Lake Prioritization Process for the Upper Columbia Basin

This report describes the process used to prioritize lakes in the Upper Columbia Basin for potential future Foreshore Integrated Management Planning surveys.

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The primary objective of this report is to determine which lakes in the Upper Columbia Basin will be surveyed in subsequent years of the FIMP Program. The Upper Columbia Basin is located in British Columbia (BC) and is defined as the tributaries and drainage areas that occur from where the Columbia River begins (i.e., Columbia Lake) to upper Arrow Lake (Figure 1).

The lake prioritization assessment was completed in four stages:

(1) The assessment criteria were described;
(2) A Candidate Lake List was created to outline which lakes would undergo assessment;
(3) A detailed assessment was completed (using the identified criteria);
(4) A Final Lake List and survey schedule was proposed.

The criteria developed was comprised of eight criterions, including geographical location, stakeholder interest, lake development pressure, and the presence of species at risk (SAR), among others. The Candidate Lake List is a carefully curated list of potential lakes for which the FIMP methodology could be applied to maximize impact of the Program. The detailed assessment focused primarily on existing fish and wildlife information and professional judgement, lake development pressure, and the presence of SAR. A general knowledge of fish and wildlife values coupled with professional judgement formed the basis of the desktop review. No formal, systematic review was completed. Lake development pressure was evaluated quantitatively using DFO referral data and qualitatively via a survey completed by FLNRORD staff. All data were summarized using R programming software and inspected visually. No statistical analyses were completed.

The detailed assessment concluded by assigning a rank and corresponding score (Low = 1; Medium = 2; and High = 3) to composite criterion. The collection of scores were summed to determine the overall Prioritization Score. The Prioritization Score was used to determine the Final

Lake List. In total, seven lakes were proposed for future FIMP surveys—four in the 2021 – 21fiscal year and three in 2022 – 2023.

Acronyms and Abbreviations

Acronym	Description
AQQC	Quality control and quality assurance
BC	British Columbia
CA	Contribution agreement
CNFASAR	Canada nature fund for aquatic species at risk
COSEWIC	Committee and the status of endangered wildlife in Canada
CRA	Commecial, recreational, and aboriginal
DFO	Fisheries and Oceans Canada
FDG	Foreshore development guidelines
FHSI	Foreshore habitat sensitivity index
FIM	Foreshore inventory and mapping
FLNRORD	Forest, Lands, and Natural Resources Operations and Rural Development
FN	First Nations
HADD	Harmful alteration disruption or destruction
IQR	Interquartile range
LLC	Living Lakes Canada
QEP	Qualified environmental professional
RDCK	Regional District of Central Kootenay
RDEK	Regional District of East Kootenay
SAR	Species at risk
SARA	Species at risk act
SHIM	Sensitive Habitat Inventory and Mapping (SHIM)

Project Background
February 1, 2021

1.0 INTRODUCTION

Living Lakes Canada (LLC) and its partners entered a four-year Contribution Agreement (CA) with Fisheries and Oceans Canada (DFO) beginning in 2019 to complete the Foreshore Integrated Management Planning (FIMP) Program. The FIMP Program is funded by DFO's Canada Nature Fund for Aquatic Species at Risk (CNFASAR) and has the general goal to conserve, protect, and restore lake foreshore habitats of the highest relative ecological value (DFO-CA 2019). The DFO-CA terminates March 31, 2023.

The FIMP framework has three main components:

1) **Foreshore Inventory and Mapping** (FIM)—is a suite of biological field method developed by consulting biologists in partnership with DFO. The FIM method was derived by adapting an existing stream mapping protocol, called Sensitive Habitat Inventory and Mapping (SHIM) (Mason and Knight 2001), for use on lakes (Schleppe et al. 2020; 2009; Magnin and Cashin 2005). As the name implies, FIM is used to delineate, inventory, and map lake foreshore habitats. A FIM report is completed to summarize field data collected. No detailed analyses are completed.

2) **Foreshore Habitat Sensitivity Index** (FHSI)—is a quantitative analysis that uses weighted criteria to help account for, and then condense multiple biological variables into an intuitive, easy to interpret ecological index. The index consists of five Ecological Ranks (e.g., Very Low, Low, Medium, High, and Very High) that is calibrated to reflect the existing fish and wildlife habitat value and sensitivity to urban development activities. The results of this component are usually described in a Foreshore Development Guideline (FDG) report (see below).

3) **Foreshore Development Guidelines** (FDG) report—is a report that summarizes the technical analysis (i.e., the FHSI) and recommends a unique set of foreshore development guidelines to conserve, protect, and restore lake foreshore habitats of the highest relative ecological value.

The resulting reports are used by municipal, provincial, and federal governments in support of evidence-based, land-use decision making. For example, the FIM and FDG reports have been used by Forest, Lands, and Natural Resources Operations and Rural Development (FLNRORD) during review of land tenure and water use applications, First Nations during their review as part of their internal referral process, and by the City of Nelson and the Regional District of Central Kootenay (RDCK) during strategic land planning initiatives (FIMP Workshop Proceedings 2020).

2.0 OBJECTIVE

The primary objective of this report is to determine which lakes located in the Upper Columbia Basin (Figure 1) will be surveyed using the FIMP framework and Program funding in the coming years. The second objective of this report is to describe the methods used to prioritize lakes so that the end result in transparent, robust, and scientifically defensible.

3.0 SCOPE

This report was scoped to satisfy key DFO-defined tasks and deliverables outlined in Section 2.2 - Activity# 2 of the DFO-LLC Contribution Agreement for fiscal year 2020 – 21(DFO-CA 2019).

3.1 DELIVERABLES

This Section acts as a Table of Concordance for related DFO-identified tasks (e.g., Activity #2 deliverables for the 2020 – 21 DFO fiscal year). The report section where each task or deliverable was met, is noted in parentheses.

3.1.1 DFO-identified Tasks

- Gather information from appropriate agencies on number of development permit applications for each lake since the initial field assessment was completed (sections 5.4.3 and 6.2.2);
- Through research, review and identify known species at risk (SAR) habitats for each lake and highlight where there is multi-species overlap in order to maximize potential for conservation (sections 5.4.4 and 6.2.3);
- Conduct site assessments including field visits by vehicle and/or boat to evaluate development pressure, change in habitat types, and new shoreline modifications and/or structures (sections 5.4.1 and 6.2.1).

DFO-identified task not met in this report:

- Review existing FIM reports and Shoreline Development Guidelines;
- Purchase required equipment as identified by updated FIM standards and methods;

- Field test and train professionals/consultants in new technology options including recently created SHIMobile application.

3.1.2 DFO-identified Deliverables

A written report, including:

- A general overview of the project works (Executive Summary of this report);
- Copy of finalized list of priority lakes for FIM and/or re-FIM and a description of revised methodology that has been field tested (Section 6.3).

DFO-identified deliverables not met in this report:

- Description of any new technology options identified.

4.0 PROJECT BACKGROUND

The Upper Columbia Basin is located in British Columbia (BC) and is defined as the tributaries and associated drainage area that occurs from where the Columbia River begins (i.e., Columbia Lake) to upper Arrow Lake (McPhail and Carveth 1994; Figure 1).

Figure 1. Columbia River Drainage.

Notes: This figure was reproduced from Wikipedia Commons (Wiki Commons 2020). The purple line indicates the Columbia River. The yellow area indicates the Columbia River drainage. The red square indicates the approximate Upper Columbia Basin.

5.0 METHODS

5.1 OVERVIEW

The lake prioritization process was completed in four stages:

1. The assessment criteria were identified and described;
2. A Candidate Lake List was created to outline which lakes would undergo assessment;
3. A detailed assessment was completed for candidate lakes;
4. A Final Lake List was proposed based on the results of the detailed assessment.

5.2 ASSESSMENT CRITERIA

Lake assessment criteria are summarized in Table 1. The criteria include key considerations outlined in the DFO-CA (DFO-CA 2019), among others, that support a robust and defensible approach for determining which lakes will be surveyed in subsequent years of the Program.

Table 1. Summary of Lake Prioritization Criteria.

Criteria	Description	Rational for Inclusion
1. Geographic Location	Refers to the geographic location of a lake. Candidate lakes must be located in the Upper Columbia Basin (see Figure 1).	Candidate lakes must be located in the Upper Columbia Basin—lakes outside this area were not considered further.
2. Accessibility and Feasibility	Refers to the ability to safely, economically, and reliably access the lake. .	Accessibility and feasibility are included because they represent potential safety and economic challenges relevant for Program success. Lakes with barriers to accessibility or feasibility were de-prioritized during the detailed assessment.
3. Stakeholder Interest	Refers to the level of interest expressed by First Nations, government, community groups, and other stakeholders towards surveying a particular lake.	Stakeholder interest is considered because it embodies various elements crucial for overall Project success, including stakeholders buy-in and expected impact.

		Lakes with high stakeholder interest were prioritized for assessment.
4. Development Pressure	Development pressure refers to known or anticipated developments on the lake foreshore for a specific lake. Development pressure was quantified via: • Number of permits submitted to regulatory agencies for lake foreshore developments; • Survey completed by FLNRORD staff; • Observations made during field reconnaissance surveys; • Professional judgement based on the social, economic, and political landscapes.	Development pressure was considered because it helped identify which lakes had the highest potential negative impacts from urbanization which can have negative effects on fish and wildlife. Lakes with high development pressure were prioritized for assessment.
5. Species at Risk	Species at Risk refers to species that are at risk of being extirpated and includes sightings of individual species or their mapped habitats. The following SAR designations were included: • BC conservation status designation (e.g., Blue- and Red-listed plants and animals); • Committee and the Status of Endangered Wildlife in Canada (COSEWIC)-listed species; • *Species at Risk Act* (SARA)-listed species.	Species at Risk were considered because protecting SAR is one of the overarching objectives of the Program. Lakes with many documented SAR (or their habitats) were prioritized for assessment.
6. Field Reconnaissance	Field reconnaissance refers to observations made during site visits to select lakes, and might include observations such as: • New foreshore infrastructure (e.g., docks, marinas, and buildings); • Changes to foreshore vegetation (e.g., loss of riparian vegetation); • Changes to foreshore substrates (e.g., erosion areas or manicured beaches); • Changes in accessibility.	Field reconnaissance was included in the assessment to help verify development pressure, stakeholder concerns, and accessibility. Field observations have the potential to prioritize or de-prioritize a lake for assessment depending on the factor considered and field observations recorded.
7. Financial Considerations	Refers to various funding considerations, which might include: • Overall cost to survey a lake; • Availability of in-kind funding.	Financial considerations were included because funding is finite, and LLC aims to deliver the best possible results given the available budget. This criterion was assessment on a case-by-case basis and, when

		available, would increase a lakes existing priority ranking.
8. Professional Judgement	This criterion reflects the professional judgement, experience, and knowledge of the LLC Program Team, FIMP Technical Committee (TC), and other Subject Matter Experts (SME) who provided input. Professional judgement includes: • Advice, recommendations, or knowledge gleaned from the FIMP Technical Workshop proceedings (FIMP Workshop Proceedings 2020); • Curated fish and wildlife information based on experience and working knowledge of the region, species, or relevant system (e.g., knowledge of productive fisheries, presence of invasive species, and wildlife habitats such as ungulates winter ranges or or use by migratory birds); • Understanding of the social, economic, and political landscapes involved; • Calibrated inferences regarding whether meaningful changes are expected since the last FIMP survey date.	Professional judgement was considered because it provided the flexibility to consider well-established yet anecdotal information not covered in other criterion. Professional judgement has the potential to prioritize or de-prioritize a lake for assessment, depending on the factor considered.

5.3 CANDIDATE LAKE LIST

The Candidate Lake List was created in consideration of the geographic location of a lake, stakeholder interest, and professional judgement and experience of the FIMP Program Team. For example, lakes located outside of the Upper Columbia Basin (e.g., Christina Lake) were not included in the Candidate Lake List. In contrast, lakes for which there was particularly high stakeholder interest (e.g., Summit Lake; FLNRORD FIMP Webinar 2020) were included (provided that they were located in the Upper Columbia Basin).

The Candidate Lake List is a carefully curated list of lakes for which the FIMP methodology could be applied to contribute meaningfully to the positive impact of the Program. The Candidate Lake List is presented in Table 2 (Section 6.1).

5.4 DETAILED ASSESSMENT

The detailed assessment focused primarily on:

- Desktop review, field reconnaissance, and professional judgement;
- Lake development pressure; and
- Species at risk.

5.4.1 Desktop Review and Field Reconnaissance

A brief desktop review of each lake was completed. Air photos of candidate lakes were reviewed to determine if obvious new developments were present. Next, professional judgement and SME input regarding the dominant fish and wildlife values (for each lake), was summarized. A formal, systematic desktop review of all available fish and wildlife information was not completed since it was deemed beyond the scope of this report. The resulting information was refined during field reconnaissance surveys.

Field reconnaissance surveys were conducted from April 27 – 30, 2020 at select lakes to verify information documented during the desktop review. Some large and very large lakes (e.g., Slocan, Whatshan, Kootenay, Koocanusa, and Arrow lakes) were not visited due to logistical constraints, some of which were related to Corona Virus Disease 2019 (COVID-19). For example, trip duration and number of personnel were reduced, and the use of a vessel was cancelled.

During field visits, lake foreshore areas were assessed visually (from shore) to estimate the amount of additional urban development detectable for previously surveyed lakes or the relative extent of development evident on un-surveyed lakes.

5.4.2 Professional Judgement

Professional judgement was included in the assessment because it allowed consideration of long-established, a priori yet difficult-to-reference information without completing a formal desktop review. While professional judgement might be considered as subjective, it was an important and valuable part of the assessment (especially considering the combined experience, training, and credentials of the Technical Committee, SMEs, and the LLC Program Team whom all provided input). Professional judgment has the potential to prioritize or de-prioritize a lake for assessment, depending on the factor considered.

5.4.3 Lake Development Pressure

Lake development pressure was evaluated both quantitatively using DFO referral data and qualitatively via a survey completed by FLNRORD staff. All data were analyzed using R programming software (R Core Team 2021) and visually inspected. No statistical analyses were completed. Key caveats associated with each data source are presented below.

5.4.3.1 DFO Referral Data

Fisheries and Oceans Canada provided LLC with permit application data (often called "referral data") submitted under the *Fisheries Act* from 1996 to 2020 (inclusive) for the Candidate Lake List. Data were queried from the Program Activity Tracking for Habitat (PATH) database by DFO staff and provided to LLC in digital format (e.g., an excel file). The data included a brief description of the activity proposed, date of submission, associated waterbody, and file number.

While these data are understood to reflect lake development pressure, they must be evaluated with caution primarily because they span multiple eras (see below). Potential changes across eras in department priorities, protocols, and data collection and inventorying practices makes comparing these data somewhat tenuous. Consequently, only simple analyses were completed (e.g., only summary statistics were calculated). Nonetheless, even these results should still be interpreted with caution.

The three *Fisheries Act* eras, include:

- Pre-2012 Era—which focused on the Harmful Alterations, Disruption, or Destruction (HADD) of fish habitat;
- 2013 to 2019 Era—which focused on Serious Harm to Commercial, Recreational, and Aboriginal (CRA) fisheries; and
- 2019 to Present Era—which re-focused on the HADD of fish habitat.

5.4.3.2 FLNRORD Survey

Living Lakes Canada developed and distributed a semi-quantitative survey to FLNRORD staff to investigate their impressions of lake development pressure (Appendix A for the complete survey). The aim of the survey was to capture the opinions of FLNRORD staff regarding the relative amount of lake development pressure experienced by each candidate lake. Participants were asked to provide a relative score from 0 to 10 to each lake (Table 2), with 0 representing the lowest lake development pressure and 10 representing the highest. The results were summarized by plotting the median and interquartile range (IQR) followed by a visual assessment and discussion of any emergent trends (Section 6.3.1; Figure 2). Raw data were overplotted to provide additional context to the results.

5.4.3.3 FLNRORD Referral Data

Unfortunately, the quantitative data provided by FLNRORD were unusable. Living Lakes Canada received referral data (that were submitted to FLNRORD under the *Water Sustainability Act* and *Lands Act*), but were unable to use them because permit entries could not be attributed to lake.

Other supporting information was not be provided due to privacy reasons and/or limited FLNRORD staff capacity. Consequently, the FLNRORD referral data were not included in the lake prioritization process.

5.4.4 Species and Ecosystems at Risk

The number of unique SAR was summarized for three different conservation status organizations—BC conservation status, Committee and the Status of Endangered Wildlife in Canada (COSEWIC), and those listed under the *Species at Risk Act* (SARA). Subsequent data queries and analyses are described below.

5.4.4.1 Platform Selection

Multiple online mapping platforms can be used to query SAR occurrences within a prescribed area. For example, the Conservation Data Center (CDC), Habitat Wizard, and Fish Inventory Data Query (FIDQ) were tested to determine which would provide the best results in the least amount of time. The CDC's iMap platform coupled with their Spatial Query tool was selected because it seemed to provide accurate results and was easy to use.

During testing, it was confirmed that the Habitat Wizard platform's "Red and Blue listed species" layers were not up-to-date. It was discovered that the Chiselmouth chub was incorrectly Blue-listed (HabWiz 2021) when in fact its status had been downgraded to Yellow-listed in 2019 (Pers. Comm ENV 2021).

The FIQD platform was not used because it provided information for fish but not terrestrial species. Since the FIMP framework includes both fish and wildlife values, the FIQD platform would not have provided a complete dataset (and additional spatial queries would have be required).

5.4.4.2 CDC iMap

The CDC's iMap platform and Spatial Query tool was used to acquire SAR data, including aquatic and terrestrial species (CDC 2021). The following data layers were selected:

- Species and ecosystems at risk—publicly available;
- Species and ecosystems at risk—extirpated and historical (observations older than 40 years);
- Critical habitat for federally listed species at risk;
- All Fish Points.

The "All Fish Points" layer was used because some fish species were not contained in the preceding layers despite being a species of conservation concern (Bull Trout and Burbot, for example, during testing; Cloutier Pers. Comm. 2021). Using this fish-specific layer guarded against this potential omission but required addition effort to summarize the fish observation data.

A polygon (or in some instances a rectangle) with a 500 m buffer was traced around each lake for all spatial queries. Care was taken to include at least 50 m of foreshore habitat so that terrestrial species were not overlooked. The resulting data were downloaded (as a ".csv" file) and analyzed using R programming software (R Core Team 2021).

Note: The "Species and ecosystems at risk—masked secure" layer was queried, but due to various constraints, no follow-up with the CDC was completed to elucidate these species. This is not expected to change the conclusions made in this report because most spatial queries did not return masked species occurrences. This suggests that only limited data might have been omitted.

5.4.4.3 Analyses

Absolute counts of unique, and known SAR were summarized for each lake by conservation status organization and designation. While it occurred to the authors to standardize species counts by lake area (hectare) or foreshore length (meter) to account for varying lake sizes and the species-area relationship (see MacArthur 1965), unstandardized, raw counts were deemed sufficient given the rather limited scope of this report.

A list of unique species for each lake was generated using the spatial query results and then matched against a reference SAR list. The SAR reference list was created by combining two lists downloaded from the BC Species and Ecosystems Explorer's (BCSEE) online data repository: (1) the "Red, Blue, and SARA-listed", and (2) the "Exotic" species lists. These two lists were downloaded using the "Quick Search" and "Other Search Options" checkbox options, respectively (BCSEE 2021).

The reference database was used to assign conservations status information to the list of unique species identified for each lake. This was accomplished by matching the lake data against the reference database using a species common name. While it would have been desirable to use a species' latin name, this information was not provided in the "All Fish Points" layer output. Consequently, additional quality control and quality assurance (QAQC) effort was required.

For instances where subpopulations existed, manual review (and R coding) of the correct subpopulation was required. For example, it was determined that the conservation status information for the generic Bull Trout (*Salvelinus confluentus*) was appropriate since the geographical area of interest, the Upper Columbia Basin, lies beyond the areas with distinct subpopulations of Bull Trout (e.g., Pacific and South Coast populations; BCSEE 2021). Similarly,

other than the BC Red-listed Burbot population documented in the lower Kootenay River (below Kootenai Falls in Montana, USA), all other Burbot are Yellow-listed. Since no other designations were documented under either COSEWIC or SARA (BCSEE 2021), it was relatively easy to change the listing for Burbot in the Kootenay Lake from the generic Yellow-listed version to a Red-listed entry. Nonetheless, it is desirable for the "All Fish Points" data layer to include latin names in the spatial query results. In that way, the results could be precisely matched against the reference database using latin and common names.

Finally, Yellow-listed species were omitted from the BC conservations status summaries because they are not of particular conservation concern and it seems that their inclusion in the database is a result of being listed by other conservation status designations (e.g., Schedule 1, 2, or 3 of the SARA for the Coeur D'alene Salamander (*Plethodon idahoensis*), for example, known to occur within the areas around Arrow and Kootenay lakes [CDC 2021]). This issue suggests a discrepancy, or at the very least, a time lag between the current BC and SARA designations for this species.

While every attempt was made to ensure the accuracy of the results presented herein, some discrepancies or omissions likely still exist. For example, some non-vascular plants, fungi, insects, and invertebrates listed in the reference SAR database do not have common names. This means that, even if they were contained in the spatial query results (i.e., the lake data), they would never survive the coding methods used here, and would always be omitted from the final outputs owing to a lack of ability to connect common names between databases. While additional coding work might have been done to correct this shortcoming (e.g., by matching fish to the reference database using their common name and matching other species using their latin name), none was pursued given the relatively narrow scope of this report.

The SAR results are summarized in Section 6.2.3 with the full species list for each lake presented in Appendix B.

5.4.5 Financial Considerations

Financial considerations were included because Program funding is finite and LLC aims to deliver the best possible results given the available budget. This criterion was assessment on a case-by-case basis and would increase a lake's existing priority ranking. For example, additional funding was offered to LLC by the Lake Windermere Ambassadors to support a second FIMP survey of Windermere Lake. Given the magnitude of funding offered and existing high stakeholder interest in this lake, it became evident that this lake was almost certain to be re-assessed before the end of the FIMP Program.

5.5 FINAL LAKE LIST

The Final Lake List was determined by assigning a qualitative rank and corresponding score (e.g., Low = 1; Medium = 2; and High = 3) to individual or composite criterion. During the assessment, it became clear that it would be more practical to combine select criterion to create composite criterion due to the high degree of overlap (and difficulty disentangling the influence of each) between desktop review, field reconnaissance, and professional judgement. Scores were summed to determine the overall Prioritization Score out of a possible maximum score of nine (since a total of three criterions were used). The Prioritization Score was used to sort the Final Lake List from highest to lowest score. Higher scoring lakes should be prioritized for survey ahead of lakes with lower scores.

6.0 RESULTS

6.1 CANDIDATE LAKE LIST

The Candidate Lake List is presented in Table 2.

Table 2. Candidate Lake List.

	Lake Name	Year First FIMP Survey was Completed	Duration Since First Survey
1	Arrow	NA	NA
2	Baynes	NA	NA
3	Brilliant Headpond	2018	3
4	Columbia	2007	13
5	Duncan	NA	
6	Edwards	2015	5
7	Jim Smith	2010	10
8	Koocanusa	2015	5
9	Kootenay	2011	9
10	Moyie	2008	12
11	Munroe	2008	12
12	Norbury and Peckhams	NA	NA
13	Rosen	2009	11
14	Slocan	2010	10
15	St Mary	2010	10
16	Summit		NA
17	Tie	2009	11
18	Trout	NA	NA
19	Wasa	2009	11
20	Whatshan Lake	NA	NA
21	Whiteswan	NA	NA
22	Whitetail	NA	NA
23	Windemere	2007	13

6.2 DETAILED ASSESSMENT

6.2.1 Desktop Review and Field Reconnaissance

Field observations and key fish and wildlife values were summarized in Table 3. As noted in the Methods Section, no formal desktop review was completed. Instead, a priori knowledge and professional judgement was used to assign fish and fish habitat value rankings.

Table 3. Summary of Field Observations and Known Fisheries Values.

	Lake Name	First Survey	Duration Since Last Survey	Lake Size Category	Lake Size (ha)	Lake Type	Site Visited	Develop. Pressure	Fisheries Values	Comments
1	Arrow	NA	NA	Very Large	Unk	R	No	Unk	High	White Sturgeon, Bull Trout, and Kokanee present; salmon reintroduction proposed under the CRT; significant crown land in surrounding area; difficult to survey entirely.
2	Baynes	NA	NA	Small	Unk	N	Yes	Unk	Low	Highly developed.
3	Brilliant Headpond	2018	3	Medium	Unk	N	No	Low	Med	Is a reservoir; salmon reintroduction proposed under the CRT
4	Columbia	2007	13	Large	2,574	N	Yes	Low	High	Kokanee present; salmon reintroduction proposed under the CRT.
5	Duncan	NA	NA	Large	7,350	R	No	Unk	Low	
6	Edwards	2015	5	Small	33	N	No	Unk	Med	Stocked lake; nearby First Nation community.
7	Jim Smith	2010	10	Small	20	N	Yes	Med		New development observed.
8	Koocanusa	2015	5	Very Large	18,800	R	No	Unk	High	Westslope Cutthroat Trout, Bull Trout, and Kokanee present; very large drawdown depth.
9	Kootenay	2011	9	Very Large	39,000	R	No	Unk	High	White Sturgeon and Kokanee present; considered a high priority lake owing to stakeholder interest.
10	Moyie	2008; 2020	0	Medium	895	N	Yes	Low	Low	Burbot present; considered easy to re-survey.
11	Munroe	2008	12	Small	Unk	N	Yes	Low	Low	Redevelopments observed.
12	Norbury and Peckhams	NA	NA	Small	Unk	N	Yes	High	Low	Private land abundant in area; highly developed.

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13	Rosen	2009	11	Small	73	N	Yes	Med	Low	New development observed.
14	Slocan	2010	10		6,929	N	No	Unk	High	Kokanee present; salmon reintroduction proposed under the CRT; ~ 30% of surrounding area is park land.
15	St Mary	2010	10	Small	295	N	Yes	Low	High	Westslope Cutthroat Trout present; new park built.
16	Summit	NA	NA	Small	Unk	N	Yes	Unk	Low	
17	Tie	2009	11	Small	Unk	N	Yes	Med	Low	New development observed.
18	Trout	NA	NA	Large	2,874	N	Yes	Med	High	Stocked lake; Kokanee present; signficant crown land in surrounding area; evidence of logging observed; easy to survey although it is remote.
19	Wasa	2009	11	Small	115	N	Yes	Unk	Low	Highly developed; Invasive species present.
20	Whatshan Lake	NA	NA	Medium	1,692	R	No	Unk	High	Kokanee, Bull Trout, and Rainbow Trout present; is a BC Hydro reservoir with ~ 7.3 m drawdown depth.
21	Whiteswan	2020	0	Medium	376	N	Yes	Low	High	Stocked lake; significant crown land area; easy to survey; access road parallels the lake.
22	Whitetail	2020	0	Small	166	N	Yes	Med	High	Evidence of logging observed. Significant crown land area; poor access.
23	Windemere	2007; 2020	0	Medium	1,610	N	Yes	Unk	Med	Kokanee present; salmon reintroduction proposed under the CRT; considered high priority and difficult to re-survey.

Notes: CRT = Columbia River Treaty; Lake Size Categories: Small = < 300 ha, Medium = 300 to < 2000 ha, Large = 2,000 to < 10,000 ha,

Very Large = > 10,000 ha. R = Reservoir, N = Natural. Unk = Unknown. Med = Medium.

6.2.2 Development Pressure

6.2.2.1 DFO Referral Data

Overall, the lakes with the highest number of DFO referral submissions included, Kootenay Lake (n = 358), Windermere Lake (n = 75), Arrow Lake (n = 60), Slocan Lake (n = 29), Koocanusa Lake (n = 23), Columbia Lake (n = 13), and Moyie Lake (n = 13) (Figure 2 and Table 5).

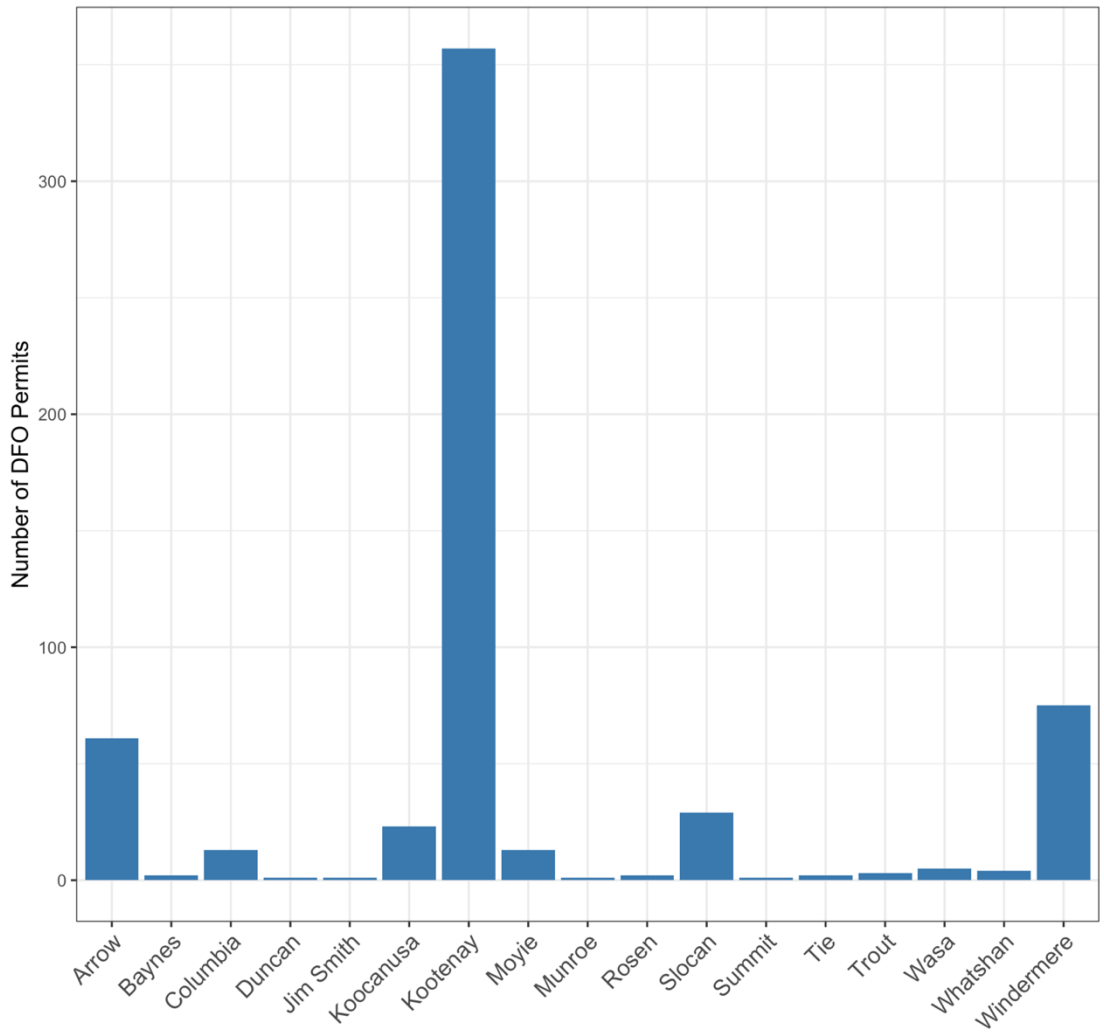

Figure 2. Total Number of DFO Referral Submissions for Candidate Lakes from 1996 to 2020.

Table 5. Summary of DFO Referral Submissions for Candidate Lakes from 1996 to 2020.

	Lake	Year 1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
1	Arrow	0	1	0	0	2	0	1	1	5	2	9	4	6	8	5	5	3	1	2	2	0	0	0	2	2	61
2	Baynes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2
3	Brilliant Headpond	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Columbia	0	0	0	0	0	0	1	2	0	0	1	2	0	4	1	1	1	0	0	0	0	0	0	0	0	13
5	Duncan	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6	Jim Smith	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
7	Koocanusa	0	0	0	1	1	0	0	5	0	0	4	1	6	2	1	1	0	1	0	0	0	0	0	0	0	23
8	Kootenay	1	1	2	1	2	4	12	21	22	36	43	32	43	37	40	27	13	5	1	3	1	5	2	1	2	357
9	Moyie	0	0	0	0	0	0	2	1	0	1	2	1	0	0	6	0	0	0	0	0	0	0	0	0	0	13
10	Munroe	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11	Norbury	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Rosen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
13	Slocan	0	0	0	0	0	3	3	1	2	2	3	4	0	0	4	1	4	0	0	0	0	0	0	0	2	29
14	St Mary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Summit	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16	Tie	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
17	Trout	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
18	Wasa	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	5
19	Whatshan	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4
20	Whitetail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Whiteswan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	Windermere	0	0	0	0	1	0	6	8	9	8	7	6	10	2	6	7	1	2	0	0	0	0	0	1	1	75
Total		**2**	**2**	**2**	**2**	**6**	**9**	**26**	**40**	**38**	**52**	**74**	**50**	**65**	**53**	**67**	**46**	**22**	**10**	**3**	**5**	**1**	**5**	**2**	**4**	**7**	**593**

Source: Program Activity Tracking for Habitat database queried by DFO (DFO 2020).
Notes: Values for Norbury do not include Peckhams Lake.

Project Background
February 1, 2021

Stantec Living Lakes CANADA

Lakes with more than ten referral submissions across the 20+ year time period (e.g., Kootenay, Windermere, Arrow, Slocan, Koocanusa, Columbia, and Moyie), were plotted for further investigation. The distribution of these data was unimodal and peaked between 2005 and 2010 (Figure 3). In the last several years, few to no referrals were submitted for most candidate lakes. However, four lakes—Arrow, Kootenay, Slocan, and Windermere—stood out from this general trend and saw a few referrals submitted in recent years (Figure 3).

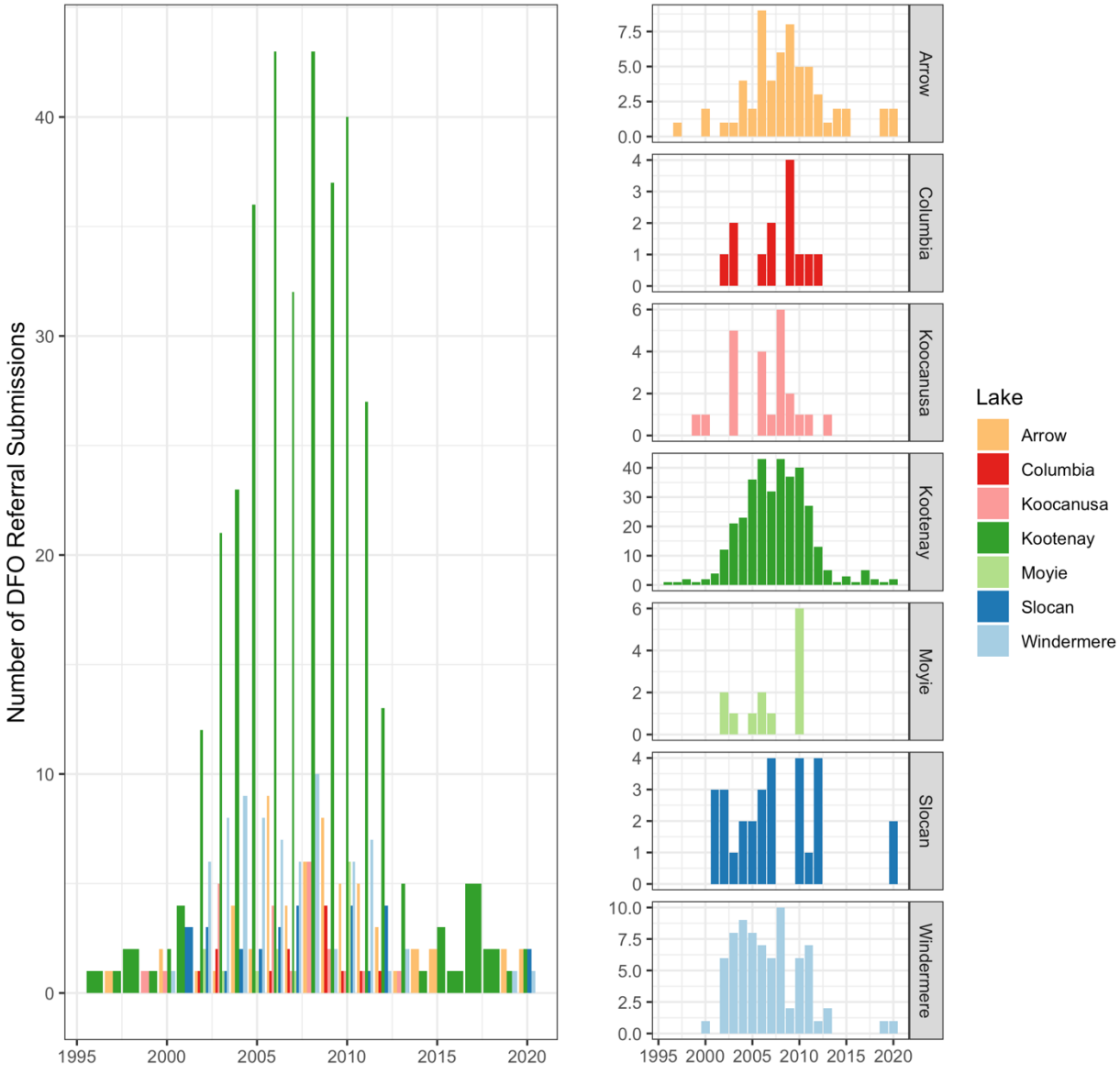

Figure 3. Number of DFO Referral Submissions by Lake and Year.

6.2.2.2 FLNRORD Survey Results

In total, six FLNRORD staff from four different offices (Nelson, Castlegar, Cranbrook, and Revelstoke) responded to the survey. The response rate was approximately 29 percent (six responses / 21 surveys sent out). Respondents self-identified as belonging to either the Lands, Water Stewardship, or Compliance and Enforcement branches of FLNRORD and were either Authorization Specialists or Natural Resource Officers. The number of years of experience per respondent ranged from 1 to 15, with the median being 1.5 years and a mean of 4.2 years. The difference in the median and mean indicate positive skewness, with the median likely being a better estimator of the central tendency of the data compared to the mean (which is more strongly influenced by the single respondent with 15 years of experience). Lakes that were not scored by survey respondents were omitted from the plot (Figure 4).

Windermere (median = 9) and Kootenay (median = 8.5) lakes had the highest relative lake development pressure scores reported by FLNRORD staff (Figure 4 and Table 5). Koocanusa and Tie lakes followed with median scores of 7 and 6.5, respectively (Figure 4 and Table 5). Despite heavily overlapping IQRs with Slocan and Summit lakes, Whatshan and Moyie lakes seem to make up the next apparent grouping with median lake development pressure scores of 5.5 and 5, respectively (Figure 4 and Table 5). Slocan and Summit lakes both had a median score of 4, but were accompanied by two of the largest IQRs (Slocan IQR = 3.75, Summit IQR = 3.25) (Figure 4 and Table 5). A large IQR suggests a lack of consensus on the relative lake development pressure experienced by a lake.

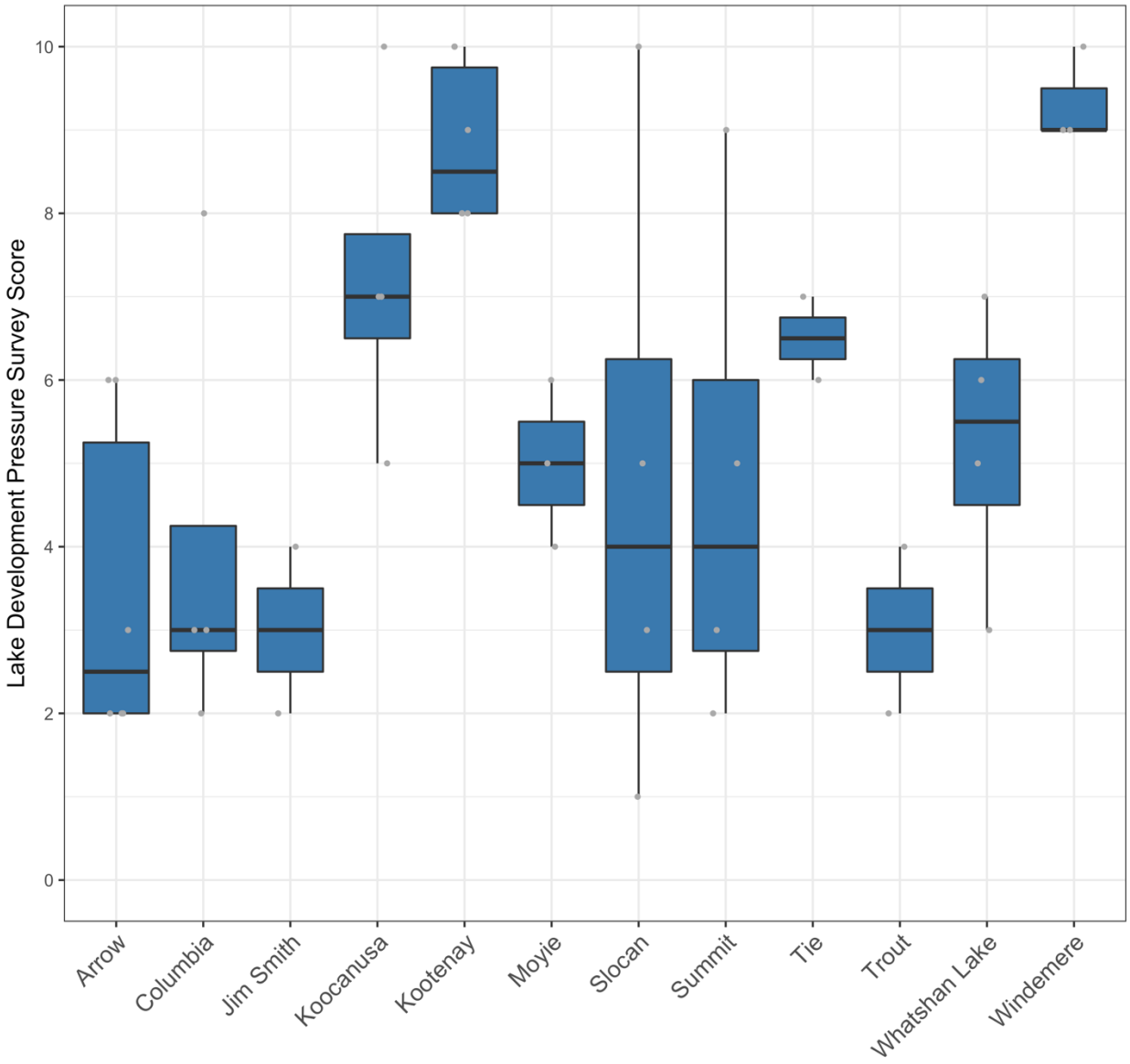

Figure 4. Lake Development Pressure Median and Interquartile Range.

Note: Grey points represent the raw data.

Table 5. Summary of Lake Development Pressure Survey Score.

Lake Name		Mean	Standard Deviation	Median	Interquartile Range
1	Windemere	9.33	0.58	9	0.5
2	Kootenay	8.83	0.98	8.5	1.75
3	Koocanusa	7.25	2.06	7	1.25
4	Tie	6.50	0.71	6.5	0.5
5	Whatshan Lake	5.25	1.71	5.5	1.75
6	Moyie	5.00	1.00	5	1
7	Slocan	4.75	3.86	4	3.75
8	Summit	4.75	3.10	4	3.25
9	Columbia	4.00	2.71	3	1.5
10	Jim Smith	3.00	1.41	3	1
11	Trout	3.00	1.41	3	1
12	Arrow	3.50	1.97	2.5	3.25
13	Baynes	NA	NA	NA	NA
14	Brilliant Headpond	NA	NA	NA	NA
15	Edwards	NA	NA	NA	NA
16	Munroe	NA	NA	NA	NA
17	Norbury	NA	NA	NA	NA
18	Rosen	NA	NA	NA	NA
19	St Mary	NA	NA	NA	NA
20	Wasa	NA	NA	NA	NA
21	Whiteswan	NA	NA	NA	NA
22	Whitetail	NA	NA	NA	NA

Notes: Peckhams and Duncan lakes were not included in the survey.

6.2.3 Species at Risk

6.2.3.1 BC Status

The lakes with the greatest total number of BC Red- and Blue-listed species were Arrow (n = 17), Kootenay (n = 14), Columbia (n = 11). Arrow (n = 5), Brilliant (n = 5), and Koocanusa (n = 4) supported the greatest number of BC listed aquatic SAR (Figure 5 and Table 6).

The lakes with the greatest number of BC Red-listed species included: Kootenay (5), Arrow (3), Wasa (n = 3), Edwards, Rosen, and Tie (n = 2 each). Lakes with none included: Munroe, Whatshan, Whiteswan, and Whitetail. All others had one documented Red-listed species (Figure 6 and Table 6).

The lakes with the greatest number of Blue-listed species included: Arrow (n = 14), Columbia (n = 10), Kootenay (n = 9), Windermere (n = 6), and Koocanusa (n = 5). Lakes with none included: Norbury and Peckhams (evaluated together), and Summit. All other had between one and four (Figure 6 and Table 6).

The lakes with the greatest number of Exotic species (i.e., invasive) included: Kootenay (n = 4), Koocanusa, Wasa, and Windermere (n = 3 each). Lakes with none included: Edwards, Munroe, and Summit. All others had either one or two known exotic species present (Figure 6 and Table 6).

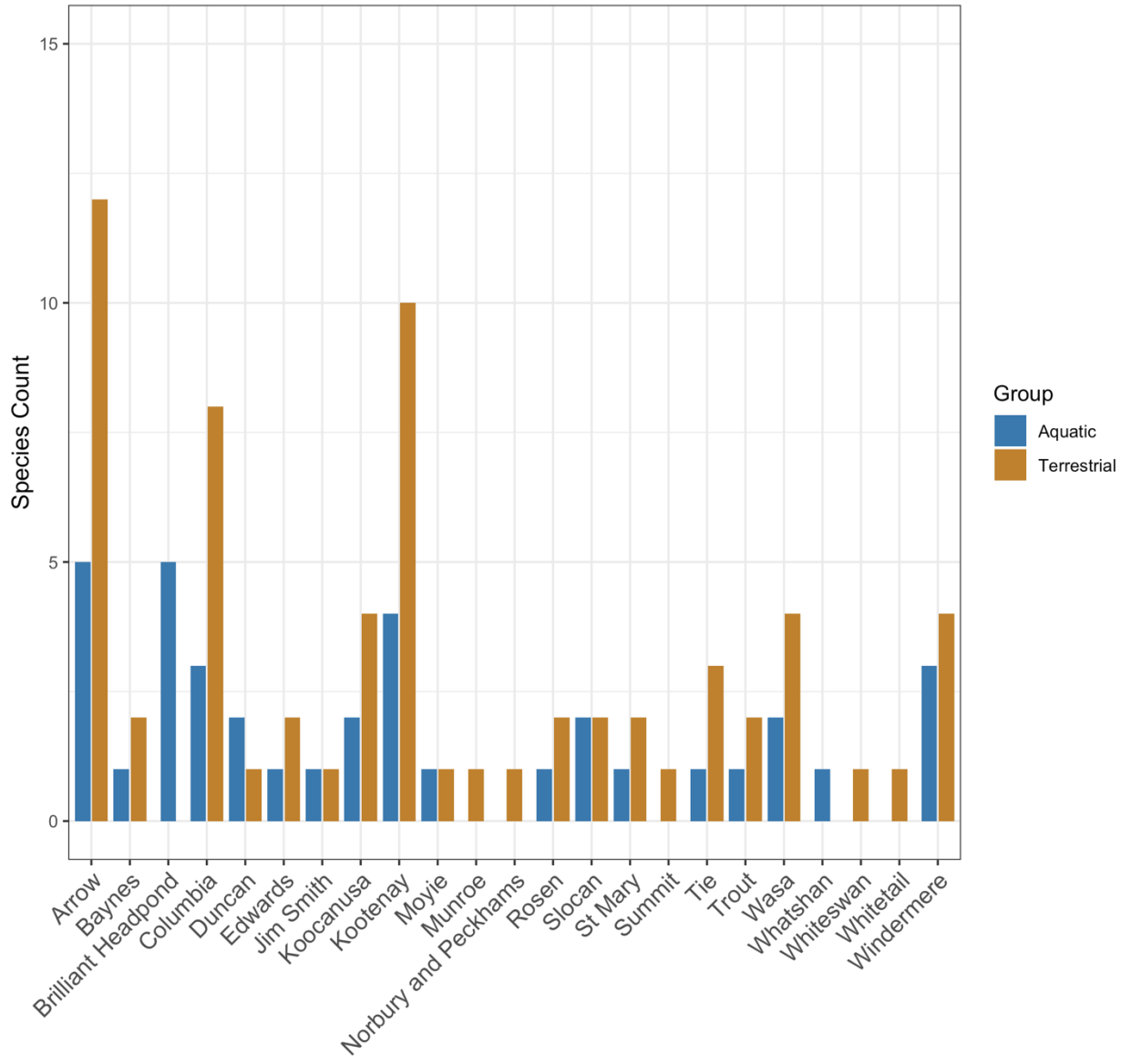

Figure 5. Total Species Count by BC Conservation Status.

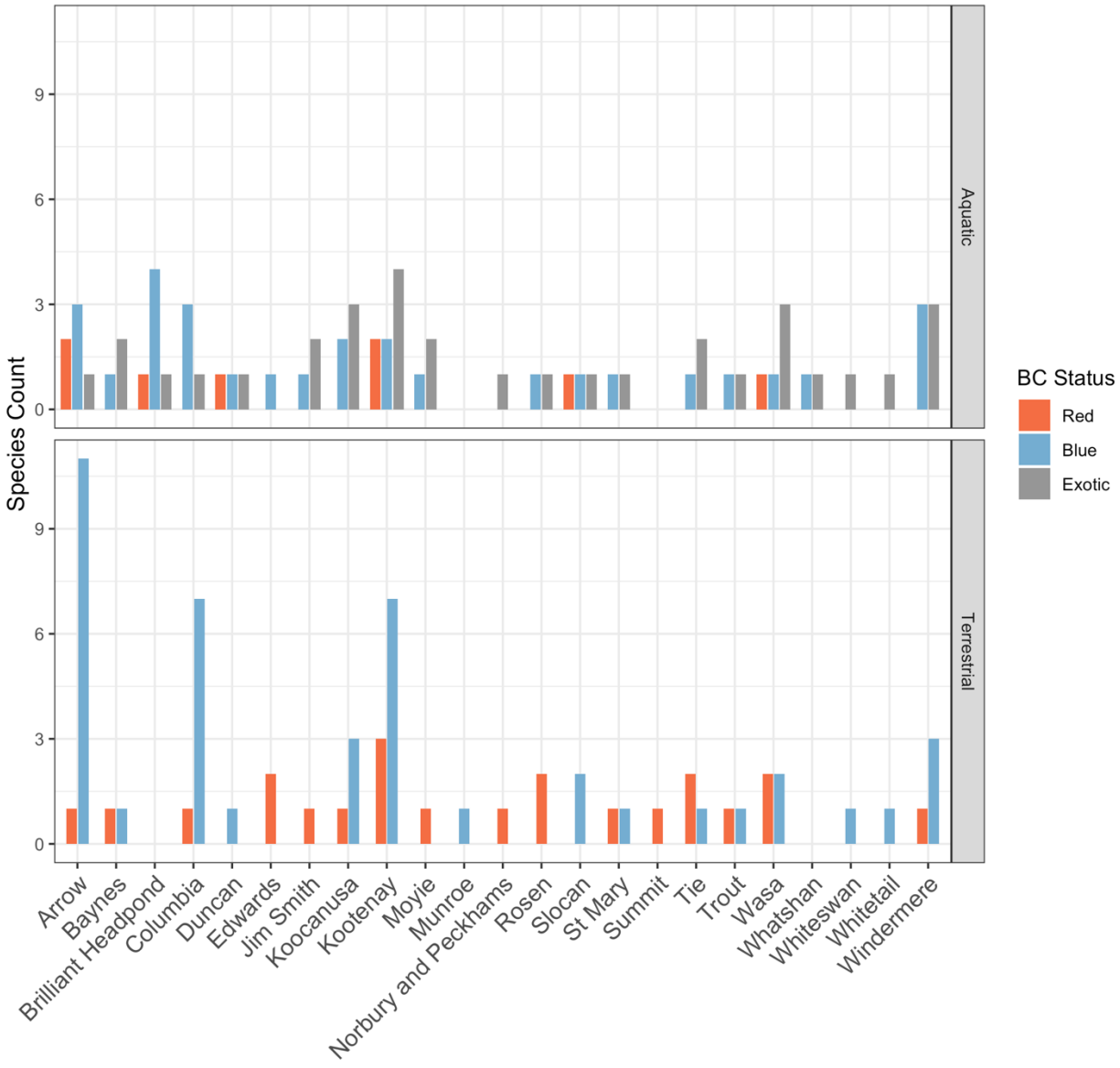

Figure 6. Species Counts by BC Conservation Status Designation.

Table 6. Species Count by BC Conservation Status Designation.

Lake Name	Aquatic Species			Terrestrial Species		Total
	Red	Blue	Exotic	Red	Blue	
Arrow	2	3	1	1	11	**17**
Kootenay	2	2	4	3	7	**14**
Columbia	0	3	1	1	7	**11**
Windermere	0	3	3	1	3	**7**
Koocanusa	0	2	3	1	3	**6**
Wasa	1	1	3	2	2	**6**
Brilliant Headpond	1	4	1	0	0	**5**
Slocan	1	1	1	0	2	**4**
Tie	0	1	2	2	1	**4**
Baynes	0	1	2	1	1	**3**
Duncan	1	1	1	0	1	**3**
Edwards	0	1	0	2	0	**3**
Rosen	0	1	1	2	0	**3**
St Mary	0	1	1	1	1	**3**
Trout	0	1	1	1	1	**3**
Jim Smith	0	1	2	1	0	**2**
Moyie	0	1	2	1	0	**2**
Munroe	0	0	0	0	1	**1**
Norbury and Peckhams	0	0	1	1	0	**1**
Summit	0	0	0	1	0	**1**
Whatshan	0	1	1	0	0	**1**
Whiteswan	0	0	1	0	1	**1**
Whitetail	0	0	1	0	1	**1**

6.2.3.2 COSEWIC Status

The lakes with the greatest total number of COSEWIC-listed species (excluding species designated as Not at Risk) were Arrow (n = 13), Kootenay (n = 11), Columbia (n = 8) (Figure 7 and Table 7). Arrow (n = 6), Brilliant (n = 6), and Kootenay (n = 5) supported the greatest number of aquatic SAR listed by the COSEWIC (Figure 7 and Table 7).

The lakes with the greatest number of COSEWIC Endangered species included: Kootenay (n = 4), Arrow and Columbia (n = 3 each). Lakes with none included: Brilliant and Whatshan. All others had either one or two (Figure 8 and Table 7).

The lakes with the greatest number of Threatened species included: Arrow (n = 5), Brilliant, Columbia, Koocanusa, Kootenay, and Windermere (n = 2 each). Duncan, Slocan, and Wasa had one species listed as Threatened, while all other lakes had none (Figure 8 and Table 7).

The lakes with the greatest number of species designated as Special Concern included: Arrow and Kootenay (n = 5 each), Brilliant (n = 4), and Columbia (n = 3). Koocanusa and Windermere each had two. Munroe, Norbury and Peckhams (evaluated together), Whiteswan, and Whitetail all had none. All other lakes had one species designated as Special Concern (Figure 8 and Table 7).

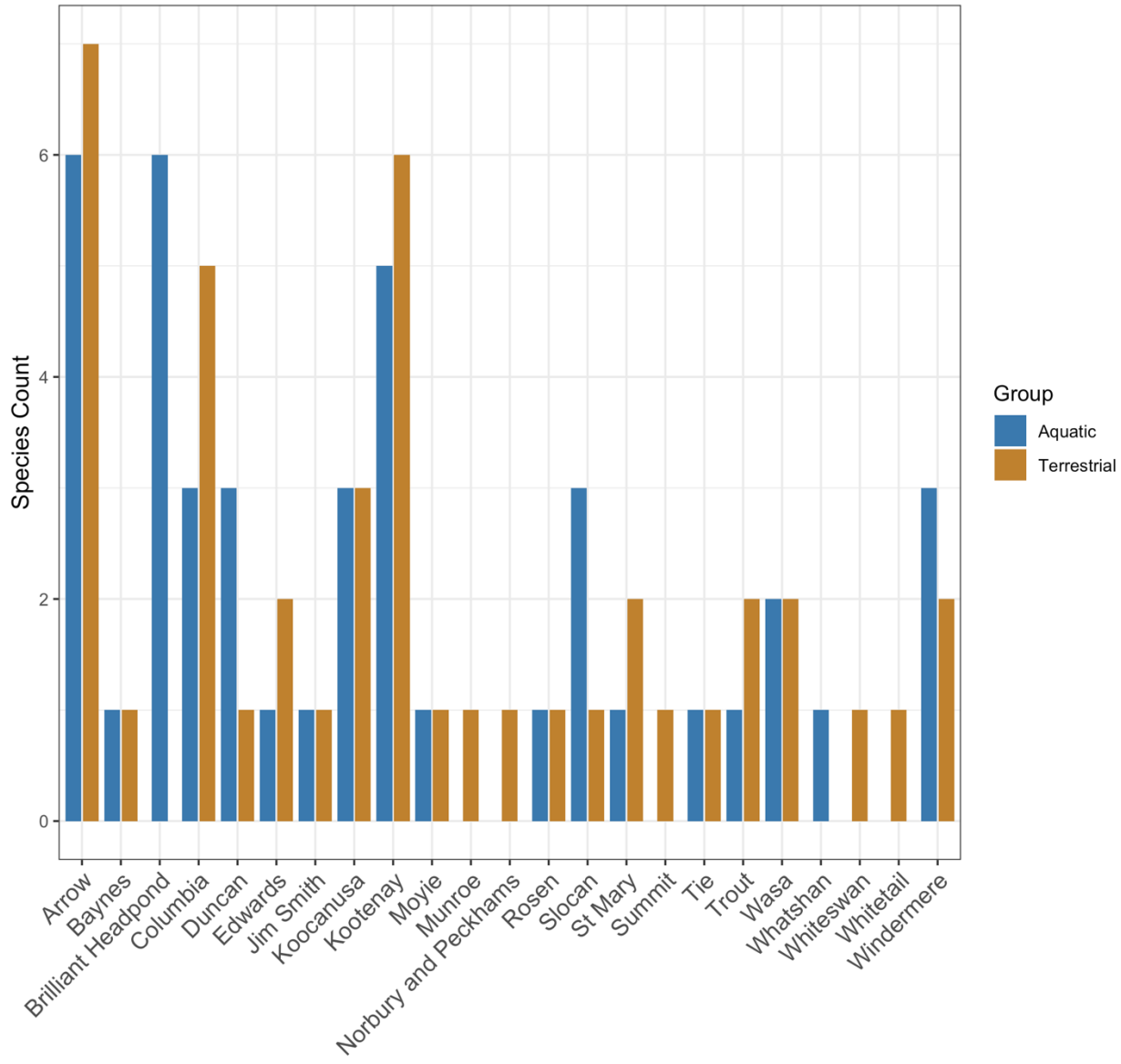

Figure 7. Total Species Count by COSEWIC Conservation Status.

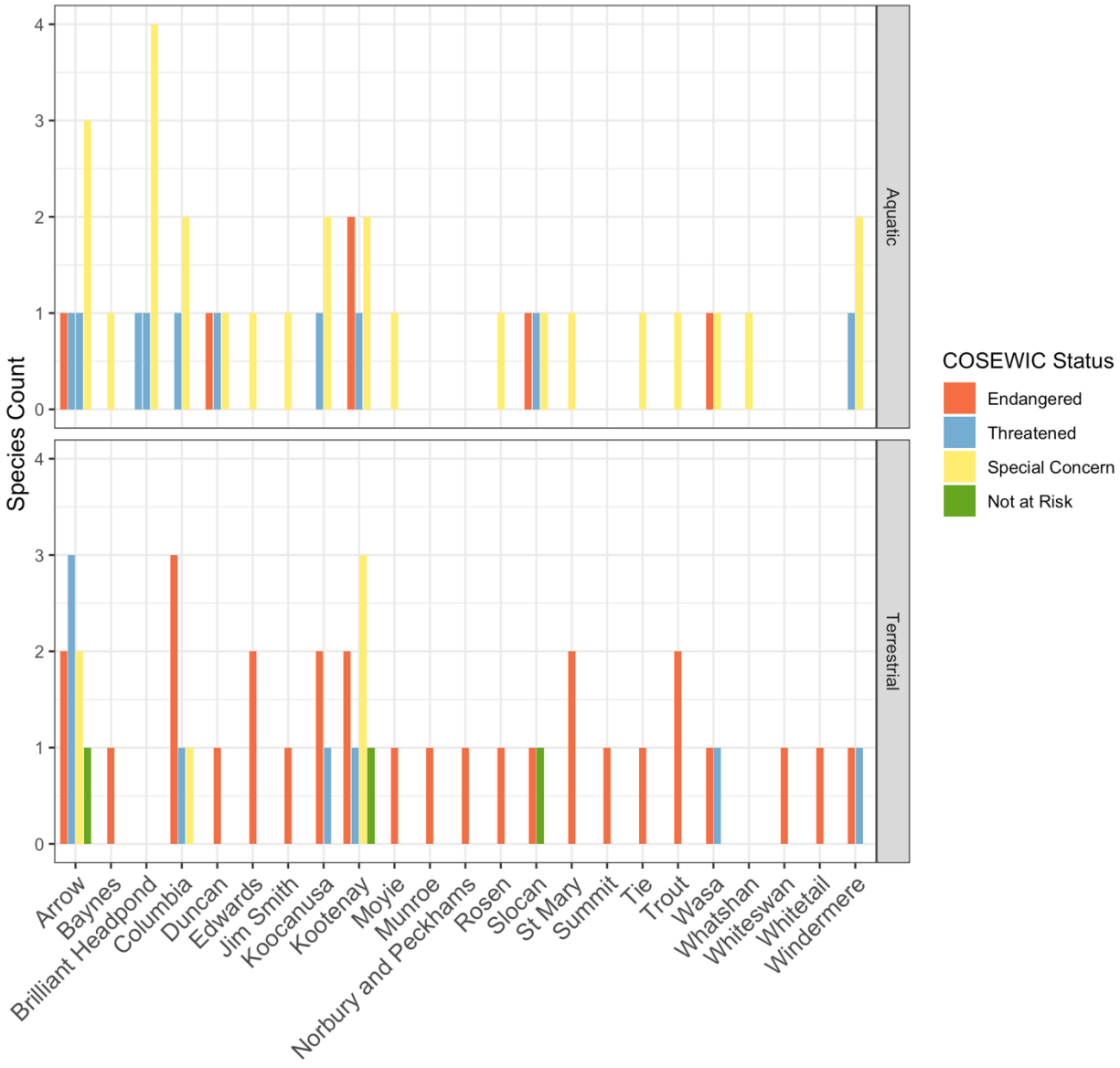

Figure 8. Species Counts by COSEWIC Conservation Status Designation.

Table 7. Species Count by COSEWIC Conservation Status Designation.

Lake Name	Aquatic Species			Terrestrial Species				Total
	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Not at Risk	
Arrow	1	2	3	2	3	2	1	13
Kootenay	2	1	2	2	1	3	1	11
Columbia	0	1	2	3	1	1	0	8
Brilliant Headpond	0	2	4	0	0	0	0	6
Koocanusa	0	1	2	2	1	0	0	6
Windermere	0	1	2	1	1	0	0	5
Duncan	1	1	1	1	0	0	0	4
Slocan	1	1	1	1	0	0	1	4
Wasa	1	0	1	1	1	0	0	4
Edwards	0	0	1	2	0	0	0	3
St Mary	0	0	1	2	0	0	0	3
Trout	0	0	1	2	0	0	0	3
Baynes	0	0	1	1	0	0	0	2
Jim Smith	0	0	1	1	0	0	0	2
Moyie	0	0	1	1	0	0	0	2
Rosen	0	0	1	1	0	0	0	2
Tie	0	0	1	1	0	0	0	2
Munroe	0	0	0	1	0	0	0	1
Norbury and Peckhams	0	0	0	1	0	0	0	1
Summit	0	0	0	1	0	0	0	1
Whatshan	0	0	1	0	0	0	0	1
Whiteswan	0	0	0	1	0	0	0	1
Whitetail	0	0	0	1	0	0	0	1

6.2.3.3 SARA Status

The lakes with the greatest total number of SARA-listed species were Arrow (n = 11), Kootenay (n = 10), and Columbia (n = 6) (Figure 9 and Table 9). Arrow, Brilliant, and Kootenay (n = 4 each) supported the greatest number of aquatic SAR listed under the SARA (Figure 9 and Table 9).

The lakes with the greatest number of Endangered species listed under the SARA included: Kootenay and Arrow (n = 4 each), Columbia, Duncan, Koocanusa, and Slocan (n = 3 each), and Edwards, Wasa, and Windermere (n = 2 each). All other lakes had one species listed as Endangered (Figure 10 and Table 9).

Seven lakes had species ranked as Threatened, including: Arrow (n = 3), Kootenay (n = 2), and Columbia, Koocanusa, St Mary, Trout, Wasa, and Windermere (n = 1 each). All other lakes had no Threatened species identified (Figure 10 and Table 9).

Lakes with species ranked as Special Concern included: Arrow and Kootenay (n = 4 each), Brilliant (n = 3), and Columbia (n = 1). The other lakes had either one or no species ranked as Special Concern (Figure 10 and Table 9).

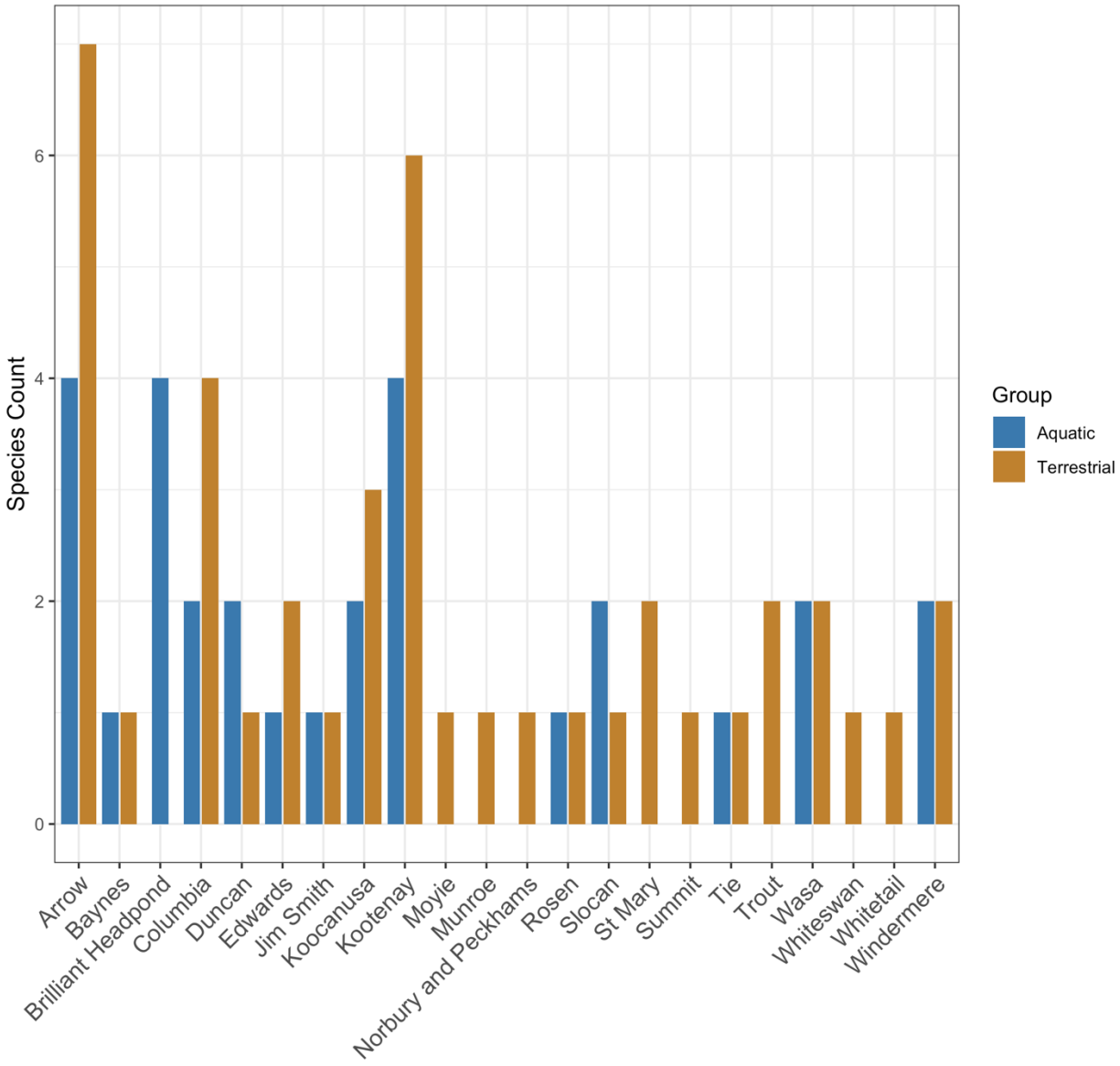

Figure 9. Total Species Count by SARA Conservation Status.

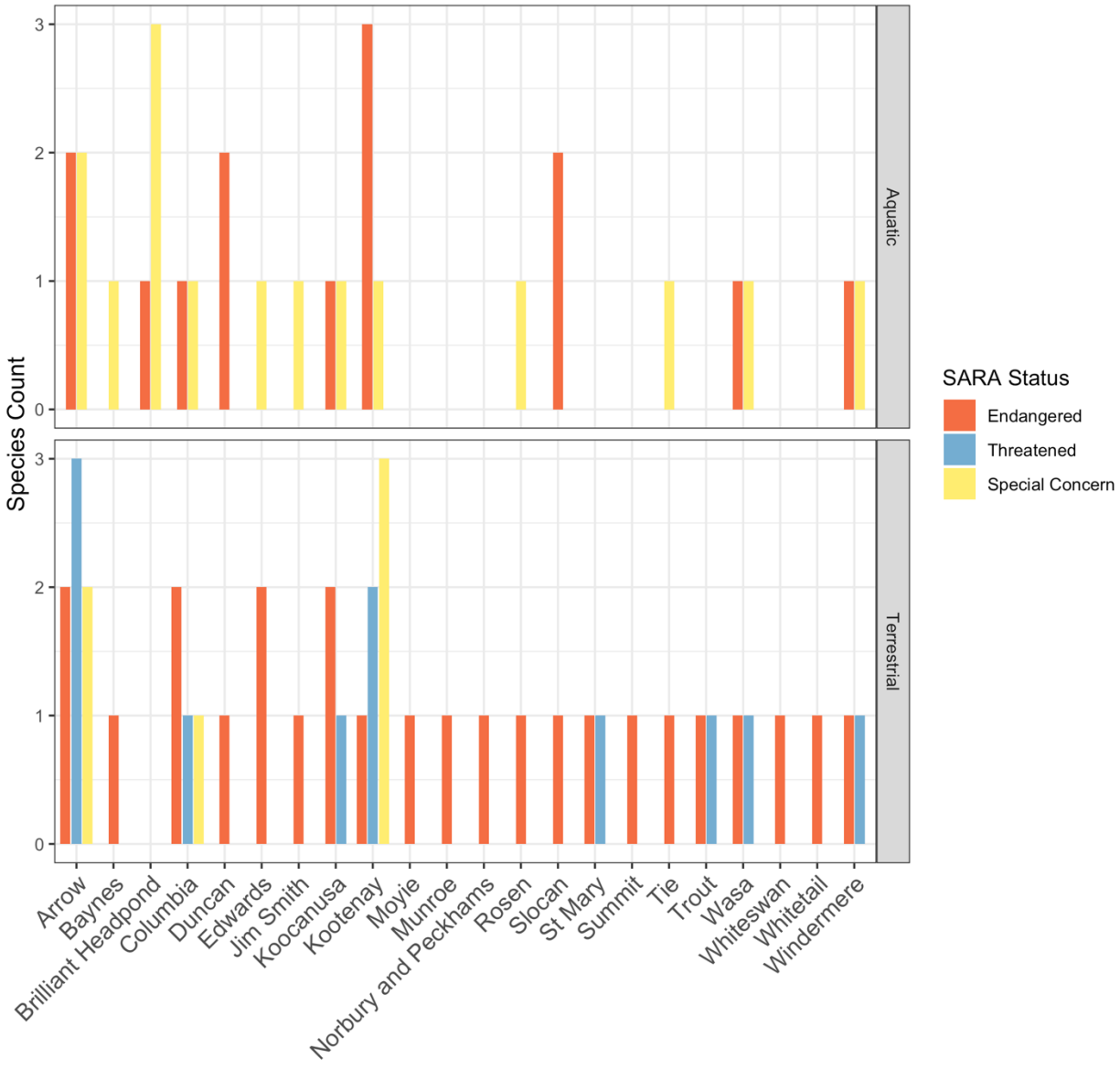

Figure 10. Species Counts by SARA Conservation Status Designation.

Table 8. Species Count by SARA Conservation Status Designation.

Lake Name	Aquatic Species		Terrestrial Species			Total
	Endangered	Special Concern	Endangered	Threatened	Special Concern	
Arrow	2	2	2	3	2	**11**
Kootenay	3	1	1	2	3	**10**
Columbia	1	1	2	1	1	**6**
Koocanusa	1	1	2	1	0	**5**
Brilliant Headpond	1	3	0	0	0	**4**
Wasa	1	1	1	1	0	**4**
Windermere	1	1	1	1	0	**4**
Duncan	2	0	1	0	0	**3**
Edwards	0	1	2	0	0	**3**
Slocan	2	0	1	0	0	**3**
Baynes	0	1	1	0	0	**2**
Jim Smith	0	1	1	0	0	**2**
Rosen	0	1	1	0	0	**2**
St Mary	0	0	1	1	0	**2**
Tie	0	1	1	0	0	**2**
Trout	0	0	1	1	0	**2**
Moyie	0	0	1	0	0	**1**
Munroe	0	0	1	0	0	**1**
Norbury and Peckhams	0	0	1	0	0	**1**
Summit	0	0	1	0	0	**1**
Whiteswan	0	0	1	0	0	**1**
Whitetail	0	0	1	0	0	**1**

6.2.4

6.2.5 Financial Considerations

No lake-specific funding was offered (except Windermere, but it was already surveyed for a second time at the time of writing, e.g., 2008 and 2020). Consequently, no further discussion is warranted.

6.2.6 Integrated Summary

The results of the detailed assessment are summarized in Table 9 and presented from highest to lowest Prioritization Score.

Table 9. Prioritization Score.

Lake Name	Desktop Review, Field Reconnaissance, and Professional Judgement	Lake Development Pressure	Species at Risk	Prioritization Score
Arrow	3	3	3	**9**
Kootenay	3	3	3	**9**
Windemere	3	3	3	**9**
Columbia	3	2	3	**8**
Slocan	3	2	2	**7**
Moyie	3	2	1	**6**
Trout	3	1	2	**6**
Edwards	3	1	1	**5**
Koocanusa	1	2	2	**5**
Tie	1	2	2	**5**
Whatshan Lake	3	1	1	**5**
Brilliant Headpond	1	1	2	**4**
Duncan	1	1	2	**4**
Rosen	1	1	2	**4**
St Mary	1	1	2	**4**
Summit	2	1	1	**4**
Wasa	1	1	2	**4**
Whiteswan	2	1	1	**4**
Whitetail	2	1	1	**4**
Baynes	1	1	1	**3**
Jim Smith	1	1	1	**3**
Munroe	1	1	1	**3**
Norbury and Peckhams	1	1	1	**3**

6.3 PRIORITIZED LAKE LIST

The Final Lake List and proposed FIMP survey schedule is presented in Table 10. Windermere (Prioritization Score = 9) and Moyie (Prioritization Score = 6) lakes were surveyed in 2020, which is after this report was finalized, so were not considered further.

Table 10. Final Lake List.

Lake (Prioritization Score)	Comments
Survey Year: 2021 – 22	
Columbia (8)	This would be a re-survey.
Kootenay (9)	This would be a re-survey.
Trout (6)	
Survey Year: 2022 – 23	
Arrow (9)	Might not be feasible to survey entire lake.
Slocan (7)	This would be a re-survey.

7.0 CLOSURE

Overall, the process used to prioritize lakes in the Upper Columbia Basin for future FIMP surveys was effective. While some criterions were undoubtedly subjective (e.g., desktop review, field reconnaissance, stakeholder interest, and professional judgement), they were based on a solid working knowledge of the geographical area and relevant issues. Consequently, the inclusion of this information was deemed supportive of a robust assessment. Moreover, these criterions were generally corroborated where quantitative data were also used (e.g., DFO referral data, SAR counts). This suggests that where subjective and quantitative information overlapped, they were generally congruent.

At the time of writing, the LLC FIMP Program Team found the Final Lake List (Table 10) to be satisfactory for their intended use. The simple analytical framework, data acquired, and results meet or exceed the stated objectives and budget of this planning report. Nonetheless, a number of potential improvements to this report are suggested below.

7.1 POTENTIAL IMPROVEMENTS

There are a number of additional avenues that could be pursued to improve the confidence in the results, including:

1. Using referral data submitted under the *Lands Act* and *Water Sustainability Act* to understand lake development pressure;
2. Using compliance and enforcement data to understand lake development pressure;
3. Exploring the potential to use property tax information as a surrogate for lake development pressure (WLLID Pers. Comm. 2021);
4. Using publicly available land ownership information (e.g., private, Crown Land, park reserve, and other zoning information) to forecast and account for potential future urban development (or lack thereof);
5. Expanding the analysis of DFO referral data (e.g., evaluating the types of permit applications to better understand the propensity for potential effects to fish and wildlife).
6. Expanding the mathematical framework used to determine the Prioritization Score (e.g., splitting grouped criterion or weighting criterions);
7. Standardization of SAR data to account for the species-area relationship (see MacArthur 1965). Other approaches to data standardization might also be applicable;
8. Including SAR identified using the Species and ecosystems—masked layer;
9. Refining the R code to match lake data with the SAR reference database using a combination of species common names and scientific names, where possible;
10. Re-distributing the FLNRORD Lake Development Survey to acquire additional responses (to bolster the sample size and confidence in the results);
11. Complete a formal desktop review of existing fish and wildlife values for each candidate lake.
12. Include a discussion of the results to provide additional explanation of the integrated summary (Section 6.2.6) and Prioritization Score results (Table 9).

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APPENDIX A. FLNRORD LAKE DEVELOPMENT PRESSURE SURVEY

APPENDIX B. SPECIES AT RISK—SUPPORTING INFORMATION

Arrow Lake

Table A1. Species at Risk Occurrences for Arrow Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Umatilla Dace	*Rhinichthys umatilla*	Red	Threatened	10-Apr	NA	05-Mar	3
2	Aquatic	Vertebrate Animal	White Sturgeon (Upper Columbia River Population)	*Acipenser transmontanus pop. 2*	Red	Endangered	12-Nov	Endangered	03-Jun	1
3	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
4	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
5	Aquatic	Vertebrate Animal	Shorthead Sculpin	*Cottus confusus*	Blue	Special Concern	10-Nov	Special Concern	NA	1
6	Aquatic	Vertebrate Animal	White Sturgeon	*Acipenser transmontanus*	No Status	Endangered / Threatened	12-Nov	Endangered	NA	1
7	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
8	Terrestrial	Invertebrate Animal	Gypsy Cuckoo Bumble Bee	*Bombus bohemicus*	Red	Endangered	14-May	Endangered	18-Jun	1

9	Terrestrial	Vascular Plant	Miner's-Lettuce	*Claytonia perfoliata ssp. intermontana*	Blue	NA	NA	NA	NA	NA
10	Terrestrial	Vascular Plant	Whitebark Pine	*Pinus albicaulis*	Blue	Endangered	10-Apr	Endangered	12-Jul	1
11	Terrestrial	Vascular Plant	Wild Licorice	*Glycyrrhiza lepidota*	Blue	NA	NA	NA	NA	NA
12	Terrestrial	Vertebrate Animal	American Avocet	*Recurvirostra americana*	Blue	NA	NA	NA	NA	NA
13	Terrestrial	Vertebrate Animal	Bobolink	*Dolichonyx oryzivorus*	Blue	Threatened	10-Apr	Threatened	17-Nov	1
14	Terrestrial	Vertebrate Animal	Canyon Wren	*Catherpes mexicanus*	Blue	Not at Risk	May-92	NA	NA	NA
15	Terrestrial	Vertebrate Animal	Great Blue Heron, Herodias Subspecies	*Ardea herodias herodias*	Blue	NA	NA	NA	NA	NA
16	Terrestrial	Vertebrate Animal	Lewis's Woodpecker	*Melanerpes lewis*	Blue	Threatened	10-Apr	Threatened	12-Jul	1
17	Terrestrial	Vertebrate Animal	Western Screech-Owl, Macfarlanei Subspecies	*Megascops kennicottii macfarlanei*	Blue	Threatened	12-May	Threatened	05-Jan	1
18	Terrestrial	Vertebrate Animal	Western Skink	*Plestiodon skiltonianus*	Blue	Special Concern	14-Nov	Special Concern	05-Jan	1
19	Terrestrial	Vertebrate Animal	White-Throated Swift	*Aeronautes saxatalis*	Blue	NA	NA	NA	NA	NA
20	Terrestrial	Vertebrate Animal	Coeur D'alene Salamander	*Plethodon idahoensis*	Yellow	Special Concern	07-Nov	Special Concern	03-Jun	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Baynes Lake

Table A2. Species at Risk Occurrences for Baynes Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
2	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
3	Aquatic	Vertebrate Animal	Largemouth Bass	*Micropterus salmoides*	Exotic	NA	NA	NA	NA	NA
4	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1
5	Terrestrial	Vascular Plant	Wild Licorice	*Glycyrrhiza lepidota*	Blue	NA	NA	NA	NA	NA

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Brilliant Headpond

Table A3. Species at Risk Occurrences for Brilliant Headpond.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Umatilla Dace	*Rhinichthys umatilla*	Red	Threatened	10-Apr	NA	05-Mar	3
2	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
3	Aquatic	Vertebrate Animal	Columbia Sculpin	*Cottus hubbsi*	Blue	Special Concern	19-Nov	Special Concern	03-Jun	1
4	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
5	Aquatic	Vertebrate Animal	Shorthead Sculpin	*Cottus confusus*	Blue	Special Concern	10-Nov	Special Concern	NA	1
6	Aquatic	Vertebrate Animal	White Sturgeon	*Acipenser transmontanus*	No Status	Endangered / Threatened	12-Nov	Endangered	NA	1
7	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Columbia Lake

Table A4. Species at Risk Occurrences for Columbia Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vascular Plant	Stiff-Leaved Pondweed	*Potamogeton strictifolius*	Blue	NA	NA	NA	NA	NA
2	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
3	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
4	Aquatic	Vertebrate Animal	White Sturgeon	*Acipenser transmontanus*	No Status	Endangered / Threatened	12-Nov	Endangered	NA	1
5	Aquatic	Vertebrate Animal	Pumpkinseed	*Lepomis gibbosus*	Exotic	NA	NA	NA	NA	NA
6	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1
7	Terrestrial	Vascular Plant	Limber Pine	*Pinus flexilis*	Blue	Endangered	14-Nov	NA	NA	NA
8	Terrestrial	Vascular Plant	Mccalla's Dwarf Braya	*Braya humilis ssp. maccallae*	Blue	NA	NA	NA	NA	NA
9	Terrestrial	Vascular Plant	Saltwater Cress	*Eutrema salsugineum*	Blue	NA	NA	NA	NA	NA
10	Terrestrial	Vascular Plant	Whitebark Pine	*Pinus albicaulis*	Blue	Endangered	10-Apr	Endangered	12-Jul	1
11	Terrestrial	Vertebrate Animal	Flammulated Owl	*Psiloscops flammeolus*	Blue	Special Concern	10-Apr	Special Concern	03-Jun	1
12	Terrestrial	Vertebrate Animal	Great Blue Heron, Herodias Subspecies	*Ardea herodias herodias*	Blue	NA	NA	NA	NA	NA

13	Terrestrial	Vertebrate Animal	Lewis's Woodpecker	*Melanerpes lewis*	Blue	Threatened	10-Apr	Threatened	12-Jul	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Duncan Lake

Table A5. Species at Risk Occurrences for Duncan Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	White Sturgeon (Upper Kootenay River Population)	*Acipenser transmontanus pop. 1*	Red	Endangered	12-Nov	Endangered	03-Jun	1
2	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
3	Aquatic	Vertebrate Animal	White Sturgeon	*Acipenser transmontanus*	No Status	Endangered / Threatened	12-Nov	Endangered	NA	1
4	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
5	Terrestrial	Vascular Plant	Whitebark Pine	*Pinus albicaulis*	Blue	Endangered	10-Apr	Endangered	12-Jul	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Edwards Lake

Table A6. Species at Risk Occurrences for Edwards Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
2	Terrestrial	Vascular Plant	Spalding's Campion	*Silene spaldingii*	Red	Endangered	05-May	Endangered	06-Aug	1
3	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Jim Smith Lake

Table A7. Species at Risk Occurrences for Jim Smith Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
2	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
3	Aquatic	Vertebrate Animal	Largemouth Bass	*Micropterus salmoides*	Exotic	NA	NA	NA	NA	NA
4	Aquatic	Vertebrate Animal	Yellow Perch	*Perca flavescens*	Unknown	NA	NA	NA	NA	NA
5	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Koocanusa Lake

Table A8. Species at Risk Occurrences for Koocanusa Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
2	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
3	Aquatic	Vertebrate Animal	White Sturgeon	*Acipenser transmontanus*	No Status	Endangered / Threatened	12-Nov	Endangered	NA	1
4	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
5	Aquatic	Vertebrate Animal	Largemouth Bass	*Micropterus salmoides*	Exotic	NA	NA	NA	NA	NA
6	Aquatic	Vertebrate Animal	Pumpkinseed	*Lepomis gibbosus*	Exotic	NA	NA	NA	NA	NA
7	Aquatic	Vertebrate Animal	Yellow Perch	*Perca flavescens*	Unknown	NA	NA	NA	NA	NA
8	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1
9	Terrestrial	Vascular Plant	Wild Licorice	*Glycyrrhiza lepidota*	Blue	NA	NA	NA	NA	NA
10	Terrestrial	Vertebrate Animal	Lewis's Woodpecker	*Melanerpes lewis*	Blue	Threatened	10-Apr	Threatened	12-Jul	1
11	Terrestrial	Vertebrate Animal	Williamson's Sapsucker	*Sphyrapicus thyroideus*	Blue	Endangered	17-Dec	Endangered	06-Aug	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Kootenay Lake

Table A9. Species at Risk Occurrences for Kootenay Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Northern Leopard Frog	*Lithobates pipiens*	Red	Endangered	09-Apr	Endangered	03-Jun	1
2	Aquatic	Vertebrate Animal	White Sturgeon (Upper Kootenay River Population)	*Acipenser transmontanus pop. 1*	Red	Endangered	12-Nov	Endangered	03-Jun	1
3	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
4	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
5	Aquatic	Vertebrate Animal	White Sturgeon	*Acipenser transmontanus*	No Status	Endangered / Threatened	12-Nov	Endangered	NA	1
6	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
7	Aquatic	Vertebrate Animal	Largemouth Bass	*Micropterus salmoides*	Exotic	NA	NA	NA	NA	NA
8	Aquatic	Vertebrate Animal	Pumpkinseed	*Lepomis gibbosus*	Exotic	NA	NA	NA	NA	NA
9	Aquatic	Vertebrate Animal	Tench	*Tinca tinca*	Exotic	NA	NA	NA	NA	NA
10	Aquatic	Vertebrate Animal	Yellow Perch	*Perca flavescens*	Unknown	NA	NA	NA	NA	NA
11	Terrestrial	Vascular Plant	Piper's Anemone	*Anemone piperi*	Red	NA	NA	NA	NA	NA

12	Terrestrial	Vertebrate Animal	Caribou (Southern Mountain Population)	Rangifer tarandus pop. 1	Red	Endangered	14-May	Threatened	03-Jun	1
13	Terrestrial	Vertebrate Animal	Western Grebe	Aechmophorus occidentalis	Red	Special Concern	14-May	Special Concern	17-Nov	1
14	Terrestrial	Invertebrate Animal	Banded Tigersnail	Anguispira kochi	Blue	Not at Risk	17-Apr	NA	NA	NA
15	Terrestrial	Vascular Plant	American Sweet-Flag	Acorus americanus	Blue	NA	NA	NA	NA	NA
16	Terrestrial	Vascular Plant	Whitebark Pine	Pinus albicaulis	Blue	Endangered	10-Apr	Endangered	12-Jul	1
17	Terrestrial	Vascular Plant	Wild Licorice	Glycyrrhiza lepidota	Blue	NA	NA	NA	NA	NA
18	Terrestrial	Vertebrate Animal	American Bittern	Botaurus lentiginosus	Blue	NA	NA	NA	NA	NA
19	Terrestrial	Vertebrate Animal	Western Screech-Owl, Macfarlanei Subspecies	Megascops kennicottii macfarlanei	Blue	Threatened	12-May	Threatened	05-Jan	1
20	Terrestrial	Vertebrate Animal	Western Skink	Plestiodon skiltonianus	Blue	Special Concern	14-Nov	Special Concern	05-Jan	1
21	Terrestrial	Vertebrate Animal	Coeur D'alene Salamander	Plethodon idahoensis	Yellow	Special Concern	07-Nov	Special Concern	03-Jun	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Moyie Lake

Table A10. Species at Risk Occurrences for Moyie Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
2	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
3	Aquatic	Vertebrate Animal	Pumpkinseed	*Lepomis gibbosus*	Exotic	NA	NA	NA	NA	NA
4	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Munroe Lake

Table A11. Species at Risk Occurrences for Munroe Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Terrestrial	Vascular Plant	Whitebark Pine	*Pinus albicaulis*	Blue	Endangered	10-Apr	Endangered	12-Jul	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Norbury and Peckham Lakes

Table A12. Species at Risk Occurrences for Norbury and Peckhams Lakes.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
2	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Rosen Lake

Table A13. Species at Risk Occurrences for Rosen Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
2	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
3	Terrestrial	Vascular Plant	Scarlet Gaura	*Oenothera suffrutescens*	Red	NA	NA	NA	NA	NA
4	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Slocan Lake

Table A14. Species at Risk Occurrences for Slocan Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	White Sturgeon (Upper Columbia River Population)	*Acipenser transmontanus pop. 2*	Red	Endangered	12-Nov	Endangered	03-Jun	1
2	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
3	Aquatic	Vertebrate Animal	White Sturgeon	*Acipenser transmontanus*	No Status	Endangered / Threatened	12-Nov	Endangered	NA	1
4	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
5	Terrestrial	Invertebrate Animal	Banded Tigersnail	*Anguispira kochi*	Blue	Not at Risk	17-Apr	NA	NA	NA
6	Terrestrial	Vascular Plant	Whitebark Pine	*Pinus albicaulis*	Blue	Endangered	10-Apr	Endangered	12-Jul	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

St Mary Lake

Table A15. Species at Risk Occurrences for St Mary Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
2	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
3	Terrestrial	Vertebrate Animal	Caribou (Southern Mountain Population)	*Rangifer tarandus pop. 1*	Red	Endangered	14-May	Threatened	03-Jun	1
4	Terrestrial	Vascular Plant	Whitebark Pine	*Pinus albicaulis*	Blue	Endangered	10-Apr	Endangered	12-Jul	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Summit Lake

Table A16. Species at Risk Occurrences for Summit Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Tie Lake

Table A17. Species at Risk Occurrences for Tie Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
2	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
3	Aquatic	Vertebrate Animal	Largemouth Bass	*Micropterus salmoides*	Exotic	NA	NA	NA	NA	NA
4	Terrestrial	Vascular Plant	Scarlet Gaura	*Oenothera suffrutescens*	Red	NA	NA	NA	NA	NA
5	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1
6	Terrestrial	Vascular Plant	Wild Licorice	*Glycyrrhiza lepidota*	Blue	NA	NA	NA	NA	NA

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Trout Lake

Table A18. Species at Risk Occurrences for Trout Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
2	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
3	Terrestrial	Vertebrate Animal	Caribou (Southern Mountain Population)	*Rangifer tarandus pop. 1*	Red	Endangered	14-May	Threatened	03-Jun	1
4	Terrestrial	Vascular Plant	Whitebark Pine	*Pinus albicaulis*	Blue	Endangered	10-Apr	Endangered	12-Jul	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Wasa Lake

Table A19. Species at Risk Occurrences for Wasa Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Northern Leopard Frog	*Lithobates pipiens*	Red	Endangered	09-Apr	Endangered	03-Jun	1
2	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
3	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
4	Aquatic	Vertebrate Animal	Largemouth Bass	*Micropterus salmoides*	Exotic	NA	NA	NA	NA	NA
5	Aquatic	Vertebrate Animal	Pumpkinseed	*Lepomis gibbosus*	Exotic	NA	NA	NA	NA	NA
6	Aquatic	Vertebrate Animal	Yellow Perch	*Perca flavescens*	Unknown	NA	NA	NA	NA	NA
7	Terrestrial	Vascular Plant	Louisiana Broomrape	*Aphyllon ludovicianum*	Red	NA	NA	NA	NA	NA
8	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1
9	Terrestrial	Vascular Plant	Wild Licorice	*Glycyrrhiza lepidota*	Blue	NA	NA	NA	NA	NA
10	Terrestrial	Vertebrate Animal	Lewis's Woodpecker	*Melanerpes lewis*	Blue	Threatened	10-Apr	Threatened	12-Jul	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Whatshan Lake

Table A20. Species at Risk Occurrences for Whatshan Lake.

Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Whiteswan Lake

Table A21. Species at Risk Occurrences for Whiteswan Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
2	Terrestrial	Vascular Plant	Whitebark Pine	*Pinus albicaulis*	Blue	Endangered	10-Apr	Endangered	12-Jul	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Whitetail Lake

Table A22. Species at Risk Occurrences for Whitetail Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
2	Terrestrial	Vascular Plant	Whitebark Pine	*Pinus albicaulis*	Blue	Endangered	10-Apr	Endangered	12-Jul	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.

Windemere Lake

Table A23. Species at Risk Occurrences for Windermere Lake.

	Group	Species Group	Common Name	Scientific Name	BC Listing	COSEWIC Status	COSEWIC Date (y-m)	SARA Status	SARA Listing Date (y-m)	SARA Schedule
1	Aquatic	Vascular Plant	Stiff-Leaved Pondweed	*Potamogeton strictifolius*	Blue	NA	NA	NA	NA	NA
2	Aquatic	Vertebrate Animal	Bull Trout	*Salvelinus confluentus*	Blue	Special Concern	12-Nov	NA	NA	NA
3	Aquatic	Vertebrate Animal	Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Blue	Special Concern	16-Nov	Special Concern	07-Dec	1
4	Aquatic	Vertebrate Animal	White Sturgeon	*Acipenser transmontanus*	No Status	Endangered / Threatened	12-Nov	Endangered	NA	1
5	Aquatic	Vertebrate Animal	Brook Trout	*Salvelinus fontinalis*	Exotic	NA	NA	NA	NA	NA
6	Aquatic	Vertebrate Animal	Largemouth Bass	*Micropterus salmoides*	Exotic	NA	NA	NA	NA	NA
7	Aquatic	Vertebrate Animal	Pumpkinseed	*Lepomis gibbosus*	Exotic	NA	NA	NA	NA	NA
8	Terrestrial	Vertebrate Animal	American Badger	*Taxidea taxus*	Red	Endangered	12-Nov	Endangered	18-Jun	1
9	Terrestrial	Ecological Community	Alkali Saltgrass - Foxtail Barley	*Distichlis spicata - Hordeum jubatum*	Blue	NA	NA	NA	NA	NA
10	Terrestrial	Vascular Plant	Saltwater Cress	*Eutrema salsugineum*	Blue	NA	NA	NA	NA	NA
11	Terrestrial	Vertebrate Animal	Lewis's Woodpecker	*Melanerpes lewis*	Blue	Threatened	10-Apr	Threatened	12-Jul	1

Source: Data obtained via the Conservation Data Center's online iMap platform (CDC 2021). Data summaries completed as per Section 5.4.4.