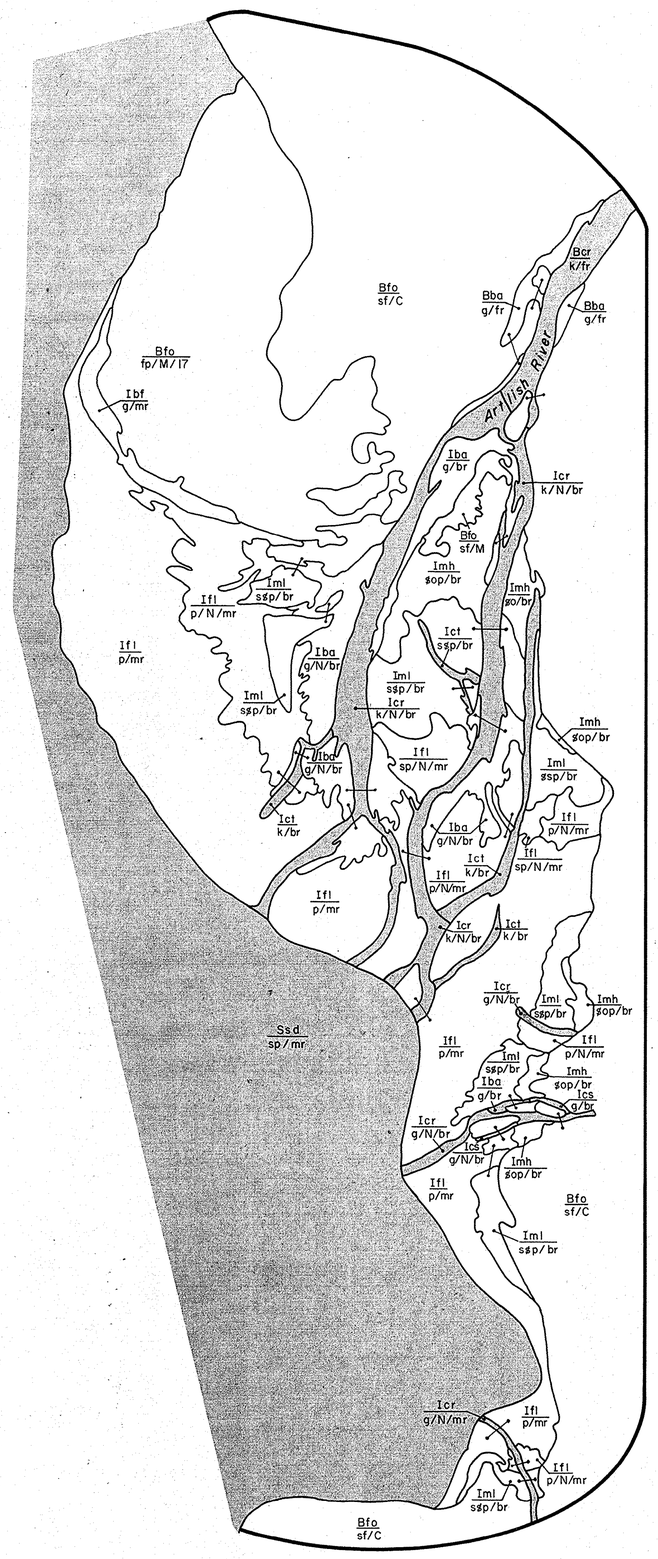
ARTLISH ESTUARINE HABITAT INVENTORY



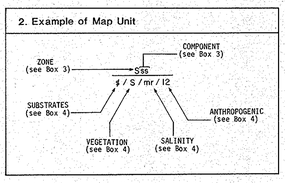
Scale: 1:4 800 approx.

LEGEND

1. Explanatory Notes

The estuarine habitat mapping and classification system is designed to delineate habitat types and describe them as a function of substrate, vegetation, salinity and anthropogenic influences. Information is derived from interpretation of recent large scale colour air photos and ground truthing, and is supplemented by information derived from historical reports and air photos. Specific descriptions of habitat types are presented in Box 5 along with area summaries expressed in hectares and as percentages. Because of the dynamic nature of estuarine systems maps may require updating. Users should therefore refer to the date of mapping shown in Box 8. Users are encouraged to consult APD Technical Paper, Estuarine Habitat Mapping and Classification System Manual 1982, for descriptions of inventory and mapping methods and terminology utilized in the classification system.

2. Example of Map Unit



3. Habitat Type

ZONE	SYMBOL	COMPONENT	SYMBOL
SUBTIDAL	S	reef	re
		deep subtidal	sd
		shallow subtidal	ss
INTERTIDAL	I	bar	ba
		berm/beach face	bf
		back channel	cb
		river channel	cr
		side channel	cs
		tide channel	ct
		flat	fl
		marsh	ma
		high marsh	mh
		intermediate marsh	mi
		low marsh	ml
		platform	pl
		reef	re
BACKSHORE	B	bar	ba
		bog	bo
		back channel	cb
		river channel	cr
		side channel	cs
		fen	fe
		forest	fo
		marsh	ma
		meadow	me
		permanent pond	pp
		semi-permanent pond	ps
		temporary pond	pt
		shrub	sh
		storm ridge	sr
		swamp	sw

4. Habitat Modifier

TYPE	SYMBOL	TYPE	SYMBOL
SUBSTRATES		SALINITY	
clay	c	brackish	br
silt	ſ	fresh	fr
fines	f	marine	mr
sand	s		
small pebble	p		
large pebble	g		
cobble	k		
boulders	b		
bedrock	r		
organic	o		
shell	m		
VEGETATION		ANTHROPOGENIC	
coniferous	C	log handling	1
deciduous	D	agriculture	2
mixed	M	landfill	3
non-vascular	N	dyke, seawall, causeway	4
submerged vascular	S	culvert	5
		floodgate	6
		outfall	7
		pollution	8
		intake	9
		residential	10
		industrial	11
		marina	12
		port facility	13
		substrate removal	14
		jetty, groin, weir	15
		log debris	16
		logged	17

5. Descriptions of Habitat Types

SYMBOL	DESCRIPTION	AREA (ha)	% TOTAL
	SUBTIDAL ZONE	70.8	29.8
Ssd	Subtidal habitats with bottom depths greater than 10 metres. Less saline areas are found in the surface water layers. These areas support a variety of groundfish as well as providing habitat for salmonid staging. Bird use includes feeding and loafing by diving birds and loafing by dabbling ducks and gulls. Harbour seals utilize subtidal habitats for feeding.	70.8	29.8
	INTERTIDAL ZONE	74.9	31.6
Iba	Intertidal bars are formed along the bends of the main river channel. These active, depositional areas are generally composed of large pebbles. Sediment transport and deposition patterns are dominated by fluvial factors with some modifications by marine processes. Filamentous green algae and rockweed occur on bars near the mouth of the estuary. Within the upper portion of the estuary these areas may serve as spawning habitat for pink and chum salmon. Bars may also serve as loafing sites for wintering and migrating waterfowl and shorebirds. Bald eagles and American black bear utilize river bars extensively during the fall salmon runs. Other mammals utilizing these habitats include American mink, river otter and raccoon. Bars located on the lower portion of the delta may be utilized as harbour seal haulouts.	7.4	3.1
Ibf	This habitat type is comprised of a gravel area on the west side of the estuary dominated by marine processes. It is unvegetated or sparcely vegetated by annual plants and is partly covered with driftwood. Bird use is limited to feeding shorebirds and songbirds and loafing dabbling ducks, Canada geese and wintering seaducks. American mink, river otter and raccoon may make extensive use of these areas.	1.3	0.6
Icr	This habitat includes mainstem areas of the Artlish River which are influenced by saltwater penetration and regular seasonal fluctuations due to tidal and fluvial influences respectively. At the head of the estuary, the river bifurcates into equal stems which continue along the east and west sides creating an island in the center. Filamentous green algae occurs along the edges of the main channel which has a cobble and large pebble substrate. The mainstem channels are important for salmonid migration, spawning and rearing. Three additional creeks enter adjacent waters, all of which support filamentous green algae and are important for salmonid rearing. Wintering and migrating diving ducks and wintering trumpeter swans utilize river channel habitats for feeding and loafing. Mammalian use includes river otter, American mink and raccoon.	7.4	3.1
Ics	A side channel with a large pebble substrate branches off the most southerly creek. This habitat functions as a rearing and spawning area for salmonid species. Mammalian use is similar to river channel habitats.	0.1	0.04
Ict	Numerous channels with sandy, silty, small pebble substrates drain the intertidal marshes and flats. Most of these dry at low tide. The channels are bordered by Lyngbye's sedge and often contain drift brown algae and sea-side arrow-grass. This habitat type is extremely important as a nursery area for juvenile salmonids. Dabbling ducks, trumpeter swans and wading birds utilize tidal channels for feeding during migratory and winter periods. These areas are also utilized by mink, river otter and raccoon.	1.5	0.6
Ifl	This habitat type is exposed only at low tides, and occurs adjacent to low marsh areas and intertidal bars. The flats are generally characterized by finer textures and lower gradients as compared to bars. Filamentous green algae and brown algae are commonly present. Epibenthic diversity on the flats is low. This habitat type serves as a nursery area for juvenile salmonids and as a pre-spawning staging area. Other fish utilize flats for year-round foraging. Waterfowl use of intertidal flats includes feeding by migrating and wintering dabbling ducks, wintering trumpeter swans and migrating Canada geese. Shorebirds and waders also utilize flats for feeding. Migrating and wintering diving duck use may be extensive at high tide stages. Bald eagles and American black bear forage on flats for salmon carcasses during fall migration periods. Harbour seals may utilize specific areas as haulouts.	42.5	17.9
Imh	This habitat type is located between backshore forest areas and lower marsh areas. It is more floristically diverse than the low marsh and is dominated by red fescue and blue wild rye grass. Other species often present are tufted hair grass, springbank clover, Alaska plantain, yarrow and meadow barley. Pacific small reed grass occurs adjacent to the Sitka spruce trees of the backshore forest. Vegetation cover is much higher than the low marsh at 90-95%. The substrate is mainly silty organic over small pebbles. High marshes provide spring forage for American black bear and important year round forage for Roosevelt elk and Columbia black-tailed deer. Waterfowl use of high marshes is limited to grazing by dabbling ducks, Canada geese and trumpeter swans. Other wildlife which utilize this habitat type include songbirds, small mammals, reptiles and amphibians. These areas are of less direct importance to salmonid rearing than lower marshes, however they are a major producer of detritus and source of nutrients for the estuary and adjacent marine areas.	3.9	1.6
Iml	This habitat type is located between intertidal flats and high marsh areas. Two plant communities are present. Lyngbye's sedge is found in areas of low elevation adjacent to tide and river channels where the substrate is sands over small pebbles. At slightly higher elevations away from the channels, a community dominated by tufted hair grass occurs on substrates of silty sand over small pebbles. Vegetation cover ranges from 15-95% with an average of approximately 75%. Many hummocks and pans are present and the area is drained by tide channels. Drift brown algae is found in the tide channels while common scurvy-grass occurs in pan areas. Both pans and tide channels support sea-side arrow-grass. These areas are important for salmonid rearing. Bird use includes feeding by wading birds, migrating dabblers and Canada geese and wintering trumpeter swans. Diving birds may feed in these areas at high tide stages. Utilization by small mammals, reptiles and amphibians is low.	10.8	4.6
	BACKSHORE ZONE	91.5	38.6
Bba	Formed along the bends of the main river channel, these active usually depositional areas are composed of large pebbles. Sediment transport and depositional patterns are dominated by fluvial factors. These areas are partially covered with deciduous trees such as red alder, and shrubs. Bars may serve as spawning habitat for chum salmon and also provide loafing sites for wintering and migrating waterfowl and shorebirds. Bald eagles and American black bear utilize river bars extensively during the fall salmon runs. Other mammals utilizing these habitats include American mink, river otter and raccoon.	1.0	0.4
Bcr	This habitat type is dominated by fluvial processes and has a cobble substrate. These areas are important for salmonid migration, spawning and rearing. Wintering and migrating diving ducks and wintering trumpeter swans utilize river channel habitats for feeding and loafing. Mammalian use includes river otter, American mink and raccoon.	1.9	0.8
Bfo	Both coniferous and mixed forests are found within the study area. The forest bordering the marsh is dominated by western hemlock and coast Douglas fir. Western red cedar is present on the wetter east side while Pacific silver fir is found on the west side. A mixed forest of Sitka spruce and red alder occurs on the island in the middle of the estuary. Salmonberry, red huckleberry and stink current are common understory components. Forest habitats are utilized extensively year round by Columbia black-tailed deer and Roosevelt elk for cover and foraging. American black bear also forage within this habitat type and use by small mammals is extensive. Bird use includes nesting by cavity dwellers, passerines and raptors.	88.6	37.4
	Total of entire study area	237.2	100

6. Anthropogenic On Site Symbols

bridge
ramp
jetty
rip rap
dyke
5 culvert
floodgate 6
submarine cable
7 outfall
intake 8
float/wharf
study area boundary

7. Sources of Further Information

Marshall, D.E., M.J. Comfort, and E.W. Bretton. 1980. Catalogue of Salmon Stream and Spawning Escapements Statistical Area 26. (Kyuquot Sound) Canadian Data Report, Fisheries and Aquatic Sciences No. 183, p. 5-7.

Planning and Resource Management Division. Coastal Water Bird Data Base. Surveys and Resource Mapping Branch, Ministry of Environment, Victoria, B.C.

8. Credits

Supervised by R.A. Hunter
Mapped by A. Campbell
Field work by A.Campbell, L.E. Jones
Date of field work, June 1981
Photography used BCC116:104-115
Map drafted by Cartography, Surveys and Resource Mapping Branch, November 1982
Base map prepared by Cartography, Surveys and Resource Mapping Branch

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