ROBSON BIGHT (MICHAEL BIGG) **ER #111**

ORIGINAL PURPOSE	To protect key habitats for killer whales, prevent their harassment while using these habitats, and maintain unique opportunities to research and observe killer whales; to protect a pristine estuary and forested shorelines

OVERVIEW

Date established:	17 June 1982	**Location:**	Johnstone Strait coastline, 10 km SE of Telegraph Cove, Vancouver Island
Date amended:	18 March 1988		
Date of second amendment:	10 Aug. 1989		
ORC #:	3111	**Latitude:**	50º21'N
Map number:	92 L/7; L/10	**Longitude:**	126º35'W
Marine chart number:	3568		
Total Area:	1,715 ha	**Elevation:**	-400-300 m
Land:	467 ha		
Marine:	1,248		
Access:	Upland portion of the Reserve is closed to public access by Order-in-Council (no. 1316, 20 Aug. 1992) Permit required to enter reserve area. Accessible by boat.		
Biogeoclimatic Zone:	Coastal Western Hemlock (CWH)		
Biogeoclimatic Variant:	CWHvm 1 CWH Submontane Very Wet Maritime		
Terrestrial Ecosection:	Northern Island Mountains		
Marine Ecosection:	Johnstone Strait		
Region:	Vancouver Island		
Management Area:	Cape Scott		

COMPOSITION

Physical:

The reserve includes a 1248 ha marine portion and a 505 ha forested upland portion. This comprises 10.7 km of Vancouver Island shoreline including a few rocky headlands and one significant bay (Robson Bight), but lacks sheltered moorage. Shoreline materials are largely rock and cobble, except for the Tsitika River estuary which has deposits of gravel, sand, and mud. Water depths plunge rapidly to 400 m or more in the glacially scoured center of Johnstone Strait. Strong tidal currents result in constant mixing of Johnstone Strait waters at all depths, and in narrow ranges in salinity and dissolved oxygen. As a result, the bottom fauna is rich and not subject to the devastating effects of low oxygen supply that plague some of the silted basins and fjords along the coast.

Terrain in the upland portion for the most part rises steeply from shore to a discontinuous series of small ridges paralleling the coastline, especially to the east of the Tsitika estuary. These ridges form the southern boundary. To the west of the estuary, the upland boundary follows a short ridge, otherwise traversing the lower slopes of Mt. Sir John. The bedrock is exposed along much of the shoreline and in many places on steep knolls east of the estuary; it belongs to the Karmutsen Volcanics and is mainly basalt and pillow lava. Glacial till and colluvium cover the bedrock only in part of the area, primarily around, and west of, the estuary. Fluvial and fluvioglacial deposits are restricted to the estuary and a small area southwest of it. Soils are Regosols on the fluvial deposits, Humo-Ferric Podzols on all other surficial deposits, and Folisols in the bedrock areas.

Biological:
(circa 1993)

Just as the strategic location of Johnstone Strait results in much marine traffic of human origin, so too is this a key migratory funnel for waterfowl, salmon, and whales. In 1993, up to 70% of salmon heading for Fraser River spawning grounds pass through these waters.

Johnstone Strait is used year-round by a "community" of 13 pods (family groups) of killer whales or orcas (*Orcinus orca*) totalling 170 animals, which reside permanently between Campbell River and Prince Rupert and contain recognizable individuals (date?). In 1989 there were 16 pods and 189 individuals (D. Briggs 1991). Robson Bight and adjacent waters in the reserve have been identified as a "core" area for the north-coast killer whale community. This identification is based on sporadic use of seven to eight pods (65 to 85 whales), and very frequent use by three pods totalling 30 whales. Robson Bight is visited mainly from June to October, the major period of salmon migration through Johnstone Strait. Studies indicate that pods enter the Bight several times per day on about 80% of the days they are present in western Johnstone Strait. The whales behave differently at Robson Bight than in adjacent waters; there is less travelling, less feeding, more resting, more play, more rubbing on beaches and rocks, and perhaps more sexual activity than in other areas. Killer whales may be seen with greater regularity in this area than any other place on the British Columbia coast. However, they are more sensitive to disturbance when near shore, in the Bight, than when travelling and feeding offshore.

The upland forest vegetation of the reserve is very diverse. Tree species, in order of abundance are western hemlock, western redcedar, amabilis fir, shore pine, Douglas-fir, red alder and Sitka spruce. Forest communities are too numerous to mention in detail, but major tree-

understory combinations are western hemlock/amabilis fir-blue and huckleberries, western redcedar/western hemlock-salal and false azalea, shore pine-salal, shore pine-*Rhacomitrium* moss, Douglas-fir-sword fern, Sitka spruce-sword fern, and red alder-salmonberry. Wet pockets with skunk cabbage, usually under western redcedar, are also common in low areas. On the islands of the estuary and on dry sites to the east of the estuary, a fire history has resulted in a variety of natural, 60 to 90 year old stands of Douglas-fir, shore pine, western hemlock, and Sitka spruce.

The Tsitika River estuary, the only undisturbed estuary on the east coast of Vancouver Island, is an important feature of the reserve. Two major vascular plant communities occur in the inner estuary. The extensive tufted hairgrass community, containing red fescue, silverweed, and meadow barley as sub-dominants, occupies the upper estuary and is replaced seaward by stands of Lyngbey's sedge, interspersed with the rockweed *Fucus distichus*, species tolerant of more frequent tidal flooding. Nutrient-rich sites in the hairgrass and sedge zones are very productive (above-ground biomass up to 600-850 g/m^2).

In and around 1993, all five species of Pacific salmon, plus Steelhead and Cutthroat Trout, Dolly Varden char, and Eulachons migrate through the estuary to spawning grounds in the Tsitika River. As of 2008, there are no recent records of Eulachon in this area. Coho and Pink Salmon and Steelhead are the most abundant salmonids. The estuary supports high populations of two invertebrates, caddis fly larvae and the crustacean *Neomysis mercedes*. These are fed upon extensively by juvenile salmonids, especially Coho and Dolly Varden, for which the estuary is an important rearing area.

Diverse shallow water subtidal communities, varying primarily in response to current exposure and kind of substrate, occur in Robson Bight. Headlands at the east and west extremities of the Bight have rocky substrates and strong back-eddies caused by Johnstone Strait currents. Marine life is abundant, typical forms being coralline algae, Plumose Anemones, seastars, Giant Barnacles, Northern Abalone, Purple-hinged Rock Scallops, rockfish and Lingcod. Further into the Bight, substrates are still rocky, but current exposure is less. Here seaweeds are more common, sea urchins and Lined Chitons are abundant. In this area, fish are less abundant, except for the Kelp Greenling. Kelp beds near the estuary have a particularly diverse flora and fauna, and provide important feeding habitat for juvenile Coho Salmon, Dolly Varden char, and Pacific Herring.

Cultural:

There are six archaeological sites within this reserve, five of which offer valuable glimpses into the historic life of First Nations in this area and demonstrates their tie to the land. The sixth site is an historic telegraph line, an artefact of European settlement.

The majority of middens within the bight itself contain mostly barnacle, while one has mostly clam shell, and appears to be the remains of a very short term camp and resource processing site. The site is located on slightly raised ground on the western side of a small point. This location provides a lee for southeast winds, although the degree of shelter is limited and heavy surf makes the beach unsuitable for long stays. Canoes would have had to be pulled right up the bank onto the terrace during a storm.

Another shell midden site is also located on slightly raised ground on the western side of a small point and appears to be the remains of a very short term camp. The angle between the point and the small bight in which this site is situated is sharp enough to provide a reasonably surf-free landing beach for canoes during south-easterly winds. Canoes would still have had to be pulled right up the bank onto the terrace during a storm.

The third archaeological site is a distinctive raised area about 10 m wide and covered with young hemlock. Probe testing uncovered no shell in this area which may be a back ridge of a small rectangular house depression or a natural feature resulting from a small slide, rather than a midden. Historic hand logging has taken place over the site and surrounding area. Widespread subsurface charcoal and ash are evidence of an old forest fire (1871 according to the M and B 1:5,000 map) on the eastern shore of the Tsitika river at Robson Bight, which may have affected the buried cultural remains.

Another site, extending along the low forested terrace behind the cobble and pebble beach on the western side of the mouth of the Tsitika River, is almost certainly Us7ekw, the place and origin of the Tlitlkit Kwagulth. There is a great deal of variation within this medium sized shell midden. The degree of crushing of the shell varies from almost none to heavy. This may correlate with external and internal house areas. Some areas contain only minimal or no cultural material, whereas locations one or two metres distant have substantial amounts. This variation is probably turbation from root displacement and tree throws. The large size of several trees growing in the centre of the site suggests that it has been abandoned for several hundred years. The site is generally narrow but is large enough to have contained several houses. A number of culturally modified hemlock and Douglas-fir trees are in the vicinity and almost certainly post date

the occupation of the site.

A stone fish weir is located in an unnamed creek at the westernmost side of the Tsitika River Delta.

Although contemporary histories refer to only one telegraph line built through this area, two are found. Both extend east to west through the reserve. The eastern and western limits of the remains outside the reserve are unknown at this time.

MANAGEMENT CONCERNS

SIGNIFICANT SPECIES	BC LIST STATUS	COSEWIC STATUS	CF PRIORITY
Grey Whale	Blue listed	Special Concern (2004)	4
Harbour Porpoise	Blue listed	Special Concern (2003)	4
Humpback Whale	Blue listed	Threatened (2003)	2
Killer Whale (Northeast Pacific northern resident population)	Blue listed	Threatened (2008)	1
Pacific White-sided Dolphin		Not At Risk (1990)	4
Dall's Porpoise		Not At Risk (1989)	4

THREATS

Climate Change: As the bulk of this reserve is marine protected area, the projected impacts of changes to the ocean will be most evident in the marine habitat. Altered species distribution and ensembles in the estuarine areas, intertidal and subtidal zones may result from raised sea levels, increased freshwater run-off and higher sea surface temperatures. Community reorganization in the marine areas may be reflected in the terrestrial community composition due to altered predator/prey dynamics.

Storm frequency and intensity is projected to increase and may erode shoreline habitat.

Harvest: Commercial fishing trawlers disturb marine floor.

Salmonids, crabs, prawns and halibut are harvested by recreational harvesters.

Program constraint: DFO authorizes commercial fishery within the reserve. Seine netting and boat activity disrupts the whales' use of the rubbing beach and has resulted in injury to the whales from vessel collisions. Resting and feeding behaviours are also disrupted.

Recreation:	Large marine vessels can disrupt marine mammals, discharge waste and drag anchor. Kayakers can approach red listed marine mammals, disrupting their natural behaviour.
Transportation:	The noise from marine vessels can disrupt marine mammal behaviour.
RESEARCH OPPORTUNITIES	Research projects have been undertaken on killer whale behaviour and communication, and on potential human disturbance. A few scientific and many popular articles are available on killer whales in the reserve and vicinity. Reports are also available on estuary vegetation and fishery/marine resources. In May 1990, the B.C. Minister of Parks and Federal Minister of Fisheries and Oceans jointly appointed the Johnstone Strait Killer Whale Committee to examine the impacts of all human activities on killer whales in the Robson Bight (Michael Bigg) Ecological Reserve, and to assess the impacts of whale watching in other areas of Johnstone Strait. The Committee released a *Background Report* in May 1991; and after a public consultation process, *Management Recommendations* and a *Public Response Summary* in June 1992.
ER WARDEN ACTIVITIES	• Monitor/report illegal camping where observed • Monitor/report un-authorized access (recreational, commercial or harvest) • Continue to survey fauna and flora present in ER (both marine and terrestrial) • Monitor for invasive plants/animals (control or eradicate where possible) • Monitor effects of human activity on orca behaviour (where and when possible)

SCIENTIFIC NAMES OF SPECIES MENTIONED IN THE ROBSON BIGHT (MICHAEL BIGG) ER ACCOUNT

Flora

alder, red (*Alnus rubra)*
azalea, false (*Menziesia ferruginea* ssp. *ferruginea)*
barley, meadow (*Hordeum brachyantherum* ssp. *brachyantherum)*
blueberry (*Vaccinium* spp.*)*
cabbage, skunk (*Lysichiton americanus)*
Douglas fir (*Pseudotsuga menziesii)*
hemlock, western (*Tsuga heterophylla)*
huckleberry (*Vaccinium* spp.*)*

fern, sword (*Polystichum munitum)*
fescue, red (*Festuca rubra ssp. rubra)*
fir, amabilis (*Abies amabilis)*
hairgrass, tufted (*Deschampsia cespitosa)*
rockweed (*Fucus distichus)*
moss (*Rhacomitrium* spp.)
pine, shore (*Pinus contorta* var. *contorta*)
redcedar, western (*Thuja plicata)*
salal (*Gaultheria shallon*)
salmonberry (*Rubus spectabilis)*
sedge, Lyngbye's (*Carex lyngbyei* ssp. *cryptocarpa)*
silverweed (*Potentilla* spp.)
spruce, Sitka (*Picea sitchensis)*

Fauna
Abalone, Northern (*Haliotis kamtschatkana)*
Anemone, Plumose (*Metridium senile)*
Barnacle, Giant (*Balanus nubilus)*
Chiton, Lined (*Tonicella lineata)*
Dolly Varden (*Salvelinus malma)*
Dolphin, Pacific White-sided (*Lagenorhynchus obliquidens)*
Eulachon (*Thaleichthys pacificus)*
Greenling, Kelp (*Hexagrammos decagrammus)*
Herring, Pacific (*Clupea pallasii)*
Lingcod (*Ophiodon elongatus)*
Orca (*Orcinus orca)*
Salmon, Chinook (*Oncorhynchus tshawytscha)*
Salmon, Chum (*Oncorhynchus keta)*
Salmon, Coho (*Oncorhynchus kisutch)*
Salmon, Pink (*Oncorhynchus gorbuscha)*
Salmon, Sockeye (*Oncorhynchus nerka)*
Scallop, Purple-hinged Rock (*Crassadoma gigantea)*
Shrimp *(Neomysis mercedes)*
Porpoise, Harbour (*Phocoean phocoena)*
Porpoise, Dall's (*Phocoenoides dalli)*
Trout, Cutthroat (*Oncorhynchus clarkii)*
Trout, Rainbow (aka Steelhead) (*Oncorhynchus mykiss)*
Urchin (*Strongylocentrotus* spp.)
Whale, Grey (*Eschrichtius robustus)*
Whale, Humpback (*Megaptera novaeangliae)*