One Mile Lake

Environmental Conditions Report



Prepared for:

Village Of Pemberton PO Box 100 Pemberton, BC V0N 2L0

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Stewardship Pemberton Society



Stewardship Pemberton Society

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1. INTRODUCTION

One Mile Lake Park is located in the Village of Pemberton. The park consists of a small lake, surrounding wetland, alluvial forest and surrounding upland. It is a high profile public location as it links directly to downtown, residential neighbourhoods and is accessed along Highway 99. The park offers a variety of walking and biking trails, a swimming beach, park amenities, non-motorized boat activities, an educational nature centre and off-leash dog areas. It is also important habitat for a variety of species which utilize the diverse habitat types that exist within the park boundaries.

This report summarizes the current environmental state of the park, detailing the history of One Mile Lake, species present including species-at-risk and invasive species, identifies sensitive ecosystems within the park as well as potential threats. The information in this report will be used to support the development of the One Mile Lake Park Master Plan Update and will be available on the Village's website and distributed to stakeholders participating in a focus group interview to determine the future management directions of the park.

2. HISTORY

One Mile Lake historically existed as a side channel of the Lillooet River. In the late 1940's the Pemberton Valley Drainage Committee was formed following an extremely large flood that had negative effects on the majority of valley residents. This, and other local efforts, drew attention from federal agencies to the potential benefits of establishing flood protection for the purpose of agriculture production. In 1946, the Federal Government passed the *Prairie Farm Rehabilitation Act* which enabled funding for the Pemberton Valley Reclamation Project. An extensive draining and dyking initiative saw 14 km of Lillooet River meanders removed and 38 km of dykes constructed. This initiative cut-off the flow from the Lillooet River into the current town centre. In the 1960's, with the development of Highway 99 and BC hydro lines, Pemberton Creek was straightened and dyked and subsequently all glacial flow into One Mile Lake was cut-off. The lake became an isolated wetland with poor water quality and no connectivity for migrating salmonids (salmon and trout).

In 1993, the Pemberton Wildlife Association (PWA), in partnership with the Department of Fisheries and Oceans Canada (DFO), constructed an intake from Pemberton Creek to provide fresh water into One Mile Lake. The goal of this project was to improve the water quality and provide access to salmonids. The intake is located along Pemberton Creek approximately 65 m downstream of Highway 99. At that time, a new outlet was also constructed which included fish habitat features such as spawning platforms, large woody debris structures and rearing areas. As part of that project, Coho fry from the Birkenhead River Hatchery were released in One Mile Lake between 1993 and 1997.

The volume of water entering the lake at the intake is controlled by a screw valve. The intake requires maintenance when there is excessive sediment deposition at the screw valve, usually requiring excavation every five years. This is usually undertaken by the Pemberton Valley Dyking District in partnership with the Village of Pemberton.



The PWA Project functioned very well for a number of years; however, uncontrolled beaver activity reduced the effectiveness of the habitat, limiting access in and out of the lake and flooding many parts of existing trail networks. Additional projects were undertaken in 2009, 2011 and 2012 to address beaver activity, improve trails and restore fish habitat features. These projects increased the inlet and outlet capacity, making the channels less conducive to dam building. Beaver deterrents were also installed on all culvert locations throughout the park (Figure 2). Additional beaver pipes were installed through dams at the inlet of the lake ensuring a sufficient supply of water from Pemberton Creek feeds into the lake (Figure 3). To date, the projects have been successful and there have been no significant drainage issues due to beaver activity.

Figure 1. 1947 Aerial photograph of Pemberton overlaid with current civic address boundaries. One Mile Lake is shown at the bottom and centre of the photo.

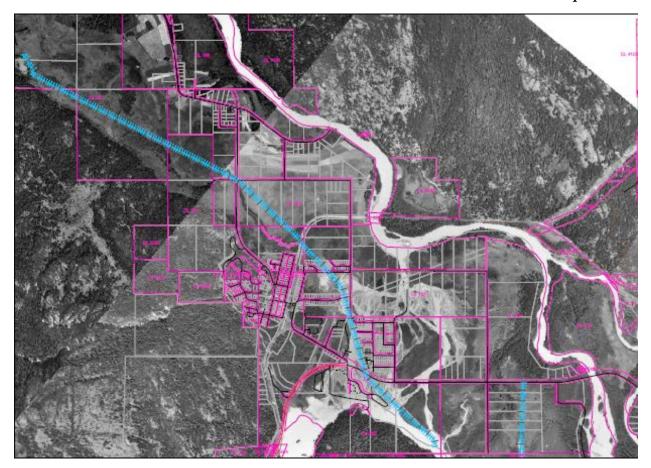






Figure 2. Beaver control installed in 2009 on culvert crossings at One Mile Lake Park.

Figure 3. Pipes installed through beaver dams at the inlet to the lake.



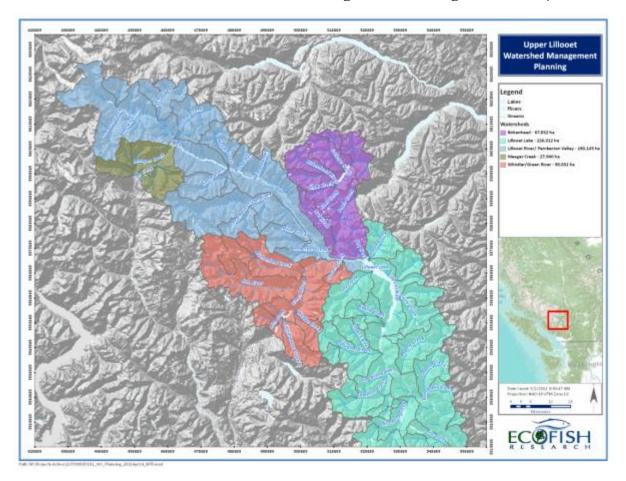


3. CURRENT ENVIRONMENTAL CONDITIONS

3.1. Watershed

One Mile Lake is located within the Pemberton Creek watershed. Pemberton Creek is part of the Lillooet-Harrison sub-basin of the Fraser River. The Lillooet River Watershed drains a mountainous glaciated landscape and encompasses approximately 602,000 ha. The headwaters begin at Silt Lake on the southern edge of the Lillooet Crown Icecap, south to Alta Lake in Whistler, the Birkenhead Lake and river system, downstream though Lillooet Lake and Little Lillooet Lake where it meets the Harrison Lake and finally the Fraser River, to the ocean (Figure 4).

Figure 4. Lillooet River Watershed (Map provided through Ecofish Research as part of the Lillooet River Watershed Management Planning Process 2011)



3.2. Biogeoclimatic Zone and Ecosystems

One Mile Lake Park is within the Coastal Western Hemlock Biogeoclimatic Zone in the dry submaritime sub variant. The upland forest is mostly previously logged young forest with the dominant trees being Western hemlock (*Tsuga heterophylla*), Douglas fir (*Pseudotsuga menziesii*) and



Western red cedar (*Thuja plicata*). There is a small area of old growth Douglas fir on the south west shore of the lake.

Most of the lake itself could be considered a shallow water wetland (<2 m deep) with a transitional marsh zone on the northern edge (MacKenzie and Moran 2004). There are four small vegetated islands on the lake.

The lake is bordered by an alluvial forest on the north end of the lake consisting mostly of black cottonwood (*Populus balsamifera ssp. trichocarpa*), red alder (*Alnus rubra*) and riparian shrub species. A portion of this forest is standing dead as it was flooded for a number of years.

There is a large rocky outcrop at the east dock which is bordered by a shale slope.

This diverse mix of ecosystem types within the park make it important habitat for a range of species.

3.3. Species Present

3.3.1. Fish

One Mile Lake provides habitat for a number of salmonids (salmon and trout) that spend a portion of their life cycle in salt water (anadromous). These species include Coho Salmon (Oncorhynchus kisutch) and Sockeye Salmon (Oncorhynchus nerka) which utilize both One Mile Lake and Pemberton Creek to spawn. Chinook Salmon (Oncorhynchus tshanytscha), Pink Salmon (Oncorhynchus gorbuscha) and Chum Salmon (Oncorhynchus keta) are found downstream in the Lillooet River. Provincial Records indicate that One Mile Lake fish include Rainbow Trout (Oncorhynchus mykiss), Cutthroat Trout (Oncorhynchus clarkii), Dolly Varden (Salvelinus malma), Bull Trout (Salvelinus confluentus), largescale sucker (Catostomus macrocheilus), Red-sided Shiner (Richardsonius balteatus), and Coastrange Sculpin (Cottus aleuticus) (FFSBC 2005). Additional species observed by Stewardship Pemberton Society include Northern Brook Lamprey (Ichthyomyzon fossor) and Northern Pike Minnow (Ptychocheilus oregonensis).

The entire lake including the intake and outflow channels are important habitat for fish. The small intake stream near the beach and the adjacent ground water spring are the most important spawning areas for salmonids in the lake.

3.3.2. Birds

The variety of habitats available at One Mile Lake Park makes it an important area for bird migration, mating and fledging. Birds that are associated with lakes, ponds, wetlands, parks, rivers, shorelines, riparian, young forest and old growth forest can be found at One Mile Lake Park. Bird counts are completed by the Pemberton Wildlife Association (PWA) in partnership with the British Columbia Conservation Data Centre (CDC) biannually during breeding season (June) and overwintering (December). Data can be found at BC Species and Ecosystems Explorer (online at http://www.env.gov.bc.ca/atrisk/toolintro.html). A printed bird list is produced by the PWA and updated annually with new sightings (Appendix A). There are approximately 240 species that have been observed in the Pemberton area.



3.3.3. Reptiles and Amphibians

Pemberton is home to five species of reptiles. Four of these species have been documented at One Mile Lake Park and include rubber boas (*Charina bottae*), alligator lizards (*Elgaria coerulea*), Northwestern garter snake (*Thamnophis ordinoides*) and common garter snakes (*Thamnophis sirtalis*). The only snake in Pemberton that has not been confirmed at One Mile is the Sharp-tailed Snake (*Contia tenuis*) which is a red-listed species, meaning it is legally recognized as endangered (Sharp-tailed Snake Recovery Team 2008). In 2011, sharp-tailed snakes were documented in Pemberton, BC. This was the first confirmed sighting outside South Eastern Vancouver Island and the Gulf Islands (Englesoft & Ovaska 2000). Further volunteer surveys in 2012 confirmed a breeding population existed surrounding the original survey site. There are survey sites at One Mile Lake Park however no sharp-tailed snakes have been observed.

The habitat with the highest value to reptiles is along the upland forested areas near the south and east shorelines including the rocky outcrop area and adjacent scree slope.

Amphibians in Pemberton that can be found in the park are long-toed salamanders (*Ambystoma macrodactylum*), Ensatina (*Ensatina eschscholtzii*), Northwestern salamanders (*Ambystoma gracile*), Western redback salamanders (*Plethodon vehiculum*) and Pacific chorus frogs (*Pseudacris regilla*). Other potential frogs that may be found at One Mile Lake Park include Western toads (*Anaxyrus boreas*) and Pacific tailed frogs (*Ascaphus truei*) both of which are confirmed in adjacent habitats.

3.3.4. Species-at-Risk

The following is a list of species that have been identified Provincially as extirpated, endangered, or threatened (red) and species of special concern to become endangered or threatened (blue) (Table 1). All the following species could reasonably occur within One Mile Lake Park.



Provincially listed speci	es potentially located in One Mile Lake Par	k
Scientific Name	Common Name	Status*
Corynorhinus townsendii	Townsend's Big Ear Bat	Blue
Myotis keenii	Keen's Myotis	Unknown
Pinicola enucleator carlottae	Pine Grosbeak, carlottae subspecies	Blue
Patagioenas fasciata	Band-tailed Pigeon	Blue
Ardea herodias fannini	Great Blue Heron, fannini subspecies	Blue
Butorides virescens	Green Heron	Blue
Hirundo rustica	Barn swallow	Blue
Megascops kennicottii kennicottii	Western Screech Owl, kennicotii subspecies	Blue
Contia tenuis	Sharp-tailed snake	Red
Rana aurora	Red-legged frog	Blue
Ascaphus truei	Coastal tailed frog	Blue
Salvelinus confluentus	Bull Trout	Blue
Oncorhynchus clarkii clarkii	Cutthroat Trout, clarkii subspecies	Blue
Monadenia fidelis	Pacific Sideband Snail	Blue
laytonia washingtoniana	Washington springbeauty	Red
Epilobium glaberrimum ssp. fastigiatum	Smooth willowherb	Blue
geyeri var. tenerum	Geyer's onion	Blue
Botrychium simplex	Least moonwort	Blue
Cheilanthes gracillima	Lace fern	Blue
Cicuta maculata var. maculata	Spotted cowbane	Red
Nothochelone nemorosa	Woodland penstemon	Blue
Oenothera pallida ssp. pallida	Pale evening-primrose	Red
Pleuropogon refractus	Nodding semaphoregrass	Blue
Schoenoplectus americanus	Olney's bulrush	Red
Sidalcea hendersonii	Henderson's checker-mallow	Blue
Carex lenticularis var. dolia	Enander's sedge	Blue
Castilleja rupicola	Cliff paintbrush	Red
Pleuropogon refractus	Nodding semaphoregrass	Blue

Table 1.	Listed species potentially occurring within Pemberton Creek watershed.
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*red-extirpated, endangered, or threatened; blue- species of special concern to become endangered or threatened

3.3.5.Invasive Species

Invasive species are not native to our area and out-compete native species as they have limited natural predators. Once established, invasive species can be difficult to control or remove. They have the potential to: reduce biodiversity; threaten waterways; and adversely impact tourism, recreational, and agricultural values. Invasive species spread through a variety of vectors, including but not limited to: recreation activities, waterways, power lines, roadways, and animal movement.



Within our local region, invasive species are having a significant impact. In Pemberton, knapweeds are affecting agricultural lands. Didymo, which smothers aquatic organisms, while reducing: aesthetic appeal; recreational opportunities; and ecological integrity, is threatening stream and water health in other regions in BC. Thick stands of Himalayan blackberry, such as those found in Squamish, form impenetrable barriers, impacting trails and recreational use. While these species are not currently a threat within One Mile Lake Park, their presence should be anticipated and planned for, especially due to the many vectors in the local area as well as the expansion of normal plant ranges as a result of climate change. As some of these species are more of a threat than others, an early detection and eradication plan should be considered for the park, with species prioritized according to their risk to both the ecological and recreational values. The Sea-to-Sky Invasive Species Council can assist with inventory, an management planning and eradication where deemed necessary (http://www.ssisc.info/home/about).

Both aquatic and terrestrial invasive species have been identified within and adjacent to One Mile Lake Park (Table 2).

Terrestrial Invasive Species		
Scientific Name	Common Name	
Centaurea sp.	Knapweeds	
Rubus armeniacus	Himalayan Blackberry	
Hieracium aurantiacum	Orange Hawkweed	
Lamium galeobdolon	Lamium	
Anchusa officianalis	Bugloss	
Berteroa incana	Hoary Alyssum	
Leucanthemum vulgare	Oxeye Daisy	
Linaria dalmatica	Dalmatian Toadflax	
Tanacetum vulgare	Common Tansy	
Cytisus scoparius	Scotch Broom	
Aquatic Invasive Species		
Scientific Name	Common Name	
Lythrum salicaria	Purple Loosestrife	
Phalaris arundinacea	Reed Canarygrass	

Yellow Flag Iris

Brown Bullhead

Goldfish

Iris pseudacorus

Cyprinidae sp.

Ameiurus nebulosus

Table 2.Invasive species located within or adjacent to One Mile Lake Park.



4. POTENTIAL CONFLICTS

As noted above, One Mile Lake Park is an important place for a number of species due to its varied habitat types. As park use increases, there are a number of potential conflicts between the natural environment of the park and its users.

4.1. Applicable Legislation

Habitat and species in One Mile Lake are protected under federal and provincial legislation. The Canadian *Fisheries Act* prevents serious harm to fish that are part of, or support, commercial, recreational or Aboriginal fisheries with the goal of ensuring their productivity and ongoing sustainability. The BC *Water Act* protects changes in and about a stream which includes One Mile Lake.

The lake, shoreline and islands are important nesting habitat for water fowl. Disturbing these areas during the breeding season can disrupt birds during mating and fledging. These areas are protected annually under the BC *Wildlife Act* between May 1 to August 1.

4.2. Natural Threats

The three natural threats to the environment at One Mile Lake Park are: fire; flood; and; fazil ice avalanches. Fire is considered a greater threat in the forested areas in the on the east and south shores of One Mile Lake. A fire prevention and response plan should be initiated to protect the park from fire. Examples of strategies suitable for One Mile Lake Park during extreme fire danger rating include public signage regarding fire hazard, smoking restrictions and by making basic fire fighting equipment (shovel, Pulaski, water pump cans) available periodically throughout the park.

Floods are a common occurrence in Pemberton Valley and most of the major flooding has been caused by rain on snow events in the fall. Based on the hydrograph of the past fifteen years, the severity of fall rain on snow events appears to be increasing (WSC 2015). One Mile Lake Park is a holding area for flood waters from Pemberton Creek. The park is able to withstand this periodic inundation and any development in the park should be constructed to the appropriate flood construction level. For example, Pemberton experienced an approximately 1 in 20 year flow return in late September 2015. Although the boardwalk, trails and other infrastructure were inundated, they were undamaged when the water receded (Figure 5). Any construction below the flood construction level should be able to withstand periodic inundation by floodwater.

Frazil ice avalanches occasionally occur in Pemberton Creek. Frazil ice avalanches occur when heavy snowfall is followed by high elevation rain which mobilizes large blocks of ice and snow into Pemberton Creek. This creates a large mass of slush which has incredible destructive shearing power as it moves through the river valley. Figure 6 and Figure 7 show a frazil ice avalanche from fall 2007. Any recreational development within 30 m of Pemberton Creek and along the northwest portion of the park should into account this potential hazard.





Figure 5. One Mile Lake during 2015 flood flow.

Figure 6. Looking upstream Pemberton Creek from Highway 99 following a frazil ice event.







Figure 7. The area at the green gate inundated by frazil ice in 2007.



REFERENCES

- MacKenzie, W.H. and J.R. Moran. 2004. Wetlands of British Columbia: a guide to identification. Res. Br., B.C. Min. For., Victoria, B.C. Land Management Handbook No. 52.
- Freshwater Fisheries Society of British Columbia. 2015. Fish Wizard. British Columbia. http://www.fishwizard.com. Accessed September 2015.
- Water Survey of Canada. 2015. Real-time Hydrometric Data Gauge #08MG0005- Lillooet River near Pemberton. <u>http://www.wateroffice.ec.gc.ca/graph/graph_e.html?stn=08MG005</u>. Accessed September 17, 2015.
- Sharp-tailed Snake Recovery Team. 2008. Recovery Strategy for the Sharp-tailed Snake (Contia tenuis) in British Columbia. Prepared for the B.C. Ministry of Environment, Victoria, BC. 27 pp.



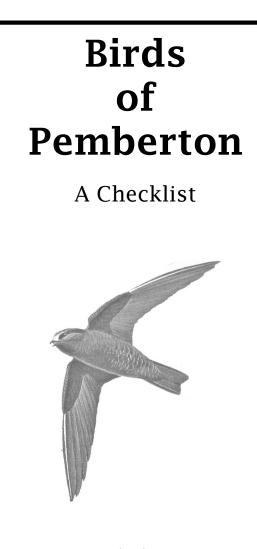
KINGLETS

KINGLETS		
0	Golden-crowned Kinglet	
0	Ruby-crowned Kinglet	
WAXWINGS		
*	Bohemian Waxwing	
¢	Cedar Waxwing	
DIPPERS	O American Dipper	
STARLINGS	 European Starling 	
VIREOS AND	ALLIES	
¢	Cassin's Vireo	
A	Hutton's Vireo	
¢	Warbling Vireo	
¢	Red-eyed Vireo	
WOOD WAR		
A	Tennessee Warbler	
¢	Orange-crowned Warbler	
¢	Nashville Warbler	
¢	Yellow Warbler	
A	Magnolia Warbler	
¢	Yellow-rumped Warbler	
¢	Black-throated Gray Warbler	
¢	Townsend's Warbler	
A	Hermit Warbler	
A	Blackpoll Warbler	
A	Black-and-white Warbler	
¢	American Redstart	
¢	Northern Waterthrush	
¢	MacGillivray's Warbler	
¢	Common Yellowthroat	
¢	Wilson's Warbler	
A	Yellow-breasted Chat	
SPARROWS,	TOWHEES, JUNCOS	
0	Spotted Towhee	
¢	Chipping Sparrow	
A	Clay-coloured Sparrow	
A	Lark Sparrow	
I← →I	Vesper Sparrow	
¢	Savannah Sparrow	
¢	Fox Sparrow	
0	Song Sparrow	
¢	Lincoln's Sparrow	
0	White-crowned Sparrow	
A	White-throated Sparrow	
¢	Golden-crowned Sparrow	
0	Dark-eyed Junco	
I← →I	Lapland Longspur	
A	American Tree Sparrow	
	•	

		APPENDIX 1
GROSBEAP	(S AND BUNTINGS	
¢	Black-headed Grosbea	ak 🗆
A	Rose-breasted Grosbe	ak 🗆
¢	Lazuli Bunting	
А	Indigo Bunting	
*	Snow Bunting	
WRENS		
A	Bewick's Wren	
O	Pacific Wren	
A	House Wren	
А	Marsh Wren	
MIMIDS		
A	Northern Mockingbird	
¢	Gray Catbird	
THRUSHES		
0	Mountain Bluebird	
O	Townsend's Solitaire	
¢	Veery	
¢	Swainson's Thrush	
A	Gray-cheeked Thrush	
0	Hermit Thrush	
0	American Robin	
0	Varied Thrush	
LONG-TAIL	-	_
A	Bushtit	
CHICKADE		••
0 0	Black-capped Chickad Mountain Chickadee	
0	Chestnut-backed Chick	
A	Boreal Chickadee	
NUTHATCH		
O	Red-breasted Nuthatcl	
A	White-breasted Nuthat	
0	Brown Creeper	
SHRIKES		
*	Northern Shrike	
CROWS AN	ID JAYS	
0	Gray Jay	
0	Steller's Jay	
A	Blue Jay	
А	Black-billed Magpie	
0	Clark's Nutcracker	
0	American Crow	
0	Northwestern Crow	
Ο	Common Raven	

ICTERIDS Red-winged Blackbird Ο ¢ Western Meadowlark 0 Yellow-headed Blackbird ₩ Rusty Blackbird Ο Brewer's Blackbird ٥ Brown-headed Cowbird ¢ Bullock's Oriole TANAGERS Western Tanager \Diamond Scarlet Tanager А FINCHES, SISKINS, CROSSBILLS Gray-crowned Rosy-Finch Ο Pine Grosbeak 翐 Ο Cassin's Finch Purple Finch Ο Ο House Finch Red Crossbill Ι White-winged Crossbill Ι Common Redpoll Ι Hoary Redpoll А Ο Pine Siskin Ο American Goldfinch Ο **Evening Grosbeak OLD WORLD SPARROWS** House Sparrow Ο Key to Symbols Ο Year Round Summer Resident ۵ Winter Resident 衆 ı⇔ı Spring / Fall Transit Accidental А Ι Irruptive New sightings and questions can be directed to: John Tschopp, Box 334, Pemberton, BC, V0N 2L0 604 894 6902 or jtschopp@shaw.ca Funded by Wildlife

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12th Edition Compiled by Nigel Mathews

Records from documented historical sightings, local observations, Christmas counts & breeding bird surveys.

AREA: The Lillooet River watershed, south of Pemberton to Shadow Lake on Highway 99, north to Gates Lake on the D'Arcy Road east to the Lillooet Lake outlet & west to the Pemberton Icecap.

LOONS		NEV
A	Pacific Loon	
ò	Common Loon	OSF
GREBES		
Ο	Pied-billed Grebe	НАМ
I ≪_	Red-necked Grebe	
I ≪_	Horned Grebe	
А	Eared Grebe	
i ¢ i	Western Grebe	
CORMORAI	NTS	
A	Double-crested Cormorant	
HERONS, E	GRETS AND BITTERNS	
0	Great Blue Heron	
A	Green Heron	
A	Cattle Egret	
A	Black-crowned Night Heron	
A	American Bittern	FAL
DUCKS, GE	ESE AND SWANS	
\	Trumpeter Swan	
i ⊂ i	Tundra Swan	
A	Snow Goose	
¢	Canada Goose	GRO
i ⊂ i	Greater White-Fronted Goose	GRU
i ←	Cackling Goose	
¢	Wood Duck	
i →	American Wigeon	
A	Gadwall	
¢	Green-winged Teal	
0	Mallard	
i →	Northern Pintail	
A	Blue-winged Teal	PHE
¢	Cinnamon Teal	
i →	Northern Shoveler	CRA
A	Canvasback	0///
¢	Ring-necked Duck	
i ⊄ i	Lesser Scaup	RAI
¢	Harlequin Duck	
A	Surf Scoter	
А	Black Scoter	
i →	Common Goldeneye	
¢	Barrow's Goldeneye	PLC
0	Bufflehead	
0	Hooded Merganser	
O t	Common Merganser	
i← →i	Ruddy Duck	

NEW WORLD VULTURES			
¢	Turkey Vulture		
OSPREY			
¢	Osprey		
HAWKS, E	AGLES AND KITES		
Ο	Bald Eagle		
\$	Northern Harrier		
Ο	Sharp-shinned Hawk		
Ο	Cooper's Hawk		
Ο	Northern Goshawk		
Õ	Red-tailed Hawk		
A	Broad-winged Hawk		
¥1	Rough-legged Hawk		
→ı A	Golden Eagle		
	-		
A	Swainson's Hawk		
FALCONS			
0	American Kestrel		
0	Merlin		
¢	Peregrine Falcon		
A	Prairie Falcon		
GROUSE A	ND PTARMIGAN		
O	Spruce Grouse		
Ŏ	Dusky Grouse		
Ŏ	Sooty Grouse		
A	Sharp-tailed Grouse		
O O	Ruffed Grouse		
0	White-tailed Ptarmigan		
-	Chukar		
A	Chukar		
PHEASAN			
A	Ring-necked Pheasant		
CRANES			
l ← →I	Sandhill Crane		
RAILS, GA	RAILS, GALLINULES AND COOTS		
¢	Virginia Rail		
¢	Sora		
¢	American Coot		
PLOVERS AND LAPWINGS			
	Semipalmated Plover		
, t	Black-bellied Plover		
÷	Pacific Golden Plover		
⇒ı ¢	Killdeer		
<i>ب</i> د			

SAN

SANDPIPERS			
¢	Wilson's Snipe		
A	Wilson's Phalarope		
i← →I	Greater Yellowlegs		
i←i	Lesser Yellowlegs		
۵	Solitary Sandpiper		
۵	Spotted Sandpiper		
i← →I	Long-billed Curlew		
А	Dunlin		
i← →	Pectoral Sandpiper		
i←i	Semipalmated Sandpiper		
I← →I	Western Sandpiper		
i← →	Least Sandpiper		
i ← →i	Baird's Sandpiper		
i← →	Long-billed Dowitcher		
A	Red-necked Phalarope		
GULLS		_	
i ←	Mew Gull		
A	Ring-billed Gull		
¢	California Gull		
A	Glaucous-winged Gull		
A	Thayer's Gull		
A	Herring Gull		
i← →i	Bonaparte's Gull		
TERNS			
i ⊄_ i	Caspian Tern		
A	Common Tern		
A	Arctic Tern		
A	Forster's Tern		
ALCIDS			
A	Marbled Murrelet		
PIGEONS A			
0	Rock Pigeon		
0	Band-tailed Pigeon		
¢	Mourning Dove		
0	Eurasian Collared Dove		
OWLS	Western Screech Oud	_	
O O	Western Screech-Owl		
0	Great Horned Owl		
A	Snowy Owl		
A	Spotted Owl		
0	Barred Owl		
0	Northern Pygmy-Owl		
A	Boreal Owl		
¢	Northern Saw-whet Owl		
A	Long-eared Owl		
i← →i	Short-eared Owl		

NIGHTJARS			
¢	Common Nighthawk		
SWIFTS	3		
\$	Black Swift		
¢	Vaux's Swift		
HUMMINGE	BIRDS		
А	Anna's Hummingbird		
A	Black Chinned Hummingbird		
А	Calliope Hummingbird		
¢	Rufous Hummingbird		
KINGFISHE	-		
Ο	Belted Kingfisher		
WOODPEC			
0	Pileated Woodpecker		
А	Lewis's Woodpecker		
¢	Red-naped Sapsucker		
¢	Red-breasted Sapsucker		
Ο	Downy Woodpecker		
Ο	Hairy Woodpecker		
0	American Three-toed Woodpecker		
A	Black-backed Woodpecker		
Ο	Northern Flicker		
TYRANT FL	YCATCHERS		
¢	Olive-sided Flycatcher		
¢	Western Wood-Pewee		
A	Alder Flycatcher		
¢	Willow Flycatcher		
А	Least Flycatcher		
¢	Hammond's Flycatcher		
¢	Dusky Flycatcher		
¢	Pacific-slope Flycatcher		
i← →i	Say's Phoebe		
¢	Western Kingbird		
¢	Eastern Kingbird		
PIPITS & W			
i ←	American Pipit		
LARKS			
i← →I	Horned Lark		
SWALLOW	S		
A	Purple Martin		
¢	Tree Swallow		
¢	Violet-green Swallow		
¢	Northern Rough-winged Swallow	′ 🗆	
¢	Bank Swallow		
¢	Cliff Swallow		
¢	Barn Swallow		