



# Crawford Bay Regional Park Biophysical Assessment

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April 20, 2020

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April 20, 2020

## EXECUTIVE SUMMARY

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The Regional District of Central Kootenay contracted EcoLogic Consultants Ltd., in conjunction with Masse Environmental Consultants Ltd., to conduct a biophysical inventory of Crawford Bay Regional Park. Baseline information collected for this inventory is intended to assist with park management planning that identifies and protects sensitive ecosystems and species biodiversity, while providing passive recreation opportunities to the residents of the Central Kootenay.

The Crawford Bay Regional Park is located in Crawford Bay on the East Shore of Kootenay Lake. The property was purchased by the RDCK in 2018 for the purpose of creating a new regional park. Previously owned as a development property, portions of the property have a long history of use starting with farming, and then the dredging of a small creek for the creation of an inland marina and pond system in 1967, and creation of a grass airstrip from 1968 to 1970.

This project included a variety of studies, including terrain and ecosystem mapping, and a biophysical survey. Mapping and inventory work was completed as per provincial protocols and methodologies. A total of 59 sample plots were established in the study area over two days in October 2019. These data were then used to create a Sensitive Ecosystem Inventory map, proposed park management zones, and management recommendations.

The results of the Sensitive Ecosystem Inventory mapping indicate that 50.2 ha (51.3%) of the park should be considered to be a Sensitive Ecosystem, while 27.0 ha (27.6%) was classified as Other Important Ecosystems and 20.6 ha (21.1%) was classified as Not Sensitive. Mapping included the identification of six types of at-risk ecosystems, including three low-bench floodplains, one mid-bench floodplain, one marsh, and one swamp.

Based on a search of the B.C. Conservation Data Centre database, a total of 119 species at risk (both federal and provincially assessed) have the potential to occur in the area, with 10 species at risk confirmed in the park. Two invertebrates (snails) were discovered during the 2019 field surveys and are new records for the study area. The other species were reported during previous studies or by local residents.

A total of 360 species of flora and fauna have been documented in the park to date. This list includes the results of literature searches to determine species found during previous studies and the results of the 2019 field surveys. As the 2019 field studies were conducted in the late fall, it is expected that the total number will increase significantly with additional field work.

## TABLE OF CONTENTS

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Executive Summary.....	i
Table of Contents.....	ii
List of Figures.....	iii
List of Tables.....	iii
List of Plates.....	iv
List of Appendices.....	v
1. Introduction.....	1
2. Project Overview.....	1
2.1 Project Setting.....	1
2.2 Biogeoclimatic Unit.....	4
3. Inventory Methodology.....	5
3.1 Ecosystem Mapping.....	5
3.2 Sensitive Ecosystem Inventory Mapping.....	6
3.3 Species and Ecosystems at Risk.....	7
3.4 Biodiversity.....	8
3.5 Management Zone Classification.....	9
4. Inventory Results.....	10
4.1 Terrain and Ecosystem Mapping.....	10
4.1.1 Terrain and Soils.....	12
4.1.2 Ecosystems.....	15
4.2 Sensitive Ecosystem Inventory Mapping.....	18
4.2.1 Sensitive Ecosystems.....	21
4.2.2 Other Important Ecosystems.....	30
4.2.3 Not Sensitive.....	31
4.3 Species and Ecosystems at Risk.....	32
4.4 Biodiversity.....	33
4.4.1 Fish and Fish Habitat.....	33
4.4.2 Mammals.....	35

4.4.3	Birds.....	37
4.4.4	Reptiles and Amphibians.....	41
4.4.5	Invertebrates.....	41
4.4.6	Vascular Plants.....	44
4.4.7	Fungi.....	49
4.4.8	Other (mosses, lichens and slime moulds).....	52
5.	Proposed Management Zones.....	53
6.	Management Recommendations.....	57
	References.....	61

### List of Figures

Figure 2.1-1.	Crawford Bay Regional Park Overview.....	2
Figure 2.1-2.	Air photo of the study area in the 1950s showing limited modification.....	3
Figure 2.1-3.	Air photo of the study area in the 1960s showing the modification of watercourses and creation of the beaver pond and construction of the airstrip.....	3
Figure 2.2-1.	Distribution of the ICHdw1 (Adapted from MacKillop and Ehman 2016).....	4
Figure 4.1-1.	Ecosystem Field Plots.....	11
Figure 4.1-2.	Terrain Mapping.....	14
Figure 4.1-3.	Ecosystem Mapping.....	17
Figure 4.2-1.	Sensitive Ecosystem Inventory Mapping.....	19
Figure 4.2-2.	Sensitive Ecosystem Inventory Subclasses.....	20
Figure 5-1.	Current Park Use Zones.....	54
Figure 5-2.	Proposed Management Zones.....	55

### List of Tables

Table 4.1-1. Summary of Terrain and Soil Mapping .....	12
Table 4.1-2. Summary of Ecosystem Mapping.....	15
Table 4.2-1. Summary of Sensitive Ecosystem Inventory Mapping.....	18
Table 4.3-1. Identified Species at Risk .....	32
Table 4.3-2. Mapped Ecosystems-at-Risk .....	33
Table 4.4-1. Fish Species .....	33
Table 4.4-2. Mammals .....	35
Table 4.4-3. Potential Mammals.....	36
Table 4.4-4. Birds .....	37
Table 4.4-5. Potential Amphibians and Reptiles .....	41
Table 4.4-6. Invertebrates.....	41
Table 4.4-7. Vascular Plants .....	45
Table 4.4-8. Fungi.....	49
Table 4.4-9. Other Species. ....	52

### List of Plates

Plate 4.2-1. Large modified pond in the middle of the study area.....	21
Plate 4.2-2. Mature conifer forest. ....	22
Plate 4.2-3. Mature mixed forest with evidence of past harvesting. ....	22
Plate 4.2-4. Mature Fm01 cottonwood floodplain forest with old-growth veterans.....	23
Plate 4.2-4. Old mixed cottonwood – western redcedar forest. ....	23
Plate 4.2-5. Large old black cottonwood wildlife tree. ....	24
Plate 4.2-6. Undercut Fm01mid-bench cottonwood floodplain along Crawford Creek.....	25
Plate 4.2-7. Sparse F100 low-bench floodplain and gravel bar in Crawford Creek. ....	25
Plate 4.2-8. Young Fm01 mid-bench floodplain at the upper flood limit on Kootenay Lake. ....	26
Plate 4.2-9. F103 low-bench floodplain along the Kootenay Lake foreshore.....	26
Plate 4.2-10. Scrubby willow lake foreshore. ....	27
Plate 4.2-11. Kootenay Lake beach.....	27
Plate 4.2-12. Ws06 swamp along Crawford Creek. ....	28
Plate 4.2-13. Ws01 swamp near Beaver Creek.....	28
Plate 4.2-14. Unclassified lesser-panicked sedge fen.....	29
Plate 4.2-15. Remnant of a Wm05 cattail marsh.....	29

Plate 4.2-16. Unclassified marsh community in old oxbow near Beaver Creek. .... 30

Plate 4.2-17. Shallow Open Water wetland in old oxbow near Beaver Creek. .... 30

Plate 4.2-18. Reed canary grass Wm! marsh. .... 31

Plate 4.2-19. Hay field. .... 31

Plate 4.4-1. Crawford creek looking upstream near mouth. Good habitat complexity with riffles, deep pools and abundant large woody debris. .... 34

Plate 4.4-2. Crawford creek looking downstream near mouth. .... 35

Plate 4.4-3. Beaver dam on historically modified creek. .... 37

Plate 4.4-4. Pileated woodpecker feeding cavities on western redcedar. .... 40

Plate 4.4-5. False jeweled beetle. There were dozens of these beetles on the beach front, Oct. 19, 2019. .... 43

Plate 4.4-6. European ground beetle. Introduced species found under black cottonwood, Oct. 18, 2019. .... 43

Plate 4.4-7. Introduced giant gardenslug (left) and native reticulate taildropper slug (right) on a large Artist’s Conk (*Ganoderma applanatum*) growing on a large dead standing black cottonwood. .... 44

Plate 4.4-8. Black gloss snail. .... 44

Plate 4.4-9. *Ciboria* cf. *seminicola* on *Alnus incana* cone in wetland habitat. This is a new record for the Kootenays..... 51

Plate 4.4-10. *Heyderia abietis*. Rarely reported fungal species of mature conifer forests..... 52

Plate 4.4-11. *Usnea* sp. A rich diversity of lichens exists within the study area. .... 53

**List of Appendices**

Appendix A. Baseline Species Inventory

Appendix B. Species and Ecosystem at Risk

## 1. INTRODUCTION

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The Regional District of Central Kootenay (RDCK) contracted EcoLogic Consultants Ltd. (EcoLogic), in conjunction with Masse Environmental Consultants Ltd. (Masse), to conduct a biophysical inventory of Crawford Bay Regional Park. Baseline information collected for this inventory is intended to assist with park management planning that identifies and protects sensitive ecosystems and species biodiversity, while providing passive recreation opportunities to the residents of the Central Kootenay.

## 2. PROJECT OVERVIEW

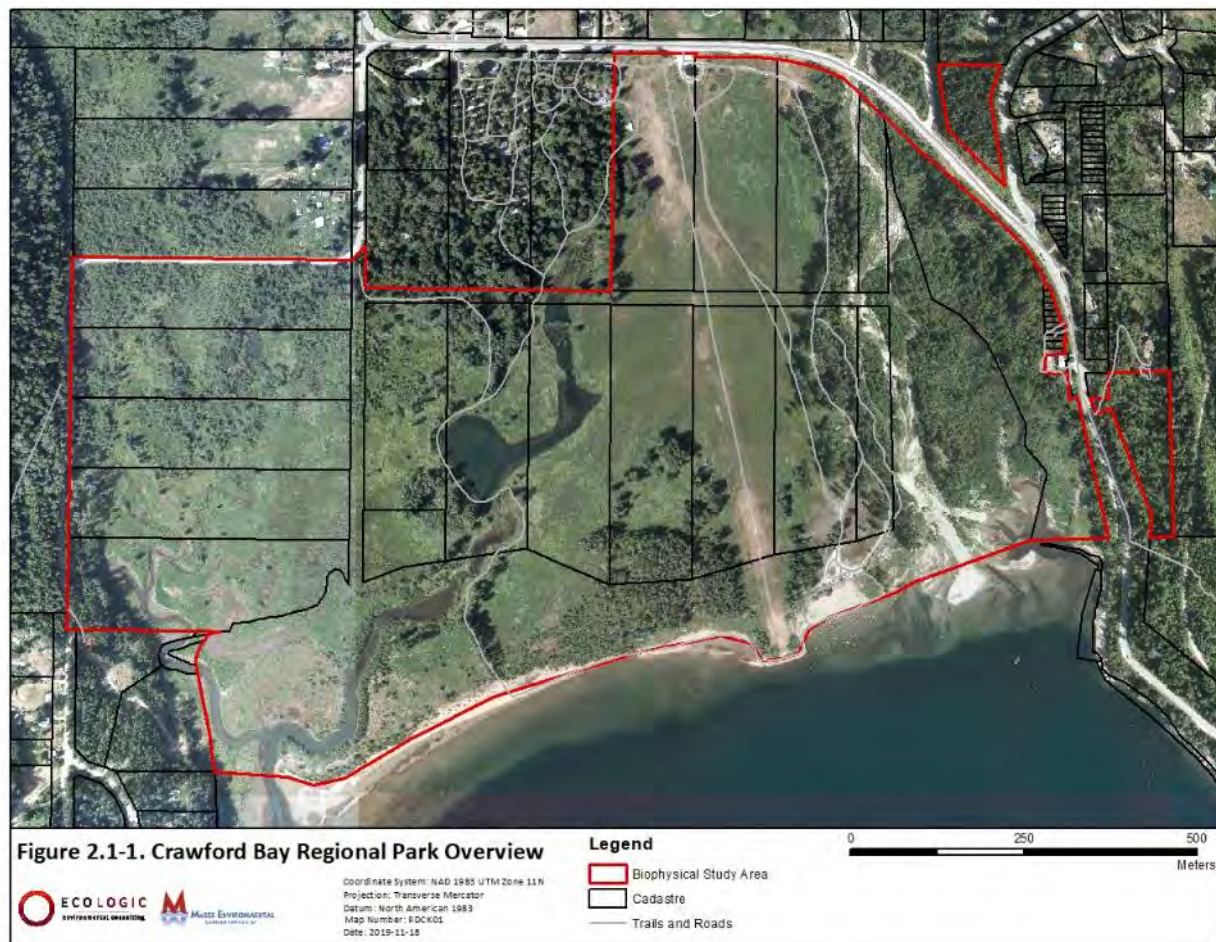
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The objectives of the Crawford Bay Regional Park Biophysical Inventory project are to:

- ◆ map, identify, and describe the ecological communities within the Regional Park suitable to a 1:1000 scale;
- ◆ map, identify, and describe all animal species that exist or probably exist within the Regional Park including all vertebrates and invertebrates;
- ◆ map, identify, and describe generally the soil and soil composition within the Regional Park;
- ◆ map, identify, and describe the landforms generally within the Regional Park;
- ◆ map, identify, and describe species at risk that exist or have the potential to exist within the Regional Park;
- ◆ map, describe, and determine the appropriate management zones within the Regional Park;
- ◆ complete a final report and mapping; and
- ◆ package and submit all GIS data including data dictionary.

### 2.1 PROJECT SETTING

The Crawford Bay Regional Park is located in Crawford Bay on the East Shore of Kootenay Lake (Figure 2.1-1). The property was purchased by the RDCK in 2018 for the purpose of creating a new regional park. Previously owned as a development property, portions of the property have a long history of use starting with farming, and then the dredging of a small creek for the creation of an inland marina and pond system in 1967 (Figure 2.1-2) and creation of a 820-m-long grass airstrip from 1968 to 1970 (Figure 2.1-3). The property has also been used by the community for recreation since the 1960s, including the creation of access roads and a swimming area, and the more recent trail development. For the purposes of this project, a 97.7-ha study area was created that includes the purchased property as well as the Crown land along the lake foreshore.



**Figure 2.1-1. Crawford Bay Regional Park Overview**

The study area is dominated by its recent geomorphological history as an alluvial fan formed and periodically modified by Crawford Creek, with a smaller influence from Beaver Creek, and the recently moderated flooding from Kootenay Lake. Historic air photos show an ecological transition in the study area, from one that was likely strongly influenced by extensive flooding before the construction of the Duncan Dam (1967) and Libby Dam (1975), which limited the establishment of forested communities. The air photos from the 1950s show much less tree cover, with marsh and grassland covering a large portion of the area as well as a larger active flood zone along Crawford Creek. Large flood events in the pre-dam era resulted in substantial changes to the creek, including channel widening, erosion, and a loss of riparian vegetation (Green 2015). The study area currently has a diverse assemblage of ecosystems including floodplain forests, conifer and shrub swamps, a variety of marshes and modified grasslands, and extensive beach and lake foreshore. The modified creek and pond system has largely naturalized, with marsh and swamp-like communities occurring along the banks. The airstrip and associated fields continue to be used for hay, and the roads, trail system, and swimming area are well-used.





**Figure 2.1-2. Air photo of the study area in the 1950s showing limited modification**



**Figure 2.1-3. Air photo of the study area in the 1960s showing the modification of watercourses and creation of the beaver pond and construction of the airstrip**

## 2.2 BIOGEOCLIMATIC UNIT

The study area falls within the West Kootenay Dry Warm Interior Cedar – Hemlock (ICHdw1<sup>1</sup>) biogeoclimatic unit (Figure 2.2-1). The ICHdw1 occurs at lower elevations (600 to over 1,000 m depending on aspect) around Kootenay, Christina, and Lower Arrow lakes, and numerous river valleys from Grand Forks to Creston and as far north as Kaslo (MacKillop and Ehman 2016). It is characterized by moist warm springs, hot, dry summers, and relatively mild, dry winters with a limited snowpack (MacKillop and Ehman 2016). The ICHdw1 is a productive biogeoclimatic unit, with high tree and shrub diversity. The majority of the ICHdw1 has been disturbed by human use, including development, logging, mining (including widespread burning), and flooding from hydroelectric development. As such, mature and old ICHdw1 forests are uncommon, especially cottonwood forests (MacKillop and Ehman 2016).

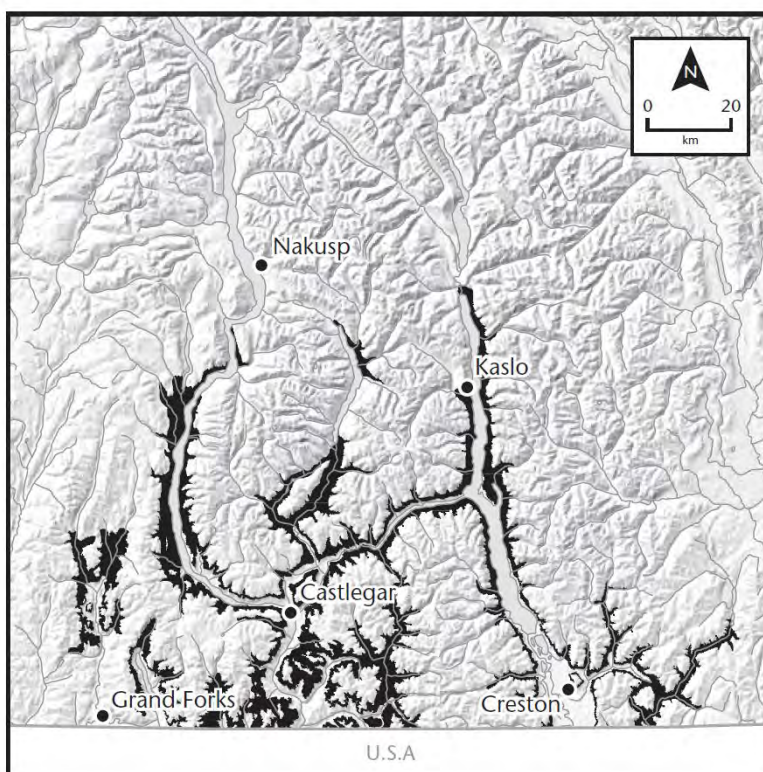


Figure 2.2-1. Distribution of the ICHdw1 (Adapted from MacKillop and Ehman 2016)

<sup>1</sup> The ICHdw1 was formerly part of the ICHdw (from Braumandl and Curran 1992), with government databases such as Conservation Data Centre not clearly distinguishing between the two units.

### 3. INVENTORY METHODOLOGY

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#### 3.1 ECOSYSTEM MAPPING

Terrestrial Ecosystem Mapping (TEM) is a standardized method for ecological classification and mapping. It uses the provincial Biogeoclimatic Ecosystem Classification (BEC) system to describe the type and extent of ecosystems within a defined study area. BEC is a provincial system that groups ecosystems at regional, local, and chronological levels using a combination of current and expected vegetation, soil, climate, and topography. Ecosystems are classified at local levels (i.e., site series) that represent specific localized ecosystem units based on vegetation composition and soils. Multiple site series are described for each regional subzone, reflecting the landscape level distribution of ecosystems based on regional climate, elevation, and physiography. Vegetation is the most important factor for ecosystem classification; however, it is based on climax and zonal theories, where the vegetation observed in a young or disturbed site may not necessarily reflect the species composition of a mature or old site (BC Ministry of Forests and Range 2016; RIC 1998).

Bioterrain mapping is the first part of the TEM process, where mapped terrain polygons are used to identify areas of similar soils and topology. Bioterrain mapping describes terrain features based mainly on the type of surficial material (e.g., fluvial, glacial till, colluvium, or others) and surficial expression (e.g., blanket, veneer, plain, steep slope, fan, or terrace), and soil drainage (e.g., well, imperfect, rapid). The bioterrain mapping also delineates terrain units by vegetation features to separate areas of different productivity, water deficits, or those influenced by more saturated soils. Ecosystem mapping uses the bioterrain polygons (dividing them into smaller polygons as needed) to map and classify ecosystem types, along with additional descriptors that provide information on the current state and condition of each ecosystem. High-resolution LiDAR and orthophotos were used to complete the bioterrain mapping as stereo imagery was not available for this project.

All mapping was completed as per current provincial methodologies, including:

- ◆ Standard for Terrestrial Ecosystem Mapping in BC (1998);
- ◆ Standard for TEM Digital Data Capture in BC, Version 3.0 (2000);
- ◆ Terrain Classification System for BC, Version 2.0 (1997);
- ◆ Biogeoclimatic Ecosystem Classification codes and names (BECdb version 8, Feb 2012);
- ◆ Biogeoclimatic Ecosystem Classification of Non-forested Ecosystems in British Columbia (MacKenzie 2012);
- ◆ Wetlands of British Columbia: a guide to identification (MacKenzie and Moran 2004);
- ◆ Field Manual for Describing Terrestrial Ecosystems; 2nd Edition (BC Ministry of Forests and Range and BC Ministry of Environment 2010); and

- ◆ A Field Guide to Ecosystem Classification and Identification for Southeast British Columbia (MacKillop and Ehman 2016).

Ecosystem polygons were delineated based upon observable characteristics such as differences in slope, aspect, drainage, and vegetation structure and composition. The final ecosystem attributes were then refined using the data collected during field inspections of ecosystem polygons. Each TEM polygon was attributed with ecosystem descriptions or, if they contained multiple ecosystem types, split into smaller ecosystem polygons which were attributed uniquely. Ecosystem polygons may be a single ecosystem type or contain a complex unit that describes up to three ecosystem types. Final ecosystem mapping was completed at a scale of 1:1000.

A robust field program is required to validate the ecosystem mapping products and fully describe each ecosystem unit found in the field. The classification process was used to assess the current condition of ecosystem types (including disturbance, seral stage, and projected climax ecosystem type) using standard descriptions. Field surveys included a crew of two ecologists who assessed each ecosystem unit based on a complete description (using the standard FS882 Ecosystem Field Forms) of site conditions, terrain type, soils, and vegetation structure and composition. Each unit was also described in terms of environmental sensitivity to enable the development of Sensitive Ecosystem Inventory (SEI) classes and subclasses (described in Section 3.2), and to form the basis of future park management zones (Section 3.5). Wildlife habitat features and incidental wildlife observations (e.g., live animals, tracks, dens, scat, and browse) were also recorded on plot forms.

Field surveys included the use of pre-typed imagery to ensure that all representative ecosystem types present in the study area are sampled in the field. All data were collected as per provincial standards, using the following primary guides:

- ◆ Wetlands of British Columbia: a guide to identification (MacKenzie and Moran 2004);
- ◆ Field Manual for Describing Terrestrial Ecosystems; 2nd Edition (BC Ministry of Forests and Range and BC Ministry of Environment 2010); and
- ◆ A Field Guide to Ecosystem Classification and Identification for Southeast British Columbia (MacKillop and Ehman 2016).

### **3.2 SENSITIVE ECOSYSTEM INVENTORY MAPPING**

Sensitive Ecosystem Inventory (SEI) mapping was created in 1993 by the Canadian Wildlife Service and the B.C. Conservation Data Centre. It was created in *'response to a need for inventory of at-risk and ecologically fragile ecosystems, and critical wildlife habitat areas on the east side of Vancouver Island.'* Since then, numerous projects have been completed on the Sunshine Coast, Bowen Island, and throughout the Okanagan. In 2006 a *Standard for Mapping Ecosystems At Risk in British Columbia* was created by the Resource Inventory Standards Committee to promote a standardized process province-wide (RISC 2006).

The main purpose of SEI mapping is to describe the ecological diversity of a given area, and determine the type and extent of vulnerable and rare elements (RISC 2006). The SEI standard describes an overview of the assessment process as follows:

‘The SEI classification uses two primary groupings of ecosystems: **Sensitive Ecosystems** and **Other Important Ecosystems**. Within each of these groups a series of classes and subclasses is defined that provides a general level of ecosystem description that is appropriate for public education and local planning exercises. Sensitive Ecosystem categories are generalised groupings of ecosystems that share many characteristics, particularly ecological sensitivities, ecosystem processes, at-risk status, and wildlife habitat values. Criteria for ecological sensitivity include: **environmental specificity**, susceptibility to hydrological changes, soil erosion, especially on shallow soils, spread of invasive alien plants, and sensitivity to human disturbance. Other Important Ecosystems have significant ecological and biological values associated with them that can be identified and mapped, although they are not defined as Sensitive Ecosystems because they have been substantially altered by human use. Consideration of Other Important Ecosystems is critical to capturing key elements of biodiversity of some project areas; they sometimes provide recruitment sites for ecosystems at risk or important wildlife habitat requiring recovery or restoration.’

The SEI layer is developed from a completed TEM. It uses the same polygons and attribute table to develop the SEI codes. Although there is a standard for SEI mapping, each project typically involves the introduction of new regional or even site-specific codes to fully capture the ecosystems of interest.

### 3.3 SPECIES AND ECOSYSTEMS AT RISK

A search of the B.C. Conservation Data Centre (CDC) for Species and Ecosystems at Risk was completed at the start of the project. The B.C. CDC tracks and assesses the level that BC species and ecosystems are at risk of being lost, and assigns a conservation status to those that are determined to be at risk (B.C. CDC 2019). Based on the conservation status, each species and ecosystem is assigned to the Red, Blue or Yellow list:

- Red (R) - any species or ecosystem that is at risk of being lost (extirpated, endangered, or threatened).
- Blue (B) - any species or ecosystem that is of special concern.
- Yellow (Y) - any species or ecosystem that is at the least risk of being lost.

In addition to the provincial system, the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) regularly assesses wildlife (including plants) species to determine their natural status. Species that are considered to be nationally at risk are ranked using the following status categories (COSEWIC 2019):

- Endangered (E) - A wildlife species facing imminent extirpation or extinction.

- Threatened (T) - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
- Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Appendix A contains the results of the species-at-risk search. Search criteria included: BC Red- and Blue-listed; COSEWIC-ranked; Interior Cedar – Hemlock (ICH); and Regional District of the Central Kootenay. Additional searches by habitat type were combined and filtered to produce a list of all potential species at risk occurring within the study area. The species list was used to target field surveys on specific habitats that were likely to support the at-risk species.

### **3.4 BIODIVERSITY**

#### *3.4.1.1 Fish and Fish Habitat*

Multiple at-risk species of fish are known to occur in Kootenay Lake and may utilize the larger creeks in the study area. For the two main creeks running through the study area, Crawford Creek and Beaver Creek, there is a substantial amount of fish occurrence data in the provincial registries; however, the modified watercourses and old constructed ponds created by the former resort owner for the development of boat moorage do not appear to have been sampled. Due to the time of year and the time required to obtain a fish sampling permit, it was outside the scope of this project to fully sample these watercourses. Literature searches were completed to describe the known fish species and use within the study area.

#### *3.4.1.2 Mammals*

Surveys for mammal sign (e.g., track, scat, dens, forage) were completed in conjunction with the ecosystem field surveys. Areas with suitable habitat were searched using the standard presence/not-detected methodology and recorded on FS882 Ecosystem Field Forms from Field Manual for Describing Terrestrial Ecosystems; 2nd Edition (BC Ministry of Forests and Range and BC Ministry of Environment 2010). Any mammals observed incidentally were also recorded.

#### *3.4.1.3 Birds*

Bird surveys have previously been completed in the study area, with comprehensive surveys performed by Janice Arndt (Canadian Wildlife Service) in 2013–2015 with a focus on marsh species. A total of 74 species were observed, with an additional 18 species observed by local residents. As it is unlikely that fall bird surveys would discover additional species, additional bird surveys were not completed for this project. Any birds observed incidentally were recorded.

#### *3.4.1.4 Reptiles and Amphibians*

Surveys for reptiles and amphibians were completed in conjunction with the ecosystem field surveys. Areas with suitable habitat were searched using the standard presence/not-detected methodology. The

surveys will focus on the species expected to occur in the general areas based on literature searches and professional experience. Due to the time of year, breeding pond surveys were not completed.

#### 3.4.1.5 *Invertebrates*

Invertebrates were identified where observed, but the fall season provides limited opportunities for a comprehensive survey. Invertebrate studies focused on at-risk gastropods, as the cool fall weather and late season is an ideal time for the identification of snails and slugs. Incidental observations of any other invertebrate were recorded.

#### 3.4.1.6 *Vascular Plants*

The B.C. Conservation Data Centre has only a single at-risk occurrence on the property: Yellow-listed spurless touch-me-not (*Impatiens ecorruta*). Due to the time of year in which the field studies were completed, the survey for rare vascular plants was not comprehensive, and focused on habitat where species that are still identifiable are most likely to occur at this time of year. All potential at-risk plants were collected when possible (if large enough populations were found where the collection will not cause harm) and sent to EcoLogic botanist Dr. Jamie Fenneman for confirmation.

#### 3.4.1.7 *Fungi*

A comprehensive fungi survey was completed to document all of the fall species. Surveys were completed in all suitable habitat throughout the study area. Voucher specimens were collected as necessary, as many fungal species cannot be reliably identified in the field.

#### 3.4.1.8 *Other Species*

In addition to the above-mentioned biodiversity surveys, incidental observations of other species and groups were also made.

### 3.5 MANAGEMENT ZONE CLASSIFICATION

A management zone classification system was developed to guide management planning. The classification scheme follows the park zoning concept approach used in the Regional District of the Central Okanagan (RDCO 2017), which delineates the following zones:

- Mixed Use. Areas within the study area boundary that include roads, residential areas, and the old airstrip and hay field.
- Nature. Areas that have natural values and limited or no current human use.
- Recreation. Trails, beach, and access roads for recreation purposes.
- Restoration. Areas that could benefit from ecological restoration.

- Additional Direction Required. Areas that have opportunities for multiple uses were further consultation is required.

## **4. INVENTORY RESULTS**

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### **4.1 TERRAIN AND ECOSYSTEM MAPPING**

A total of 59 sample plots were established in the study area over two days in October 2019 (Figure 4.1-1). Of those, 7 were full FS882 plots, 13 were site inspection plots (SIVI), and 39 were visuals. The full plots included site descriptions, soils, and vegetation lists, along with an ecosystem classification to the site series or site association level. SIVI plots were used to collect similar information, but not as comprehensive, while visual observations were limited to significant information but lacked the comprehensive details of the full and SIVI plots.





**Figure 4.1-1. Ecosystem Field Plots**



### 4.1.1 Terrain and Soils

Terrain mapping of the study area was completed using LiDAR, 2018 ortho imagery, and field inspections (Figure 4.1-2). The mapping indicated that the most common (34.1 ha) parent material in the study area was inactive fluvial material, composed of sand, gravel, and silt (Table 4.1-1). These inactive fluvial materials were deposited by Crawford and Beaver creeks. Due to anthropogenic modification (mainly the construction of the highway bridge, armouring of the creek banks, and small dikes, Crawford Creek is largely confined to its existing channel and no longer able to flood the larger area. Past studies of the creek indicated significant events occurred in 1910, resulting in the main channel moving to the west side of the study area (specific location unknown), and pre-dam floods in the 1960s overtopping the highway (Nichols 1987). Active fluvial material accounts for 13.9 ha of the study area, and is confined to the active floodplains along Crawford and Beaver creeks and several smaller watercourses. Crawford Creek appears to be a depositional system, with large gravel bars. Portions of the lower creek are undercutting banks and eroding in areas. Beaver Creek is largely stable, with no significant deposition or erosion. Inactive fluvial areas were well- to imperfectly drained due to the high component of sand. Active fluvial areas were highly variable (rapidly to poorly drained), with gravel bars and low-bench floodplains of coarse sand and gravel rapidly to well-drained. Off-channel swamps and mid-bench floodplains that often have deep accumulations of silt and fine sands are imperfectly to poorly drained. Soil moisture and nutrient were also highly variable, ranging from mesic to subhygric and very poor to rich. Soils range from moderate to well-developed Gleysols in the swamps and forests, to poorly developed Regosols that are actively flooded.

Table 4.1-1. Summary of Terrain and Soil Mapping

Map Code	Parent Material	Soil Texture	Surficial Expression	Drainage	Moisture Regime	Nutrient Regime	Soil Great Groups	Area (ha)
A	Anthropogenic	variable (sand, gravel, silt)	variable (plain, gentle slope, depression)	rapidly to poorly	xeric to subhygric	very poor to rich	NA, Regosol	29.2
F	Fluvial (Inactive)	sand, gravel, silt	plain	well to imperfectly	mesic to subhygric	poor to rich	Gleysol	34.1
FA	Fluvial (Active)	sand, gravel (silt)	plain	rapidly to poorly	mesic to subhygric	very poor to rich	Regosol, Gleysol	13.9
L	Lacustrine	silt, sand	plain, depression	moderately to poorly	subhygric to hygric	medium to very rich	Regosol, Gleysol	13.4
M	Morainal	silt	blanket, gentle slope, moderate slope	well to imperfectly	submesic to hygric	medium to rich	Brunisol, Gleysol, Podzol	5.2

Map Code	Parent Material	Soil Texture	Surficial Expression	Drainage	Moisture Regime	Nutrient Regime	Soil Great Groups	Area (ha)
O	Organic	mesic	depression	poorly to poorly	subhydryc to hydric	rich to very rich	Mesisol	2.0
Total								97.7

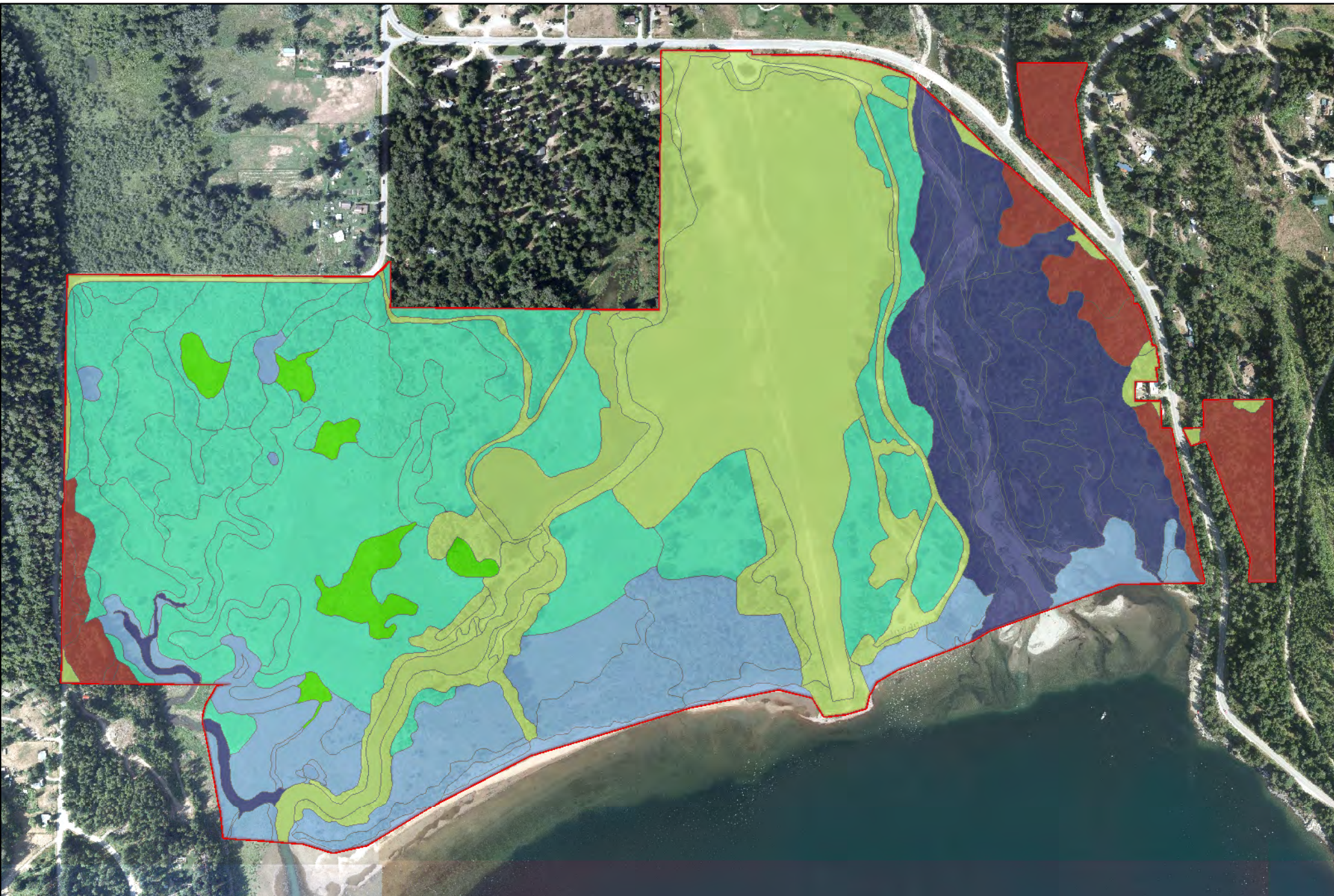
Lacustrine (derived from lakes) materials occur along the foreshore of Kootenay Lake, with evidence of past and current flooding extending well into the study area, with a total of 13.4 ha mapped. Small areas with lacustrine deposits also occur in small ponds and other depressions, likely over coarser fluvial deposits. The lacustrine material is composed of silt and fine sands, with the precise boundary between lacustrine and inactive fluvial plains hard to differentiate. Lacustrine soils are generally moderately to poorly drained due to the fine soil texture and occurrence as flat plains. With the high water table present through the study area, the lacustrine soils have a subhydryc to hydric soil moisture regime and a medium to very rich soil nutrient regime. Most of the vegetated communities that occur on the lacustrine soils have moderately well-developed Gleysolic soils, with Regosols occurring on the lake foreshore where little to no soil development has occurred.

Morainal (derived from glaciers) materials were mapped on 5.2 ha of the study area, and were limited to the lower slopes on the west and east sides of the valley. Morainal material is typically a matrix of silty fines and coarse, sub-rounded rocks of various sizes. In the study area, they occur as blankets (unconsolidated materials more than 1 m deep) on gently to moderately steep slopes. Soil types include well- to imperfectly drained Brunisols, Podzols, and Gleysols, with soil moisture ranging from submesic to hydric and nutrients ranging from medium to rich.

Organic soils are uncommon in the study area (2.0 ha). They are restricted to several small depressions that are underlain by inactive fluvial material. Mesic organic soil textures were the only type observed in the study area, and they appeared to be derived from sedges. These Mesisolic soils are poor to very poorly drained, with a soil moisture regime of subhydryc to hydric and rich to very rich soil nutrients.

Anthropogenic material is common in the study area, accounting for 29.2 ha. These modified materials include the excavated creek, hay fields, old airstrip, and various roads. The historic air photos indicate that most of the anthropogenic soils were likely sourced from the study area (excavations from the creek and ponds, and potential sand and gravel removal from Crawford Creek); however, it is entirely possible that additional material was deposited in the study area from outside sources. Anthropogenic soils had variable textures, but were generally composed of sand and gravels. Most of the material was deposited in a large flat plain, with smaller built-up areas at the end of the airstrip, an old dike along Crawford Creek, and mounded dredgings along the excavated creek and ponds. As the soil has been modified, they typically could not be classified to a great group, and soil moisture and nutrients are highly variable.




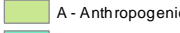
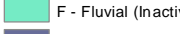
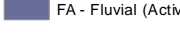
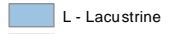
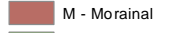
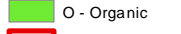


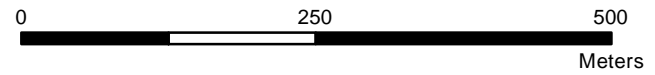
**Figure 4.1-2. Terrain Mapping**



Coordinate System: NAD 1983 UTM Zone 11N  
 Projection: Transverse Mercator  
 Datum: North American 1983  
 Map Number: RDCK01  
 Date: 2019-11-26

**Legend**

	L - Lacustrine
	A - Anthropogenic
	F - Fluvial (Inactive)
	FA - Fluvial (Active)
	M - Morainal
	O - Organic
	Biophysical Study Area





### 4.1.2 Ecosystems

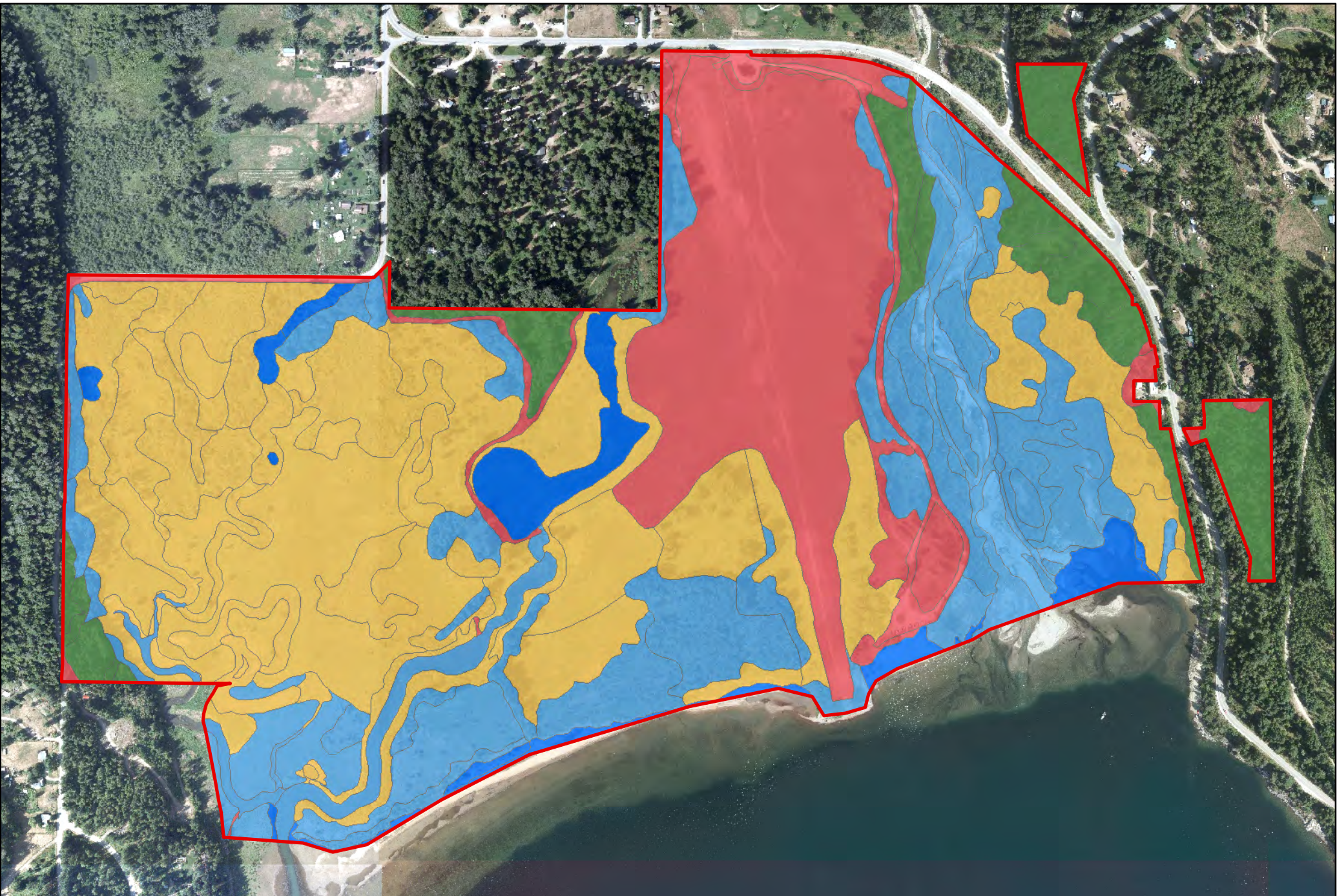
Table 4.1-2 presents a summary of the ecosystem types that are present in the study area. Reed Canarygrass Marsh (Wm!.1), a modified wet meadow community, is the most common ecosystem type in the study area, mapped on 21.0 ha (Figure 4.1-3). The Cottonwood – Snowberry – Rose Mid Bench Floodplain (Fm01) occurs extensively along Cottonwood Creek, and to a lesser degree along the smaller creeks to the west. It was mapped on 14.0 hectares, including various structural stages ranging from tall shrub to mature forests. Cultivated field (the hay fields) is the largest anthropogenic ecosystem type in the study area, mapped on 16.0 hectares.

Table 4.1-2. Summary of Ecosystem Mapping

General Type	Map Code	Description	Structural Stage	Area (ha)
Forest	101	CwFd – Prince’s pine – Twinflower	3a	0.2
			5	1.9
			6	1.1
	104	FdCw – Douglas maple – Prince’s pine	5	0.9
	110	CwHw – Oak fern	5	0.8
			6	0.5
	111	CwHw – Devil’s club – Lady fern	5	0.3
			6	<0.1
			7	0.5
	112	CwHw – Horsetail – Lady fern	5	0.4
	113	CwSxw – Skunk cabbage	3b	0.1
			5	0.6
	Freshwater	BE	Beach	1
LA		Lake	-	0.8
PD		Pond	-	2.3
Modified	CF	Cultivated Field	2b	16.0
	RR	Rural Residential	-	1.5
	RZ	Road	-	2.5
	UR	Urban	-	0.4
Riparian	FI00	Unclassified Low Bench Floodplain	3a	3.0
			3b	0.2
	FI02		3a	0.1







General Type	Map Code	Description	Structural Stage	Area (ha)
		Mountain alder – Red-osier dogwood – Lady fern Low Bench Floodplain	3b	1.8
	FI03	Pacific willow – Red-osier dogwood – Horsetail Low Bench Floodplain	3a	0.1
			3b	1.8
	FI06	Sandbar willow Low Bench Floodplain	3a	1.1
			3b	0.5
	Fm00	Unclassified Mid Bench Floodplain	3b	0.3
	Fm01	Cottonwood – Snowberry – Rose Mid Bench Floodplain	3b	0.1
			4	0.2
			5	11.7
			6	2.0
	GB	Gravel Bar	1	0.7
	RI	River	-	4.9
Wetland	OW	Shallow Open Water	2c	0.1
	Wf00	Unclassified Fen	2b	0.9
	Wm!.1	Reed Canary grass Marsh	2b	21.0
	Wm00	Unclassified Marsh	2b	4.0
	Wm05	Cattail Marsh	2b	0.9
	Ws00	Unclassified Swamp	3a	1.0
			3b	2.9
	Ws01	Mountain alder – Skunk cabbage – Lady fern Swamp	3a	0.2
			3b	2.9
	Ws06	Sitka willow – Sitka sedge Swamp	3a	0.2
			3b	3.4
		Total		97.7

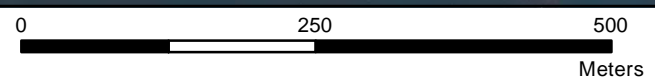




**Figure 4.1-3. Ecosystem Mapping**

**Legend**

 Biophysical Study Area	 Modified
<b>General Ecosystem Type</b>	 Riparian
 Forest	 Wetland
 Freshwater	





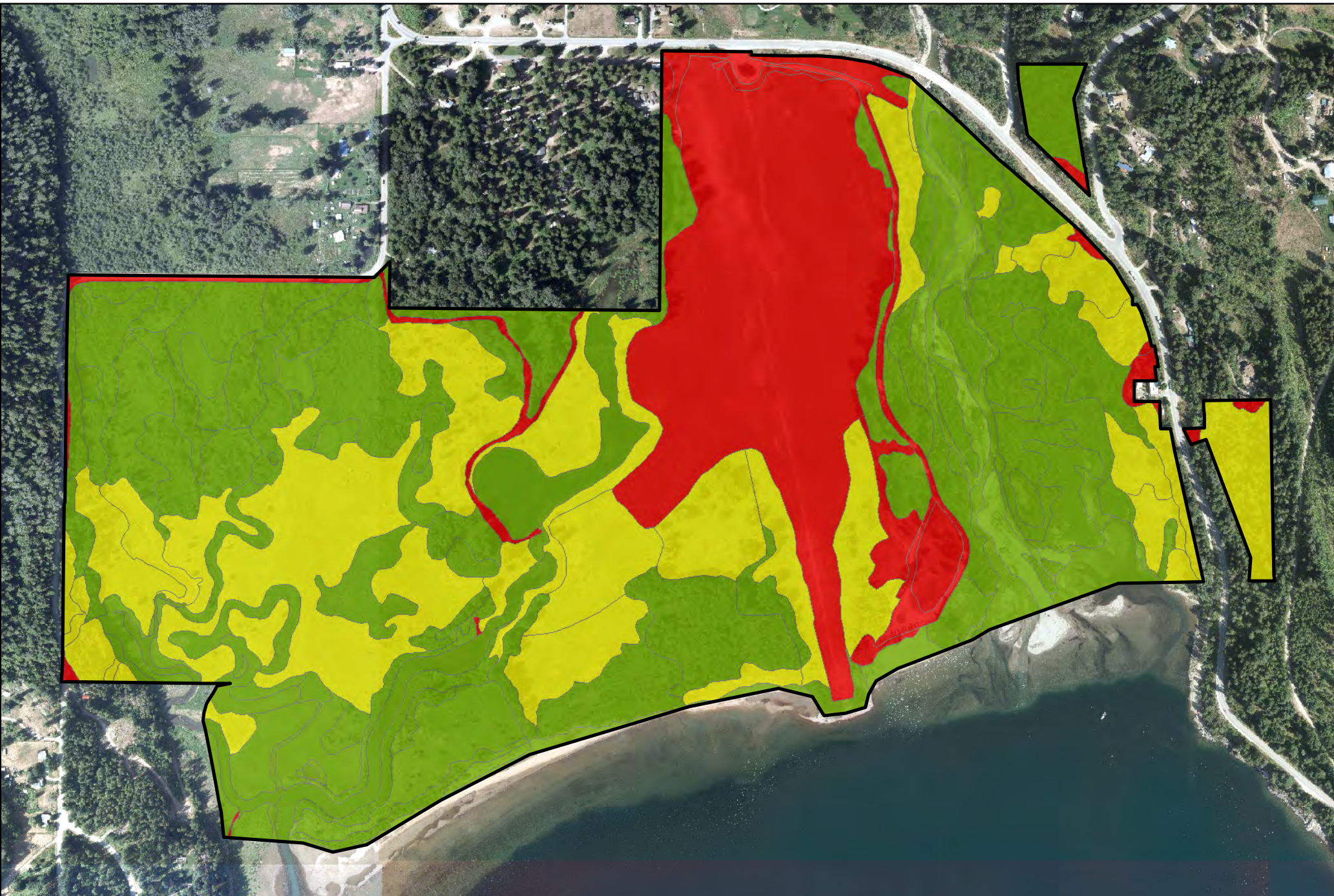
## 4.2 SENSITIVE ECOSYSTEM INVENTORY MAPPING

The TEM was converted to an SEI map as per Table 4.2-1. Each TEM ecosystem unit was placed with an SEI group based on ecosystem type, structural stage, condition, and sensitivity. The results of the SEI mapping (Figures 4.2-1 and 4.2-2) indicate that 50.2 ha (51.3%) of the study area should be considered to be a Sensitive Ecosystem (SE), while 27.0 ha (27.6%) was classified as Other Important Ecosystems (OIE) and 20.6 ha (21.1%) was classified as Not Sensitive (NS). The following sections describe the SEI classes in greater detail.

Table 4.2-1. Summary of Sensitive Ecosystem Inventory Mapping

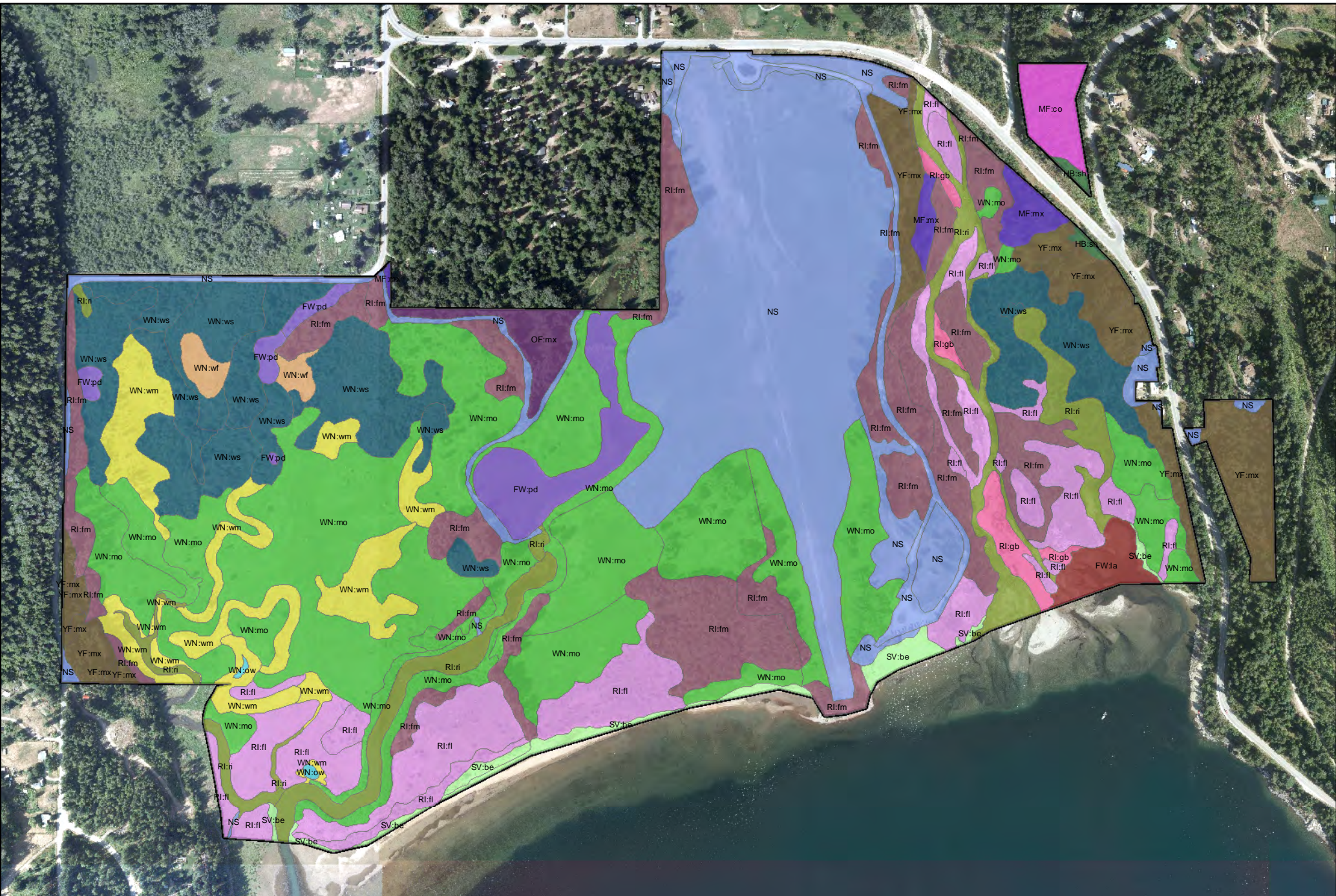
Sensitive Ecosystem	Class	Subclass	Description	Area (ha)
SE	FW	la	Freshwater - lake	0.8
		pd	Freshwater - pond	2.3
	MF	co	Mature Forest – conifer	0.9
		mx	Mature Forest - mixed	0.8
	OF	mx	Old Forest - mixed	0.5
	RI	fl	Riparian – low bench floodplain	8.6
			Riparian – medium bench floodplain	14.1
		gb	Riparian – gravel bar	0.7
			Riparian - river	4.9
	SV	be	Sparsely Vegetated - beach	1.1
	WN	ow	Wetland – open water	0.1
			Wetland – fen	0.9
		wm	Wetland – marsh	4.9
			Wetland – swamp	9.6
SE Total				50.2
OIE	WN	mo	Wetland - modified	22.1
	YF	mx	Young Forest - mixed	4.9
OIE Total				27.0
NS	NS		Not Sensitive	20.4
	HB	sh	Herbaceous - shrub	0.2
NS Total				20.6
Total				97.7





**Figure 4.2-1. Sensitive Ecosystem Inventory Mapping**





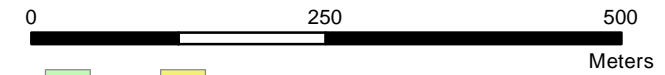
**Figure 4.2-2. Sensitive Ecosystem Inventory Subclasses**

Coordinate System: NAD 1983 UTM Zone 11N  
 Projection: Transverse Mercator  
 Datum: North American 1983  
 Map Number: RDCK01  
 Date: 2019-11-26



**Legend**

SEI Class:Subclass	Color
FW:ia	Dark Red
FW:pd	Purple
HB:sh	Dark Green
MF:co	Pink
MF:mx	Light Purple
NS	Light Blue
OF:mx	Dark Purple
RI:fl	Light Pink
RI:fm	Dark Red
RI:gb	Pink
RI:ri	Light Green
SV:be	Light Green
WN:wm	Yellow
WN:mo	Light Green
WN:ws	Dark Blue
WN:ow	Cyan
WN:wf	Light Orange
YF:mx	Brown
Biophysical Study Area	Black Outline





## 4.2.1 Sensitive Ecosystems

### 4.2.1.1 Freshwater

Freshwater ecosystems include a small portion of Kootenay Lake and several ponds. The ponds ranged from the large modified pond in the middle of the study area (Plate 4.2-1), to several smaller permanent to ephemeral ponds interspersed in the wetland complexes.



*Plate 4.2-1. Large modified pond in the middle of the study area.*

### 4.2.1.2 Mature Forest

Mature forests are uncommon in the study area, with 0.9 hectares of mature conifer forest (Plate 4.2-2) and 0.8 hectares of mature mixed forests (Plate 4.2-3) mapped. An additional 2.0 hectares of mature mid-bench floodplain (Plate 4.2-4) that is represented within the Riparian sub-class also occurs in the study area.



*Plate 4.2-2. Mature conifer forest.*



*Plate 4.2-3. Mature mixed forest with evidence of past harvesting.*





*Plate 4.2-4. Mature Fm01 cottonwood floodplain forest with old-growth veterans.*

#### *4.2.1.3 Old Forest*

Old forests are uncommon in the study area, with only 0.5 hectares of old mixed forest mapped (Plate 4.2-4). In addition to old forests, individual old trees, mainly cottonwood, occur sporadically throughout the study area (Plate 4.2-5).



*Plate 4.2-4. Old mixed cottonwood – western redcedar forest.*



*Plate 4.2-5. Large old black cottonwood wildlife tree.*

#### *4.2.1.4 Riparian*

Four riparian communities occur in the study area, with black cottonwood mid-bench floodplains the most common type. The majority of the riparian areas occur along Crawford Creek, with mid-bench floodplain forests along higher banks (Plate 4.2-6) and low-bench floodplain communities (Plate 4.2-7) and gravel bars occurring within the active river channel. Mid-bench floodplain forests also occur along Kootenay Lake (Plate 4.2-8) above narrow bands of low-bench willow-dominated communities (Plate 4.2-9).





*Plate 4.2-6. Undercut Fm01mid-bench cottonwood floodplain along Crawford Creek.*



*Plate 4.2-7. Sparse F100 low-bench floodplain and gravel bar in Crawford Creek.*



*Plate 4.2-8. Young Fm01 mid-bench floodplain at the upper flood limit on Kootenay Lake.*



*Plate 4.2-9. F103 low-bench floodplain along the Kootenay Lake foreshore.*

#### *4.2.1.5 Sparsely Vegetated*

Sparsely vegetated communities are restricted to the Kootenay Lake foreshore. These communities include sandy areas with small amounts of shrubby or herbaceous vegetation (Plate 4.2-10), and the larger sandy beaches (Plate 4.2-11).





*Plate 4.2-10. Scrubby willow lake foreshore.*



*Plate 4.2-11. Kootenay Lake beach.*

#### **4.2.1.6 Wetlands**

Wetlands are common in the study area, and include multiple types of marsh, fen, swamp, and shallow open water. Several types of swamps were mapped along Crawford Creek (Plate 4.2-12) and in the western portion of the study area along Beaver Creek (Plate 4.2-13). Several small pockets of unclassified lesser-panicle sedge (*Carex diandra*) fen occur in the western portion of the study area (Plate 4.2-14). While this fen forms a distinct community type, it is not classified with the provincial BGC system. Marshes are common in the western portion of the study area, with Wm05 cattail marsh (Plate 4.2-15) the only

classifiable type, and unclassified marshes occurring in old oxbows of Beaver Creek and other depressions (Plate 4.2-16). Several small shallow open-water communities also occur in depressions and old oxbows along Beaver Creek (Plate 4.2-17).



*Plate 4.2-12. Ws06 swamp along Crawford Creek.*



*Plate 4.2-13. Ws01 swamp near Beaver Creek.*





*Plate 4.2-14. Unclassified lesser-panicled sedge fen.*



*Plate 4.2-15. Remnant of a Wm05 cattail marsh.*



Plate 4.2-16. Unclassified marsh community in old oxbow near Beaver Creek.



Plate 4.2-17. Shallow Open Water wetland in old oxbow near Beaver Creek.

#### 4.2.2 Other Important Ecosystems

Modified wetlands (Wm!1 Reed Canarygrass Marshes) are a commonly occurring ecosystem though much of the western portion of the study area. These communities have marsh-like characteristics (Plate 4.2-18), but are almost completely dominated by the invasive reed canary grass (*Phalaris arundinacea*). This ecosystem type was considered to be an OIE based on its wetland-like values and habitat potential. Young mixed forests also fall in the OIE class, as they are early climax or seral communities that are recovering from past disturbance and provide limited habitat value.





*Plate 4.2-18. Reed canary grass Wm!.1 marsh.*

### **4.2.3 Not Sensitive**

The NS class contains a variety of mapped units, including paved and dirt roads, trails, the old airstrip, the large hay field (Plate 4.2-19), and highly disturbed areas along the highway and adjacent residential area. While these areas may provide some habitat values (such as high-value ungulate grazing in the hay field), they are highly modified and contain few natural features.



*Plate 4.2-19. Hay field.*

### 4.3 SPECIES AND ECOSYSTEMS AT RISK

A search of the B.C. Conservation Data Centre database yielded a list of 119 species at risk (both federal and provincially assessed) with potential to occur in the area (Appendix A). Some of these species are likely to be found with additional targeted survey effort. Surveys for at-risk vascular plants should be conducted in late spring and summer; surveys of mosses, lichens, fungi, and invertebrates during other portions of the growing season may also result in the discovery of additional at-risk species.

A total of 10 species at risk have been confirmed in the study area (Table 4.3-1). Two invertebrates (snails) were discovered during the 2019 field surveys and are new records for the study area. The other species were reported during previous studies or by local residents. There is a documented population of western painted turtle (*Chrysemys picta*) at nearby Fraser Lake, along Highway 3A between Crawford Bay and Kootenay Bay, east of Kootenay Lake. The artificial modified channels and ponds in the study area may provide suitable habitat for western painted turtle.

Table 4.3-1. Identified Species at Risk

Group	Scientific	English	Status
Bird	<i>Ardea herodias</i>	Great Blue Heron	B
Bird	<i>Botaurus lentiginosus</i>	American Bittern	B
Bird	<i>Chordeiles minor</i>	Common Nighthawk	SC
Bird	<i>Cygnus columbianus</i>	Tundra Swan (migration)	B
Bird	<i>Dolichonyx oryzivorus</i>	Bobolink	B (T)
Bird	<i>Hirundo rustica</i>	Barn Swallow	B
Fish	<i>Salvelinus confluentus</i>	bull trout	B
Invertebrate	<i>Anguispira kochi</i>	banded tigersnail	B
Invertebrate	<i>Cryptomastix mullani</i>	Coeur D'Alene Oregonian	B
Mammal	<i>Ursus arctos</i>	grizzly bear	B (SC)

The B.C. Conservation Data Centre also tracks ecological communities at risk. A search of the database for the ICHdw1 (and the older ICHdw unit) yielded only two Red-listed ecological communities at risk that have the potential to occur in the vicinity of the study area. The black cottonwood/common snowberry – roses (ICHdw/Fm01) mid-bench floodplain occurs throughout the study area. The Douglas-fir/tall Oregon-grape/parsley fern (ICHdw1/02) community is associated with dry forest types that do not exist in the study area. Two at-risk wetlands and three at-risk low-bench floodplains were also identified in the study area (Table 4.3-2). While these ecosystem types are not tracked by the CDC for the ICHdw, they are generally considered to be at-risk throughout the province even when not officially listed by the CDC for a specific BGC unit (Stacey pers. Communications 2018).

Table 4.3-2. Mapped Ecosystems-at-Risk

Map Code	Description	Area (ha)	Status
FI02	Mountain alder – Red-osier dogwood – Lady fern Low Bench Floodplain	1.9	B
FI03	Pacific willow – Red-osier dogwood – Horsetail Low Bench Floodplain	1.9	R
FI06	Sandbar willow Low Bench Floodplain	1.6	R
Fm01	Cottonwood – Snowberry – Rose Mid Bench Floodplain	14.0	R
Wm05	Cattail Marsh	0.9	B
Ws06	Sitka willow – Sitka sedge Swamp	3.6	B

## 4.4 BIODIVERSITY

A total of 360 species have been documented in the study area to date (Appendix B). This list includes the results of literature searches to determine species found during previous studies and the results of the 2019 field surveys. As the 2019 field studies were conducted in the late fall, it is expected that the total number will increase significantly with additional field work. The following sections list the identified species, along with an assessment of the completeness of each list.

### 4.4.1 Fish and Fish Habitat

Literature searches indicated that eight species of fish (including the provincially blue-listed bull trout) are known to occur in Crawford Creek and Beaver Creek, and at the mouth of the creeks in Kootenay Lake (Tables 4.4-1 and 4.4-2). Based on the available habitat in the study area, and the number of previous fish studies that have been completed, this list is considered to be comprehensive with the discovery of additional species unlikely. However, information is lacking for the current assemblage of aquatic species within the historic modified channels. Minnows were observed in the channel below the first beaver dam, but no fish sampling was done.

Crawford Bay is considered one of the high- and medium-use areas where the endangered Upper Kootenay River White Sturgeon (*Acipenser transmontanus*) aggregates (B.C. CDC 2019). The study area encompasses part of the lower reach of Crawford creek, which is a dynamic floodplain with the best potential habitat for most of the fish species present in the system (Kokanee Forests Consulting and Mirkwood Ecological Consultants 1996). This reach features a low-gradient (averaging 2%), riffle bar pool habitat with mainly gravel substrate, and pools formed by large woody debris and boulders (Plates 4.4-1 and 4.4-2). This reach was evaluated as high-priority for habitat enhancement through creation of fish habitat structures using boulders or large woody debris (Kokanee Forests Consulting and Mirkwood Ecological Consultants 1996).

Table 4.4-1. Fish Species

Scientific	English	Native <sup>2</sup>	Status
<i>Cottus asper</i>	Prickly Sculpin	N	
<i>Couesius plumbeus</i>	Lake Chub	N	
<i>Oncorhynchus mykiss</i>	Rainbow Trout	N	
<i>Oncorhynchus nerka</i>	Kokanee	N	
<i>Prosopium williamsoni</i>	Mountain Whitefish	N	
<i>Rhinichthys cataractae</i>	Longnose Dace	N	
<i>Salvelinus confluentus</i>	Bull Trout	N	B
<i>Salvelinus fontinalis</i>	Brook Trout	E	



Plate 4.4-1. Crawford creek looking upstream near mouth. Good habitat complexity with riffles, deep pools and abundant large woody debris.

<sup>2</sup> N = native species; E = exotic species.





Plate 4.4-2. Crawford creek looking downstream near mouth.

#### 4.4.2 Mammals

A total of 21 mammals have been observed (Table 4.4-2) in the study area, including observations and sign located during the 2019 field surveys (Plate 4.4-3), and observations recorded by local residents (Robin pers. Communications 2019) and experts (Lausen pers. Communications 2019). Of note is the use of the study area by the provincially Blue-listed (Federally Special Concern) grizzly bear. The study area is within mapped critical habitat (Southeast Kootenay) for the Southern Mountain Cariboo (*Rangifer tarandus*) population, though it is unlikely to be currently used by the species.

This list is considered to be fairly comprehensive for larger species, with the potential for additional small mammals to be located in the study area. Table 4.4-3 lists species that have a potential to occur in the study area.

Table 4.4-2. Mammals

Scientific	English	Native	Status
<i>Alces alces</i>	moose	N	
<i>Canis latrans</i>	coyote	N	
<i>Canis lupus</i>	timber wolf	N	
<i>Castor canadensis</i>	beaver	N	
<i>Cervus canadensis</i>	American elk	N	
<i>Eptesicus fuscus</i>	big brown bat	N	
<i>Lepus americanus</i>	snowshoe hare	N	
<i>Lontra canadensis</i>	river otter	N	

Scientific	English	Native	Status
<i>Microtus pennsylvanicus</i>	meadow vole	N	
<i>Mustela erminea</i>	ermine	N	
<i>Mustela frenata</i>	long-tailed weasel	N	
<i>Myotis evotis</i>	Long-eared bat	N	
<i>Myotis yumanensis</i>	Yuma Myotis	N	
<i>Neovison vison</i>	American mink	N	
<i>Odocoileus virginianus</i>	white-tailed deer	N	
<i>Ondatra zibethicus</i>	common muskrat	N	
<i>Peromyscus maniculatus</i>	deer mouse	N	
<i>Procyon lotor</i>	raccoon	N	
<i>Puma concolor</i>	cougar	N	
<i>Tamiasciurus hudsonicus</i>	red squirrel	N	
<i>Ursus americanus</i>	black bear	N	
<i>Ursus arctos</i>	grizzly bear	N	B (SC)

Table 4.4-3. Potential Mammals

Scientific	English	Native	Status
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	N	B
<i>Lasionycteris noctivagans</i>	silver-haired bat	N	
<i>Lasiurus cinereus</i>	hoary bat	N	
<i>Myotis californicus</i>	Californian Myotis	N	
<i>Myotis evotis</i>	long-eared Myotis	N	
<i>Myotis lucifugus</i>	little brown Myotis	N	
<i>Myotis volans</i>	long-legged Myotis	N	E
<i>Sorex spp.</i>	shrews	N	



Plate 4.4-3. Beaver dam on historically modified creek.

#### 4.4.3 Birds

A total of 95 bird species have been identified in the study area through formal surveys and observations made by local residents and visitors (Table 4.4-4). This list is considered to be comprehensive, with a low potential for the discovery of very many additional species. The study area contains a wide variety of bird habitat, including abundant high-value wildlife trees (Plate 4.4-4). Of note are the six at-risk species that have been observed using the study area.

Table 4.4-4. Birds

Scientific	English	Native	Status
<i>Accipiter striatus</i>	Sharp-shinned Hawk	N	
<i>Actitis macularius</i>	Spotted Sandpiper	N	
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	N	
<i>Aix sponsa</i>	Wood Duck	N	
<i>Anas americana</i>	American Wigeon	N	
<i>Anas crecca</i>	Green-winged Teal	N	
<i>Anas cyanoptera</i>	Cinnamon Teal	N	
<i>Anas discors</i>	Blue-winged Teal	N	
<i>Anas platyrhynchos</i>	Mallard	N	
<i>Anthus rubescens</i>	American Pipit	N	
<i>Archilochus alexandri</i>	Black-chinned Hummingbird	N	
<i>Ardea herodias</i>	Great Blue Heron	N	B

Scientific	English	Native	Status
<i>Aythya collaris</i>	Ring-necked Duck	N	
<i>Aythya valisineria</i>	Canvasback	N	
<i>Bombycilla cedrorum</i>	Cedar Waxwing	N	
<i>Botaurus lentiginosus</i>	American Bittern	N	B
<i>Branta canadensis</i>	Canada Goose	N	
<i>Bubo virginianus</i>	Great Horned Owl	N	
<i>Bucephala albeola</i>	Bufflehead	N	
<i>Bucephala clangula</i>	Common Goldeneye	N	
<i>Bucephala islandica</i>	Barrow's Goldeneye	N	
<i>Buteo jamaicensis</i>	Red-tailed Hawk	N	
<i>Calypte anna</i>	Anna's Hummingbird	N	
<i>Cathartes aura</i>	Turkey Vulture	N	
<i>Catharus fuscescens</i>	Veery	N	
<i>Catharus ustulatus</i>	Swainson's Thrush	N	
<i>Chaetura vauxi</i>	Vaux's Swift	N	
<i>Charadrius vociferus</i>	Killdeer	N	
<i>Chordeiles minor</i>	Common Nighthawk	N	SC
<i>Cinclus mexicanus</i>	American Dipper	N	
<i>Colaptes auratus</i>	Northern Flicker	N	
<i>Contopus sordidulus</i>	Western Wood-Pewee	N	
<i>Corvus brachyrhynchos</i>	American Crow	N	
<i>Corvus corax</i>	Common Raven	N	
<i>Cygnus columbianus</i>	Tundra Swan (migration)	N	B
<i>Dolichonyx oryzivorus</i>	Bobolink	N	B (T)
<i>Dryocopus pileatus</i>	Pileated Woodpecker	N	
<i>Dumetella carolinensis</i>	Gray Catbird	N	
<i>Empidonax difficilis</i>	Pacific-Slope Flycatcher	N	
<i>Empidonax hammondi</i>	Hammond's Flycatcher	N	
<i>Empidonax minimus</i>	Least Flycatcher	N	
<i>Empidonax oberholseri</i>	Dusky Flycatcher	N	
<i>Empidonax traillii</i>	Willow Flycatcher	N	
<i>Euphagus cyanocephalus</i>	Brewer's Blackbird	N	

Scientific	English	Native	Status
<i>Falco sparverius</i>	American Kestrel	N	
<i>Fulica americana</i>	American Coot	N	
<i>Gallinago delicata</i>	Wilson's Snipe	N	
<i>Gavia immer</i>	Common Loon	N	
<i>Geothlypis trichas</i>	Common Yellowthroat	N	
<i>Glaucidium gnoma</i>	Northern Pygmy-Owl	N	
<i>Grus canadensis</i>	Sandhill Crane (migration)	N	
<i>Haliaeetus leucocephalus</i>	Bald Eagle	N	
<i>Hirundo rustica</i>	Barn Swallow	N	B
<i>Ixoreus naevius</i>	Varied Thrush	N	
<i>Junco hyemalis</i>	Dark-eyed Junco	N	
<i>Lophodytes cucullatus</i>	Hooded Merganser	N	
<i>Megaceryle alcyon</i>	Belted Kingfisher	N	
<i>Melospiza melodia</i>	Song Sparrow	N	
<i>Mergus merganser</i>	Common Merganser	N	
<i>Molothrus ater</i>	Brown-headed Cowbird	N	
<i>Myadestes townsendi</i>	Townsend's Solitaire	N	
<i>Oporornis tolmiei</i>	MacGillivray's Warbler	N	
<i>Pandion haliaetus</i>	Osprey	N	
<i>Parkesia noveboracensis</i>	Northern Waterthrush	N	
<i>Passerculus sandwichensis</i>	Savannah Sparrow	N	
<i>Passerina amoena</i>	Lazuli Bunting	N	
<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak	N	
<i>Picoides pubescens</i>	Downy Woodpecker	N	
<i>Picoides villosus</i>	Hairy Woodpecker	N	
<i>Podiceps grisegena</i>	Red-Necked Grebe	N	
<i>Poecile atricapillus</i>	Black-capped Chickadee	N	
<i>Poecile rufescens</i>	Chestnut-backed Chickadee	N	
<i>Porzana carolina</i>	Sora	N	
<i>Regulus satrapa</i>	Golden-Crowned Kinglet	N	
<i>Selasphorus rufus</i>	Rufous Hummingbird	N	
<i>Setophaga coronata</i>	Yellow-rumped Warbler	N	

Scientific	English	Native	Status
<i>Setophaga petechia</i>	Yellow Warbler	N	
<i>Setophaga ruticilla</i>	American Redstart	N	
<i>Sialia currucoides</i>	Mountain Bluebird	N	
<i>Sitta canadensis</i>	Red-breasted Nuthatch	N	
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	N	
<i>Spinus pinus</i>	Pine Siskin	N	
<i>Spinus tristis</i>	American Goldfinch	N	
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	N	
<i>Sturnus vulgaris</i>	European Starling	E	
<i>Sturnus vulgaris</i>	Starling	E	
<i>Tachycineta bicolor</i>	Tree Swallow	N	
<i>Tachycineta thalassina</i>	Violet-green Swallow	N	
<i>Troglodytes pacificus</i>	Pacific Wren	N	
<i>Turdus migratorius</i>	American Robin	N	
<i>Tyrannus tyrannus</i>	Eastern Kingbird	N	
<i>Vireo gilvus</i>	Warbling Vireo	N	
<i>Vireo olivaceus</i>	Red-eyed Vireo	N	
<i>Wilsonia pusilla</i>	Wilson's Warbler	N	
<i>Zonotrichia leucophrys</i>	White-Crowned Sparrow	N	



Plate 4.4-4. Pileated woodpecker feeding cavities on western redcedar.

#### 4.4.4 Reptiles and Amphibians

No reptiles or amphibians were identified during the field surveys. This result was expected due to the time of year in which the surveys were completed. The study area contains a variety of habitat that is suitable for amphibians, and limited reptile habitat. There are mapped occurrences of Columbia spotted frog (*Rana luteiventris*) within the study area (Dulisse and Hausleitner 2009). Northern alligator lizard (*Elgaria coerulea*) and western painted turtle are reported from nearby Fraser Lake (Dulise 2006, B.C. CDC 2019). Table 4.4-5 presents a list of species that have the potential to occur in the study area.

Table 4.4-5. Potential Amphibians and Reptiles

Scientific	English	Native	Status
<b>Amphibians</b>			
<i>Ambystoma macrodactylum</i>	long-toed salamander	N	
<i>Anaxyrus boreas</i>	Western toad	N	Y (SC)
<i>Lithobates pipiens</i>	northern leopard frog	N	R(E)
<i>Plethodon idahoensis</i>	Coeur d'Alene salamander	N	B (SC)
<i>Pseudachris regius</i>	northern Pacific tree frog	N	
<b>Reptiles</b>			
<i>Charina bottae</i>	northern rubber boa	N	Y (SC)
<i>Chrysemys picta</i>	Painted turtle	N	B (SC)
<i>Elgaria coerulea</i>	northern alligator lizard	N	
<i>Plestiodon skiltonianus</i>	western skink	N	B (SC)
<i>Thamnophis elegans</i>	terrestrial gartersnake	N	
<i>Thamnophis sirtalis</i>	common gartersnake	N	

#### 4.4.5 Invertebrates

A total of 14 insect species and 15 gastropod species were identified during the field surveys (Table 4.4-6; Plates 4.4-5 to 4.4-8). An additional eight species of dragonfly were reported for the study area by Cannings (2000). Two of the gastropods are provincially Blue-listed snails, and four are introduced species.

Table 4.4-6. Invertebrates

Scientific	English	Native	Status
<b>Insects</b>			
<i>Aeshna palmata</i>	Paddle-tailed Darner	N	
<i>Agonum cf. placidum</i>	ground beetle 3	N	

Scientific	English	Native	Status
<i>Carabus nemoralis</i>	European ground beetle	E	
<i>Enallagma ebrium</i>	Marsh Bluet	N	
<i>Eristalis tenax</i>	common drone fly	N	
<i>Ischnura cervula</i>	Pacific Forktail	N	
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	N	
<i>Melanoplus sp.</i>	grasshopper	N	
<i>Ophiogomphus severus</i>	<i>pale snaketail</i>	N	
<i>Opisthius richardsoni</i>		N	
<i>Pyrrharctia isabella</i>	woolly bear	N	
<i>Scaphinotus marginatus</i>	snail eating beetle	N	
<i>Tetrix subulata</i>	awl-shaped pygmy grasshopper	N	
<i>Vespula alascensis</i>			
<b>Gastropods</b>			
<i>Limax maximus</i>	giant garden slug	E	
<i>Allogona ptychophora</i>	Idaho forestsnail	N	
<i>Anguispira kochi</i>	banded tigersnail	N	B
<i>Arion rufus</i>	chocolate arion	E	
<i>Arion subfuscus</i>	dusky arion	E	
<i>Cepaea nemoralis</i>	grovesnail	E	
<i>Cryptomastix mullani</i>	Coeur D'Alene Oregonian	N	B
<i>Discus rotundatus</i>	rotund disc	N	
<i>Helisoma anceps</i>	two-ridge ramshorn	N	
<i>Helisoma trivolvis</i>	marsh ramshorn	N	
<i>Pristiloma stearnsii</i>	striate tightcoil	N	
<i>Prophysaon andersonii</i>	reticulate tailedropper	N	
<i>Prophysaon foliolatum</i>	yellow-bordered tailedropper	N	
<i>Zonitoides nitidus</i>	black gloss	N	





*Plate 4.4-5. False jeweled beetle. There were dozens of these beetles on the beach front, Oct. 19, 2019.*



*Plate 4.4-6. European ground beetle. Introduced species found under black cottonwood, Oct. 18, 2019.*



Plate 4.4-7. Introduced giant gardenslug (left) and native reticulate taildropper slug (right) on a large Artist's Conk (*Ganoderma applanatum*) growing on a large dead standing black cottonwood.



Plate 4.4-8. Black gloss snail.

#### 4.4.6 Vascular Plants

A total of 136 vascular plants were identified during the field studies (Table 4.4-7). While this list should be considered comprehensive for trees and most shrubs, the time of year in which the surveys were completed was not appropriate for the identification of most herbaceous species.

Table 4.4-7. Vascular Plants

Scientific	English	Native	Noxious	Status
<b>Trees</b>				
<i>Abies grandis</i>	grand fir	N		
<i>Abies lasiocarpa</i>	subalpine fir	N		
<i>Acer glabrum</i>	Douglas maple	N		
<i>Betula papyrifera</i>	paper birch	N		
<i>Larix occidentalis</i>	western larch	N		
<i>Picea engelmannii x glauca</i>	hybrid white spruce	N		
<i>Pinus monticola</i>	western white pine	N		
<i>Pinus ponderosa</i>	ponderosa pine	N		
<i>Populus tremuloides</i>	trembling aspen	N		
<i>Populus trichocarpa</i>	black cottonwood	N		
<i>Pseudotsuga menziesii</i>	Douglas-fir	N		
<i>Thuja plicata</i>	western redcedar	N		
<i>Tsuga heterophylla</i>	western hemlock	N		
<b>Shrubs</b>				
<i>Alnus incana</i>	mountain alder	N		
<i>Amelanchier alnifolia</i>	saskatoon	N		
<i>Chimaphila umbellata</i>	prince's pine	N		
<i>Cornus stolonifera</i>	red-osier dogwood	N		
<i>Crataegus douglasii</i>	black hawthorn	E		
<i>Cytisus scoparius</i>	Scotch broom	E		
<i>Mahonia aquifolium</i>	tall Oregon-grape	N		
<i>Lonicera involucrata</i>	black twinberry	N		
<i>Oplopanax horridus</i>	devil's club	N		
<i>Rhamnus purshiana</i>	cascara	N		
<i>Ribes lacustre</i>	black gooseberry	N		
<i>Rosa canina</i>	dog rose	E		
<i>Rosa gymnocarpa</i>	baldhip rose	N		
<i>Rubus idaeus</i>	red raspberry	N		
<i>Rubus parviflorus</i>	thimbleberry	N		
<i>Salix exigua</i>	sandbar willow	N		



Scientific	English	Native	Noxious	Status
<i>Salix lasiandra</i>	Pacific willow	N		
<i>Salix sitchensis</i>	Sitka willow	N		
<i>Salix sp.</i>	willow	N		
<i>Shepherdia canadensis</i>	soopolallie	N		
<i>Symphoricarpos albus</i>	common snowberry	N		
<b>Herbs</b>				
<i>Achillea millefolium</i>	yarrow	N		
<i>Agrostis gigantea</i>	redtop	E		
<i>Anaphalis margaritacea</i>	pearly everlasting	N		
<i>Anthoxanthum odoratum</i>	sweet vernalgrass	E		
<i>Arctium minus</i>	common burdock	E		
<i>Artemisia lindleyana</i>	Columbia River mugwort	N		
<i>Artemisia suksdorfii</i>	Suksdorf's mugwort	N		
<i>Asarum caudatum</i>	wild ginger	N		
<i>Athyrium filix-femina</i>	lady fern	N		
<i>Botrypus virginianus</i>	rattlesnake fern	N		
<i>Bromus inermis</i>	smooth brome	E		
<i>Calamagrostis canadensis</i>	bluejoint reedgrass	N		
<i>Carex bebbii</i>	Bebb's sedge	N		
<i>Carex diandra</i>	lesser-panicled sedge	N		
<i>Carex utriculata</i>	beaked sedge	N		
<i>Centaurea stoebe</i>	spotted knapweed	E	Y	
<i>Cerastium fontanum</i>	mouse-ear chickweed	N		
<i>Ceratophyllum demersum</i>	common hornwort	N		
<i>Chrysanthemum leucanthemum</i>	oxeye daisy	E		
<i>Cichorium intybus</i>	chicory	E		
<i>Cirsium arvense</i>	Canada thistle	E	Y	
<i>Cirsium vulgare</i>	bull thistle	E		
<i>Clintonia uniflora</i>	queen's cup	N		
<i>Comarum palustre</i>	marsh cinquefoil	N		
<i>Corallorhiza sp.</i>	coralroot	N		
<i>Dactylis glomerata</i>	orchard-grass	E		

Scientific	English	Native	Noxious	Status
<i>Dryopteris carthusiana</i>	toothed wood fern	N		
<i>Dryopteris cristata</i>	crested wood fern	N		
<i>Dryopteris expansa</i>	spiny wood fern	N		
<i>Eleocharis acicularis</i>	needle spikerush	N		
<i>Eleocharis erythropoda</i>	bald spikerush	N		
<i>Eleocharis palustris</i>	common spikerush	N		
<i>Elodea sp.</i>		N		
<i>Elymus glaucus</i>	blue wildrye	N		
<i>Epilobium ciliatum</i>	purple-leaved willowherb	N		
<i>Equisetum arvense</i>	common horsetail	N		
<i>Equisetum fluviatile</i>	swamp horsetail	N		
<i>Equisetum hyemale</i>	scouring-rush	N		
<i>Equisetum laevigatum</i>	smooth scouring-rush	N		
<i>Equisetum variegatum</i>	northern scouring-rush	N		
<i>Euphrasia nemorosa</i>	eastern eyebright	E		
<i>Fragaria vesca</i>	wood strawberry	N		
<i>Galeopsis tetrahit</i>	hemp-nettle	E		
<i>Galium boreale</i>	northern bedstraw	N		
<i>Galium trifidum</i>	small bedstraw	N		
<i>Geum macrophyllum</i>	large-leaved avens	N		
<i>Glyceria sp.</i>		N		
<i>Gnaphalium uliginosum</i>	marsh cudweed	E		
<i>Goodyera oblongifolia</i>	rattlesnake-plantain	N		
<i>Gratiola neglecta</i>	American hedge-hyssop	N		
<i>Gymnocarpium dryopteris</i>	oak fern	N		
<i>Helenium autumnale</i>	mountain sneezeweed	N		
<i>Heracleum maximum</i>	cow-parsnip	N		
<i>Hieracium murorum</i>	wall hawkweed	E		
<i>Hippuris vulgaris</i>	common mare's-tail	N		
<i>Hypericum perforatum</i>	common St. John's-wort	E		
<i>Juncus bufonius</i>	toad rush	N		
<i>Juncus effusus</i>	common rush	N		

Scientific	English	Native	Noxious	Status
<i>Juncus ensifolius</i>	dagger-leaf rush	N		
<i>Juncus sp.</i>	rush	N		
<i>Lathyrus latifolius</i>	broad-leaved peavine	E		
<i>Leucanthemum vulgare</i>	oxeye daisy	E		
<i>Lycopus sp.</i>		N		
<i>Lysichiton americanus</i>	skunk cabbage	N		
<i>Melilotus alba</i>	white sweet-clover	E		
<i>Mentha arvensis</i>	field mint	N		
<i>Monotropa uniflora</i>	indian-pipe	N		
<i>Mycelis muralis</i>	wall lettuce	E		
<i>Myosotis scorpioides</i>	European forget-me-not	E		
<i>Persicaria amphibia</i>	water smartweed	N		
<i>Persicaria hydropiper</i>	marshpepper smartweed	N		
<i>Persicaria hydropiperoides</i>	water-pepper	N		
<i>Phalaris arundinacea</i>	reed canary grass	E		
<i>Phleum pratense</i>	common timothy	E		
<i>Plantago lanceolata</i>	ribwort plantain	N		
<i>Plantago major</i>	common plantain	N		
<i>Poa palustris</i>	fowl bluegrass	N		
<i>Poa pratensis</i>	Kentucky bluegrass	N		
<i>Poa sp.</i>	bluegrass	N		
<i>Prunella vulgaris</i>	self-heal	N		
<i>Pteridium aquilinum</i>	bracken fern	N		
<i>Ranunculus acris</i>	meadow buttercup	N		
<i>Rumex maritimus</i>	golden dock	N		
<i>Sceptridium multifidum</i>	leathery grape fern	N		
<i>Scirpus microcarpus</i>	small-flowered bulrush	N		
<i>Scutellaria lateriflora</i>	blue skullcap	N		
<i>Solidago lepida</i>	Western Canada goldenrod	N		
<i>Sparganium sp.</i>	bur-reed	N		
<i>Stellaria obtusa</i>	blunt-sepaled starwort	N		
<i>Symphotrichum ciliolatum</i>	Lindley's aster	N		



Scientific	English	Native	Noxious	Status
<i>Symphotrichum lanceolatum</i>	western willow aster	N		
<i>Tanacetum vulgare</i>	common tansy	E	Y	
<i>Taraxacum sp.</i>	dandelion	N		
<i>Trifolium repens</i>	white clover	E		
<i>Typha latifolia</i>	common cattail	N		
<i>Urtica dioica</i>	stinging nettle	N		
<i>Verbascum thapsus</i>	great mullein	E		
<i>Veronica beccabunga</i>	American speedwell	N		
<i>Veronica officinalis</i>	common speedwell	N		
<i>Vicia americana</i>	American vetch	N		
<i>Vicia cracca</i>	tufted vetch	E		
<i>Viola sempervirens</i>	trailing yellow violet	N		

#### 4.4.7 Fungi

A total of 63 species of macrofungi (those fungi visible to the naked eye) were recorded in the study area during the 2019 field surveys (Table 4.4-8). Many specimens were only confidently identified to the level of genus; positive identification to species level is challenging for many fungi and beyond the scope of this initial inventory. The timing of the surveys coincided with the peak in annual fungal fruiting and available mycological expertise on the survey team enabled this preliminary list of fungal species to be generated. This represents only a snapshot of fungal diversity in the study area, and some of the species are new records of occurrence for the Kootenays, and indeed some could be undescribed species (Plates 4.4-9 and 4.4-10). A generally used estimation for fungal species diversity is based on the ratio of 6 to 1 for fungi to plants over a given area. Using this formula and the preliminary plant list (n=136), it is estimated there are at least 800 and likely well over 1,000 fungal species in the study area.

Table 4.4-8. Fungi.

Scientific	English	Native	Status
<i>Bisporella citrina</i>		N	
<i>Bovista cf. plumbea</i>		N	
<i>Calvatia sp.</i>		N	
<i>Ciboria cf. seminicola</i>		N	
<i>Cystoderma amianthinum</i>		N	
<i>Clavariadelphus truncatus</i>		N	
<i>Clavulinopsis corniculata</i>		N	
<i>Clavulinopsis laeticolor</i>		N	

Scientific	English	Native	Status
<i>Clitocybe sp.1</i>		N	
<i>Clitocybe fragrans</i>		N	
<i>Collybia sp.</i>		N	
<i>Cortinarius sp.1</i>		N	
<i>Crepidotus mollis</i>		N	
<i>Crucibulum crucibuliforme</i>		N	
<i>Exidia recisa</i>		N	
<i>Fomitopsis rosea</i>		N	
<i>Ganoderma applanatum</i>		N	
<i>Hebeloma sp.</i>		N	
<i>Hemipholiota populnea</i>		N	
<i>Hericium corraloides</i>		N	
<i>Heyderia abietis</i>		N	
<i>Hygrocybe miniata</i>		N	
<i>Hygrocybe singeri</i>	witch's hat	N	
<i>Hygrophorus aurantiaca</i>		N	
<i>Hypomyces lactifluorum</i>	lobster mushroom	N	
<i>Hypsizygus tessulatus</i>		N	
<i>Incocybe cf. geophylla</i>		N	
<i>Laccaria laccata</i>		N	
<i>Lactarius rubrilacteus</i>	bleeding milk cap	N	
<i>Lepiota clypeolaria</i>		N	
<i>Lepiota magnispora</i>		N	
<i>Lepista cf. glaucocana</i>		N	
<i>Lichenomphalia umbellifera</i>		N	
<i>Marasmius cf. tremulae</i>		N	
<i>Marasmius oreades</i>		N	
<i>Merismodes cf. fasciculata</i>		N	
<i>Multiclavula mucida</i>		N	
<i>Mycena pura</i>		N	
<i>Mycena sp.1</i>		N	
<i>Mycena sp.2</i>		N	
<i>Mycena sp.3</i>		N	

Scientific	English	Native	Status
<i>Mycena sp.4</i>		N	
<i>Mycena sp.5</i>		N	
<i>Paxillus involutus</i>		N	
<i>Pholiota aurivella</i> group		N	
<i>Pseudohydnum gelatinosum</i>	spirit gummy bear	N	
<i>Ramaria sp.1</i>		N	
<i>Rhytisma salicinum</i>	black tar spot	N	
<i>Russula brevipes</i>	short-stemmed Russula	N	
<i>Russula sp.1</i>		N	
<i>Suillus clintonianus</i>	larch Suillus	N	
<i>Suillus lakei</i>		N	
<i>Tremella sp.</i>		N	
<i>Trichaptum bifforme</i>		N	
<i>Tricholoma cf. terreum</i>	mouse Tricholoma	N	
<i>Tricholoma murrillianum</i>	pine mushroom	N	
<i>Tricholoma pardinum</i>	tiger Tricholoma	N	
<i>Tricholoma populinum</i>		N	
<i>Tricholomopsis sp.</i>		N	



Plate 4.4-9. *Ciboria cf. seminicola* on *Alnus incana* cone in wetland habitat. This is a new record for the Kootenays.





Plate 4.4-10. *Heyderia abietis*. Rarely reported fungal species of mature conifer forests.

#### 4.4.8 Other (mosses, lichens and slime moulds)

Other taxonomic groups that were recorded during field surveys included lichens (seven species), mosses (six species), and slime molds (two species) (Table 4.4-9). These are just a handful of the more prominent species (Plate 4.4-11); there was insufficient time to identify many of the great variety of these species groups that exist over such a diverse range of habitat types as present in the study area.

Table 4.4-9. Other Species.

Scientific	English	Native	Status
<b>Lichens</b>			
<i>Peltigera sp.</i>	pelt lichen	N	
<i>Letharia vulpina</i>	wolf lichen	N	
<i>Usnea cf. glabrata</i>		N	
<i>Usnea cf. lapponica</i>		N	
<i>Nephroma sp.</i>		N	
<i>Evernia prunastri</i>		N	
<i>Lobaria pulmonaria</i>	lungwort	N	
<b>Moss</b>			
<i>Amblystegiaceae</i>	feather moss	N	
<i>Ceratodon purpureus</i>	fire moss	N	
<i>Hylocomium splendens</i>	step moss	N	

Scientific	English	Native	Status
<i>Syntrichia ruralis</i>		N	
<i>Rhytidiadelphus triquetrus</i>	electrified cat's-tail moss	N	
<i>Rhytidiopsis robusta</i>	pipecleaner moss	N	
<b>Myxomycete</b>			
<i>Trichia cf. varia</i>		?	
<i>Lycogala epidendrum</i>		?	



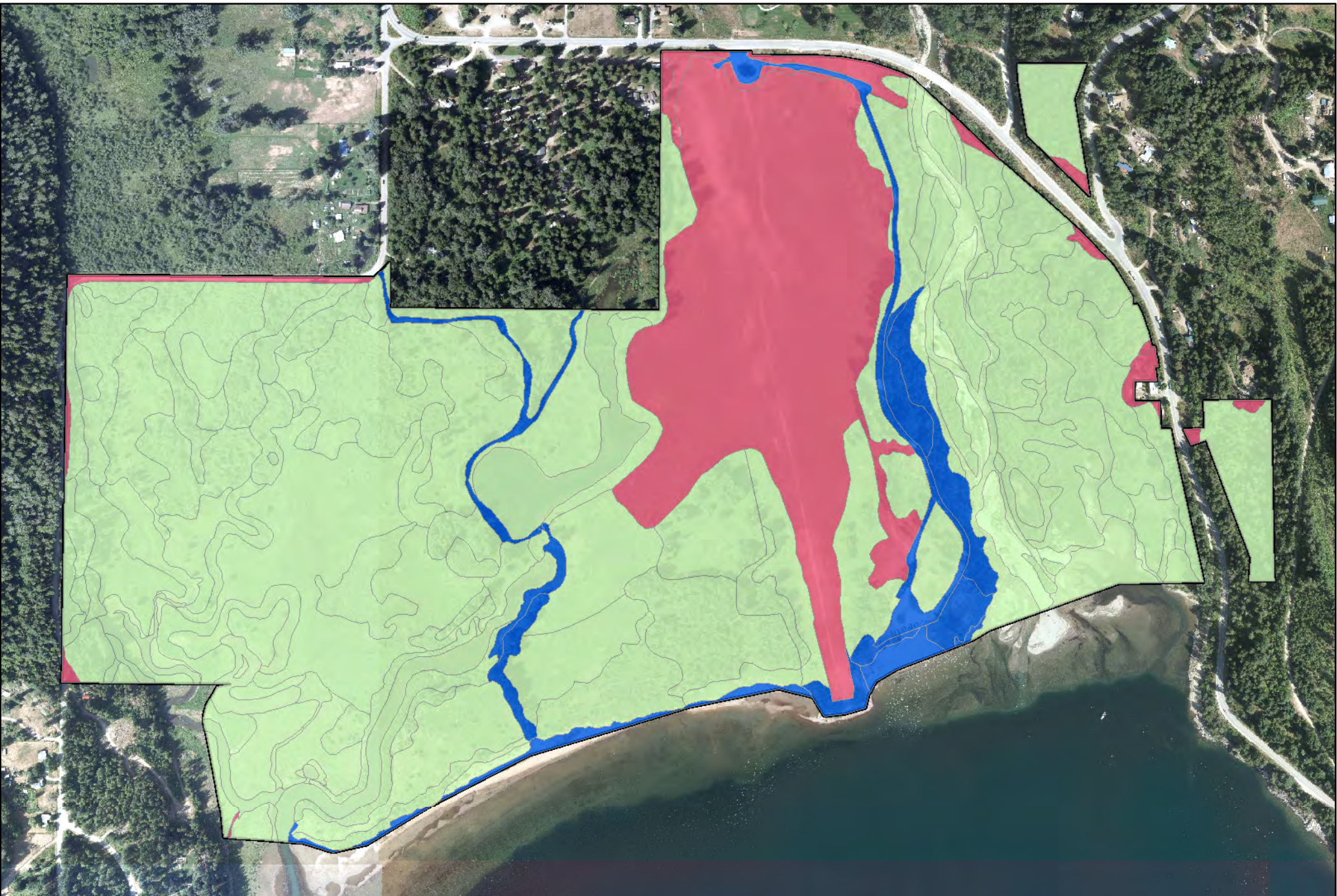
Plate 4.4-11. *Usnea* sp. A rich diversity of lichens exists within the study area.

## 5. PROPOSED MANAGEMENT ZONES

The current management zones were created using the ecosystem polygons (Figure 5-1). This map illustrates the general anthropogenic use, or lack thereof, in the study area. Mixed Use (M) includes areas within the study area boundary that contain roads, residential areas, and the old airstrip and hay field. Areas mapped as Nature (N) have natural values and do not have evidence of current human use. The Recreation (R) areas include the well-used trails, beaches, and access roads.

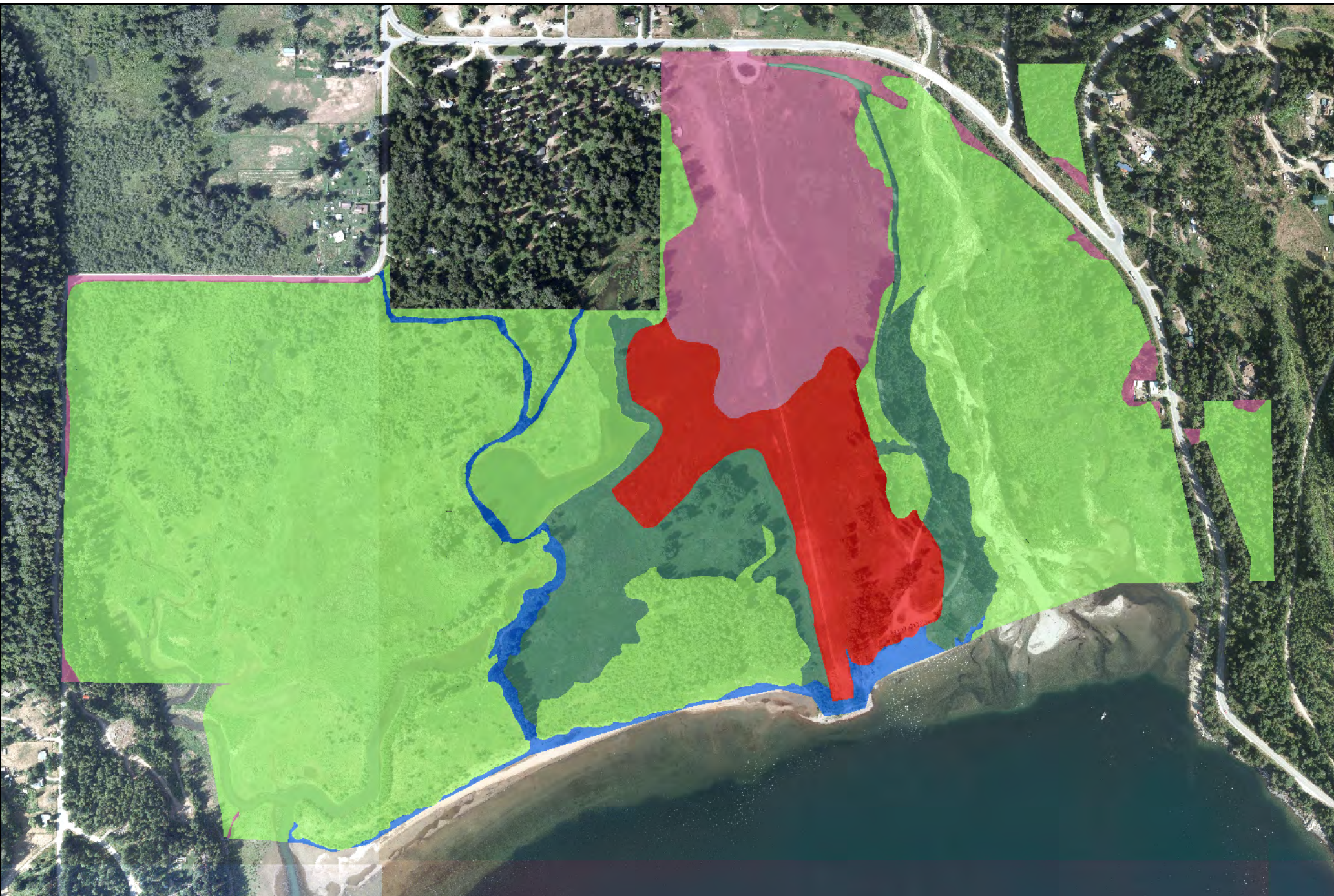
Figure 5-2 presents proposed management areas. It is based on the results of the field program and mapping exercises. The management zones are focused on preserving the sensitive ecosystems and biodiversity hot spots within the study area, while continuing to allow for recreation.



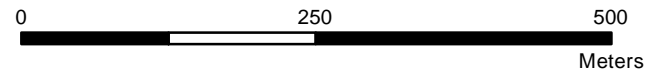


**Figure 5-1. Current Park Use Zones**

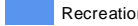




**Figure 5-2. Proposed Management Zones**



**Legend**

 Mixed Use	 Restoration
 Nature	 Additional Direction Required
 Recreation	



## 6. MANAGEMENT RECOMMENDATIONS

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Based on the results of this project, we have the following management recommendations. The general location of each recommendation is presented on Figure 6-2:

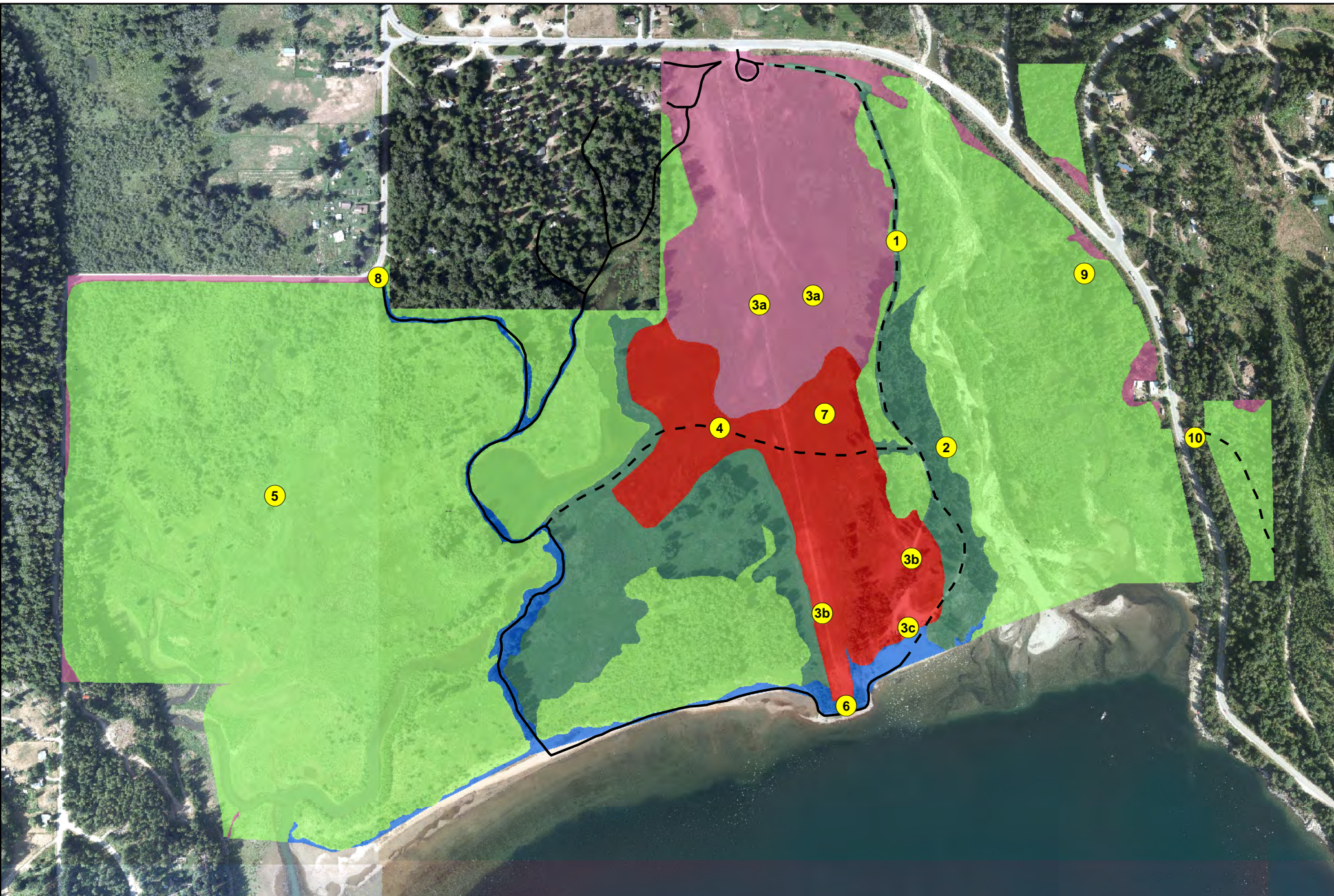
1. Remove and restore the current access road along Crawford Creek. The road is located in a sensitive floodplain ecosystem, and in places, is at risk of erosion from the creek. The road could be restored by roughing up the compacted soil and planting—or letting native vegetation—naturally re-colonize it. A trail system could be established along the reclaimed road to provide recreational activities.
2. Close and move the informal trail along the west side of Crawford Creek. The trail is located in a sensitive ecosystem area and is unsafe in several locations due to erosion.
3. Create a new access road along the old airstrip or abandoned access road (3a). These locations appear to be suitable for a road and are in elevated locations that are unlikely to flood. The preferred location for a parking area for access to the beach and trail system would be near the end of the old airstrip or at the previously modified location at the end of the abandoned access road (3b). The existing parking area (3c), which occasionally floods, could then be restored to a more natural state (willow and cottonwood floodplain communities).
4. Create a new trail from the southern side of the constructed pond which crosses the old airstrip and connects to the proposed trail system along the reclaimed road. This location is above the Kootenay Lake flood line, and would be located in modified reed canarygrass marshes that have limited ecological values. A trail in this area would allow for spring and early summer recreational use of the park while southern portions of the trail system may be affected by seasonal flood waters.
5. Continue to restrict all access to the wetland complexes along Beaver Creek. The large wetland complexes in the Beaver Creek area contain an abundance of wildlife habitat and are currently mostly weed free (other than reed canarygrass). Restricting access to this portion of the park will help maintain the quality of the ecological habitat.
6. Preserve the end of the old airstrip that juts into Kootenay Lake for continued recreation and enhanced restoration use. This rocky area provides additional niche habitat along the foreshore. Cottonwood and willow plantings could be considered at the end of the old airstrip to create a continuous forest and reclaim a portion of the modified area.
7. Restore portions of the hay field and adjacent reed canarygrass dominated areas. Portions of these grass areas could be planted to re-establish the cottonwood floodplain forests that should naturally occur. Restoration would increase the diversity and structure of the area, while still allowing for a large area of hay field (and associated ungulate use) at the higher (northern) elevations. A Bobolink nesting survey should be completed before any alterations are made to the grass dominated areas to ensure there is not a negative impact to this at-risk species.

8. Install signage or consider trail closures when grizzly bears are observed in the area.
9. Any proposed trail in the OIE forests east of Crawford Creek should be assessed for rare species, as two at-risk species of snails were observed in this area. Any trail route should stay out of wet forests and the Crawford Creek floodplain.
10. Investigate the old roads in the Mixed Use area east of Crawford Creek as a potential trail area. Due to past logging, this area has a lower potential for species-at-risk.

The following future studies are recommended for the park:

- Consider an early and mid-season vegetation study of the park. As this report was based on late season field studies, a more complete list of vascular plant species could be created with additional inventory work.
- Create an invasive plant management plan to address the extensive reed canarygrass and other introduced species.
- Develop a restoration plan for the park. As mentioned above, there are multiple projects that could be undertaken. A more detailed restoration plan should be created prior to this work. And work near Kootenay Lake or Crawford Creek may require permits under the provincial *Water Sustainability Act*, and may require cultural and archology studies.
- Develop a park management plan for the park which is informed by this report. Additional recommendations may be required depending on proposed development activities in the area identified as Additional Direction Required on Figure 6-1.

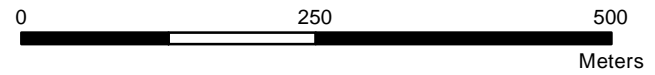




**Figure 6-1. Management Recommendations**

**Legend**

- Management\_Locations
- Mixed Use
- Nature
- Restoration
- Additional Direction Required
- Existing Trails
- Proposed Trail
- Recreation





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## APPENDIX A. SPECIES AND ECOSYSTEMS AT RISK

### Potential Species at Risk

Scientific Name	English Name	COSEWIC	BC List	SARA
<i>Accipiter gentilis atricapillus</i>	Northern Goshawk, <i>atricapillus</i> subspecies	NAR (May 1995)	Blue	
<i>Acipenser transmontanus</i> pop. 1	White Sturgeon (Upper Kootenay River Population)	E (Nov 2012)	Red	1-E (Jun 2003)
<i>Acorus americanus</i>	American sweet-flag		Blue	
<i>Aechmophorus occidentalis</i>	Western Grebe	SC (May 2014)	Red	1-SC (Nov 2017)
<i>Aeronautes saxatalis</i>	White-throated Swift		Blue	
<i>Aeshna constricta</i>	Lance-tipped Darner		Blue	
<i>Anaxyrus boreas</i>	Western Toad	SC (Nov 2012)	Yellow	1-SC (Jun 2018)
<i>Anguispira kochi</i>	Banded Tigersnail	NAR (Apr 2017)	Blue	
<i>Arctoparmelia subcentrifuga</i>	abrading ring		Blue	
<i>Ardea herodias herodias</i>	Great Blue Heron, <i>herodias</i> subspecies		Blue	
<i>Argia emma</i>	Emma's Dancer		Blue	
<i>Argia vivida</i>	Vivid Dancer	SC (May 2015)	Blue	1-SC (Feb 2019)
<i>Asio flammeus</i>	Short-eared Owl	SC (Mar 2008)	Blue	1-SC (Jul 2012)
<i>Astragalus microcystis</i>	least bladderly milk-vetch		Blue	
<i>Barbula convoluta</i> var. <i>eustegia</i>			Red	
<i>Botaurus lentiginosus</i>	American Bittern		Blue	
<i>Botrychium michiganense</i>	Michigan moonwort		Blue	
<i>Brachythecium holzingeri</i>			Blue	
<i>Campylium calcareum</i>			Red	
<i>Carex adusta</i>	lesser brown sedge		Blue	
<i>Carex pedunculata</i>	peduncled sedge		Blue	
<i>Carex scopulorum</i> var. <i>prionophylla</i>	saw-leaved sedge		Blue	
<i>Castilleja tenuis</i>	hairy paintbrush	E (May 2019)	Red	
<i>Catherpes mexicanus</i>	Canyon Wren	NAR (May 1992)	Blue	
<i>Charina bottae</i>	Northern Rubber Boa	SC (Apr 2016)	Yellow	1-SC (Jan 2005)
<i>Chordeiles minor</i>	Common Nighthawk	SC (May 2018)	Yellow	1-T (Feb 2010)
<i>Chrysemys picta</i> pop. 2	Painted Turtle - Intermountain - Rocky Mountain Population	SC (Nov 2016)	Blue	1-SC (Dec 2007)
<i>Cicindela hirticollis</i>	Hairy-necked Tiger Beetle		Blue	
<i>Cladonia luteoalba</i>	lemon pixie		Blue	
<i>Clarkia rhomboidea</i>	common clarkia		Blue	
<i>Claytonia cordifolia</i>	heart-leaved springbeauty		Blue	

Scientific Name	English Name	COSEWIC	BC List	SARA
<i>Coccothraustes vespertinus</i>	Evening Grosbeak	SC (Nov 2016)	Yellow	1-SC (May 2019)
<i>Colias pelidne</i>	Pelidne Sulphur		Blue	
<i>Coluber constrictor</i>	North American Racer	T (Nov 2015)	Blue	1-SC (Aug 2006)
<i>Contopus cooperi</i>	Olive-sided Flycatcher	SC (May 2018)	Blue	1-T (Feb 2010)
<i>Copablepharon absidum</i>	Columbia Dune Moth	DD (Apr 2017)	Red	
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat		Blue	
<i>Cottus confusus</i>	Shorthead Sculpin	SC (Nov 2010)	Blue	1-SC
<i>Cottus hubbsi</i>	Columbia Sculpin	SC (Nov 2010)	Blue	1-SC (Jun 2003)
<i>Crotalus oreganus</i>	Western Rattlesnake	T (May 2015)	Blue	1-T (Jul 2005)
<i>Cryptomastix mullani</i>	Coeur d'Alene Oregonian		Blue	
<i>Cypseloides niger</i>	Black Swift	E (May 2015)	Blue	1-E (May 2019)
<i>Danaus plexippus</i>	Monarch	E (Nov 2016)	Blue	1-SC (Jun 2003)
<i>Dolichonyx oryzivorus</i>	Bobolink	T (Apr 2010)	Blue	1-T (Nov 2017)
<i>Downingia elegans</i>	common downingia		Red	
<i>Entosthodon fascicularis</i>	banded cord-moss	SC (May 2015)	Blue	1-SC (Aug 2006)
<i>Epargyreus clarus</i>	Silver-spotted Skipper		Blue	
<i>Epargyreus clarus clarus</i>	Silver-spotted Skipper, <i>clarus</i> subspecies		Blue	
<i>Euphagus carolinus</i>	Rusty Blackbird	SC (Apr 2017)	Blue	1-SC (Mar 2009)
<i>Euptoieta claudia</i>	Variegated Fritillary		Blue	
<i>Falco mexicanus</i>	Prairie Falcon	NAR (May 1996)	Red	
<i>Falco peregrinus anatum</i>	Peregrine Falcon, <i>anatum</i> subspecies	NAR (Dec 2017)	Red	1-SC (Jun 2012)
<i>Fisherola nuttalli</i>	Shortface Lanx	E (Apr 2016)	Red	
<i>Galba dalli</i>	Dusky Fossaria		Blue	
<i>Galba truncatula</i>	Attenuate Fossaria		Blue	
<i>Glycyrrhiza lepidota</i>	wild licorice		Blue	
<i>Gulo gulo luscus</i>	Wolverine, <i>luscus</i> subspecies	SC (May 2014)	Blue	1-SC (Jun 2018)
<i>Gyraulus crista</i>	Star Gyro		Blue	
<i>Hemphillia camelus</i>	Pale Jumping-slug		Blue	
<i>Hesperochiron pumilus</i>	dwarf hesperochiron	E (May 2019)	Red	
<i>Hirundo rustica</i>	Barn Swallow	T (May 2011)	Blue	1-T (Nov 2017)
<i>Hygrohypnum alpinum</i>			Blue	
<i>Icteria virens</i>	Yellow-breasted Chat	E (Nov 2011)	Red	1-E (Jun 2003)
<i>Isoetes minima</i>	Columbia quillwort	E (May 2019)	Red	
<i>Kootenaia burkei</i>	Pygmy Slug	SC (Apr 2016)	Blue	1-SC (Feb 2019)

Scientific Name	English Name	COSEWIC	BC List	SARA
<i>Libellula pulchella</i>	Twelve-spotted Skimmer		Blue	
<i>Limenitis archippus</i>	Viceroy		Red	
<i>Lithobates pipiens</i>	Northern Leopard Frog	E (Apr 2009)	Red	1-E (Jun 2003)
<i>Lota lota</i> pop. 1	Burbot (Lower Kootenay Population)		Red	
<i>Lycaena nivalis</i>	Lilac-bordered Copper		Blue	
<i>Magnipelta mycophaga</i>	Magnum Mantleslug	SC (May 2012)	Blue	1-SC
<i>Megascops kennicottii macfarlanei</i>	Western Screech-Owl, <i>macfarlanei</i> subspecies	T (May 2012)	Blue	1-T
<i>Melanerpes lewis</i>	Lewis's Woodpecker	T (Apr 2010)	Blue	1-T (Jul 2012)
<i>Musculium partumeium</i>	Swamp Fingernailclam		Blue	
<i>Myotis ciliolabrum</i>	Western Small-footed Myotis		Blue	
<i>Myotis lucifugus</i>	Little Brown Myotis	E (Nov 2013)	Yellow	1-E (Dec 2014)
<i>Myotis thysanodes</i>	Fringed Myotis	DD (May 2004)	Blue	3 (Mar 2005)
<i>Neotamias ruficaudus simulans</i>	Red-tailed Chipmunk, <i>simulans</i> subspecies		Blue	
<i>Nephroma isidiosum</i>	pebbled paw		Blue	
<i>Numenius americanus</i>	Long-billed Curlew	SC (May 2011)	Blue	1-SC (Jan 2005)
<i>Olsynium douglasii</i> var. <i>inflatum</i>	satinflower		Red	
<i>Oncorhynchus clarkii lewisi</i>	Cutthroat Trout, <i>lewisi</i> subspecies	SC (Nov 2016)	Blue	1-SC (Feb 2010)
<i>Ophiogomphus occidentis</i>	Sinuuous Snaketail		Blue	
<i>Oreamnos americanus</i>	Mountain Goat		Blue	
<i>Oreohelix subrudis</i>	Subalpine Mountainsnail		Blue	
<i>Ovis canadensis</i>	Bighorn Sheep		Blue	
<i>Pekania pennanti</i>	Fisher		Blue	
<i>Phalacrocorax auritus</i>	Double-crested Cormorant	NAR (May 1978)	Blue	
<i>Philonotis marchica</i>			Blue	
<i>Philonotis yezoana</i>			Blue	
<i>Physella columbiana</i>	Rotund Physa		Red	
<i>Platyhypnidium riparioides</i>			Blue	
<i>Plestiodon skiltonianus</i>	Western Skink	SC (Nov 2014)	Blue	1-SC (Jan 2005)
<i>Plethodon idahoensis</i>	Coeur d'Alene Salamander	SC (Nov 2007)	Yellow	1-SC (Jun 2003)
<i>Podiceps nigricollis</i>	Eared Grebe		Blue	
<i>Polemonium californicum</i>	California Jacob's ladder		Red	
<i>Polites themistocles themistocles</i>	Tawny-edged Skipper, <i>themistocles</i> subspecies		Blue	
<i>Pyrgus communis</i>	Checkered Skipper		Blue	
<i>Rangifer tarandus</i> pop. 1	Caribou (Southern Mountain Population)	E (May 2014)	Red	1-T (Jun 2003)
<i>Rhinichthys umatilla</i>	Umatilla Dace	T (Apr 2010)	Red	3 (Mar 2005)
<i>Salvelinus confluentus</i>	Bull Trout	SC (Nov 2012)	Blue	

Scientific Name	English Name	COSEWIC	BC List	SARA
<i>Scouleria marginata</i>	margined streamside moss	E (May 2012)	Red	1-E (Jan 2005)
<i>Scrophularia lanceolata</i>	lance-leaved figwort		Blue	
<i>Seligeria tristichoides</i>			Blue	
<i>Senecio hydrophiloides</i>	sweet-marsh butterweed		Blue	
<i>Senecio hydrophilus</i>	alkali-marsh butterweed		Red	
<i>Sphaerium occidentale</i>	Herrington Fingernailclam		Blue	
<i>Sphaerium striatinum</i>	Striated Fingernailclam		Blue	
<i>Stagnicola traski</i>	Widelip Pondsnaail		Blue	
<i>Sterna forsteri</i>	Forster's Tern	DD (May 1996)	Red	
<i>Sympetrum vicinum</i>	Autumn Meadowhawk		Blue	
<i>Symphotrichum ascendens</i>	long-leaved aster		Blue	
<i>Taxidea taxus</i>	American Badger	E (Nov 2012)	Red	1-E (Jun 2018)
<i>Thomomys talpoides segregatus</i>	Northern Pocket Gopher, <i>segregatus</i> subspecies		Red	
<i>Tortula obtusifolia</i>			Blue	
<i>Ursus arctos</i>	Grizzly Bear	SC (May 2002)	Blue	1-SC (Jun 2018)
<i>Valvata tricarinata</i>	Threeridge Valvata		Red	
<i>Veronica catenata</i>	pink water speedwell		Blue	
<i>Zacoleus idahoensis</i>	Sheathed Slug	SC (Apr 2016)	Blue	1-SC (Feb 2019)

### Potential Ecosystems at Risk

Scientific Name	English Name	Prov Status	BC List	Ecosystem Group
<i>Alnus incana</i> / <i>Cornus sericea</i> / <i>Athyrium filix-femina</i>	mountain alder / red-osier dogwood / lady fern	S3	Blue	Terrestrial Realm - Flood Group (F): Low Bench Flood Class (FI)
<i>Betula nana</i> / <i>Carex aquatilis</i>	scrub birch / water sedge	S3	Blue	Wetland Realm - Peatland Group: Fen Wetland Class (Wf)
<i>Carex lasiocarpa</i> / <i>Drepanocladus aduncus</i>	slender sedge / common hook-moss	S3	Blue	Wetland Realm - Peatland Group: Fen Wetland Class (Wf)
<i>Dulichium arundinaceum</i> Herbaceous Vegetation	three-way sedge	S2	Red	Wetland Realm - Mineral Wetland Group: Marsh Wetland Class (Wm)
<i>Festuca idahoensis</i> - <i>Pseudoroegneria spicata</i> - <i>Lupinus sericeus</i> - <i>Koeleria macrantha</i>	Idaho fescue - bluebunch wheatgrass - silky lupine - junegrass	S2	Red	Terrestrial Realm - Grassland Group (G): Grassland Class (Gg)
<i>Menyanthes trifoliata</i> - <i>Carex lasiocarpa</i>	buckbean - slender sedge	S3	Blue	Wetland Realm - Peatland Group: Fen Wetland Class (Wf)



Scientific Name	English Name	Prov Status	BC List	Ecosystem Group
<i>Pseudotsuga menziesii</i> / <i>Berberis aquifolium</i> / <i>Cryptogramma acrostichoides</i>	Douglas-fir / tall Oregon-grape / parsley fern	S2?	Red	Terrestrial Realm - Forest: Coniferous - dry
<i>Schoenoplectus acutus</i> Deep Marsh	hard-stemmed bulrush Deep Marsh	S3	Blue	Wetland Realm - Mineral Wetland Group: Marsh Wetland Class (Wm)
<i>Thuja plicata</i> - <i>Tsuga heterophylla</i> / <i>Equisetum arvense</i>	western redcedar - western hemlock / common horsetail	S3	Blue	Terrestrial Realm - Forest: Coniferous - moist/wet
<i>Trichophorum cespitosum</i> / <i>Campylium stellatum</i>	tufted clubrush / golden star-moss	S2S3	Blue	Wetland Realm - Peatland Group: Fen Wetland Class (Wf)
<i>Tsuga heterophylla</i> / <i>Symphoricarpos albus</i>	western hemlock / common snowberry	S2	Red	Terrestrial Realm - Forest: Coniferous - mesic

## APPENDIX B. BASELINE SPECIES INVENTORY

Group	Scientific	English	Native	Noxious	Status	Source
<b>Trees</b>						
Vascular Plant	<i>Abies grandis</i>	grand fir	N			TE RD IA 2019
Vascular Plant	<i>Abies lasiocarpa</i>	subalpine fir	N			TE RD IA 2019
Vascular Plant	<i>Acer glabrum</i>	Douglas maple	N			TE RD IA 2019
Vascular Plant	<i>Betula papyrifera</i>	paper birch	N			TE RD IA 2019
Vascular Plant	<i>Larix occidentalis</i>	western larch	N			TE RD IA 2019
Vascular Plant	<i>Picea engelmannii x glauca</i>	hybrid white spruce	N			TE RD IA 2019
Vascular Plant	<i>Pinus monticola</i>	western white pine	N			TE RD IA 2019
Vascular Plant	<i>Pinus ponderosa</i>	ponderosa pine	N			TE RD IA 2019
Vascular Plant	<i>Populus tremuloides</i>	trembling aspen	N			TE RD IA 2019
Vascular Plant	<i>Populus trichocarpa</i>	black cottonwood	N			TE RD IA 2019
Vascular Plant	<i>Pseudotsuga menziesii</i>	Douglas-fir	N			TE RD IA 2019
Vascular Plant	<i>Thuja plicata</i>	western redcedar	N			TE RD IA 2019
Vascular Plant	<i>Tsuga heterophylla</i>	western hemlock	N			TE RD IA 2019
<b>Shrubs</b>						
Vascular Plant	<i>Alnus incana</i>	mountain alder	N			TE RD IA 2019
Vascular Plant	<i>Amelanchier alnifolia</i>	saskatoon	N			TE RD IA 2019
Vascular Plant	<i>Chimaphila umbellata</i>	prince's pine	N			TE RD IA 2019
Vascular Plant	<i>Cornus stolonifera</i>	red-osier dogwood	N			TE RD IA 2019
Vascular Plant	<i>Crataegus douglasii</i>	black hawthorn	E			TE RD IA 2019
Vascular Plant	<i>Cytisus scoparius</i>	Scotch broom	E			TE RD IA 2019
Vascular Plant	<i>Mahonia aquifolium</i>	tall Oregon-grape	N			TE RD IA 2019
Vascular Plant	<i>Lonicera involucrata</i>	black twinberry	N			TE RD IA 2019
Vascular Plant	<i>Oplopanax horridus</i>	devil's club	N			TE RD IA 2019
Vascular Plant	<i>Rhamnus purshiana</i>	casacara	N			TE RD IA 2019
Vascular Plant	<i>Ribes lacustre</i>	black gooseberry	N			TE RD IA 2019
Vascular Plant	<i>Rosa canina</i>	dog rose	E			TE RD IA 2019
Vascular Plant	<i>Rosa gymnocarpa</i>	baldhip rose	N			TE RD IA 2019
Vascular Plant	<i>Rubus idaeus</i>	red raspberry	N			TE RD IA 2019
Vascular Plant	<i>Rubus parviflorus</i>	thimbleberry	N			TE RD IA 2019
Vascular Plant	<i>Salix exigua</i>	sandbar willow	N			TE RD IA 2019
Vascular Plant	<i>Salix lasiandra</i>	Pacific willow	N			TE RD IA 2019
Vascular Plant	<i>Salix sitchensis</i>	Sitka willow	N			TE RD IA 2019
Vascular Plant	<i>Salix sp.</i>	willow	N			TE RD IA 2019
Vascular Plant	<i>Shepherdia canadensis</i>	soopolallie	N			TE RD IA 2019
Vascular Plant	<i>Symphoricarpos albus</i>	common snowberry	N			TE RD IA 2019
<b>Herbs</b>						
Vascular Plant	<i>Achillea millefolium</i>	yarrow	N			TE RD IA 2019
Vascular Plant	<i>Agrostis gigantea</i>	redtop	E			TE RD IA 2019
Vascular Plant	<i>Anaphalis margaritacea</i>	pearly everlasting	N			TE RD IA 2019
Vascular Plant	<i>Anthoxanthum odoratum</i>	sweet vernalgrass	E			TE RD IA 2019
Vascular Plant	<i>Arctium minus</i>	common burdock	E			TE RD IA 2019

Group	Scientific	English	Native	Noxious	Status	Source
Vascular Plant	<i>Artemisia lindleyana</i>	Columbia River mugwort	N			TE RD IA 2019
Vascular Plant	<i>Artemisia suksdorfii</i>	Suksdorf's mugwort	N			TE RD IA 2019
Vascular Plant	<i>Asarum caudatum</i>	wild ginger	N			TE RD IA 2019
Vascular Plant	<i>Athyrium filix-femina</i>	lady fern	N			TE RD IA 2019
Vascular Plant	<i>Botrypus virginianus</i>	rattlesnake fern	N			TE RD IA 2019
Vascular Plant	<i>Bromus inermis</i>	smooth brome	E			TE RD IA 2019
Vascular Plant	<i>Calamagrostis canadensis</i>	bluejoint reedgrass	N			TE RD IA 2019
Vascular Plant	<i>Carex bebbii</i>	Bebb's sedge	N			TE RD IA 2019
Vascular Plant	<i>Carex diandra</i>	lesser-panicled sedge	N			TE RD IA 2019
Vascular Plant	<i>Carex utriculata</i>	beaked sedge	N			TE RD IA 2019
Vascular Plant	<i>Centaurea stoebe</i>	spotted knapweed	E	Y		TE RD IA 2019
Vascular Plant	<i>Cerastium fontanum</i>	mouse-ear chickweed	N			TE RD IA 2019
Vascular Plant	<i>Ceratophyllum demersum</i>	common hornwort	N			TE RD IA 2019
Vascular Plant	<i>Chrysanthemum leucanthemum</i>	oxeye daisy	E			TE RD IA 2019
Vascular Plant	<i>Cichorium intybus</i>	chicory	E			TE RD IA 2019
Vascular Plant	<i>Cirsium arvense</i>	Canada thistle	E	Y		TE RD IA 2019
Vascular Plant	<i>Cirsium vulgare</i>	bull thistle	E			TE RD IA 2019
Vascular Plant	<i>Clintonia uniflora</i>	queen's cup	N			TE RD IA 2019
Vascular Plant	<i>Comarum palustre</i>	marsh cinquefoil	N			TE RD IA 2019
Vascular Plant	<i>Corallorhiza sp.</i>	coralroot	N			TE RD IA 2019
Vascular Plant	<i>Dactylis glomerata</i>	orchard-grass	E			TE RD IA 2019
Vascular Plant	<i>Dryopteris carthusiana</i>	toothed wood fern	N			TE RD IA 2019
Vascular Plant	<i>Dryopteris cristata</i>	crested wood fern	N			TE RD IA 2019
Vascular Plant	<i>Dryopteris expansa</i>	spiny wood fern	N			TE RD IA 2019
Vascular Plant	<i>Eleocharis acicularis</i>	needle spikerush	N			TE RD IA 2019
Vascular Plant	<i>Eleocharis erythropoda</i>	bald spikerush	N			TE RD IA 2019
Vascular Plant	<i>Eleocharis palustris</i>	common spikerush	N			TE RD IA 2019
Vascular Plant	<i>Elodea sp.</i>		N			TE RD IA 2019
Vascular Plant	<i>Elymus glaucus</i>	blue wildrye	N			TE RD IA 2019
Vascular Plant	<i>Epilobium ciliatum</i>	purple-leaved willowherb	N			TE RD IA 2019
Vascular Plant	<i>Equisetum arvense</i>	common horsetail	N			TE RD IA 2019
Vascular Plant	<i>Equisetum fluviatile</i>	swamp horsetail	N			TE RD IA 2019
Vascular Plant	<i>Equisetum hyemale</i>	scouring-rush	N			TE RD IA 2019
Vascular Plant	<i>Equisetum laevigatum</i>	smooth scouring-rush	N			TE RD IA 2019
Vascular Plant	<i>Equisetum variegatum</i>	northern scouring-rush	N			TE RD IA 2019
Vascular Plant	<i>Euphrasia nemorosa</i>	eastern eyebright	E			TE RD IA 2019
Vascular Plant	<i>Fragaria vesca</i>	wood strawberry	N			TE RD IA 2019
Vascular Plant	<i>Galeopsis tetrahit</i>	hemp-nettle	E			TE RD IA 2019
Vascular Plant	<i>Galium boreale</i>	northern bedstraw	N			TE RD IA 2019
Vascular Plant	<i>Galium trifidum</i>	small bedstraw	N			TE RD IA 2019
Vascular Plant	<i>Geum macrophyllum</i>	large-leaved avens	N			TE RD IA 2019
Vascular Plant	<i>Glyceria sp.</i>		N			TE RD IA 2019



Group	Scientific	English	Native	Noxious	Status	Source
Vascular Plant	<i>Gnaphalium uliginosum</i>	marsh cudweed	E			TE RD IA 2019
Vascular Plant	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	N			TE RD IA 2019
Vascular Plant	<i>Gratiola neglecta</i>	American hedge-hyssop	N			TE RD IA 2019
Vascular Plant	<i>Gymnocarpium dryopteris</i>	oak fern	N			TE RD IA 2019
Vascular Plant	<i>Helenium autumnale</i>	mountain sneezeweed	N			TE RD IA 2019
Vascular Plant	<i>Heracleum maximum</i>	cow-parsnip	N			TE RD IA 2019
Vascular Plant	<i>Hieracium murorum</i>	wall hawkweed	E			TE RD IA 2019
Vascular Plant	<i>Hippuris vulgaris</i>	common mare's-tail	N			TE RD IA 2019
Vascular Plant	<i>Hypericum perforatum</i>	common St. John's-wort	E			TE RD IA 2019
Vascular Plant	<i>Juncus bufonius</i>	toad rush	N			TE RD IA 2019
Vascular Plant	<i>Juncus effusus</i>	common rush	N			TE RD IA 2019
Vascular Plant	<i>Juncus ensifolius</i>	dagger-leaf rush	N			TE RD IA 2019
Vascular Plant	<i>Juncus sp.</i>	rush	N			TE RD IA 2019
Vascular Plant	<i>Lathyrus latifolius</i>	broad-leaved peavine	E			TE RD IA 2019
Vascular Plant	<i>Leucanthemum vulgare</i>	oxeye daisy	E			TE RD IA 2019
Vascular Plant	<i>Lycopus sp.</i>		N			TE RD IA 2019
Vascular Plant	<i>Lysichiton americanus</i>	skunk cabbage	N			TE RD IA 2019
Vascular Plant	<i>Melilotus alba</i>	white sweet-clover	E			TE RD IA 2019
Vascular Plant	<i>Mentha arvensis</i>	field mint	N			TE RD IA 2019
Vascular Plant	<i>Monotropa uniflora</i>	indian-pipe	N			TE RD IA 2019
Vascular Plant	<i>Mycelis muralis</i>	wall lettuce	E			TE RD IA 2019
Vascular Plant	<i>Myosotis scorpioides</i>	European forget-me-not	E			TE RD IA 2019
Vascular Plant	<i>Persicaria amphibia</i>	water smartweed	N			TE RD IA 2019
Vascular Plant	<i>Persicaria hydropiper</i>	marshpepper smartweed	N			TE RD IA 2019
Vascular Plant	<i>Persicaria hydropiperoides</i>	water-pepper	N			TE RD IA 2019
Vascular Plant	<i>Phalaris arundinacea</i>	reed canarygrass	E			TE RD IA 2019
Vascular Plant	<i>Phleum pratense</i>	common timothy	E			TE RD IA 2019
Vascular Plant	<i>Plantago lanceolata</i>	ribwort plantain	N			TE RD IA 2019
Vascular Plant	<i>Plantago major</i>	common plantain	N			TE RD IA 2019
Vascular Plant	<i>Poa palustris</i>	fowl bluegrass	N			TE RD IA 2019
Vascular Plant	<i>Poa pratensis</i>	Kentucky bluegrass	N			TE RD IA 2019
Vascular Plant	<i>Poa sp.</i>	bluegrass	N			TE RD IA 2019
Vascular Plant	<i>Prunella vulgaris</i>	self-heal	N			TE RD IA 2019
Vascular Plant	<i>Pteridium aquilinum</i>	bracken fern	N			TE RD IA 2019
Vascular Plant	<i>Ranunculus acris</i>	meadow buttercup	N			TE RD IA 2019
Vascular Plant	<i>Rumex maritimus</i>	golden dock	N			TE RD IA 2019
Vascular Plant	<i>Sceptridium multifidum</i>	leathery grape fern	N			TE RD IA 2019
Vascular Plant	<i>Scirpus microcarpus</i>	small-flowered bulrush	N			TE RD IA 2019
Vascular Plant	<i>Scutellaria lateriflora</i>	blue skullcap	N			TE RD IA 2019

Group	Scientific	English	Native	Noxious	Status	Source
Vascular Plant	<i>Solidago lepida</i>	Western Canada goldenrod	N			TE RD IA 2019
Vascular Plant	<i>Sparganium sp.</i>	bur-reed	N			TE RD IA 2019
Vascular Plant	<i>Stellaria obtusa</i>	blunt-sepaed starwort	N			TE RD IA 2019
Vascular Plant	<i>Symphotrichum ciliolatum</i>	Lindley's aster	N			TE RD IA 2019
Vascular Plant	<i>Symphotrichum lanceolatum</i>	western willow aster	N			TE RD IA 2019
Vascular Plant	<i>Tanacetum vulgare</i>	common tansy	E	Y		TE RD IA 2019
Vascular Plant	<i>Taraxacum sp.</i>	dandelion	N			TE RD IA 2019
Vascular Plant	<i>Trifolium repens</i>	white clover	E			TE RD IA 2019
Vascular Plant	<i>Typha latifolia</i>	common cattail	N			TE RD IA 2019
Vascular Plant	<i>Urtica dioica</i>	stinging nettle	N			TE RD IA 2019
Vascular Plant	<i>Verbascum thapsus</i>	great mullein	E			TE RD IA 2019
Vascular Plant	<i>Veronica beccabunga</i>	American speedwell	N			TE RD IA 2019
Vascular Plant	<i>Veronica officinalis</i>	common speedwell	N			TE RD IA 2019
Vascular Plant	<i>Vicia americana</i>	American vetch	N			TE RD IA 2019
Vascular Plant	<i>Vicia cracca</i>	tufted vetch	E			TE RD IA 2019
Vascular Plant	<i>Viola sempervirens</i>	trailing yellow violet	N			TE RD IA 2019
<b>Moss</b>						
Vascular Plant	<i>Amblystegiaceae</i>	feather moss	N			TE RD IA 2019
Vascular Plant	<i>Hylocomium splendens</i>	step moss	N			TE RD IA 2019
Vascular Plant	<i>Syntrichia ruralis</i>		N			TE RD IA 2019
Vascular Plant	<i>Rhytidiadelphus triquetrus</i>	electrified cat's-tail moss	N			TE RD IA 2019
Vascular Plant	<i>Rhytidiopsis robusta</i>	pipecleaner moss	N			TE RD IA 2019
<b>Lichens</b>						
Vascular Plant	<i>Peltigera sp.</i>	pelt lichen	N			TE RD IA 2019
Vascular Plant	<i>Letharia vulpina</i>	wolf lichen	N			TE RD IA 2019
Vascular Plant	<i>Usnea cf. glabrata</i>		N			TE RD IA 2019
Vascular Plant	<i>Usnea cf. lapponica</i>		N			TE RD IA 2019
Vascular Plant	<i>Nephroma sp.</i>		N			TE RD IA 2019
Vascular Plant	<i>Evernia prunastri</i>		N			TE RD IA 2019
Vascular Plant	<i>Lobaria pulmonaria</i>	lungwort	N			TE RD IA 2019
<b>Insects</b>						
Invertebrate	<i>Aeshna palmata</i>	Paddle-tailed Darner	N			Cannings, R. 2000. Living Landscapes. The dragonflies (Insecta: Odonata) of the Columbia Basin, British Columbia.
Invertebrate	<i>Agonum cf. placidum</i>	ground beetle 3	N			TE RD IA 2019
Invertebrate	<i>Carabus nemoralis</i>	European ground beetle	E			TE RD IA 2019
Invertebrate	<i>Enallagma ebrium</i>	Marsh Bluet	N			Cannings, R. 2000. Living Landscapes. The dragonflies (Insecta: Odonata) of the Columbia Basin, British Columbia.
Invertebrate	<i>Eristalis tenax</i>	common drone fly	N			TE RD IA 2019
Invertebrate	<i>Ischnura cervula</i>	Pacific Forktail	N			Cannings, R. 2000. Living Landscapes. The dragonflies

Group	Scientific	English	Native	Noxious	Status	Source
						(Insecta: Odonata) of the Columbia Basin, British Columbia.
Invertebrate	<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	N			Cannings, R. 2000. Living Landscapes. The dragonflies (Insecta: Odonata) of the Columbia Basin, British Columbia.
Invertebrate	<i>Melanoplus sp.</i>	grasshopper	N			TE RD IA 2019
Invertebrate	<i>Ophiogomphus severus</i>	pale snaketail				Doerksen 1979 (Cosewic status rpt. for Olive Clubtail 2001)
Invertebrate	<i>Opisthius richardsoni</i>	beach beetle	N			TE RD IA 2019
Invertebrate	<i>Pyrrharctia isabella</i>	woolly bear	N			TE RD IA 2019
Invertebrate	<i>Scaphinotus marginatus</i>	snail eating beetle	N			TE RD IA 2019
Invertebrate	<i>Sympetrum danae</i>	Black Meadowhawk	N			Cannings, R. 2000. Living Landscapes. The dragonflies (Insecta: Odonata) of the Columbia Basin, British Columbia.
Invertebrate	<i>Sympetrum obtrusum</i>	White-faced Meadowhawk	N			Cannings, R. 2000. Living Landscapes. The dragonflies (Insecta: Odonata) of the Columbia Basin, British Columbia.
Invertebrate	<i>Sympetrum semicinctum</i>	Band-winged Meadowhawk	N			Cannings, R. 2000. Living Landscapes. The dragonflies (Insecta: Odonata) of the Columbia Basin, British Columbia.
Invertebrate	<i>Tetrix subulata</i>	awl-shaped pygmy grasshopper	N			TE RD IA 2019
Invertebrate	<i>Vespula alascensis</i>	wasp	N			TE RD IA 2019
<b>Gastropods</b>						
Invertebrate	<i>Limax maximus</i>	giant garden slug	E			TE RD IA 2019
Invertebrate	<i>Allogona ptychophora</i>	Idaho forestsnail	N			TE RD IA 2019
Invertebrate	<i>Anguispira kochi</i>	banded tigersnail	N		Blue	TE RD IA 2019
Invertebrate	<i>Arion rufus</i>	chocolate arion	E			TE RD IA 2019
Invertebrate	<i>Arion subfuscus</i>	dusky arion	E			TE RD IA 2019
Invertebrate	<i>Cepaea nemoralis</i>	grovesnail	E			TE RD IA 2019
Invertebrate	<i>Cryptomastix mullani</i>	Coeur D'Alene Oregonian	N		Blue	TE RD IA 2019
Invertebrate	<i>Discus rotundatus</i>	rotund disc	N			TE RD IA 2019
Invertebrate	<i>Helisoma anceps</i>	two-ridge ramshorn	N			TE RD IA 2019
Invertebrate	<i>Helisoma trivolvis</i>	marsh ramshorn	N			TE RD IA 2019
Invertebrate	<i>Pristiloma stearnsii</i>	striate tightcoil	N			TE RD IA 2019
Invertebrate	<i>Prophysaon andersonii</i>	reticulate tailedropper	N			TE RD IA 2019
Invertebrate	<i>Prophysaon foliolatum</i>	yellow-bordered tailedropper	N			TE RD IA 2019
Invertebrate	<i>Zonitoides nitidus</i>	black gloss	N			TE RD IA 2019
Fungi	<i>Ampuloclitocybe clavipes</i>		N			TE RD IA 2019



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Fungi	<i>Armillaria sp.</i>		N			TE RD IA 2019
Fungi	<i>Armillaria sp.</i>		N			TE RD IA 2019
Fungi	<i>Armillaria sp.</i>		N			TE RD IA 2019
Fungi	<i>Bisporella citrina</i>		N			TE RD IA 2019
Fungi	<i>Bovista cf. plumbea</i>		N			TE RD IA 2019
Fungi	<i>Calvatia sp.</i>		N			TE RD IA 2019
Fungi	<i>Ciboria cf. seminicola</i>		N			TE RD IA 2019
Fungi	<i>Cystoderma cf. amianthinum</i>		N			TE RD IA 2019
Fungi	<i>Clavariadelphus truncatus</i>		N			TE RD IA 2019
Fungi	<i>Clavulinopsis corniculata</i>		N			TE RD IA 2019
Fungi	<i>Clavulinopsis laeticolor</i>		N			TE RD IA 2019
Fungi	<i>Clitocybe</i>		N			TE RD IA 2019
Fungi	<i>Clitocybe fragrans</i>		N			TE RD IA 2019
Fungi	<i>Collybia sp.</i>		N			TE RD IA 2019
Fungi	<i>Cortinarius sp.1</i>		N			TE RD IA 2019
Fungi	<i>Crepidotus mollis</i>		N			TE RD IA 2019
Fungi	<i>Crucibulum crucibuliforme</i>		N			TE RD IA 2019
Fungi	<i>Exidia recisa</i>		N			TE RD IA 2019
Fungi	<i>Fomitopsis rosea</i>		N			TE RD IA 2019
Fungi	<i>Ganoderma applanatum</i>		N			TE RD IA 2019
Fungi	<i>Hebeloma</i>		N			TE RD IA 2019
Fungi	<i>Hemipholiota populnea</i>		N			TE RD IA 2019
Fungi	<i>Hericium corraloides</i>		N			TE RD IA 2019
Fungi	<i>Heyderia abietis</i>		N			TE RD IA 2019
Fungi	<i>Hygrocybe miniata</i>		N			TE RD IA 2019
Fungi	<i>Hygrocybe miniata</i>		N			TE RD IA 2019
Fungi	<i>Hygrocybe singeri</i>	witch's hat	N			TE RD IA 2019
Fungi	<i>Hygrophorus aurantiaca</i>		N			TE RD IA 2019
Fungi	<i>Hypomyces lactifluorum</i>	lobster mushroom	N			TE RD IA 2019
Fungi	<i>Hypsizygus tessulatus</i>		N			TE RD IA 2019
Fungi	<i>Incocybe cf. geophylla</i>		N			TE RD IA 2019
Fungi	<i>Laccaria laccata</i>		N			TE RD IA 2019
Fungi	<i>Lactarius rubrilacteus</i>	bleeding milk cap	N			TE RD IA 2019
Fungi	<i>Lepiota clypeolaria</i>		N			TE RD IA 2019
Fungi	<i>Lepiota magnispora</i>		N			TE RD IA 2019
Fungi	<i>Lepista cf. glaucocana</i>		N			TE RD IA 2019
Fungi	<i>Lichenomphalia umbellifera</i>		N			TE RD IA 2019
Fungi	<i>Marasmius cf. tremulae</i>		N			TE RD IA 2019
Fungi	<i>Marasmius oreades</i>		N			TE RD IA 2019
Fungi	<i>Merismodes cf. fasciculata</i>		N			TE RD IA 2019
Fungi	<i>Multiclavula mucida</i>		N			TE RD IA 2019
Fungi	<i>Mycena pura</i>		N			TE RD IA 2019
Fungi	<i>Mycena sp.1</i>		N			TE RD IA 2019
Fungi	<i>Mycena sp.2</i>		N			TE RD IA 2019

Group	Scientific	English	Native	Noxious	Status	Source
Fungi	<i>Mycena sp.3</i>		N			TE RD IA 2019
Fungi	<i>Mycena sp.4</i>		N			TE RD IA 2019
Fungi	<i>Mycena sp.5</i>		N			TE RD IA 2019
Fungi	<i>Paxillus involutus</i>		N			TE RD IA 2019
Fungi	<i>Pholiota aurivella</i> group		N			TE RD IA 2019
Fungi	<i>Pseudohydnum gelatinosum</i>	spirit gummy bear	N			TE RD IA 2019
Fungi	<i>Ramaria sp.1</i>		N			TE RD IA 2019
Fungi	<i>Rhytisma salicinum</i>	black tar spot	N			TE RD IA 2019
Fungi	<i>Russula brevipes</i>	short-stemmed Russula	N			TE RD IA 2019
Fungi	<i>Russula sp.1</i>		N			TE RD IA 2019
Fungi	<i>Suillus clintonianus</i>	larch Suillus	N			TE RD IA 2019
Fungi	<i>Suillus lakei</i>		N			TE RD IA 2019
Fungi	<i>Tremella sp.</i>		N			TE RD IA 2019
Fungi	<i>Trichaptum biforme</i>		N			TE RD IA 2019
Fungi	<i>Tricholoma cf. terreum</i>	mouse Tricholoma	N			TE RD IA 2019
Fungi	<i>Tricholoma murrillianum</i>	pine mushroom	N			TE RD IA 2019
Fungi	<i>Tricholoma pardinum</i>	tiger Tricholoma	N			TE RD IA 2019
Fungi	<i>Tricholoma populinum</i>		N			TE RD IA 2019
Fungi	<i>Tricholomopsis sp.</i>		N			TE RD IA 2019
Myxomycete	<i>Trichia cf. varia</i>		?			TE RD IA 2019
Myxomycete	<i>Lycogala epidendrum</i>		?			TE RD IA 2019
Mammal	<i>Castor canadensis</i>	beaver	N			TE RD IA 2019
Mammal	<i>Ursus americanus</i>	black bear	N			TE RD IA 2019
Mammal	<i>Cervus canadensis</i>	American elk	N			TE RD IA 2019
Mammal	<i>Odocoileus virginianus</i>	white-tailed deer	N			TE RD IA 2019
Mammal	<i>Canis lupus</i>	timber wolf	N			TE RD IA 2019
Mammal	<i>Canis latrans</i>	coyote	N			TE RD IA 2019
Mammal	<i>Ondatra zibethicus</i>	common muskrat	N			TE RD IA 2019
Mammal	<i>Alces alces</i>	moose	N			kootenaylake.bc.ca
Mammal	<i>Lontra canadensis</i>	river otter	N			kootenaylake.bc.ca
Mammal	<i>Puma concolor</i>	cougar	N			kootenaylake.bc.ca
Mammal	<i>Neovison vison</i>	American mink	N			kootenaylake.bc.ca
Bird	<i>Accipiter striatus</i>	Sharp-shinned Hawk	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Actitis macularius</i>	Spotted Sandpiper	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Aix sponsa</i>	Wood Duck	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Anas americana</i>	American Wigeon	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Anas crecca</i>	Green-winged Teal	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Anas cyanoptera</i>	Cinnamon Teal	N			kootenaylake.bc.ca; Arndt 2015

Group	Scientific	English	Native	Noxious	Status	Source
Bird	<i>Anas discors</i>	Blue-winged Teal	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Anas platyrhynchos</i>	Mallard	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Anthus rubescens</i>	American Pipit	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Archilochus alexandri</i>	Black-chinned Hummingbird	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Ardea herodias</i>	great blue heron	N		B	TE RD IA 2019; Arndt 2015
Bird	<i>Aythya collaris</i>	Ring-necked Duck	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Aythya valisineria</i>	Canvasback	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Bombycilla cedrorum</i>	Cedar Waxwing	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Botaurus lentiginosus</i>	American Bittern	N		B	kootenaylake.bc.ca; Arndt 2015
Bird	<i>Branta canadensis</i>	Canada Goose	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Bubo virginianus</i>	Great Horned Owl	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Bucephala albeola</i>	Bufflehead	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Bucephala clangula</i>	Common Goldeneye	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Bucephala islandica</i>	Barrow's Goldeneye	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Buteo jamaicensis</i>	Red-tailed Hawk	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Calypte anna</i>	Anna's Hummingbird	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Cathartes aura</i>	Turkey Vulture	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Catharus fuscescens</i>	Veery	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Catharus ustulatus</i>	Swainson's Thrush	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Chaetura vauxi</i>	Vaux's Swift	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Charadrius vociferus</i>	Killdeer	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Chordeiles minor</i>	Common Nighthawk	N		SC	kootenaylake.bc.ca; Arndt 2015
Bird	<i>Cinclus mexicanus</i>	American Dipper	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Colaptes auratus</i>	Northern Flicker	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Contopus sordidulus</i>	Western Wood-Pewee	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Corvus brachyrhynchos</i>	American Crow	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Corvus corax</i>	Common Raven	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Cygnus columbianus</i>	Tundra Swan (migration)	N		B	kootenaylake.bc.ca; Arndt 2015

Group	Scientific	English	Native	Noxious	Status	Source
Bird	<i>Dryocopus pileatus</i>	Pileated Woodpecker	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Dumetella carolinensis</i>	Gray Catbird	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Empidonax difficilis</i>	Pacific-Slope Flycatcher	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Empidonax hammondii</i>	Hammond's Flycatcher	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Empidonax minimus</i>	Least Flycatcher	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Empidonax oberholseri</i>	Dusky Flycatcher	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Empidonax traillii</i>	Willow Flycatcher	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Euphagus cyanocephalus</i>	Brewer's Blackbird	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Falco sparverius</i>	American Kestrel	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Fulica americana</i>	American Coot	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Gallinago delicata</i>	Wilson's Snipe	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Gavia immer</i>	Common Loon	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Geothlypis trichas</i>	Common Yellowthroat	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Glaucidium gnoma</i>	Northern Pygmy-Owl	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Grus canadensis</i>	Sandhill Crane (migration)	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Haliaeetus leucocephalus</i>	Bald Eagle	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Hirundo rustica</i>	Barn Swallow	N		B	kootenaylake.bc.ca; Arndt 2015
Bird	<i>Junco hyemalis</i>	Dark-eyed Junco	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Lophodytes cucullatus</i>	Hooded Merganser	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Megaceryle alcyon</i>	Belted Kingfisher	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Melospiza melodia</i>	Song Sparrow	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Mergus merganser</i>	Common Merganser	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Molothrus ater</i>	Brown-headed Cowbird	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Myadestes townsendi</i>	Townsend's Solitaire	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Oporornis tolmiei</i>	MacGillivray's Warbler	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Pandion haliaetus</i>	Osprey	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Parkesia noveboracensis</i>	Northern Waterthrush	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Passerculus sandwichensis</i>	Savannah Sparrow	N			kootenaylake.bc.ca; Arndt 2015



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Bird	<i>Passerina amoena</i>	Lazuli Bunting	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Picoides pubescens</i>	Downy Woodpecker	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Picoides villosus</i>	Hairy Woodpecker	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Poecile atricapillus</i>	Black-capped Chickadee	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Poecile rufescens</i>	Chestnut-backed Chickadee	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Porzana carolina</i>	Sora	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Regulus satrapa</i>	Golden-Crowned Kinglet	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Selasphorus rufus</i>	Rufous Hummingbird	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Setophaga coronata</i>	Yellow-rumped Warbler	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Setophaga petechia</i>	Yellow Warbler	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Setophaga ruticilla</i>	American Redstart	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Sialia currucoides</i>	Mountain Bluebird	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Sitta canadensis</i>	Red-breasted Nuthatch	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Spinus pinus</i>	Pine Siskin	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Spinus tristis</i>	American Goldfinch	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Sturnus vulgaris</i>	European Starling	E			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Sturnus vulgaris</i>	Starling	E			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Tachycineta bicolor</i>	Tree Swallow	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Tachycineta thalassina</i>	Violet-green Swallow	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Troglodytes pacificus</i>	Pacific Wren	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Turdus migratorius</i>	American Robin	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Tyrannus tyrannus</i>	Eastern Kingbird	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Vireo gilvus</i>	Warbling Vireo	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Vireo olivaceus</i>	Red-eyed Vireo	N			kootenaylake.bc.ca; Arndt 2015
Bird	<i>Wilsonia pusilla</i>	Wilson's Warbler	N			kootenaylake.bc.ca; Arndt 2015

Group	Scientific	English	Native	Noxious	Status	Source
Fish	<i>Oncorhynchus mykiss</i>	rainbow trout	N			BC Gov - Habitat Wizard Nov. 19 2109
Fish	<i>Oncorhynchus nerka</i>	Kokanee	N			BC Gov - Habitat Wizard Nov. 19 2109
Fish	<i>Prosopium williamsoni</i>	mountain whitefish	N			BC Gov - Habitat Wizard Nov. 19 2109
Fish	<i>Cottus asper</i>	prickly sculpin	N			BC Gov - Habitat Wizard Nov. 19 2109
Fish	<i>Salvelinus confluentus</i>	bull trout	N		B	BC Gov - Habitat Wizard Nov. 19 2109
Fish	<i>Salvelinus fontinalis</i>	brook trout	E			BC Gov - Habitat Wizard Nov. 19 2109
Fish	<i>Rhinichthys cataractae</i>	longnose dace	N			BC Gov - Habitat Wizard Nov. 19 2109
Fish	<i>Couesius plumbeus</i>	lake chub	N			BC Gov - Habitat Wizard Nov. 19 2109