

SHORELINE MANAGEMENT GUIDELINES

Kootenay Lake *A Living Document (Version 7)*

Updated: January 16, 2018

Prepared For:
Kootenay Lake Partnership

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, Archaeologist

PREFACE

The guidelines presented in this report are founded on the beliefs that it is possible and desirable to manage our watersheds and their natural surroundings in a sustainable manner and that sustainable management is the shared responsibility of all stakeholders; including proponents, professionals and all levels of government. This report provides risk-based management guidelines for riparian and fish habitat, Ktunaxa Nation Cultural values and Pre-contact Archeological resources along shorelines of Kootenay Lake. Proponents and Qualified Professionals can access important information to aid in the submission of applications for works and better understand required processes through implementation of these guidelines. The intent is to allow common, low-risk works and activities to proceed with minimal submission requirements but where risks are higher specific, detailed design and assessment information is required for less common or higher-risk activities based upon values present along the shoreline, whether they are environmental, cultural, or archeological. This document outlines the steps necessary for these works to be considered by identifying permitting requirements of Crown Lands, Federal Fisheries and Oceans and several Provincial Agencies, noting that not all permitting requirements have been identified for every type of application. For areas above the natural boundary, reference is made to the Regional District of Central Kootenay, noting that there may be other local government bylaws that are applicable. Further, this document also provides a summary of Ktunaxa Nation Council engagement and permitting requirements based upon the Strategic Engagement Agreement between the Ktunaxa Nation Council and the Province of British Columbia. **It is noted here that certain applications may require other agency approvals such as Interior Health or the Archaeology Branch for post-contact heritage wreck sites, and it is the responsibility of the proponent to ensure that all applicable permits or applications have been submitted and approved prior to proceeding with any works.**

The guidelines outlined in this report present the results of three assessments: an ecological assessment, an archaeological assessment, and a Ktunaxa cultural values assessment, which were completed on Kootenay Lake as a part of the Kootenay Lake Partnership.

The ecological inventories provided important background information concerning fish and wildlife habitat values that occur and fish habitat impacts caused by common development activities. The guidelines are intended to protect and restore important fish and wildlife habitat values¹, consistent with conservation and restoration goals typical of Best Management Practices, and applicable legislation. The assessment only includes features that are within 30 meters inland of the natural boundary, except in rare instances of large floodplains, which are a transitional community and provide important habitat features. Therefore, these guidelines do not address development risks to non-fish species (e.g., reptiles, etc.), or upland ecosystems that do not also provide function for fish or aquatic habitat (e.g., provincially “red-listed” cottonwood riparian ecosystems on large river floodplains). Additional inventory and mapping projects such as Sensitive Ecosystem Inventory Mapping (SHIM) or Sensitive Ecosystem Inventory (SEI) would be required to address concerns related to wildlife species and ecosystems along the shoreline.

¹ It is noted here wildlife and terrestrial mapping are needed as the FIM focusses more so on fish habitat than terrestrial and wildlife habitat. Recommendations are provided for further assessment needs to better address terrestrial or wildlife considerations.

A solid understanding of aquatic and riparian fish habitat values, common development activities and the effects of these activities on fish habitat is required to identify and differentiate low and high risk works. Foreshore Inventory and Mapping (FIM) is a standardized, spatially explicit shoreline inventory methodology that was employed to map the shoreline of Kootenay Lake. This methodology has been used to map the shorelines of other BC lakes and provides a common basis for integrating environmental information into land use guidance documents. The Fish and Fish Habitat guidelines presented in this document are based upon the FIM methodology and data collected during FIM surveys:

1. Shoreline Inventories following the FIM methodology were completed using a variety of techniques and data was derived from numerous sources (Schleppe, 2009b). These baseline inventories provided an understanding of the current condition of the shoreline areas of Kootenay Lake.
2. An Aquatic Habitat Index (AHI) was generated using FIM and fisheries data to determine the relative fish habitat value of mapped shoreline areas (Schleppe, 2010). This index employed similar methodologies to previous AHI projects on such as Shuswap, Mara, Moyie, and Monroe Lakes.²

These guidelines also contain Archaeological Potential Mapping conducted through an Archaeological Overview Assessment (AOA), and provide information about when, and where to obtain permitting and conduct in-field assessments pertaining to impacts to Archaeological Sites. Under the provincial *Heritage Conservation Act (HCA)*, archaeological sites that pre-date 1846 are automatically protected **whether on public or private land, as are heritage wrecks and cargo**. Protected sites may not be damaged, altered or moved in any way without a Section 12 or 14 Permit as issued through the *HCA*.

The AOA is based upon methodology required by the Ministry of Forests Lands and Natural Resource Operations, Archaeology Branch. The AOA was generated by extrapolating regional models of past human land and resource use in the upper Columbia River Drainage and applying these to the foreshore of Kootenay Lake during the shoreline inventory. The prediction of probability of site occurrence (i.e. Archaeological Potential) is linked to the landscape by geographic characteristics including aspect; relationship to water; biotic associations such as vegetation, ungulate range and fisheries values; age of a given landform; and the geological processes that created that landform.

Finally, the guidelines also include information pertaining to Ktunaxa Cultural Values. The Ktunaxa Cultural Values Study was conducted by the Ktunaxa Nation Council (KNC) using customized methodology based on previous work by Jennings et al (2003), Tobias (2009) and The Firelight Group (2015). The KNC worked with Ktunaxa elders, knowledge holders and land users to identify areas of high ecological and cultural values following these steps:

Build broad-based community support within Ktunaxa communities;

- a) Identify Cultural Values (CV) that exist on and adjacent to Kootenay Lake;

² See Schleppe (2009a, 2009b, 2010, 2011a, 2011b) for examples.

- b) Locate aquatic and terrestrial CV areas on and adjacent to Kootenay Lake;
- c) Develop Management Strategies to protect these CV areas;
- d) Build local community support for these CV areas and the management strategies to protect them;
- e) Align (harmonize) identified CV areas and management strategies with other land managers; and
- f) Monitor effectiveness of management strategies and/or activities within CV areas.

The values identified by the Ktunaxa have been harmonized with this guidance document (step f) in order to clarify the engagement and permitting processes required by the Ktunaxa Nation Council when considering development activities on the foreshore of Kootenay Lake.

Key deliverables for this project include a map of the shoreline of Kootenay Lake in which individual shoreline segments - or "vulnerability zones" were colour-themed based on three criteria: 1) Fisheries and Wildlife Values, 2) Ktunaxa Cultural Values, and 3) Archeological Potential.

Under this system shore areas of highest value receive the highest level of protection and require the most detailed project design and assessment information to support agency, Ktunaxa Nation and local government reviews. In contrast, segments in areas of lower value, or areas where low risk activities are occurring, may proceed with minimum submission requirements. Application of present-day development guidelines to all shoreline segments is expected to maintain current fish habitat values of natural areas, protect Ktunaxa cultural values, and protect Archeological Values. This shoreline plan is intended to achieve key goals such as helping aid in recovering fish habitat values lost to past development impacts and protect and enhance culturally important areas for the Ktunaxa. This gradual recovery of values is required due to the extent of development-related impacts that have already occurred in absence of best management practices to mitigate for these impacts and is now noticeable (e.g., loss of traditional areas of access to the lake, extensive substrate modification due to groynes, or removal of important riparian vegetation to create "landscaped" areas consisting predominantly of turf).

Relative risks of common development activities are also recorded in tabular format for the full range of relative values and tables and flow charts developed to guide proponents, professionals and practitioners through project assessment, reviews and works.

The table below provides a quick overview of the key considerations:

Table 1: Summary of Environmental Values Rankings, First Nations, Map colours, and associated relative risks for interpretation of the guidance document.

Consideration	Rank	Map Colour
Fish / Wildlife	Very Low	Grey
	Low	Blue
	Moderate	Yellow
	High	Orange
	Very High	Red
Ktunaxa Cultural Values	Standard Engagement	Grey
	Enhanced Engagement	Purple
		Red
Archeological Potential Index		Orange
		Yellow
		Brown

TABLE OF CONTENTS

PREFACE.....	i
1.0 INTRODUCTION.....	7
2.0 MANAGEMENT GUIDELINES OVERVIEW	7
2.1 Common Development Activities.....	7
2.2 Project Considerations.....	8
2.2.1 Summary of Applicable Legislation.....	9
2.2.3 Summary of Applicable BMPs.....	10
2.2.4 New and Existing Works	14
2.2.5 Professional Reliance and Accountability.....	14
2.3 Environmental Shoreline Vulnerability Zones and Sensitive Habitat Types	15
2.3.1 Background	15
2.3.2 Overview of Environmental Risk.....	17
2.3.3 Environmental Activity Risk Matrix.....	20
2.3.4 Avoidance of Impacts.....	23
2.3.5 Minimization of Unavoidable Impacts.....	23
2.3.6 Compensation for Residual Impacts	23
2.3.8 Requirements of Other Agencies.....	24
2.4 Archeological Shoreline Potential	25
2.4.1 Background	25
2.4.2 Overview of Archeological Process.....	25
2.4.3 Overview of Archeological Risk.....	26
2.4.4 Archeological Activity Risk Matrix.....	27
2.5 Cultural Values Shoreline Vulnerability	29
2.5.1 Cultural Values Overview.....	29
2.5.2 Cultural Values Process.....	29
2.5.3 Cultural Values Activity Risk Matrix	31
3.0 PROCESS CONSIDERATIONS.....	33
3.1 Monitoring and Adaptive Management.....	33
REFERENCES.....	34

TABLES

Table 1..... Summary of Environmental Rankings
Table 2..... Summary of Environmental Best Management Practices Resources
Table 3..... Activity Risk Matrix
Table 4..... Archeological Activity Risk Matrix
Table 5..... Cultural Values Activity Risk Matrix

FLOW CHARTS

Chart 1..... Design Assessment and Review
Chart 2..... Erosion Control
Chart 3..... Private Moorage
Chart 4..... Commercial or Strata Moorage

ATTACHMENTS

ATTACHMENT 1..... Shoreline Guidance Figure Binder

1.0 INTRODUCTION

The Kootenay Lake Partnership is a multi-agency planning process that was initiated in response to concerns over the management of shoreline areas surrounding Kootenay Lake. As part of this work, the Regional District of Central Kootenay, Fisheries and Oceans Canada, the Ministry of Forests, Lands, and Natural Resource Operations (MFLNRO), the Lower Kootenay Band and the Ktunaxa Nation Council (KNC) have collaborated in a mapping initiative in response to increasing development and recreation pressures on Kootenay Lake. In recent years, several issues, including shoreline impacts and degraded habitat, recreational use conflicts, and water quality impacts have prompted government agencies at various levels to initiate projects focused on increasing our understanding and providing better management for our watersheds.

Shoreline management guidelines are intended to clarify and streamline land use decision-making processes between different agencies, proponents, and stakeholders as they relate to riparian, fish and fish habitat. This guidance document is based on other similar planning processes undertaken for Shuswap and Mara Lakes (Ecoscape, 2011) and Windermere Lake (EKLIMP, 2008) but is unique in its integration of Archaeology and Ktunaxa cultural values. Original authorship credit is given here for portions of this report that are similar to or amended from those or other similar planning processes and documents and will not be referenced further in order to improve readability of this report. Though these templates were utilized to promote consistency between different areas of the province, original authors should be credited for their contributions where appropriate.

2.0 MANAGEMENT GUIDELINES OVERVIEW

2.1 Common Development Activities

The following common development activities were identified using FIM survey data for Kootenay Lake:

- aquatic vegetation removal
 - dredging, infilling and beach creation
 - erosion control and shoreline sediment control structures
 - boat launches
 - buoys
 - docks
 - marinas
 - water withdrawal and use
 - construction of pile-supported structures below the natural boundary
 - land development within 30 meters of the natural boundary
-

To address the scale of observations, these activities were sub-categorized by location (e.g. above vs. below the natural boundary), scale (e.g. single family residential, commercial, industrial, strata or multi-family), whether they involved new works or maintenance of existing works and other factors (i.e., legal works with a Crown Lands tenure or not) related to the level of risk that could cause different design and assessment standards to be applied (see Table 1). It has consistently been identified throughout mapping initiatives on BC lakes that as the density, intensity, or type of development changes, the consequences to habitat, and relative risks increase. Further, risks also increase as habitat values increase (i.e., the risk of development density increases in areas of higher habitat value). It is important to note that scale of activity also affects risks. For instance, removal of one native aquatic plant poses relatively lower risk than larger scale vegetation removal, meaning that while risks have been categorized, it is difficult to categorize all potential scales of what may be proposed, and these guidelines are best intended to address common development scenarios. In all cases, anyone who is planning to do work on Crown Land must first contact FrontCounterBC, or retain the services of Qualified Professionals (QP) to do so on their behalf; for information pertaining to the works planned on Crown land. Depending on the situation, guidance will be given in respect to whether or not the proposed work is allowed or not allowed under the respective legislation. Similarly, works on private lands must also consider local government's requirements, who can be contacted for further information.

An assessment of the relative risk posed by each common development activity to fish or riparian habitat in each shoreline vulnerability zone was initially completed and was based upon similar assessments of risks in other lakes (e.g., Mabel, Shuswap, Moyie and Monroe and Windermere). The initial risk ratings were refined in a workshop and subsequently reviewed by DFO and MFLNRO Ecosystems Section staff responsible for development-related fish habitat assessments on the Kootenay Lake system. Activity risk ratings range from Low to Very High and vary depending upon the activity or habitat value present. As mentioned above, the risks to fish habitat are directly related to the habitat value present and therefore land use impact risk ratings increase from areas of Very Low to Very High shoreline vulnerability and reach their maximum in known fish spawning habitat (see Table 2).

A similar exercise and suite of meetings was used to develop risk matrices for Ktunaxa cultural values and for archeological values. A separate risk matrix was developed for each of these different categories and classified within this document.

2.2 Project Considerations

For works located in shoreline segments with identified shoreline sensitivities (e.g., shore spawning kokanee) having an AHI rank of Moderate, High or Very High, or along shoreline segments with environmental or aquatic shoreline sensitivities, proponents will likely require the services of a qualified environmental professional (QP) to complete and

submit documentation to FrontCounterBC and possibly DFO. Similarly, sites with archeological potential or of cultural importance may require Qualified Professionals (QP) to assist with your application. The necessity to engage a QP increases as site sensitivities, AHI rankings, the presence of environmental site sensitivities increases or a cultural or archeological potential increases. Information contained in this report(s) will assist proponents and Qualified Professionals in their work, but additional studies may be required to address site-specific issues and limitations of currently available information.

2.2.1 Summary of Applicable Legislation

The following provides a brief summary of legislation that may be applicable to a proponent project. While this list is fairly inclusive, other pieces of legislation may be applicable and proponents are required to ensure that they have identified all applicable legislation. Information included in this document related to the Fisheries Protection Program of Fisheries & Oceans Canada is relevant as of (July, 2016). The Project Near Water website may be updated to reflect the integration of permitting under the *Species at Risk Act* and *Fisheries Act*. It is the proponents' responsibility to refer to the Projects Near Water website for any updates. In addition, the review of changes to the *Fisheries Act* began in June 2016 with changes, if required, expected to be implemented by 2018. Any changes to the *Fisheries Act* as a result of the review may impact advice or recommendations within this document.

Federal Acts:

- The Department of Environment Act
- Fisheries Act
- Species at Risk Act (SARA)
- Migratory Birds Convention Act
- Canada Wildlife Act
- Navigable Waters Protection Act
- Pesticides Act
- Canadian Environmental Assessment Act (CEAA)
- Indian Act

Regulations

- Canada Environmental Protection Act, 1999 (CEPA 1999) Regulations
 - Migratory Birds Regulations
 - Fisheries Act Regulations
 - Wildlife Area Regulations
-

Provincial:

- Water Sustainability Act
- Fish Protection Act
- Wildlife Act
- Environmental Management Act
- Land Act
- Weed Control Act
- Local Government Act
- Heritage Conservation Act

Regional District of Central Kootenay

- Development Permit Areas (DPAs)
- Subdivision Servicing Bylaw
- Floodplain Management Bylaw
- Building Bylaw

2.2.3 Summary of Applicable BMPs

The following section provides a summary of potentially applicable best management practices, noting that this list is neither exhaustive, nor all-inclusive and other best management practices may be applicable to any given project. Further, many of the documents are dated, and may have been adapted from the time of this publication. FrontCounterBC or a QP should be contacted for more information on recent Provincial BMP's that may be specifically applicable to Kootenay Lake. For Federal documents, the Projects Near Water website by Fisheries and Oceans Canada can also be referred to.

Table 2: Summary of BMPs and guidelines that may be applicable to development in the Kootenay Region.

Provincial BMPs	Target Species Group and/or Habitat Feature	Applicability	Web link
Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia. (BC MOE 2014a)	Regionally Sensitive Species Terrestrial Aquatic Riparian	This document is applicable to works involving any form of land development.	http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/index.html#Main
Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia (BC MOE 2014b)	Amphibians and Reptiles	This BMP is applicable to ecosystems comprised of aquatic habitats, rocky outcrops and forested areas.	http://www.env.gov.bc.ca/wld/documents/bmp/HerptileBMP_complete.pdf
Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (BC MOE 2013)	Raptors	This BMP is applicable to terrestrial ecosystems comprised of mature coniferous and mixed woodlands.	http://www.env.gov.bc.ca/wld/documents/bmp/raptor_conservation_guidelines_2013.pdf
Best Management Practices Guidelines for Bats during Urban and Rural Land Development in British Columbia in BC (BC MOE 2016)	Bats	This BMP is applicable to terrestrial ecosystems comprised of arid grassland, Ponderosa Pine - Douglas-fir forests, insect rich riparian zones, as well as wetlands, forest edges and open woodland.	http://a100.gov.bc.ca/pub/eirs/finishDownloadDocument.do?subdocumentId=10325
Standards and Best Practices for Instream Works (BC MOE 2004)	Aquatic	This BMP is applicable for works undertaken instream.	http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf
Best Management Practices for Lakeshore Stabilization (BC MOE 2006b)	Aquatic Riparian	This BMP is applicable to areas with steep slopes that are accompanied by seepage, which increases the risk of releasing sediment and non-point source pollution..	http://www.env.gov.bc.ca/wld/documents/bmp/BMPLakeshoreStabilization_WorkingDraft.pdf
Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al. 1992)	Aquatic	This BMP is applicable to works undertaken in areas adjacent to riparian features.	http://www.dfo-mpo.gc.ca/Library/165353.pdf
Best Management Practices for Hazard Tree and Non-Hazard Tree	Terrestrial Aquatic	This BMP is applicable for works involving tree removal.	http://www.env.gov.bc.ca/wld/documents/bmp/BMPTreeRemoval_WorkingDraft.pdf

Table 2: Summary of BMPs and guidelines that may be applicable to development in the Kootenay Region.			
Provincial BMPs	Target Species Group and/or Habitat Feature	Applicability	Web link
Limbing, Topping or Removal (BC MOE 2006)			
Best Management Practices for Boat Launch Construction & Maintenance on Lakes (BC MOE 2006)	Terrestrial Aquatic	**Okanagan	http://www.env.gov.bc.ca/okanagan/documents/BMPBoat_LaunchDraft.pdf
Best Management Practices for Small Boat Moorage on Lakes (BC MOE 2006)	Terrestrial Aquatic	**Okanagan	http://www.env.gov.bc.ca/okanagan/documents/BMPSmallBoatMoorage_WorkingDraft.pdf
Best Management Practices for Installation and Maintenance of Water Line Intakes (BC MOE 2006)	Aquatic	**Okanagan	http://www.env.gov.bc.ca/okanagan/documents/BMPIntakes_WorkingDraft.pdf
Beaver Management Guidelines in British Columbia (BC MOE 1988)	Aquatic	This BMP is applicable to areas that support beaver communities.	http://www.env.gov.bc.ca/van-island/pa/pdf/beaver_mgt.pdf
Beaver Management Guidelines (BC MOE 2001)	Aquatic	This BMP is applicable to areas that support beaver communities.	http://www.env.gov.bc.ca/van-island/pa/pdf/Beaver-Guide.pdf
Tree replacement criteria (BC MOE 1996)	Terrestrial	This criteria document is applicable to works involving tree removal and replacement.	http://www.env.gov.bc.ca/wld/documents/bmp/treereplcrit.pdf
Terms and Conditions for Changes In and About a Stream Specified by Ministry of Environment (MOE) Habitat Officers, Kootenay Region (Region 4)	Aquatic	This BMP is applicable to works involving changes in and about a stream.	http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/terms_conditions_kootenays.pdf
Fish Habitat Rehabilitation Procedures	Aquatic	This document is applicable to works with an erosion and sediment risk near water.	http://www.env.gov.bc.ca/wld/documents/wrp/wrtc_9.pdf
Ktunaxa Nation Council BMPs	Target Area	Applicability	Web Link
Guidelines for Conducting Archaeological Assessment in	Archaeology	This document is applicable to activities with moderate to high risk	http://www.ktunaxa.org/four-pillars/lands-resource-agency/

Table 2: Summary of BMPs and guidelines that may be applicable to development in the Kootenay Region.

Provincial BMPs	Target Species Group and/or Habitat Feature	Applicability	Web link
Ktunaxa Territory		to Archaeological values	
Ktunaxa Nation Council BMPs	Target Area	Applicability	Web Link
Ktunaxa Archaeological Chance Find Procedure	Archaeology	Activities with moderate risk to archaeological values	http://www.ktunaxa.org/four-pillars/lands-resource-agency/

2.2.4 New and Existing Works

The Kootenay Lake Foreshore Inventory and Mapping project identified extensive impacts from existing structures along the shoreline of the lake. In carrying out this survey, it was identified that many works had proceeded without appropriate permits or approvals in place and that these activities were often not compliant with standard best management practices. It is suggested that land owner's first determine if the existing works are on their land or on Crown Land, and if they are located in an Application Only Area / Reserve Area established under the Land Act. Depending on the situation, the proponent should then determine if the works were authorized by the appropriate authority or not. If no authorization was granted, the proponent must seek approval from the appropriate authority before proceeding. Approval may or may not be granted depending on the situation. In keeping with standard BMP's, proponents should expect to address existing infrastructure and current best management practices as part of their application by upgrading existing works or working to upgrade works as part of an application process. Existing infrastructure should be improved to meet current best management practices or design standards as part of mitigation planning for *all* applications. Further, including other mitigation practices such as landscape restoration (i.e., planting native riparian vegetation), improving historic substrate modification (i.e., removal or mitigation of existing groynes, etc.), and other habitat improvements should all be considered during application planning by proponents and qualified environmental professionals. In addressing these issues, it is expected that applications can be reviewed more effectively.

Proponents interested in proposing new works must ensure that they make the appropriate application and seek the necessary approvals from Federal, Provincial and Local government. Commencing work without approval is considered to be in trespass and may be subject to enforcement actions by the respective agencies. Contact FrontCounterBC and the Regional District of Central Kootenay for information pertaining to your proposal. Alternatively, retain the services of Qualified Professionals to do this work on your behalf.

2.2.5 Professional Reliance and Accountability

Should proponents choose to retain the services of Qualified Professionals to assist with developing a proposal to do work, it is important to understand the concepts of Professional Reliance and Accountability and how that might impact the proponent. Reliance on qualified professionals to complete assessments that provide professional opinion is a primary source of risk. For instance, environmental professionals that provide opinion on whether or not serious harm to fish and fish habitat will occur after avoidance and mitigation measures are applied is a primary source of risk if that opinion is based upon insufficient data collection or has not adequately considered habitats, species, or other features that are present. This is due to the fact that a qualified professional's opinions that proposed works will not cause serious harm to fish or fish habitat would

likely permit works to proceed without DFO review if they are located in a shoreline segment having an Aquatic Habitat Index Ranking of Low, Very Low or Moderate, noting that some applications will require review regardless of location. Though this may be in keeping with the due diligence defense already available to proponents that carry out a work or undertaking that causes harm to fish habitat under the *Fisheries Act*, it represents an increase in risk relative to the past practice of limiting determinations of harm to DFO assessors. Further, this means that proponents should carefully consider whom they retain as part of their application process.

Professional reliance is the practice of accepting and relying upon the decisions and advice of resource professionals who accept responsibility and can be held accountable for the decisions they make and the advice that they give (for example, see PRWG, 2008). Professional accountability is acknowledgement and assumption of obligations under professional legislation and accompanying bylaws, including the potential for investigations and discipline to be imposed by the profession (for example, see PRWG, 2008).

2.3 Environmental Shoreline Vulnerability Zones and Sensitive Habitat Types

2.3.1 Background

Shoreline vulnerability zones mirror the five class relative habitat value rankings of the Aquatic Habitat Index (AHI) for Kootenay, Mabel, and Shuswap, Little Shuswap and Mara lakes (Schleppe, 2011; Schleppe, 2009b). Under this system, the AHI ranking for an individual shoreline segment represents its current habitat value relative to all other shoreline segments on Kootenay Lake. This shoreline index considers many biophysical characteristics, riparian condition, contribution to key salmonid / white sturgeon life history stages (e.g., shore spawning kokanee or high salmonid juvenile rearing values), wildlife values, and existing land use impacts (see the FIM and AHI for more details regarding the index and rationale for fish and life history stages considered). Though rankings range from Very High to Very Low, all areas of the lake shoreline provide fish habitat and even segments of Very Low relative habitat value contribute to overall fisheries production or some contain important wildlife habitat (e.g., Osprey nests). Further, while the relative value of any shoreline area may be Moderate; key habitat features may be present (e.g., aquatic vegetation, critical sturgeon areas, etc.) that warrant consideration as part of any land use decision or shoreline alteration making process. A key assumption of this classification system is that the vulnerability of a shoreline segment to land use impact or related changes corresponds directly with its value as fish habitat or to the presence of key site sensitivities (i.e., the risks to fish habitat are greatest in areas of greatest fish habitat value and therefore these are more vulnerable).

The AHI describes the relative habitat value of the Kootenay Lake shoreline and incorporates data from a variety of sources and strengths³. In some shoreline areas, habitat degradation has occurred but high values have been documented indicating they contain a habitat attribute that is critical to the maintenance of a healthy population (e.g., shore spawning kokanee). Based on their particularly high fish habitat value and sensitivity irrespective of land use impacts, stream deltas, aquatic vegetation, kokanee shore spawning areas, and high value juvenile rearing areas are also considered. These areas are similar to 'Zones of Sensitivity' developed within other shoreline guidance documents.

The mapping provides the location of many site sensitivities. For the purposes of this document, these are classified as either aquatic site sensitivities, or environmental site sensitivities. To determine the specific site sensitivity, readers should refer to the Kootenay Lake Foreshore Inventory and Mapping and Aquatic Habitat Index report maps. The mapping label indicates a site sensitivity is present, and the segment number can be used as a reference to find the specific site sensitivity in these maps. This was done to provide clarity in cartography, and avoid overly confusing maps with too many labels. The information for each segment is also available in GIS for the project (Cormano and Schleppe, 2013). The mapping can be found on the Kootenay Lake Partnership website (www.kootenaylakepartnership.com). In summary, the following are associated site sensitivities in each group:

1. Aquatic Site sensitivities include potential fish staging or migration areas, confirmed or potential shore spawning kokanee, presence of critical white sturgeon habitat in the federal recovery plan (Fisheries and Oceans Canada, 2014), or high value juvenile rearing salmonid areas;
2. Environmental Sites include the presence of known habitats important to bats, presence of raptor nests, presence of heron nesting areas, presence of other avian nesting areas, Conservation Data Center⁴ occurrences, presence of Red or Blue listed communities, and presence of important areas for amphibians. It is noted here that some of the data used to generate these is based upon incomplete surveys, and site sensitivities may be updated as more information becomes available.

Shoreline vulnerability zones and site sensitivities are best viewed graphically as they relate to specific shoreline areas. Shoreline vulnerability zones on Kootenay Lake are illustrated in the attached Figure Binder (see Foreshore Inventory and Mapping (FIM) Figure Binder).

³ For example, field data describing habitat modifications was field verified during inventory, whereas other data sets such as the juvenile rearing value are based upon habitat characteristics rather than sampling effort.

⁴ The B.C. Conservation Data Centre (CDC) assists in the conservation of our province's biodiversity by collecting and sharing scientific data and information about wildlife and ecosystems in B.C.

2.3.2 Overview of Environmental Risk

The following generic design and assessment standards were developed to clarify and streamline review processes for common Low, Moderate, High and Very High risk development activities that may impact fish and fish habitat but may lack existing or endorsed standards:

<i>Low Risk Activities</i>
<ul style="list-style-type: none">• Pose low risk of harm to fish habitat.• Harm to fish habitat can usually be prevented if experienced contractors complete works following endorsed best management practices.• Supervision of works by a qualified environmental professional is recommended to ensure harm to fish habitat does not occur.• DFO review depends upon the proposed works and at minimum should follow endorsed best management practices referenced in activity-specific footnotes to Table 2.• Project proponents are responsible for ensuring that they comply with fish habitat protection provisions of <i>Fisheries Act</i> section 35(1) (see http://laws.justice.gc.ca/en/F-14/index.html).• Refer to the DFO Projects Near Water website before starting your work and complete a submission of a Project Review Application Form is desired or needed. (see http://dev-public.rhq.pac.dfo-mpo.gc.ca/habitat/steps/praf/form-formulaire-eng.pdf).• Refer to Table 3 to determine if a Section 11 under the Water Sustainability Act may be needed and submit any required documentation to Front Counter BC. FrontCounterBC can provide guidance to help determine what permits or approvals are necessary for an application.• Refer to Table 3 to determine if a Crown Land tenure is required. Indicated coding of Y (Yes), N (No) or Maybe, is only a preliminary guide; each application and the requirement is based upon the site specific situation. You must contact FrontCounterBC before proposing work. Staff will provide additional guidance and provide you with information to determine what permits or approvals are necessary for an application. In certain situations, the indicated activity will not be allowed and no tenure will be issued.

Moderate Risk Activities

- Pose moderate risk of harm to fish habitat.
- Some works will require authorization under section 35(2) of the *Fisheries Act* to legally proceed.
- Harm to fish or fish habitat can usually be prevented if appropriate relocation, redesign and mitigation measures are implemented.
- Professional planning and assessment is required; costs to the proponent *may* be high.
- Mitigation and compensation costs to the proponent *may* be high.
- DFO review depends upon the proposed works and at minimum should follow endorsed best management practices referenced in activity-specific footnotes to Table 2.
- Project proponents are responsible for ensuring that they comply with fish habitat protection provisions of *Fisheries Act*, section 35(1) (see <http://laws.justice.gc.ca/en/F-14/index.html>).
- Refer to the DFO Projects Near Water website before starting your work and complete a submission if a Project Review Application Form is desired or needed. (see <http://dev-public.rhq.pac.dfo-mpo.gc.ca/habitat/steps/praf/form-formulaire-eng.pdf>).
- Refer to Table 3 to determine if a Section 11 under the Water Sustainability Act may be needed and submit any required documentation to Front Counter BC. Front Counter BC can provide guidance to help determine what permits or approvals are necessary for an application.
- Refer to Table 3 to determine if a Crown Land tenure is required. Indicated coding of Y (Yes), N (No) or Maybe, is only a preliminary guide; each application and the requirement is based upon the site specific situation. You must contact FrontCounterBC before proposing work. Staff will provide additional guidance and provide you with information to determine what permits or approvals are necessary for an application. In certain situations, the indicated activity will not be allowed and no tenure will be issued.

High Risk Activities

- Pose high risk of harm to fish habitat.
- Most works will require authorization under section 35(2) of the *Fisheries Act* to legally proceed.
- Include significant challenges to prevention of harm through relocation, redesign and mitigation measures or to compensation for fish habitat losses that may occur.
- Professional planning and assessment is required; costs to the proponent *may* be high.
- Mitigation and compensation costs to the proponent *may* be high.
- DFO review depends upon the proposed works and at minimum should follow endorsed best management practices referenced in activity-specific footnotes to Table 1. It is advisable to submit a Project Review for Very High and High risk activities to avoid potential harm to fish or their habitats.
- Project proponents are responsible for ensuring that they comply with fish habitat protection provisions of *Fisheries Act*. section 35(1) (see <http://laws.justice.gc.ca/en/F-14/index.html>).
- Refer to the DFO Projects Near Water website before starting your work and complete a submission of a Project Review Application Form is desired or needed. (see <http://dev-public.rhq.pac.dfo-mpo.gc.ca/habitat/steps/praf/form-formulaire-eng.pdf>).
- Refer to Table 3 to determine if a Section 11 under the Water Sustainability Act may be needed and submit any required documentation to Front Counter BC. Front Counter BC can provide guidance to help determine what permits or approvals are necessary for an application.
- Refer to Table 3 to determine if a Crown Land tenure is required. Indicated coding of Y (Yes), N (No) or Maybe, is only a preliminary guide; each application and the requirement is based upon the site specific situation. You must contact FrontCounterBC before proposing work. Staff will provide additional guidance and provide you with information to determine what permits or approvals are necessary for an application. In certain situations, the indicated activity will not be allowed and no tenure will be issued.

Very High Risk Activities

- Pose very high risk of harm to fish habitat.
- Most works will require authorization under section 35(2) of the *Fisheries Act* to legally proceed.
- Include significant challenges to prevention of harm through relocation, redesign and mitigation measures or to compensation for fish habitat losses that may occur.
- Professional planning and assessment is required; costs to the proponent may be high.
- Mitigation and compensation costs to the proponent may be high.
- DFO review depends upon the proposed works and at minimum should follow endorsed best management practices referenced in activity-specific footnotes to Table 1. It is advisable to submit a Project Review for Very High and High risk activities to avoid potential harm to fish or their habitats.
- Project proponents are responsible for ensuring that they comply with fish habitat protection provisions of *Fisheries Act*. section 35(1) (see <http://laws.justice.gc.ca/en/F-14/index.html>).
- Refer to the DFO Projects Near Water website before starting your work and complete a submission of a Project Review Application Form is desired or needed. (see <http://dev-public.rhq.pac.dfo-mpo.gc.ca/habitat/steps/praf/form-formulaire-eng.pdf>).
- Refer to Table 3 to determine if a Section 11 under the Water Sustainability Act may be needed and submit any required documentation to Front Counter BC. Front Counter BC can provide guidance to help determine what permits or approvals are necessary for an application.
- Refer to Table 3 to determine if a Crown Land tenure is required. Indicated coding of Y (Yes), N (No) or Maybe, is only a preliminary guide; each application and the requirement is based upon the site specific situation. You must contact FrontCounterBC before proposing work. Staff will provide additional guidance and provide you with information to determine what permits or approvals are necessary for an application. In certain situations, the indicated activity will not be allowed and no tenure will be issued.

In cases where multiple activities are proposed, the combined risk to fish habitat may increase. In these cases, proponents should default to the highest risk identified and retain a qualified environmental professional to determine whether the overall risk to fish habitat has increased. For development activities not listed in Table 1, proponents are recommended to apply design, assessment and review standards for High risk activities unless advised of a Very High risk by a qualified professional.

2.3.3 Environmental Activity Risk Matrix

The following table summarizes environmental risks for different activities, as they relate to shoreline habitat values on Kootenay Lake (Aquatic Habitat Index). For more complex sites or activities, readers may need to refer to specific flow charts at the end of the document.

Table 3: Activity Risk Matrix. Risks are classified by designation (Very High, High, Moderate, and Low). Habitats are ranked by the Aquatic Habitat Index as High (Red), High (Orange), Moderate (Yellow), Low (Blue) and Very Low (Grey).

Activity*	Crown Land Tenure Required	Section 11 Water Sustainability Act	Fisheries Act Review Recommended	Risk Assessment				
				AHI Ranking Very High	AHI Ranking High	AHI Ranking Moderate	AHI Ranking Low	AHI Ranking Very Low
Aquatic Vegetation Removal								
Removing native aquatic vegetation by hand or mechanical cutting for swimming areas and private beach access	N	Y	Refer to Website	VH	VH	VH	VH	H
Removing non-native/invasive aquatic vegetation by hand or mechanical cutting for swimming areas and private beach access	N	Y	Refer to Website	VH	VH	H	M	L
Dredging, Infilling and Beach Creation								
Dredging (new proposals)	Maybe	Y	Y	VH	VH	VH	VH	VH
Maintenance Dredging: dredging has occurred in last 10 years, no temporary or permanent increase in footprint below the NB**, dredged material deposited on land	Maybe	Y	Refer to Website, Likely N	VH	VH	VH	VH	VH
Lake infilling (e.g. extension of upland landscaping)	Y	Y	Refer to Website, Likely Y	VH	VH	VH	VH	VH
Beach creation below the lake NB	Maybe	Y	Y	VH	VH	VH	VH	H
Beach creation above the lake NB	Maybe	Maybe	Refer to Website, Likely N	Refer to Landscaping in Land Development				
Transition to Private Land from Crown Land								
Application to purchase crown land (crown grant)	Y	N	N	VH	H	M	L	L
Erosion Control, Foreshore Sediment Control, Foreshore Disturbance or Wave Control Structures								
Refer to Figure 2								
New groyne construction or increase in existing footprint	Not allowed							
Maintenance of existing groyne, no increase in existing footprint	Maybe	Y	N	Refer to Forests, Lands and Natural Resource Operations				
Erosion control (e.g. concrete, rip rap, vegetation, etc.)	Maybe	Y	Refer to Website	VH	VH	H	M	L
Infill breakwaters or boat basins	Y	Y	Refer to Website	VH	VH	H	H	M
Wave control structures	Y	Y	Refer to Website	VH	VH	H	M	L
Foreshore sediment disturbance and removal of lakebed substrate	N	Y	Refer to Website	VH	VH	H	M	L
Boat Launches								
Construction of new hard surface boat launch or repair/upgrade of existing hard surface boat launch without land tenure	Y	Y	Refer to Website	VH	VH	VH	H	H
Upgrade/repair of existing hard surface boat launch with land tenure and within existing footprint	Maybe	Y	N	VH	H	H	M	M
Upgrade/repair of existing hard surface boat launch with land tenure and increasing size of the existing allowable footprint	Y	Y	Y	VH	VH	H	M	M
Construction of new boat rail launch or repair/upgrade of existing boat rail launch without land tenure	Y	Y	Refer to Website	VH	H	M	L	L
Upgrade/repair of existing boat rail launch with land tenure and within existing footprint	Maybe	Y	N	H	H	M	M	M
Buoys								
Placement of up to 2 helical screw anchor mooring buoys for non-commercial use. Refer also to Transport Canada - Navigable Waters	N	Maybe	N	H	H	M	L	L
Placement of up to 2 non-helical screw mooring buoys for non-commercial use. Refer also to Transport Canada - Navigable Waters	N	Maybe	N	VH	H	H	M	L
Placement mooring buoys for commercial use – refer to Marina Activities.	Y	Maybe	N	Refer to Transport Canada - Navigable Waters				
Docks / Boathouses / covered boat storage areas								
Docks	Maybe - Refer to Dock Figure 3	Y	Refer to Website	Refer to Figure 3				
Residential boathouses / covered boat storage (residential)	Not allowed							
Marinas - Commercial								
Upgrade and new construction	Y	Y	Refer to Website, Likely Y	Refer to Figure 4				
Water Withdrawal, Use or Discharge								
Waterline - directional drilling (may require a Water License)	N	Y	Refer to Website	H	H	M	M	L
Waterline - open excavation (may require a Water License)	N	Y	Refer to Website	VH	VH	H	M	L
Geothermal heating/cooling - commercial, industrial, strata or multi-family (may require a Water License)	Maybe	Y	Refer to Website	VH	VH	VH	H	H
Geothermal heating/cooling - single family residence (may require a Water License)	Maybe	Y	Refer to Website	VH	H	M	M	M
Treated effluent discharge pipe	Maybe	Y	N (EC)	VH	VH	H	M	M
Commercial water withdrawals (may require a Water License)	Maybe	Y	Refer to Website	VH	VH	H	M	L
Pile-supported Structures below the NB								
Overwater piled structure (e.g. building, deck, etc.)	Y	Y	Refer to Website	VH	VH	VH	VH	H
Elevated boardwalk located offshore of the lake NB	Y	Y	Refer to Website	VH	H	H	H	M
Land development								
Native Vegetation modification / removal	Maybe	Maybe	Refer to Website	VH	VH	VH	H	H
Non-native Vegetation modification / removal	Maybe	Maybe	Refer to Website	VH	H	M	L	L
Building permit application	Y	Y	Y	Refer to Applicable Local Government				
Landscaping with Native Vegetation	N	N	Refer to Website	Refer to Applicable Local Government				
Landscaping with Non-native Vegetation	N	N	Refer to Website	Refer to Applicable Local Government				
Development permit applications	N	N	N	Refer to Applicable Local Government				
Drilling and blasting (note that any drilling or blasting within 30 m also requires liaison with Local Government, as other permits may exist.)	N	N	Refer to Website	VH	VH	VH	H	M
Septic application	Maybe	N	N	Refer to Interior Health Authority				
* For all Activities if SARA species and/or critical habitat present refer to Projects Near Water Website for next steps.								
**NB refers to natural boundary								

2.3.4 Avoidance of Impacts

The general principles of shoreline development are to design such that there is “No Net Loss” in habitats present. These principles are supported by the Provincial policy for Environmental Mitigation (<http://www.env.gov.bc.ca/emop/>). In general, this principle is achieved through application of the following mitigation options: (1) avoidance of environmental impacts and associated components; (2) minimization of unavoidable impacts on environmental values and associated components; (3) restore on site environmental values and associated components, and, (4) offset impacts to environmental values of components for residual impacts that cannot be minimized.

The first step, avoidance, involves the prevention of impacts, either by choosing an alternate project, alternate design or alternate site for development. It is the first and best choice of mitigation alternatives. Because it involves prevention, the decision to avoid a high value/high risk area or to redesign a project so that it does not affect a high value area must be taken very early in the planning process. It may be the most efficient, cost effective way of conserving important habitats because it does not involve minimization, compensation or monitoring costs. Avoidance may include a decision not to proceed with the project due to the values/risk that are present.

2.3.5 Minimization of Unavoidable Impacts

Minimization should only be considered once the decision has been made that a project must proceed; that there are no reasonable alternatives to the project; and, that there are no reasonable alternatives to locating the project within key/high value habitat or high risk areas. Minimization involves the reduction of adverse effects of development on the functions and values at all project stages (including planning, design, reclamation, remediation, implementation and monitoring), to the smallest practicable degree.

2.3.6 Compensation for Residual Impacts

Compensation is the last resort in the mitigation process and an indication of failure in the two earlier steps. In many cases, compensation may not be an option and it should only be considered for residual effects that were impossible to minimize or offset habitat related effects. Compensation refers to a variety of alternatives that attempt to “make up for” the unavoidable losses of, or damage to, values. Compensation may be an option for achieving “no net loss” when residual impacts of projects on values are deemed irreversible after relocation, redesign or mitigation options have been implemented.

After reviewing the project proposal and the potential impacts or risk to identified values, MFLNRO, DFO, the KNC and/or the Regional District of Central Kootenay may determine that the impacts are not acceptable if the impact to the values identified are too great and compensation is not feasible or adequate to address the impacts.

Habitat compensation involves replacing the loss of fish habitat with newly created habitat or improving the productive capacity of some other natural habitat. Depending on the nature and scope of the compensatory works, habitat compensation may require, but not be limited to, several years of post-construction monitoring and evaluation to ensure actions completed were effective. In the event that functional objectives of the compensation are not achieved (i.e., due to failure or inadequate maintenance), additional remediation or redevelopment of the compensation works may be required to achieve the compensation objectives. There is no guarantee that projects in high value fish habitats that result in serious harm of fish habitat will be authorized by either the Province under the Water Sustainability Act, or by DFO under the Fisheries Act.

All proponents are advised that data collected within the FIM is available for use and proponents are encouraged to include this information in their planning for proposed activities. The data collected within the FIM does not remove the requirement for proponents to retain a Qualified Environmental Professional to help them develop plans for their activities because it does not include site-specific considerations due to the scale of the assessment.

2.3.8 Requirements of Other Agencies

The guidelines presented in this document are best applied during the initial stages of development planning. Proposed works may be subject to other requirements such as local government zoning or permitting, Water Sustainability Act approvals or notifications (many are noted herein, but not necessarily all) and Section 11 Water License applications, Heritage Conservation Act permits, Land Act permits, licenses or permissions for occupation of Crown Lands, or Navigable Waters Protection Act approvals. It remains the responsibility of the project proponent to verify this information and meet all regulatory requirements that may apply to their project.

The MFLNRO, KNC and DFO support the use of these guidelines by other regulatory agencies to define and communicate design, assessment and review standards for protection of identified values on Kootenay Lake. All agencies in the Kootenay Lake Partnership recognize and respects that local governments and other agencies may limit works or activities for reasons other than those listed in this document, provided that design, assessment and review standards for activities that are supported meet or exceed the minimum described in this report.

2.4 Archeological Shoreline Potential

2.4.1 Background

Archaeological remains include deposits of objects (stone artifacts, bone fragments and fire broken rock) and features such as pits, hearths, cairns and pictographs that were left behind as a result of a range of human activities that took place hundreds to more than 10,000 years ago. The arrangement of these materials on the landscape provides clues as to what these activities were, so as to decipher and reconstruct the ways of life of past inhabitants. Any disturbance of the arrangements of the clues makes it difficult to accurately reconstruct what happened. The *Heritage Conservation Act* was passed with the intention of protecting archaeological sites from disturbances or alterations that would negatively affect their value or “significance”. One activity of archaeologists is to assemble inventories of archaeological sites so that they can be conserved.

There have been a number of inventories conducted over the years, but the scarcity of resources to support this activity are such that most parts of the province have not been subject to intensive investigation. The need to be proactive in attempting to conserve important archaeological evidence has given rise to the prediction of the likelihood of occurrence of significant archaeological remains (known as “archaeological potential”), one of the products of an Archaeological Overview Assessment (AOA).

A number of historic shipwrecks exist on the West Arm and main body of Kootenay Lake. While these sites are not covered by the Shoreline Management Guideline’s Archaeology Risk Assessment or associated shoreline maps, all Historic Wrecks and their cargo are protected under the provincial *Heritage Conservation Act*, and may not be damaged, altered or moved in any way without a Section 12 or 14 permit.

2.4.2 Overview of Archeological Process

In the Kootenay Lake AOA (Choquette, 2015), the definition of archaeological potential is an expert knowledge assessment based in part on the known distribution of archaeological sites in the Kootenay Lake vicinity (including Duncan Reservoir and Creston Flats) and in part by extrapolation from regional models of past human land and resource use in the upper Columbia River drainage. In both cases, the prediction of probability of site occurrence is linked to the landscape by geographic characteristics including aspect; relationship to water; biotic associations such as vegetation, ungulate range, fisheries values; the age of a given landform; and the geological processes that created it.

The landscape within 100 metres of the present Kootenay Lake shoreline was evaluated using this process and landforms were identified and assessed for their archaeological potential. These landforms were then tested in the field to ensure that the model was accurate and incorporated into the mapping for this Shoreline Guidance Document.

2.4.3 Overview of Archeological Risk

In this assessment, Risk to Archaeological Values relates to the likelihood of disturbance occurring to landforms known to be associated with archaeological materials and features. The following table outlines whether the proposed activity would risk impacting archaeological sites, based on which coloured shoreline segment that activity falls within. Below the table is a description of what each of those risk categories mean, and recommended actions to take in order to streamline a development application process.

Low Risk

Low risk implies that the action is not likely to impact archaeological materials or features. This could also mean that the action is to take place where recent disturbance is sufficiently great as to have altered the context beyond the capacity of archaeological investigation to detect evidence or reconstruct past human activity beyond presence.

If your proposed activity is deemed to have low risk, no further archaeological assessment or action is required.

Moderate Risk

Moderate Risk applies to situations where the activity itself might not constitute a potential threat to intact archaeological materials but ancillary activities (e.g. those involving access to, from or across land or some disturbance of mineral soil) may cause impacts to known archaeological sites or where such are likely to be present.

If your proposed activity is deemed to have moderate risk, please follow the Archaeological Chance Find procedure found in Table 2.

High Risk

High Risk pertains to localized and/or relatively superficial effects in locations where the physical evidence is likely to be very sparse, highly localized, deeply buried and/or already too highly disturbed to be of further archaeological value.

If your activity is deemed to be of high risk, please contact a consulting archaeologist with experience in this area. The Archaeologist should conduct a review of your project and provide you with a recommendation for further action. If the recommendation is that no further work is needed, please submit this in writing to the relevant regulatory agencies as part of your application. If further work is needed in the form of an in-field assessment, please submit the results of the assessment as a part of your application package.

Very High Risk

Very High Risk is defined as the potential for significant pre-contact archaeological remains to be adversely impacted by the activity.

If your activity is deemed to be very high risk, please contact a consulting archaeologist with experience in this area to conduct an in-field archaeological assessment. This assessment may require an additional permit, which can take time to obtain, so it is recommended that you contact an archaeologist as soon as possible. The results of the assessment should be submitted to the relevant regulatory agencies as part of your application package.

A list of archaeological consultants who are permitted to conduct work in British Columbia can be found here: <http://www.bcapa.ca/members/consulting-firms>.

2.4.4 Archeological Activity Risk Matrix

The following table summarizes archeological risks as they relate to the shoreline of Kootenay Lake.

Table 4: Archeological Risk Matrix. Risk is identified by colour and symbol (Very High, High, Moderate, and Low). Archeological zones are identified on the Figure Binder, and coloured as Red, Orange, Yellow, and Brown (see Table 1).

Activity*	Risk Assessment			
	Red	Orange	Yellow	Brown
Aquatic Vegetation Removal				
Removing native aquatic vegetation by hand or mechanical cutting for swimming areas and private beach access	M	M	L	L
Removing non-native/invasive aquatic vegetation by hand or mechanical cutting for swimming areas and private beach access	M	M	L	L
Dredging, Infilling and Beach Creation				
Dredging (new proposals)	H	H	M	L
Maintenance Dredging: dredging has occurred in last 10 years, no temporary or permanent increase in footprint below the NB**, dredged material deposited on land	H	H	M	L
Lake infilling (e.g. extension of upland landscaping)	H	H	M	L
Beach creation below lake NB	VH	VH	M	L
Beach creation above the lake NB	Refer to Landscaping in Land Development			
Transition to Private Land from Crown Land				
Application to purchase crown land (crown grant)	VH	VH	H	L
Erosion Control, Foreshore Sediment Control, Foreshore Disturbance or Wave Control Structures				
New groyne construction or increase in existing footprint	Not allowed			
Maintenance of existing groyne, no increase in existing footprint	VH	VH	H	L
Erosion control (e.g. concrete, rip rap, vegetation, etc.)	H	H	H	L
Infill breakwaters or boat basins	H	H	H	L
Wave control structures	H	H	H	L
Foreshore sediment disturbance and removal of lakebed substrate	VH	VH	H	L
Boat Launches				
Construction of new hard surface boat launch or repair/upgrade of existing hard surface boat launch without land tenure	VH	VH	H	L
Upgrade/repair of existing hard surface boat launch with land tenure and within existing footprint	VH	VH	H	L
Upgrade/repair of existing hard surface boat launch with land tenure and increasing size of the existing allowable footprint	VH	VH	H	L
Construction of new boat rail launch or repair/upgrade of existing boat rail launch without land tenure	VH	VH	H	L
Upgrade/repair of existing boat rail launch with land tenure and within existing footprint	H	H	M	L
Buoys				
Placement of up to 2 helical screw anchor mooring buoys for non-commercial use. Refer also to Transport Canada - Navigable Waters	M	M	M	L
Placement of up to 2 non-helical screw mooring buoys for non-commercial use. Refer also to Transport Canada - Navigable Waters	M	M	M	L
Placement mooring buoys for commercial use – refer to Marina Activities. Refer also to Transport Canada - Navigable Waters	H	H	M	L
Docks / Boathouses / covered boat storage areas				
Docks	VH	VH	M	L
Residential boathouses / covered boat storage	Not allowed			
Marinas - Commercial				
Upgrade and new construction	VH	VH	H	L
Water Withdrawal, Use or Discharge				
Waterline - directional drilling (May require a Water Licence)	M	M	M	L
Waterline - open excavation (May require a Water Licence)	VH	VH	H	L
Geothermal heating/cooling - commercial, industrial, strata or multi-family (May require a Water Licence)	VH	VH	H	L
Geothermal heating/cooling - single family residence (May require a Water Licence)	H	H	H	L
Treated effluent discharge pipe	H	H	H	L
Commercial water withdrawals (May require a Water Licence)	H	H	H	L
Pile-supported Structures below the NB				
Overwater piled structure (e.g. building, deck, etc.)	M	M	M	L
Elevated boardwalk located offshore of the lake NB	M	M	M	L
Land development				
Native Vegetation modification / removal	H	H	H	L
Non-native Vegetation modification / removal	M	M	M	L
Building permit application	M	M	M	L
Landscaping with Native Vegetation	M	M	M	L
Landscaping with Non Native Vegetation	M	M	M	L
Development permit applications	H	H	H	M
Drilling and blasting (note that any drilling or blasting within 30 m of HWL also requires liaison with Local Government, as other permits may exist.)	VH	VH	H	M
Septic application	VH	VH	H	M

* For all Activities if SARA species and/or critical habitat present refer to Projects Near Water Website for next steps.

**NB refers to natural boundary

2.5 Cultural Values Shoreline Vulnerability

2.5.1 Cultural Values Overview

The Ktunaxa Nation Council (KNC) represents the aboriginal rights and title of Ktunaxa citizens living in Canada, including at Yaqan Nukiy (Lower Kootenay Band) at the south end of Kootenay Lake near Creston. Ktunaxa rights and title remained in place after Canada and the United States settled on a border in 1846 and Aboriginal rights were recognized and affirmed in the Canadian constitution of 1982. As such, the Ktunaxa Nation Council and the people of Yaqan Nukiy play an important role in the past, present and future stewardship of Kootenay Lake and its shorelines.

The special nature of Ktunaxa rights requires local, provincial and federal governments (the Crown) to consult meaningfully with the Ktunaxa Nation Council and work to accommodate Ktunaxa cultural values and other interests where they may be impacted by a government decision. On Kootenay Lake, many Ktunaxa rights are closely connected to important places, resources (including plants, fish, and habitats), and practices that rely on Kootenay Lake shorelines. While the ultimate responsibility for consultation and engagement with the Ktunaxa is held by local, provincial and federal governments (the Crown), the Crown may delegate some aspects of this to third parties like private land owners and developers. When this happens, the Crown remains responsible for making sure that consultation happens properly. Depending on the specific activities proposed the process may be time consuming especially in areas identified by the KNC for enhanced engagement. The table below, and associated maps, are intended to help regulators, as well as others, anticipate where certain kinds of Kootenay Lake shoreline activities are likely to require more in-depth engagement in relation to currently documented Ktunaxa cultural values. As additional work takes place, the table below, and associated maps, may be refined or updated.

2.5.2 Cultural Values Process

Criteria used to identify Ktunaxa Valued Cultural Components (VCCs) for the Kootenay Lake Shoreline fall into three broad categories:

- 1) **Archaeological:** Proximity to known Ktunaxa archaeological sites (pre-1846, as well as pictographs, burials and other defined archaeological sites), or high archaeological potential (see archaeological value mapping).
 - 2) **Ecological:** Proximity to high value riparian and shoreline habitat (see ecological value mapping).
 - 3) **Cultural:** Proximity to documented Ktunaxa cultural values including:
 - environmental features and highly valued habitat areas (e.g. spawning areas, beach fan habitats, migration corridors), or;
-

- known Ktunaxa cultural use areas (e.g. trails, habitation areas, harvesting areas, other cultural areas), or;
- historic wetlands and wetland restoration areas, and areas related to restoration and maintenance of natural (pre-regulation) flow patterns and landforms, or;
- access values, including areas that are regularly used due to existing access, and areas where changes in access may influence the practice of Ktunaxa rights and title in the area.

This document provides shoreline guidance specific to currently recorded Ktunaxa cultural values. Shoreline areas were associated with particular Ktunaxa cultural values where they were located within 500m of a documented Ktunaxa cultural use area, or other identified shoreline feature.

Standard Engagement with Ktunaxa

Shoreline areas identified as requiring standard engagement with the Ktunaxa Nation should follow the engagement procedure outlined within the Ktunaxa – BC Strategic Engagement Agreement:

<http://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations-negotiations/first-nations-a-z-listing/ktunaxa-nation>

Applications in standard engagement areas should be submitted to the appropriate regulatory agency, and referred to the KNC as per standard practice. Please follow the guidelines within the aquatic ecosystem and archaeological risk matrices, and provide a detailed application package to the regulatory body.

Enhanced Engagement Process With Ktunaxa Nation Council

Shoreline areas identified as requiring enhanced engagement with the Ktunaxa Nation Council are those that are anticipated, based on current information, to be more complex in nature and require a more in depth review by the Ktunaxa Nation Council or one of its member communities. Decisions made within enhanced engagement areas will generally call for increased Ktunaxa Nation involvement.

This level of engagement aligns with the Ktunaxa – BC Strategic Engagement Agreement available here:

<http://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations-negotiations/first-nations-a-z-listing/ktunaxa-nation>

If a development falls within an area requiring enhanced Ktunaxa engagement, please follow the guidelines within the aquatic ecosystem and archaeological risk matrices, and provide a detailed application package to the appropriate BC or local regulatory body.

Depending on the activity and the shoreline area, there may be a high risk of infringing on Ktunaxa title and rights. In many cases, activities with high risk to Ktunaxa Cultural Values are unlikely to be supported unless mitigations or specific work procedures are agreed to, implemented and monitored. If you have questions about an activity identified being high risk, please contact the Ktunaxa Nation Council Referral Coordinator.

Referral Coordinator
Ktunaxa Nation Council
7468 Mission Road
Cranbrook, BC, V1C 7E5
Referrals@ktunaxa.org
1-250-489-2464 ext. 4026

2.5.3 Cultural Values Activity Risk Matrix

Cultural values vary in space, resulting in differences in risks, and levels of engagement needed. The following table highlights the level of engagement.

Table 5: Cultural Engagement Matrix. The level of engagement is identified as either enhanced or standard. The colour at the top is identified in the attached Figure Binder and refers to specific locations around Kootenay Lake. The risk is identified by the colour of the cell. Red indicates a high risk that the Ktunaxa Nation Council will not support the application without consultation and mitigation, yellow indicates moderate risk, and green indicates low risk.

Activity*	Level of Engagement Areas	
	Purple	Grey
Aquatic Vegetation Removal		
Removing native aquatic vegetation by hand or mechanical cutting for swimming areas and private beach access	Enhanced	Standard
Removing non-native/invasive aquatic vegetation by hand or mechanical cutting for swimming areas and private beach access	Standard	Standard
Dredging, Infilling and Beach Creation		
Dredging (new proposals)	Enhanced	Standard
Maintenance Dredging: dredging has occurred in last 10 years, no temporary or permanent increase in footprint below the NB**, dredged material deposited on land	Enhanced	Standard
Lake infilling (e.g. extension of upland landscaping)	Enhanced	Standard
Beach creation below lake NB	Enhanced	Standard
Beach creation above the lake NB	Enhanced	Standard
Transition to Private Land from Crown Land		
Application to purchase crown land (crown grant)	Enhanced	Standard
Erosion Control, Foreshore Sediment Control, Foreshore Disturbance or Wave Control Structures		
New groyne construction or increase in existing footprint	Not Allowed	
Maintenance of existing groyne, no increase in existing footprint	Enhanced	Standard
Erosion control (e.g. concrete, rip rap, vegetation, etc.)	Enhanced	Standard (Low to Moderate Risk)
Infill breakwaters or boat basins	Enhanced	Standard
Wave control structures	Enhanced	Standard
Foreshore sediment disturbance and removal of lakebed substrate	Enhanced	Standard
Boat Launches		
Construction of new hard surface boat launch or repair/upgrade of existing hard surface boat launch without land tenure	Enhanced	Standard
Upgrade/repair of existing hard surface boat launch with land tenure and within existing footprint	Enhanced	Standard
Upgrade/repair of existing hard surface boat launch with land tenure and increasing size of the existing allowable footprint	Enhanced	Standard
Construction of new boat rail launch or repair/upgrade of existing boat rail launch without land tenure	Enhanced	Standard
Upgrade/repair of existing boat rail launch with land tenure and within existing footprint	Enhanced	Standard
Buoys		
Placement of up to 2 helical screw anchor mooring buoys for non-commercial use. Refer also to Transport Canada - Navigable Waters	Standard	Standard
Placement of up to 2 non-helical screw mooring buoys for non-commercial use. Refer also to Transport Canada - Navigable Waters	Enhanced	Standard
Placement mooring buoys for commercial use – refer to Marina Activities. Refer also to Transport Canada - Navigable Waters	Enhanced	Standard
Docks / Boathouses / covered boat storage areas		
Docks	Enhanced	Standard
Residential boathouses / covered boat storage	Not Allowed	
Marinas - Commercial		
Upgrade and new construction	Enhanced (risk varies from Moderate to High)	Standard (Low to Moderate Risk)
Water Withdrawal, Use or Discharge		
Waterline - directional drilling (May require a Water Licence)	Enhanced	Standard
Waterline - open excavation (May require a Water Licence)	Enhanced	Standard
Geothermal heating/cooling - commercial, industrial, strata or multi-family (May require a Water Licence)	Enhanced	Standard
Geothermal heating/cooling - single family residence (May require a Water Licence)	Enhanced	Standard
Treated effluent discharge pipe	Enhanced	Standard
Commercial water withdrawals (May require a Water Licence)	Enhanced	Standard
Pile-supported Structures below the NB		
Overwater piled structure (e.g. building, deck, etc.)	Enhanced	Standard
Elevated boardwalk located offshore of the lake NB	Enhanced	Standard
Land development		
Native Vegetation modification / removal	Enhanced	Standard
Non-native Vegetation modification / removal	Enhanced	Standard
Building permit application	Enhanced	Standard
Landscaping with Native Vegetation	Enhanced	Standard
Landscaping with Non Native Vegetation	Enhanced	Standard
Development permit applications	Enhanced	Standard
Drilling and blasting (note that any drilling or blasting within 30 m of HWL also requires liaison with Local Government, as other permits may exist.)	Enhanced	Standard
Septic application	Enhanced	Standard
* For all Activities if SARA species and/or critical habitat present refer to Projects Near Water Website for next steps.		
**NB refers to natural boundary		

3.0 PROCESS CONSIDERATIONS

3.1 Monitoring and Adaptive Management

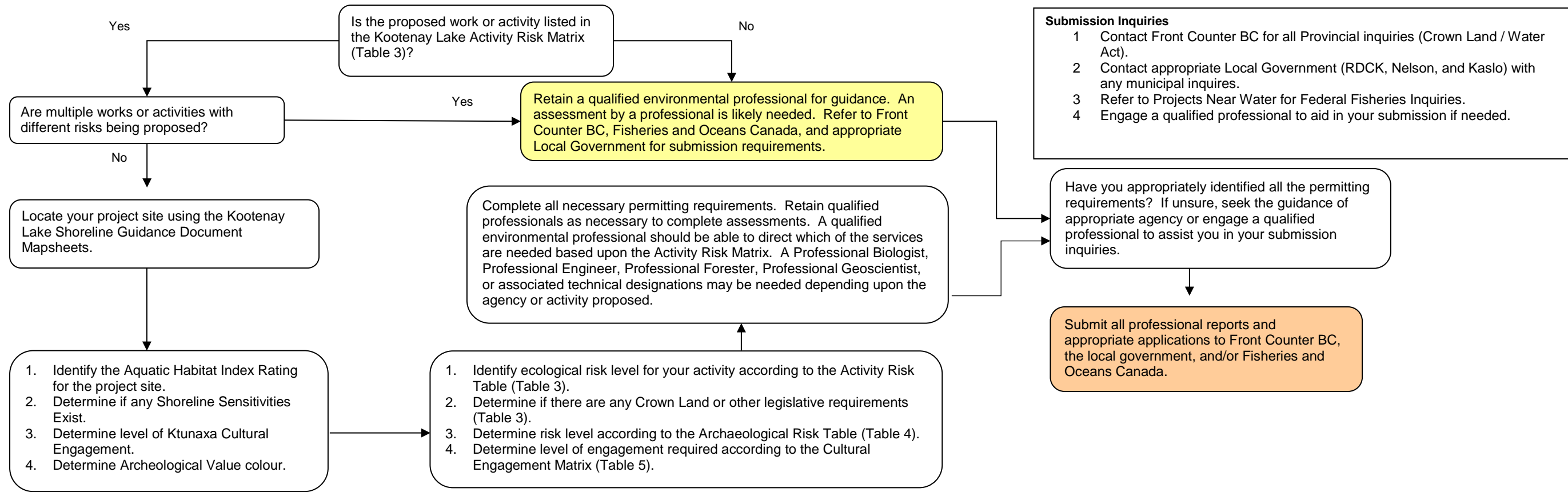
The management guidelines presented in this report represent an assumption of risk by the Kootenay Lake Partnership in regards to balancing environmental, archaeological and Ktunaxa cultural values concerns with ongoing development. They provide an opportunity to move from a reactive position that solicits referrals, offers advice and authorizations and tracks correspondence as a measure of program outputs to a proactive position. This proactive position enables and engages those best-placed to deliver results-based standards, monitor and audit compliance and effectiveness. It also allows for reporting on the status of fish and riparian habitat at an ecosystem level through periodic updates to FIM survey data, updating the provincial archaeological database and a way to better address Ktunaxa concerns. Ultimately, whether or not this change achieves objectives such as “No Net Loss” of productive fish habitat or preventing further loss of public access to the Lake will likely depend on agency preparedness at all levels of government to reallocate staff time that would previously have been spent on referral review and response to compliance and effectiveness monitoring of the FIM, the AOA and the Ktunaxa Values identification and adaptive management of the risk-based guidelines presented in this report.

REFERENCES

- Choquette, Wayne, 2015. Archaeological Overview Assessment of Fortis Infrastructure Around Kootenay Lake BC. On file with the Ktunaxa Nation Council.
- Cormano, A. and Schleppe, J., 2013. Kootenay Lake Foreshore Inventory and Mapping and Aquatic Habitat Index. Ecoscape Environmental Consultants Ltd. Project File: 12-952. July 2013. Prepared for: Kootenay Lake Partnership & Fisheries and Oceans Canada.
- DFO, 2001. Policy for the Management of Fish Habitat. Published by: Fisheries and Oceans Canada. Prepare by: Fish Habitat Management Branch.
- Ecoscape, 2011. Shoreline Management Guidelines For Fish and Fish Habitat: Shuswap, Mara, and Little Shuswap Lakes. Prepared in in conjunction and cooperation with: Fisheries and Oceans Canada and Ministry of Natural Resource Operations. Prepared for: Fraser Basin Council Society.
- East Kootenay Integrated Lakes Management Partnership [EKLIMP], 2008. Windermere Lake Shoreline Management Guidelines for Fish and Wildlife Habitats. January, 2008.
- Jennings, S., Nussbaum, R., Judd, N., et al., 2003. The High Conservation Value Toolkit. Proforest, Oxford (three-part document).
- Professional Reliance Working Group [PRWG], 2008. Applying Professional Reliance under FRPA, April 2008. Association of BC Forest Professionals Web site 3 March 2011. http://www.abcfp.ca/publications_forms/publications/documents/report_PR_Workgroup.pdf
- Schleppe, J., 2009a. Moyie Lake Foreshore Inventory and Mapping. Ecoscape Environmental Consultants Ltd.. Project File: 09-371. July, 2009. Prepared for: East Kootenay Integrated Lake Management Partnership.
- Schleppe, J., 2009b. Shuswap and Mara Lake Foreshore Inventory and Mapping. Ecoscape Environmental Consultants Ltd. Project File: 08-329. April, 2009. Prepared for: Fisheries and Oceans Canada and Columbia Shuswap Regional District
- Schleppe, J., 2010. Mabel Lake Foreshore Inventory and Mapping. Ecoscape Environmental Consultants Ltd. Project File: 09-485. November, 2010. Prepared for: Fisheries and Oceans Canada and Project Partners
- Schleppe, J. 2011a. Mabel Lake Shoreline Guidance Document. Prepared for: Regional District of North Okanagan, Fisheries and Oceans Canada, and the Ministry of Natural Resource Operations. Prepared by Ecoscape Environmental Consultants Ltd. March 2011.
- Schleppe, J. 2011b. Shuswap Lake Shoreline Guidance Document. Prepared for: Fraser Basin Council Society, Fisheries and Oceans Canada, the Ministry of Natural Resource Operations, and the Shuswap Lake Integrated Planning Partnership. Prepared by Ecoscape Environmental Consultants Ltd. April 2011.
- Tobias, Terry N. 2009. *Living Proof: The Essential Data-Collection Guide for Indigenous Use-and-Occupancy Map Surveys*. Vancouver, BC: Ecotrust Canada and Union of BC Indian Chiefs.
- The Firelight Group, 2015. Ktunaxa Nation Community Report 2015: Summary of Recent Research on Ktunaxa Diet and Qukin ʔamakʔis (Raven's Land) Ktunaxa Interest and Use. <http://www.ktunaxa.org/four-pillars/lands-resource-agency/lands-and-resources-multimedia/>
-

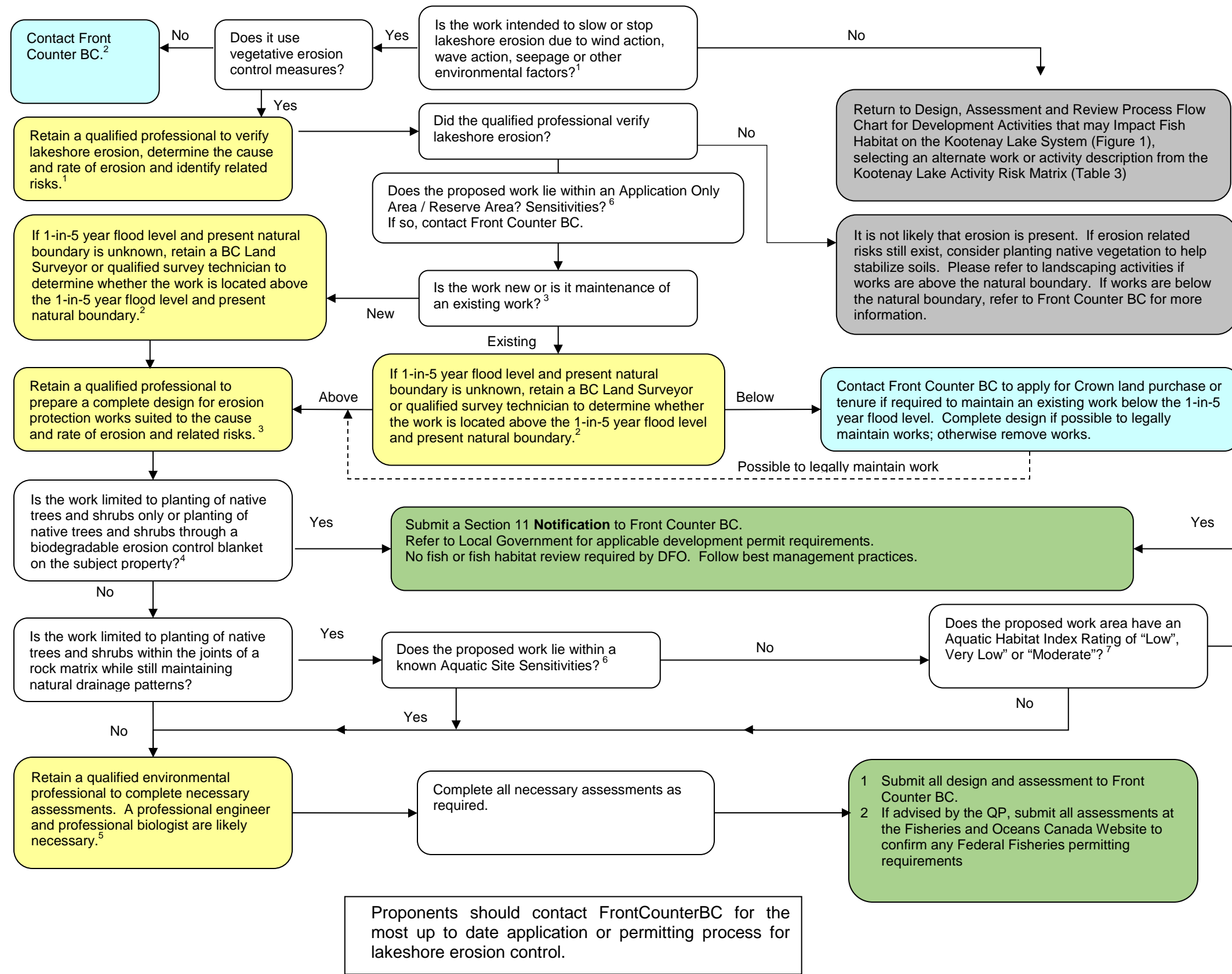
FLOW CHARTS

Figure 1 Design, Assessment and Review Process Flow Chart for Development Activities that may Impact Fish Habitat, Archaeological and Cultural Values on the Kootenay Lake System.



Proponents should contact FrontCounterBC for the most up to date application or permitting process for development activities that may impact fish habitat.

Figure 2 Design and Assessment Flow Chart for Lakeshore Erosion Control on the Kootenay Lake System

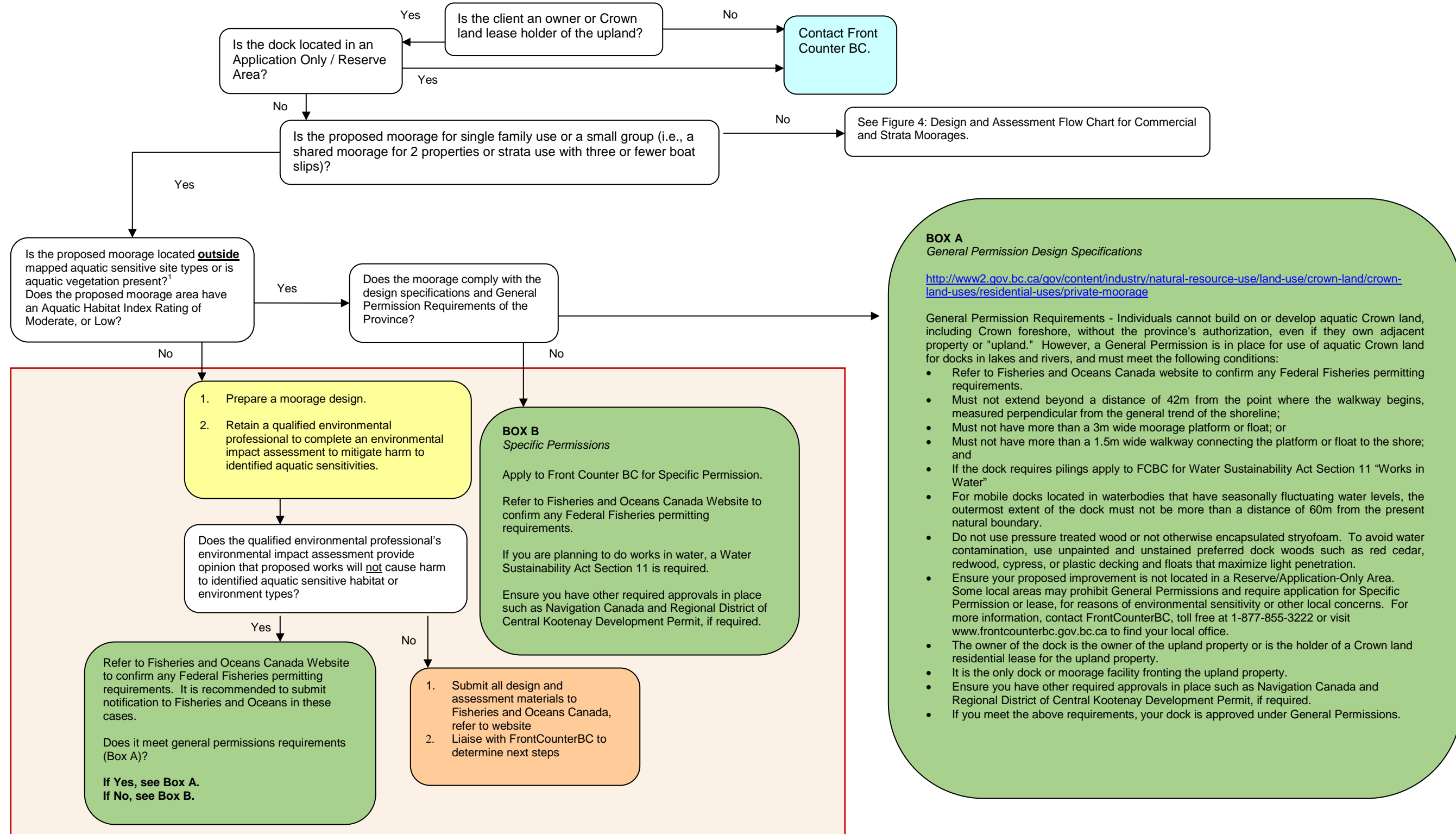


Notes:

- Indicators of lakeshore erosion include large areas of bare soil and steep, high banks at the natural boundary, noticeable recession of the natural boundary over a period of time, leaning or downed trees with exposed roots at the natural boundary, large patches of muddy water at the lake margin during high water and large deposits of eroded soil on the lakeshore following high water.
- All proposed works should not alter the present natural boundary of the subject property and a survey is needed to confirm the location with a high degree of accuracy. Erosion-related risks include loss of property and damage or loss of nearshore structures. You must prove that the works are not able to be placed on private land. Applications pertaining to rock gravity walls, retaining walls, or foreshore fills on Crown land are not normally accepted by FrontCounterBC.
- The proposed design should be bioengineered and may require the services of a Professional Biologist and Engineer. Maintenance of an existing work is limited to replacement of less than one half of an existing erosion control structure on its existing foundation and must not include any lake ward extension of the existing structure or backfill.
- Refer to appropriate bioengineered Best Management Practices and seek the guidance of a professional(s) as needed. Depending upon risks, more than one professional may be required to address engineering or biological considerations.
- Many lakeshore erosion protection options are available, including planting of native trees and shrubs, planting of native trees and shrubs through a biodegradable erosion control blanket, planting of native trees and shrubs within the joints of a rock matrix and hard armoring techniques. Additional information is provided in the BC Ministry of Environment report titled *Best Management Practices for Lakeshore Stabilization* (refer to referenced Best Management Practices in this document and through Provincial or Federal Agencies).
- Known site sensitivities are located on maps. Aquatic Site sensitivities include known or potential shore spawning kokanee, identified sturgeon habitat, or potential high value juvenile rearing areas. Other site sensitivities may also be present onsite and a qualified environmental professional should be consulted for guidance if needed (e.g., raptor nests, etc.)
- Aquatic Habitat Index Ratings are located on the Figure Binder.

Proponents should contact FrontCounterBC for the most up to date application or permitting process for lakeshore erosion control.

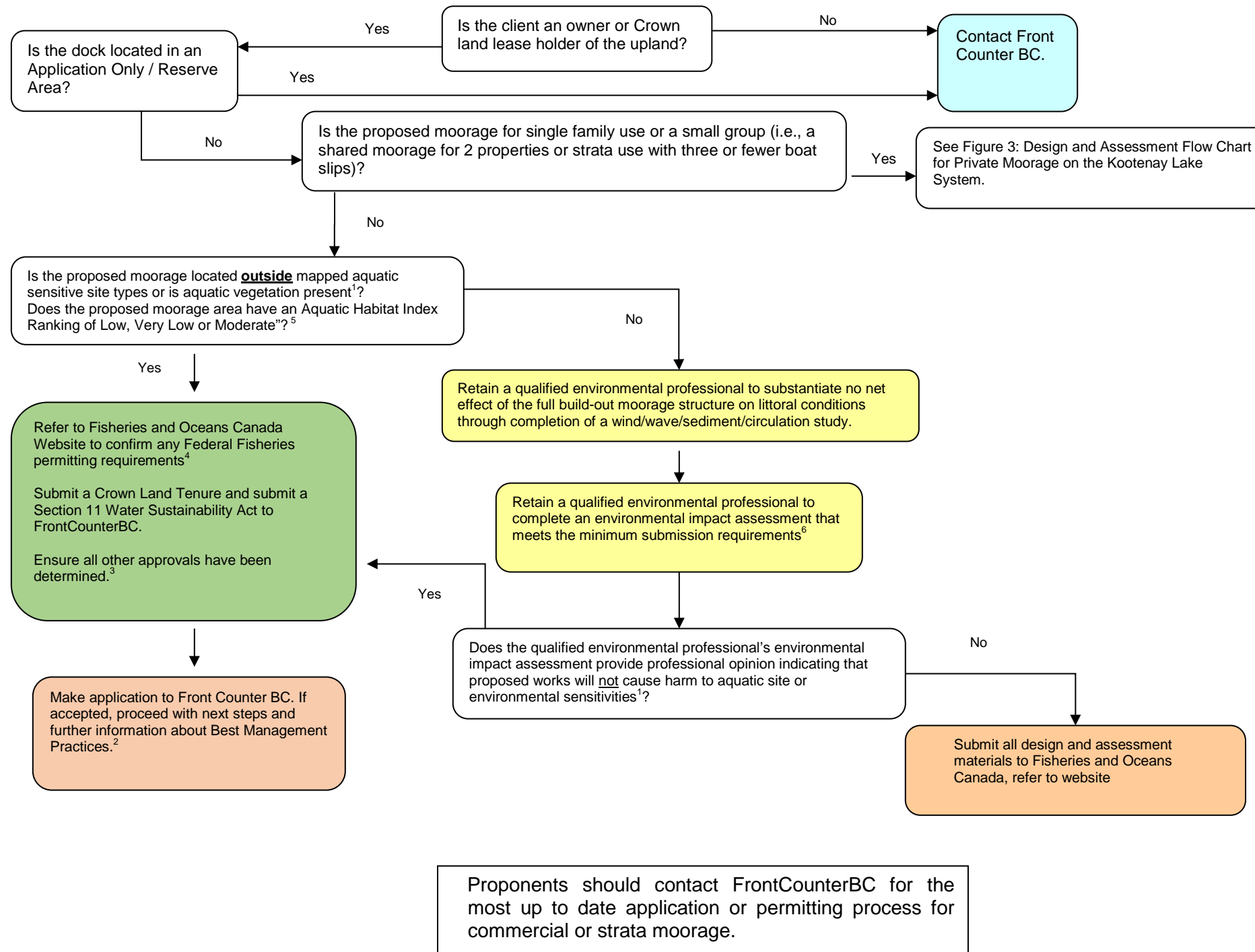
Figure 3 Design and Assessment Flow Chart for New Private Moorage on the Kootenay Lake System



1 Sensitive aquatic or aquatic site types are identified on the maps. The specific aquatic site sensitivity is found in the Foreshore Inventory and Mapping Report (see Schleppe and Cormano, 2012) and includes known or potential kokanee spawning areas, identified critical sturgeon habitat, and/or a high salmonid juvenile rearing

Proponents should contact FrontCounterBC for the most up to date application or permitting process for both general and specific permissions.

Figure 4 Design and Assessment Flow Chart for Commercial and Strata Moorage on the Kootenay Lake System



¹ Sensitive aquatic or aquatic site types are identified on the maps. The specific aquatic site sensitivity is found in the Foreshore Inventory and Mapping Report (see Schleppe and Cormano, 2012) and includes known or potential kokanee spawning areas, identified critical sturgeon habitat, proximity to salmon spawning streams, and/or a high salmonid juvenile rearing potential

² Draft MFLNRO include the following walkout/dock dimensions and shoreline proximity standards (http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/regs_best_mgmt_practices_updated.pdf) :

- o Floating portions of the dock must be located offshore of the 6 meter depth contour at mean annual low water.
- o Access to floating portions of the dock must be achieved by a single elevated fixed deck and ramp that must not exceed 1.5 meters in width. At a minimum, the base of the elevated fixed deck must be located at least 1 meter above the lake 1-in 5 year flood level. The remainder of the dock surface must not exceed 3 meters in width for any other portion of the dock.
- o Supported dock structures must use widely spaced wooden or steel piles that are made of non-toxic materials (solid core pilings will not be allowed). Do not use pressure treated wood.
- o Dock structures including any attached or detached boatlift mechanism must be greater than 5 meters from property lines. (Generally, property lines are projected perpendicular to shoreline.) If property is adjacent to a dedicated public beach access or park - a 6 meter offset is required. At least 10 m from any other moorage facility should be accommodated.
- o The placement of the dock shall be undertaken in a manner that:
 - o is consistent with the orientation of neighboring docks
 - o is sensitive to views and other impacts on neighbors
 - o is sensitive to increased boat traffic on neighbors
 - o avoids impacts on access to existing docks and adjacent properties
- o No roof or covered structures are to be placed on the dock or the boat lift.
- o Boat Lifts:
 - o No overhead boat lift mechanisms - utilize post style or facsimile that is supported from the bottom of the lake or to dock.
 - o No roof or covered structures.
 - o Must be located at least 5 meters from property line as lifts are considered as part of moorage structure.
- o Follow Operational Best Practices detailed in the BC Ministry of Environment document "Best Management Practices for Small Boat Moorage on Lakes" (see http://www.env.gov.bc.ca/wld/documents/bmp/BMPSmallBoatMoorage_WorkingDraft.pdf)

³ Refer to Fisheries and Oceans Canada website or Front Counter BC for minimum submission requirements.

⁴ Applications should be submitted to the Projects Near Water Website for review by DFO.

⁵ Aquatic Habitat Index Ratings are illustrated in the Figure Binder

Attachment 1
FORESHORE INVENTORY AND MAPPING
FIGURE BINDER
