



REGIONAL DISTRICT OF CENTRAL KOOTENAY
DEVELOPMENT PERMIT
DP2116A-05497.170-Kehler-DP000121

Date: December 13, 2021

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

1. This Development Permit is issued to Dave of David and Rhonda Kehler, 12523 Lewis Bay Road, as the registered owner (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 STRATA LOT 17, PLAN NES75, DISTRICT LOT 5027, KOOTENAY LAND DISTRICT, TOGETHER WITH AN INTEREST IN THE COMMON PROPERTY IN PROPORTION TO THE UNIT ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V (PID 029-641-608) 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 'Country Residential' and are located within a Development Permit Area pursuant to the Electoral Area 'A' Comprehensive Land Use Bylaw No. 2315, 2013 as amended.
5. The Permittee has applied to the Regional District of Central Kootenay for an Environmentally Sensitive Development Permit in order to construct a water line to service the new residence, and a 1 m wide elevated ramp, stairway and/or pervious pathway (15 m²) to access the foreshore of Kootenay Lake. 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 residential purposes.
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 Construction of works identified in Section 5 of this permit are authorized within the terms of the report titled '12523 Lewis Bay Rd. Boswell BC Riparian Assessment' and dated August 26, 2021 and referred to hereafter as 'the report' including:
 - 6.1.1 Measures to protect the integrity of the Streamside Protection and Enhancement Area (SPEA) including the protection of trees and vegetation within the SPEA, sediment and erosion control, storm water management, protection of fish and wildlife habitat, management of fuel/lubricant materials and invasive species management identified in Section 5 of the report are adhered to. **All work will be done in accordance with Section 5 of the attached report.** Notably, the following will be adhered to:

- 6.1.1.1 Staging of materials and access should only occur in previously disturbed areas of the site;
 - 6.1.1.2 Natural drainage will be maintained as much as possible;
 - 6.1.1.3 Invasive weeds will be removed;
 - 6.1.1.4 Pollutants will not be allowed to contaminate the soil within the development area next to the SPEA;
 - 6.1.1.5 The ramp/stairway be constructed above grade to minimize ground disturbance and constructed in such a way as to allow light to penetrate underneath and vegetation to grow;
 - 6.1.1.6 Vegetation clearing is avoided, and any vegetation lost is replaced according to the BC Tree Replacement Criteria (MoE 1996) with suitable native species;
 - 6.1.1.7 The water line is installed on an alignment which avoids significant ground disturbance and vegetation clearing that would associated with drilling and excavation required to install the infrastructure under the frost line.
- 6.2 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 an irrevocable Letter of Credit submitted by the Permittee in the amount of \$1250.00 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 Letter of Credit 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 Letter of Credit 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 June 30, 2023. 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 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 Letter of Credit was submitted.
 - 7.4 If the landscaping is approved within this time period without the Regional District having to draw the on the Letter of Credit, 90% of the original amount of the Letter of Credit shall be returned to the Permittee.
 - 7.5 A hold back of 10% of the original amount of the Letter of Credit 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 Letter of Credit the funds 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 Letter of Credit 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 a building permit.
14. 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

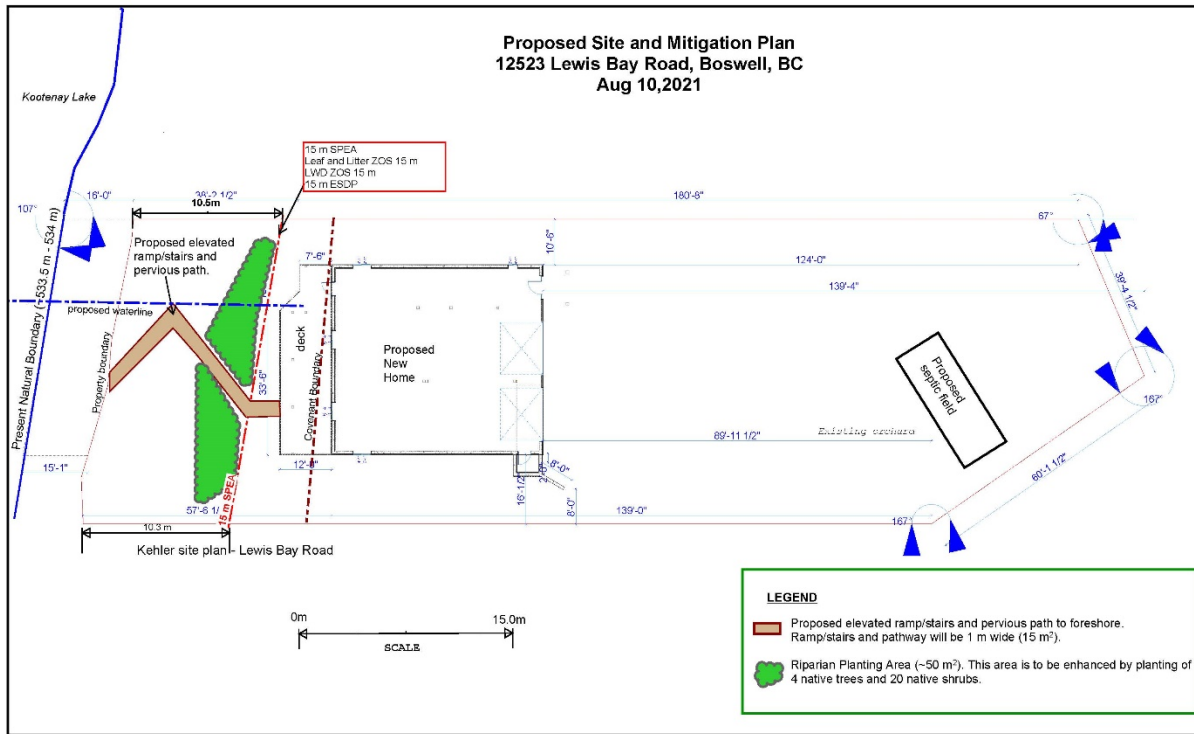
January 5, 2022
Date of Approval (date of review and approval)

February 11, 2022
Date of Issuance (pending receipt of securities)

Schedule 1: Subject Property



Schedule 2: Site Plan



Schedule 3: Riparian Assessment



12523 LEWIS BAY RD
BOSWELL, BC

Riparian Assessment



Prepared for:
Regional District of Central Kootenay
202 Lakeside Drive,
Nelson BC, V1L 5R4

Prepared by:
Masse Environmental Consultants Ltd.
812 Vernon St.
Nelson, BC, V1L 4G4

Aug 26, 2021

TABLE OF CONTENTS

Table of Contents i

List of Tables ii

List of Appendices ii

1 Introduction 3

2 Project Overview 4

 2.1 Location 4

 2.2 Existing Site Conditions 4

 2.2.1 Watercourses 4

 2.2.2 Existing Development 5

 2.3 Proposed Development 5

 2.4 Services 6

3 Regulatory Review 6

 3.1 Streamside Protection and Enhancement Area 6

 3.2 Kootenay Lake Shoreline Management Guidelines 6

4 Resources 7

 4.1 Fish and Fish Habitat 7

 4.2 Riparian Vegetation 7

 4.3 Wildlife 9

 4.3.1 Reptiles and Amphibians 9

 4.3.2 Birds 9

 4.3.3 Mammals 10

 4.4 Species at Risk 10

 4.5 Archaeological Resources 10

5 Measures to Protect the Integrity of SPEA 10

 5.1 Danger Trees 10

 5.2 Windthrow 11

 5.3 Slope Stability 11

 5.4 Protection of Trees and Vegetation in the SPEA 11

 5.5 Encroachment 11

 5.6 Sediment and Erosion Control 12

 5.7 Stormwater Management 12

 5.8 Floodplain Concerns 12

 5.9 Protection of Wildlife Habitat 12

 5.10 Protection of Fish Habitat 13

 5.11 Management of Equipment and Fuel/Lubricant Materials 13

 5.12 Invasive Plant Management 13

6 Mitigation Plan 14

 6.1 Revegetation 14

7 Environmental Monitoring 15

8 Conclusion 15

9	Closure.....	15
10	References	17

LIST OF TABLES

Table 1.	Results of detailed assessment.....	6
Table 2.	Environmental and archaeological risk results.	7
Table 3.	Plant species encountered in the riparian are of the property.....	8
Table 4.	Additional weed species encountered in the upland area of the property.....	9
Table 5.	Wildlife species with confirmed or suspected presence on the property.....	10
Table 6.	Recommended plant species.....	15

LIST OF APPENDICES

- Appendix 1. Location Map
- Appendix 2. Site and Mitigation Plan

ABBREVIATIONS

- AHI: Aquatic Habitat Index
- CDC: Conservation Data Centre
- DBH: Diameter at Breast-Height
- DFO: Department of Fisheries and Oceans Canada
- ESDP: Environmentally Sensitive Development Permit
- FIM: Foreshore Inventory Mapping
- HWM: High Water Mark
- ICHdw1: Interior Cedar - Hemlock dry warm variant 1 biogeoclimatic subzone
- IPMA: Invasive Plant Management Area
- LWD: Large Woody Debris
- QEP: Qualified Environmental Professional
- RAPR: Riparian Area Protection Regulation
- RDCK: Regional District of Central Kootenay
- RPF: Registered Professional Forester
- sp.: used when the actual specific name is not specified (spp. is plural)
- SPEA: Streamside Protection and Enhancement Area
- SPVT: site potential vegetation type
- ZOS: Zones of Sensitivity

1 INTRODUCTION

Masse Environmental Consultants Ltd. was retained by Dave Kehler (Owner) to conduct a riparian assessment at 12523 Lewis Bay Rd (PID 029-641-608) to:

- 1) Determine the streamside protection and enhancement area (SPEA) as per the criteria of the Riparian Areas Protection Regulation (*RAPR*).
- 2) Determine whether the SPEA aligns with the existing protective environmental covenant on Title. (Appendix 1).
- 3) Provide environmental consulting services for a watercourse development permit application for the proposed development within the Environmentally Sensitive Development Permit Area (ESDP) area.

The Owner is proposing an access path and ramp down to the foreshore within the 15 m ESDP. The existing covenant on title prohibits the construction of buildings, structures, or improvements of any kind on the portion of land outlined in black on the property survey. It is the Owner's intent to have the covenant either removed or revised to meet the riparian assessment findings and recommendations. A site survey was conducted on July 6 , 2021, by Fiona Lau, B.Tech., A.Sc.T. and Jennifer Ross, M.Sc., P. Chem.

This riparian assessment evaluated the existing conditions of the property and riparian areas, identified habitat values, assessed potential environmental impacts, and recommends mitigation measures to protect and compensate for the proposed alterations within the riparian area. It is based on the following regulatory framework and best management practices documents:

- Electoral Area 'A' Comprehensive Land Use Bylaw No. 2315, 2013 (RDCK 2013).
- British Columbia *Riparian Areas Protection Regulation* (Government of BC 2016)
- Kootenay Lake Shoreline Management Guidelines (Schleppe and Cormano 2013, KLP 2020)
- British Columbia *Water Sustainability Act* (Government of BC 2014)
- Develop with Care. Environmental Guidelines for Urban and Rural Land Development in British Columbia (MFLNRORD 2014)
- Metro Vancouver- A Homeowner's Guide to Stormwater Management (MV ND)
- British Columbia FireSmart Manual (BC Wildfire Service 2021)
- Riparian Factsheet No. 6 – Riparian Plant Acquisition and Planting (MoA 2012)
- BC Tree Replacement Criteria (MoE 1996)

This report has been prepared by Jennifer Ross, M.Sc., P.Chem. and reviewed by Fiona Lau B.Tech., A.Sc.T.

I, Fiona Lau, hereby certify that:

- a) I am a Qualified Environmental Professional (QEP), as defined in Section 21 of the *Riparian Areas Protection Regulation* made under the *Riparian Areas Protection Act*;
- b) I am qualified to carry out the assessment of the proposal made by the owner (Dave Kehler), which is described in Section 2.3 of this Assessment Report (the "development proposal");

- c) I have carried out an assessment of the development proposal, and my assessment is set out in this Assessment Report; and
- d) In carrying out my assessment of the development proposal, I have followed the specifications of the *Riparian Areas Protection Regulation* and assessment methodology set out in the Minister's manual.

2 PROJECT OVERVIEW

2.1 Location

The subject property is located ~50 km north of the City of Creston, BC (Appendix 1). The property is bordered by private property to the north (12525 Lewis Bay Rd), private property to the south (15521 Lewis Bay Rd), Lewis Bay Rd to the east and Kootenay Lake to the west.

The project area is within the Interior Cedar Hemlock dry warm variant 1 (ICHdw1) biogeoclimatic subzone (MacKillop and Ehman 2016). This moist climatic region is characterized by very hot, moist summers; and very mild winters with light snowfall. Soils generally dry out in late summer for varying extents of time ranging from insignificant to extensive. Snowpacks are very shallow to shallow and of short duration and combined with the mild climate result in no significant soil freezing (MacKillop and Ehman 2016).

2.2 Existing Site Conditions

2.2.1 Watercourses

One watercourse, Kootenay Lake (Photos 1-2), was identified within the subject property.

During the site visit, the visible high-water mark (HWM) of Kootenay Lake was located at ~533.5 m – 534.0 m elevation, approximately the natural boundary line shown on the attached Site Plan (Appendix 2). The natural boundary was evaluated using high-water indications on the bedrock and the location and presence of terrestrial vegetation along the foreshore (see definition below). The riparian setbacks will be measured from the natural boundary line as depicted on the survey.

“Natural Boundary” means the visible high water mark of any lake, river, stream or other body of water is 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 body of water a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself (MOE 2016).”

Kootenay Lake's main inflows include the Lower Duncan River to the north and the Kootenay River to the south. It drains through the west arm into the Kootenay River. Kootenay Lake typically experiences one seasonal water level increase annually which occurs in the late spring and early summer months. Lake levels can vary by up to 4 m throughout the year affecting the extent of exposed shoreline.

No drainage features were observed on the subject property. The property was observed to be dry with a warm western aspect, shallow soils, and moderately steep slopes down to the rocky shoreline. No drainage or erosion issues were observed during the environmental assessment.



Photo 1. View of Kootenay Lake near northern property boundary, looking south.



Photo 2. View of Kootenay Lake near southern property boundary, looking west.

2.2.2 Existing Development

Historical development on the subject property within the ESDP area includes: vegetation removal (tree and shrub clearing), existing orchard and lawn area. Most recently the Owner has parked a trailer on the property at the top of bank (~ 20 m from the natural boundary) and has had several trees removed within and around the proposed building site at the recommendation of a certified arborist.



Photo 3. Trees removed from subject property.



Photo 4. Trailer parked on subject property.

2.3 Proposed Development

The proposed development within the default 15 m ESDP area consists of a water line to service the new residence, and a 1 m wide elevated ramp, stairway and/or pervious pathway (15 m²) to access the foreshore

of Kootenay Lake. Total disturbance is estimated at ~17 m² within the ESDP area. The proposed residence is sited approximately 16 m from the natural boundary of Kootenay Lake at its closest point.

Refer to Site Plan for proposed development footprint and locations (Appendix 2).

2.4 Services

The property is currently un-serviced. The proposed development will require the installation of a septic system, waterline and powerline line. The proposed septic field will be located in the eastern portion of the property, > 30 m from Kootenay Lake and >100m from the nearest well as per BC Sewerage System Standard Practice Manual – Version 3 (MoH 2014). Water will be drawn from the lake, with an approved water license. The proposed waterline alignment is located ~7 m south of the north property line. The new home will be connected to the existing Fortis power line on Lewis Bay Rd.

3 REGULATORY REVIEW

3.1 Streamside Protection and Enhancement Area

The default ESDP area is 15 meters from natural boundary of Kootenay Lake. To determine if the ESDP area aligns with the *RAPR* criteria, a detailed assessment of the subject property was conducted to calculate the Streamside Protection and Enhancement Areas (SPEAs) for Kootenay Lake. Results for the Zones of Sensitivity (ZOS) and SPEA are presented in Table 1 and shown on the Site Plan Appendix 2. The SPEA was calculated to be 15 m along the foreshore of Kootenay Lake.

Table 1. Results of detailed assessment.

Feature Type	SPVT	Zones of Sensitivity			SPEA
		LWD	Litter fall	Shade	
Kootenay Lake	TR	15 m	15 m	0 m	15 m

SPVT- site potential vegetation type (TR-tree)

LWD- large woody debris

SPEA- streamside protection and enhancement area

Kootenay Lake

As per the *RAPR*, the large woody debris (LWD) and litter ZOS were plotted 15 m inland from the HWM of Kootenay Lake. The Shade ZOS was plotted 0 m south of the HWM. The SPEA setback is determined based on the ZOS with the greatest width. Therefore, within the subject property the SPEA is 15 m from the HWM.

3.2 Kootenay Lake Shoreline Management Guidelines

The Kootenay Lake Foreshore Inventory Mapping (FIM) and the Kootenay Lake Shoreline Management Guidelines documents (Schleppe and Cormano 2013, KLP 2020) were used to help determine site-specific risks for riparian habitat, Ktunaxa Nation cultural values, and archaeological resources along the shoreline. The property is within FIM segment 165.

Table 2 provides the environmental and archaeological risk results identified in the FIM along the shoreline of the property.

Table 2. Environmental and archaeological risk results.

Aquatic Habitat Index Rating (AHI)	Environmental Sensitivity	Archaeological Risk	Enhanced Engagement Required
Low	Yes	Yellow ¹	Yes

¹Yellow: Moderate to high risk depending on the activity.

4 RESOURCES

4.1 Fish and Fish Habitat

The Kootenay Lake foreshore consists of a rocky shoreline with angular boulders and pockets of gravel and cobble overlying bedrock (Photo 5). The bedrock is steeply sloping at 50 - 70 % gradient (Photo 6). A rocky beach at the north corner of the property was more moderately sloped at ~ 18 % (Photos 1-2). The angular boulders instream provide potential rearing and cover habitat for juvenile fish. LWD on the shoreline may also provide some cover at high water. No aquatic vegetation was observed in Kootenay Lake along the subject property.

Kootenay Lake supports a variety of fish species, including several species of regional interest, such as Rainbow Trout (*Oncorhynchus mykiss*), Bull Trout (*Salvelinus Confluentus*), Kokanee (*Oncorhynchus nerka*), White Sturgeon (*Acipenser transmontanus*), Westslope Cutthroat Trout (*Oncorhynchus clarkii lewis*), and Burbot (*Lota lota*). Mussels were not observed along the foreshore; however, a complete mussel survey was not conducted as part of the site visit, since potential in-water works have not been finalized.

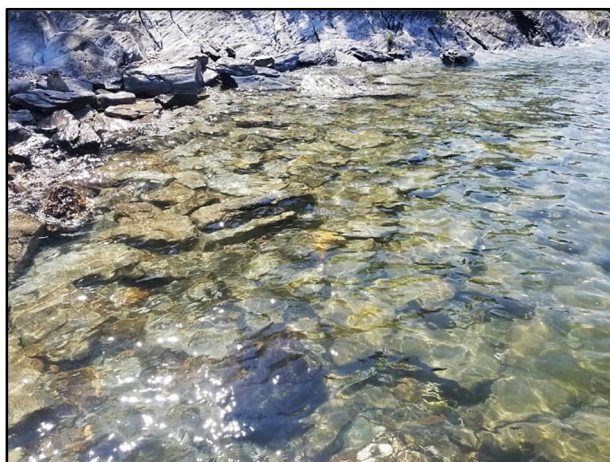


Photo 5. Substrate in Kootenay Lake

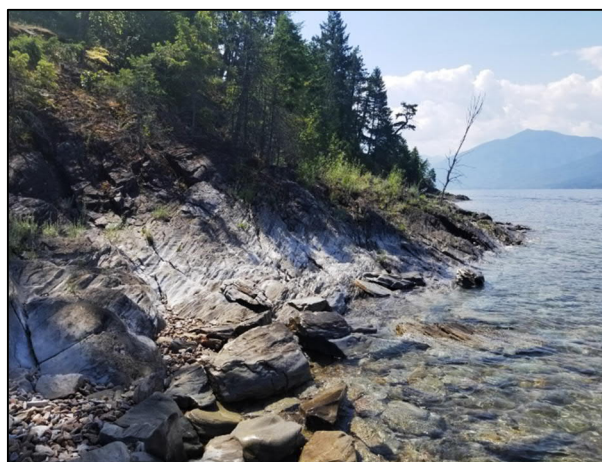


Photo 6. Steeply sloping bedrock on Kootenay Lake.

4.2 Riparian Vegetation

The riparian area along Kootenay Lake consists of native trees with pockets of understory shrubs and herbaceous species (Photo 7-8). This provides some bank stability and erosion protection, shade, litter fall,

and insect drop that benefit aquatic organisms and wildlife including birds, amphibians, and reptiles. The property has an overall westerly aspect and is generally undisturbed within the SPEA. The bedrock shoreline (Photo 6) graduates to a steep embankment (50-70 % gradients) that flattens out to a bench with 10-25 % gradients. Exposed fractured bedrock is evident throughout the riparian area and is overlain with a thin layer of topsoil. Riparian trees are expected to have shallow root systems and be susceptible to windthrow due to lack of topsoil and available nutrients. Dominant vegetation included black cottonwood (*Populus balsamifera ssp. trichocarpa*), interior Douglas fir (*Pseudotsuga menziesii*), lupin (*Lupinus sp.*), tall Oregon grape (*Mahonia aquifolium*), Western red cedar (*Thuja plicata*), and exotic/weed species. Table 3 provides a list of plant species encountered within the riparian area of Kootenay Lake.

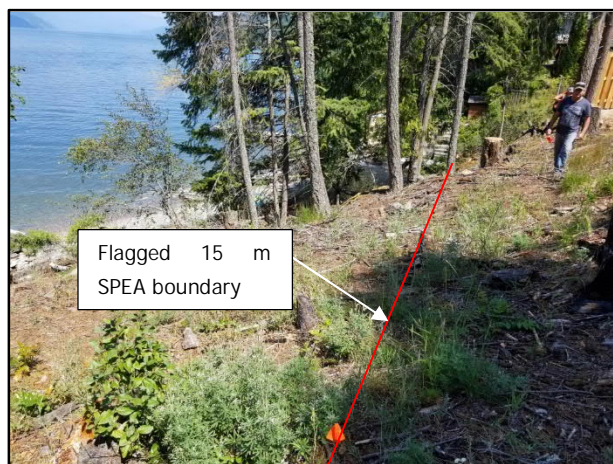


Photo 7. View of riparian area looking north and Photo 8. Trees and shrubs in the riparian area. flagged SPEA boundary.

Table 3. Plant species encountered in the riparian are of the property.

Species Name	Latin Name	Species Name	Latin Name
Trees		Herbaceous (cont.)	
black cottonwood	<i>Populus balsamifera ssp. trichocarpa</i>	common dandelion	<i>Taraxacum officinale</i>
interior Douglas fir	<i>Pseudotsuga menziesii</i>	common harebell	<i>Campanula rotundifolia</i>
paper birch	<i>Betula papyrifera</i>	fireweed	<i>Epilobium angustifolium</i>
Western red cedar	<i>Thuja plicata</i>	nodding onion	<i>Allium cernuum</i>
Shrubs		pinegrass	<i>Calamagrostis rubescens</i>
alder	<i>Alnus sp.</i>	self-heal	<i>Prunella vulgaris</i>
common snowberry	<i>Symphoricarpos albus</i>	showy aster	<i>Eurybia conspicua</i>
kinnikinnick	<i>Arctostaphylos uva-ursi</i>	tufted vetch	<i>Vicia cracca</i>
lupin	<i>Lupinus sp.</i>	yarrow	<i>Achillea millefolium</i>
red raspberry	<i>Rubus idaeus</i>	Exotic/Weeds	
rose	<i>Rosa sp.</i>	oxeye daisy	<i>Leucanthemum vulgare</i>
saskatoon	<i>Amelanchier alnifolia</i>	prickly lettuce	<i>Lactuca serriola</i>
soopolallie	<i>Shepherdia canadensis</i>	spotted knapweed	<i>Centaurea biebersteinnii</i>
tall Oregon grape	<i>Mahonia aquifolium</i>	white sweet clover	<i>Melilotus albus</i>

Species Name	Latin Name	Species Name	Latin Name
Herbaceous		wormwood (absinth)	<i>Artemisia absinthium</i>
birch-leaved spirea	birch-leaved spirea	yellow salsify	<i>Tragopogon dubius</i>
brown-eyed Susan	brown-eyed Susan	Grasses spp. & mosses spp.	

Dominant vegetation upland of the riparian area was limited to fruit trees, grasses, and weeds. Table 4 provides a list of additional invasive species encountered within upland area of the property.

Table 4. Additional weed species encountered in the upland area of the property.

Species Name	Latin Name	Species Name	Latin Name
Weeds			
black medic	<i>Medicago lupulina</i>	field bindweed	<i>Convolvus arvensis</i>
cleavers	<i>Galium aparine</i>	lamb's-quarters	<i>Chenopodium album</i>
clovers	<i>Trifolium spp.</i>	thistle	<i>Cirsium spp.</i>

4.3 Wildlife

The riparian area of the property is part of an open stand of interior Douglas fir trees; however, several trees were recently removed by an arborist for development and firesmart measures. Overall wildlife value is limited on the property due to adjacent disturbance (ie. subdivision development), fencing and lack of upland habitat connectivity. The property does provide some potential habitat for songbirds, shoreline birds, raptors, reptiles and semi aquatic animals such as river otter (*Lontra canadensis*).

4.3.1 Reptiles and Amphibians

The fractured bedrock and crevices within the riparian area of Kootenay Lake provide potential habitat for reptiles including western skink (*Plestiodon skiltonianus*) a provincially blue listed species. No reptiles were observed during the site visit; however, Northern alligator lizards (*Elgaria coerulea*) have been sighted nearby (*pers. comm.* Dave Kehler).

4.3.2 Birds

Coniferous and deciduous trees on the property provide habitat for species such as cavity dwellers, songbirds, and raptors. A quick nest survey was conducted and no nests or important wildlife trees were observed. Several birds were observed on the property or in the neighbouring bushes during the site visit. These species are listed in Table 5.

Table 5. Wildlife species with confirmed or suspected presence on the property.

Common Name	Scientific Name	BC Conservation Status	Comment
bald eagle	<i>Haliaeetus leucocephalus</i>	Yellow	Frequents area per Dave Kehler.
hummingbirds	<i>Trochilidae family</i>	Yellow	Observed on property.
Northern flicker	<i>Colaptes auratus</i>	Yellow	Observed/heard in neighbouring bushes.
sparrows	<i>Emberizidae family</i>	Yellow	Observed/heard in neighbouring bushes.

¹Yellow listed species include species or ecological communities that are apparently secure and not at risk of extinction. Yellow-listed species may have red- or blue-listed subspecies.

4.3.3 Mammals

The riparian area has some suitable habitat for mammals with palatable vegetation including grasses and young saplings. Ungulates and bears may use the area infrequently to access the water and browse on vegetation. A red squirrel (*Tamiasciurus hudsonicus*) was observed on the property during the site visit.

4.4 Species at Risk

The BC Conservation Data Center (CDC) occurrence data and critical habitat for Federally listed species were queried within iMap BC, using a 10 km buffer around the center point of the subject property. Based on this query, two species at risk occurrences are known to occur within 10 km of the project area:

- 1) The Upper Kootenay River white sturgeon (*Acipenser transmontanus*) population. The nearest white sturgeon Critical Habitat is at the Crawford Creek delta ~15 km north of the property (Environment Canada 2014).
- 2) A western skink (*Plestiodon skiltonianus*) observation on the east shore ~6.3 km south of the property.

4.5 Archaeological Resources

Kootenay Lake is part of the traditional territory of the Sinixt, Okanagan, and Ktunaxa First Nations and archaeological evidence is documented at multiple shoreline sites. A review of archaeological resources on this property is outside the scope of this report.

5 MEASURES TO PROTECT THE INTEGRITY OF SPEA

This section provides measures to protect the integrity of the SPEA as described in RAPR, as well as recommended best management practices. The SPEA was determined to be at a 15 m setback from the natural boundary of Kootenay Lake (Refer to Appendix 2).

5.1 Danger Trees

A Registered Professional Forester (RPF) was not retained to assess danger trees; however, an arborist was recently retained by the Owner to assess and remove trees from the property to accommodate for proposed development (Photo 3). Two trees within the 15 m SPEA area were removed because they were

considered hazard trees by the arborist (*pers. comm.* Dave Kehler). No other danger trees were identified by the QEP.

5.2 Windthrow

An RPF was not retained to assess potential windthrow. Any additional clearing activities within the development footprint may increase the risk of windthrow on the property.

5.3 Slope Stability

No hazard indicators for slope stability listed in Table 3.8 of the RAPR Technical Assessment Manual (VIU 2019) were observed. Further assessment of geotechnical hazard is beyond the scope of this report, and any such assessment should be led by a Professional Geologist or a Professional Engineer.

5.4 Protection of Trees and Vegetation in the SPEA

Protection of trees and other vegetation in the SPEA can be achieved by implementing the following measures:

- The SPEA was clearly marked with flagged stakes during the site visit. The SPEA has been identified as a no-construction zone to protect the root systems of all vegetation within the SPEA and to maintain shoreline stability and habitat complexity. It is recommended that snow fencing be installed along the 15 m setback from Kootenay Lake and that it remain in place through the duration of construction.
- Staging and access should only occur in previously disturbed areas of the site.
- Maintain the natural drainage of the site as much as possible.
- Remove invasive weed species throughout the properties.
- Ensure that no pollutants are allowed to contaminate the soil within the development area next to the SPEA.

5.5 Encroachment

The proposed development within the SPEA includes an elevated handicap ramp/stairway and pervious path and the installation of a water line to service the new residence. These developments have relatively small footprints and can be constructed with minimal impact to the riparian area if the following are met:

- The ramp/stairway is constructed above grade to minimize ground disturbance and constructed in such a way as to allow light to penetrate underneath and vegetation to grow.
- Vegetation clearing is avoided, and any vegetation lost is replaced according to the BC Tree Replacement Criteria (MoE 1996) with suitable native species (see Section 6.1 for additional details).
- The water line is installed on an alignment which avoids significant ground disturbance and vegetation clearing that would be associated with drilling and excavation required to install the infrastructure under the frost line.

Future encroachment within the SPEA of Kootenay Lake is discouraged to preserve the function of the riparian vegetation and to help maintain bank stability. Any future development (ie. structures, landscaping, vegetation tree removal) proposed within the SPEA will require a QEP review and an RDCK ESDP.

5.6 Sediment and Erosion Control

The following mitigation measures should be implemented to reduce the risk of sediment input to Kootenay Lake:

- Keep soil disturbance to the minimum possible area.
- Control and direct any surface runoff away from exposed soils and away from Kootenay Lake.
- During construction, install mitigation measures such as ditching, silt fencing, etc. as necessary to manage turbid wastewater generated by heavy rain events. Turbid wastewater will not be permitted to leave the construction site.
- Safely stockpile any erodible materials in a manner that eliminates the possibility of erosion and sediment transport. This may require covering the stockpiles with tarps or with a vegetative cover.
- Re-vegetate disturbed soils as soon as possible after construction.

5.7 Stormwater Management

The proposed development will result in an increase in the total impervious area of the property (footprint 240 m²). The following mitigation measures will help decrease stormwater impacts:

- Rainwater collected on roofs should not be allowed to form surface runoff. Downspouts should direct rainwater into suitable landscape features which can absorb and utilize runoff rather than discharging it directly to Kootenay Lake.
- Stormwater discharges must adhere to the *Water Sustainability Act* or any other application legislation.

5.8 Floodplain Concerns

There were no floodplain concerns observed on the subject property.

5.9 Protection of Wildlife Habitat

Riparian zones provide migration corridors for wildlife along the foreshore and between upland areas and the water. They also help circulate nutrients between terrestrial and aquatic ecosystems. The proposed development is expected to have minimal impact on habitat availability and quality if the following recommendations are followed:

- Retain both live and dead trees, especially deciduous trees, over 30 cm diameter at breast height (DBH), unless considered a direct hazard to infrastructure.
- To protect nesting bird species, any clearing of trees and vegetation should be conducted outside of the songbird breeding season (April 1-August 15). If clearing is to occur during the songbird breeding season a QEP should be retained to evaluate the presence of any active nests within areas to be cleared and propose measures to protect these nests.

- Design access to the foreshore to allow for wildlife movement across the riparian area.

5.10 Protection of Fish Habitat

Development of the property should protect fish habitat by adhering to all of the considerations outlined in Section 5. In addition to previous recommendations, water intake pipe diameters should be minimized and fish screens should be installed at the lake end of the intake. End-of-pipe fish protection screens for small water intakes in freshwater should follow the Department of Fisheries and Oceans (DFO) interim Code of Practice (DFO 2020).

Any proposed works in and about Kootenay Lake may require a *Water Sustainability Act* Change Approval or Notification application.

5.11 Management of Equipment and Fuel/Lubricant Materials

Deleterious substances degrade water quality and affect fish and fish habitat. To minimize the likelihood and impact of a spill of a deleterious substance, such as fuels, oils, and lubricants contained in equipment or vehicles used or stored on-site, a spill response plan should be developed.

At a minimum, this plan should:

- Ensure that each piece of heavy equipment is equipped with its own spill response kit that is appropriate to the types and quantities of fluids stored within. The contents of each kit must be replaced immediately after use.
- Ensure that all equipment operators are familiar with the use of spill kits and their contents.
- Store all equipment in a designated area as far from Kootenay Lake and the small unnamed wetland as possible. If equipment cannot be stored > 30 m away from these watercourses, secondary containment will be utilized to capture any potential spills or leaks.

5.12 Invasive Plant Management

Spotted knapweed (*Centaurea biebersteinnii*) and common tansy occur on the subject property and are listed as species for 'containment' within the Creston Invasive Plan Management Area (IPMA) (CKISS 2021). As part of the offsetting measures for the proposed development, spotted knapweed and common tansy will be hand pulled from the property, buried and covered in a deep hole (>1.5 m) on the property. Alternatively, invasive species can be double-bagged in heavy-duty clear plastic and disposed of as household waste at one of the regional landfills. Areas of disturbance shall be re-seeded.

Construction activities can potentially increase the prevalence of invasive plant species which can out-compete native riparian vegetation, causing damage to habitat and ecosystem function. The following mitigation measures are recommended to reduce the establishment and proliferation of invasive plant species:

- All equipment should be thoroughly washed and inspected before entering the subject property to prevent the import of new invasive plant seeds and parts.
- Minimize the amount of vegetation clearing and soil disturbance.
- Revegetate all exposed soils immediately following construction.

6 MITIGATION PLAN

The Shoreline Management Guidelines for Kootenay Lake (KLP 2020) outlines general principles for shoreline development in order to achieve a “No Net Loss” of habitat. The principle is achieved by applying the following priority sequence of mitigation options: 1. *Avoidance* of environmental impacts and associated components; 2. *Minimization* of unavoidable impacts; 3. On-site *restoration*; and 4. *Offsetting* residual impacts that cannot be minimized through compensation.

The proponent has demonstrated the principle of “*Avoidance*” by locating the proposed residence outside of the 15 m SPEA of Kootenay Lake and “*Minimization*” by proposing an elevated ramp which allows light penetration below and pervious pathway down to the foreshore.

6.1 Revegetation

To mitigate for potential vegetation loss within the SPEA and to compensate for the removal of two Douglas fir trees considered to be hazardous, it is recommended that the Owner revegetate a 50 m² area west of the proposed residence within the SPEA to enhance existing riparian habitat.

Revegetation will include:

- Planting of at least 4 native trees (>1.5 m in height) and 20 native shrubs (minimum pot size 1 gallon). (Refer to Table 6 for recommended plant species list).
- Trees to be planted at minimum 3 m spacing and shrubs will be planted with a minimum 1 m spacing.
- Composition and plant locations within the revegetation area are at the discretion of the owner.
- Planting should not occur during periods of hot dry weather unless they are irrigated daily. Preferred planting periods are in the spring or fall.
- Additional soil amendments, including topsoil, mycorrhizae, and shrub and tree transplant fertilizer are recommended during planting.
- Bark mulch placement around each of the planted stock will help the soil retain moisture and reduce weeds and watering requirements.
- Replanting of trees around the proposed buildings should adhere to principles of rural residential fire protection (BC FireSmart 2021).
- Ensure the objective of the restoration is to naturalize the riparian area and not create a landscaped garden.
- Regularly irrigate new plantings during the plant establishment period for a minimum of 3 years.

Table 6. Recommended plant species.

Species	Scientific Name	Pot Size	Species	Scientific Name	Pot Size
<i>Trees</i>			<i>Shrubs cont.</i>		
Interior douglas fir	<i>Pseudotsuga menziesii</i>	#5	Douglas maple	<i>Acer glabrum</i>	#1
Paper birch	<i>Betula papyrifera</i>	#5	kinnikinnick	<i>Arctostaphylos uva-ursi</i>	4"
ponderosa pine	<i>Pinus ponderosa</i>	#5	mallow ninebark	<i>Physiocarpus malvaceus</i>	#1
Western larch	<i>Larix occidentalis</i>	#5	nootka rose or native rose sp.	<i>Rosa nutkana or rosa sp.</i>	4"
Western red cedar	<i>Thuja plicata</i>	#5	ocean spray	<i>Holodiscus discolor</i>	#1
Western white pine	<i>Pinus monticola</i>	#5	oregon grape	<i>Mahonia aquifolium</i>	4"
<i>Shrubs</i>			red flowering currant	<i>Ribes sanguineum</i>	#1
black twinberry	<i>Lonicera involucrata</i>	#1	red osier dogwood	<i>Cornus stolonifera</i>	#1
blue elderberry	<i>Sambucus caerulea</i>	#1	Saskatoon berry	<i>Amelanchier alnifolia</i>	#1

7 ENVIRONMENTAL MONITORING

The anticipated effort for environmental monitoring and professional guidance on this project includes the following:

- QEP may be required by the RDCK to conduct a post construction site visit once revegetation is complete to assess compliance and completion of the project.
- QEP may be required by the RDCK to prepare an environmental summary report.

8 CONCLUSION

The riparian area of the subject property has seen some minor disturbances (ie. hazard tree removal). The proposed development, if completed in accordance with the mitigation measures proposed in this report, will be of low magnitude. Any future development proposed within the SPEA will require a QEP review and an amendment to the RDCK ESDP. If you have any comments or questions, please do not hesitate to contact the undersigned.

9 CLOSURE

This report has been prepared by a QEP who has not acted for, or as an agent(s) of the RDCK and was at the expense of the property owner.

I, Fiona Lau, certify that I am qualified to carry out this assessment; and that the assessment methods under the *Regulation* have been followed; and that, in my professional opinion:

- (i) if the development is implemented as proposed, or

(ii) if the streamside protection and enhancement areas identified in the report are protected from the development, and

(iii) if the developer implements the measures identified in the report to protect the integrity of those 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.

Sincerely,



Jennifer Ross, M.Sc., P. Chem.
Masse Environmental Consultants

Reviewed by:



Fiona Lau, A.Sc.T., BTech.
Masse Environmental Consultants

10 REFERENCES

- [BC] Province of British Columbia. 2019. *Riparian Areas Protection Regulation*. B.C. Reg. 178/2019, last amended May 4, 2020, by B.C. Reg 99/2020. Victoria, British Columbia, Canada.
- [BC] Province of British Columbia. 2014. *Water Sustainability Act*. SBC 2014, current to March 24, 2021. Victoria, British Columbia, Canada.
- [BC] Province of British Columbia. 1996. Tree Replacement Criteria Information Bulletin. Prepared by the British Columbia Ministry of Environmental, Lands and Parks on November 1996.
- [BC FireSmart]. 2021. British Columbia FireSmart – FireSmart Begins at Home Manual. Produced by FireSmart BC. Available at:
https://firesmartbc.ca/wp-content/uploads/2019/09/FireSmart_Booklet_web-Updated.pdf
- [CKISS] Central Kootenay Invasive Species Society. 2021. Invasive Species Priority Lists. Available at:
<https://ckiss.ca/species/invasive-plant-priority-lists/>
- [DFO] Department of Fisheries and Oceans Canada. 2020. Interim Code of Practice: End-of-pipe fish protection screens for small water intakes in freshwater. Available at:
<https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html>
- [KLP] Kootenay Lake Partnership. 2020. Shoreline Guidance Document: Kootenay Lake. Originally prepared by Ktunaxa Nation Council, Regional District of Central Kootenay, Ministry of Forests, Lands, and Natural Resource Operations, Ecoscape Environmental Consultants Ltd., Tipi Mountain Eco-Cultural Services Ltd. The Firelight Group Ltd., Wayne Choquette.
- MacKillop, D. and Ehman, A. 2016. A Field Guide to Site Classification and Identification for Southeast British Columbia: the South-Central Columbia Mountains. Province of B.C., Victoria, B.C. Land Management Handbook 70.
- [MV] Metro Vancouver. N.D. A Homeowner's Guide to Stormwater Management.
- [MOA] BC Ministry of Agriculture. 2012. Riparian Factsheet No. 6 – Riparian Plant Acquisition and Planting.
- [MOE] BC Ministry of Environment. 2014. Develop with Care. Province of British Columbia. Victoria, British Columbia, Canada.
- [MOE] BC Ministry of Environment. 2015. General BMPs and Standard Project Considerations. Victoria, British Columbia, Canada.

[MOH] Health Protection Branch of the BC Ministry of Health. 2014. Sewerage System Standard Practice Manual – Version 3.

[RDCK] Regional District of Central Kootenay. 2013. East Shore of Kootenay Lake, Electoral Area 'A' Comprehensive Land Use Bylaw No. 2315, 2013. Last amended April 16, 2020.

Schleppe, J. and Cormano, A. 2013. Kootenay Lake Foreshore Inventory and Mapping and Aquatic Habitat Index. Ecoscape Environmental Consultants Ltd. Project File: 12-952. July 2013. Prepared for: Kootenay Lake Partnership & Fisheries and Oceans Canada

[VIU] Vancouver Island University. 2019. Riparian Areas Protection Regulation Technical Assessment Manual Version 1. Prepared by the Natural Resources Extension Program of the Vancouver Island University in consultation with the British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development – Fish and Aquatic Habitat Branch and Fisheries and Oceans Canada.

APPENDIX 1
LOCATION MAP

RDCK Map





Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen.



REGIONAL DISTRICT OF CENTRAL KOOTENAY
 Box 590, 202 Lakeside Drive,
 Nelson, BC V1L 5R4
 Phone: 1-800-268-7325 www.rdck.bc.ca
 maps@rdck.bc.ca

Legend

-  RDCK Boundary
-  Electoral Areas

Map Scale:

1:400,000

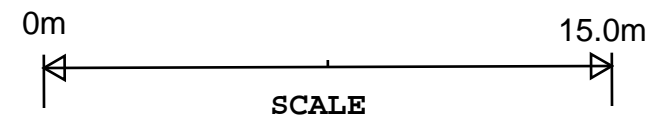
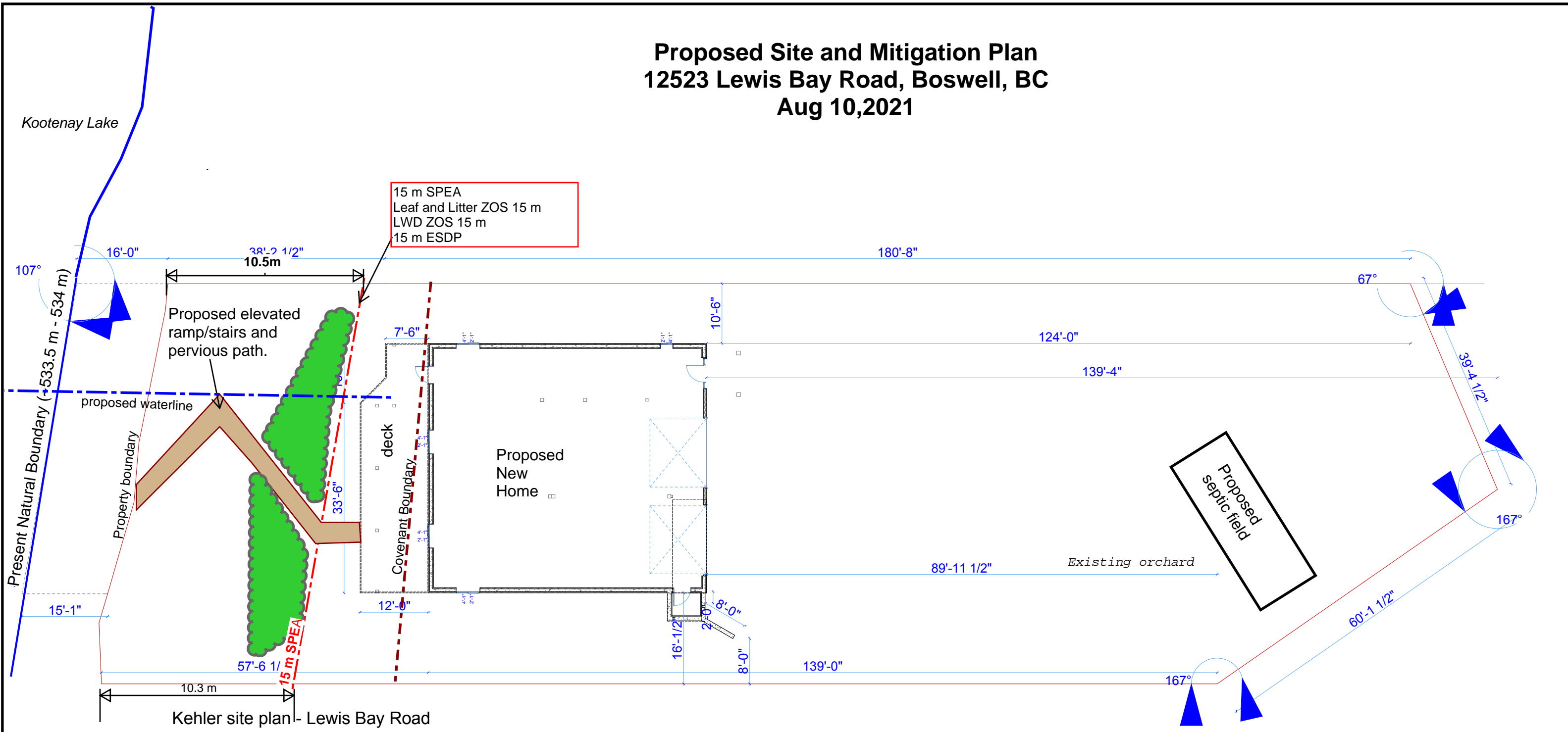
Date: August 21, 2021



The mapping information shown are approximate representations and should only be used for reference purposes. The Regional District of Central Kootenay is not responsible for any errors or omissions on this map.

APPENDIX 2
SITE AND MITIGATION PLAN

Proposed Site and Mitigation Plan 12523 Lewis Bay Road, Boswell, BC Aug 10, 2021



LEGEND

- Proposed elevated ramp/stairs and pervious path to foreshore. Ramp/stairs and pathway will be 1 m wide (15 m²).
- Riparian Planting Area (~50 m²). This area is to be enhanced by planting of 4 native trees and 20 native shrubs.