



## Species and Ecosystems at Risk in the Resort Municipality of Whistler 2022 Update

**Prepared for:**  
Resort Municipality of Whistler

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## Notes about this report

The data and conclusions presented here are the culmination of almost 20 years of work with the Whistler Biodiversity Project (WBP) which has now inventoried over 4,900 species in the Resort Municipality of Whistler (RMOW). The assessment and inclusion of species at risk are based on data compiled by the WBP, data from the BC Conservation Data Centre (CDC), other online and printed sources, and the experts mentioned below and referenced in the report. I chose to be as definitive as possible about the likelihood and, perhaps as importantly, non-likelihood of species at risk in the RMOW. This intention means that some species labelled, for example, “Likely” may never be found in the RMOW and some labelled “Unlikely” may eventually be found.

The uncertainty surrounding the distribution of species, whether at risk or not, is always an interesting challenge for biologists whose goal is a complete, accurate list for a given area. Best results require properly-qualified surveyors who conduct surveys for the species groups of interest at appropriate times and with appropriate protocols. The specialists I’ve been lucky to work with are delighted to prove a list inaccurate by finding new species or correcting past data. This and previous updates are therefore living documents that will continue to evolve as new information emerges about species and ecosystems in the RMOW.

## Acknowledgements

When I started the Whistler Biodiversity Project in late 2004, a comprehensive list as presented here was one of my major goals. These results would not have been possible without the contributions of the many scientists and volunteers listed in Appendix D who performed targeted surveys for the Whistler Biodiversity Project and/or contributed to Whistler BioBlitz and Fungus Among Us. All three of those efforts would not have been possible without support from the Whistler Naturalists, Community Foundation of Whistler (CFOW), Resort Municipality of Whistler (RMOW), Association of Whistler-Area Residents for the Environment (AWARE), Whistler Blackcomb EFund, and others.

I would especially like to thank the following scientists for improving the accuracy of the original 2016 report and updates since: Curtis Björk (lichens and vascular plants); Trevor Goward and Daryl Thompson (lichens); Steve Joya and Olivia Lee (mosses and liverworts); Adolf Ceska and Andy MacKinnon (vascular plants); Karen Needham, Chris Ratzlaff, Scott Gilmore, Sean McCann, Tyler Kelly, and Claudia and Darren Copley (insects); Robb Bennett (spiders); Scott Gilmore (beetles); Libby and Rick Avis (moths), Crispin Guppy, Mike Toochin, and Derrick Marven (butterflies); Denis Knopp and Mike Toochin (dragonflies); Robert Forsyth (snails and slugs); Christopher Stinson and Steve Rochetta (mammals); Eric Crowe and Veronica Woodruff (fish); Karl Ricker, Heather Baines, and George Clulow (birds); Elke Wind (amphibians); Leslie Anthony (reptiles); Andy MacKinnon, Paul Kroeger, Kem Luther, and many others (fungi), Jared Hobbs and Pamela Zevit (legal implementation), and Andy MacKinnon, Bob Green, and Will MacKenzie (ecosystems at risk).

BioBlitz and Fungus Among Us would not have been possible without my co-organizer Kristina Swerhun. I also appreciate all the work done for these events by Julie Burrows, Melanie Tardif, Sabrina Hinitz, Shawn Mason, and many other volunteers from the Whistler Naturalists. Tina Symko and Heather Beresford (RMOW) were instrumental in ensuring this information was originally published in 2016. Carol Coffey (CFOW) helped in many ways to support the Whistler Biodiversity Project from its early days. I’d also like to acknowledge the vast efforts of Brian and Rose Klinkenberg whose EFlora and EFauna websites are incredible resources for identification and information about species in BC. Bob Green and Pamela Zevit provided helpful comments to improve the original report that I have followed since. This update also benefitted from review by Tina Symko and Kristina Swerhun.

## Cover Photos

Hoary Bat (top left) is one of two bats that reassessed since 2020 that are now listed as at-risk (photo courtesy of Jared Hobbs). The CDC first assessed and ranked macrofungi in 2021. Agarikon (top right) is one of 70 macrofungi listed as at-risk that are documented or likely in Whistler. Killdeer (bottom right) is one of three bird species that occur in Whistler that were upranked in 2022 to at-risk status. Blue Dasher (bottom left) is a dragonfly first documented in Whistler by Mike and Sharon Toochin at the 2021 Whistler BioBlitz (Wikimedia Commons photo).

## Suggested Citation

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## Executive Summary

This report presents the fifth update of the Resort Municipality of Whistler's (RMOW) list of species and ecosystems at risk first published in 2016. It combines and updates local data collated by the Whistler Biodiversity Project (most importantly, contributions from the Whistler Naturalists' BioBlitz and Fungus Among Us events), the knowledge of many experts, RMOW records, and museum and government data.

Before these reports, the BC Conservation Data Centre (CDC) was the primary and sometimes sole source for information about local species at risk in the Whistler area. In spite of the important work the CDC does, it is still not possible to access a full and accurate list of species at risk that do or could occur in the RMOW from the CDC. The CDC has limited resources for species surveys throughout BC and limited resources to assess and enter existing information. As a result, online searches at the CDC website yield many false positives (species which are unlikely or impossible in the RMOW) and, more importantly, many false negatives (the omission of species which are in Whistler or could occur here).

The intent of this updated report is to provide the best available information about species and ecosystems at risk within the RMOW. It is meant to be the authoritative reference for conservation planning within the RMOW and provide more accurate information than the CDC currently can about which species are known to occur, or could occur, in the RMOW. Conservation planners, environmental consultants, and others concerned with species at risk in the RMOW should therefore consider this list a necessary adjunct to, if not replacement for, CDC searches.

This report includes the following updates since the last update in 2020:

- Updated species rankings and taxonomy by the BC Conservation Data Centre (CDC), including species that have been downranked, upranked, and delisted.
- The addition of species groups assessed for the first time. For example, the CDC first assessed macrofungi in 2021 which resulted in the addition of 70 fungal species at risk to Whistler lists.
- Updated species rankings under Federal Species At Risk (SARA) legislation.
- The addition of a new dragonfly (Blue Dasher), first documented at the 2021 Whistler BioBlitz.
- Reassessment of all species included in the 2020 report based on new records.

The 299 species at risk included for consideration in this report are almost twice the 159 species included in the 2020 report. That increase is mainly due to: (a) the first assessment by the CDC of at-risk macrofungi; and (b) an expanded assessment of species returned by CDC online searches. This report is therefore the most comprehensive assessment yet of species at risk already documented in the RMOW, those that could occur in the RMOW, and those that almost certainly do not or could not occur within the RMOW (in spite of CDC search results to the contrary).

The total number of species at risk by RMOW status as of December 31, 2022 is as follows (2020 totals in parentheses):

- 122 (49) Resident;
- 10 (11) Seasonal;
- 21 (15) Likely;
- 24 (24) Possible;
- 6 (6) Data Deficient;
- 2 (2) Extirpated;
- 21 (18) Accidental;
- 85 (31) Unlikely to Not Possible species (all from CDC searches); and
- 8 (3) Downranked and Delisted.

Most (20 of 23) of the low-elevation forested ecosystems that occur in the RMOW are at-risk, including 9 of 11 in the CWHms1, and 10 of 11 in the CWHds1. Almost all of these ecosystems occur in old forests at lower elevations in Whistler Valley, areas with the highest risk of development and/or logging. A further four wetland ecosystems at risk are tentatively included in this report, of which two are additions since 2020. Field work outside the scope of this report would be necessary to confirm their occurrence.

The following tables list species at risk that are Resident, Seasonal, or Likely, and should therefore be the highest priorities for conservation planning. These and all other groups are listed in full in Section 3.

**Species at risk Resident in the RMOW (Conservation Priority #1).** COSEWIC/SARA key: E (Endangered), T (Threatened), SC (Special Concern). Species group abbreviations: F (Fungus); I (Invertebrate), M (Mollusc), P (Plant), V (Vertebrate).

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
F-Lichen	<i>Alectoria imshaugii</i>	spiny witch's hair	Blue			
F-Lichen	<i>Nodobryoria subdivergens</i>	alpine redhead	Blue			
F-Lichen	<i>Umbilicaria decussata</i>	electric rocktripe	Blue			
F-Macrofungus	<i>Amanita augusta</i>	western yellow-veil amanita	Blue			New to CDC Rankings
F-Macrofungus	<i>Amanita smithiana</i>	Smith's amanita	Blue			New to CDC Rankings
F-Macrofungus	<i>Arrhenia acerosa</i>	moss oysterling	Blue			New to CDC Rankings
F-Macrofungus	<i>Arrhenia obscurata</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Atheniella flavoalba</i>	ivory bonnet	Blue			New to CDC Rankings
F-Macrofungus	<i>Baeospora myriadophylla</i>	lavender baeospora	Blue			New to CDC Rankings
F-Macrofungus	<i>Bjerkandera adusta</i>	smoky polypore	Blue			New to CDC Rankings
F-Macrofungus	<i>Boletopsis grisea</i>	grey false bolete	Blue			New to CDC Rankings
F-Macrofungus	<i>Boletopsis leucomelaena</i>	black false bolete	Blue			New to CDC Rankings
F-Macrofungus	<i>Boletus barrowsii</i>	white king bolete	Red			New to CDC Rankings
F-Macrofungus	<i>Boletus coniferarum</i>	bitter bolete	Blue			New to CDC Rankings
F-Macrofungus	<i>Bonomyces sinopicus</i>	brick-red clitocybe	Blue			New to CDC Rankings
F-Macrofungus	<i>Cantharellus roseocanus</i>	rainbow chanterelle	Blue			New to CDC Rankings
F-Macrofungus	<i>Cantharellus subalbidus</i>	white chanterelle	Blue			New to CDC Rankings
F-Macrofungus	<i>Cerioporus varius</i>	lead-coloured puffball	Blue			New to CDC Rankings
F-Macrofungus	<i>Chamonixia caespitosa</i>	false truffle	Blue			New to CDC Rankings
F-Macrofungus	<i>Cheilymenia fimicola</i>	orange cup fungus	Blue			New to CDC Rankings
F-Macrofungus	<i>Chlorociboria aeruginosa</i>	blue stain fungus	Blue			New to CDC Rankings
F-Macrofungus	<i>Chroogomphus ochraceus</i>	ochre pine spike	Blue			New to CDC Rankings
F-Macrofungus	<i>Chroogomphus vinicolor</i>	wine-coloured pine spike	Blue			New to CDC Rankings
F-Macrofungus	<i>Chrysomphalina chrysophylla</i>	goldgill navelcap	Blue			New to CDC Rankings
F-Macrofungus	<i>Clitocybe albirhiza</i>	snowmelt Clitocybe	Blue			New to CDC Rankings
F-Macrofungus	<i>Clitocybe dealbata</i>	sweat-producing clitocybe	Blue			New to CDC Rankings
F-Macrofungus	<i>Clitocybe odora</i>	blue-green anise mushroom	Blue			New to CDC Rankings
F-Macrofungus	<i>Collybia cookei</i>	splitpea shanklet	Blue			New to CDC Rankings
F-Macrofungus	<i>Cortinarius boulderensis</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Cortinarius evernii</i>	silky webcap	Blue			New to CDC Rankings
F-Macrofungus	<i>Cortinarius malicorius</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Cortinarius olympianus</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Cortinarius renidens</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Cuphophyllus virgineus</i>	snowy waxcap	Blue			New to CDC Rankings
F-Macrofungus	<i>Dacryonaema rufum</i>	coral fungus	Blue			New to CDC Rankings
F-Macrofungus	<i>Deconica horizontalis</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Deconica inquilina</i>	grass rotting psilocybe	Blue			New to CDC Rankings
F-Macrofungus	<i>Elaphomyces muricatus</i>	common deer truffle	Blue			New to CDC Rankings
F-Macrofungus	<i>Fomitopsis officinalis</i>	agarikon	Blue			New to CDC Rankings
F-Macrofungus	<i>Galerina stylifera</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Gastrum saccatum</i>	bowl earthstar	Blue			New to CDC Rankings
F-Macrofungus	<i>Gomphidius smithii</i>	Smith's gomphidius	Blue			New to CDC Rankings
F-Macrofungus	<i>Gomphus clavatus</i>	pig's ears	Blue			New to CDC Rankings
F-Macrofungus	<i>Hydropus marginellus</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Hygrophorus pustulatus</i>	waxy cap	Blue			New to CDC Rankings
F-Macrofungus	<i>Lactarius camphoratus</i>	candy cap	Red			New to CDC Rankings
F-Macrofungus	<i>Mycena algeriensis</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Mycena cinerella</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Phaeotremella foliacea</i>	brown witch's butter	Blue			New to CDC Rankings
F-Macrofungus	<i>Phellodon atratus</i>	black tooth	Blue			New to CDC Rankings
F-Macrofungus	<i>Phellodon melaleucus</i>	grey tooth	Blue			New to CDC Rankings



**Species at risk Resident in the RMOW (cont.).** COSEWIC/SARA key: E (Endangered), T (Threatened), SC (Special Concern).  
Species group abbreviations: F (Fungus); I (Invertebrate), M (Mollusc), P (Plant), V (Vertebrate).

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
F-Macrofungus	<i>Phellodon tomentosus</i>	owl eyes; zoned phellodon	Blue			New to CDC Rankings
F-Macrofungus	<i>Ramaria cyaneigranosa</i>	coral mushroom	Blue			New to CDC Rankings
F-Macrofungus	<i>Ramaria rubrievanescens</i>	fading pink coral	Red			New to CDC Rankings
F-Macrofungus	<i>Ramaria stuntzii</i>	orange-red coral	Blue			New to CDC Rankings
F-Macrofungus	<i>Rhizopogon alexsmithii</i>	false truffle	Red			New to CDC Rankings
F-Macrofungus	<i>Tapinella panuoides</i>	fan pax	Blue			New to CDC Rankings
F-Macrofungus	<i>Thelephora palmata</i>	fetid false coral	Blue			New to CDC Rankings
F-Macrofungus	<i>Tolypocladium capitatum</i>	truffle eater	Blue			New to CDC Rankings
F-Macrofungus	<i>Trametes hirsuta</i>	turkey-tail	Blue			New to CDC Rankings
F-Macrofungus	<i>Tremella aurantia</i>	jelly fungus	Blue			New to CDC Rankings
F-Macrofungus	<i>Tricholoma apium</i>	celery-scented trich	Blue			New to CDC Rankings
F-Macrofungus	<i>Tricholoma caligatum</i>	cinnamon pine	Blue			New to CDC Rankings
F-Macrofungus	<i>Tricholomopsis decora</i>	prunes and custard	Blue			New to CDC Rankings
F-Macrofungus	<i>Turbinellus floccosus</i>	scaly vase chanterelle	Blue			New to CDC Rankings
F-Macrofungus	<i>Turbinellus kauffmanii</i>	Kauffman's gomphus	Blue			New to CDC Rankings
I-Bee	<i>Bombus flavidus</i>	Fernald's Cuckoo Bumblebee	Blue			
I-Butterfly	<i>Callophrys eryphon sheldonensis</i>	Western Pine Elfin, <i>sheldonensis</i> ssp.	Blue			
I-Butterfly	<i>Euphyes vestris</i>	Dun Skipper	Blue	T/T		
I-Butterfly	<i>Icaricia icarioides montis</i> *	Boisduval's Blue	Blue			CDC Uprank: Yellow to Blue; Name (from <i>Plebejus</i> )
I-Butterfly	<i>Parnassius clodius pseudogallatinus</i>	Clodius Parnassian, <i>pseudogallatinus</i> ssp.	Blue			
I-Butterfly	<i>Parnassius smintheus olympianus</i>	Rocky Mountain Parnassian, <i>olympianus</i> ssp.	Blue			CDC Uprank: Yellow to Blue
I-Dragonfly	<i>Pachydiplax longipennis</i>	Blue Dasher	Blue			First record (2021)
P-Liverwort	<i>Diplophyllum obtusifolium</i>	liverwort	Blue			CDC Uprank: Yellow to Blue
P-Liverwort	<i>Haplomitrium hookeri</i>	liverwort	Blue			
P-Liverwort	<i>Jungermannia atrovirens</i>	liverwort	Blue			
P-Liverwort	<i>Nardia breidlerii</i>	liverwort	Red			CDC Uprank: Blue to Red
P-Liverwort	<i>Nardia compressa</i>	liverwort	Blue			
P-Liverwort	<i>Nardia geoscyphus</i>	liverwort	Blue			Record from 2002 first entered in 2022
P-Liverwort	<i>Scapania mucronata</i>	liverwort	Blue			CDC Uprank: Yellow to Blue
P-Liverwort	<i>Scapania obscura</i>	liverwort	Blue			
P-Liverwort	<i>Scapania scandica</i> var. <i>scandica</i>	liverwort	Blue			
P-Liverwort	<i>Solenostoma confertissimum</i>	liverwort	Blue			CDC Downrank: Red to Blue
P-Liverwort	<i>Tritomaria scitula</i>	liverwort	Blue			CDC Uprank: Yellow to Blue
P-Moss	<i>Brachydontium olympicum</i>	Olympic brachydontium moss	Red			
P-Moss	<i>Grimmia caespiticia</i>	grimmia moss	Blue			
P-Moss	<i>Grimmia donniana</i>	Donn's grimmia	Blue			
P-Moss	<i>Grimmia incurva</i>	black grimmia	Red			
P-Moss	<i>Homalothecium nevadense</i>	Nevada homalothecium moss	Blue			
P-Moss	<i>Lewinskya pylaisii</i> *	Pylais' orthotrichum moss	Blue			Name (from <i>Orthotrichum</i> )
P-Moss	<i>Niphotrichum pygmaeum</i> *	pygmy racomitrium moss	Blue			Name (from <i>Racomitrium</i> )
P-Moss	<i>Platyhypnum alpinum</i> *	alpine hygrohypnum moss	Blue			Name (from <i>Hygrohypnum</i> )
P-Moss	<i>Pohlia cardotii</i>	Cardot's pohlia moss	Blue			
P-Moss	<i>Polytrichum sphaerothercium</i> *	haircap moss	Red			Name (from <i>Polytrichastrum sexangulare</i> )
P-Moss	<i>Ptychostomum pallescens</i> *	tall-clustered thread-moss	Blue			Name (from <i>Bryum</i> )
P-Moss	<i>Ptychostomum schleicheri</i> *	Schleicher's thread-moss	Blue			Name (from <i>Bryum</i> )

**Species at risk Resident in the RMOW (cont.).** COSEWIC/SARA key: E (Endangered), T (Threatened), SC (Special Concern).

Species group abbreviations: F (Fungus); I (Invertebrate), M (Mollusc), P (Plant), V (Vertebrate).

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
P-Moss	<i>Schistidium crassipilum</i>	thickpoint grimmia	Blue			
P-Moss	<i>Tripterocladium leucocladulum</i>	tripterocladium moss	Blue			
P-Vascular	<i>Pinus albicaulis</i>	whitebark pine	Blue	E/E		
P-Vascular	<i>Utricularia ochroleuca</i>	ochroleucous bladderwort	Blue			
V-Amphibian	<i>Anaxyrus boreas</i>	Western Toad	Yellow	SC/SC		
V-Amphibian	<i>Ascaphus truei</i>	Coastal Tailed Frog	Yellow	SC/SC	Yes	
V-Amphibian	<i>Rana aurora</i>	Northern Red-Legged Frog	Blue	SC/SC	Yes	
V-Bird	<i>Accipiter gentilis laingi</i>	Northern Goshawk, <i>laingi</i> ssp.	Red	T/T	Yes	
V-Bird	<i>Ardea herodias fannini</i>	Great Blue Heron, <i>fannini</i> ssp.	Blue	SC/SC	Yes	
V-Bird	<i>Butorides virescens</i>	Green Heron	Blue			
V-Bird	<i>Charadrius vociferus</i>	Killdeer	Blue			CDC Uprank: Yellow to Blue
V-Bird	<i>Chordeiles minor</i>	Common Nighthawk	Blue	SC/T		CDC Uprank: Yellow to Blue
V-Bird	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Yellow	SC/SC		
V-Bird	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Yellow	SC/T		CDC Downrank: Blue to Yellow
V-Bird	<i>Cypseloides niger</i>	Black Swift	Blue	E/E		
V-Bird	<i>Eremophila alpestris</i>	Horned Lark	Blue			CDC Uprank: Yellow to Blue
V-Bird	<i>Hirundo rustica</i>	Barn Swallow	Yellow	SC/T		CDC Downrank: Blue to Yellow; COSEWIC T to SC
V-Bird	<i>Megascops kennicottii kennicottii</i>	Western Screech-Owl, <i>kennicottii</i> ssp.	Blue	T/T		
V-Bird	<i>Patagioenas fasciata</i>	Band-tailed Pigeon	Blue	SC/SC		
V-Fish	<i>Salvelinus confluentus</i> pop. 28	Bull Trout - South Coast Pop.	Blue	SC/SC	Yes	
V-Mammal	<i>Gulo gulo luscus</i>	Wolverine, <i>luscus</i> ssp.	Blue	SC/SC	Yes	
V-Mammal	<i>Lasiurus cinereus</i>	Hoary Bat	Blue			CDC Uprank: Yellow to Blue
V-Mammal	<i>Myotis lucifugus</i>	Little Brown Myotis	Blue	E/E		CDC Uprank: Yellow to Blue
V-Mammal	<i>Myotis yumanensis</i>	Yuma Myotis	Blue			CDC Uprank: Yellow to Blue
V-Mammal	<i>Oreamnos americanus</i>	Mountain Goat	Blue			
V-Mammal	<i>Ursus arctos</i>	Grizzly Bear	Blue	SC/SC	Yes	

**Species at risk at-risk Seasonal in the RMOW (Conservation Priority #2).** This list includes migratory birds with consistent, seasonal use of habitat in Whistler. COSEWIC/SARA key: E (Endangered), T (Threatened), SC (Special Concern). Species group abbreviations: F (Fungus); I (Invertebrate), M (Mollusc), P (Plant), V (Vertebrate).

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
V-Bird	<i>Aechmophorus occidentalis</i>	Western Grebe	Red	SC/SC		
V-Bird	<i>Clangula hyemalis</i>	Long-tailed Duck	Blue			
V-Bird	<i>Cygnus columbianus</i>	Tundra Swan	Blue			
V-Bird	<i>Gavia adamsii</i>	Yellow-billed Loon	Blue	NAR		
V-Bird	<i>Hydroprogne caspia</i>	Caspian Tern	Blue	NAR/		
V-Bird	<i>Larus californicus</i>	California Gull	Red			CDC Uprank: Blue to Red
V-Bird	<i>Melanitta perspicillata</i>	Surf Scoter	Blue			
V-Bird	<i>Numenius americanus</i>	Long-billed Curlew	Yellow	SC/SC	Yes	CDC Downrank: Blue to Yellow
V-Bird	<i>Podiceps auritus</i>	Horned Grebe	Yellow	SC/SC		
V-Bird	<i>Podiceps nigricollis</i>	Eared Grebe	Blue			

**Species at risk Likely to be in the RMOW but not yet documented (Conservation Priority #3).** COSEWIC/SARA key: E (Endangered), T (Threatened), SC (Special Concern). Species group abbreviations: F (Fungus); I (Invertebrate), M (Mollusc), P (Plant), V (Vertebrate).

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
F-Lichen	<i>Nephroma isidiosum</i>	pebbled paw	Blue			
F-Lichen	<i>Peltigera gowardii</i>	northwest waterfan	Red	SC/SC		
F-Lichen	<i>Scytinium californicum</i> *	midlife vinyl	Blue			Name (from Leptogium)
F-Macrofungus	<i>Boletus rex-veris</i>	king bolete	Red			New to CDC Rankings; Tent. ID (2013)
F-Macrofungus	<i>Chloroscypha flavida</i>	n/a	Red			New to CDC Rankings
F-Macrofungus	<i>Ciboria rufofusca</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Entoloma sinuatum</i>	lead poisoner	Blue			New to CDC Rankings; Tent. ID (2007, 2009)
F-Macrofungus	<i>Polyporoletus sylvestris</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Ramaria aurantiiscescens</i>	coral mushroom	Red			New to CDC Rankings; Tent. ID (2010)
F-Macrofungus	<i>Syzygospora mycetophila</i>	n/a	Blue			New to CDC Rankings; Tent. ID (2007, 2013)
I-Dragonfly	<i>Tanypteryx hageni</i>	Black Petaltail	Blue			
I-Moth	<i>Dysstroma suspectata</i>	geometer moth	Blue			CDC Uprank: Yellow to Blue
M-Snail (FW)	<i>Pristiloma arcticum</i>	Northern Tightcoil	Blue			Tent. ID (2013)
P-Liverwort	<i>Marchantia polymorpha</i> ssp. <i>montivagans</i>	liverwort	Blue			
P-Liverwort	<i>Tritomaria exsectiformis</i> ssp. <i>exsectiformis</i>	liverwort	Blue			Tent. ID (2021)
P-Moss	<i>Bucklandiella affinis</i> *	lesser fringe-moss	Blue			Tent. ID (2010); Name (from <i>Racomitrium affine</i> )
P-Moss	<i>Grimmia anomala</i>	grimmia dry rock moss	Blue			
P-Moss	<i>Lescurea saxicola</i>	lescuraea moss	Blue			Tent. ID (2021)
P-Moss	<i>Tortula leucostoma</i>	desmatodon moss	Blue			
P-Vascular	<i>Polystichum setigerum</i>	Alaska holly fern	Blue			
V-Mammal	<i>Cervus elaphus roosevelti</i>	Roosevelt Elk	Blue			

**Terrestrial Ecosystems at Risk in the RMOW (Confirmed)**

BGC Site Series	Scientific Name	English Name	BC List	BC FRPA
CWHds1/01	<i>Tsuga heterophylla</i> - <i>Pseudotsuga menziesii</i> / <i>Hylocomiadelphus triquetrus</i> Dry Submaritime 1	western hemlock - Douglas-fir / electrified cat's-tail moss Dry Submaritime 1	Blue	Yes
CWHms1/01	<i>Tsuga heterophylla</i> - <i>Abies amabilis</i> / <i>Hylocomium splendens</i>	western hemlock - amabilis fir / step moss	Blue	No
CWHds1/02	<i>Pseudotsuga menziesii</i> - <i>Pinus contorta</i> / <i>Arctostaphylos uva-ursi</i> Dry Submaritime	Douglas-fir - lodgepole pine / kinnikinnick Dry Submaritime	Red	No
CWHms1/02	<i>Pseudotsuga menziesii</i> - <i>Pinus contorta</i> / <i>Arctostaphylos uva-ursi</i> Moist Submaritime	Douglas-fir - lodgepole pine / kinnikinnick Moist Submaritime	Blue	No
CWHds1/03; CWHms1/03	<i>Pseudotsuga menziesii</i> - <i>Tsuga heterophylla</i> / <i>Paxistima myrsinites</i>	Douglas-fir - western hemlock / falsebox	Blue	No
CWHds1/04	<i>Pseudotsuga menziesii</i> / <i>Acer glabrum</i> / <i>Prosartes hookeri</i>	Douglas-fir / Douglas maple / Hooker's fairybells	Red	No
CWHms1/04	<i>Abies amabilis</i> - <i>Thuja plicata</i> / <i>Gymnocarpium dryopteris</i>	amabilis fir - western redcedar / oak fern	Blue	No
CWHds1/05	<i>Thuja plicata</i> - <i>Pseudotsuga menziesii</i> / <i>Acer circinatum</i>	western redcedar - Douglas-fir / vine maple	Blue	Yes
CWHds1/06	<i>Tsuga heterophylla</i> / <i>Clintonia uniflora</i>	western hemlock / queen's cup	Red	No
CWHms1/06	<i>Abies amabilis</i> - <i>Thuja plicata</i> / <i>Oplopanax horridus</i> Moist Submaritime	amabilis fir - western redcedar / devil's club Moist Submaritime	Blue	No
CWHds1/07	<i>Thuja plicata</i> / <i>Oplopanax horridus</i>	western redcedar / devil's club	Blue	Yes
CWHms1/07	<i>Picea sitchensis</i> / <i>Rubus spectabilis</i> Moist Submaritime	Sitka spruce / salmonberry Moist Submaritime	Red	No
CWHds1/08	<i>Picea sitchensis</i> / <i>Rubus spectabilis</i> Dry	Sitka spruce / salmonberry Dry	Red	No
CWHds1/09; CWHms1/08	<i>Populus trichocarpa</i> - <i>Alnus rubra</i> / <i>Rubus spectabilis</i>	black cottonwood - red alder / salmonberry	Blue	No
CWHms1/09	<i>Populus trichocarpa</i> / <i>Salix sitchensis</i> - <i>Rubus parviflorus</i>	black cottonwood / Sitka willow - thimbleberry	Red	No
CWHds1/10	<i>Populus trichocarpa</i> / <i>Salix</i> spp. Dry Submaritime	black cottonwood / willows Dry Submaritime	Blue	No
CWHds1/12; CWHds1/Ws54; CWHms1/11; CWHms1/Ws54	<i>Thuja plicata</i> - <i>Picea sitchensis</i> / <i>Lysichiton americanus</i>	western redcedar - Sitka spruce / skunk cabbage	Blue	No

**Wetland Ecosystems at Risk in the RMOW (Tentative)**

BGC Units	Scientific Name	English Name	BC List	BC FRPA
Wf13	<i>Eriophorum angustifolium</i> - <i>Carex limosa</i>	narrow-leaved cotton-grass - shore sedge	Blue	No
Wm02	<i>Equisetum fluviatile</i> - <i>Carex utriculata</i>	swamp horsetail - beaked sedge	Blue	No
Wm04	<i>Eleocharis palustris</i> Herbaceous Vegetation	common spike-rush Herbaceous Vegetation	Blue	No
Ws51	<i>Salix sitchensis</i> - <i>Salix lasiandra</i> var. <i>lasiandra</i> / <i>Lysichiton americanus</i>	Sitka willow - Pacific willow / skunk cabbage	Red	No



## Glossary of Terms

<b>Term</b>	<b>Definition</b>
<b>Accidental (Birds)</b>	"Only one on record for season noted" (Ricker et al. 2014). These species are generally far out of range and therefore not a conservation concern within the RMOW.
<b>CDC</b>	The BC Conservation Data Centre (CDC) is the Provincial authority to track and assess the conservation status of species and ecosystems.
<b>COSEWIC</b>	The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is the Federal counterpart of the BC CDC.
<b>Data Deficient (DD)</b>	There is not enough information about some species at risk to ascertain their current status within the RMOW. For example, the local status of Coastal Cutthroat Trout ( <i>Oncorhynchus clarkii</i> ssp. <i>clarkii</i> ) and Bank Swallow ( <i>Riparia riparia</i> ) is still uncertain. COSEWIC also lists some species as Data Deficient.
<b>Delisted</b>	When a species is removed from the BC list because: (a) past records within the Province are deemed to have been in error (misidentification); or (b) because of taxonomic changes. Only species delisted since the last update are included here.
<b>Downranking</b>	When a species is reassessed from a higher to lower threat ranking (e.g., BC Blue to Yellow list). Species can also be upranked.
<b>Extirpated</b>	A species that has been recorded within the RMOW in the past but which: (a) no longer occurs; and (b) is unlikely to re-establish in the future.
<b>Highly Unlikely</b>	Species at risk that have a very to extremely low probability of occurring in the RMOW. If species in this category are eventually found in the RMOW, it would represent a very large (and therefore improbable) range extension.
<b>Likely</b>	Species at risk not yet confirmed in the RMOW with a high likelihood they are present. Some of these have already been documented just outside RMOW boundaries in habitats that occur within the RMOW. The others are included because their habitat requirements and/or distributional range could include Whistler (based on consultation with specialists and/or published data).
<b>Not At Risk</b>	Species that are ranked by the CDC and/or COSEWIC as secure. For this report, this category refers only to species downranked since the 2020 report (i.e., that were previously species at risk).
<b>Not Possible</b>	Species that have no chance of occurring in the RMOW due to habitat types that are not in Whistler, for example, marine and estuarine species.
<b>Possible</b>	Species at risk not yet confirmed in the RMOW with a low probability of occurring in the RMOW. Although there is no particular reason they couldn't occur, there is also no data that strongly suggests they would. Only a small portion of the species in this category is likely to be documented in the RMOW regardless of search effort.
<b>Resident</b>	Species at risk confirmed within the RMOW. This classification is clear for non-moving species such as plants and fungi, but less clear for wide-ranging species such as birds and large mammals. Such mammals are therefore only included if they make significant use of Whistler habitat in most seasons. Migratory birds that nest in Whistler but spend non-nesting months elsewhere are also included.
<b>Seasonal</b>	Birds that use Whistler habitat during spring and/or fall migrations each year but which do not nest within the RMOW.
<b>Unlikely</b>	Species at risk that have a low probability of occurring in the RMOW. If species in this category are eventually found in the RMOW they would represent large range extensions (e.g., Pacific Water Shrew or Common Sharp-tailed Snake).
<b>Upranking</b>	When a species is reassessed from a lower to higher threat ranking (e.g., BC Yellow to BC Blue list). Species can also be downranked.

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# 1. Introduction

## 1.1 Background and Report Goals

Whistler's first comprehensive list of species and ecosystems at risk in the Resort Municipality of Whistler (RMOW) was published in 2016 (Brett 2016). It analyzed 178 species and grouped them into five classes based on their likelihood of being resident in the RMOW: Confirmed, Likely, Probable, Unlikely, and Not Possible. The intention of that classification was to improve species-level conservation efforts by targeting species most likely to be in Whistler (either already documented or with a high probability of occurring). The 2016 report was updated annually through 2020 (Brett 2017 to 2019, 2020b). This report documents changes since 2020.

The 2016 report first documented some of the challenges in determining which species at risk occur or are likely to occur in the Whistler area. In particular, it described strengths and weaknesses of records compiled by the BC Conservation Data Centre (CDC) and available through their Species and Ecosystems Explorer.<sup>1</sup> While an accurate account of species known to inhabit, or possible within, an area is essential to proper environmental planning, search results from the CDC are often inaccurate and/or misleading. As a result, CDC searches return false positives (the inclusion of species that are unlikely or not possible within the RMOW) and false negatives (the omission of species which actually do or could occur in the RMOW). While the most detailed discussion of these challenges is included in the 2016 report, all updates since have also reported similar problems.

The 2016 report the first compilation of information that included Whistler Biodiversity Project (WBP) data, and therefore was able to produce lists that were far more accurate and comprehensive than available online through the CDC. This local data was compiled from targetted surveys by the WBP, museum searches and extensive data from the Whistler Naturalists' BioBlitz and Fungus Among Us events (Sections 1.3 and 1.4). Data compiled from those two events has been the main source of updates for annual reports since.

This report updates species and ecosystems at risk in the RMOW to the end of 2022. Its goals are to:

1. Update threat rankings for species and ecosystems that occur or may occur in Whistler, as listed by the CDC and the Federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC).
2. Update any other changes by the CDC and/or COSEWIC to species and ecosystems, including upranking, downranking, additions, and deletions.
3. Add any species documented since the 2020 report.
4. Reassess the likelihood of occurrence of species not yet recorded in the RMOW.
5. Provide suggestions and content to provide better species at risk resources on the RMOW website.

The rest of Section 1 describes the legal framework for species at risk in BC, the terminology used, sources of data, and the Whistler Biodiversity Project. Methods are described in Section 2. Section 3 provides an updated list of 299 species assessed in this report and presented by RMOW Status Groups (e.g., Resident, Seasonal, Likely, Possible, etc.).<sup>2</sup> A discussion of changes since 2020 is presented in Section 4. Ecosystems at risk are discussed in Sections 5 and 6. Section 5 includes a discussion of search methods. Terrestrial ecosystems at risk, unchanged since 2020, are presented in Section 6.1. For the first time in these reports, a list of wetland ecosystems is presented and discussed separately (Section 6.2)

A Glossary is included before the Table of Contents, and the definitions it contains are key to understanding much of the results presented below. A summary of definitions for species and ecosystems at risk used in BC is included as Appendix A. A full list of species returned by the narrowest search of CDC data (Search 5) is included as Appendix B. A detailed description of rationales for assigning species to Status Groups is included as Appendix C. The many scientists and volunteers who have helped provide data to the Whistler Biodiversity Project are listed in Appendix D.

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<sup>1</sup> <https://a100.gov.bc.ca/pub/eswp/>.

<sup>2</sup> See the introduction in Section 3 for an explanation of the change in terminology used in past reports (Confirmed and Migratory Birds) to their equivalents in this report (Resident and Seasonal, respectively).

## 1.2 Legislation and Terminology for Species at Risk

Municipalities have struggled with an increasing maze of legislation, strategies, plans, and guidelines introduced at Federal and Provincial levels, including the Species at Risk Act (SARA 2022), the Migratory Birds Convention Act (MBCA 2022), conservation threat assessments by the BC Conservation Data Centre (Red and Blue listings in particular; CDC 2022), the Identified Wildlife Management Strategy (BC MOE 2022), as well as species-specific Management Plans, Recovery Strategies, and Implementation Plans. These initiatives unfortunately provide municipalities in BC with very little clear guidance or tools to implement conservation goals (SAR LGWG 2011, 2012, 2013; Bedore 2014).

Leigh-Spencer (2004; Table 1.1) discussed a number of different ways a species can be determined to be “at risk.” At the Provincial level, risks to a species are identified three ways: (i) by Red and Blue lists; (ii) as Identified Wildlife under the Forest and Range Practices Act; and (iii) under the Provincial Wildlife Act. At the Federal level, species at risk are identified by: (i) the Committee on the Status of Endangered Wildlife in Canada (COSEWIC); (ii) the Species at Risk Act (SARA); and/or (iii) the Migratory Bird Conventions Act (MBCA).

**Table 1.1: Summary of Federal and Provincial species at risk jurisdictions, legislative frameworks, and means of protections (Leigh-Spencer 2004, p. 2 and Green et al. 2005, pp. 2-3, with minor updates to 2022).**

Jurisdiction	Responsible Agency	Legislative Framework	Form of Protection	Ranking System (risk of extinction)
Federal	COSEWIC (Committee on the Status of Endangered Wildlife in Canada; 2022)	Species at Risk Act (SARA 2022)	Recovery Strategies are required for extirpated, endangered and threatened species and Management Plans for species of concern. Protecting species from being killed and protecting “residences” is paramount.	<p><b>Endangered:</b> species facing imminent extirpation or extinction<sup>3</sup>;</p> <p><b>Threatened:</b> species likely to become endangered if nothing is done to reverse factors leading to its extirpation or extinction.</p> <p><b>Special Concern:</b> species that may become threatened or endangered because of a combination of biological characteristics and identified threats.</p>
British Columbia	NatureServe and CDC (Conservation Data Centre)		Provide an objective ranking system based on all sources of credible information regarding distribution, abundance, trends and threats.	S = Provincial; N = National; G = Global; X = Extirpated or extinct; H = Historical 1=critically imperiled; 2=imperiled; 3=vulnerable; 4=apparently secure; 5=secure; ?=unranked; U=unrankable
	Province of BC, Ministry of Water, Land and Air Protection	Wildlife Act; BC Species at Risk Strategy (Endangered Species and Ecosystems in BC)	Red- listed (sometimes Blue-listed) species require special management attention by protecting critical habitat in the form of special management guidelines.	<p><b>Red:</b> Any species or ecosystem that is at risk of being lost (Extirpated, Endangered or Threatened)</p> <p><b>Blue:</b> Any species or ecosystem that is of special concern (formerly Vulnerable).</p>
	Ministry of Water, Land and Air Protection	Forest and Range Practices Act  Identified Wildlife Management Strategy (IWMS)	Wildlife Habitat Areas (WHA), General Wildlife Measures (GWM), and Higher-Level Plans	<b>Yellow:</b> Any species or ecosystem that is secure. <sup>4</sup>  Schedule 1 species list (section 11 (1)) (May 6th, 2004): Red and Blue- listed species negatively affected by forest or range management on Crown Lands.

<sup>3</sup> Endangered and Threatened rankings are defined in:

[https://www.cosewic.ca/images/cosewic/pdf/Assessment\\_process\\_criteria\\_Nov\\_2021\\_en.pdf](https://www.cosewic.ca/images/cosewic/pdf/Assessment_process_criteria_Nov_2021_en.pdf).

<sup>4</sup> [https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre/explore-cdc-data/faq#red\\_blue\\_and\\_yellow](https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre/explore-cdc-data/faq#red_blue_and_yellow).



A similar summary was prepared by the South Coast Conservation Program (Bedore 2014; SCCP 2016). It adds helpful interpretations of the various processes, terms, and legislation that impact the management of species at risk in BC and is included with the kind permission of the SCCP<sup>5</sup> as an appendix to this report (Appendix 1).

### Terminology for Species at Risk

The number of terms used to describe species at risk can cause confusion, and that confusion is sometimes compounded when some of these terms have both legal and casual uses. Even the term “species at risk” may cause confusion to people who may be more familiar with the related terms “rare species” or “endangered species.”

For the purposes of this report, all species listed under any of BC or Canadian Government processes (Table 1.1; Appendix A) are considered species at risk. The situation for ecosystems at risk is much easier since it is simply a BC process that assesses them in a similar manner to the Red and Blue (or Yellow) listings for species.

“Wildlife” is another term that can cause confusion. In the past, the only species groups to be assessed and listed were animals (primarily game mammals and fish) so the legal and public uses of the term were the same. Now the application of that term has been stretched widely. In BC, for example, butterflies, plants, and even ecological communities (ecosystems) can be labelled “Identified Wildlife.” With the exception of that legally designated term, “wildlife” will not be used in this report.

To help reduce confusion, this report capitalizes terms when they refer to legal or other distinct categories, for example: Endangered, Threatened, Special Concern, Red-listed, and Blue-listed. It also extends that capitalization to the likelihood that a species is resident in the RMOW (as defined in the Glossary of Terms, p. ix), for example, Resident, Seasonal, Likely or Possible.

## **1.3 Sources of Species Data**

The process to rank species in BC and Canada includes a vast dataset and many experts. These efforts are published on BC’s very helpful Species and Ecosystem Explorer and on the Federal Species at Risk Public Registry.<sup>6</sup> These data are nonetheless incomplete due to the scale of effort needed to document species at risk, a fact which creates a challenge for municipalities when assessing conservation risks. The RMOW is fortunately ahead of many municipalities in Canada due to local sources of data including:

1. The Whistler Biodiversity Project (WBP) surveys and data collation since 2004 (Brett 2007, 2022).
2. Data generated by Fungus Among Us (since 2003) and Whistler BioBlitz (since 2007) which are collated by the WBP into its master list.
3. Greatly expanded access to data online, including museum collections such as UBC Beaty Museum databases (UBC Beaty 2022), citizen science and other initiatives such as EFauna and EFlora (Klinkenberg 2022a, b), EBird ([www.ebird.org](http://www.ebird.org)), iNaturalist ([www.inaturalist.org](http://www.inaturalist.org)), and the Flora of North America ([www.efloras.org](http://www.efloras.org)).<sup>7</sup>

Scientific knowledge of species diversity has expanded greatly since E.O. Wilson (1988) promulgated the prospect that there were probably five to as many as 30 million species on the planet. Since then, scientists have continued to expand what is known about the diversity of species in various habitats, including the RMOW. Combined with this increase in scientific knowledge has been an increase in the belief that all species and their habitats deserve to be protected from extirpation or extinction, especially by human causes. For these two reasons, the CDC continues to add species groups to its rankings as resources allow, including the important addition of macrofungi in 2021.

<sup>5</sup> Pamela Zevit, pers. comm.

<sup>6</sup> <http://a100.gov.bc.ca/pub/eswp/> (CDC 2020); [https://wildlife-species.canada.ca/species-risk-registry/sar/index/default\\_e.cfm](https://wildlife-species.canada.ca/species-risk-registry/sar/index/default_e.cfm) (COSEWIC 2020).

<sup>7</sup> Note that the WBP has continues to compile and edit data from these sources as they become available online.

## 1.4 The Whistler Biodiversity Project

When Green et al. (2005) compiled their list of confirmed and possible species at risk in the RMOW, the total number of species that were publicly documented in Whistler was approximately 335. The majority of those species were mammals, birds, and fish. As of 2005, the vast majority of species groups therefore remained mostly unknown, including such important groups as vascular plants, fungi, lichens, mosses and liverworts, amphibians, reptiles, butterflies and moths, dragonflies, snails and slugs, spiders, and other insects. Even when past surveys had targetted some of these groups, the results of those surveys were not compiled or easily accessible. Due to three main sources of new data (Section 1.3), Whistler has since then amassed access to more information about local species than almost any other community in BC or Canada.

Whistler's situation in 2005 was similar to that of many communities in BC. Most of the mammal and fish data was originally compiled by the BC Government, often with contributions from universities (especially UBC) and the Royal BC Museum. Whistler was nonetheless fortunate to have a wealth of vertebrate data starting in the 1920s from Ken Racey and, later, his son-in-law and namesake of the UBC Cowan Tetrapod Collection (UBC Beaty 2022), Ian McTaggart-Cowan (e.g., Racey and McTaggart-Cowan 1935). The Whistler Naturalists and its predecessors (before 1999) have continued to document important data for birds (e.g., Gotz et al. 1996, Ricker and Baines 2005; Ricker et al. 2009, 2014, 2022). The RMOW itself has also added to the amount known about species, especially in its partnerships with the Whistler Fish Stewardship Group and the BC Government.

The Whistler Biodiversity Project began in late 2004 and has been the primary source of new data since, both through surveys and data compilation (Brett 2007, 2022). One of its primary goals was to improve the inventory of species in Whistler and thereby aid conservation planning. It engaged specialists in many species groups to conduct the first targetted surveys in a number of species groups, especially between 2005 and 2011. It also conducted the first comprehensive data searches from museums and universities in BC and across Canada that have been ongoing since 2005.<sup>8</sup> These surveys and data searches helped establish for the first-time species lists in the species groups mentioned above.

Two additional sources of data are the source of approximately half of all WBP records: BioBlitz and Fungus Among Us. The annual Whistler BioBlitz began in 2007 and has established itself as an essential source of new knowledge about local species.<sup>9</sup> BioBlitz is organized by the Whistler Naturalists to increase public interest in biodiversity and also provide valuable data from all the volunteer scientists who participate. The data from BioBlitz, compiled by the Whistler Biodiversity Project, has added over 1,500 species to the total list in just 14 years. The Whistler event is Canada's longest-running BioBlitz and has helped spawn similar events across BC.

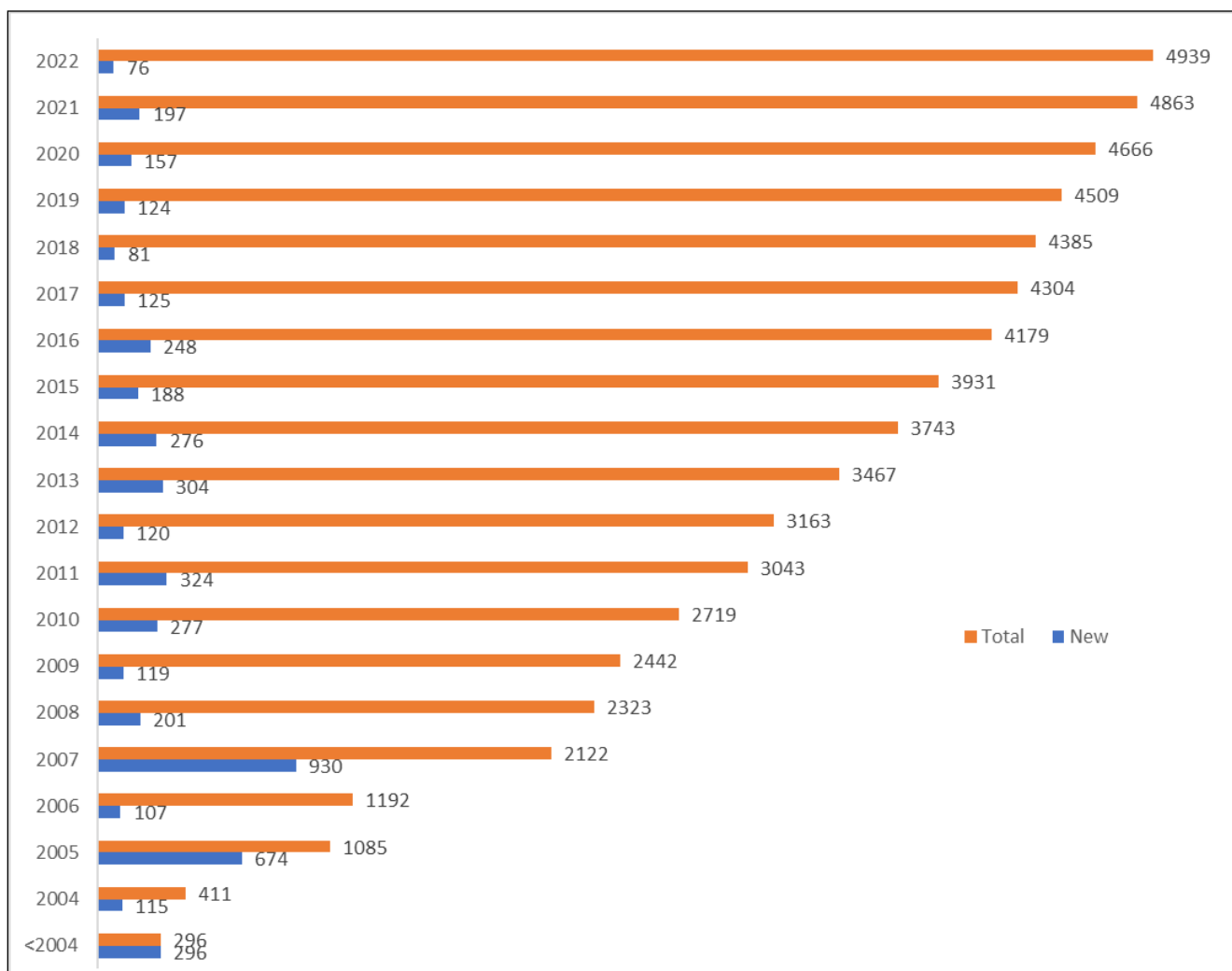
In 2021, the CDC added macrofungi (e.g., mushrooms and bracket fungi) to their species rankings for the first time. It is therefore fortunate that Whistler already had an excellent list of over 1,000 fungal species (Figure 1.2; Brett 2022). Most of this data was compiled from annual Fungus Among Us events run by the Whistler Naturalists event since 2003.<sup>10</sup> Additional records of fungi that only emerge in non-fall months were mainly added from Whistler BioBlitz events as well as incidental sightings during other WBP surveys.

As of December 31, 2022, the WBP has amassed a total of 30,800 records, most of which are from the Whistler area (records from the Sea to Sky Corridor and Pemberton Valley comprise the rest of the records; Brett 2022). The current total number of species now documented in the Whistler area is 4,939 (Figure 1.1).

<sup>8</sup> The most productive searches have been from UBC (the Beaty Museum and online predecessors; UBC Beaty 2022) and Royal BC Museum (RBCM 2022). Other museums across Canada have also been searched, including by Elke Wind (Brett 2007).

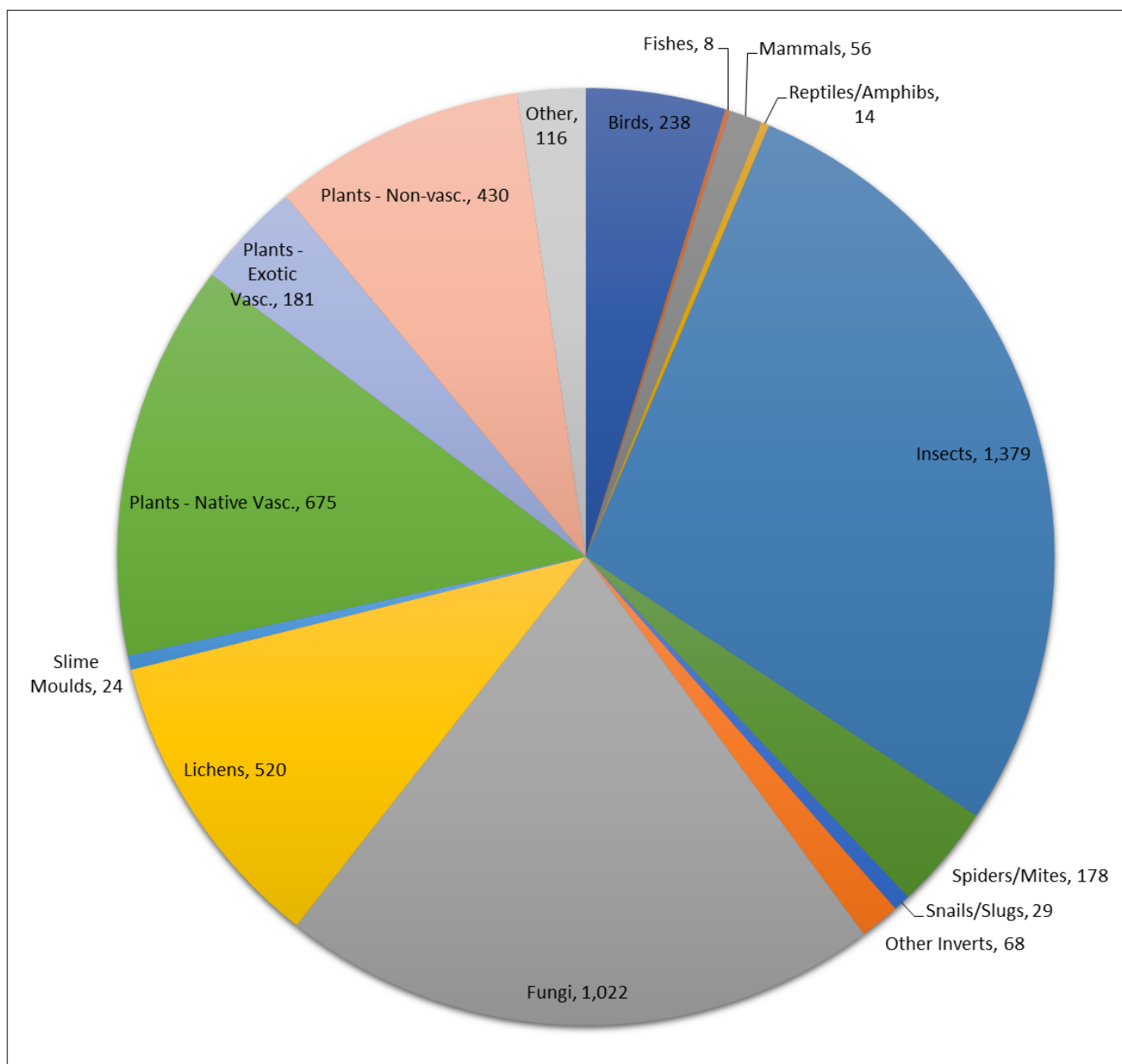
<sup>9</sup> [www.whistlerbioblitz.ca](http://www.whistlerbioblitz.ca).

<sup>10</sup> [www.whistlernaturalists.ca](http://www.whistlernaturalists.ca)



**Figure 1.1: Number of species documented in the RMOW by year to date. The WBP began in fall 2004; the majority of its targeted surveys and data collation began in 2005. Data from *Fungus Among Us* was first entered in 2004; data from Whistler BioBlitz starting with the first event in 2007.**

One key takeaway from the breakdown of the WBP by major species group (Figure 1.2) is that vertebrates are relatively uncommon and represent only 6% of the total. And while the vertebrate inventory has grown only slightly over the past 17 years (mainly due to WBP surveys for amphibians, reptile, and bats) it is unlikely to increase much more, if at all. In contrast, the number of species documented in other groups continues to grow (the most notable growth has been for fungi and, more recently, insects). Vertebrates are nonetheless important for conservation planning since protecting them often protects the habitats required by many other species groups (as keystone and/or umbrella species).



**Figure 1.2: Number of species in Figure 1.1 by group. Vertebrates represented virtually all documented species prior to the WBP but that proportion has continued to decrease.**

The RMOW is in an enviable position compared to many municipalities since it already knows a great deal about which species inhabit the area. As a result of new data since 2005, it can also determine with a high degree of certainty which other species are Likely and, often as importantly, which are Not Likely or Not Possible. The data presented here is more comprehensive and accurate than available through the BC Conservation Data Centre (CDC). That gap will lessen as WBP data is eventually added to CDC records. In the meantime, this report demonstrates the essential role that local-level surveys and data compilation can play.

## 2. Species at Risk – Search Methods and Terminology

### 2.1 Sources for Updated Lists

This report builds on previous versions that originated with the 178 species considered in the 2016 version (Brett 2016). Each year, that list has been revised based on:

1. Changes to threat rankings by the CDC and/or Canadian Government (that is, uprankings, downrankings, and delistings);
2. Any new species documented within or near the RMOW;
3. New information about species distribution and/or habitat requirements; and/or
4. Results from CDC searches for species at risk in the Whistler area.

#### CDC Changes:

Of these sources, changes in CDC ranking comprise the majority of changes since 2020 reflected in this report. Each year, the CDC reports all changes made to rankings and taxonomy (i.e., scientific and common names) for the species groups it tracks.<sup>11</sup> It also lists all new species groups that have been ranked for the first time, for example, the addition in 2021 of rankings for macrofungi. All CDC changes since 2022 are included in the updated lists in the next section.

#### New Species:

Any new species documented in the Whistler area is also included in lists updated for 2022; for example, a Blue-listed dragonfly, Blue Dasher, was recorded for the first time during the 2021 Whistler BioBlitz by Mike and Sharon Toochn. The source for the vast majority of such new records is Whistler BioBlitz and Fungus Among Us, but sometimes also museum records which have recently been published online (e.g., a 2002 record of a Blue-listed liverwort, *Nardia geoscyphus*, first found online and entered to the WBP database in 2022).

#### New Information:

Consultations with specialists (most past participants in BioBlitz and/or Fungus Among Us; Appendix D) provided updated information about the likelihood of species to occur in the Whistler area. These consultations are in addition to an assessment of information about species distribution and habitat requirements available through the CDC, online resources such as EFlora and EFauna, and various publications (Section 7).

#### CDC Searches:

The final source of changes to the species considered within this report is an online search of the CDC Species and Ecosystem Explorer, discussed in this section below.

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<sup>11</sup> <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre/explore-cdc-data/conservation-data-centre-updates>.



## 2.2 Terminology Used in Assessments and Conservation Priorities

Based on available information, all species were assigned to one of 12 Status Groups (Table 2.1; see full definitions in the Glossary of Terms, p. ix). For the first time, this report assigns a “Conservation Priority” to each of categories. Only species that are classified as Resident, Seasonal, Possible, Data Deficient, or Extirpated are included as conservation priorities. The highest priority is of course assigned to species that have been confirmed to use habitat in Whistler throughout at least most of year and/or breed within Whistler (Resident). The second highest priority are migratory birds that require habitat during spring and/or fall migrations each year (Seasonal). Likely species are assigned the third highest priority in recognition of the high probability they actually occur in Whistler even though they haven’t yet been documented.

**Table 2.1: Key to Status of Species At Risk in the RMOW by Status Code and Conservation Priority.**

Status Code	RMOW Status Group	Conservation Priority	Include in Conservation Planning?
1	Resident	1	Include
2	Seasonal	2	
3	Likely	3	
4	Possible	4	
5	Data Deficient	4	
6	Extirpated	4	
7	Accidental	n/a	Exclude
8	Unlikely	n/a	
9	Highly Unlikely	n/a	
10	Not Possible	n/a	
11	Delisted	n/a	
12	No Longer At Risk	n/a	

Species that are Possible, Data Deficient, and Extirpated merit some consideration in conservation planning, even though they are lower priorities than the first three groups. In particular, species in these groups that have very specific habitat needs and/or habitats that are rare should be included in conservation planning. For example, Marbled Murrelets (Possible) as well as Fishers and Spotted Owls (Extirpated) all require old-growth forest habitats. Even if there is a low to near-zero likelihood they will ever be documented in Whistler<sup>12</sup>, including them in conservation planning provides additional reasons to protect that kind of habitat for other species.

Scarce conservation resources should meanwhile not be directed to any species in the other six groups. In spite of CDC searches that may return lists of species included in those six groups, they should essentially be ignored unless their status changes. An example of what would be necessary for such a change would be if an Unlikely species were recorded in or near Whistler and therefore was changed to Resident or Likely, respectively. See Section 4.3 for further discussion of conservation priorities.

<sup>12</sup> Or, for Fishers and Spotted Owls, documented again since they were resident at least until they were last recorded in 1946 and 1956, respectively (Appendix C.6).

## 2.3 Problems with CDC Searches

The Conservation Data Centre (CDC) assists conservation efforts in British Columbia by assessing threats to species and ecosystems. As part of the NatureServe network, it also contributes to national and international conservation efforts. In spite of the wealth of information that the CDC provides, there are many problems using it as the sole source of information about species-level conservation priorities at the municipal level (e.g., the RMOW). An extended discussion of these problems is included in the original version of this report (Brett 2016), and these problems have not been addressed to date.

There are two main problems with any search via the CDC Species and Ecosystems Explorer:<sup>13</sup> (i) false positives and (ii) false negatives. In both cases, there is no combination of search terms I have found that prevents these online searches from returning very inaccurate lists of species. All searches inevitably include species that are Unlikely to Not Possible in the RMOW (false positives), and omit species that have already been, or likely will be, documented in the RMOW (false negatives). Although both errors can divert conservation efforts away from species and habitat types that actually need protection, the omission of species that occur in Whistler is by far the more serious error.

The 2016 report included a detailed description of the challenges in obtaining accurate and comprehensive results from online searches via the CDC. Although the majority of that discussion is still relevant, I performed a number of search combinations to determine if there have been any improvements since that time. In short, the answer is no. Regardless of search term combinations, there are even more errors and omissions than in 2016.

To test the current state of CDC online data for the Whistler area, I used five different combinations of search terms. All five filtered for: (a) all Provincial and Federal species at risk; plus, (b) all species listed under the BC Forest and Range Practices Act (FRPA, and formerly termed Identified Wildlife). Descriptions of the different terms used for the five searches are included below (Table 2.2).

**Table 2.2: Search terms used on the CDC Species and Ecosystems Explorer.**

Search	Description	No. of Species	Whistler	BGC Subzone	BGC Variant	CMAun, CWHun, MHun
Search 1	Whistler	203	Yes	No	No	No
Search 2	To Subzone, including undifferentiated CMA, CWH, MH	326	No	Yes	No	Yes
Search 3	To Subzone, excluding undifferentiated CMA, CWH, MH	326	No	Yes	No	No
Search 4	To Subzone and Variant, excluding undifferentiated CMA, CWH, MH	327	No	Yes	Yes	No
Search 5	Search 1 plus Search 5	151	Yes	Yes	Yes	No

Searches 1, 2, 3, and 4 (Table 2.2) all returned results that included many species that do not and/or could not occur in Whistler. Search 5 had the most narrowly-defined search terms that specified Whistler plus the lowest possible Biogeoclimatic (BGC) units, but still returned very inaccurate results (Appendix B). Search 5 results included only 26% of species that are conservation priorities in Whistler (Table 2.3). It was returned all the species ranked as Unlikely, Highly Unlikely, and Not Possible within this report (Tables 3.8, 3.9, and 3.10, respectively). In total, only 32% (49 of 151) of the species returned by Search 5 have been documented in Whistler (Resident or Seasonal) or are Likely or Possible. Even more troublesome is that only 20% (25 of 122) of the species already documented in Whistler were correctly returned by this CDC search. The addition of macrofungi in 2021 amplified a pre-existing problem since there is virtually no geographic information for them included in the Species and Ecosystems Explorer. Even without macrofungi, the Search 5 results still demonstrate severe problems with CDC searches.

<sup>13</sup> <https://a100.gov.bc.ca/pub/eswp/>.

**Table 2.3: Results of species at risk returned by Search 5 (Table 2.1; Appendix B) by RMOW Status and compared to actual totals presented in Section 3 of this report.**

	Status Code	RMOW Status	From Search 5	Actual	Actual to Search 5
Priority Species	1	Resident	25	122	20%
	3	Seasonal	6	10	60%
	2	Likely	4	21	19%
	4	Possible	12	24	50%
	5	Data Deficient	1	6	17%
	6	Extirpated	1	2	50%
			49	185	26%
Non- Priority Species	7	Accidental	17	21	81%
	8	Unlikely	30	30	100%
	9	Highly Unlikely	46	46	100%
	10	Not Possible	9	9	100%
			102	106	96%

The main conclusions from these search results are that:

1. While the CDC's extensive data provides a starting point for assessing which species occur at the local level, online searches are nonetheless remarkably inaccurate.
2. Local data available in Whistler, and the basis of this report, is far more accurate and complete. This report and future updates should therefore be given priority in all conservation planning, at least until CDC data becomes more accurate and search options are improved.

### 3. Species at Risk - 2022 Updated Lists

#### Guide to 2022 Updated Lists

The following tables represent the status of species at risk<sup>14</sup> in the RMOW as of December 31, 2022:

- 3.1: Resident species at risk.
- 3.2: Seasonal species at risk.
- 3.3: Likely species at risk.
- 3.4: Possible species at risk.
- 3.5: Data Deficient species.
- 3.6: Extirpated species at risk.
- 3.7: Accidental species at risk.
- 3.8: Unlikely species at risk.
- 3.9: Very Unlikely species at risk.
- 3.10: Not Possible species at risk.
- 3.11: Delisted species (delisted since 2020).
- 3.12: Not At Risk species (downranked since 2020).

The rationale for the assignment to the first six (conservation priority) groups is included in Appendix C as follows: Resident (Table C.1), Seasonal (Table C.2), Likely (Table C.3), Possible (Table C.4), Data Deficient (Table C.5), and Extirpated (Table C.6). The rationale for assignment to Accidental, Unlikely, Very Unlikely, and Not Possible (exclude from conservation planning) groups is included with their corresponding tables below (that is, Tables 3.7 to 3.10). No rationale is given for assignment of species in the Delisted and Not At Risk groups since these simply list changes the CDC made since the 2020 report.

Note that the terminology for two groups has been changed for clarity since previous reports:

- Species included in previous reports as “Confirmed” are now termed “Resident,” and
- Species included in previous reports as “Migratory Birds” are now termed “Seasonal.”

These changes are meant to better clarify that both groups have been documented within the RMOW (that is, have been confirmed). The main distinction is that Resident species can be presumed to have a more continuous use of Whistler habitat than Seasonal species, and are therefore a higher conservation priority (on average).

<sup>14</sup> See the Glossary of Terms (p. ix) for definitions for each.

## Key to Columns in Tables Below

Column Name	Major Group	Minor Group	Group Code
Group	Fungus	Lichen	F-Lichen
		Macrofungus	F-Macrofungus
	Insect	Bee	I-Bee
		Beetle	I-Beetle
		Butterfly	I-Butterfly
		Dragonfly	I-Dragonfly
		Moth	I-Moth
	Mollusc	Freshwater Clam	M-Clam (FW)
		Marine	M-Marine
		Slug	M-Slug
		Freshwater Snail	M-Snail (FW)
		Terrestrial Snail	M-Snail (Terr.)
	Plant	Liverwort	P-Liverwort
		Moss	P-Moss
		Vascular Plant	P-Vascular
	Vertebrate	Amphibian	V-Amphibian
		Bird	V-Bird
		Fish	V-Fish
		Mammal	V-Mammal
		Reptile	V-Reptile

**Scientific Name\*** The asterisk (\*) indicates a name change recorded by the CDC since 2020. The old name is included in the "Changes Since 2020" column.

**Common Name** The common name used by the CDC.

**BC List** The current CDC threat ranking: Blue (Special Concern); Red (Extirpated, Endangered, or Threatened).

**COSEWIC / SARA** The current listings under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Canadian Species At Risk Act (SARA) are shown before and after the forward slash. A blank means there is no listing.

**BC FRPA** If "Yes," the species is designated as Identified Wildlife under the BC Forest and Range Practices Act (FRPA).

**Changes Since 2020 (Groups 1 to 7; 11, 12)** Includes rank changes (up- and downranking), previous scientific name, and any relevant notes.

**Rationale for Exclusion (Groups 8 to 10)** Brief rationales for assessments of Unlikely, Highly Unlikely, or Not Possible species (all included erroneously by CDC Search 5, Section 2.5) are included with their respective tables (3.8 to 3.10).



### 3.1 Resident Species at Risk (Conservation Priority #1)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
F-Lichen	<i>Alectoria imshaugii</i>	spiny witch's hair	Blue			
F-Lichen	<i>Nodobryoria subdivergens</i>	alpine redhead	Blue			
F-Lichen	<i>Umbilicaria decussata</i>	electric rocktripe	Blue			
F-Macrofungus	<i>Amanita augusta</i>	western yellow-veil amanita	Blue			New to CDC Rankings
F-Macrofungus	<i>Amanita smithiana</i>	Smith's amanita	Blue			New to CDC Rankings
F-Macrofungus	<i>Arrhenia acerosa</i>	moss oysterling	Blue			New to CDC Rankings
F-Macrofungus	<i>Arrhenia obscurata</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Atheniella flavoalba</i>	ivory bonnet	Blue			New to CDC Rankings
F-Macrofungus	<i>Baeospora myriadophylla</i>	lavender baeospora	Blue			New to CDC Rankings
F-Macrofungus	<i>Bjerkandera adusta</i>	smoky polypore	Blue			New to CDC Rankings
F-Macrofungus	<i>Boletopsis grisea</i>	grey false bolete	Blue			New to CDC Rankings
F-Macrofungus	<i>Boletopsis leucomelaena</i>	black false bolete	Blue			New to CDC Rankings
F-Macrofungus	<i>Boletus barrowsii</i>	white king bolete	Red			New to CDC Rankings
F-Macrofungus	<i>Boletus coniferarum</i>	bitter bolete	Blue			New to CDC Rankings
F-Macrofungus	<i>Bonomyces sinopicus</i>	brick-red clitocybe	Blue			New to CDC Rankings
F-Macrofungus	<i>Cantharellus roseocanus</i>	rainbow chanterelle	Blue			New to CDC Rankings
F-Macrofungus	<i>Cantharellus subalbidus</i>	white chanterelle	Blue			New to CDC Rankings
F-Macrofungus	<i>Cerioporus varius</i>	lead-coloured puffball	Blue			New to CDC Rankings
F-Macrofungus	<i>Chamonixia caespitosa</i>	false truffle	Blue			New to CDC Rankings
F-Macrofungus	<i>Cheilymenia fimicola</i>	orange cup fungus	Blue			New to CDC Rankings
F-Macrofungus	<i>Chlorociboria aeruginosa</i>	blue stain fungus	Blue			New to CDC Rankings
F-Macrofungus	<i>Chroogomphus ochraceus</i>	ochre pine spike	Blue			New to CDC Rankings
F-Macrofungus	<i>Chroogomphus vinicolor</i>	wine-coloured pine spike	Blue			New to CDC Rankings
F-Macrofungus	<i>Chrysomphalina chrysophylla</i>	goldgill navelcap	Blue			New to CDC Rankings
F-Macrofungus	<i>Clitocybe albirhiza</i>	snowmelt Clitocybe	Blue			New to CDC Rankings
F-Macrofungus	<i>Clitocybe dealbata</i>	sweat-producing clitocybe	Blue			New to CDC Rankings
F-Macrofungus	<i>Clitocybe odora</i>	blue-green anise mushroom	Blue			New to CDC Rankings
F-Macrofungus	<i>Collybia cookei</i>	splitpea shanklet	Blue			New to CDC Rankings
F-Macrofungus	<i>Cortinarius boulderensis</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Cortinarius evernius</i>	silky webcap	Blue			New to CDC Rankings
F-Macrofungus	<i>Cortinarius malicorius</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Cortinarius olympianus</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Cortinarius renidens</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Cuphophyllus virgineus</i>	snowy waxcap	Blue			New to CDC Rankings
F-Macrofungus	<i>Dacryonaema rufum</i>	coral fungus	Blue			New to CDC Rankings
F-Macrofungus	<i>Deconica horizontalis</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Deconica inquilina</i>	grass rotting psilocybe	Blue			New to CDC Rankings
F-Macrofungus	<i>Elaphomyces muricatus</i>	common deer truffle	Blue			New to CDC Rankings
F-Macrofungus	<i>Fomitopsis officinalis</i>	agarikon	Blue			New to CDC Rankings
F-Macrofungus	<i>Galerina stylifera</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Gastrum saccatum</i>	bowl earthstar	Blue			New to CDC Rankings
F-Macrofungus	<i>Gomphidius smithii</i>	Smith's gomphidius	Blue			New to CDC Rankings
F-Macrofungus	<i>Gomphus clavatus</i>	pig's ears	Blue			New to CDC Rankings
F-Macrofungus	<i>Hydropus marginellus</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Hygrophorus pustulatus</i>	waxy cap	Blue			New to CDC Rankings
F-Macrofungus	<i>Lactarius camphoratus</i>	candy cap	Red			New to CDC Rankings
F-Macrofungus	<i>Mycena algeriensis</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Mycena cinerella</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Phaeotremella foliacea</i>	brown witch's butter	Blue			New to CDC Rankings
F-Macrofungus	<i>Phellodon atratus</i>	black tooth	Blue			New to CDC Rankings
F-Macrofungus	<i>Phellodon melaleucus</i>	grey tooth	Blue			New to CDC Rankings

### 3.1 (cont.). Resident Species at Risk (Conservation Priority #1)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
F-Macrofungus	<i>Phellodon tomentosus</i>	owl eyes; zoned phellodon	Blue			New to CDC Rankings
F-Macrofungus	<i>Ramaria cyaneigranosa</i>	coral mushroom	Blue			New to CDC Rankings
F-Macrofungus	<i>Ramaria rubrievanescens</i>	fading pink coral	Red			New to CDC Rankings
F-Macrofungus	<i>Ramaria stuntzii</i>	orange-red coral	Blue			New to CDC Rankings
F-Macrofungus	<i>Rhizopogon alexsmithii</i>	false truffle	Red			New to CDC Rankings
F-Macrofungus	<i>Tapinella panuoides</i>	fan pax	Blue			New to CDC Rankings
F-Macrofungus	<i>Thelephora palmata</i>	fetid false coral	Blue			New to CDC Rankings
F-Macrofungus	<i>Tolypocladium capitatum</i>	truffle eater	Blue			New to CDC Rankings
F-Macrofungus	<i>Trametes hirsuta</i>	turkey-tail	Blue			New to CDC Rankings
F-Macrofungus	<i>Tremella aurantia</i>	jelly fungus	Blue			New to CDC Rankings
F-Macrofungus	<i>Tricholoma apium</i>	celery-scented trich	Blue			New to CDC Rankings
F-Macrofungus	<i>Tricholoma caligatum</i>	cinnamon pine	Blue			New to CDC Rankings
F-Macrofungus	<i>Tricholomopsis decora</i>	prunes and custard	Blue			New to CDC Rankings
F-Macrofungus	<i>Turbinellus floccosus</i>	scaly vase chanterelle	Blue			New to CDC Rankings
F-Macrofungus	<i>Turbinellus kauffmanii</i>	Kauffman's gomphus	Blue			New to CDC Rankings
I-Bee	<i>Bombus flavidus</i>	Fernald's Cuckoo Bumblebee	Blue			
I-Butterfly	<i>Callophrys eryphon sheltonensis</i>	Western Pine Elfin, <i>sheltonensis</i> ssp.	Blue			
I-Butterfly	<i>Euphyes vestris</i>	Dun Skipper	Blue	T/T		
I-Butterfly	<i>Icaricia icarioides montis</i> *	Boisduval's Blue	Blue			CDC Uprank: Yellow to Blue; Name (from <i>Plebejus</i> )
I-Butterfly	<i>Parnassius clodius pseudogallatinus</i>	Clodius Parnassian, <i>pseudogallatinus</i> ssp.	Blue			
I-Butterfly	<i>Parnassius smintheus olympiannus</i>	Rocky Mountain Parnassian, <i>olympiannus</i> ssp.	Blue			CDC Uprank: Yellow to Blue
I-Dragonfly	<i>Pachydiplax longipennis</i>	Blue Dasher	Blue			First record (2021)
P-Liverwort	<i>Diplophyllum obtusifolium</i>	liverwort	Blue			CDC Uprank: Yellow to Blue
P-Liverwort	<i>Haplomitrium hookeri</i>	liverwort	Blue			
P-Liverwort	<i>Jungermannia atrovirens</i>	liverwort	Blue			
P-Liverwort	<i>Nardia breidleri</i>	liverwort	Red			CDC Uprank: Blue to Red
P-Liverwort	<i>Nardia compressa</i>	liverwort	Blue			
P-Liverwort	<i>Nardia geoscyphus</i>	liverwort	Blue			Record from 2002 first entered in 2022
P-Liverwort	<i>Scapania mucronata</i>	liverwort	Blue			CDC Uprank: Yellow to Blue
P-Liverwort	<i>Scapania obscura</i>	liverwort	Blue			
P-Liverwort	<i>Scapania scandica</i> var. <i>scandica</i>	liverwort	Blue			
P-Liverwort	<i>Solenostoma confertissimum</i>	liverwort	Blue			CDC Downrank: Red to Blue
P-Liverwort	<i>Tritomaria scitula</i>	liverwort	Blue			CDC Uprank: Yellow to Blue
P-Moss	<i>Brachydontium olympicum</i>	Olympic brachydontium moss	Red			
P-Moss	<i>Grimmia caespiticia</i>	grimmia moss	Blue			
P-Moss	<i>Grimmia donniana</i>	Donn's grimmia	Blue			
P-Moss	<i>Grimmia incurva</i>	black grimmia	Red			
P-Moss	<i>Homalothecium nevadense</i>	Nevada homalothecium moss	Blue			
P-Moss	<i>Lewinskya pylaisii</i> *	Pylais' orthotrichum moss	Blue			Name (from <i>Orthotrichum</i> )
P-Moss	<i>Niphotrichum pygmaeum</i> *	pygmy racomitrium moss	Blue			Name (from <i>Racomitrium</i> )
P-Moss	<i>Platyhypnum alpinum</i> *	alpine hygrohypnum moss	Blue			Name (from <i>Hygrohypnum</i> )
P-Moss	<i>Pohlia cardotii</i>	Cardot's pohlia moss	Blue			
P-Moss	<i>Polytrichum sphaerothercium</i> *	haircap moss	Red			Name (from <i>Polytrichastrum sexangulare</i> )
P-Moss	<i>Ptychostomum pallescens</i> *	tall-clustered thread-moss	Blue			Name (from <i>Bryum</i> )
P-Moss	<i>Ptychostomum schleicheri</i> *	Schleicher's thread-moss	Blue			Name (from <i>Bryum</i> )

### 3.1 (cont.). Resident Species at Risk (Conservation Priority #1)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
P-Moss	<i>Schistidium crassipilum</i>	thickpoint grimmia	Blue			
P-Moss	<i>Tripterocladium leucocladulum</i>	tripterocladium moss	Blue			
P-Vascular	<i>Pinus albicaulis</i>	whitebark pine	Blue	E/E		
P-Vascular	<i>Utricularia ochroleuca</i>	ochroleucous bladderwort	Blue			
V-Amphibian	<i>Anaxyrus boreas</i>	Western Toad	Yellow	SC/SC		
V-Amphibian	<i>Ascaphus truei</i>	Coastal Tailed Frog	Yellow	SC/SC	Yes	
V-Amphibian	<i>Rana aurora</i>	Northern Red-Legged Frog	Blue	SC/SC	Yes	
V-Bird	<i>Accipiter gentilis laingi</i>	Northern Goshawk, <i>laingi</i> ssp.	Red	T/T	Yes	
V-Bird	<i>Ardea herodias fannini</i>	Great Blue Heron, <i>fannini</i> ssp.	Blue	SC/SC	Yes	
V-Bird	<i>Butorides virescens</i>	Green Heron	Blue			
V-Bird	<i>Charadrius vociferus</i>	Killdeer	Blue			CDC Uprank: Yellow to Blue
V-Bird	<i>Chordeiles minor</i>	Common Nighthawk	Blue	SC/T		CDC Uprank: Yellow to Blue
V-Bird	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Yellow	SC/SC		
V-Bird	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Yellow	SC/T		CDC Downrank: Blue to Yellow
V-Bird	<i>Cypseloides niger</i>	Black Swift	Blue	E/E		
V-Bird	<i>Eremophila alpestris</i>	Horned Lark	Blue			CDC Uprank: Yellow to Blue
V-Bird	<i>Hirundo rustica</i>	Barn Swallow	Yellow	SC/T		CDC Downrank: Blue to Yellow; COSEWIC T to SC
V-Bird	<i>Megascops kennicottii kennicottii</i>	Western Screech-Owl, <i>kennicottii</i> ssp.	Blue	T/T		
V-Bird	<i>Patagioenas fasciata</i>	Band-tailed Pigeon	Blue	SC/SC		
V-Fish	<i>Salvelinus confluentus</i> pop. 28	Bull Trout - South Coast Pop.	Blue	SC/SC	Yes	
V-Mammal	<i>Gulo gulo luscus</i>	Wolverine, <i>luscus</i> ssp.	Blue	SC/SC	Yes	
V-Mammal	<i>Lasiurus cinereus</i>	Hoary Bat	Blue			CDC Uprank: Yellow to Blue
V-Mammal	<i>Myotis lucifugus</i>	Little Brown Myotis	Blue	E/E		CDC Uprank: Yellow to Blue
V-Mammal	<i>Myotis yumanensis</i>	Yuma Myotis	Blue			CDC Uprank: Yellow to Blue
V-Mammal	<i>Oreamnos americanus</i>	Mountain Goat	Blue			
V-Mammal	<i>Ursus arctos</i>	Grizzly Bear	Blue	SC/SC	Yes	

### 3.2 Seasonal Species at Risk (Conservation Priority #2)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
V-Bird	<i>Aechmophorus occidentalis</i>	Western Grebe	Red	SC/SC		
V-Bird	<i>Clangula hyemalis</i>	Long-tailed Duck	Blue			
V-Bird	<i>Cygnus columbianus</i>	Tundra Swan	Blue			
V-Bird	<i>Gavia adamsii</i>	Yellow-billed Loon	Blue	NAR		
V-Bird	<i>Hydroprogne caspia</i>	Caspian Tern	Blue	NAR/		
V-Bird	<i>Larus californicus</i>	California Gull	Red			CDC Uprank: Blue to Red
V-Bird	<i>Melanitta perspicillata</i>	Surf Scoter	Blue			
V-Bird	<i>Numenius americanus</i>	Long-billed Curlew	Yellow	SC/SC	Yes	CDC Downrank: Blue to Yellow
V-Bird	<i>Podiceps auritus</i>	Horned Grebe	Yellow	SC/SC		
V-Bird	<i>Podiceps nigricollis</i>	Eared Grebe	Blue			

### 3.3 Likely Species at Risk (Conservation Priority #3)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
F-Lichen	<i>Nephroma isidiosum</i>	pebbled paw	Blue			
F-Lichen	<i>Peltigera gowardii</i>	northwest waterfan	Red	SC/SC		
F-Lichen	<i>Scytinium californicum</i> *	midlife vinyl	Blue			Name (from Leptogium)
F-Macrofungus	<i>Boletus rex-veris</i>	king bolete	Red			New to CDC Rankings; Tent. ID (2013)
F-Macrofungus	<i>Chloroscypha flavida</i>	n/a	Red			New to CDC Rankings
F-Macrofungus	<i>Ciboria rufofusca</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Entoloma sinuatum</i>	lead poisoner	Blue			New to CDC Rankings; Tent. ID (2007, 2009)
F-Macrofungus	<i>Polyporoletus sylvestris</i>	n/a	Blue			New to CDC Rankings
F-Macrofungus	<i>Ramaria aurantiiscescens</i>	coral mushroom	Red			New to CDC Rankings; Tent. ID (2010)
F-Macrofungus	<i>Syzygospora mycetophila</i>	n/a	Blue			New to CDC Rankings; Tent. ID (2007, 2013)
I-Dragonfly	<i>Tanypteryx hageni</i>	Black Petaltail	Blue			
I-Moth	<i>Dysstroma suspectata</i>	geometer moth	Blue			CDC Uprank: Yellow to Blue
M-Snail (FW)	<i>Pristiloma arcticum</i>	Northern Tightcoil	Blue			Tent. ID (2013)
P-Liverwort	<i>Marchantia polymorpha</i> ssp. <i>montivagans</i>	liverwort	Blue			
P-Liverwort	<i>Tritomaria exsectiformis</i> ssp. <i>exsectiformis</i>	liverwort	Blue			Tent. ID (2021)
P-Moss	<i>Bucklandiella affinis</i> *	lesser fringe-moss	Blue			Tent. ID (2010); Name (from <i>Racomitrium affine</i> )
P-Moss	<i>Grimmia anomala</i>	grimmia dry rock moss	Blue			
P-Moss	<i>Lescurea saxicola</i>	lescurea moss	Blue			Tent. ID (2021)
P-Moss	<i>Tortula leucostoma</i>	desmatodon moss	Blue			
P-Vascular	<i>Polystichum setigerum</i>	Alaska holly fern	Blue			
V-Mammal	<i>Cervus elaphus roosevelti</i>	Roosevelt Elk	Blue			

### 3.4 Possible Species at Risk (Conservation Priority #4)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
F-Lichen	<i>Nephroma occulta</i>	cryptic paw	Blue	T/SC		
F-Lichen	<i>Pannaria rubiginosa</i>	considerable gingerbread	Red			
F-Lichen	<i>Pseudocyphellaria rainierensis</i>	old growth specklebelly	Blue			
F-Lichen	<i>Scytinium polycarpum</i> *	peacock vinyl	Yellow	SC/SC		Name (from <i>Leptogium</i> )
F-Lichen	<i>Scytinium rivale</i> *	skin lichen	Red			Name (from <i>Leptogium</i> )
I-Bee	<i>Bombus occidentalis</i> *	Western Bumble Bee	Blue	T/		Name (from <i>Bombus o. ssp. occidentalis</i> )
I-Butterfly	<i>Callophrys johnsoni</i>	Johnson's Hairstreak	Red		Yes	COSEWIC Uprank: NR to SC
I-Butterfly	<i>Erynnis propertius</i>	Propertius Duskywing	Red			
I-Butterfly	<i>Parnassius clodius claudianus</i>	Clodius Parnassian, <i>claudianus</i> ssp.	Blue			
M-Clam (FW)	<i>Sphaerium striatinum</i>	Striated Fingernailclam	Blue			
M-Snail (FW)	<i>Physella propinqua</i>	Rocky Mountain Physa	Blue			
M-Snail (FW)	<i>Physella virginea</i>	Sunset Physa	Blue			
P-Liverwort	<i>Frullania hattoriana</i>	liverwort	Blue			
P-Moss	<i>Andreaea heinemannii</i>	Heinemann's andreaea moss	Red			
P-Moss	<i>Atrichum tenellum</i>	slender smoothcap moss	Red			
P-Moss	<i>Bryum calobryoides</i>	bryum moss	Red			
P-Moss	<i>Pohlia andalusica</i>	Roth's thread-moss	Red			
P-Moss	<i>Trematodon asanoi</i>	Boas' long-necked moss	Blue			
P-Vascular	<i>Arceuthobium tsugense</i> ssp. <i>mertensianae</i>	mountain hemlock dwarf mistletoe	Blue			
P-Vascular	<i>Bidens amplissima</i>	Vancouver Island beggarticks	Blue	SC/SC		Added tentative 1939 record (2022)
V-Bird	<i>Brachyramphus marmoratus</i>	Marbled Murrelet	Blue	T/T	Yes	
V-Bird	<i>Falco peregrinus anatum</i>	Peregrine Falcon, <i>anatum</i> ssp.	Red	NAR/SC		
V-Mammal	<i>Corynorhinus townsendii</i>	Townsend's Big-Eared Bat	Blue			
V-Reptile	<i>Charina bottae</i>	Northern Rubber Boa	Yellow	SC/SC		

### 3.5 Data Deficient Species (Conservation Priority #4)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
F-Lichen	<i>Stereocaulon pileatum</i>	pixie foam	Unknown			
P-Liverwort	<i>Scapania curta</i> var. <i>curta</i>	liverwort	Unknown			CDC Downrank: Blue to Unknown
P-Moss	<i>Imbriobryum alpinum</i> *	alpine thread-moss	Unknown			CDC Downrank: Red to Unknown; Name (from <i>Bryum</i> )
P-Vascular	<i>Muhlenbergia racemosa</i>	satin grass	Unknown			
V-Bird	<i>Riparia riparia</i>	Bank Swallow	Yellow	T/T		
V-Fish	<i>Oncorhynchus clarkii clarkii</i>	Cutthroat Trout, <i>clarkii</i> ssp.	Blue			

### 3.6 Extirpated Species at Risk (Conservation Priority #4)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
V-Bird	<i>Strix occidentalis</i>	Spotted Owl	Red	E/E	Yes	
V-Mammal	<i>Pekania pennanti</i>	Fisher	No Status		Yes	



### 3.7 Accidental Bird Species at Risk (Non-priority)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
V-Bird	<i>Ammodramus savannarum</i>	Grasshopper Sparrow	Red		Yes	
V-Bird	<i>Asio flammeus</i>	Short-eared Owl	Blue	T/SC	Yes	COSEWIC Uprank: SC to T
V-Bird	<i>Botaurus lentiginosus</i>	American Bittern	Blue			
V-Bird	<i>Buteo lagopus</i>	Rough-legged Hawk	Blue	NAR/		
V-Bird	<i>Euphagus carolinus</i>	Rusty Blackbird	Blue	SC/SC		
V-Bird	<i>Falco mexicanus</i>	Prairie Falcon	Red	NAR/	Yes	
V-Bird	<i>Icteria virens</i>	Yellow-breasted Chat	Red	E/E	Yes	Omitted in 2020
V-Bird	<i>Limnodromus griseus</i>	Short-billed Dowitcher	Blue			Omitted in 2020
V-Bird	<i>Melanerpes lewis</i>	Lewis's Woodpecker	Blue	T/T	Yes	
V-Bird	<i>Melanitta americana</i>	Black Scoter	Blue			Downrank from Migratory
V-Bird	<i>Nannopterum auritum</i> *	Double-crested Cormorant	Blue	NAR/		Omitted in 2020
V-Bird	<i>Numenius phaeopus</i>	Whimbrel	Red			Omitted in 2020
V-Bird	<i>Pelecanus erythrorhynchos</i>	American White Pelican	Blue	NAR	Yes	
V-Bird	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Blue	SC/SC		
V-Bird	<i>Pluvialis dominica</i>	American Golden-Plover	Blue			
V-Bird	<i>Progne subis</i>	Purple Martin	Blue			
V-Bird	<i>Sterna forsteri</i>	Forster's Tern	Red	DD/		
V-Bird	<i>Tringa flavipes</i>	Lesser Yellowlegs	Blue	T/		Omitted in 2020; (CDC Uprank 2022)
V-Bird	<i>Tringa incana</i>	Wandering Tattler	Blue			
V-Bird	<i>Tyto alba</i>	Barn Owl	Blue	T/T		CDC Downrank: Red to Blue
V-Bird	<i>Zonotrichia querula</i>	Harris's Sparrow	Unknown	SC/		

### 3.8 Unlikely Species at Risk (Non-priority)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Rationale for Exclusion
I-Beetle	<i>Cicindela hirticollis</i>	Hairy-necked Tiger Beetle	Blue			per Karen Needham
I-Butterfly	<i>Cercyonis pegala incana</i>	Common Wood-nymph, <i>incana</i> ssp.	Red			Only one record (to sp.) at Joffre Lk.
I-Butterfly	<i>Epargyreus clarus californicus</i>	Silver-spotted Skipper [ <i>californicus</i> ssp.]	Blue [Red]			Sp. and ssp. level all from Interior, except for 2 Cortes I. records.
I-Dragonfly	<i>Argia emma</i>	Emma's Dancer	Blue			Restricted to Fraser Valley and Grand Forks
I-Dragonfly	<i>Argia vivida</i>	Vivid Dancer	Blue	SC/SC		Hot springs (e.g., Meager)
I-Dragonfly	<i>Sympetrum vicinum</i>	Autumn Meadowhawk	Blue			Low elevations, Lower Mainland
M-Clam (FW)	<i>Sphaerium patella</i>	Rocky Mountain Fingernailclam	Red			Historic records from L. Mainland and Kyuquot
M-Snail (FW)	<i>Galba bulimoides</i>	Prairie Fossaria	Blue			per Robert Forsyth
M-Snail (FW)	<i>Galba dalli</i>	Dusky Fossaria	Blue			per Robert Forsyth
M-Snail (FW)	<i>Galba parva</i>	Pygmy Fossaria	Blue			N. and E. BC
M-Snail (FW)	<i>Gyraulus crista</i>	Star Gyro	Blue			per Robert Forsyth
M-Snail (FW)	<i>Planorbula campestris</i>	Meadow Rams-horn	Blue			Prob. only S. and E. BC
M-Snail (FW)	<i>Stagnicola traski</i>	Widelip Pondsnaill	Blue			Only records from s. Interior
P-Moss	<i>Brotherella roellii</i>	Roell's brotherella	Red	E/E		Unlikely in RMOW (Joya)
P-Moss	<i>Bryoerythrophyllum columbianum</i>	Columbian carpet moss	Blue	SC/SC		Fraser Valley and Interior
P-Moss	<i>Fissidens pauperculus</i>	poor pocket moss	Red	E/E		"Mediterranean climates" (CDC)
P-Vascular	<i>Anemone drummondii</i> var. <i>drummondii</i>	alpine anemone	Blue			Fraser Valley and E. BC
P-Vascular	<i>Polemonium elegans</i>	elegant Jacob's-ladder	Red			One CDC record from Skagit Valley
P-Vascular	<i>Scrophularia lanceolata</i>	lance-leaved figwort	Blue			Only CDC records Skagit and SE BC
P-Vascular	<i>Viola purpurea</i> var. <i>venosa</i>	purple-marked yellow violet	Blue			Only CDC records Skagit/Manning Parks
V-Bird	<i>Bartramia longicauda</i>	Upland Sandpiper	Red			Breeds central/NE BC
V-Bird	<i>Branta bernicla</i>	Brant	Blue			Coastal migrant only
V-Bird	<i>Chondestes grammacus</i>	Lark Sparrow	Blue			Interior BC
V-Bird	<i>Falco rusticolus</i>	Gyr Falcon	Blue	NAR		Nests NW BC
V-Bird	<i>Limosa haemastica</i>	Hudsonian Godwit	Red	T/		Nests NW BC
V-Bird	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	Red			Limited range: Fraser Delta/Interior
V-Bird	<i>Oreoscoptes montanus</i>	Sage Thrasher	Red	E/E	Yes	Extreme SC BC
V-Bird	<i>Recurvirostra americana</i>	American Avocet	Blue			Mainly central Interior
V-Mammal	<i>Sorex bendirii</i>	Pacific Water Shrew	Red	E/E	Yes	Closest record low elev in Squamish
V-Reptile	<i>Contia tenuis</i>	Common Sharp-tailed Snake	Red	E/T/E		Pemberton in IDF-like, warm-aspect sites

### 3.9 Highly Unlikely Species at Risk (Non-priority)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Rationale for Exclusion
I-Beetle	<i>Omus audouini</i>	Audouin's Night-stalking Tiger Beetle	Red	T/		Only found Boundary Bay and Victoria
I-Butterfly	<i>Chlosyne hoffmanni</i>	Hoffman's Checkerspot	Red			Manning Park and south
I-Butterfly	<i>Danaus plexippus</i>	Monarch	Red	E/SC		No Monardia in RMOW, historic in Pemberton
I-Butterfly	<i>Hesperia colorado oregonia</i>	Western Branded Skipper, <i>oregonia</i> ssp.	Red	E/		Eastern Vcr. Island
I-Butterfly	<i>Papilio indra</i>	Indra Swallowtail	Red			Only known from Manning Park
I-Butterfly	<i>Speyeria zerene bremnerii</i>	Zerene Fritillary, <i>bremnerii</i> ssp.	Red			Dry meadows, Gulf I. and s. Interior
I-Dragonfly	<i>Enallagma clausum</i>	Alkali Bluet	Blue			S. Interior n. to Cariboo
I-Dragonfly	<i>Erythemis collocata</i>	Western Pondhawk	Blue			Lowlands, Fraser Valley and Osoyoos Lk.
I-Dragonfly	<i>Octogomphus specularis</i>	Grappletail	Red	SC/		N. end of range = Lower Fraser Valley
I-Dragonfly	<i>Ophiogomphus occidentis</i>	Sinuous Snaketail	Blue			Low elevations, SW BC
M-Clam (FW)	<i>Sphaerium occidentale</i>	Herrington Fingernailclam	Blue			Only SE BC
M-Slug	<i>Hemphillia camelus</i>	Pale Jumping-slug	Blue			Southeast BC
M-Snail (Terr.)	<i>Allogona townsendiana</i>	Oregon Forestsnail	Red	E/E		Fraser Valley, broadleaf maple
M-Snail (Terr.)	<i>Carychium occidentale</i>	Western Thorn	Blue			Low elevation Acer macrophyllum
P-Vascular	<i>Actaea elata</i> var. <i>elata</i>	tall bugbane	Red	E/E	Yes	Restricted to Chilliwack area
P-Vascular	<i>Eleocharis nitida</i>	slender spike-rush	Blue			Only 3 CDC records, all far from RMOW
P-Vascular	<i>Elmera racemosa</i>	elmera	Red			Skagit Valley s. to US
P-Vascular	<i>Mitellastrum caulescens</i>	leafy mitrewort	Blue			S. Van Island; Fraser Valley
V-Amphibian	<i>Dicamptodon tenebrosus</i>	Coastal Giant Salamander	Blue	T/	Yes	Restricted to Chilliwack area
V-Amphibian	<i>Rana pretiosa</i>	Oregon Spotted Frog	Red	E/E		Lower Fraser Valley only
V-Bird	<i>Aeronautes saxatalis</i>	White-throated Swift	Blue			Interior BC, not recorded in RMOW
V-Bird	<i>Ammospiza nelsoni</i>	Nelson's Sparrow	Red	NAR	Yes	NE BC, not recorded in RMOW
V-Bird	<i>Calcarius pictus</i>	Smith's Longspur	Blue			Casual NE BC only
V-Bird	<i>Calidris canutus</i>	Red Knot	Blue	T/		Uncommon coastal transient
V-Bird	<i>Cardellina canadensis</i>	Canada Warbler	Blue	SC/T		NE BC only
V-Bird	<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	Red			"Vagrant" sp.; no records near RMOW
V-Bird	<i>Dolichonyx oryzivorus</i>	Bobolink	Red	SC/T		SC BC north to Cariboo
V-Bird	<i>Eremophila alpestris strigata</i>	Horned Lark, <i>strigata</i> ssp.	Red	E/E		S. Van Island; Fraser Valley
V-Bird	<i>Fratercula cirrhata</i>	Tufted Puffin	Blue			Offshore (marine)
V-Bird	<i>Fulmarus glacialis</i>	Northern Fulmar	Red			Offshore (marine)
V-Bird	<i>Ptychoramphus aleuticus</i>	Cassin's Auklet	Red	SC/SC	Yes	Mainly on outer coast
V-Bird	<i>Setophaga virens</i>	Black-throated Green Warbler	Blue		Yes	Peace River area
V-Bird	<i>Synthliboramphus antiquus</i>	Ancient Murrelet	Blue	SC/SC	Yes	Mainly Haida Gwaii, marine
V-Bird	<i>Uria aalge</i>	Common Murre	Red			Coastal, marine
V-Fish	<i>Catostomus</i> sp. 4	Salish Sucker	Red	T/		Fraser Valley
V-Fish	<i>Rhinichthys cataractae</i> - <i>Chehalis</i> lineage	Nooksack Dace	Red	E/E		Only found in Nooksack drainage
V-Fish	<i>Spirinchus</i> sp. 1	Pygmy Longfin Smelt	Red	DD/		Restricted to Harrison and Pitt Lakes
V-Mammal	<i>Aplodontia rufa</i>	Mountain Beaver	Yellow	SC/SC		Fraser and Skagit drainages
V-Mammal	<i>Lepus americanus washingtonii</i>	Snowshoe Hare, <i>washingtonii</i> ssp.	Red			Low elevation, Fraser Valley/Cascades

### 3.9 (cont.) Highly Unlikely Species at Risk (Non-priority)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Rationale for Exclusion
I-Beetle	<i>Omus audouini</i>	Audouin's Night-stalking Tiger Beetle	Red	T/		Only found Boundary Bay and Victoria
I-Butterfly	<i>Chlosyne hoffmanni</i>	Hoffman's Checkerspot	Red			Manning Park and south
I-Butterfly	<i>Danaus plexippus</i>	Monarch	Red	E/SC		No Monardia in RMOW, historic in Pemberton
I-Butterfly	<i>Hesperia colorado oregonia</i>	Western Branded Skipper, <i>oregonia</i> ssp.	Red	E/		Eastern Vcr. Island
I-Butterfly	<i>Papilio indra</i>	Indra Swallowtail	Red			Only known from Manning Park
I-Butterfly	<i>Speyeria zerene bremnerii</i>	Zerene Fritillary, <i>bremnerii</i> ssp.	Red			Dry meadows, Gulf I. and s. Interior
I-Dragonfly	<i>Enallagma clausum</i>	Alkali Bluet	Blue			S. Interior n. to Cariboo
I-Dragonfly	<i>Erythemis collocata</i>	Western Pondhawk	Blue			Lowlands, Fraser Valley and Osoyoos Lk.
I-Dragonfly	<i>Octogomphus specularis</i>	Grappletail	Red	SC/		N. end of range = Lower Fraser Valley
I-Dragonfly	<i>Ophiogomphus occidentis</i>	Sinuous Snaketail	Blue			Low elevations, SW BC
M-Clam (FW)	<i>Sphaerium occidentale</i>	Herrington Fingernailclam	Blue			Only SE BC
M-Slug	<i>Hemphillia camelus</i>	Pale Jumping-slug	Blue			Southeast BC
M-Snail (Terr.)	<i>Allogona townsendiana</i>	Oregon Forestsnail	Red	E/E		Fraser Valley, broadleaf maple
M-Snail (Terr.)	<i>Carychium occidentale</i>	Western Thorn	Blue			Low elevation Acer macrophyllum
P-Vascular	<i>Actaea elata</i> var. <i>elata</i>	tall bugbane	Red	E/E	Yes	Restricted to Chilliwack area
P-Vascular	<i>Eleocharis nitida</i>	slender spike-rush	Blue			Only 3 CDC records, all far from RMOW
P-Vascular	<i>Elmera racemosa</i>	elmera	Red			Skagit Valley s. to US
P-Vascular	<i>Mitellastris caulescens</i>	leafy mitrewort	Blue			S. Van Island; Fraser Valley
V-Amphibian	<i>Dicamptodon tenebrosus</i>	Coastal Giant Salamander	Blue	T/	Yes	Restricted to Chilliwack area
V-Amphibian	<i>Rana pretiosa</i>	Oregon Spotted Frog	Red	E/E		Lower Fraser Valley only
V-Bird	<i>Aeronautes saxatalis</i>	White-throated Swift	Blue			Interior BC, not recorded in RMOW
V-Bird	<i>Ammospiza nelsoni</i>	Nelson's Sparrow	Red	NAR	Yes	NE BC, not recorded in RMOW
V-Bird	<i>Calcarius pictus</i>	Smith's Longspur	Blue			Casual NE BC only
V-Bird	<i>Calidris canutus</i>	Red Knot	Blue	T/		Uncommon coastal transient
V-Bird	<i>Cardellina canadensis</i>	Canada Warbler	Blue	SC/T		NE BC only
V-Bird	<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	Red			"Vagrant" sp.; no records near RMOW
V-Bird	<i>Dolichonyx oryzivorus</i>	Bobolink	Red	SC/T		SC BC north to Cariboo
V-Bird	<i>Eremophila alpestris strigata</i>	Horned Lark, <i>strigata</i> ssp.	Red	E/E		S. Van Island; Fraser Valley
V-Bird	<i>Fratercula cirrhata</i>	Tufted Puffin	Blue			Offshore (marine)
V-Bird	<i>Fulmarus glacialis</i>	Northern Fulmar	Red			Offshore (marine)
V-Bird	<i>Ptychoramphus aleuticus</i>	Cassin's Auklet	Red	SC/SC	Yes	Mainly on outer coast
V-Bird	<i>Setophaga virens</i>	Black-throated Green Warbler	Blue		Yes	Peace River area
V-Bird	<i>Synthliboramphus antiquus</i>	Ancient Murrelet	Blue	SC/SC	Yes	Mainly Haida Gwaii, marine
V-Bird	<i>Uria aalge</i>	Common Murre	Red			Coastal, marine
V-Fish	<i>Catostomus</i> sp. 4	Salish Sucker	Red	T/		Fraser Valley
V-Fish	<i>Rhinichthys cataractae</i> - <i>Chehalis</i> lineage	Nooksack Dace	Red	E/E		Only found in Nooksack drainage
V-Fish	<i>Spirinchus</i> sp. 1	Pygmy Longfin Smelt	Red	DD/		Restricted to Harrison and Pitt Lakes
V-Mammal	<i>Aplodontia rufa</i>	Mountain Beaver	Yellow	SC/SC		Fraser and Skagit drainages
V-Mammal	<i>Lepus americanus washingtonii</i>	Snowshoe Hare, <i>washingtonii</i> ssp.	Red			Low elevation, Fraser Valley/Cascades

### 3.9 (cont.) Highly Unlikely Species at Risk (Non-priority)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Rationale for Exclusion
V-Mammal	<i>Mustela frenata altifrontalis</i>	Long-tailed weasel, <i>altifrontalis</i> ssp.	Red			Possibly extirpated
V-Mammal	<i>Myodes gapperi occidentalis</i>	Southern Red-backed Vole, <i>occidentalis</i> ssp.	Red			S. of Fraser R. delta
V-Mammal	<i>Scapanus townsendii</i>	Townsend's Mole	Red	E/E		Lower Fraser Valley only
V-Mammal	<i>Sorex rohweri</i>	Olympic Shrew	Red			Lower Fraser Valley only
V-Mammal	<i>Sorex trowbridgii</i>	Trowbridge's Shrew	Blue			S. of Fraser River
V-Reptile	<i>Chrysemys picta</i> pop. 1	Painted Turtle - Pacific Coast pop.	Red	T/		Mainly southern Interior
V-Reptile	<i>Pituophis catenifer catenifer</i>	Gophersnake, <i>catenifer</i> ssp.	Red	XT/XT		Presumed extirpated in BC

### 3.10 Not Possible Species at Risk (Non-priority)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Rationale for Exclusion
M-Marine	<i>Haliotis kamtschatkana</i>	Northern Abalone	Red	E/E		Marine only
M-Snail (Terr.)	<i>Cryptomastix devia</i>	Puget Oregonian	Red	XT/XT		Extirpated in BC
V-Fish	<i>Acipenser medirostris</i>	Green Sturgeon	Blue	SC/SC		Marine and estuarine
V-Fish	<i>Acipenser transmontanus</i>	White Sturgeon	No Status	E/T/E		Major rivers
V-Fish	<i>Acipenser transmontanus</i> pop. 4	White Sturgeon (Lower Fraser River pop.)	Red	T/		Fraser River
V-Fish	<i>Cottus aleuticus</i> pop. 1	Coastrange Sculpin, Cultus pop.	Red	E/T		Only in Cultus Lake and tributaries (CDC)
V-Fish	<i>Thaleichthys pacificus</i>	Eulachon	Blue	E/T/		Anadromous
V-Mammal	<i>Eumetopias jubatus</i>	Steller Sea Lion	Blue	SC/SC		Marine
V-Reptile	<i>Actinemys marmorata</i>	Northwestern Pond Turtle	Red	XT/XT		Extirpated in BC

### 3.11 Delisted Species (Delisted since 2020; Non-priority)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
F-Lichen	<i>Umbilicaria krascheninnikovii</i>	lesser salted rocktripe	n/a			CDC Delisted (2020)
P-Liverwort	<i>Tritomaria polita</i> ssp. <i>polita</i>	liverwort	n/a			CDC Delisted (2020)
P-Moss	<i>Pohlia tundrae</i>	tundra pohlia moss	n/a			CDC Delisted (2022)
V-Mammal	<i>Myotis keenii</i> *	Keen's Myotis*	n/a	DD/	Yes?	CDC Delisted (2020); Now = <i>M. evotis</i>

### 3.12 Not At Risk Species (Downranked since 2020; Non-priority)

Group	Scientific Name (*Changed Since 2020)	Common Name	BC List	COSEWIC / SARA	BC FRPA	Changes Since 2020
P-Moss	<i>Lescurea incurvata</i> *	brown leskea moss	Yellow			CDC Downrank: Red to Yellow; Name (from <i>Pseudoleskea</i> )
P-Moss	<i>Lescurea radicata</i> *	pseudoleskea moss	Yellow			CDC Downrank: Blue to Yellow; Name (from <i>Pseudoleskea</i> )
P-Moss	<i>Sciuro-hypnum oedipodium</i> *	Holzinger's brachythecium moss	Yellow			CDC Downrank: Blue to Yellow; Name (from <i>Brachythecium holzingeri</i> )
P-Vascular	<i>Botrychium spathulatum</i>	spoon-shaped moonwort	Yellow			CDC Downrank: Blue to Yellow

## 4. Species at Risk – Discussion of Changes since 2020

### 4.1 Species Totals by Status Group, Year, and Conservation Priority

A total of 299 species at risk were included assessed for this report (Table 4.1). Species were included if they: (a) were in the 2020 report; (b) had been confirmed in the RMOW since that report; (c) were not-at-risk species recorded in Whistler prior to 2020 that were added due to CDC upranking; and/or, (d) were returned by CDC Search 5 (Sections 1.3, 2.3; Appendix B).

**Table 4.1. Species at risk by RMOW Status Group.**

Status Code	RMOW Status Group	Total Species
1	Resident	122
2	Seasonal	10
3	Likely	21
4	Possible	24
5	Data Deficient	6
6	Extirpated	2
7	Accidental	21
8	Unlikely	30
9	Highly Unlikely	46
10	Not Possible	9
11	Delisted	4
12	Not at Risk (2022)	4
		<b>299</b>

The total number of species included in this report is the highest yet (Table 4.2). This increase is mainly due to: (a) the addition of 70 macrofungi resulting from the CDC's first assessment of macrofungi in 2021; and, (b) the inclusion of the highest number yet of species returned by a CDC online search (Section 2.3). This latter reason meant that 85 species that were from Unlikely to Not Possible were included for assessment – almost twice the highest number in the 2016 report. As discussed in Section 2.3, the purpose for this exercise was to fully assess the accuracy and completeness of CDC searches for species at risk in the RMOW.

**Table 4.2. Species at risk by RMOW Status Group, Conservation Priority, and report year.**

Status Code	RMOW Status	Conservation Priority	2022			2020	2019	2018	2017	2016
			Total	Without Fungi	Fungi Only					
1	Resident	1	122	59	63	49	50	58	70	69
2	Seasonal	2	10	3	7	11	11	11	NR	NR
3	Likely	3	21	21	n/a	15	13	12	10	9
4	Possible	4	24	24	n/a	24	22	23	23	23
5	Data Deficient	4	6	6	n/a	6	6	2	3	3
6	Extirpated	4	2	2	n/a	2	1	2	0	0
7	Accidental	n/a	21	21	n/a	18	18	16	NR	NR
8+9	Unlikely to Highly Unlikely	n/a	76	76	n/a	27	27	29	33	33
10	Not Possible	n/a	9	9	n/a	4	4	5	13	12
11+12	Downlisted and Delisted	n/a	8	8	n/a	3	10	22	n/a	n/a
<b>Total</b>			<b>299</b>	<b>229</b>	<b>70</b>	<b>159</b>	<b>162</b>	<b>180</b>	<b>152</b>	<b>149</b>
Conservation Planning Priority Species (1 to 6)			185	115	70	107	103	108	106	104
Exclude from Conservation Planning (6 to 12)				114		52	59	72	46	45



The addition of 63 macrofungi is the main reason the number of Resident species increased from 49 in 2020 to 122 in 2022. To be clear, these additions were due to the upranking of species to at-risk status that were already-documented in Whistler (that is, they were not new records). Other examples of upranking to at-risk status added two Resident bats (Hoary Bat and Yuma Myotis<sup>15</sup>) and three Resident birds (Common Nighthawk, Horned Lark, and Killdeer). See further discussion of these last five species below (Section 4.2).

Another result of the addition of macrofungi to CDC assessments is that fungi and lichens now represent more than half of all species of conservation concern (Table 4.3; Section 4.3). Non-vascular plants and vertebrates comprise most of the rest. It is somewhat surprising, therefore, that vertebrates comprise more than half (67 of 114) species that should be excluded from conservation planning because they are so unlikely to be in the RMOW.

**Table 4.3. Species at risk by species group, RMOW Status Group, and Conservation Priority.**

Group	Species to Include in Conservation Planning						Species to Exclude from Conservation Planning					
	Resident	Seasonal	Likely	Possible	Data Deficient	Extirpated?	Accidental	Unlikely	Highly Unlikely	Not Possible	Delisted	Not At Risk
Fungi & Lichens	66	0	10	5	1	0	0	0	0	0	1	0
Insects	7	0	2	4	0	0	0	6	10	0	0	0
Molluscs	0	0	1	3	0	0	0	7	4	2	0	0
Plants - Non-Vascular	25	0	7	6	2	0	0	3	0	0	2	3
Plants - Vascular	2	1	0	2	1	0	0	4	4	0	0	1
Vertebrates	22	10	1	4	2	2	21	10	28	7	1	0
Total	122	11	21	24	6	2	21	30	46	9	4	4
	186						114					

## 4.2. Notable Changes to Species Rankings

### Blue Dasher (Dragonfly)

Blue Dasher (*Pachydiplax longipennis*; Photo 4.1) is a dragonfly associated with ponds and lakes with abundant vegetation in the water and on the shore (Cannings 2002), as well as wooded wetlands and slow streams (Paulsen 2009). Even though online records (CDC 2022; Klinkenberg 2022) show occurrences only from Bowen Island south to Victoria, Mike Toochnin (pers. comm.) believes its true range is much wider. He was therefore not surprised when he and Sharon Toochnin recorded it for the first time in Whistler during the 2021 BioBlitz, at McGuire Pond. Their record is a range extension for the species.



**Photo 4.1. Blue Dasher (Wikimedia Commons photo).**

<sup>15</sup> A third bat upranked to at-risk status by the CDC, Little Brown Myotis (*Myotis lucifugus*) was already included as a species at risk in past versions of this report due to it had been already assessed as at-risk through the Federal (COSEWIC) process. All three are discussed in Section 4.2.

### **Hoary Bat, Yuma Myotis, and Little Brown Myotis (Bats)**

Worrying threats to three species of bats resulted in their upranking to at-risk status by the CDC in 2022: Hoary Bat (*Lasiurus cinereus*; Photo 4.2), Yuma Myotis (*Myotis yumanensis*; Photo 4.3), and Little Brown Myotis (*Myotis lucifugus*).<sup>16</sup> Of the three, only Little Brown Myotis had already been assessed as at-risk by COSEWIC (and was therefore the only one included in previous versions of this report). COSEWIC is now finalizing a detailed threats analysis for Hoary Bat which will be published in April 2023 and which will likely lead to Federal listing.<sup>17</sup> At present, COSEWIC considers Yuma Myotis a mid-priority candidate for assessment with no firm timeline.<sup>18</sup>

The CDC upranked Hoary Bat to the Blue list as a result of an apparently unpublished detailed threats assessment completed by COSEWIC in 2021.<sup>19</sup> It is therefore unclear what threats are of most concern to Hoary Bat, but must be related at least in part to a prediction that its population could decline by as much as 90% in the next 50 years if current mortality rates due to wind turbines continue (reported in Lausen et al. 2022, p. 195).



**Photo 4.2. Hoary Bat (Jared Hobbs photo)**



**Photo 4.3. Yuma Myotis (Bob Brett photo).**

Smaller bats that overwinter in large colonies, especially *Myotis* spp., are especially susceptible to mortality due to White Nose Syndrome (WNS). WNS is an exotic fungus that has already caused huge population declines in overwintering bats in eastern North America. Though not yet recorded in BC, it seems inevitable that this fungus will eventually spread to BC given that it has already been recorded in Washington State (Lausen et al. 2022). Due to this potentially devastating threat, the CDC added two of *Myotis* species that occur in Whistler to its Blue list: Little Brown Myotis and Yuma Myotis. If White Nose Syndrome does enter British Columbia, other colonial bats would presumably also be at severe risk, including the other *Myotis* spp. that occur in Whistler: California Myotis (*M. californicus*), Long-Eared Bat (*M. evotis*), and Long-Legged Myotis (*M. volans*).

### **Common Nighthawk, Horned Lark, and Killdeer (Birds)**

Three bird species that are Resident in Whistler and previously ranked by the CDC as secure (Yellow list) were similarly reassessed as at-risk in 2022 due to increased threats: Common Nighthawk (*Chordeiles minor*; Photo 4.4), Horned Lark (*Eremophila alpestris*), and Killdeer (*Charadrius vociferus*; Photo 4.).<sup>20</sup> Common Nighthawk was upranked due to “updates to trends and the area of the occupancy.” Horned Lark was upranked “due to large and unexplained declines” that “is based on trends in all seasons, not just for breeders.” Killdeer was upranked “due to declining short-term and long-term trends.” All three species breed in Whistler and declines in their BC-wide population are of obvious concern.

<sup>16</sup> [https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/conservation-data-centre/data-changes/2022\\_animal\\_changes\\_summary.pdf](https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/conservation-data-centre/data-changes/2022_animal_changes_summary.pdf).

<sup>17</sup> <https://www.cosewic.ca/index.php/en-ca/reports/status-reports-preparation.html>.

<sup>18</sup> <https://www.cosewic.ca/index.php/en-ca/reports/candidate-wildlife-species.html>

<sup>19</sup> [https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/conservation-data-centre/data-changes/2022\\_animal\\_changes\\_summary.pdf](https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/conservation-data-centre/data-changes/2022_animal_changes_summary.pdf). I could not find any online links to this document.

<sup>20</sup> Ibid.



**Photo 4.4. Common Nighthawk in a lodgepole pine forest at the north end of Brandywine Falls Provincial Park (Mike Gravnic photo).**



**Photo 4.5. Killdeer beside a pond on the Whistler Golf Course (Bob Brett photo).**

### **Macrofungi**

As detailed above (Section 4.1), the CDC's first assessment of macrofungi in 2021 added 63 Resident and seven Likely species at risk to the Whistler list. As with the bats and birds mentioned above, these again reflect the upranking of species already documented within the RMOW rather than the discovery of new species. These are welcome additions to our ability to consider all possible species within conservation planning, especially given the greatly expanded understanding of the importance of fungal networks in forests and virtually all vegetated systems.

The rationales included for these 70 species (Appendix C) represent a first pass at understanding the habitat requirements for each. In most cases, existing publications list fairly general requirements such as: "under conifers," "associated with western hemlock and Douglas-fir," "on well-rotted stumps and logs," or "grassy areas." Future iterations of this report will ideally provide more specific habitat requirements for at least some of these species, through consultation with mycologists and also as greater understanding emerges for each species' habitat affinities.

Without such specificity, it will be difficult to incorporate the full suite of Resident and at-risk macrofungi into conservation planning. Nonetheless, there are some species known to be strongly associated with imperilled ecosystems, notably old-growth forests:

- Agarikon (*Fomitopsis officinalis*<sup>21</sup>; Photo 4.6): This polypore (bracket fungus) is strongly associated with old-growth Douglas-fir forests, which is the only Whistler habitat in which has been found to date. It is a slow-growing, long-lived species that has reputed medicinal value which means that it is threatened both by the loss of habitat due to logging and other development, as well as direct removal by humans.
- Pig's Ears (*Gomphus clavatus*; Photo -4.7) and Rainbow Chanterelle (*Cantharellus roseocanus*): Although both of these fungi are also associated with old-growth forests, they don't appear to have such a strong (obligate) requirement for that habitat as agarikon.

<sup>21</sup> The more commonly-accepted scientific name for this species is *Laricifomes officinalis* (e.g., MacKinnon and Luther 2021).





**Photo 4.6. Agarikon on an old-growth Douglas-fir in Spruce Grove Park (Bob Brett photo).**



**Photo 4.7. Pig's Ear's in an ancient, subalpine forest in the Callaghan Valley (Bob Brett photo).**

### 4.3 Implications for Conservation Planning

When considering conservation priorities, species with confirmed habitat use within the RMOW should be ranked highest, which therefore includes 122 Resident species and also 10 Seasonal (migratory bird) species (Tables 3.1, 3.2, 4.2). Note that both groups include species with documented habitat use in the RMOW, but that the latter category is restricted to birds that require habitat only during spring and/or fall migration (that is, they do not breed in the Whistler area).<sup>22</sup>

Although Likely species are ranked as the third conservation priority (Table 4.2), they should still be considered in all conservation planning. Even though they have yet to be documented, the majority of them likely occur in this area (that is, probably or almost certainly occur). The habitat requirements for species within categories ranked as the fourth conservation priority (Possible, Data Deficient, and Extirpated) should be addressed within conservation planning, even if no active management is deemed necessary. For example, although Marbled Murrelet (ranked as Possible) has not been documented within the RMOW, its requirement for old-growth habitat should remain a consideration. Likewise, the old-growth habitat needs of the two species currently shown as Extirpated (Fisher and Northern Spotted Owl) are shared by many other species. Not only will ensuring an adequate representation of their habitat maintain the potential for future recolonization (if they persist within BC as a whole), it will also provide habitat for those other species.

Species returned by CDC searches that are Unlikely to Not Possible (e.g., species such as Burrowing Owl, Coho Salmon, and marine species such as Eulachon; Sections 3.8 to 3.10) should be excluded from conservation planning in order to focus on species that do or could occur in Whistler. Likewise, there is no longer a need to consider species that have been downranked or delisted since 2020 (that is, are no longer considered species at risk).

<sup>22</sup> ) Other birds that are potential (but undocumented) breeders in Whistler are included in Likely and Possible categories. The Accidental category includes birds that have been recorded so infrequently (Ricker et al. 2022) that they are not a conservation concern in Whistler.

## 5. Ecosystems At Risk – Search Methods

### 5.1 Search Methods

In addition to tracking species at risk, the CDC also assesses and ranks possible threats to Ecological Communities, synonymous in this usage with “ecosystems.”<sup>23</sup> The term refers to distinctive plant communities which can occur in a variety of Biogeoclimatic (BGC) Zones and similar growing conditions (represented by the most specific class in the BGC system, Site Series<sup>24</sup>). These mappable units are also a very important tool to locate habitats for species at risk.

#### CDC Search Criteria

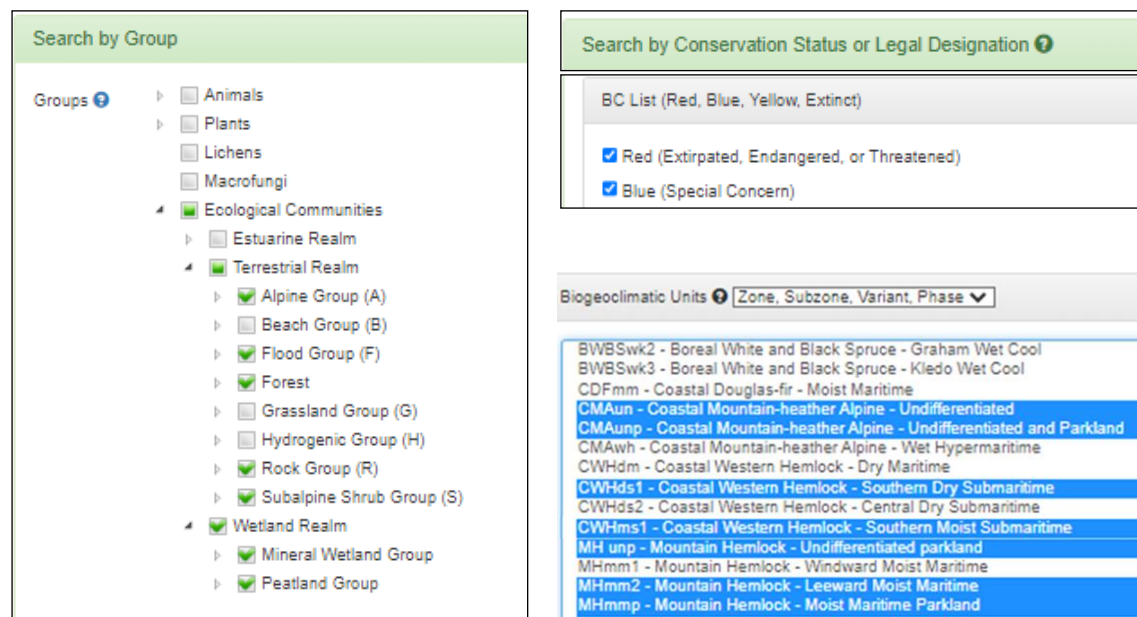
As with species at risk (Section 2.3) there is no easy way I know of that can be used to produce from a CDC search a complete and accurate list of ecosystems at risk for a given area. Three CDC search combinations were therefore used to compare results for ecosystems at risk in the RMOW. All three searches included:

- All ecological communities other than Estuarine Realm, Beach Group, and Grassland Group; and
- All Red- and Blue-listed occurrences.

Search 1 further specified to lowest Biogeoclimatic (BGC) unit (Table 5.1; Figure 5.1). Search 2 instead specified results only for Whistler. Search 3 combined criteria for Search 1 and Search 2.

**Table 5.1. Biogeoclimatic (BGC) units that occur in the RMOW that were specified in CDC searches.**

BGC Unit	BGC Class	Full Description
CMAun	Zone	Coastal Mountain-heather Alpine – undifferentiated
CMAunp	Zone + Subzone	Coastal Mountain-heather Alpine - undifferentiated and parkland
CWHds1	Variant	Coastal Western Hemlock Southern Dry Submaritime
CWHms1	Variant	Coastal Western Hemlock Southern Moist Submaritime
MHm2	Variant	Mountain Hemlock Leeward Moist Maritime
MHmmp	Subzone	Mountain Hemlock Moist Maritime Parkland



**Search by Group**

Groups ?

- Animals
- Plants
- Lichens
- Macrofungi
- Ecological Communities**
  - Estuarine Realm
  - Terrestrial Realm**
    - Alpine Group (A)
    - Beach Group (B)
    - Flood Group (F)
    - Forest
    - Grassland Group (G)
    - Hydrogenic Group (H)
    - Rock Group (R)
    - Subalpine Shrub Group (S)
  - Wetland Realm**
    - Mineral Wetland Group
    - Peatland Group

**Search by Conservation Status or Legal Designation ?**

BC List (Red, Blue, Yellow, Extinct)

☒ Red (Extirpated, Endangered, or Threatened)

☒ Blue (Special Concern)

**Biogeoclimatic Units ?** Zone, Subzone, Variant, Phase ▾

- BWBSwk2 - Boreal White and Black Spruce - Graham Wet Cool
- BWBSwk3 - Boreal White and Black Spruce - Kledo Wet Cool
- CDFmm - Coastal Douglas-fir - Moist Maritime
- CMAun - Coastal Mountain-heather Alpine - Undifferentiated**
- CMAunp - Coastal Mountain-heather Alpine - Undifferentiated and Parkland**
- CMAwh - Coastal Mountain-heather Alpine - Wet Hypermaritime
- CWHdm - Coastal Western Hemlock - Dry Maritime
- CWHds1 - Coastal Western Hemlock - Southern Dry Submaritime**
- CWHds2 - Coastal Western Hemlock - Central Dry Submaritime**
- CWHms1 - Coastal Western Hemlock - Southern Moist Submaritime**
- MHunp - Mountain Hemlock - Undifferentiated parkland**
- MHm1 - Mountain Hemlock - Windward Moist Maritime**
- MHm2 - Mountain Hemlock - Leeward Moist Maritime**
- MHmmp - Mountain Hemlock - Moist Maritime Parkland**

**Figure 5.1. Screenshot from the CDC Species and Ecosystem Explorer showing search terms used in Search 1 to narrow results.**

<sup>23</sup> <http://a100.gov.bc.ca/pub/eswp/search.do>

<sup>24</sup> See Green and Klinka (1994) for information on Site Series in the Whistler area. See Section 6.2 for a discussion of the classification of wetland ecosystems which are based on a similar concept as terrestrial ecosystems, but are tracked by site association rather than a site-based measure.

### Comparison of CDC Search Results

None of the three searches returned complete and accurate results for ecosystems at risk (Table 5.2).

**Table 5.2. Biogeoclimatic (BGC) units that occur in the RMOW that were specified in CDC searches.**

Search	No. of Ecosystems						Notes
	Total	Forested	Wetland	Correct	Incorrect	Missing	
Search 1	18	18	0	17	1	2	Includes all 17 correct (Table 6.a) and one incorrect terrestrial ecosystem, but omits wetland ecosystems.
Search 2	21	17	4	19	2?	0	Includes all correct terrestrial ecosystems (Table 6.1), as well as four wetland ecosystems that could or do occur in Whistler (Table 6.2).
Search 3	17	17	0	17	0	2	Includes all correct terrestrial ecosystems (Table 6.1), but excludes wetland ecosystems.

**Search 1:** Search 1 correctly included all terrestrial<sup>25</sup> ecosystems that are at-risk in Whistler (Table 6.1), but also included one that does not occur: Garry oak – bigleaf maple – cherries (*Quercus garryana* - *Acer macrophyllum* - *Prunus* spp.) The only occurrence of this Garry oak ecosystem mapped by the CDC (2022) is north of Yale in the Fraser Valley, and is not possible in Whistler. In fairness to the CDC, its presence in Search 1 results is only due to the inclusion of CWHds1, even though the vast majority of CWH units in the RMOW are CWHms1 (Section 5.2). Search 1 failed to return any wetland ecosystems that occur in Whistler (Section 6.2).

**Search 2:** Even though Search 2 used simpler search terms (“Whistler” only, rather than the suite of BGC units shown in Table 5.1), it returned the best results. It correctly included all 17 of the Red- and Blue-listed forested ecosystems that occur in Whistler (Table 6.1), and was the only search combination that also included wetland ecosystems at risk that could occur in the RMOW (Table 6.2).

**Search 3:** Search 3, the combination of the other two’s search terms, provided accurate results for terrestrial ecosystems but, as with Search 1, omitted wetland ecosystems

Overall, these results again demonstrate that at least some familiarity with the CDC Species and Ecosystems Explorer is necessary to prevent, or at least limit, errors and/or omissions. On the positive side, and in contrast to CDC searches for species at risk (Section 2.3), assembling search terms that return accurate and complete results is at least possible for ecosystems at risk.

## 5.2 Notes on the inclusion of CWHds1 in CDC searches

There is no question that the vast majority of sites at elevations below mid-mountain (approximately 900 to 1100 m, depending on aspect) are correctly mapped as CWHms1 (Coastal Western Hemlock Southern Moist Submaritime Variant). There is, meanwhile, a question of where the transition to its southern neighbour (CWHds1; the Dry Submaritime Variant) occurs. As with all ecological classifications, these transitions are seldom as obvious on the ground as maps imply. In spite of the small area potentially occupied by CWHds1 ecosystems in the RMOW, I still believe there are good reasons to include them in these reports, as discussed below.

Two reports (MOT 2003; Timberline 2007) mapped CWHds1 occurrences at the south end of the RMOW, near Brandywine Provincial Park and further south. The Timberline report was the source used for a CDC Occurrence Report even though (as noted by the CDC) they had not verified it with a field visit, and that the site included both CWHms1 and CWHds1 BGC

<sup>25</sup> Note that all terrestrial ecosystems at risk in the RMOW are forested (Section 6.1). In the context of this report, the two terms are synonymous.

units.<sup>26</sup> And while Green (2010) mapped all low-elevation ecosystems in the RMOW as Moist Submaritime (CWHms1), he acknowledged that the southern boundary between CWHms and CWHds Subzones was difficult to establish (p. 8). Ecological communities from the CWHds1 Variant have therefore been included since the first iteration of this report (Brett 2016) for three reasons:

1. The southern end of the RMOW includes sites that are at least transitional to CWHds1 ecosystems (references above and personal observations);
2. Approximately 10% of the Whistler Landscape Unit for the Cheakamus Community Forest (in which the RMOW is a partner) is classified as CWHds1 (Green 2010) which means it should be included in conservation planning; and,
3. The CWHds1 includes a higher proportion of at-risk, forested ecosystems than the CWHms1 (especially of Red-listed ecosystems), so it is safest to err on the side of caution during conservation planning.

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<sup>26</sup> B.C. Conservation Data Centre. 2014. Occurrence Report Summary, Shape ID: 118616, western hemlock - Douglas-fir / electrified cat's-tail moss Dry Submaritime 1. B.C. Ministry of Environment. Available: <http://maps.gov.bc.ca/ess/hm/cdc>, (accessed February 16, 2023).



## 6. Ecosystems at Risk – 2022 Updated Lists

### 6.1 Terrestrial Ecosystems at Risk in the RMOW.

The number of terrestrial ecosystems that are at risk is unchanged since 2020 (Table 6.1).<sup>27</sup> The only and very minor alteration is a name change to reflect new taxonomy for the ecosystem found in the CWHds1/08 Site Series. That ecosystem is now the *Tsuga heterophylla* - *Pseudotsuga menziesii* / *Hylocomiadelphus triquetrus* Dry Submaritime 1 in which the current genus name of *Hylocomiadelphus* replaces the previous name *Rhytidiadelphus*.

As in 2020, most (20 of 23) of the low-elevation forested ecosystems that occur in the RMOW are at-risk, including 9 out of 11 in the CWHms1, and 10 of 11 in the CWHds1 (Table 6.1).<sup>28</sup> The fact that almost all are at-risk reflects the heavy impact of past logging at lower elevations in Whistler.

The “BC FRPA” column lists three plant communities designated as Identified Wildlife under the Forest and Range Practices Act (BC MOE 2022). While this designation theoretically adds protection to them, there are few examples in which it has actually prevented logging or other development anywhere in BC.

Note that no terrestrial ecosystems are listed as at-risk for Mountain Hemlock (MH) Zone or Coastal Mountain Alpine (CMA) Zones. Given the extensive impact of logging of subalpine forests in the MH in recent decades (after low elevation forests were mostly logged out), it seems likely the CDC will eventually assess at least some as at-risk. Meanwhile, high elevation non-forested ecosystems also have yet to be thoroughly assessed.<sup>29</sup> Will Mackenzie expects to publish a high-elevation classification that matches his work on wetland ecosystems (MacKenzie and Moran 2004; Section 6) in the near future (pers. comm. in Brett and Björk 2016).

<sup>27</sup> <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre/explore-cdc-data/conservation-data-centre-updates>

<sup>28</sup> The only three terrestrial ecosystems that the CDC considers secure are: CWHds1/11 and CWHms1/10 (Lodgepole pine – Sphagnum) and CWHms1/05 (western hemlock - amabilis fir / queen's cup). Note that numbers do not add up between ecosystems at risk and the BGC units in which they are found. The reason is that the same ecosystem can occur in both the CWHds1 and CWHms1 (e.g., the Douglas-fir - western hemlock / falsebox ecosystem that

<sup>29</sup> A methodological framework has, however, been published (see MacKenzie 2012).

**Table 6.1. Terrestrial ecosystems at risk in the Whistler area as of December 31, 2022. The BGC Site Series present in the RMOW associated with each are presented in the in the first column. All of the ecosystems present in this table are forested (Green and Klinka 1994).**

BGC Site Series	Scientific Name	English Name	BC List	BC FRPA
CWHds1/01	<i>Tsuga heterophylla</i> - <i>Pseudotsuga menziesii</i> / <i>Hylocomiadelphus triquetrus</i> Dry Submaritime 1	western hemlock - Douglas-fir / electrified cat's-tail moss Dry Submaritime 1	Blue	Yes
CWHms1/01	<i>Tsuga heterophylla</i> - <i>Abies amabilis</i> / <i>Hylocomium splendens</i>	western hemlock - amabilis fir / step moss	Blue	No
CWHds1/02	<i>Pseudotsuga menziesii</i> - <i>Pinus contorta</i> / <i>Arctostaphylos uva-ursi</i> Dry Submaritime	Douglas-fir - lodgepole pine / kinnikinnick Dry Submaritime	Red	No
CWHms1/02	<i>Pseudotsuga menziesii</i> - <i>Pinus contorta</i> / <i>Arctostaphylos uva-ursi</i> Moist Submaritime	Douglas-fir - lodgepole pine / kinnikinnick Moist Submaritime	Blue	No
CWHds1/03; CWHms1/03	<i>Pseudotsuga menziesii</i> - <i>Tsuga heterophylla</i> / <i>Paxistima myrsinites</i>	Douglas-fir - western hemlock / falsebox	Blue	No
CWHds1/04	<i>Pseudotsuga menziesii</i> / <i>Acer glabrum</i> / <i>Prosartes hookeri</i>	Douglas-fir / Douglas maple / Hooker's fairybells	Red	No
CWHms1/04	<i>Abies amabilis</i> - <i>Thuja plicata</i> / <i>Gymnocarpium dryopteris</i>	amabilis fir - western redcedar / oak fern	Blue	No
CWHds1/05	<i>Thuja plicata</i> - <i>Pseudotsuga menziesii</i> / <i>Acer circinatum</i>	western redcedar - Douglas-fir / vine maple	Blue	Yes
CWHds1/06	<i>Tsuga heterophylla</i> / <i>Clintonia uniflora</i>	western hemlock / queen's cup	Red	No
CWHms1/06	<i>Abies amabilis</i> - <i>Thuja plicata</i> / <i>Oplopanax horridus</i> Moist Submaritime	amabilis fir - western redcedar / devil's club Moist Submaritime	Blue	No
CWHds1/07	<i>Thuja plicata</i> / <i>Oplopanax horridus</i>	western redcedar / devil's club	Blue	Yes
CWHms1/07	<i>Picea sitchensis</i> / <i>Rubus spectabilis</i> Moist Submaritime	Sitka spruce / salmonberry Moist Submaritime	Red	
CWHds1/08	<i>Picea sitchensis</i> / <i>Rubus spectabilis</i> Dry	Sitka spruce / salmonberry Dry	Red	No
CWHds1/09; CWHms1/08	<i>Populus trichocarpa</i> - <i>Alnus rubra</i> / <i>Rubus spectabilis</i>	black cottonwood - red alder / salmonberry	Blue	No
CWHms1/09	<i>Populus trichocarpa</i> / <i>Salix sitchensis</i> - <i>Rubus parviflorus</i>	black cottonwood / Sitka willow - thimbleberry	Red	No
CWHds1/10	<i>Populus trichocarpa</i> / <i>Salix</i> spp. Dry Submaritime	black cottonwood / willows Dry Submaritime	Blue	No
CWHds1/12; CWHds1/Ws54; CWHms1/11; CWHms1/Ws54	<i>Thuja plicata</i> - <i>Picea sitchensis</i> / <i>Lysichiton americanus</i>	western redcedar - Sitka spruce / skunk cabbage	Blue	No

## 6.2 Wetland Ecosystems at Risk in the RMOW

The classification of wetland ecosystems in BC is much more recent, and arguably more complex, than the classification of terrestrial ecosystems. The classification used by the CDC as the basis of its threat assessments is less than 20 years old (MacKenzie and Moran 2004). Since that publication was not available during the preparation of Whistler's Terrestrial Ecosystem Mapping (TEM; Green 2004), it means that the wetland units used by the CDC and those mapped in Whistler are not the same. As a result, it is not possible at this time to confirm with certainty the presence of wetland ecosystems listed as at-risk by the CDC.

In spite of this challenge, previous versions of this report compared Red- and Blue-listed ecosystems that could occur in Whistler with units defined by Green (2004). Green relied on his own field work in Whistler, and also on two previous studies that described wetland units that occur throughout southwest BC (Klinka et al. 1997; Brett 2001). Equivalents for two at-risk ecosystems listed by the CDC were thereby included in previous versions of this report (Table 6.1), and the CDC rankings for these have not changed. These first two units, as well as two additional that were also returned by Search 2 (Section 5.1), are discussed individually below.

**Table 6.2. Tentative list of wetland ecosystems at risk in Whistler.**

In 2020 Report?	BGC Unit(s)	Scientific Name	English Name	BC List
No	Wf13 (ESSF, MS, SBS)	<i>Eriophorum angustifolium</i> - <i>Carex limosa</i>	narrow-leaved cotton-grass - shore sedge	Blue
No	Wm02 (BG, BWBS, ESSF, ICH, IDF, MS, PP, SBPS, SBS)	<i>Equisetum fluviatile</i> - <i>Carex utriculata</i>	swamp horsetail - beaked sedge	Blue
Yes	CWH/Wm04	<i>Eleocharis palustris</i> Herbaceous Vegetation	common spike-rush Herbaceous Vegetation	Blue
Yes	CWH/Ws51	<i>Salix sitchensis</i> - <i>Salix lasiandra</i> var. <i>lasiandra</i> / <i>Lysichiton americanus</i>	Sitka willow - Pacific willow / skunk cabbage	Red

The terminology for Biogeoclimatic (BGC) wetland units follows conventions in MacKenzie and Moran (2004). As an example, CWH/Wm04 (the common spike-rush Herbaceous Vegetation unit) is coded as follows:

- It occurs in the CWH Zone, but without the edaphic grid (Soil Nutrient by Soil Moisture gradient) that is the basis of Site Series (cf. Green and Klinka 1994).
- Wf02 refers to an ecosystem in the Wetland realm (W) and Fen (f) group, as described in MacKenzie and Moran (2004, p. 15). The numbers following the codes for realm and group (e.g., "13") identify the Site Association. Two other wetland groups are included in Table 6.2: Wm = Wetland marsh; and Ws = Wetland swamp.

Each of the four wetland ecosystems returned by Search 2 (Table 6.2) is discussed below. Even though I conclude they should all tentatively be included as wetland ecosystems that occur or could occur in Whistler, field work will be necessary to confirm their presence, as well as the possible presence of other listed wetland ecosystems not returned by CDC searches. Of the four, the Wm02 (Swamp horsetail – beaked sedge) wetland ecosystem is least likely to occur in the Whistler area, though a more thorough understanding of its characteristics would need to be compared.

### Narrow-leaved cotton-grass - shore sedge (Wf13)

MacKenzie and Moran (2004) describe this ecosystem as occurring in the Engelmann Spruce – Subalpine fir Zone (ESSF) in depressions or gradual seepage slopes and at elevations from 1200 to 1800 m. Two locations recorded by the Whistler Biodiversity Project (Brett 2022) have both species: Brandywine basalt ponds and the Wildlife Refuge. Both sites are at lower elevations (505 m and 635 m, respectively) than those referenced by MacKenzie and Moran but may still meet criteria for this unit. High elevation sites in Whistler could also potentially also have the requisite characteristics, though I found no documentation of any yet. Narrow-leaved cotton-grass (*Eriophorum angustifolium*) has been recorded from treeline at Black Tusk, and an alternate associate described by MacKenzie and Moran (poor sedge; *Carex magellanica*) has been recorded at two, similar high elevation sites on Whistler and Blackcomb Mountains (Brett 2022). In the absence of more data, this unit can tentatively be considered analogous to Green's (2004, pp. 11 and 21) *Carex-Eriophorum* unit that describes ecological conditions that are very similar to those described for Wf13. In addition, Green's *Carex-Eriophorum* was in turn based on Brett et al.'s (2001) "*Eriophorum angustifolium* order," a wetland unit that included sampling in the Whistler area.

**Swamp horsetail - beaked sedge (Wm02)**

MacKenzie and Moran (2004) describe this ecosystem as uncommon at lower elevations in the BC Interior in protected bays of large lakes and sediment-laden, low-gradient streams (p. 109). Swamp horsetail (*Equisetum fluviatile*) is common in valleybottom lakes such as Alta and Alpha Lakes, as well as the Wildlife Refuge. Beaked sedge (*Carex utriculata*), however, has not been recorded in Whistler to date and is unlikely given its upper elevational range of 300m (CDC 2022). Although similar horsetail-dominated ecosystems that include other sedge (*Carex*) species are present in Whistler, they therefore appear not to be an exact match for the Wm02 unit listed by the CDC. Green (2004, p. 12) described an *Equisetum* unit that occurs on lakeshore fringes in shallow water (site code 36, p. 21). He also notes very limited distribution of this unit, for example at Rainbow Park. Given the information available, I consider the Wm02 wetland ecosystem unlikely in the RMOW.

**Common spike-rush Herbaceous Vegetation (Wm04)**

MacKenzie and Moran (2004) describe this ecosystem as “widely distributed throughout the Interior at elevations below 1300 m” on the shore of lakes and slow-moving rivers (p. 111). I have seen similar plant associations in shallow parts of the Alta Lake shoreline and at the Brandywine basalt flats (among other locations). Green (2004) does not appear to describe a directly comparable unit so the local status of the Wm04 ecosystem is therefore unclear at present.

**Sitka willow - Pacific willow / skunk cabbage (Ws51)**

Mackenzie and Moran (2004) describe this wetland ecosystem from shallow water in low-elevation floodplain forests and wetlands. There are sites in Whistler that appear to meet the criteria for this unit in the Emerald Forest and at the south end of the Chateau Golf Course (among other locations). Green’s Alder/Willow – Skunk Cabbage site unit<sup>30</sup> appears to be an exact match.<sup>31</sup>

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<sup>30</sup> Coded as “DrWi-Skunk Cabbage.”

<sup>31</sup> Note that Green based his unit on Klinka et al.’s (1997) “*Lysichitum*<sup>31</sup>-*Salix* inundated alluvial site” (Green 2004, p. 21).

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- Baines, Heather. Bird expert and co-author of the Whistler bird checklist, Whistler Naturalists, Whistler, BC. Personal communications by telephone and email.
- Björk, Curtis. Botanist and Lichenologist, Enlivened Consulting, Clearwater, BC. Personal communications in person, by phone, and by email.
- Ceska, Adolf. Botanist and mycologist, Ceska Geobotanical Consulting, Victoria, BC and former botanist with the CDC. Personal communications by email and telephone.
- Crowe, Eric. Angler, fish historian, and naturalist, Whistler, BC. Personal communications by email and telephone.
- Forsyth, Robert. Malacologist (expert in snails, slugs, and other molluscs) and author of Land snails of British Columbia (Forsyth 2004), Smithers, BC. Personal communications by email.
- Green, Bob. Ecologist and Terrestrial Ecosystem Mapping specialist, BA Blackwell & Assoc., Vancouver, BC. Personal communication by email and telephone.
- Guppy, Crispin. Lepidopterist (butterfly expert) and lead author of Butterflies of British Columbia (Guppy and Shepard 2001). Senior Biologist, Ecofor Consulting BC Ltd., Whitehorse, Yukon. Personal communications by email.
- Hobbs, Jared. Species at Risk Biologist and lead author of many reports on Spotted Owl and other species, Pender Island, BC. Consulted frequently by phone and email regarding Coastal Tailed Frogs, Northern Spotted Owl, other species, and relevant government processes. Most recent communication on Feb. 5, 2023.
- Joya, Steve. Bryologist (expert in mosses and liverworts), UBC Herbarium, Beaty Biodiversity Museum, Vancouver, BC. Personal communications via email.
- Klinka, Karel. Emeritus Professor in Forest Ecology at the University of BC and co-author of many publications on Biogeoclimatic (BGC) Ecosystem Classification in BC (e.g., Green and Klinka 1994; Brett et al. 2001), Vancouver, BC. Personal communications between 1992 and 2002.
- Knopp, Denis. Field biologist with numerous specialties including species at risk, Wild Heritage Environmental Consultants and Chilliwack Field Naturalists, Chilliwack, BC. Personal communications by email.
- Lausen, Cori. Bat biologist, Birchdale Ecological Ltd, Kaslo, BC. Personal communications and unpublished data.
- Lee, Olivia. Bryologist (expert in mosses and liverworts), UBC Herbarium, Beaty Biodiversity Museum, Vancouver, BC. Many communications via email.
- Mackenzie, Will. Research Ecologist, BC Min. of Forest, Lands and Nat. Res. Op., lead author of Wetlands of BC, and lead scientist assessing high-elevation ecosystems for the CDC, Smithers, BC. Personal communications by email.
- Marven, Derrick. Amateur lepidopterist, dragonfly expert, and bird expert, Cowichan Valley Naturalists, Duncan, BC. Personal communications in person and by phone and email.
- Matsuda, Brent. Herpetologist, ornithologist, and field biologist. Biodiversity West Environmental Consulting, Burnaby, BC. Personal communications in person, by phone, and by email.
- Needham, Karen. Entomologist and Curator of the Spencer Entomological Collection, Beaty Biodiversity Museum, UBC, Vancouver, BC. Personal communications by email.
- Ricker, Karl. Bird expert and lead author of the Whistler bird checklist, Whistler Naturalists, Whistler, BC. Personal communications by telephone, in person, and via printed materials. Most recent communication on Feb. 5, 2023.
- Rochetta, Steve. Ecosystem Biologist and mammal expert, BC Min. of Forests, Lands, and Natural Resource Operations, Brackendale, BC. Personal communications by email and telephone.
- Stinson, Christopher. Biologist and Curatorial Assistant for mammals, reptiles, and amphibians, Cowan Tetrapod Collection, Beaty Biodiversity Museum, UBC, Vancouver, BC. Personal communications by email and in person.
- Wind, Elke. Research herpetologist specializing in amphibians, E. Wind Consulting, Nanaimo, BC. Personal communications in person and by phone and email.
- Woodruff, Veronica. Fish specialist, naturalist, Project Manager, Ecofish Research Ltd., Pemberton, B.C. Personal communication by email.

## Appendix A. Species and Ecosystems at Risk Definitions

Term	Definition
Federal Definitions <sup>8</sup> (COSEWIC and the Species At Risk Act [SARA] use same rankings. COSEWIC is not a legal listing; the legal list is under SARA)	
Extinct	A species that no longer exists.
Extirpated	A species that no longer exists in its native habitat, but may occur elsewhere.
Endangered	A species facing imminent extinction or extirpation. *
Threatened	A species that is likely to become endangered if limiting factors such as diminishing population sizes, isolated geographic distribution, and habitat threats are not reversed. *
Special Concern	A species of special concern because of characteristics that make it is particularly sensitive to human activities or natural events.
Not at Risk	A species that has been evaluated and found to be not at risk.
Data Deficient	A species for which there is insufficient scientific information to support status designation.
Provincial Definitions <sup>9</sup>	
Endangered Species (legal list under BC Wildlife Act)	A species of wildlife that is threatened with imminent extinction throughout all or a significant portion of its range in British Columbia because of the action of humans, not including controlled alien species. Only 3 species are legally listed as endangered under the BC Wildlife Act: Vancouver Island Marmot, American White Pelican and Burrowing Owl.
Threatened Species (legal list under BC Wildlife Act)	A species of wildlife that is likely to become endangered in British Columbia if the factors affecting its vulnerability are not reversed, not including controlled alien species. Only 1 species is legally listed as threatened under the BC Wildlife Act: Sea Otter.
Forest and Range Practices Act (Identified Wildlife Management Strategy)	B.C. designates both species and ecological communities under FRPA. There are 62 animal species, 2 plant species and 17 ecological communities provincially designated.
BC Ministry of Environment Conservation Data Centre Red list (not a legal list)	The list of ecological communities and indigenous species and subspecies that are extirpated, endangered or threatened in BC. They may or may not be considered candidates for provincial legal designations under the Wildlife Act or under FRPA. There are 98 species and 54 ecological communities on the CDC's red list in the South Coast. Although no species are actually listed as endangered or threatened under the Wildlife Act, individual vertebrates receive protection under the Wildlife Act (see above).
BC Ministry of Environment Conservation Data Centre Blue list (not a legal list)	The list of ecological communities and indigenous species and subspecies of special concern in BC. There are 177 species and 50 ecological communities blue-listed in the South Coast.

<sup>8</sup> Government of Canada Environment Canada. 2014. <[http://www.sararegistry.gc.ca/about/glossary/default\\_e.cfm](http://www.sararegistry.gc.ca/about/glossary/default_e.cfm)>

<sup>9</sup> Government of British Columbia Ministry of Environment. Ecosystems Branch. 2014. <<http://www.env.gov.bc.ca/atrisk/index.html>>

Source: Bedore 2014, p. 8 and SCCP 2016, used with permission of the SCCP (P. Zevit, pers. comm.).



## Appendix B. CDC Online Search 5 (Whistler + Lowest BGC Unit; Section 2.3)

RMOW Status	Group	Scientific Name	Common Name	BC List	COSEWIC / SARA	BC FRPA
Confirmed	I-Butterfly	<i>Callophrys eryphon sheltonensis</i>	Western Pine Elfin, <i>sheltonensis</i> ssp.	Blue		
Confirmed	I-Butterfly	<i>Euphyes vestris</i>	Dun Skipper	Blue	T/	
Confirmed	I-Butterfly	<i>Parnassius clodius pseudogallatinus</i>	Clodius Parnassian, <i>pseudogallatinus</i> ssp.	Blue		
Confirmed	I-Dragonfly	<i>Pachydiplax longipennis</i>	Blue Dasher	Blue		
Confirmed	P-Vascular	<i>Pinus albicaulis</i>	whitebark pine	Blue	E/E	
Confirmed	V - Fish	<i>Salvelinus confluentus</i> pop. 28	Bull Trout - South Coast Pop.	Blue	SC/SC	
Confirmed	V-Amphibian	<i>Anaxyrus boreas</i>	Western Toad	Yellow	SC/SC	
Confirmed	V-Amphibian	<i>Ascaphus truei</i>	Coastal Tailed Frog	Yellow	SC/SC	Yes
Confirmed	V-Amphibian	<i>Rana aurora</i>	Northern Red-legged Frog	Blue	SC/SC	Yes
Confirmed	V-Bird	<i>Accipiter gentilis laingi</i>	Northern Goshawk, <i>laingi</i> ssp.	Red	T/	Yes
Confirmed	V-Bird	<i>Ardea herodias fannini</i>	Great Blue Heron, <i>fannini</i> ssp.	Blue	SC/SC	Yes
Confirmed	V-Bird	<i>Butorides virescens</i>	Green Heron	Blue		
Confirmed	V-Bird	<i>Chordeiles minor</i>	Common Nighthawk	Blue	SC/T	
Confirmed	V-Bird	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Yellow	SC/SC	
Confirmed	V-Bird	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Yellow	SC/T	
Confirmed	V-Bird	<i>Cypseloides niger</i>	Black Swift	Blue	E/E	
Confirmed	V-Bird	<i>Hirundo rustica</i>	Barn Swallow	Yellow	SC/T	
Confirmed	V-Bird	<i>Megascops kennicottii kennicottii</i>	Western Screech-Owl, <i>kennicottii</i> ssp.	Blue	T/	
Confirmed	V-Bird	<i>Patagioenas fasciata</i>	Band-tailed Pigeon	Blue	SC/SC	
Confirmed	V-Mammal	<i>Gulo gulo luscus</i>	Wolverine, <i>luscus</i> ssp.	Blue	SC/SC	Yes
Confirmed	V-Mammal	<i>Lasiurus cinereus</i>	Hoary Bat	Blue		
Confirmed	V-Mammal	<i>Myotis lucifugus</i>	Little Brown Myotis	Blue	E/E	
Confirmed	V-Mammal	<i>Myotis yumanensis</i>	Yuma Myotis	Blue		
Confirmed	V-Mammal	<i>Oreamnos americanus</i>	Mountain Goat	Blue		
Confirmed	V-Mammal	<i>Ursus arctos</i>	Grizzly Bear	Blue	SC/SC	Yes
Likely	F-Lichen	<i>Nephroma isidiosum</i>	pebbled paw	Blue		
Likely	F-Lichen	<i>Scytinium californicum</i>	midlife vinyl	Blue		
Likely	I-Dragonfly	<i>Tanypteryx hageni</i>	Black Petaltail	Blue		
Likely	V-Mammal	<i>Cervus elaphus roosevelti</i>	Roosevelt Elk	Blue		
Migratory	V-Bird	<i>Aechmophorus occidentalis</i>	Western Grebe	Red	SC/SC	
Migratory	V-Bird	<i>Hydroprogne caspia</i>	Caspian Tern	Blue	NAR	
Migratory	V-Bird	<i>Larus californicus</i>	California Gull	Red		
Migratory	V-Bird	<i>Melanitta perspicillata</i>	Surf Scoter	Blue		
Migratory	V-Bird	<i>Numenius americanus</i>	Long-billed Curlew	Yellow	SC/SC	Yes
Migratory	V-Bird	<i>Podiceps nigricollis</i>	Eared Grebe	Blue		
Possible	F-Lichen	<i>Nephroma occultum</i>	cryptic paw	Blue	T/	
Possible	I-Butterfly	<i>Callophrys johnsoni</i>	Johnson's Hairstreak	Red	SC/	Yes
Possible	I-Butterfly	<i>Erynnis propertius</i>	Propertius Duskywing	Red		
Possible	I-Butterfly	<i>Parnassius clodius claudianus</i>	Clodius Parnassian, <i>claudianus</i> ssp.	Blue		
Possible	M-Clam (FW)	<i>Sphaerium striatinum</i>	Striated Fingernailclam	Blue		
Possible	M-Snail (FW)	<i>Physella propinqua</i>	Rocky Mountain Physa	Blue		
Possible	M-Snail (FW)	<i>Physella virginea</i>	Sunset Physa	Blue		
Possible	P-Vascular	<i>Bidens amplissima</i>	Vancouver Island beggarticks	Blue	SC/SC	
Possible	V-Bird	<i>Brachyramphus marmoratus</i>	Marbled Murrelet	Blue	T/	Yes
Possible	V-Bird	<i>Falco peregrinus anatum</i>	Peregrine Falcon, <i>anatum</i> ssp.	Red	NAR/SC	
Possible	V-Mammal	<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	Blue		
Possible	V-Reptile	<i>Charina bottae</i>	Northern Rubber Boa	Yellow	SC/SC	
Data Deficient	V - Fish	<i>Oncorhynchus clarkii clarkii</i>	Cutthroat Trout, <i>clarkii</i> ssp.	Blue		
Extirpated	V-Bird	<i>Strix occidentalis</i>	Spotted Owl	Red	E/E	Yes
Accidental	V-Bird	<i>Asio flammeus</i>	Short-eared Owl	Blue	T/	Yes
Accidental	V-Bird	<i>Botaurus lentiginosus</i>	American Bittern	Blue		



## Appendix B (cont.). CDC Online Search 5

RMOW Status	Group	Scientific Name	Common Name	BC List	COSEWIC / SARA	BC FRPA
Accidental	V-Bird	<i>Buteo lagopus</i>	Rough-legged Hawk	Blue	NAR	
Accidental	V-Bird	<i>Euphagus carolinus</i>	Rusty Blackbird	Blue	SC/SC	
Accidental	V-Bird	<i>Falco mexicanus</i>	Prairie Falcon	Red	NAR	Yes
Accidental	V-Bird	<i>Icteria virens</i>	Yellow-breasted Chat	Red	E/E	Yes
Accidental	V-Bird	<i>Limnodromus griseus</i>	Short-billed Dowitcher	Blue		
Accidental	V-Bird	<i>Melanerpes lewis</i>	Lewis's Woodpecker	Blue	T/	Yes
Accidental	V-Bird	<i>Melanitta americana</i>	Black Scoter	Blue		
Accidental	V-Bird	<i>Nannopterum auritum</i>	Double-crested Cormorant	Blue	NAR	
Accidental	V-Bird	<i>Pelecanus erythrorhynchos</i>	American White Pelican	Red	NAR	Yes
Accidental	V-Bird	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Blue	SC/SC	
Accidental	V-Bird	<i>Pluvialis dominica</i>	American Golden-Plover	Blue		
Accidental	V-Bird	<i>Progne subis</i>	Purple Martin	Blue		
Accidental	V-Bird	<i>Sterna forsteri</i>	Forster's Tern	Red	DD/	
Accidental	V-Bird	<i>Tringa incana</i>	Wandering Tattler	Blue		
Accidental	V-Bird	<i>Tyto alba</i>	Barn Owl	Blue	T/	
Unlikely	I-Beetle	<i>Cicindela hirticollis</i>	Hairy-necked Tiger Beetle	Blue		
Unlikely	I-Butterfly	<i>Cercyonis pegala incana</i>	Common Wood-nymph, <i>incana</i> ssp.	Red		
Unlikely	I-Butterfly	<i>Epargyreus clarus californicus</i>	Silver-spotted Skipper, <i>californicus</i> ssp.	Blue [Red]		
Unlikely	I-Dragonfly	<i>Argia emma</i>	Emma's Dancer	Blue		
Unlikely	I-Dragonfly	<i>Argia vivida</i>	Vivid Dancer	Blue	SC/SC	
Unlikely	I-Dragonfly	<i>Sympetrum vicinum</i>	Autumn Meadowhawk	Blue		
Unlikely	M-Clam (FW)	<i>Sphaerium patella</i>	Rocky Mountain Fingernailclam	Red		
Unlikely	M-Snail (FW)	<i>Galba bulimoides</i>	Prairie Fossaria	Blue		
Unlikely	M-Snail (FW)	<i>Galba dalli</i>	Dusky Fossaria	Blue		
Unlikely	M-Snail (FW)	<i>Galba parva</i>	Pygmy Fossaria	Blue		
Unlikely	M-Snail (FW)	<i>Gyraulus crista</i>	Star Gyro	Blue		
Unlikely	M-Snail (FW)	<i>Planorbula campestris</i>	Meadow Rams-horn	Blue		
Unlikely	M-Snail (FW)	<i>Stagnicola traski</i>	Widelip Pondsnailed	Blue		
Unlikely	P-Moss	<i>Brotherella roellii</i>	Roell's brotherella	Red	E/E	
Unlikely	P-Moss	<i>Bryoerythrophyllum columbianum</i>	Columbian carpet moss	Blue	SC/SC	
Unlikely	P-Moss	<i>Fissidens pauperculus</i>	poor pocket moss	Red	E/E	
Unlikely	P-Vascular	<i>Anemone drummondii</i> var. <i>drummondii</i>	alpine anemone	Blue		
Unlikely	P-Vascular	<i>Polemonium elegans</i>	elegant Jacob's-ladder	Red		
Unlikely	P-Vascular	<i>Scrophularia lanceolata</i>	lance-leaved figwort	Blue		
Unlikely	P-Vascular	<i>Viola purpurea</i> var. <i>venosa</i>	purple-marked yellow violet	Blue		
Unlikely	V-Bird	<i>Bartramia longicauda</i>	Upland Sandpiper	Red		
Unlikely	V-Bird	<i>Branta bernicla</i>	Brant	Blue		
Unlikely	V-Bird	<i>Chondestes grammacus</i>	Lark Sparrow	Blue		
Unlikely	V-Bird	<i>Falco rusticolus</i>	Gyr Falcon	Blue	NAR	
Unlikely	V-Bird	<i>Limosa haemastica</i>	Hudsonian Godwit	Red	T/	
Unlikely	V-Bird	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	Red		
Unlikely	V-Bird	<i>Oreoscoptes montanus</i>	Sage Thrasher	Red	E/E	Yes
Unlikely	V-Bird	<i>Recurvirostra americana</i>	American Avocet	Blue		
Unlikely	V-Mammal	<i>Sorex bendirii</i>	Pacific Water Shrew	Red	E/E	Yes
Unlikely	V-Reptile	<i>Contia tenuis</i>	Common Sharp-tailed Snake	Red	E/T/E	
Highly Unlikely	I-Beetle	<i>Omus audouini</i>	Audouin's Night-stalking Tiger Beetle	Red	T/	
Highly Unlikely	I-Butterfly	<i>Chlosyne hoffmanni</i>	Hoffman's Checkerspot	Red		
Highly Unlikely	I-Butterfly	<i>Danaus plexippus</i>	Monarch	Red	E/SC	
Highly Unlikely	I-Butterfly	<i>Hesperia colorado oregonia</i>	Western Branded Skipper, <i>oregonia</i> ssp.	Red	E/	
Highly Unlikely	I-Butterfly	<i>Papilio indra</i>	Indra Swallowtail	Red		
Highly Unlikely	I-Butterfly	<i>Speyeria zerene bremnerii</i>	Zerene Fritillary, <i>bremnerii</i> ssp.	Red		

## Appendix B (cont.). CDC Online Search 5

RMOW Status	Group	Scientific Name	Common Name	BC List	COSEWIC / SARA	BC FRPA
Highly Unlikely	I-Dragonfly	<i>Enallagma clausum</i>	Alkali Bluet	Blue		
Highly Unlikely	I-Dragonfly	<i>Erythemis collocata</i>	Western Pondhawk	Blue		
Highly Unlikely	I-Dragonfly	<i>Octogomphus specularis</i>	Grappletail	Red	SC/	
Highly Unlikely	I-Dragonfly	<i>Ophiogomphus occidentis</i>	Sinuous Snaketail	Blue		
Highly Unlikely	M-Clam (FW)	<i>Sphaerium occidentale</i>	Herrington Fingernailclam	Blue		
Highly Unlikely	M-Slug	<i>Hemphillia camelus</i>	Pale Jumping-slug	Blue		
Highly Unlikely	M-Snail (Terr.)	<i>Allogona townsendiana</i>	Oregon Forestsnail	Red	E/E	
Highly Unlikely	M-Snail (Terr.)	<i>Carychium occidentale</i>	Western Thorn	Blue		
Highly Unlikely	M-Snail (Terr.)	<i>Cryptomastix devia</i>	Puget Oregonian	Red	XT/XT	
Highly Unlikely	P-Vascular	<i>Actaea elata</i> var. <i>elata</i>	tall bugbane	Red	E/E	Yes
Highly Unlikely	P-Vascular	<i>Eleocharis nitida</i>	slender spike-rush	Blue		
Highly Unlikely	P-Vascular	<i>Elmera racemosa</i>	elmera	Red		
Highly Unlikely	P-Vascular	<i>Mitellastrum caulescens</i>	leafy mitrewort	Blue		
Highly Unlikely	V - Fish	<i>Catostomus</i> sp. 4	Salish Sucker	Red	T/	
Highly Unlikely	V - Fish	<i>Rhinichthys cataractae</i> - <i>Chehalis</i> lineage	Nooksack Dace	Red	E/E	
Highly Unlikely	V - Fish	<i>Spirinchus</i> sp. 1	Pygmy Longfin Smelt	Red	DD/	
Highly Unlikely	V-Amphibian	<i>Dicamptodon tenebrosus</i>	Coastal Giant Salamander	Blue	T/	Yes
Highly Unlikely	V-Amphibian	<i>Rana pretiosa</i>	Oregon Spotted Frog	Red	E/E	
Highly Unlikely	V-Bird	<i>Aeronautus saxatalis</i>	White-throated Swift	Blue		
Highly Unlikely	V-Bird	<i>Ammospiza nelsoni</i>	Nelson's Sparrow	Red	NAR	Yes
Highly Unlikely	V-Bird	<i>Calcarius pictus</i>	Smith's Longspur	Blue		
Highly Unlikely	V-Bird	<i>Calidris canutus</i>	Red Knot	Blue	T/	
Highly Unlikely	V-Bird	<i>Cardellina canadensis</i>	Canada Warbler	Blue	SC/T	
Highly Unlikely	V-Bird	<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	Red		
Highly Unlikely	V-Bird	<i>Dolichonyx oryzivorus</i>	Bobolink	Red	SC/T	
Highly Unlikely	V-Bird	<i>Eremophila alpestris strigata</i>	Horned Lark, <i>strigata</i> ssp.	Red	E/E	
Highly Unlikely	V-Bird	<i>Fratercula cirrhata</i>	Tufted Puffin	Blue		
Highly Unlikely	V-Bird	<i>Fulmarus glacialis</i>	Northern Fulmar	Red		
Highly Unlikely	V-Bird	<i>Ptychoramphus aleuticus</i>	Cassin's Auklet	Red	SC/SC	Yes
Highly Unlikely	V-Bird	<i>Setophaga virens</i>	Black-throated Green Warbler	Blue		Yes
Highly Unlikely	V-Bird	<i>Synthliboramphus antiquus</i>	Ancient Murrelet	Blue	SC/SC	Yes
Highly Unlikely	V-Bird	<i>Uria aalge</i>	Common Murre	Red		
Highly Unlikely	V-Mammal	<i>Aplodontia rufa</i>	Mountain Beaver	Yellow	SC/SC	
Highly Unlikely	V-Mammal	<i>Lepus americanus washingtonii</i>	Snowshoe Hare, <i>washingtonii</i> ssp.	Red		
Highly Unlikely	V-Mammal	<i>Mustela frenata altifrontalis</i>	Long-tailed weasel, <i>altifrontalis</i> ssp.	Red		
Highly Unlikely	V-Mammal	<i>Myodes gapperi occidentalis</i>	Southern Red-backed Vole, <i>occidentalis</i> ssp.	Red		
Highly Unlikely	V-Mammal	<i>Scapanus townsendii</i>	Townsend's Mole	Red	E/E	
Highly Unlikely	V-Mammal	<i>Sorex rohweri</i>	Olympic Shrew	Red		
Highly Unlikely	V-Mammal	<i>Sorex trowbridgii</i>	Trowbridge's Shrew	Blue		
Highly Unlikely	V-Reptile	<i>Chrysemys picta</i> pop. 1	Painted Turtle - Pacific Coast pop.	Red	T/	
Highly Unlikely	V-Reptile	<i>Pituophis catenifer catenifer</i>	Gophersnake, <i>catenifer</i> ssp.	Red	XT/XT	
Not Possible	M-Marine	<i>Haliotis kamtschatkana</i>	Northern Abalone	Red	E/E	
Not Possible	V - Fish	<i>Acipenser medirostris</i>	Green Sturgeon	Blue	SC/SC	
Not Possible	V - Fish	<i>Acipenser transmontanus</i>	White Sturgeon	No Status	E/T/E	
Not Possible	V - Fish	<i>Acipenser transmontanus</i> pop. 4	White Sturgeon (Lower Fraser River pop.)	Red	T/	
Not Possible	V - Fish	<i>Cottus aleuticus</i> pop. 1	Coastrange Sculpin, Cultus pop.	Red	E/T	
Not Possible	V - Fish	<i>Thaleichthys pacificus</i>	Eulachon	Blue	E/T/	
Not Possible	V-Mammal	<i>Eumetopias jubatus</i>	Steller Sea Lion	Blue	SC/SC	
Not Possible	V-Reptile	<i>Actinemys marmorata</i>	Northwestern Pond Turtle	Red	XT/XT	

## Appendix C. Assessment Rationale for Species at Risk in the RMOW<sup>32</sup>

**Table C.1. Resident species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
F-Lichen	<i>Alectoria imshaugii</i> (spiny witch's hair)	CWHwh	One record from Brandywine Provincial Park (C. Björk in Brett 2022)	Infrequent on low elevation conifers (Goward 1994, McCune and Geiser 2009).
F-Lichen	<i>Nodobryoria subdivergens</i> (alpine redhead)	no data	One 1994 record from Whistler alpine (T. Goward in Brett 2022),	On rocks and trees at treeline (Goward et al. 1994). "On rock, soil, or alpine sod" (McCune and Geiser 2009).
F-Lichen	<i>Umbilicaria decussata</i> (electric rocktripe)	BAFA; MS	Three local records on granitic rock in exposed alpine sites (Brett 2022).	The UBC Beaty collection includes only two old records, one from SE BC in 1957) and one from Spatsizi Plateau in 1975 (UBC Beaty 2022).
F-Macrofungus	<i>Amanita augusta</i> (western yellow-veil amanita)	no data	Low-elevation coniferous forest (Brett 2022).	Uncommon in older conifer and mixedwood forests (MacKinnon and Luther 2021).
F-Macrofungus	<i>Amanita smithiana</i> (Smith's amanita)	no data	Low-elevation coniferous forest (Brett 2022).	Coniferous forests, often in or near rotting wood (Klinkenberg 2022b).
F-Macrofungus	<i>Arrhenia acerosa</i> (moss oysterling)	no data	One low-elevation record without habitat notes (Brett 2022).	On mosses (especially <i>Dicranum</i> spp.) in a variety of sites including coniferous forests (Redhead in Klinkenberg 2022b).
F-Macrofungus	<i>Arrhenia obscurata</i>	no data	Low-elevation coniferous forest (Brett 2022).	Sandy soil or sometimes moss (Klinkenberg 2022b).
F-Macrofungus	<i>Atheniella flavoalba</i> (ivory bonnet)	no data	Low-elevation coniferous forest (Brett 2022).	On conifer needle beds (Beug 2021).
F-Macrofungus	<i>Baeospora myriadophylla</i> (lavender baeospora)	no data	One record with no habitat data (Brett 2022).	"Hardwood logs and stumps, and less often on conifer wood and forest floor litter" (Trudell and Ammirati 2009). On decayed <i>Abies</i> logs sometimes at higher elevations (Castellano in Klinkenberg 2022b).
F-Macrofungus	<i>Bjerkandera adusta</i> (smoky polypore)	no data	One low-elevation record without habitat notes (Brett 2022).	Much more common on hardwoods than conifers (Ginns 2017).
F-Macrofungus	<i>Boletopsis grisea</i> (grey false bolete)	no data	Low-elevation coniferous forest (Brett 2022).	More common in coniferous than hardwood forests (MacKinnon and Luther 2021)
F-Macrofungus	<i>Boletopsis leucomelaena</i> (black false bolete)	no data	No habitat data (Brett 2022).	"[G]enerally a spruce associate" (Klinkenberg 2022b; MacKinnon and Luther 2021).
F-Macrofungus	<i>Boletus barrowsii</i> (white king bolete)	no data	Low-elevation coniferous forest (Brett 2022).	Local species that could have mycorrhizal associations include spruce and true firs (Winkler 2023).
F-Macrofungus	<i>Boletus coniferarum</i> (bitter bolete)	no data	The only specimens documented to date were in mid elevation, old-growth forest (Brett 2022).	Under conifers (Klinkenberg 2022b).
F-Macrofungus	<i>Bonomyces sinopicus</i> (brick-red clitocybe)	no data	Four records from low to high elevation (Brett 2022).	On sandy soil and/or beside roads or paths (Klinkenberg 2022b).
F-Macrofungus	<i>Cantharellus roseocanus</i> (rainbow chanterelle)	no data	Coniferous forest at low to middle elevations (Brett 2022).	Most common under spruce or pine in wetter old-growth sites (MacKinnon and Luther 2021).
F-Macrofungus	<i>Cantharellus subalbidus</i> (white chanterelle)	no data	Low-elevation coniferous forest (Brett 2022).	Typically under conifers, especially Douglas-fir and hemlock (Klinkenberg 2022b).

<sup>32</sup> See following sections for rationales for other classifications: Unlikely (3.8) , Highly Unlikely (3.9), and Not Possible (3.10).

**Table C.1 (cont.). Resident species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
F-Macrofungus	<i>Cerioporus varius</i> (lead-coloured puffball)	no data	Low-elevation coniferous forest (Brett 2022).	Grass, including meadows and pastures (Arora in Klinkenberg 2022b).
F-Macrofungus	<i>Chamonixia caespitosa</i> (false truffle)	no data	Low-elevation coniferous forest (Brett 2022).	Grows underground under most conifers that occur in Whistler (e.g., spruce, true fir, hemlocks, and Douglas-fir; Klinkenberg 2022b).
F-Macrofungus	<i>Cheilymenia fimicola</i> (orange cup fungus)	no data	One record from Whistler Mt. alpine (Brett 2022).	Grows on "dung, rich soil, and plant debris" (Trudell and Ammirati 2009).
F-Macrofungus	<i>Chlorociboria aeruginosa</i> (blue stain fungus)	no data	Low-elevation coniferous forest (Brett 2022).	Decayed, barkless wood (Klinkenberg 2022b); usually hardwoods but sometimes conifers (MacKinnon and Luther 2021).
F-Macrofungus	<i>Chroogomphus ochraceus</i> (ochre pine spike)	no data	Low-elevation coniferous forest (Brett 2022).	Under conifers (Klinkenberg 2022b).
F-Macrofungus	<i>Chroogomphus vinicolor</i> (wine-coloured pine spike)	no data	Low-elevation coniferous forest (Brett 2022).	Under conifers (Klinkenberg 2022b).
F-Macrofungus	<i>Chrysomphalina chrysophylla</i> (goldgill navelcap)	no data	Low to mid elevation coniferous forests (Brett 2022).	Rotting conifer logs and sometimes forest floor (Klinkenberg 2022b).
F-Macrofungus	<i>Clitocybe albirhiza</i> (snowmelt Clitocybe)	no data	One record from Harmony Lake (Brett 2022).	Under conifers at higher elevations, often near snowmelt line (MacKinnon and Luther 2021).
F-Macrofungus	<i>Clitocybe dealbata</i> (sweat-producing clitocybe)	no data	Low to mid elevation coniferous forests (Brett 2022).	Grassy areas (MacKinnon and Luther 2021)
F-Macrofungus	<i>Clitocybe odora</i> (blue-green anise mushroom)	no data	Low to mid elevation coniferous forests (Brett 2022).	Under conifers (Klinkenberg 2022b).
F-Macrofungus	<i>Collybia cookei</i> (splitpea shanklet)	no data	Two records without habitat notes (Brett 2022).	On rotted remains of larger fungi or sometimes in rich humus; coniferous and mixedwood forests (MacKinnon and Luther 2021).
F-Macrofungus	<i>Cortinarius boulderensis</i>	no data	Low-elevation coniferous forest (Brett 2022).	Under conifers (Klinkenberg 2022b).
F-Macrofungus	<i>Cortinarius evernius</i> (silky webcap)	no data	Low-elevation coniferous forest (Brett 2022).	Under conifers near boggy areas (Phillips) or in moss (Arora; both in Klinkenberg 2022b).
F-Macrofungus	<i>Cortinarius malicorius</i>	no data	One record with no habitat data (Brett 2022).	Under conifers, sometimes in <i>Sphagnum</i> (peat moss; Klinkenberg 2022b).
F-Macrofungus	<i>Cortinarius olympianus</i>	no data	Low-elevation coniferous forest (Brett 2022).	Under conifers (Klinkenberg 2022b).
F-Macrofungus	<i>Cortinarius renidens</i>	no data	Low-elevation coniferous forest (Brett 2022).	Under conifers (Beug 2021).
F-Macrofungus	<i>Cuphophyllus virgineus</i> (snowy waxcap)	no data	Low-elevation coniferous forest (Brett 2022).	On "soil, at times among moss, in deciduous, coniferous, and mixed woods" (Hesler in Klinkenberg 2022b).
F-Macrofungus	<i>Dacryonaema rufum</i> (coral fungus)	no data	One record with no habitat data (Brett 2022).	Found "scattered to gregarious on pine wood:" "in dense groups on decaying wood" (Brough and Raitviir, in Klinkenberg 2022b).

**Table C.1 (cont.). Resident species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
F-Macrofungus	<i>Deconica horizontalis</i>	no data	One low-elevation record without habitat notes (Brett 2022).	Grows on old fabrics or on wood (MacKinnon and Luther 2021).
F-Macrofungus	<i>Deconica inquilina</i> (grass rotting psilocybe)	no data	One low-elevation record without habitat notes (Brett 2022).	"Grows on rotting grass bases or on twigs and sticks" (MacKinnon and Luther 2021).
F-Macrofungus	<i>Elaphomyces muricatus</i> (common deer truffle)	no data	One low-elevation record without habitat notes (Brett 2022).	Underground, under conifers (Beug 2021).
F-Macrofungus	<i>Fomitopsis officinalis</i> (agarikon)	no data	Old-growth associate (MacKinnon and Luther 2021) that in Whistler has been so far been found only on Douglas-fir trees and stumps (Brett 2022).	Uncommon and found only on old trees in old-growth forests (Taylor in Klinkenberg 2022b).
F-Macrofungus	<i>Galerina stylifera</i>	no data	Low-elevation coniferous forest (Brett 2022).	On buried sticks, usually coniferous (Beug 2021).
F-Macrofungus	<i>Gastrum saccatum</i> (bowl earthstar)	no data	Low-elevation coniferous forest (Brett 2022).	"In rich humus, most commonly in conifer forests, also in mixedwoods and open areas" (MacKinnon and Luther 2021).
F-Macrofungus	<i>Gomphidius smithii</i> (Smith's gomphidius)	no data	Low-elevation coniferous forest (Brett 2022).	Parasitic on <i>Suillus lakei</i> (Beug 2021), which in turn is most commonly associated with Douglas-fir (MacKinnon and Luther 2021).
F-Macrofungus	<i>Gomphus clavatus</i> (pig's ears)	no data	Higher montane to subalpine old-growth (Brett 2022).	In conifer forests, especially old-growth (MacKinnon and Luther 2021).
F-Macrofungus	<i>Hydropus marginellus</i>	no data	Two records without habitat notes (Brett 2022).	On conifer logs (Beug 2021).
F-Macrofungus	<i>Hygrophorus pustulatus</i> (waxy cap)	no data	Three records without habitat notes (Brett 2022).	Under conifers (Klinkenberg 2022b).
F-Macrofungus	<i>Lactarius camphoratus</i> (candy cap)	no data	Low-elevation coniferous forest (Brett 2022).	Under conifers (Klinkenberg 2022b).
F-Macrofungus	<i>Mycena algeriensis</i>	no data	Low-elevation coniferous forest (Brett 2022).	Well-decayed logs and stumps (mushroomexpert.com).
F-Macrofungus	<i>Mycena cinerella</i>	no data	Low-elevation coniferous forest (Brett 2022).	Conifer litter (wikipedia.org).
F-Macrofungus	<i>Phaeotremella foliacea</i> (brown witch's butter)	no data	Low-elevation coniferous forest (Brett 2022).	Grows on conifers as a parasite of <i>Stereum sanguinolentum</i> (a small shelf fungus; MacKinnon and Luther 2021).
F-Macrofungus	<i>Phellodon atratus</i> (black tooth)	no data	Low elevation to treeline (Brett 2022).	Under conifers (Beug 2021).
F-Macrofungus	<i>Phellodon melaleucus</i> (grey tooth)	no data	Low-elevation coniferous forest (Brett 2022).	Under conifers and in mixed woods (Beug 2021).
F-Macrofungus	<i>Phellodon tomentosus</i> (owl eyes; zoned phellodon)	no data	Low to mid elevation coniferous forests (Brett 2022).	On forest floor under conifers (MacKinnon and Luther 2021).
F-Macrofungus	<i>Ramaria cyaneigranosa</i> (coral mushroom)	no data	One record from Harmony Lake (Brett 2022).	Under western hemlock (Klinkenberg 2022b).
F-Macrofungus	<i>Ramaria rubrievanescens</i> (fading pink coral)	no data	One record from Ancient Cedars (Brett 2022).	Under conifers (Winkler 2023).

**Table C.1 (cont.). Resident species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
F-Macrofungus	<i>Ramaria stuntzii</i> (orange-red coral)	no data	Old-growth forests at low to mid elevations (Brett 2022).	On forest floor under conifers, especially western hemlock (MacKinnon and Luther 2021).
F-Macrofungus	<i>Rhizopogon alexsmithii</i> (false truffle)	no data	Two records without habitat notes (Brett 2022).	Under conifers, especially western and mountain hemlock (Klinkenberg 2022b).
F-Macrofungus	<i>Tapinella panuoides</i> (fan pax)	no data	Low to mid elevation coniferous forests (Brett 2022).	On stumps or logs, typically hardwood (MacKinnon and Luther 2021).
F-Macrofungus	<i>Thelephora palmata</i> (fetid false coral)	no data	Low-elevation coniferous forest (Brett 2022).	Conifer litter (Trudell and Ammirati 2009).
F-Macrofungus	<i>Tolypocladium capitatum</i> (truffle eater)	no data	Low-elevation coniferous forest (Brett 2022).	On forest floor, 'growing on underground fruiting bodies of common deer truffle' (MacKinnon and Luther 2021).
F-Macrofungus	<i>Trametes hirsuta</i> (turkey-tail)	no data	Low-elevation coniferous forest (Brett 2022).	Hardwood logs or other woody substrates (Trudell and Ammirati 2009).
F-Macrofungus	<i>Tremella aurantia</i> (jelly fungus)	no data	Low-elevation coniferous forest (Brett 2022).	Parasitizes <i>Stereum</i> (turkey tail) species that typically grow on hardwood branches and trunks (MacKinnon and Luther 2021).
F-Macrofungus	<i>Tricholoma apium</i> (celery-scented trich)	no data	Low-elevation coniferous forest (Brett 2022).	Drier coniferous forests, often with spruce or pine (MacKinnon and Luther 2021).
F-Macrofungus	<i>Tricholoma caligatum</i> (cinnamon pine)	no data	Low to mid elevation coniferous forests (Brett 2022).	Under conifers (Beug 2021).
F-Macrofungus	<i>Tricholomopsis decora</i> (prunes and custard)	no data	Low to mid elevation coniferous forests (Brett 2022).	Rotting conifer logs (MacKinnon and Luther 2021).
F-Macrofungus	<i>Turbinellus floccosus</i> (scaly vase chanterelle)	no data	Low to mid elevation coniferous forests (Brett 2022).	On the ground under conifers (MacKinnon and Luther 2021).
F-Macrofungus	<i>Turbinellus kauffmanii</i> (Kauffman's gomphus)	no data	Low to mid elevation coniferous forests (Brett 2022).	Under conifers (Klinkenberg 2022b).
I-Bee	<i>Bombus flavidus</i> (Fernald's Cuckoo Bumblebee)	no data	One Whistler record (Whistler Mt. alpine) plus two others just outside Whistler: Black Tusk microwave tower and Madely Lake (Brett 2022).	Subalpine and low alpine habitats (CDC 2022).
I-Butterfly	<i>Callophrys eryphon sheltouensis</i> (Western Pine Elfin, <i>sheltouensis</i> ssp.)	CDF, CWH	Low-elevation conifer forests in Whistler (Brett 2022). Their larval food plants are lodgepole and western white pine (Guppy and Shepard 2001); photo ID confirmed by C. Guppy.	Mostly concentrated on southern Vancouver Island and Gulf Islands with some records from Sunshine Coast and Squamish (CDC 2022). The Whistler records are therefore range extensions.
I-Butterfly	<i>Euphyes vestris</i> (Dun Skipper)	CDF; CMA; CWH; ESSF; IDF; IMA; MH; PP	Single record from late June 2019, feeding on western yarrow (Brett 2022). Unclear distribution and abundance elsewhere in the RMOW.	Generally open, grassy and/or wet areas with availability of sedge ( <i>Carex</i> spp.). Previously known only from drier habitats, including Pemberton Valley (CDC 2022).
I-Butterfly	<i>Icaricia icarioides montis</i> (Boisduval's Blue)	CMA; CWH; ESSF; IDF; IMA; MS; PP	High elevations/alpine (Brett 2022).	Larval foodplant is <i>Lupinus</i> spp. (lupines; Guppy and Shepard 2001).

**Table C.1 (cont.). Resident species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
I-Butterfly	<i>Parnassius clodius pseudogallatinus</i> (Clodius Parnassian, <i>pseudogallatinus</i> ssp.)	CMA; CWH; ESSF; IDF; IMA; MH; MS	Subspecies <i>pseudogallatinus</i> is most likely based on range and photos, but otherwise would be the also Blue-listed subspecies <i>claudianus</i> (C. Guppy, pers. comm.). It has been found in various low-elevation sites in Whistler (Brett 2022) and could extend to subalpine elevations (Guppy and Shepard 2001).	Habitat from 100 m to subalpine elevations; <i>Dicentra</i> spp. are the documented larval food plant (Guppy and Shepard 2001) which, in Whistler, would be <i>Dicentra formosa</i> (Pacific bleeding heart).
I-Butterfly	<i>Parnassius smintheus olympiannus</i> (Rocky Mountain Parnassian, <i>olympiannus</i> ssp.)	CDF; CMA; CWH; MH	High elevations/alpine (Brett 2022).	Larval foodplant is <i>Sedum</i> spp. (stonecrops; Guppy and Shepard 2001).
I-Dragonfly	<i>Pachydiplax longipennis</i> (Blue Dasher)	CWH	First record in 2021 from McGuire Pond (Brett 2022).	Ponds and lakes with abundant vegetation in the water and on the shore (Cannings 2002), possibly including wooded wetlands and slow streams (Paulsen 2009). Only CDC records from Vancouver and Bowen Island.
P-Aquatic	<i>Utricularia ochroleuca</i> (ochroleucous bladderwort)	BWBSdk; CDFmm; ESSFmv; ICHmw	One 2007 record from Wildlife Refuge wetland (H. Roemer in Brett 2022).	Low nutrient lakes in the montane zone (Klinkenberg 2022b).
P-Liverwort	<i>Diplophyllum obtusifolium</i> (liverwort)	no data	Two low-elevation records: one on a boulder slope, one on sand and litter beside a streambank (Brett 2022).	<i>Diplophyllum</i> spp. are typically found on moist, non-calcareous rocks or moist banks (Conard and Redfearn 1979).
P-Liverwort	<i>Haplomitrium hookeri</i> (liverwort)	no data	Humus and soil in the alpine (Brett 2022; Schofield 2002)	Late snowmelt areas near or above treeline (Schofield 2002).
P-Liverwort	<i>Jungermannia atrovirens</i> (liverwort)	no data	Incorrectly labelled "Likely" in 2016 and 2017 reports. Two 1980 records from Brandywine Creek via the UBC database were added to the WBP list in 2014 (Brett 2022).	On emergent rock, upper edge of Brandywine Falls (Brett 2022). Found on damp, calcareous rock and soil (Bosanquet in RBGE 2020).
P-Liverwort	<i>Nardia breidlerii</i> (liverwort)	no data	Wet soil at high elevations (Brett 2022; FNA 2022)	<i>Nardia</i> spp. are generally found on moist exposed mineral soil in habitats such as late-snowmelt sites and near water (Schofield 2002).
P-Liverwort	<i>Nardia compressa</i> (liverwort)	no data	Over wet rocks along streams and peaty bogs, alpine and Brandywine PP (Brett 2022; FNA 2022)	<i>Nardia</i> spp. are generally found on moist exposed mineral soil in habitats such as late-snowmelt sites and near water (Schofield 2002).
P-Liverwort	<i>Nardia geoscyphus</i> (liverwort)	no data	On dry rocks or damp rocks in streams, alpine (Brett 2022)	<i>Nardia</i> spp. are generally found on moist exposed mineral soil in habitats such as late-snowmelt sites and near water (Schofield 2002).
P-Liverwort	<i>Scapania mucronata</i> (liverwort)	no data	Exposed boulder in high-elevation stream (Brett 2022).	"Rocks and decaying wood, occasionally on soil" ( <a href="https://www.mobot.org/plantscience/bfna/V3/Scapania_R2.pdf">https://www.mobot.org/plantscience/bfna/V3/Scapania_R2.pdf</a> ).
P-Liverwort	<i>Scapania obscura</i> (liverwort)	no data	Moist sites in the alpine (Brett 2022).	Peaty soil on late snowmelt sites in the alpine (Wagner 2008)
P-Liverwort	<i>Scapania scandica</i> var. <i>scandica</i> (liverwort)	no data	Four RMOW record, none of which identify to variety, but the CDC (2022) lists only var. <i>scandica</i> as present in BC. The specimens are from diverse habitats from low to subalpine elevations (Brett 2022).	Usually on "crumbling, acidic soil banks" at all elevations, rarely on decaying logs (Bosanquet in RBGE 2020).



**Table C.1 (cont.). Resident species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
P-Liverwort	<i>Solenostoma confertissimum</i> (liverwort)	no data	Added in 2018 based on two 1980 records from Whistler Mt. (UBC Beaty 2020, reported in Brett 2020b). The Beaty Museum database (2022) no longer shows these records	"On soil and rocks along streams and on tree bases" (Conard and Redfearn 1979).
P-Liverwort	<i>Tritomaria scitula</i> (liverwort)	no data	Exposed boulder in high-elevation stream (Brett 2022).	"With other bryophytes on calcareous soil and decayed wood" (FNA 2022).
P-Moss	<i>Brachydontium olympicum</i> (Olympic brachydontium moss)	MH	First and only record from Blackcomb Lake in 2014 (Brett 2022); only 4 records in BC (Klinkenberg 2020b; S. Joya, pers. comm.) makes this a significant record	Moist, acidic boulders mainly in the alpine (FNA 2022). Nearest records from Diamond Head (UBC Beaty 2022).
P-Moss	<i>Grimmia caespiticia</i> (grimmia moss)	no data	One record from a (presumably acidic) boulder in full sun in Harmony Meadows (Brett 2022).	On exposed, dry to moist acidic rock at moderate to high elevations (FNA 2022)
P-Moss	<i>Grimmia donniana</i> (Donn's grimmia)	no data	Exposed rock on Whistler Mt., presumably above treeline (Brett 2022).	Exposed, acidic substrates at moderate to high elevations (FNA 2022).
P-Moss	<i>Grimmia incurva</i> (black grimmia)	CMA	Treeline on Blackcomb Mt.; with <i>Cassiope mertensiana</i> and <i>Luetkea pectinata</i> (Brett 2022).	Shaded, damp, acidic rock at moderate to high elevations (FNA 2022).
P-Moss	<i>Homalothecium nevadense</i> (Nevada homalothecium moss)	no data	One record from a boulder in the Emerald Forest, i.e., valley bottom (Brett 2022).	Perpendicular rock surfaces inc. shaded cliffs (Schofield 1992). Dry habitats at low elevations (McCune and Hutton 2018; as ssp. nevadense). Various substrates at low to high elevations (FNA 2022)
P-Moss	<i>Lewinskya pylaisii</i> (= <i>Orthotrichum pylaisii</i> ; Pylais' orthotrichum moss)	BWBS	Two records mistakenly recorded as outside RMOW in Brett (2020b) are actually inside Brandywine Falls Prov. Park (UBC Beaty 2022).	Granitic rock to alpine elevations (FNA 2022). Brandywine Falls specimens were growing on a dry basalt cliff face (UBC Beaty 2022).
P-Moss	<i>Niphotrichum pygmaeum</i> (= <i>Racomitrium pygmaeum</i> ; pygmy racomitrium moss)	BAFA; ESSF; MH	Dry, acidic soil near treeline (Brett 2022).	"Dry and open acidic ground in alpine heaths; moderate to high elevations" (FNA 2022).
P-Moss	<i>Platyhypnum alpinum</i> (= <i>Hygrohypnum alpinum</i> ; alpine hygrohypnum moss)	BAFA; CWH; ESSF; ICH; IDF; SWB	Four local records, all from Whistler-Blackcomb alpine; no other habitat data (Brett 2022).	On emergent rocks in subalpine to alpine creeks (FNA 2022)
P-Moss	<i>Pohlia cardotii</i> (Cardot's pohlia moss)	CMA; CWH; IMA; MH	Moist, seepy sites, predominantly alpine (Brett 2022)	Mesic subalpine and alpine sites; can form deep turfs in moist microsites (FNA 2022).
P-Moss	<i>Polytrichum sphaerothecium</i> (= <i>Polytrichastrum sexangulare</i> var. <i>vulcanicum</i> ; haircap moss)	MHm (Squamish Forest District)	Variety of wet to dry habitats at alpine elevations (Brett 2022).	Volcanic rocks at high elevations (FNA 2022).
P-Moss	<i>Ptychostomum pallescens</i> (= <i>Bryum pallescens</i> ; tall-clustered thread-moss)	no data	One record from thin soil over boulder in stream at 1200 m (Brett 2022)	On "damp to wet soil, low to high elevations" (FNA 2022).
P-Moss	<i>Ptychostomum schleicheri</i> (= <i>Bryum schleicheri</i> ; Schleicher's thread-moss)	CMA; CWH; IMA; MH	Tent. ID by Olivia Lee from Blackcomb Lake (Brett 2022)	Other BC records from wet subalpine sites (UBC Beaty 2022).

**Table C.1 (cont.). Resident species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
P-Moss	<i>Schistidium crassipilum</i> (thickpoint grimmia)	no data	One record from Whistler Village, substrate not specified (Brett 2022)	On low elevation, often limestone substrates including sidewalks FNA (2022).
P-Moss	<i>Tripterocladium leucocladulum</i> (tripterocladium moss)	CWH; IDF; MH	On dry rocks at lower elevations, e.g., Brandywine Falls Prov. Park (Brett 2022)	Dry, shaded cliffs and boulders at low to moderate elevations (FNA 2022).
P-Tree	<i>Pinus albicaulis</i> (whitebark pine)	CMAunp; CWHds; CWHms; CWHun; MHmm; MHmmp + >40 other BGC units	Infrequent to common on warm aspect sites near treeline, and as krummholz above treeline (Brett 2022). Decay and death caused by white pine blister rust ( <i>Cronartium ribicola</i> ) is the main threat to whitebark pine and the rust's effects are evident in the Whistler area, including the killing of saplings. This pine does not produce cones until it is 50+ years old which increases the risk. Ski area development is another local threat, e.g., the cone-producing trees cut for the installation of the Blackcomb station of the Peak-to-Peak Gondola.	Much higher mortality has been documented east of Whistler, especially in the Rocky Mountains (ECCC 2017). Fire suppression has been implicated as one cause of suppressed regeneration in those areas (due to the lack of exposed sites; CDC 2022), but does not appear to be a major limiting factor in the Whistler area (Brett, pers. obs.). Logging, climate change, and mountain pine beetle also threaten this species' long-term survival.
V-Amphibian	<i>Anaxyrus boreas</i> (Western Toad)	BG; BWBS; CDF; CWH; ESSF; ICH; IDF; PP; SBS; SWB	Lost Lake is the only known continuous breeding site in Whistler (Horan 2007; Brett 2022); past detections at Cheakamus Crossing and Brandywine (Brett 2007; J. Burrows and E. Tayless, pers. comm.). Mature toads have been observed in summer far from Lost Lake, including above treeline on Blackcomb Mt. (Brett 2022).	Breeding pond detected in 2022 in Whistler Olympic Park (K. Swerhun in Snowline 2022). The non-calling variant of Western Toad is widespread in BC likely in decline, especially in SW BC and Southern Vancouver Island due to urban development (ECCC 2020b).
V-Amphibian	<i>Ascaphus truei</i> (Coastal Tailed Frog)	CWH; ESSF; ICH; IDF; MH; MS	Almost all mountainside creeks with continuous flow -- confirmed presence in at least 41 RMOW creeks with others likely (Brett 2022; Cascade 2014 to 2016; Palmer and Snowline 2017 to 2020; Snowline 2021, 2022).	Requires clean, cold mountain streams (ECCC 2018a). Recent detections at Brandywine Meadows and Brew Lake have extended the known elevational range to ca. 1500 m. (Snowline 2021, 2022).
V-Amphibian	<i>Rana aurora</i> (Northern Red-legged Frog)	CDF; CWH; MH	Lakes and small ponds in warm sites at the south end of the RMOW, especially Brandywine (Brett 2022; L. Anthony pers. comm.); also confirmed on n. side of Callaghan R. on CalCheak FSR (J. Mullen in Brett 2007; L. Barrett in Snowline 2021).	The range of Red-legged Frogs is greater than reported as recently as 2015 (BC MOE 1015c). Ranid frogs in the Whistler area extend to subalpine elevations in the Callaghan, as reported by Denis Knopp and Mike Toochn during the 2012 BioBlitz (Brett 2022). Photo records since by Liz Barrett and from iNaturalist are strong evidence of a range extension for Columbia Spotted Frog ( <i>Rana luteiventris</i> ), but it is possible some hybridization with <i>R. aurora</i> occurs.
V-Bird	<i>Accipiter gentilis laingi</i> (Northern Goshawk, <i>laingi</i> ssp.)	CDF; CWH	Current and past breeding in low-elevation old-growth forests with Douglas-fir, including Comfortably Numb Trail, Millar's Pond, Lower Sproatt, and Lower Blackcomb Mt. (MFLNRO and Madrone 2014, 2015; Palmer and Snowline 2017, 2018; Brett 2020a; Snowline 2021, 2022).	Northern Goshawks rely on intact old forest for breeding success so the continuing conversion to young forest by logging is the greatest threat to them (COSEWIC 2013; MFLNRO 2013, 2015a)
V-Bird	<i>Ardea herodias fannini</i> (Great Blue Heron, <i>fannini</i> ssp.)	CDF; CWH	Forages mainly in valleybottom lakes, wetlands, and riparian areas (Campbell et al. 1990a; Ricker et al. 2022); no known breeding sites nearby; local herons may return to coast for breeding (K. Ricker, pers. comm.).	At risk due to habitat loss and bald eagle predation (ECCC 2020a). Heather Baines suspected there may have been a small colony in the Soo Valley and that their habitat has been reduced by the removal of cottonwoods and wetlands (by email, Feb. 2, 2019).

**Table C.1 (cont.). Resident species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
V-Bird	<i>Butorides virescens</i> (Green Heron)	BG; CDF; CWH; ICH; IDF; PP; SBS	Rivers & streams, wetlands, riparian adjacent to shrub or small tree cover (Ricker et al. 2022; Campbell et al. 1990a); Campbell et al. report breeding on Alta and Green Lakes but not recorded since 2013 on Green Lake by Karl Ricker (pers. comm., Dec. 2019). Current status in Whistler unclear.	Usually nests near water (Campbell and Kennedy 2020) but can nest up to 1 km away from water (CDC 2022).
V-Bird	<i>Charadrius vociferus</i> (Killdeer)	BG; BWBS; CDF; CWH; ESSF; ICH; IDF; MS; PP; SBPS; SBS; SWB	Breeds in Whistler area; inhabits shorelines and open grassy areas (Ricker et al. 2022).	Wide variety of open habitats, including human-altered (Campbell and Kennedy 2020).
V-Bird	<i>Chordeiles minor</i> (Common Nighthawk)	BG; BWBS; CDF; CWH; ESSF; ICH; IDF; MH; MS; PP; SBPS; SBS; SWB	Lakes & ponds, CWH forest, riparian (Ricker et al. 2022); recorded most years in Breeding Bird Survey (D. Marven unpubl. data) and at Brandywine basalt flats (Brett 2022).	Ground nester on open sites (Campbell et al. 1990b; Environment Canada 2016a).
V-Bird	<i>Coccothraustes vespertinus</i> (Evening Grosbeak)	All non-alpine throughout BC.	Breeding in Whistler according to Ricker et al. (2022) but Karl Ricker (pers. comm., Dec. 2018) notes this species is not recorded each year.	Inhabits a variety of mature and old mixedwood and conifer forests (COSEWIC 2016). Campbell et al. (2001) reported very few BC nest records.
V-Bird	<i>Contopus cooperi</i> (Olive-sided Flycatcher)	BWBS; CDF; CWH; ESSF; ICH; IDF; MH; MS; PP; SBPS; SBS; SWB	CWH & MH forest, riparian habitats, breeding (Ricker et al. 2022); requires snags adjacent to openings (Campbell et al. 1997); breeds most commonly at mid-elevations, +/- 1100 m (Campbell et al. 1997); sightings decreasing (K. Ricker, pers. comm.).	Inhabits a variety of forest types but most common in pristine forests, in edge habitat especially near water; tall trees and snags are important habitat elements (Campbell et al. 1997; Environment Canada 2016b; COSEWIC 2018).
V-Bird	<i>Cypseloides niger</i> (Black Swift)	BAFA; BG; CDF; CMA; CWH; ESSF; ICH; IDF; IMA; MH; MS; PP; SBPS; SBS; SWB	Alpine, CWH & MH forest (Ricker et al. 2022); nests in cliffs/steep bluffs (Campbell et al. 1990b); known nests under Brandywine Falls (Levesque and Rock 2017; C. Levesque email, Oct. 22, 2020); and maybe Soo Bluffs (K. Ricker, pers. comm., Dec. 2018). Seen flying over Shadow Lake in 2019 (K. Ricker, pers. comm., Dec. 2019). Presumed habitat use within RMOW.	Black swifts typically nest at montane waterfalls (COSEWIC 2015; e.g., Brandywine Falls) and sometimes other sites; requirements include moisture, high relief, safe from predators, open flight path, and shade (COSEWIC 2015).
V-Bird	<i>Eremophila alpestris</i> (Horned Lark)	all	Breeds in Whistler area; inhabits shoreline and alpine areas (Ricker et al. 2022).	Lowland grasslands to alpine meadows (Campbell and Kennedy 2020).
V-Bird	<i>Hirundo rustica</i> (Barn Swallow)	BAFA; BG; BWBS; CDF; CWH; ESSF; ICH; IDF; IMA; MH; MS; PP; SBPS; SBS; SWB	Wetlands, grassy areas, riparian, urban areas, breeding (Ricker et al. 2022); nest at float plane wharf last seen in 2018 (K. Ricker, pers. comm.).	92% of documented nests were on structures (Campbell et al. 1997)
V-Bird	<i>Megascops kennicottii kennicottii</i> (Western Screech-Owl, <i>kennicottii</i> ssp.)	BG; CDF; CWH; ICH; IDF; PP	Deemed a non-resident (Ricker et al. 2022) and "essentially non-migratory" by Campbell et al. (1990b). Recent records from Greg Ferguson (2017), Mark Beaven (2018 video), and Karl Ricker (pers. comm., Dec. 2018) suggest resident (breeding?) birds are likely though may not each year.	Screech-owls are known to breed in Pemberton (Ferguson 2017) and are often associated with cottonwood and similar habitats where tree cavities are available for nesting (COSEWIC 2012b).

**Table C.1 (cont.). Resident species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
V-Bird	<i>Patagioenas fasciata</i> (Band-tailed Pigeon)	CDF; CWH; ICH; IDF; MS; SBS	Seen in CWH & MH forest, riparian, urban areas (Ricker et al. 2022); can breed in urban edges and forests; historic (Campbell et al 1990b). Ricker et al. (2022) lists as possible breeder but numerous spring/summer records suggest breeding is almost certain in the RMOW.	Low reproductive rate due to only one egg per clutch (ECCC 2019) means this species is less resilient to population loss. Mainly nests in coniferous and mixed forests (Campbell and Kennedy 2020).
V-Fish	<i>Salvelinus confluentus</i> pop. 28 (Bull Trout - South Coast Population)	CDF; CWH; MH	Green Lake, Fitzsimmons Creek, occasionally Alta Lake and historic records from Lost Lake and 21-Mile Creek (Rebellato 2005) and more recently from Fitzsimmons Creek (Cascade 2016).	Temperature-dependent on cold water; slow maturation (seven years) may slow long-term survival and recovery (CDC 2022).
V-Mammal	<i>Gulo gulo luscus</i> (Wolverine, <i>luscus</i> ssp.)	BAFA; BWBS; CMA; CWH; ESSF; ICH; IDF; IMA; MH; MS; SBPS; SBS; SWB	"Potentially breeding and habitat use specifically Brandywine, Callaghan, Fitzsimmons and Cheakamus River (Steve Rochetta, pers. comm.); plus, Whistler and Blackcomb Mts. alpine (Laird Brown photo and E. Crowe, pers. comm.)	Large home ranges (COSEWIC 2014b; Steve Rochetta by email, Feb. 2, 2019) make confirmation of habitat use difficult.
V-Mammal	<i>Lasiurus cinereus</i> (Hoary Bat)	BG; BWBS; CDF; CWH; ICH; IDF; MS; PP; SBS	Low-elevation coniferous forest or talus slope (Brett 2022).	Roosting requirements of Hoary Bats in BC are not well known, but they probably roost primarily in trees (both coniferous and broadleaf), and occasionally in caves (Lausen et al. 2022). Lausen et al. also report that in Oregon Hoary Bat was restricted to old Douglas-fir forests. Almost certainly migratory.
V-Mammal	<i>Myotis lucifugus</i> (Little Brown Myotis)	BG; BWBS; CDF; CWH; ESSF; ICH; IDF; MH; MS; PP; SBPS; SBS; SWB	Common over wetlands, lake edges, trails; roosts in houses (Brett 2007; Lausen and Isaac 2010; Isaac and Lausen 2012) and likely loose bark of large trees and other sites (Nagorsen and Brigham 1993).	Over-wintering survival is threatened by a fungus that causes White-nose Syndrome (WNS); severe mortality, especially in eastern Canada, led the Federal Government in 2018 to list them as Endangered (ECCC 2018b). While the closest record so far is in Washington State ( <a href="https://www.whitenosesyndrome.org/">https://www.whitenosesyndrome.org/</a> ), WNS is expected to spread to BC.
V-Mammal	<i>Myotis yumanensis</i> (Yuma Myotis)	BG; CDF; CWH; ICH; IDF; MH; PP	Variety of low-elevation habitats, all near water (Brett 2022).	Roosts in coniferous forests but also buildings and other anthropogenic structures; little known about migration and overwintering (Lausen et al. 2022).
V-Mammal	<i>Oreamnos americanus</i> (Mountain Goat)	BAFA; BG; BWBS; CDF; CMA; CWH; ESSF; ICH; IDF; IMA; MH; MS; PP; SBPS; SBS; SWB	"Historically breeding and habitat use, however people, helicopters and snowmobiles have significantly impacted former range. Possibly there is still some use of Sproatt winter range?" (S. Rochetta, pers. comm., Feb 2019 email); also, Overlord/Fitzsimmons (K. Ricker, pers. comm.), Brandywine Mt. (B. Brett, pers. obs.); maybe Phalanx through Singing Pass?	Overwintering habitat elsewhere is typically <1200m, in older forest and areas with lower snowpacks and, crucially, close to escape terrain such as cliffs (Wilson 2005; Mountain Goat Management Team 2010).
V-Mammal	<i>Ursus arctos</i> (Grizzly Bear)	BAFA; BWBS; CMA; CWH; ESSF; ICH; IDF; IMA; MH; MS; SBPS; SBS; SWB	"Some breeding and habitat use specifically Brandywine, Callaghan, Sproatt" (S. Rochetta, pers. comm., Nov. 2016). Occupancy by sow and cubs on Sproatt Mt in 2018 and 2019. Sightings, including in 2020, may indicate higher numbers and/or more people in the backcountry [BB to check with Steve Rochetta].	Population studies showing very low population within Squamish-Lillooet and Stein-Nahatlatch GBPU (Apps et al. in COSEWIC 2012a; COSEWIC 2013a). [BB: Checking for update from Bruce McLellan.]

**Table C.2. Seasonal species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
V-Bird	<i>Aechmophorus occidentalis</i> (Western Grebe)	BG; BWBS; CDF; CWH; ICH; IDF; MS; PP; SBPS; SBS	Fairly common during fall migration on local lakes (Ricker et al. 2022).	Only three remaining nesting locations, all in the southern Interior; winters in large flocks on salt water along the BC coast (Campbell and Kennedy 2020).
V-Bird	<i>Clangula hyemalis</i> (Long-tailed Duck)	SBS	One to 10 birds recorded most years on local lakes during spring and fall migrations (Ricker et al. 2022).	Nests in northwest BC; winters in coastal habitats north to Haida Gwaii (Campbell and Kennedy 2020).
V-Bird	<i>Cygnus columbianus</i> (Tundra Swan)	no data	One to 10 birds usually recorded on local lakes during fall and early winter (Ricker et al. 2022).	Does not nest in BC; winters; locally uncommon in the Fraser Valley in winter (Campbell and Kennedy 2020).
V-Bird	<i>Gavia adamsii</i> (Yellow-billed Loon)	no data	One to 10 birds usually recorded on local lakes during fall migration (Ricker et al. 2022).	Does not nest in BC; winters in coastal habitats north to Haida Gwaii (Campbell and Kennedy 2020).
V-Bird	<i>Hydroprogne caspia</i> (Caspian Tern)	BG; BWBS; CDF; CWH; ICH; IDF; PP; SBS	One to 10 birds usually recorded on local lakes during spring migration (Ricker et al. 2022).	Mainly found in beaches, tidal mudflats, and protected bays on the southern coast, including Vancouver Island (Campbell et al. (1990b).
V-Bird	<i>Larus californicus</i> (California Gull)	BG; BWBS; CDF; CWH; ICH; IDF; MS; PP; SBS	One to 10 birds recorded each year on local lakes during spring migration (Ricker et al. 2022).	Nests in southcentral BC; often seen in coastal areas of BC in various habitats (Campbell et al. 1990b).
V-Bird	<i>Melanitta perspicillata</i> (Surf Scoter)	BG; BWBS; CDF; CWH; ICH; IDF; MS; PP; SBPS; SBS; SWB	More than 10 records during spring migration and into summer (Ricker et al. 2022)	Breeds in wooded ponds and lakes in northeast BC; winters in coastal areas north to Haida Gwaii (Campbell and Kennedy 2020).
V-Bird	<i>Numenius americanus</i> (Long-billed Curlew)	BG; CDF; CWH; ICH; IDF; PP; SBPS; SBS	One to 10 birds recorded most years on local lakes during spring migration and summer months (Ricker et al. 2022).	Breeds in the southern BC Interior on dry grasslands (Campbell and Kennedy 2020); mostly overwinters in same locations but also seen rarely on the Vancouver Island coast and the Lower Fraser Valley (Campbell et al. (1990b).
V-Bird	<i>Podiceps auritus</i> (Horned Grebe)	BG; BWBS; CDF; CWH; ICH; IDF; PP; SBS	Fairly common during fall migration on local lakes; occasional records in other months (Ricker et al. 2022).	Breeds and locally common throughout year in Interior BC; also aggregates in winter in coastal areas north to Haida Gwaii (Campbell et al. 1990a).
V-Bird	<i>Podiceps nigricollis</i> (Eared Grebe)	BAFA; BG; BWBS; CMA; CWH; ESSF; ICH; IDF; IMA; MH; MS; PP; SBPS; SBS	One to 10 birds usually recorded on local lakes during spring and fall migrations (Ricker et al. 2022).	Nests in the southern Interior; uncommon in winter in coastal areas north to Haida Gwaii (Campbell and Kennedy 2020).

**Table C.3. Likely species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
F-Lichen	<i>Nephroma isidiosum</i> (pebbled paw)	BAFAun; BGxh; CWHwm; ESSFwc; ESSFwcp; ESSFwv; ESSFwvp; ICHmc; ICHmw; ICHvk; ICHwk; IDFdk; MHmm; MSdm; SBSdh; SBSdw; SBSwk	MH forest habitat like the 2002 Goward record occurs in Whistler.	One 2002 record by Trevor Goward from upper Pitt R. drainage in Garibaldi PP (UBC Beaty 2022). Brodo et al. (2001) consider it a good old-growth indicator.
F-Lichen	<i>Peltigera gowardii</i> (northwest waterfan)	no data	Not yet documented in RMOW, but likely given two records to the south – in streams <1m wide near treeline at Black Tusk and Brew Lake (COSEWIC 2013; BC MOE 2015a; Paula Bartemucci - Oct, 2022 photos).	At or below water level in small (<1 m) subalpine to alpine streams (COSEWIC 2013; BC MOE 2015a).
F-Lichen	<i>Scytinium californicum</i> (=Leptogium californicum; midlife vinyl)	CDF; CWH; IDF	Brandywine PP area on <i>Acer macrophyllum</i> (just outside RMOW? Brett 2022)	On mossy rock on open, lower-elevation sites (Goward 1994).
F-Macrofungus	<i>Boletus rex-veris</i> (king bolete)	no data	Fungus Among Us scientists expect this species to be in Whistler. Closely related to <i>B. edulis</i> group.	Local associates include lodgepole pine and true firs (Klinkenberg 2022b). Typically at higher elevations than <i>Boletus edulis</i> (MacKinnon and Luther 2021).
F-Macrofungus	<i>Chloroscypha flavida</i>	no data	One record from Callaghan Lake (Brett 2022).	Near or under melting snowbanks on the twigs, cones, and needles of yellow cedar ( <i>Xanthocyparis nootkatensis</i> ; Klinkenberg 2022b, MacKinnon and Luther 2021).
F-Macrofungus	<i>Ciboria rufofusca</i>	no data	One record from Madely Lake on <i>Abies</i> cone scales (Brett 2022).	On "damp scales of <i>Abies</i> [true fir] cones lying on the ground" (Breitenbach in Klinkenberg 2022b).
F-Macrofungus	<i>Entoloma sinuatum</i> (lead poisoner)	no data	One treeline record without habitat notes (Brett 2022).	Under conifers and hardwoods (Klinkenberg 2022b).
F-Macrofungus	<i>Polyporoletus sylvestris</i>	no data	Two records from Callaghan Lake (Brett 2022).	Under conifers from 1200m to treeline (Beug 2021).
F-Macrofungus	<i>Ramaria aurantiisiccescens</i> (coral mushroom)	no data	One tentative ID from Callaghan Valley (Brett 2022).	Under western hemlock, <i>Abies</i> (true fir), and Douglas-fir (Klinkenberg 2022b).
F-Macrofungus	<i>Syzygospora mycetophila</i>	no data	Two low elevation records without habitat data (Brett 2022).	Parasite of <i>Gymnopus dryophilus</i> (Trudell and Ammirati (2009).
I-Dragonfly	<i>Tanypteryx hageni</i> (Black Petaltail)	CWH [MH]	Documented for first time in Whistler area (near treeline below Brandywine Meadows) during 2020 BioBlitz by Sharon and Mike Toochn (Brett 2022). Likely to also be inside RMOW boundaries Whistler (D. Marven and D. Knopp, pers. comm.).	In seeps at mid to high elevations (Cannings 2002; CDC 2022).
I-Moth	<i>Dysstroma suspectata</i> (geometer moth)	no data	One tentative ID from Alpha Lake Park (Brett 2022).	"Mesic deciduous and mixedwood forests and woodlands" ( <a href="https://www.inaturalist.org/guide_taxa/158173">https://www.inaturalist.org/guide_taxa/158173</a> ).



**Table C.3 (cont.). Likely species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
I-Snail	<i>Pristiloma arcticum</i> (Northern Tightcoil)	ESSF; ICH	Tentatively confirmed by Kristiina Ovaska at Harmony Lake (Brett 2022); could occur in RMOW (R. Forsyth, pers. comm.) but see notes re taxonomy.	Under woody debris/litter (Burke 2013); wet subalpine sites under rocks/vegetation (Forsyth 2004). Should occur in Whistler but Coast Mt. spp. might be <i>P. crateris</i> instead (R. Forsyth, pers. comm.)
P-Fern	<i>Polystichum setigerum</i> (Alaska holly fern)	CMA, CWH [MH]	Documented for first time in Whistler area (in Brandywine Meadows) during 2020 BioBlitz by Ken Marr (Brett 2022). No habitat notes are currently available.	"Moist to mesic shady forests, rock outcrops and lava flows in the lowland and montane zones" (Klinkenberg 2020b). The closest record is from the Upper Elaho Valley (P. Kroeger; UBC Beaty 2022).
P-Liverwort	<i>Marchantia polymorpha</i> ssp. <i>montivagans</i> (liverwort)	no data	Not yet documented in RMOW (Brett 2022) but almost certain based on nearby records, e.g., Russet Lake (Brett and Björk 2016), and a tentative ID from the Whistler Olympic Park (B. Brett photo).	Margins of snowmelt streams and high elevation ponds/lakes (Brett and Björk 2016). Occurs at higher elevations than common liverwort ( <i>M. polymorpha</i> ), and lacks its purple centre line (cf. Schofield 2002).
P-Liverwort	<i>Tritomaria exsectiformis</i> ssp. <i>exsectiformis</i> (liverwort)	no data	One tentative ID from Brandywine Meadows (Brett 2022).	"Creek banks, decayed wood, and humus over decayed wood in forests" (FNA 2022).
P-Moss	<i>Bucklandiella affinis</i> (= <i>Racomitrium affine</i> ; lesser fringe-moss)	no data	Tentative ID by Olivia Lee and Steve Joya from Rainbow Trail (Brett 2022).	Acidic, moist to dry sites to high elevations (FNA 2022).
P-Moss	<i>Grimmia anomala</i> (grimmia dry rock moss)	CWH; MH	Not yet documented in RMOW (Brett 2022); possible in RMOW (O. Lee, pers. comm.).	Exposed, damp soils at mid and high elevations (FNA 2022); closest record is from 1974 on Brew Lk. trail from Brandywine (Brett 2022).
P-Moss	<i>Lescurea saxicola</i> (lescuraea moss)	BAFA; CWH; ESSF; SWB	One tentative ID from Whistler Mt. - no habitat notes (Brett 2022).	"Granitic or sandstone boulders, outcrops, exposed mineral soil, seepage areas in subalpine and arctic-alpine regions" (FNA 2022).
P-Moss	<i>Tortula leucostoma</i> (desmatodon moss)	BAFA; MH; SWB	The only local record to date is from dry soil in alpine heath at Russet Lake (UBC Beaty 2022; Brett 2022).	Soil, especially calcareous (presumably exposed), and usually in the alpine (FNA 2022).
V-Mammal	<i>Cervus elaphus roosevelti</i> (Roosevelt Elk)	CWH; MH	Recently introduced to upper Squamish Valley; occasional sightings (K. Ricker, pers. comm.; Brett 2022). Only bull elk have been reported locally but elk could expand their range (S. Rochetta, pers. comm.).	Elk are wide-ranging animals that use a wide range of habitats at all elevations (CDC 2022). They were reintroduced to the Squamish Valley and have also been seen (males only?) in Pemberton Valley.

**Table C.4. Possible species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
F-Lichen	<i>Nephroma occultum</i> (cryptic paw)	CWH, ICH	Possible in the RMOW, e.g., in “puddle forests” such as the Wildlife Refuge, on the branches of small, slow-growing trees (C. Björk, email Dec. 29, 2020).	Moist old forests at elevations below 1,200 m (COSEWIC 2019). It is considered a flagship species for other rare and uncommon lichens and bryophytes that require moist old-growth habitats (COSEWIC 2019).
F-Lichen	<i>Pannaria rubiginosa</i> (considerable gingerbread)	CWHds; CWHvh; CWHwh; CWHxm	Not yet documented in RMOW, and may not reach to south end of RMOW (i.e., CWHds).	Bark and wood substrates in wide variety of lowland habitats (Goward 1994; McCune and Geiser 2009).
F-Lichen	<i>Pseudocyphellaria rainierensis</i> (old growth specklebelly)	CWHvh; CWHvm; CWHwh	Not yet recorded in Whistler and if found would be a large range extension. Many surveys in subalpine yellow cedar forests for the WBP, BioBlitz, and Fungus Among Us in the past 15 years have not yet encountered the species.	Currently known only from the five wettest CWH Subzones, i.e., nearer the coast than Whistler (BC MOE 2015b; COSEWIC 2017b). Associated with yellow cedar-amabilis fir forests and therefore possible within Whistler (Trevor Goward, pers. comm., 2007).
F-Lichen	<i>Scytinium polycarpum</i> (=Leptogium polycarpum; peacock vinyl)	no data	Not yet documented in RMOW (Brett 2022) but C. Björk (pers. comm.) suggests it's worth looking for.	Typically grows amidst moss mats on deciduous trees in humid sites (which prevents desiccation); often found with other rare lichens and vascular plants (COSEWIC 2011).
F-Lichen	<i>Scytinium rivale</i> (=Leptogium rivale; skin lichen)	no data	One record from Brew Lake on basalt in an upper subalpine stream (C. Björk in Brett 2022). A “good find” and surprising to find it at such a high elevation (C. Björk, pers. comm.)	“Grows directly on rock or near running water” (Goward 1994). Submerged much of the year in or near small- to medium-sized mountain streams (McCune and Geiser 2009).
I-Bee	<i>Bombus occidentalis</i> (Western Bumble Bee)	no data	Possible in the RMOW but rare and difficult to find (K. Needham, pers. comm.).	Mainly open areas and edges to subalpine elevations (COSEWIC 2014a). In 2020, EFauna showed records from Mt. Garibaldi and Blackwater Lake near Mt. Currie (in Brett 2020b), but are no longer shown there or by the CDC (Klinkenberg 2020a; CDC 2022).
I-Bivalve	<i>Sphaerium striatinum</i> (Striated Fingernailclam)	BAFA; BG; BWBS; CDF; CMA; CWH; ESSF; ICH; IDF; IMA; MH; MS; PP; SBPS; SBS; SWB	Not yet documented; uncertain likelihood in Whistler due to lack of data Province-wide	Permanent bodies of water including lakes, ponds, and streams; only 3 BC records, none near Whistler (CDC 2022).
I-Butterfly	<i>Callophrys johnsoni</i> (Johnson’s Hairstreak)	CDF; CMA; CWH	“The habitat requirements, especially elevation, of Johnson’s, are even less well known than for Cedar, so it simply cannot be predicted whether it may occur at Whistler. All one can do is look.” (C. Guppy email, June 13, 2019.)	Recorded on southeastern Vancouver Island and in the Fraser Valley below 625m; larvae feed on mistletoe ( <i>Arceuthobium</i> spp.) growing on western hemlock (Klinkenberg 2022a).

**Table C.4 (cont.). Possible species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
I-Butterfly	<i>Erynnis propertius</i> (Propertius Duskywing)	CDF, CMA, CWH, MH	A range extension for this species was recorded in Pemberton in 2010 and 2015 (Brett 2022). Possible larval food plant is <i>Aquilegia formosa</i> (C. Guppy; email Jan. 2018) which also occurs in Whistler. Although Guppy thinks the range limitation may be warm winters, Pemberton's winter is not markedly warmer, nor does it have as much insulating snow.	The main threat to Propertius Duskywing is the loss of Garry oak habitat (Garry oak is its larval food plant in those habitats; CDC 2022). C. Guppy (email Jan. 2018) notes that larval food plants in other locations is not yet known.
I-Butterfly	<i>Parnassius clodius claudianus</i> (Clodius Parnassian, claudianus ssp.)	CDF; CMA; CWH; MH	The one Whistler record (Brett 2022) is likely ssp. <i>pseudogallatinus</i> (tentative photo ID by C. Guppy) but this ssp. is also possible in Whistler (C. Guppy, pers. comm.)	Riparian and moist meadows at low to subalpine elevations (Guppy and Shepard 2001).
I-Snail	<i>Physella propinqua</i> (Rocky Mountain Physa)	BAFA; CDF; CMA; CWH; ESSF; IDF; IMA; MH; MS; SBPS; SBS	Not documented in Whistler (Brett 2022) unknown likelihood in Whistler due to taxonomic/ID difficulties (R. Forsyth, pers. comm.)	Wet areas; the few records are not close to Whistler (CDC 2022); <i>Physa</i> spp. are an "outright taxonomic evil" (R. Forsyth, pers. comm.); i.e., it will be difficult to survey for and/or confirm the presence of these species.
I-Snail	<i>Physella virginea</i> (Sunset Physa)	BAFA; BG; CDF; CMA; CWH; ESSF; ICH; IDF; IMA; MH; MS; SBPS; SBS	Not documented in Whistler (Brett 2022) unknown likelihood in Whistler due to taxonomic/ID difficulties (R. Forsyth, pers. comm.)	Wet areas; the few records are not close to Whistler (CDC 2022); <i>Physa</i> spp. are an "outright taxonomic evil" (R. Forsyth, pers. comm.); i.e., it will be difficult to survey for and/or confirm the presence of these species.
P-Herb	<i>Arceuthobium tsugense</i> ssp. <i>mertensianae</i> (mountain hemlock dwarf mistletoe)	MH	Possible (or Likely) in Whistler due to its parasitic association with common local species, primarily <i>Tsuga mertensiana</i> , but also <i>T. heterophylla</i> , <i>Abies amabilis</i> , and <i>A. lasiocarpa</i> (CDC 2022).	The only CDC records are from Cypress Mt. and Vancouver Island (CDC 2022).
P-Herb	<i>Bidens amplissima</i> (Vancouver Island beggarticks)	CDFmm; CWHdm; CWHms; CWHxm	One 1939 record by Ken Racey without habitat notes (Brett 2022). Need to check RBCM specimen since it seems unlikely in Whistler.	Wet areas, especially estuaries but also ditches, wetlands, and riparian areas; possibly restricted to more coastal parts of BC (based on Klinkenberg 2022b).
P-Liverwort	<i>Frullania hattoriana</i> (liverwort)	no data	Not yet documented in RMOW (Brett 2022). possible in RMOW (O. Lee, pers. comm.); see notes about records from Brandywine Falls.	Four specimens collected by Godfrey and Schofield from Brandywine Falls, probably all from base of falls (Godfrey 1977 as " <i>Frullania</i> new species;" UBC Beaty 2022; Brett 2022). Three on tree trunks (Douglas-fir, <i>Abies</i> cf. <i>amabilis</i> , <i>Alnus rubra</i> ), and one beside stream.
P-Moss	<i>Andreaea heinemannii</i> (Heinemann's andreaea moss)	MH	Not yet documented in RMOW (Brett 2022); possible in Whistler (S. Joya and O. Lee, pers. comm.).	Acidic rocks at low to moderate elevations (FNA 2022).
P-Moss	<i>Atrichum tenellum</i> (slender smoothcap moss)	BAFA; ESSF	Could occur in Whistler (O. Lee, pers. comm.).	Variety of mainly exposed habitats on clay or sandy soil, and at low to moderate elevations (FNA 2022).
P-Moss	<i>Bryum calobryoides</i> (bryum moss)	ESSF; MH	Not yet documented in RMOW (Brett 2022); possible in RMOW (O. Lee, pers. comm.).	Calcareous soils and rock at moderate to high elevations (FNA 2022).

**Table C.4 (cont.). Possible species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
P-Moss	<i>Pohlia andalusica</i> (Roth's thread-moss)	CMA	Not yet documented in RMOW (Brett 2022).	Coastal alpine (CMA Zone; CDC 2022). Loose, acidic soils (FNA 2022).
P-Moss	<i>Trematodon asanoi</i> (Boas' long-necked moss)	MHmm	Not yet documented in RMOW (Brett 2022); possible in RMOW (O. Lee, pers. comm.)	Moist, bare soil at subalpine elevations (Christy (2007).
V-Bird	<i>Brachyramphus marmoratus</i> (Marbled Murrelet)	CDF: CWH; MH	Not recorded in Whistler, and unlikely due to distance from salt water.	Mossy canopies in moist, old-growth forests; even though their nests can be up to 50 km away from marine foraging (MFLNRORD 2018; Campbell and Kennedy 2020; ECCC 2013a) they are more likely to nest closer to the ocean (which would exclude Whistler).
V-Bird	<i>Falco peregrinus anatum</i> (Peregrine Falcon, <i>anatum</i> ssp.)	BG; BWBS; CDF; CWH; IDF; MS; PP; SBS	CWH forest, wetlands, urban areas (Ricker et al. 2022); nests in cliffs/steep bluffs. May nest at Soo Bluffs (K. Ricker, pers. comm., Dec. 2018). While similar, suitable nest habitat is likely not present within the RMOW, foraging within the RMOW is possible.	“Low population size still in recovery stage. Few breeding sites known. Significant contraction from historical range” (CDC 2022). Preferred nest sites are on cliffs from 50 to 200 m high (COSEWIC 2017a).
V-Mammal	<i>Corynorhinus townsendii</i> (Townsend's Big-eared Bat)	BG; CDF; CWH; ICH; IDF; PP	Karl Ricker (pers. comm.) included this species on an early list of Mammal compiled with help from the RBCM but I have not been able to locate any records from there.	Buildings, caves, and mines; known only from locations far from Whistler (Nagorsen and Brigham 1993); may be possible in Whistler, e.g., in old mine adits (C. Lausen, pers. comm.).
V-Reptile	<i>Charina bottae</i> (Northern Rubber Boa)	BG; CWH; ICH; IDF; PP	Non-resident, though there have been unconfirmed anecdotal records (Johnny Mikes from Lost Lake; Cathy Ivany from Emerald Estates, pers. comm.).	Dry, warm sites with rock habitat; the closest record is from Rutherford Creek (Leslie Anthony, pers. comm.).

**Table C.5. Data Deficient species at risk**

Group	Scientific (Common) Name	BGC Units (CDC)	Whistler status and habitat notes	Habitat elsewhere, esp. if not documented in RMOW
F-Lichen	<i>Stereocaulon pileatum</i> (pixie foam)		Now ranked "Unknown" by the CDC (2022). Previous CDC listings (e.g., in Brett 2020b) showed this species as Confident or Certain in the CMAunp (alpine ecosystems that occur within the RMOW).	Habitat information is lacking for this species in BC. A description from Minnesota ( <a href="https://www.dnr.state.mn.us/">https://www.dnr.state.mn.us/</a> ) reports records from exposed rock near water.
P-Grass	<i>Muhlenbergia racemosa</i> (satin grass)	BGxh; IDFxh	One Muhlenbergia sp. site confirmed in the Wildlife Refuge wetland (Brett 2022), originally identified by Adolf Ceska as <i>M. glomerata</i> and re-identified as <i>M. racemosa</i> by Hans Roemer. A UBC specimen and one retrieved in 2018 by B. Brett need to be re-examined.	The CDC removed Muhlenbergia racemosa in error in 2018 (Curtis Björk, by email, June 7, 2018) and reinstated it as "Unknown" in 2019 (CDC 2022). Given how far Whistler is from other CDC records of this species, it is possible the Whistler population is the Yellow-listed (non-SAR) <i>M. glomerata</i> .
P-Liverwort	<i>Scapania curta</i> var. <i>curta</i> (liverwort)	no data	One local record from an alpine meadow on Whistler Mt. (UBC Beaty 2022).	<i>Nardia</i> spp. are generally found on moist exposed mineral soil in habitats such as late-snowmelt sites and near water (Schofield 2002).
P-Moss	<i>Imbriobryum alpinum</i> (= <i>Bryum alpinum</i> ; alpine thread-moss)	no data	One tentative record from Whistler alpine (O. Lee in Brett 2022); but may be <i>Imbriobryum muehlenbeckii</i> (S. Joya, pers. comm.).	Rock and soil over rock at all elevations (FNA 2022).
V-Bird	<i>Riparia riparia</i> (Bank Swallow)	no data	Karl Ricker (pers. comm., Dec. 2019) recorded nesting in sand banks before development of Rainbow subdivision. Heather Baines (Jan 2, 2019 email) doubts the accuracy of eBird records: "...unless it was a really good birder" since she's only seen them in Interior BC.	Main range is east of the Coast Mountains (CDC 2022), only two records west of the Coast Mountains, in the Fraser Valley, as of 2009 (Campbell and Kennedy 2020, based on 1st ed. 2009).
V-Fish	<i>Oncorhynchus clarkii clarkii</i> (Cutthroat Trout, <i>clarkii</i> ssp.)	BWBS; CDF; CWH; ICH; SBS	Historic presence in local lakes and streams before introduction of Rainbow Trout (Eric Crowe, pers. comm.). Sterile cutthroats have since been introduced to Alta Lake and as of 2018 and based on DNA evidence Eric Crowe and Veronica Woodruff (pers. comm.) thought native cutthroats unlikely to persist in RMOW. In 2020, however, Crowe found a native cutthroat in the Whistler Wildlife Refuge (pers. comm.).	Still potentially viable in isolated water bodies north into Pemberton, e.g., Keyhole Falls (E. Crowe, pers. comm.). Requires cool water (<18 deg. C.) in small, low-gradient streams (CDC 2022).

**Table C.6. Extirpated species at risk**

V-Bird	<i>Strix occidentalis</i> (Spotted Owl)	CWH; ESSF; IDF; MH	Extirpated (Ricker et al. 2022); last record from Ken Racey in 1946 (Campbell et al. 1990a; Brett 2022).	For many years, the BC Government has allowed logging in this owl's few remaining ranges. Two Wildlife Habitat Areas in the Whistler area (ECCC 2023b) allow logging with constraints (BC MOE-MOFR 2009) but include mostly unsuitable habitat (J. Hobbs, pers. comm.). As of Feb. 2023, the Federal Govt. announced plans to invoke an emergency order to stop logging in remaining owl habitat ( <a href="https://thenarwhal.ca/bc-emergency-order-spotted-owl/">https://thenarwhal.ca/bc-emergency-order-spotted-owl/</a> ).
V-Mammal	<i>Pekania pennanti</i> (Fisher)	BAFA; BWBS; CDF; CMA; CWH; ESSF; ICH; IDF; IMA; MH; MS; PP; SBPS; SBS; SWB	Unknown current status (S. Rochetta, pers. comm.); historic presence with last two records from Green Lake in 1956 (Brett 2022); UBC Tetrapod Museum specimens)	Closely associated with old growth forests with large trees (CDC 2022). In 2020, a CDC reassessment determined there were two small populations. The closest known records are from the Columbian population near Bridge River.

## Appendix D. Scientists Who Contributed to the Whistler Biodiversity Project Database

Data in this report is from the 326 contributors to the WBP, Fungus Among Us, Whistler BioBlitz, and Whistler Naturalists' birding events (as well as others inadvertently not included on the list below). Most have volunteered their valuable time and expertise and only a few have been recompensed in any way. In short, these people have contributed to the project because of their love for nature and desire to protect it. I apologize for any omissions and thank everyone for their efforts.

Adolf Ceska	Christopher Di Corrado	Emma Tayless	Jeremy Winkler	Kristiina Ovaska	Nicola Brabyn	Shannon Berch
Adriana Suarez-Gonzalez	Christopher Stinson	Enid Martin	Jess Wagstaffe	Kristina Swerhun	Nicole Basaraba	Shannon Didier
Adrien Baudouin	Claire Johnson	Eric Crowe	Jill Cooper	Larissa Taylor	Nicole Harrison	Shari Willmott
Agnes Lynn	Claire Ruddy	Eric Wight	Jim Cuthbert	Larry Evans	Noah Haave	Sharmin Gamiet
Alex Burns	Clare Greenberg	Erin Campbell	Jim Ginns	Laura Dilley	Nora Ciurysek	Sharon Toochn
Alexandra Gilliss	Claudia Copley	Erin Edal	Jodie Krakowski	Leanne Elliott	Olivia Lee	Shawn Mason
Alicia Fontaine	Cody Labossiere	Erin Edwards	Joe Kiegel	Leanne Gallon	Oluna Ceska	Shayn McAskin
Amy Burns	Colin Sanders	Erin Feldman	Joern Rohde	Leanne Williams	Pablo Jost	Sorcha Masterson
Ana Radojičić	Connor McGillion	Erin Rutherford	John Swann	Lee Larkin	Pamela Zevit	Stephanie Hurst
Andree Janyk	Connor Wardrop	Ethan Askey	Johnny Mikes	Leigh Anne Isaac	Patricia Thomson	Steve Joya
Andy MacKinnon	Cori Lausen	Felix Martinez	Jonathan Goff	Lennart Sopuck	Patrick Lilly	Sue Maxwell
Angela Manweiler	Curtis Björk	Fleur Sweetman	Jordan Rosenfeld	Leslie Anthony	Patrick Mulligan	Susan Hamersley
Angus MacKinnon	Dan Luoma	Fraser Willmott	Jory Mullen	Lex Joseph	Paul Girodo	Susan Leech
Anita Wheatley	Dan McDonald	Genevieve Rowe	Joyce Eberhart	Libby Avis	Paul Higginson	Suzie Lavallee
Anna Bazzicalupo	Dan Nash	Geoff Barnett	Joyce Lee	Lindsay Coulter	Paul Kroeger	Tanya Luszcz
Anne Leathem	Dan Peach	Geoff Playfair	Judith Harpel	Lisa Neame	Pauline Ng	Tara Schaufele
Ariane Comeau	Danica Shannon	George Clulow	Judith Holm	Lisa Rockwell	Peter Gaffney	Terry McIntosh
Asher Price	Daniel Mosquin	Greg Ferguson	Julian Gan	Liz Barrett	Purnima Govindarajulu	Theresa Oswald
Asta Kovanen	Daniel Winkler	Greg Lee	Julian Heavyside	Liz Snair	Rebecca MacKay	Thibault Doix
Aynsley Thielmann	Danny Miller	Greg Michalenko	Julie Burrows	Lois Joseph	Rebecca Merenyi	Thom O'Dell
Bardia Khaledi	Daren Romano	Hamzeh Karim-Ramezani	Julie Sims	Luana Kodato	Regina Chan	Thor Henrich
Barry Janyk	Darren Copley	Hans Roemer	Julie Wray	Ludovic Le Renard	Rex Kenner	Tiia Haapalainen
Ben Hircok	Daryl Thompson	Harriet Jarvis	Juliet Pendray	Luke Harrison	Rich Mably	Tim Goater
Betty Rebellato	Dave Cunningham	Heather Baines	Karen Needham	Luke Mikler	Rick Avis	Tim Howay
Bill Caulfield	Dave Williamson	Heather Beresford	Karina Valeretto	Lynne Henderson	Riley Fleet	Tim Joy
Bill Weir	David Aldcroft	Heidi Guest	Karl Ricker	Makie Matsumo-Hervol	Rob Lyske	Tina Symko
Birken Metza	David Bell	Hillary Williamson	Kate Brandon	Mallory Clarke	Robb Bennett	Todd Bush
Bob Brett	David Blades	Hitomi Kimura	Kate Entwistle	Marcia Danielson	Robert Forsyth	Tom Pietrzak
Breanne Johnson	David Cunningham	Hugh Daubeney	Kathleen Stormont	Marian Daubeney	Roger Bean	Tom Plath
Brent Matsuda	David Langor	Irmgard Carter	Kathy Jenkins	Mary Lightle	Roland Treu	Tracy Fleming
Brian Didier	David Snair	Jaclyn Dee	Kathy McMillian	Mathew Bayly	Rose Klindenber	Trevor Goward
Brian Klindenber	David Walde	Jacqueline Shaben	Katie Joya	Max Gotz	Roxy Tripp	Trevor Van Loon
Brook Moyers	Davina Dube	Jagoda Kozikowska	Keenan Moses	Meg Fellowes	Ruby Pennel	Tristan Galbraith
Brooke Fochuk	Dawn Hanna	James Holko	Keenan Peddie	Meg Loop	Ruth Joy	Trystan Willmott
Bruce Worden	Dawn Johnson	James Miskelly	Keith Browning	Melanie Tardif	Sabrina Hinitz	Tyler Kelly
Bryce Kendrick	Dea Lloyd	Jamie Fenneman	Kelly Ng	Mendel Shulski	Sam Cousins	Tyrel Pinnegar
Candace Rose-Taylor	Denis Knopp	Jamie Marconi	Kem Luther	Michael Thompson	Sam Evans	Valena Bradbury
Cara Richard	Derrick Marven	Jared Hobbs	Ken Marr	Michele Thomas	Sam Reeve	Vanessa Logie
Catherine Soper	Don Brett	Jasper George	Kent Anders	Michelle Crowe	Samantha Woods	Veronica Woodruff
Cathy Ivany	Don MacLaurin	Jeff Joy	Kent Brothers	Mike Boyd	Sara Jennings	Vesna Young
Chloe Reid Van Loon	Doug Sinclair	Jeff Shatford	Kevin Bell	Mike Gravnic	Sarah Yontez	Virginia Skilton
Chris Byrd	Doug Skilton	Jen Sibbald	Kevin Rosé	Mike Toochn	Saskia Wolsak	Wendy Horan
Chris Dale	Dylan Rawlyk	Jenn Barrett	Kevin Trim	Mitchel Martin Downie	Savi Raghuraman	Will Gibson
Chris Ratzlaff	Edward Sun	Jennifer Chia	Kiran Pal-Ross	Morgan Black	Scott Gilmore	Zoey Slater
Chrispin Guppy	Elke Wind	Jennifer Heron	Kris Shoup	Murray Lashmar	Sean Aldcroft	
Christina Nick	Emilie Trudeau	Jeremy Gatten	Kristen Harrison	Nancy Lee	Sean McCann	
Christine Olsen	Emma Harrower	Jeremy Nilson	Kristen Jones	Naomi Sands	Seth Rudman	