VASCULAR PLANTS OF DRIZZLE LAKE ECOLOGICAL RESERVE: SPECIES LIST AND HABITAT DESCRIPTION.

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Seventy-five species of vascular plants are found on the Drizzle Lake Ecological Reserve (DLER); their habitats and general abundance are listed in Table 1. A species not previously reported for the Queen Charlotte Islands, Juncus nevadensis Watson, forms a large colony in the major inlet to the lake. There are 2 other records of J. nevadensis in British Columbia, housed in the Provincial Museum Herbarium, Victoria, one from Williams Lake in central B.C. and the other from the extreme southeast corner of the province. DLER contains several plants considered rare on the Queen Charlotte Islands (Calder and Taylor 1968), Lycopodium inundatum, Eleocharis acicularis and Juncus filiformis. All three are locally common in the littoral zone of the lake.

DLER can be segregared into 6 major habitats: closed forest, open forest, transitional, bog, lakeshore and aquatic (Figure 1 and Table 2). Each is defined by a characteristic topography, moisture regime, light exposure and plant community.

CLOSED FOREST occurs in well-drained sites primarily on the north and west borders of the lake and along the inlet stream. Western hemlock (Tsuga heterophylla) and western red cedar (Thuja plicata), the dominant elements of this habitat, form a high canopy, creating predominantly shaded conditions. Sitka spruce (Picea sitchensis) is occasional, and lodgepole pine (Pinus contorta) is found only in areas more exposed to light at the outer limits

of the habitat. Conifer seedlings are rare. Bryophytes form an almost continuous dry mat on the forest floor, with Rhytidiadelphus loreus most common. The only herbs are Listera cordata, L. caurina and Calypso bulbosa; shrubs (Gaultheria shallon, Menziesia ferruginea and Vaccinium parvifolium) are widely scattered with sparse foliage.

OPEN FOREST occupies the greatest portion of the Reserve and occurs primarily on gently sloping land. Although the substrate is usually damp, adequate drainage prevents accumulation of water. Species composition and density varies considerably in different areas and over short distances. In general, widely spaced conifers (western red cedar, western hemlock, yellow cedar (Chamaecyparis nutkaensis), and lodgepole pine) provide a sparse canopy. The dominant bryophyte is Hylocomium splendens, and Pleurozium schreberi is common is well lit areas. Cornus unalaschkensis, Gaultheria shallon, Ledum groenlandicum, Menziesia ferruginea, Vaccinium parvifolium and V. vitus-idaea reach their highest density in this habitat, with G. shallon often forming continuous thickets. Blechnum spicant and Carex pluriflora occur throughout the habitat. In wetter depressions, Sphagnum spp. are the dominant substrate, and Gentiana douglasiana and Coptis asplenifolia become locally common. Dead spires and fallen logs (western red cedar and yellow cedar) are prominent, remnants of an historical fire.

TRANSITIONAL zones on the Reserve are an extension of the bog habitat, characterized by an increase in the size and density of conifers and a resultant decrease in light. The amount of transitional

habitat on the Reserve (15.4%) is only a close approximation, as distinct boundaries to the zone are absent.

The BOG habitat has a perenially wet ground cover and maximum light exposure; bogs are found on primarily flat land at the lake level and on plateaus to the north and east of the lake. Year-round pools, often connected by intermittent runnels, are common, and temporary pot-holes and seepy depressions are found throughout the habitat. Sphagnum imbricatum is the dominant bryophyte, often providing a continuous ground cover over large areas. Other species of Sphagnum and Rhacomitrium lanuginosum are secondary in abundance. Prostrate Juniperis communis and dwarfed lodgepole pine are conspicuous trees in the habitat, while small western hemlock, western red cedar and yellow cedar are widely spaced. The elements common to all bogs on the Reserve are Agrostis aequivalvis, Rhynchospora alba, Scirpus cespitosum, Eriophorum angustifolium, Empetrum nigrum, Andromeda polifolia, Kalmia polifolia, Ledum groenlandicum, Tofieldia glutinosa, Gentiana douglasiana and Apargidium boreale. Along the margins of bog pools and runnels Coptis trifolia, Drosera rotundifolia, Loiseleuria procumbens and Vaccinium uliginosum are common.

LAKESHORE habitat includes the narrow band of vegetation that extends back from the high water mark a distance less than 5 m. The lower margin, although terrestrial during winter high water, is subject to wave action and, occasionally, several days of inundation during fall rains. The most common vegetative substrate at this level is Polytrichum commune, and in wetter areas, Sphagnum spp.;

Drosera rotundifolia, Vaccinium uliginosum, Agrostis aequivalvis and Carex obnupta are common. Calamagrostis nootkaensis reaches its greatest abundance above the splash zone. The upper margin of the lakeshore is one of the few areas on DLER where Alnus rubra, Vaccinium alaskense, V. ovalifolium and Pyrus fusca occur. Western red cedar, yellow cedar, lodgepole pine and western hemlock are similar in abundance along the lakeshore, with sitka spruce occasional. A dense understory of G. shallon usually grows beneath the conifer canopy.

The AQUATIC habitat occupies 17.0% of DLER, yet since light penetrates the water to a depth of only 2 m, distribution of aquatic plants is restricted to shallow pools, streams and the littoral region of the lake. Annual fluctuations of 0.5 m in the lake level, at maximum from November to March and minimum in August, forces considerable environmental changes on the littoral zone. Submerged flora (at water minimum) is sparse, consisting of primarily Liliaeopsis occidentalis. Emergent species, those left mostly terrestrial during receding water, include Eleocharis acicularis, E. palustris, Juncus falcatus, J. filiformis and J. oreganus. Both Agrostis aequivalvis and Carex obnupta extend in some areas from the terrestrial lakeshore zone to the emergent habitat. Nuphar luteum, the only floating aquatic, grows in protected bays in the lake, and is often abundant in large bog pools. The pH throughout the habitat is low (lake - 4.5; pools - 4.0; inlet - 3.9).

TABLE 1. Distribution of plants in habitats, DLER. Nomenclature follows Calder and Taylor (1968) except where authorities are listed. 1 = Uncommon: not a conspicuous plant in the community OR not commonly found in the habitat; 2 = Present: generally found in the habitat but not a dominant element; 3 = Abundant: always found in the habitat and often a conspicuous element. The Aquatic habitat is divided into lake (L), streams (S) and bog pools (P).

Species	Habitat					
	Closed forest	Open forest	Transi-tional	Bog	Lake shore	Aquatic
Lycopodiaceae						
Lycopodium annotium		1	1	1		
L. inundatum					1	
Selaginellaceae						
Selaginella selaginoides				1		
Polypodiaceae						
Blechnum spicant	1	2	2	1		
Polypodium glycyrrhiza D.C. Eaton					1	
Pinaceae						
Picea sitchensis	2	1	1	1	1	
Pinus contorta	1	2	3	3	3	
Tsuga heterophylla	3	3	2	1	2	

TABLE 1 (cont.)

	Closed forest	Open forest	Transi-tional	Bog	Lake shore	Aquatic
Cupressaceae						
Chamaecyparis nootkaensis	1	2	2	1	2	
Juniperis communis			1	3		
Thuja plicata	3	3	3	2	2	
Sparganiaceae						
Sparganium angustifolium Mich.						1(L),2(S) 1(P)
Graminae						
Agrostis aequivalvis				3	3	
Calamagrostis nutkaensis		1	1	1	3	
Cyperaceae						
Carex obnupta				1	3	
C. pauciflora			2	3		
C. phyllomanica		1				
C. sitchensis				1	1	
C. pluriflora		2	2	1		
Eleocharis acicularis						3(L)
E. palustris (L.) R. & S.						1(L)
Eriophorum angustifolium			1	3		
E. chamissonis		1			1	
Rhynchospora alba			1	3		
Scirpus cespitosus			1	3		
Araceae						
Lysichiton americanum						1(C)

TABLE 1 (cont.)

	Closed forest	Open forest	Transi-tional	Bog	Lake shore	Aquatic
Juncaceae						
Juncus falcatus						2(L)
J. filiformis						2(L)
J. oreganus						2(L)
J. nevadensis Watson						3(S) 1(L)
Liliaceae						
Maianthemum dilatatum		1				
Tofieldia glutinosa ssp. *glutinosa*				2		
Orchidaceae						
Calypso bulbosa ssp. *occidentalis*	2					
Habenaria dilatata				1		
H. saccata		1				
Listera caurina	3					
L. cordata	3	1				
Spiranthes romanzoffiana					1	
Myricaceae						
Myrica gale				1		
Betulaceae						
Alnus rubra		1			2	
Nymphaeaceae						
Nuphar luteum ssp. *polysepalum*						1(L) 2(P)

TABLE 1 (cont.)

	Closed forest	Open forest	Transi-tional	Bog	Lake shore	Aquatic
Ranunculaceae						
Coptis asplenifolia		1				
C. trifolia				3		
Droseraceae						
Drosera rotundifolia		1	1	3	2	
Rosaceae						
Potentilla pacifica					1	
Pyrus fusca					1	
Rubus chamaemorus		1	1	3		
R. pedatus		1				
Sanguisorba officianalis ssp. *microcephala*			2	3		
Empetraceae						
Empetrum nigrum		1	2	3	2	
Umbelliferae						
Lilaeopsis occidentalis						3(L)
Cornaceae						
Cornus unalaschkensis		2	2	2		
Pyrolaceae						
Monesis uniflora ssp. *reticulata*	1					
Ericaceae						
Andromeda polifolia				3		
Gaultheria shallon	1	3	3	1	3	
Kalmia polifolia		1	2	3	2	

TABLE 1 (cont.)

	Closed forest	Open forest	Transi-tional	Bog	Lake shore	Aquatic
Ericaceae						
Ledum palustre ssp. *groenlandicum*		2	2	3	2	
Loiseleuria procumbens				2		
Menziesia ferruginea	1	2	2		2	
Vaccinium alaskense					1	
V. caespitosum				1		
V. ovalifolium					1	
V. oxycoccus			1	2	1	
V. parvifolium	1	2			1	
V. uliginosum				3	2	
V. vitus-idaea ssp. *minus*		2	2	1	1	
Primulaceae						
Dodecatheon jeffreyi					2	
Trientalis europaea				1	2	
Gentianaceae						
Gentiana douglasiana		2	2	3		
Menyanthaceae						
Fauria crista-galli		1		1	1	
Menyanthes trifoliata						1(L) 2(S)
Lentibulariaceae						
Pinguicula villosa				1		
P. vulgaris ssp. *microceras*				1		

TABLE 1 (cont.)

	Closed forest	Open forest	Transitional	Bog	Lake shore	Aquatic
Caprifoliaceae						
Linnaea borealis ssp. *longiflora*		1				
Compositae						
Apargidium boreale			1	3		

Voucher specimens for the majority of plants have been deposited in the Queen Charlotte Islands Museum Herbarium, Skidegate and the B.C. Provincial Museum Herbarium, Victoria. Dr. T.C. Brayshaw kindly identified *Juncus nevadensis* and several other sedges.

TABLE 2. Proportions of habitats in DLER. Relative areas of each habitat assessed from air photographs.

Habitat	%
Closed Forest	4.2
Open Forest	39.4
Transitional	15.4
Bog	24.0
Aquatic	
Lake/limnetic	11.1
Lake/littoral	3.4
Bog pools	1.5
Inlet, outlet streams	1.0

FIGURE 1. Distribution of habitats in DLER.