

**Great Barrier Reef Marine Park
Southern Sections
(Capricorn & Capricornia Sections)**

INFORMATION SUMMARY



Great Barrier Reef Marine Park Authority

Great Barrier Reef Marine Park Southern Sections (Capricorn & Capricornia Sections)

INFORMATION SUMMARY

A summary of information collected by the Great Barrier Reef Marine Park Authority prior to preparation of a zoning plan for the Capricorn Section and review of the Zoning Plan for the Capricornia Section.



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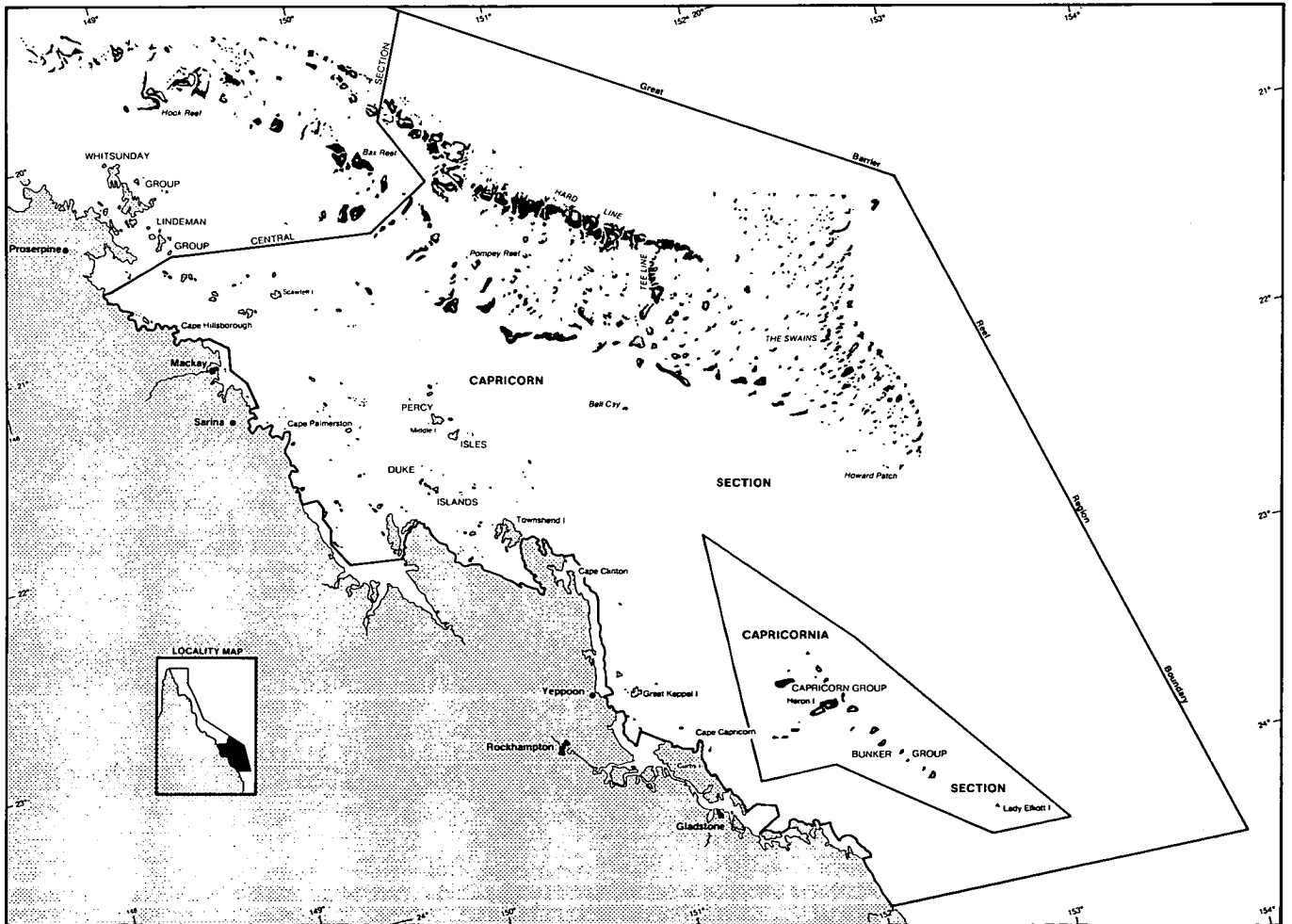
DEFINITION OF THE SOUTHERN SECTIONS

You will see from the map below that we are actually dealing with two Sections of the Marine Park.

The Capricorn Section of the Great Barrier Reef Marine Park was proclaimed in 1984 and it has not been zoned previously. This Section surrounds the Capricornia Section.

The Capricornia Section Zoning Plan has been in effect since July, 1981. The Great Barrier Reef Marine Park Authority has a policy of reviewing zoning plans every 5 years. A review of the Capricornia Section Zoning Plan will coincide with the development of the Capricorn Section Zoning Plan.

It should be noted that although the Capricornia Section Zoning Plan is being reviewed it remains in effect until the new plan for the combined Sections comes into effect.



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1. THIS BOOKLET

Before a zoning plan can be developed for the southern (Capricorn and Capricornia) sections it is necessary to know about the Reef in these sections, its resources and the distribution of, and demand for these resources. This document is a summary of the information the Authority has collected about the southern sections.

This information summary is presented to help you comment effectively on possible zoning provisions. From this booklet you should be able to gather the range of information and factors that will be considered in making zoning decisions. You may also be able to identify errors or gaps in our knowledge with which you can help.

This booklet is intended for use in conjunction with the brochure "Help Zone The Southern Sections". The brochure seeks answers to a number of questions and it is hoped that this booklet will assist you in addressing those questions.

Thematic Maps

The maps in Appendix 2 depict features such as navigation aids, anchorages and shipping channels, adjacent mainland land uses, the location of seagrass and mangrove areas and known commercial and recreational fishing areas.

The information displayed on the thematic maps is a summary of data collected by staff of the Great Barrier Reef Marine Park Authority with assistance from other government agencies and researchers. Your assistance in updating or correcting the information will be valuable.

Reef Appreciation Areas

A Reef Appreciation Area is a small area on a heavily used reef where the public may observe and appreciate relatively undisturbed marine life. The Great Barrier Reef Marine Park Authority has declared Reef Appreciation Areas in the Capricornia Section following a review of comments received during a public participation program. To assist users of the Capricornia Section in locating these Reef Appreciation Areas, maps showing their locations may be found in the back of this booklet.

2. INTRODUCTION

The Great Barrier Reef is the largest system of coral reefs and associated life forms in the world. It is a beautiful and natural environment on a uniquely grand scale and is an integral part of the world's heritage. For this reason the Great Barrier Reef has been inscribed on the World Heritage List.

In recent times, tourism and its associated industries, combined with a large and diverse fishing industry, have increased the

economic significance of the Great Barrier Reef to Queensland and Australia. The future of these industries depends significantly on the conservation of the whole Great Barrier Reef as a viable living system.

The unopposed passing by the Commonwealth Parliament in 1975 of the Great Barrier Reef Marine Park Act was the result of recognition by all political parties that this great natural heritage should be conserved for future generations. The Act established the Great Barrier Reef Marine Park Authority which, amongst other things, is a resource planning and management body with the goal of providing for the protection, wise use, appreciation and enjoyment of the Great Barrier Reef in perpetuity through the development and care of the Great Barrier Reef Marine Park. Since the passage of the 1975 Act the Commonwealth and Queensland Governments have worked together to this end.

The main framework for planning and management used by the Great Barrier Reef Marine Park Authority is the zoning plan. Zoning plans describe what activities may take place in each area of the Marine Park. Zoning plans separate different uses so they do not conflict. They also ensure that some areas of the Reef are set aside free from human use (except for some scientific research). Zoning plans are devised to provide for reasonable use and conservation of the resources of the Reef.

The Authority aims to minimise regulation of, and interference in human activities. Management of the Marine Park is conducted primarily through the community's understanding and acceptance of the provisions of zoning plans, regulations and management practices.

Planning for the Great Barrier Reef Marine Park is based on the analysis and synthesis of information on the character, resources and use of the Region as a whole, and of Sections of the Marine Park in particular. Information is obtained from technical literature, specialist reports prepared by consultants, staff and other public instrumentalities, and from representations made by the public.

Public Participation

As provided in the Act, the public is encouraged to participate in each of the major planning stages. From 7 April 1986 to 30 June 1986 the public is invited to provide information on the uses and characteristics of the southern sections, to express any related concerns and interests and to make recommendations for zoning and management.

With the aid of this information, as well as discussions with Queensland and Commonwealth Government departments and recommendations offered at public meetings, a zoning plan will be prepared for the sections in the latter half of 1986. The public will then be asked to comment on the proposed zoning plan in the early part of 1987.

3. PHYSICAL AND BIOLOGICAL FEATURES

Within the boundaries of the southern sections there are approximately 534 reefal structures, 87 coral cays of reefal origin and 405 continental islands.

Reefal structures may take a number of forms. A reef is generally a large entity that is described as ribbon, planar, lagoonal or crescentic depending on its physical characteristics and orientation influenced by the prevailing wind and current patterns. Incipient fringing reefs are mainly rock platforms, or occasionally sand shoals with only scattered corals, attached to or closely adjacent to high continental islands or the mainland. Fringing reefs are clearly identifiable reefs with recognisable reef flat development attached to a high continental island or the mainland. A shoal or submerged reef is one that has not grown up to modern sea surface.

BIOLOGICAL COMMUNITIES

Distribution of different reef types indicates that morphological variation occurs in distinct regional patterns. These morphological patterns can, in combination with known biological community variations, be used to divide the southern sections into a number of distinct reefal and community types.

Mainland Coastline:

The western boundary of the Capricorn Section extends to low-water on the mainland coastline along approximately a third of its length. Communities include: soft shores, particularly in sheltered, estuarine aspects, sometimes dominated by beds of seagrass; and rocky shores comprising exposed headlands or rock outcrops dominated by barnacles but with occasional corals subtidally.

Inshore Continental Islands:

Many continental islands lie close to the coastline, particularly in the northern part of the Capricorn Section. Inshore islands are normally characterised by biological communities similar to those of the mainland coastline, but islands in less turbid waters, away from freshwater influence or in deeper waters, may have incipient fringing coral reefs, dominated subtidally by macro algae.

Offshore Continental Islands:

Fringing coral reefs have developed off islands outside the 20 metre isobath. Best development of fringing reefs occurs in the northern part of the Capricorn Section. Penrith Island and Bushy Island have the most southerly of the developed fringing reefs on the Great Barrier Reef.

Pompey Reefs:

The Pompey Reefs comprise a discrete group of large, meandering platform reefs separated by steep-sided winding channels (to 100m depths) with complex drainage systems. Channels and "blue holes" have been formed by surface erosion during extensive periods of lowered sea level during the ice ages and are unusual features of the Capricorn Section and the Pompey Reefs in particular.

The Pompeys can be sub-divided into: the outer shelf reefs, shoals and drowned reef systems formed during the periods of lowered sea levels; the "hard-line" reefs which form a discontinuous barrier; and the large, more isolated inner reefs which because of the wave fetch in the Capricorn Channel have a reversed zonation (i.e. exposed south west margins).

The group is characterised by very strong tidal currents (to 8 knots or 14 kph), large tidal range (4 metre amplitude), high water turbidity and the coral fauna which has affinities with the Whitsunday and the mid-shelf reefs of the Central Section.

Swain Reefs:

The Swains is a large complex of small to medium sized reefs, some of which have vegetated cays. The large platform reefs which characterize the Pompey Complex are found only in the northwestern area. Currents and tides are less pronounced than in the Pompey Complex but are still considerable.

The western reefs, like the Pompeys, have a reversed zonation (i.e. western edge exposed), a relatively low coral cover with outer shelf affiliations, and a fish fauna with mid-shelf affiliations.

The inner, protected reefs have exceptionally high coral cover, and mid to inner shelf corals and fish.

The outer eastern reefs have a very low coral cover (particularly in shallow waters) and a similar coral and fish fauna to the western edge reefs.

Capricorn and Bunker Reefs:

The Capricornia Section includes the Capricorn and Bunker Reefs, Lady Elliott Reef and associated reefal shoals. The Section comprises 21 drying reefs, 13 with vegetated cays.

These reefs can be divided into four groups on geomorphological and biological grounds: the submerged reefal shoals; the main line of the Capricorn-Bunkers (North Reef to Lady Musgrave Reef); the western reefs with a strong inshore influence (Irving Reef to Erskine Reef); and Lady Elliott Reef, which is distinct from the Capricorn-Bunker line but with close affinities.

Maps 1 and 2 indicate the approximate locations of each of the major biological community types in the southern sections.

Tidal Currents and Heights

The southern sections are noted for their large geographical variation in tidal range, producing a maximum range greater than 10 metres in the Broad Sound area, and reducing rapidly to little more than 4 metres on the outer Pompey Complex. There is a rapid reduction in tidal range to the south creating tides at the Bunker/Capricorn Group reefs of less than 3 metres.

A major area of strong tidal currents is in the southern Pompey and Swains Reef complexes. Tidal currents in excess of 8 knots have been recorded in the narrow passages between reefs of the Pompey Complex.

WILDLIFE CONSERVATION

A number of species require special management consideration. Some of these occur in the southern sections, and areas of significance are noted on Map 3.

Dugong

Dugong (Dugong dugon) are considered vulnerable to extinction (International Union for Conservation of Nature and Natural Resources, 1982) throughout most of their range, and Australian waters contain a large proportion of the world population. Australia has therefore an international responsibility to help conserve the world population (Marsh, 1979).

Dugong appear to prefer sheltered, relatively shallow clear water with substantial seagrass communities, and areas with minimal human disturbance. During the breeding season it appears that they prefer very shallow, protected water near sand banks to protect the new born young from sharks (Heinsohn and Marsh, 1981).

The two sites where most dugong have been recorded are Shoalwater Bay and Clinton Bay, while sightings have also been made in Port Curtis, near Long Island in Broad Sound and parts of Repulse Bay (Marsh, James Cook University, pers. comm.; Beumer, Qld Dept. of Primary Industry, pers. comm.).

Dugong deaths have been attributed to drowning in nets, injuries from colliding with boats, destruction of habitat and traditional and illegal hunting.

Turtles

Australian turtle populations are thought to be reservoirs for other populations (International Union for Conservation of Nature and Natural Resources, 1982). This suggests that there is an international responsibility to ensure the Australian stocks remain healthy to help support other, more endangered, populations.

Turtle feeding, breeding and nesting sites need to be identified and considered in the zoning process, for their conservation

value and because they provide an opportunity for nature appreciation and the conduct of educational programs.

There are five species of turtle found in the southern sections, with rookeries of major importance for some species.

Flatback turtles (Chelonia depressa) have major rookeries on Wild Duck Island and Avoid Island. Flatback turtles are endemic to the Australian continental shelf and are common with a low nesting density throughout the coastal areas (International Union for Conservation of Nature and Natural Resources, 1982).

Loggerhead turtles (Caretta caretta) nest throughout the Capricornia Section and the Swain Reefs, with Wreck and Tryon Islands the most important sites (International Union for Conservation of Nature and Natural Resources, 1982). Heron Island is an important scientific research area for these turtles.

Green turtles (Chelonia mydas) tend to return to their ancestral beaches to nest. Since they mate just offshore from their nesting beach there are genetically distinct populations. Their feeding areas are closely associated with seagrass communities. Major rookeries are located in the Capricorn and Bunker Groups, especially Wreck Island, Hoskyn Islands and on Bell Cay in the Capricorn Section (International Union for Conservation of Nature and Natural Resources, 1982).

The hawksbill turtle (Eretmochelys imbricata) and the leatherback turtle (Dermochelys coriacea) appear to have no major rookeries in the Section. There is little available information on the hawksbill, but it appears to be sedentary and associated with coral reefs. Their nesting pattern is very diffuse. The leatherback appears to prefer coastal beaches with deep water approaches and heavy surf (International Union for Conservation of Nature and Natural Resources, 1982).

Crocodiles

Salt water crocodiles (Crocodylus porosus) tend to inhabit large rivers and estuaries associated with coastal mangroves and are occasionally seen out to sea. Habitats are not well documented in the sections, but Shoalwater Bay seems to be a most likely site (Taplin, Queensland National Parks & Wildlife Service, pers comm). Most of the potential habitats are outside the Marine Park.

Cetaceans (Whales and Dolphins)

Whales move through the southern sections on their migration from their Antarctic feeding grounds to their breeding grounds in the warmer tropical waters. Very little is known about specific breeding locations and to date none have been identified in the sections. Humpback whales (Megaptera novoangliae) move north through the sections in June and July and start to return south in August through to October, in the Capricornia Section. Juveniles appear in August and increase in numbers through to October, when they leave the area. Surveys carried out in 1983 and 1984 in the Capricornia Section identified approximately 50

animals in a one month period (Simmons, 1985). A further survey reported 200 whale sightings between 1 July and 31 November, 1985.

Several surveys of dolphins have been carried out in the sections. Heinsohn (1979) in a report on small cetaceans identified 5 species of dolphins and one pilot whale on the coastal section of the Capricorn Section. The species sighted were:

indo-pacific hump-back dolphin (Sousa lentiginosa)
irrawaddy dolphin (Orcaella brevirostris)
electra dolphin (Peponocephala electra)
bottlenose dolphin (Tursiops truncatus)
spinner dolphin (Stenella longirostris)
short-finned pilot whale (Globicephala macrorhynchus)

The main threat to dolphins is being caught and drowned in nets. Research is being carried out in the Northern Territory by the Western Australian Museum to identify materials that are readily detected by dolphins as an alternative for present netting material (Australian National Parks and Wildlife Service, 1985).

Sea Snakes

Sea snakes are common throughout the Marine Park and are not a threatened species. However, they appear to have specific habitat requirements that are not well understood. It appears that within the known geographic range, some localities will support very dense populations of a species, whereas other, seemingly similar areas will have none (Heatwole, University of New England, pers comm.).

Most sea snake research undertaken in the Marine Park has been in the Swain Reefs, by researchers from the University of New England. Hixon Cay, Sanctuary Reef, Sweetlip Reef, Surprise Reef, Zodiac Cay and Mystery Cay have all been found to have sea snakes in abundance.

Sea snakes are also common in the Capricorn and Bunker groups and around Great Keppel Island.

Molluscs

Several of the Volutidae family are prized by shell collectors and have very restricted distributions. Also of concern are two species of giant clam Tridacna gigas and Hippopus hippopus, the giant triton (Charonia tritonis) and the helmet shell (Cassis cornuta).

Birds

The birds of the Great Barrier Reef Region are important because of:

- . the role of birds in the ecological processes of the Great Barrier Reef;
- . the importance of some species or populations, for example, because they are endangered elsewhere and have stable populations in the Region;
- . the attractiveness and aesthetic appeal of bird species.

The major threat to the seabirds of the southern sections is from the activities of humans during the breeding season - usually when seabirds are too closely approached by people, their pets or machinery.

Capricornia Section:

The Capricornia Section is noted for its birds, particularly the seabirds which nest in their thousands on the islands and feed in the surrounding waters.

Masthead, Hoskyn and Lady Musgrave Islands, all with six breeding species, have the most diverse breeding assemblages in the Capricornia Section.

Brown boobies, wedge-tailed shearwaters, crested terns, lesser crested terns, black noddies and silver gulls all breed in significant numbers on islands in the Section. The presence of silver gulls is probably at least partly due to the effect of human presence, leading to increased rubbish as a food source, and providing more opportunity for preying on the breeding colonies of other species when they are disturbed.

Swain Reefs:

The occurrence and distribution of seabirds in the Swain Reefs is only now beginning to be known in any detail.

Of the cays of the Swain Reefs for which information is available, Gannet, Bell, Gillet, Price and Frigate Cays stand out because of their significant bird colonies.

Apart from Raine Island and the nearby Pandora Cay in the far north, cays of the Swain Reefs form the only breeding sites on the Great Barrier Reef for the least frigatebird (Limpus and King, 1983).

Birds breeding on cays in the Swain Reefs include masked boobies, brown boobies, common noddies, least frigate birds, bridled terns, crested terns and silver gulls. The breeding colonies of masked boobies in the Swain Reefs are the only Great Barrier Reef breeding sites apart from Raine Island and Pandora Cay in the Far Northern Section. The Swain Reefs population may be about ten percent of the total Great Barrier Reef population (Limpus and King, 1983).

Bell Cay has the highest number of breeding species so far recorded in the Swain Reefs (masked booby, brown booby, least frigatebird, silver gull, bridled tern, crested tern, and common noddy). This cay has one of only two significant common noddy nesting sites in the Swain Reefs.

Though no evidence has been reported of any shearwaters breeding in the Swain reefs, at least parts of the area are significant feeding sites.

Inshore Continental Islands:

The birds of the inshore continental islands in the Capricorn Section are not well known.

As a generalisation, the continental islands of the Great Barrier Reef Region do not support large seabird colonies. However, most have resident pairs of raptors (white-breasted sea eagle, osprey and brahminy kite) (King, 1984).

4. HUMAN USAGE

FISHING

The southern sections have a diverse fish and invertebrate fauna, some of which constitute an important commercial and recreational resource.

The Great Barrier Reef Marine Park Act specifies that zoning plans should have regard to the regulation of the use of the Marine Park so as to protect the Reef while allowing the reasonable use of the Region. Generally commercial and recreational fishing is considered to be a reasonable use of the Reef's resources. However, at some level or in some areas of intensive use, fishing may become un-reasonable.

It is generally recognised by both commercial and recreational fishermen that there is a need to regulate the catch of reef fish. Apart from information on current fishing activity it is necessary to obtain further information on the resource. Through public participation, the Authority hopes to draw on the knowledge accumulated by Reef users to provide adequate conservation measures, and at the same time ensure that the needs of the fishing industry are adequately considered. Fishermen, who spend much of their life observing the habits of their catch, are able to provide important information on breeding, nursery and other areas. The Authority would appreciate a response from Reef users on these topics.

Commercial Fishing

All fisheries are now subject to limited entry management to control the number of fishermen working in any one fishery.

Maps showing the location of fishing activities have been attached. These maps show approximate areas of fishing activity and are based on information supplied by the Queensland Fish Management Authority.

The number of fishermen and vessels operating in each fishery may be approximated from the number of vessels that have their home ports adjacent to the sections. Fishing endorsements are attached to the primary vessels, and the 411 primary vessels with a home port from Bundaberg to Proserpine inclusive are classified according to primary and secondary fisheries in Table 1.

Table 1: Primary and Secondary Fishing Vessel Endorsements

	Otter Trawl	PRIMARY VESSEL ENDORSEMENTS				Other	Total
		Beam Trawl	Net Fish	Crabbing	Line Fish		
<u>Primary Fishery</u>	167	41	122	31	45	5	411
<u>Secondary Fishery</u>							
Otter Trawl	-	-	-	-	-	-	-
Beam Trawl	13	-	41	4	-	-	58
Net Fish	97	10	-	30	30	1	168
Crabbing	90	13	105	-	14	-	222
Line Fish	167	41	122	31	-	-	361
Other	-	-	-	-	-	-	-

Source: Queensland Fish Management Authority
Jan 1986, pers. comm.

Some permit applications are currently being considered for tuna and shark longlining in the sections at Sandy Cape.

Trawling occurs for tiger, king, endeavour, banana and coral prawns as well as scallops.

The availability of good anchorages is an important aspect to consider when zoning for fisheries especially in the outer reef areas.

Recreational Fishing

Line fishing, light tackle game fishing, net fishing, crabbing and spearfishing are popular activities occurring throughout the southern sections except where prevented in the Capricornia Section Zoning Plan.

Access to the reefs of the southern sections is provided either through private boats or charter vessels, the latter usually being associated with fishing the more remote off-shore reefs. Recent survey results indicate that there is a decrease in activity with increasing distance from the coast, such that, on average 37% of fishing trips are to destinations no further than 5km from the coast (Map 8).

Species sought by recreational fishermen include a variety of reef fish such as coral trout, emperor and sweetlip, and pelagic species including mackerel, blue fin tuna, queenfish, trevally, black marlin and sailfish. A number of crustacea including crabs, crayfish and prawns are also taken in nets, traps, or are caught by hand or spear.

There are areas in the southern sections that are closed to spearfishing under Queensland legislation, these being waters adjacent to Heron Island, and locations adjacent to the Keppel Islands, St. Bees Island and Keswick Island.

Popular spearfishing areas are not well documented, and it is hoped that information on these areas will be collected from the public participation phase, as will information on other recreational fishing activities.

COLLECTING

Another use of the southern sections is the collecting of non-food resources (shell-producing molluscs, fish and invertebrates for the aquaria trade, and coral).

Map 9 indicates known sites regularly used for collecting in the southern sections.

Shell Collecting

Some 4000 shell-producing mollusc species (shells) occur within the southern sections. The number of shells naturally occurring in any given locality is dependant upon a variety of natural and human induced factors.

Shell collecting is a popular activity carried out by casual collectors, specimen-shell collectors (club members and non-members), collecting parties on charter trips and commercial operators.

Amateur shelling occurs at easily accessible coastal locations, islands and reefs and particularly on drying reefs which provide greater opportunities because of their accessibility.

There is apparently very little commercial shell collecting carried out in the southern sections. Trochus are known to occur on the seaward side of reefs but the occurrence of commercial quantities is patchy on and between reefs in the sections (Cyran, pers. comm.). Two licenses are current for the collection of trochus in the Great Barrier Reef Region and collectors do occasionally collect in the Capricorn Section.

Trawlers occasionally retain shells brought up in their nets for resale to collectors, however, generally the shells are thrown back because of the difficulty of cleaning for small financial return.

There are numerous anecdotal reports of local depletion of shells. However, for most species, while localised or seasonal depletion may occur, it is unlikely that collecting alone could reduce a species to the point of extinction. At present there are no substantiated instances of widespread damage caused by the use of equipment associated with shell collecting in the sections.

Coral Collecting

Under existing legislation, collection of coral from the Great Barrier Reef is only permitted with a license or permit from the responsible agencies.

Although it is illegal without the appropriate licenses or permits, collection of coral by tourists and other Reef visitors does occur. The extent of this collection is not known, but is probably focused around the resort and camping islands.

Coral is also collected for research purposes. Most collection for research is undertaken adjacent to the research stations on Heron, Wistari and One Tree islands.

There are 2 collectors licensed to harvest coral in the Capricorn Section of the Marine Park. There are no licenses current for collection in the Capricornia Section.

Corals commercially collected from the Capricorn Section are almost exclusively the Scleractinia, or stony corals, which are collected for live aquaria specimens or bleached and often painted for use in the tourist curio and aquarium trades.

A recent study found that at the current level of commercial collecting there is no obvious threat to corals on the Great Barrier Reef (Oliver, 1985). However, the study concluded that there is insufficient information to determine the effects of a substantial increase in collecting activity.

Aquarium Fish Collecting

The distance required to travel from populated areas to the reefs of the southern sections has meant that aquarium fish collecting has not developed to any great extent in the sections. Most of the collecting that does occur is focussed around the mainland coast and islands. The reefs off Mackay are occasionally visited while the reefs of the Capricornia Section are visited by a

number of collectors, each making one or two trips annually to the Section.

There are approximately 12 commercial collectors and probably at least twice that number of amateurs operating within the two sections. Available information indicates that a great number of species of fish and invertebrates are presently collected.

Although there are unsubstantiated reports of reduction in numbers of some species in heavily collected areas, there is no documented information regarding the effects of removal of aquarium fish. Management of the Great Barrier Reef must consider the possible impacts of removal of large numbers of fish in terms of the impacts on the fish population in the local area, the secondary impacts on the local ecosystem which may result from a change in the species diversity and the opportunity for other reef users to view relatively undisturbed fish populations in accessible areas. Habitat damage may also occur through accidental, or intentional, breakage of coral.

TRADITIONAL ABORIGINAL USE

Coastal Aboriginal and Islander people have traditionally harvested from the Great Barrier Reef resources such as dugong, turtle, fish and shellfish. In association with their culture, certain areas are considered to have special significance, as sacred sites, traditional hunting areas or ceremony areas.

To ensure that traditional Aboriginal/Islander communities can maintain their culture and continue to traditionally harvest resources, certain provisions have been made in State and Commonwealth legislation.

The Capricorn Section has been used historically for harvesting foods, but no applications have been lodged in recent times for permits to traditionally collect protected species (K. Sutcliffe, Qld Dept. Comm. Services, pers comm.)

In previous zoning plans provision has been made for traditional hunting by permit.

RESEARCH

A University of Queensland research station is located at Heron Island. A further research station is operated by the University of Sydney at One Tree Island. Automatic weather stations on Heron Island and Gannet Cay and manned lighthouses on Pine Islet and Lady Elliott Island also act as fixed information sources, providing valuable information for navigation and research.

The Capricorn and Bunker reefs have, in the past, been the main focus of detailed and long term scientific studies in the Great Barrier Reef Region. More recently, there has been an increasing amount of research carried out on the less accessible reefs. Even so there is still a paucity of scientific information for the southern sections. The reefs most often used for research are marked on Map 10.

EDUCATIONAL FACILITIES

The Boyne Island Field Study Centre off Gladstone is operated by the Queensland Education Department and caters for school groups. The Centre is not within the boundaries of the Marine Park, however, it does organise excursions (usually week-long) to destinations within the Capricornia Section, specifically to North West Island Reef, Heron Island Reef and Wistari Reef.

There are a small number of facilities which are not specifically educational facilities but which cater for the needs of educational groups, particularly senior secondary, tertiary and adult groups. These include Heron Island Research Station, Heron Island Resort, and Lady Elliott Island Resort.

There are a number of destinations which do not offer education facilities, but which are frequently used by educational groups for excursions. These include Keswick, St Bees, Penrith, Tern, Bushy, Redbill, North West, Tryon and Lady Musgrave islands and reefs (see Map 10).

TOURISM AND RECREATION

Resorts

Resort accommodation is available on Newry, Brampton, North Keppel and Great Keppel islands in the Capricorn Section, with proposed resorts on St. Bees, Wild Duck and Curtis islands. In the Capricornia Section resorts are located on Heron Island and Lady Elliott Island.

Access to the resort islands is variable but includes charter boats, yachts, launches, fixed wing aircraft and helicopters.

A wide range of water-based activities are associated with resorts, including cruises, coral viewing, sailing, skiing, diving and snorkelling, as well as extractive activities such as fishing and collecting.

Camping

Camping for the greater part is carried out within the many National Parks of the southern sections. Caravans and camping are available privately at Wapparaburra Haven on Great Keppel Island.

Charter and Cruise Vessel Operations

The most apparent feature of the charter and cruise vessel industry over the last five to ten years is its rapid growth and change. This period has seen the advent of the large high-speed catamarans, which have greatly increased the accessibility of the reefs to the general public. Activities offered by charter operators are equally diverse. The major activities are fishing, snorkelling, SCUBA diving, cruising, coral viewing, reef walking and island drop-offs.

There are approximately 40 registered charter vessels operating in the southern sections. The major destinations of those charter vessels have been included on Map 12.

The greater ease of access to reefs which have previously been considered too remote for day trips, and the large passenger capacity of modern charter vessels will be important considerations for zoning.

Aviation

The Authority's interest in aviation is in the control of low flying or landing aircraft which may upset nesting birds or interfere with the enjoyment of other Park users.

Existing aircraft activities may be divided into defence, airline, tourist charter, surveillance and private categories.

Commercial operations are focussed at airports adjacent to the Capricorn Section at Mackay, Rockhampton, Bundaberg and the resorts on Brampton and Great Keppel Islands.

Charter operations fly a diversity of routes, often at lower altitudes than regular commercial flights. These flights are used for access to resort islands or for sightseeing. Helicopters and seaplanes expand the number of landing sites and low level flights.

Nearly all private and tourist charter flights are to the islands and reefs in the Capricornia Section. Very few flights venture out to the reefs further north.

Surveillance flights operate under contract to the Australian Government and fly irregular paths, descending to low levels to investigate Park user activities.

Known sites regularly used for landing aircraft are indicated on Map 12.

NAVIGATION, SHIPPING AND DEFENCE AREAS

Shipping

Current recommended shipping lanes are indicated on Map 13. These lanes are used by transitory ships and ships accessing ports adjacent to the sections. Also indicated on the map are the locations of navigation aids within the sections.

There are two distinct pilot services operating in the Marine Park. The Queensland Pilot Service, a branch of the Dept. of Harbours and Marine, covers port pilotage and the Queensland Coast and Torres Strait Pilot Service covers coastal shipping.

Anchorage

The popular yachting guides to the Reef provide the main published source of information on the location, nature and effectiveness of known anchorages. Information on the known

locations has been supplemented with anchorages indicated on navigation charts and has been included on Map 13.

The nature of yachting guides results in more knowledge of anchorages in inshore waters than in offshore reef areas. It is hoped this gap in the record will be filled through public representation.

Dredging

In the Great Barrier Reef Region dredging is conducted mainly for harbour and shipping access purposes. There is no dredging for mineral recovery. As a consequence, most dredging is conducted in inshore locations, usually in close proximity to urban, industrial and agricultural centres. In offshore areas, some dredging may be necessary for vessel access to resorts/tourist destinations.

Historic Shipwrecks

Information available from the Queensland Museum and the Commonwealth Department of Arts, Heritage, and Environment indicates that these sections of the Marine Park contain over 105 ships which were wrecked in the period between 1831 and 1942. None of these wrecks have to date been declared as 'Historic Shipwrecks' under the provisions of the Historic Shipwrecks Act 1976, and the exact position of most of the wrecks is not known.

It is possible that a large number of the wrecks could fulfil the requirements for declaration as 'Historic Wrecks', but their historic significance has not yet been determined.

Defence Operations

All three arms of the Defence Forces conduct operations either in or adjacent to the sections. The conduct of these operations is almost always within the gazetted defence areas in the Section (Map 13). With one exception these areas are located in the Shoalwater Bay Training Area. The sections are also used on occasion by aircraft on low-level navigation training exercises and for RAN manoeuvres.

5. ADJACENT LAND USE

A wide range of land use types exist on the mainland near or adjacent to the Capricorn Section, and on islands within the outer boundaries of the sections. Whilst it is possible that some of these uses may have impacts on either the resources of the sections or the use of those resources, recent findings indicate that levels of agricultural or industrial contaminants are extremely low.

Types of land use occurring adjacent to the sections include:

- . Farming
 - ...sugar cane
 - ...other crops
- . Grazing
 - ...dairying
 - ...sheep
 - ...cattle
- . Residential Areas
- . Forestry
- . Tourist Resorts
- . Industrial Developments
- . Ports and Harbours
- . Defence Training Areas
- . Mining
- . Recreation Reserves
- . Conservation (Map 14)
 - ...National Parks
 - ...Beach Protection Areas
 - ...Environmental Parks
 - ...Fish Habitat Reserves
 - ...Wetland Reserves
 - ...Fish Sanctuaries
- . Vacant Crown Land

Waste Discharge

Regulation 15 made under the Act makes it an offence to discharge or deposit household, industrial or commercial waste in the Marine Park. Exceptions are:

- . where permission has been given under the zoning plan;
- . certain types of wastes from vessels or aircraft.

Five licensed permit discharges occur within the southern sections. Three emanate from tourist resorts.

6. PARK MANAGEMENT

In 1979 agreement was reached between the Commonwealth and Queensland governments on a complementary approach to management of the Great Barrier Reef Marine Park. The Great Barrier Reef Marine Park Authority is responsible for management planning, policy and guidelines and general oversight of Marine Park management. The Queensland National Parks and Wildlife Service (Q.NPWS) is the principal agency responsible to the Authority for day-to-day management of the Marine Park. Other agencies with ancillary responsibilities for day-to-day management are the Queensland Boating and Fisheries Patrol, the Federal Police and the Federal Sea Safety and Surveillance Centre.

The Q.NPWS is also responsible in its own right for the management of Queensland islands and tidal waters within the boundaries of the southern sections.

Day-to-day management of the Capricornia Section is now well established and includes such tasks as park surveillance, maintenance of facilities, public education, monitoring and law enforcement.

Q.NPWS operations are co-ordinated from the Regional Office at Rockhampton. Staff are also located at the Gladstone office and the Heron Island Field Station. From all these centres islands and reefs within the Marine Park are regularly patrolled. Emphasis is placed on servicing the camping islands of North West, Tryon, Masthead and Lady Musgrave. In addition, frequent surveillance flights cover all reefs and islands.

Surveillance and enforcement procedures for the Capricornia Section resulted in the detection of 120 infringements over a one year period. Infringements were particularly noted among a minority of collectors and trawler operators. A recent review of those surveillance and enforcement procedures has highlighted the need to improve the capacity of night surveillance. Most offences are dealt with by counselling, however, in serious cases or when a minor offence is repeated legal action is pursued.

A key concept in day-to-day management is the emphasis placed on making contact with user groups and the public at large. Illustrated talks are held frequently to educate visitors about the Marine Park and the management activities carried out by Q.NPWS staff. Public displays, media productions and brochures are also produced to increase public awareness of conservation values.

User groups are regularly contacted in the major towns adjacent to the Park to explain legislation and other matters which may affect them. Such groups include commercial fishermen, angling and diving clubs, retail outlets, educational groups and charter vessel operators.

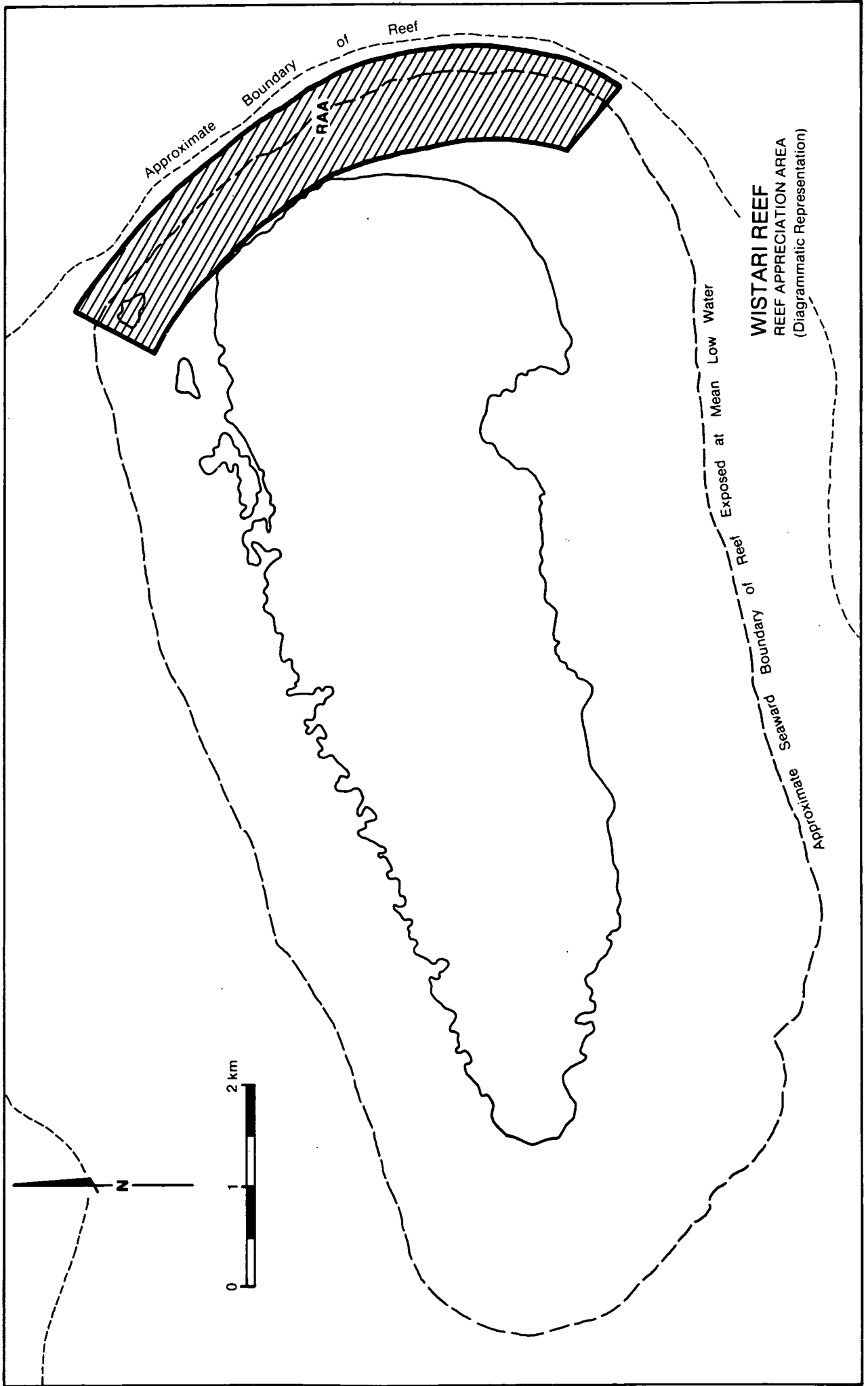
Research and Monitoring

Research and monitoring programs have been instituted to provide information for the effective management of the Marine Park. Research is generally conducted by universities, government research agencies and private consultants and where appropriate by the Authority's own staff and staff of the Q.NPWS.

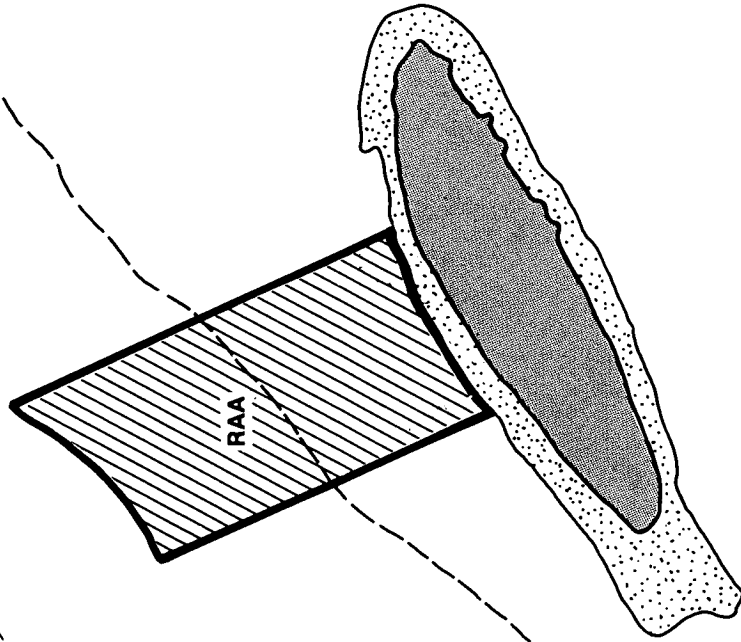
The diverse information requirements of the Authority necessitate a multi-disciplinary and wide-ranging research program covering marine natural sciences, marine engineering and social sciences. Monitoring the environment and the ways people use the Park is vital to ensure the objectives of management are being attained and to identify where problems may be occurring. Feedback from Park users concerning all aspects of zoning, legislation, management and the environment is recorded during public contact programs and by questionnaire surveys. The distribution of the activities of the various types of park users is systematically recorded on aerial and surface patrols. Significant aspects of the natural environment such as important fish and seabird populations are monitored to determine whether adequate protection or management is being provided.

7. REFERENCES

- Australian National Parks and Wildlife Service (1985) Progress report on cetacean research to the International Whaling Commission.[Unpublished]
- Heinsohn G.E.(1979) Biology of small cetaceans in North Queensland waters. [Report to the Great Barrier Reef Marine Park Authority, unpublished].
- Heinsohn G.E. & H. Marsh (1981) Ecology and Conservation of the Dugong, Dugong dugon; Final report to the Australian National Parks & Wildlife Service. Zoology Department, James Cook University.
- International Union for the Conservation of Nature and Natural Resources (1982) The Amphibia-Reptilia Red Data Book, IUCN
- King B.R. (1984) Report to the Queensland National Parks and Wildlife Service and Great Barrier Reef Marine Park Authority on Sensitive Bird Areas of the Great Barrier Reef Province. Unpublished.
- Limpus C.J. & B.R. King (1983) Birds of the Swain Reefs. In Flood P.G.(ed). Aust. Coral Reef Soc. Annual Meeting Abstracts ACRS, Armidale.
- Marsh H. (1979) The Dugong; Proceedings of a seminar/workshop at James Cook University, 8-13 May 1979. James Cook University .
- Oliver J. (1985) An evaluation of the biological and economic aspects of commercial coral collecting in the Great Barrier Reef Region. [Report to the Great Barrier Reef Marine Park Authority. Unpublished].
- Simmons M. (1985) Humpback whales return to the Great Barrier Reef. Reeflections (16) p5.



TRYON ISLAND REEF
REEF APPRECIATION AREA
(Diagrammatic Representation)



Approximate
Boundary
of
Reef

Water

Low

at

Mean

Reef

Boundary

of

Seaward

Approximate

Boundary

of

Reef

Exposed

at

Mean

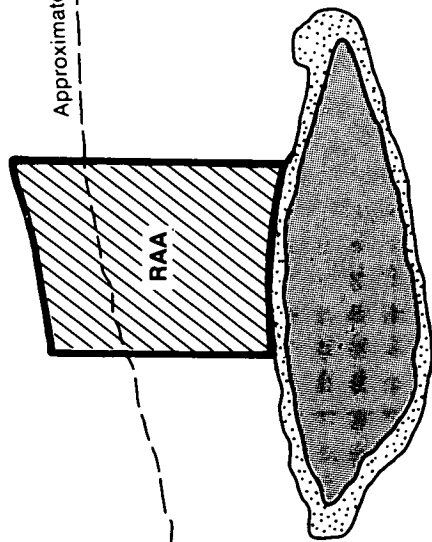
Low

Water

N

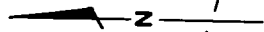
0 100 200 300 400 m

MASTHEAD ISLAND REEF
REEF APPRECIATION AREA
(Diagrammatic Representation)

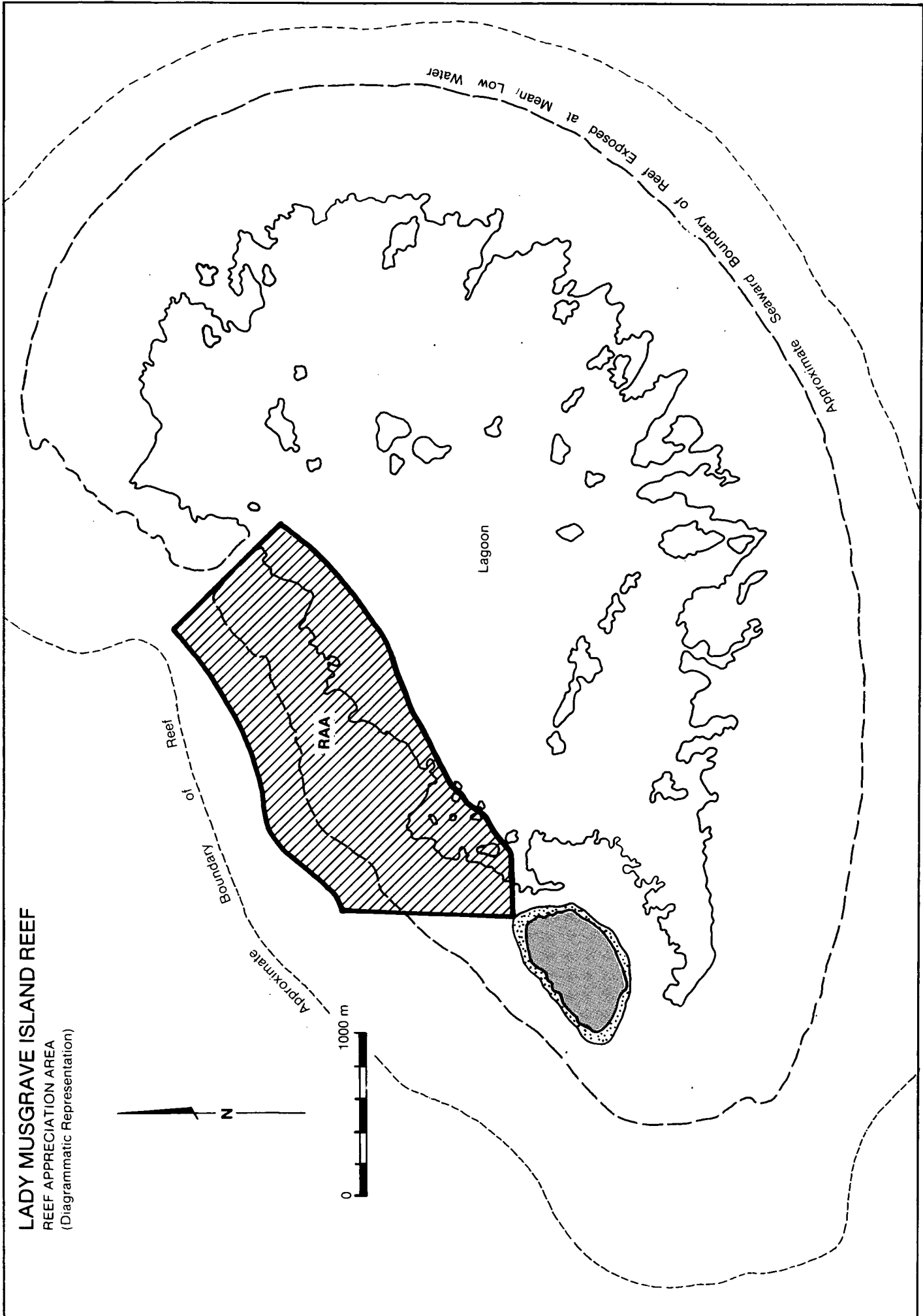
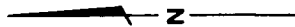


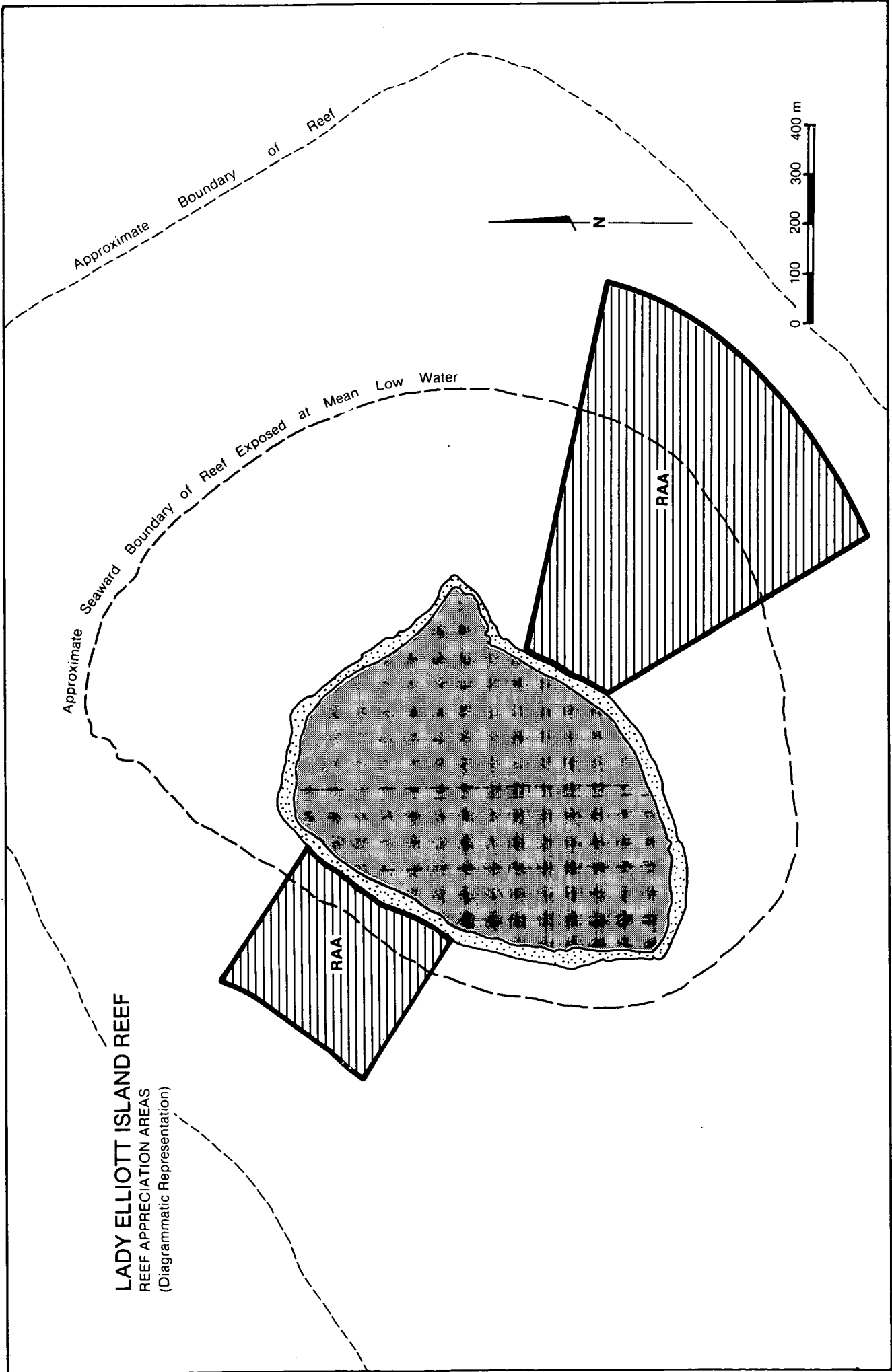
Approximate Seaward Boundary of Reef Exposed at Mean Low Water

Approximate Boundary of Reef



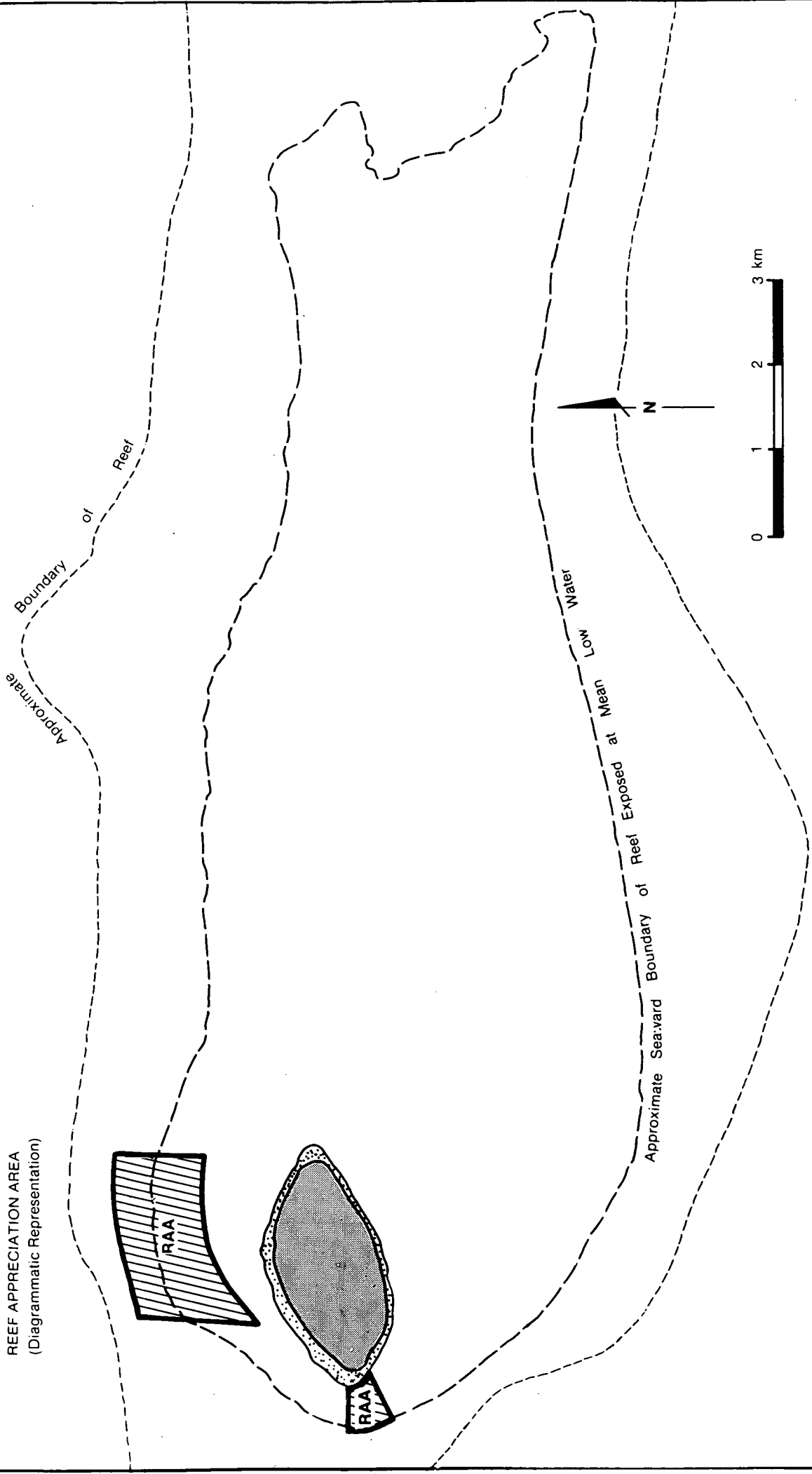
LADY MUSGRAVE ISLAND REEF
REEF APPRECIATION AREA
(Diagrammatic Representation)



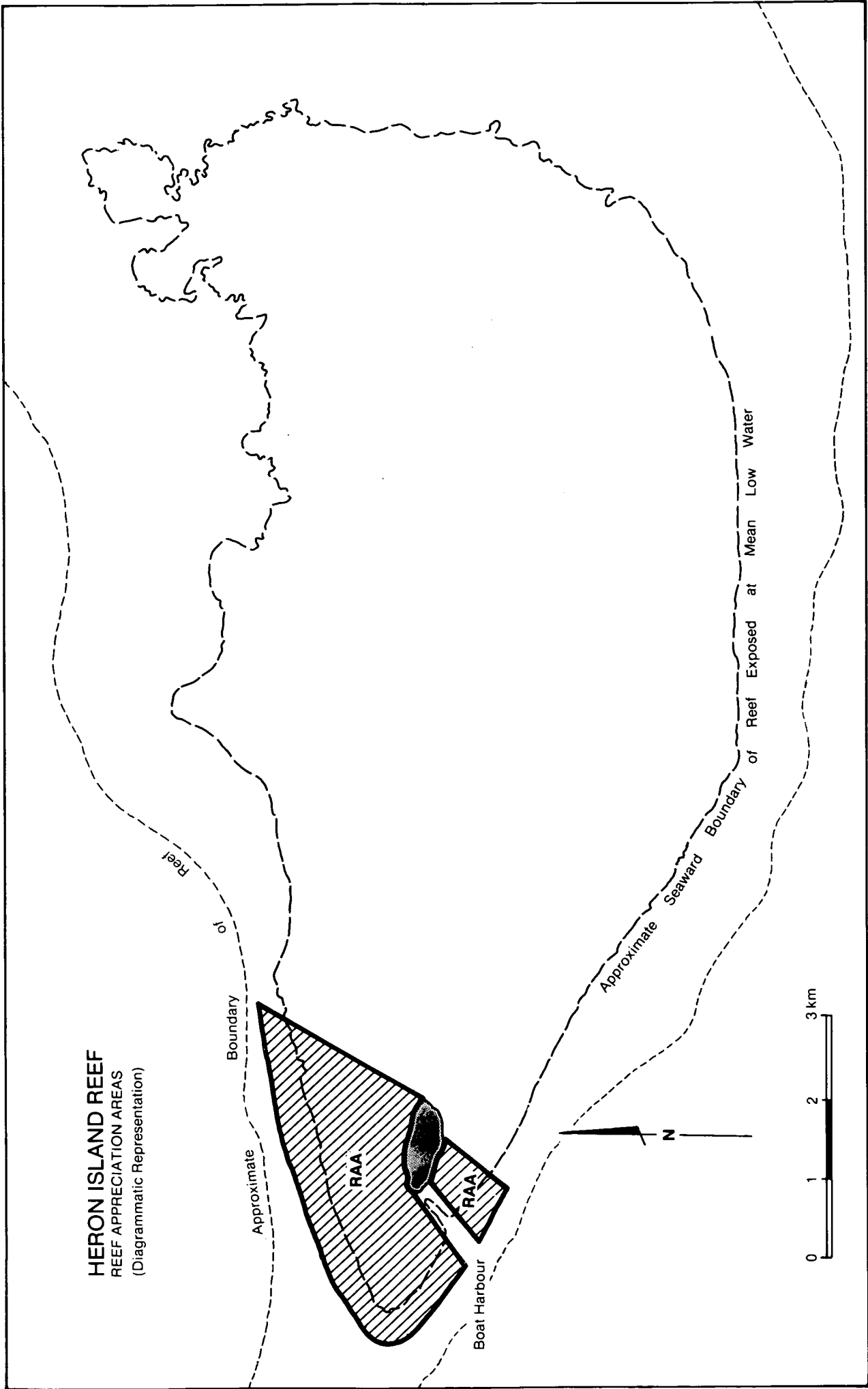


LADY ELLIOTT ISLAND REEF
REEF APPRECIATION AREAS
(Diagrammatic Representation)

NORTH WEST ISLAND REEF
REEF APPRECIATION AREA
(Diagrammatic Representation)

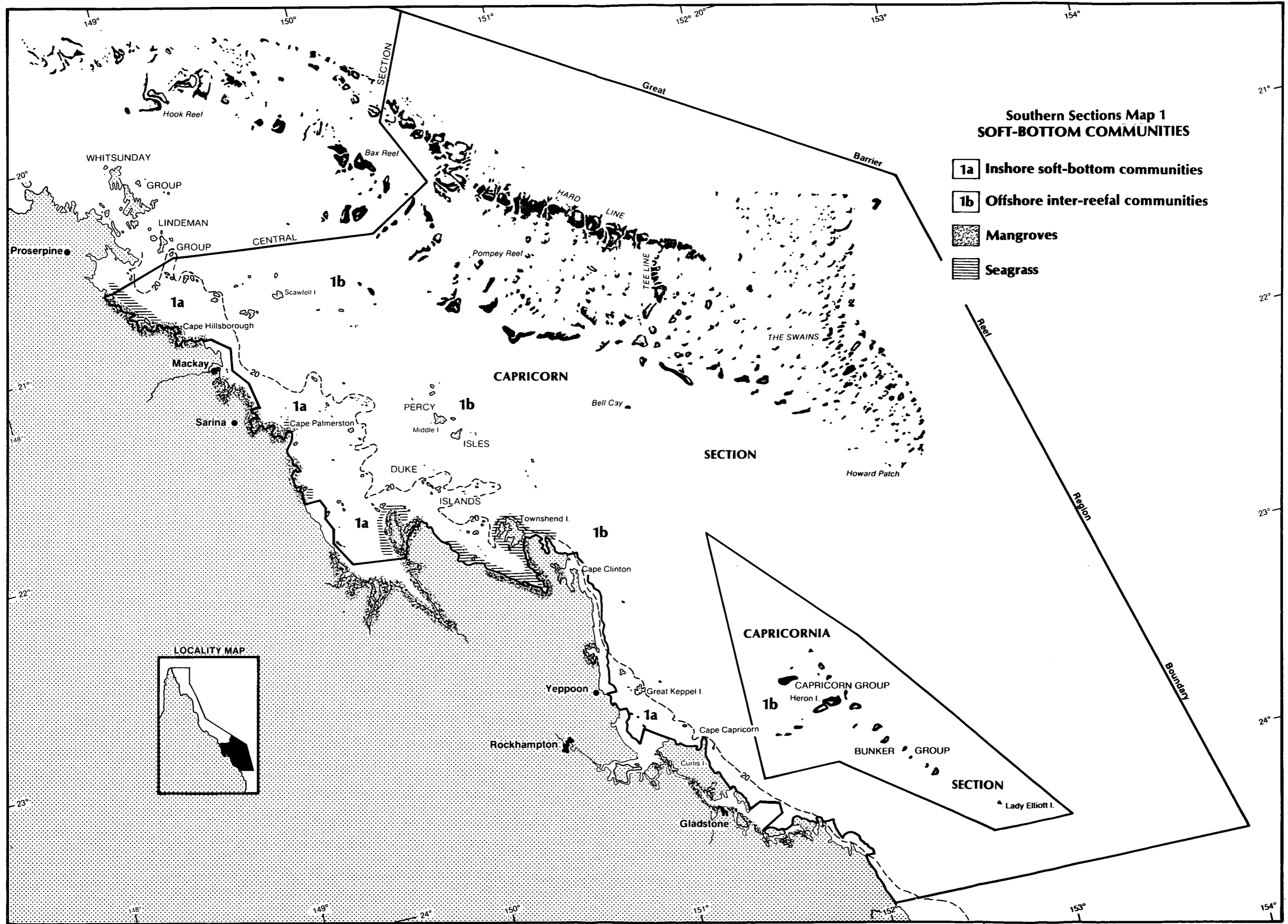


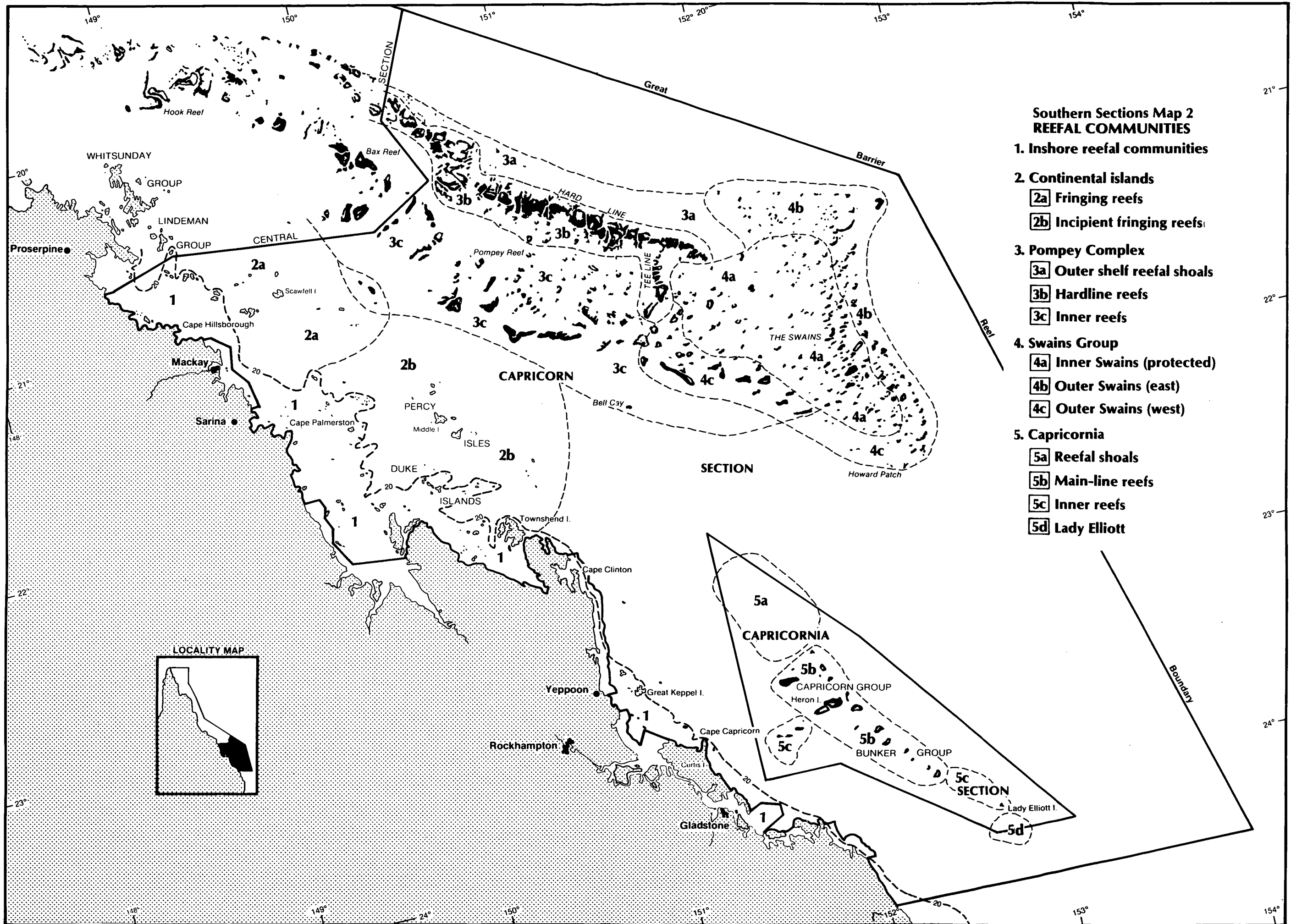
HERON ISLAND REEF
REEF APPRECIATION AREAS
(Diagrammatic Representation)



**Southern Sections Map 1
SOFT-BOTTOM COMMUNITIES**

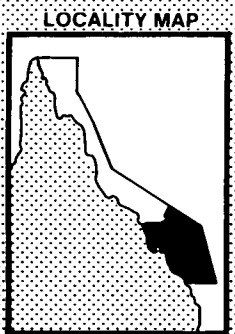
- 1a Inshore soft-bottom communities
- 1b Offshore inter-reefal communities
- Mangroves
- Seagrass









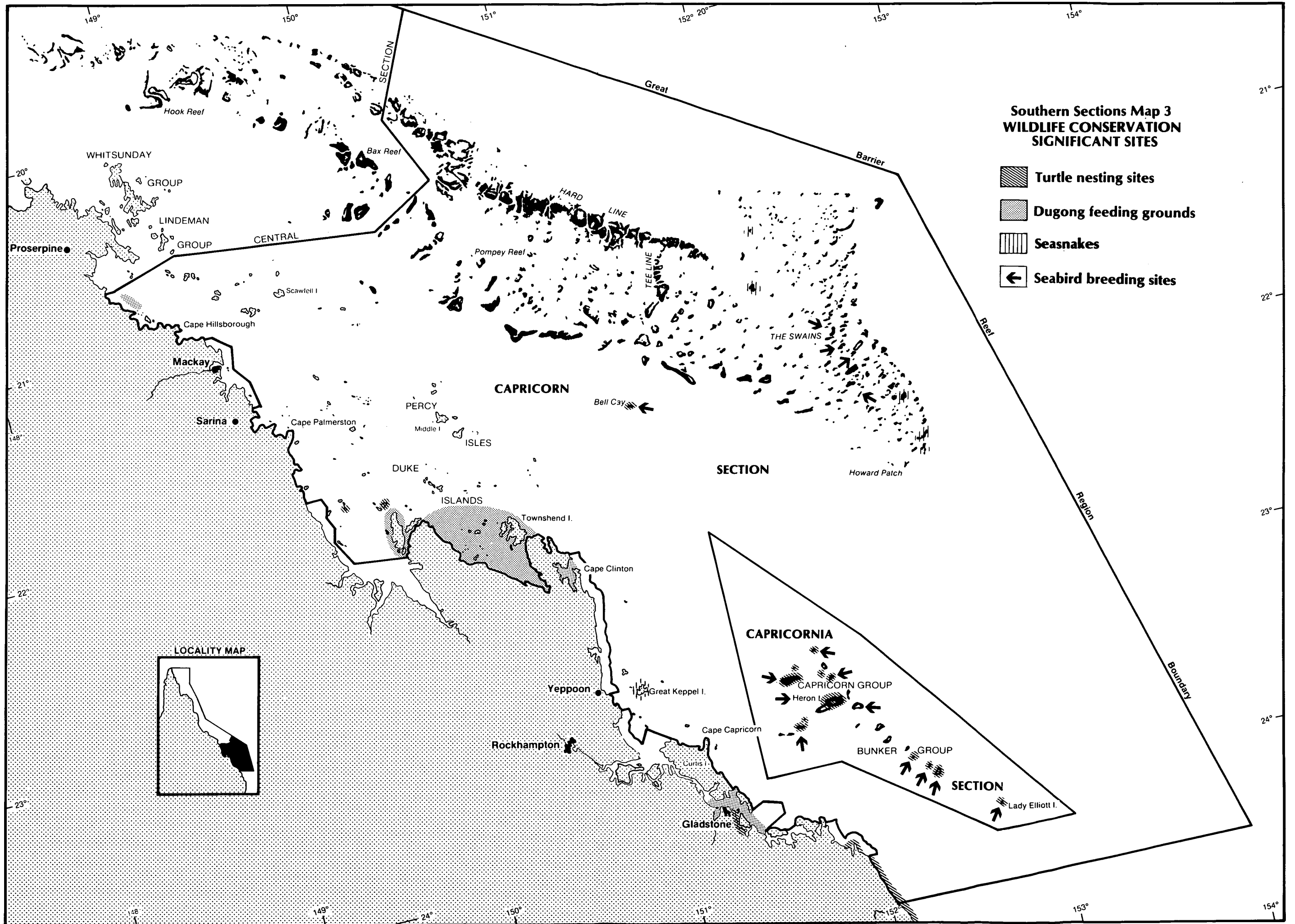
**Southern Sections Map 2
REEFAL COMMUNITIES**

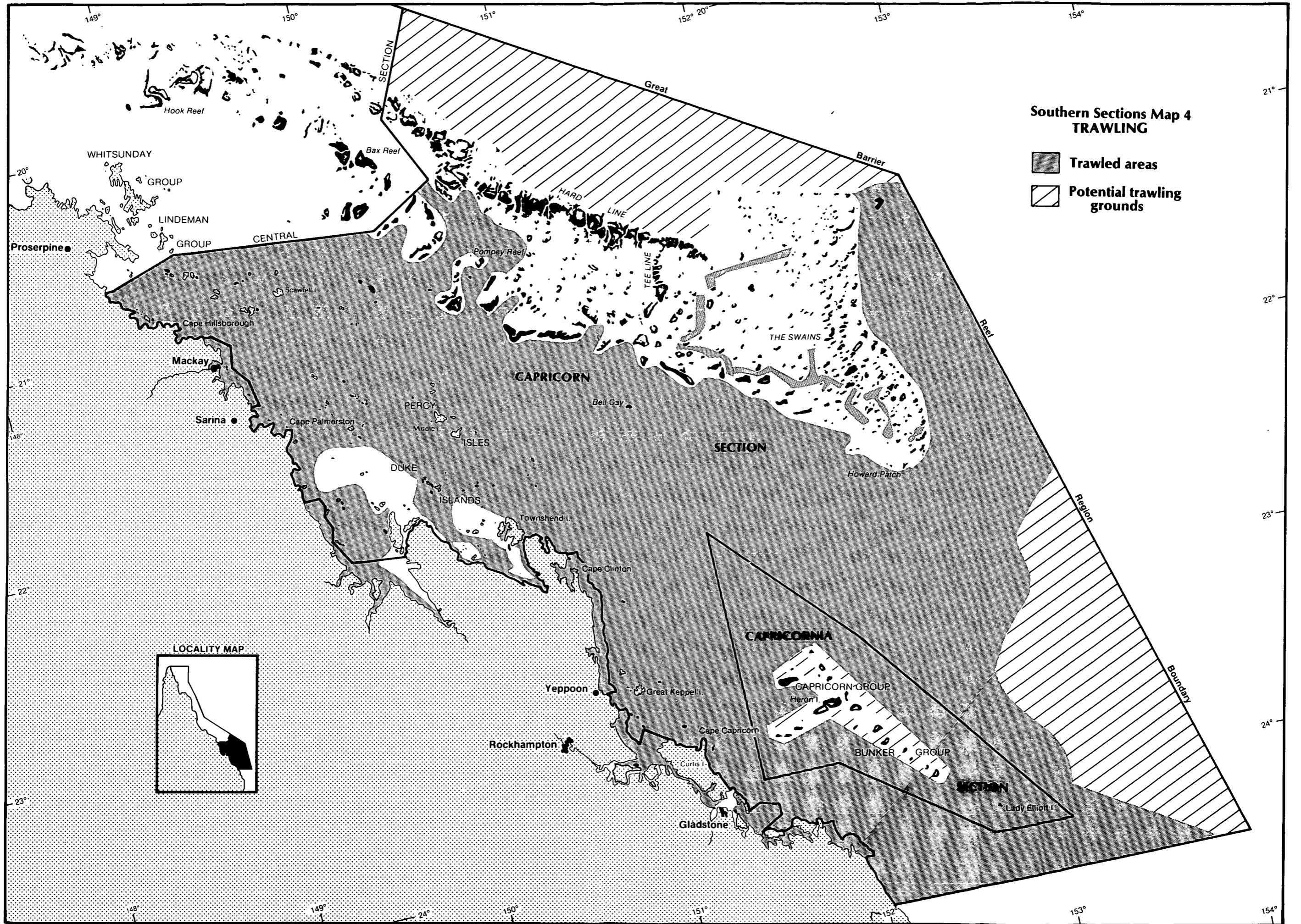
- 1. Inshore reefal communities**
- 2. Continental islands**
 - 2a** Fringing reefs
 - 2b** Incipient fringing reefs
- 3. Pompey Complex**
 - 3a** Outer shelf reefal shoals
 - 3b** Hardline reefs
 - 3c** Inner reefs
- 4. Swains Group**
 - 4a** Inner Swains (protected)
 - 4b** Outer Swains (east)
 - 4c** Outer Swains (west)
- 5. Capricornia**
 - 5a** Reefal shoals
 - 5b** Main-line reefs
 - 5c** Inner reefs
 - 5d** Lady Elliott



**Southern Sections Map 3
WILDLIFE CONSERVATION
SIGNIFICANT SITES**

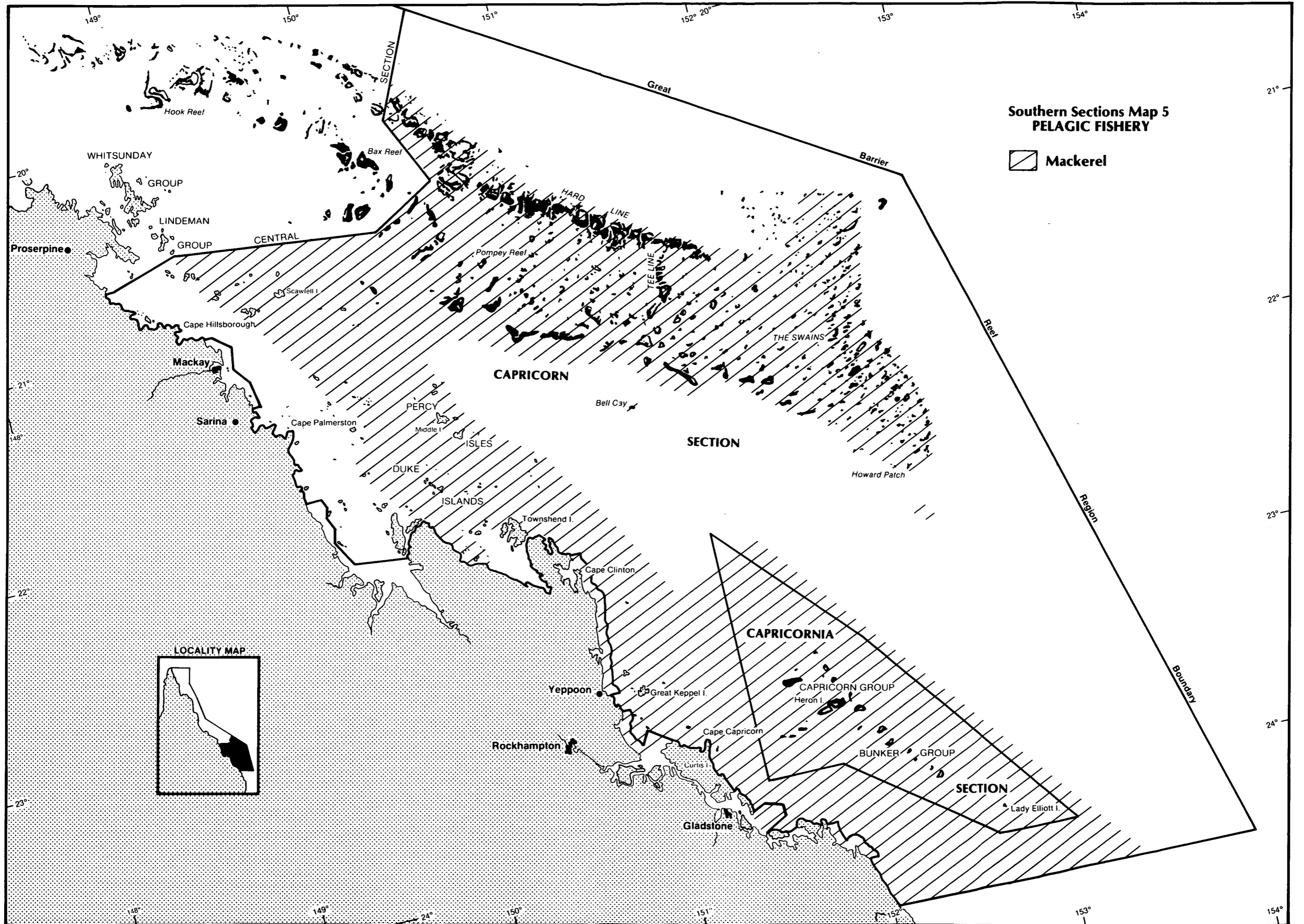
-  Turtle nesting sites
-  Dugong feeding grounds
-  Seasnakes
-  Seabird breeding sites



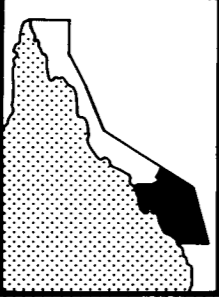


**Southern Sections Map 5
PELAGIC FISHERY**

 **Mackerel**

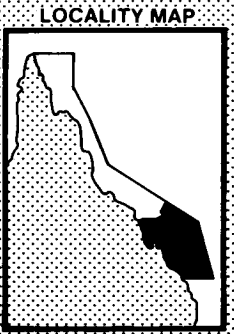
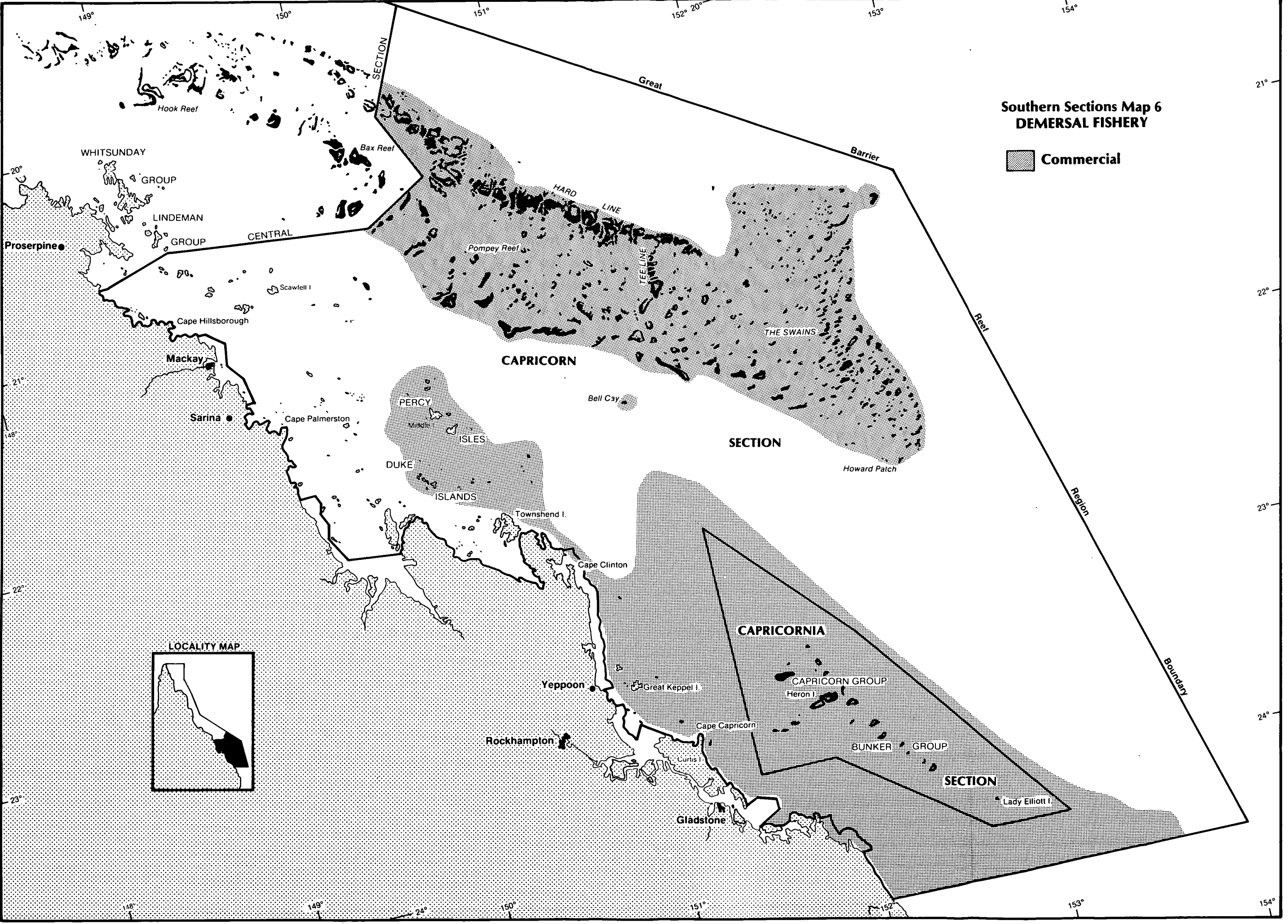


LOCALITY MAP





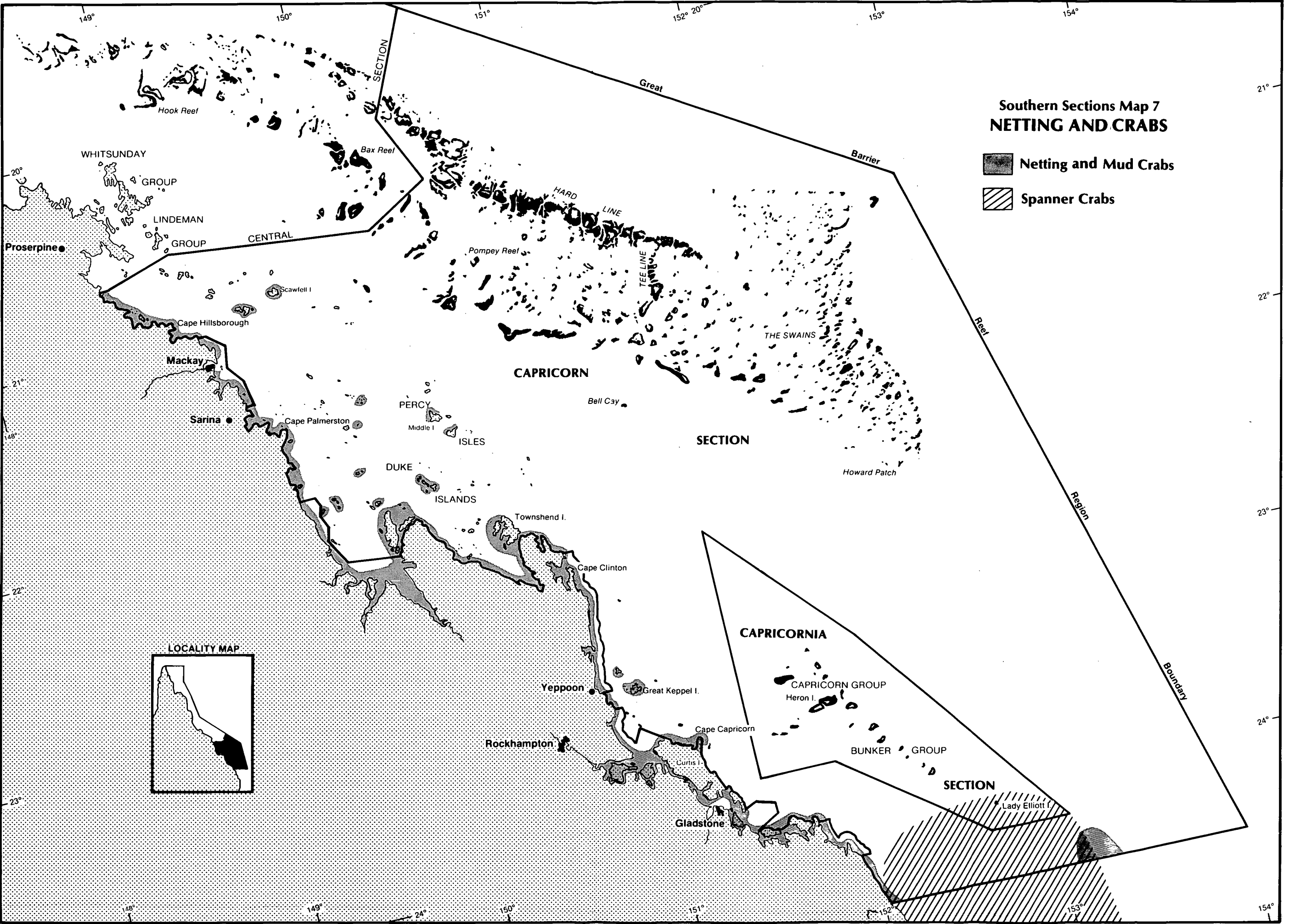
**Southern Sections Map 6
DEMERSAL FISHERY**

 **Commercial**

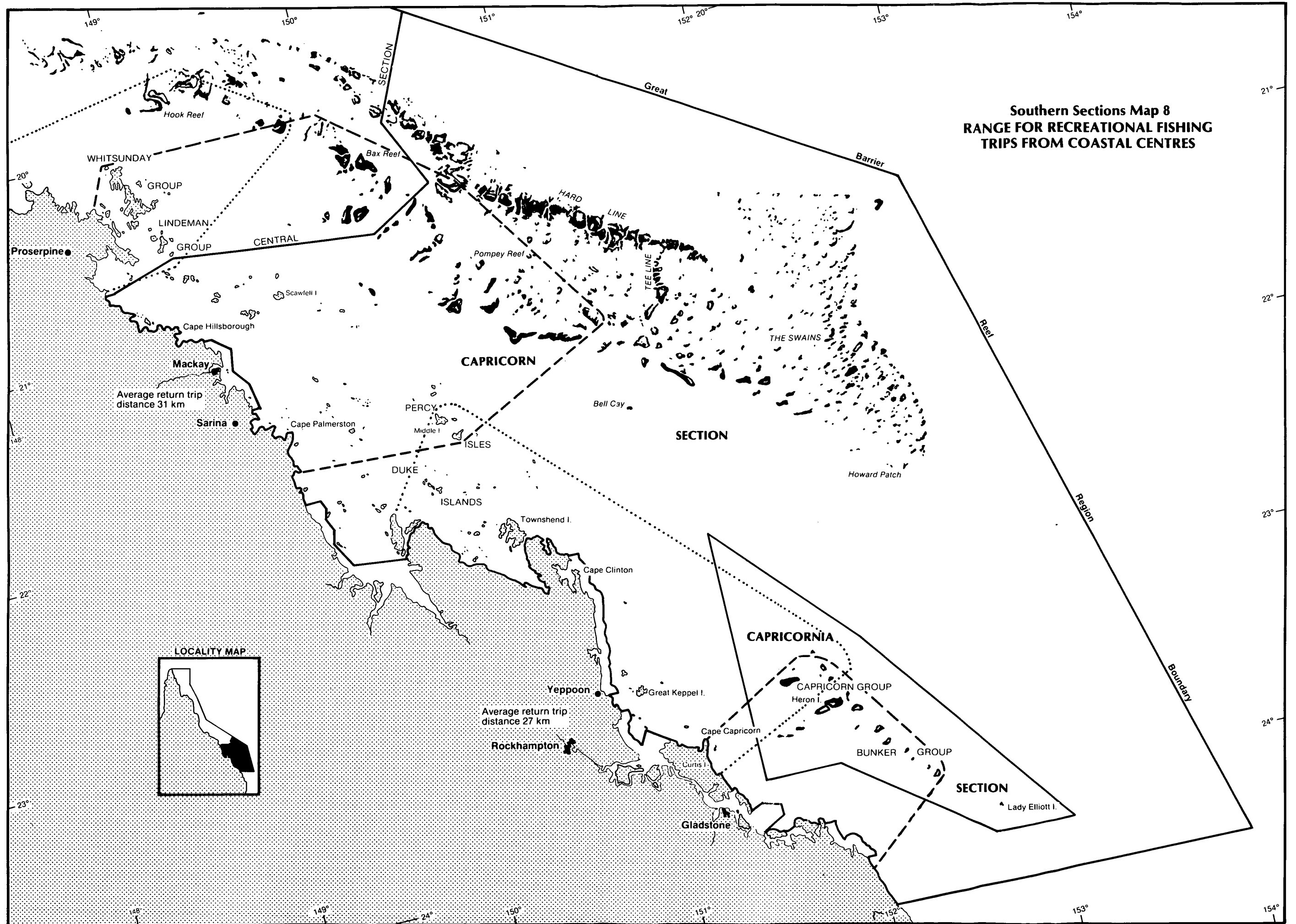


**Southern Sections Map 7
NETTING AND CRABS**


-  Netting and Mud Crabs
-  Spanner Crabs

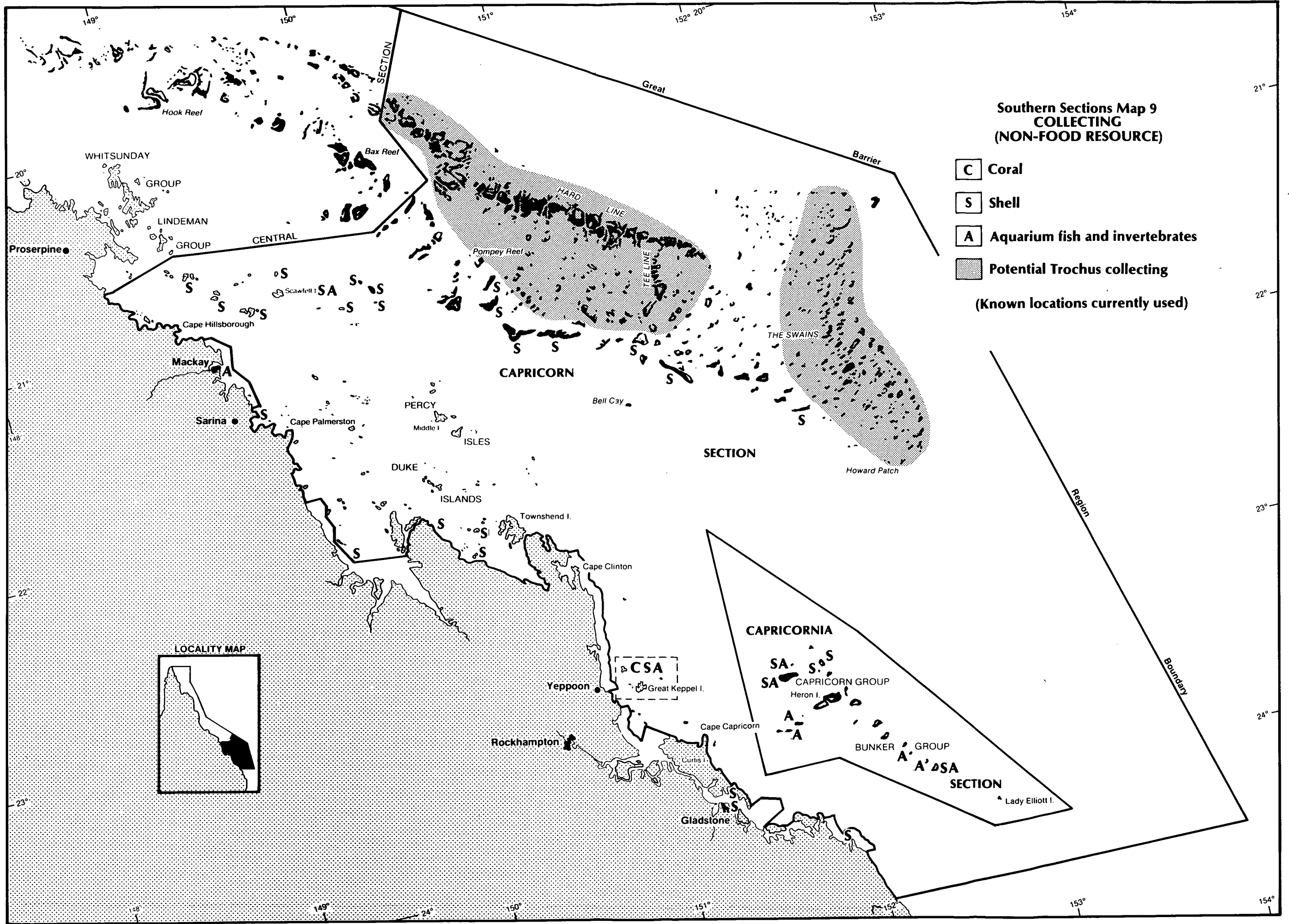


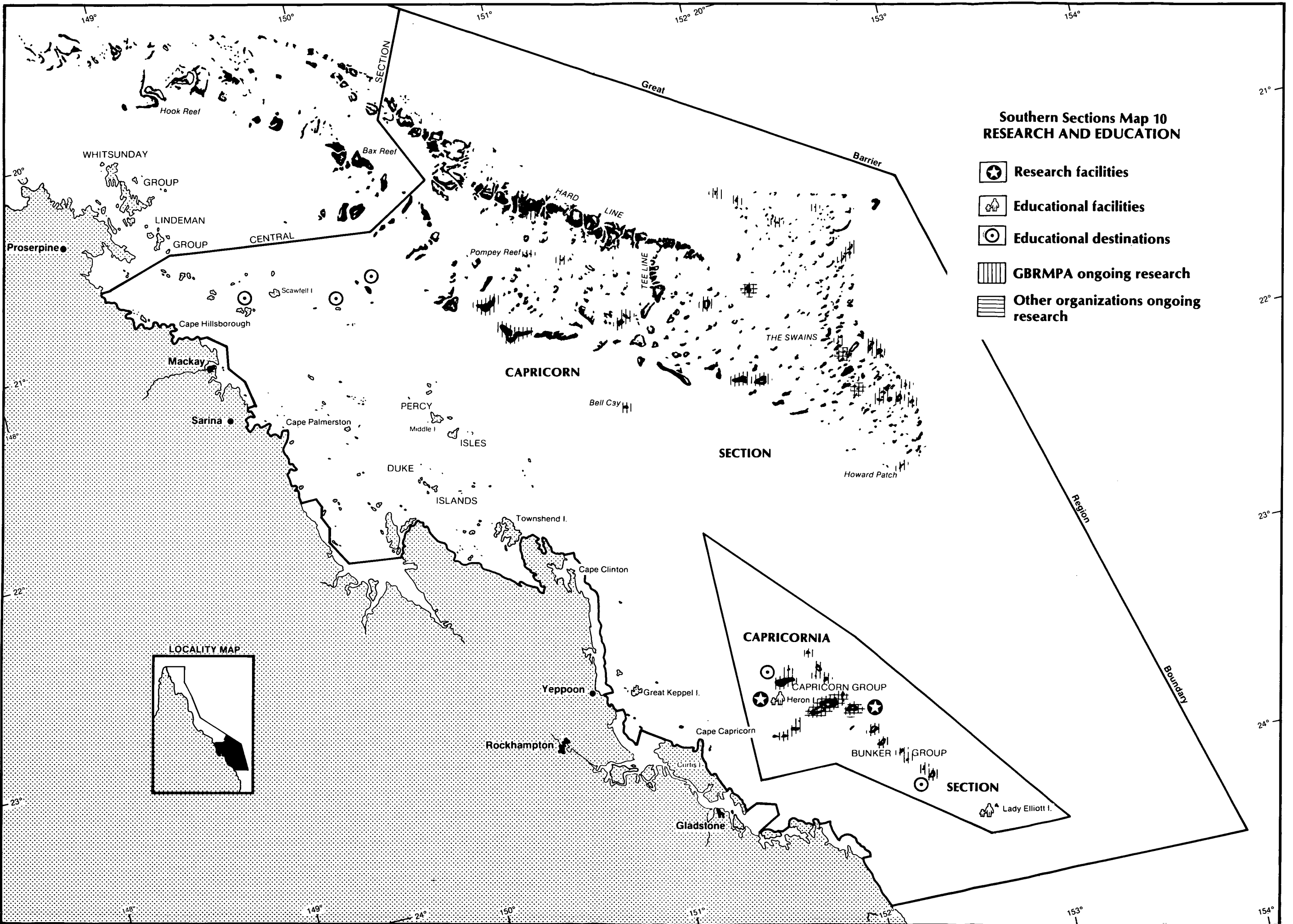
**Southern Sections Map 8
RANGE FOR RECREATIONAL FISHING
TRIPS FROM COASTAL CENTRES**







**Southern Sections Map 9
COLLECTING
(NON-FOOD RESOURCE)**

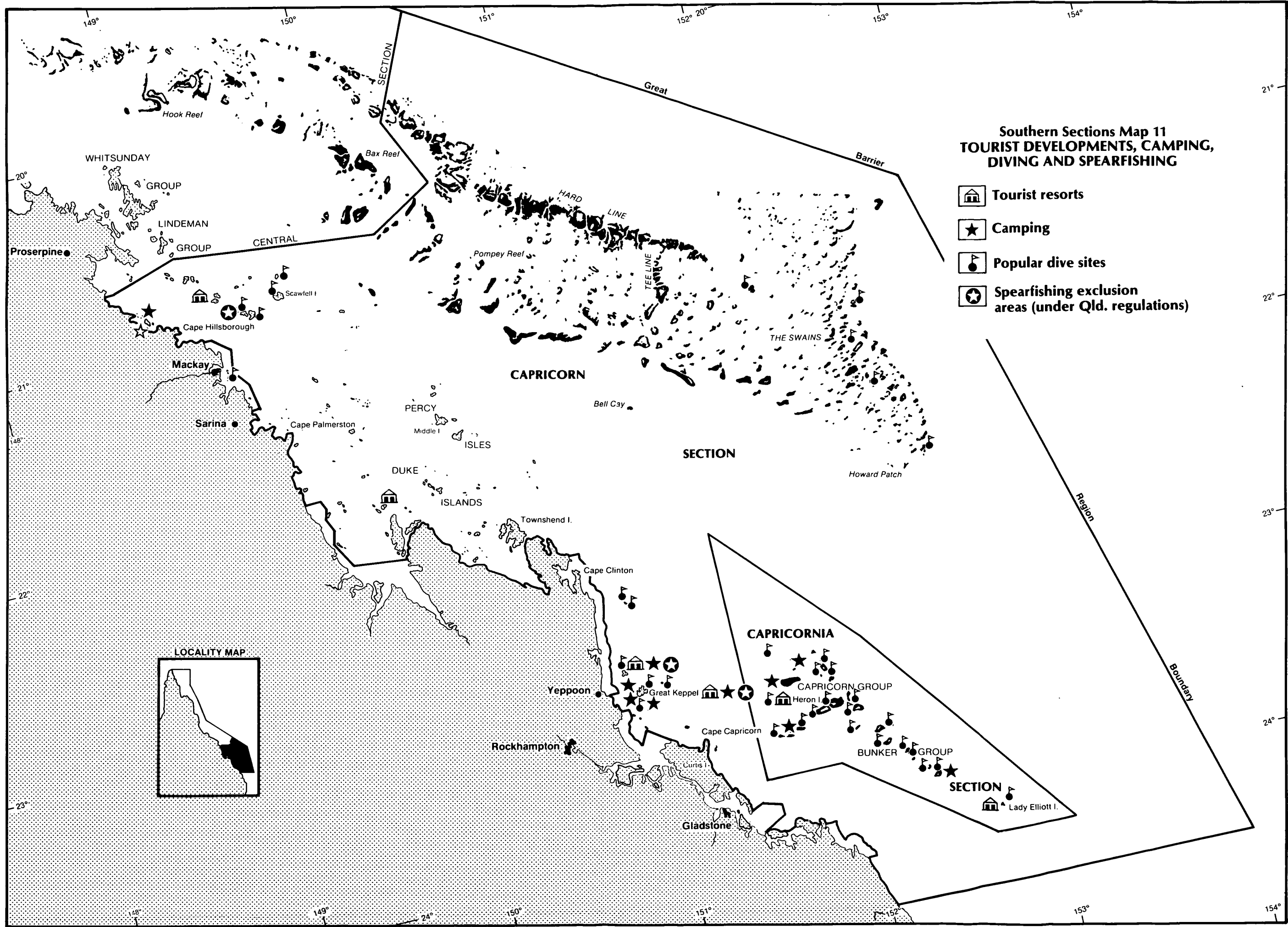
- C** Coral
- S** Shell
- A** Aquarium fish and invertebrates
-  Potential Trochus collecting
(Known locations currently used)









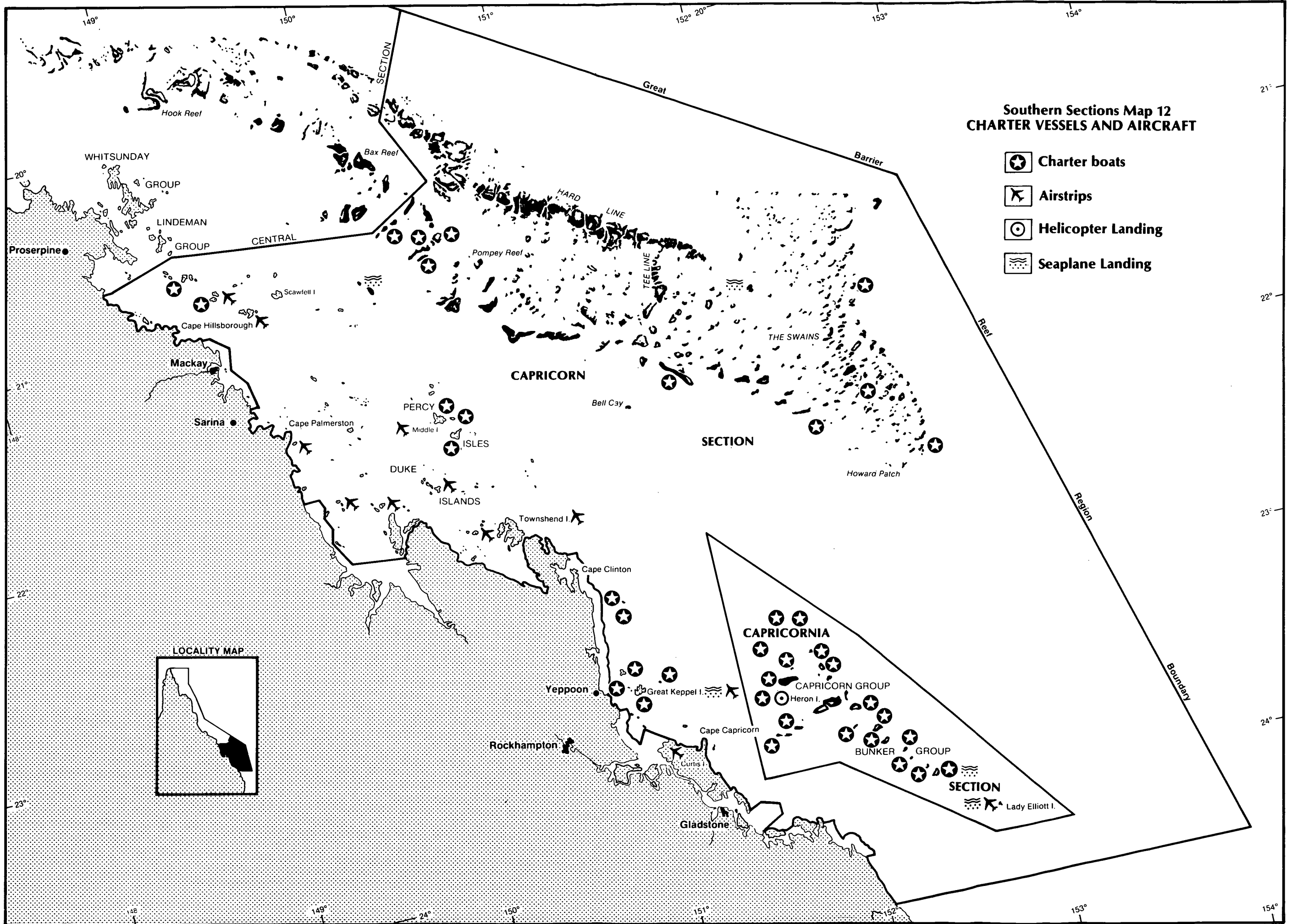
**Southern Sections Map 11
TOURIST DEVELOPMENTS, CAMPING,
DIVING AND SPEARFISHING**

-  Tourist resorts
-  Camping
-  Popular dive sites
-  Spearfishing exclusion areas (under Qld. regulations)







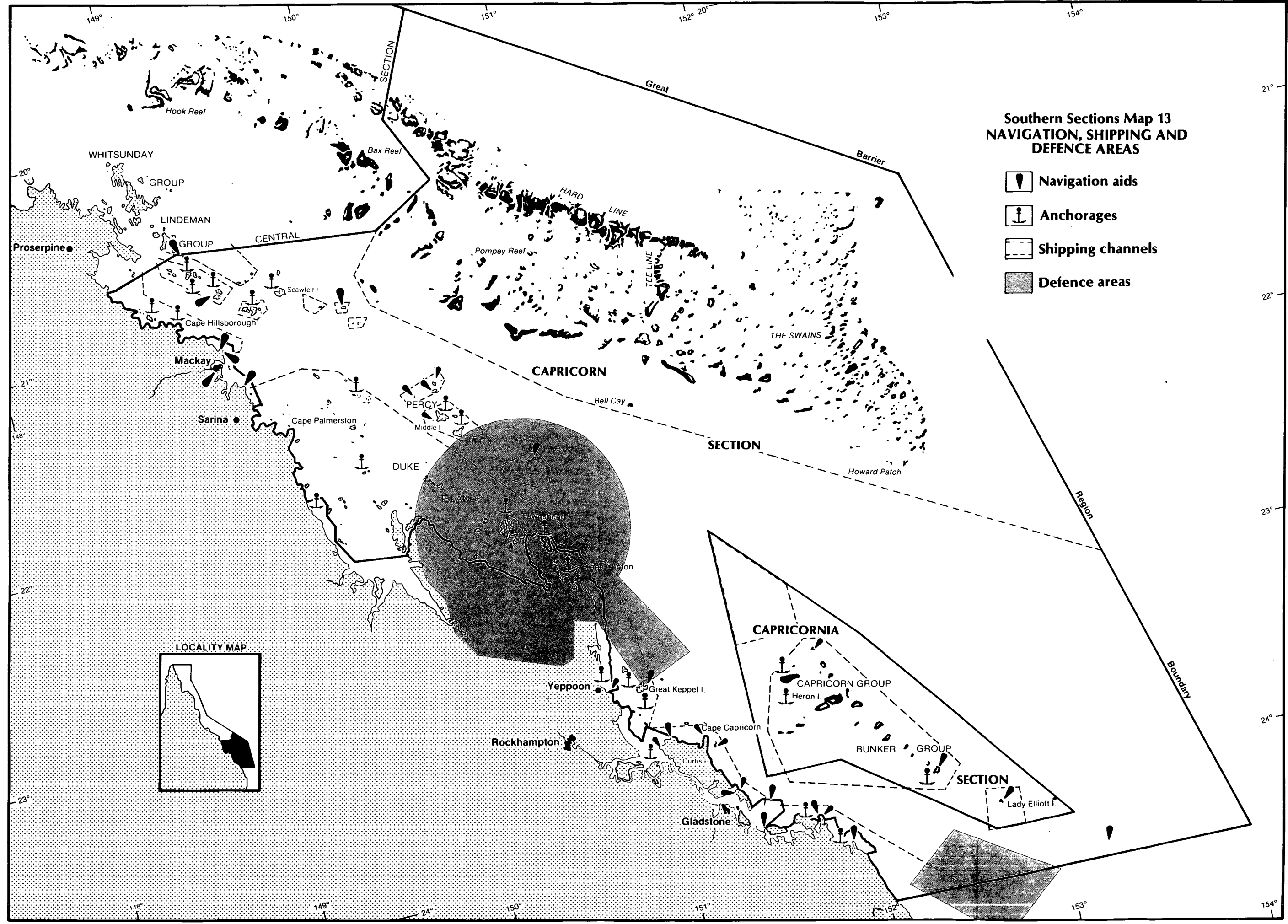
**Southern Sections Map 12
CHARTER VESSELS AND AIRCRAFT**

-  Charter boats
-  Airstrips
-  Helicopter Landing
-  Seaplane Landing



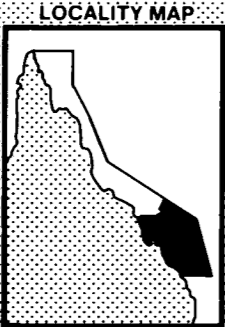
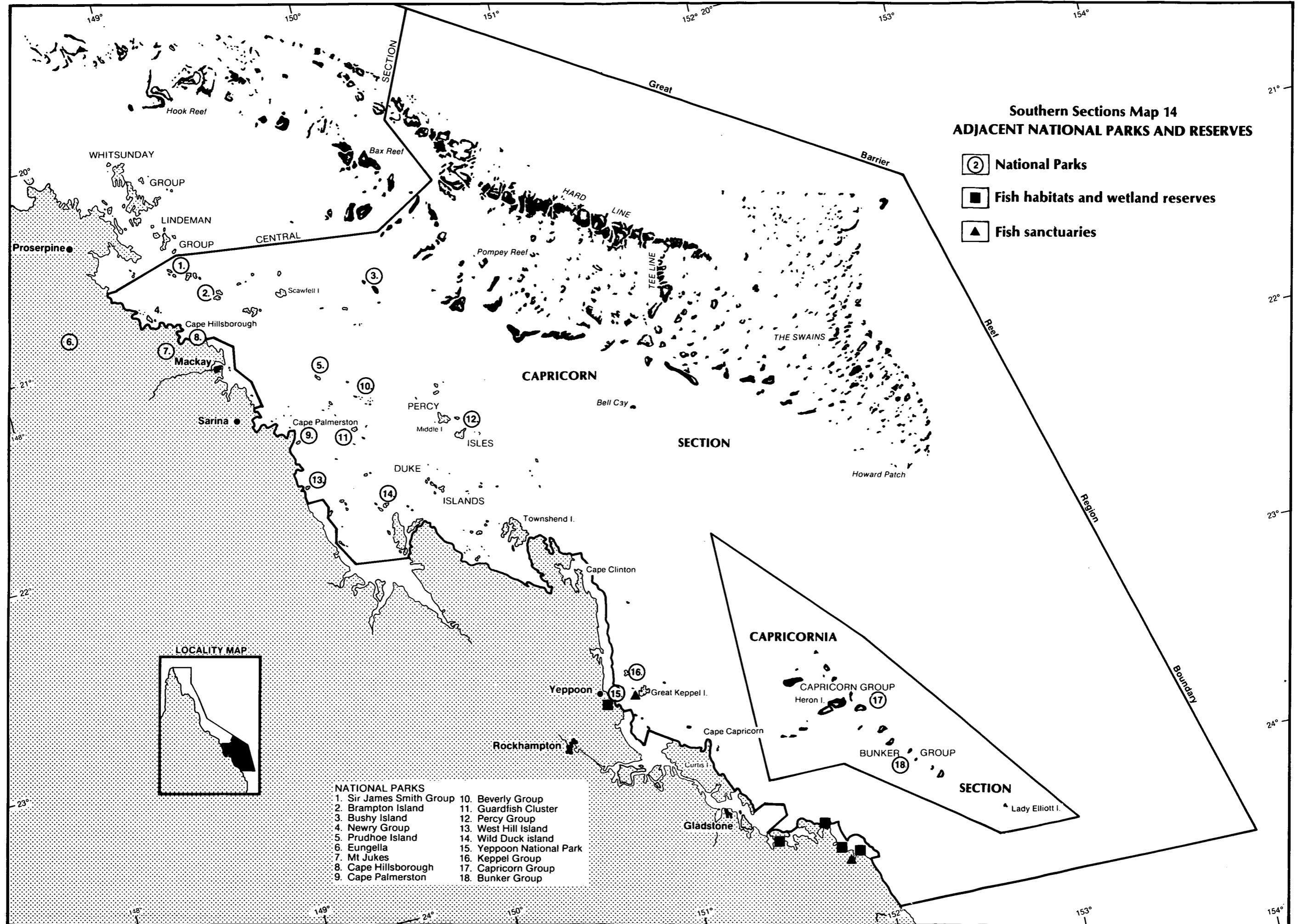
**Southern Sections Map 13
NAVIGATION, SHIPPING AND
DEFENCE AREAS**

-  Navigation aids
-  Anchorages
-  Shipping channels
-  Defence areas



**Southern Sections Map 14
ADJACENT NATIONAL PARKS AND RESERVES**

- 2 National Parks
- Fish habitats and wetland reserves
- Fish sanctuaries



- NATIONAL PARKS**
- | | |
|--------------------------|---------------------------|
| 1. Sir James Smith Group | 10. Beverly Group |
| 2. Brampton Island | 11. Guardfish Cluster |
| 3. Bushy Island | 12. Percy Group |
| 4. Newry Group | 13. West Hill Island |
| 5. Prudhoe Island | 14. Wild Duck island |
| 6. Eungella | 15. Yeppoon National Park |
| 7. Mt Jukes | 16. Keppel Group |
| 8. Cape Hillsborough | 17. Capricorn Group |
| 9. Cape Palmerston | 18. Bunker Group |