



**REGIONAL DISTRICT OF CENTRAL KOOTENAY**  
**DEVELOPMENT PERMIT**  
**DP2311E (POLLOCK)**

Date: October 31, 2022

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

1. This Development Permit is issued to John Robert Pollock of Whitewood, SK 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 3 DISTRICT LOT 6498 KOOTENAY DISTRICT STRATA PLAN EPS4977 TOGETHER WITH AN INTEREST IN THE COMMON PROPERTY IN PROPORTION TO THE UNIT ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V (PID: 030-820-022) 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 'Watercourse Development Permit Area' pursuant to the *Electoral Area 'E' Rural Official Community Plan Bylaw No. 2260, 2013*.
5. The Permittee seeks to construct a waterline from Kootenay Lake to be installed to service a new residence (outside of the riparian area) on the said lands. 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 this purpose.
6. The Permittee is required to obtain approval in writing from the Regional District of Central Kootenay prior to any further disturbance, construction any new buildings, external additions to existing buildings or for any deviation from the development authorized under Schedules 2 and 3 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.
    - 6.1.1 Development is authorized in accordance with the terms described in the report titled "6826 Marian Lane Water Intake Riparian Assessment" prepared by Masse Environmental Consultants Ltd., dated July 24, 2023, and attached to this permit as Schedule 3. The proposed work will require minimal clearing of vegetation for the installation of the waterline. The proposed waterline is 15 metres long by 0.6 metres in width will encroach into the SPEA totaling 9 m<sup>2</sup> in area. The following mitigation measures will be implemented to protect existing vegetation within the Streamside Protection and Enhancement Area (SPEA):
    - 6.1.2 Clearing of vegetation will be kept to the minimum possible area required for the waterline trench. The waterline will be laid out in a way to avoid removal of trees.

- 6.1.3 Avoid cutting and severing root systems.
- 6.1.4 Avoid the introduction and establishment of invasive weed species.
- 6.1.5 To prevent erosion of the property and to prevent
  - 6.1.5.1 Staging and access should only occur in previously disturbed areas of the site;
  - 6.1.5.2 The SPEA should be clearly marked prior to construction of the new waterline to protect vegetation and root systems within the SPEA. Snow fencing shall be installed along the 15 metre setback from Kootenay Lake or top of embankment and shall remain in place through the duration of construction.
  - 6.1.5.3 No pollutants should be allowed to contaminate the soil within the development area next to the SPEA.
  - 6.1.5.4 To reduce the risk of sediment input into Kootenay Lake the amount of soil disturbance should be kept to a minimum. Disturbed soils should be revegetated as soon as possible after construction.
  - 6.1.5.5 Works should be scheduled to avoid impacts to nesting birds. The best timing for vegetation clearing is within the least risk window for nesting birds (August 15-April 15). Any clearing outside of these windows shall require a nesting survey.
  - 6.1.5.6 Development of the waterline on the property should protect fish habitat by adhering to sediment, stormwater, and waste management best practices outlined in the Riparian Assessment to ensure that there is no release of deleterious materials into Kootenay Lake.
  - 6.1.5.7 To minimize the likelihood and impact of a spill of fuel/lubricant materials within the riparian area, ensure that: each piece of heavy equipment will have its own spill response kit; all staff will be familiar with the use of spill kits and their contents; and equipment shall 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.
  - 6.1.5.8 To reduce the establishment and proliferation of invasive plant species on site: all equipment should be thoroughly washed and inspected before entering the project site to prevent the import of new invasive plant seeds and root fragments; amount of vegetation clearing, and soil disturbance should be minimized; all exposed soils should be re-vegetated immediately following construction.
- 6.3 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. 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.
- 8. 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.
- 9. 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.

10. 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.
11. 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.
12. This Development Permit does not constitute a building permit.
13. 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*

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Sangita Sudan, General Manager of Development Services

November 8, 2023

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Date of Approval

November 8, 2023

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Date of Issuance

**Schedule 1: Location Map**



Esri Community Maps  
Contributors, Esri Canada,  
Esri, HERE, Garmin,  
SafeGraph,  
GeoTechnologies, Inc.



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 Streets
- Cadastre
- Address Points

**Map Scale:**

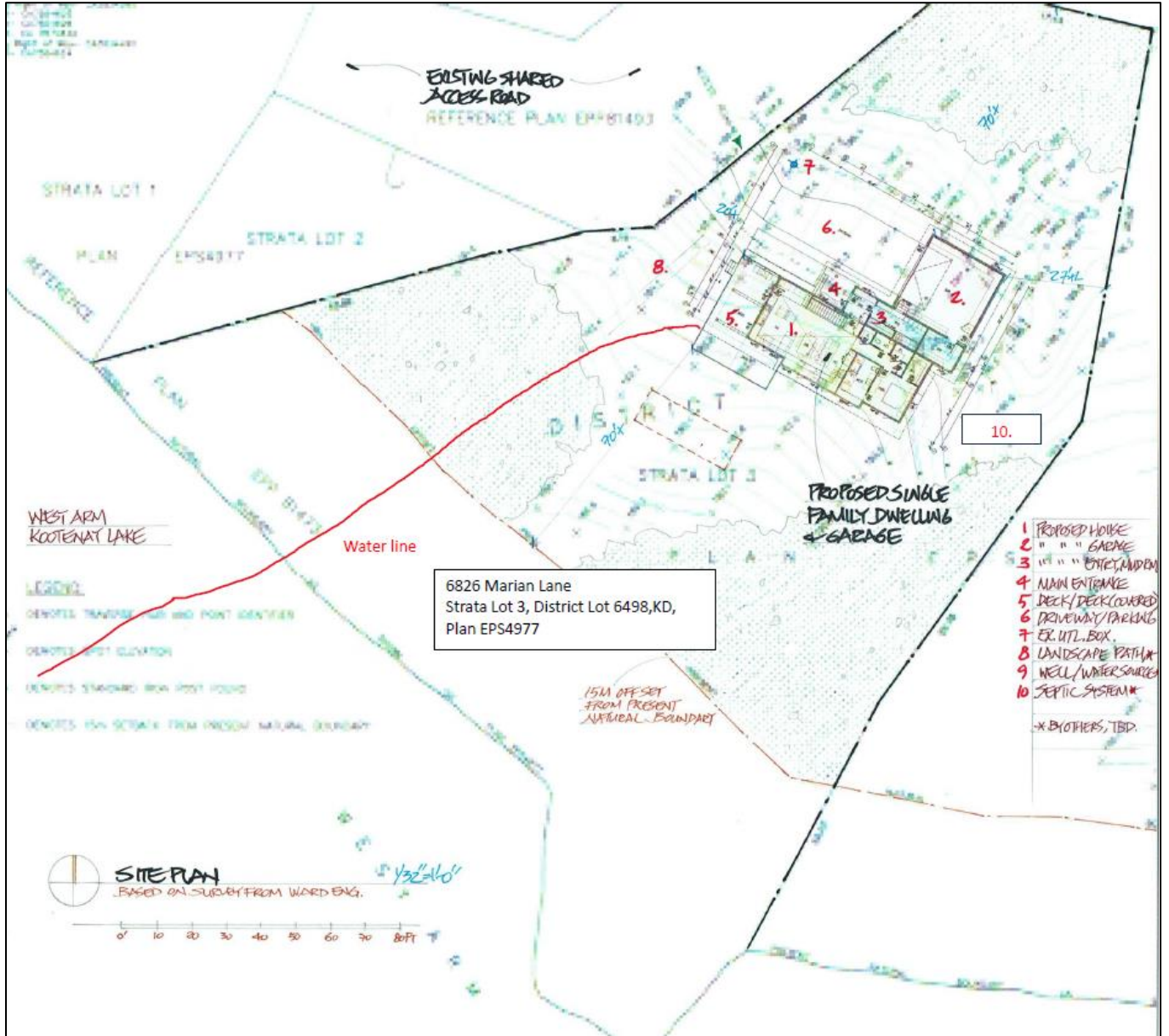
1:2,257

Date: July 31, 2023



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.

**Schedule 2: Site Plan**

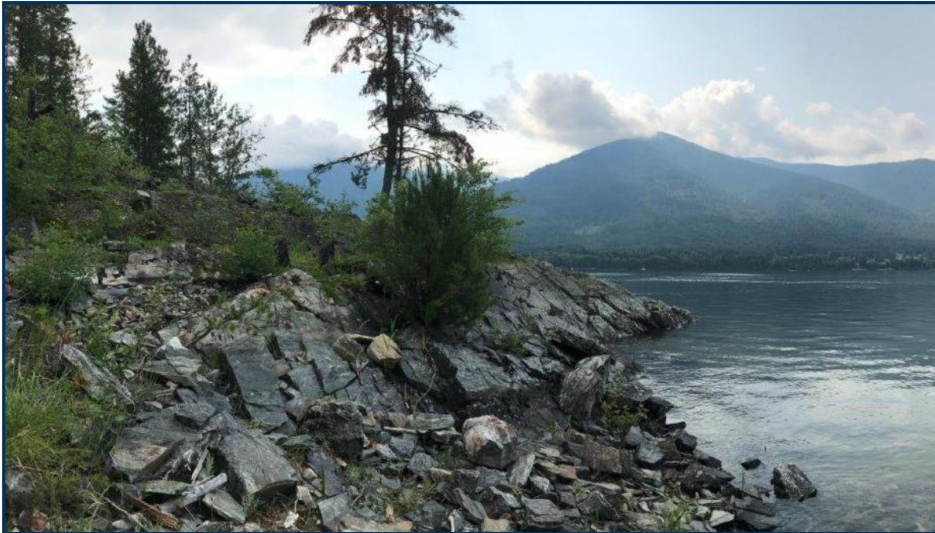




**Schedule 3:** Riparian Assessment, dated July 24, 2023 by Masse Environmental Consultants Ltd. for 6826 Marian Lane



## **John Pollock – 6826 Marian Lane Water Intake Riparian Assessment**



Prepared for:

**Regional District of Central Kootenay**

202 Lakeside Drive

Nelson, BC, V1L 5R4

July 24, 2023

Prepared by:  
Masse Environmental Consultants  
812 Vernon Street  
Nelson, BC, V1L 4G4

Project Number 2023-1047

Pollock WDP – Riparian Assessment

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Pollock WDP – Riparian Assessment

## 1 INTRODUCTION

Masse Environmental Consultants Ltd. was retained by John Pollock (owner) to conduct a riparian assessment to accompany an application for a Watercourse Development Permit (WDP) on his waterfront property at 6826 Marian Lane, Belfour, BC (PID 030-820-022, Strata Lot 3 Kootenay District Lot 6498, Kootenay District Strata Plan EPS4977). The owner is proposing to install a waterline from Kootenay Lake through the riparian area, triggering the requirement for a Watercourse Development Permit (WDP) application.

A site visit was completed on June 15, 2023, by Chanel Gagnon, B.Sc., B.I.T., to conduct a riparian assessment on the property within the 15 m WDP area. The riparian assessment evaluates the existing conditions of the riparian area for Kootenay Lake, 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:

- RDCK Electoral Area 'E' Rural Official Community Plan Bylaw No. 2260, 2013
- British Columbia *Riparian Areas Regulation*
- British Columbia *Water Sustainability Act*
- British Columbia *Wildlife Act*
- Federal *Fisheries Act*
- *Federal Migratory Birds Convention Act*
- *Requirements and Best Management Practices for Making Changes In and About A Stream in British Columbia*
- *Develop with Care. Environmental Guidelines for Urban and Rural Land Development in British Columbia*
- *General BMPs and Standard Project Considerations (Ministry of Environment)*
- *On the Living Edge: Your Handbook for Waterfront Living*
- *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 B.Sc., B.I.T., 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;

## Pollock WDP – Riparian Assessment

- 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 Protection Regulation.

## 2 PROJECT OVERVIEW

### 2.1 Site Location

The subject property is located in Area E of the Regional District of Central Kootenay (RDCK), approximately 29 km northeast of Nelson, BC (see Appendix 1 for Location Map). The property (Lot 3) is ~0.9 acres, with ~82 m of frontage on the West Arm of Kootenay Lake. The property is located at 6826 Marian Lane, in Balfour and is bordered by private properties to the north, west and east, and Kootenay Lake to the south.

The area falls within the Very Dry Warm Interior Cedar Hemlock (ICHxw) biogeoclimatic subzone. The ICHxw is a relatively small subzone occurring at low elevations in the southernmost parts of the Columbia Basin in BC (MacKillop and Ehman 2016). The climate is characterized by very hot, very dry summers and mild dry winters (MacKillop and Ehman 2016). The ICHxw subzone contains forests with a diverse assemblage of tree and shrub species and a disproportionately large number of wildlife and plant species at risk (MacKillop and Ehman 2016).

### 2.2 Existing Site Conditions

The property has a southwestern aspect, with elevations ranging from 533 to 555 m and is located along the north shore of the West Arm of Kootenay Lake. The property is steep (up to 25%) with a rocky shoreline, and the WDP area is generally undisturbed. The shoreline gradually steepens towards the southeast and northeast.

#### 2.2.1 Watercourses

Kootenay Lake borders the subject property along the southern boundary; it is a long, narrow and deep lake with a surface area of approximately 400 km<sup>2</sup>. Kootenay Lake's main inflows include the Lower Duncan River to the north and the Kootenay River to the south and 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 (late May through July). Lake levels can vary up to 4 m throughout the year, affecting the extent of the exposed shoreline.

## Pollock WDP – Riparian Assessment

During the site visit, the visible high-water mark (HWM) of Kootenay Lake was observed to be at ~535m elevation (Parcelmap BC 2023). Based on the definition of natural boundary, the natural boundary line shown on the site plan (Appendix 3) will be used as the HWM from which the streamside protection and enhancement area (SPEA) setbacks will be determined as 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 (MOE 2016).”

### 2.2.2 Existing Development

Existing development within the WDP area (15 m from the natural boundary of Kootenay Lake) includes a treated sewage effluent discharge pipe that was installed in 2010, located at 11U.498672.5495710. From the wastewater treatment plant, the effluent discharge pipe is buried underground for ~80 m before it reaches the shoreline of Kootenay Lake, where it then runs westward offshore along the lakebed for a distance of 330 m before discharging at an approximate depth of 26 m.

### 2.3 Proposed Development

The proposed development within the 15 m WDP area includes a new waterline that is expected to be ~40 m long above the HWM and ~57 m long below the HWM, with a total approximate length of 97 m. The waterline is expected to be installed in a 60 cm wide and 60 cm deep trench on the west side of the property and will extend into the lake at 240 degrees (Appendix 2). The waterline installation will be completed during low water to allow for the pipe to be buried as far into the lake as possible before running along the lakebed. The water intake stand depth is estimated to be 7.6– 10.7 m depending on the lake level throughout the year.

Refer to Appendix 2 for proposed waterline alignment.

### 2.4 Services

Domestic water for the main house will be extracted from Kootenay Lake. The water service line will be installed to the new home at the western end of the property. A sewage treatment facility and effluent discharge pipe are located west of the property that services the six-lot residential subdivision.

## Pollock WDP – Riparian Assessment

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## Pollock WDP – Riparian Assessment

**3 REGULATORY OVERVIEW**

To determine whether the 15 m WDP setback from the HWM of Kootenay Lake aligns with the 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 0 m from the HWM from Kootenay Lake. 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 15 m.

Table 1. Results of detailed RAPR assessment for Kootenay Lake.

Feature Type	SPVT <sup>1</sup>	Zones of Sensitivity			SPEA <sup>3</sup>
		LWD <sup>2</sup>	Litter fall	Shade	
Kootenay Lake	TR	15 m	15 m	0 m	15 m

<sup>1</sup> SPVT: site potential vegetation type (TR-tree)

<sup>2</sup> LWD- large woody debris

<sup>3</sup> SPEA- streamside protection and enhancement area

**3.1 Kootenay Lake Shoreline Management Guidelines**

The Kootenay Lake Foreshore Integrated Management Planning (FIMP; Schleppe and McPherson 2022), the Foreshore Inventory Mapping (FIM; Schleppe and Cormano 2013) and the Kootenay Lake Shoreline Management Guidelines (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 37. This segment has been identified as supporting juvenile rearing habitat.

Table 2. Aquatic and archaeological risk results.

Aquatic Habitat Index Rating (AHI)	Aquatic Sensitivity	Archaeological Risk	Enhanced Engagement Required
Moderate	Non-Sensitive	Moderate	No

The subject parcel was flagged as moderate archaeological risk; however, further assessment of archaeological risk is beyond the scope of this report. For further information please consult the Kootenay Lake Shoreline Guidance Document (KLP 2020). Archaeological Chance Find Procedures are provided in Appendix 3.

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#### 4 ENVIRONMENTAL RESOURCES

##### 4.1 Fish and Aquatic Habitat

The foreshore of the property consists of a rocky shoreline with a southwest aspect (Photo 1 and Photo 2). The littoral zone has a mixed substrate consisting mostly of boulders and exposed bedrock, with angular cobble, gravel and sand intermixed (Photo 3 and Photo 4). Fish habitat along this section of foreshore supports juvenile rearing habitat (Schleppe and Cormano 2013), with boulders and cobbles providing cover for fish when water levels are higher. This area has also been reported to support Rainbow Trout (*Oncorhynchus mykiss*) spawning habitat (pers. comm. Taylor Josephy 2023).

Kootenay Lake supports a variety of fish species, including several species of regional interest, such as Kokanee (*O. nerka*), Rainbow Trout, Bull Trout (*Salvelinus confluentus*; BC-Blue-Listed; SARA Special Concern), White Sturgeon (*Acipenser transmontanus pop.1*; BC Red-Listed, SARA Endangered), Westslope Cutthroat Trout (*O. clarki lewisi*; BC Blue-Listed; SARA Special Concern), and Burbot (*Lota lota pop.1*; BC-Red-Listed).



Photo 1. Foreshore habitat, looking southeast (June 15, 2023).



Photo 2. Foreshore habitat, looking northwest (June 15, 2023).



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Photo 3. View of in-water substrate along the shoreline (June 15, 2023).



Photo 4. View of rocky in-water substrate along the shoreline (June 15, 2023).

#### 4.2 Vegetation

The riparian area along Kootenay Lake foreshore is rocky and supports a mix of native trees and understory shrubs and herbaceous species (Photo 5 – 8). Overstory vegetation along the shoreline consists of Lodgepole pine (*Pinus contorta*), western redcedar (*Thuja plicata*), grand fir (*Abies grandis*) and Douglas-fir (*Pseudotsuga menziesii*). The shrub community consists of mountain alder (*Alnus incana*), red-osier dogwood (*Cornus sericea*), Douglas maple (*Acer glabrum*), saskatoon (*Amelanchier alnifolia*), oceanspray (*Holodiscus discolor*), mountain ash (*Sorbus sp.*), pacific yew (*Taxus brevifolia*), and regenerating black cottonwood (*Populus trichocarpa*). The herbaceous plant community was dominated by common wormwood (*Artemisia absinthium*), grass spp. (*Poa spp.*), horsetail (*Equisetum sp.*), scouring rush (*Equisetum hyemale*), with drought tolerant species on drier rocky sites including kinnickinnick (*Arctostaphylos uva-ursi*), lance-leaved stonecrop (*Sedum lanceolatum*), common juniper (*Juniperus communis*), Oregon grape (*Mahonia aquifolium*) and soopolallie (*Shepherdia canadensis*). Non-native species mostly present on the upper limits of the 15 m WDP area include spotted knapweed (*Centaurea stoebe*; invasive), oxeye daisy (*Leucanthemum vulgare*; invasive) and yellow devil hawkweed (*Pilosella glomerata*). The foreshore vegetation provides shade, litterfall and insect drop that benefit aquatic organisms in Kootenay Lake.



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Photo 5. Mountain alder, black cottonwood and lodgepole pine along the foreshore area, looking southeast.



Photo 6. Riparian vegetation on the foreshore and exposed bedrock, looking northwest.



Photo 7. Boulders and riparian vegetation, looking northeast.



Photo 8. View of upper limits of riparian area and embankment descending from housing development.

### 4.3 Wildlife

The riparian area along Kootenay Lake provides suitable habitat for reptiles such as western skink (*Plestiodon skiltonianus*; BC Blue-listed; SARA Special Concern), northern alligator lizard (*Elgaria coerulea*), northern rubber boa (*Charina bottae*; SARA Special Concern), garter snakes (*Thamnophis* spp.) and a variety of birds. Rocky outcrops with southern exposure along the foreshore provide basking sites, food sources and cover habitat for reptiles. Shrubs and deciduous trees provide potential nesting habitat for birds, although no nests were observed during the site visit.

Several bird species including Cedar Waxwings (*Bombycilla cedrorum*), Song Sparrow (*Melospiza melodia*), American Robin (*Turdus migratorius*), Golden-crowned Kinglet (*Regulus satrapa*), Northern Flicker (*Colaptes auratus*), Red-breasted Nuthatch (*Sitta canadensis*) and Pacific-sloped Flycatcher (*Empidonax difficilis*) were observed flying over and perching in the shrubs within the subject property. Pileated

## Pollock WDP – Riparian Assessment

Woodpecker (*Dryocopus pileatus*) feeding cavities were observed on a western red cedar at the upper limits of the foreshore. Mammals that may use the riparian area within the subject property include American black bear (*Ursus americanus*), yellow pine chipmunks (*Tamias amoenus*), red squirrels (*Sciurus vulgaris*), white tail deer (*Odocoileus virginianus*) and bats. No tracks or droppings were observed during the site visit.

#### 4.4 Species at Risk

The BC Conservation Data Center (CDC) occurrence data and critical habitat for federally listed species at risk were queried within iMap BC (BC 2023), using a 10 km buffer around the center point of the subject property. The query results are presented in Table 3. Five species at risk were identified within this buffer. Potential occurrence on the property was assessed as likely, possible, unlikely, or unknown, according to known species habitat affinities and the habitat profile of the property, and in proximity to mapped occurrences.

Table 3. Species at risk with potential occurrence based on iMap BC 10 km radius query.

Common Name (Scientific Name)	Likelihood of Occurrence on Subject Property	Comment	BC Conservation Status <sup>1</sup>	COSEWIC <sup>2</sup> / SARA <sup>2</sup>
Banded Tigersnail ( <i>Anguispira kochi</i> )	Possible	CDC occurrence mapped ~8 km west of the subject property in Kokanee Creek Provincial Park (Shape ID: 120189, Occurrence ID: 15025).	Blue	NAR
Western Bumble Bee ( <i>Bombus occidentalis</i> )	Possible	CDC occurrence mapped ~8.3 km west of the subject property in Kokanee Creek Provincial Park (Shape ID: 131768, Occurrence ID: 16454).	Blue	NAR
Western Skink ( <i>Plestiodon skiltonianus</i> )	Likely	CDC occurrence mapped ~5.8 km west of the subject property, along highway 3a in rocky outcrops and coarse talus slopes (Shape ID: 29931, Occurrence ID: 6940).	Blue	SC
White Sturgeon (Upper Kootenay River Population) ( <i>Acipenser transmontanus pop. 1</i> )	Unlikely	Found in Kootenay Lake (Shape ID: 1370, Occurrence ID: 4745). Associated with deep lakes and large rivers.	Red	E
Whitebark pine ( <i>Pinus albicaulis</i> )	Unlikely	CCD occurrence is mapped within ~6.5 km east of the subject property (Shape ID: 136831, Occurrence ID: 17120). Habitat is subalpine and timberline zones, so it is not expected at the subject site.	Blue	E



## Pollock WDP – Riparian Assessment

<sup>1</sup>Red = Species that is at risk of being lost (extirpated, endangered, or threatened) within British Columbia. Blue = Species considered to be of special concern within British Columbia. <sup>2</sup>(E)Endangered = Facing imminent extirpation or extinction. (T)Threatened = Likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction. (SC)Special concern = May become a threatened or an endangered species because of a combination of biological characteristics and identified threats. Information sources: British Columbia Conservation Data Centre, and personal sightings.

### 4.5 Archeological 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 sites along the shoreline and mountain sides of Kootenay Lake. 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.

## 5 IMPACT ASSESSMENT

The proposed works were assessed based on current site conditions and proposed construction of the waterline within the SPEA and the littoral zone. Potential impacts include removal of some riparian vegetation along a 15 m long by 0.6 m (9 m<sup>2</sup>) wide trench and temporary disturbance to fish and wildlife from digging in the littoral zone associated with the construction of the trench. Provided that measures to protect the SPEA (detailed below) are followed, any negative impacts are anticipated to be negligible.

## 6 MEASURES TO PROTECT THE INTEGRITY OF THE SPEA

This section provides measures to protect the integrity of the SPEA as described in the RAPR, as well as recommended best management practices.

### 6.1 Danger Trees

No hazard tree indicators were observed during the site assessment. A certified danger tree assessor was not retained as a part of this assessment.

### 6.2 Windthrow

No windthrow risk indicators were observed during the site visit. Further assessment of windthrow risk is beyond the scope of this report, and any such assessment should be led by a Registered Professional Forester (RPF).

## Pollock WDP – Riparian Assessment

### 6.3 Slope Stability

No slope stability hazard indicators were observed during the site visit. Further assessment of geotechnical hazard is beyond the scope of this report, and 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 work will require minimal clearing of vegetation for the installation of the waterline. The following mitigation measures will be implemented to protect existing vegetation within the SPEA:

- Clearing of vegetation will be kept to the minimum possible area required for the waterline trench. The waterline will be laid out in such a way to avoid removal of trees.
- Avoid cutting and severing root systems.
- Avoid the introduction and establishment of invasive weed species.

### 6.5 Encroachment

The proposed waterline (15 m long by 0.6 m [9 m<sup>2</sup>]) will encroach into the SPEA.

### 6.6 Sediment and Erosion Control

In order to prevent erosion of the property and to prevent sediment from entering Kootenay Lake, soil disturbance will be minimized as much as possible and exposed soils will be re-vegetated as soon as possible.

### 6.7 Stormwater Management

There are no stormwater management concerns.

### 6.8 Floodplain Concerns

There were no floodplain concerns observed on the subject property.

### 6.9 Fish and Wildlife Protection

To minimize disturbance to fish, wildlife and their habitat, the following measures will be implemented:

- Installation of the waterline through the littoral zone should be completed at low water levels in later winter or early spring in order to avoid working in water. To reduce the impact on lake substrate, the trench will be infilled and covered with native material.
- The water intake will be at least 30 cm above the lakebed and equipped with a fish screen that will meet the interim code of practice for end-of-pipe fish protection (DFO 2020).

## Pollock WDP – Riparian Assessment

- The water intake box should be placed at a sufficient depth outside of the littoral zone (or light penetrated zone) to avoid impacting aquatic habitat and potential spawning habitat.
- Adhere to sediment and stormwater best practices outlined in this report to ensure that there is no release of deleterious materials into Kootenay Lake.
- If vegetation clearing takes place during the nesting bird period (early-April to mid-August), a nesting sweep conducted by a QEP is recommended prior to clearing activities commencing. If an active nest is identified during the construction works, the QEP is to be notified and develop appropriate mitigation measures.
- Follow the Best Management Practices for Bats in British Columbia (MoE 2016) if bats are known to be roosting within 100 m of the subject property or if noise in excess of 150 dB is expected.
- Avoid any modifications to the beach substrate and preserve the foreshore vegetation and boulders, which provide fish habitat during period of inundation.

### 6.10 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:

- All equipment should be thoroughly washed and inspected before entering the project site to prevent the import of new invasive plant seeds and root fragments.
- The amount of soil disturbance should be minimized.
- Invasive plants shall be removed and disposed of at a licensed landfill facility.

## 7 CONCLUSION

Overall, the measures to protect the SPEA will help mitigate the environmental impacts potentially caused by the installation of the waterline. Disturbance to fish and fish habitat will be minimized by conducting the works at low water levels and covering the trench with native material. Provided that measures to protect the SPEA are followed, any negative impacts from the trenching to fish are anticipated to be negligible.

## 8 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.

Pollock WDP – Riparian Assessment

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.

If you have any comments or questions, please do not hesitate to contact the undersigned.

Sincerely,



Chanel Gagnon, B.Sc., B.I.T.

[chanel@masseenvironmental.com](mailto:chanel@masseenvironmental.com)



Sylvie Masse, MSc, RPBio

Masse Environmental Consultants

Pollock WDP – Riparian Assessment

**9 REFERENCES**

[BC]. 2019. *Riparian Areas Protection Regulation*. B.C. Reg. 178/2019, Last amended February 5, 2021 by B.C. Reg. 11/2021. Victoria, British Columbia, Canada.

[BC]. 2023. iMap BC Mapping Application. Available online at:  
<https://www2.gov.bc.ca/gov/content/data/geographic-data-services/web-based-mapping/imapbc>

British Columbia FireSmart. N.D. FireSmart BC Homeowner’s Manual. Available online at:  
[https://firesmartbc.ca/wp-content/uploads/2021/04/05.31.22.FireSmartBC\\_HomeownersManual\\_Printable.pdf](https://firesmartbc.ca/wp-content/uploads/2021/04/05.31.22.FireSmartBC_HomeownersManual_Printable.pdf)

[DFO]. 2020. Government of Canada. Interim code practice: End-of-pipe fish protection screens for small water intakes in freshwater. Available online at: <https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html>

[ECCC]. 2023b. General Nesting Periods of Migratory Birds. Available online at:  
<https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html>

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

Josephy, Taylor. 2023. Water Authorizations Specialist, Water Stewardship Division, Kootenay Boundary. Ministry of Forests.

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

[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.

[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



Pollock WDP – Riparian Assessment

Services Ltd. The Firelight Group Ltd., Wayne Choquette. 2020. Shoreline Guidance Document – Kootenay Lake. Prepared for Kootenay Lake Partnership.

[KLP]. 2023. Kootenay Lake Shoreline Inventory Mapping Interactive Map. Available online at: <http://kootenaylakepartnership.com/>

[LTSA] Land Title and Survey Authority of British Columbia. 2023. ParcelMap BC Mapping Application. Available online at: <https://ltsa.ca/products-services/parcelmap-bc/>

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.

Metro Vancouver. N.D. A Homeowner's Guide to Stormwater Management. Available Online at: <http://www.metrovancouver.org/services/liquid-waste/LiquidWastePublications/HomeownersGuideStormwaterManagement.pdf>

[MFLNRORD] BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development. 2019. Riparian Areas Protection Regulation Technical Assessment Manual. V 1.1. November 2019.

[MoE] BC Ministry of Environment. 2013. Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (2013). Province of British Columbia. Victoria, British Columbia, Canada.

[MoE] BC Ministry of Environment. 2014. Develop with Care 2014. Environmental Guidelines for Urban and Rural Land Development in British Columbia. Province of British Columbia. Victoria, British Columbia, Canada.

[MoE] BC Ministry of Environment. 2016. Best Management Practices and Guidelines for Bats in British Columbia. Province of British Columbia. Victoria, British Columbia, Canada.

[MWLAP] BC Ministry of Water, Land and Air Protection. 2004. Standards and Best Practices for Instream Works. Province of British Columbia. Victoria, British Columbia, Canada.

[RDCK] Regional District of Central Kootenay. 2009. Floodplain Management Bylaw No. 2080, 2009. Last updated December 2019.

Pollock WDP – Riparian Assessment

[RDCK]. 2013. Electoral Area 'E' Rural Official Community Plan Bylaw No. 2260, 2013. Last updated October 2021.

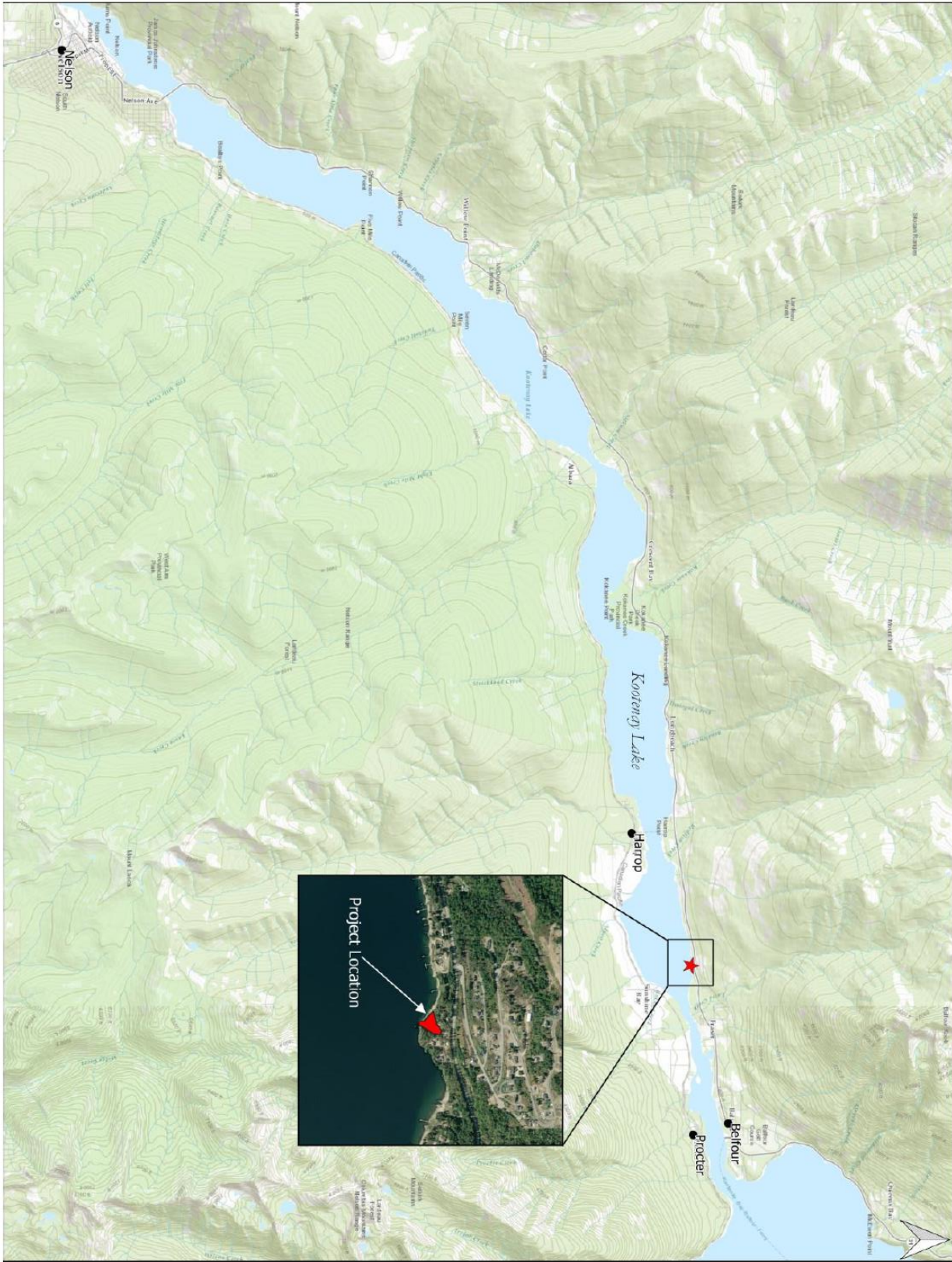
[RDCK]. N.D. A Resource for Kootenay Lake Living. Available online at:

[https://www.rdck.ca/assets/Services/Land~Use~and~Planning/Documents/2021-04-20-KLDPA\\_Resource-V5.pdf](https://www.rdck.ca/assets/Services/Land~Use~and~Planning/Documents/2021-04-20-KLDPA_Resource-V5.pdf)

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

Schleppe, J.<sup>1</sup> , and S. McPherson<sup>2</sup> . 2022. Kootenay Lake Foreshore Integrated Management Planning. Prepared for Living Lakes Canada. Prepared by: Ecoscape Environmental Consultants Ltd.<sup>1</sup> , and Lotic Environmental Ltd.<sup>2</sup>

**APPENDIX 1. SITE LOCATION MAP**









**APPENDIX 2. SPEA SETBACKS**





### Riparian Assessment | SPEA Setbacks

- |   |   |
|---|---|
|  Property Boundary (PID 030-820-022) |  RDCK WDP Setback (15 m)       |
|  Natural Boundary                    |  LWZ and Litterfall ZOS (15 m) |
|  Approximate location of water line  |  Shade ZOS (0 m)               |
|   |  SPEA Setback Area (15 m)      |



Map Date: 2023/06/07  
Projection: NAD83 UTM Zone 11  
Project: 6826 Marian Lane  
Map Scale: 1:1150



**APPENDIX 3. ARCHAEOLOGICAL CHANGE FIND PROCEDURE**



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[www.ktunaxa.org](http://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](http://www.bcapa.ca). The proponent may also wish to contact the Ktunaxa Nation Council's Archaeology Technician Nathalie Allard for direction (1-250-426-9549; [nallard@ktunaxa.org](mailto:nallard@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

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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

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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](http://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 Broken Rock (FBR), bone, antler and tooth.

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Lithics: What to look for

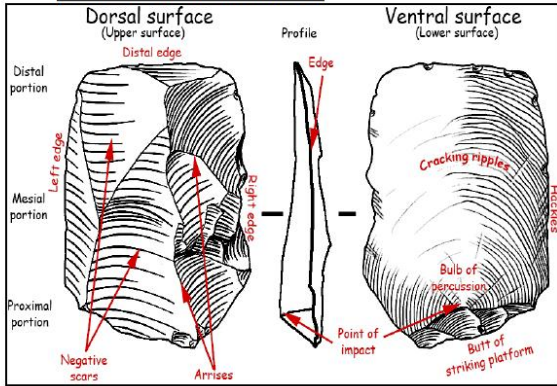


Image 1: Basic flake morphology



Image 2: Examples of lithic flakes

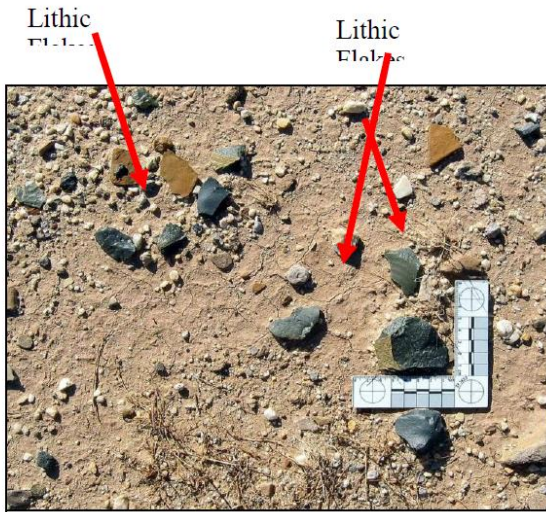


Image 3: Example of lithic scatter found on ground surface



Image 4: Example of formed lithic artifacts

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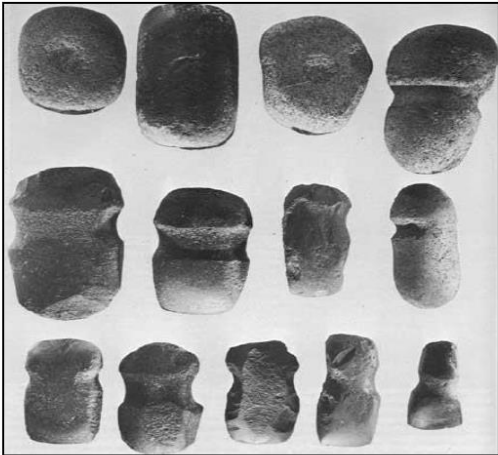


Image 5: Ground stone artifacts

Bone, Tooth and Antler Artifacts: What to Look For

- Obvious shaping
- Incising
- Unnatural holes



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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 FBR and charcoal, and
- depressions in the earth associated with FBR, reddened or blackened matrix and charcoal.

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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, cooking 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 FBR 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 FBR
- Depressions associated with fire reddening and blackening of the matrix

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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

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