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SEAGRASS BEDS AND PRAWN NURSERY GROUNDS BETWEEN CAPE YORK AND CAIRNS

R. G. Coles, W. J. Lee Long
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Fisheries Research Branch

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INTRODUCTION

Research in southern Queensland, Cairns, Weipa, the Wellesley Islands, and around Groote Island has shown that inshore seagrass beds act as nursery grounds for juvenile prawns. These include important commercial species such as the tiger prawns Penaeus esculentus and Penaeus semisulcatus, and the endeavour prawns Metapenaeus endeavouri and Metapenaeus ensis.

These prawns spawn offshore on the fishing grounds and their eggs hatch rapidly giving rise to a series of planktonic, larval stages which are transported by currents and wind action into inshore areas. Where there is seagrass bottom vegetation, these larval prawns settle. In the protection of these inshore areas they grow to large juveniles before moving back into the fishery to spawn and complete their annual life cycle.

To the best of our knowledge, if these larval prawns do not settle in an area of seagrass they will be unlikely to survive and therefore will be lost to the fishery.

Seagrass beds that form effective prawn nursery grounds include only a small proportion of inshore waters. It is essential for the long-term survival of the prawn stocks that these areas not be damaged by trawling or other forms of development. Any activity that increases turbidity or siltation over seagrass beds may result in a reduction of the beds and the stocks of juvenile prawns.

In November 1984 a research team from the Fisheries Research Branch mapped seagrass beds and sampled juvenile prawn populations on the east Queensland coast to the north of Cairns. This report presents a series of charts of the distribution of these seagrass beds. Its purpose is to enable fishermen to reduce their catch of juvenile prawns by avoiding trawling on or near areas which may form prawn nursery grounds. This report forms part of the results of research supported by funds from the Fishing Industry Research Trust Account (FIRTA).

METHODS

The survey involved visual assessment of the seabed by diving along transects out from the coastline at intervals of about 4 km. Extra dive checks were made between transects for continuity. Where seagrass was present, four, 0.25 m² samples of the bottom vegetation were collected for laboratory analysis. The height of each species of seagrass and a percentage cover of the bottom were also estimated. On selected sites, where seagrass was found, juvenile prawns were sampled at night using fine mesh beam trawls.

RESULTS

Eight species of seagrass were common. These were:

Cymodocea serrulata
Syringodium isoetifolium
Halodule uninervis
Thalassia hemprichii
Halophila spinulosa
Halophila ovalis
Halophila decipiens
Enhalus acaroides

Zostera capricornii was abundant in and adjacent to Trinity Inlet but was not found elsewhere. Several other species were identified but were relatively uncommon.

Dense seagrass beds were found between the low tide mark and a depth of 10 m. Only very low densities of mainly Halophila species were found in deeper water. At depths greater than 15 m seagrass was rare.

Five species of commercially important penaeid prawns were caught on the seagrass beds. These included:

<u>Penaeus esculentus</u>	the brown tiger prawn
<u>Penaeus semisulcatus</u>	the grooved tiger prawn
<u>Metapenaeus endeavouri</u>	the endeavour prawn
<u>Penaeus latisulcatus</u>	the western king prawn
<u>Penaeus longistylus</u>	the red spot king prawn

Fourteen figures of seagrass distribution were compiled from data based on visual assessments of seagrass cover. Seagrasses are mapped in three categories according to percentage vegetation cover. These are less than 10%, between 10% and 50%, and greater than 50%.

Each figure includes a description of the distribution of the seagrass beds and of the juvenile prawns caught.

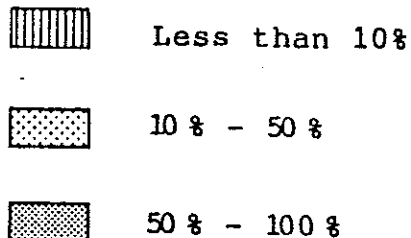
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Coles, R.G. and Lee Long, W.J. 1985. Juvenile prawn biology and distribution of seagrass prawn nursery grounds in the south eastern Gulf of Carpentaria. In: Proceedings of the Second National Prawn Seminar, CSIRO (In Press).

Figures 1 to 14 show the distribution of seagrass beds on the Queensland coast between Cape York (Mount Adolphus Island) and Cairns (Cape Grafton). Seagrasses are mapped in three categories according to percentage vegetation cover.

Figure 1. Mount Adolphus Island to Gilmore Bank. Seagrass was found in the bay at Mount Adolphus Island and on the extensive shallow banks in the Escape River. Juvenile tiger and endeavour prawns were found at Mount Adolphus Island. Tiger, endeavour, red spot king and western king prawns were common in the Escape River.

Seagrass cover



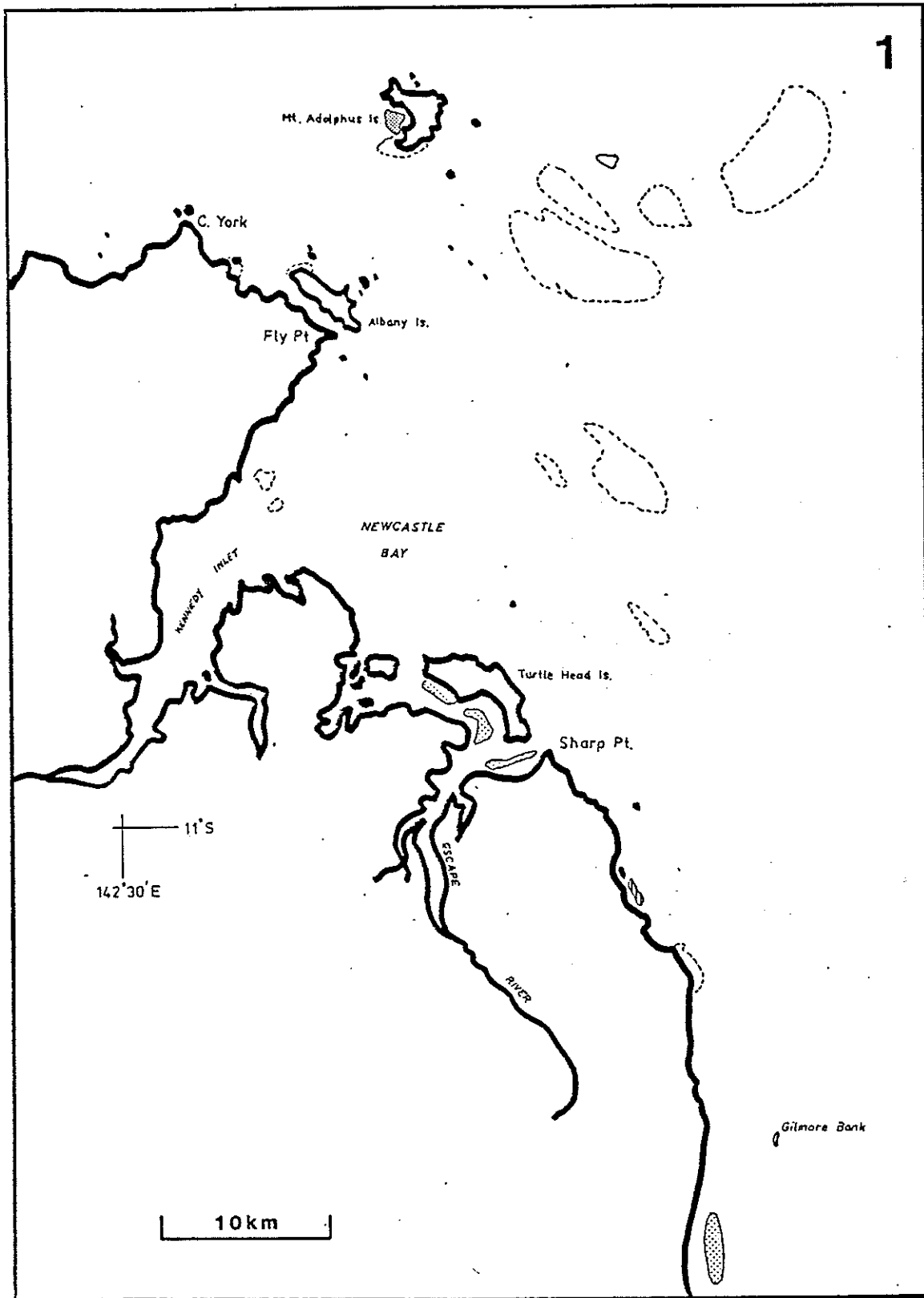





Figure 2. Gilmore Bank to Macarthur Island. Only small areas of seagrass were found in Orford Bay. On this part of the coast the bottom appeared to be generally clean sand.

Seagrass cover

	Less than 10%
	10% - 50%
	50% - 100%

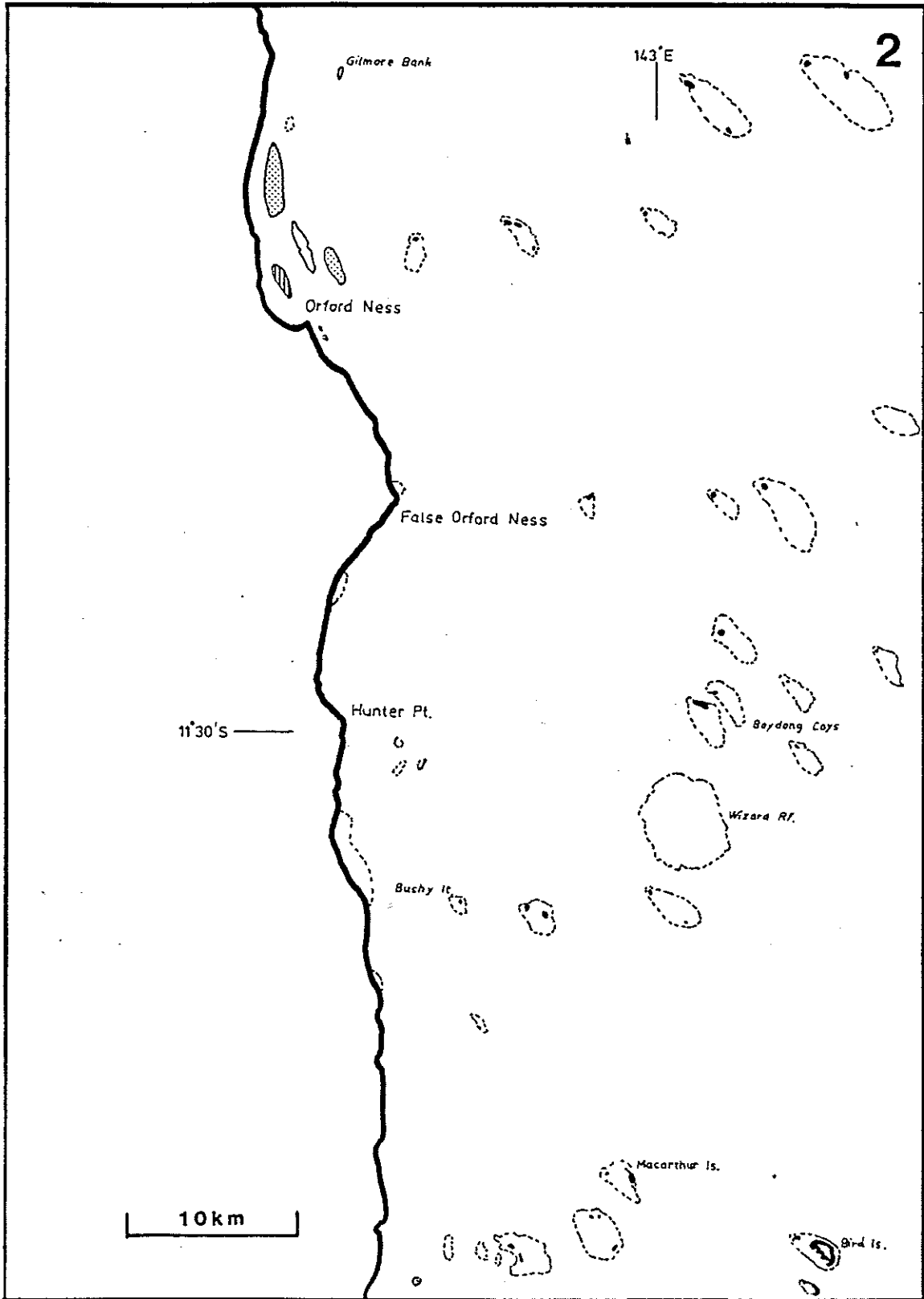





Figure 3. Macarthur Island to Temple Bay. Extensive areas of seagrass growth occurred in the sheltered southern part of Shelburne and Margaret Bays. Large areas of light seagrass cover occurred in Temple Bay. Juvenile tiger and endeavour prawns were common in both bays, along with some western king prawns.

Seagrass cover

	Less than 10%
	10% - 50%
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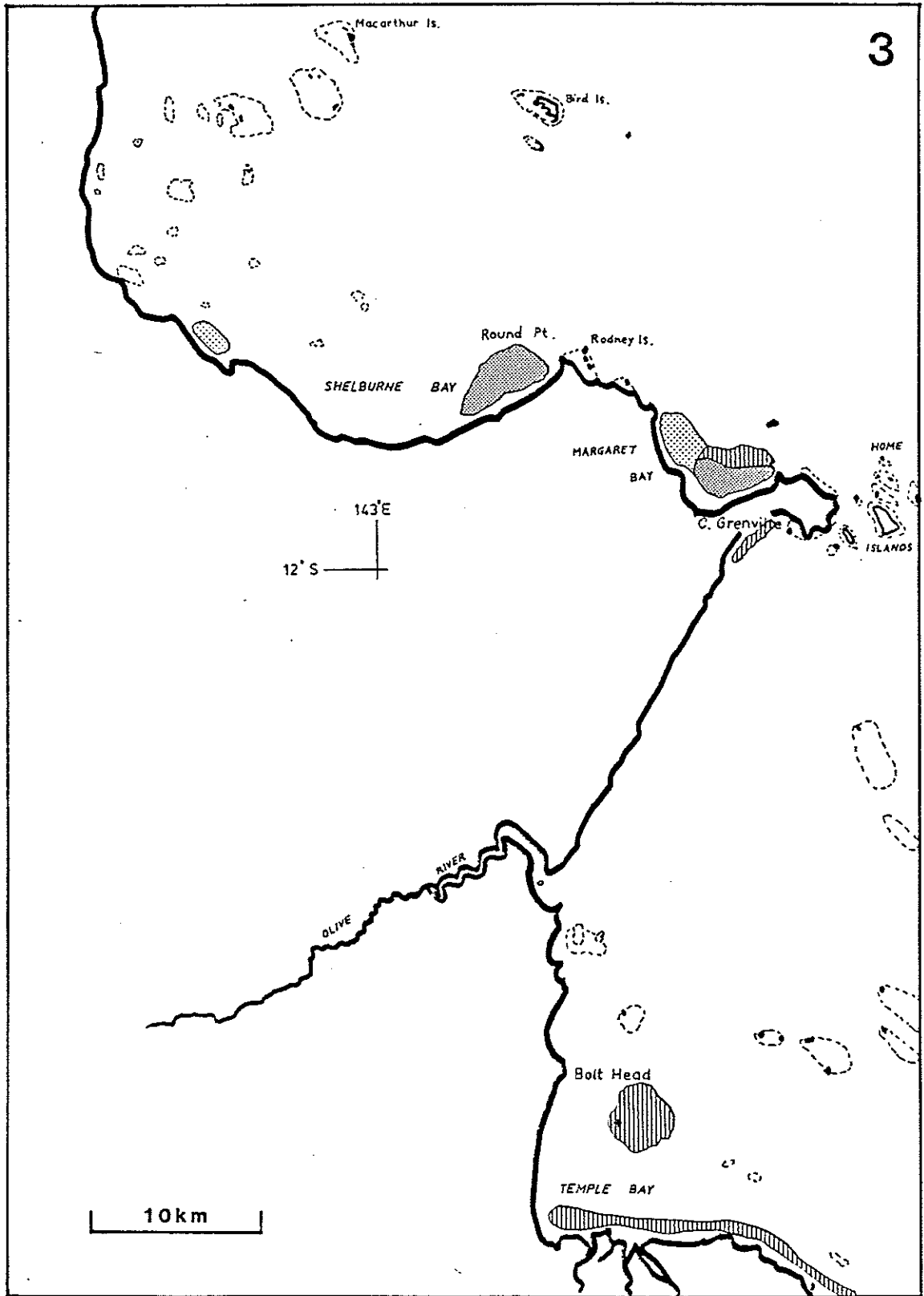
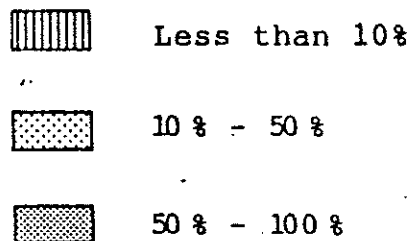


Figure 4. Temple Bay to Lloyd Bay. An isolated patch of dense seagrass was found in Weymouth Bay south of the Pascoe River. Seagrass in Lloyd Bay was associated with patch reef. These areas were not sampled for juvenile prawns.

Seagrass cover



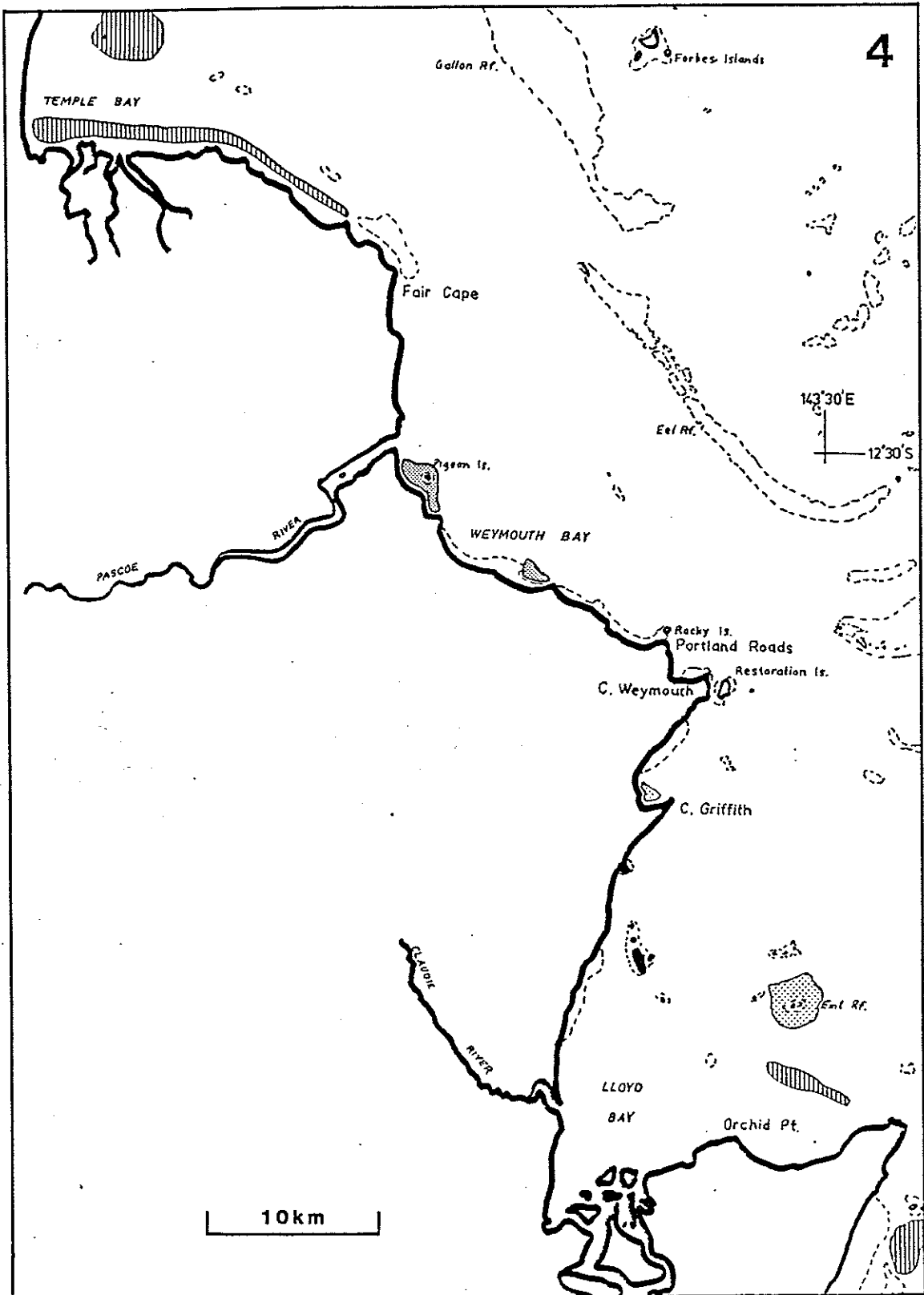
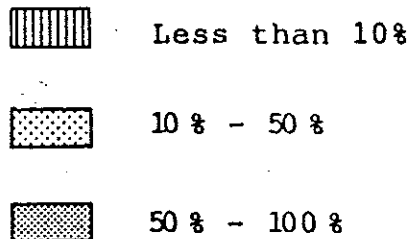


Figure 5. Lloyd Bay to Friendly Point. Extensive areas of seagrass in this region were associated with areas sheltered by fringing reefs. Trawls between Friendly Point and Night Island revealed stocks of juvenile tiger and endeavour prawns.

Seagrass cover



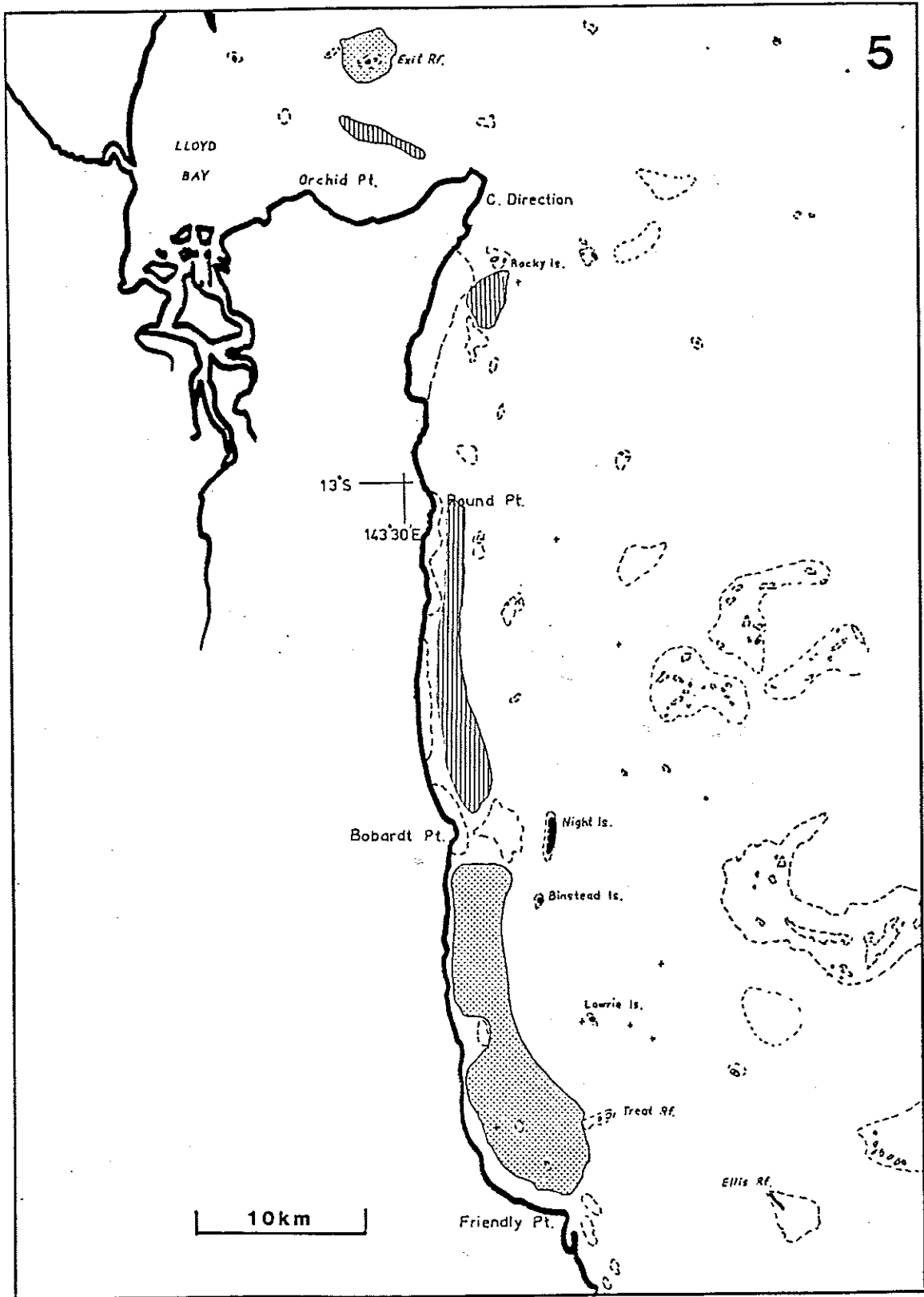


Figure 6. Friendly Point to Claremont Point. The extensive beds of dense seagrass between Frenchmans Reef and Claremont Point were unusual in that they are exposed to prevailing winds and wave action. Juvenile brown tiger prawns and endeavour prawns were caught on these beds.

Seagrass cover



Less than 10%



10% - 50%



50% - 100%

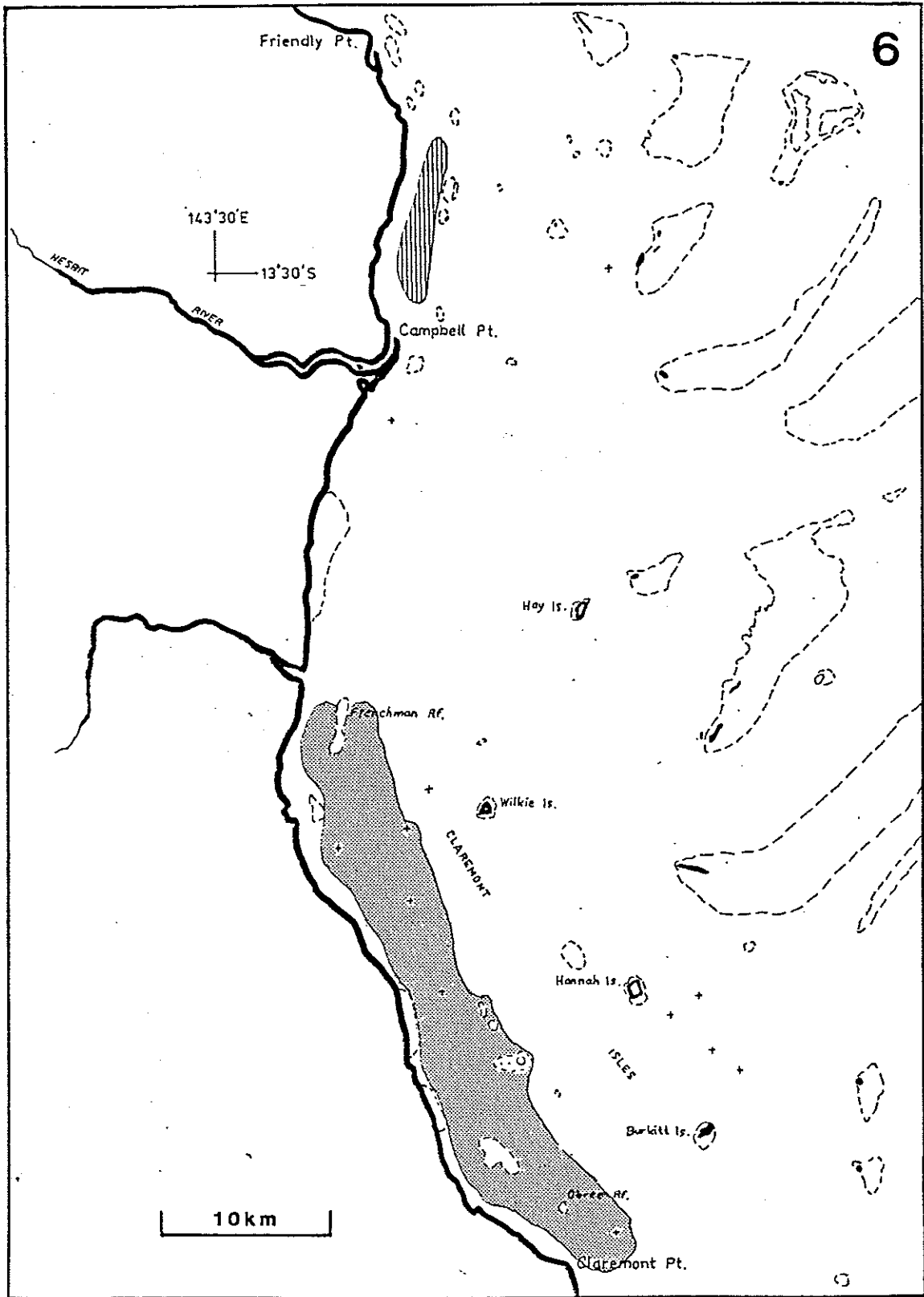


Figure 7. Claremont Point to Bathurst Head. Seagrass beds occurred around Cliff Island and fringed the shore in the south east of Princess Charlotte Bay. Brown tiger and endeavour prawns were sampled on these beds.

Seagrass cover



Less than 10%



10% - 50%



50% - 100%

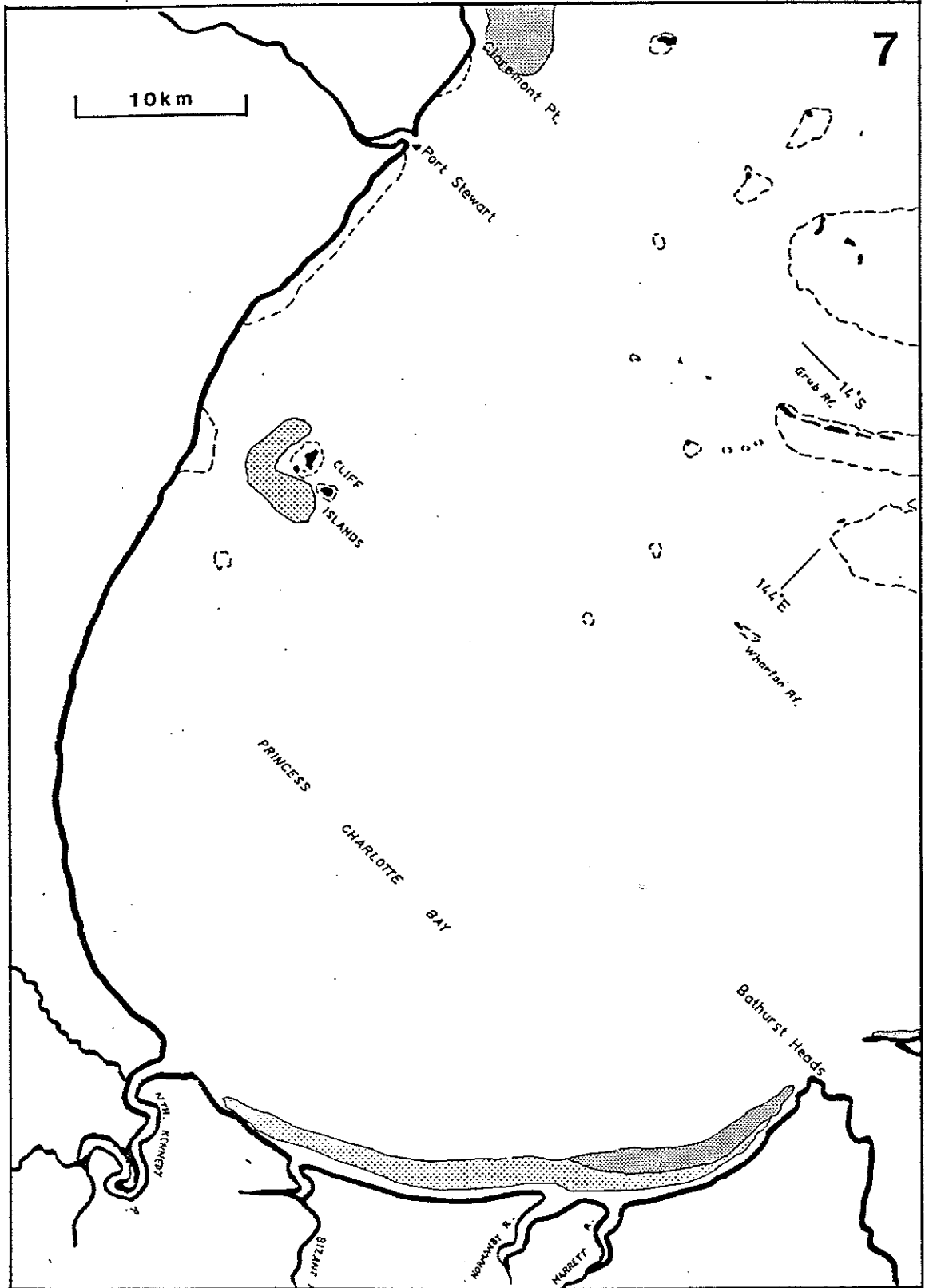


Figure 8. Bathurst Head to Cape Melville. Dense seagrass beds were found around the Flinders Islands and within Bathurst Bay. This region contained the largest seagrass beds surveyed. Thick growths of unattached algae covered the substrate in this bay. Juvenile brown tiger and endeavour prawns were found here.

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50% - 100%

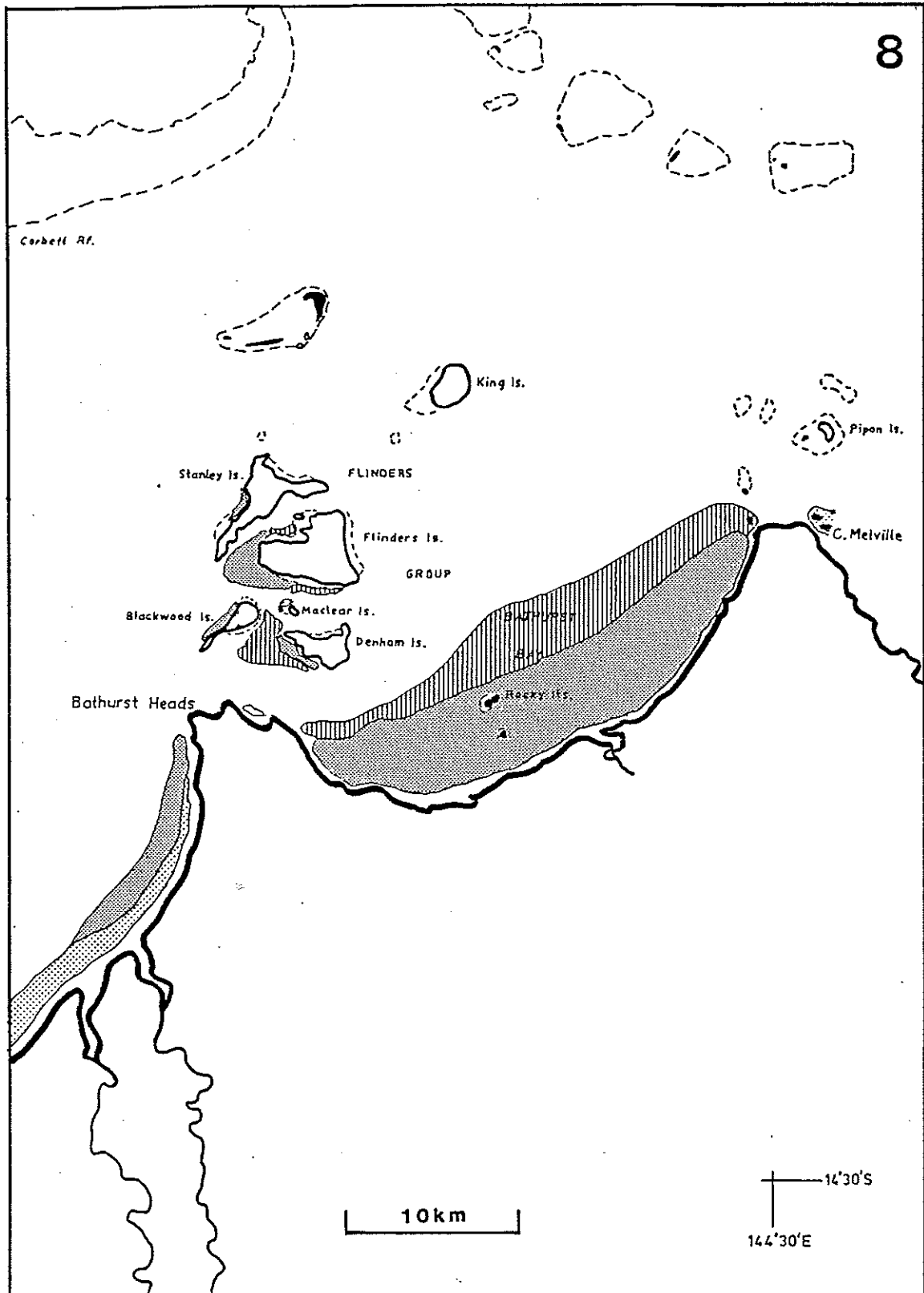
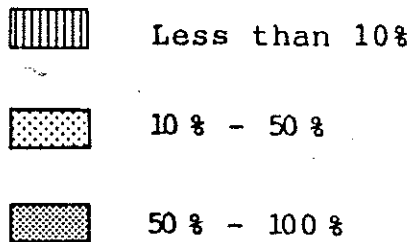


Figure 9. Cape Melville to Murdoch Point. Dense seagrass was found in shallow waters of Ninian Bay with extensive lighter cover in other areas. Juvenile brown tiger, endeavour and western king prawns were caught in the southern half of Ninian Bay.

Seagrass cover



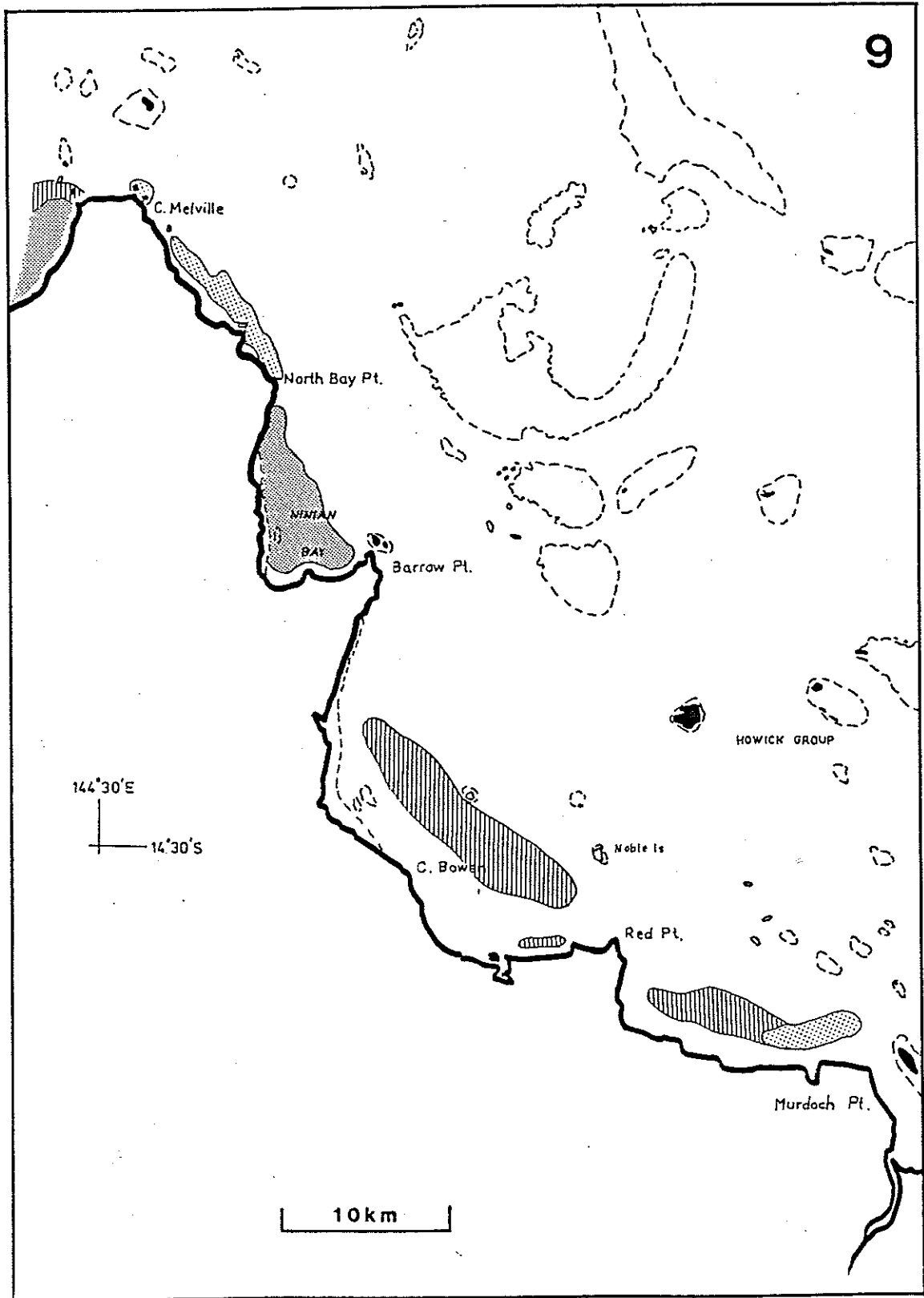
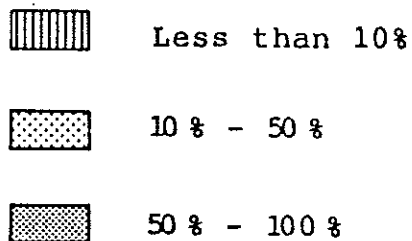


Figure 10. Murdoch Point to Cape Flattery. Although this region was not sampled for prawns, the extensive seagrass cover undoubtedly provides a nursery habitat for juveniles. Most seagrass beds in this region are protected by a scientific research zone of the Great Barrier Reef Marine Park.

Seagrass cover



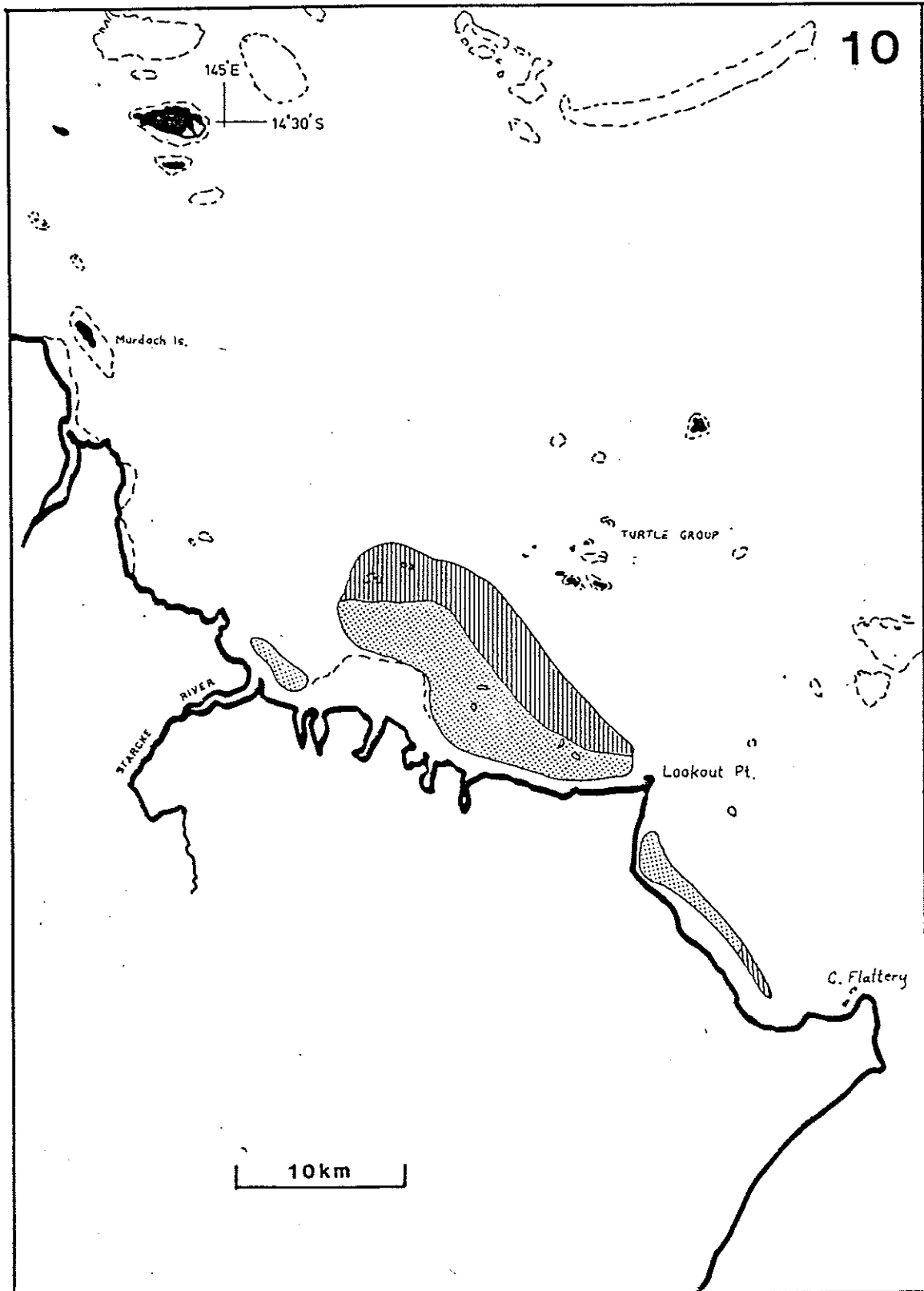





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Seagrass cover

	Less than 10%
	10% - 50%
	50% - 100%

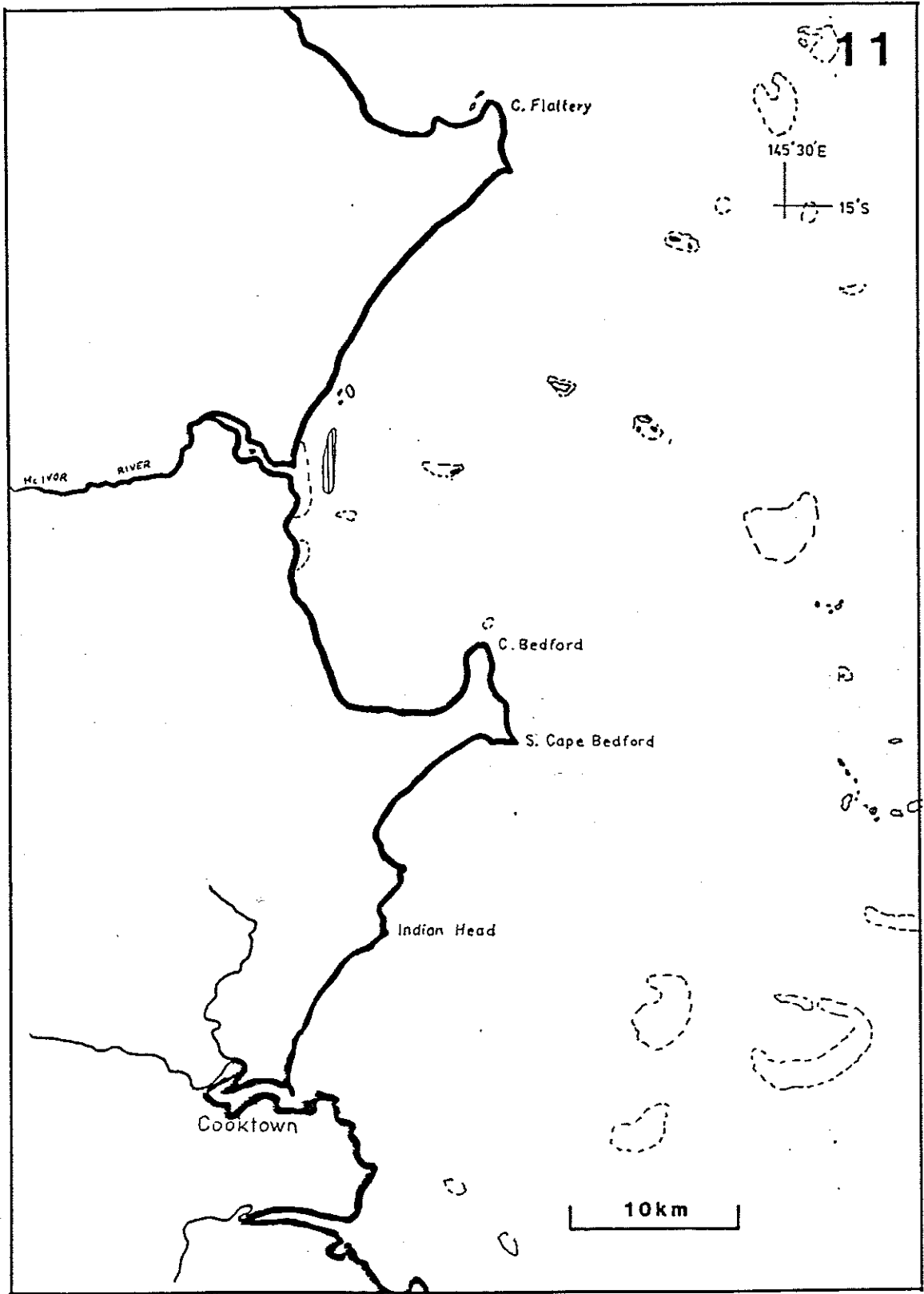





Figure 12. Cape Bedford to Weary Bay. Light seagrass covered the mudbanks at Cooktown Harbour and proved to be nursery ground for tiger and endeavour prawns. The only dense seagrass on this part of the coastline was in Walker Bay, behind Draper Patch. Although not sampled for prawns, this area appeared to be suitable habitat for juvenile prawns.

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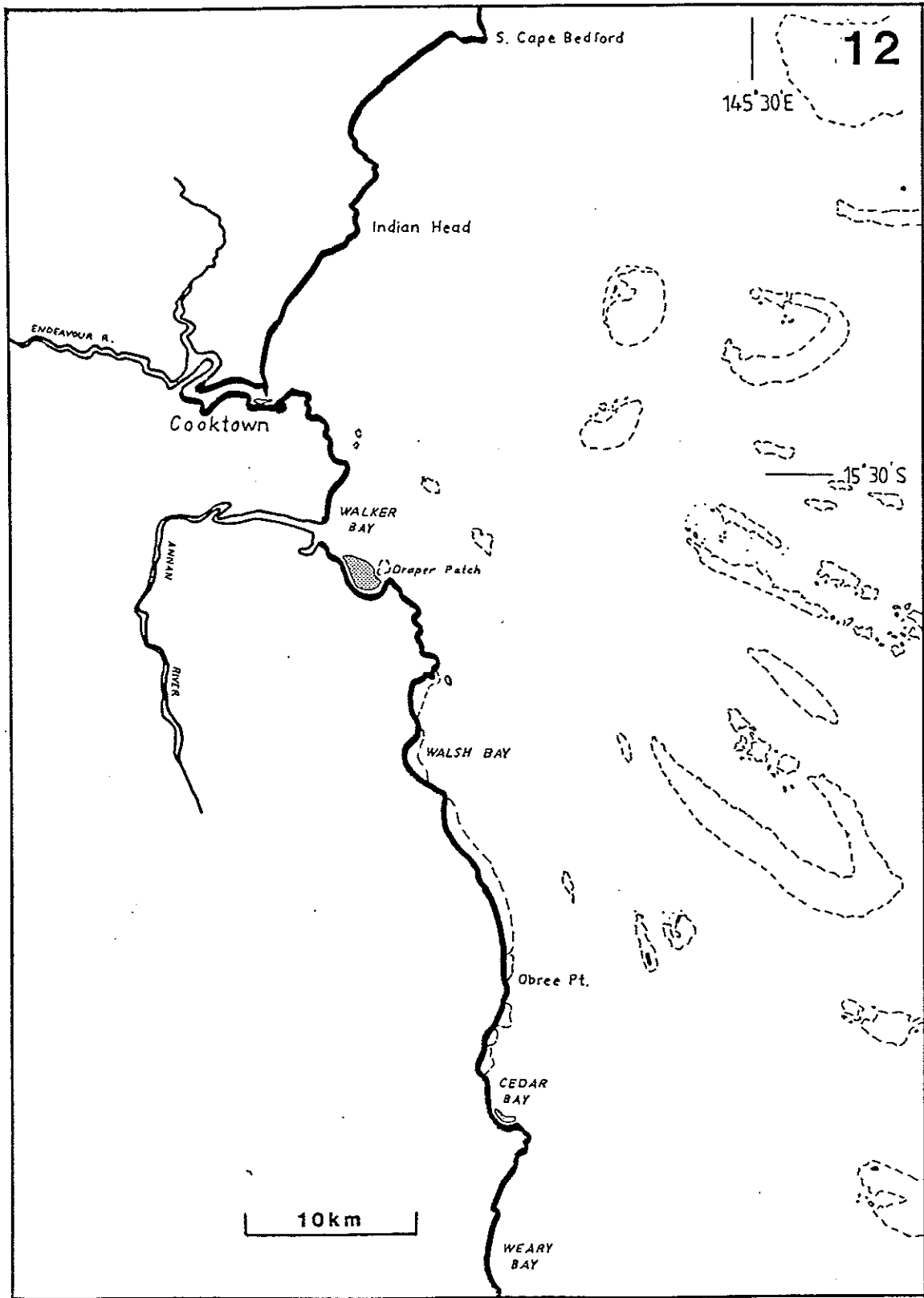





Figure 13. Weary Bay to Port Douglas. Only a small area of light seagrass cover was found at the southern end of Weary Bay.

Seagrass cover

	Less than 10%
	10% - 50%
	50% - 100%

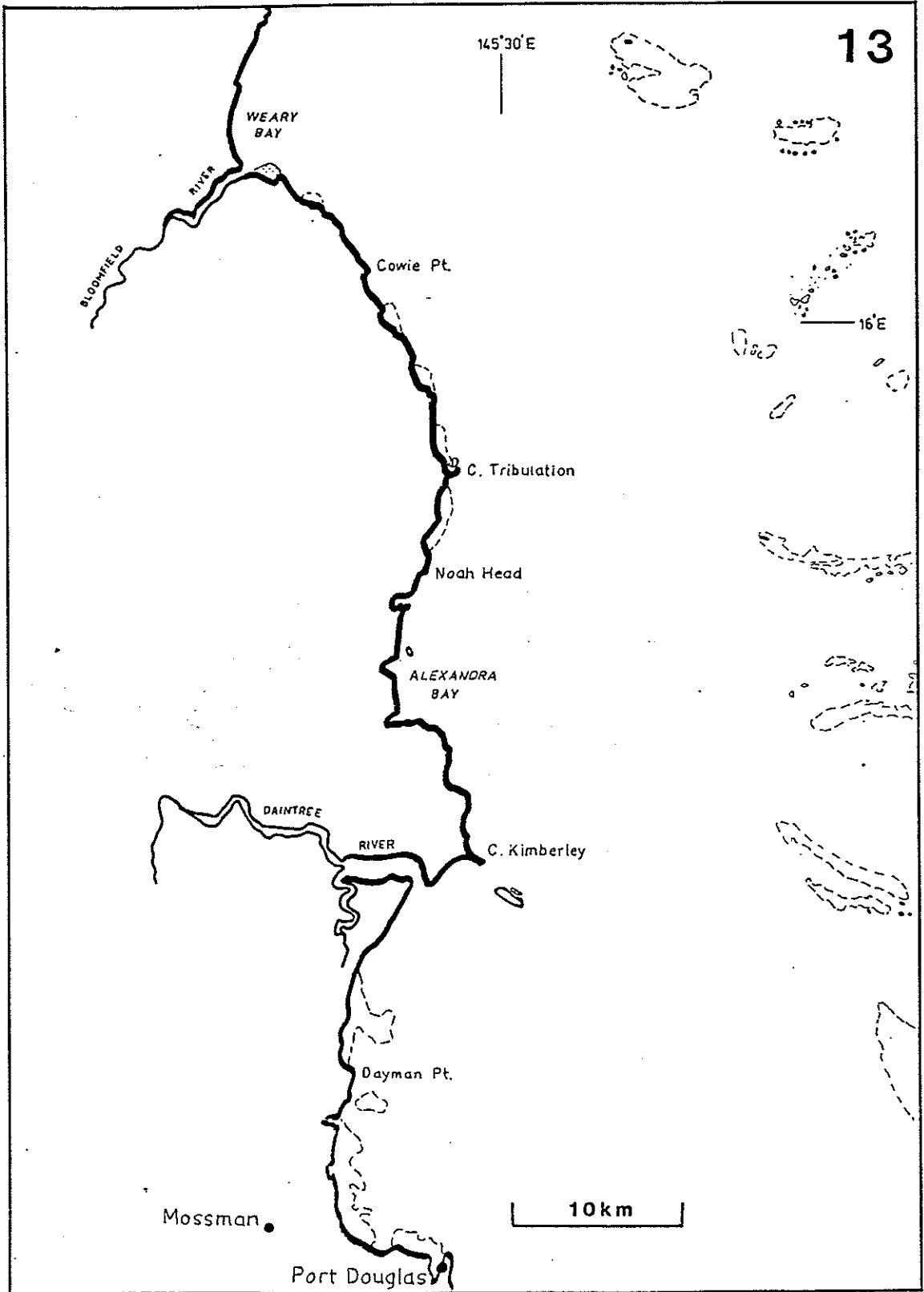





Figure 14. Port Douglas to Cape Grafton. Dense seagrass beds occurred only in Trinity Inlet and Mission Bay, adjacent to the Yarrabah aboriginal community. These were productive nursery grounds for juvenile tiger and endeavour prawns.

Seagrass cover

	Less than 10%
	10% - 50%
	50% - 100%

