



REGIONAL DISTRICT OF CENTRAL KOOTENAY

DEVELOPMENT PERMIT

DP2008Hn (DP2008Hn-02401.000-Dascher-DP000105)

Date: December 15, 2021

Issued pursuant to Section 490 and 491 of the *Local Government Act*

1. This Development Permit is issued to Mark Dascher and Diana Wolff of PO Box 628 Golden, BC V0A 1H0, as the registered owners (hereinafter called the “Permittee”) and shall only apply to those lands within the Regional District of Central Kootenay, in the Province of British Columbia legally described as LOT 6 DISTRICT LOT 7686 KOOTENAY DISTRICT PLAN 6736 (PID 014-040-859) as shown on the attached Schedules 1 and 2, forming part of this Permit, referred to hereafter as the “said lands”.
2. This Development Permit is issued subject to compliance with all of the bylaws of the Regional District of Central Kootenay applicable thereto, except as specifically varied or supplemented by this Permit.
3. This Development Permit shall not have the effect of varying the use or density of land as specified in the applicable Zoning Bylaw of the Regional District of Central Kootenay, nor a Floodplain Specification under Section 524 of the Local Government Act.
4. The said lands have been designated ‘Rural Residential’ (R3) and are located within a Development Permit Area pursuant to the Slocan Lake North Portion of Electoral Area ‘H’ Official Community Plan Bylaw No. 1967, 2009 as amended.
5. The Permittee has applied to the Regional District of Central Kootenay to remediate unauthorized works and establish a small access trail within the Development Permit Area (hereinafter called the “Works”). Pursuant to this Development Permit and subject to the terms and conditions herein contained, as well as all other applicable Regional District Bylaws, the Regional District of Central Kootenay hereby authorizes the use of the said lands for the aforementioned Works.
6. The Permittee is required to obtain approval in writing from the Regional District of Central Kootenay prior to the construction any new buildings, external additions to existing buildings or for any deviation from the development authorized under Section 5 of this Development Permit. Furthermore, the Permittee is hereby advised of the following requirements:
 - 6.1 The Works shall be carried out in accordance with Schedule 3 of this Permit and under the guidance of a Qualified Environmental Professional, in accordance with the *Riparian Areas Protection Regulation*.
 - 6.2 The Works, specifically rip-rap removal and any activity affecting fish, fish habitat, and/or Slocan Lake, as described in Schedule 3 of this Permit require Provincial authorization. Relevant Federal and Provincial authorizations shall be obtained prior to the commencement of these Works.
 - 6.3 The Regional District of Central Kootenay Building Department requires that the Permittee obtain a demolition permit and/or building permit prior to the removal of any existing buildings and structures, the renovation, expansion or alteration of any existing

building and the construction of any new building. The removal of "Structure #2", as labelled in Schedules 2 and 3, shall not require a building or demolition permit.

- 6.4 A building permit shall be required prior to any construction involving land in this location at which time the Permittee shall be required to address sewage disposal issues to the satisfaction of the Interior Health Authority and Regional District of Central Kootenay Senior Building Official.
7. As a condition of the issuance of this Permit, the Regional District shall hold a security submitted by the Permittee in the amount of \$8812.50 (hereinafter called the "Security") to ensure the landscaping requirements as set forth in Section 6 are completed and in accordance with the following provisions:
 - 7.1 A condition of the posting of the Security is that should the Permittee fail to carry out the works and services as herein above stated, according to terms and conditions of this permit within the time provided, the Regional District may use the Security to complete these works or services by servants, agents or contractors, and any surplus shall be paid over to the Permittee. If the amount of funds is insufficient to cover the actual cost of completing the works, then the Permittee shall pay such deficiency to the Regional District immediately upon receipt of the Regional District's bill for same.
 - 7.2 The Permittee shall complete the landscaping works required by this Permit prior to November 30, 2022. Within this time period the required landscaping must be inspected and approved by the Regional District.
 - 7.3 If the landscaping is not approved within this time period, the Regional District has the option of continuing to renew the Letter of Credit until the required landscaping is completed or has the option of drawing from the Letter of Credit or other form of Security to complete the required landscaping. In this event, the Regional District or its agents have the irrevocable right to enter into the property to undertake the required landscaping for which the Security was submitted.
 - 7.4 If the landscaping is approved within this time period without the Regional District having to draw the on the Security, 90% of the original amount of the Security shall be returned to the Permittee.
 - 7.5 A hold back of 10% of the original amount of the Security shall be retained until a final inspection is undertaken within 12 months of the date of the original inspection and approval was given to the landscaping. If the landscaping receives approval at final inspection, the 10% hold back will be returned to the Permittee. If after the final inspection, approval of the landscaping is not given, the Regional District has the option of continuing to renew the Letter of Credit until the required landscaping is approved or has the option of drawing on the Security to complete the required landscaping. In this event, the Regional District or its agents have the irrevocable right to enter onto the property to undertake the required landscaping for which the Security was submitted.
8. The said lands shall be developed strictly in accordance with the terms and conditions of this Development Permit and the requirements of all applicable Regional District Bylaws as well as any plans and specifications which may, from time to time, be attached to this Permit shall form a part thereof.
9. In accordance with the Local Government Act, if the development authorized by this Development Permit is not commenced within two years of the date of this Permit, this Permit shall lapse.

10. In accordance with the Local Government Act, 'Notice' shall be filed in the Land Title Office that the said lands are subject to this Development Permit.
11. The terms of this Development Permit including subsequent amendments, are binding on all persons who acquire an interest in the said lands associated with this Permit.
12. It is understood and agreed that the Regional District has made no representations, covenants, warranties, guarantees, promises, or agreement (verbal or otherwise) with the Permittee other than those in this Development Permit. It is solely the responsibility of the Permittee to ensure that the requirements of all other applicable government agencies are satisfied.
13. This Development Permit does not constitute an authorization under the *Water Sustainability Act*, *Land Act*, *Fisheries Act*, or any other relevant Provincial or Federal Legislation.
14. This Development Permit does not constitute a building permit.
15. This Development Permit shall come into force and effect 14 days after the date of issuance unless a Waiver of Appeal is received from the Permittee at which time the Development Permit shall be deemed to be issued upon receipt of the Waiver of Appeal. OR If a Notice of Appeal is received the Development Permit shall be suspended until such time as the Board of the Regional District of Central Kootenay has decided the Appeal.

S Sudan

Sangita Sudan, General Manager of Development Services

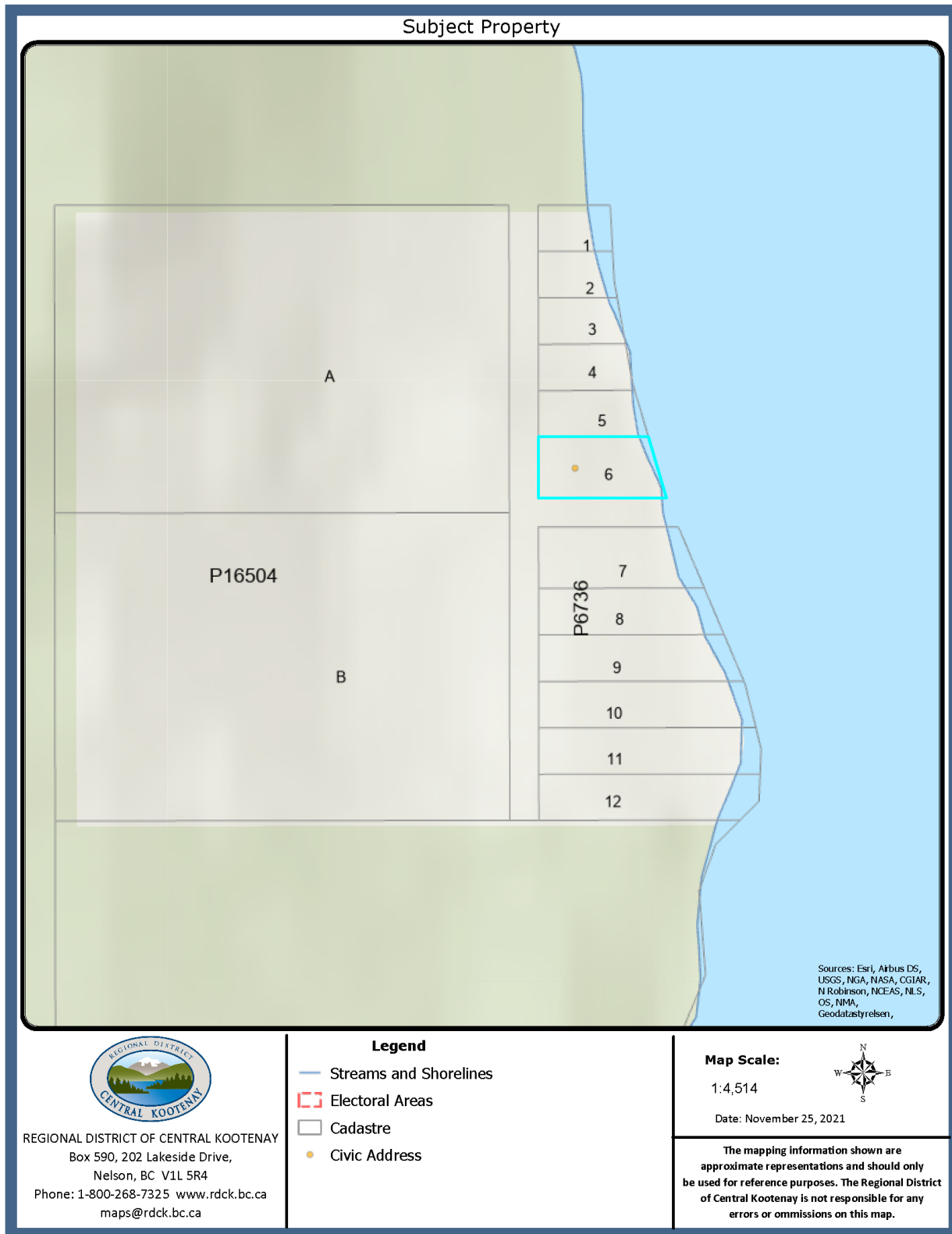
December 16, 2021

Date of Approval (date of review and approval)

March 7, 2021

Date of Issuance (pending receipt of securities)

Schedule 1: Subject Property



600 Slocan Lake Boat Access

DETAILED RIPARIAN ASSESSMENT

November 2021
Version 3.0

PREPARED FOR:

Regional District of Central Kootenay
Planning Department

202 Lakeside Drive
Nelson, BC V1L 5R4

PREPARED BY:

Pioneer Forest Consulting Ltd.
Suite 205-806 9th street north
Golden, BC V0A 1H4

Limitations of Report

The Riparian Assessment Report was prepared for the owners of the property as requested following an RDCK field visit in the summer of 2020. The report has been prepared for and at the expense of the owner of the property and the Qualified Environmental Practitioner (QEP) has not acted for or as an agent for the RDCK.

The guidance and findings documented in this report have been prepared for the specific application to this property. This assessment has been developed in a manner consistent with the level of care normally exercised by environmental professionals currently practicing under similar conditions in BC and is considered accurate at the time of this report.

Disclaimer

I, Mark Dascher, RPF working for Pioneer Forest Consulting Ltd. am completing this assessment and I am also one of the legal owners of the subject property.

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1 INTRODUCTION

Pioneer Forest Consulting Ltd. (Pioneer) was retained by Mark Dascher and Diana Wolff (hereafter referred to as “the Owners” to conduct a riparian assessment for 600 Slocan Lake Boat Access (Lot 6 DL 7686, Plan 6736, Kootenay District, BC, PID: 014-040-859)

Table 1: Location Summary

Property Details	
Proximity < 30 m from water	YES
Closest Community	Silverton, BC
Watershed name	Slocan Lake
Type of waterbody involved/Name	Lake/Slocan Lake
Coordinates of Property	49.953° N 117.395° W
Elevation of Property	542m
Legal description of property	Lot 6 DL7686, Plan 6736, PID 014-040-859
Landowner	Mark Dascher and Diana Wolff
Regional District	Regional District of Central Kootenay Area H
Forest Region/District	Southern Interior/Selkirk

Activities proposed/performed on the property involve works within the 30-meter Watercourse Development Permit (WDP) Area of a watercourse, as defined in the Slocan Lake North portion of Electoral Area ‘H’ *Official Community Plan Bylaw No. 1967, 2009*. Site visits were conducted in July 2019, April 2020, August 2020, and October 2020 by Mark Dascher, RPF. A further site review was done by Mr. Scott Wilson, RP Bio in 2021. Recommendations from Mr. Scott Wilson, RPBio – fisheries biologist from Grassroots Environmental have been incorporated into this final report submission.

As a detailed riparian assessment has been completed, this report will only discuss and summarize the SPEA area conditions, concerns, and prescription. Everything outside of the SPEA that has no impact on the SPEA has been removed from this version of the report.

The assessment will address the existing fisheries resource (habitat values, spawning, species); waterbody assessment; assesses potential environmental impacts; and recommends measures to protect environmentally sensitive areas during/after development as well as a rehabilitation plan for disturbed areas within the SPEA. The overall goal is to bring the SPEA and associated riparian area back to pre-existing conditions as much as possible.

1.1 GUIDING DOCUMENTS AND APPLICABLE LEGISLATION

Regulatory framework and best management practices documents:

- Slocan Lake North portion of Electoral Area 'H' *Official Community Plan Bylaw No. 1967, 2009.*
- British Columbia *Riparian Areas Regulation*
- Slocan Lake Foreshore Fish & Wildlife Habitat Assessment (Prepared by Galena Environmental Ltd.)
- British Columbia *Water Sustainability Act*
- *Forest and Practices Regulation*
- General BMPs and Standard Project Considerations (Ministry of Environment)
- On the Living Edge: Your Handbook for Waterfront Living
- Develop with Care. Environmental Guidelines for Urban and Rural Land Development in British Columbia
- British Columbia FireSmart Homeowners Manual
- Riparian Factsheet No. 6 – Riparian Plant Acquisition and Planting
- BC Tree Replacement Criteria
- Stormwater Planning: A Guidebook for British Columbia
- Provincial Water Sustainability Act
- Federal Fisheries Act
- Provincial Heritage Conservation Act
- Federal Migratory Birds Convention Act
- Federal Species at Risk Act
- Federal Transportation of Dangerous Goods Act
- Provincial Spill Reporting Regulation
- Weed Control Act
- Provincial Wildlife Act.

2 PROJECT OVERVIEW

2.1 LOCATION

The subject property is located adjacent to the west foreshore of Slocan Lake immediately across the lake from Silverton, BC and within Area 'H' of the RDCK (*Appendix 1 – Overview Map*). The subject property is in the middle of a total of 11 other adjacent private properties and is surrounded by Valhalla Provincial Park. The property access is by boat only. There are no roads to the subject property. (*see Appendix 2 – Location Map*)

The property is within the Interior Cedar Hemlock Slocan Moist Warm variant (ICHmw2) biogeoclimatic subzone. This is one of the most extensive biogeoclimatic units in the Southern Interior. The climate is characterized by warm, moist summers and cool to mild, moist winters with moderate snowfall. The property ranges from mesic to wet sites. Vegetation is generally western hemlock leading with codominant western cedar and minor Douglas-fir and larch with predominantly herbaceous undergrowth. (*MacKillop and Ehman 2016*)

2.2 PRE-EXISTING SITE CONDITIONS

The first review of the property occurred in 2019. At that time, no works on the property had been carried out by the current landowners. The previous landowners/users had completed some works on the property over the years. Outlined below are works that occurred **in the SPEA**.

The following works had occurred in the SPEA before the current owners purchased the property:

1. Removal of some trees within the SPEA. It is estimated that 6 dominant conifer trees were removed and 5-10 small saplings. Some understory vegetation and coarse woody debris was also removed.
2. Narrow trail from lakeshore to upland areas through the SPEA

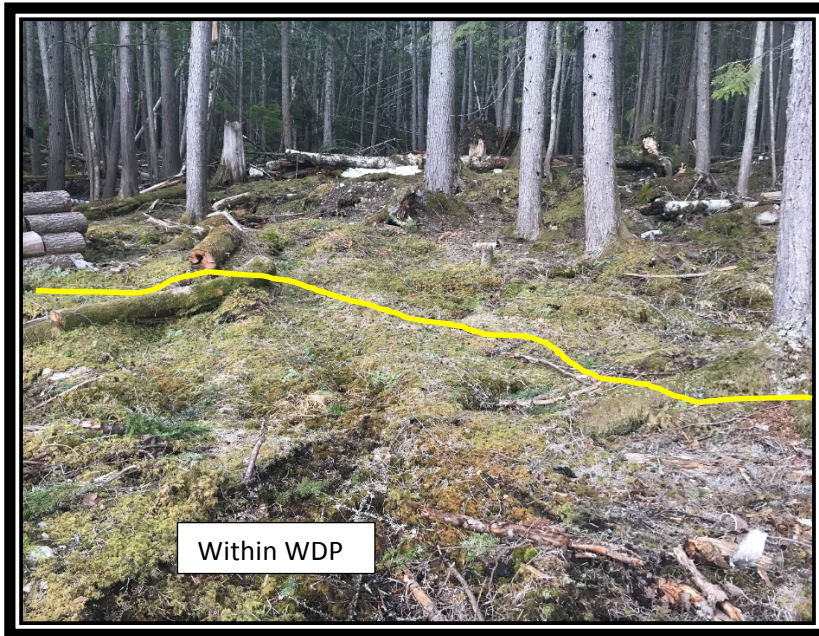


Photo 1: Pre-existing WDP Area. **Yellow line** represents the approximate upper boundary of WDP area.(30 meters from foreshore). This is a typical representation of the understory vegetation within the 30 meter WDP area and the SPEA area.

Table 2: Summary of SPEA disturbances

Total SPEA Area on property (15meter zone from natural boundary of the lake) 675m ²	Previous SPEA disturbance	SPEA disturbance 2020	Future Planned Disturbance	Planned Rehabilitation Area 2022
Previous Tree Removal/Vegetation Removal (unknown as to whether it was blowdown, hazard trees or just cosmetic) *previous tree and vegetation removal occurred within the SPEA area. To quantify the ground disturbance an estimate of the number of trees removed and an average of 20m ² of area/tree was used to represent disturbance from crowns falling to the ground and disturbing vegetation and works done to clean trees up. Estimated to be 6 trees (based on piles of firewood and logs) or 120m ² . Although disturbed, the area had grown back with mosses, horsetail, and bracken fern.	120m ²	n/a	0m ²	Fully Rehabilitate (100%). 120m ² (part of the 593 below)
Garden/Blowdown/Danger tree removal Disturbance 2020	n/a	593m ²	0m ²	Fully rehabilitate (100%) 593m ²
Rip Rap Riprap was placed at high water mark. The plan is to intermix additional plantings of hemlock, alder, sedges, and natural grasses in the area and remove the rip rap. The end result after plantings is considering this area to be fully rehabilitated.	n/a	35m ²	0m ²	Fully rehabilitate (100%) 35m ² .

Total SPEA Area on property (15meter zone from natural boundary of the lake) 675m2	Previous SPEA disturbance	SPEA disturbance 2020	Future Planned Disturbance	Planned Rehabilitation Area 2022
SETTLING PONDS Settling ponds were created to capture and filter surface flow water before reaching Slocan Lake. The ponds worked as planned and prevented sedimentation into the lake. Further plantings are planned around settling ponds to improve SPEA habitat as per RP Bio recommendations. The ponds will remain in place as removing them would be more detrimental than keeping them. Plantings around them are planned as per RP Bio recommendations. Estimated after plantings to be 73% rehabilitated back to pre-disturbance conditions. The non-rehabbed area (water surface area of the ponds) will be beneficial to the overall riparian/SPEA area.	n/a	15m2	0m2	11m2 (73% rehabilitated)
Deck Structure (lakeshore)	n/a	20m2	0m2	Fully rehabilitate (100%) 20m2. Remove the structure entirely)
Upland Access trail from lake to cabin site. Access from the lake to the upland cabin site is required as this property is lake access only. The trail utilizes a previously established foot trail that will be upgraded to a 1meter width to allow for material transport and access to the upland cabin site. The trail will maintain a natural, permeable surface.	6m2	12m2	0m2	0m2 (access to the upland areas of the property is required)
Total Accumulated SPEA disturbance 10		675m2 (100%)	0m2	659m2 (98%). Access trail and ponds will remain)



Photo 6: Rip rap area to be removed and planting of conifer and deciduous stems to be undertaken



Photo 7: Settling pond . Ponds will remain with tree plantings surrounding

2.3.2 Watercourse Description

The watercourse impacting this property is Slocan Lake.

Much of the data presented in the following pages including charts and photo is taken from the *“Paquin, L. 2011. Slocan Lake Foreshore Fish & Wildlife Habitat Assessment, including a FIM and a AHI. Consultant Report prepared for the Slocan Lake Stewardship Society. Prepared by Galena Environmental Ltd, Silverton, BC*

This was a very comprehensive assessment of the lake foreshore and habitat completed in 2011 and is the best information available on the watercourse.

Slocan Lake is a 39 km long, cold, oligotrophic lake that covers a surface area of 6908 ha). The lake has a foreshore length of approximately 87km, a mean depth of 171 m and a maximum depth of 298 m. The lake differs from its neighbors in that it does not have a major river flowing through it. As a result, its bulk water residence time is 7 years, compared to Arrow Reservoir (< 1year) and Kootenay Lake (1.5 years). The longer residence time for Slocan Lake is somewhat misleading due to its deep water volume (Andrusak 2006). The Slocan Lake watershed code is 340-047200 and the waterbody identifier is 00115SLOC.



Photo 8: Slocan Lake

3 RESOURCES

5.1 Fish and Fish Habitat

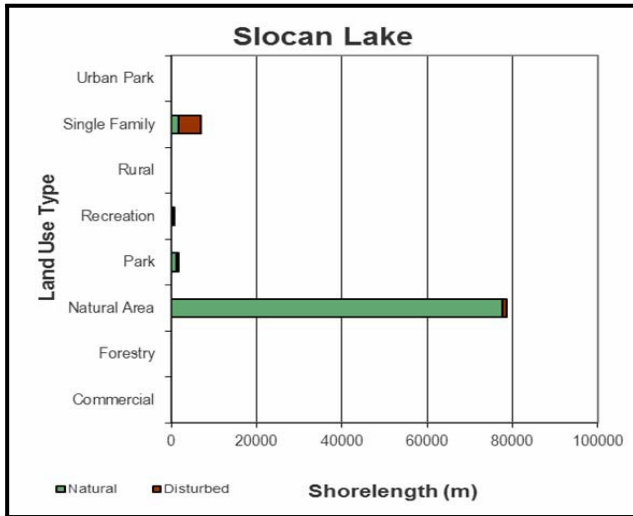
The following species of fish are known to inhabit Slocan Lake. Those marked in the right column were observed during snorkeling observations in front of the property over 6 different times in the summer of 2020. Largescale suckers represented 65% of the observations and Sculpins represented 30% of the observations.

Table 3: Species known to inhabit Slocan Lake

COMMON NAME	SPECIES CODE	SCIENTIFIC NAME	OBSERVED IN THE WATERS DIRECTLY IN FRONT OF SUBJECT PROPERTY (%of total fish observed)
Bull Trout	BT	<i>Salvelinus confluentus</i>	
Burbot	BB	<i>Lota lota</i>	
Cyprinids spp.	C		X (3%)
Dolly Varden ¹	DV	<i>Salvelinus malma</i>	
Eastern Brook Trout	EB	<i>Salvelinus fontinalis</i>	
Kokanee	KO	<i>Oncorhynchus nerka</i>	X (1%)
Lake Chub	LKC	<i>Couesius plumbeus</i>	
Largescale Sucker	CSU	<i>Catostomus macrocheilus</i>	X (65%)
Mountain Whitefish	MW	<i>Prosopium williamsoni</i>	
Northern Pikeminnow	NSC	<i>Ptychocheilus oregonensis</i>	
Peamouth Chub	PCC	<i>Mylocheilus caurinus</i>	
Rainbow Trout	RB	<i>Oncorhynchus mykiss</i>	X (1%)
Redside Shiner	RSC	<i>Richardsonius balteatus</i>	
Sculpin spp.	CC	<i>Cottus spp.</i>	X (30%)
Westslope Cutthroat Trout	WCT	<i>Oncorhynchus clarki lewis)</i>	
White Sturgeon	WSG	<i>Acipenser transmontanus</i>	

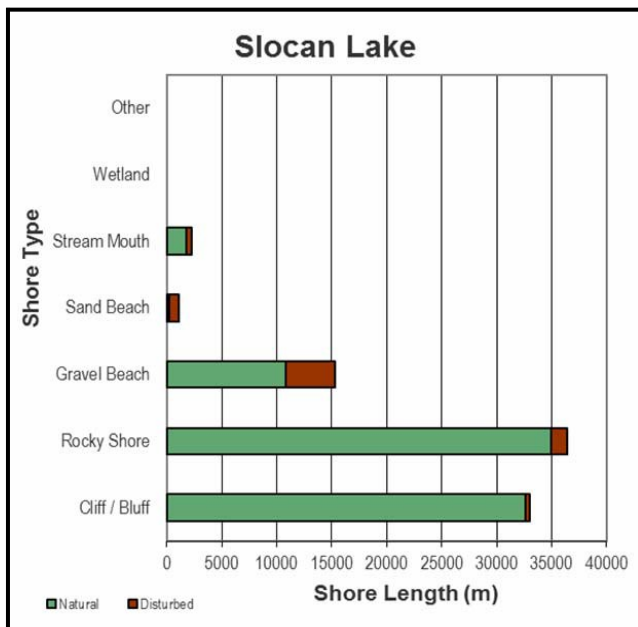
Most of the Slocan Lake shoreline, 89.4% (78,654m), is designated as a Natural Area. The Single Family designation accounts for 7.8% (6,846m) of the Slocan Lake shore. The vast majority of Single Family developments were concentrated within village boundaries. The Industrial designation covers 0.9% of the shoreline (788m). Most of this component is located in the town of Slocan and in Rosebery (log dump). The Recreational area represents 0.7% (590m) and includes two Forestry campsites: Bannock Point, located on the east shore and south of Silverton, and Wragge Beach, located on the northwest corner of the lake.

Table 4: Representative Land use type to Shore length



Based on the reports assessment, the subject property falls into lakeshore Segment #26 which has a Habitat Index Rating of HIGH and a Juvenile Rearing Rating of MODERATE. These segments are generalized and variations from low grade sandy beaches to straight drop off cliff areas are all included in the same segment with the same rating. This segment has a length of 22,964 meters. Several areas within the segment on a detailed assessment would be rated higher or lower for habitat, rearing, staging, or migration. For the subject property, however, the above ratings seem representative. The shore type for section 26 is classified as predominantly “rocky” which is the **most dominant shore type** on the lake representing 41.4% of the lake’s shoreline.

Table 5: Shore types on Slocan Lake



5.1 Riparian Vegetation

Following the 2020 alterations there remains approximately 20% of the original tree layer in the SPEA. The stems per hectare (SPH) is around 20. The predominant species is Douglas-fir with cedar, hemlock, and a small white pine also present. There is some alder on site and remains in much the original state as always. The herbaceous layer is dominated by bracken fern and horsetail with very minimal other species (less than 2% ground cover). Adjacent properties show a similar species mix. The percent crown closure in the SPEA is estimated at 20%. The ground cover by vegetation is estimated at 20% , 90% of which are annual bracken fern and horsetail.

Very little overhanging vegetation (vegetation hanging beyond the HWM) is or was present. The rehabilitation plan is to improve streamside vegetation.

Table 6: List of plant species noted within the riparian area.

Common Name (in order of dominance on site)	Scientific Name
TREES	
Western Hemlock	<i>Tsuga heterophylla</i>
Western Red Cedar	<i>Thuja plicata</i>
Douglas-fir	<i>Pseudotsuga menziesii</i>
Paper Birch	<i>Betula papyrifera</i>
White pine	<i>Pinus monticola Dougl</i>
TALL SHRUBS	
Mountain Alder	<i>Alnus incana</i>
HERBACEOUS AND LOW SHRUBS	
Bracken Fern	<i>Pteridium aquilinum</i>
Common horsetail	<i>Equisetum arvense</i>
Lady Fern	<i>Athyrium filix-femina</i>
Wild Ginger	<i>Asarum caudatum</i>
One-leafed Foam Flower	<i>Tiarella unifoliata</i>
Grass sp.	

5.2 Wildlife

Reptiles and Amphibians

The property in general is very moist year-round (outside of the WDP) providing upland amphibian habitat. A Western toad was noted in the upland areas during site visits. Common Garter snakes were observed in the rip rap area along the high-water mark.

Birds

Trees and shrubs on the property provide foraging and nesting habitat to songbirds. Class 2-5 Wildlife trees are located throughout the property but predominantly outside of the WDP. During site visits the following bird species were noted: Northern flicker with hatchlings, nuthatch, chickadee, pileated woodpecker, common mergansers (frequently feeding on the shoreline); loons; robins; belted kingfisher; and varied thrush. The planting of fruit trees should have the added benefit of drawing more insects to the property and in turn more bird species.

Mammals

The property provides potential habitat to several mammals. Observed on the property in 2020 were: red squirrels; chipmunks; least weasel (in the rip rap on several occasions); white tailed deer; cougar; little brown bat (roosting in roof of neighbor's cabin); and river otters.

4.1.4 Species at Risk

A 10 km buffer around the subject property was used to query BC Conservation Data Center records using the CDC iMap tool. The query indicated white sturgeon and white bark pine as species at risk. Neither of these species are located on the property and the aquatic environment out from the property is not conducive to white sturgeon.

4 REGULATORY REVIEW

4.1 Streamside Protection and Enhancement Area

To determine whether the 30 meter WDP setback from the High Water Mark (HWM) of Slocan Lake aligns with Riparian Area Regulation (RAR) criteria, a detailed assessment of the subject property was conducted to calculate the Streamside Protection and Enhancement Area (SPEA) setbacks. Results for the Zones of Sensitivity (ZOS) and SPEA are presented in Table 3, and on the *Proposed Site Plan in Appendix 5*. As per the RAR, the large woody debris (LWD), and litter ZOS were plotted 15 m inland from the HWM. The Shade ZOS was plotted 30m south of the HWM and 0m north of the HWM. This resulted in a shade ZOS of maximum 14meters. The SPEA setback is determined based on the ZOS with the greatest width. Therefore, within the subject property the SPEA is 15m from the HWM of the lake. For reference, the *Forest Planning and Practices Regulation* for L1-A class lakes (>1000ha) defines the Riparian Management Area as 0 meters. (see Appendix 9)

The BC Riparian Areas Regulation (BC 2015) defines the HWM as follows:

“**High Water Mark**” means the visible high water mark of a stream where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark on the soil of the bed of the stream a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself, and includes the active floodplain.”

Table 7: Results of Detailed RAR assessment.

Feature Type	SPVT ¹	Zones of Sensitivity (ZOS)			SPEA (calculated)	WDP
		Large Woody Debris	Litter fall	Shade		
Lake	TR	15 m	15 m	2-14m	15 m	30 m

¹ SPVT: site potential vegetation type (TR-tree)

5 SUMMARY OF PROPOSED DEVELOPMENTS

The owners are proposing the following developments on their property. Proposed developments will be carried out in such a manner as to minimize disturbance to the SPEA as well as upland areas on the property.

Table 8: Proposed Works

Proposed Works	Area within SPEA (m2)	Summary
Small trail to access upland cabin	12	Require an access from proposed dock to cabin. Boat access only property so permanent access trail from foreshore to building site above the WDP is a necessity. Trail is staying as natural permeable surface and as narrow as possible (1m) to allow for material transport/wheelchair access to cabin. (1.8% of SPEA)
Rehabilitation of SPEA	659	Rehabilitation of disturbance in the SPEA as per the rehabilitation plan. (97.6% rehabilitation of SPEA)
Settling Ponds	4	Existing. Will remain in place as per RP Bio review. Additional plantings to be done to improve function. (0.6% of SPEA)

6 MEASURES TO PROTECT AND MAINTAIN THE SPEA

6.1 Assessment and Treatment of Danger Trees

Multiple trees on the subject property were assessed by a Provincially certified danger tree assessor as danger trees due to their proximity to the proposed cabin; greenhouse; beach area; and access path. These trees have been felled to minimize safety hazards on site. Nesting bird surveys were completed before tree removal occurred.

It is anticipated that further danger trees may need to be removed as there is an active population of Douglas-fir beetle in the area. These trees are not in the SPEA but depending on assessment may need to be felled into the SPEA zone to ensure faller safety. The property owner's pheromone baited the large Douglas-fir trees on site with repellent pheromones (2019/2020) in an attempt to keep these trees alive. The Douglas-fir beetle population increase in 2020 was likely due to the windthrow that occurred, attracting the beetles to the site. Adjacent areas up and down the lake show increasing sign of Douglas-fir beetle.

Where possible danger trees will be felled at a height of 2-3 meters to maintain the base area for cavity nesting birds and low perches while maintaining safety and WorkSafe BC compliance.

6.2 Windthrow

The potential for additional blowdown exists. If additional blowdown occurs the trees in the SPEA will remain as coarse woody debris.

6.3 Slope Stability

No slope stability hazard indicators were observed during the site visit. Slopes are low gradient.

Lakeshore plantings above high water mark will prevent erosion at the high water mark of Slocan Lake.

6.4 Protection of Trees and Vegetation During Construction

No tree removal is planned or required for the proposed works. The following measures will be implemented for all other works:

- Cabin and associated future structures are located outside the WDP
- Preserving what vegetation remains
- Continued Douglas-fir beetle tree baiting to protect remaining trees in the WDP area

6.5 Prevention of Encroachment

A portion of the SPEA will be impacted with proposed developments but they have been kept to a minimum to allow permanent access on this boat access only property and to allow for the ability to have a self-sustaining homestead. Proposed developments still maintain natural drainage flows and vegetation. Re-establishment of pre-existing riparian vegetation is promoted and planned within the mitigation plan. New construction is planned outside of the SPEA area. The SPEA area will be identified so workers are aware when they are within this zone.

6.6 Sediment and Erosion Control

Soil disturbance during construction activities on the cabin will occur. This disturbance creates the potential for erosion and sediment release. The following measures have/will be taken to ensure the protection of the WDP area:

- All works will be undertaken under the direction of a QEP/environmental monitor
- Minimize soil disturbance as much as possible
- Runoff around building site is directed through silt fencing and then into a drainage ditch that flows into a settling pond area before reaching the lake. Silt fencing will be used as required under the direction of the environmental monitor.
- Disturbed soils will be revegetated as soon as possible after construction
- Turbid wastewater from the construction site is not to be directly discharged into the watercourse.
- Ensure any erosion and sediment control silt fencing is removed and properly disposed of when no longer required.

6.7 Floodplain

There are no floodplain issues with this property.

6.8 Stormwater Management

The proposed cabin development outside the WDP area will result in ~61 m² increase in the total impervious area of the property. The following mitigation measures will help decrease stormwater impacts:

- Minimize impervious surfaces (this has been done by planning flow through deck areas, minimizing cabin size, and using natural permeable pathways kept as narrow as functionally possible.
- Maintain greenspace on the entire property as much as possible.
- Rainwater collected on roofs should not be allowed to form surface runoff. Downspouts/vegetation should direct rainwater into suitable landscape features which can absorb and utilize runoff rather than discharging it directly to the watercourse.
- Ditch and settling pond allow for capture and filtration of storm waters

6.9 Protection of Fish Habitat

All proposed activities must be done in such a way as to maintain fish and fish habitat. Measures to include:

- Rehabilitation of SPEA area as per Rehabilitation Plan
- Retention and reestablishment of vegetation which promote insect activity and a food source for fish.
- Adhere to sediment, stormwater, and waste management best practices outlined in this report to ensure that there is no release of deleterious materials into the watercourse.
- No instream works

6.10 Fuel and Lubricant Handling and Storage

The following is a list of general best management practices associated with refueling and the storage of fuel for construction works to minimize the risk of spills.

- Equipment, Fuel or other hydrocarbon containers must not be stored or re-fuelled within 30 m of the stream.
- Spill kits must be available at all refuelling areas to allow immediate response to spills. All on-site staff must be trained in refuelling practices, handling requirements, and spill kit location and deployment.
- Equipment working on this project must be clean and free of leaks.
- Small fuel tanks (jerry cans) must be stored within containment areas or spill trays capable of containing 110% of the volume of the liquid; and,
- Pumps, generators or other small equipment will be placed on a spill tray when working near water.

6.11 Invasive Plant Management

- The following mitigation measures are recommended to reduce the establishment of invasive plant species on site:
- Annual review and hand removal, bagging, and appropriate removal of any invasive species found anywhere on the property.
- All exposed soils should be re-vegetated immediately following construction with suitable guaranteed weed free mixtures.

7 SPEA REHABILITATION PLAN

Below is a comprehensive rehabilitation plan scheduled for the SPEA zone on this property. This plan is a result of Mark Dascher, RPF and Scott Wilson, RP Bio working together to come up with the best overall plan for the protection and enhancement of the SPEA and the associated fish habitat.

Through this rehabilitation plan all areas except the settling pond and the upland access trail will be fully rehabilitated in the SPEA. This will amount to approximately 98% of the SPEA area being fully rehabilitated (see Table 2 page 5)

Goals:

- To rehabilitate the disturbances that have occurred on the property to a functioning riparian habitat that existed before the disturbances occurred.
- To establish a multi-storied forest to provide stream shade, as well as organic matter and food for the stream.
- To increase bank stability and to reduce sediment and pollution from surface run-off by streambank plantings.
- To increase surface sediment filtering by re-establishing ground cover.

The rehabilitation plan involves both short term and long-term measures.

Short Term Goal: The immediate goal is to stabilize the ground surface to prevent surface erosion and subsequent siltation of the watercourse.

Short Term measures include:

- Planting an erosion control mix of natural grasses to provide immediate ground cover along with the natural horse tail growing in the area already.
- Remove all **rip rap** and all **structures** within the SPEA
- Plant native conifers and deciduous trees/shrubs to repair the riparian habitat
- Maintain the settling ponds as they filter water before entering the lake.

Long Term Goal: The long-term goal is to create a functioning riparian/SPEA area that has more diversity and more value to fish and fish habitat than the pre-existing SPEA area. All rehabilitation and plantings will happen in 2022 but the effectiveness of the plantings is likely not to be significant until plantings grow to a larger size.

Long Term measures include:

- **Treatment Unit 1: (0-3meters from HWM) For the immediate area above the high water mark**
This area will be planted with sedges and alder in and amongst the rip rap to mimic the natural shoreline in this area. The best protection of streambanks against the erosive power of stream water is a mix of plants with differing types of root systems. For example, one of the strongest mixtures is a combination of sedge and willow. The willow provides deep roots for anchorage and the sedge provides very strong fibrous roots near the surface. (*BC Government Riparian Factsheet – June 2012*).

- **Treatment Unit 2 (3m to 15m) Plantings through the rest of the SPEA.** An estimated 20 trees have been lost in the SPEA over time. This proposal is to rehabilitate the site at a 2new:1lost ratio including: Planting 10 hemlock and 10 cedar trees; 10 of (willow, alder, dogwood, or high-bush cranberry); 10 of (paper birch or Douglas-maple). Other herbaceous species such as huckleberry and saskatoon will be intermixed if growing space is available. A complete listing of acceptable species is in Appendix 10 (*RAR Implementation Guidebook – Southern Interior Moist Species List*)

This filter strip of thriving vegetation will bind the soil and minimize erosive soil loss from surface runoff, wave action, and use by people and animals.

- **Treatment Unit 3 (15m up to cabin location). Objective is to revegetate to provide ground cover, loosen soils, and increase organic matter.** Conifer plantings
 - Ensure that all equipment and supplies have been removed from the SPEA
 - Complete post-rehabilitation monitoring to ensure revegetation meets survival requirements. The test for success will be vegetation successfully established that mimics natural SPEA areas on this stretch of the lake and that erosion is prevented.

See Appendix 6 for a planimetric view of the rehabilitation site plan.

9 CONCLUSION

With the mitigation/rehabilitation plans followed the end result will be a more diversely functioning SPEA area than existed before the 2020 disturbances. Fish and fish habitat in Slocan Lake will not be adversely affected.

10 CLOSURE

I, Mark Dascher, RPF certify that I am qualified to carry out this assessment and that the assessment methods under the Riparian Area Regulation have been followed. In my professional opinion:

- (i) if the development is implemented as proposed, and
- (ii) if the mitigation measures identified in the report are fully implemented, and
- (iii) if the developer implements the measures identified in the report to protect areas from the effects of the development,

then there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area.

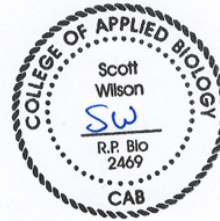
I, Scott Wilson, RP Bio; after reviewing the original Detailed Riparian Assessment Report and visiting the site, have prepared site-specific reclamation recommendations in accordance with best practices and BC fish habitat protection regulations. These recommendations, included in the SPEA Rehabilitation Plan, were used in context for the purposes of enhancing fish and fish habitat, and halting / remediating bankside erosion at the 600 Slocan Lake Boat Access property.

Prepared by:



Mark C. Dascher, RPF #2882

Reviewed by:



Scott Wilson, B.Sc. (RP Bio)

11 REFERENCES

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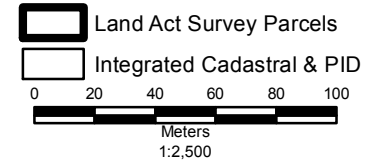
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600 Slocan Lake Boat Access
Riparian Assessment

Location Map



Coordinate System: NAD 1983 UTM Zone 11N
Projection: Transverse Mercator
Datum: North American 1983



November 15, 2021








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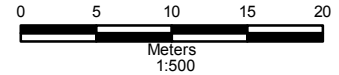
DETAILED RIPARIAN ASSESSMENT RESULTS

Feature Type	SPVT ¹	Zones of Sensitivity (ZOS)			SPEA	WDP
		Large Woody Debris	Litter fall	Shade		
Lake	TR	15 m	15 m	2 - 14 m	15 m	30 m

1 SPVT: site potential vegetation type (TR-tree)

**600 Slocan Lake Boat Access
Detailed Riparian Assessment Map**

-  High Water Mark
-  Streamside Protection & Enhancement Area
-  Watercourse Development Permit Area
-  Shade Line
-  Integrated Cadastral & PID



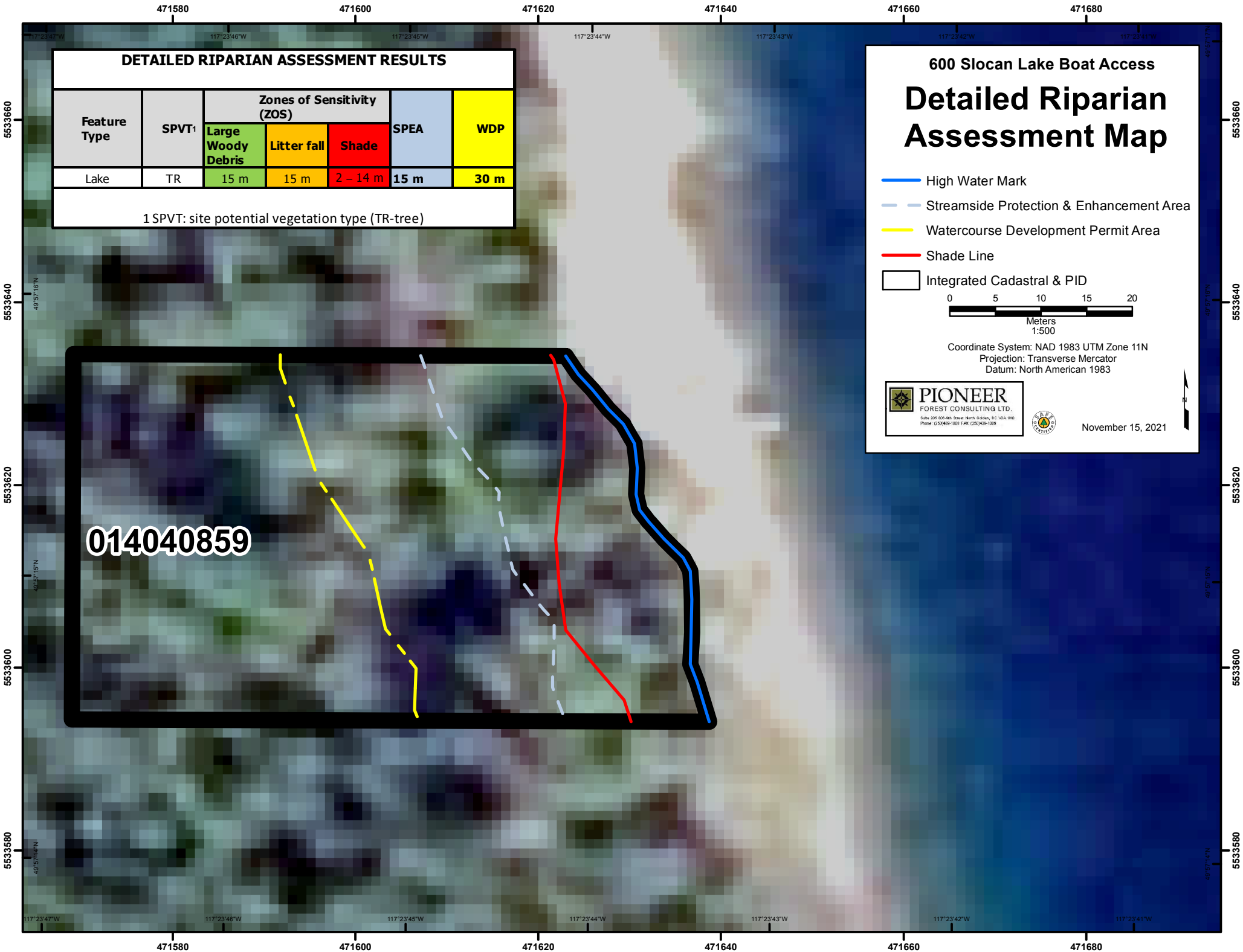
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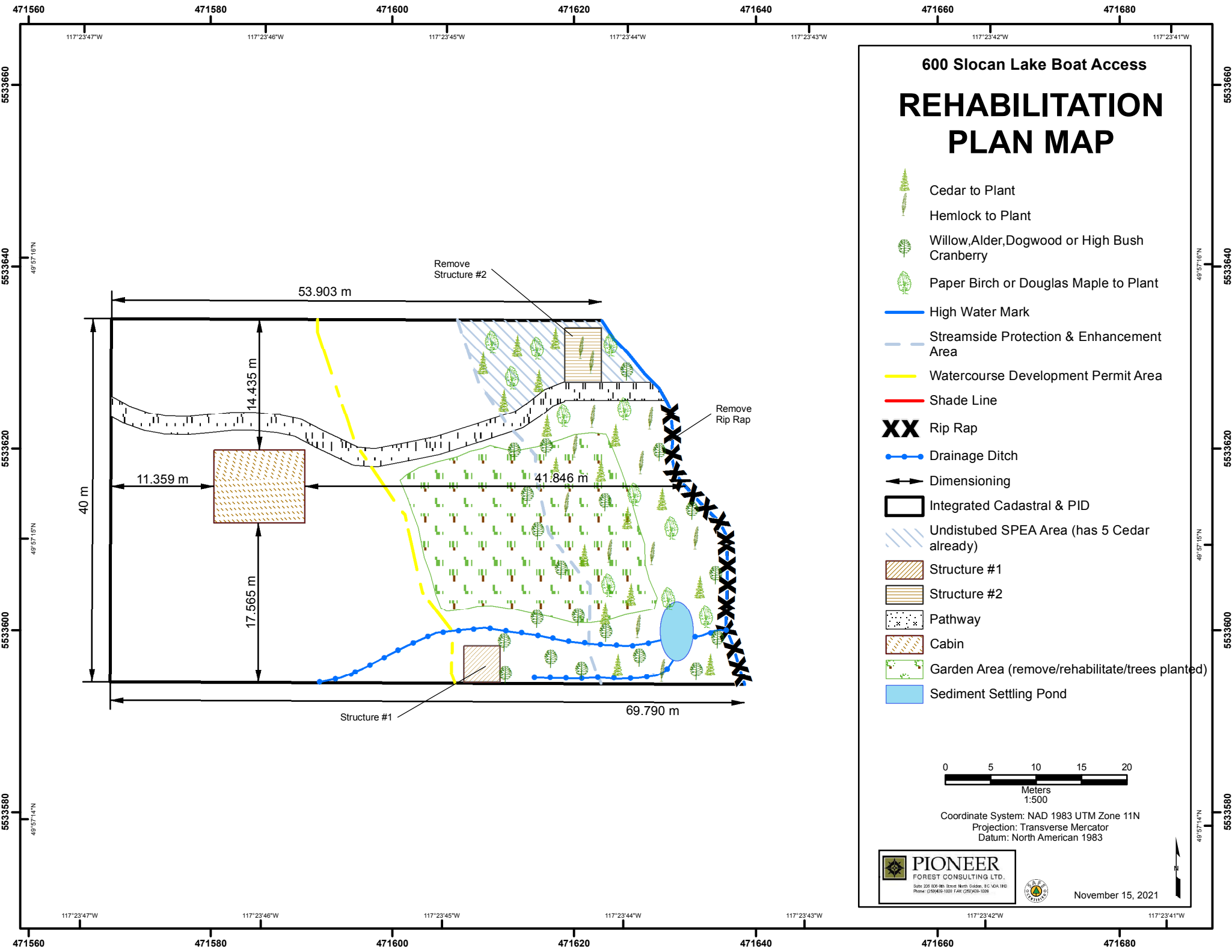


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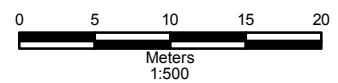
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600 Slocan Lake Boat Access REHABILITATION PLAN MAP

- Cedar to Plant
- Hemlock to Plant
- Willow, Alder, Dogwood or High Bush Cranberry
- Paper Birch or Douglas Maple to Plant
- High Water Mark
- Streamside Protection & Enhancement Area
- Watercourse Development Permit Area
- Shade Line
- Rip Rap
- Drainage Ditch
- Dimensioning
- Integrated Cadastral & PID
- Undisturbed SPEA Area (has 5 Cedar already)
- Structure #1
- Structure #2
- Pathway
- Cabin
- Garden Area (remove/rehabilitate/trees planted)
- Sediment Settling Pond

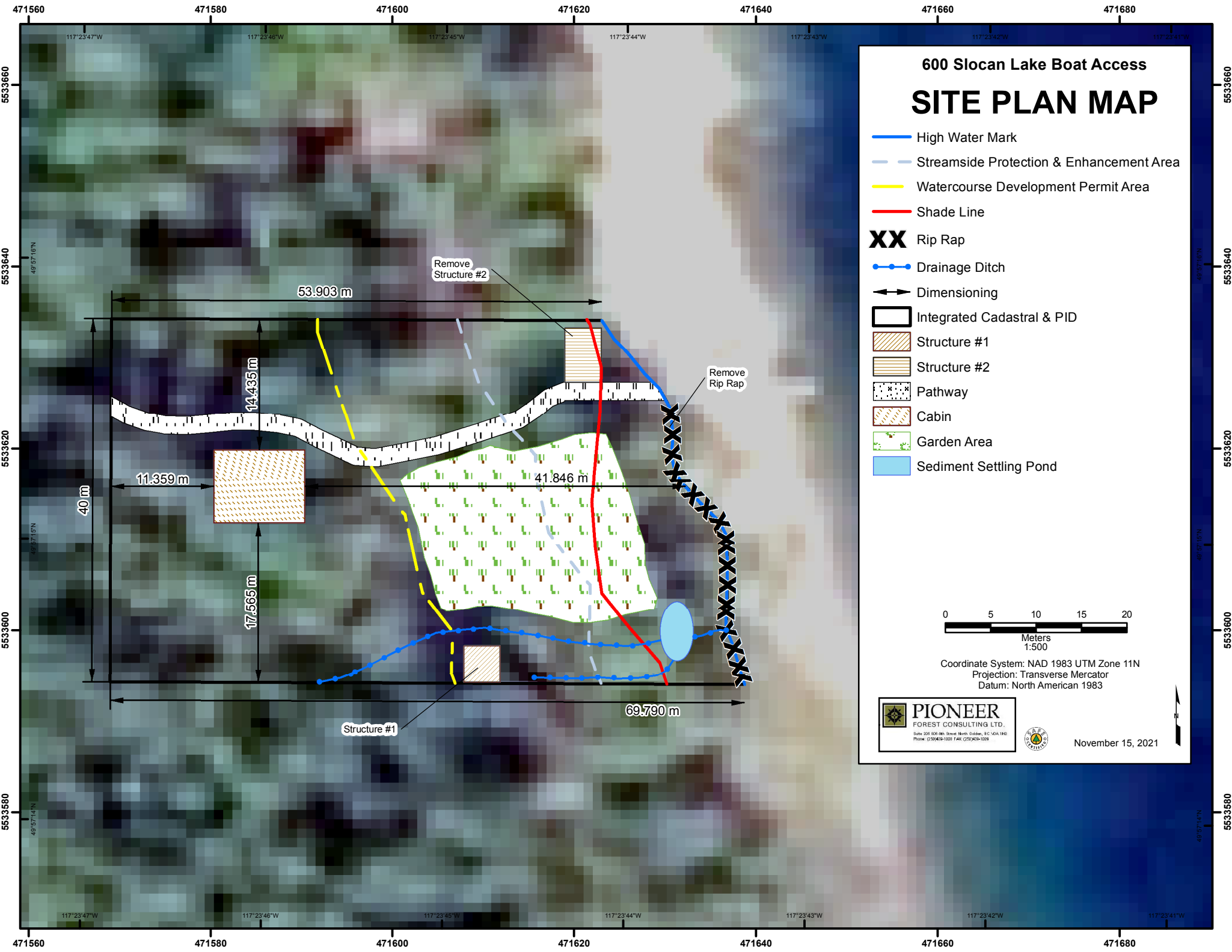


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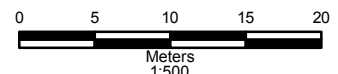




600 Slocan Lake Boat Access

SITE PLAN MAP

- High Water Mark
- Streamside Protection & Enhancement Area
- Watercourse Development Permit Area
- Shade Line
- XX** Rip Rap
- Drainage Ditch
- \longleftrightarrow Dimensioning
- Integrated Cadastral & PID
- Structure #1
- Structure #2
- Pathway
- Cabin
- Garden Area
- Sediment Settling Pond



Coordinate System: NAD 1983 UTM Zone 11N
 Projection: Transverse Mercator
 Datum: North American 1983



November 15, 2021



600 Slocan Lake Boat Access Rehabilitation Budget

Item	Machine Rate (hourly)	Machine Hours	Worker Rate (hourly)	Worker Hours	Supplies Cost	Total cost
Mobilization of Equipment to site (includes barge time)						\$ 1,500.00
Remove Deck Structure			\$ 50.00	10	\$ -	\$ 500.00
Remove Rip Rap (mini excavator)	\$ 100.00	4	\$ 50.00	2	\$ -	\$ 500.00
Remove Garden Area and reestablish natural ground slope (mini excavator)	\$ 100.00	4	\$ 50.00	3	\$ -	\$ 550.00
Planting trees and shrubs			\$ 50.00	8		\$ 400.00
Purchase Soil Amendments for plantings					\$ 500.00	\$ 500.00
Purchase Trees (30 units @ \$80/unit)					\$ 2,400.00	\$ 2,400.00
Purchase Shrubs/grasses (25 units at \$20/unit)					\$ 500.00	\$ 500.00
Delivery of Trees and Shrubs					\$ 250.00	\$ 250.00
Environmental Monitoring (including travel costs)			\$ 100.00	12		\$ 1,200.00
Silt Fencing			\$ 50.00	2	\$ 150.00	\$ 250.00
					Total	\$ 7,050.00