

ORIGINAL PURPOSE To maintain undisturbed lake and bog ecosystems on the Argonaut Plain, Haida Gwaii, for research on unique stickleback populations and their predators

OVERVIEW

Date established:	10 August 1973	Location:	10 km SSE of Masset on Graham Island
ORC #:	3052	Latitude:	53°56'N
Map number:	103 F/16	Longitude:	132°04'W

Total Area:	837 ha	Elevation:	52-91 m
Land:	727 ha		
Lake:	110 ha		

Access: Accessible only by foot. The reserve boundary is 0.75 km from Highway 16; Drizzle Lake is 1.5 km away.

Biogeoclimatic Zones:	Coastal Western Hemlock (CWH)
Biogeoclimatic Variant:	CWH Submontane Wet Hypermaritime
Ecosection:	Queen Charlotte Lowland
Region:	Skeena
Management Area:	Haida Gwaii

COMPOSITION

Physical: The reserve is located at the southwestern edge of the Argonaut Plain, a low-lying boggy subdivision of the Queen Charlotte Lowland. Soils are mostly saturated organic types (Fibrisols; Mesisols) developed by decay of sphagnum mosses and other bog plants. Forest soils (Podzols) occur on higher ground. Drainage on this low-relief surface is poorly organized. Drizzle Lake, 148 ha in area and 16 m deep, drains northward to Dixon Entrance via Drizzle Creek and Skonun and Sangan rivers. Reserve boundaries enclose all upstream drainage into Drizzle Lake. The relatively smooth lake bottom consists mostly of fine sand and hard-packed sand and gravel. Some pebble beaches occur around the shoreline, sometimes overhung by banks of peat.

Biological: Plant communities here are arranged in a complex mosaic which varies according to wetness of the site. Five major habitats have been described, and transitional types also occur. Small areas of closed forest occur on the best drained sites, primarily around the shore of Drizzle Lake and along its inlet stream. Western hemlock and western redcedar are dominant trees in the closed forest. Open forest, usually on moist but not ponded gently sloping land, occupies about half of the reserve area.

Interesting bog habitats formed by compressed layers of dead sphagnum moss cover flat terrain on about one quarter of the reserve. These giant sponges are fed by rainfall, and drainage out of them is restricted by an underlying layer of compressed sand and gravel. Sphagnum moss is the dominant bog vegetation;

prostrate common juniper, “bonsai”-like pines, and dwarfed hemlocks and cedars are conspicuous but well-spaced. Indicator plants of the bogs include Alaska bentgrass, beak-rush, tufted deer-grass, cotton-grass, crowberry, bog rosemary, bog-laurel, alpine-azalea, bog blueberry, Labrador tea, sticky false asphodel, swamp gentian and the insectivorous sundew. Bands of lakeshore vegetation commonly include several of the above bog plants, mosses and Pacific reedgrass, as well as red alder and Pacific crab apple trees. Aquatic habitats cover nearly 20% of the reserve, much of this being Drizzle Lake itself. Due to poor light penetration, aquatic plants are not extensive in the lake. Western lilaopsis is the only common submerged plant; various rushes and sedges grown sparingly as emergents.

Seventy-five species of vascular plants, 37 mosses, six liverworts and 24 mushrooms have been recorded.

Drizzle Lake is noteworthy for the varied use by at least 36 species of aquatic birds. These include migrants such as ducks and geese that are present for only a few days, seasonal residents like grebes which occur for up to three months, and itinerants such as loons, cormorants, herons and gulls which make daily feeding flights to and from the ocean. Species accounting for most use in terms of bird-days are the Mallard, Canada Goose, Common Merganser, Red-throated Loon and Common Loon. Up to 60 Common and 20 Red-throated loons occur on Drizzle Lake in summer; most are non-breeding adults but a few Red-throated Loons nest on mossy hummocks near the shoreline. Feeding strategies of the loons show fascinating contrasts. Common Loons come from the ocean to feed on sticklebacks in the central part of the lake, with activity concentrated near mid-day. Red-throated Loons use shallower parts of the lake, mostly from early evening to dawn. Red-throated Loons that nest on the lake make an average of 11 one-hour flights per day to the ocean to obtain spineless fish to feed their nestlings. Canada Geese, Mallards, Green-winged Teal, and Hooded Mergansers also nest in the reserve as well as Great Blue Herons and Marbled Murrelets.

All six endemic sub-species of Queen Charlotte Island mammals (River Otter, Short-tailed Weasel, American Marten, Black Bear, Dusky Shrew, Deer Mouse) occur in the reserve as well as the introduced Black-tailed Deer, American Beaver, Red Squirrel, and Raccoon. Two species of amphibians, the native Western Toad and introduced Pacific Treefrog, are also present.

Drizzle Lake and its inlet stream contain populations of the three-spined stickleback fish that are of great scientific interest. The lake contains very large (up to ten cm long), dark-coloured, long-spined specimens while inlet fish are much smaller, lighter coloured, and have short spines. Although these populations come into contact where the inlet stream enters the lake, hybrids have not been found. This degree of divergence, equivalent to that known across the entire circumboreal range of the species, is thought to have developed during the past 10 000 years, a remarkable rate of evolution. Large size, dark colour, and long spines in the lake-dwelling form have evolved as protection against predation by trout, and possibly loons. Other fish at Drizzle Lake are dolly varden, cutthroat, and coho salmon.

Cultural: This reserve resides on the Haida First Nation's traditional territory of the Queen Charlotte Islands.
Pioneer research cabins are located within the reserve.

MANAGEMENT CONCERNS

SIGNIFICANT SPECIES	BC LIST STATUS	COSEWIC STATUS	CF PRIORITY
Ermine, ssp. <i>haidarum</i>	Red listed	Threatened (2001)	2
Giant Black Stickleback	Red listed	Special Concern (1980)	1
Hairy Woodpecker, ssp. <i>picoideus</i>	Blue listed		1
Northern Saw-whet Owl, ssp. <i>brooksi</i>	Blue listed	Threatened (2006)	1
Steller's Jay, ssp. <i>carlottae</i>	Blue listed		2

THREATS

Climate Change: The warming temperatures and changing hydrology that may result from climate change could alter the water quality of Drizzle Lake and affect the unique stickleback population. The bog ecosystems may also be at risk of drying and changing the associated community composition. Endemic subspecies and species of migratory waterfowl that are protected within this reserve may be at risk of losing unique and necessary habitat.

Non-native species: Beavers are altering key waterways which may impact future transitory routes of the unique stickleback populations in the future.

Transportation: Possible illegal float plane activity on Drizzle Lake which may disrupt the wildlife.

RESEARCH OPPORTUNITIES

Several unpublished reports and journal papers by University of Alberta scientists are available on sticklebacks and loons. Research on those species is on-going. Other reports are available on the flora and on plant-insect relationships. These reports provide background material to research in the reserve.

Dr. Tom Reimchen has conducted studies on the local stickleback populations in this area for over 20 years. This research provides good background material for future study.

SCIENTIFIC NAMES OF SPECIES MENTIONED IN THE DRIZZLE LAKE ER ACCOUNT

Flora

alder, red (*Alnus rubra*)
 alpine-azalea (*Loiseleuria procumbens*)
 asphodel, sticky false (*Triantha glutinosa*)
 beak-rush (*Rhynchospora alba*)
 bentgrass, Alaska (*Agrostis aequivalvis*)
 blueberry, bog (*Vaccinium uliginosum*)
 bog-laurel, western (*Kalmia microphylla*)
 cotton-grass, narrow leaved, (*Eriophorum angustifolium*)

crab apple, Pacific (*Malus fusca*)
crowberry (*Empetrum nigrum*)
gentian, swamp (*Gentiana douglasiana*)
hairgrass, tufted (*Deschampsia cespitosa*)
hemlock, western (*Tsuga heterophylla*)
juniper, common (*Juniperus communis*)
Labrador tea (*Ledum groenlandicum*)
lilaeopsis, Western (*Lilaeopsis occidentalis*)
moss, peat (*Sphagnum spp.*)
redcedar, western (*Thuja plicata*)
reedgrass, Pacific (*Calamagrostis nutkaensis*)
rosemary, bog (*Andromeda polifolia*)
sundew (*Drosera sp.*)

Fauna

Bear, American Black (*Ursus americanus*)
Beaver, American (*Castor canadensis*)
Deer, Black-tailed (*Odocoileus hemionus hemionus*)
Dolly Varden (*Salvelinus malma*)
Ermine, ssp. *haidarum* (*Mustela ermine haidarum*)
Frog, Pacific Chorus (*Pseudacris regilla*)
Goose, Canada (*Branta Canadensis*)
Heron, Great Blue (*Ardea herodias*)
Jay, Steller's, ssp. *carlottae* (*Cyanocitta stelleri carlottae*)
Loon, Common (*Gavia immer*)
Loon, Red-throated (*Gavia stellata*)
Mallard (*Anas platyrhynchos*)
Marten, American (*Martes americana*)
Merganser, Common (*Mergus merganser*)
Merganser, Hooded (*Lophodytes cucullatus*)
Mouse, Deer (*Peromyscus maniculatus*)
Murrelet, Marbled (*Brachyramphus marmoratus*)
Otter, Northern River (*Lontra canadensis*)
Owl, Northern Saw-whet, ssp. *brooksi* (*Aegolius acadicus brooksi*)
Raccoon (*Procyon lotor*)
Salmon, Coho (*Oncorhynchus kisutch*)
Shrew, Dusky (*Sorex monticolus*)
Squirrel, Red (*Tamiasciurus hudsonicus*)
Stickleback, Giant Black (*Gasterosteus sp. 1*)
Stickleback, Threespine (*Gasterosteus aculeatus*)
Teal, Green-winged (*Anas crecca*)
Toad, Western (*Bufo boreas*)
Trout, Cutthroat (*Oncorhynchus clarkii*)
Woodpecker, Hairy, ssp. *picoides* (*Picoides villosus picoides*)