Development Permit

DP2402E (Pruett)

Date: June 18, 2024

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

1. This Development Permit is issued to Donald Thomas Pruett, Jr. and Holly Fredrica Pruett 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 STRATA LOT 31 DISTRICT LOT 873 KOOTENAY DISTRICT STRATA PLAN NES3286 TOGETHER WITH AN INTEREST IN THE COMMON PROPERTY IN PROPORTION TO THE UNIT ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V (PID 027-785-114) 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 'Suburban Residential (RS)' 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 undertake the construction of a main residence and sleeping, and to use land and buildings situated on the said lands for this residential 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 above landscape works.

6. The Permittee is required to obtain approval in writing from the Regional District of Central Kootenay prior to the construction any new buildings, external additions to existing buildings or for any deviation from the development authorized under Section 5 of this Development Permit. Furthermore, the Permittee is hereby advised of the following requirements:

   6.1 The 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 in *"389 Park Avenue (Lot 31), Procter, BC Riparian Assessment"* prepared by Masse Environmental Ltd., dated June 12, 2024 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 Environmental Monitoring – In accordance with the recommendations in Section 6 of The Report:

      6.4.1 QEP to provide guidance during revegetation, as required.

      6.4.2 QEP will conduct a post site visit once revegetation is complete to assess compliance and completion of the project and submit an environmental summary report to the RDCK.

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 $5,772.50 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 May 18, 2026. Within this time period the required landscaping must be inspected and approved by the Regional District.

   7.3 If the landscaping is not approved within this time period, the Regional District has the option of continuing to renew the Letter of Credit until the required landscaping is completed or has the option of drawing from the Letter of Credit to complete the required landscaping. In this event, the Regional District or its agents have the irrevocable right to enter into the property to undertake the required landscaping for which the Letter of Credit was submitted.

   7.4 If the landscaping is approved within this time period without the Regional District having to draw the on the Letter of Credit, 90% of the original amount of the Letter of Credit shall be returned to the Permittee.

   7.5 A hold back of 10% of the original amount of the Letter of Credit shall be retained until a final inspection is undertaken within 12 months of the date of the original inspection and approval was given to the landscaping. If the landscaping receives approval at final inspection, the 10% hold back will be returned to the Permittee. If after the final inspection, approval of the landscaping is not given, the Regional District has the option of continuing to renew the Letter of Credit until the required landscaping is approved or has the option of drawing on the Letter of Credit the funds to complete the required landscaping. In this event, the Regional District or its agents have the irrevocable right to enter onto the property to undertake the required landscaping for which the Letter of Credit was submitted.

8. The said lands shall be developed strictly in accordance with the terms and conditions of this Development Permit and the requirements of all applicable Regional District Bylaws as well as any plans and specifications which may, from time to time, be attached to this Permit shall form a part thereof.

9. In accordance with the Local Government Act, if the development authorized by this Development Permit is not commenced within two years of the date of this Permit, this Permit shall lapse.

10. In accordance with the Local Government Act, 'Notice' shall be filed in the Land Title Office that the said lands are subject to this Development Permit.

11. The terms of this Development Permit including subsequent amendments, are binding on all persons who acquire an interest in the said lands associated with this Permit.

12. It is understood and agreed that the Regional District has made no representations, covenants, warranties, guarantees, promises, or agreement (verbal or otherwise) with the Permittee other than those in this Development Permit. It is solely the responsibility of the Permittee to ensure that the requirements of all other applicable government agencies are satisfied.

13. This Development Permit does not constitute a building permit.

14. This Development Permit shall come into force and effect 14 days after the date of issuance unless a Waiver of Appeal is received from the Permittee at which time the Development Permit shall be deemed to be issued upon receipt of the Waiver of Appeal. OR If a Notice of Appeal is received the Development Permit shall be suspended until such time as the Board of the Regional District of Central Kootenay has decided the Appeal.

S Sudan

Sangita Sudan, General Manager of Development and Community Sustainability Services

June 18, 2024

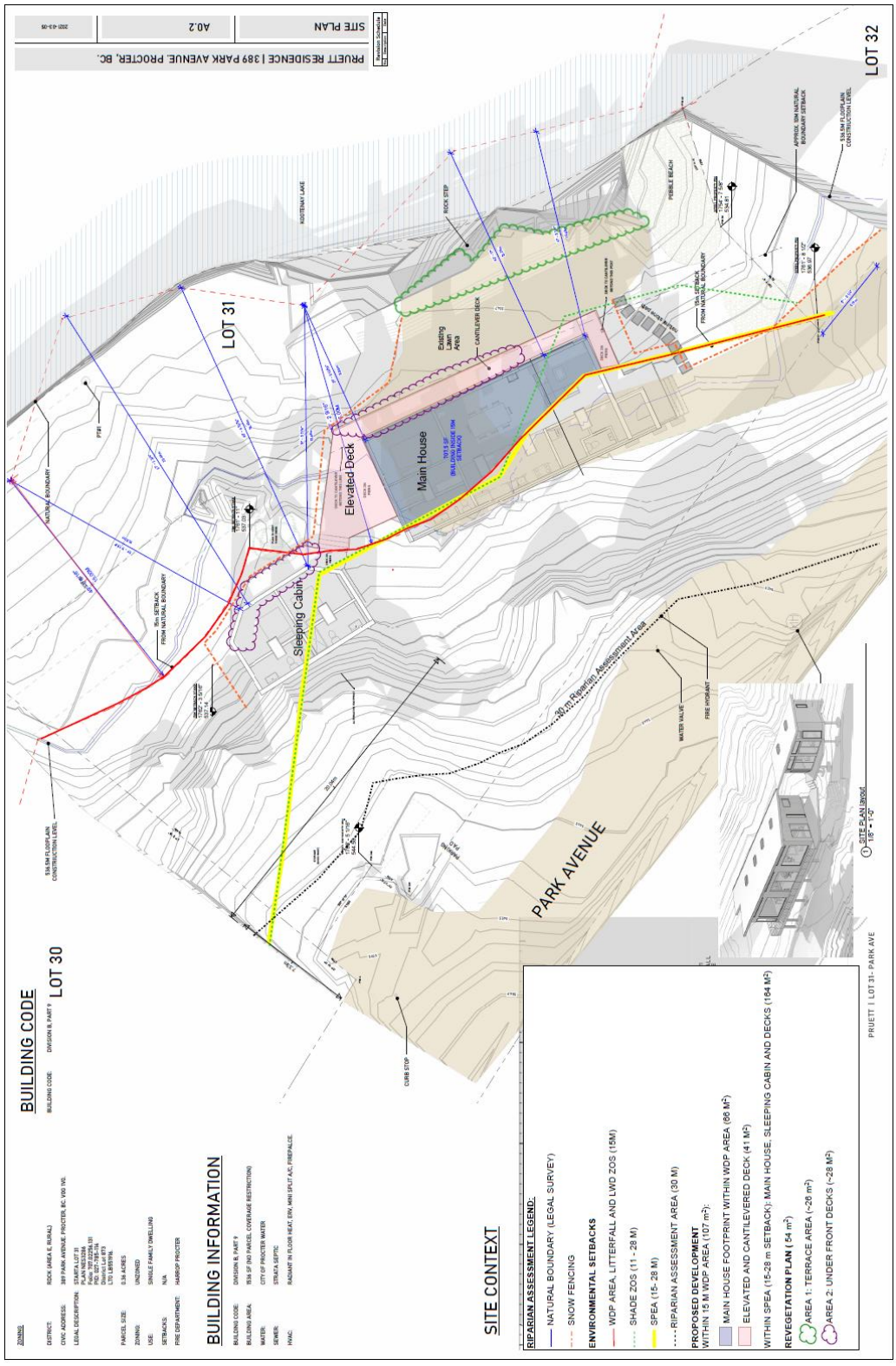
Date of Approval (date of review and approval)

November 15, 2024

Date of Issuance (pending receipt of securities)

Schedule 1: Subject Property

Schedule 2: Restoration Plan Schematic



Schedule 3: *"389 Park Avenue (Lot 31), BC Riparian Assessment"* prepared by Masse Environmental Ltd., dated June 12, 2024

MASSE ENVIRONMENTAL

389 Park Avenue (Lot 31), Procter, BC
Riparian Assessment V2.0

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

June 12, 2024

Riparian Assessment Report Revision History

Version	*Date*	*Description*	*Author*
1.0	Nov 27, 2023	Report Submitted to RDCK	Fiona Lau
2.0	June 12, 2024	Report revised and re-submitted to RDCK Added Section 3.2-Undue Hardship Updated Appendix 2 Site Plan	Fiona Lau

Disclosure Statement

This report has been prepared by Fiona Lau B.Tech., AScT. and reviewed by Ico de Zwart, PChem. RP Bio.

I, **Fiona Lau**, hereby certify that:

a) I am a qualified environmental professional (QEP), 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 Protection Regulation.

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

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389 Park Avenue – Riparian Assessment

1 INTRODUCTION

Masse Environmental Consultants Ltd. was retained by Holly and Don Pruett (Owners) to conduct a riparian assessment to accompany an application for a Watercourse Development Permit (WDP) on their waterfront property at 389 Park Avenue, Procter, BC (Strata Lot 31 Plan NES3286 District Lot 873; PID 027-785-114).

The development permit is required as residential development is proposed within the 15 m WDP area. The Owner is concurrently seeking a site-specific floodplain exemption in order to develop the property, which involves a relaxation of the floodplain setback from 15 m to 8.86 m, as property characteristics are challenging and present a proposed case of "serious hardship".

Site visits were completed on April 8, 2021, September 23, 2022 and May 5, 2023 by Fiona Lau B.Tech., ASc T., Jennifer Ross, PChem. and Sylvie Masse, RPBio. to conduct a riparian assessment on the property. The riparian assessment evaluates the existing conditions of the riparian area (up to 30 m from the natural boundary of 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 ecological 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*
- RDCK Floodplain Management Bylaw No. 2080, 2009
- British Columbia *Riparian Areas Protection Regulation*
- Kootenay Lake Shoreline Management Guidelines
- British Columbia *Water Sustainability Act*
- British Columbia Wildlife Act
- *Federal Migratory Birds Convention Act*
- General BMPs and Standard Project Considerations (Ministry of Environment)
- Develop with Care. Environmental Guidelines for Urban and Rural Land Development in British Columbia
- On the Living Edge: Your Handbook for Waterfront Living

2 PROJECT OVERVIEW

2.1 Site Description

2.1.1 Location

The subject property is in the Procter Point Subdivision in Area E of the Regional District of Central Kootenay (RDCK), (see Appendix 1 for Location Map). The property is 0.36 acres, with ~39.4 m of frontage on Kootenay Lake and is located on the main arm of Kootenay Lake, just south of the outlet into the West Arm. This property has a north-eastern aspect and is exposed to strong southerly winds, and ranges in elevation from ~533 to 547 m above sea level. The property is bordered by private property to the northwest, and south, Park Avenue Road Right of Way (RoW) to the southwest and Kootenay Lake to the east.

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

2.1.2 Watercourses

Kootenay Lake

Kootenay Lake borders the subject property along the eastern boundary; it is a long, narrow, and deep lake with a surface area of approximately 400 km². Kootenay Lake's main inflows are the Kootenay River to the south and the Duncan River to the north. The lake drains through the West Arm into the Kootenay River. Lake levels can vary up to 4 m throughout the year, affecting the extent of the exposed shoreline.

The ***natural boundary*** of Kootenay Lake was legally surveyed in October 2021 by Darrin B.C. Connatty and is identified on the survey plan (Appendix 2). The natural boundary surveyed varies up to 5 m from the eastern property boundary shown on Parcelmap BC (2023). The ***natural boundary*** is commonly referred to as the "***high water mark***" around a lake or wetland. Based on the definition of high-water mark[1], the natural boundary shown on the legal survey will be used to delineate the 15 m RDCK WDP area and streamside protection and enhancement area (SPEA) setbacks in accordance with the Riparian Area Protection Regulation (RAPR).

[1] **High water mark** means the visible high water mark of a watercourse 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 watercourse 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 (RDCK 2013).

2.1.3 Riparian Vegetation

The subject property supports both undisturbed and disturbed riparian habitat. The undisturbed riparian habitat (northern half and southwestern portion) consists of rocky terrain supporting an Interior Douglas fir (*Pseudotsuga menziesii*), and western red cedar (*Thuja plicata*) forest with a relatively open understorey and mixed riparian shrubs and forbes (Photo 1 thru Photo 3). Mosses are dominant throughout the forest floor in this area. The undisturbed rocky shoreline in the northeastern portion supports sporadic trees, shrubs, forbes, and mosses (Photo 4). The disturbed habitat in the south-eastern portion of the property (where vegetation was removed during preliminarily development activities) is colonized by agronomic grasses and weeds (Photo 5and Photo 6). A list of all plant species observed on site is presented in Table 3.

Photo 1. Rocky, steep undisturbed conifer forest on north portion of property.

Photo 2. Rocky, steep undisturbed forest between driveway and Park Avenue on south portion of property.

Photo 3. Rocky area supporting tree and shrub habitat within 15 m of HWM, in north portion of property .

Photo 4. Rocky area supporting tree and shrub habitat within 15 m of HWM, in north portion of property .

Photo 5. Disturbed area for driveway access in south portion of property.

Photo 6. Disturbed grass and weedy area along shore where terrace was created in south portion.

Table 1. Plant species list

Common Name	Scientific Name	Common Name	Scientific Name
Trees		**Herbaceous and Low Shrubs**	
Douglas-fir	*Pseudotsuga menziesii*	grasses	*Poa sp.*
western redcedar	*Thuja plicata*	kinnikinnick	*Arctostaphylos uva-ursi*
black cottonwood	*Populus trichocarpa*	Oregon grape	*Mahonia aquifolium*
Western hemlock	*Tsuga heterophylla*	thimbleberry	*Rubus parviflorus*
Tall Shrubs		pearly everlasting	*Anaphalis margaritacea*
falsebox	*Pachistima myrsinites*	princess pine	*Chimaphila umbellata*
mountain alder	*Alnus incana*	rattlesnake plantain	*Goodyera oblongifolia*
Nootka rose	*Rosa nutkana*	spotted knapweed	*Centaurea stoebe*
paper birch	*Betula papyrifera*	tufted vetch	*Vicia cracca*
red raspberry	*Rubus idaeus*	twinflower	*Linnaea borealis*
red-osier dogwood	*Cornus stolonifera*	western licorice fern	*Polypodium hesperium*
rose	*Rosa sp.*	yarrow	*Achillea millefolium*
common snowberry	*Symphoricarpos albus*	yellow clover	*Trifolium aureum*
soopolallie	*Shepherdia canadensis*	yellow devil hawkweed	*Hieracium glomeratum*
water birch	*Betula occidentalis*	**Mosses**	
willow sp	*Salix sp.*	pipecleaner moss	*Rhytidiopsis robusta*
Herbaceous and low shrubs		red-stemmed feathermoss	*Pleurozium schreberi*
bull thistle	*Cirsium vulgare*	rockmoss	*Racomitrium sp.*
dandelion species	*Taraxacum sp.*	lichens	
fescue sp.	*Fescue sp.*		

2.1.4 Aquatic Habitat

The shoreline in front of the property consists primarily of a bedrock outcrop and a mixture of cobbles and angular boulders occupy the littoral zone (Photo 7 and Photo 8). Migration of some of the gravel imported to create a beach area can be observed along the shoreline (Photo 7). Slopes range from almost vertical along the bedrock outcrops to 5-10 % in the littoral zone. Sparse herbaceous and shrubby vegetation is present on and above the rock outcrops, but no submergent vegetation was observed. This area provides rearing habitat for juvenile fish as well as fry that can utilize the cobble and boulder substrate for cover. Shallow foreshore areas may be used for broadcast spawning by non-sport fish species (i.e., peamouth chub (*Mylocheilus caurinus*) and northern pikeminnow (*Ptychocheilus oregonensis*). Species of regional interest that reside in Kootenay Lake are Kokanee (*Oncorhynchus. nerka*), Rainbow Trout (*O. mykiss*), Bull Trout (*Salvelinus confluentus*; BC-Blue-Listed; SARA Special Concern), White Sturgeon (*Acipenser transmontanus;* BC Red-Listed, SARA Endangered), Westslope Cutthroat Trout (*O. clarki lewisi*; BC Blue-Listed; SARA Special Concern), and Burbot (*Lota lota*; BC-Red-Listed).

Mussel beds have been identified along the shoreline of Kootenay Lake in multiple locations both on the West Arm and main body of the lake. No evidence of mussels was seen on the shoreline (i.e., mussel shells). A mussel survey was not conducted to determine presence or absence, as no works are proposed below the HWM.

Photo 7. North view of foreshore with angular boulders in littoral zone and bedrock outcrop. Note imported gravel from beach creation along foreshore.

Photo 8. South view of bedrock outcrops at north end of property.

2.1.5 *Wildlife Habitat*

Riparian ecosystems offer important habitat features for wildlife, affording them essential resources like water, shelter, and food. These areas frequently serve as migration corridors connecting aquatic, riparian, and upland environments, playing a pivotal role in the life cycles of numerous species.

The rocky foreshore may provide habitat for northern alligator lizards (*Elgaria coerulea*), garter snakes (*Thamnophis spp.*) and western skink (*Plestiodon skiltonianus*). The subject property is likely visited by songbirds, waterfowl, and raptors particularly during the spring breeding season, as well as may provide habitat for ungulates, bears and small mammals.

No significant incidental wildlife observations were made during the site visits.

2.1.6 *Species at Risk*

A 10 km buffer around the subject property was used to query BC Conservation Data Center species at risk (SAR) records using the CDC iMap tool (BC 2023) and Habitat Wizard (BC 2023). In addition, a 5 km buffer around the subject property was used to query recorded observations on iNaturalist (2023). Based on these queries, five species at risk occurrences are known within the 10 km buffer around the project area. These are white sturgeon (*Acipenser transmontanus*; BC Red listed, SARA Schedule 1), western skink (*Plestiodon skiltonianus*, BC Blue listed), Western toad (*Anaxyrus boreas*; BC blue listed), Southern Mountain Caribou (*Rangifer tarandus*; BC Red listed; SARA Endangered) and wild licorice (*Glycyrrhiza lepidota*, BC blue listed). None of these species are likely to occur on the property as the specific habitat attributes that require are not present

In addition to this list, many bat species are blue-listed in BC (e.g.: little brown myotis (*Myotis lucifugus*), Western small-footed myotis (*Myotis ciliolabrum*), and the Yuma myotis (*Myotis yumanensis*). The little brown myotis is also listed as 'endangered' under the Species At Risk Act. Bat roosting habitat includes tall, live or dead trees with crevices, peeling bark, or cavities. No significant habitat features for bats were observed.

The subject property is within a critical habitat polygon (matrix range) for Southern Mountain Caribou (EC 2014). Matrix range is the area adjacent to core habitat that has periodic or low use by caribou but supports primary prey and associated predators that have the potential to affect the caribou subpopulation. Critical habitat attributes for matrix range are those that provide "ecological conditions that allow for low predation risk, defined as wolf population densities of < 3 wolves/1000km^{2}" (EC 2014).

2.1.7 Invasive Species

Central Kootenay Invasive Species Society (CKISS) manages invasive species regionally using a prioritized approach. The management strategy for a specific species is based on a number of factors including the phase of invasion and the potential impacts of the species (CKISS 2023). Priority species lists can be found at https://ckiss.ca/species/invasive-plant-priority-lists/.

Based on the CKISS 2023 Priority List, there were no species identified on the subject property that are actively managed regionally.

2.2 Existing Development

The property was created as part of the 182 ha Procter Point Subdivision, formerly called Kootenay Lake Village. The lot was modified and prepared for development into a series of small terraces and pathways protected by rock walls prior to purchase by the current owners. The building site was leveled into two terrace areas between a steep slope below the Park Avenue ROW and the rugged shoreline of Kootenay Lake (Photo 9 thru Photo 12).

In the southeast corner at the upper margin of the high water mark (HWM), two 12 m long, tiered rock stack retaining walls have been constructed to form a 6 m wide terrace colonized with non-native grasses (Appendix 3, Photo 11 and Photo 12). The terrace is showing signs of erosion indicating that flood levels have extended beyond the Natural Boundary (Photo 13). Gravel was imported into an area at the south end of the property to create a "beach area" measuring approximately 6 m x 10 m (Photo 14). The remainder of the property is relatively undisturbed with a mature forest and open understory.

Photo 9. Existing access from Park Avenue, looking north.

Photo 10. Existing access and tiered area, looking north.

Photo 11. Rugged foreshore with rock retaining walls.

Photo 12. Tiered rock stack retaining walls supporting greenspace terrace.

Photo 13. View of erosion along edge of terrace.

Photo 14. Imported gravel to create beach area.

2.3 Proposed Development

Proposed development on the subject property includes the construction of a residential home consisting of a main house and sleeping cabin and new water and sewer lines connecting to existing infrastructure on Park Avenue.

Proposed development within the 15 m WDP area includes:

- Construction of a main house (66m^2) with an elevated/cantilevered deck (41 m^2) along the east and north side of the home totalling 107 m^2. This will require the removal of 6 small to medium sized trees (ranging from 50 mm- 270 mm diameter at breast height(dbh)).

Beyond the 15 m setback, but within the 30 m riparian assessment area, the proposed development includes:

- Construction of the remaining section of the main house (47m²).
- Construction of a sleeping cabin and deck (46 m²), which requires the removal of 7 small to medium sized trees (50 mm-200 mm dbh).
- Installation of a new water line and septic line connected to the community system located along Park Avenue.

Photo 15. Aerial image of subject property (RDCK Mapping 2023).

Photo 16.View of a proposed building area for main house looking southeast.

Photo 17. View or proposed area for sleeping cabin and deck.

The site plan provided by North Mountain Construction, and marked up to show relevant setbacks is provided in Appendix 3. The building designs have incorporated both geotechnical and environmental recommendations, which involve constructing the main house and sleeping cabin on piers and

cantilevering the deck along the frontside of the house. The front side of both the house and sleeping cabin are elevated by up to 2 meters above the ground. This design feature serves several purposes:

- Allowing waves to pass beneath the structure during extreme flood events.
- Minimizing ground disturbance, including the need for blasting and rock removal.
- Facilitating the growth of vegetation under the deck areas.
- Preserving the movement of small mammals and reptiles below the elevated structures.

Due to the challenging topography of the site, characterized by steep rocky slopes supporting mature forest vegetation beyond the 15-meter setback, and the limited width of the lot on its southern half, the preferred location for constructing the main house has been identified within the area previously designated and disturbed for development. Please refer to Section 2.2 for a detailed description of the existing site conditions.

The building site was developed prior to the current floodplain and OCP bylaws, when the designated floodplain setback was 7.5 m from the natural boundary of Kootenay Lake. The Owners are requesting a site-specific floodplain exemption from the RDCK, seeking a reduction of the floodplain and riparian setbacks from 15 meters to 8.86 meters due to a case of "serious hardship", in order to facilitate property development. The proposed relaxation of the setback is supported by the VAST Solutions Flood Assessment Report (2023), which provides development specific recommendations for residential construction within the floodplain.

3 Regulatory Overview

3.1 Riparian Area Protection Regulation (RAPR) Review

The 15 m WDP setback from the boundary of Kootenay Lake was compared with the Riparian Area Protection Regulation (RAPR) criteria by conducting a detailed assessment of the subject property and determining the Streamside Protection and Enhancement Area (SPEA) setback. Results for the Zones of Sensitivity (ZOS) and SPEA are presented in Table 1 and Appendix 3.

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 11-28 m south from the HWM of 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 ranges from 15 m -28 m (Table 1). The SPEA is 15 m at the south end and increases to 28 m at the north end.

Table 2. Results of detailed RAPR assessment for Kootenay Lake.

Feature Type	SPVT[1]	Zones of Sensitivity			SPEA[3]
		LWD[2]	Litter fall	Shade	
Kootenay Lake	TR	15 m	15 m	11-28 m	15-28 m

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

[2] LWD- large woody debris

[3] SPEA- streamside protection and enhancement area

Proposed development within the 15- 28 m SPEA is the construction of a main house and sleeping cabin totaling 164 m² and requiring the removal of 13 trees.

3.2 Undue Hardship

To determine if this property is considered a case of undue under the RAPR the developable area needs to be less than the Allowable Area; in order for a reduction of the SPEA setback to be considered. See calculations below and map provided in Figure 1. demonstrating a case of undue hardship on the subject property where the developable area is 330 m² is less than the Allowable area is 360 m².

Lot 1 - Undue Hardship calculations (Based on 15-28 m SPEA)

Total Area= 1200 m²
SPEA Area= 870 m²
Government Restrictions= 0 m²

Non- Disturbed Site = Allowable footprint is 30%

Allowable Area = Total Area - Gov Restrictions x 0.3

= (1200 - 0) x 0.3
=360m²

Developable Area= Total Area - SPEA - Govt restrictions
= 1200m² -870 m² - 0 m²
= 330 m²

Developable Area (330 m²) < Allowable Area (360 m²) = Case of undue hardship

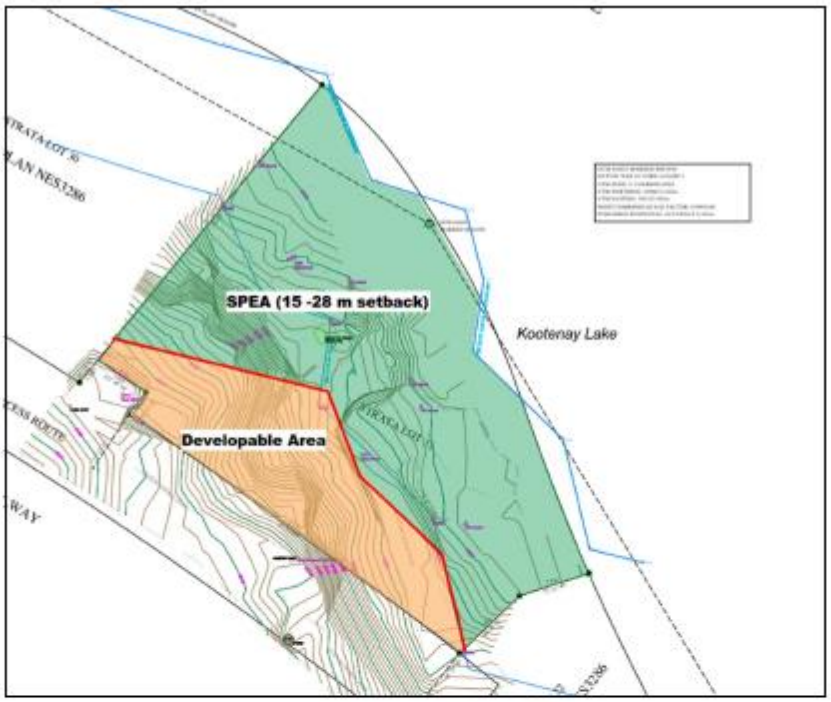


Figure 1. Map showing case of Undue Hardship on subject property

3.3 Kootenay Lake Shoreline Management Guidelines

The Kootenay Lake Foreshore Integrated Management Planning (FIMP; Schleppe and McPherson 2022), the Foreshore Inventory Mapping (FIM; KLP 2023) 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 (Table 3). The property is within FIM segment 214. The aquatic habitat index rating was rated high in this segment because of the high value juvenile rearing habitat and potential for kokanee spawning habitat. Based on the Ecological Activity Risk Matrix (Table 3a Shoreline Guidance Document KLP 2020), any "Native vegetation modification/removal" within the riparian area is considered 'very high risk'.

Table 3. Aquatic and archaeological risk results

Aquatic Habitat Index Rating (AHI)	Aquatic Sensitivity	Archaeological Risk	Enhanced Engagement Required (Work below HWM)
High	Yes	Yellow	No

According to the Kootenay Lake Shoreline Management Document, the proposed activities on the subject property area have high archaeological risk. 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).

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. Archaeological Chance Find Procedures are provided in Appendix 4 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.

4 Potential Ecological Effects

Potential ecological effects directly associated with the proposed development include:

- Reduction of suitable wildlife habitat (i.e. potential nesting and perch habitat), biodiversity, and nutrient cycling within the development footprint.
- Change in cover habitat from natural forest to anthropogenic structures within development footprint.
- Increased risk of sedimentation into Kootenay Lake during construction and from stormwater run-off.
- Increased human presence and activity, which may lead to decreases of wildlife presence and increases in human-wildlife contact.
- Increased biodiversity within a previously disturbed area along the shoreline by removal of weeds and planting of native vegetation. This will positively effect fish habitat by creating some shade habitat during high water levels and leaf-litter and insect drop.
- Increased risk of invasive weed introduction from construction equipment and exposed soils.

Mitigation measures to help minimize the potential negative effects are detailed in Section 5 and a restoration plan to help mitigate and restore the degraded riparian area is prescribed in Section 6.

5 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 to minimize the potential effects of the development.

5.1 Danger Trees

No danger trees around the proposed home were identified. Further assessment of potential danger trees is outside the scope of this report. Any proposed danger tree removal should be assessed by a certified arborist, prior to removal.

5.2 Windthrow

No significant clearing of trees is proposed on the property; therefore, changes to windthrow risk are minimal. Additional assessment of windthrow risk is beyond the scope of this report, and any such assessment should be led by a Registered Professional Forester (RPF).

5.3 Slope Stability

No signs of slope instability were observed on the property. 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.

5.4 Protection of Trees and Vegetation in the SPEA

The following protection measures have been incorporated into the design to minimize impacts to existing and potential trees and vegetation within the SPEA:

- The proposed development requires limited tree removal (13 trees with a DBH ranging from 50-270 mm).
- The sleeping cabin is sited within an area of the SPEA that is mostly rocky with minimal trees compared to other vegetated areas within SPEA.
- The proposed construction of both the main house and sleeping cabin on piers minimizes ground disturbance and protects existing tree roots. This design allows for light penetration below the front side of the structures to facilitate the growth of vegetation under the deck areas.
- Install snow fencing along the alignment shown on the site plan to protect existing riparian vegetation.

5.5 Encroachment

Protection measures to minimize effects of the encroachment within the SPEA are:

- Development footprint within 15-28 m of Kootenay Lake has been minimized.

- Structures are elevated and supported by piers to allow for unobstructed wave migration under the structures during flood events, facilitation of plant growth under structures and small mammal wildlife movement.

5.6 Erosion and Sediment 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. This site is mostly rocky, therefore erosion and sedimentation are expected to be minimal.

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

- Any surface water coming into the site will be conveyed around any development area where exposed soils are present.
- During construction, activities should be suspended during periods of heavy rain if there is any risk that continued work could result in sediment delivery to Kootenay Lake. Where required, additional mitigation measures, such as sediment fencing, ditching, check dams, or covering soils may be required to manage turbid wastewater generated by construction or heavy rain events. Turbid wastewater will not be permitted to leave the construction site.
- Soils will be safely stockpiled in a manner that eliminates the possibility of erosion and sediment transport and stockpiles will be located as far away from Kootenay Lake as possible.
- Disturbed soils should be revegetated as soon as possible after construction.

5.7 Stormwater Management

The re-development of the property will result in an increase in the total impervious area. The following mitigation measures will help decrease stormwater impacts to the SPEA:

- Groundwater and surface water will be conveyed around any area where disturbed/exposed soils may occur.
- Pervious materials (e.g., gravel) are recommended for driveways, parking areas, and pathways. This minimizes stormwater runoff from impervious materials (e.g., asphalt and concrete), which must be managed using natural hydrologic pathways. Storm water will not be permitted to discharge directly into Kootenay Lake.
- Design roof rainwater collection systems that direct rainwater into suitable landscape features which can absorb and utilize runoff. Roof runoff is not permitted to discharge directly into Kootenay Lake.

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

5.8 Floodplain Concerns

Refer to Flood Hazard Assessment Pruett 389 Park Avenue report completed by Vast Resource Solutions Inc (2023).

5.9 Fish and Wildlife Protection

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

- Adhere to erosion and sediment control and stormwater best management practices outlined in this report to ensure that there is no release of deleterious materials into Kootenay Lake.
- Clearing of vegetation shall be completed outside of the songbird breeding season (mid August – end of March) (ECCC 2023b). If clearing of vegetation is completed within the breeding window, confirm that no active nests are present.
- Follow the Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (MOE 2013) if any active raptor nests are discovered within 100 m of the subject property. Active raptor nests are legally protected at all times of the year and some inactive nests (ex: Bald Eagle nests) are similarly protected.
- Avoid any modifications to the beach substrate and preserve the remaining riparian vegetation.

5.10 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 in order 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 RESTORATION 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 proposed re-development; therefore, Minimization of unavoidable impacts and On-site restoration is being proposed. Minimization is achieved by constructing the residential structures on piles to minimize impacts to natural ground and facilitating vegetation growth below the deck area and onsite restoration for the direct loss of 13 trees is achieved by revegetating a previously degraded area.

6.1 Riparian Revegetation

The on-site restoration opportunities are limited on the subject property; however, two areas have been identified for revegetation: Area 1 (Terrace Area -26 m^2) and Area 2 (Under Front Decks- 28 m^2) totalling 54 m^2. Refer to Appendix 3 for revegetation areas.

Table 4. Revegetation Plan Prescription

Restoration Area	Size (m^2)	Prescription
Area 1: Terrace Area	~26	• Strip and remove grass and weeds. • De-compact soil, add topsoil and soil amendments (compost and mycorrhizae to planting area. Additional rock may need to be placed in areas of high erosion along edge of terrace to protect plants. • Plant a mixture of >20 native trees and shrubs, with additional herb species in between (Table 5). • Trees and shrubs shall be 1 gallon pot size or larger.
Area 2: Under Front Decks	~28	• Add top soil and soil amendments including compost and mycorrhizae to planting areas. • Plant a mixture of >20 native shrubs and ferns (Table 6)

6.2 Recommended Plant Species

A list of recommended plant species that will be used for revegetation is provided in Table 5 and

Table 6. Acceptable non-native plant species that can be substituted (no greater than 15 % of total plants) is provided in Table 7. Final species selection is at owners' discretion. Native plants can be purchased from Sagebrush Nursery located in Oliver BC (https://sagebrushnursery.com), Peels Nursery located in Mission, BC (https://www.peelsnurseries.com/) and potentially other nurseries within the local area if stock is available. Recommended seed mix to be used on disturbed soils is presented in Table 8 and can be purchased through Masse Environmental for small quantities (if available) and Interior Seed and Fertilizer (https://interiorseedandfertilizer.ca/) for larger quantities.

Plant species were selected based on their suitability for the property (ecoregion, exposure, and moisture regime) and based on the following resources:

- Conservation, Restoration and Stewardship of Low Elevation Brushland (GB), Grassland (Gg) and Dry Forest Ecosystems in the West Kootenay Region (McKenzie and Hill 2023).
- British Columbia FireSmart Landscaping Guide
- Invasive Species Council of BC Grow Me Instead Guide
- The EcoGarden Project Plant List for West Kootenay Gardens (CKISS N.D.)
- Riparian Factsheet No. 6 – Riparian Plant Acquisition and Planting (Ministry of Agriculture 2012).
- A Resource for Kootenay Lake Living

Table 5. Area 1 (Terrace) recommended plant species.

Common Name	Scientific Name	Common Name	Scientific Name
Trees		**Shrubs (Cont'd)**	
Western white pine	*Pinus monticola*	blue elderberry	*Sambucus caerula*
Interior Douglas fir	*Pseudotsuga menziesii*	thimbleberry	*Rubus parviflorus*
paper birch	*Betula papyrifera*	blueberry	*Vaccinium ovalifolium*
Shrubs		common snowberry	*Symphoricarpus albus*
red osier dogwood	*Cornus stolonifera*	soopalalie	*Sheperdia canadensis*
sandbar willow	*Salix exigua*	**Herbaceous**	
Scouler's willow	*Salix scouleriana*	blue joint grass	*Calamagrostis canadensis*
nootka rose	*Rosa nutkana*	Idaho fescue	*Festuca idahoensis*
mountain alder	*Alnus incana*	junegrass	*Koeleria macrantha*
water birch	*Betula occindentalis*	nodding onion	*Allium cernuum*
Douglas maple	*Acer glabrum*	pink spirea	*Spirea douglasii spp. Menziesii*
mallow ninebark	*Physocarpus malvaceus*	Canadian goldenrod	*Solidago lepida*
oceanspray	*Holodiscus discolor*		

Table 6. Area 2 (Under deck) recommended plant species.

Common Name	Scientific Name	Common Name	Scientific Name
Shrubs		**Ferns and Forbs**	
kinnikinnick	*Arctostaphylos uva-ursi*	deer fern	*Blechum spicant*
common snowberry	*Symphoricarpus albus*	Western sword fern	*Polystichum munitu,*
falsebox	*Pachistima myrsinites*		
Thimbleberry	*Rubus parviflorus*		

Table 7. Acceptable non-native species

Common Name	Scientific Name
Forbs	
bleeding heart	*Lamprocapnos spectabilis*
Elijah blue fescue	*Festuca glauca*
hosta spp.[1]	*Hosta sp.*
'Karl Foerster' feather reed grass	*Calamagrostis acutifolia*

[1]Suitable only for Area 2 under front deck.

Table 8. Native Riparian Seed Blend

Native Riparian Blend 1	% weight	% by species
slender wheatgrass	25.0%	18%
streambank wheatgrass	25.0%	18%
fringed brome grass	24.7%	9%
northern wheatgrass	20.0%	14%
sheep fescue	3.0 %	10%
tufted hairgrass	1.0 %	11%
fowl bluegrass	1.0 %	9%
yarrow	0.3 %	3%

6.3 General Planting Guidelines

General planting guidelines for revegetation are:

- Conifer trees shall be planted at minimum 3 m spacing.
- Deciduous trees and shrubs shall be planted at 0.5 – 1.0 m spacing. Planting in clusters vs. grid formation is preferred and produces a more natural appearance.

- Herbs shall be planted between shrubs and trees and can be spaced as little as 30 cm apart depending on the size.
- Planting shall occur in the early spring or fall and will not occur during the hottest summer months unless the owners are prepared to irrigate this area daily.
- Shrub and tree roots shall be inoculated with mycorrhizae during installation.
- Mix 50% compost and topsoil with onsite soils into each planting hole.
- Inoculate plant roots with mycorrhizae.
- Irrigate initially and throughout the growing season (May-September) until plants are established and thereafter as required.

6.4 Maintenance and Monitoring

The anticipated maintenance required for the revegetation plan includes the following:

- Annual weeding and brushing around potted stock.
- Irrigate initially and throughout the growing season (May-September) until plants are established and thereafter as required.
- Any dead plants shall be replaced within the first 3 years.

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 site visit once revegetation is complete to assess compliance and completion of the project and submit an environmental summary report to the RDCK.
- QEP will conduct an inspection 3 year's post development to evaluate the health and condition of the revegetation areas.

7 Conclusion

The Owners seek a reduction in the floodplain and WDP setback from 15 m to 8.86 m due to the unique features of the property which present challenging building terrain (steep rocky forested area) beyond the 15 m floodplain and WDP setbacks, and because the proposed development area within the 15 m setback is relatively flat and has been previously disturbed. The lot was subdivided at a time when the required floodplain setback was 7.5 m, and other building site alternatives would result in greater disturbance.

From an ecological standpoint, the development when located as proposed, will result in the removal of less riparian vegetation compared to a scenario where the development is entirely situated beyond the

15-meter setback. The proposed development has a footprint of 164 m^2 within the SPEA and will require the removal of 13 small to medium sized trees, contributing to cumulative local losses of wildlife and fish habitat within local riparian areas.

To help reduce the ecological effects caused by the land development the Owners have incorporated these four important mitigation measures:

- Minimization of the house footprint within the 15 m WDP area.
- Elevated structures on piles to minimize impacts to natural lake flow movement during flood events, minimize ground disturbance, preservation of small mammal movements and facilitation of plant growth under the front deck structures.
- Minimization of mature tree removal with the SPEA by proposing development mostly within existing disturbed areas and/or areas that are rocky with minimal trees.
- Revegetation of disturbed areas to help mitigate loss of habitat and help restore riparian function on the subject property.

Sincerely,

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

Reviewed by:

Ico de Zwart, PChem, RPBio
Masse Environmental Consultants

8 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

[EC] Environment Canada. 2014. Recovery Strategy for the Woodland Caribou, Southern Mountain population (Rangifer tarandus caribou) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. viii + 103 pp

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.

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

[KLP] Kootenay Lake Partnership. 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.

[KLP]. Kootenay Lake Partnership. 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.

[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. 2014. Develop with Care 2014. Environmental Guidelines for Urban and Rural Land Development in British Columbia. 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.

[RDCK]. 2013. Electoral Area 'E' Official Community Plan Bylaw No. 2260, 2013.

[RDCK]. Regional District of Central Kootenay 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

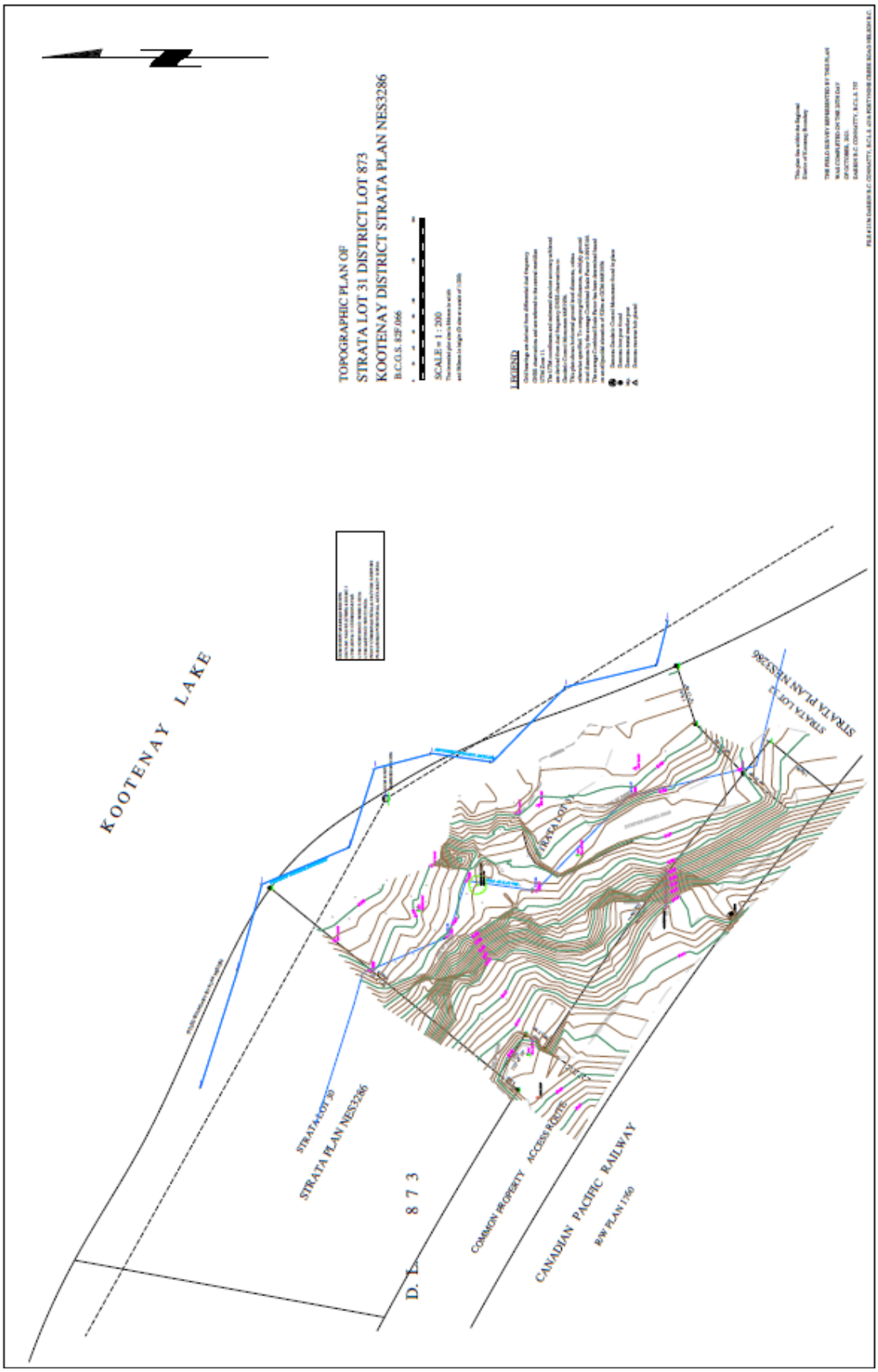
Schleppe, J.[1], and S. McPherson[2]. 2022. Kootenay Lake Foreshore Integrated Management Planning. Prepared for Living Lakes Canada. Prepared by: Ecoscape Environmental Consultants Ltd.[1], and Lotic Environmental Ltd.[2]

VAST Resource Solutions Inc. (2023). Pruett Flood Hazard Assessment. Prepared for Ms. Holly Pruett.

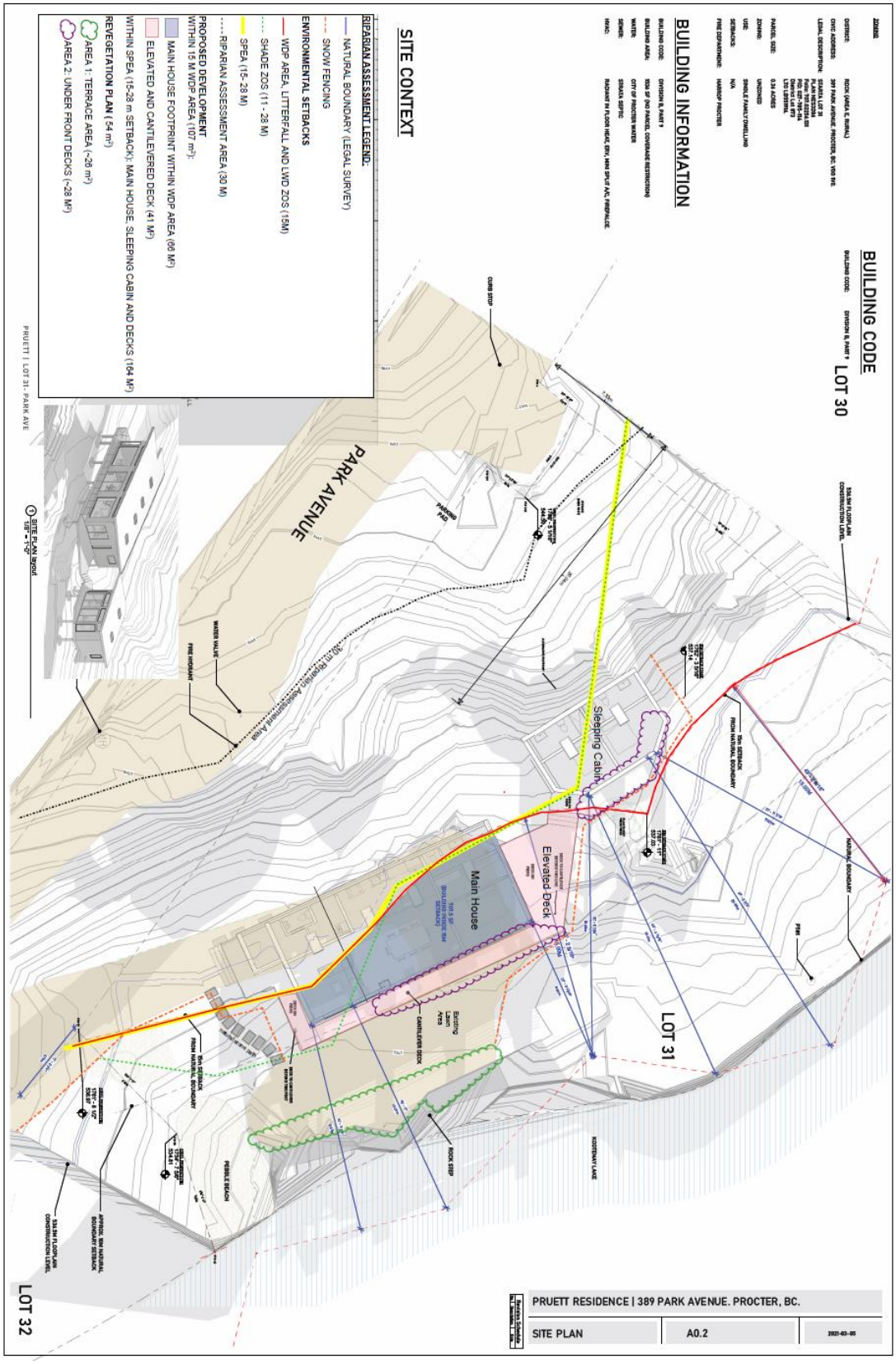
APPENDIX 1. SITE LOCATION MAP


RDCK Map
Lake
2240 m
Hamilton Dr
Queens Bay
31
Queens Bay
Kootenay Lake
Eagleview Golf Centre
Balfour
629 m
Upper Balfour Rd
Project Site
Procter Rd E
West Arm
Procter
Fraser
Narrows Creek
Harrop Procter Rd
Pilot Bay Ry
Pilot Bay Rd
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen,
Legend
Electoral Areas
Project Location Map
Lot 31, Kootenay Lake Village
(389 Park Avenue)
Procter, BC
Map Scale:
1:72,224
Date: April 26, 2021
N
W
E
S
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
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 ommissions on this map.

Appendix 2. Legal Survey


TOPOGRAPHIC PLAN OF
STRATA LOT 31 DISTRICT LOT 873
KOOTENAY DISTRICT STRATA PLAN NES3286
B.C.G.S. 82F.066
SCALE = 1 : 200
LEGEND
KOOTENAY LAKE
STRATA LOT 30
STRATA PLAN NES3286
STRATA LOT 31
STRATA PLAN NES3286
COMMON PROPERTY ACCESS ROUTE
CANADIAN PACIFIC RAILWAY
R/W PLAN 1760
D. L. 8 7 3

Appendix 3. Proposed Development Site Plan


BUILDING CODE
LOT 30
BUILDING INFORMATION
SITE CONTEXT
RIPARIAN ASSESSMENT LEGEND:
NATURAL BOUNDARY (LEGAL SURVEY)
SNOW FENCING
ENVIRONMENTAL SETBACKS
WDP AREA, LITTERFALL AND LWD ZOS (15M)
SHADE ZOS (11 - 28 M)
SPEA (15- 28 M)
RIPARIAN ASSESSMENT AREA (30 M)
PROPOSED DEVELOPMENT
WITHIN 15 M WDP AREA (107 m²):
MAIN HOUSE FOOTPRINT WITHIN WDP AREA (66 M²)
ELEVATED AND CANTILEVERED DECK (41 M²)
WITHIN SPEA (15-28 m SETBACK): MAIN HOUSE, SLEEPING CABIN AND DECKS (164 M²)
REVEGETATION PLAN (54 m²)
AREA 1: TERRACE AREA (~26 m²)
AREA 2: UNDER FRONT DECKS (~28 M²)
PARK AVENUE
Sleeping Cabin
Main House
Elevated Deck
LOT 31
LOT 32
KOOTENAY LAKE
PRUETT RESIDENCE | 389 PARK AVENUE. PROCTER, BC.
SITE PLAN
A0.2

Appendix 4. Archaeological Chance Find Procedure.

KTUNAXA NATION
Ktunaxa Nation Council
7825 Mission Road
Cranbrook, BC V1C 7E5
tel: 250-489-2464
fax: 250-489-2438
visit us at:
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 Archaeology Technician Nathalie Allard for direction (1-250-426-9549; 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

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 Broken Rock (FBR), bone, antler and tooth.

Lithics: What to look for

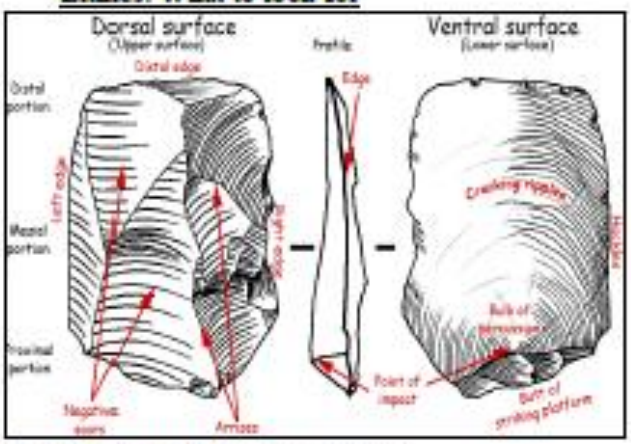


Image 1: Basic flake morphology

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

<u>Bone, Tooth and Antler Artifacts: What to Look For</u>

- 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 FBR and charcoal, and
- depressions in the earth associated with FBR, 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, 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

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