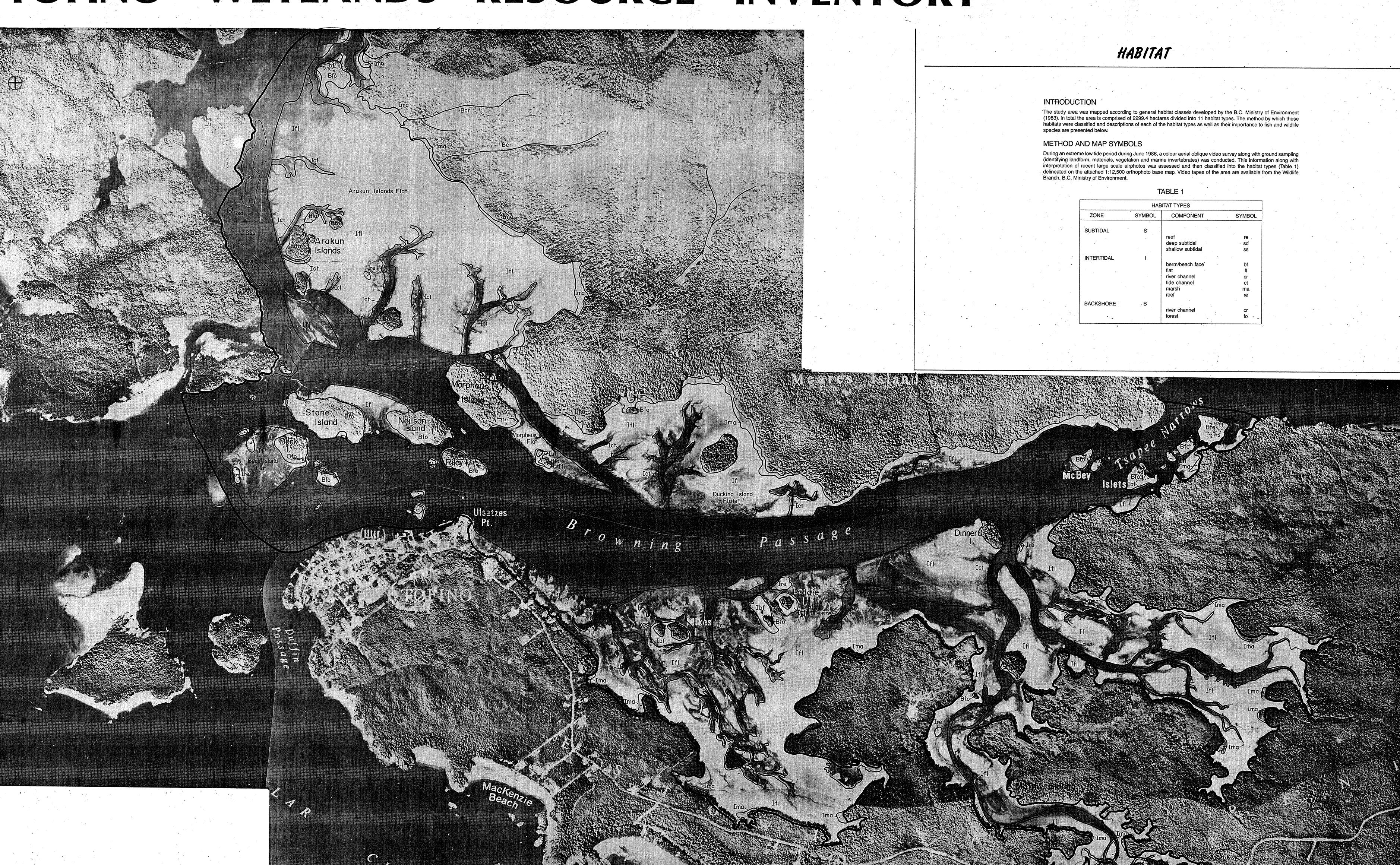
## TOFINO WETLANDS RESOURCE INVENTORY





	DESCRIPTION OF HABITAT TYPES	•			DESCRIPTION OF HABITAT TYPES	· · · · · · · · · · · · · · · · · · ·	
SYMBOL	DESCRIPTION OF FISH AND WILDLIFE VALUE	AREA (ha)	%	SYMBOL	DESCRIPTION OF FISH AND WILDLIFE VALUE	AREA (ha)	%
,	SUBTIDAL ZONE	(1.4)		<u> </u>	Stone/Neilson Island Flats. These flats are	(na)	•
Sre	Included in this habitat type are small bedrock islands and reefs originating within the subtidal	1.7	0.1	. 1	predominantly sandy with shell hash and organic materials in higher areas and fine sands in lower areas. Eelgrass (90% cover) occurs throughout the		•
	zone. Rockweed and green algae are the dominant vegetation.	* * * * * * * * * * * * * * * * * * * *			lower areas, particularly along low tide fringes of the flats. Above these lower areas clams are common and green algae occurs at approximately 30–40%		
	VALUES  These areas provide roosting and loafing sites for		,		cover.  Beck Island Flats. These are made up of sands to		
	waterbirds and may serve as haulout sites for harbour seals.			·	fine sand with eelgrass cover ranging from 20–100%.  Areas of lower percent cover are associated with higher wave energy.		
Ssd	Included in this habitat type are marine subtidal areas with bottom depths greater than 10 metres (maximum depth approximately 30 m). Marine	263.2	11.4		Morpheus Island Flat. Sands are dominant here with vegetation (eelgrass and algae) somewhat sparser on		
	processes dominate in this area of finer substrates.				this flat than in other areas. The majority is under an oyster lease and clams are harvested as well.		
	VALUES  This habitat type provides deep water feeding and				VALUES		-
·	loafing areas for waterbirds. It is particularly important for loons, grebes, cormorants and alcids, for general migration use by harbour seals and			: :	Without doubt, the Tofino Flat complex represents the most valuable waterbird habitat on the west coast of Vancouver Island. This distinction is due		
	killer whales, and for occasional use by gray whales. Dungeness crab and finfish feed on the accumulation of nutrient-rich material which				to: (i) the extent of these very low gradient areas, unrivaled by any other on the west coast of the Island and few on the entire coast; (ii) the low		, ,
	originates from adjacent habitats and settles within these deep water areas.				energy (well protected) area within which it occurs; (iii) the extensive areas of eelgrass, algae (primary producers) and benthic organisms (secondary		
Sss	This habitat type includes marine water areas that occur between the lower low tide area and a depth of 10 metres. This encompasses the foreshore slope	545.7	23.7		producers) which they support and which in turn contribute through their decomposition to an incredible nutrient-rich environment.		
	area or outer edge of steeply dropping intertidal flats. The area owes much of its nutrient rich				These fundamental values in turn lead to the		
-	nature to materials derived from shallow water areas.	,	٠,		presence of extremely high and visible biological values in the form of: (i) dense populations of crabs for which the flats provide critical nursery	·	^
	VALUES  The edge of the flats are frequented by Dungeness crabs as they advance to shallower nursery areas.				areas; (ii) isolated but valuable clam beds (particularly along Arakun, Ducking and Beck/Morpheus complex where both commercial and, to		
	Horse and geoduck clams are harvested commercially within this habitat off Arakun Flats and the	,	·		a lesser extent, recreational horse clam harvesting occurs); and (iii) extremely high numbers of migratory and wintering shorebirds, dabbling ducks		
	Beck/Morpheus Flat complex. Diving ducks (particularly scoter and scaup) are the predominant avian species utilizing this habitat type. Harbour				and geese. In addition, during the high part of the tidal cycle the flats provide important feeding areas for diving birds, particularly diving ducks,		
	seals, mink and river otters also utilize these area.			•	that forage on the localized beds of mussels and particularly diving ducks, that forage on the localized beds of mussels and extensive smaller		,
lbf	INTERTIDAL ZONE  Within the study area, intertidal beach face habitat	12.0	0.5	lor	benthic invertebrates which inhabit the flats.		0.4
	types normally occur between the backshore and adjacent flats or shallow subtidal areas. Materials (sands, pebbles, and cobbles) generally are coarser			lcr	Only one area of this habitat type occurs within the study area, that being within Ginnard Creek.  Materials with this habitat type support dense	1.0	. 0.1
	than those of the flats and provide attachment sites for rockweed, barnacles and sometimes mussels.  Narrow marsh fringes may also occur within this		***		stands of eelgrass and erratics wholly or partially covered by green algae. During summer low flow periods, the channel is dominated by tidal		
	habitat type.			-	influences. VALUES		, ,
	VALUES  Waterbird use is generally limited to shorebird feeding and loafing by dabbling ducks. Mink, river			·	Some chum salmon may spawn in this habitat type and some utilization by juvenile salmonids may occur.		
	ofter and raccoon also feed within this habitat type.			lct	Major tidal channels with small feeder channels drain the intertidal flats and for the most part	102.3	4.4
IfI	Low gradient intertidal flats exposed at low tide are the most extensive habitat type within the study	1222.2	53.2		contain water throughout the tidal cycle. Substrates are predominantly sands sometimes mixed with finer materials such as silt and clay.		
	area. For the sake of convenience individual flats are described in some detail below. Before describing those areas individually, however, some				Eelgrass commonly occurs along channel edges and is frequently found within the channels themselves along with green algae.		, ,
	general characteristics and patterns are worth noting.		,	. *	VALUES		
	A common feature of almost all of the flats is the extensive luxurient growth of eelgrass and green algae. Besides the Fraser Delta, probably only one			·	These areas are important for juvenile salmonid rearing, and because they generally contain water throughout the tidal cycle they serve as refuge for		
	other area, the Kumdis complex on the Queen Charlotte Islands, represents such an extensive and productive tidal flat area. A special feature		<i>.</i>		juvenile fish. Dabbling ducks and waders utilize channels for feeding during migration and over-wintering. Clams also occur in tidal channels,		
	common to the Tofino Flats, however, is the retention of water within tidal channels and		·		particularly Arakun Island Flats and Ducking Island Flats.		;
	depressions throughout the tidal cycle (see lct):  Despite their common attributes several unique			lma	Although not at a mapable scale, fairly continuous bands of marsh occur along the upper edges of Arakun, Ducking and Ginnard Flats. Materials are	31.7	1.4
	patterns are also evident. For example, the flats along the north side of Browning Passage are generally more discrete (less interconnected),		•		generally sandy pebbles. Species commonly present are Arctic rush (20–50% cover) and grasses (0–20%,		
	comprised of coarser materials (fewer silts) and not as extensively channelized as the flats along the south side of the Passage.		•		predominantly red fescue and rye) in the higher marsh. Lower marsh areas are dominated by Lyngbye's sedge (50–70% cover), sea-side arrow-grass (10%		
	North Side of Browning Passage (Meares Island)  Arakun Islands Flat. This extensive area of habitat		<b></b> .		cover) and sea-side plantain.  Marshes occurring along the upper edges of the flats		
	is located along the east side of Lemmens Inlet.  The upper portion of the flat is composed of fine				on the south side of Browning Passage tend to be discontinuous bands or pockets. Materials tend to be organic sands or organic veneers over coarser		
	sands and vegetated with green algae (10-60% cover) and smaller eelgrass (10-70% cover). Invertebrates consist of tunicates and scattered beds of oysters,				materials (cobbles). High marsh areas are dominated by Arctic rush (15–70%), Pacific silverweed (15–45%), grasses (tufted hair grass, 0–10%;		:
	mussels and clams. The lower portion of the flats is blanketed with organic silts. In this portion of the flats, extensive eelgrass beds (80% cover),				seashore salt grass, 0–5%; red fescue, 1–20%; Yorkshire flag, 5%; and sea-side plantain, 0–50%). The low marsh areas are predominantly Lyngbye's		
	green algae (30% cover), and shellfish (clams, oysters, as well as significant beds of mussels, 30–60% cover) can be observed.				sedge (0-40%), American glasswort (0-10%), and sea-side arrow-grass (<5%) with minor amounts of sea-milk wort.		
	The Ducking Island Flats. The upper intertidal zone has fine materials (silty-sand), supporting green				VALUES		
	algae ( <u>Enteromorpha</u> 25% cover, <u>Ulva</u> 5% cover), eelgrass (5%) and crustaceans (primarily ghost shrimp and <u>Hemigrapsus</u> . In the lower flat,				Although marshes are relatively scarce within the study area, they provide valuable forage for dabbling ducks, geese and shorebirds. In addition,		
	materials are coarse sand/shell hash. Eelgrass is the dominant plant species (10–90% cover); <u>Ulva</u> (10–25%), <u>Enteromorpha</u> (1–10%) are also obvious.				through the food chain they add nutrients utilized by juvenile salmon prey.		
•	Clams and oysters occasionally occur.  Ginnard Creek Flat. Located east of Ducking			Ire	This habitat includes outcrops of bedrock which are occasionally covered by gravel veneer. Most reefs are submerged at high tide. Bookweed tends to be	4.2	0.2
,	Island Flat, materials of this flat are coarser (sand/gravel and occasional boulder). As with the				are submerged at high tide. Rockweed tends to be the dominant vegetation, although green algae are also present.	*	
	previous flats, green algae covers approximately 50–70% of the substrate in most areas and eelgrass occurs at levels of approximately 20% cover on the			,	VALUES  These areas provide loafing sites for waterbirds and		
-	upper half of the flats and at approximately 80% cover in lower areas.		·		are sometimes used as haulout sites for harbour seals.		
	A pipeline transporting the water supply from Ginnard Creek for the municipality of Tofino crosses this flat in a shallow trench which has ultimately		•	D4-	BACKSHORE	د شویت پیر	
	South Side of Browning Passage			Bfo	Both coniferous and deciduous species occur. Sitka spruce dominates the conifers especially in exposed shoreline areas. Other species include western	115.4	5.0
	Mikes Island/Laddie Island Flat. This area is composed primarily of organic sands. Extensive		•		hemlock, western red cedar and Pacific silver fir. The understory is most commonly dominated by fern or salmonberry and salal.		
	eelgrass cover (70–100%) occurs throughout the lower two thirds of the flat and in upper depressions.  Occasional mussel beds (up to 15% cover) also occur				VALUES		
	in this area. Green algae are common (up to 50% cover) in the upper flat and eelgrass generally				Trees provide nesting and roosting areas for birds, as well as protection from extreme weather conditions. Understory vegetation act as		
	covers approximately 10% (ranging from 0% to 50%) of the area. Mussels are sparsely distributed within localized areas of the upper half of the flats.			D	sources of food for some species.	-	
	Clams and ghost shrimp are also common within this portion of the Mikes Island Flats. The pipeline which originates at Ginnard Flat also forms an		•	Bcr	Numerous creeks (the majority unnamed) flow into the heads of all the major flats (except for Mikes Island Flat).	13.3	3 km
	intermittent tidal channel on these flats.  Maltby Slough/South Bay. The extensive flat to the				Creeks within the study area which support salmonids are listed below.	, ,	
	east (Dinner I. Flat) divides into 2 arms: Maltby Slough to the west and South Bay to the east. The outer flat is comprised of sand and fine sand with dense eelgrass (95–100%	· · ·			Sharp Creek. This creek flows into the north end of		
-	cover). Ghost shrimp, mussels and mats of green algae (up to 70% cover) are also present.				Arakun, has pebbly boulder substrates and supports chum and possibly coho.		
,	Maitby Slough. Generally, materials are finer here than in any other portion of the study area.	·			Meares Creek. Water from this creek flows into the west side of Ducking Flats supports escapements of 200 to 3500 chum salmon.		
	Organic sands appear throughout the seaward half and even finer materials (clay-sands) in the upper areas. Dense eelgrass beds (90–100% cover) occur in				In addition, the creek which flows into the head of Maltby Slough supports an annual escapement of 50 to		
	the organic sands areas in the lower third of the slough decreasing to sparse cover throughout the rest of the slough (except along the channel banks).			. ]	100 coho.	2000 1	1000
	Enteromorpha is present in the upper area 30% cover). Ghost shrimp occur there as well.				Total Area	2299.4	100.0
	South Bay. Materials here are sands and organic silty-sands. Eelgrass generally occurs throughout			Brown, R.F. M.J	INFORMATION SOURCES  Comfort and D.E. Demarchi, 1979. Catalogue of Salmon Streams and Sp	pawning Escal	pements of
	(50–70% cover). Enteromorpha is variable from 80–95% cover to none. Ghost shrimp and Hemigrapsus are present and minor numbers of cockles also			Statistical Ar	rea 24 (Clayoquot Sound). Dept. of Fisheries, Data Report No. 80, Nanain T. Robinson, 1980. Fisheries Inventory of Meares Island. Unpublished.		
	McBey Islets Flats. Located in Tsapee Narrows these		•	Branch, Vict		id Commercia	l Fisheries
	are small sandy flats supporting dense (90% cover) eelgrass bends in their lower portions diminishing to 15% cover in higher areas, where it is replaced		*	Haegele, C.W. an	Tofino Mudflats Waterbird Census: Summary Report. Unpublished. and M.J. Hamey, 1979. Shoreline Vegetation on Herring Spawning Grounds in	n Clayoquot Sc	ound. DFO,
	by green algae (20–70% cover). Mussels occur sporadically throughout the area with cover ranging from 1–5%.		,	Harcombe, A., Pe	nd Marine Service Manuscript Report No. 1536, Nanaimo, B.C. Personal Communications, Ministry of Environment, Wildlife Branch, Victori		
	Other small flats listed below are associated with				E. Jones, M.M. Wayne and B.A. Pendergast, 1983. Estuarine Habitat Manual. Ministry of Environment, Surveys and Resource Mapping Branch, Vid		assification.

Fisheries and Marine Service Manuscript Report No. 1536, Nanaimo, B.C. Harcombe, A., Personal Communications, Ministry of Environment, Wildlife Branch, Victoria, B.C. Hunter, R.A., L.E. Jones, M.M. Wayne and B.A. Pendergast, 1983. Estuarine Habitat Mapping and Classification.
System Manual. Ministry of Environment, Surveys and Resource Mapping Branch, Victoria, B.C. Photography used BC81074: 189, 243, 244, 246, 248.

Other small flats listed below are associated with islands along the west end of Browning Passage.