Development Permit

DP2210E (Upper)

Date: November 7, 2023

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

1. This Development Permit is issued to Craig Upper and Lisa Upper of Nelson, BC 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 LOT A DISTRICT LOT 1316 KOOTENAY DISTRICT PLAN NEP81885 (PID 026-802-406) 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 (RC)' and are located within a Development Permit Area pursuant to the Electoral Area 'E' Rural Official Community Plan Bylaw No. 2260, 2013 as amended.

5. The Permittee has applied to the Regional District of Central Kootenay to construct a one-storey boat house and to use land and buildings situated on the said lands for this purpose. 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 proposed development.

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 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.

   6.2 Development is authorized in accordance with the terms described "2165 Bealby Point Nelson, BC: Riparian Assessment V4" prepared by Masse Environmental Consultants Ltd., dated October 27, 2023 hereinafter referred to as "The Report" and attached to this permit as Schedule 3. Compliance with all terms, conditions, guidelines and recommendations is required.

   6.3 The development authorized by this permit shall be substantially in accordance with "2165 Bealby Point Proposed Site and Mitigation Plan, drawn by Chanel Gagnon, dated August 8, 2023" which is attached to this permit as Schedule 2.

6.4 Environmental Monitoring – In accordance with the recommendations in Section 8 of The Report:

6.4.1 QEP to provide guidance during revegetation, as required

6.4.2 QEP will conduct a post construction site visit once planting is complete to assess compliance and completion of the project.

6.4.3 QEP will prepare an environmental summary report and submit to the RDCK, as required.

6.4.4 Further effectiveness monitoring of mitigation measures may also be required. The following indicators of success of riparian plantings should be documented:

6.4.4.1 Plant composition includes only native plant species

6.4.4.2 Establishment of >80% of planted riparian species after 3 full years would be a reasonable indication that the mitigation plan has been successfully completed.

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 $5,585.35 to ensure the landscaping and restoration 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 November 7, 2025. 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.

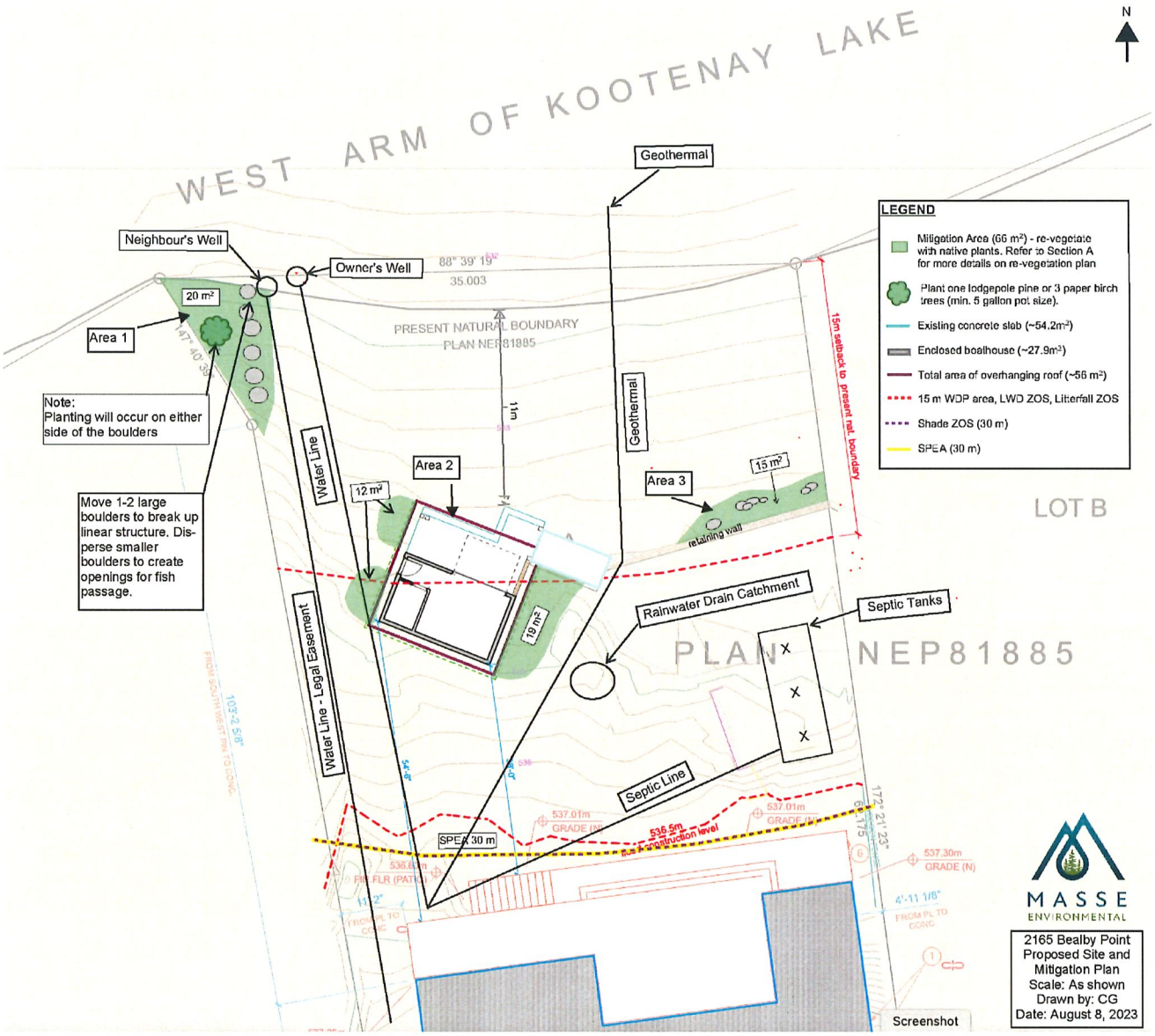
Sangita Sudan, General Manager of Development and Community Sustainability Services

Nov. 21, 2023.
Date of Approval (date of review and approval)

December 1, 2023
Date of Issuance (pending receipt of securities)

Schedule 1: Subject Property

Schedule 2: Site and Mitigation Plan



Schedule 3: "2165 Bealby Point Nelson, BC: Riparian Assessment V4" prepared by Masse Environmental Consultants Ltd., dated October 27, 2023

MASSE ENVIRONMENTAL
CONSULTANTS LTD.

2165 BEALBY POINT
NELSON, 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

Oct 27, 2023

V4

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ABBREVIATIONS

AHI: Aquatic Habitat Index
ESDP: Environmentally Sensitive Development Permit
FIM: Foreshore Inventory Mapping
GSC: Geodetic Survey of Canada
HWM: High Water Mark
FLNRORD: Forests, Lands and Natural Resource Operations and Rural Development
QEP: Qualified Environmental Professional
RAR: Riparian Area Regulation
RDCK: Regional District of Central Kootenay
ROW: Right of Way
SPEA: Streamside Protection and Enhancement Area
ZOS: Zones of Sensitivity

1 INTRODUCTION

Masse Environmental Consultants Ltd. was retained by Lisa Upper (Owner), to conduct a riparian assessment for a proposed boathouse at 2165 Bealby Point Road (LOT A, PLAN NEP81885 DISTRICT LOT 1316 KOOTENAY LAND DISTRICT). The proposed boathouse is within the Watercourse Development Permit (WDP) area, triggering the requirement for a WDP application (RDCK 2013). This is the third version of the document which includes a reduced footprint of the proposed boathouse.

A site visit was completed on November 17, 2022, by Sylvie Masse, MSc., RPBio., and Chanel Gagnon, BSc., BIT, to conduct a riparian assessment of the property within the 15 m WDP area. The riparian assessment evaluates the existing conditions of the property and riparian areas, identifies habitat values, assesses potential environmental impacts, and recommends measures to mitigate or compensate for the alteration of the riparian area to maintain environmental values. It is based on the following regulatory framework and best management practices documents:

- Electoral Area 'E' Rural Official Community Plan Bylaw *No. 2260, 2013*
- British Columbia *Riparian Areas Regulation*
- Kootenay Lake Shoreline Management Guidelines
- British Columbia *Water Sustainability Act*
- 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
- A Homeowner's Guide to Stormwater Management

This report has been prepared by Chanel Gagnon, BSc., BIT., and reviewed by Sylvie Masse, MSc, RPBio. I, Sylvie Masse, hereby certify that:

a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the Fish Protection Act;
b) I am qualified to carry out this part of the assessment of the development proposal made by the developer;
c) I have carried out my 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 assessment methods set out in the Schedule to the Riparian Areas Regulation.

2 PROJECT OVERVIEW

2.1 Location

The subject property is located ~5 km northeast of Nelson, BC, on Bealby Point Road. The property is bordered by private property to the east and west, Bealby Point Road to the south, and Kootenay Lake to the north. The property covers 0.64 acres with ~35 m of frontage on Kootenay Lake.

The area falls within the Dry Warm Interior Cedar - Hemlock (ICHdw1) biogeoclimatic subzone. The ICHdw1 is characterized by moist warm springs, hot to very hot dry summers, and mild dry winters with a moderately shallow snowpack (MacKillop and Ehman 2016). This subzone is highly productive with a wide variety of tree species, including western redcedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), lodgepole pine (*Pinus contorta*), grand fir (*Abies grandis*), western white pine (*P. monticola*), western larch (*Larix occidentalis*), ponderosa pine (*P. ponderosa*), paper birch (*Betula papyrifera*), trembling aspen (*Populus tremuloides*) and black cottonwood (*P. trichocarpa*).

2.2 Existing Site Conditions

The subject property is located on the south end of a shallow bay area on the south shore of the West Arm of Kootenay Lake. The property is gently sloped (7-8% gradient) along the yard and foreshore.

The subject property has undergone new ownership in the last couple years and was redeveloped in 2020. The existing house was demolished and was replaced with a new home at which time earthwork activities on the foreshore portion of the property were conducted, including landscaping, placement of boulders along the foreshore and the installation of a concrete foundation for the proposed boathouse (Photo 1 and 2). Native vegetation was present on portions of the property within the WDP area, especially along the west boundary prior to the existing Owner's purchase (GoogleEarth 2018; Photo 3) and was removed and replaced with agronomic grasses (Photo 4). The east portion of an existing retaining wall was retained (Photo 1). It appears that a WDP was not obtained from the RDCK to complete the works that were completed within the 15 m WDP area.

Previous development activities within the WDP area included:

- Removal of riparian vegetation (total area unknown);
- Landscaping into a manicured lawn with agronomic grasses.
- Installation of irrigation system throughout the lawn to the retaining wall;
- Upgrades to an existing waterline;
- Upgrades to geothermal line;
- Placement of the concrete slab (54.2 m^2) for patio and proposed boathouse, located ~10 m from the natural boundary;
- Installation of electrical services to the proposed boathouse, and
- Boulders (~7) encountered during digging for the house foundation were relocated to the northwest corner of the property along the foreshore, with some placed below the HWM, outside of the property boundary.

Based on the definition of natural boundary, the natural boundary shown on the survey will be used as the HWM from which the streamside protection and enhancement area (SPEA) setbacks will be determined per the Riparian Area Protection Regulation.

> "**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."

Photo 1. Concrete slab for patio and proposed boathouse, and landscaping partially within the 15 m WDP area, looking west.

Photo 2. Concrete foundation for the proposed boathouse and landscaping in relation to the foreshore, looking north.

Photo 3. View of property pre-development. Note native vegetation on the west side of property.

Photo 4. View of property post-development. Nov 17, 2022.

2.3 Proposed Development

The proposed development within the 15 m WDP area includes:

- Construction of a new boathouse with an overall footprint of 54.2 m^2 sited on the existing concrete slab constructed in 2020. The size of the proposed boathouse has been reduced from 76.6 m^2 shown in the original proposal dated Dec 1, 2022. The proposed boathouse will have an enclosed area of 27.9 m^2. The overall footprint including the entire concrete slab measures 66 m^2.
- Revegetation of a portion of the riparian area (~66 m^2) to compensate for permanent habitat loss.

2.4 Services

Services for the boathouse include an electrical line, which is already in place.

3 REGULATORY REVIEW

3.1 Streamside Protection and Enhancement Area

To determine whether the 15 m WDP setback from the High Water Mark (HWM) of Kootenay Lake aligns with Riparian Area Protection Regulation (RAPR) 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 1 and Appendix 2.

As per the RAPR, the large woody debris (LWD), and litter ZOS were plotted 15 m inland from the HWM of Kootenay Lake, with the shade ZOS plotted 30 m south from the HWM. The SPEA setback is determined based on the ZOS with the greatest width. Therefore, within the subject property the SPEA from the HWM of Kootenay Lake is 30 m, which extends beyond the 15 m WDP area.

The BC Riparian Areas Regulation (BC 2015) defines "High Water Mark" and "Stream" 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."

"Stream" includes any of the following that provides fish habitat:
(a) a watercourse, whether it usually contains water or not;
(b) a pond, lake, river, creek or brook;
(c) a ditch, spring or wetland that is connected by surface flow to something referred to in paragraph (a) or (b).

Table 1. Results of detailed RAPR assessment.

Feature Type	SPVT[1]	Zones of Sensitivity			SPEA
		LWD	Litter fall	Shade	
Kootenay Lake	TR	15 m	15 m	30 m	**30 m**

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

3.2 Kootenay Lake Shoreline Management Guidelines

The Kootenay Lake Foreshore Inventory Mapping (FIM) and the Kootenay Lake Shoreline Management Guideline documents (EEC 2016, KLP 2020) were used to help determine site specific risk for riparian habitat, Ktunaxa Nation cultural values, and archaeological resources along the shoreline. The property is within FIM segment 243 and indicates that the foreshore is located within an area with emergent vegetation and has high juvenile fish rearing potential (EEC 2016, KLP 2020).
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)	Aquatic Sensitivity	Archaeological Risk	Enhanced Engagement Required
Low	Yes	Yes	Yes

4 RESOURCES

4.1 Fish and Aquatic Habitat

4.1.1 Kootenay Lake

The foreshore of the property consists of a gently sloping beach (~7% gradient) with substrate consisting of fines, gravel, and some cobbles (Photo 5 and 6). A historical rock groin extends into the water along the west property boundary, with new boulders recently placed east of the rock groin (Photo 7 and 8). Some emergent vegetation located below the HWM of the lake was observed and would provide both cover and nutrient input for fish (Photo 7). Fish habitat along this section of foreshore supports juvenile rearing habitat with coarser substrates providing cover. No known kokanee spawning has been reported in this area (EEC 2016).

Kootenay Lake supports a variety of fish species, including several species of regional interest, such as bull trout (*Salvelinus confluentus*; BC Blue-listed; SARA Special Concern), rainbow trout (*Oncorhynchus mykiss*), kokanee (*O. nerka*), white sturgeon (*Acipenser transmontanus pop. 1*; BC Red-Listed; SARA Endangered), Westslope cutthroat trout (*O. clarkii lewisi*; BC Blue-listed; SARA Special Concern), and burbot (*Lota lota pop 1.*; BC Red-listed). Mussels were not observed along the foreshore; however, a complete mussel survey was not conducted as part of the initial site visit.

Photo 5. View of foreshore looking west.

Photo 6. View of foreshore looking east.

Photo 7. Emergent vegetation at northern point on west property boundary, looking north.

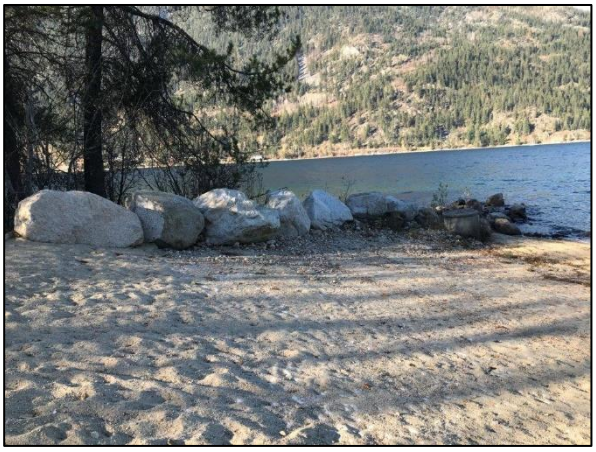


Photo 8. Boulders placed at the northwestern corner of the property boundary, looking northwest.

4.2 Riparian Vegetation

The riparian area has been entirely disturbed by removal of native vegetation and conversion to a continuous cover of agronomic grasses. To determine native species occurring along the foreshore, riparian vegetation on the neighbouring property to the west was assessed. This area supports an ecologically diverse and functioning riparian system (Photo 9 to 11), including mature lodgepole pine, and tall shrubs, including mountain ash (*Sorbus sp.*), beaked hazelnut (*Corylus cornuta*), black hawthorn (*Crataegus douglasii*), red-osier dogwood (*Cornus sericea*), willow (*Salix spp.*), woods rose (*rosa woodsii*) and regenerating black cottonwood on the immediate foreshore. Herbaceous vegetation includes common tansy (*Tanacetum vulgare*), fleabane (*Erigeron spp.*) western mugwort (*Artemisia ludoviciana*), wormword (*Artemisia absinthium*) growing on the northwest corner of the property within the foreshore (Table 3). A few horticultural terrestrial species have been planted on the property including a ~5 m^2 area on the west side of the concrete foundation (Photo 12), a raspberry patch on the northeast corner (Photo 13) and horticultural evergreen shrubs at the southeast corner of the property next to the house (Photo 14). Refer to Table 3 for list of riparian vegetation species suspected to occur on the property.

Photo 9. Existing riparian vegetation on adjacent property to the west. Nov. 17, 2022.

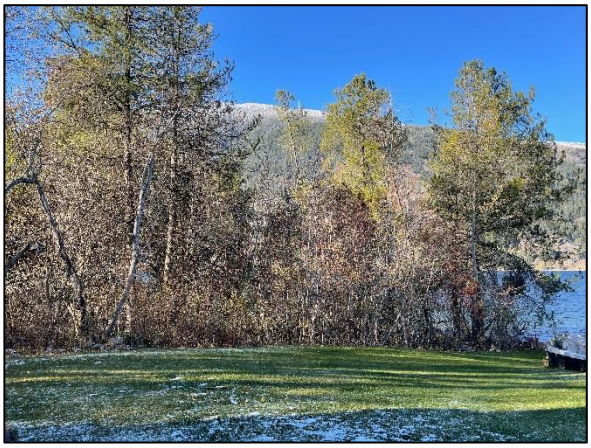


Photo 10. Riparian vegetation on neighbouring to the west. Nov. 17, 2022.

Photo 11. Riparian vegetation on the west property boundary, looking south. Nov. 17, 2022.

Photo 12. View of vegetation on the west side of the concrete foundation. Nov. 17, 2022.

Photo 13. Raspberry patch on the northeast property boundary. Nov. 17, 2022.

Photo 14. Horticultural evergreen shrubs next to the house. Nov. 17, 2022.

Table 3. Plant species encountered in the forest on neighboring property to the west.

Common Name	Scientific Name	Common Name	Scientific Name
Trees		**Shrubs (Cont'd)**	
black cottonwood	*Populus balsamifera*	willow sp.	*Salix sp.*
lodgepole pine	*Pinus contorta*	woods rose	*Rosa woodsii*
Shrubs		**Herbaceous**	
beaked hazelnut	*Corylus cornuta*	common tansy	*Tanacetum vulgare*
black hawthorn	*Acer glabrum*	fleabane	*Erigeron spp.*
grey alder	*Alnus incana*	western mugwort	*Artemisia ludoviciana*
mountain ash	*Sorbus sp.*	wormword	*Artemisia absinthium*
red osier dogwood	*Cornus stolonifera*	aster sp.	*Symphytrichum sp.*
vetch sp.	*Vicia sp.*		

4.3 Wildlife

4.3.1 Reptiles and Amphibians

The large boulders and vegetated riparian areas along the northwest corner of the property provide potential habitat for northern alligator lizard (*Elgaria coerulea*), western skink (*Plestiodon skiltonianus*) and garter snakes (*Thamnophis spp.*). Wandering garter snakes are often found in wetland and riparian areas and have high potential to occur.

4.3.2 Birds

Due to the time of year, there were no birds observed during the survey; however, the subject property is likely visited by waterfowl and some songbirds. The current habitat on the subject property is limited due to the lack of tree and shrub habitat for nesting and foraging; however, some areas may provide foraging habitat to songbirds such as the American Robin (*Turdus migratorius*) which could utilize the lawn area as a source for worms.

4.3.3 Mammals

The subject property most likely is not frequented by mammals due to lack of cover and forage habitat; however, may sometimes be used as a migration corridor by deer, bears and small mammals along the foreshore to access water and the adjacent undisturbed riparian habitat.

4.4 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. Based on this query, six species at risk occurrences are known within 10 km of the project area:

1) Kootenay Lake supports the Upper Kootenay River white sturgeon population. Critical sturgeon habitat is not present next to the property.
2) Several western skinks (*Plestiodon skiltonianus;* BC Blue-listed, SARA Special Concern) have been recorded on the north shore of Kootenay Lake; the closet observation is ~1 km north from the subject property. The property does provide potential habitat for western skinks along the western property boundary.
3) Banded tigersnail (*Anguispira kochi*; BC Blue-listed) has been recorded on the east and west shore of Kootenay Lake. The intact forests outside of the property has potential to support banded tigersnail habitat.
4) Western Screech Owl (*Megascops kennicottii macfarlanei;* BC Blue-listed, SARA Threatened) recorded observations near Crawford Bay 9.5 km from the subject property. The subject property does not provide suitable habitat for Western Screech Owl.
5) Rocky Mountain painted turtle (*Chrysemys picta pop.2;* BC Blue-listed, SARA Special Concern) recorded observations on the south shore of Kootenay Lake, west of Nelson, ~4.5 km away. The property does not provide suitable habitat for turtles.

6) Whitebark pine (*Pinus albicaulis;* BC Blue-listed, SARA Endangered) is known to occur on the east side of Kootenay Lake, ~10 km north of the subject property. The property does not provide suitable habitat for whitebark pine.

4.5 Archaeological and Heritage Resources

Kootenay Lake is part of the traditional territory of the Ktunaxa, Sinixt and Syilx Okanagan 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. Archaeological Chance Find Procedures are provided in Appendix 3 for guidance on which protocols to follow in the event of a chance archaeological find, to ensure that archaeological sites are documented and protected as required for compliance with the BC Heritage Conservation Act. The property is located within an enhanced engagement area and consultation with First Nations by the RDCK will be required.

5 IMPACT ASSESSMENT

The impact assessment pertains to proposed works within the 30 m SPEA, including the proposed boathouse and related appurtenances such as the existing concrete slab and electrical works. Previous disturbances (i.e., riparian vegetation removal and landscaping) conducted during the redevelopment of the property are not addressed herein. Impacts associated with the existing concrete slab include the permanent removal of riparian vegetation over an area of 54.2 m^2. The total footprint of the boathouse including the overhanging roof and additional concrete slab totals an area of 66 m^2, which will be used as a basis for the mitigation and revegetation plan.

Riparian areas are important for the maintenance of aquatic health by providing large woody debris recruitment, shade potential, water temperature regulation, nutrient input (litter fall and insect drop), and soil stabilization. In addition, functioning riparian areas are biodiverse, provide wildlife migration habitat to and from upland forest habitat and are important for multiples species of wildlife, specifically species at risk.

Increased human activity within the riparian area has the potential to reduce wildlife habitat for birds, mammals and amphibians, increased noise and light disturbance to local wildlife, increased sediment and erosion potential, and increased stormwater runoff.

Provided that measures to protect the SPEA are followed, and the recommended mitigation plan is implemented, the negative impacts to the environment will be minimized; however the mitigation measures are not expected to fully compensate for the previous loss of riparian vegetation and adverse effects to the riparian area function.

6 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.

6.1 Danger Trees

No danger trees were identified as there were no trees on the subject property within the SPEA.

6.2 Windthrow

No windthrow concerns were identified as there were no trees on the subject property within the SPEA.

6.3 Slope Stability

No slope stability hazard indicators were observed during the site visit as the property is gently sloping. Further assessment of geotechnical hazard is beyond the scope of this report, and if required any such assessment should be led by a P.Geo. or P.Eng.

6.4 Protection of Trees and Vegetation in the SPEA

The proposed restoration works along the western property line have the potential to impact existing root systems of shrubs and trees located on the adjacent property. Measures to protect existing vegetation includes:

- Avoid compacting native soils,
- Avoid cutting and severing root systems,
- Ensure that recommended plant spacing is followed.

6.5 Encroachment

The existing concrete slab and proposed boathouse are located within the SPEA with a total footprint of 66m^2. No further encroachments into the SPEA are anticipated in relation to the proposed boathouse. Future encroachment within the SPEA of Kootenay Lake must be avoided to maintain the natural environment, its ecosystems (aquatic and riparian), and biological diversity. Any future development (i.e., landscaping, and/or construction of any additional structures) proposed within the SPEA will require a RAPR assessment conducted by a QEP and an RDCK Watercourse Development Permit. Further development beyond the previously disturbed areas and restoration areas is discouraged to promote re-establishment of riparian vegetation.

6.6 Sediment and Erosion Control

There will be no excavation or soil disturbance as a result of the proposed boathouse construction since the concrete slab is already in place and erosion potential is not a concern.

6.7 Stormwater Management

The proposed development will increase the total impervious area of the property. The following mitigation measures will help decrease stormwater impacts:

- Downspouts from the boathouse should direct rainwater into suitable landscape features which can absorb and utilize runoff.

- Stormwater discharges must adhere to the *Water Sustainability Act* or any other applicable legislation.

6.8 Floodplain Concerns

The proposed boathouse and existing concrete foundation are located inside the 15 m floodplain setback of Kootenay Lake and will not be used as a habitable area. There were no floodplain concerns observed on the subject property.

6.9 Scheduling of Environmentally Sensitive Activities

Works should be scheduled to avoid any additional impacts to SPEA vegetation, aquatic habitat, and nesting birds. Existing vegetation on the neighbouring property to the west should be monitored for nesting birds when completed during the bird nesting season (April 15-August 15) to minimize disturbance. Planting shall be completed during lower water levels and cooler weather periods (April-early May or October) to minimize risk of sedimentation into the lake and promote plant establishment.

6.10 Protection of Fish Habitat

Protection of fish habitat shall be implemented by:

- Adhere to sediment, stormwater, and waste management best practices outlined in this report to ensure that there is no release of deleterious substances into Kootenay Lake.

6.11 Concrete Management

Fresh concrete and concrete laden water is caustic (causing elevated water pH) and toxic to aquatic organisms. To mitigate against potential environmental impacts associated with concrete works in and around water the following measures will be implemented:

- No concrete (or grout) will be disposed of onsite.
- No wastewater that has been in contact with fresh concrete (or grout) will be disposed of onsite without appropriate water quality testing.
- Any spill of wastewater that has been in contact with fresh concrete (or grout), or spill of concrete/grout-laden water must be contained and cleaned-up.
- Collection trays or plastic tarping will be positioned beneath all concrete transfer points to collect fugitive concrete products where fresh concrete could potentially escape from the delivery system.
- A wash basin will be made available onsite for washing residual concrete/grout from tools and equipment (including shovels, finishing tools, and any mixing apparatus). The wash basin will be located on flat, solid ground and placed at least 30 m away from Kootenay Lake.

6.12 Management of Equipment and Fuel/Lubricant Materials

The most likely source of any contaminant is from potential equipment (i.e., bobcat or small excavator) used or stored on-site during revegetation activities, either during fueling or from unanticipated leaks or

the failure of a hydraulic hose. The following measures are to be used if equipment that utilize petroleum base products are used during the construction of the boathouse:

- A spill response kit will be kept on site in case of a spill.
- All staff will be familiar with the use of spill kits and their contents. The contents of the kits will be replaced immediately after use.
- Equipment will be stored in a designated area as far from Kootenay Lake as possible and secondary containment will be utilized to capture any potential spills or leaks.

6.13 Invasive Plant Management

Construction activities can potentially increase 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 on site:

- In the event that ground disturbance occurs, soils should be re-vegetated as soon as possible.

7 MITIGATION PLAN

The Shoreline Management Guidelines for Kootenay Lake outlines general principles for shoreline development in order to achieve a "No Net Loss" of habitats present. The principle is achieved by applying the following priority sequence of mitigation options: 1. *Avoidance* of environmental impacts; 2. *Minimization* of unavoidable impacts; 3. On-site *restoration*; and 4. *Offset* residual impacts that cannot be minimized through compensation (KLP 2018). Avoidance was not achievable with the existing and proposed development as the disturbance has already occurred; therefore, mitigation measures to restore the riparian area are being recommended and are described in the following sections. Refer to Appendix 2 for mitigation and proposed site plan.

The proposed revegetation plan herein addresses the impacts that have resulted from the installation of the existing concrete slab and construction of the proposed boathouse with a total area of 66 m^2. The success of the proposed revegetation plan will require appropriate growing medium. See Section 7.1 for growing medium specifications.

The remediation area, as per the site plan attached (Appendix 2), includes three areas:

- Area 1: Northwest corner (20 m^2);
- Area 2: Surrounding the proposed boathouse on two sides (31 m^2);
- Area 3: North of retaining wall on east property boundary (15 m^2).

7.1 Revegetation

The proposed revegetation is designed with a focus on naturalizing the foreshore and will require appropriate growing medium and planting with native potted stock. The final plant species selection and quantities shall be determined by the QEP in consultation with the owners and will be dependent on plant availability at the time of ordering. The landscape design shall provide mixed plant structure and layering,

which meets or exceeds the below prescription. The proposed revegetation will require ongoing maintenance (i.e., irrigation and weeding), until it becomes naturalized over the moderate to long term.

Area 1: Northwest corner of property (above natural boundary – 20 m^2)

- Plant one lodgepole pine or three paper birch trees (min 5-gallon pot size) at corner of wall and property line.
- Plant minimum 10 flood tolerant native shrubs at ~1 m spacing and 20 flood tolerant sedge, rush or grass species at ~0.5 m spacing. Refer to Table 4 for recommended plant list.
- This area will require imported growing medium for each planting hole to be mixed with native material to provide nutrients for the revegetation to be successful.
- Cobble/gravel mixture (~3" thick) shall be placed over the planting medium to reduce erosion potential of soils. Native substrate from planting excavations can be used if found to be suitable material.
- Planting will occur on either side of the boulders.
- Move 1-2 large boulders to break up linear structure. Disperse smaller boulders to create openings for fish passage.

Area 2: Area surrounding proposed boathouse (31 m^2)

- Plant minimum 18 native shrubs at 1 m spacing and a minimum of 13 perennials and grasses at ~1 m spacing. Refer to Table 4 for recommended plant list.
- This area will require imported growing medium for each planting hole to be mixed with native material in order to provide nutrients for the revegetation to be successful.

Area 3: Area north of retaining wall (15 m^2)

- Plant minimum 8 native shrubs at 1 m spacing and a minimum of 7 perennials and grasses at ~1 m spacing. Refer to Table 4. for recommended plant list.
- This area will require imported growing medium for each planting hole to be mixed with native material in order to provide nutrients for the revegetation to be successful.
- Install 5-7 large boulders to create a boulder cluster in this general area.

General Planting and Maintenance Guidelines

- Planting should not occur during periods of hot dry weather unless they are irrigated daily.
- Locally adapted native plants are preferable to those collected or grown outside the region. The species listed in Table 4 are available from Sagebrush Nursery in Oliver https://sagebrushnursery.com , or Tipi Mountain Native Plants http://tmnp.tipimountain.com/ near Kimberley.
- Native riparian seed blend specially formulated for riparian area application is available at Interior Seed & Fertilizer https://interiorseedandfertilizer.ca (Table 5).
- Planting in clusters vs. grid formation is preferred and produces a more natural appearance.
- Planting holes shall be a minimum of 3 times the size of the pot.

- Specific locations of plants shall be directed by a QEP or professional landscaper.
- Use transplant fertilizer (i.e., Mykes Mycorrhizae Tree and Shrub or similar) as per manufacturers specifications in each planting hole.
- Plantings which do not survive should be replaced to ensure complete establishment of native plants, and exclusion of exotic plants.
- Ensure the objective of the restoration is to naturalize the riparian area and not create a landscaped garden.
- Irrigate initially and throughout the growing season (May-September) for a minimum of 5 years until plants are established and thereafter as required.
- Pull any invasive weeds on a yearly basis prior to going to seed.
- Replanting of riparian vegetation around buildings should adhere to principles of rural residential fire protection (for more information see the FireSmart Homeowner's Manual MFLNRO N.D.).

8 ENVIRONMENTAL MONITORING

Environmental support is recommended during the revegetation activities to ensure that the recommended measures are implemented adequately and improve the success rate.

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

- QEP to provide guidance during revegetation, as required.
- QEP will conduct a post construction site visit once planting is complete to assess compliance and completion of the project.
- QEP will prepare an environmental summary report and submit to the RDCK, as required.

Further effectiveness monitoring of mitigation measures may also be required. The following indicators of success of riparian plantings should be documented:

- Plant composition includes only native plant species.
- Establishment of >80% of planted riparian species after 3 full years would be a reasonable indication that the mitigation plan has been successfully completed.

Table 4. Recommended plant list.

Common Name	Latin Name	Recommended Pot Size
Area 1 and Area 3 (below retaining wall)		
Trees		
lodgepole pine*	*Pinus contorta*	*#5*
paper birch*	*Betula papyrifera*	*#5*
Shrubs		
red osier dogwood	*Cornus stolonifera*	*#1 or #2*
sandbar willow	*Salix exigua*	*#1 or #2*
scoulers willow	*Salix scouleriana*	*#1 or #2*
sitka willow	*Salix sithencis*	*#1 or #2*
sitka alder	*Alnus sinuata*	*#1 or #2*
black hawthorn	*Crataegus douglasii*	*#1 or #2*
nootka rose or prickly rose	*Rosa nootkana or Rosa acicularis*	*#1 or #2*
Perennials and grasses		
Canada bluejoint reedgrass	*Calamggrosis canadiensis*	*4" or #1*
Little blue stem pixie fountain	*Schizachyrium scoparium*	*4" or #1*
Canada goldenrod	*Solidago canadensis*	*4" or #1*
Area 2 (above retaining wall)		
Shrubs		
diablo ninebark	*Physocarpus opulifolius*	*#1 or #2*
mallow ninebark	*Physocarpus malyceus*	*#1 or #2*
Saskatoon	*Amelanchier almifolia*	*#1 or #2*
Oregon grape	*Mahonia aquifolium*	*#1 or #2*
Lewis' mock orange	*Philadephus lewisii*	*#1 or #2*
oceanspray	*Mahonia aquifolium*	*#1 or #2*
red flowering current	*Ribes sanguineum*	*#1 or #2*
common snowberry	*Symphoricarpos albus*	*#1 or #2*
Perennials and grasses		
Canada bluejoint reedgrass	*Calamggrosis canadiensis*	*4" or #1*
Little blue stem pixie fountain	*Schizachyrium scoparium*	*4" or #1*
Canada goldenrod	*Solidago canadensis*	*4" or #1*
bluebunch wheatgrass	*Pseudogenaria spicata*	*4" or #1*
rough fescue	*Festuca campestris*	*4" or #1*
native columbine	*Aquilegia canadensis*	*4" or #1*
junegrass	*Koeleria macrantha*	*4" or #1*
scarlet gilia	*Gilia aggregata*	*4" or #1*
shrubby penstemon	*Penstemon fruiticosa*	*4" or #1*
birch leaved spirea	*Spirea betulifolia*	*4" or #1*
common yarrow	*Achillea millefolium*	*4" or #1*
coral bells -	*Heuchera cylindrica*	*4" or #1*
old mans whiskers	*Geum trifolium*	*4" or #1*
golden aster	*Heterotheca villosa*	*4" or #1*
Elijah blue fescue	*Festuca glauca*	*4" or #1*
Karl Foerster feather reed grass	*Calamagrostis acutiflora*	*4" or #1*

9 CONCLUSION

Overall, the mitigation plan as proposed will help mitigate the permanent loss of potential riparian vegetation by the construction of the boathouse within the SPEA. As the restoration areas become established with native species, the riparian function will be improved along the foreshore over time. If you have any comments or questions, please do not hesitate to contact the undersigned.

10 CLOSURE

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

I, Sylvie Masse, 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,

Chanel Gagnon, BSc., BIT
chanel@masseenvironmental.com

Reviewed by:

Fiona Lau, BSc., AScT
fiona@masseenvironmental.com

Sylvie Masse, MSc, RPBio
Masse Environmental Consultants

11 REFERENCES

[BC] Province of British Columbia. 2015. Riparian Areas Regulation. Victoria, British Columbia, Canada.

[EEC] Ecoscape Environmental Consultants. 2016. Kootenay Lake Foreshore Inventory and Mapping and Aquatic Habitat Index. Prepared for: Kootenay Lake Partnership & Fisheries and Oceans Canada.

Environment Canada. 2014a. Recovery Strategy for White Sturgeon (*Acipenser transmontanus*) in Canada. Environment Canada, Ottawa.

[HPBMOH] Health Protection Branch Ministry of Health. 2014. Sewerage System Standard Practice Manual Version 3.

Kipp, S. and Callaway, C. 2002. On the Living Edge. Your Handbook for Waterfront Living.

[KLP] 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. 2020. Shoreline Guidance Document – Kootenay Lake. Prepared for Kootenay Lake Partnership.

Mackillop, D. and Ehman, A. 2016. A Field Guide to site classification and identification for southeast: the southeast Columbia Mountains. Province of B.C., Victoria, B.C. Land Management Handbook 70.

[MOE] BC Ministry of Environment. 2014. Develop with Care. Province of British Columbia. Victoria, British Columbia, Canada.

Gov BC . 2022. Requirements and Best Management Practices for Making Changes In and About a Stream in British Columbia, V. 2022.01.

[MOE] BC Ministry of Environment. 2016. Provincial Water Sustainability Act. Victoria, British Columbia, Canada.

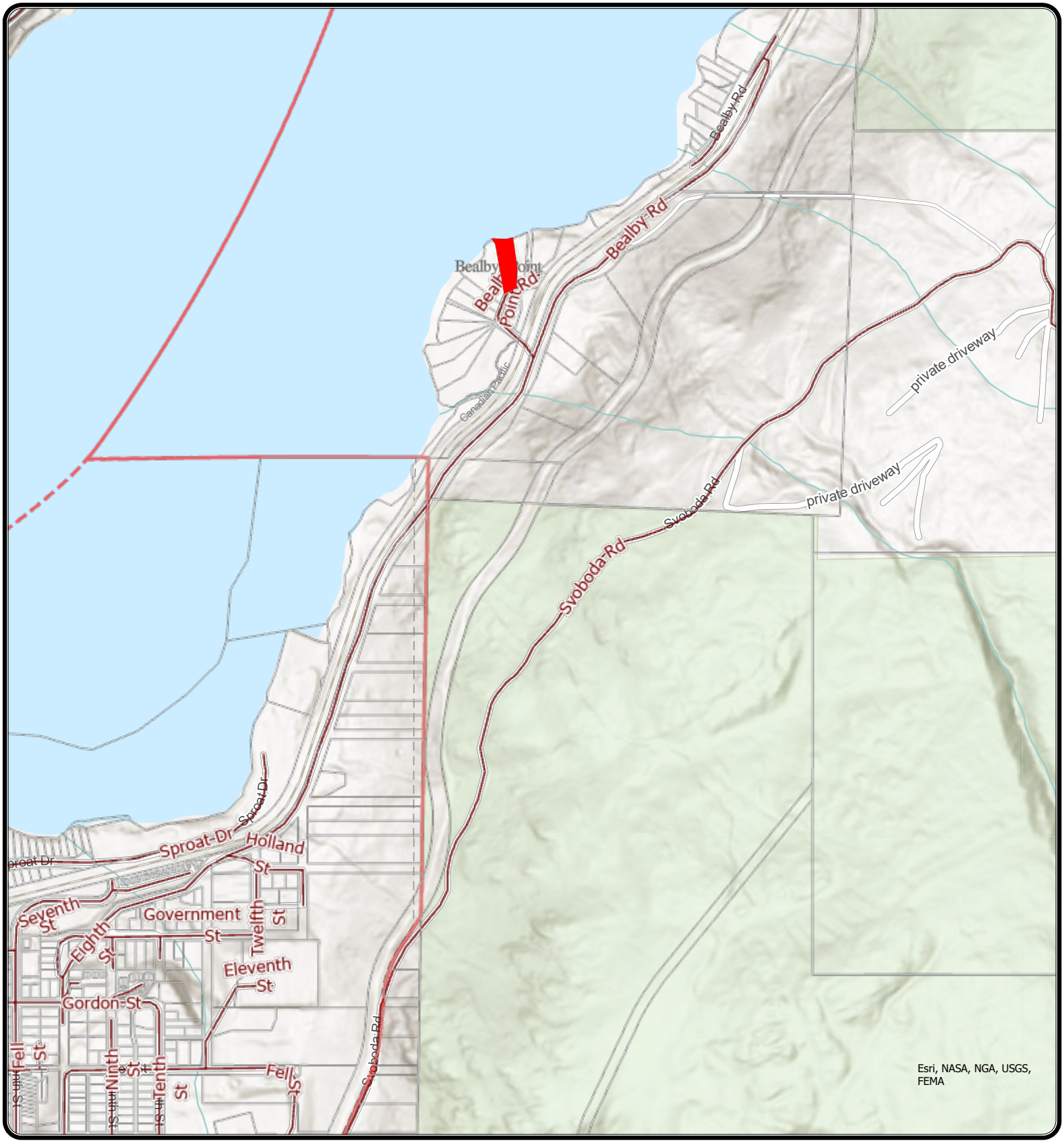
[MOH] Health Protection Branch of the BC Ministry of Health. 2014. Sewerage System Standard Practice Manual – Version 3.

[MFLNRO] BC Ministry of Forests Lands and Natural Resource Operations. N.D. Firesmart Homeowner's Manual.

[RDCK] Regional District of Central Kootenays. 2013. Electoral Area 'A' Rural Official Community Plan Bylaw No. 2315, 2013.

APPENDIX 1
LOCATION MAP

RDCK Map



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

- Electoral Areas
- RDCK Roads
- Cadastre - Legal Parcels

Map Scale:

1:15,000

Date: December 1, 2022

APPENDIX 2
PROPOSED SITE PLAN AND MITIGATION PLAN

WEST ARM OF KOOTENAY LAKE

N

Geothermal

Neighbour's Well

Owner's Well

88° 39' 19"

35.003

20 m²

Area 1

147° 40' 39"

PRESENT NATURAL BOUNDARY
PLAN NEP81885

11m

15m setback to present nat. boundary

Note:
Planting will occur on either side of the boulders

Water Line

Geothermal

Area 2

12 m²

Area 3

15 m²

retaining wall

Move 1-2 large boulders to break up linear structure. Disperse smaller boulders to create openings for fish passage.

Water Line - Legal Easement

19 m²

Rainwater Drain Catchment

Septic Tanks

PLAN NEP81885

LOT B

FROM SOUTH WEST PIN TO CONC.

103'-2 5/8"

54'-6"

38'-0"

Septic Line

SPEA 30 m

537.01m
GRADE (N)

536.5m
floor construction level

537.01m
GRADE (N)

536.60m
FIN FLR (PATIO)

11'-2"
FROM PL TO CONC.

172° 21' 23"
60.175

537.30m
GRADE (N)

4'-11 1/8"
FROM PL TO CONC.

LEGEND

- Mitigation Area (66 m²) - re-vegetate with native plants. Refer to Section A for more details on re-vegetation plan
- Plant one lodgepole pine or 3 paper birch trees (min. 5 gallon pot size).
- Existing concrete slab (~54.2m²)
- Enclosed boathouse (~27.9m²)
- Total area of overhanging roof (~56 m²)
- 15 m WDP area, LWD ZOS, Litterfall ZOS
- Shade ZOS (30 m)
- SPEA (30 m)

MASSE
ENVIRONMENTAL

2165 Bealby Point
Proposed Site and Mitigation Plan
Scale: As shown
Drawn by: CG
Date: August 8, 2023

Screenshot

APPENDIX 3
CHANCE FIND PROCEDURES

KTUNAXA NATION

Ktunaxa Nation Council
Lands & Resource Agency
7468 Mission Road
Cranbrook, BC V1C 7E5

www.ktunaxa.org

Chance Find Procedures for Archaeological Material

This document provides information on how a developer and/or their contractor(s) can manage for potential archaeological material discoveries while undertaking construction and/or maintenance activities. This document can provide assistance to in-field contractors in the identification of archaeological remains and the procedures to follow if a discovery is made. The discovery of human remains initiates a different course of action and is outlined separately.

Under the provincial *Heritage Conservation Act (HCA)*, archaeological sites that pre-date 1846 are automatically protected whether on public or private land. Protected sites may not be damaged, altered or moved in any way without a Section 12 or 14 Permit as issued through the *HCA*. It is illegal to collect or remove any heritage object from an archaeological site unless authorized to do so under permit.

1. Activities occurring outside of known Archaeological Sites:

When archaeological material is encountered outside of known archaeological site areas work in the vicinity must stop immediately no matter what type of material or feature has been identified. Alteration to an archaeological site can only occur under a Section 12 (Site Alteration Permit) or Section 14 (Heritage Inspection Permit) *Heritage Conservation Act* permit. Such permit applications should be prepared by a professional archaeologist.

If archaeological material is discovered during the course of construction activities:

1.1 **Stop Work:** Halt all work in the area of the discovery and safely secure the area. Contact the project manager or site foreman.

1.2 **Contact an Archaeologist:** An archaeologist should be contacted as soon as possible. For a list of qualified archaeologists in the area, the proponent is directed to the BC Association of Professional Consulting Archaeologists website: www.bcapa.ca. The proponent may also wish to contact the Ktunaxa Nation Council's Cultural Resources Stewardship Technician for direction (1-250-420-2739; njkapell@ktunaxa.org).

1.3 **Archaeologist provides guidance:** The archaeologist will direct the proponent on the next courses of action, which will include notifying the Archaeology Branch and First Nations with interest in the area.

2. Activities Occurring within Known Archaeological Site Boundaries:

Land altering activity within a previously recorded archaeological site must be conducted under a Section 12 HCA Site Alteration Permit (SAP), in some cases with an onsite archaeological monitor. It is common for additional archaeological material and features to be encountered during activities occurring within previously recorded archaeological sites. Minor finds (lithic flakes, diffuse charcoal or fire altered rock) may not require work to stop, however significant finds require a level of assessment by a professional archaeologist, and it is up to the onsite project manager to determine the level of significance based on criteria presented below.

2.1 Significant Cultural Finds that Require a Professional Archaeologist (described in detail in Section 4)

- Intact archaeological features, which can include but are not limited to hearths, cultural depressions (e.g. cache pits, house depressions) and rock alignments or forms (e.g. tipi rings, cairns, blinds)
- Significant archaeological materials, which include but are not limited to, the presence of formed lithic tools (e.g. projectile point, microblade core, scraper), a dense concentration of lithic waste flakes, or artistic items
- Human Remains (described in detail in Section 3)

2.2 Archaeological Site Management Options

2.2.1 **Site Avoidance**: If the boundaries of a site have been delineated, redesign the proposed development to avoid impacting the site. Avoidance is normally the fastest and most cost effective option for managing archaeological sites. Site avoidance could also be achieved through minimizing ground disturbance by looking for alternative constructive methods.

2.2.2 **Mitigation**: If it is not feasible to avoid the site through project redesign, it is necessary to conduct systematic data collection and analysis within the site prior to its loss. This could include surface collection and/or excavation. This work can be time-consuming and therefore expensive to conduct.

2.2.3 **Protection**: It may be possible to protect all or portions of the site which will be impacted through installation of barriers during the development period and possibly for a longer period of time. Methods for barrier construction could include fencing around site boundaries or applying geotextile to the ground surface and capping it with fill. The exact method used would be site-specific.

3. Chance Find Procedures for Identified Human Remains

Procedures in the event of the discovery of human remains during construction are covered in depth by an Archaeology Branch Policy Statement, found on their website at www.for.gov.bc.ca/archaeology, and are summarized below.

3.1 Stop all construction activities immediately in the area of found or suspected human remains and contact the RCMP and/or Office of the Coroner.

3.2 The coroner must determine whether the remains are of contemporary forensic concern or archaeological/aboriginal.

3.3 If the remains are found to be of aboriginal ancestry then the next step involves the relevant First Nations collaboratively determining the appropriate treatment of those remains.

The key to respectfully dealing with ancient aboriginal remains is to involve the appropriate First Nations as early as possible in the process. However this must be done in a manner that does not interfere with the coroner's office ability to conduct their business in the manner that they see fit.

4. Site Identification Guide

The following are characteristics typical to site types found within the Ktunaxa Traditional Territory.

4.1 Artifact Scatters

Lithic (stone) scatters from the production and maintenance of stone tools are the most common type of archaeological site found in the region. Other materials that may be represented in artifact scatters are Fire Altered Rock (FAR), bone, antler and tooth.

Lithics: What to look for

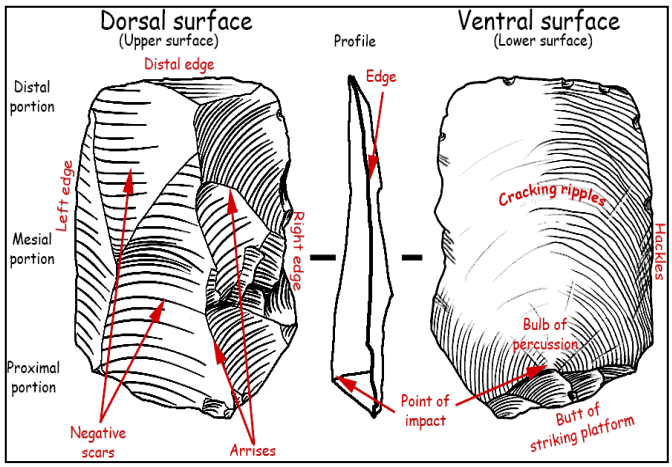


Image 1: Basic flake morphology

Image 2: Examples of lithic flakes

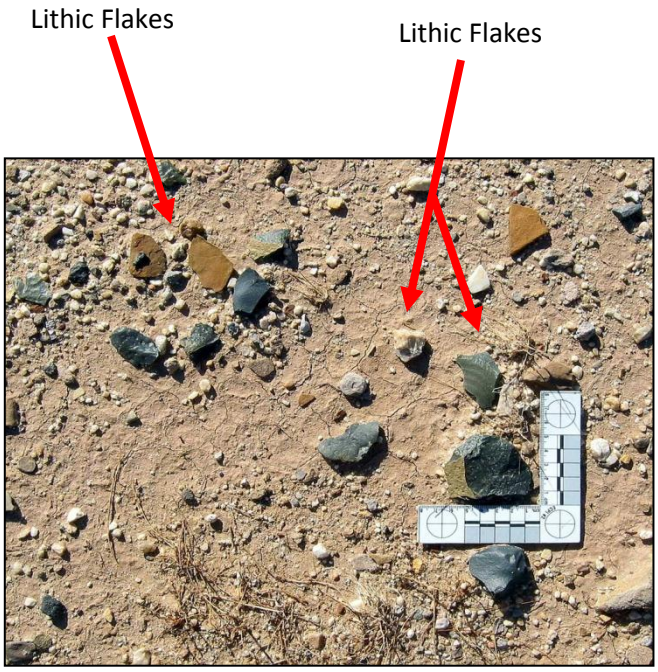


Image 3: Example of lithic scatter found on ground surface

Image 4: Example of formed lithic artifacts

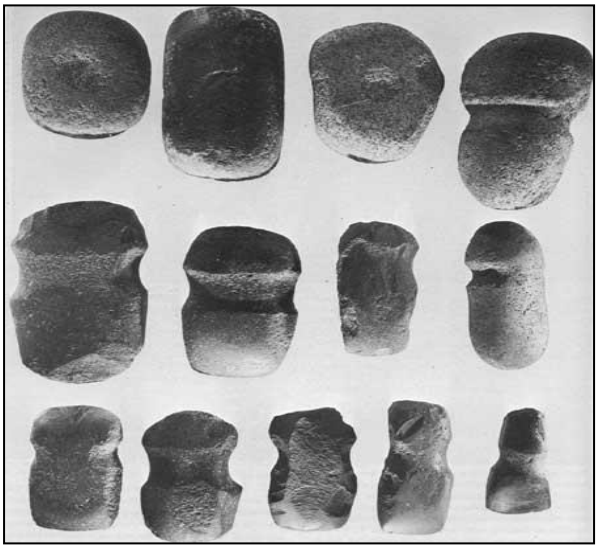


Image 5: Ground stone artifacts

Bone, Tooth and Antler Artifacts: What to Look For

- Obvious shaping
- Incising
- Unnatural holes

Image 6: Bone and Antler artifacts

4.2 Fire Broken Rock and Hearths

Fire-broken rock (FBR) results from the use of fire during cooking, heating and processing activities. FBR is often associated with other features including hearths and cultural depressions, but can also be thinly scattered in concentrations away from the features with which they were first associated.

When looking for FBR, note concentrations of roughly fractured rock from rapid heating and cooling, rock showing signs of burning or oxidation and/or reddening or blackening of surrounding matrix.

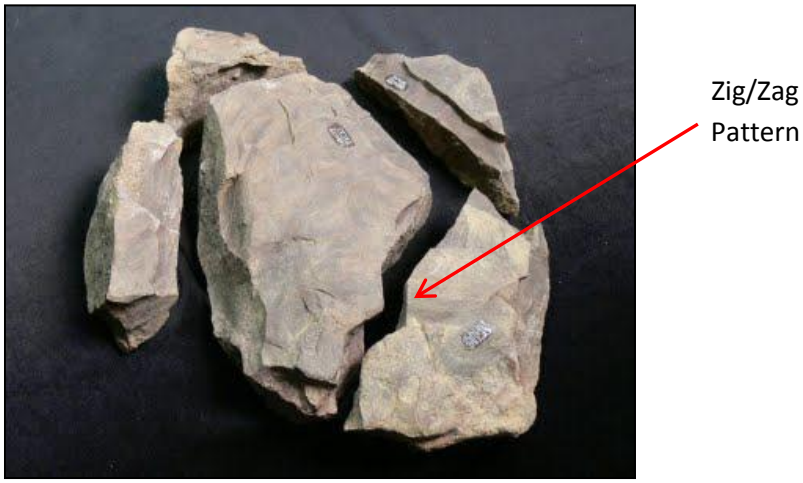


Image 7: Example of FBR; note the zig/zag pattern of breakage common to FBR

A hearth feature is evidence of a fire pit or other fireplace feature of any period. Hearths were used for cooking, heating, and processing of some stone, wood, faunal, and floral resources and may be either lined with a wide range of materials like stone or left unlined. Occasionally site formation processes (e.g., farming or excavation) deform or disperse hearth features, making them difficult to identify without careful study.

Hearths: What to look for

- FBR
- reddening or blackening of the associated soil/sediment
- charcoal
- layering of FAR and charcoal, and
- depressions in the earth associated with FAR, reddened or blackened matrix and charcoal.

Image 8: Example of a hearth uncovered along the wall of an excavation unit

4.3 Cultural Depressions

Any depression seen on the ground surface that appears to have been excavated by man can be a cultural depression and have archaeological significance. These “pits” were dug for a variety of reasons such as for food storage or as a base for a dwelling. They can range in size from 1m across to 7-10m across, and are usually found associated with other artifacts such as FAR and lithic scatters.

To identify a cultural depression, look for:

- Subtle to deep scours on the ground surface that are circular to rectilinear in shape
- A raised rim along the edge of a depression
- Depressions associated with artifacts and FAR
- Depressions associated with fire reddening and blackening of the matrix

Image 9: Example of a large cultural depression in a natural setting

4.6 Rock Alignments

There are several types of rock alignments that occur within the culture area, which include tipi rings, medicine wheels, cairns and blinds. When attempting to identify rock alignments, look for a group of rocks that look purposefully placed as in a circle, pile or line; isolated groups of rock that do not seem to belong to that landscape; and/or rocks which form a pattern.

Image 10: Example of a Cairn or piling of rocks

Image 11: Example of a tipi ring in a natural setting