fuels and strategic road placement that can be integrated into fire suppression planning within the WUI areas.	

SECTION 2: Local Area Description

2.1 Local Area of Interest (AoI)

The SLRD Electoral A communities of Bralorne, Gold Bridge, Gun Lake, Tyaughton Lake and Marshall Lake are situated in the Upper Bridge River Valley which is located approximately 100 kilometres west of Lillooet, on the lee side of the BC Coast Mountains. The area can be accessed from Lillooet along Highway 40 or through the Hurley Forest Service Road from Pemberton to the southwest. This area has a small town feel, rich in mining history and is a friendly "community of communities" anchored in beautiful mountain surroundings. The area of interest also includes notable parks, such as the South Chilcotin Mountains Park, Bridge River Delta Park and the Gwyneth Lake Park. The area also hosts multiple recreational locations and sites, including Spruce Lake. The area of interest includes four community watersheds which are the main water source for Gold Bridge and Bralorne's community water systems. Timber harvesting, tourism, mining and agriculture all contribute to the local economy. The Upper Bridge River Valley also houses the third largest of BC Hydro's hydroelectric generating facilities. The entire Electoral Area A falls within the unceded territory of the St'át'imc, which has supported hunting, gathering and cultural traditions for thousands of years.

The SLRD Electoral A is located entirely within the Lillooet Timber Supply area. The area has varied landscapes including dry grasslands, coniferous forests and alpine tundra that supports a wide variety of wildlife, bird and fish species. This includes 10 red-listed species (Endangered or Threatened), and 30 blue-listed species (Species of Concern). These wide-ranging landscapes have diverse forest types dominated by lodgepole pine, Douglas-fir and spruce-leading stands, with other species including ponderosa pine, white bark pine, subalpine fir (balsam), western redcedar and hemlock. The general landscape and topography are characterized by broad valleys and ridges, numerous lakes and rivers, subalpine/alpine meadows and mountain peaks which draws in outdoor and recreational enthusiasts alike. (MOF FAIB, 2022)

The communities in the SLRD A electoral area are quite remote and isolated, with limited services. Residents are required to be generally self-sustained and work closely together in times of crisis. There are emergency medical services (BCEHS station) based in Gold Bridge with monthly visits provided to the community through a physician based out of Lillooet. The closest hospitals are Lillooet or Pemberton, resulting in an approximate 1.5 hour travel time to either hospital. There are limited search and rescue services and equipment in the communities, with the primary service response dispatched from Lillooet. The closest police services come from Lillooet or Pemberton. Wildland forest suppression crews are stationed in and dispatched from Lillooet, which results in a wildfire suppression response time of approximately 1.5 hours by vehicle.

There are a small number of residents that permanently reside in each of the communities year-round, but during the summer months the area population swells as many of the properties and dwellings are owned as secondary recreational properties.

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SLRD Electoral Area A:

Population: 305 (2021 Canada Census)

Size: 3,715.03 square kilometres

Figure 1: SLRD Electoral Area A Community Locations

The 1,470 square kilometre Area of Interest (AoI) for this Community Wildfire Resiliency Plan includes a subset of the Electoral Area A that directly surrounds the communities and adjacent critical infrastructure such as communications towers (Appendix 3). The AoI also encompasses the Wildfire Development Permit Area that was established by the SLRD through existing Bylaw 608 – Upper Bridge River Valley Official Community Plan, Bylaw No. 608, 1996 (Consolidated June 2018) Wildfire Development Permit Area (WDPA) 3 – Wildfire Protection.

2.2 Wildland Urban Interface (WUI) and Community Descriptions

The Wildland Urban Interface (WUI) is generally defined as any area where combustible forest fuel is found adjacent to homes, farm structures or other outbuildings. This may occur at the interface, where development and forest fuel (vegetation) meet at a well-defined boundary, or in the intermix, where development and forest fuel intermingle with no clearly defined boundary. The WUI areas, as defined by the Community Resiliency Investment program and used for analysis in this plan were created by applying a buffer to a maximum of one kilometre from the structure density class greater than 6. This represents a reasonable distance that embers can travel from a wildfire to ignite a structure. A total of six WUI areas were delineated for the SLRD Area A communities.

Table 2: SLRD Area A WUI Areas

WUI	Total WUI area (ha)	Private land (ha)	Municipal land (ha)	First Nation reserve land (ha)	Crown land (ha)	Water (ha)
Bralorne	1,275	310	2	0	959	4
Gold Bridge	1,204	138	3	0	939	124
Tyaughton Lake	1,489	178	0	0	1,161	149
Gun Lake	2,715	457	0	0	1,606	652
Marshall Lake	620	14	0	0	543	63
Marshall Lake Road	326	60	0	0	262	4

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These six distinct rural communities; Bralorne, Gold Bridge, Tyaughton Lake, Gun Lake, Marshall Lake, and Marshall Lake Road comprise the majority of the residential population in the electoral area.

Table 3: SLRD Area A Community Infrastructure Summary

Community	Homes	Critical Infrastructure	Fire Hydrants / Fire Boxes	Services and Businesses	Historical Features
Bralorne	118	7	6	14	22
Gold Bridge	58	12	3	6	1
Tyaughton Lake	87	3	0	5	0
Gun Lake	277	1	0	0	0
Marshall Lake	30	0	0	0	0
Marshall Lake Road	13	0	0	0	0

Bralorne is located 13 kilometres south of Gold Bridge along the Lillooet Pioneer Road. It has around 118 residents as well as the Bralorne Adventure Inn, a fire hall, pub, water treatment plant, along with the Bralorne Gold Mine.

Photo Credit: Michelle Nortje

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Photo Credit: Michelle Nortje

Gold Bridge is located at the western end of Carpenter Lake, and on the northeast edge of the Downtown Lake Reservoir and the Lajoie Dam. It is an unincorporated community in the Bridge River Valley, having only around 40 permanent residents and is the service and supply centre for the upper basin of the Bridge River Valley. Gold Bridge houses the ambulance station, a gas station, grocery store, post office, school, restaurants and motels.

Tyaughton Lake, also known as Tyax Lake, is a well-developed recreational area with lakeshore cabins and a major resort. Access to the area is from the Gun Creek Forest Service Road from a junction on Highway 40, midway between the outlets into Carpenter Lake of Tyaughton Creek (E) and Gun Creek (W). There are approximately 87 residences plus another resort located south of the main residential area of Tyaughton Lake, and north of Gun Creek. Mountain biking in the summer and heli-skiing in the winter are regular activities in the local mountains.

Photo Credit: Michelle Nortje

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Gun Lake, located 5 miles northwest of the community of Gold Bridge has the highest density of structures in the area with over 277 residences recorded, including residents located at Lajoie Lake or "Little Gun Lake".

Photo Credit: Michelle Nortje

There are only approximately 20 residents that live in this area permanently, but the population in the area grows to over 200 during the summer months through returning recreational property owners. The areas are accessed from the Lillooet Pioneer Highway 40 along Gun Lake Road to the western end, the southcentral area by a local gravel road or on the east end by the Slim Creek FSR. Gun Lake also houses a fire hall for response in the area.

The ***Marshall Lake*** area includes Brett Creek Meadows and Liza Lake and is accessed 2.5 km north of Highway 40. The community of Marshall Lake consists of 30 recreational lakefront cabins. There are only two full-time residents residing at Marshall Lake. Most cabins are "rustic" and are typically only used during spring and summer long weekends, at which time the temporary population may grow to between 25 and 50 people. There are another 13 homes and cabins in the Brett Creek Meadows area along Marshall Lake Road.

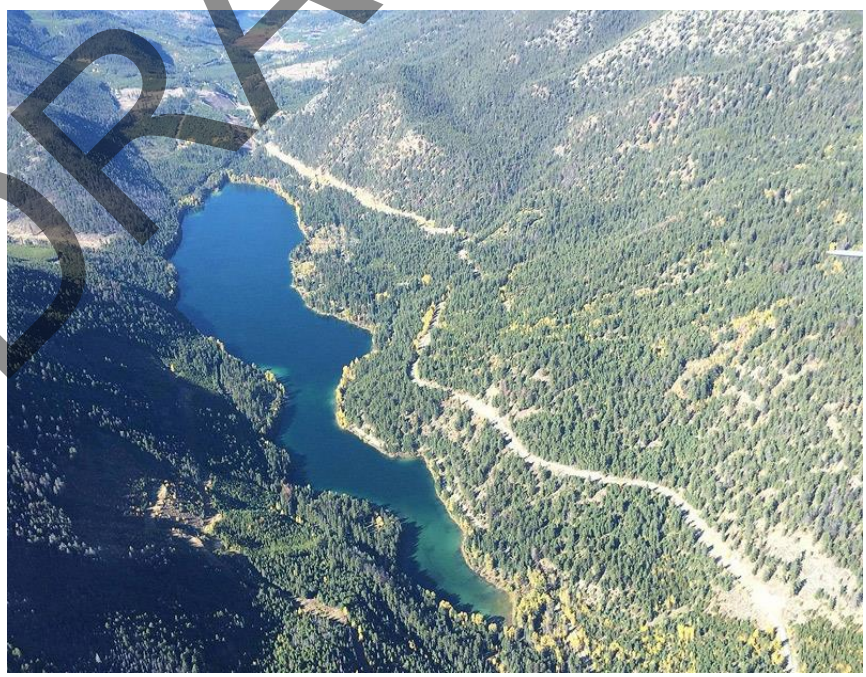

Photo Credit: BRVCA facebook page

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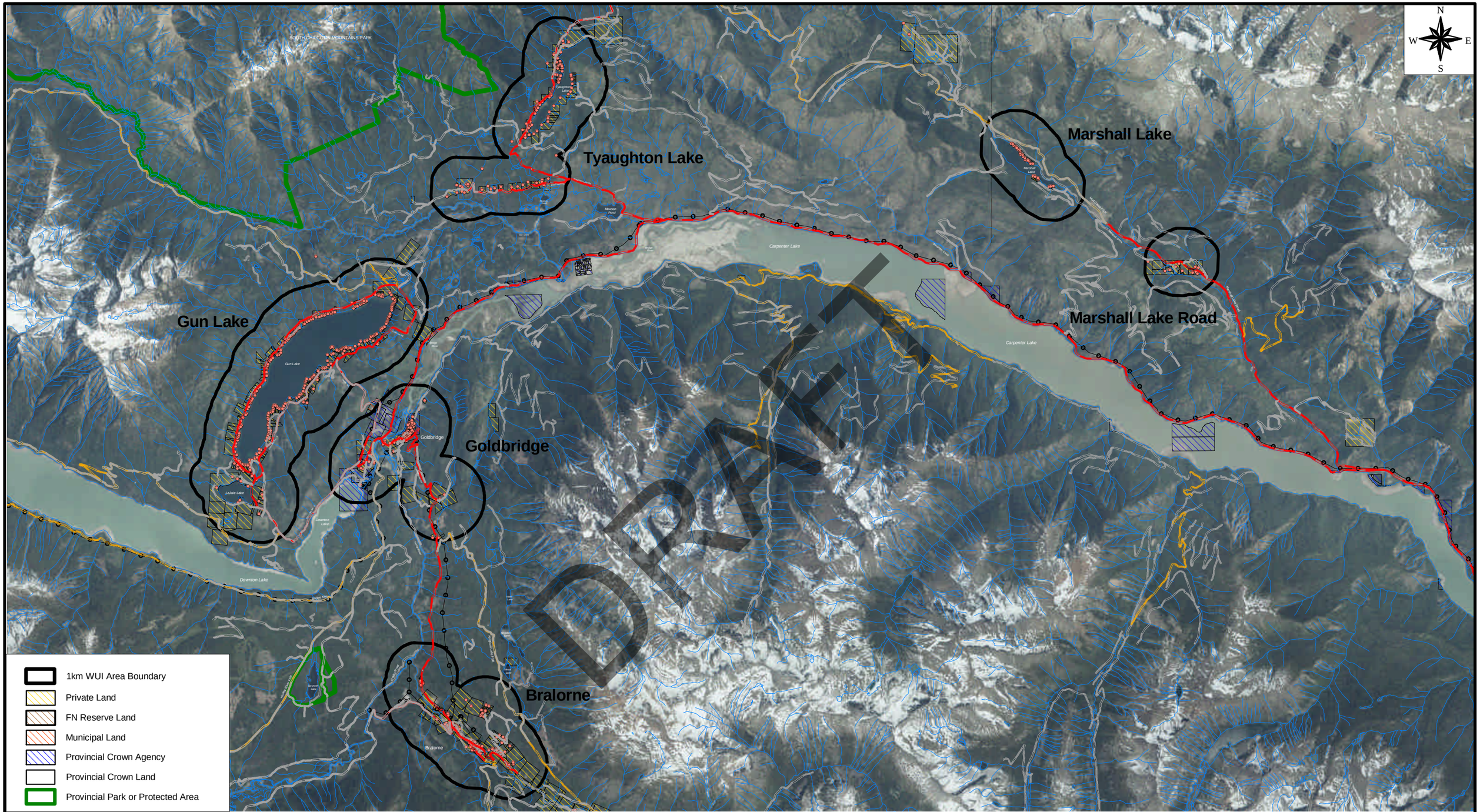


- 1km WUI Area Boundary
- Private Land
- FN Reserve Land
- Municipal Land
- Provincial Crown Agency
- Provincial Crown Land
- Provincial Park or Protected Area
- Structure
- Primary Roads
- Secondary Roads
- Forest Service Road
- BC Hydro Transmission Line
- Streams

WILDLAND-URBAN INTERFACE MAP

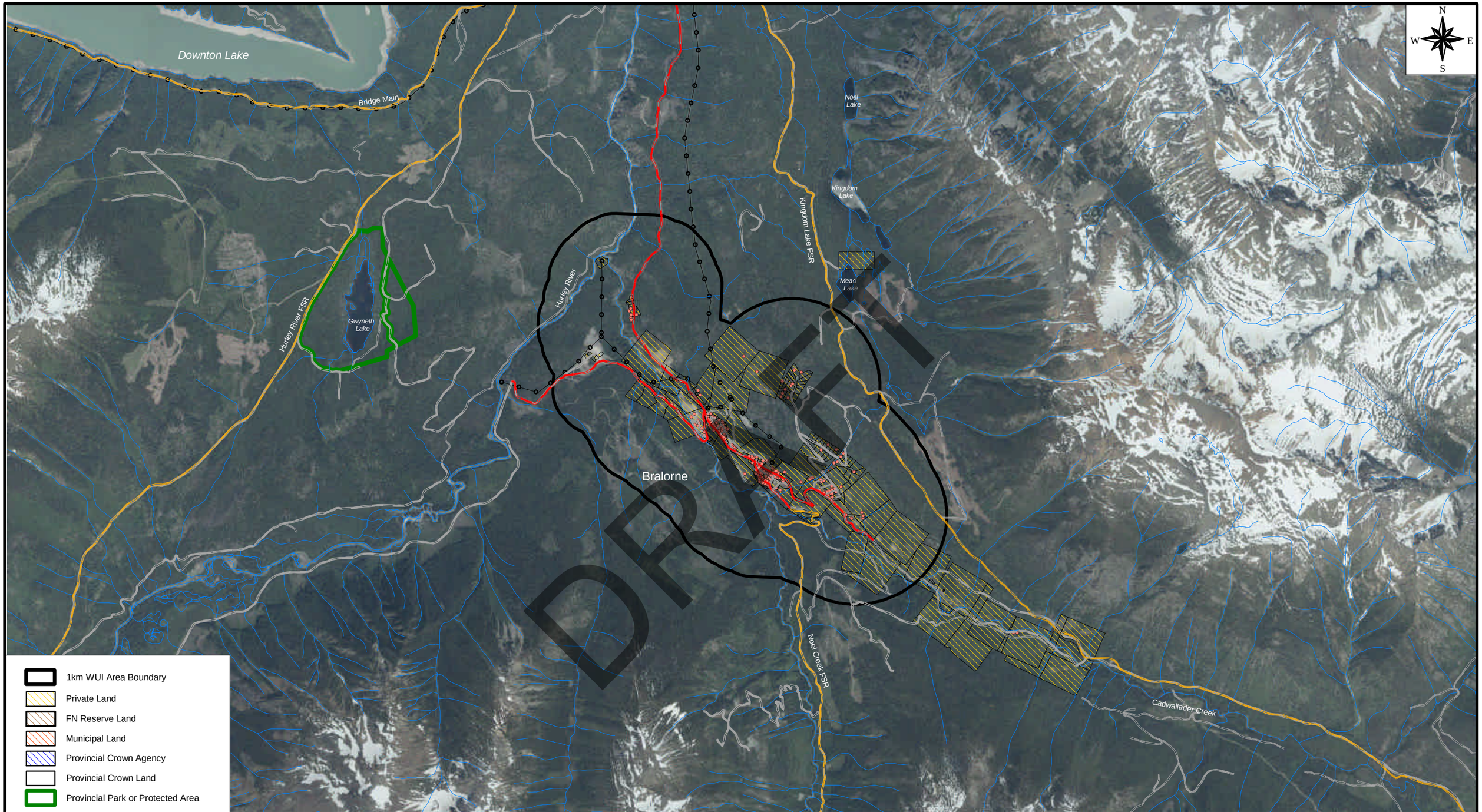
Squamish-Lillooet Regional District - Electoral Area A CWRP
Overview

1:100,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: January 22, 2023

Landscope Consulting Corporation



1km WUI Area Boundary
Private Land
FN Reserve Land
Municipal Land
Provincial Crown Agency
Provincial Crown Land
Provincial Park or Protected Area

Structure
Primary Roads
Secondary Roads
Forest Service Road
BC Hydro Transmission Line
Streams

WILDLAND-URBAN INTERFACE MAP

Squamish-Lillooet Regional District - Electoral Area A CWRP
Bralorne

1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: January 22, 2023

Landscope Consulting Corporation

WILDLAND-URBAN INTERFACE MAP

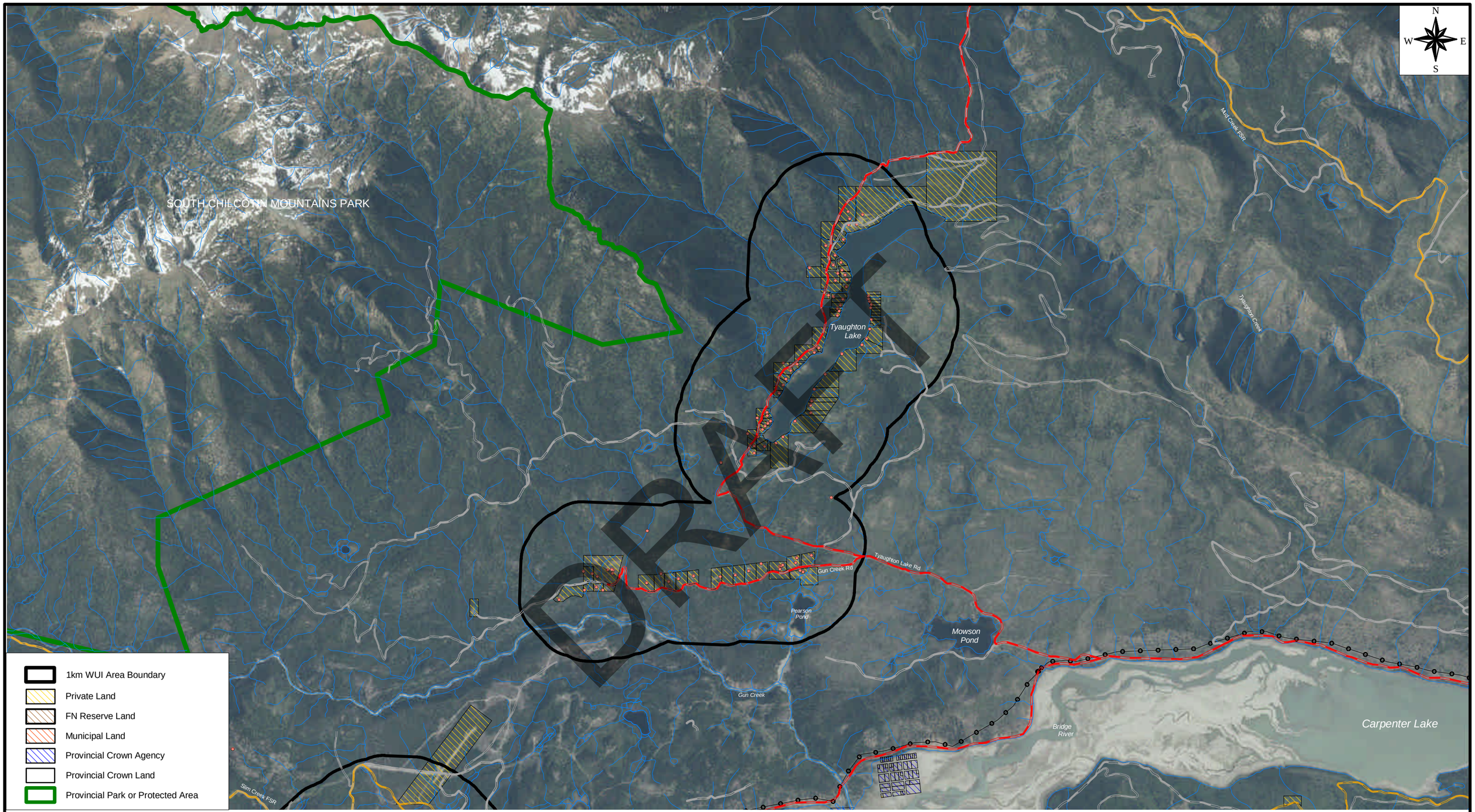
Squamish-Lillooet Regional District - Electoral Area A CWRP
Gun Lake & Goldbridge

1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 **Kilometers**

Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: January 22, 2023

Landscope Consulting Corporation



1km WUI Area Boundary
Private Land
FN Reserve Land
Municipal Land
Provincial Crown Agency
Provincial Crown Land
Provincial Park or Protected Area

Structure
Primary Roads
Secondary Roads
Forest Service Road
BC Hydro Transmission Line
Streams

WILDLAND-URBAN INTERFACE MAP

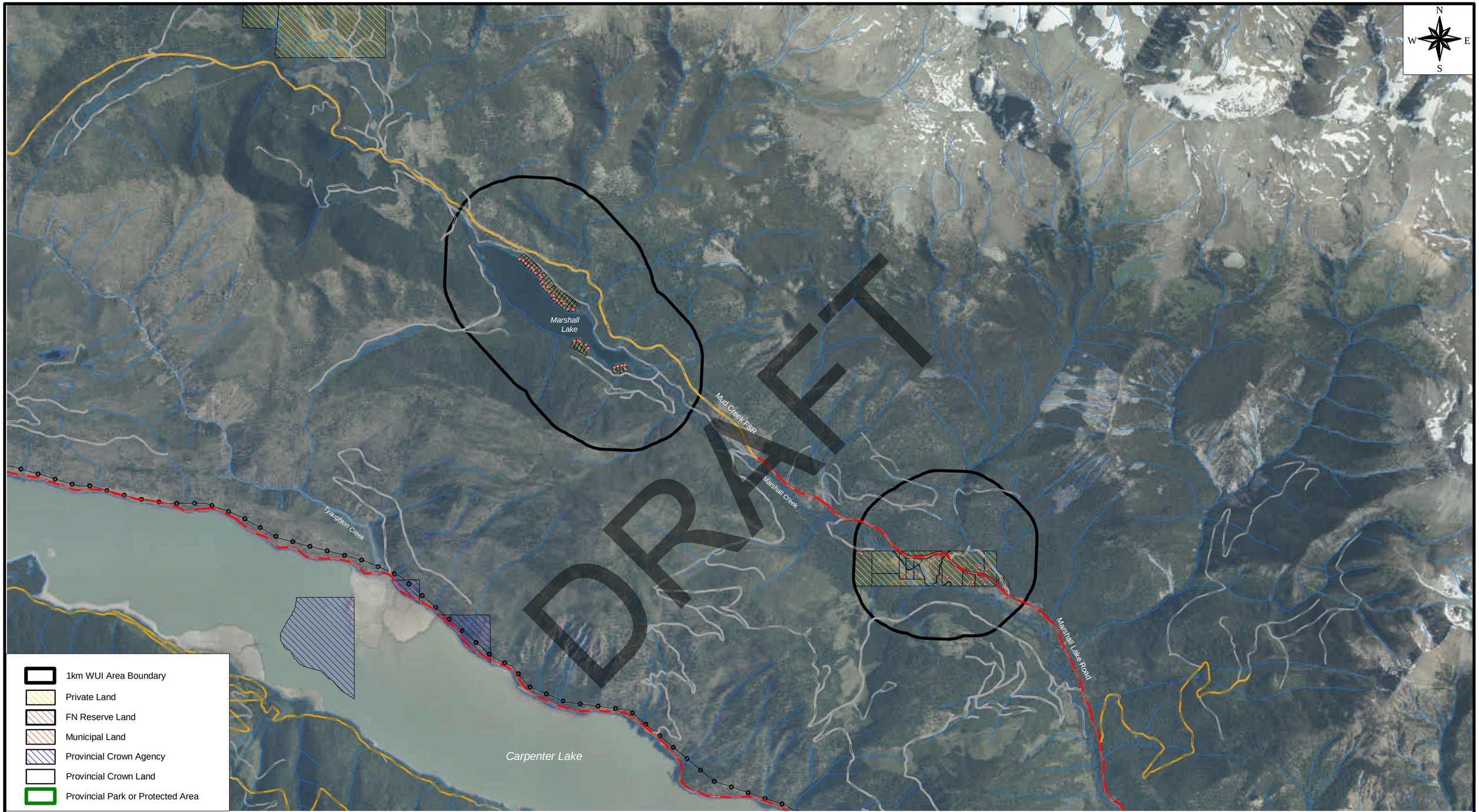
Squamish-Lillooet Regional District - Electoral Area A CWRP
Tyaughton Lake

1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 **Kilometers**

Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: January 22, 2023

Landscope Consulting Corporation



Structure
Primary Roads
Secondary Roads
Forest Service Road
BC Hydro Transmission Line
Streams

WILDLAND-URBAN INTERFACE MAP

Squamish-Lillooet Regional District - Electoral Area A CWRP
Marshall Lake & Marshall Lake Road

1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: January 22, 2023

Landscope Consulting Corporation

2.3 Local Fire Department Capacity

The SLRD provides financial contributions to two independent fire protection societies in Electoral Area A; The Bralorne Fire Protection Association and the Gun Lake Fire Protection Society. An updated Fire Services Review for the SLRD Area A Fire Services is occurring in 2023.

SECTION 3: Values at Risk (VAR)

Wildfire has the potential to impact values within a community which include human life, property, critical infrastructure, high environmental and cultural values, and resource values. Updating VAR data is critical for effective mitigation planning. The intent of this section is to identify and understand where values are located within the WUI in order to effectively determine the wildfire risk and identify mitigation activities. This data should be reviewed minimally on an annual basis and can be updated through the Critical Infrastructure Assessment process or during the updating of the Local Authority Emergency Response Plan.

3.1 Human Life and Safety

An evacuation is the process of moving persons and/or domestic animals from an area that may pose a threat to life and limb to an area of safety. Depending on the nature and scope of the threat, an evacuation may involve a single building, a group of buildings or an entire community. Ordering residents to evacuate is one of the most difficult decisions a Local Authority is likely to make. Timing is critical. Safety is the most important consideration when ordering an evacuation and should only be done after careful consideration of all the factors involved. The majority of evacuee movement will take place via roadways, however, consideration should also be given to alternative methods (air, boat, rail) especially in locations with single or limited exit routes. When determining evacuation routes, a number of key considerations should include, but are not limited to:

- Number and geographic distribution of evacuees
- Available transportation resources
- Capacities and vulnerabilities of transportation infrastructure and network
- Potential for congestion, bottle necks
- Areas vulnerable to damage
- Available facilities, e.g., fuel supplies
- Vehicle breakdown contingencies
- Access control and security of evacuated area

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3.1.1 Evacuation Routes and Access

Wildfire can move quickly and unpredictably. When an evacuation order is authorized; it means that evacuating the area is mandatory and the impacted population must leave the specified area immediately. The evacuation order should provide pertinent details such as designated evacuation routes, identification of closed routes, and the location of ESS Reception Centres. It takes time for people to evacuate an area and safe egress can be blocked by the fire itself or by vehicle congestion or accidents.

The primary evacuation routes leading out of the Upper Bridge River Valley identified in the Community Emergency Plans, are through the following routes, passable by road in the summer months:

1) Pemberton via the Hurley Forest Service Road
2) Lillooet via Highway 40

Evacuation route planning and evacuation tabletop exercises were identified by the SLRD Area A communities as a high priority for implementation. The considerations listed above should be evaluated not only for the main routes out of the Upper Bridge River Valley, but also used to evaluate egress routes from each community to the main evacuation corridors to ensure a safe and timely evacuation. Executing the logistics of an evacuation as part of a preparedness exercise will help to identify any gaps in the process, as well as provide wildfire readiness and preparedness knowledge to residents prior to each wildfire season.

These planning exercises, along with increased coordination and information exchange with applicable authorities including BC Parks, MOF, forest licensees and MoTI regarding road statuses during the wildfire season will ensure that residents and area visitors receive current and updated information throughout the wildfire season and will provide assurance that identified evacuation routes will be functional during an emergency event.

3.2 Critical Infrastructure

Critical infrastructure (CI) is identified as assets owned by the Provincial government, local government, public institution (such as health authority or school district), private organization (such as a communication company cellular tower or forest company radio repeater), First Nation or Treaty First Nation that are essential to the health, safety, security or economic wellbeing of the community and the effective functioning of the organizations. Assets may be identified in a Local Authority Emergency Plan Hazard, Risk & Vulnerability and/or through a Critical Infrastructure assessment.

Due to the remoteness and isolation of the SLRD Area A communities, many of the businesses in the community that typically provide day-to-day routine services such as grocery stores and gas stations, may become essential services during emergency events. Gas stations provide fuel to vehicles during an evacuation, and grocery stores can provide food and water during a shelter in place situation. It is imperative that identified critical infrastructure and essential services in the communities are protected from the impacts of wildfire as much as possible so they are able to remain operational for as long as possible during times of emergency for residents. They will also serve a pivotal role during recovery efforts.

Table 4 provides an overview of current community critical infrastructure and essential services that warrant consideration during emergency planning:

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Table 4: Critical Infrastructure and Essential Services

Gold Bridge		
Type	**Name**	**Agency / Owner**
Emergency Response	Gold Bridge Community Complex BCEHS Library Post Office	SLRD
Avalanche rescue equipment Road maintenance Mechanical	Dawson Road Maintenance Office	Dawson Road Maintenance
Fire	8 Fire Protection fire boxes	SLRD
Food/Fuel	Gold Bridge General Store	Privately Owned
Water	Gold Bridge Water System	SLRD
Water	Water valve	SLRD
Power Generation	Lajoie Dam generation station	BC Hydro
Accommodations	Gold Bridge Hotel Gold Dust Motel	Privately Owned
Communications	Storage Shed Exchange Building Tower	Telus
Communications/Public Information	Community Resource Building	Bridge River Valley Economic Development Society / School District 74
Bralorne		
Type	**Name**	**Agency / Owner**
Emergency Response	Bralorne Fire Hall	SLRD
Emergency Response	Bralorne Community Hall	Bridge River Valley Economic Development Society
Emergency Response	Bralorne Church/Hall	Bralorne-Bridge River Community Church Society
Water	Bralorne Water reservoir	SLRD
Water/Waste	Bralorne Water Waste facility	SLRD
Water	Bralorne Water treatment plant	SLRD
Water	Water tower	SLRD

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Electricity	Power House	BC Hydro
Gun Lake		
Type	**Name**	**Agency / Owner**
Fire	Gun Lake Fire Hall	SLRD
Communications	Minto Communications	Privately Owned
Water	Two water intakes	Privately Owned
Tyaughton Lake		
Type	**Name**	**Agency / Owner**
Water	Two seasonal water intakes	Privately Owned

3.3 Electrical Power

The Bridge River Valley residents and businesses receive power through BC Hydro services. The area hosts a variety of BC Hydro infrastructure, including transmission lines, distribution lines and dam infrastructure that is located in close proximity to the communities.

The Lajoie Dam located southwest of Gold Bridge is within the Gold Bridge WUI. There is also a major transmission line that originates from the Lajoie Dam and connects to the larger electrical grid at Seton Portage. Electrical power is supplied to residents by BC Hydro through distribution lines, although some residences on Tyaughton Lake and Marshall Lake operate on independent solar or wind power systems. Currently most, if not all of the distribution poles are wooden structures. Street lighting in both Bralorne and Gold Bridge is provided through joint services between BC Hydro and the SLRD. The SLRD owns the infrastructure and BC Hydro provides the electrical service. There is a high likelihood that the entire power supply to the area would be impacted from a wildfire event if the fire was approaching the communities from the southwest or south direction.

BC Hydro has implemented a number of strategies to reduce the likelihood of wildfire impacting critical infrastructure and power supplies to communities and is currently updating their internal wildfire reduction programs and guidelines to reflect these initiatives. There is a fire services agreement between BC Hydro and BC Wildfire Service for infrastructure protection during wildfire events. BC Hydro also conducts annual inspections/patrolling of both the transmission and distribution lines and prioritizes vegetation management treatments based on wildfire risk modelling.

3.4 Communications

There are a number of different communication platforms that service the Bridge River Valley communities and residents. Cellular reception is not available in the general area. Landline and internet access is provided to residents through a microwave link provided by Telus, who has a central office in Gold Bridge. Minto Communication Society (MCS) then provides internet service to the outlying residents. Minto Communications has an office in Gold Bridge that houses backup battery power which can run for 3 days during a power outage. Repeater sites are backed up with wind/solar generators. There is also radio communication available at the BCEHS station in Gold Bridge through provincial repeater towers.

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The Gun Lake area receives communication services from the providers based in Gold Bridge. The Gun Lake Fire Protection members have basic training in radio communications which can be used to request assistance for evacuations or structural fires.

The Tyaughton Lake area is generally serviced by Telus and Minto Communication Services, with the exception of 16 properties on the east side of the lake and other intermittent properties that do not have these services. 9-1-1 services are not available.

There is no cellular, landline, internet, 9-1-1 or emergency alert services that currently service the Marshall Lake and Marshall Lake Road area. Internet is brought in through satellite connections limited to only a very few homes in the area, while phone communication is through satellite phones limited to 3 or 4 homes with intermittent reception.

3.5 Community Water Sources and Infrastructure

There are four designated community watersheds that service Bralorne and Gold Bridge residents; Fergusson Creek, Blackbird Creek, Countless Creek and Presidents Creek. Fergusson and Blackbird Creeks are the primary watersheds. The Countless and Presidents Creek designations as community watersheds are currently under review, as these are legacy designations and may no longer be in use. Residents and businesses are serviced with drinking water by the Gold Bridge Water Treatment Plant/Pumphouse and the Bralorne Pumphouse. Bralorne is also serviced by a centralized wastewater treatment system that is operated by the SLRD (SLRD CRA, 2021). Currently there are three fire hydrants located in Gold Bridge and six fire hydrants in Bralorne that are available to supply water for structure fire fighting purposes in those communities. Most individual residents on the outskirts of Bralorne and Gold Bridge and in Gun Lake, Tyaughton Lake and Marshall Lake have their own private water and septic systems and are not connected to municipal services.

3.6 Cultural Values

Indigenous cultural heritage resources include any recorded or known archaeological sites, traditional use sites, historic buildings and artifacts, heritage trails, or any other objects or places of historical, cultural, or archaeological significance to British Columbia, a community or Indigenous people. Important cultural heritage can also include intangible resources such as spiritual and ceremonial sites or areas.

Archaeological sites in British Columbia that date to 1846 or earlier are protected from alteration of any kind by the Heritage Conservation Act (HCA). The provisions of the HCA apply to archaeological sites located on both public and private land, known and unknown, and are binding on government. It is extremely important that agencies involved in the implementation of fire suppression or wildfire preparedness initiatives that may include ground disturbing activities such as mechanical fire guard construction or tree feeling, collaborate with Indigenous communities to identify and mitigate for archaeological and cultural values ideally before, but also during and after wildfire events. It is also extremely important to engage with Indigenous communities at the very early planning stages of fuel reduction projects to identify and mitigate for culturally significant features prior to treatment work commencing.

3.7 Environmental Values

There are a number of important ecological considerations that have been identified within the AoI, including Species At Risk and identified species that require additional habitat management considerations during land-based planning activities. Noted ecological considerations include:

- Grizzly Bear – Wildlife Habitat Area (WHA) 3-221 overlaps with several WUI areas
- Proposed WHA 3-201 for Western Screech Owl overlaps with the Gold Bridge WUI

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- Critical habitat identified for White Bark Pine
- Steep slopes and natural erosion processes resulting in land movement
- Invasive plant species identification and mitigation
- Fish bearing streams
- Water quality impacts

3.8 Other Resource Values

Other resource values and sectors that should be considered during planning activities within the WUI include agriculture, tourism, historical buildings and places, mining, forestry and recreation.

SECTION 4: Wildfire Risk Framework and Assessment

Current wildfire trends in both in B.C. and Canada are showing increased impacts from wildfires to multiple values: increased threats to communities and infrastructure; increased losses of natural resources including mid-term timber supply; increased losses to cultural heritage including impacts to wildlife, gathering and hunting grounds; short- and long-term impacts to riparian areas and community watersheds, and; increased wildfire suppression costs. The following table summarizes wildfire statistics for the past 10 years, demonstrating a generalized upward trend in the number of total fires recorded, total hectares burnt and fire suppression costs. These statistics do not include the 2021 fire season, which was one of the most challenging fire seasons recorded in recent history.

Table 5: Ten-year average statistics of wildfire activity in BC

Year	Total Fires	Total Hectares	Total Cost (millions)	Person-caused	Person-caused (%)	Lightning-caused	Lightning-caused (%)
2020	670	14,536	$193.7	395	(59%)	275	(41%)
2019	825	21,138	$182.5	450	(55%)	375	(45%)
2018	2,117	1,354,284	$615.0	628	(30%)	1,489	(70%)
2017	1,353	1,216,053	$649.0	580	(43%)	773	(57%)
2016	1,050	100,366	$129.0	564	(54%)	486	(46%)
2015	1,858	280,605	$277.0	621	(33%)	1,237	(67%)
2014	1,481	369,168	$297.9	664	(45%)	817	(55%)
2013	1,861	18,298	$122.2	564	(30%)	1,297	(70%)
2012	1,649	102,122	$133.6	708	(43%)	941	(57%)
2011	653	12,604	$53.5	444	(68%)	209	(32%)
2010	1,672	337,149	$212.2	680	(41%)	992	(59%)
Ten-year average	**1,352**	**348,917**	**$265.3**	**562**	**(42%)**	**790**	**(58%)**

Communities can be threatened by wildfires in two basic scenarios: The first is a landscape level (large) wildfire starting outside of and moving into the community, and the second is a wildfire starting within the community and quickly threatening adjacent structures. The volatile and aggressive wildfire behaviour being observed in recent years is being driven by the effects of climate change and increased fuel loading on the forested land base. With expanding residential and commercial development comes an expanded wildland urban interface area that must be pre-emptively managed to reduce potential impacts from future

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wildfires. Assessing the wildfire risk to communities takes into consideration the likelihood and consequences of an unwanted wildfire. The risk is measured as the product of the likelihood and the consequences of a wildfire. Assessing the overall risk factors supports the establishment of priority wildfire threat mitigation activities such as fuel reduction treatments and locally driven opportunities to increase community resiliency.

4.1 Fire Regime

The majority of the SLRD Area A WUI's are located in the Natural Disturbance Type (NDT) 4 Zone, which indicates that this area should naturally experience frequent, low intensity, stand-maintaining fires. The Bralorne WUI is primarily situated in the NDT 3, which indicates that this ecosystem historically would be experiencing frequent stand-initiating events. Surface fire return intervals for the Interior Douglas Fir (IDF) biogeoclimatic zones historically ranged from 4 to 50 years; with stand-initiating crown fires occurring at intervals ranging from at least 150 to 250 years or more in the IDF. In NDT3 ecosystems, fire events typically have a wide range of landscape succession impacts, ranging from small spot fires to large fires covering thousands of hectares, with a mean average return of around 100 years. The Gold Bridge, Tyaughton Lake, Gun Lake and Marshall Lake Roads WUI's are primarily located in the IDF biogeoclimatic zone. The Bralorne and Marshall Lake WUI's are located primarily in the IDF biogeoclimatic zone but have Montane Spruce (MS) zone influence.

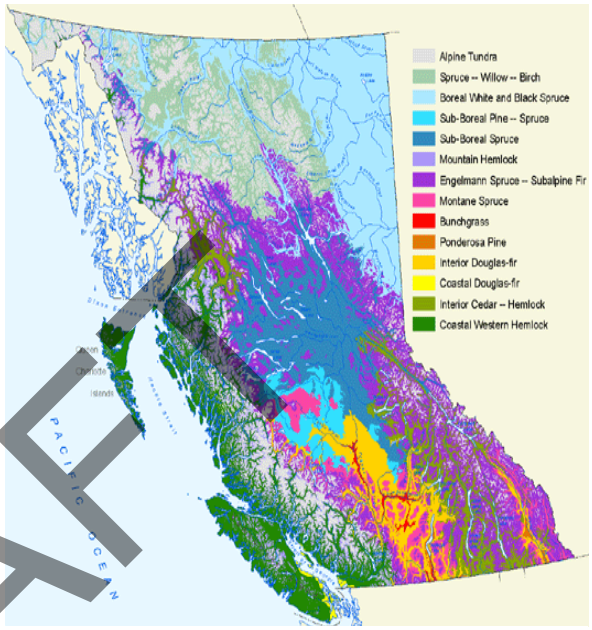

Figure 2: British Columbia Biogeoclimatic Zones

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Table 6: SLRD Area A BEC and NDT Zones

BEC	Bralorne		Gold Bridge		Tyaughton Lake		Gun Lake		Marshall Lake		Marshall Lake Road		WUI Totals	
	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%
IDF (NDT4)	1051	82	1194	99	1471	99	2717	100	577	93	326	100	7336	96
MS (NDT3)	224	18	11	1	18	1	0	0	44	7	0	0	298	4
Total	1,276	100	1,205	100	1,490	100	2,717	100	621	100	326	100	7,634	100

Fire exclusion, forest health and timber harvesting practices have significantly altered the forest ecosystems in the NDT3 and NDT4. Enhanced fire suppression efforts have allowed mature pine stands to grow past ecological rotation age, providing vast areas with a suitable host for the Mountain Pine Beetle (MPB). This has contributed to the large MPB epidemic that swept through the area in the 1980s and again in the 2000s. Areas affected have been salvage harvested and replanted with Lodgepole Pine, creating a forest mosaic not unlike that resulting from small wildfire events. Douglas-fir leading-stands along the valley bottom were also heavily defoliated by the Western Spruce Budworm in 2011 and 2012.

As observed from the provincial aerial overview surveys over the last five years, the area continues to experience light to moderate infestations of Mountain Pine Beetle and Douglas-fir Beetle, as well as

localized mortality from drought. The Western Balsam Bark Beetle is the most prevalent forest health factor, impacting the high-elevation subalpine-fir forests.

4.2 Climate Change

As a whole, British Columbia has become warmer and wetter over the last century. The most notable changes are warmer winters, more frequent extreme rainfall events, drier conditions in the summer and decreasing snowpacks. Due to the existing effects of greenhouse gas emissions, climate scientists agree these warming trends will continue. Over the past century, B.C.'s average annual temperature has increased by 1.2°C, with winter temperatures rising the most. Province-wide average annual precipitation has already increased by an average of 12% (ranging from 10 to 21% by region) from 1900 to 2013, with heavier, sporadic rainfall events in the spring, and increases in extreme wet and extreme dry conditions in summer (MOE, Climate change strategy 2021).

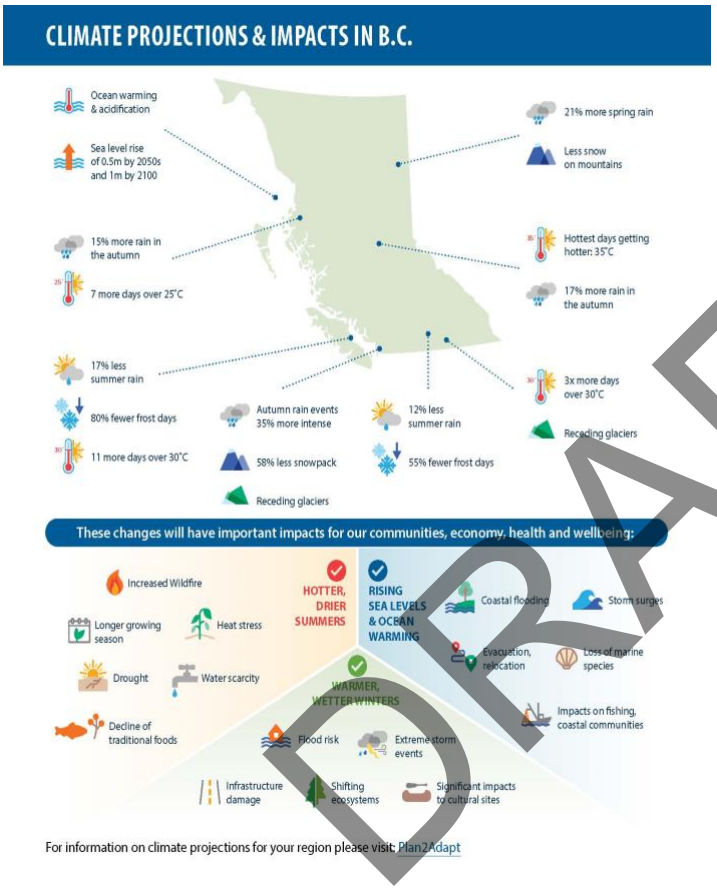

Figure 3: Climate Change Projections for BC

The most profound changes to BC's ecosystems in this century are expected to be the result of more frequent and severe natural disturbances. In the Southern Interior, the area influenced by natural disturbances could double over the next century, with forest and grassland drought, fire and insects expected to be primary disturbance agents.

The increased prevalence of disturbance will vary by climatic sub-regions, elevation and forest type, with the biggest changes projected for dry forested ecosystems at low elevations. Drought will increase in all but the coolest, wettest ecozones; drought is expected to increase mortality in many tree species, including lodgepole pine, Douglas-fir, spruce, subalpine fir and trembling aspen.

Fires are projected to be larger, more intense and more frequent, with the risk of large wildfires being particularly high in dry ecozones with lodgepole pine. Fire intensity will increase with more intermittent to full crown fires and the frequency of such fires will increase; in the Thompson-Okanagan, the area experiencing fires every 50 years or less may expand from 34% to over 90% by 2085. Fire refugia (areas where organisms can survive the unfavourable conditions) are expected to decrease; in the Thompson-Okanagan, refugia may decrease from 41% to 2% of the landscape by 2085 (Ministry of Forests, Lands and Natural Resource Operations, 2016).

Natural disturbance dynamics will also likely change including increased fire and drought in southern and coastal BC, increased storms and windthrow on the coast, and more frequent and extensive tree mortality due to bark beetles, defoliators and diseases across BC. The establishment and expansion of invasive species will increase. Hydrological regimes will shift due to increased evaporation, altered vegetation communities, increased storm frequency and magnitude, decreased snow accumulation, seasonal changes to precipitation, and accelerated ice melt followed by diminished glacier extent (Ministry of Forests, Lands and Natural Resource Operations, 2016).

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As a result, wildfires are generally predicted to increase in frequency, become more intense and more difficult to control which will likely result in increased tree mortality, detrimental impacts to soils and hydrology, and increased threat to the community and interface areas.

4.3 Provincial Strategic Threat Analysis (PSTA)

One of the key elements contained in the BC Fuel Reduction Strategy is the province-wide analysis, through applied GIS, of the major factors that contribute to the potential threat of wildfires. These factors include ignition potential, fire occurrence history, forest fuels and fire intensity, and the potential for a fire to crown and spot a distance away from the head of the main fire. This analysis and associated mapping is known as the Provincial Strategic Threat Analysis (PSTA). By combining the PSTA data outputs with local topographic and weather-related factors along with wildland-urban interface (WUI) attributes including location and density of structures in a community, all contribute to identifying at-risk areas. In this context, “values” refer to natural resources or man-made structures or features that have a measurable or intrinsic worth and could be negatively impacted by wildfires.

The results of the PSTA analysis offers local governments, private landowners, industry and other stakeholders an opportunity to review the threat ratings in their areas of interest, assess how much fire prevention work has been done in those areas (e.g., FireSmart activities or fuel management treatments) and determine what additional steps they could take to safeguard their interests and make their communities more fire-resilient.

Wildfire threat is directly related to the likelihood of hazardous fuel igniting and fire spreading into the community either directly or through ember transport. The PSTA provides information to help evaluate the three conditions necessary for a wildfire to threaten a community:

1. the ignition and potential spread of the fire based on historic fire occurrence patterns. (Fire History and Density)

2. the resulting fire generates sufficient intensity (Head Fire Intensity) and spreads rapidly, and

3. the fire spreads into and/or transports embers into the community (Spotting Impact)

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4.3.1 Fire History and Density

The potential for very large, destructive and landscape-altering fires is related to the historical fire and fire response patterns within a given area. Fire history (the location and origin of fires larger than four hectares) is the first input entered into the PSTA and is represented at the provincial scale by fire start density (the ignition and fire spread potential based on historic fire occurrence patterns). The fire density component is analyzed using fires with final sizes greater than 4.0 hectares; these are given a weight of one (1) in the analysis, while large fires (> 500 ha) were given a weight of 5 in order to reflect the much greater cost and damage usually associated with larger fires. The final output is the weighted number of fires mapped at a radius of 10 kilometres. This is shown on the fire history and start density map in Appendix 3 for the SLRD Area A area of interest.

Recorded spatial historical fire data show that there has been intermittent fire activity in the area. The overall trend is that both the number of fires and fires starts in close proximity to WUI areas are increasing, although this reported increase may be attributable to improved record keeping. Generally, the majority of recorded fires in the area were labelled human caused “nuisance fires” and tend to originate primarily from recreational sites in the area.

Table 7 summarizes the fire history within the SLRD Area A WUI areas for both spot (<1 ha) and larger perimeter (>1 ha) fires.

Table 7: SLRD Area A WUI Fire History

WUI	Years recorded	Total fires recorded	# of Fires (< 1 ha)	# of Fires (> 1 ha)	# of Person Starts	# of Lighting Starts	# of Unknown Starts	Comments
Bralorne	1938 - 2020	38	35	3	35	2	1	The 1958 fire boundary is (11.5 ha) mapped in between Bralorne and Bradian.
Gold Bridge	1950-2020	29	29	0	28	0	1	No larger fires than 1 ha noted in the WUI area.
Gun Lake	1932-2020	42	39	3	32	6	4	All >1 ha fires recorded were all under 2 ha.
Tyaughton Lake	1927-2020	69	65	4	65	2	2	Most notable fire is K70216 (2009) that burnt 8,051 ha.
Marshall Lake	1926-2020	45	43	2	44	1	0	Most notable fire is K70216 (2009) that burnt 8,051 ha. Other large fire was in 1926 mapped at 262.8 ha
Marshall Lake Road	1920-2020	3	2	1	3	0	0	Large fire noted to have burnt 568.5 ha in 1920

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Recent fires, such as the 2009 Tyaughton fire, demonstrated the volatile behaviour that a fire can exhibit under dry and windy conditions. At over 8,000 hectares, it burned the area south of Tyaughton Lake, east to Marshall Lakes and resulted in the evacuation of Tyaughton Lake and Tyax Resort, Pearson Pond and Gun Creek Road, and evacuation alerts issued for Gold Bridge, Bralorne and Gun Lake. Road closures were also implemented. This high intensity wildfire, fuelled by local winds, damaged the coniferous forest cover within its boundaries and reduced the duff layer, successionally setting the area back to a brush type ecosystem. The second most impactful fire in the area was started at the Mowson Ponds Recreation Site on Tyaughton Lake Road, south of the Lake in May 2012. This wildfire spread west, threatening the ranch properties along Gun Creek Road. (Morrow, 2019).

The fire start density is predominantly low across the Bralorne, Gold Bridge, Marshall Lake and Marshall Lake Road WUI areas with weighted fire start values in the 1 – 17 range, with most of the recorded fires being small in size. Gun Lake shows a portion of the WUI area with a weighted fire start density in the moderate 17.1 - 33 range, while Tyaughton Lake shows most of the WUI Area falling in the moderate

17.1 - 33 weighted fire start range. This is largely due to the significant fires that occurred within and adjacent to the WUI area in 1931 and 2009.

Table 8: SLRD Area A WUI Fire Density

Fire Density	Bralorne		Gold Bridge		Gun Lake		Tyaughton Lake		Marshall Lake		Marshall Lake Rd	
	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
Water	3	0.2	116	9.6	636	23.4	134	9.0	64	10.3		
1 - 5					22	0.8			557	89.7	326	100.0
5.1 - 10					892	32.8						
10.1 - 17	1272	99.8	558	46.4	630	23.2	77	5.1				
17.1 - 24			530	44.0	437	16.1	453	30.4				
24.1 - 33					101	3.7	826	55.4				

4.3.2 Head Fire Intensity

The Head Fire Intensity represents the energy output of the flaming front of a wildfire, measured in kilowatts per metre (kW/m), and is related to fire spread rate and fuel consumption at the leading edge of a wildfire. The head fire intensity is also linked to flame height and is correlated to both fire suppression effort and danger to fire suppression personnel. The head fire intensity component is developed using the 90th percentile fire weather index (FWI) value for an analysis of data gathered from the BC Wildfire weather stations across the province, applied to the actual fuel types from the provincial fuel type layer. The output of this analysis is shown on the head fire intensity map in Appendix 3 for the SLRD Area A area of interest.

Table 9: SLRD Area A WUI Head Fire Intensity

Head Fire Intensity (kW/m)	Bralorne		Gold Bridge		Gun Lake		Tyaughton Lake		Marshall Lake		Marshall Lake Rd	
	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
No Data	328	25.7	160	13.3	464	17.1	186	12.5	14	2.0	67	20.7
Water	3	0.2	117	9.7	654	24.1	137	9.2	65	9.4		
Non-Fuel	20	1.5	142	11.8	84	3.1	17	1.2			2	0.7
>0 to 1000												
1000 to 2000	30	2.4	186	15.4	301	11.1	221	14.8	170	24.5	27	8.2
2000 to 4000	639	50.1	45	3.8	148	5.5	301	20.2	22	3.2	68	20.8
4000 to 6000	5	0.4	431	35.8	777	28.6	453	30.4	275	39.6	76	23.2
6000 to 10000			3	0.2								
10000 to 18000	240	18.8	46	3.8	92	3.4			74	10.7	64	19.8
18000 to 30000	12	0.9	74	6.1	197	7.3	150	10.1	74	10.6	22	6.6
30000 to 60000							24	1.6				

The head fire intensity is predicted to be low-moderate across most of the six WUI areas, with an energy output less than 10,000 kW/m. There are sections of the Marshall Lake and Marshall Lake Road WUI

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areas that are showing a higher predicted fire intensity in the 10,000 – 30,000 kW/m, in forested areas on the valley bottom, on slopes with a north aspect and C-7 fuel types.

4.3.3 Spotting Impact

The physical movement of firebrands and embers (burning needles, bark flakes and small branchwood) from a fire to areas outside of the fire perimeter is known as spotting. Spotting is most often associated with high intensity crown fires burning in coniferous forest types. Spotting activity is known to be strongly affected by wind speed and fuel types, as well as instability of the atmosphere and resulting development of convection columns. During conditions of extreme fire behaviour, spot fires may ignite several kilometres downwind from the fire perimeter, contributing to the fire's rapid rate of expansion across the landscape. Spotting has also been recognized as a key characteristic of extreme fire behaviour that is often associated with destructive impacts to communities and structure losses. The predicted spotting activity for the SLRD Area A area of interest is shown on the spotting impact map in Appendix 3.

Table 10: SLRD Area A Spotting Impact

Spotting Impact	Bralorne		Gold Bridge		Gun Lake		Tyaughton Lake		Marshall Lake		Marshall Lake Rd	
	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
No Data	326	25.6	157	13.0	455	21.8	181	13.2	14	2.2	64	19.6
Water	3	0.2	117	9.7	651	31.1	137	10.0	65	10.3	0	0
Low	0	0	170	18.1	11	0.5	52	3.8	130	20.6	0	0
Moderate	225	17.7	330	53.7	1521	56.0	967	70.6	325	52.4	132	40.5
High	721	56.5	114	9.5	80	2.9	33	2.4	91	14.5	130	39.9
Very High	0	0	0	0	0	0	0	0	0	0	0	0

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The spotting potential is shown to be moderate across the Gold Bridge, Gun Lake and Tyaughton Lake WUI areas, with a higher spotting potential predicted for the Bralorne, Marshall Lake and Marshall Lake Road WUI areas. The WUI areas with higher coniferous components of C-3, C-7 and M-1/2 fuel types are considered to have a higher spotting potential than those WUI areas with significant components of O-1a/b open grass and D-1/2 deciduous aspen fuel types.

4.4 Wildfire Threat

The final wildfire threat analysis involves the combination of the three component data layers (fire start density, head fire intensity and spotting impact) using a weighted averaging process of values assigned as 30% fire density, 60% head fire intensity and 10% spotting impact. The weighted values are added together to produce a final fire threat analysis value that takes into account fire occurrence history, predicted fire intensity under extreme conditions, and spotting impact. Areas with a final fire threat value of zero consists of areas that had no record of wildfire, were typed as non-fuel (such as alpine rock, glaciers and water bodies), and were too distant to be at risk of spotting from nearby fuels.

Areas rated in the High-Extreme wildfire fire threat class are locations where the fire intensity, frequency and spotting risks can be severe enough to potentially cause catastrophic losses to values at risk. These areas are considered to be particularly prone to wildfires, be susceptible to crown fires and are most likely to be affected by spotting of the fire. As a result, these areas should be considered high priority for some form of fuel reduction effort where it is feasible to do so, most importantly areas within the WUI zone of communities.

The predicted wildfire threat for the SLRD Area A AoI and WUI areas is shown on the wildfire risk map in Appendix 3.

Table 11: SLRD Area A WUI Wildfire Threat

Wildfire Threat	Bralorne		Gold Bridge		Gun Lake		Tyaughton Lake		Marshall Lake		Marshall Lake Rd	
	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
No Data	330	25.9	162	13.4	463	17.1	184	12.4	14	2.2	67	20.7
Water	3	0.2	118	9.8	654	24.1	137	9.2	65	10.5		
Low	14	1.1	112	9.3	52	1.9	3	0.2			2	0.7
Moderate	174	13.6	243	20.2	408	15.0	240	16.1	415	66.8	145	44.3
High	503	39.4	449	37.3	868	32.0	751	50.4	105	16.9	90	27.6
Extreme	252	19.7	120	10.0	272	10.0	175	11.7	22	3.5	22	6.6

Most of the forested land base within the six WUI areas falls within the Moderate to High wildfire threat, ranging from 47% of the land base at Gun Lake to 83% at Marshall Lake. 20% of the land base in the Bralorne WUI area was observed to fall within the Extreme wildfire threat, whereas less than 12% of the land base within the Gold Bridge, Gun Lake, Marshall Lake, Marshall Lake Road and Tyaughton Lake WUI areas fell within the Extreme wildfire threat. The remaining portions of the WUI areas fell within the Low wildfire threat, No Threat (water), or were classified as private land where no data was available.

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4.5 Provincial Level WUI Risk Class Assessment

The WUI risk class assessment completed by the BC Wildfire Service is driven by structure location (not by administrative boundaries) in relation to wildfire threat. This creates WUI polygons that may include multiple jurisdictions that are linked by the continuation of structure density. Structure densities are used to define the human structure interface boundary of the wildland urban interface (WUI) for fire and risk management planning purposes. The WUI identifies the zone of transition between unoccupied land and human development. A 2 km buffer distance is then applied to represent a reasonable maximum distance that embers can travel from a wildfire to ignite a structure.

Currently, the province only has data available to support fire threat analysis on Provincial Crown land. There are large tracts of private land that exists within the WUI where no data is available. The amount of private land is an important component in the risk analysis due to the lack of data to inform fire risk identification across jurisdictional boundaries. Therefore, the WUI buffer was expanded to 2.75 km around structure groups with a density of >25 for the analysis in order to create the WUI polygons. Once defined, the WUI polygon layer is combined with the PSTA wildfire threat layer (Crown land) to create a coarse scale spatial pattern of risk area using certain criteria such as density and threat ratings. The level of risk ("risk class") reflects the analysis of weighted PSTA threat components within the individual WUI Risk Class polygons. Five risk class ratings are then applied to the WUI polygons, with "1" being a higher relative risk and "5" being the lowest relative risk. The associated risk class ratings for WUI areas will assist in the determination of the most effective risk management options as part of overall wildfire resiliency planning efforts that include an assessment of local threat conditions and wildfire mitigation activities. The ratings are also used to demonstrate wildfire risk and support the rationale for proposed risk reduction activities in applications for funding including the Community Resiliency Investment program.

The SLRD Area A provincial WUI Risk Class Polygons identified in the Area of Interest are summarized below and shown on the wildfire risk map in Appendix 3.

Table 12: SLRD Area A Provincial WUI Risk Class Polygons and Ratings

WUI Area	Risk Class Polygon Name	Risk Class Rating
Bralorne	Ogden	1
Gold Bridge	Gold Bridge 191	1
Gun Lake	Gold Bridge 191	1
Marshall Lake	Gold Bridge 199	3
Tyaughton Lake	Gold Bridge 201	1

4.6 Local Wildfire Threat Assessments

Identifying stand structure attributes and local fuel hazard information through the Wildfire Threat Assessment (WTA) worksheet data collection assists in the identification of fuel types, the proximity of the fuels to the community, local fire spread patterns and topographical features, which aid in establishing the local wildfire threat and subsequent risk reduction actions and priorities. Field data was gathered through field reconnaissance and wildfire threat/fuel assessment work completed at 74 plot locations within the SLRD Electoral Area A covering the six 1 km WUI Area communities during October and November 2022. The plot locations are shown on the CWRP wildfire risk map in Appendix 3.

Key information gathered from the WTA Worksheets is used to develop the local wildfire threat and risk ratings. The wildfire risk components include; proximity (proximity of fuel treatment area to value/interface), fire spread patterns (predominant wildfire spread direction), slope position of value and slope percent components. The 'local fuel hazard' as defined through the Fuel Assessment Site Level Scoring process of the WTA is also part of the final wildfire risk class assignment and includes the collection of the following data:

- Depth of organic layer
- Surface fuel composition
- Dead and down material continuity (<7 cm)Ladder fuel composition
- Ladder fuel horizontal continuity
- Understory stems/ha
- Overstory composition/crown base height
- Crown closure
- Fuel Strata Gap (m)
- Overstory stems/ha
- Dead and dying % of dominant and co-dominant stems

Each of these categories on the wildfire threat – fuel assessment worksheets are assigned a numerical value and summed to produce a fuel assessment rating for each established plot. The final wildfire risk class (E/H/M/L) is based on the local wildfire risk score and the local fuel hazard as determined through the Fuel Assessment (Site Level) final score. These plot ratings, along with the PSTA, fuel types, local topographic features and site-level attributes such as wind direction and fire spread pattern are then incorporated into the evaluation and subsequent development of areas proposed for fuel modification treatments. For each proposed treatment area recommended, a wildfire threat - priority setting worksheet was also completed to assist with the prioritization of the treatment areas overall.

The Wildfire Threat Assessment score and rating for each of the established plot locations can be found in appendix 4. Overall, the wildfire threat rating determined at the plot locations was observed to be consistent with the PSTA wildfire threat across the six WUI areas.

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4.7 SLRD Area A Wildfire Environments

There are three major factors of the wildfire environment that influence wildfire behaviour: fuel, topography and weather. These factors are known as the Fire Behaviour Triangle, which are shown in Figure 4.

4.7.1 Forest Fuels

Fuels in a wildfire context is defined as any organic matter, living or dead, in the ground, on the ground, or in the air that can ignite and burn. This can include dry grass, dead leaves and tree needles, brush and small trees. Light fuels ignite quickly and cause rapid spread of the fire. Heavier fuels are typically logs, stumps, branch wood and deep duff layers. The fuels take longer to ignite, spread slower, burn longer and throw off large volumes of heat when dry. Fuel continuity is also an important factor in the behaviour of fire because it indicates how quickly and where a fire may spread. A wide range of horizontal and vertical fuel continuity conditions is typically found in most forested areas. When fuels are scattered or separated by natural barriers such as rock, outcropping, streams, or areas of bare ground, the fire will be irregular and spread more slowly. A common method used in fire suppression is to break the continuity of the fuel by separating burning fuels from unburned fuels. When fuels are closely spaced and intertwined vertically, fire is able to spread rapidly upwards into the upper tree crowns as these fuels will be preheated prior to ignition. When fuels are spaced far apart vertically, the heat is less able to ignite the fuels above.

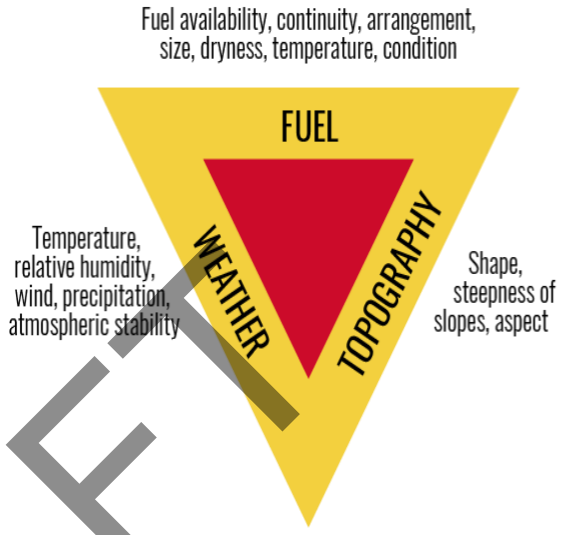

Figure 4: Wildfire Behaviour Factors

Since fuel is the only fire behaviour driver that can be modified by people and is a critical input of the PSTA Fire Threat Analysis, considerable time has gone into classifying British Columbia's ecosystems according to the Canadian Forest Fire Behaviour Prediction (FBP) fuel types. For each of the different fuel classifications, there has been a prediction generated of fire behaviour in each of these types of forests. For the purposes of fire behaviour prediction, the FBP system categorizes fuel into 17 distinct types, which are detailed in Appendix 2.

The amount, type and continuity of fuel and its moisture content directly influence fire behaviour. The fuel load determines the potential amount of heat that can be released during a burn, whereas the type and distribution of fuel elements affect their combustibility. Fine fuels (diameter <6 mm) burn more readily than coarse ones. Fuel characteristics differ among ecosystems, resulting in differences in fire behaviour and hence in damage to plants. To manage fire, it is therefore important to understand the variability in fire behaviour in different ecosystems (Gambiza, Campbell, Moe & Frost, 2005).

4.7.1.1 Gold Bridge WUI

The community of Gold Bridge was built on a mid slope benchland above the Bridge River at an elevation of approximately 700 m. The majority of the homes and structures are located in the immediate Gold Bridge community, however, there are a few homes located south along Bralorne Road with some recreational cabins situated close to the Lajoie Dam.

Forests around Gold Bridge are variable with a different structure per aspect. In general, the south and west aspects around Gold Bridge are forested with Douglas-fir, and Lodgepole Pine with Trembling Aspen growing in groves within openings, on slope crests, and along the roadsides. The stands along the east aspects of the community are more mixedwood dominated primarily by fir and aspen with large

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amounts of fine fuels and a dense LFH layer. Trembling Aspen and willow grow exclusively in dense groves along the sand bars found along the Bridge River.

The forests in the wildland interface zone around the homes along Bralorne Road are dominated by Lodgepole Pine and Douglas-fir with high amounts of blowdown present. At a higher elevation of 1000 m, the slopes are typically very dry. Where blowdown is not present, areas are dominated by dense Douglas-fir suppressed stems in the understory.

Table 13: Gold Bridge WUI Fuel Types and Crown Fire/Spotting Potential

Fuel Type	FPB/CFDDRS Fuel Type Description	WUI Fuel Type Description	% Fuel Type in WUI area	Crown Fire/ Spotting Potential
C-2	Boreal Spruce	Pure, moderately well-stocked interior Hybrid Spruce, White Spruce, and Engelmann Spruce stands.	1	High
C-3	Mature Jack or Lodgepole Pine	100% mature conifer dominated stand, primarily Lodgepole Pine or Douglas Fir.	6	Moderate
C-7	Ponderosa Pine – Douglas-fir	Uneven-aged stands of Ponderosa Pine, Lodgepole Pine, and Douglas-fir in various proportions with a potential minor Trembling Aspen component.	52	Moderate
D-1/2	Green/Leafless Aspen	Pure Trembling Aspen stands with a well-developed medium to tall shrub layer consisting of Red Osier Dogwood and Willow spp.	6	Very Low
M-1/2	Green/Leafless Mixed wood	Stand mixtures consisting of coniferous and deciduous tree species in varying proportions, including spruce, fir, aspen, birch, and cottonwood.	3	Very Low
O1-a/b	Matted or Standing Grass	Moderate to continuous grass cover, with scattered trees or shrub clumps.	17	Low
S-1	Jack or Lodgepole Pine Slash	Lodgepole Pine and Douglas-Fir slash in old cutblocks.	3	Low
N	Non-fuel	Sand bars, rock, gravel pits, developed areas, etc. that have little or no combustible fuels present.	4	Very Low
W	Water	Downton Reservoir, Carpenter Lake, Hurley River, Bridge River, and wetlands.	8	Very Low

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4.7.1.2 Bralorne WUI

The historic mining community of Bralorne was built on a mid slope benchland above Cadwallader Creek. The Bralorne WUI includes the heritage town of Bradian which has occupied homes on the upper slopes along Pineridge Drive and Eagle Ridge Road at elevations between 1100-1300 m. The majority of the homes and structures are located in the immediate Bralorne community, however, there are a few homes located to the north along Bralorne Road and the Hurley River Road a few kilometres past the Bralorne Gold Mine. Both Bralorne and the housing in the Bradian area is entirely intermixed at both the wildland interface and home ignition zone level with surrounding forested vegetation.

The south and west aspects around Bralorne are generally forested with Douglas-fir, Lodgepole Pine, and spruce with Trembling Aspen found in groves within openings, meadows, and on slope crests. These aspects experience the most sun and tend to have elevated levels of Lodgepole Pine blowdown and a

suppressed Douglas-fir understory, resulting in high fuel loading in these areas. The north and eastern aspects, specifically the stands along the mountainside above Noel Creek FSR and the Hurley River Road, are more even aged, closed canopy forests containing Amabilis Fir, Subalpine Fir, spruce, and sparse Lodgepole Pine. Thin continuous stands of Trembling Aspen are found lining the roadsides adjacent to the coniferous stands found on the slopes. In the lower elevations around the heritage town of Bradian and Pineridge Road, the slopes are primarily open, with stands dominated by Trembling Aspen, Douglas Maple and willow. At the higher elevations, stands are dominated by Lodgepole Pine and have higher concentrations of blowdown, standing dead, and conifer regeneration ingrowth.

Table 14: Bralorne WUI Fuel Types and Crown Fire/Spotting Potential

Fuel Type	FPB/CFDDRS Fuel Type Description	WUI Fuel Type Description	% Fuel Type in WUI area	Crown Fire/ Spotting Potential
C-3	Mature Jack or Lodgepole Pine	100% mature conifer dominated stand, primarily Lodgepole Pine or Douglas Fir.	30	Moderate
C-7	Ponderosa Pine – Douglas-fir	Uneven-aged stands of Lodgepole Pine, Douglas-Fir, Hybrid Spruce, and Amabalis Fir in various proportions with a minor component of Trembling Aspen.	43	Moderate
D-1/2	Green/Leafless Aspen	Pure Trembling Aspen stands with a well-developed medium to tall shrub layer consisting of Douglas Maple, Red Alder, and Saskatoon.	3	Very Low
M-1/2	Green/Leafless Mixed wood	Stand mixtures consisting of coniferous and deciduous tree species in varying proportions, including pine, spruce, fir, aspen, and birch.	9	Very Low
O1-a/b	Matted or Standing Grass	Low to moderate grass cover, with a mixed wood component of fir, pine, aspen, and brush.	11	Low
N	Non-fuel	Bare land, rock, developed areas, etc. that have little or no combustible fuels present.	3	Very Low
W	Water	Hurley River, Cadwallader Creek, Noel Creek, and wetlands	1	Very Low

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4.7.1.3 Tyaughton Lake WUI

Tyaughton Lake rests at the valley bottom above Highway 40 at an elevation of approximately 1100 m. It has homes and structures along its east and west slopes, with the Tyax Adventure Lodge found at its northmost end. The WUI also includes the homes and structures that are found on Gun Creek Road at elevations between 850-950 m. The WUI area and home ignition zone areas at Tyaughton Lake and on Gun Creek Road are predominantly intermixed within the surrounding forests.

The slopes immediately above Tyaughton Lake are primarily forested with Douglas-fir and Lodgepole Pine, with higher elevation crests and openings containing an increased component of deciduous stems. The cutblocks on the west side of Tyaughton Lake have been replanted with Lodgepole Pine, Douglas-fir, and spruce and show relatively low levels of brush and shrub regrowth. Alternatively, the cutblocks found on the east side of the lake are older and contain elevated levels of windthrow. Cutblocks around the Gun Lake Road area have dense concentrations of fir and pine regeneration establishing. In the lower gently sloped areas on the southwest side of Tyaughton Lake, there are continuous stands of Douglas-fir, along with a dense understory containing elevated levels of blowdown and fine fuels. The lower slope areas around Gun Creek Road are dominated with mix wood stands of Trembling Aspen, Lodgepole Pine, and Douglas-fir. The south aspect slopes above the homes along Gun Creek Road are dominated

by Lodgepole Pine and have elevated amounts of blowdown. In 2009, a wildfire burned 8,051 hectares just east of Tyaughton Lake and Gun Creek Road. The fire approached within 400 m of homes along Tyaughton Lake and within 200 m along Gun Creek Road but did not impact any structures. Where burn severity was less, a dense conifer and shrub layer has re-established.

Table 15: Tyaughton Lake Fuel Types and Crown Fire/Spotting Potential

Fuel Type	FPB/CFDDRS Fuel Type Description	WUI Fuel Type Description	% Fuel Type in WUI area	Crown Fire/ Spotting Potential
C-3	Mature Jack or Lodgepole Pine	100% mature conifer dominated stand, primarily Lodgepole Pine or Douglas Fir.	2	Moderate
C-7	Ponderosa Pine – Douglas-fir	Uneven-aged stands of Ponderosa Pine, Lodgepole Pine, Hybrid Spruce, and Douglas-fir in various proportions with a minor component of Trembling Aspen.	50	Moderate
D-1/2	Green/Leafless Aspen	Pure Trembling Aspen stands with a well-developed medium to tall shrub layer found only around the lakeside.	5	Very Low
M-1/2	Green/Leafless Mixed wood	Stand mixtures consisting of coniferous and deciduous tree species in varying proportions, including pine, spruce, fir, aspen, and birch.	10	Very Low
O1-a/b	Matted or Standing Grass	Continuous grass cover, with no more than occasional trees or shrub clumps found within old cutblocks.	21	Low
S-1	Jack or Lodgepole Pine Slash	Lodgepole Pine slash found within old cutblocks.	1	Low
S-2	Spruce or Balsam Slash	Spruce or Balsam slash found within old cutblocks	5	Low
W	Water	Tyaughton Lake, Pearson Pond, Gun Creek, and wetlands.	7	Very Low

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4.7.1.4 Gun Lake WUI

Gun Lake is located in the valley bottom above Gold Bridge at an elevation of 900-1000m. It has homes and recreational cabins encircling all aspects of the lake with the majority being along its east and west sides. There are approximately 275 homes in the WUI and is the largest community within SLRD Area A. The WUI and home ignition zone areas at Gun Lake are predominantly intermixed within the surrounding forest.

The forests on the slopes east of Gun Lake were heavily affected by the Western Spruce Budworm, have frequent openings with large amounts of blowdown and dense fir regeneration in the understory. Other stands around Gun Lake are more even aged with a closed canopy and self pruned lower limbs. The forests found west of Gun Lake have currently not been impacted by the budworm. Cutblocks found in these areas have been replanted with Lodgepole Pine and Spruce. Trembling Aspen grows in dense groves on either side of the lake in openings where fir regeneration has not established. The north side of Gun Lake along the Slim Creek FSR is dominated by extremely dense Lodgepole Pine with dense understory of re-establishing conifers. This area is situated primarily on a south aspect and has minimal surface fuel loading and brush levels, although the overstory density is quite high. The areas on the south side of Gun Lake are influenced by cutblocks and wetlands. The forested area around the Dale FSR is

primarily an even-aged Douglas-fir/spruce forest with a closed canopy and minimal understory along with high amounts of Douglas-fir windthrow and scattered fine fuels.

Table 16: Gun Lake WUI Fuel Types and Crown Fire/Spotting Potential

Fuel Type	FPB/CFDDRS Fuel Type Description	WUI Fuel Type Description	% Fuel Type in WUI area	Crown Fire/ Spotting Potential
C-3	Mature Jack or Lodgepole Pine	100% mature conifer dominated stand, primarily Lodgepole Pine or Douglas Fir.	6	Moderate
C-7	Ponderosa Pine – Douglas-fir	Uneven-aged stands of Lodgepole Pine, Hybrid Spruce and Douglas-fir in various proportions with a minor component of Ponderosa Pine and/or Trembling Aspen.	48	Moderate
D-1/2	Green/Leafless Aspen	Pure Trembling Aspen stands.	1	Very Low
M-1/2	Green/Leafless Mixedwood	Stand mixtures consisting of coniferous and deciduous tree species in varying proportions, including pine, spruce, fir, aspen, and birch.	2	Very Low
O1-a/b	Matted or Standing Grass	Pockets of grass cover found within old cutblocks or wildfire burn areas with high brush content and scattered trees.	13	Low
S-1	Jack or Lodgepole Pine Slash	Lodgepole Pine, Douglas Fir, and Hybrid Spruce slash.	5	Low
W	Water	Gun Lake, Lajoie Lake, and wetlands	23	Very Low

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4.7.1.5 Marshall Lake WUI

The Marshall Lake community is a cluster of off-grid recreational cabins on the shores of Marshall Lake. The lake is in a high elevation valley in the Shulaps Range. Homes are situated at 1150m elevation and mountains around the lake rise to 2500m peaks. There are approximately 30 structures in the WUI. This area is heavily used for recreation including hunting, camping, fishing, hiking, motor sports and mountain biking. There are two campgrounds located along the shores of Marshall Lake.

The majority of the forests found around Marshall Lake are a combination of mature even and uneven aged Douglas-fir, spruce, and Lodgepole Pine stands. Areas around the homes have heavy surface and ladder fuel loading due to elevated levels of beetle-kill blowdown. Uneven stands of Ponderosa Pine and Douglas-Fir are found on the northeast side of the Marshall Lake near exposed cliffs and talus slopes. Many of these stands also have heavy grass, brush and shrub content. Cutblocks or previously burned areas southwest of the lake have been replanted with Lodgepole Pine, Douglas-fir and spruce. There is also an open grass fuel type area found in the valley bottom that has been kept short and cropped by cattle grazing. These field areas contain juniper and low-growing shrubs intermixed with the grasses.

Table 17: Marshall Lake WUI Fuel Types and Crown Fire/Spotting Potential

Fuel Type	FPB/CFDDRS Fuel Type Description	WUI Fuel Type Description	% Fuel Type in WUI area	Crown Fire/ Spotting Potential
C-3	Mature Jack or Lodgepole Pine	100% mature conifer dominated stand, primarily Lodgepole Pine or Douglas Fir.	6	Moderate
C-7	Ponderosa Pine – Douglas-fir	Uneven-aged stands of Lodgepole Pine, Hybrid Spruce, and Douglas-Fir in various proportions with a minor component of Ponderosa Pine and/or Trembling Aspen.	46	Moderate
D-1/2	Green/Leafless Aspen	Pure Trembling Aspen stands with a well-developed medium to tall shrub layer.	1	Very Low
M-1/2	Green/Leafless Mixedwood	Stand mixtures consisting of coniferous and deciduous tree species in varying proportions, including pine, spruce, fir, aspen, birch, and cottonwood.	2	Very Low
O1-a/b	Matted or Standing Grass	Moderate grass cover in forest openings or terrain benches with scattered trees and high brush content.	25	Low
S-2	Spruce or Balsam Slash	Spruce or Balsam slash.	10	Low
W	Water	Marshall Lake and wetlands	10	Very Low

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4.7.1.6 Marshall Lake Road WUI

The Marshall Lake Road residential area is located along the access road to Marshall Lake and sits within a high elevation valley in the Shulaps Range. Homes are situated at 1050m elevation. There are approximately 13 structures in the WUI which include year-round and recreational residences. The trailhead for the popular Shulaps Traverse trail located at Brett Creek in this WUI.

The dominant forested stand types are both even and uneven aged mature Douglas-fir, spruce, and Lodgepole Pine stands. Some areas around the homes have elevated surface and ladder fuel loading due to past beetle-kill blowdown. Trembling Aspen is also found growing in the valley bottom throughout the WUI. Old cutblocks and previously burnt areas have been re-established with pine, fir, and spruce. There are also intermixed grassland areas that are used for cattle grazing. Where cattle grazing is excluded, increased ladder fuels including regenerating conifer trees, pine beetle blowdown, juniper, long grasses, and a thick brush/shrub component is found.

Table 18: Marshall Lake Road WUI Fuel Types and Crown Fire/Spotting Potential

Fuel Type	FPB/CFDDRS Fuel Type Description	WUI Fuel Type Description	% Fuel Type in WUI area	Crown Fire/ Spotting Potential
C-3	Mature Jack or Lodgepole Pine	100% mature conifer dominated stand, primarily Lodgepole Pine or Douglas Fir.	10	Moderate
C-7	Ponderosa Pine – Douglas-fir	Uneven-aged stands of Lodgepole Pine, Hybrid Spruce, and Douglas-Fir in various proportions with a minor component of Ponderosa Pine and/or Trembling Aspen.	59	Moderate

D-1/2	Green/Leafless Aspen	Pure Trembling Aspen stands with a well-developed medium to tall shrub layer.	3	Very Low
O1-a/b	Matted or Standing Grass	Continuous grass cover, with no more than occasional trees and juniper..	28	Low

4.7.2 Topography

Topography, or the 'lay of the land' is an important factor in how the rate and direction of fire spreads. Topography is typically broken into three categories: slope, aspect and terrain. Terrain includes features such as hills, mountains, lakes, rivers, and other natural topographic characteristics. Each of these items can significantly influence where wind flows as it will always try to follow the path of least resistance. The places winds flow will influence where fire travels. Bodies of water like lakes and rivers can also serve to limit the spread of surface fires by providing a natural break in flammable fuels. Values that are located downslope and in the path of prevailing wind directions are at greatest risk.

Slope is the steepness of the land and has the greatest influence on a fire's trajectory and rate of spread. Fire generally moves faster uphill than downhill, with fire spreading faster on steeper slopes. On the uphill side, flames are closer to the fuel, and the fuels become drier and ignite more quickly than if on the level ground. Wind currents typically flow uphill and this tends to push the heat from flames into new fuels. Although typical fire behaviour is to spread uphill, an additional concern on steep slopes is that burning embers and 'chunks' of burning fuel may roll downhill into unburned fuels below, increasing the spread and starting new fires. The range of slopes observed across the SLRD Area A area of interest is shown on the Slope Class map in Appendix 3.

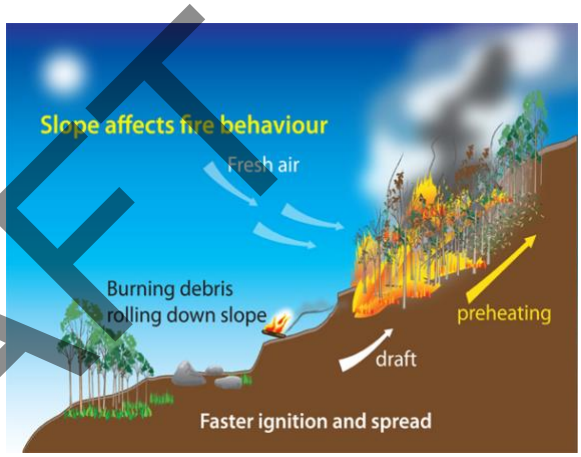

Figure 5: Slope Affects on Fire Behaviour

Slope position relates to the ability of a wildfire to gain momentum during an uphill run and affects the potential impact to the value. A value at the bottom of the slope is equivalent to a value on flat ground; a value on the upper 1/3 of the slope would be impacted by faster rates of spread than that of a value located on flat ground.

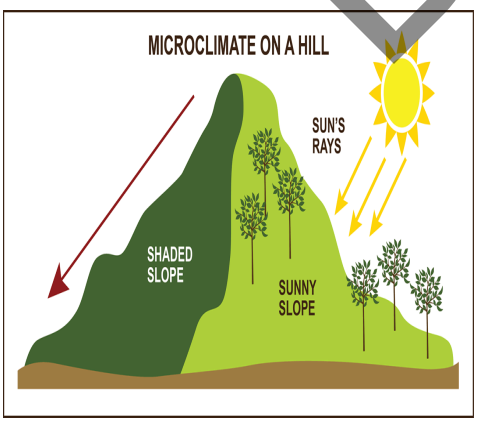

Figure 6: Solar Radiation and Aspect

Aspect is the direction the land faces - north, south, east or west and can influence fire behaviour in several ways. North facing slopes tend receive more shade, have heavier fuel loading levels, higher humidity and fuel moistures. North facing aspects will typically have less intense fire activity than a south-facing slope. Southern aspects receive more direct heat from the sun, generally are hotter and have drier vegetation and soils and support more flashy fuels such as grasses and shrubs. These combined factors make southern aspects more susceptible to fires than that of northern slopes. In the northern hemisphere, eastern facing slopes experience earlier heating and cooling patterns as the sun moves from east to west, whereas west facing slopes will have later heating and cooling times.

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4.7.2.1 Gold Bridge WUI

The homes and structures of Gold Bridge all reside along a mid slope benchland. The slope around the homes vary from mild at 5-20%, gradually increasing to 25-40% above and below the community. The predominant aspect for the benchland and community as a whole is a west to northwestern facing; these aspects encompass 80% of the structures. The other 20% of the structures are located around the Lajoie Dam area, with an east to northeastern facing aspect.

Table 19: Gold Bridge WUI Slope Classes

Slope Class	Slope % in WUI	Fire Behaviour Implications
<20%	39	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	22	Flame tilt begins to preheat fuel, increase rate of spread.
31-45%	18	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
46-60%	11	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	10	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

Gold Bridge is located at the intersection of where the Hurley River enters the Bridge River as they flow northeast towards the Carpenter Reservoir. These major river systems, ranging in 30-160 meters in width, have a braided morphology with many offshoot channels and ephemeral gravel bars which are dominated by less flammable riparian vegetation. The Downton Reservoir, Lajoie Dam and several large gravel pits in close proximity to the community are other notable features that are currently not vegetated. Both these natural and man-made features could be considered for use as anchor points during fire suppression efforts.

4.7.2.2 Bralorne WUI

The homes and structures found in Bralorne are located along a mid slope benchland above Cadwallader Creek. Although the slopes where the homes and structures are located are somewhat gentle (5-20%), the slopes above and below the community are steep, ranging from 50-70% to 100% leading into the Cadwallader Creek drainage below the community. The predominant aspect for the WUI is west to southwest facing.

Table 20: Bralorne WUI Slope Classes

Slope Class	Slope % in WUI	Fire Behaviour Implications
<20%	35	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	19	Flame tilt begins to preheat fuel, increase rate of spread.
31-45%	24	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
46-60%	14	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	8	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

Cadwallader Creek, located southwest of the community and the Hurley River to the northeast are major stream systems that were considered during the design of the proposed fuel reduction treatment areas, and could be integrated into overall fire suppression planning. In addition, there are also several large gravel/sand pits and older, well roaded cutblocks surrounding the community that could also be

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considered as anchor points. The strips of aspen along the major roads in the community are also advantageous, as these stands typically do not support aggressive fire behaviour.

4.7.2.3 Tyaughton Lake WUI

The terrain in the valley bottom residential area is gently rolling/sloping ground with slopes becoming increasingly steeper behind the residential area. The mountainous terrain surrounding Tyaughton Lake is generally continuous with slopes ranging between 40-60%. There are also frequent small benches creating tiered plateaus of flat to rolling ground within the steeper sloped areas. 63% of structures are located on the west side of the Tyaughton Lake with an east to southeastern aspect, and the remaining 26% of the homes are found on the west side of the lake with a northwest aspect.

Along Gun Creek Road, terrain is flat to rolling with gentler slopes between 5-15%. At the far west end of Gun Creek Road, topography changes abruptly with much more severe slopes of 80-90% leading into Pearson Creek to the south. The predominant aspect for this residential area is south, however, aspect is quite variable due to the flat terrain.

Table 21: Tyaughton Lake WUI Slope Classes

Slope Class	Slope % in WUI	Fire Behaviour Implications
<20%	44	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	19	Flame tilt begins to preheat fuel, increase rate of spread.
31-45%	18	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
46-60%	10	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	9	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

There are generally few fuel-free areas or non-combustible features found in this WUI besides Tyaughton Lake itself. The right of way along the main roads accessing the lake area is heavily forested and are generally not of adequate width to be considered as an effective fuel break for suppression efforts. Along Gun Creek Road, there are grass fields and deciduous groves that could possibly be evaluated for use as anchor points.

4.7.2.4 Gun Lake WUI

The residential area at Gun Lake is located on the valley bottom surrounding the lake, although some homes on the east side are situated on more of a mid-slope continuous topography. Slopes around the homes typically range from 0-15% with flat or rolling terrain. The number of homes along the lake is almost split evenly on the east and west sides of the lake. The east side of the lake faces a west to southwest aspect and receives the most sunlight, whereas the west side of the lake faces an east to southeast aspect.

Table 22: Gun Lake WUI Slope Classes

Slope Class	Slope % in WUI	Fire Behaviour Implications
<20%	46	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	23	Flame tilt begins to preheat fuel, increase rate of spread.
31-45%	21	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.

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46-60%	8	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	2	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

Potential fire suppression anchor points around the Gun Lake and Lajoie Lake residential areas include the lake features, large cutblocks and an established airstrip located at the north end of the lake.

4.7.2.5 Marshall Lake WUI

Along the shores of Marshall Lake, slopes vary from flat to steep (0 – 90%). The homes are primarily located in the valley bottom, although some back on to the steep slopes behind Marshall Lake. Exposed cliff faces and talus slopes along the northeastern side of the lake, and Marshall Lake Road found on the east side of the lake which has minimal vegetation along the right of way due to aspect, could be considered as anchor points in the area. Aspects around the lake are generally northeast and southwest, but with the dominant mountainous topography, all aspects are found within the WUI. 68% of the homes have a northeast aspect while the other 32% have a southwest aspect.

Table 23: Marshall Lake WUI Slope Classes

Slope Class	Slope % in WUI	Fire Behaviour Implications
<20%	18	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	15	Flame tilt begins to preheat fuel, increase rate of spread.
31-45%	25	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
46-60%	24	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	18	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

4.7.2.6 Marshall Lake Road WUI

The homes and structures along Marshall Lake Road are located on the flat valley bottom. The terrain changes above the road to the north, with slope increasing to 40-60%. The predominant aspects found within this area are southwest and a northeast aspect.

Table 24: Marshall Lake Road WUI Slope Classes

Slope Class	Slope % in WUI	Fire Behaviour Implications
<20%	31	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	12	Flame tilt begins to preheat fuel, increase rate of spread.
31-45%	21	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread.
46-60%	19	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	17	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

There are a few natural features near Marshall Lake Road that could be considered as potential fuel breaks around this residential area.

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4.8.1 Fire Weather

Fire weather information such as temperature, relative humidity, precipitation, wind speed and wind direction are considered when making fire prevention, preparedness and suppression decisions. Wind speed affects the rate of spread and flame height. Air temperature, precipitation and relative humidity affect the fuel moisture. High relative humidity increases the moisture content of cured fuel whereas high temperatures reduce it through enhanced evaporative losses.

The BC Wildfire Service operates approximately 260 weather stations across the province that generate weather reports for specific weather indices including wind speed, precipitation, wind direction, Fine Fuel Moisture Content (FFMC) and Buildup Index (BUI) on an hourly basis. The closest BCWS weather stations for communities located in the SLRD area A are the “Five Mile” weather station 1029, located north of Carpenter Lake, between Marshall and Gun Lake areas, and the “Gwyneth Lake” station 309 located west of Bralorne.

4.8.1.1 ISI Roses

Diagrams generated from wind speed and direction data collected through BCWS weather stations are termed Initial Spread Index (ISI) roses. The ISI Rose for the Five Mile weather station 1029 shows that the general prevailing wind direction for the majority of the year is blowing from a southwest direction. This is also the direction that the winds approach the communities during the peak fire season months (June-Aug), with wind speeds also generally increasing during this period. Wind speed and direction are influenced from topographical features in the area, such as lakes, steep slopes and narrow stream channels. Peak winds speeds are generally found to be between the hours of 1200 and 2400 hours, typically reaching highest speeds around 1600, in a west to southwest direction.

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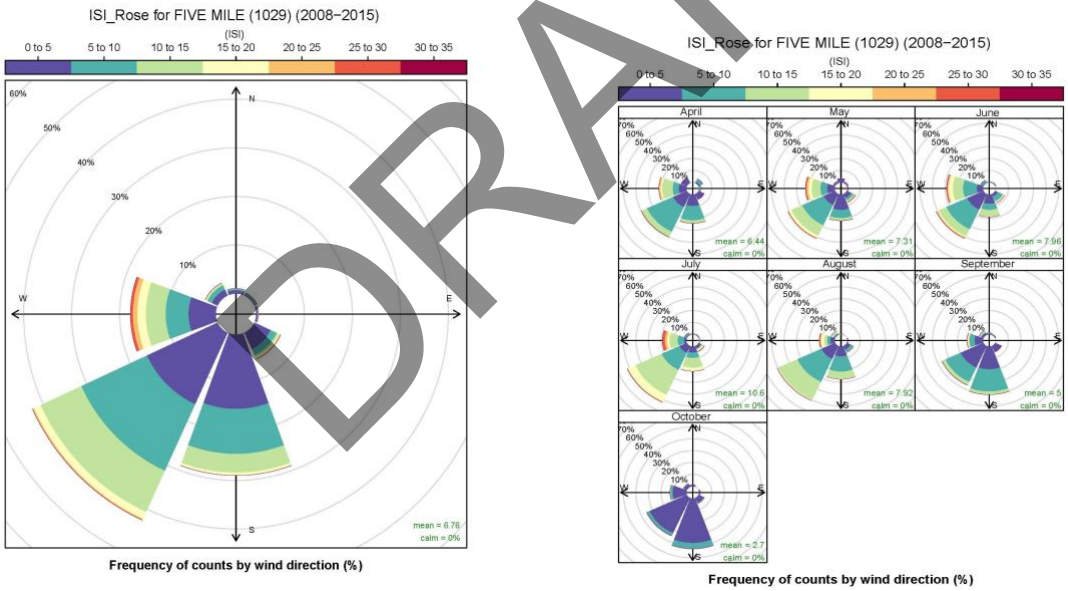

Figure 7: Five Mile Weather Station ISI Rose

The ISI Rose for the Gwyneth Lake weather station 309 shows that the general prevailing wind direction for the majority of the year is in a north – south direction. The Gwyneth Lake weather station is located closest to the community of Bralorne. During the peak fire season months (June-Aug), the prevailing wind direction is also predominantly from a north – south direction with wind speeds also increasing during these months. Community members of Bralorne, Tyaughton Lake and Gun Lake also reported experiencing intermittent high intensity north wind events during the peak fire season months. Wind speed and direction are generally influenced from steep slopes and major rivers in the area. Peak winds

speeds are recorded between the hours of 1200 and 1800 hours, typically reaching highest speeds around 1600 and primarily approaching the community from a southerly direction.

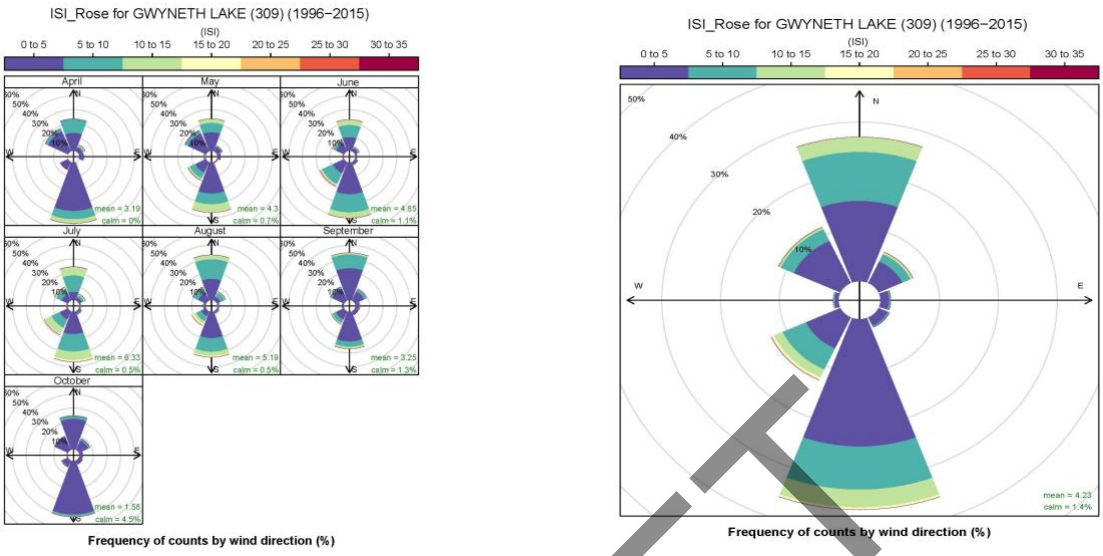

Figure 8: Gwyneth Lake Weather Station ISI Rose

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4.8.1.2 Temperature

As noted in the preceding section, there are two BCWS weather stations situated in the general area of the SLRD Area A communities. The Five Mile location is central between most of the communities and was chosen as the representative weather station for temperature, precipitation and relative humidity analysis.

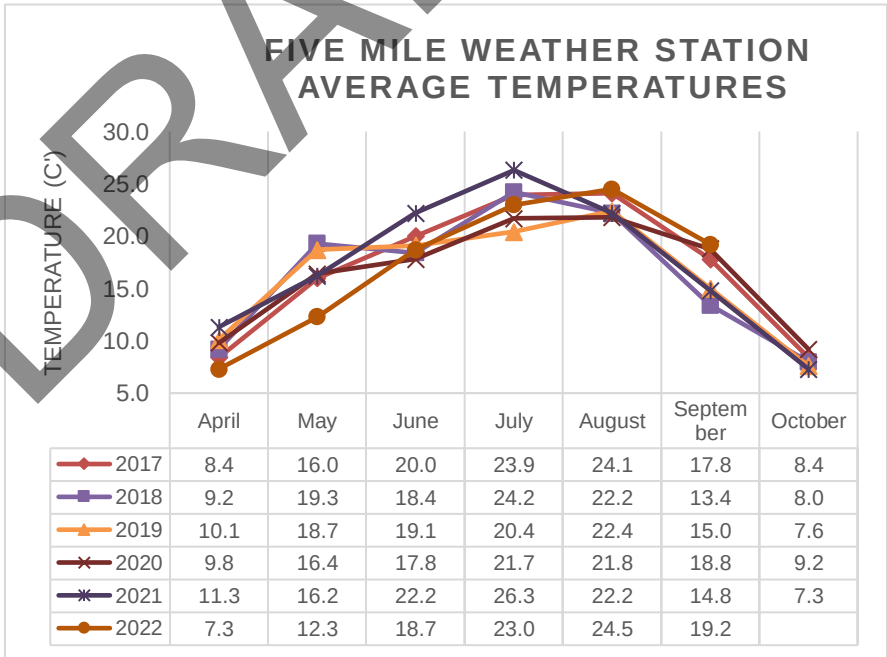
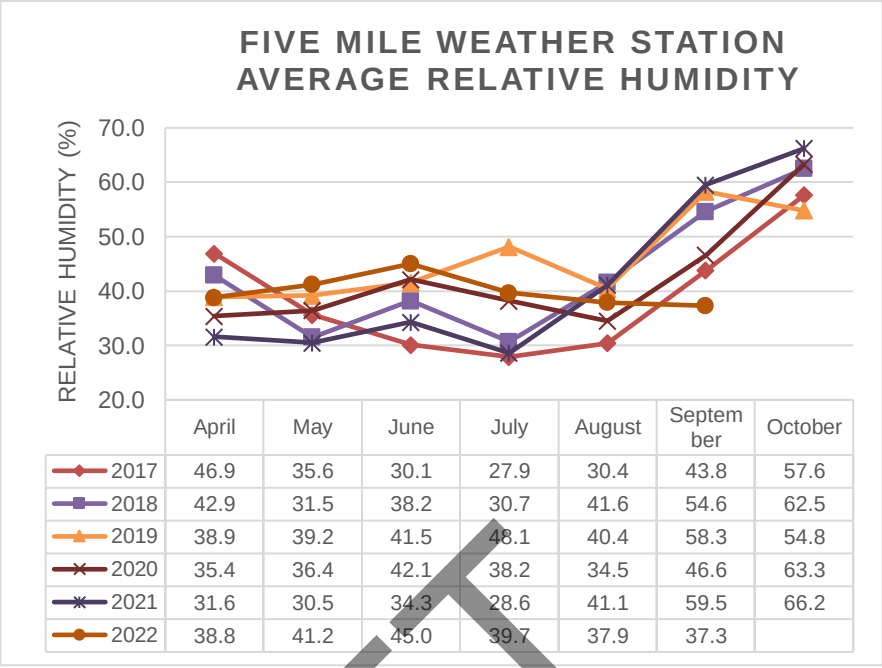


Figure 9: Five Mile Weather Station Average Temperature

Average monthly temperatures June through August from 2017 - 2021 for the Five Mile weather station 291 range between 7 and 26 degrees Celsius. It is noted that the years with the highest recorded monthly temperatures (2017, 2018 and 2021) during peak wildfire months directly correlates with notable wildfire seasons. Typically, the warmest temperatures are experienced during July-August. In 2021, the highest average temperature of 26.3 degrees was recorded in the month of July.

4.8.1.3 Relative Humidity

Average relative humidity levels for the Five Mile weather station range between 27.9% and 48.1% during the peak fire season months of June through August. There is a direct correlation noted between years with drastically reduced relative humidity levels and notable wildfire seasons (2017, 2018 and 2021). Trends indicate that relative humidity levels are fairly consistent throughout the wildfire season, with the lowest levels typically seen in the month of July. The lowest level of relative humidity recorded was during July 2017 with an average of 27.9%.

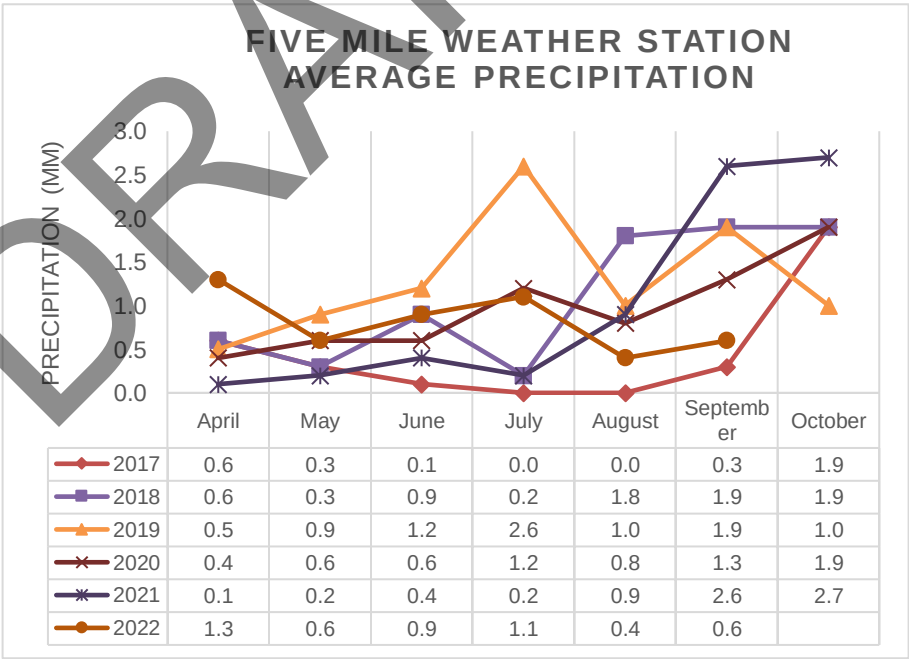


	April	May	June	July	August	September	October
2017	46.9	35.6	30.1	27.9	30.4	43.8	57.6
2018	42.9	31.5	38.2	30.7	41.6	54.6	62.5
2019	38.9	39.2	41.5	48.1	40.4	58.3	54.8
2020	35.4	36.4	42.1	38.2	34.5	46.6	63.3
2021	31.6	30.5	34.3	28.6	41.1	59.5	66.2
2022	38.8	41.2	45.0	39.7	37.9	37.3	

Figure 10: Five Mile Weather Station Average Relative Humidity

4.8.1.4 Precipitation

Average precipitation for the Five Mile weather station ranged between 0.0 mm and 1.8 mm during the peak fire season months of June through August. There again is a direct correlation noted between years with drastically reduced precipitation levels and notable wildfire seasons (2017, 2018 and 2021). 2017 experienced the lowest precipitation recorded with July and August recording no, or trace amounts of precipitation for three consecutive months. Trends generally indicate that the area receives most of the annual precipitation in the fall/winter months.



	April	May	June	July	August	September	October
2017	0.6	0.3	0.1	0.0	0.0	0.3	1.9
2018	0.6	0.3	0.9	0.2	1.8	1.9	1.9
2019	0.5	0.9	1.2	2.6	1.0	1.9	1.0
2020	0.4	0.6	0.6	1.2	0.8	1.3	1.9
2021	0.1	0.2	0.4	0.2	0.9	2.6	2.7
2022	1.3	0.6	0.9	1.1	0.4	0.6	

Figure 11: Five Mile Weather Station Average Precipitation

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4.9 Fire Danger Rating

Wildfire threat exposure to a community varies throughout the fire season. The data outlined in the preceding sections is analyzed daily by BC Wildfire Service and communicated out as a numerical value termed Fire Danger Rating. The Fire Danger rating (the risk of a wildfire starting) is updated daily at 1400 hours and is grouped within the following Fire Danger classes throughout the fire season.

Fire Danger Class 1 and 2 – Very low to low danger rating. Fires may start easily and spread quickly but there will be minimal involvement of deeper fuel layers or larger fuels.

Fire Danger Class 3 – Moderate danger rating. Forest fuels are drying and there is an increased risk of surface fires starting. Carry out any forest activities with caution.

Fire Danger Class 4 – High danger rating. 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.

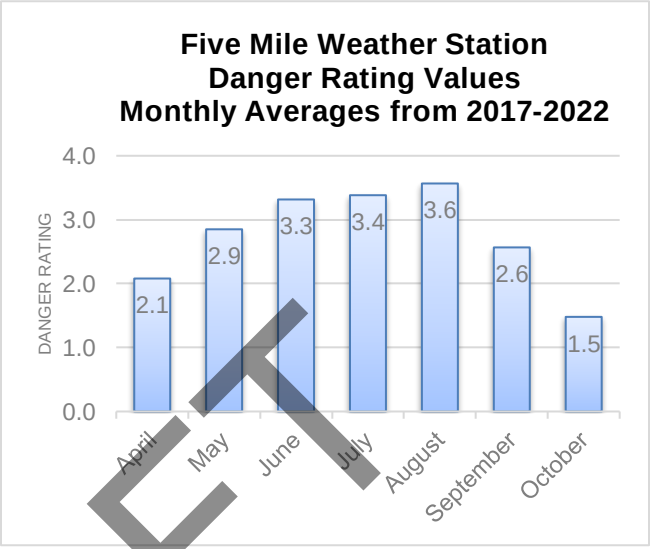

Figure 12: Five Mile Weather Station Danger Rating Monthly Average Values (2017-2022)

Fire Danger Class 5 – Extreme danger rating. 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.

The danger rating values from the Five Mile Weather station from 2017-2022 were averaged and summarized. The values indicate that the general area typically reaches a moderate (high) fire danger rating during the peak wildfire season months, although there have been several months during recent challenging fire years that the danger rating reached high to extreme levels in this area.

As the fire danger ratings increase throughout the wildfire season, the level of community emergency preparedness and awareness should also correspondingly increase. Table 26 provides an example of EOC and community readiness levels, along with associated tasks that should be incrementally implemented in tandem with increasing fire danger rating levels.

Table 25: Wildfire Response Preparedness Condition Guide

Prep-Con LEVEL	ACTION GUIDELINES
I LOW	• All Community staff on normal shifts. • Staff will update fire danger signs.
II MODERATE	• All Community staff on normal shifts
III HIGH	• All Community staff on normal shifts. • Daily detection patrols by staff. • Regional fire situation evaluated. • Daily fire behaviour advisory issued.

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	• Wildland fire-trained Community staff and EOC staff notified of Prep- Con level. • Establish weekly communications with local wildland fire agency contacts • Hourly rain profile for all weather stations after lightning storms. • Duty Park Technician/ KFRS members will update fire danger signs.
IV EXTREME	• Rain profile (see III). • Daily detection patrols by Staff. • Daily fire behaviour advisory issued. • Regional fire situation evaluated. • EOC staff considered for standby. • Wildfire Incident Command Team members considered for standby/extended shifts. • Designated Community staff: water tender and heavy machinery operators, arborists may be considered for standby/extended shifts. • Consider initiating Natural Area closures to align with regional situation. • Provide regular updates to media services members/Community staff on fire situation. • Update public website as new information changes.
V FIRE(S) ONGOING	• All conditions apply as for Level IV (regardless of actual fire danger rating). • Provide regular updates to media/structural fire departments/park staff on fire situation. • Mobilize EOC support if evacuation is possible, or fire event requires additional support. • Mobilize Wildfire Incident Command Team under the direction of the Fire Chief. • Implement Evacuation Alerts and Orders based on fire behaviour prediction and under the direction of the Fire Chief.

Daily updated fire danger class ratings during the wildfire season can be found at the following site: [WFWX - Fire Weather Danger Class Report (gov.bc.ca)]

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4.10 Hazard Risk Vulnerability Assessment

The purpose of a Hazard Risk Vulnerability Assessment (HVRA) is to help emergency planners and communities identify all potential risks, to make risk-based choices to address identified vulnerabilities, plan to mitigate the identified hazards and prepare for response and recovery efforts. Risk-based means making informed choices based on the frequency of hazards and acceptable consequences. The HVRA process considers the likelihood of an unwanted hazard event occurring (probability) and the corresponding damage to communities as a result of the event (consequence). Risk is measured as the product of likelihood and consequence, but multiple inputs are required in order to effectively quantify risk, including severity, value type, and vulnerability. The identification of risk

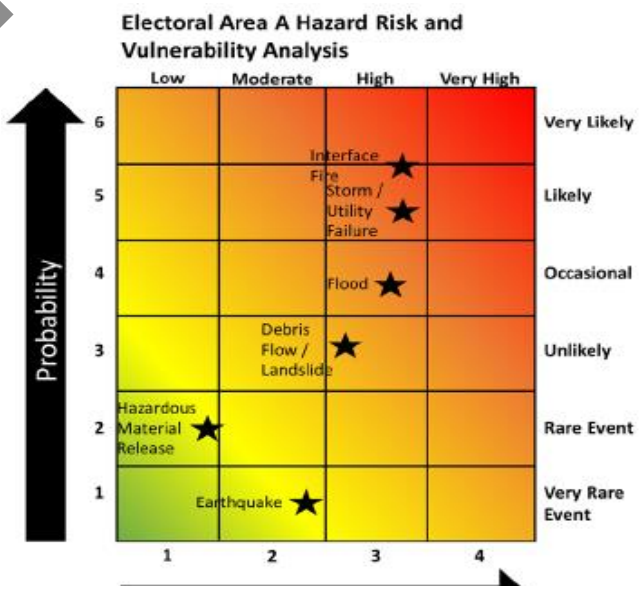

Figure 13: SLRD Area A Hazard, Risk and Vulnerability Profile

levels will help inform priorities for increased community resiliency efforts.

The Hazard, Risk and Evacuation hazard profile for all SLRD Area a communities shown in Figure 13 identifies interface fires as having a likely to very likely probability of occurrence along with a high consequence rating. (SLRD CRA, 2021)

SECTION 5: Recommendations for Mitigating Wildfire Risk

Mitigating wildfire risk is a proactive approach to reducing potential impacts and subsequent losses from devastating wildfires. Understanding and assessing all of the risks that apply to a given community is a key consideration when determining actions that organizations can undertake to mitigate and manage the wildfire risk within and adjacent to their respective jurisdictions.

Comprehensive community wildfire resiliency planning involves evaluating the risks and implementing a robust program that incorporates a variety of different mitigation options to reduce the identified risks. Activities including enhanced emergency planning, policy and legislation development, increased interagency cooperation and training, forest fuel and vegetation reduction programs within and surrounding communities, as well as communicating, educating and promoting FireSmart activities that homeowners can implement will proactively increase wildfire resiliency not only for individual residents, but the communities as a whole.

5.1 FireSmart Disciplines

FireSmart Canada is a national program that was founded over 20 years ago to address common wildfire concerns in WUI areas. FireSmart Canada works closely with the provincial and territorial chapters to implement FireSmart programming and services from coast to coast. FireSmart BC is the provincial program created to increase wildfire resilience among homeowners, communities, emergency responders, and all levels of government in BC (FireSmart BC, n.d.). The FireSmart program provides tools to help increase wildfire preparedness for residents, their homes, neighbourhoods, critical infrastructure and natural resources from wildfire. It is a holistic approach that encourages efforts from grassroots to high-level organizations. At the grassroots level, FireSmart principles are based on the actions of residents and neighbourhoods helping each other protect their homes from wildfire. At an organizational level, it may include direction such as developing legislation or improving emergency response procedures for wildfire events. FireSmart information is based on scientific research which has studied past wildfire disasters, wildfire dynamics and emergency response.

The wildfire risk reduction recommendations presented in this CWRP follow the disciplines outlined in the provincial FireSmart program and have been compiled into the following sections: (Disciplines | FireSmart BC):

1) Local Community FireSmart Initiatives
2) Education and Communication
3) Legislation, Planning and Development
4) Inter-Agency Cooperation
5) Emergency Planning
6) Cross-training
7) Vegetation Management

The FireSmart Coordinator role is a critical position to assist with the overall implementation of local FireSmart initiatives. The FireSmart Coordinator is an integral link to establishing a collaborative working relationship between the SLRD and individuals and organizations at the local level. Having this positive working relationship will help foster support for neighbourhoods to continue the successful Community FireSmart and Resiliency Committees, participate in programs for Home Ignition Zone Assessments and

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rebates, and receive FireSmart Neighbourhood Recognition, all of which are identified activities to improve overall wildfire resiliency.

Section 5.1 FireSmart Coordination						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
1	Continue to employ a dedicated FireSmart Coordinator to oversee the FireSmart program within the SLRD. Access funding through the CRI program to hire a full-time FireSmart Coordinator.	To work with the SLRD Electoral Area A communities to implement identified wildfire resiliency objectives and goals.	Ongoing	High	SLRD Emergency Program	Continued funded FireSmart Coordinator role

5.2 SLRD Completed FireSmart Engagement and Initiatives

As a governing body, the SLRD plays a key role in establishing, supporting and promoting wildfire resiliency within communities. While FireSmart as a whole focuses primarily on individual residents taking charge of wildfire resiliency, it's important that the SLRD support and inspire homeowners with the application of the various FireSmart program areas. The SLRD has been very proactive in implementing various wildfire resiliency and FireSmart initiatives which are highlighted in Table 26.

Table 26: SLRD Wildfire Resiliency Initiative Highlights

Wildfire Resiliency Initiatives	Community	Result
Hiring the SLRD FireSmart Administrator	All electoral areas	1 FireSmart Administrator hired
Identifying local FireSmart Champions	All electoral areas	10 Champions identified
FireSmart Rebate Program	10 pilot communities within all SLRD Electoral Areas. Marshall Lake and Gun Lake were selected for Area A.	146 homeowners participated
Free curbside chipping for homeowners	Upper Squamish Valley and Pemberton Portage Road	5 homeowners participated
Critical Infrastructure Assessments	Bralorne, Lillooet, Devine	4 CI Assessments were completed
Residential FireSmart Services for homeowners age 65+	SLRD Areas A, B, and C; District of Lillooet	102 homeowners participated
FireSmart Education Days	10 pilot communities within all SLRD Electoral Areas. Marshall Lake and Gun Lake were selected for Area A.	Marshall Lake pile burning event: 15-20 participants Gun Lake Enchanted Forest cleanup day: 17 participants

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Community FireSmart Resiliency Committees	All electoral areas.	Area A residents participated 5 CFRC meetings in 2021/22
Lillooet & Area Community Wildfire Roundtable	SLRD Area A + B	2 Roundtable meetings were held in 2022
EOC Live Exercise (Drill)	SLRD in collaboration with District of Lillooet and Northern St'at'imc communities	1 live exercise completed
Forest fuel mitigation	SLRD Area A SLRD Area B	22.5 ha completed 163 ha completed 213 ha in prescription
FireSmart BC Conference 2022	All electoral areas	2 SLRD staff attended
Public Outreach	All electoral areas	Ongoing distribution of educational materials through social media and print materials. Five virtual FireSmart seminars were delivered to targeted communities in the SLRD in 2021.

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5.3 Local Level FireSmart Initiatives

There are a number of initiatives that can be undertaken to reduce the risk of a wildfire impacting homes and structures. This section outlines examples of activities that both residents and communities can undertake based on unique factors including local wildfire threat, fuel type (forests and grasslands) and structure types and locations.

At the most local scale, homeowners can assess their individual residences for wildfire risks using the FireSmart BC Homeowner's Manual or have a Home Ignition Zone Assessment completed by a qualified Local FireSmart Representative (LFR). These assessments will identify present risks and provide suggestions for mitigative activities that can be completed to reduce the risks of wildfire impacting their homes. Some examples of pre-emptive activities include moving combustible items out from underneath decks and carports, moving wood piles at least 10 metres away from the house, replacing combustible siding with non-combustible options such as fibre cement siding, and ensuring that the 1.5-metre zone around the home is completely free of combustible vegetation and items. Homeowners should work with neighbours on shared concerns, such as cedar hedges along property lines.

Local Neighbourhood Champions are integral to the successful implementation of neighbourhood activities. The SLRD should continue to identify and support interested community members in assuming a lead role for the implementation of wildfire resiliency efforts in their neighbourhoods. These individuals would work closely with the SLRD FireSmart Coordinator who would assist with the implementation, tracking and logistics of events and provide support for the neighbourhood champion to organize and attend CFRC meetings as well as any regionally based roundtables. Incentives provided to Neighbourhood Champions may increase the willingness to participate and assume this type of role.

Neighbourhood-level activities or events involve the residents coming together to participate in a variety of locally based activities which can include the creation of a Community FireSmart Resiliency Committee (CFRC), holding wildfire community preparedness days, community cleanup days, communication and outreach events, developing a neighbourhood level action plan, and rebate programs. The SLRD should

provide support for established Community FireSmart Resiliency Committees to come together regularly to review their neighbourhood action plans, discuss emergency preparedness and to plan for any upcoming events. This can be done by assisting with meeting coordination and providing funds for venue rentals and meals.

The SLRD has been successful implementing neighbourhood level events including community cleanup days and various educational events, as noted above. These events have been well attended and should be continued. Future topics could include evacuation routes, emergency preparedness and landscaping techniques. These events can also be used as opportunities to provide organizations such as fire departments and/or the BCWS to also incorporate a training component while delivering educational material. Examples of training activities could include structural protection unit mobilization and setup, pump and rooftop sprinkler demonstrations, pile burning techniques and safety precautions, home assessment overviews and proper thinning/pruning techniques.

The culmination of the above-noted effort is to receive FireSmart Canada Neighbourhood Recognition. This is achievable for all neighbourhoods through an application to FireSmart Canada. The FireSmart Canada Neighbourhood Recognition program requires the following activities to be completed to be eligible for recognition (FireSmart Canada Neighbourhood Recognition Program (FCNRP) | FireSmart BC):

- Enlisting a Local FireSmart Representative to complete an assessment and create a plan that identifies locally agree-upon solutions that the neighbourhood can implement
- Sponsoring a local Neighbourhood or Community FireSmart Resiliency Committee, which maintains the FireSmart Neighbourhood Plan and tracks its progress or status
- Conducting FireSmart events each year that are dedicated to a local FireSmart project
- Investing a minimum of $2 per capita annually in local FireSmart neighbourhood effort
- Submitting an annual report to FireSmart Canada that documents continuing compliance with the program.

To assist with the logistics and scope of the neighbourhood recognition programming, it is suggested that neighbourhoods are ideally grouped between 20-50 structures. Table 27 identifies thirteen proposed structure groupings that can be considered for use as SLRD Area A community FireSmart neighbourhoods. The proposed neighbourhood maps are found in appendix 5. Seven of the suggested areas identified exceed the recommended structure groupings, but were developed to be flexible and can be adjusted accordingly through the specific needs and requirements of neighbourhood residents.

Table 27: SLRD Area A proposed FireSmart Neighbourhoods (FSN)

Proposed FireSmart Neighbourhood ID	Area Name	Number of Structures	Number of Critical Infrastructure
FSN 1	Gun Lake South East	70	0
FSN 2	Gun Lake South	81	1
FSN 3	Gun Lake North West	60	0
FSN 4	Gun Lake North	53	0
FSN 5	Lajoie Lake	12	0
FSN 6	Gold Bridge	80	17
FSN 7	Bralorne – Sucker Lake	6	0

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FSN 8	Bralorne North West	64	3
FSN 9	Bralorne South East	89	5
FSN 10	Marshall Lake Road	13	0
FSN 11	Marshall Lake	29	0
FSN 12	Tyaughton Lake	63	2
FSN 13	Tyaughton Lake South	31	1

Section 5.3 Local Level FireSmart Initiatives						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
2	Continue to encourage and support community-level CFRC committee meetings.	To provide an opportunity for collaboration between neighbourhoods and other organizations or communities, and to support neighbourhoods working towards FireSmart Canada Neighbourhood Recognition.	Ongoing	High	SLRD FireSmart Coordinator Neighbourhood Champions Local FireSmart Representatives	Funding to support meeting logistics
3	Encourage and support individuals in the communities to become Neighbourhood Champions.	Identify key individuals within each community to work with the SLRD FireSmart Coordinator to implement initiatives in their local neighbourhoods.	Ongoing	High	SLRD FireSmart Coordinator Neighbourhood Champions	One Champion per neighbourhood
4	Complete neighbourhood wildfire assessments for all identified neighbourhoods.	Complete the Neighbourhood Wildfire Hazard Assessment Form to further identify risks within the identified neighbourhood areas.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator Qualified LFR	Completion of wildfire assessments for all identified neighbourhoods
5	Continue to offer Home Ignition Zone Assessments for all residences in the WUI areas.	Increase homeowner education about current wildfire risks and how to reduce them using the FireSmart principles.	Ongoing	High	SLRD FireSmart Coordinator Qualified LFR	Completion of HIZ assessments for all interested homeowners

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6	Continue to work with the local Neighbourhood Champions to implement information/education sessions in the SLRD Area A communities.	Continued education and information distribution through events such as Community cleanup or FireSmart preparedness day and Local emergency preparedness days.	Ongoing	High	SLRD FireSmart Coordinator Community participants/Fire Departments/Fire Brigades/LFRs BC Wildfire Service	At least two community events held annually for the SLRD communities
7	Support interested neighbourhoods in achieving recognition through the FireSmart Canada Neighbourhood Recognition Program.	SLRD FireSmart Coordinator to provide support to local Neighbourhood Champions with CFRC coordination, creating neighbourhood plans, hosting events and submitting documents to FireSmart Canada.	Short Term (Within 1 year)	Moderate	SLRD FireSmart Coordinator Neighbourhood Champions	Achieve one FireSmart Canada Neighbourhood recognition by 2024
8	Re-establish the rebate program.	Create an annual program that provides rebates to homeowners for completion of recommended FireSmart activities. This will provide an incentive for residents to reduce the wildfire risks on their properties.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator Qualified LFR	A fully funded rebate program for 2023/24 and future years.

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5.4 Education and Communication

Education | FireSmart BC

Public education is the critical foundation of FireSmart. In order for a community to become resilient in the face of wildfire, all members of the community need to understand the wildfire risks and their role in reducing those risks. As people learn the importance of taking initiatives in protecting their homes from wildfire, they inspire their neighbours, which creates a ripple effect of wildfire resiliency. Education can happen on many levels, from one-on-one training to social media campaigns.

Most permanent residents are aware of wildfire risks and are motivated to implement wildfire safety measures to protect their properties. This area receives a high number of tourists each year (mountain biking, motorized off-road vehicles, hunting and camping) as well as an increase in population and activity during the summer months when families vacation at their recreational properties. During the community engagement sessions, emphasis was placed on needing further education and communication that focused primarily on tourists, seasonal residents, and newcomers to the area as they may not have the knowledge of what can be done to increase wildfire resiliency. As a result, this increases the risk to residents that reside year-round in the area. The timing of increased communications should be focused in the spring and summer months in order to target recreational property owners and visitors that are

planning to frequent the area during the summer months. Collaborating with external agencies such as BC parks and school districts will also increase the distribution of FireSmart principles and wildfire readiness to further demographics within the electoral area.

The following table highlights the target audiences, delivery formats and topics that participants identified were important and the methods that could be considered to reach the widest audience.

Table 28: Education Delivery Audience, Format and Topics

Target Audiences	Education Delivery Formats	Education Topic Areas
General public Community members Existing and new/potential homeowners, which would include year-round residents and seasonal residents. Tourists Backcountry recreationists Businesses Farmers and ranchers	Open houses Information booths FireSmart demonstration projects Public presentations and information sessions (in-person and virtual) Mail outs Social media postings Videos posted on the SLRD website Door to door distribution of flyers and fact sheets Community information sessions Hands-on FireSmart 'community cleanup days Radio and newspaper advertisements Kiosks and/or billboards Public signage in key areas such as trail heads or information centres.	Wildfire mitigation, preparedness and readiness Emergency Preparedness Household emergency planning Proper backyard burning techniques FireSmart landscaping Locations to dispose of vegetation removed from yards Provide and review evacuation routes and procedures Demonstration videos including proper and safe fuel reduction techniques Backcountry FireSmart practices Available communication methods in the area Campfire bans Wildfire prevention messaging Road restrictions Back country closures Key emergency contact numbers

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Farmers and ranchers should also be engaged, providing education and planning support that is tailored to their specific needs due to the complexity of wildfire response and evacuations which involve livestock and farm infrastructure. An agriculture-specific wildfire plan can help producers pre-emptively make decisions, consider options and collect specific information that may be difficult to obtain during a crisis. This plan will help inform family members, staff, neighbours, and first responders how they can help during a wildfire emergency and ultimately will help reduce the potential for harm to agricultural operations, assets, crops and livestock from a wildfire. Vegetation management techniques, such as prescribed burning in grasslands or fields can also be discussed with ranchers. This would assist with reducing areas of elevated surface fuel loading on larger land parcels.

A formal communications strategy should be completed to detail timelines and delivery methods to ensure that education and communication happen on a regular and consistent basis.

Section 5.4 Education and Communication						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
9	Increased public messaging during the spring months and throughout the wildfire months.	Increased FireSmart and emergency preparedness public messaging reminding people of the importance of clearing hazards away from their recreational properties for upcoming wildfire seasons and emergency preparedness.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator SLRD Fire Departments Neighbourhood Champions SLRD Communications Department	Increased messaging frequency and targeted topic selection to coincide with appropriate preparednes s activities
10	Develop a formal communication strategy for information distribution throughout the wildfire season.	Improved coordination of SLRD messaging resulting in increased awareness for residents and tourists in the SLRD. This includes defining audiences, identifying key messages, creating a plan for outreach methods, and developing a timeline for messaging.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator and Communications Department	Communicati on strategy/plan
11	Work with school districts to incorporate FireSmart BC educational materials, wildfire preparedness information and household emergency planning including home evacuation route plans into lesson planning or school events.	To increase FireSmart, emergency and household preparedness awareness for school-aged children. Ideal timing is in the spring and/or during fire prevention week in October.	Mid Term (1-3 years)	Moderate	SLRD FireSmart Coordinator SLRD Fire Departments School District Liaisons	Hold at least one information session in the school annually
12	Engage with local ranchers and farmers to determine the interest in developing a Farm and Ranch Wildfire Plan with a Local FireSmart	Assist farmers with information for wildfire preparedness planning, including completing a Farm and Ranch Wildfire Plan that includes developing an	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator Qualified LFR	Engage with ranchers and complete one Farm and Ranch Wildfire Plan in 2023/24

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	Representative specializing in agriculture.	evacuation plan for livestock.				
13	Engage with Rec Sites and Trails BC and BC Parks to establish signage and/or display boards for key locations such as trailheads and kiosks that contains critical emergency information that the public should be aware of during wildfire season.	To provide the public with key information regarding evacuation routes, protocols and contacts in the event of a wildfire.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator Rec Sites and Trails / BC Parks	Designate or create at least one dedicated location to display public information.
14	Encourage BCWS to have more presence in and around the communities during active wildfire season, and to increase the number of fire ban signage (when applicable).	This will help to improve information exchange with tourists/visitors frequenting the back country, stronger enforcement of campfire bans, and increased presence for monitoring the area for fire starts.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator BCWS	Include this topic in an upcoming interagency meeting.
15	Continue to build upon successful FireSmart public education outreach initiatives that have been previously implemented.	Continued FireSmart and wildfire resiliency awareness through public events. Examples of successfully completed outreach activities are open houses, farmers market info booths, and virtual FireSmart seminars.	Ongoing	High	SLRD FireSmart Coordinator Community participants/Fire Departments/Fire Brigades/LFRs BC Wildfire Service	Hold at least 2 public education outreach initiatives annually.

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5.5 Legislation, Planning and Development

(Legislation & Planning | FireSmart BC) (Development Considerations | FireSmart BC)

Legislation, planning and development standards are an effective way for regional governments to improve the wildfire resiliency of their communities. Many of the services offered by a regional district require integration with wildfire resiliency initiatives, including housing development, emergency response, and community water systems. Existing legislation that may be applicable to implementation of components within the CWRP are:

- BC Building Act and Building Code
- BC Emergency Program Act
- BC Local Government Act
- Open Burning and Smoke Control Regulations (OBSCR)
- BC Wildfire Act
- BC Forest and Range Practices Act (FRPA)

- BC Foresters Act
- Canada Federal Fisheries Act and Species at Risk Act

Through good planning, communities can improve the chances that new or existing developments will successfully withstand the impacts of wildfires. Considering factors such as land use, structure density and road locations early in a development process can greatly improve the survivability of structures and neighbourhoods as well as facilitate better emergency response and first responder safety.

The Official Community Plan (OCP) for Area A provides a direction for land use and development that reflects the long-term vision and goals of the local communities. The OCP for Electoral A is currently being updated, and through the OCP community engagement sessions residents identified hazard planning as a top priority for consideration and action, along with environmental protection and outdoor recreation. Through these updates, there is opportunity to include additional or improved wildfire resiliency measures in the OCP including provisions for the design of new developments, FireSmart landscaping and building materials for new builds or renovations. The existing OCP currently has a defined Development Permit Area (DPA) 3: Wildfire Protection area. This DPA provides direction for construction on all properties in the Upper Bridge River Valley to ensure wildfire mitigation measures are in place. The boundaries of the Wildfire Protection DPA are shown on the CWRP Area of Interest and Values and Risk map in Appendix 3. It was noted that both Marshall Lake and Marshall Lake Road WUI areas are located outside of the current DPA area, and it is recommended that DPA 3 be reviewed and amended to include both the Marshall Lake and Marshall Lake Road WUI areas.

During a wildfire emergency, a vital piece of knowledge for emergency responders is how much water is readily available for fire suppression, how long it is available for and where to access additional sources if required. This information will be of particular importance if residential rooftop water sprinklers are being considered for implementation, or there are other known draws on water systems during an emergency, such as refilling water storage units or refilling mobile water tanks. Most residents in the communities have their own private water systems, so this information will be most applicable to the community water systems in Bralorne and Gold Bridge. If water availability during a wildfire event is found to be an issue, alternative and/or additional water storage units, such as cisterns or above-ground storage tanks should be installed. Additional water storage options should also be evaluated and considered during the design phase of the remote housing developments or new subdivisions. An experienced fire suppression specialist should be consulted to help determine appropriate locations and requirements for alternative water storage systems, if required.

Climatic trends are predicting an increase to both the frequency and intensity of wildfires in the future. An important component of community wildfire resiliency, emergency preparedness and recovery planning is understanding the wildfire risk and potential impacts a wildfire could have on community and domestic use watersheds. As seen with the 2021 wildfires, community watersheds that are the primarily water supply for several communities were greatly impacted. These watersheds may now experience longer term instability and compounding consequences such as terrain stability issues, channel blockages, and sediment loading which could potentially affect the future water quality and quantity for residents, especially during the freshet months. Engaging with and developing monitoring programs in conjunction with organizations such as the Ministry of Forests, Ministry of Environment and Climate Change Strategy and/or post-secondary institutions to further understand the climatic changes occurring in watersheds within the electoral area would help identify, monitor, and track changing trends. This information would then inform pre-emptive measures that could be explored for implementation to reduce potential impacts of wildfire to watersheds. Suggested areas that could be considered for integration in a monitoring program include the following:

- Climatic factors including temperature, precipitation, winds, snowpack levels, glacial melt and extreme weather events
- Disturbance trends including fire weather index, mass earth movements, insect and disease prevalence by seral stage, and soil moisture.
- Hydrology trends including stream flow by watershed, water temperature, channel stability, forest cover, erosion, and suspended sediment.

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- Biodiversity trends including regime shifts, seral stage, habitat supply, species health, connectivity, invasive species and distribution shifts.

Section 5.5 Legislation, Planning and Development						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
16	Conduct Critical Infrastructure assessments for all critical infrastructure, including those outside the WUI areas, but within the AoI.	Complete all CI assessments and recommended mitigative actions.	Short Term (Within 1 year)	High	SLRD FireSmart Coordinator Qualified LFR	Complete CI assessments and recommendation
17	Review pertinent sections of the OCP and embed FireSmart principles where applicable.	The OCP is currently being updated for Area A, providing the opportunity to include FireSmart principles to strengthen requirements for wildfire resiliency during new home development, renovations, and/or landscaping. This could include researching the impacts and feasibility of strengthening development and landscaping requirements for new home builds and renovations to meet current FireSmart standards. The economic and environmental impacts of these requirements would be considered prior to implementation.	Mid Term (1-3 years)	High	SLRD FireSmart Coordinator SLRD Planning Department	Inclusion of FireSmart principles in the updated OCP for Area A
18	Expand the Wildfire Development Permit Area (DPA) to include the Marshall Lake Road and Marshall Lake areas.	To ensure that all identified SLRD Area A WUI areas are included in the DPA so wildfire development bylaws apply to all residents.	Mid Term (1-3 years)	Moderate	SLRD Planning Department	Inclusion of Marshall Lake and Marshall Lake Road WUIs in the DPA area

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19	Conduct a review to assess the adequacy of water quantity for fire suppression activities within each SLRD community.	To understand the current capacity of community water systems (if present) in relation to fire suppression requirements to determine if improvements are needed.	Mid Term (1-3 years)	High	SLRD Planning Department SLRD Fire Chief	Report on community water system capacity for fire suppression.
20	Continue to include wildfire prevention and suppression considerations in the design of subdivisions (e.g., road widths, turning radius for emergency vehicles, and access and egress points).	Improved emergency response ability for new areas considered for development.	Ongoing	Moderate	SLRD Planning / SLRD Emergency Program	Updated bylaws and policies.
21	That the SLRD engage with organizations such as MOF, MOECCS and post-secondary institutions to further investigate and understand climatic changes that may be occurring within the electoral area. This data would help inform a pre-emptive wildfire hazard and risk analysis that could be completed for community and domestic use watersheds.	To provide SLRD with predictive information to allow planners to proactively develop and implement a mitigation plan to address identified potential impacts that could occur as a result of a wildfire event. This information would assist in understanding the short and mid-term implications a wildfire could have on the integrity of a watershed, including but not limited to water quantity and quality, terrain stability, riparian and wildlife considerations.	Long Term (3-5 years)	Moderate	SLRD/MOF/MOECCS Post-secondary Institutions	Include this topic at an upcoming interagency or Lillooet Area Community Wildfire Roundtable meeting

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5.6 Interagency Cooperation

(Interagency Cooperation | FireSmart BC)

Achieving wildfire resilience requires collaboration at all levels, from individual homeowners to local and regional government administrators, elected officials, local fire departments, and provincial government representatives. The collaboration of these groups is essential in successful emergency preparedness, prevention, response and recovery from wildfire events.

One of the most important relationships that must be fostered to increase the success of wildfire resiliency is between the SLRD and the Indigenous Nations and communities whose territories and areas of interest overlap with the Electoral area administration boundary. Relationships must be formed at both the grassroots and at the government-to-government tables, as many local indigenous communities reside immediately adjacent to the SLRD communities. It is crucial to have shared and aligned emergency preparedness objectives. The SLRD should expand their ongoing engagement efforts through extending invites to Indigenous Nations to planning tables and providing appropriate compensation for participation. It would also be beneficial for SLRD emergency program staff to participate in Indigenous cultural safety awareness training to provide additional tools in working towards more effective partnerships with local First Nations in emergency response and wildfire prevention.

The SLRD already has established relationships with many of the stakeholders involved in wildfire response for the communities in Area A, including the local fire brigades (Gun Lake and Bralorne), BC Wildfire Service, Ministry of Forests - Cascades Natural Resource District, Emergency Management BC, and other key players. During the development of the CWRP, Community FireSmart Resiliency Committees (CFRC's) and the Lillooet Area Wildfire Roundtable (LAWR) inter-agency meetings were held, which provided a platform for collaborative discussions. Meetings were held both virtually and in person. These meetings were integral in gathering local interests, concerns, input and suggestions into the development of this plan. These meetings also helped create and foster relationships to collectively share information and to explore a coordinated approach to emergency planning moving forward. The Upper St'at'imc communities and governments participated in both the local level CFRC meetings as well as at the high-level community roundtable meetings.

Through discussions at both the CFRC and LAWR meetings, several opportunities and suggestions were identified to improve both the working relationship and communication with other organizations who have a pivotal wildfire resiliency role within the electoral area:

- Additional engagement and collaboration efforts are required with Forest Licencees, MoF, MoTI and BC Hydro regarding the status, maintenance and upkeep of existing fire guards and secondary roads that are/could be used for community evacuation egress routes.
- Coordinate with the MoF, local forest licensees and woodlot owners to ensure that wildfire resiliency and fuel loading considerations are incorporated into any site-specific plans developed within the SLRD Area A WUI areas.
- Develop and strengthen relationships between the SLRD, BCWS and the communities in Area A to provide an increased presence in the area by BCWS staff during the wildfire season, and for improved collaboration on delivering community FireSmart projects. Potential opportunities can be built off successful past initiatives, such as the wildfire response training held with BCWS and the Gun Lake Fire Department.
- Planning is required for the protection of critical infrastructure outside of the WUI areas, including enhanced protection measures for provincial repeater/cell towers and internet infrastructure.
- Explore fuel reduction opportunities with BC Parks and Rec Sites and Trails BC who have jurisdiction over South Chilcotin Mountains Park and several other popular hiking trails and campgrounds in the local area. This area is a major tourist destination for hiking, biking, camping and horseback riding.
- Engage with the MoF, local fire departments and the Neighbourhood Champions on an annual basis to review and assess if any areas within the WUI have experienced increased fuel loading and/or wildfire threat including sources such as residual harvesting waste or excess firewood debris.
- Participants identified the following topics as suggested agenda items for discussion and collaboration at upcoming inter-agency meetings:
    - Completed and ongoing FireSmart programs and initiatives
    - Collaborative programming opportunities
    - Stakeholder updates
    - Evacuation routes
    - Completed and planned emergency preparedness exercises
    - Communication protocols
    - ERP presentation and reviews

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- Training opportunities
- Continual improvement feedback (fire season debriefs/lessons learned)

Section 5.6 Interagency Cooperation						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
22	Provide honoraria when inviting members of Indigenous communities to participate in SLRD-led inter-agency meetings.	To encourage inclusion and provide compensation for participation.	Short Term (Within 1 year)	High	SLRD Emergency Program	Secure funding
23	That SLRD staff participate in Indigenous cultural safety awareness training.	To provide a deeper understanding of Indigenous history and culture and to foster more effective partnerships with local First Nations in emergency response and wildfire prevention.	Short Term (Within 1 year)	Moderate	SLRD Staff	Complete training
24	Continue to organize/support/ participate in inter-agency meetings and Lillooet Area Community Wildfire Roundtable LACWR) meetings with key emergency response organizations including, but not limited to DoL, BCWS, MOF, BC Hydro, MOTI, EMCR, BC Parks, Rec Sites and Trails BC, local First Nation organizations, and community fire departments.	Continued coordination and collaboration with organizations involved in wildfire response and preparedness initiatives within the electoral area.	Ongoing	High	SLRD FireSmart Coordinator SLRD Emergency Program	Participation in all LACWR meetings and secure funding to host two inter-agency meetings per year.
25	Collaborate and engage with organizations such as MOF, forest licensees and local woodlot owners to ensure that a coordinated approach to future wildfire resiliency	To create a consistent and coordinated approach to wildfire resiliency and fuel reduction initiatives on the land base within the WUI area around communities,	Short Term (Within 1 year)	Moderate	SLRD FireSmart Coordinator Neighbourhood Champions and/or SLRD Area A Fire Department personnel	Complete an introductory meeting with identified stakeholders . Identify high-risk areas.

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	measures are incorporated into any land-based activities proposed in WUI areas.	including addressing potential excess fuel buildup in the WUI area around the communities.				
26	Engage with BC Parks and Rec Sites and Trails BC to explore options for fuel reduction opportunities along well used and travelled recreational trails in the Upper Bridge River Valley area, especially trails that are located in close proximity to the communities.	To explore collaborative opportunities for fuel reduction initiatives along potential fire ignition corridors. These features could also be considered for use as fuel breaks around communities.	Mid Term (1-3 years)	Moderate	SLRD FireSmart Coordinator Neighbourhood Champions and/or SLRD Area A Fire Department personnel	Complete an introductory meeting with identified stakeholders . Identify high-risk areas.

5.7 Emergency Planning

(Emergency Planning | FireSmart BC)

Community preparations for a wildfire emergency requires a multi-pronged approach. Individuals and agencies need to be ready to react by developing plans, mutual-aid agreements, resource inventories, training and emergency communication systems. Encouraging emergency planning by combining local knowledge with expertise in wildfire management helps communities become better prepared in responding to and recovering from a wildfire. The SLRD has recently expanded its emergency programming in response to increased natural disasters and an identified need for enhanced planning and emergency response. These expanded initiatives, particularly in relation to improved working relationships and organizational collaboration were positively noted during the community engagement sessions.

The remoteness of the Area A communities creates specific challenges with regard to emergency planning and response, including limited phone and internet access in some areas, non-paved, narrow and seasonal evacuation routes, long distances to service centres and delayed response times. These challenges highlight the need for enhanced comprehensive emergency planning and preparedness. Emergency preparedness in remote communities can be improved by providing the necessary skills, equipment, information and training to local residents in each community, who know the area best, and particularly to those individuals that are already involved in existing local response efforts.

The local emergency response plans should be updated with specific information that is applicable to each community requirements, needs, systems and infrastructure. Maps of all pre-identified evacuation routes should also be included in the emergency response plans as information for residents, responders and also those visiting in the area during the peak wildfire season months. Identifying at least two egress routes out of the local community centres, as well as out of the main Upper Bridge River Valley is a critical component for a safe and efficient evacuation. Support should be provided to local fire services personnel and/or local first responders to carry out pre-wildfire season evacuation route inspections of all identified roads, to ensure the routes will be functional during the wildfire season. Evacuation routes and procedures should also be developed for non-wildfire season periods when egress routes may be compromised due to weather or other natural events.

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An emergency communication protocol should be developed with the communities and included in each specific ERP. Because of the diverse communication systems and infrastructure within the communities, it is important to understand the existing systems, as well as the limitations, and what the communities are currently using for means of communication during emergency situations. It was identified that a communication liaison within each community should be delegated and have this information documented in the ERP. The communication liaison provides a critical link between neighbourhood residents and emergency response organizations.

Emergency response plans should be reviewed every 1-2 years with residents in the community and other emergency response organizations, prior to the wildfire season, and updates completed if necessary. In addition to updating the content in the ERP document, it is also important to evaluate and test the information and identified processes using pre-designed emergency exercises, such as workshops, tabletops, or functional exercises which can help test specific components of the response plan. Identifying gaps and providing additional training to responders and residents will help reduce confusion and fear during a real-life event.

Backup power system requirements for critical infrastructure in the communities should be evaluated and implemented, focusing primarily on the main community water and sewer systems. Most residents that reside outside of Bralorne and Gold Bridge have private water and sewer systems that already have privately owned backup systems. Having a secondary backup electrical source will ensure that critical services are able to continue functioning even if the main electrical power sources have been compromised by an emergency event. Engaging with local businesses, who have been identified as providing an essential service during an emergency to encourage them to also explore the requirements and installation of a backup system for their infrastructure. Having operational essential services would be important if a shelter in place event was ever required for the community.

A recommendation was made during the community engagement sessions to purchase additional mobile fire response units (both suppression equipment units and SPU trailers) and situate them in strategic areas within the WUI area not currently covered by fire protection services (Tyaughton Lake, Marshall Lake, Marshall Lake Road and Gun Lake north). These mobile units would greatly improve first responders response time, and the ability to strategically and rapidly deploy suppression equipment as required. Equipment training, mobilization and setup training would be required. The locations of where the mobile units would be situated would be included in a Community Structure Protection Plan, which would then be shared with BCWS and other emergency responders to provide information around available local resources that can be utilized during a wildfire event. This would ensure the coordinated deployment of SPU units between local responders and BC Wildfire if required. The Community Structure Protection Plan would also provide situational awareness information for emergency responders with limited understanding of the geography and local conditions. Additionally, the current Fire Protection agreements could be reviewed to evaluate the possibility of officially including Gold Bridge, Gun Lake Road, Tyaughton Lake and Marshall Lake/Marshal Lake Road into the AoR of the Bralorne VFD or the GLFPS.

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Section 5.7 Emergency Planning						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
27	Update community Emergency Response Plans. Ensure each plan is specific to each community's needs and requirements. Increase the frequency of reviewing the plan with the community to annually or to a maximum of every two years.	To provide ongoing or updated emergency preparedness information to community members for emergency events.	Short Term (Within 1 year)	High	SLRD Emergency Program	Hold one meeting annually with each specific community to review and update the ERP.

28	Develop a comprehensive communication protocol for emergency events specific to each community's needs and communication infrastructure requirements.	To improve effective communication during emergency events.	Short Term (Within 1 year)	High	SLRD Communities SLRD Emergency Program	Communicati on Protocol
29	Support and encourage the development of communication liaisons – residents who can be a point of contact for a neighbourhood or community.	This will improve the flow of communications during wildfires between emergency response organizations and communities for remote areas that have limited cell service and internet access.	Mid Term	High	SLRD Emergency Program	Identification of 1 liaison per community.
30	Review communication options for providing Marshall Lake residents with emergency alert systems.	To ensure that Marshall Lake residents receive emergency alert information in a timely manner.	Mid Term (1-3 years)	High	SLRD Emergency Program	Integrated emergency alert system for Marshall Lake residents
31	Provide support to local fire services personnel to carry out pre-wildfire season evacuation route inspections of all evacuation routes identified in the ERP.	To ensure that all identified evacuation routes are passable during an emergency event. This will involve coordination with other agencies responsible for the upkeep and maintenance of these routes if repairs are required.	Short Term (Within 1 year)	High	SLRD Emergency Program SLRD Fire Departments/Fire Brigades	Identify costs and secure funding to support and complete pre-wildfire season inspections
32	Develop and conduct various tabletop evacuation scenarios with SLRD communities.	That an all-hazard planning approach is taken to ensure that residents are functionally prepared for all types of emergency events and situations.	Mid Term (1-3 years)	Moderate to High	SLRD Emergency Program	Complete one tabletop evacuation scenario with the SLRD Area A communities by 2024-2025.

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33	Install backup power systems/generators for all SLRD critical infrastructure assets, particularly the Bralorne and Gold Bridge water and sewer systems.	To ensure that critical services can continue to function even if the electrical grid system is compromised by a wildfire or other event.	Mid Term (1-3 years)	High	SLRD Planning/ SLRD Emergency Program	Secure funding
34	Engage with and encourage SLRD Area A businesses and other organizations that own essential service infrastructure to also invest in backup power generators.	Backup power will provide business continuity during an emergency event even if the electrical system has been compromised. This is of particular importance during a shelter in place event due to the remote location of the communities.	Short Term (Within 1 year)	Moderate	SLRD FireSmart Coordinator SLRD Emergency Program	Hold one meeting with SLRD Area A businesses in 2023-2024.
35	Initiate the purchase of mobile fire suppression and SPU units and situate them in strategic locations in WUI areas that are not currently covered under fire protection services (Tyaughton Lake, Marshall Lake, Marshall Lake Road and Gun Lake north).	These units would be included in the SPU plan for the communities and provide additional first response suppression equipment available for use by local responders during a wildfire event.	Mid-Term (1-3 years)	High	SLRD Emergency Program Local fire Departments / Brigades	Secure funding through CRI
36	Complete a Community Structure Protection Plan for each community and share with BCWS to facilitate rapid and coordinated deployment of SPU units in an emergency.	The Community Structure Protection Plan will play a crucial pre-organizational role for wildfire preparedness by ensuring that adequate SPU resources are identified, are available and strategic placements determined prior to a wildfire event.	Short Term (within 1 year)	High	SLRD Regional Fire Chief Local fire Departments / Brigades	Report

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37	Review the current Fire Protection agreements to evaluate the option of including Gold Bridge, Gun Lake Road, Tyaughton Lake, Marshall Lake and Marshal Lake Road into the AoR of the Bralorne Volunteer Fire Department or the Gun Lake Fire Protection Society.	To provide additional emergency response capacity to communities who are currently located outside the local fire response AoR.	Long Term (3-5 years)	Moderate	SLRD Emergency Program SLRD Regional Fire Chief Local fire Departments / Brigades	Complete review of existing agreements to examine feasibility.

5.8 Cross Training

(Cross-training | FireSmart BC)

Cross training focuses on sharing the necessary knowledge needed to address structural and wildland fires. Courses focus on equipment, practical skills, fire behaviour, communications and various other firefighting techniques. FireSmart cross training enables specialized firefighters from one discipline to gain the basic skills of the other discipline. In order to improve response capabilities and increase community safety, cross-training can occur between structural firefighters, wildland firefighters, SLRD staff, First Nations administrations, and other key players in wildfire response. Cross training fosters better communication between jurisdictions and provides necessary skills to others that may be involved in emergency response, but who may not typically work in a wildfire or structural firefighting environment. Providing support and training for interested individuals in the communities to increase their knowledge around both the Emergency Operations Center (EOC) and Incident Command System (ICS) is also recommended. These are the standardized systems that are used during emergencies by emergency response organizations and providing training would greatly enhance the understanding and communication between those who are involved in response efforts, but may not have formal training, responding agencies and community members.

Due to the isolated location of the Area A communities, emergency response from outside agencies can sometimes take several hours to arrive on site. When a wildfire occurs in the Electoral Area A, local fire brigades, individuals and organizations come together out of necessity as a collective to respond to a fire, often well before BCWS is able to arrive on site. This underscores the need for enhanced cross-training for residents, fire brigades and community organizations who are the default first responders in Area A. A key recommendation that was highlighted during the CFRC meetings was to identify funding to support and deliver basic wildfire response training for all current and interested first responders, including local individuals, community organizations and fire departments. Funding should include delivering variety of courses, including basic wildfire suppression, safety training, equipment use, fire behaviour and structural firefighting modules. This training will help build community capacity and their ability to provide safe and efficient first response activities in the event of a fire. The following course outline is an example of a basic wildland fire suppression training program that has been delivered in other communities:

- Basic Power Saw Safety, Based on BC Forest Safety Council
- FireSmart Community Champion
- Grp S Structure Protection Group Supervisor
- Home Partners Program
- ICS 100 Incident Command System
- Local FireSmart Representative training
- S 100 Basic Fire Suppression & Safety Day 1 + 2
- S 185 Fire Entrapment Avoidance & Safety
- S 211 The Fire Environment for Fire Fighters & Dispatchers
- S 211 The Fire Environment for Fire Fighters & Dispatchers

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- S 212 Fire Line Communications,
- S 213 Use of Bulldozers
- S 230 Introduction to Supervision (Crew Boss)
- S 231 Engine Boss
- S 235 Burn Off and Backfiring
- S 290 Principles of Fire Behaviour
- Task Force Leader
- Wildfire Risk Reduction Basics
- WSPP-115 Structure Protection Unit Crews and WSPP-FF1 Train the Trainer

Another recommendation that was made was identifying a need to develop and create a training and succession/recruitment plan for the current local fire brigades and fire departments. The current fire department and fire brigade members have been with their respective organizations for many years, and relayed the need to 'pass the corporate knowledge torch' along to other community members who may have an interest in becoming involved in community emergency response. The development of a training and succession/recruitment plan will assist with developing skill sets for new members, and providing assurance to the community that essential first response will continue for the communities in the future.

Section 5.8 Cross Training						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
38	Fund, support and provide additional emergency response training and education, including basic EOC and ICS training for local first responders, Neighbourhood Champions and interested community members.	To increase community awareness and knowledge about the standardized Incident Command Systems that are used during emergencies.	Short Term (Within 1 year)	Moderate	SLRD Emergency Program	Fund and coordinate training sessions.
39	Fund and assist coordinate training sessions for the local community fire services personnel, first responders and interested community members to practise and improve on basic fire suppression techniques and tactics including joint training sessions with BCWS.	Due to the remoteness of the communities and lengthy response times, it is imperative to have locally trained first responders to provide initial fire suppression response safely and effectively for interface fires.	Short Term (Within 1 year)	High	SLRD Regional Fire Chief in conjunction with BCWS and/or other qualified training facilitators Local Fire Departments / Brigades	Fund and assist coordination of training sessions
40	That SLRD provide assistance to the volunteer fire departments to create and complete a training/recruitment plan for each established SLRD fire response entity.	To ensure that there is ongoing and sustained capacity within the communities for future local fire suppression and emergency response needs. The plan should identify the type of	Mid Term (1-3 years)	Moderate	SLRD Regional Fire Chief Local fire Departments / Brigades	Completed training and recruitment plan

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		training required, costs and timelines for implementation. This plan should also integrate various FireSmart training initiatives.				

5.9 Vegetation Management and Forest Fuel Reduction

(Vegetation Management | FireSmart BC)

The impacts of an extreme wildfire on a community can be mitigated through the implementation of vegetation management and forest fuel reduction at multiple scales. Vegetation management and fuel reduction strategies should be designed and implemented within each of the following zones – the Structure Ignition Zone (0-100 m from structure) and the Wildland Urban Interface Zone (100-1000 m from structures). Completing comprehensive fuel reduction or modification treatments in these zones will greatly enhance wildfire resiliency in and around communities. A general strategy is to complete vegetation management near homes and structures first and then move outwards into the WUI zone. The more aggressive vegetation reduction should occur within 30 metres of the home. The objectives of vegetation management within these zones will vary based on site-specific factors such as topography, vegetation or fuel type, proximity to structures, and ecosystem values.

The Structure Ignition Zone (SIZ) includes proposed activities that are 0-100 m from a home or critical infrastructure. These areas are typically located on private, federal or municipal land jurisdictions, and can overlap multiple land jurisdictions. It is important to work closely and collaboratively with neighbouring landowners to achieve targeted vegetation reduction objectives in overlapping areas in this zone. Vegetation management and reduction recommendations for this zone are primarily focused on areas immediately adjacent to and surrounding structures and include tasks that property owners can undertake themselves. Recommendations for vegetation management around critical infrastructure may differ slightly then for those around homes. Critical infrastructure requirements will be assessed by a Local FireSmart Representative and tailored to each structure.

Fuel reduction in the Wildland Urban Interface (WUI) zone is typically completed in 100 metres to 1000 metres out from structures. In this zone, fuel reduction and vegetation management planning is often done at the landscape level, with an objective of reducing forest fuels to a level that will lower the probability of an extreme or "mega" fire threatening communities. Fuel reduction planning in this zone incorporates natural landscape features such as roads, water bodies or other natural non-combustible or fuel-free areas as tactical fire suppression anchor points in the design of proposed treatment areas. Vegetation reduction strategies in these areas can be accomplished through a number of techniques including hand treatments, mechanical fuel reduction techniques such as timber harvesting or commercial thinning, alternative silviculture practices such as realigning cutblock boundaries, reduction of stocking standards in key areas, widening roads right-of-ways, or through the use of prescribed fire.

Section 5.9 Vegetation Management						
Action Item	**Recommended Activity**	**Description**	**Timing**	**Priority**	**Responsibility**	**Output**
41	Create tenured vegetation disposal sites near each community in Area A.	This will provide alternatives to burning on private properties where there are small lots adjacent to wildland debris	Mid Term (1-3 years)	Moderate	SLRD Emergency Program and Environmental Services Department	Identify and designate appropriate vegetation disposal sites for

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		(e.g., Marshall Lake and Gun Lake) and discourage illegal dumping of vegetative debris.				each community.
42	Fund and coordinate a seasonal roadside chipping program for residents.	Participants would bring vegetative debris to the roadside for chipping by an arborist company and provide alternative options for debris disposal for local residents. This would further encourage residents to complete vegetation reduction in and around their properties.	Short Term (Within 1 year)	Moderate	SLRD Emergency Program SLRD FireSmart Coordinator	Secure funding and contractors
43	Advocate to the UBCM for funds that provide free vegetation removal programs for residents located on high-risk properties.	Homeowners will be able to reduce their wildfire risk regardless of financial status, physical ability, remoteness, and other barriers.	Mid Term (1-3 years)	High	SLRD Emergency Program	Restore similar activities that were included in the past CRI Stream 3 program.
44	Develop an annual vegetation maintenance program to ensure that vegetation around all identified SLRD critical infrastructure (particularly in zone 1) is kept maintained throughout the wildfire season. Areas around other public buildings should also be considered for inclusion.	This will further reduce the possibility of a wildfire impacting critical infrastructure. A maintenance plan should identify the frequency and type of vegetation maintenance needed such as full removal, weed whacking, pruning, or watering.	Short Term (Within 1 year)	High	SLRD Emergency Program SLRD FireSmart Coordinator	Vegetation maintenance plan development

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		Implementation could be achieved through existing or new staff, including summer students.				
45	That the SLRD work with WRR program staff to complete fuel reduction treatments (forest fuel reduction and prescribed burning) for the proposed treatment areas identified in the SLRD Area A WUI Areas.	Reduction of high hazard fuels/vegetation adjacent to the communities.	Short Term (Within 1 year)	High	SLRD Emergency Program SLRD FireSmart Coordinator Cascades Natural Resource District WRR staff.	Identify priority areas and secure treatment funding.

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5.9.1 Structure Ignition (SI) Zone Fuel Reduction and Vegetation Management

Vegetation management in the SI zone which is completed within 100 metres of a home or structure (also called the WUI 100). In this zone, vegetation management is focused on reducing flammable plants in the first 30 m of the home (both landscaping plants and natural vegetation), clearing dry and dead materials from roofs and gutters, and disposing of the resulting vegetative debris. Work in the Structure Ignition Zone is focused on the areas closest to the home, then working outwards. The SI Zone is divided into four sub-zones to help homeowners focus and prioritize their efforts.

Non-combustible Zone (0 – 1.5m from structures). This zone focuses on reducing the risk of wind-blown embers igniting materials on or near the structure. It is essential that all combustible items and vegetation are removed from this zone. Property owners should create a 1.5 metre wide zone of concrete, gravel, dirt or short lawn immediately next to the structure, keep roofs and gutters clean, and avoid storing combustible items on or under decks (for example; firewood, tires, recycling, and furniture).

Zone 1 (1.5 – 10 metres from structure): All coniferous trees and high flammability shrubs should be removed from this zone. Grasses should be regularly mowed and any dead vegetation removed. Deciduous tree may be planted if tree cover is desired. The following plants are examples of high-flammability plants that should be removed:

- Douglas-fir
- Ponderosa pine
- Cedar hedges
- Juniper
- Spruce
- Long, dry grasses, including decorative grasses

Zone 2 (10 – 30 metres from structure): Lawn, grasslands and fields should be regularly mowed in this zone. If there are conifer trees in this zone, select trees should be removed to ensure that there is 3 metres of space between the branches of each tree. Branches from the lower 2 metres of the trunks should be removed. Trees can be pruned up to 5 metres as long as no more than 30% of the live branches are removed. Dead wood, twigs and needles should be removed.

Zone 3 (30 – 100 m from structure). Work in this zone helps reduce the intensity of wildfires that are approaching from a distance. Property owners should selectively remove trees so that there is a 3-meter gap between the crowns of each tree. Lower branches of conifer trees should be removed from the lower 5 metres of the tree (to a maximum of 30% removal of live crown), and dead vegetation and needle buildup should be removed from the ground. Grasslands and fields in this zone should also be maintained regularly through controlled burning, mowing, and/or irrigation to reduce fuel load and increase fuel moisture.

Figure 14: Structure Ignition Zone

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Reducing vegetation generates residual debris. This debris should be eliminated on site or brought to a location at least 100 metres from any home or structure. There is one designated debris disposal site for residents of Area A, which is located at the Gold Bridge Transfer Station. Due to the designated disposal site being a long distance from most homes, it has been common practice for residents to just leave the debris in the home ignition zone, dump it illegally, or burn it on site. While some residents can safely burn the debris on their property, most homeowners find this challenging due to small property sizes, burning restrictions, lack of experience and/or risk to their own property, or surrounding properties. A possible solution to encourage increased debris disposal away from structures is to create tenured disposal sites in each of the six communities. The debris at these sites would need to be regularly maintained through burning, chipping, composting or other means. As additional support and education around the importance of removing debris, the SLRD could consider implementing a roadside chipping program and collaborating with BCWS or the Fire Departments to provide education to homeowners about safe burning practices or other methods such as composting.

Through past programming, the residents of Area A were introduced to the importance of vegetation removal in the Structure Ignition Zone through participation in SLRD-led FireSmart Home Ignition Zone assessments and vegetation removal programs. During the implementation of these initiatives, there was overall positive feedback received regarding the programming, although challenges such as mobility issues, aging populations, high costs to implement the recommendations, lack of debris disposal sites and access to professionals were communicated as barriers for community members to fully implement their vegetation reduction recommendations noted on their HIZ assessments. It is recommended that the SLRD advocate to the UBCM to restore funding to implement programs similar to the CRI Stream 3 - 65+

program, which was extremely successful in helping address some of the barriers noted above that many residents faced.

Identified critical infrastructure in Area A should have a maintenance plan developed to ensure that vegetation in zone 1 remains maintained or watered during the wildfire season months. This will help reduce the chance of wildfires damaging critical infrastructure (such as communication towers and water systems).

5.9.2 Wildland Urban Interface (WUI) Zone Vegetation and Fuel Reduction

Vegetation management and fuel reduction strategies in the WUI zone area are designed to alter the forest fuel conditions, that in the event of a wildfire the levels of fire behaviour, the likelihood of crown fire initiation, fire intensity and rate of spread will be reduced to a level that the wildfire will be less aggressive and destructive in areas of close proximity to communities.

Fuel reduction projects reduce the risk to the adjacent residences from severe wildfire by reducing the surface fuels (including the accumulation of dead and downed trees), removing the ladder fuels and opening up the overstory forest canopy. Thinning/brushing and pruning treatments focus on reducing the crown closure and crown bulk density while greatly increasing the crown base height to levels that will inhibit a ground surface fire from reaching the crown, while still providing the proper crop tree foliage retention for continued growth. Wildfire behaviour threats are also decreased by targeting the surface fuel continuity (where possible), fine woody debris, large woody debris, live and dead coniferous crown closure percentages, increasing conifer crown base height, and reducing the density of suppressed and understory conifers. Surface cleanup and debris disposal through piling and burning further reduces the current fine fuel and excess large woody debris content throughout the treatment areas. The application of a low intensity under burn should also be considered to further reduce excess surface fuel remaining from treatments.

Fuel reduction strategies are accomplished through tree felling, hazard tree removal, brushing, thinning, pruning, prescribed and cultural burning, along with debris disposal, and can be accomplished using hand or mechanical treatments. Treatment regimes generally include the activities listed below. Hand treatments are the generally preferred method to reduce fuels in close proximity to community as opposed to using heavy equipment. Mechanical fuel reduction treatments can include the integration of commercial thinning and/or harvesting treatment opportunities, and generally focus on thinning the upper layers of the forest canopy, removing ladder fuels and disposing of the resulting debris.

Treatment area field work and development of a Fuel Reduction Prescription

The boundaries of a proposed Treatment Unit will be mapped and areas to be excluded such as cultural sites, wildlife trees, and riparian zones will be identified. A Fuel Reduction Prescription will be completed by a Registered Professional Forester that outlines the forest management activities to be undertaken and provides measurable objectives and targets to be achieved on a site-specific basis. Discussions with all First Nations, local governments, agencies, ministries and stakeholders potentially impacted by the proposed forest Fuel Reduction activities will be done to solicit feedback and incorporated into the prescription where required.

Hand Treatments

Thinning reduces the crown density and inter-tree connectivity within a stand. Brushing is done to remove identified brush and other ladder debris from under the crown of leave trees. Dead and dying stems and vegetation are also removed with the exception of that designated for wildlife retention. Pruning removes the lower branches of leave trees preventing a ground fire from spreading up into the crown of the tree through the severing of the continuity of ground ladder fuels to tree crowns. The resulting debris from operational treatment activities will be managed through one or more of the following techniques: hand piling and burning, chipping and/or hauling, removal as posts, rails or firewood or removed off site.

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Timber Harvesting

The harvesting of mature timber is an optional treatment approach that may be considered as part of the overall fuel reduction objectives for a given area if it is operationally feasible and within a suitable forest type. If timber harvesting is considered, a qualified and experienced Professional Forester will prepare and execute a prescription specific to the treatment approach. For proposed timber harvesting within WUI areas, it is recommended that the SLRD engages with operational planners to ensure that community, environmental and wildfire risk reduction values are accounted for, including recreation, riparian, wildlife and post-harvest debris loading considerations.

Cultural Burning and Prescribed Fire

Indigenous people have used fire for thousands of years to create and maintain hunting grounds, cleansing the land of insect and disease, maintenance of wildlife habitat and to promote herb and berry production. Cultural burning practices are Indigenous-led and utilize a low intensity burn that is strategic, planned, controlled and requires comprehensive engagement and guidance from Elders and/or Fire Knowledge Holders. Since time immemorial, cultural burning practices have been carried out by Indigenous communities to enhance the health of the land and its peoples from cleaning trails, reducing fuels, maintaining ecosystem stewardship, including advancing cultural objectives for traditional diet/nutrition, medicinal and livelihood (Caverley, Cardinal Christianson, & Eustache, n.d.).

Prescribed fire is the planned and controlled application of fire to achieve desired objectives. It is an ecologically appropriate means for achieving a variety of land management objectives and has a long history in British Columbia. The regular burning of forests and grasslands plays a vital role in maintaining the health of “fire-maintained” ecosystems by encouraging the proliferation of the important native plant species while hindering the spread of invasive species, or introduction and encroachment of shrubs and tree species from other ecosystems.

Where suitable, the application of a low-intensity burn should be integrated into proposed treatments to further reduce the residual fine fuel content in treatment areas. Care must be taken to appropriately assess and design the burn to ensure that the application of fire will achieve the stated objectives and be applied at the most ecologically appropriate time of year.

Maintenance Treatments.

Once an area is successfully treated through the various operational activities outlined in the previous sections, it is equally important to monitor that area on a regular basis to ensure that the wildfire threat is not increasing due to juvenile stem ingrowth, windthrow and surface fuel accumulations. All the activities described above can be considered as part of a maintenance program to address any increase in wildfire threat in previously treated areas.

Project Implementation.

Project implementation, monitoring, quality assurance and reporting of fuel treatment activities by experienced professionals and field technicians ensures that all work will be implemented using safe-work practices and completed to the standards detailed in the prescription or burn plan.

At the WUI level, vegetation management and fuel reduction programs are administered by and delivered through the Ministry of Forests Wildfire Risk Reduction (WRR) program - Cascades Natural Resource District for the SLRD Area A. Provincial WRR funding for crown land fuel mitigation projects flows to the Natural Resource Districts which select projects for implementation and distribute project funding. Through identification of treatment areas proposed in the CWRP’s, the WRR program works with regional districts, Indigenous Nations, BC parks and other organizations to identify those areas of crown land near communities that are of high priority for fuel treatments and develop projects aimed at reducing the wildfire threat.

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Fifty-three (53) individual treatment units have been developed for this Community Wildfire Resiliency Plan based on an in-depth analysis of wildfire risk factors and community values and are listed in and shown on the following table and maps. Data considered in the analysis included Provincial Strategic Threat Analysis (PSTA) mapping, slope, aspect, wind direction, and fuel type. Fuel and wildfire threat information was verified through local-area fieldwork. The location of treatment units also considers the proximity to homes and other values and linkages to previously treated areas or natural fuel breaks.

Table 29: Fuel Reduction Treatment Area Summary

CWRP WUI Area	TU#	Area (ha)	Local Fuel Threat	Priority	Treatment Type/Objective
Bralorne	BRA1	77.8	High	Moderate	Interface: surface, ladder and crown fuel reduction
Bralorne	BRA2	6.6	Moderate-High	High	Interface: surface, ladder and crown fuel reduction
Bralorne	BRA3	26.3	High	Moderate	Interface: surface, ladder and crown fuel reduction
Bralorne	BRA4	21.3	High	High	Interface: surface, ladder and crown fuel reduction
Bralorne	BRA5	8.6	Low-Moderate	High	Interface: surface, ladder and crown fuel reduction
Bralorne	BRA6	4.8	Moderate	High	Interface: surface, ladder and crown fuel reduction
Bralorne	BRA7	21.1	High	High	Interface: surface, ladder and crown fuel reduction
Bralorne	BRA8	10.8	Moderate	Moderate	Interface: surface, ladder and crown fuel reduction
Bralorne	BRA9	33.7	Moderate	High	Interface: surface, ladder and crown fuel reduction
Bralorne	BRA10	14.4	Moderate	Moderate	Interface: surface, ladder and crown fuel reduction
Bralorne	BRA11	61.9	Moderate	Moderate	Interface: surface, ladder and crown fuel reduction
Gold Bridge	GBR1	33.5	Moderate	High	Interface: surface, ladder and crown fuel reduction, evac. road buffer expansion
Gold Bridge	GBR2	13.5	Moderate	High	Interface: surface, ladder and crown fuel reduction
Gold Bridge	GBR3	5.1	Moderate	High	Interface: surface, ladder and crown fuel reduction
Gold Bridge	GBR4	10.9	Moderate-High	High	Interface: surface, ladder and crown fuel reduction
Gold Bridge	GBR5	16.4	Moderate	High	Interface: surface, ladder and crown fuel reduction
Gold Bridge	GBR6	51.2	Moderate-High	Moderate	Interface: surface, ladder and crown fuel reduction

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Gold Bridge	GBR7	22.1	High	Moderate	Interface: surface, ladder and crown fuel reduction
Gold Bridge	GBR8	14.0	Moderate	Low	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL1	38.4	Moderate	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL2	35.8	Moderate	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL3	51.4	Moderate-High	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL4	19.5	Moderate	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL5	27.9	Moderate	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL6	26.3	Moderate-High	Moderate	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL7	28.7	Moderate	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL8	27.4	Low-Moderate	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL9	37.4	High	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL10	19.1	Low	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL11	58.6	Moderate	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL12	13.6	Moderate	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL13	55.5	Moderate-High	High	Interface: surface, ladder and crown fuel reduction
Gun Lake	GL14	19.6	Moderate	Low	Fuel Reduction: evac road buffer expansion
Gun Lake	GL15	14.3	Moderate	Moderate	Fuel Reduction: evac. road buffer expansion
Marshall Lake	ML1	13.8	High	Moderate	Interface: surface, ladder and crown fuel reduction
Marshall Lake	ML2	35.6	High	High	Interface: surface, ladder and crown fuel reduction
Marshall Lake	ML3	20.6	High	High	Interface: surface, ladder and crown fuel reduction
Marshall Lake	ML4	15.1	Moderate-High	High	Interface: surface, ladder and crown fuel reduction
Marshall Lake	ML5	33.7	Moderate	Moderate	Interface: surface, ladder and crown fuel reduction

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Marshall Lake Rd	MLR1	9.6	Moderate	Moderate	Interface: surface, ladder and crown fuel reduction
Marshall Lake Rd	MLR2	35.0	Moderate-High	Moderate	Interface: surface, ladder and crown fuel reduction
Marshall Lake Rd	MLR3	41.5	Moderate-High	Moderate	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL1	16.9	Low	High	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL2	37.0	Moderate-High	High	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL3	20.9	Moderate	High	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL4	9.1	Low	High	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL5	40.0	Moderate	High	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL6	31.8	Moderate	Moderate	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL7	12.2	Moderate	Moderate	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL8	17.9	Moderate	Moderate	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL9	19.0	Moderate	High	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL10	20.2	High	High	Interface: surface, ladder and crown fuel reduction
Tyaughton Lake	TL11	17.9	Moderate-High	Low	Fuel Reduction: road buffer expansion

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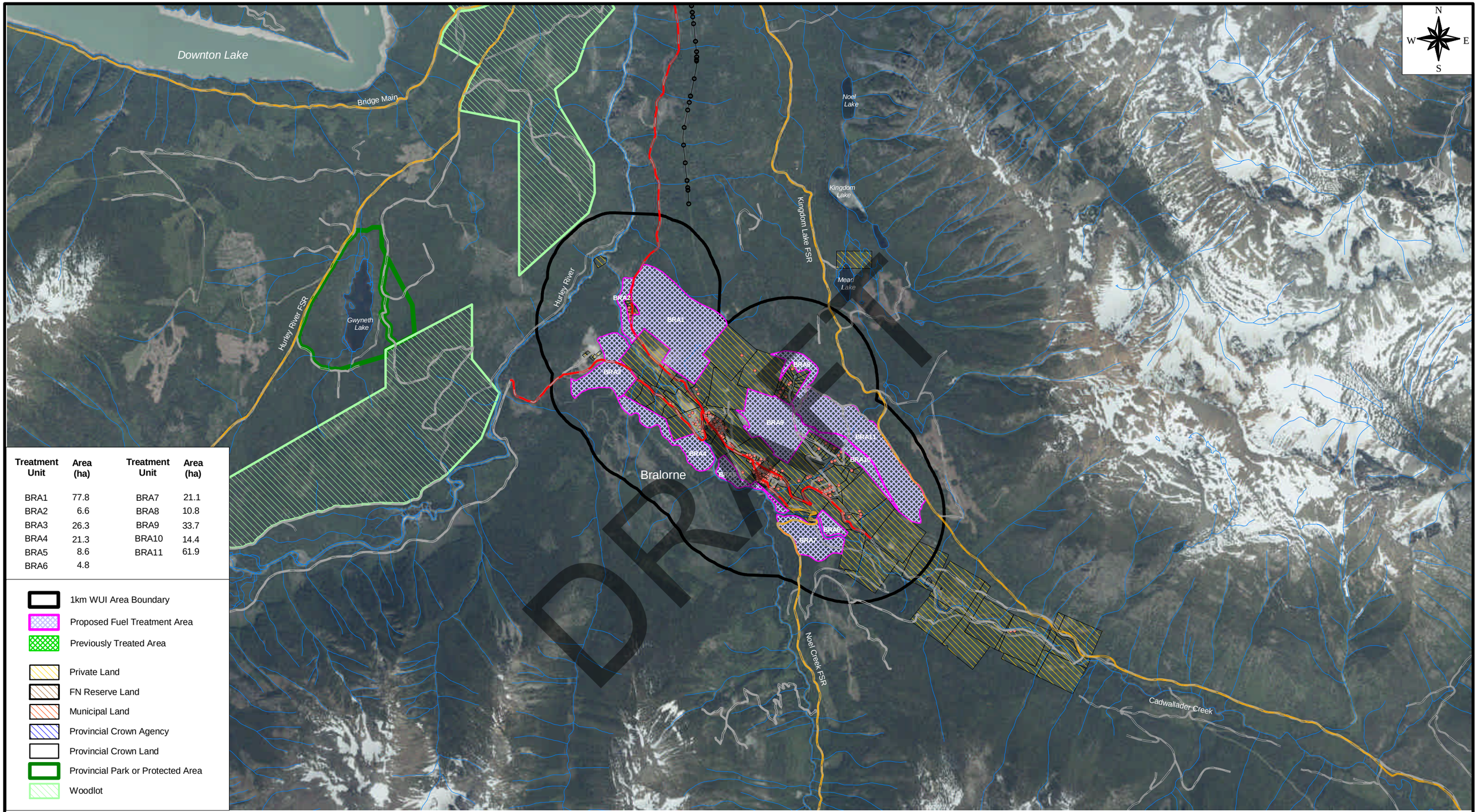


Treatment Unit	Area (ha)	Treatment Unit	Area (ha)
BRA1	77.8	BRA7	21.1
BRA2	6.6	BRA8	10.8
BRA3	26.3	BRA9	33.7
BRA4	21.3	BRA10	14.4
BRA5	8.6	BRA11	61.9
BRA6	4.8		

- 1km WUI Area Boundary
- Proposed Fuel Treatment Area
- Previously Treated Area
- Private Land
- FN Reserve Land
- Municipal Land
- Provincial Crown Agency
- Provincial Crown Land
- Provincial Park or Protected Area
- Woodlot
- Structure
- Primary Roads
- Secondary Roads
- Forest Service Road
- BC Hydro Transmission Line
- Streams

PROPOSED FUEL TREATMENT UNITS

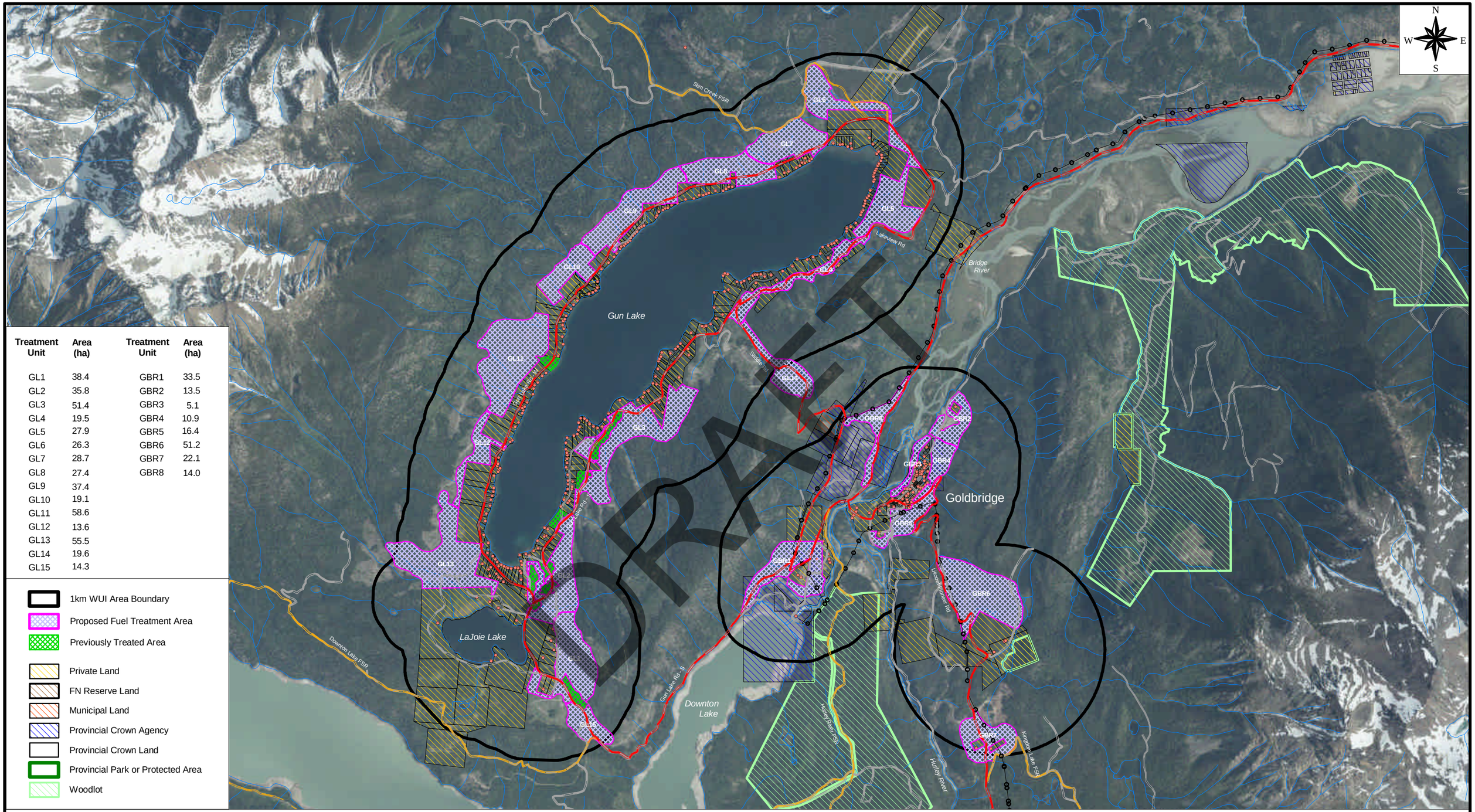
Squamish-Lillooet Regional District - Electoral Area A CWRP
Bralorne

1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: December 28, 2022

Landscope Consulting Corporation



Treatment Unit	Area (ha)	Treatment Unit	Area (ha)
GL1	38.4	GBR1	33.5
GL2	35.8	GBR2	13.5
GL3	51.4	GBR3	5.1
GL4	19.5	GBR4	10.9
GL5	27.9	GBR5	16.4
GL6	26.3	GBR6	51.2
GL7	28.7	GBR7	22.1
GL8	27.4	GBR8	14.0
GL9	37.4		
GL10	19.1		
GL11	58.6		
GL12	13.6		
GL13	55.5		
GL14	19.6		
GL15	14.3		

- 1km WUI Area Boundary
- Proposed Fuel Treatment Area
- Previously Treated Area
- Private Land
- FN Reserve Land
- Municipal Land
- Provincial Crown Agency
- Provincial Crown Land
- Provincial Park or Protected Area
- Woodlot
- Structure
- Primary Roads
- Secondary Roads
- Forest Service Road
- BC Hydro Transmission Line
- Streams

PROPOSED FUEL TREATMENT UNITS

Squamish-Lillooet Regional District - Electoral Area A CWRP
Gun Lake & Goldbridge

1:40,000

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Mapping Project: SLRD Area A_CWRP
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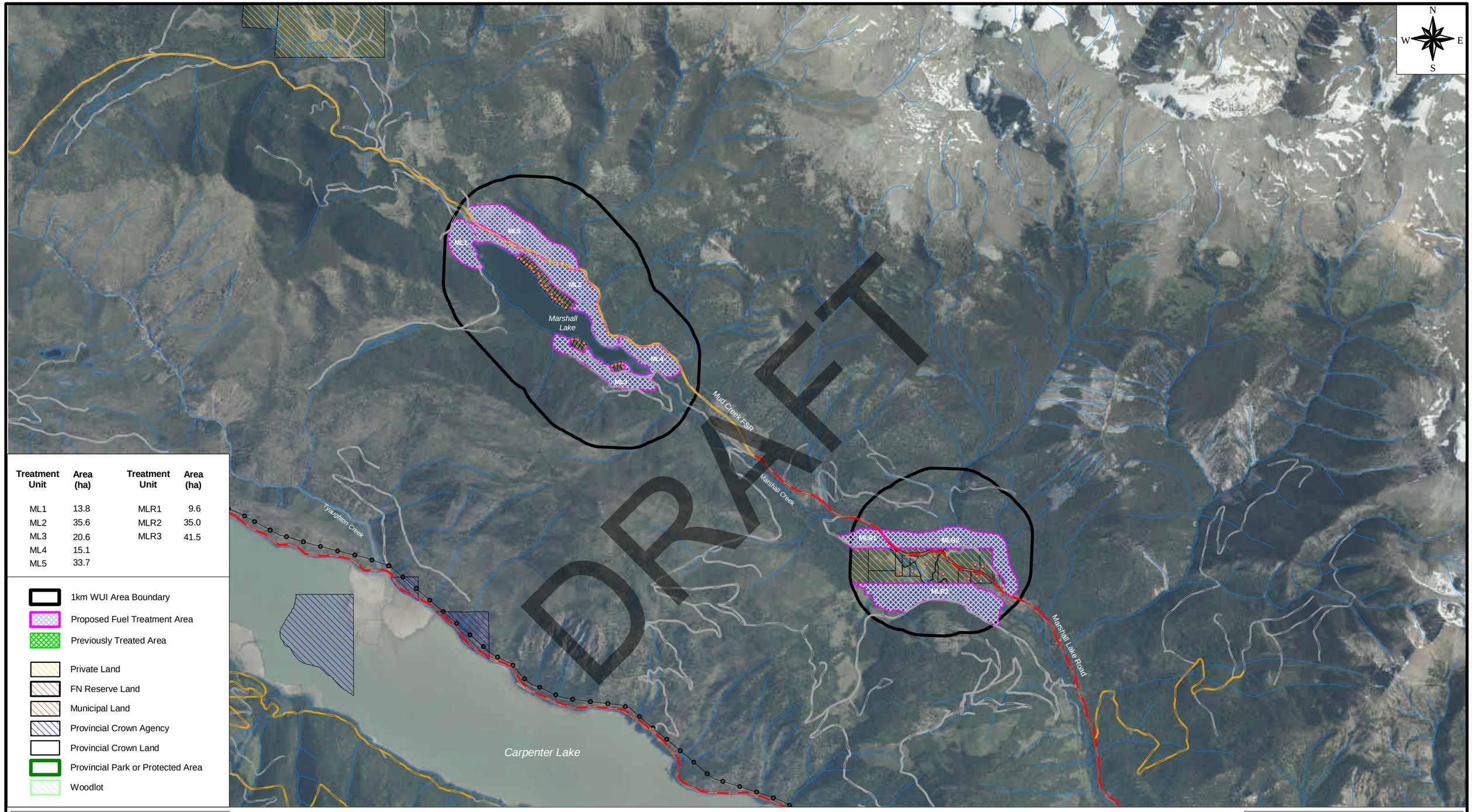
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: December 28, 2022

Landscope Consulting Corporation



Treatment Unit	Area (ha)	Treatment Unit	Area (ha)
ML1	13.8	MLR1	9.6
ML2	35.6	MLR2	35.0
ML3	20.6	MLR3	41.5
ML4	15.1		
ML5	33.7		

- 1km WUI Area Boundary
- Proposed Fuel Treatment Area
- Previously Treated Area
- Private Land
- FN Reserve Land
- Municipal Land
- Provincial Crown Agency
- Provincial Crown Land
- Provincial Park or Protected Area
- Woodlot
- Structure
- Primary Roads
- Secondary Roads
- Forest Service Road
- BC Hydro Transmission Line
- Streams

PROPOSED FUEL TREATMENT UNITS

Squamish-Lillooet Regional District - Electoral Area A CWRP
Marshall Lake & Marshall Lake Road

1:40,000

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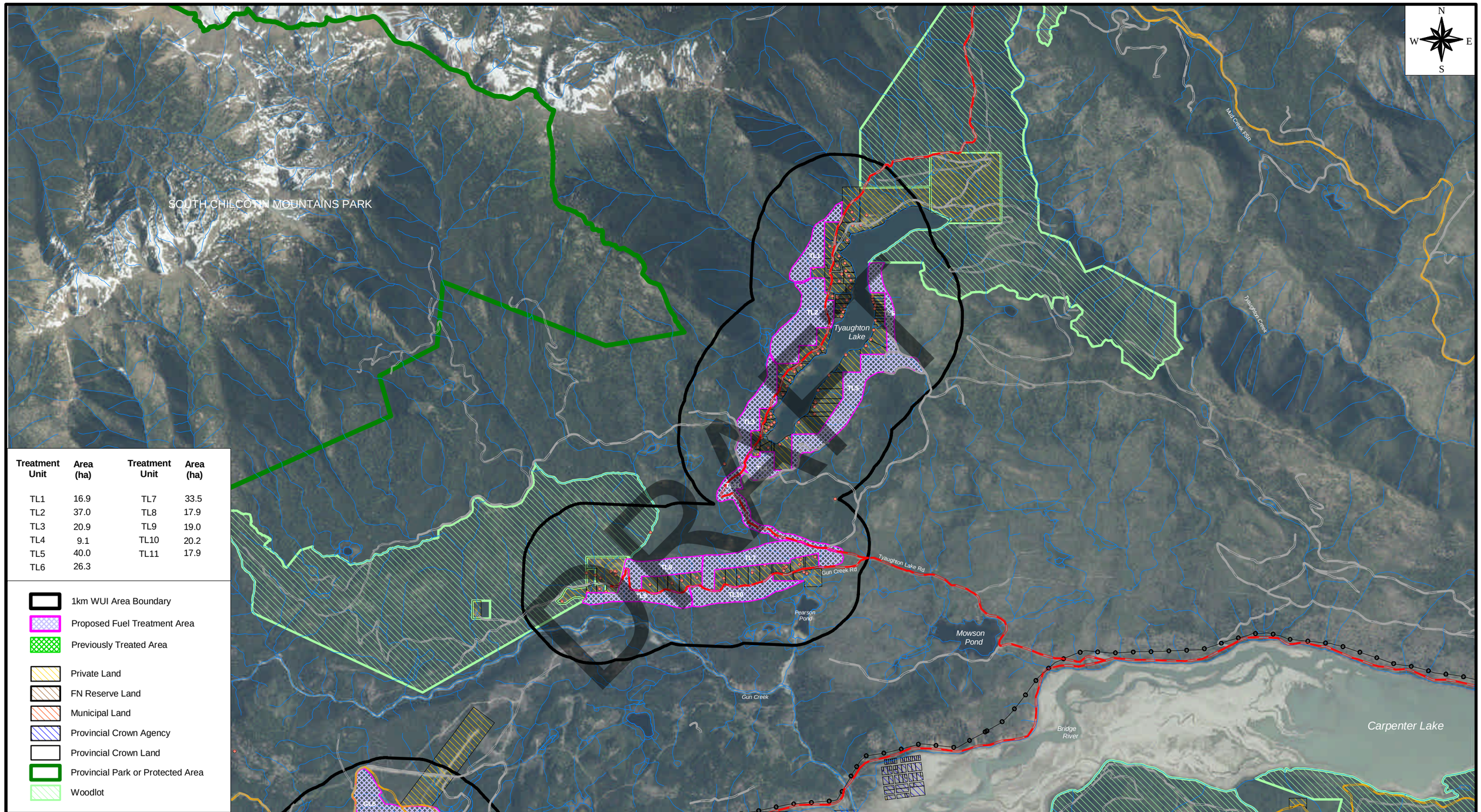
Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: December 28, 2022

Landscope Consulting Corporation



Treatment Unit	Area (ha)	Treatment Unit	Area (ha)
TL1	16.9	TL7	33.5
TL2	37.0	TL8	17.9
TL3	20.9	TL9	19.0
TL4	9.1	TL10	20.2
TL5	40.0	TL11	17.9
TL6	26.3		

- 1km WUI Area Boundary
- Proposed Fuel Treatment Area
- Previously Treated Area
- Private Land
- FN Reserve Land
- Municipal Land
- Provincial Crown Agency
- Provincial Crown Land
- Provincial Park or Protected Area
- Woodlot
- Structure
- Primary Roads
- Secondary Roads
- Forest Service Road
- BC Hydro Transmission Line
- Streams

PROPOSED FUEL TREATMENT UNITS

Squamish-Lillooet Regional District - Electoral Area A CWRP
Tyaughton Lake

1:40,000

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Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: December 28, 2022

Landscope Consulting Corporation

SECTION 6: Plan Monitoring and Updates

Scheduling regular monitoring, reviewing and updating of the CWRP ensure that the plan does more than "sit on a shelf". Communities should set a schedule that ideally includes a minimum annual review of the CWRP action plan and a five-year comprehensive review of the entire plan. During the annual review, consider whether any significant changes have occurred, such as the adoption of a new planning process that could affect CWRP implementation. In addition, columns can be added to the action table that annually note whether actions have been completed, if they are in progress, and any changes to priority levels. The five-year comprehensive review should cover the entire plan and consider how risk has changed based on any recent wildfires occurring, completed vegetation management treatments, significant changes to the urban environment due to growth and development, government legislation, program funding changes, or other factors that would influence the overall success of the plan.

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Appendices

Appendix 1: Public Engagement

The following engagement sessions were completed during the CWRP development:

- June 11, 2021, via zoom – 18 participants
- July 8, 2021, via zoom – 7 participants
- October 14, 2021 – 12 participants
- February 24, 2022 – 14 participants
- June 2, 2022, in person at the Bralorne church – 11 participants
- June 27, 2022, and November 24, 2022 – Lillooet and Area Community Wildfire Roundtable

Community FireSmart and Resiliency Committee Participants (including CFRC subcommittee and Lillooet and Area Community Wildfire Roundtable).

	Name	Organization	Role (if known)
1	Al Leighton	Gun Lake Fire Department	Fire Chief
2	Alan Leung	First Nations Health Authority	Public Health Officer
3	Alycia Fennings	Cascades Natural Resource District	Land and Resource Specialist
4	Andrew Snetsinger	Cascades Natural Resource District	
5	Benno Chapman	Bralorne Fire Department	Fire Chief
6	Brett Squirrell	Coldstream Nature-Based Solutions	Research Biologist
7	Cheryl Rogers	Canadian Disaster Animal Response Team	MST Coordinator
8	Chris Walder	Cascades Natural Resource District	
9	Darrick Andrew	First Nations Emergency Services Society	Mitigation Liaison
10	Darryl Adrian	Lillooet Tribal Council	Emergency Management Coordinator
11	Darwyn John	St'at'imc Government Services	
12	Delaney Adolph	Sekw'el'was	
13	Denise Bob	Sekw'el'was	Emergency Program Coordinator
14	Ellen Reyes	St'at'imc Government Services	Environmental Manager
15	Geoff Playfair	Gun Creek + Texas Creek neighbourhoods	resident
16	Gerald Michel	Xwisten	
17	Jennifer Young	BC Wildfire Service	Senior Wildfire Officer Prevention
18	Jim Blair	Tyaughton Lake neighbourhood	resident
19	Justin Rommel	BC Wildfire Service	Wildfire Technician
20	Justin Waito	BC Wildfire Service	Wildfire Prevention Officer

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21	Leo Porter	Sekw'el'was	Director of Operations
22	Martin Ponsioen	Cascades Natural Resource District	Senior Advisor
23	Mary Benson	Gun Creek neighbourhood	resident
24	Michael Aldred	BC Wildfire Service	Wildfire Prevention Officer
25	Michael Pritchard	Bralorne Fire Department	Volunteer firefighter
26	Myrus Doss	T'it'q'et	
27	Nicole Bonnett	BC Wildfire Service	Wildfire Technician - Prevention
28	Nora Billy	St'at'imc Government Services	
29	Quinton Nelson	First Nations Emergency Services Society	Mitigation Manager
30	Reid Goldie	Gun Lake neighbourhood	resident
31	Ryan de Visser	Cascades Natural Resource District	Stewardship Forester
32	Sal DeMare	Squamish-Lillooet Regional District	Director, Area A
33	Steve Crowe	Marshall Lake neighbourhood	resident
34	Sue Eckersley	Tyaughton Lake neighbourhood	resident
35	Susan Napoleon	T'it'q'et	Emergency Operations Director
36	Travis Peters	Xwisten	Lands Manager
37	Verne Rasmussen	BC Wildfire Service	Wildfire Officer
38	Yvonne Michel	Xwisten	FireSmart Coordinator

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Appendix 2: Canadian Forest Fire Behaviour Prediction (FBP) – Fuel Type Descriptions

C1 - Spruce–Lichen Woodland

This fuel type is characterized by open, parklike black spruce (***Picea mariana*** (Mill.) B.S.P.) stands occupying well-drained uplands in the subarctic zone of western and northern Canada. Jack pine (***Pinus banksiana*** Lamb.) and white birch (***Betula papyrifera*** Marsh.) are minor associates in the overstory. Forest cover occurs as widely spaced individuals and dense clumps. Tree heights vary considerably, but bole branches (live and dead) uniformly extend to the forest floor and layering development is extensive. Accumulation of woody surface fuel is very light and scattered. Shrub cover is exceedingly sparse. The ground surface is fully exposed to the sun and covered by a nearly continuous mat of reindeer lichens (***Cladonia*** spp.), averaging 3-4 cm in depth above mineral soil.

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C2 - Boreal Spruce

This fuel type is characterized by pure, moderately well-stocked black spruce (***Picea mariana*** (Mill.) B.S.P.) stands on lowland (excluding ***Sphagnum*** bogs) and upland sites. Tree crowns extend to or near the ground, and dead branches are typically draped with bearded lichens (***Usnea*** spp.). The flaky nature of the bark on the lower portion of stem boles is pronounced. Low to moderate volumes of down woody material are present. Labrador tea (***Ledum groenlandicum*** Oeder) is often the major shrub component. The forest floor is dominated by a carpet of feather mosses and/or ground-dwelling lichens (chiefly ***Cladonia***). ***Sphagnum*** mosses may occasionally be present, but they are of little hindrance to surface fire spread. A compacted organic layer commonly exceeds a depth of 20–30 cm.

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C3 - Mature Jack or Lodgepole Pine

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

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C4 - Immature Jack or Lodgepole Pine

This fuel type is characterized by pure, dense jack pine (***Pinus banksiana*** Lamb.) or lodgepole pine (***Pinus contorta*** Dougl. ex Loud.) stands (10,000–30,000 stems/ha) in which natural thinning mortality results in a large quantity of standing dead stems and dead downed woody fuel. Vertical and horizontal fuel continuity is characteristic of this fuel type. Surface fuel loadings are greater than in fuel type C3, and organic layers are shallower and less compact. Ground cover is mainly needle litter suspended within a low shrub layer (***Vaccinium*** spp.).

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C5 - Red and White Pine

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

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C6 - Conifer Plantation

This fuel type is characterized by pure, fully stocked conifer plantations with closed crowns and no understory or shrub layer. The forest floor is covered by needle litter with an underlying duff layer up to 10 cm deep. The crown base height is taken into account in predicting fire spread rate and crowning.

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C7 - Ponderosa Pine–Douglas-Fir

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

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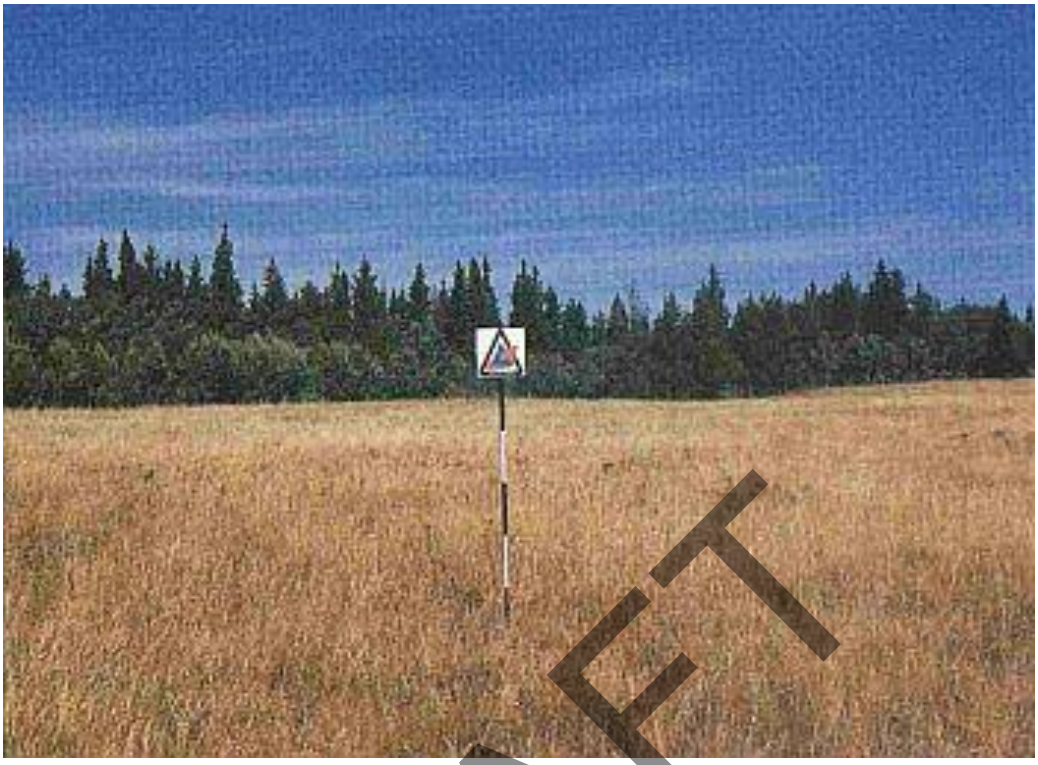
O1 – Grass



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

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D1 - Leafless Aspen

This fuel type is characterized by pure, semimature trembling aspen (***Populus tremuloides*** Michx.) stands before bud break in the spring or following leaf fall and curing of the lesser vegetation in the autumn. A conifer understory is noticeably absent, but a well-developed medium to tall shrub layer is typically present. Dead and down roundwood fuels are a minor component of the fuel complex. The principal fire-carrying surface fuel consists chiefly of deciduous leaf litter and cured herbaceous material that is directly exposed to wind and solar radiation. In the spring the duff mantle (F and H horizons) seldom contributes to the available combustion fuel because of its high moisture content.

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S1 - Jack or Lodgepole Pine Slash

This fuel type is characterized by slash resulting from tractor or skidder clear-cut logging of mature jack pine (***Pinus banksiana*** Lamb.) or lodgepole pine (***Pinus contorta*** Dougl. ex Loud.) stands. The slash is typically one or two seasons old, retaining up to 50% of the foliage, particularly on branches closest to the ground. No post-logging treatment has been applied, and slash fuels are continuous. Tops and branches left on site result in moderate fuel loads and depths. Ground cover is continuous feather moss mixed with discontinuous fallen needle litter. Organic layers are moderately deep and fairly compact.

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S2 - White Spruce–Balsam Slash

This fuel type is characterized by slash resulting from tractor or skidder clear-cut logging of mature to overmature stands of white spruce (***Picea glauca*** (Moench) Voss) and sub-alpine fir (***Abies lasiocarpa*** (Hook.) Nutt.) or balsam fir (***Abies balsamea*** (L.) Mill.). Slash is typically one or two seasons old, retaining from 10% to 50% of the foliage on the branches. No postlogging treatment has been applied. Fuel continuity may be broken by skid trails unless the site was logged in winter. Tops have been left on site, and most branch fuels have broken off during skidding of logs to landings, which results in moderate fuel loads and depths. Quantities of shattered large and rotten woody fuels may be significant. Ground cover is feather moss with considerable needle litter fallen from the slash. Organic layers are moderately deep and compact.

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S3 - Coastal Cedar–Hemlock–Douglas-Fir Slash

This fuel type is characterized by slash resulting from high-lead clear-cut logging of mature to overmature coastal British Columbia mixed conifer stands. Predominant species are western redcedar (***Thuja plicata*** Donn.), western hemlock (***Tsuga heterophylla*** (Raf.) Sarg.), and Douglas-fir (***Pseudotsuga menziesii*** (Mirb.) Franco). Slash is typically one season old, with the cedar component retaining all its foliage in a cured condition on the branches, whereas the hemlock and Douglas-fir components will have dropped up to 50% of their foliage. Slash fuels tend to be continuous and uncompacted. Very large loadings of broken and rotten unmerchantable material may be present, depending on degree of stand decadence. Slash fuel depths may range from 0.5 to 2.0 m. Ground cover may be feather moss or just compact old needle litter under significant quantities of recent needle litter fallen from the slash. Organic layers are moderately deep to deep and compact. Minor to moderate shrub and herbaceous understory components may be present. This fuel type designation may also be applied to wet belt cedar–hemlock slash of coastal and interior British Columbia where the Douglas-fir component is absent.

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M1 - Boreal Mixedwood–Leafless

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

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M2 - Boreal Mixedwood–Green

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

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M3 - Dead Balsam Fir Mixedwood–Leafless

This fuel type (and its "green" counterpart, M4) is characterized by mixedwood stands in which balsam fir (***Abies balsamea*** (L.) Mill.) grows, often as an understory species, in a heterogeneous mix with spruce (***Picea*** spp.), pine (***Pinus*** spp.), and birch (*Betula* spp.). These stands are found in the Great Lakes – St. Lawrence and Boreal Forest regions of Canada and are not to be confused with the pure balsam fir stands typical of Nova Scotia and New Brunswick. Repeated annual defoliation (due to spruce budworm (***Choristoneura fumiferana*** Clemens) attack) causes balsam fir mortality, followed by peeling bark, draped lichen (Spanish moss or old man's beard, ***Usnea*** spp.) development, top breakage, and windthrow, peaking 5–8 years after mortality. The volume of down woody material is initially low but increases substantially with progressive stand decomposition following mortality. The forest floor is a mixture of feather mosses, conifer needles, and hardwood leaves. The organic layer is moderately compacted and 8–10 cm deep. After mortality, spring fires in this fuel type behave extremely vigorously, with continuous crowning and downwind spotting.

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M4 - Dead Balsam Fir Mixedwood–Green

This fuel type (and its "leafless" counterpart, M3) is characterized by mixedwood stands in which balsam fir (***Abies balsamea*** (L.) Mill.) grows, often as an understory species, in a heterogeneous mix with spruce (***Picea*** spp.), pine (***Pinus*** spp.), and birch (***Betula*** spp.). These stands are found in the Great Lakes – St. Lawrence and Boreal Forest regions of Canada and are not to be confused with the pure balsam fir stands typical of Nova Scotia and New Brunswick. Repeated annual defoliation (due to spruce budworm (***Choristoneura fumiferana*** Clemens) attack) causes balsam fir mortality, followed by peeling bark, draped lichen (Spanish moss or old man's beard, ***Usnea*** spp.) development, top breakage, and windthrow, peaking 5–8 years after mortality. The volume of down woody material is initially low but increases substantially with progressive stand decomposition following mortality. The forest floor is a mixture of feather mosses, conifer needles, and hardwood leaves. The organic layer is moderately compacted and 8–10 cm deep. Summer fires are hampered by the proliferation of green understory vegetation resulting from the opening of stand canopy. As sufficient surface fuel accumulates through stand decomposition (usually after 4–5 years), fires will spread through the fuel complex, although not as vigorously as in spring. Forest fire behaviour potential is greatest 5–8 years after mortality, decreasing gradually as the surface fuels decompose and the understory vegetation continues to proliferate.

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Appendix 3: CWRP Area of Interest Maps

CWRP Map 1: Area of Interest & Values at Risk

CWRP Map 2: Local Wildfire Risk

CWRP Map 3: Proposed Fuel Treatment Units

CWRP Map 4: Fuel Types

CWRP Map 5: Slope Class

CWRP Map 6: Wildfire History and Density

CWRP Map 7: Head Fire Intensity

CWRP Map 8: Spotting Impact

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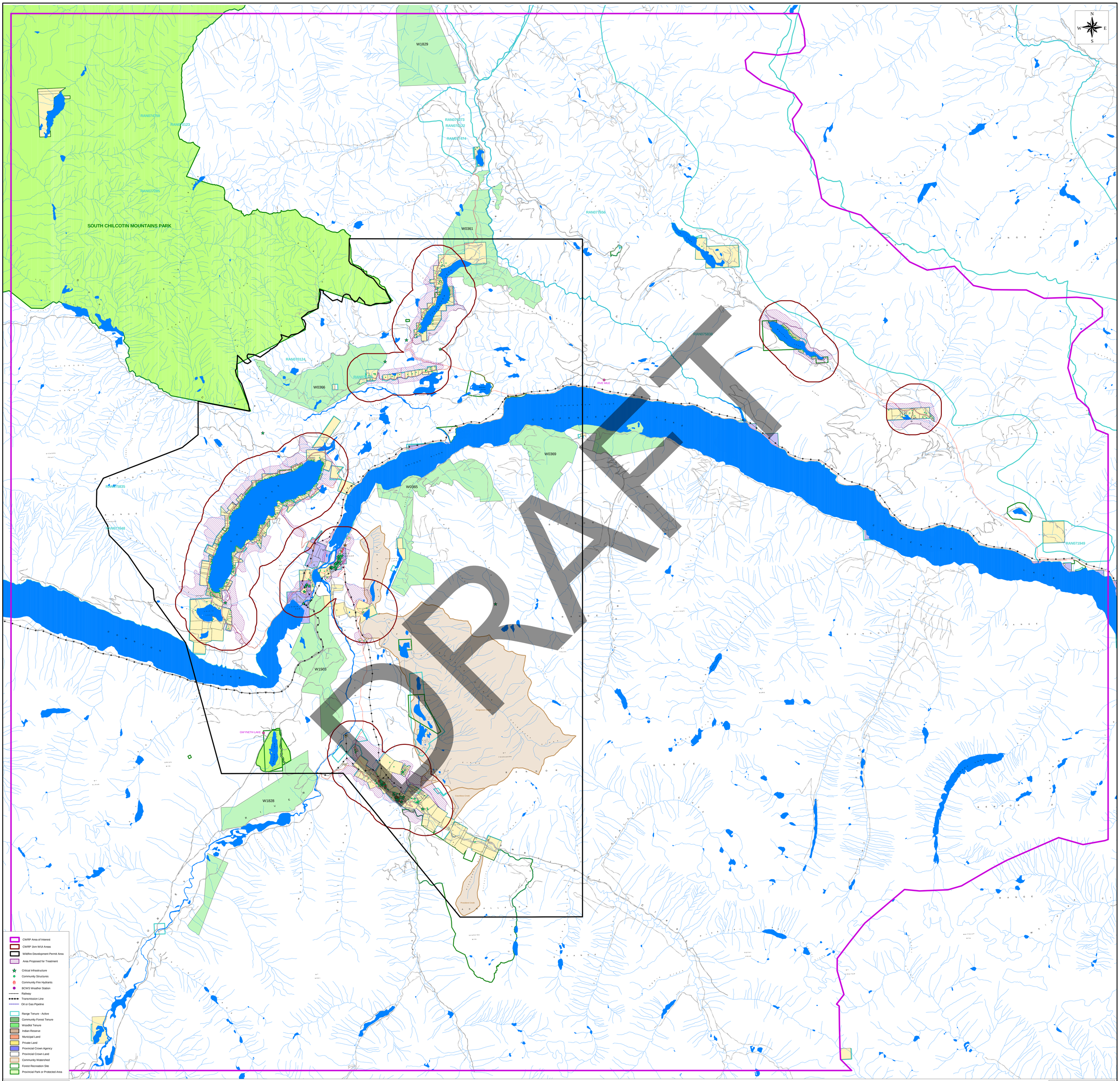

CWRP MAP 1: AREA OF INTEREST & VALUES AT RISK

Squamish - Lillooet Regional District
Electoral Area A
1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

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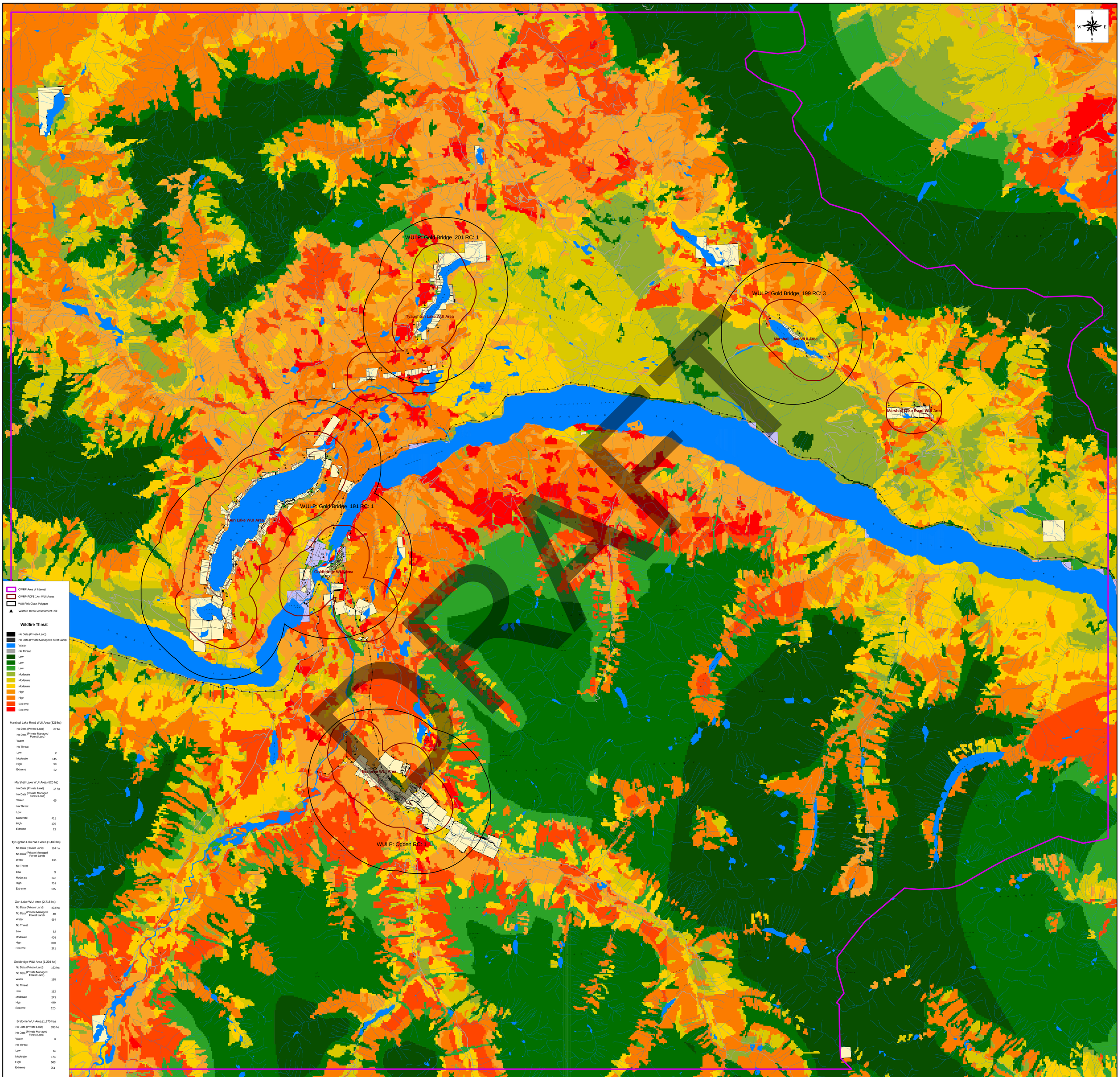
Map Projection:
Drawn By: E Senger
Production Date: January 8, 2023

Landscope Consulting Corporation



CWRP Area of Interest
CWRP FCFS 1km WUI Areas
WUI Risk Class Polygon
Wildfire Threat Assessment Plot

Wildfire Threat

- No Data (Private Land)
- No Data (Private Managed Forest Land)
- Water
- No Threat
- Low
- Low
- Low
- Moderate
- Moderate
- Moderate
- High
- High
- Extreme
- Extreme

Marshall Lake Road WUI Area (326 ha)

No Data (Private Land)	67 ha
No Data (Private Managed Forest Land)	
Water	
No Threat	
Low	2
Moderate	145
High	90
Extreme	22

Marshall Lake WUI Area (620 ha)

No Data (Private Land)	14 ha
No Data (Private Managed Forest Land)	
Water	65
No Threat	
Low	
Moderate	415
High	105
Extreme	21

Tyaughton Lake WUI Area (1,489 ha)

No Data (Private Land)	184 ha
No Data (Private Managed Forest Land)	
Water	136
No Threat	
Low	3
Moderate	240
High	751
Extreme	175

Gun Lake WUI Area (2,715 ha)

No Data (Private Land)	423 ha
No Data (Private Managed Forest Land)	40
Water	654
No Threat	
Low	52
Moderate	408
High	868
Extreme	271

Goldbridge WUI Area (1,204 ha)

No Data (Private Land)	162 ha
No Data (Private Managed Forest Land)	
Water	118
No Threat	
Low	112
Moderate	243
High	449
Extreme	120

Bralorne WUI Area (1,275 ha)

No Data (Private Land)	330 ha
No Data (Private Managed Forest Land)	
Water	3
No Threat	
Low	14
Moderate	174
High	503
Extreme	251

- Lakes and Rivers
- Streams
- Primary Roads
- Secondary Roads
- Railway
- Transmission Line
- Oil or Gas Pipeline

CWRP MAP 2: LOCAL WILDFIRE RISK

Squamish - Lillooet Regional District
Electoral Area A

1:40,000

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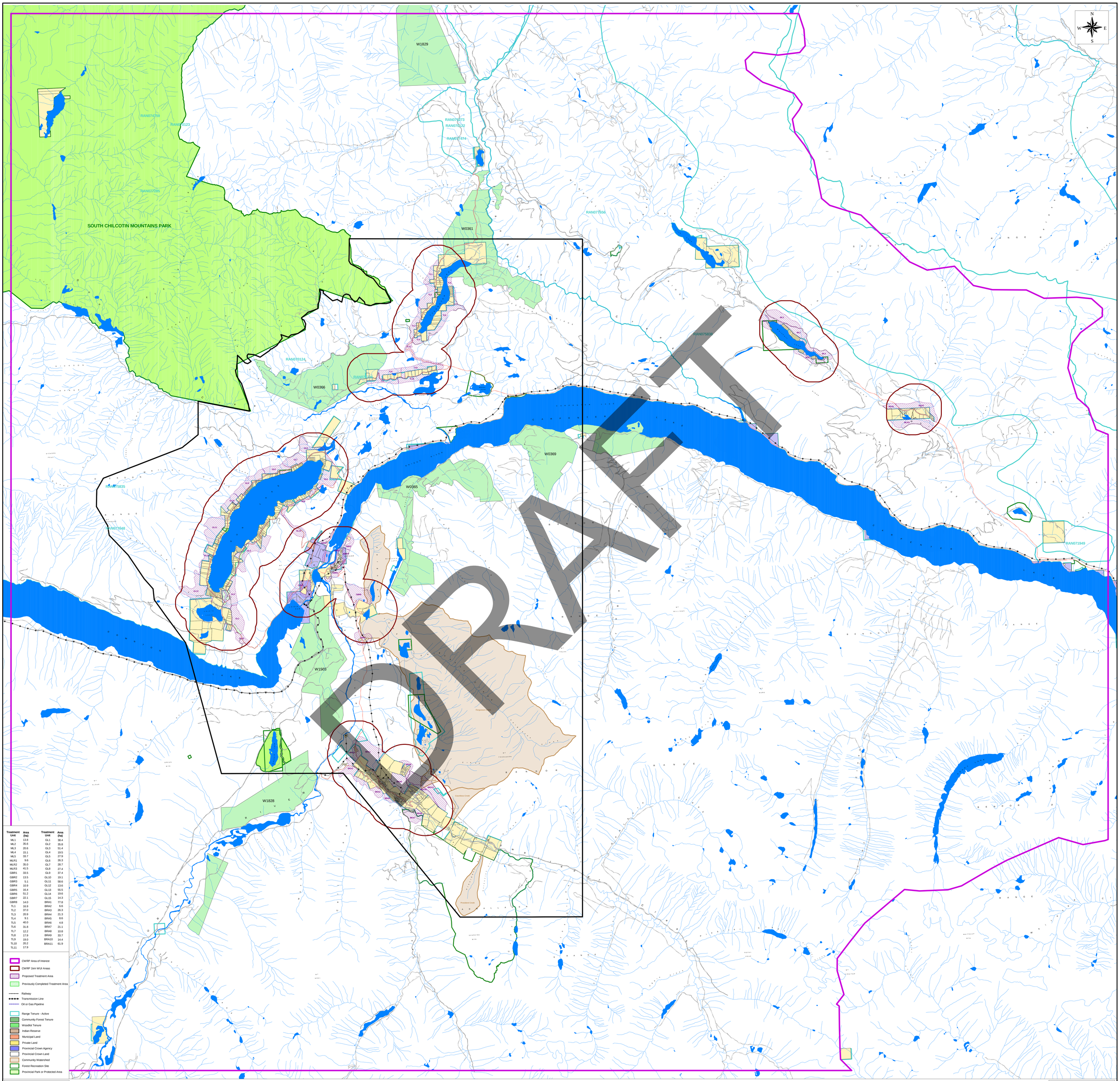
Map Projection: ALBERS
Drawn By: E.Senger
Production Date: January 8, 2023

Landscope Consulting Corporation



Treatment Unit	Area (ha)	Treatment Unit	Area (ha)
ML1	13.8	GL1	38.4
ML2	35.6	GL2	35.8
ML3	20.6	GL3	51.4
ML4	15.1	GL4	19.5
ML5	33.7	GL5	27.9
MLR1	9.6	GL6	26.3
MLR2	35.0	GL7	28.7
MLR3	41.5	GL8	27.4
GBR1	33.5	GL9	37.4
GBR2	13.5	GL10	19.1
GBR3	5.1	GL11	58.6
GBR4	10.9	GL12	13.6
GBR5	16.4	GL13	55.5
GBR6	51.2	GL14	19.6
GBR7	22.1	GL15	14.3
GBR8	14.0	BRA1	77.8
TL1	16.9	BRA2	6.6
TL2	37.0	BRA3	26.3
TL3	20.9	BRA4	21.3
TL4	9.1	BRA5	8.6
TL5	40.0	BRA6	4.8
TL6	31.8	BRA7	21.1
TL7	12.2	BRA8	10.8
TL8	17.9	BRA9	33.7
TL9	19.0	BRA10	14.4
TL10	20.2	BRA11	61.9
TL11	17.9		

- CWRP Area of Interest
- CWRP 1km WUI Areas
- Proposed Treatment Area
- Previously Completed Treatment Area
- Railway
- Transmission Line
- Oil or Gas Pipeline
- Range Tenure - Active
- Community Forest Tenure
- Woodlot Tenure
- Indian Reserve
- Municipal Land
- Private Land
- Provincial Crown Agency
- Provincial Crown Land
- Community Watershed
- Forest Recreation Site
- Provincial Park or Protected Area
- Lakes and Rivers
- Streams
- Primary Roads
- Secondary Roads

CWRP MAP 3: PROPOSED FUEL TREATMENT UNITS

Squamish - Lillooet Regional District
Electoral Area A
1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

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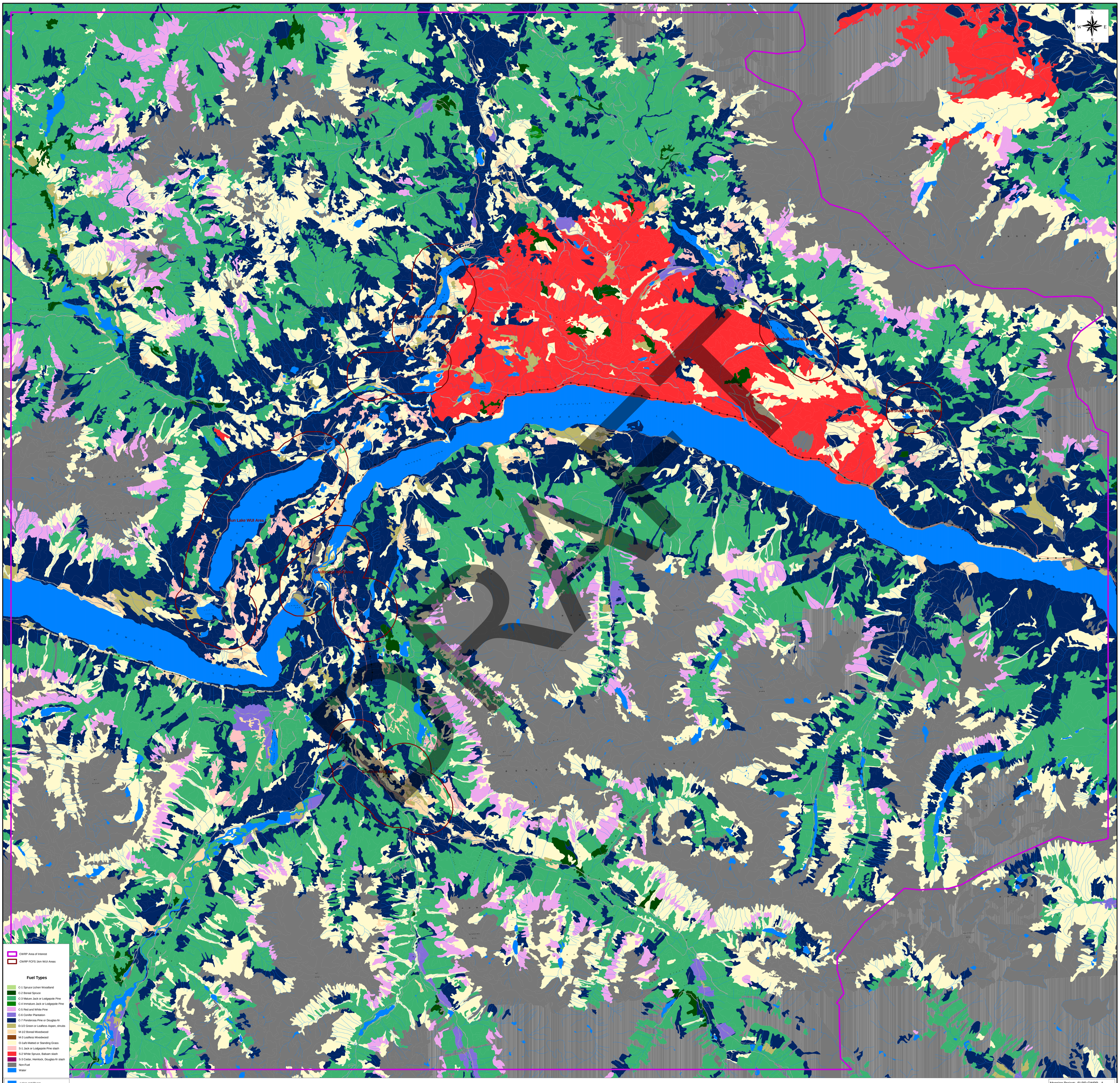
Drawn By: E Senger
Production Date: January 8, 2023

Landscope Consulting Corporation



CWRP MAP 4: FUEL TYPES

Squamish - Lillooet Regional District
Electoral Area A

1:40,000

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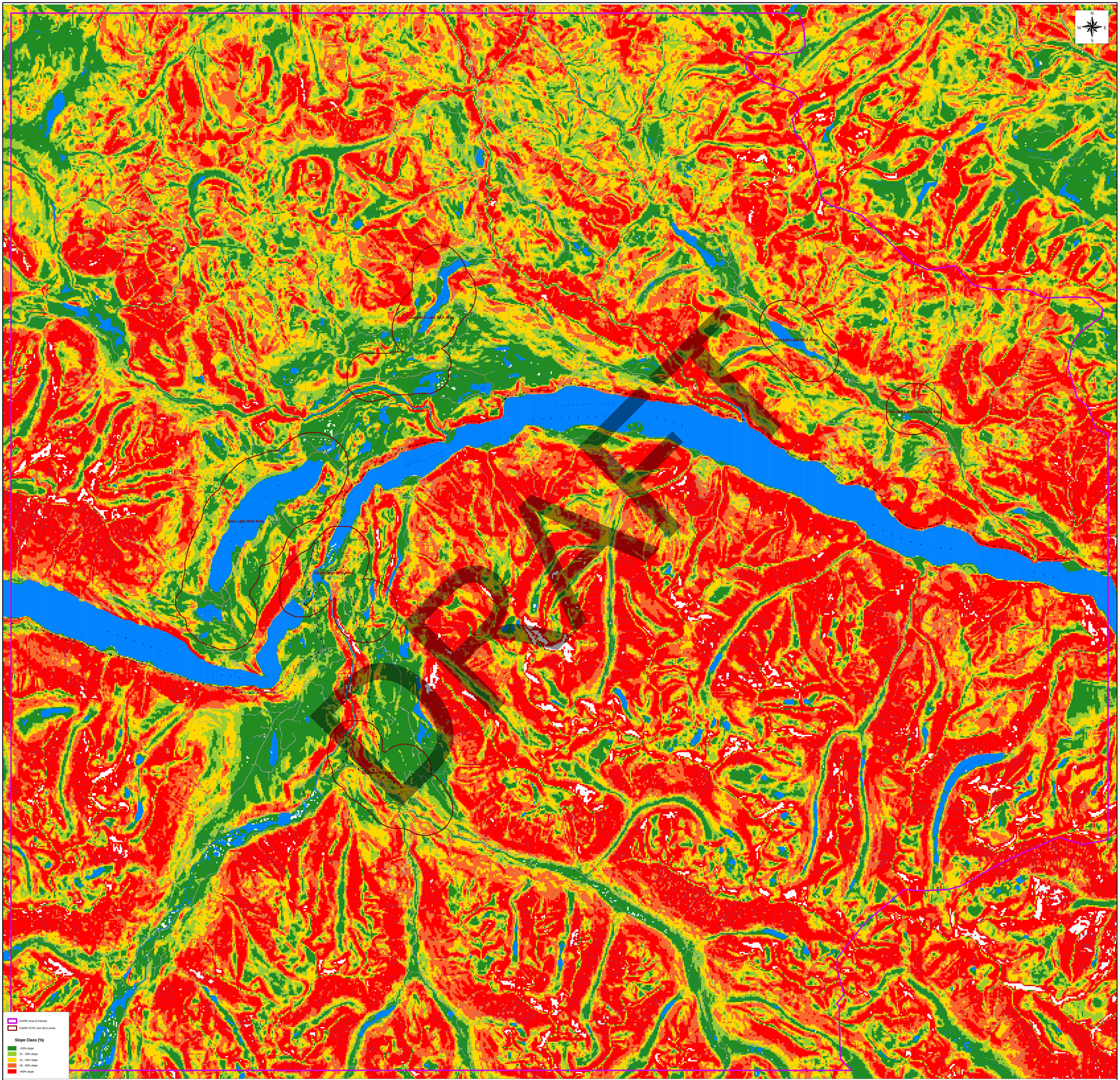
Map Projection: ALBERS
Drawn By: E.Senger
Production Date: January 16, 2023

Landscope
Consulting Corporation



CWRP MAP 5: SLOPE CLASS

Squamish - Lillooet Regional District
Electoral Area A
1:40,000

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Map Projection: ALBERS
Drawn By: E.Senger
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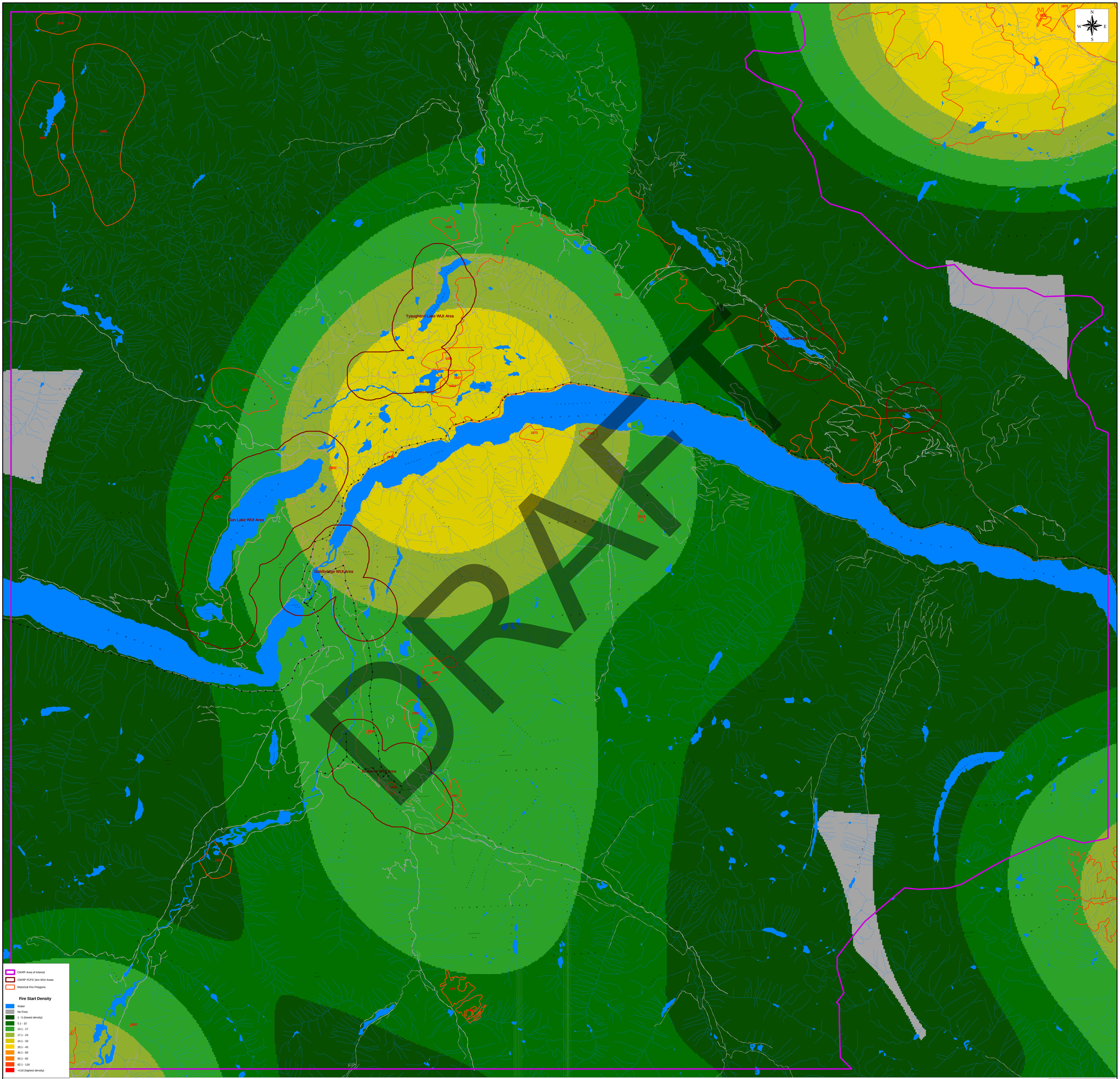
Landscope
Consulting Corporation



CWRP MAP 6: WILDFIRE HISTORY AND DENSITY

Squamish - Lillooet Regional District
Electoral Area A

1:40,000

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Mapping Project: SLRD CWRP - A
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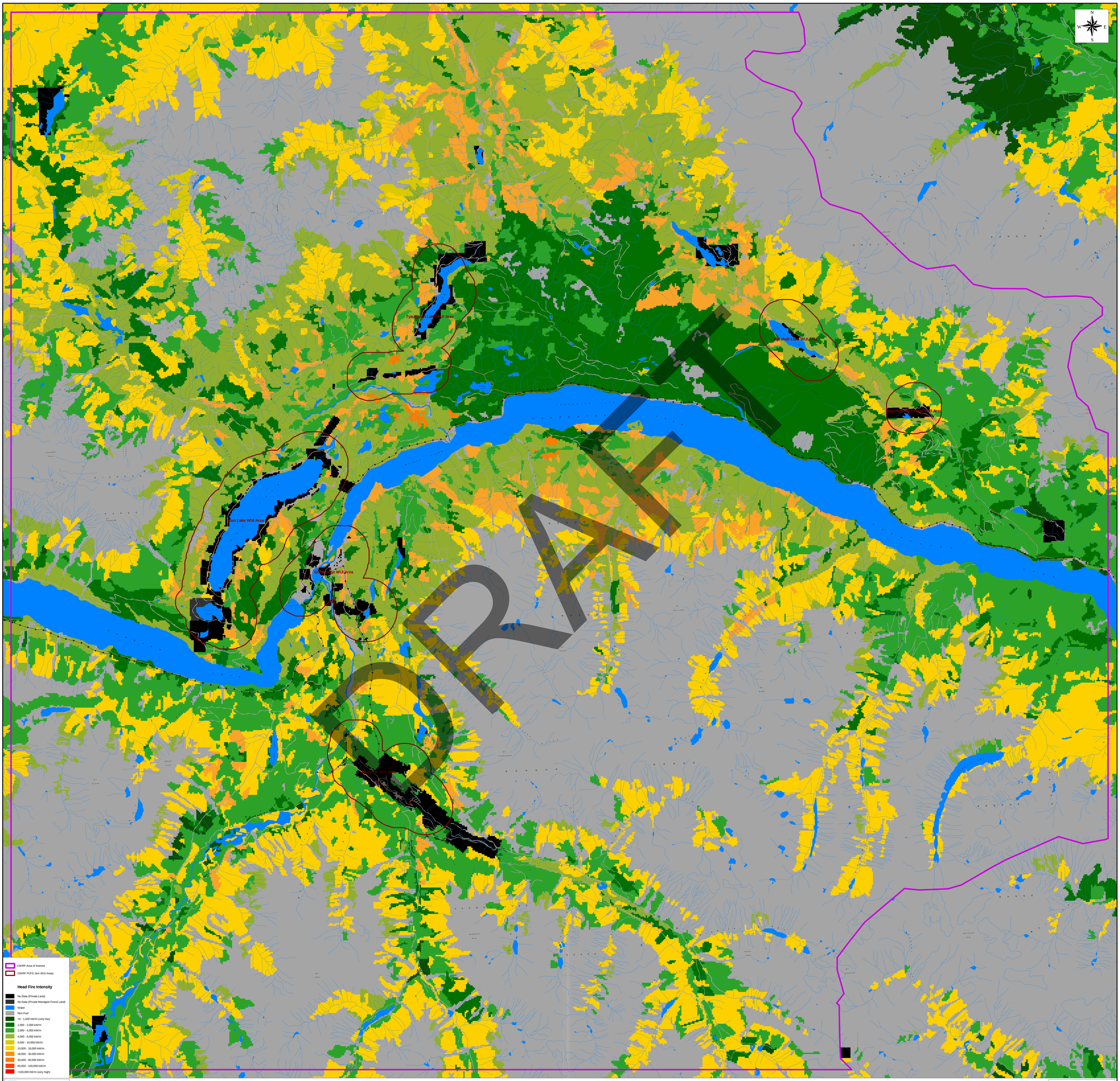
Map Projection: ALBERS
Drawn By: E.Senger
Production Date: January 16, 2023

Landscope Consulting Corporation



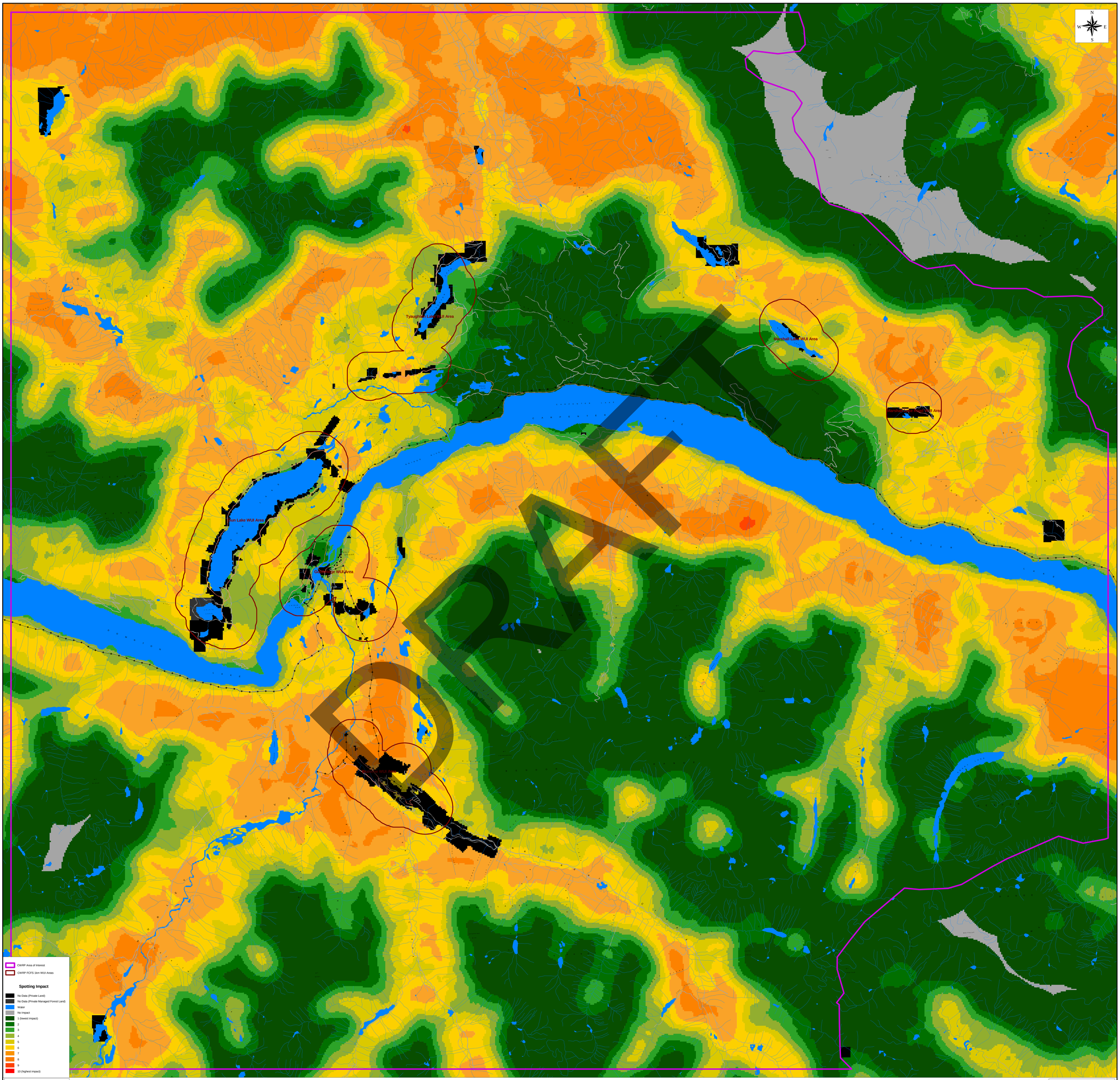
CWRP MAP 7: HEAD FIRE INTENSITY

Squamish - Lillooet Regional District
Electoral Area A
1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

Mapping Project: SLRD CWRP - A
Datum: NAD83
Map Projection: ALBERS
Drawn By: E.Senger
Production Date: January 16, 2023

Landscope Consulting Corporation



CWRP MAP 8: SPOTTING IMPACT

Squamish - Lillooet Regional District
Electoral Area A
1:40,000

Mapping Project: SLRD CWRP - A
Datum: NAD83
Map Projection: ALBERS
Drawn By: E.Senger
Production Date: January 16, 2023

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Appendix 4: Wildfire Threat Assessment Plot Score and Rating

Plot#	WUI Area	WTA Score	WTA Rating	Plot#	WUI Area	WTA Score	WTA Rating
1	Marshall Lake Rd	34	Low	40	Gun Lake	50	Moderate
2	Marshall Lake Rd	73	High	41	Gun Lake	69	High
3	Marshall Lake Rd	55	Moderate	42	Gun Lake	64	Moderate
4	Marshall Lake Rd	51	Moderate	43	Gun Lake	51	Moderate
5	Marshall Lake Rd	50	Moderate	44	Gun Lake	49	Moderate
6	Marshall Lake	64	Moderate	45	Gun Lake	51	Moderate
7	Marshall Lake	72	High	46	Gun Lake	50	Moderate
8	Marshall Lake	77	High	47	Gun Lake	63	Moderate
9	Marshall Lake	64	Moderate	48	Gold Bridge	50	Moderate
10	Marshall Lake	83	Extreme	49	Gold Bridge	55	Moderate
11	Marshall Lake	35	Low	50	Gold Bridge	53	Moderate
12	Marshall Lake	64	Moderate	51	Gold Bridge	43	Low
13	Marshall Lake	52	Moderate	52	Gold Bridge	55	Moderate
14	Marshall Lake	69	High	53	Gold Bridge	37	Low
15	Marshall Lake	66	High	54	Gold Bridge	42	Low
16	Tyaughton Lake	61	Moderate	55	Gold Bridge	65	Moderate
17	Tyaughton Lake	53	Moderate	56	Gold Bridge	68	High
18	Tyaughton Lake	67	High	57	Gold Bridge	61	Moderate
19	Tyaughton Lake	58	Moderate	58	Gold Bridge	53	Moderate
20	Tyaughton Lake	55	Moderate	59	Gold Bridge	56	Moderate
21	Tyaughton Lake	67	High	60	Gold Bridge	60	Moderate
22	Tyaughton Lake	44	Low	61	Gold Bridge	66	High
23	Tyaughton Lake	55	Moderate	62	Gold Bridge	71	High
24	Tyaughton Lake	54	Moderate	63	Bralorne	71	High
27	Tyaughton Lake	55	Moderate	64	Bralorne	65	Moderate
28	Tyaughton Lake	48	Moderate	65	Bralorne	66	High
29	Tyaughton Lake	70	High	66	Bralorne	65	Moderate
30	Tyaughton Lake	43	Low	67	Bralorne	74	High
31	Gun Lake	35	Low	68	Bralorne	45	Low
32	Gun Lake	54	Moderate	69	Bralorne	68	High
33	Gun Lake	45	Moderate	70	Bralorne	49	Moderate
34	Gun Lake	64	Moderate	71	Bralorne	48	Moderate
35	Gun Lake	54	Moderate	72	Bralorne	35	Low

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36	Gun Lake	48	Moderate	73	Bralorne	48	Moderate
37	Gun Lake	46	Moderate	74	Bralorne	50	Moderate
38	Gun Lake	69	High	75	Bralorne	63	Moderate
39	Gun Lake	45	Low	76	Bralorne	58	Moderate

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Appendix 5: Proposed SLRD Area A FireSmart Neighbourhoods

Proposed Firesmart Neighborhoods – Gun Lake & Goldbridge

Proposed Firesmart Neighborhoods – Marshall Lake & Marshall Lake Road

Proposed Firesmart Neighborhoods – Tyaughton Lake

Proposed Firesmart Neighborhoods – Bralorne

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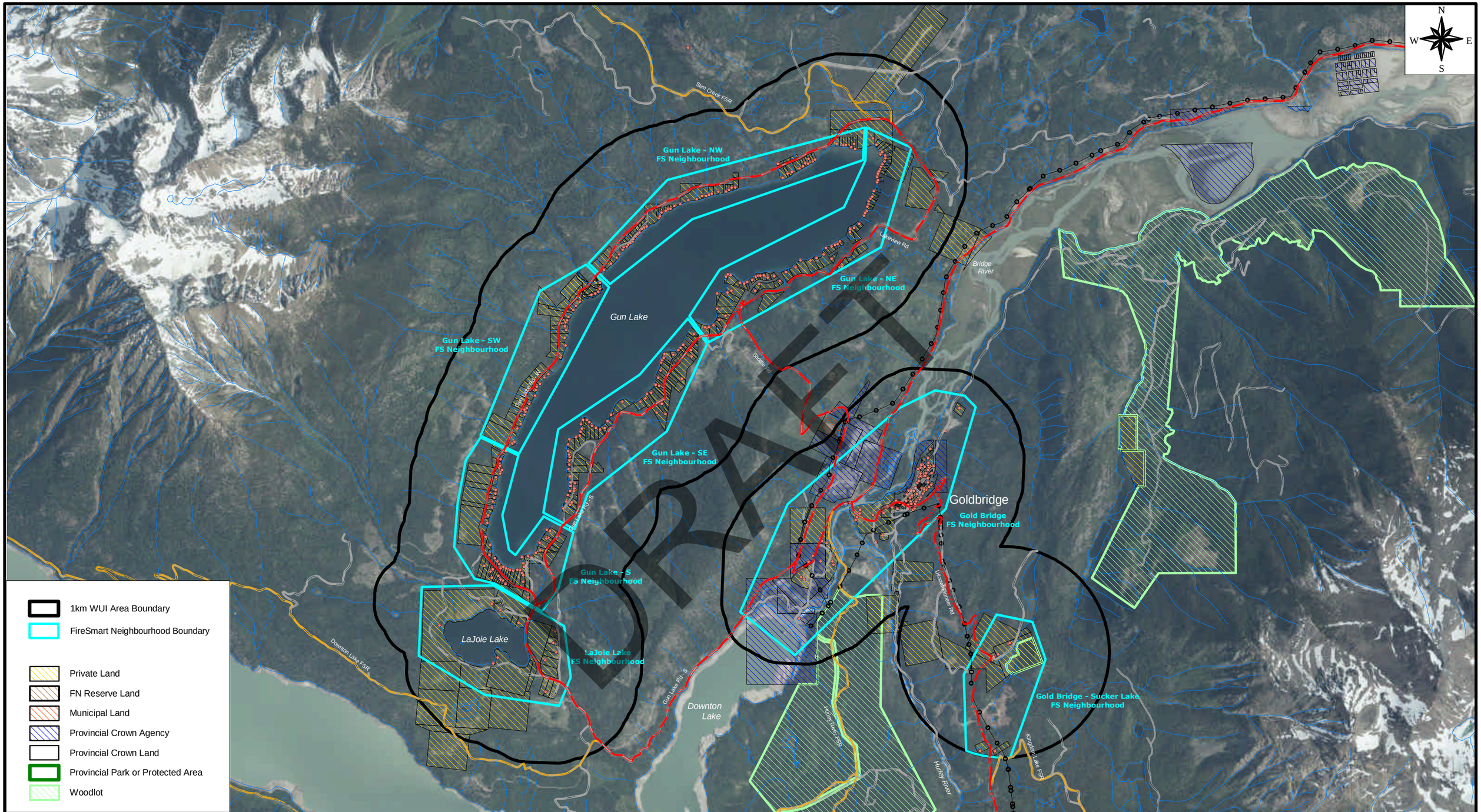

PROPOSED FIRESMART NEIGHBORHOODS

Squamish-Lillooet Regional District - Electoral Area A CWRP
Gun Lake & Goldbridge

1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: January 8, 2023

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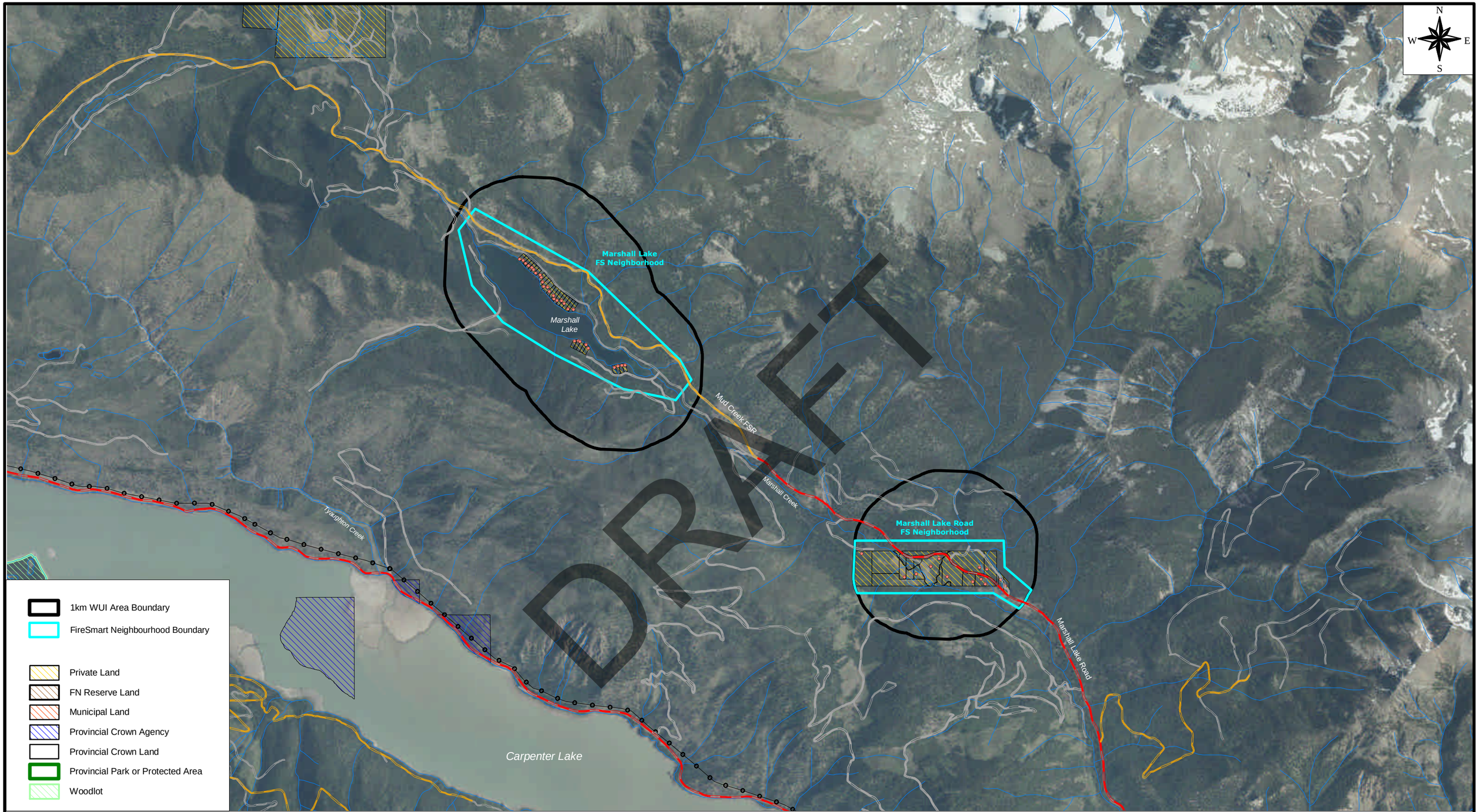

Structure
Primary Roads
Secondary Roads
Forest Service Road
BC Hydro Transmission Line
Streams

PROPOSED FIRESMART NEIGHBORHOODS

Squamish-Lillooet Regional District - Electoral Area A CWRP
Marshall Lake & Marshall Lake Road

1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: January 8, 2023

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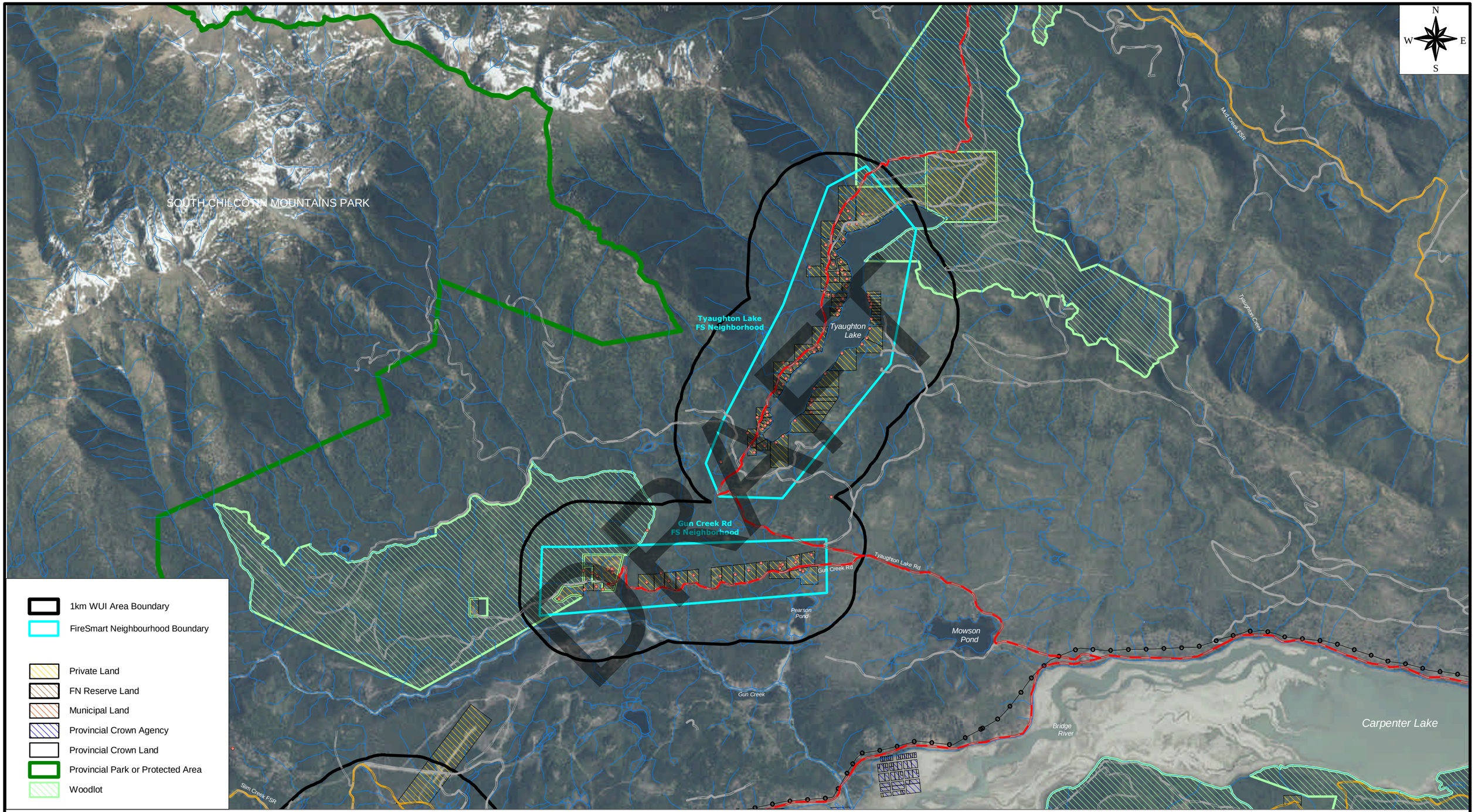


Structure
Primary Roads
Secondary Roads
Forest Service Road
BC Hydro Transmission Line
Streams

PROPOSED FIRESMART NEIGHBORHOODS

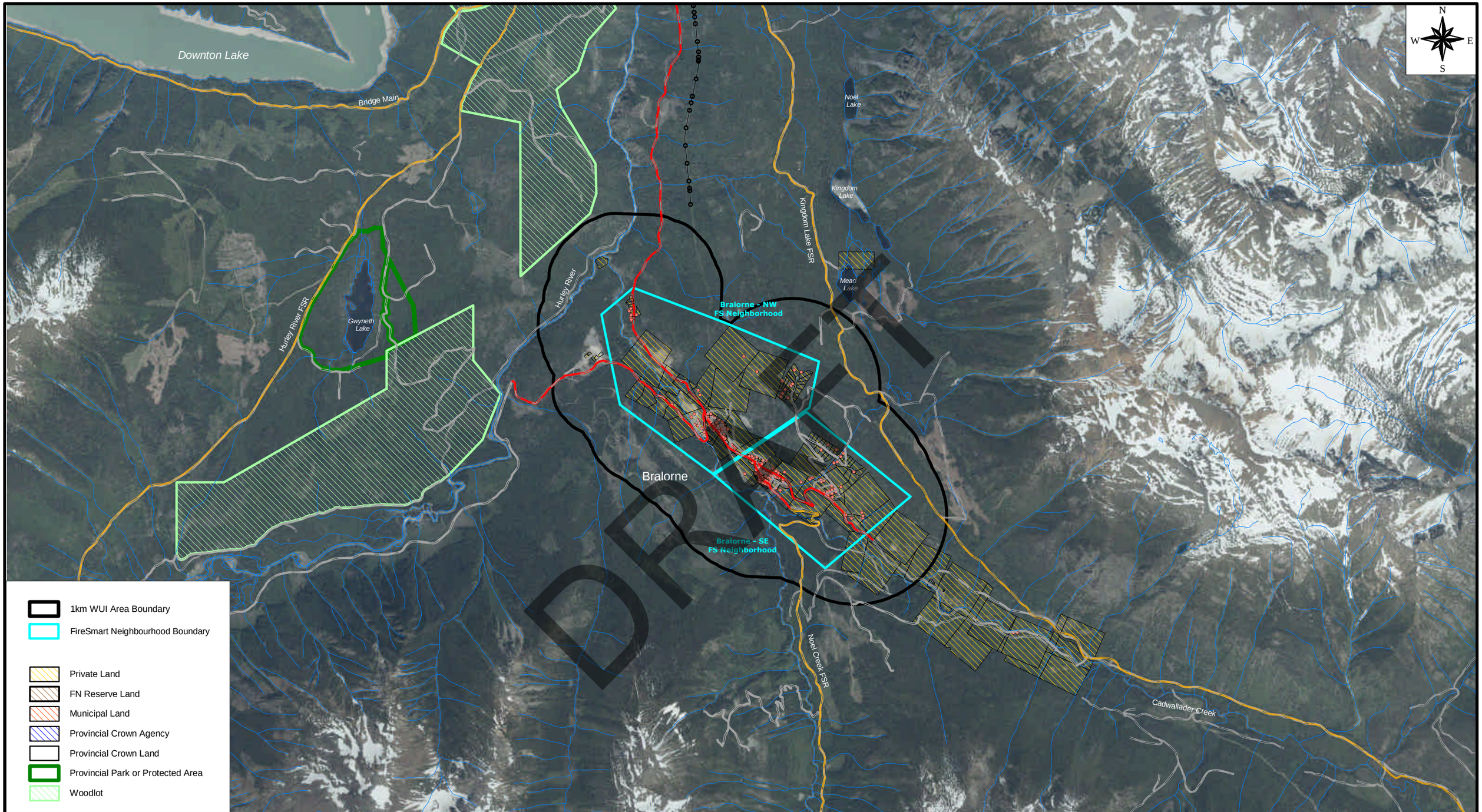
Squamish-Lillooet Regional District - Electoral Area A CWRP
Tyaughton Lake

1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: January 8, 2023

Landscope
Consulting Corporation



PROPOSED FIRESMART NEIGHBORHOODS

Squamish-Lillooet Regional District - Electoral Area A CWRP
Bralorne

1:40,000

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 Kilometers

Mapping Project: SLRD Area A_CWRP
Datum: NAD83
Map Projection: NAD83 UTM Zone 10
Drawn By: E.Senger
Production Date: January 8, 2023

Landscope Consulting Corporation