

CSIRO Marine Laboratories
Report No. 210

**A Checklist of the Fishes of
Albatross Bay and the
Embley Estuary,
North-eastern Gulf of
Carpentaria**

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Abstract

The fish species recorded in Albatross Bay and the Embley estuary from 1986 to 1989 are listed. In all, 344 species were collected: 197 from the Embley estuary and 237 from Albatross Bay. Ninety species were common to both areas. In the Embley estuary, the occurrence of species in the upper, middle and lower reaches is indicated. The presence of species in each of five depth strata (7-10, 11-20, 21-30, 31-40 and 41-50 m) in Albatross Bay is shown.

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Introduction

The Embley estuary flows into Albatross Bay on the west coast of Cape York peninsula. The fishes of both the estuary and bay were studied from 1986 to 1989 as part of a CSIRO investigation into the interrelationships of commercial prawns and fishes. Particular attention was paid to fish predation on prawns (Brewer *et al.*, 1989; in prep; Salini *et al.*, 1990), and to the species composition and biomasses of fishes in the Embley estuary, their occurrence in the adjoining sea and their degree of estuarine dependence (Blaber *et al.*, 1990). The catch rates, biomasses and ecological aspects of the fishes of Albatross Bay were described by Blaber *et al.* (in prep).

This paper gives a complete list of all species recorded in the Embley estuary and Albatross Bay. There have been few long-term, detailed studies on fish in the Gulf of Carpentaria, although such studies are important for taxonomic, ecological and zoogeographic reasons. The publications on the fishes of the Gulf of Carpentaria (e.g. Rainer and Munro, 1982; Okera and Gunn, 1986) and similar turbid shallow seas of the region, such as the Gulf of Papua (Kailola and Wilson, 1978), Gulf of Thailand (Chayakul and Okiyama, 1987) and South China Sea (Mohsin *et al.*, 1986) are on a very broad scale and omit adjacent estuaries. Some are based on single surveys, and most do not include complete species lists. In a similar way, species lists for tropical estuaries seldom include adjacent marine areas.

Study Areas

The Embley estuary in the north-eastern Gulf of Carpentaria is approximately 50 km long (to the ebb and flow) and 2 km wide in the lower reaches (Figure 1). It is almost entirely fringed by a well-developed intertidal zone of mangrove forest, except near the mouth where a port has been built. For much of its length it is 2 to 6 m deep, but in the mouth and port area of the lower reaches the shipping channel is dredged to 15 to 20 m. It has a maximum tidal range of 2.6 m. The substrates are predominantly muddy, although there are sandy beaches near the mouth. Seagrasses grow in shallow water on the south side of the lower reaches. Further details of the habitats and salinity, temperature and turbidity regimes are given in Staples *et al.* (1985) and Blaber *et al.* (1990). For sampling purposes the estuary was divided into lower, middle and upper reaches (Figure 1).

Albatross Bay is a fully marine coastal embayment into which the Embley and Mission estuaries open. A depth of 50 m is reached 72 km from the mouth of the Embley estuary (Figure 1). The substrates are predominantly sandy mud (Jones, 1987), although there are small patches of reef in the south-east and north-east corners. All sampling took place within the area included in Figure 2. Further details of the physical characteristics of the bay are given in Rothlisberg *et al.* (1989).

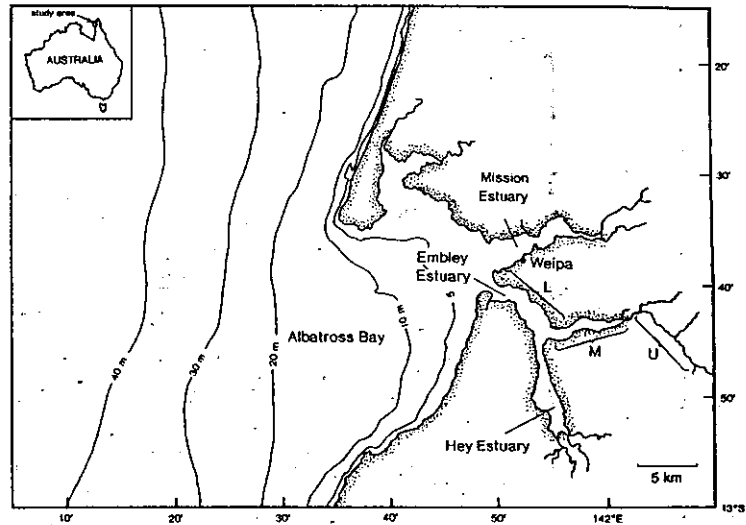


Figure 1. Study areas of Albatross Bay and Embley estuary. L = lower reaches, M = middle reaches, U = upper reaches

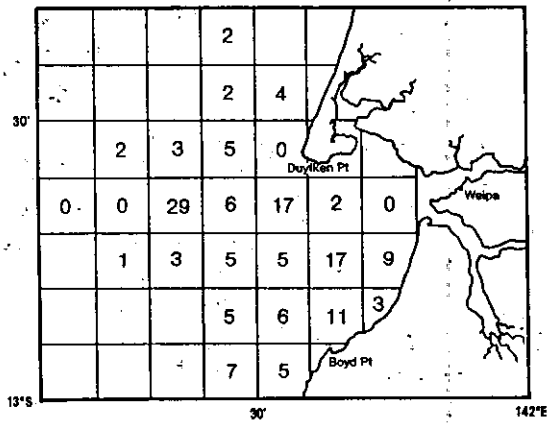


Figure 2. The 26 trawl-sampling grids in Albatross Bay, showing the number of trawls shot in each grid.

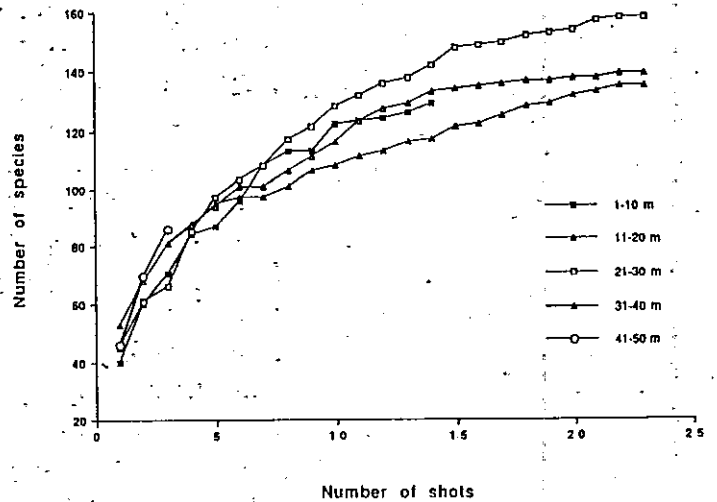


Figure 3. Cumulative catch curves from the first 24 trawl shots in each of the depth strata in Albatross Bay in terms of numbers of species.

Materials and Methods

Embley estuary

Sampling took place over three-week periods in October/November 1986 (pre-wet season); February 1987 (wet season); August 1987 (dry season); November 1987 (pre-wet season); March 1988 (wet season) and July 1988 (dry season). All major habitats, including open-water channels, intertidal sandy mud beaches, seagrass areas, intertidal mudflats and mangrove creeks, were sampled. Fish were captured by gill nets (nets down for 1472.4 h total, comprising 602.6 h in the lower reaches, 492.8 h in the middle reaches and 377.0 h in the upper reaches); seine nets (36 hauls); stake net (single operation covering 9167 m²); beam trawl (17 shots); and with rotenone (10 sites, 15 operations). Further details of sampling equipment and methods are given in Blaber *et al.* (1989).

Albatross Bay

Fish were captured during random stratified trawl surveys with an 18 m trawler equipped with a Frank and Bryce demersal otter trawl (32 m footrope length) fitted with 55 m bridles. The bay was sampled in August and November 1986; March, August and November 1987; March and November 1988; and April 1989. For sampling the bay was divided into the 26 grids shown in Figure 2. The grids were trawled according to a predetermined sequence that was random for both grid number and depth. Further details of trawling methods and sampling strategy are given in Blaber *et al.* (in press). A total of 149 trawls towed at 5 km h⁻¹ for either 15 or 30 min were shot in the following depth zones: 7–10 m (15 shots), 11–20 m (60 shots), 21–30 m (31 shots), 31–40 m (40 shots) and 41–50 m (3 shots). The number of trawls shot in each grid is shown in Figure 2. Fifteen shots were also made with a small otter trawl (4 m footrope length) in the same depth zones.

Species identification

All fish were identified from specialist taxonomic keys. Where difficulties were encountered, specimens were sent to the taxonomic authorities. A few species remain either unidentified or undescribed (Table 1).

Checklist of Species

The distribution of fishes recorded in the Embley estuary and Albatross Bay is shown in Table 1. In all, 344 species were collected, of which 197 occurred in the Embley estuary and 237 in Albatross Bay. Ninety species were common to both areas, leaving 107 recorded only in the estuary and 147 only in Albatross Bay.

The distributions of individual species and their significance are discussed in Blaber *et al.* (1989; in press). In the estuary there is a marked reduction in species numbers from the lower to the upper

Table 1. Species collected from the Embley estuary and Albatross Bay from 1986 to 1989. * = present, - = absent, L = lower reaches, M = middle reaches, U = upper reaches. References after incomplete species names refer either to published data (indicated by publication date) or to the unpublished keys or personal identifications of the authority named (no date shown).

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
ORECTOLOBIDAE								
<i>Nebrius ferrugineus</i>	-	-	-	*	-	-	-	-
<i>Stegostoma fasciatum</i>	-	-	-	-	-	-	*	-
CARCHARHINIDAE								
<i>Carcharhinus amblyrhynchoides</i>	*	-	*	-	-	-	-	-
<i>Carcharhinus amblyrhynchos</i>	*	*	*	-	*	*	*	-
<i>Carcharhinus brevipinna</i>	-	-	*	-	-	-	-	-
<i>Carcharhinus cautus</i>	-	*	*	*	*	*	-	-
<i>Carcharhinus dussumieri</i>	*	*	*	*	*	*	*	*
<i>Carcharhinus fitzroyensis</i>	-	-	-	-	*	-	-	-
<i>Carcharhinus leucas</i>	*	*	-	-	-	-	-	-
<i>Carcharhinus limbatus</i>	*	*	*	-	*	-	-	-
<i>Carcharhinus macloiti</i>	-	-	-	-	*	-	*	-
<i>Carcharhinus melanopterus</i>	-	-	-	-	*	*	-	-
<i>Carcharhinus sorrah</i>	-	-	*	-	*	*	*	-
<i>Carcharhinus tilstoni</i>	-	-	-	-	*	*	*	*
<i>Hemigaleus microstoma</i>	-	-	*	-	*	*	*	-
<i>Hemipristis elongatus</i>	-	-	*	*	*	*	*	-
<i>Negaprion acutidens</i>	*	*	*	-	*	-	*	-
<i>Rhizoprionodon acutus</i>	*	-	*	*	*	*	*	*
<i>Rhizoprionodon taylori</i>	-	-	-	-	*	-	-	-
SPHYRNIDAE								
<i>Sphyrna lewini</i>	*	-	*	-	*	*	*	-
<i>Sphyrna mokarran</i>	-	-	*	-	-	-	-	-

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
PRISTIDAE								
<i>Anoxypristis cuspidata</i>	-	-	-	-	*	*	*	-
<i>Pristis pectinata</i>	-	*	-	-	-	-	-	-
<i>Pristis pristis</i>	-	*	*	-	*	-	*	-
<i>Pristis zijsron</i>	-	-	-	-	*	-	-	-
RHINOBATIDAE								
<i>Rhina ancylostoma</i>	-	-	-	-	-	-	*	-
<i>Rhinobatos</i> sp. 1 [Sainsbury <i>et al.</i> (1985)]	-	-	*	-	-	-	-	-
<i>Rhynchobatus djiddensis</i>	-	*	*	*	*	-	*	-
DASYATIDIDAE								
<i>Dasyatis annotatus</i>	-	-	*	*	*	*	-	-
<i>Dasyatis kuhlii</i>	-	-	-	-	*	*	-	-
<i>Dasyatis leylandi</i>	-	-	*	-	*	*	-	-
<i>Dasyatis sephen</i>	-	-	*	*	-	-	-	-
<i>Dasyatis thetidis</i>	-	-	-	-	*	-	-	-
<i>Himantura granulata</i>	-	-	*	*	*	-	-	-
<i>Himantura toshi</i>	-	-	-	*	*	*	*	-
<i>Himantura uarnak</i>	-	*	*	-	-	-	-	-
<i>Taeniura lymna</i>	-	-	*	-	-	-	-	-
GYMNURIDAE								
<i>Gymnura australis</i>	-	-	-	*	*	*	*	-
MYLIOBATIDAE								
<i>Aetobatus narinari</i>	-	-	*	-	*	-	-	-
<i>Aetomyleus nichofii</i>	-	-	-	*	*	*	*	-
RHINOPTERIDAE								
<i>Rhinoptera</i> sp. cf <i>adpersa</i>	-	-	*	*	*	-	-	-
ELOPIDAE								
<i>Elops machnata</i>	-	*	*	-	*	-	-	-

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
MEGALOPIDAE								
<i>Megalops cyprinoides</i>	*	*	*	-	-	-	-	-
MURAENESOCIDAE								
<i>Muraenesox cinereus</i>	-	-	-	-	*	-	*	-
OPHICHTHIDAE								
<i>Moringua microchir</i>	-	-	-	-	-	-	*	-
<i>Ophichthus</i> sp. (of Castle)	-	*	-	-	-	-	-	-
CLUPEIDAE								
<i>Anodontostoma chacunda</i>	*	*	*	*	*	*	*	*
<i>Dussumieria acuta</i>	-	-	-	*	*	*	*	-
<i>Herklotsichthys koningsbergeri</i>	-	-	-	*	*	*	*	-
<i>Herklotsichthys lippa</i>	*	-	-	*	*	*	*	-
<i>Hyperlophus vittatus</i>	-	-	*	-	*	-	-	-
<i>Nematalosa come</i>	-	-	*	*	*	-	-	-
<i>Nematalosa erebi</i>	*	*	*	-	-	-	-	-
<i>Pellona ditchela</i>	-	-	*	*	*	*	*	*
<i>Sardinella albella</i>	*	-	*	*	*	*	*	*
<i>Sardinella gibbosa</i>	-	-	-	-	*	*	*	-
ENGRAULIDIDAE								
<i>Stolephorus andhraensis</i>	-	-	*	-	-	-	-	-
<i>Stolephorus carpentariae</i>	-	-	*	-	*	*	-	-
<i>Stolephorus indicus</i>	-	-	*	*	*	*	*	-
<i>Thryssa hamiltoni</i>	-	-	*	*	*	*	*	-
<i>Thryssa setirostris</i>	-	*	-	*	*	*	*	*
CHIROCENTRIDAE								
<i>Chirocentris dorab</i>	-	-	-	*	*	*	*	*
<i>Chirocentris nudus</i>	-	-	*	-	-	-	-	-
CHANIDAE								
<i>Chanos chanos</i>	*	*	*	-	-	-	-	-

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
SYNODONTIDAE								
<i>Saurida longimanus</i>	-	-	-	-	*	-	-	-
<i>Saurida micropectoralis</i>	-	-	-	*	*	*	*	*
<i>Saurida</i> sp. 2 [Sainsbury <i>et al.</i> (1985)]	-	-	-	*	-	-	-	-
<i>Saurida</i> sp. 4 [" " ""]	-	-	-	-	*	-	*	-
<i>Saurida undosquamis</i>	-	-	-	*	*	*	*	*
ARIIDAE								
<i>Arius bilineatus</i>	-	-	-	-	*	*	-	-
<i>Arius graeffei</i>	*	*	-	-	-	-	-	-
<i>Arius leptaspis</i>	*	*	*	-	-	-	-	-
<i>Arius macrocephalus</i>	*	*	*	-	*	*	-	-
<i>Arius mastersi</i>	*	*	*	-	-	-	-	-
<i>Arius proximus</i>	*	*	*	-	-	-	-	-
<i>Arius</i> sp. 2 [of Kailola]	*	*	*	-	-	-	-	-
<i>Arius</i> sp. 4 [of Kailola]	-	-	*	-	-	*	-	-
<i>Arius thalassinus</i>	-	-	*	*	*	*	*	*
PLOTOSIDAE								
<i>Euristhmus nudiceps</i>	*	*	*	-	*	-	-	-
<i>Plotosus lineatus</i>	-	-	-	-	*	-	-	-
BREGMACEROTIDAE								
<i>Bregmaceros</i> sp.	-	-	-	-	-	-	*	-
BATRACHOIDIDAE								
<i>Batrachomoeus trispinosus</i>	*	-	-	-	-	-	-	-
EXOCOETIDAE								
<i>Parexocoetus mento</i>	-	-	-	-	-	*	-	-

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
HEMIRAMPHIDAE								
<i>Arrhamphus sclerolepis</i>	-	*	*	-	-	-	-	-
<i>Hemiramphus far</i>	-	-	*	-	-	-	-	-
<i>Hyporhamphus dussumieri</i>	-	-	*	-	-	-	-	-
<i>Hyporhamphus quoyi</i>	-	-	*	-	-	-	-	-
<i>Zenarchopterus buffonis</i>	*	*	*	-	-	-	-	-
<i>Zenarchopterus dispar</i>	-	-	*	-	-	-	-	-
BELONIDAE								
<i>Ablennes hians</i>	-	-	-	*	-	-	-	-
<i>Lhotskia gavioloides</i>	-	-	*	-	-	-	-	-
<i>Strongylura incisa</i>	-	-	*	-	-	-	-	-
<i>Strongylura leiura</i>	-	*	*	-	-	-	-	-
<i>Strongylura strongylura</i>	*	*	*	-	-	-	-	-
<i>Tylosurus crocodilus</i>	*	*	*	-	-	-	-	-
<i>Tylosurus punctulatus</i>	-	*	*	-	-	-	-	-
ATHERINIDAE								
<i>Atherinomorus duodecimalis</i>	-	-	*	-	-	-	-	-
<i>Atherinomorus endractensis</i>	-	-	*	-	-	-	-	-
MELANOTAENIIDAE								
<i>Pseudomugil gertrudae</i>	*	*	*	-	-	-	-	-
VELIFERIDAE								
<i>Velifer hypselopterus</i>	-	-	-	-	*	-	*	-
FISTULARIDAE								
<i>Fistularia commersonii</i>	-	-	-	-	*	*	*	*
<i>Fistularia petimba</i>	-	-	-	*	*	*	*	*
CENTRISCIDAE								
<i>Centriscus scutatus</i>	-	-	-	-	*	-	*	-

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
SYNGNATHIDAE								
<i>Hippichthys heptagonus</i>	-	-	*	-	-	-	-	-
<i>Hippocampus kuda</i>	-	-	*	-	-	-	-	-
<i>Hippocampus whitei</i>	-	-	*	-	-	-	-	-
SCORPAENIDAE								
<i>Apistus carinatus</i>	-	-	-	-	-	*	*	-
<i>Pterois volitans</i>	-	-	-	-	*	-	-	-
<i>Synanceia horrida</i>	-	-	*	-	-	-	-	-
TRIGLIDAE								
<i>Lepidotrigla spiloptera</i>	-	-	-	-	-	-	*	-
PLATYCEPHALIDAE								
<i>Cymbacephalus nematophthalmus</i>	-	-	*	-	-	-	-	-
<i>Elates ransonetti</i>	-	-	-	-	*	*	*	*
<i>Platycephalus arenarius</i>	-	-	-	-	*	-	-	-
<i>Platycephalus endrachtensis</i>	-	-	*	-	*	-	-	-
<i>Platycephalus indicus</i>	-	*	*	-	*	-	-	-
<i>Suggrundus isacanthus</i>	-	-	-	-	*	*	*	-
<i>Suggrundus japonicus</i>	-	-	-	-	*	-	-	-
<i>Suggrundus macracanthus</i>	-	-	-	-	-	*	*	*
CENTROPOMIDAE								
<i>Lates calcarifer</i>	*	*	*	-	-	-	-	-
<i>Psammoperca waigiensis</i>	-	-	*	-	-	-	-	-
AMBASSIDAE								
<i>Ambassis dussumieri</i>	-	-	*	-	-	-	-	-
<i>Ambassis gymnocephalus</i>	-	-	*	-	-	-	-	-
<i>Ambassis nalua</i>	-	*	*	-	-	-	-	-

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
SERRANIDAE								
<i>Centrogenys vaigiensis</i>	-	-	*	-	-	-	-	-
<i>Epinephelus areolatus</i>	-	-	-	-	-	-	*	-
<i>Epinephelus malabaricus</i>	*	*	-	*	*	*	*	-
<i>Epinephelus merra</i>	-	-	*	-	-	-	-	-
<i>Epinephelus sexfasciatus</i>	-	-	-	-	*	-	*	-
<i>Epinephelus suillus</i>	*	-	*	-	-	-	-	-
PSEUDOCHROMIDAE								
<i>Pseudochromis quinquedentatus</i>	-	-	-	-	-	-	*	-
TERAPONIDAE								
<i>Amniataba caudivittatus</i>	-	-	*	-	-	-	-	-
<i>Pelates quadrilineatus</i>	-	-	*	*	*	*	*	*
<i>Pelates sexlineatus</i>	-	-	*	*	*	-	-	-
<i>Terapon jarbua</i>	-	*	*	*	*	*	*	-
<i>Terapon puta</i>	-	-	*	*	*	*	*	-
<i>Terapon theraps</i>	-	-	-	*	*	*	*	*
PRIACANTHIDAE								
<i>Priacanthus tayenus</i>	-	-	-	*	*	*	*	*
APOGONIDAE								
<i>Apogon ellioti</i>	-	-	-	-	*	*	*	-
<i>Apogon hyalosoma</i>	-	-	*	-	-	-	-	-
<i>Apogon poecilopterus</i>	-	-	-	*	*	*	*	-
<i>Apogon quadrifasciatus</i>	-	-	-	-	-	*	-	-
<i>Apogon robustus</i>	-	-	-	*	*	*	-	-
<i>Apogon ruppelli</i>	-	-	*	-	-	-	-	-
<i>Apogon sangiensis</i>	-	-	*	-	-	-	-	-
<i>Siphamia roseigaster</i>	-	-	*	-	-	-	-	-
PERCICHTHYIDAE								
<i>Acropoma japonicum</i>	-	-	-	-	*	-	-	-

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
<i>Scomberoides commersonianus</i>	*	*	*	*	*	*	*	*
<i>Scomberoides tala</i>	-	*	-	*	*	*	*	-
<i>Scomberoides tol</i>	-	-	-	*	*	*	*	*
<i>Selar boops</i>	-	-	-	*	*	*	*	*
<i>Selar crumenophthalmus</i>	-	-	-	*	-	*	*	*
<i>Selaroides leptolepis</i>	-	-	-	*	*	*	*	*
<i>Seriolina nigrofasciata</i>	-	-	-	-	*	*	*	-
<i>Trachinotus bailloni</i>	-	-	*	-	-	-	-	-
<i>Trachinotus</i> sp. cf <i>mookalee</i>	-	-	*	-	-	-	-	-
<i>Ulua aurochs</i>	-	-	-	-	-	*	*	-
<i>Uraspis uraspis</i>	-	-	-	-	-	-	*	-
FORMIONIDAE								
<i>Apolectus niger</i>	-	-	*	*	*	*	*	*
MENIDAE								
<i>Mene maculata</i>	-	-	-	-	*	*	*	-
LEIOGNATHIDAE								
<i>Gazza minuta</i>	-	-	*	*	*	*	*	*
<i>Leiognathus bindus</i>	-	-	-	*	*	*	*	*
<i>Leiognathus decorus</i>	-	*	*	*	*	*	*	-
<i>Leiognathus equulus</i>	-	*	*	*	*	*	*	*
<i>Leiognathus fasciatus</i>	-	-	-	-	-	*	*	-
<i>Leiognathus leuciscus</i>	-	-	*	*	*	*	*	*
<i>Leiognathus moretoniensis</i>	-	-	*	*	*	*	*	*
<i>Leiognathus popei</i>	-	-	-	-	-	-	*	*
<i>Leiognathus smithursti</i>	-	-	*	*	*	*	*	*
<i>Leiognathus</i> sp. 2 [Jones (1985)]	-	-	-	-	*	*	*	*
<i>Leiognathus splendens</i>	-	-	*	*	*	*	*	*
<i>Secutor insidiator</i>	-	-	*	*	*	*	*	*
<i>Secutor ruconius</i>	-	-	*	*	*	*	*	-

Estuary
ReachesAlbatross Bay
Depth zones in metres

	U	M	L	7-10	11-20	21-30	31-40	41-50
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LUTJANIDAE

<i>Lutjanus argentimaculatus</i>	*	*	*	*	-	*	*	-
<i>Lutjanus carponotatus</i>	-	-	-	*	-	*	-	-
<i>Lutjanus erythropterus</i>	-	-	-	*	*	*	*	-
<i>Lutjanus johnii</i>	-	*	-	-	-	-	-	-
<i>Lutjanus lutjanus</i>	-	-	-	*	-	-	-	-
<i>Lutjanus malabaricus</i>	-	-	-	*	*	*	*	*
<i>Lutjanus russelli</i>	*	*	*	*	*	*	*	-
<i>Lutjanus sebae</i>	-	-	-	*	*	*	*	-
<i>Lutjanus vitta</i>	-	-	-	-	*	*	*	*

NEMIPTERIDAE

<i>Nemipterus celebicus</i>	-	-	-	-	-	-	-	*
<i>Nemipterus furcosus</i>	-	-	-	-	*	*	*	*
<i>Nemipterus hexodon</i>	-	-	-	*	*	*	*	*
<i>Nemipterus nematopus</i>	-	-	-	-	-	-	-	*
<i>Nemipterus peronii</i>	-	-	-	*	*	*	*	*
<i>Nemipterus tambuloides</i>	-	-	-	-	-	-	*	*
<i>Pentapodus porosus</i>	-	-	-	*	*	*	*	*
<i>Scolopsis monogramma</i>	-	-	-	-	-	*	*	*
<i>Scolopsis taeniopterus</i>	-	-	-	-	*	*	*	*

GERREIDAE

<i>Gerres abbreviatus</i>	-	*	*	-	-	-	-	-
<i>Gerres filamentosus</i>	*	*	*	*	*	*	*	*
<i>Gerres oyena</i>	-	-	*	*	*	*	*	-
<i>Gerres poieti</i>	-	-	*	-	-	-	-	-
<i>Gerres subfasciatus</i>	-	-	*	*	*	*	*	*
<i>Pentaprion longimanus</i>	-	-	-	*	*	*	*	*

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
HAEMULIDAE								
<i>Diagramma pictum</i>	-	-	-	-	*	*	*	*
<i>Gaterin sordidus</i>	-	-	-	*	-	-	-	-
<i>Plectorhinchus gibbosus</i>	*	-	-	-	-	-	-	-
<i>Pomadasys argenteus</i>	*	*	*	-	*	*	*	-
<i>Pomadasys kaakan</i>	*	*	*	*	*	*	*	*
<i>Pomadasys maculatus</i>	-	-	-	*	*	*	*	*
<i>Pomadasys trifasciatus</i>	-	-	-	*	*	*	*	*
LETHRINIDAE								
<i>Lethrinus choerorynchus</i>	-	-	-	-	-	-	*	*
<i>Lethrinus fraenatus</i>	-	-	-	-	-	*	-	-
<i>Lethrinus lentjan</i>	-	-	*	*	*	*	*	*
<i>Lethrinus sp. (unidentified)</i>	-	-	-	-	*	*	-	-
SPARIDAE								
<i>Acanthopagrus berda</i>	*	*	*	-	-	-	-	-
<i>Argyrops spinifer</i>	-	-	-	-	-	*	-	-
SCIAENIDAE								
<i>Austronibea oedogenys</i>	-	-	-	*	*	-	-	-
<i>Johnieops vogleri</i>	-	-	-	*	*	*	*	*
<i>Johnius amblycephalus</i>	-	-	-	*	*	*	*	*
<i>Nibea soldado</i>	-	-	*	-	-	-	-	-
<i>Nibea sp. (of McKay)</i>	-	-	*	-	-	-	-	-
<i>Otolithes ruber</i>	-	-	-	*	*	*	-	-
<i>Protonibea diacanthus</i>	-	-	-	-	*	*	*	-
MULLIDAE								
<i>Parupeneus pleurospilus</i>	-	-	-	-	*	-	-	-
<i>Upeneus asymmetricus</i>	-	-	-	-	*	-	-	-
<i>Upeneus luzonius</i>	-	-	-	*	-	*	-	-
<i>Upeneus sulphureus</i>	-	-	-	*	*	*	*	*
<i>Upeneus sundaicus</i>	-	-	-	*	*	*	*	*
<i>Upeneus tragula</i>	-	-	*	-	-	-	-	-

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
SPHYRAENIDAE								
<i>Sphyraena barracuda</i>	-	-	*	-	-	-	-	-
<i>Sphyraena forsteri</i>	-	-	-	-	*	*	*	-
<i>Sphyraena jello</i>	-	-	-	-	*	-	-	-
<i>Sphyraena obtusata</i>	-	-	-	*	*	*	*	*
<i>Sphyraena putnamiae</i>	*	*	*	*	*	*	*	*
<i>Sphyraena genie</i>	-	-	*	-	-	-	-	-
POLYMENIDAE								
<i>Eleutheronema tetradactylum</i>	*	*	*	-	-	-	-	-
<i>Polynemus multiradiatus</i>	-	-	-	*	*	*	*	*
<i>Polynemus sheridani</i>	*	*	*	-	*	-	-	-
LABRIDAE								
<i>Choerodon monostigma</i>	-	-	-	-	*	-	-	*
<i>Choerodon schoenleinii</i>	-	-	-	-	-	*	-	-
<i>Halichoeres dussumieri</i>	-	-	*	-	-	-	-	-
BLENNIIDAE								
<i>Omobranchus rotundiceps</i>	-	*	*	-	-	-	-	-
CALLIONYMIDAE								
<i>Callionymus</i> sp. (juveniles)	-	-	*	-	-	-	-	-
GOBIIDAE								
<i>Acentrogobius caninus</i>	-	-	*	-	-	-	-	-
<i>Acentrogobius gracilus</i>	-	-	*	-	-	-	-	-
<i>Acentrogobius janthinopterus</i>	-	-	*	-	-	-	-	-
<i>Acentrogobius viridipunctatus</i>	-	-	*	-	-	-	-	-
<i>Amoya</i> sp. (of Hoese)	-	*	-	-	-	-	-	-
<i>Cryptocentrus</i> sp. (of Hoese)	-	-	*	-	-	-	-	-
<i>Drombus globiceps</i>	-	-	*	-	-	-	-	-
<i>Drombus ocyurus</i>	-	-	*	-	-	-	-	-

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
PSETTODIDAE								
<i>Psettodes erumei</i>	-	-	-	*	*	*	*	-
BOTHIDAE								
<i>Engyprosopon grandisquama</i>	-	-	-	-	*	-	-	-
<i>Grammatobothus polyophthalmus</i>	-	-	-	-	-	*	-	-
<i>Pseudorhombus argus</i>	-	-	-	-	-	*	-	-
<i>Pseudorhombus arsius</i>	-	-	*	*	*	-	-	-
<i>Pseudorhombus diplospilus</i>	-	-	-	-	-	*	*	-
<i>Pseudorhombus elevatus</i>	-	-	*	-	*	*	*	-
<i>Pseudorhombus spinosis</i>	-	-	-	-	*	*	*	-
CYNOGLOSSIDAE								
<i>Cynoglossus bilineatus</i>	-	-	-	-	*	-	-	-
SOLEIDAE								
<i>Dexillichthys muelleri</i>	-	-	*	-	-	-	-	-
TRIACANTHODIDAE								
<i>Triacanthus biaculeatus</i>	-	-	-	*	-	-	-	-
<i>Tripodichthys oxycephalus</i>	-	-	*	-	-	-	-	-
<i>Trixiphichthys weberi</i>	-	-	*	*	*	*	*	*
BALISTIDAE								
<i>Abalistes stellaris</i>	-	-	-	-	*	*	*	*
MONACANTHIDAE								
<i>Acreichthys tomentosus</i>	-	-	*	-	-	-	-	-
<i>Alutera monoceros</i>	-	-	-	-	-	-	*	-
<i>Monacanthus chinensis</i>	-	-	*	-	*	-	-	-
<i>Paramonacanthus japonicus</i>	-	-	*	-	*	*	*	*
<i>Paramonacanthus filicauda</i>	-	-	-	-	-	*	-	-
<i>Pardicula setifer</i>	-	-	*	-	-	-	-	-

	Estuary Reaches			Albatross Bay Depth zones in metres				
	U	M	L	7-10	11-20	21-30	31-40	41-50
OSTRACIIDAE								
<i>Rhynchostracion nasus</i>	-	-	-	*	*	*	*	-
TETRAODONTIDAE								
<i>Arothron immaculatus</i>	-	-	*	-	-	-	-	-
<i>Arothron stellatus</i>	-	-	-	*	-	-	-	-
<i>Chelonodon patoca</i>	-	-	*	*	*	*	*	-
<i>Lagocephalus lunaris</i>	-	-	*	*	*	*	*	*
<i>Lagocephalus scleratus</i>	-	-	-	*	*	*	*	*
<i>Lagocephalus spadiceus</i>	-	-	-	*	*	*	*	-
<i>Marilyna darwinii</i>	-	*	*	-	-	-	-	-
<i>Tetraodon erythrotaenia</i>	*	*	*	-	-	-	-	-
<i>Torquigener hicksi</i>	-	-	-	-	*	-	-	-
<i>Torquigener whitleyi</i>	-	-	-	*	*	-	*	-
DIODONTIDAE								
<i>Cylichthys hardenbergi</i>	-	-	-	-	-	*	*	-
<i>Cylichthys jaculiferus</i>	-	-	-	-	-	-	*	-
Number of species	56	77	182	124	191	166	169	85

reaches. In Albatross Bay no sampling was possible between the estuary mouth and a depth of 7 m. Hence the fauna of the shallow marine zone remains largely unknown. In the bay the three depth zones between 11 and 40 m have a similar species composition. Only 85 species were caught in depths greater than 40 m; however, as only three trawl shots were made in this depth stratum this is certainly an underestimate. Cumulative catch curves for the five depth strata in the bay (Figure 3) indicate three shots are inadequate to obtain a realistic species count. Figure 3 also suggests that the 15 shots made in 7-10 m depth may be too few, and that the 124 species recorded may also be an underestimate.

The mean number of species caught per trawl shot was not significantly different for each of the five depth strata in Albatross Bay (Table 2).

Table 2. Mean numbers of species per trawl shot for the five depth strata in Albatross Bay (n = number of trawl shots)

Depth Stratum (m)	n	Mean	(\pm S.E.)
7 - 10	15	39.14	(2.75)
11 - 20	60	43.35	(1.31)
21 - 30	31	40.42	(1.68)
31 - 40	40	40.08	(1.70)
41 - 50	3	47.3	(2.96)

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