



Cobourg Marine Park

Plan of Management



Cobourg Marine Park Plan of Management

Prepared by the Cobourg Peninsula Sanctuary and Marine Park Board
and
Parks and Wildlife Service of the Northern Territory,
Department of Natural Resources, Environment, The Arts and Sport

Published August 2011

ISBN 1 920772 53 7

Foreword

It would take many pages and a long time for me to explain how important the Cobourg Marine Park is to traditional owners and their families who live on, and are related to the gunak and lala (land and sea) of the Cobourg Peninsula. Traditional owners and their families belong to this place and their future is tied to it. The story of our connection to our land and sea continues into the stories of our children and grandchildren to come.

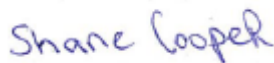
Traditional owners and their families are proud to be able to manage the gunak and lala of Cobourg Peninsula and to share this place with others. We work with the Northern Territory Government through the Cobourg Peninsula Sanctuary and Marine Park Board so that everyone can enjoy and benefit from the Park.

The Board has developed this Plan of Management so everyone knows how the Marine Park is managed and how the Traditional Owners and the Northern Territory Government look after land and sea country according to Aboriginal tradition and Territory law.

The Traditional owners and the NT Government take the responsibility of writing and putting in place this Plan of Management very seriously. Traditional owners, their families and the Board know that the Marine Park is important to many people. They have taken a long time to develop the plan, and listened and talked to a lot of people so the plan reflects and balances different opinions as much as possible. We hope this makes the Plan strong.

Now the Plan is written the real job of managing the park together begins. But good management can only happen if the Board keeps talking to the people who use the Park or have interests in it.

The Board looks forward to the challenges ahead and hopes that this strong Plan of Management will help to protect the Marine Park, and that future generations of traditional owners and their families, Territorians, park visitors and others will continue to enjoy and benefit from the wonderful natural and cultural environments that make the Marine Park so important nationally and internationally.



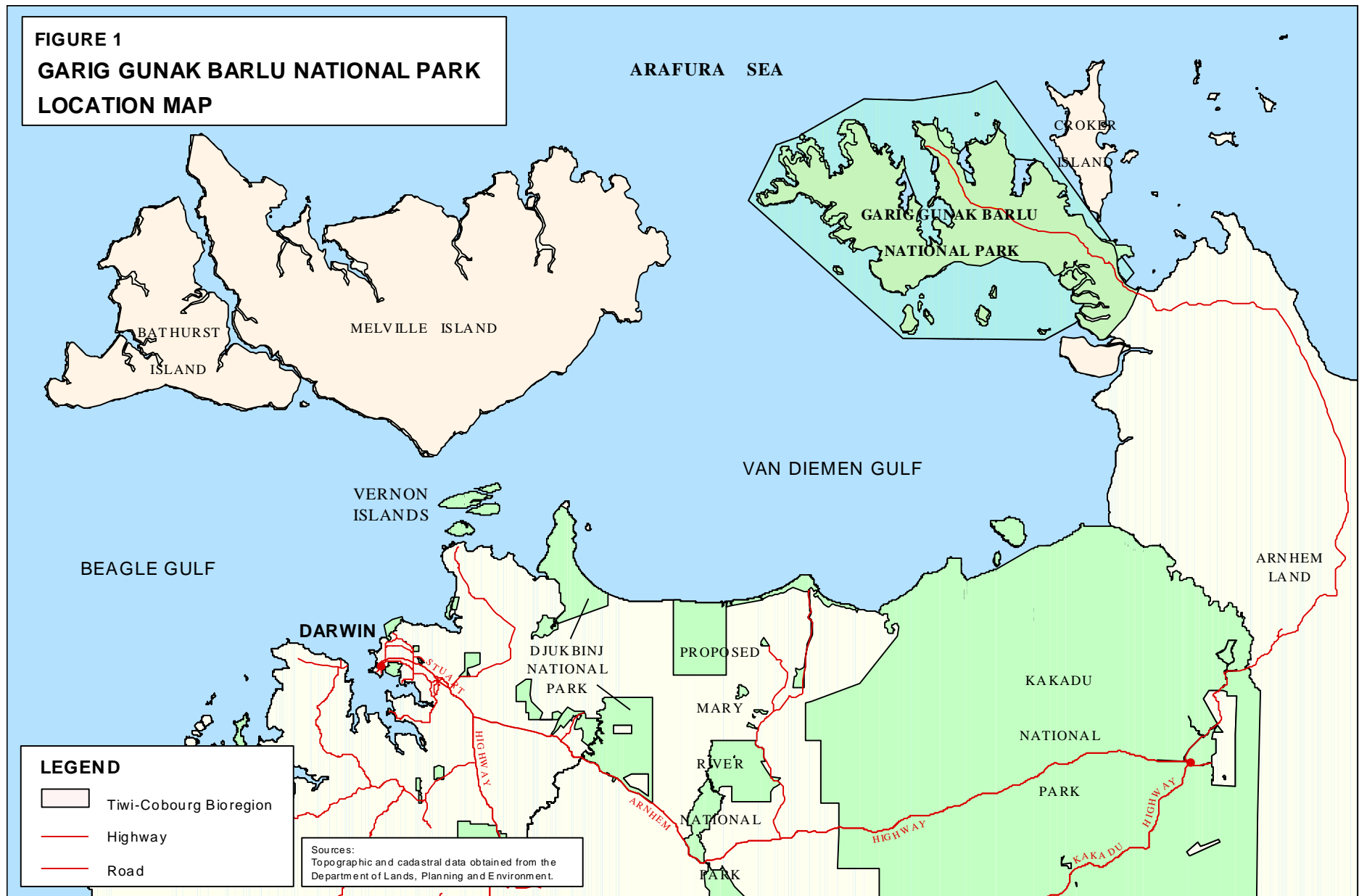
Mr Shane Cooper
Chairman
Cobourg Peninsula Sanctuary and Marine Park Board
August 2011

CONTENTS

1.	INTRODUCTION	1
1.1	BACKGROUND	2
1.2	REGIONAL CONTEXT	3
2.0	MANAGEMENT OF THE PARK	5
2.1	OBJECTIVES OF MANAGEMENT	7
2.2	MANAGEMENT VALUES.....	7
2.3	MAKING DECISIONS AND EVALUATING PROPOSALS.....	8
3.0	MANAGEMENT FOR CONSERVATION AND SCIENTIFIC VALUES	9
3.1	MARINE HABITATS AND ECOSYSTEMS	9
3.2	FLORA AND FAUNA	10
4.0	MANAGING FOR ABORIGINAL VALUES	14
4.1	TRADITIONAL RESOURCE USE AND CULTURAL SIGNIFICANCE.....	15
4.2	ABORIGINAL ECONOMIC DEVELOPMENT.....	16
5.0	MANAGING FOR HISTORICAL VALUES	17
6.0	MANAGING FOR TOURISM AND RECREATIONAL VALUES	19
6.1	RECREATIONAL FISHING AND TOURISM.....	19
6.2	SHIPPING AND BOATING	21
6.3	VISITOR ACCESS AND SAFETY	21
7.0	MANAGING FOR ECONOMIC VALUES	23
7.1	COMMERCIAL FISHING	23
7.2	PEARLING	25
7.3	AQUACULTURE	25
7.4	MINING AND EXPLORATION	26
8.0	MANAGING FOR EDUCATIONAL VALUES	27
9.0	STRATEGIES FOR MANAGEMENT	28
9.1	ZONING SCHEME	28
9.2	OTHER MANAGEMENT STRATEGIES.....	36

10.0	ENFORCEMENT OF THE PLAN	45
11.0	EVALUATION AND REVIEW OF THE PLAN	45
12.0	REFERENCES	46
TABLE 1:	SUMMARY OF ZONES	30
TABLE 2:	USES AND ACTIVITIES WITHIN EACH ZONE	32
FIGURE 1:	LOCATION MAP	iii
FIGURE 2:	ZONING SCHEME	33
SCHEDULE 1:	CO-ORDINATES FOR ZONING SCHEME	49
APPENDIX 1:	DESCRIPTIONS OF IMCRA	54
APPENDIX 2:	PRELIMINARY FAUNA LIST	59

FIGURE 1
GARIG GUNAK BARLU NATIONAL PARK
LOCATION MAP



This page is left intentionally blank



1. INTRODUCTION

This Plan of Management is prepared pursuant to Part IV of the *Cobourgh Peninsula Aboriginal Land, Sanctuary and Marine Park Act*, and Section 23 of the Northern Territory *Fisheries Act*. This Plan of Management states the intent of the Cobourgh Board, Parks and Wildlife Commission (Department of Natural Resources, Environment, The Arts and Sport), Traditional Owners and the Fisheries Group (Department of Primary Industry, Fisheries and Mines) with regard to management of the Cobourgh Marine Park. It sets management objectives and values, outlines current issues and proposes management strategies to guide future management and development of the Cobourgh Marine Park.

The co-operative approach that was established in preparing this Plan of Management will continue throughout the life of the Plan. The Cobourgh Fishery Management Advisory Committee was established as a forum for key stakeholder involvement in developing the Cobourgh Marine Park Plan of Management.

The Plan will be in operation for a maximum of ten years unless amended or revoked by the preparation of a new plan in accordance with the provisions of either of the above named Acts. A review of the Plan and its provisions will be conducted once the Plan has been in operation for 5 years (mid term review). The Cobourgh Board in consultation with recreational and commercial fishers will review the management programs annually to assess the progress of implementation of the plan and the effectiveness of those programs.

In March 2007 the full bench of the Federal Court ruled that under the Commonwealth *Aboriginal Land Rights Act (Northern Territory)* traditional Aboriginal owners have exclusive possession of the waters over the Arnhem Land Aboriginal Land Trust land including intertidal areas and tidal estuaries. The implications of the ruling for the management of Cobourgh Marine Park are unclear and the judgement may be subject to an appeal. This Plan of

Management may need to be amended to comply with and reflect any High Court decision and relevant Northern Territory and Commonwealth legislation.

1.1 Background

Cobourg Marine Park is located in the waters surrounding Cobourg Peninsula, approximately 220 km north-east of Darwin (Figure 1) and occupies an area of approximately 229,000 ha. The Marine Park was first declared in July 1983 under Section 12 of the *Territory Parks and Wildlife Conservation Act* (the Act). The Park was re-declared in November 2002 under section 12 (1) (aa) of the Act in order to recognise the possibility of the existence of native title interests and rights in the Marine Park.

The Marine Park is part of the larger Garig Gunak Barlu National Park. Garig Gunak Barlu National Park includes both the Marine Park and the Cobourg Sanctuary. The Sanctuary extends to low water mark and includes the intertidal zone and waters covering the peninsula whilst the Marine Park extends seaward from the low water mark.

An area of sea surrounding Cobourg Peninsula and corresponding closely to the boundary of the Cobourg Marine Park, but extending to the high water mark, has been declared a Fishery Management Area under section 22(a) of the *Fisheries Act*. The Fishery Management Area includes the water and beds of the Sanctuary between high and low water (the intertidal zone).

The waters of the Park are generally less than 15 metres in depth. Wave energy is relatively low except during periods of strong storm activity and cyclonic events. This wave energy tends to be stronger in the Van Diemen Gulf in the southern area of the Park. Tides are generally between 2 – 2.5 metres in the northern section of the Park and 3 metres in the southern section of the Park. There are no major creeks or rivers on the adjoining Sanctuary and consequently there is no major freshwater discharge from the Sanctuary into the Marine Park.

The waters of the Van Diemen Gulf section of the Park are always turbid due to the relatively large tidal range and discharge from the large tidally influenced rivers in the southern part of the Gulf. Conversely the northern section of the park experiences low turbidity due to the small tidal range and small discharge from creeks and estuaries on the Sanctuary.

Currents tend to flow in accordance with prevailing winds. Between March and August the currents flow east to west with the predominantly easterly winds. Between September and February the currents generally flow west to east with the predominantly westerly winds. The northern portion of the Park is situated in an area of sea that experiences some of the strongest currents in the Territory.

The Marine Park is characterised by a number of deeply incised bays and estuaries on its northern shores. These bays are ancient river valleys that were drowned during periods of sea level rise and provide a varied environment and habitat that is quite distinct from the open water areas of the Park. The areas of the Park that have been studied and where extensive collections have been made indicates that the Park supports rich and diverse marine life including live coral reefs, seagrass, diverse reef and pelagic fish populations and threatened marine turtles and dugong.

The waters and resources of the Marine Park are used by Aboriginal people of Cobourg, recreational and commercial fishermen, fishing tour operators, yachtsmen and other pleasure craft users as well as visitors to the adjacent Sanctuary.

1.2 Regional Context

The Cobourg Marine Park is the only marine park declared under the *Territory Parks and Wildlife Conservation Act*. However, a number of parks and reserves, such as Charles Darwin National Park, Berry Springs Nature Park, Casuarina Coastal Reserve, Shoal Bay Coastal Reserve, Tree Point Conservation Area and Kakadu National Park include marine and coastal areas. Two aquatic life reserves have been declared under the Northern Territory *Fisheries Act*, one at Doctors Gully and one at East Point.

The Cobourg Marine Park takes in two of the thirteen marine biogeographic regions (bioregions) identified in the Interim Marine and Coastal Regionalisation for Australia (IMCRA) for Northern Territory waters (IMCRA Technical Group 1998). Bioregions are discrete geographic localities containing distinctive physical and biological attributes, and provide a basic framework for development of comprehensive, adequate and representative networks of marine protected areas and a base for the protection of marine biodiversity across Australia. The Cobourg Marine Park is located in the Cobourg and Van Diemen Gulf marine bioregions with the northern portion of the Park covered by the Cobourg marine bioregion and the southern portion covered by the Van Diemen Gulf marine bioregion. A description of these bioregions is in Appendix 1.

The Northern Territory Coastal Management Policy provides the broad policy framework for protection of marine and coastal areas with high conservation values. The Northern Territory Government may develop a more detailed framework for establishing marine protected areas and implementing other marine conservation initiatives, through the development of the Parks and Conservation Masterplan. The purpose of the Masterplan is to develop strategies for the conservation of the Territory's marine and terrestrial biodiversity.

In accordance with Australia's Ocean Policy the Australian Government is in the process of developing a bioregional plan under the *Environmental Protection and Biodiversity Conservation Act* for Commonwealth waters. This includes bioregional planning for Commonwealth waters extending from Cape York to the border between the Northern Territory and Western Australia (Northern Planning Area). The Northern Territory Government is also in the process of preparing a Marine Biodiversity Conservation Strategy and a Marine Protected Area Strategy for the Territory.

Most of the Territory's marine environment has not been surveyed and there is a distinct lack of detailed knowledge of the marine environment that hampers the process of establishing marine protected areas. The strategic planning processes established through the Parks and Conservation Masterplan, Northern Territory Marine Biodiversity Conservation Strategy and Marine Protected Area Strategy and the Australian Governments bioregional marine planning initiatives may help to fill some of these knowledge gaps and develop processes to improve our knowledge.



2. MANAGEMENT OF THE PARK

The main pieces of legislation that apply to the Marine Park are the *Cobourg Peninsula Aboriginal, Land, Sanctuary and Marine Park Act* (CPS&MP Act), the *Territory Parks and Wildlife Conservation Act* (TP&WC Act) and the Northern Territory *Fisheries Act*.

The Cobourg Marine Park is managed jointly by the Northern Territory Government and the Cobourg Aboriginal people through the Cobourg Peninsula Sanctuary and Marine Park Board under the provisions of the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act*. The Parks and Wildlife Commission have responsibility for the day to day management of the park and are responsible for administration of the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act* on behalf of the Department of Natural Resources, Environment, The Arts and Sport and the Northern Territory Government. The Board and Commission are responsible for the preparation of Plans of Management for the Marine Park.

The functions of the Board and the Commission are detailed under Sections 24 and 25 of the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act*. Nothing in this Plan of Management is to be construed or taken as a delegation of the Board and Commission's functions and powers under the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act* to another agent. The Board's power to make by-laws in regard to the Sanctuary remains.

Fish and aquatic life in the Marine Park (below low water) with the exception of turtle, dugong and crocodiles are regulated under the Northern Territory *Fisheries Act*. A Fishery Management Area Advisory Committee has been established under the Northern Territory *Fisheries Act* to provide advice to the Director of Fisheries on the appropriate management of fish and aquatic life in the Fishery Management Area and the Marine Park. The committee consists of commercial, recreational, prawning, pearling and traditional Aboriginal owner interests. This committee has also operated as an advisory group to the Cobourg Board and as a forum to facilitate key stakeholder input into the preparation of this Plan of Management.

It should be noted that the Cobourg Board has requested the Northern Territory Government consider amending the *Cobourg Peninsula Aboriginal, Land, Sanctuary and Marine Park Act* to enable the Board to determine bylaws for the Marine Park. At this stage, the Board only has the powers to determine bylaws for the Sanctuary to the low water mark.

The Board believes that, without appropriate powers to determine bylaws for the Marine Park, it cannot effectively discharge its management responsibilities under the CPS&MP Act. The traditional owners of Cobourg Peninsula support this position.

It is intended that the Cobourg Fishery Management Area that includes the Marine Park and the intertidal area of the Sanctuary will be managed under a Fishery Management Area Management Plan in accordance with part 3 of the Northern Territory *Fisheries Act*. The provisions of the Fishery Management Area Management Plan will mirror those established in this plan of management.

Following the implementation of this Plan, there will be continued close co-operation between the Cobourg Board, Cobourg Aboriginal people, Parks and Wildlife Commission, Fisheries and key fisheries stakeholders (eg Northern Territory Seafood Council, Amateur Fishermen's Association of the Northern Territory) in the management of fisheries in the Marine Park. The Cobourg Fishery Management Area Advisory Committee will be retained as the forum for key fisheries stakeholder involvement in management of the Marine Park. Consultation processes for other stakeholders including marine conservation and environment groups will be developed by the Board"

If the Board gains bylaw making powers over the marine park the Northern Territory Seafood Council and Amateur Fishermen's Association of the Northern Territory would be invited to attend Board meetings when fisheries issues are considered.

By arrangement between the Northern Territory and Commonwealth Government under the Offshore Constitutional Settlement and incorporated within Territory and Commonwealth fisheries legislation, jurisdiction for management of the penaeid prawn fishery rests with the Commonwealth. In view of this, close consultation will be undertaken with the Commonwealth Government over matters related to prawn trawl activities within the Marine Park.

2.1 Objectives of Management

It is intended that Cobourg Marine Park be managed as a multiple use marine park, providing for protection of the ecology of the marine environment whilst allowing for ecologically sustainable commercial, recreational and customary use of the area.

The principle objective in managing the Marine Park is to protect the marine biodiversity whilst allowing continued sustainable use of its resources and enjoyment of its values.

More specific management objectives for the Marine Park include:

- Maintaining biological productivity, species diversity and abundance.
- Providing for sustainable customary use by traditional owners.
- Providing for sustainable commercial, recreational and tourism use.
- Improving knowledge, understanding and management of the Northern Territory's marine environment.
- Protection of cultural and historical values in accordance with Commonwealth and NT legislation and Traditional Aboriginal Owner directions.
- Provision of appropriate, safe and enjoyable visitor experiences.
- Management of marine resources under a co-operative framework.

2.2 Management Values

There are a number of stakeholder groups that have an interest in the Marine Park and its management. Major stakeholder groups include commercial and recreational fishers, pearl farmers, Park visitors and tourists.

These stakeholder groups value the Park and its resources for a variety of reasons. These reasons can be categorised into the following broad areas:

- (i) Conservation and Scientific Values;
- (ii) Aboriginal Cultural Values;
- (iii) Historical Values;
- (iv) Tourism and Recreational Values;
- (v) Economic Values; and
- (vi) Educational Values.

The Park will be managed to protect and maintain these values.

2.3 Making Decisions and Evaluating Proposals

The Board may be called upon to make decisions on a broad range of matters related to the management and operations of the Park. It is important that Board decisions are well informed, consistent with relevant legal requirements and take into account the views of traditional owners and key stakeholders.

In considering proposals and other matters requiring a resolution of the Board, its members may require written advice from the Parks and Wildlife Commission, Fisheries or other parties on particular issues before making a decision. Wherever possible, such advice will be provided in agenda papers for Board meetings and may include reference to:

- issues to be considered in relation to relevant legislation, such as the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act*, the *Northern Territory Fisheries Act* and the *Northern Territory Aboriginal Sacred Sites Act*,
- whether a proposal is consistent with the Plan of Management in operation for the Park,
- whether a proposal is consistent with relevant strategies or policies endorsed by the Board for the management of the Park
- potential implications for Park operations and the Park budget, and
- the views of traditional owners or key stakeholders.

A fundamental feature of Aboriginal decision making in relation to land and sea country is the primary right of traditional Aboriginal owner groups to make decisions about matters affecting their country. Exercising this right can be difficult in the context of joint management arrangements and the legislated role of the Board in making decisions about the Park.

Some traditional owners have expressed concern that, on occasions, it may not be possible or appropriate for them to consider their views on particular issues in the context of a Board meeting. This is particularly so if a proposal is likely to have a significant impact primarily on the land and marine interests of one group. In such circumstances, the group may request an opportunity to meet for the purpose of considering and forming an opinion on a matter before the Board is asked to make a decision.

The Board may, during the life of this Plan, develop and endorse more specific protocols to provide guidance on consulting traditional owners and processes for decision making by the Board.



3.0 MANAGEMENT FOR CONSERVATION AND SCIENTIFIC VALUES

The Park's conservation and scientific values derive from:

- the presence of a variety of marine habitats supporting a rich diversity of marine life,
- the occurrence of live coral reefs and seagrass,
- its role as a habitat for dugongs, marine turtles, sea-birds, saltwater crocodiles, reef fish and a variety of other animals which inhabit the sea and coastal margins,
- a well-developed benthos (flora and fauna of the ocean floor) in the bays and estuaries which are important nursery areas for marine life, and
- a rare and unusual association of coral reef with closed mangrove forest at Popham Creek.

The Park protects habitat for threatened species, including the dugong and six species of marine turtle including three species that nest on the beaches of Cobourg Peninsula. The Park affords scientists with the opportunity to study these animals and develop strategies for their management and conservation across the NT.

The intertidal zone that forms part of the Sanctuary and the adjacent sub-tidal zone in the Marine Park contain the most significant diversity and structure for the known marine benthic fauna of the Sanctuary and Marine Park.

3.1 Marine Habitats and Ecosystems

The Cobourg Marine Park is known to contain a large number of diverse marine habitats including coral reefs, rocky reefs, sand and mudflats, and areas of mangroves, seagrass and seaweed. Scientists generally agree that certain areas show a distinctly greater species diversity and abundance than others. These include Orontes Reef (just outside the Park) the *Sargassum* beds near Gul Gul (Danger Point) and the fringing reefs near Black Point, Sandy Island I and Caiman Creek.

The semi-enclosed water bodies such as Port Essington and the bays along the coast provide a range of marine environments with different salinity and temperature regimes. These environments are thought to be of high scientific, conservation, economic education and recreational value as they are likely to support diverse habitats that are important nursery areas for marine life. Unlike many major bays and harbours along the NT coastline, the bays and estuaries at Cobourg Peninsula have restricted freshwater input and therefore scouring of benthos in channels is minimal.

To date, the habitat of the inshore waters of the Marine Park between Vashon Head and Danger Point (Gul Gul) including Port Bremmer and the bays of Port Essington have been surveyed and studied. Of the areas surveyed, the fringing rocky and coral reefs, and oyster beds have been studied in detail. The structure of the rocky and fringing coral reefs within the Marine Park is typical of northwest inshore waters.

In 2001, a network of reef monitoring stations was established on fringing coral reef at Coral Bay, Sandy Island I and near Black Point, to monitor changes and impacts to the reefs and to improve understanding of these habitats in the Park. The studies show that, despite their small size, the coral communities around Sandy Island I and in the bay between Black Point and Smith Point are highly diverse in both coral and fish fauna. This study found that the once diverse and relatively extensive coral communities at Coral Bay are now in decline. This decline may be due to both environmental factors such as coral bleaching and siltation and human activities. A study of the effects of coral bleaching events in 2002-03 showed that most of the fringing reefs have been severely impacted. In 2003, 90% of live coral cover was lost in some areas of the Park.

3.2 Flora and Fauna

The mangrove flora of the sanctuary is diverse and includes species that have a restricted distribution in the NT. Based on a broad definition of mangroves, there are 51 species in the NT. Of these, 35 species have been recorded from the Sanctuary, and it is estimated that a further eight species occur within the Marine Park but as yet have not been formally recorded.

Mangrove areas on the northern coastline of the Marine Park are small in area, while those on the protected southern coastline are generally larger and better developed. An extensive area of mangroves occurs at the south-east extremity of the Park in the Ilamayi River system. This system represents one of the largest mangrove communities in the NT. The Mangrove Palm (*Nypa fruticans*) occurs at Trepang Bay and is known from only two other locations in the NT. The Native Frangipani (*Cerbera manghas*) is only known from the Cobourg Sanctuary and the Wessel Islands.

There is a broad range of traditional Aboriginal knowledge relating to the mangrove communities of the Park. The names and uses of mangrove plants associated with the Iwaidja language has been recorded by traditional owners and scientists.

The Park's seagrass beds provide a direct food source for dugongs and turtles, and some fish and crustaceans. They also provide an important input into the detrital food chain and act as nursery areas for many animals including fish, crustacea and trepang. No systematic survey of seagrass communities has been undertaken in the Park, however the presence of a large number of dugong in certain areas of the Park would suggest that there is significant seagrass habitat.

Dugong are present in most areas of the Marine Park, however there are some areas where the total number and density is particularly high. One of these areas is along the coast from Aiton Bay east to Wurgurlu Bay and surrounding Greenhill Island. In this area the density of dugong ranges up to 20 animals per square kilometre with the total population estimated to be in excess of 1000 animals.

The Marine Park is considered to be one of the most significant areas for dugong in the NT and Australia. Dugongs are classified as near threatened in the NT and are listed under the Convention on the Conservation of Migratory Species of Wild Animal (Bonn Convention). The Bonn Convention is an international agreement between many governments including Australia to protect wild animals that migrate across international boundaries.

Cetaceans are common within the Marine Park. Little is known about their distribution, abundance and genetic composition. All are listed marine species under the Commonwealth's *Environmental Protection and Biodiversity Conservation Act*.

Six species of marine turtle - green, flatback, olive ridley, loggerhead, leatherback, and hawksbill - inhabit the waters of the Marine Park. In the NT the loggerhead is listed as endangered and the leatherback is listed as vulnerable. The olive ridley, flatback and hawksbill turtles are considered to be data deficient (ie not enough is known about the populations of these species) in the NT to properly assess their conservation status. As such, a more conservative approach to management and further research is warranted.

The beaches from Black Point around the mainland to opposite Sandy Island II, the Danger Point area and the larger islands in the southern area of the Park all have significant numbers of marine turtle (mainly the green and flatback) nesting on their beaches.

The islands and waters of the Cobourg Peninsula are considered to be some of the most important flatback nesting areas (along with Bare Sand and Quail Islands off Bynoe Harbour)

in the NT. Although breeding can occur at any time of year, the majority occurs between May and October.

Nationally, all six species of turtles found in the Marine Park are listed as threatened. The loggerhead and olive ridley turtles are listed as endangered and the green, flatback, hawksbill and leatherback are listed at a national level. All marine turtle species except the flatback turtle are listed on the Bonn Convention (International Convention on Migratory Species). Cobourg Peninsula may contain the last regular nesting by leatherback turtles in Australia.

In other parts of Australia and Indonesia, marine turtle populations are in decline. It is likely that marine turtles present in the Marine Park migrate between the Park and other parts of Australia and possibly Indonesia. Declines in populations in these areas are likely to be reflected in NT populations.

The Marine Park is also an important feeding ground for several species of seabird with Sandy Islands I and II regularly used for breeding by significant numbers of crested terns (low 1000's) and significant numbers of black-naped terns (100+). The Islands are a nationally significant breeding site for crested terns and regionally significant breeding site for black-naped terns. Other species such as silver gull, roseate and bridled terns also use these islands to breed but not in significant numbers.

Sandy Islands I and II, along with Seagull Island (off Melville Island also in the NT), are the only regular crested tern breeding sites between the Cobourg Peninsula and the Western Australian border.

The breeding seabirds on Sandy Islands I and II are very susceptible to disturbance. The mere presence of people in the area causes adult birds to leave their nests, and as a consequence mortality rates for young birds are high and successful egg hatching rates are lowered. Access to these areas by people needs to be carefully managed.

A number of the seabirds that use the Marine Park including the black-naped tern are listed on international agreements (JAMBA and CAMBA) for the Protection of Migratory Birds and their habitats.

The Estuarine Crocodile is present on Cobourg Peninsula and in the surrounding waters. It is classified as a protected species under the *Territory Parks and Wildlife Conservation Act*. Estuarine Crocodiles are also listed on the Convention on International Trade in Endangered Species of Flora and Fauna (CITES). Although numbers are not known, there are sufficient numbers of crocodiles in the area to render most forms of water-based recreation hazardous.

The hard corals are one of the more conspicuous life forms at the seaward end of Port Essington and at Orontes Reef (just outside the Park). A total of 136 species have been identified, including one probable new species of *Acropora* (tabular/plate coral). Some of the species were of special interest, being otherwise known in Australian waters only from the Solitary Islands, off New South Wales. By way of comparison, the Capricorn-Bunker Reefs at the southern end of the Great Barrier Reef, have only 174 species. Some data is also available for the alcyonarians (soft corals) and gorgonians (sea fans) with some 22 genera being represented.

Although diverse communities of fish are known to inhabit the Park, very little appears to be known about the establishment or maintenance of the communities or their habitat requirements. Appendix 4 lists the 465 nominal species known (including sharks, manta rays and stingrays). Nine are new species, including one known only from Coral Bay. The area is also the type locality (site from which the species became known to western science) for 21 species of fish that were collected by the early British expeditions and visitors to Victoria Settlement between 1838-49. Many of the fish species occur in the intertidal zone and the inshore waters on rocky and coral reefs. Commercial and recreational fishers target a number of these fish species in the Park.

Extensive collections of bryozoans (10-15 species described), annelids (300 species described), crustaceans (75 species described including shrimps and crab spp.), molluscs (331 species described including gastropod, bivalve and cephalopod spp.) and echinoderms (100 species described including crinoid and holothurian spp) were made in the Marine Park. Not all of the specimens collected in the Park have been described, however of those specimens that have been described, three species of gastropods and three species of echinoderms are new records for the NT. The new species of echinoderms are also new to Australia.

After fish species, the most recognised marine species in the Park are probably the rock oyster (*Sacrostrea cucculata amasa*) and mud crab (*Scylla serrata*). Rock oysters and mud crabs are relatively abundant in the Garig Gunak Barlu National Park with rock oysters generally occurring in the intertidal zone of the Sanctuary and mud crabs occurring in both the Marine Park and the Sanctuary.



4.0 MANAGING FOR ABORIGINAL VALUES

Cobourg Aboriginal people refer to the Marine Park as sea country. They are connected to this sea country through Aboriginal tradition and law and this connection remains an intimate part of their everyday existence today.

Aboriginal tradition and law places cultural rights, responsibilities and obligations on Cobourg people including the responsibility and obligation to care for sea country. These rights, obligations and responsibilities have been handed on from their ancestors through many generations.

Cobourg people care for sea country by managing and maintaining sacred sites and sites of cultural significance through ceremony and ritual and by passing on indigenous knowledge of the marine environment, its resources and traditional management to younger generations. This knowledge is generally passed on through participation in customary activities including ceremony and ritual and hunting and use of marine resources. This is an important cultural reason for Cobourg people to continue customary use and management practices.

Additionally, in a contemporary marine management context, developing commercial and employment opportunities from the sustainable use of the Marine Park's natural resources is important to Cobourg people and stems from their desire to develop a secure economic base from their traditional estates. Cobourg Aboriginal people are also interested in developing opportunities and capacity within their communities for employment as Parks and Wildlife Commission rangers and community based land and sea rangers, in addition to employment in commercial fisheries.

Cobourg Aboriginal people continue to hunt and use marine resources and carry out customary management practices in the Marine Park. Finally, managing for Aboriginal values also include regulation of outside interests (forces), such as regulation of marine debris, by-catch, pearling and impact of recreational and commercial fishing.

4.1 Traditional Resource Use and Cultural Significance

Section 122 of the *Territory Parks and Wildlife Conservation Act* provides for traditional use of land and water by Aboriginal people that have traditional rights.

Section 53 of the NT *Fisheries Act* reaffirms the rights of Aboriginal people to continue to use the resources of an area of land or water in the traditional manner in which they have done so historically. Traditional manner effectively recognises that Aboriginal clans have marine estates and have cultural rights and responsibilities in those estates.

The Marine Park is used extensively by the traditional owners of Cobourg Peninsula. The traditional owners generally access the Marine Park and its resources from the outstations that have been established on the adjacent Sanctuary. There are currently six outstations established on the Sanctuary. Some traditional owners also live on Croker Island and access the Marine Park and its resources from there. Dugong, turtle, crabs, fish and shellfish have always been an important part of Aboriginal people's diet. Additionally, many marine species such as dugong and turtle have spiritual, ritual and mythological significance in Aboriginal traditions.

The Park contains a number of sacred sites and sites of significance to the Cobourg people; there are dreaming tracks and sacred sites in and under the sea. Whilst the location and traditions associated with some of these sites and dreaming tracks have been recorded, many more sites remain unrecorded. Much information relating to the traditional management of the Marine Park also remains unrecorded and there are concerns that this knowledge will be lost with the passing of senior elders. This indigenous knowledge is also important to the management of the Marine Park, particularly in relation to managing sacred sites and marine species in a culturally appropriate manner.

Protecting and managing sacred sites and sites of significance in accordance with Aboriginal law and tradition is part of the obligation and responsibility of traditional custodians. In a Marine Park context, this may include regulating access and activities in some areas of the Marine Park. The zoning scheme is the primary management tool used for the management of activities and developments in the Cobourg Marine Park.

Sacred sites are also protected under the provisions of the *Northern Territory Aboriginal Sacred Sites Act* whether they are registered or not. The provisions of the *Northern Territory Heritage Conservation Act* may also provide protection for Aboriginal cultural heritage sites if they are listed on the NT Heritage Register.

4.2 Aboriginal Economic Development

Of prime importance to the traditional owners of Cobourg Peninsula is the establishment of a viable economic base to provide Cobourg Aboriginal people with the ability to live on the Sanctuary if they choose and continue traditional cultural practices and obligations for both the Marine Park and Sanctuary.

Generally, opportunities for employment and training for Aboriginal people in the Park include:

- direct employment by the Parks and Wildlife Commission as Rangers and trainees;
- short term employment through Community Development Employment Programs (CDEP) for specific land and sea management projects. These projects are generally performed in conjunction with Park staff;
- employment through establishment of community based land and sea management ranger programs, and
- employment stemming from agreements with commercial operators in the Park, including commercial fisheries and pearling operations.
- employment in respect of managing the marine park according to traditional management practices.

Opportunities also exist for employment of individuals in commercial enterprises established by the Gurig Association or other representative organisations of the Cobourg Aboriginal people.



5.0 MANAGING FOR HISTORICAL VALUES

During the life of the Plan the Board will research, record and understand the Aboriginal marine history in the Park with emphasis on post contact and contemporary history.

The use of the Marine Park during the operation of the early European settlement of Fort Wellington (1827-29) in Raffles Bay and Victoria Settlement (1838-49) in Port Essington has been well documented and is of historic interest. Also of historic interest is the fact that some of the first western scientific descriptions and records of NT marine fauna come from specimens collected in Port Essington by residents and visitors to Victoria Settlement.

There are also several known shipwrecks within the Park. All shipwrecks over 75 years old are declared historic shipwrecks under the Commonwealth *Historic Shipwrecks Act*. The Museum and Art Gallery of the Northern Territory, within the Department of Natural Resources, Environment and the Arts, administers this Act. Shipwrecks, which lie within NT waters, are also subject to the *Heritage Conservation Act* administered by the Department Natural Resources, Environment, The Arts and Sport.

To date, there are six recorded shipwrecks within the Cobourg Marine Park; four have been inspected, seven are known but still unallocated and there are a further five that still remain unverified. The inspected wrecks are of European origin, however, there are also thought to be Macassan wrecks within the Park.

The wreck of the *Australian* off Vashon head is probably the most well known and best surveyed wreck in the Marine Park. Information on this wreck is provided as part of the display in the cultural centre at Black Point. The wreck of the *Australian* is still relatively intact, enhancing its heritage value. The Museum and Art Gallery of the Northern Territory has prepared a management plan for this wreck.

The major threat to most wreck sites is physical deterioration due to environmental conditions such as oxidation. There is also a potential risk of vandalism and anchor damage. Education and controlled access assist in reducing the risk of vandalism and anchor damage.



6.0 MANAGING FOR TOURISM AND RECREATIONAL VALUES

The Marine Park is currently used by three categories of visitors; those who are visiting and staying at Cobourg Sanctuary, sailors who moor in the area and stay on their boats and guests of Seven Spirit Bay Resort at Coral Bay.

The coastal scenery and opportunities for fishing, including sports and game fishing makes the Marine Park attractive. Passive recreational pursuits such as boating, sightseeing and wildlife viewing are also popular activities undertaken in the Park. The Park provides ideal conditions for sailing and cruising with sheltered waters and safe anchorage for all types of vessels.

The reefs and wrecks provide interesting and challenging opportunities for scuba divers and there are opportunities for observing marine turtles, dolphins and dugong within the Park. To date, these significant opportunities for commercial ecotourism activities with the Park have not been exploited to any great extent.

There may also be recreational and tourism opportunities for visitors seeking an indigenous cultural experience. These opportunities whilst desired by visitors have not always been able to be realised. The board and /or Parks and Wildlife Commission will investigate opportunities to facilitate, support, mentor and build aboriginal capacity in the Park.

6.1 Recreational Fishing and Tourism

The Park is very attractive for recreational fishing and tourism purposes. It features beautiful coastal scenery with safe anchorages for all types of vessels, and offers excellent opportunities for pleasure cruising, fishing, and boat trips to various parts of the Cobourg Sanctuary, including Victoria Settlement. The sheltered waters are ideal for sailing and are within one day's journey from Darwin.

The fishing is particularly good with opportunities for sport and game fishing for mackerel, queenfish, trevally, shark, barramundi, snapper and a variety of reef fish. Small sailfish and marlin have also been sighted in the Park. Of interest to visitors, and especially to divers, are the six known shipwrecks off the coast of the Cobourg Sanctuary.

Visitors to the Sanctuary often bring small dinghies with them and use these to explore the Marine Park and go fishing. Those who do not bring a boat have the option of joining a tour boat for fishing and sightseeing, including a visit to the ruins of Victoria Settlement at Port Essington.

Yachtsmen generally moor in sheltered bays, often in Port Essington, and cruise the seas of the Marine Park sightseeing, fishing, and in many instances, visiting Victoria Settlement.

The Seven Spirit Bay Resort at Coral Bay in the Cobourg Sanctuary is a relatively small scale, low impact development catering for approximately sixty guests and providing them with a variety of outdoor recreational opportunities.

The Resort runs its own boats and provides guests with a range of activities in the Marine Park, including fishing, sightseeing, and sailing. These activities are conducted according to the terms of the *Marine Park Agreement* entered into by the Resort and the Parks and Wildlife Commission. Under the terms of an agreement entered into with the Resort interests, the Parks and Wildlife Commission has issued the proprietor with a permit, renewable on a five yearly basis for the purpose of conducting tourism and tourism-oriented activities.

The tour operators based at Black Point and Cape Don on the Sanctuary provide sport fishing tours within the Marine Park. Sightseeing boat tours to Victoria Settlement are also operated from Black Point and the tour operator based at Cape Don has a permit to take clients by boat to Popham Creek where they can view corals under a closed canopy of mangroves.

In recent times, there have been a number of requests for the Board to permit additional fishing tour operators to operate in the Park. These requests have come from operators wanting permission to conduct 'mothership' type operations. Such operations do not require establishment of land based facilities, however mooring facilities may need to be provided for these vessels in some areas of the Marine Park, particularly in areas where there is potential for mooring and anchoring to damage important marine habitats and Park values. It is likely that the number of these types of requests will increase during the life of the Plan.

With the possibility of increasing number of large boats and yachts entering the Park, there is a need to develop mooring facilities in the more popular locations of the Marine Park.

The relative presence of coral reefs and the presence and abundance of marine turtles, dugong and whales in the Marine Park may provide opportunities for developing tours focussed on marine wildlife. These types of tours will require careful management.

6.2 Shipping and Boating

The Park presently receives a range of boating traffic including small recreational dinghies, sailing and cruising yachts, large naval patrol vessels, vessels used for Park management purposes, cruise ships, freight and supply barges, commercial fishing vessels and mother ships supplying commercial fishing boats. A major shipping lane is located in the vicinity of Cape Don.

It is anticipated that both powered and sailing craft will increase in numbers in the future. It is therefore important that management is able to respond to the varying needs of different vessels as well as the potential for oil spills and increased incidence of solid and liquid waste disposal. The natural and cultural values of the Park are recognised as a high priority area in the NT Oil Spill Response Atlas.

6.3 Visitor Access and Safety

A vast majority of visitors access the Cobourg Marine Park via the adjoining Sanctuary. There is a limit to the number of vehicles allowed within the Sanctuary at any one time (maximum 20 vehicles). There are no restrictions on visitor numbers accessing the Marine Park via the sea. At this stage, the number of visitors entering the Marine Park via the sea is unknown, but it is estimated to be less than 1000 visitors per year.

The safety of visitors in the Park is of prime importance to the Cobourg traditional owners, the Board and the Parks and Wildlife Commission. The remote locality of Cobourg Marine Park adds to its sense of adventure and self-reliance, but also requires that people take added care and caution in planning their visit.

The weather has a strong influence on the comfort level and safety of people visiting the Park and also has a strong bearing on the degree of access to the Park; flooding, strong winds, even cyclones and high seas can and do occur between November and April. As such, it presents life-threatening hazards to boat users. In addition, the presence of estuarine crocodiles, box jellyfish and sharks in the waters presents serious hazards to swimmers and, to a lesser extent, to divers.

While the Board will make every effort to ensure the safety of visitors to the Park, the onus is on visitors to comply with the legal requirements of the Ports and Harbour Authority with regard to the operation of vessels and with the requirements of the Northern Territory *Marine Act*. Pre-visit information and information provided at the visitor centre in the adjoining sanctuary that outlines visitor safety issues and preparedness will help to improve safety in the Park. Costs associated with search and rescue arising as a result of carelessness or disregard of regulations may be sought from the individuals concerned.

There are three serviced airstrips in the adjoining Sanctuary including one at Black Point, one at Cape Don and one in the vicinity of the Seven Spirit Bay Resort on Coral Bay. In the event of an emergency, these airstrips would provide important emergency response capacity and medical evacuation capacity.



7.0 MANAGING FOR ECONOMIC VALUES

7.1 Commercial Fishing

A variety of commercial fishing operations take place within the boundaries of the Marine Park. These include net fishing for sharks and barramundi, longline fishing for sharks, drop lining and trapping of finfish, mud crab fishing, mackerel trolling and to a much lesser degree reef fishing. Commercial hand harvesting of trepang (sea cucumber) also takes place in the Marine Park.

NT Fisheries in consultation with key stakeholders manage the sustainable use of marine resources in the Marine Park under the NT *Fisheries Act*. To achieve this, a number of management strategies are used including limiting the number of licences, catch shares based on estimated sustainable catch, restrictions on fishing gear and areas of operation restrictions, as well as seasonal closures. Each of the fisheries that operate in the Park is currently managed using one of more of these mechanisms. In addition, a number of the fisheries operating within the Marine Park, including the Northern Prawn, Spanish Mackerel, Offshore Net and Line, Trepang and Mud Crab Fisheries, have been assessed by the Department of Environment and Heritage under the EPBC Act as sustainable and have been licensed to continue to export.

There is currently little information available on the impact of commercial fishing operations on the flora and fauna and ecosystems within the Marine Park. Fisheries conducts research and monitoring of the commercial fishing industry in the NT. This research and monitoring includes research into the biology of important commercial species, collection of data on fish stocks and collection of data on fishing catch and effort. If managed fisheries are to be sustainable in the Marine Park, more site specific monitoring and research will be required such as information on the levels of commercial fishing effort from commercial fishers operating within the Park.

The Northern Prawn Fishery also operates within the Marine Park, although catch and effort information suggest, that areas outside the boundary of the Marine Park are likely to be of greater importance to the Northern Prawn Fishery. The Northern Prawn Fishery is managed by the Australian Fisheries Management Authority under the *Fisheries Management Act 1991* and the Northern Prawn Fishery Management Plan. In general, prawn trawling takes place at depths of 10-80 metres over mud or sandy bottom. Historically, prawn trawling has occurred within Port Essington and Port Bremer.

It is known that prawn trawling generally has a substantial by-catch. The introduction of turtle exclusion devices (TED) has reduced the incidence of marine turtle and other large marine species by-catch however large numbers of other smaller non-target species are caught and discarded. The impact of this by-catch on fish stocks in the Marine Park is not known. The Northern Prawn Fishery is also developing by-catch reduction devices to reduce the amount of small by-catch in the fishery.

The Board is also concerned about the impact of prawn trawling on the Park's benthic environment. Currently CSIRO is conducting a study on the effects of trawling on benthos in the Gulf of Carpentaria and the Board would like similar research to be undertaken within the Park.

A considerable amount of discarded net and other marine debris is washed ashore. Most of the nets are of Asian origin however some is from Australian fisheries. Marine debris, including discarded nets, presents a significant threat to marine species such as marine turtles.

The code of practice for individual commercial fisheries requires commercial fishermen to collect and dispose of discarded gear and debris. The codes of practice also require that any accidental loss of gear be reported to the appropriate authorities immediately and all attempts are made to retrieve the gear.

Traditional owners have expressed interest in participating in commercial fishing industry in the Marine Park and more generally. Traditional owners should continue to be encouraged to participate in sustainable commercial fishing operations.

It is important that use of the Marine Park, including use by all commercial fishing interests, is consistent with the overall objectives of the management of the Marine Park.

7.2 Pearling

The pearling industry within Australia's northern waters is recognised as one of the best in the world. The main areas of pearling activity in the NT are Bynoe Harbour, Cobourg Peninsula and English Company Islands. The pearling industry has operated in Northern Territory waters since the late 19th Century. Diving for pearl shells probably occurred in the waters off Cobourg Peninsula from the early 1940's until the mid 1950's when the pearl shell industry declined. Pearling leases for the cultured pearl industry in the waters surrounding the Cobourg Peninsula were first granted in 1979 although pearl farms were operating at Cobourg before this time. These pearling leases were granted before the Marine Park was declared in 1983 and these leases do not form part of the Marine Park.

Pearl culture in the NT is open water farming. Pearl oysters, either collected from the wild or hatchery reared, are impregnated with "nuclei" which stimulates the pearl oyster to cover it with nacre. Seeded oysters are normally suspended in panels that are attached to floating long-lines within a pearling lease area. Quality pearls are retrieved from the oyster after approximately two years.

Within the area bounded by the Cobourg Marine Park, pearling lease areas exist in Port Bremer, Raffles Bay, Berkley Bay as well as Knocker and Curlew Bays in Port Essington. However, these lease areas are leasehold areas and as such do not form part of the Marine Park. The pearling lease site in Raffles Bay is directly adjacent to an outstation living area.

There is great potential for increased use of the Marine Park for pearling culture. However, any future pearling lease areas will be subject to this Plan of Management and Aboriginal aspirations to participate in this industry.

7.3 Aquaculture

There are currently no aquaculture practices being undertaken within the boundaries of the Cobourg Marine Park. However, there are certain characteristics of this area and the adjacent sanctuary, which make the Marine Park potentially attractive for aquaculture purposes. Such characteristics include numerous indented bays, sheltered conditions, close proximity to Darwin and its relatively small population. Potential viable aquaculture opportunities may include (but not limited to) coastal mariculture for edible oysters, ranching practices for trepang and sponge culture.

In accordance with this Plan of Management, aquaculture is only allowed, by permit, in the Multiple Use A, Multiple Use B and Port Essington Zones of the Marine Park.

Aquaculture may provide opportunities for traditional owners to develop partnerships with commercial fishery operators and help to fulfil their desire to build a more secure economic future for residents and traditional owners of the Cobourg Peninsula.

7.4 Mining and Exploration

There are currently no operations for the recovery of minerals in the Park, nor any mining permits or petroleum exploration licences over the Marine Park. Proposals for mineral resource recovery and exploration in the waters in the Park have the potential to impact upon the Park values. These activities may also impact nationally threatened species and migratory species listed under international treaties and conventions.

Under the provisions of the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act*, the Board may provide advice to the Minister for Parks and Wildlife Commission on matters relating to the exploration and recovery or proposals for the exploration and recovery of minerals from the Marine Park.



8.0 MANAGING FOR EDUCATIONAL VALUES

To adequately manage visitors and help to ensure their safety within the Marine Park, provision of appropriate communication programs that provide clear directions, orientation and information is essential. A range of educational and interpretive material has been developed for both the Marine Park and the Sanctuary to assist the Traditional Aboriginal Owner's with educational and interpretative tourism opportunities. The Board will continue to monitor and improve interpretive material for the Park.

It is recognised that there is a need for more information about the Marine Park so that visitors may appreciate the range of recreational opportunities available and the management strategy being adopted to conserve the values of the Park. By increasing public awareness of the area, its enjoyment by visitors can be improved while at the same time increasing the protection afforded to the Marine Park's natural resources. Additionally, explaining the reasons for management practices can increase the level of compliance with Park regulations.

The lifestyle and culture of the Aboriginal people, and opportunities for contact with Cobourg Aboriginal people, especially in regard to their use of the Marine Park, represents an added dimension to the Park. Aspects of Aboriginal culture, lifestyle and resource use are of considerable interest to the visiting public.



9.0 STRATEGIES FOR MANAGEMENT

9.1 Zoning Scheme

The Zoning Scheme for the Park is one of the major strategies used in pursuing the intent of the Plan and provides a broad basis for the management of activities and developments within defined zones. This is to ensure that the uses of the Park are compatible with the overall objectives and values for management of the Marine Park (Section 2).

The Board, Parks and Wildlife Commission, traditional owners of land and sea in the region and Fisheries Group have developed the zoning scheme in co-operation with key stakeholder groups including commercial, recreational fishing and pearling interests.

It is intended that this zoning scheme and other management strategies will be mirrored in the Cobourg Marine Park Fishery Management Area Management Plan prepared under part 3 of the Northern Territory *Fisheries Act*.

The following management zones have been developed to assist in the regulation and management of the Marine Park.

- Multiple Use A Zone
- Multiple Use B Zone
- Port Essington Zone
- Conservation Zone
- Scientific Reference Zone
- Coral Bay Zone
- Outstation Privacy Area Zone

There are currently six outstations in the Sanctuary adjacent to the Marine Park; Araru, Ardbinae, Gumuragi, Gul Gul, Meriah and Irgul.

The traditional owners of Cobourg Peninsula and surrounding marine areas acknowledge the interests of various stakeholders in the use and enjoyment of the Park. However, they also wish to ensure a degree of privacy in the vicinity of their outstations, including adjacent marine areas. Consequently, they have requested the establishment of Outstation Privacy Area Zones in the Marine Park. This request has been supported by the Board and is reflected in the Park zoning scheme.

The Park Zoning Scheme is provided at Figure 2. A description of the management zones, management objectives and strategies is provided in Table 1. A list of the uses and activities within each zone is outlined in Table 2. A description of the zones by way of co-ordinates is outlined in Schedule 1.

The Park Zoning Scheme will be legislated pursuant to existing Territory and Commonwealth Legislation. That is, the *Territory Parks and Wildlife Conservation Act*, *Fisheries Act*, *Cobourg Peninsula Aboriginal, Land, Sanctuary and Marine Park Act*, *Marine Act* and the *Commonwealth Fisheries Act* unless otherwise stated. Activities and access to the Outstation privacy zone will not be legislated.

The regulation of activities and access within any of the zones may be adjusted if activities or access is shown to be inconsistent with the objectives of the Park and where values are threatened.

TABLE 1: COBOURG MARINE PARK SUMMARY OF ZONES

MANAGEMENT ZONE	PURPOSE	MANAGEMENT STRATEGY	ACCESS
Multiple Use A	To provide for multiple use of the park's resources including more intensive commercial fishing activities, protection of important conservation and scientific values and sustainable use of natural resources	To provide appropriate areas for more intensive commercial fishing activities such as prawn trawling and netting and establish co- operative monitoring programs to monitor and manage those fisheries in the Park. Undertake research to better understand the values of this part of the Park.	Uses consistent with Park management objectives and values will be permitted to continue. Scope has been provided for future aquaculture prospects. These will be considered on a case by case basis.
Multiple Use B	To provide for multiple use of the park's resources including less intensive commercial fishing activities, protection of important conservation and scientific values and sustainable use of natural resources	To provide appropriate areas for less intensive commercial fishing activities and establish co- operative monitoring programs to monitor and manage those fisheries in the Park. Undertake research to better understand the values of this part of the Park.	Uses consistent with Park management objectives and values will be permitted to continue. Commercial netting, trawling and longlining is not permitted in this zone. Recreational drag netting is not permitted in this zone. Scope has been provided for continued fishing and non-extractive tourism, as well as aquaculture prospects. These will be considered on a case by case basis.
Port Essington	To provide for a higher level of protection of marine biodiversity and habitats, and significant cultural heritage sites in an area of the Marine Park that sustains a higher level of visitor/ recreation use.	Limit the range of commercial and recreational activities to those consistent with higher levels of visitor use. Establish co- operative monitoring programs and research to improve management and knowledge of the values of this part of the Park. Hand harvest of Trepang is permitted in this zone by agreement with Traditional Owners.	Commercial fishing is restricted to trepang fishing only in this area. Recreational drag netting, crab potting and spearfishing is not permitted in this zone. Scope has been provided for continued fishing and non-extractive tourism, as well as aquaculture prospects. These will be considered on a case by case basis.
Conservation	To protect significant species and their habitat including dugong and marine turtle populations.	To provide a high level of protection to the conservation values within the zone by limiting commercial, recreational and traditional owner activities and providing a focus for conservation initiatives.	No commercial or recreational fishing and no fishing tourism. Provision is made for non-extractive tours to be undertaken on a permit basis. No traditional hunting of turtle or dugong. Speed restriction of max 15 knots on motor boats in order to reduce incidence of dugong and turtle strikes. Anchoring and mooring will only be permitted on a permit basis.

MANAGEMENT ZONE	PURPOSE	MANAGEMENT STRATEGY	ACCESS
Scientific Reference	To provide special protection to areas of high ecological significance and monitor condition over time. To protect sites of Aboriginal cultural significance.	Limit and regulate access. Establish research and monitoring programs for significant ecosystems and habitat. Manage Aboriginal sites of significance in accordance with relevant Commonwealth and NT legislation and in accordance with directions from Traditional Owners.	Highly restrictive access in order to protect values of outstanding scientific and conservation significance. Access by permit only.
Coral Bay	To provide privacy to resort guests at Seven Spirit Bay Resort at Coral Bay.	Manage the area in accordance with the Lease Agreement and Marine Park Agreement. Access restricted to Seven Spirit Bay Resort staff and guests only.	Fishing Tourism opportunities, day use anchorage and traditional owner use will be permitted. Speed restriction of max 15 knots on motor boats in order to reduce incidence of dugong and turtle strikes. Anchoring and mooring will only be permitted on a permit basis.
Outstation Privacy Areas *	To protect the privacy of the Traditional Owners in the vicinity of their outstations and to provide for traditional Aboriginal resource use.	Through educational and promotional initiatives, enhance public awareness to ensure the protection of privacy for residents at outstations established on the sanctuary. Activities in this zone will not be regulated through legislation. Vessels may traverse zone, no fishing or anchoring (except in emergency). The number of outstation privacy areas is restricted to a maximum of eight within the life of this plan.	Through education and promotion enhance public awareness of the range of activities to provide for traditional Aboriginal resource use and to protect the privacy of the Traditional Owners in the vicinity of their outstations. Vessels may traverse zone, no fishing or anchoring (except in emergency conditions).

* the outstation privacy area surrounding the Meriah outstation does not form part of the Marine Park however the same respect for traditional owner privacy should be exercised as per the other outstation privacy areas.

TABLE 2: USES AND ACTIVITIES WITHIN EACH ZONE

ZONING SCHEME	Multiple Use A	Multiple Use B	Port Essington	Conservation	Scientific Reference	Coral Bay	Outstation Privacy Areas*
COMMERCIAL							
Prawn Trawling	Yes	No	No	No	No	No	No
Netting (all types)	Yes	No	No	No	No	No	No
Longlining	Yes	No	No	No	No	No	No
Line fishing	Yes	Yes	No	No	No	No	No
Fish Trawling	No	No	No	No	No	No	No
Crab potting	Yes	Yes	No	No	No	No	No
Aquaculture	Permit	Permit	Permit	No	No	No	No
Hand harvest (eg trepang)	Yes	Yes	Yes ¹	No	No	No	No
Aquarium collecting ²	Yes	Yes	No	No	No	No	No
RECREATIONAL							
Line fishing	Yes	Yes	Yes	No	No	No	No
Crab potting	Yes	Yes	No	No	No	No	No
Cast netting	Yes	Yes	Yes	No	No	No	No
Drag netting (baitnet)	Yes	No	No	No	No	No	No
Hand harvest (eg shellfish)	Yes	Yes	Yes	No	No	No	No
Spearfishing	Yes	Yes	No	No	No	No	No
Diving (non extractive)	Yes	Yes	Yes	Yes	No	Yes ⁵	No
Boating	Yes	Yes	Yes	Yes ³	No	No	Yes (traverse)
OTHER ACTIVITIES							
Traditional owner use	Yes	Yes	Yes	Yes ⁴	Yes	Yes	Yes
Anchoring & moorings	Yes	Yes	Yes	Permit	Permit	Permit	Permit
Authorized research	Permit	Permit	Permit	Permit	Permit	Permit	Permit
Fishing Tour Operator	Permit	Permit	Yes	No	Permit	Yes ⁵	No
Day Use Anchorage	Yes	Yes	Yes	Yes	No	Yes ⁵	No
Non Extractive Tours	Permit	Permit	Permit	Permit	Permit	No	No

1 Port Essington remains open for hand harvest of trepang subject to the agreement between Traditional Owners and the trepang licensee.

2 A review of management arrangements for aquarium fish collecting is to be conducted if in any one year four or more aquarium collectors' licences become active.

3 15 knot limit on motorised craft.

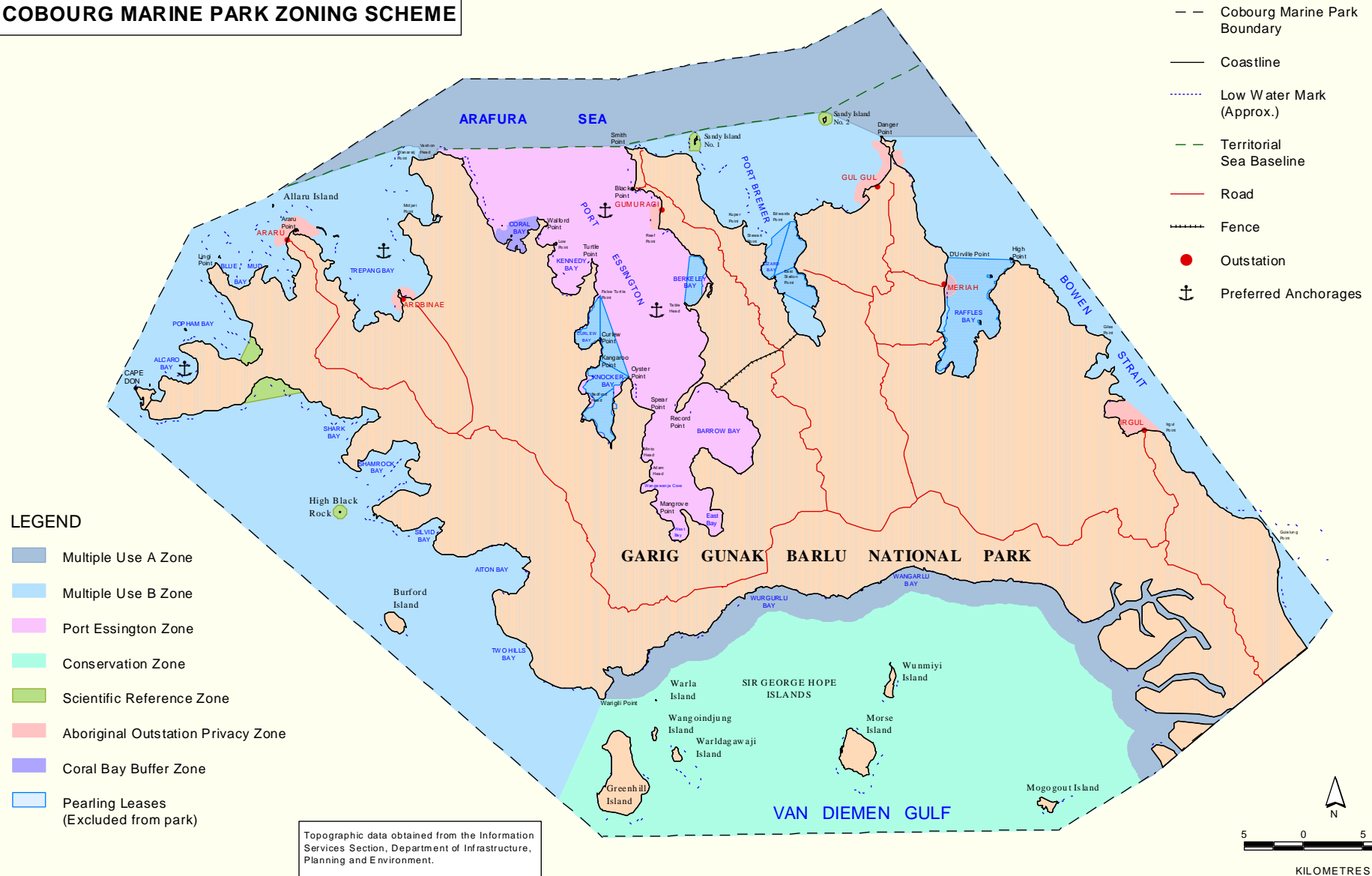
4 No traditional hunting of dugong and turtle.

5 Visitors (clients, staff and staff guests) of Seven Spirit Bay Resort and approved and licenced fishing tour operators only.

*Compliance with uses and activities in the Outstation Privacy Areas will be promoted through education not legislation.

FIGURE 2

**GARIG GUNAK BARLU
COBOURG MARINE PARK ZONING SCHEME**



All commercial operations are required to operate under a permit, lease, licence and/or concession agreement issued by the Board and/or under the provisions of the *NT Fisheries Act*. The Board may approve the issuing of leases, licences and permits in accordance with the provisions of the *Territory Parks and Wildlife Conservation Bylaws*. The leases, licences or concession agreements specify conditions associated with the operation of commercial activities within the Park.

A permit from the Cobourg Board is required to undertake the following activities in part of or all of the Marine Park:

- Commercial Aquaculture (including future pearling activities)
- Research
- Fishing Tour Operations (including the use of motherships)
- Non Extractive Tours (sightseeing/wildlife viewing tours)
- Anchoring and Mooring

(refer to Table 1 Uses and Activities Permitted within each Zone for details).

The Director of Fisheries will consider any aspirations or issues raised by the Board when requested to issue aquaculture permits for the Park.

Individuals, institutions, groups or companies wanting to undertake one or more of these activities in areas of the Marine Park where a permit is required will need to apply to the Cobourg Peninsula Sanctuary and Marine Park Board for a permit.

In assessing an application, the Board will take account of the following:

- Benefit to management of the Marine Park;
- Benefit to residents of the Park and members of the group;
- Protection of natural and cultural values;
- Adequacy of information provided in the application;
- Existing arrangements or operations;
- Likely impact on management operations of the Park;
- Provisions of this Plan of Management;
- Requirement for Environmental Assessment;
- Provisions of the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act* and other relevant Legislation;

- Permits and/or licence requirements of other management authorities;
- Area, location and time of operation;
- The number of persons permitted to undertake activity at any one time
- The number and type of equipment that can be used;
- Facilities that can be used;
- Specific environmental requirements (eg type and number of species that can be taken and requirement to prepare environmental management plan);
- Specific access requirements (eg route that can be taken, access site to be used, area to be used for mooring or anchoring);
- Reporting requirements; and
- Fees and royalty payments.

The Board will not be limited to considering only these elements of an application and the processes and timeframe for assessing an application will vary depending on the type of activity and specific proposals in the application. The Board will however, undertake a transparent and open, fair and equitable process in its assessment of applications.

In approving a specific operation or use, the Board may set conditions in regards to the permit. The range of conditions applied to a permit will vary depending on the specific proposal. An open, consistent and transparent process will be undertaken in negotiating with applicants the conditions applied to each permit. The Board will endeavour to maintain consistency in permit conditions wherever possible and appropriate. When assessing applications to conduct research, the Board should take into account compliance with existing relevant ethical guidelines and protocols.

The Board shall determine the tenure of a permit, having due regard for other legislative requirements.

9.2 Other Management Strategies

9.2.1 Conservation and Scientific Values

- i) Establishment of a working group to identify and coordinate research and monitoring activities within the Park. A primary function of the group will be to remedy current deficiencies in knowledge about the natural environment and human impact on the ecosystems of the Park. Areas that the working group may wish to investigate include:
 - mapping of marine environments and habitats of the Park, particularly coral reefs and seagrass beds;
 - investigation of the cultural importance of the Park and Aboriginal use of marine resources;
 - investigation of the significance of bays and estuaries as breeding areas for marine life;
 - research into the invertebrates of the Park;
 - long term and short term monitoring of commercial (including fishing tour operators) and recreational fishing, including possible changes in the fish resource, and the prawn catch, effect of fishing on reef areas, and the effects of trawlers and commercial fishing on dugong, turtles and other marine wildlife and habitats;
 - monitoring for water quality;
 - Monitoring of marine debris;
 - location and survey of historic shipwrecks; and
 - traditional management practices and its incorporation into marine park management.
- ii) The Parks and Wildlife Commission will establish a mapping program to identify and characterise the marine environments, substrata and habitats of the Park. Information obtained from the mapping program will be used to identify significant habitat and to develop research and monitoring programs and management strategies for significant marine habitat and species in the Marine Park.
- iii) Monitoring and survey of rocky reefs and coral reefs will continue as a matter of priority in the Park.
- iv) Develop a mooring policy for the Marine Park.

- v) An oil spill emergency response plan will be prepared for the Park detailing procedures to be followed in the event of a spill.
- vi) The management of the intertidal areas of the Sanctuary with the adjacent areas of the Marine Park will be integrated through the development of complementary management strategies and zoning in the Sanctuary Plan of Management.
- vii) The Parks and Wildlife Commission, in cooperation with the Cobourg Board and Park's traditional Aboriginal owners, custodians, and park residents will develop a monitoring program of traditional resource use within the Marine Park. The program will assist in establishing sustainable use of marine resources and assist in incorporating traditional management practices into marine management.
- viii) The Board will employ Aboriginal people in the researching and monitoring programs for the Park, particularly programs that aim to establish sustainable traditional harvesting and commercial harvesting and will identify commercial opportunities for aboriginal people in harvesting marine resources.
- ix) The Museum and Art Gallery of the Northern Territory will be encouraged to continue with its research into the fauna and flora of Cobourg Marine Park, with a particular focus on Port Essington. Close liaison will be maintained to ensure that the Museum's work is integrated with the overall Research and Monitoring Program, and that the results are made available for Park management purposes.
- x) Other research bodies such as the Australian Institute of Marine Science and Charles Darwin University will be encouraged to assist in the conduct of priority projects in the Park.
- xi) Detailed proposals of all research and monitoring projects will require Board approval before any field work commences. Project proposals should provide information on the purpose and significance of the project, areas of the Park to be visited, procedures to be adopted, equipment to be used, likely impacts on the Park and the duration of the project. The Board in reaching a decision on any proposal will consider:
 - desirability of the research from the traditional owners' point of view,
 - benefits which may flow to the traditional owners in conducting the research,

- the extent to which the proposal fits within the framework of this Plan of Management,
- the professional status of the researcher (or researcher's supervisor),
- the potential for impacts on the Park's cultural and natural resources, and
- its relevance to Park management.
- In providing approval for a research or monitoring project, the Board will specify any restrictions on movements and activities of the research personnel. Failure to comply with these requirements may result in the withdrawal of approval for the project to continue. A report on the research undertaken and summary of the results must be submitted to the Board, at the completion of the project.

9.2.2 Aboriginal Values

- i) Within the constraints imposed by existing agreements with the Seven Spirit Bay Resort, the traditional owners of Cobourg Peninsula will be encouraged to develop appropriate tourist enterprises which provide a wider variety of experiences for visitors together with an appreciation of Aboriginal culture.
- ii) The Parks and Wildlife Commission will encourage the integration of Aboriginal tourist-based enterprises. This will be an important consideration in reaching decisions about commercial operations in the Park.
- iii) Joint venture style commercial operations will be encouraged.
- iv) If requested the Parks and Wildlife Commission will assist the traditional custodians in the care, management and control of Aboriginal sites of significance in accordance with their direction. If requested the Board and Parks and Wildlife Commission will facilitate the recording and registration of sacred sites under the provisions of the *Northern Territory Aboriginal Sacred Sites Act*.
- v) The Board will assist the traditional owners in having their history and cultural heritage, including sites of significance, documented according to their wishes. In most instances, this will mean referral to outside authorities or experts, in particular, the Aboriginal Areas Protection Authority. This documentation will be undertaken under conditions specified by the Board and the resulting information may be used to guide Park management or for interpretive purposes, but only in so far as the traditional custodians permit.

- vi) The Parks and Wildlife Commission will employ and train Aboriginal people as rangers in the Park in accordance with the Commission's Indigenous Employment Strategy.
- vii) Wherever possible, the number of Aboriginal employees and opportunities for different kinds of employment in the Park will be increased. Where there are opportunities for part-time, temporary or contract employment, the Parks and Wildlife Commission will, in the first instance, employ qualified and experienced Aboriginal people.
- viii) The Board will develop a program for the employment of Aboriginal people in management of the Marine Park including using CDEP and community ranger programs.
- ix) If requested the Board and Parks and Wildlife Commission will assist traditional owners in establishing a community sea ranger program for the Park.
- x) In order to provide privacy in the vicinity of Aboriginal living areas and to meet obligations under the Marine Park Agreement entered into with the proprietor of the Seven Spirit Bay Resort, some areas will be accessible only by permit.
- xi) The Board may further regulate access to any areas within the Park if it becomes apparent that such access is having a negative impact on values of the Park.

9.2.3 Historical Values

- i) The Board will be responsible for setting guidelines and conditions for scuba diving on wrecks within the Marine Park.
- ii) Consideration will be given to identifying and installing safe anchoring and/or mooring facilities in the vicinity of wrecks.
- iii) Removal of artefacts and damaging of wrecks is not permitted.
- iv) All survey and protection work on historic shipwrecks will be in accordance with the *Historic Shipwrecks Act* and the *Heritage Conservation Act*.

9.2.4 Tourism and Recreational Fishing Values

- i) All recreational fishing activities will be managed in accordance with the Park Zoning Scheme and relevant NT and Commonwealth legislation.
- ii) Visitor access and activities will be regulated in accordance with the Park's Zoning Scheme.
- iii) Changes to the management practices or licensing arrangements for recreational fishing in the Marine Park will be developed through a cooperative process and in consultation with the key stakeholder groups.
- iv) Recreational fishing surveys will be undertaken within the Park within the life of this plan.
- v) All boats entering the Marine Park must comply with relevant Commonwealth and NT boating and shipping regulations.
- vi) Information will be provided to ships and boats operating in the Park about safety requirements, access and zoning and conditions of use including waste disposal regulations within the Marine Park.
- vii) A Visitor Safety and Disaster Contingency Plan will be prepared for the Park. The Plan will take into account the following:
 - provision of printed information and signs relating to hazards in the Park including crocodiles, box jellyfish, sharks, snakes and potential driving and boating hazards,
 - the provision of safety information with regard to cyclones,
 - the inclusion of safety warnings on permits and booking slips issued to visitors,
 - the provision of information on general safety procedures with regard to boating and vehicle transport,
 - safety and emergency procedures to be adopted,
 - staff training in first aid and search and rescue procedures.
- viii) Safety standards will be followed in all aspects of Park management.

- ix) The Park Zoning Scheme designates preferred sites for anchoring within the Park based on natural and cultural values. Boat owners are encouraged to use these sites.
- x) Discharge of solid and liquid waste is prohibited in the Marine Park under the provisions of the *Territory Parks and Wildlife Conservation Bylaws*.
- xi) Dumping of bilge water or disposal of waste from boats is not be permitted within the Marine Park.
- xii) During the life of the plan, the Board will give consideration to establishing approved procedures for disposing of bilge water and waste by visitors to the area.
- xiii) The carrying of firearms or ammunition in the Park by visitors is regulated under the Bylaws, except in the case of the traditional owners of the Sanctuary for purposes of hunting traditional food sources. All persons must comply with the provisions of the Northern Territory *Firearms Act*.
- xiv) Recreational diving is permitted within the Marine Park under the provisions of the Park Zoning Scheme. Where diving is permitted, there is to be no site disturbance and no material is to be carried away.
- xv) Parks and Wildlife Commission rangers will have the right to inspect and monitor tourism and recreational activities being undertaken within the Marine Park.
- xvi) All fishing tour operations including those regulated under the provisions of the *NT Fisheries Act* are required to operate under a permit, lease, licence and/or concession agreement issued by the Board. Leases, licences and permits are issued under the provisions of the *Territory Parks and Wildlife Conservation Bylaws*. The leases, licences or concession agreements will specify conditions associated with the operation of commercial activities within the Park. In approving the issuing of leases, permits and concessions the Board will take account of the following:
 - potential impacts on the Park's natural and cultural values and the possible need for environmental protection measures and the preparation of an Environmental Impact Statement,
 - employment and income earning opportunities for the Park's traditional owners,

- protection of sites and relics of historical significance,
- maintenance of scenic and recreational values,
- potential impacts on health, safety, social and cultural issues,
- the capacity of the company to carry out the agreement in accordance with the values of the park and comply with the legal and management requirements.

9.2.5 Economic Values

- i) Commercial fisheries operating in the Marine Park will be managed in accordance with the Park Zoning Scheme / Fisheries Management Area Management Plan and relevant NT and Commonwealth legislation.
- ii) Any changes to the management practices or licensing arrangements for commercial fisheries operating in the Marine Park will be developed through a co-operative process and in consultation with the key stakeholder groups.
- iii) Any mining or exploration proposals in relation to the Park must be conducted in accordance with the relevant NT and Commonwealth legislation including the Northern Territory *Environmental Assessment Act* and the Commonwealth *EPBC Act*.
- iv) The board will encourage and support Aboriginal involvement in commercial fisheries, pearling and aquaculture operations in the park.
- v) The Board will seek to have biologically important areas of the Park such as the Conservation Zone and Scientific Reference Zones reserved from occupation of mining.
- vi) In accordance with Section 34A of the Act, the Board in consultation with the Cobourg Fisheries Management Area Advisory Committee (CFMAAC) may consider the impact of mineral recovery and exploration in the waters surrounding the Marine Park and provide appropriate advice to the Minister responsible for the *Mining Act*.

9.2.6 Educational Values

- i) A Communication Plan will be developed for the Park in consultation with the Board and traditional owners. The Plan will clearly identify:

- stakeholders and audience,
- resources for interpretation,
- messages and interpretive themes,
- media, communication techniques and sites, and
- evaluation techniques.

ii) The Communication Plan will:

- provide opportunities for visitors to gain an understanding and appreciation of the values of the Marine Park;
- increase visitor awareness and appreciation of the variety and significance of marine life and habitats;
- include messages that encourage a low impact ethos in the Marine Park and inform visitors about potential threatening processes in the Park;
- increase public awareness of the importance of the Marine Park in protecting marine biodiversity;
- include strategies to ensure that accurate information about the Park's special cultural significance, physical features and joint management arrangements are presented to visitors;
- include strategies to ensure that visitors receive adequate information and advise on the hazards and risks present in parts of the Park or associated with certain activities;
- include strategies to ensure that traditional owners have opportunities to directly interpret their culture and traditions for visitors; and
- make provision for interpretive training for interested traditional owners.

iii) Efforts will be made in the Communication Plan to increase visitor awareness and appreciation of Aboriginal culture and lifestyle.

iv) Pre-visit information will be made available to intending visitors informing them of permit requirements, safety precautions and other relevant information to better prepare them for their visit.

v) Provision will be made for the traditional owners, in so far as they wish, to be involved in the interpretation of the Park and to communicate to visitor's aspects of Aboriginal lifestyle and culture. This may provide an opportunity for traditional owners to develop commercial tourism opportunities relating to visitor education.

- vi) The Park's traditional owners will be consulted in the development of the educational and interpretive program for the Park, and will have the right to determine its Aboriginal content.
- vii) Interpretative measures will be used, where appropriate, to inform visitors of any restrictions on their access to or use of certain areas and to bring relevant bylaws or other regulations to their attention in a positive way. These measures will include an explanation of the reasons underlying such regulations and restrictions.



10.0 ENFORCEMENT OF THE PLAN

The Plan of Management for the Marine Park will be enforced by the Parks and Wildlife Commission rangers as well as the Police, Marine and Fisheries Enforcement Unit. Opportunities for greater involvement of traditional owners to contribute to the enforcement and education of the general public on the permitted uses of the Park will be investigated and supported during the life of the Plan by the Board. The Fisheries Group will implement a marine ranger program in conjunction with all other interested parties during the life of the Plan.

11.0 EVALUATION AND REVIEW OF THE PLAN

The Plan will be in operation for a maximum of ten years unless amended or revoked by the preparation of a new plan in accordance with the provisions of either of the above named Acts. A review of the Plan and its provisions will be conducted once the Plan has been in operation for five years (mid term review).

It will be the responsibility of the Cobourgh Board and the Cobourgh Fisheries Management Area Advisory Committee (CFMAAC) to review the management programs annually to assess the progress of implementation of the plan and the effectiveness of those programs. Measures of effectiveness of the management strategies will be developed by the Cobourgh Board in consultation with the CFMAAC within the first two years of the life of the Plan. If necessary, consideration will be given to means of improving the effectiveness of a particular management strategy within the life of the Plan.



12.0 REFERENCES

- Bayliss, P (1986) "Factors Affecting Aerial Surveys of Marine Fauna, and their Relationship to a Census of Dugong in the Coastal waters of the Northern Territory", *Aust. Wild. Res.* 13, 27-37
- Blake, N. M., Wightman, G. M., Williams, L. L. V. 1998. Iwaidja Ethnobotany: Aboriginal plant knowledge from Gurig National Park, Northern Australia. Northern Territory Botanical Bulletin No. 23, Parks and Wildlife Commission of the Northern Territory, Palmerston.
- Bruce, A. J. (1986) "Three New Species of Commensal Shrimps from Port Essington, Arnhem Land, Northern Australia", *The Beagle, Occasional Papers of the N.T. Museum of Arts and Sciences*, 3(1), 143-166
- California State Department of Parks and Recreation, *Underwater Parks Masterplan*, Sacramento, California
- Chatto, R and Warneke, R. M. (2000) Records of cetacean strandings in the Northern Territory of Australia. *The Beagles, Record of the useums and Art Gallery of the Northern Territory* 16:163 – 175.
- Conservation Commission of the Northern Territory (1987) *Area Statement for Cobourg Marine Park*. Unpublished.
- Conservation Commission of the Northern Territory (1987) *Coastal Resources Atlas of the N.T.* Unpublished.
- Conservation Commission of the Northern Territory (1987) *Garig Gunak Barlu National Park Gunak (Sanctuary) Plan of Management*, Darwin, N.T.
- Craik, W. (1978) *Fisheries Factors Affecting Marine Park Management*, Great Barrier Reef Marine Park Authority

- Dodd, C. K. (1988) *Synopsis of the Biological Data on the Loggerhead Sea Turtle*, Fish and Wildlife Service, U.S. Department of the Interior
- Edgar, G. (1981) *An Initial Survey of Potential Marine Reserves in Tasmania*, Tasmania National Parks and Wildlife Service
- Ferns, L (1999) *Interim Marine Biophysical Regionalisation for the Northern Territory Version I: A bioregional framework for marine conservation in the Northern Territory*, Northern Territory Parks and Wildlife Commission, Darwin Australia.
- Gomeluk V.E (2002) *Assessment of Condition of Rock Oysters at Cobourg Marine Park*, Northern Territory Parks and Wildlife Service, Darwin Australia
- Gomeluk V.E (2003) *Checklist of Coral and Rock Reef Fish Species at Garig Gunak Barlu National Park*, Northern Territory Parks and Wildlife Service, Darwin Australia
- Gomeluk V.E (2003) *Coral Bleaching at Cobourg Marine Park in 2002-2003*, Northern Territory Parks and Wildlife Service, Darwin Australia
- Gomeluk V.E (2003) *First Months of Coral Environment Monitoring at Cobourg Peninsula*, Northern Territory Parks and Wildlife Service, Darwin Australia
- Hope R., and Smit N. (1998) Marine Turtle Monitoring in Gurig National Park and Cobourg Marie Park. In Kennett, R., Webb, A., Duff, G., Guinea, M. and Hill, G. *Marine Turtle Conservation and Management in Northern Australia*. CINCRM and CTWM, Darwin. Pp 53 – 62.
- House of Representatives Standing Committee on Environment, (1980) *Management of the Australian Coastal Zone*, AGPS, Canberra
- Interim Marine and Coastal Regionalisation Technical Group (1998) *Interim Marine and Coastal Regionalisation of Australia: an ecosystem based classification for marine and coastal environments. Version 3.3*, Environment Australia, Commonwealth Department of the Environment, Canberra
- Marsh, H. (1979) *The Dugong*, James Cook University of North Queensland, Townsville
- Morgan, G. J. (1987) "Hermit Crabs of Darwin and Port Essington, Northern Australia", *The Beagle, Records of the Northern Territory Museum of Arts and Sciences*, 4(1), 165-186
- Poiner, I. and Roberts, G. (1986) *A Brief Review of Seagrass Studies in Australia*, CSIRO Division of Fisheries Research, Cleveland, Qld.
- Porter, L. and Chivers, B. L. (2005). *Small Cetacean Survey of the Timor Sea: Australian – Indonesian Timor Leste Marine Mammal Research Training Programme and*

Demonstration Survey. A Final Report prepared for Environment Australia. WWF Australia. Pp50.

Salm, R. and Clark, J.R. (1984) *Marine and Coastal Protected Areas: A Guide for Planners and Managers*, IUCN, Gland, Switzerland

Spillet, P.G. (1972) *Forsaken Settlement*, Landsdowne Press, Melbourne

Steinberg, D (1999) *The Australian Historic Shipwreck Plan of Management*, Museum and Art Gallery of the Northern Territory, Darwin Australia.

SCHEDULE 1 Co-ordinates for Zoning Scheme

Point	Latitude			Longitude			Description	
	Deg	Min	Sec	Deg	Min	Sec		
A	-11	9	2.86339	131	52	29.15978		Multiple Use A Zone (Northern): All that area of sea from the Seaward boundary of the Marine Park to the Territorial Sea Baseline and including the areas between the territorial sea baseline and a straight line between point F and G and a straight line between H and I.
B	-11	4	12.84399	132	0	46.24606		
C	-11	4	17.83572	132	7	53.24096		
D	-11	2	56.8393	132	16	31.23803		
E	-11	1	16.83347	132	20	4.23925		
F	-11	7	1.45082	132	24	20.77962		
G	-11	6	59.1842	132	20	2.01605	Eastern side of Danger Point	
H	-11	6	58.91949	132	19	57.84218	Western side of Danger Point.	
I	-11	5	51.27105	132	17	25.53151	From this point the boundary of zone follows the Territorial Sea baseline to point A.	
A	-11	32	25.58299	132	6	57.07113	Warigili Point	Multiple Use A Zone (Southern): All area of sea and estuary (below high water mark) extending out to 2 km from high water mark running parallel to the coast between points B and C and all area of sea from high water mark to the straight line between point A (Warigili point) and point B.
B	-11	32	26.25847	132	8	11.78165		
C	-11	36	22.9781	132	31	39.25677	Boundary of the Marine Park	

	Latitude			Longitude			Description	
Point	Deg	Min	Sec	Deg	Min	Sec		
A	-11	7	30.48439	131	59	38.59525	North west boundary of Port Essington zone	Multiple Use B Zone (West): All areas below high water mark to the Park Boundary from a line between A and B (North west boundary of Port Essington zone) following the territorial sea baseline to point A. and then to the line between G and H (Western boundary of Conservation Zone) but not including the Scientific Reference Zone.
B	-11	7	25.75432	131	59	38.64653		
C	-11	9	2.86339	131	52	29.15978		
D	-11	9	34.87431	131	51	34.24176		
E	-11	10	52.84553	131	48	12.24078		
F	-11	18	54.87134	131	44	12.22905		
G	-11	36	56.20768	132	4	52.2569	Western boundary of Conservation Zone between Warigilli Point and seaward boundary of the Park.	
H	-11	32	25.58299	132	6	57.07113		
I	-11	30	21.80628	132	39	21.64317		Multiple Use B Zone (east): All areas below high water mark to the Park Boundary and the southern boundary of Multiple Use A zone (Northern) from I to the line between O and P (North east boundary of Port Essington zone) but not including the Scientific Reference Zone.
J	-11	28	46.90264	132	40	34.19846		
K	-11	7	1.45082	132	24	20.77962	Southern Boundary of Multiple Use A Zone (Northern)	
L	-11	6	59.1842	132	20	2.01605		
M	-11	6	58.91949	132	19	57.84218		
N	-11	5	51.27105	132	17	25.53151		
O	-11	7	18.37468	132	8	11.68917	North east boundary of Port Essington zone	
P	-11	7	21.14225	132	8	11.65778		

	Latitude			Longitude			Description	
Point	Deg	Min	Sec	Deg	Min	Sec		
A	-11	7	18.37468	132	8	11.68917	Port Essington Zone (Northeast): Territorial Sea Baseline at point A to highwater at point B.	Port Essington Zone: All that area below high water bounded by the territorial sea baseline and the northeast and north-west boundary; but not including coral bay or pearling leases in Knocker, Curlew and Berkley Bays or privacy zone around Gumeragi outstation.
B	-11	7	21.14225	132	8	11.65778		
C	-11	7	30.48439	131	59	38.59525	Port Essington Zone (Northwest): Territorial Sea Baseline at point C to highwater at point D.	
D	-11	7	25.75432	131	59	38.64653		
A	-11	32	25.58299	132	6	57.07113	Western boundary of Conservation Zone	Conservation Zone: All that area of sea between the seaward boundary of the Marine Park east of a straight line between Points A and B to the seaward boundary of Multiple Use A Zone (Southern).
B	-11	36	56.20768	132	4	52.2569		
C	-11	32	26.25847	132	8	11.78165		
D	-11	36	22.9781	132	31	39.25677		
E	-11	38	32.90903	132	27	48.19649		
F	-11	38	38.89735	132	6	50.20988		

Point	Latitude			Longitude			Description
	Deg	Min	Sec	Deg	Min	Sec	
A	-11	11	6.57058	132	9	43.68729	Outstation Privacy Zones
B	-11	11	6.33125	132	9	18.54965	
C	-11	9	55.60812	132	9	28.74998	
D	-11	9	55.8234	132	9	51.42077	
A	-11	10	6.85951	132	19	9.80209	
B	-11	9	55.6923	132	18	47.36502	
C	-11	7	14.12368	132	19	33.85644	
D	-11	7	14.32858	132	19	56.90859	
E	-11	7	37.89985	132	20	32.44847	
F	-11	7	38.10362	132	20	55.50111	
G	-11	8	5.52501	132	21	3.45032	
H	-11	8	25.41477	132	20	52.19887	
A	-11	13	44.03659	132	22	49.73398	
A	-11	19	2.91391	132	31	4.7461	
B	-11	20	33.62453	132	32	51.53045	
A	-11	11	35.08058	131	52	34.46502	
B	-11	11	43.50414	131	52	3.20714	
C	-11	11	10.52631	131	54	5.55534	
D	-11	11	18.95288	131	53	34.2983	
A	-11	14	10.78996	131	57	56.49648	

	Latitude			Longitude			Description	
Point	Deg	Min	Sec	Deg	Min	Sec		
	-11	23	47.56	131	54	53.889	Scientific Reference Zone High Black Rock: All that area of sea extending 500 metres from high water mark at High Black Rock.	Scientific Reference Zone High Black Rock
A	-11	16	52.50796	131	50	21.13107	Scientific Reference Zone - northern Popham Creek All that area of sea below high water between points A and B.	Scientific Reference Zone (Popham Creek)
B	-11	15	48.93844	131	50	54.20606		
C	-11	18	49.73739	131	50	26.15672	Scientific Reference Zone - southern Popham Creek All that area of sea below high water between points C and D.	
D	-11	18	20.28183	131	53	13.04391		
A	-11	7	32.78961	132	11	4.56382	Scientific Reference zone Sandy Island I: All that area seaward of the Island between high and low Water to the North, East and West extending approximately 500 metres from high water and 500 metres to the south to a line extending between these A and B.	Scientific Reference Zone (Sandy Island I and II)
B	-11	7	16.7117	132	11	24.12197		
							Scientific Reference zone Sandy Island II: All that area seaward of the Island between High and Low Water extending approximately 300 m from high water.	

This page is left intentionally blank

APPENDIX 1 Descriptions of Interim Marine and Coastal Regionalisation for Cobourg Marine Park

Taken from the Interim Marine and Coastal Regionalisation Technical Group (1998) Interim Marine and Coastal Regionalisation of Australia: an ecosystem based classification for marine and coastal environments. Version 3.3, Environment Australia, Commonwealth Department of the Environment, Canberra

Cobourg

Location: Cape Don to Turner Point, and seaward from the High Water Mark to the 30m isobath. Includes the northern side of Cobourg Peninsula and Croker and Golbourn Islands.

Remarks: Coast of numerous bays and inlets lined by sandy beaches. Lack of rivers with small tidal range (2–3 m) infers minimal sediment debouchment and relatively low turbidity throughout the region. Mangroves restricted to narrow strips along bays and creek inlets. Numerous fringing reefs throughout entire region.

Climate: Climate is monsoon tropical with annual rainfall averaging from 1200–1400 mm. Runoff is between 500–100 mm of annual rainfall, however no major rivers occur along the coastline of this region. Cyclone frequency is low to moderate.

Oceanography: The region is meso-tidal with a 2–3 m variation although north-east of Croker Island micro-tidal conditions (<1 m variation) apply. Currents are generally easterly in the wet season (October to March) and westerly in the dry season (May to September). Annual sea surface temperature variation is approximately 5°C. Turbidity is lower than other NT coastal regions due to meso and micro tidal conditions and the lack of significant stream inputs. Deeply incised bays provide substantial shelter from strong seasonal winds, with a resulting mild wave climate along much of the coastline.

Geology and geomorphology: Geology is dominated by lateritised Cretaceous siltstones, sandstones and mudstones of the Bathurst Island Formation. The coastline consists of deeply incised bays terminating in beaches or muddy mangrove creeks. Coastal relief is low with numerous rocky headlands with fringing coral and coralline algal reefs. Rocky patch reefs are common offshore. Numerous islands occur in the eastern portion of the region, the largest being Croker Island. The majority of islands are rocky, continental islands with fringing reefs, however coral cays, such as New Year Island and the Sandy Islands, also occur. Sediments are primarily biogenic sands and muds.

Biota: Mangrove diversity is lower than sites in the Darwin region although the locally rare mangrove palm *Nypa fruticans* is present. Coral diversity is high in this region, particularly on fringing reefs surrounding islands to the east and north-east of Croker Island. Sea turtles breed on the numerous beaches in the region. The offshore islands support numerous seabird rookeries. Substantial dugong populations occur across the region and seagrass beds are abundant inshore. The region is a major trawling ground for the Northern Prawn Fishery. Prawn by-catch data indicate that inshore (<30 m depth) fish assemblages are distinctly different from those of the Tiwi Region to the west, having similar compositions to inshore assemblages from Arnhem Land and Gulf of Carpentaria.

Estuaries: Estuaries dominated by funnel-shaped estuaries (6 of 7 major estuaries) with little freshwater input. Major estuaries: Popham Bay, Port Essington, Raffles Bay.

Van Diemen Gulf

Location: Includes all waters of Van Diemen Gulf. Western boundary a line from Cape Hotham to Muranapi Point, northern boundary a line from Soldier Point to Cape Don.

Remarks: Region includes the entirety of the Van Diemen Gulf. Coastline can be categorised into two types: (1) low, flat, alluvial, deltaic estuarine floodplains, with associated chenier dunes and narrow mangrove fringes, particularly in the south; (2) intermittent fringing reefs backed by well developed mangrove forests along the coasts of the Cobourg Peninsula and Melville Island. Waters always turbid due to dominance by fine terrigenous sediments, macro-tidal range (4-6m) shallow water depths, and Wet season input from the Mary River and the Alligator rivers system.

Climate: Climate is monsoon tropical. Rainfall averages between 1200–1400 mm annually. Cyclone frequency is low to moderate. Runoff ranges from 500–1000 m of annual rainfall. Wet season river discharges are high from the Mary, South Alligator and East Alligator River systems. The coastline is relatively sheltered from south-easterly dry season winds, but is exposed to north-west monsoons.

Oceanography: Due to physical restriction of gross water movement at the Vernon Islands and Dundas Strait circulation is largely internal. Tidal amplitude is macro tidal, ranging from 4–6 m. Waters are turbid due to fine grained sediments, macro tides, riverine sediment discharges and shallow waters. Sea surface temperatures vary 4–5°C annually. Coastal waters experience periods of lowered salinity during wet season riverine flows.

Geology & geomorphology: Geology consists of sediments (sandstones, siltstones) and basement igneous and metamorphic rocks (granite, migmatite, gneiss, schist) of the Pine creek geosyncline overlain in the north-east by Cretaceous sandstones and siltstones of the Bathurst Island Formation. Landforms are dominated by extensive riverine plains fringed at the coast by chenier ridges and saline mudflats. Rocky reefs are scattered infrequently offshore, and a number of small islands occur, particularly in the north-east of the region, with Greenhill Island being the most noteworthy. Sediments are largely terrigenous sands and muds coastally grading to biogenic muds offshore.

Biota: Mangrove diversity is high (38 species) in vicinity of the Alligator Rivers. Areas of seagrass provide dugong (*Dugong dugon*) habitat in the north-east of the region, while flatback turtles (*Natator depressus*) nest on most of the regions beaches. The coastline exhibits excellent wader and water bird feeding habitat.

Estuaries: Estuary types dominated by straight-banked river mouths (6 of 14 major estuaries) and deltaic river mouths (5 of 14 major estuaries). Major estuaries: The Wildman, West Alligator, South Alligator, and East Alligator Rivers, Tommycut, Sampan, Mini-mini and Ilyamari Creeks, and Shamrock Bay.

Northern Province

Location: Extending from east of Cape Hotham to west of Cape York.

Remarks: This Province represents a core area traversed by a large suite of tropical Indo-West Pacific fishes whose ranges extend variably down the eastern and western Australian coasts. It is not demarcated by an obvious suite of indicator species. The Gulf of Carpentaria is represented by a comparatively simple range of habitats (i.e. coral reef habitats and their faunas are poorly represented) that may contain unique faunal elements that so far remain undefined. A weak disjunction exists at Gove (north-western tip of Gulf of Carpentaria) possibly indicating a boundary at the meso-scale level. It is bounded in the east by a major faunal disjunction and the North-eastern Biotone (NEB). Further work is needed to evaluate substructure within this Province and adjacent biotones. Meso-scale regions: Includes West Cape York, Wellesly, Karumba-Nassau, Pellew, Carpentaria, Groote, Arafura, Arnhem Wessel and Cobourg regions.

APPENDIX 2: Preliminary Fauna List of Cobourg Peninsula Marine Park and Adjacent Areas

by Helen K. Larson
Northern Territory Museum

This preliminary list is based on specimens held at the Northern Territory Museum, and on all available published scientific literature as of 1988. The list does not include records based on specimens held at other museums (interstate and overseas). Several species are represented by literature records only. These may be erroneous identifications, or be truly rare fish.

Species are arranged by family, with the family number given beside each family name. In some cases, fish are identified only to family or genus. Species which were originally described from Port Essington have (usually) a basic reference accompanying them. Please note that this list has not been updated since 1988; therefore for a number of species, their names have changed, or they have been described, synonymised with other species, or split into more than one species. Work is continuing on a complete checklist of all Northern Territory fishes, including the Cobourg Marine Park.

Family	Genus species
Fishes	
Orectolobidae (wobbegongs)	<i>Chiloscyllium punctatum</i>
	<i>Hemiscyllium trispeculare</i>
	<i>Stegostoma fasciatum</i>
Scylliorhinidae (catsharks)	<i>Atelomycterus macleayi</i>
Carcharhinidae (whaler sharks)	<i>Carcharhinus brevipinna</i>
	<i>Carcharhinus dussumieri</i>
	<i>Carcharhinus limbatus</i>
	<i>Carcharhinus melanopterus</i>
	<i>Carcharhinus sealei</i>
	<i>Carcharhinus tilstoni</i>
	<i>Hemipristis elongatus</i>
	<i>Rhizoprionodon acutus</i>
Sphyrnidae (hammerhead sharks)	<i>Sphyrna lewini</i>
	<i>Sphyrna mokarran</i>

Family**Genus species**

Rhynchobatidae (shovelnose rays)

Rhynchobatus djiddensis

Dasyatidae (stingrays)

Amphotistius kuhli

Dasyatis sp.

Himantura uarnak

Gymnuridae (butterfly rays)

Gymnura australis

Megalopidae (tarpons)

Megalops cyprinoides

Muraenidae (moray eels)

Gymnothorax fimbriata

Gymnothorax sp.1 (Bali book)

Muraenesocidae (pike eels)

Muraenesox cinereus

Congridae (conger eels)

Conger wilsoni

Lumiconger arafura

Uroconger lepturus

Ophichthidae (snake eels)

Muraenichthys

Pisoodonophis cancrivorus

Clupeidae (sardines and herrings)

Anodontostoma chacunda

Herklotsichthys

Herklotsichthys koningsbergeri

Herklotsichthys lippa

Pellona ditchela

Sardinella

Spratelloides

Spratelloides delicatulus

Engraulidae (anchovies)

Setipinna

Stolephorus

Stolephorus advenus

Stolephorus waitei

Thryssa

Thryssa hamiltoni Gray 1832

Thryssa setirostris

Chirocentridae (wolf herrings)

Chirocentrus dorab

Synodontidae (grinners)

Saurida

Saurida micropectoralis

Chanidae (milkfish)

Chanos chanos

Ariidae (forktailed catfish)

Arius bilineatus

Arius polystaphylodon

Family	Genus species
	<i>Arius proximus</i>
	<i>Arius thalassinus</i>
Plotosidae (eel-tailed catfish)	<i>Euristhmus</i>
	<i>Euristhmus nudiceps</i>
	<i>Paraplotosus albilabrus</i>
	<i>Paraplotosus butleri</i>
Batrachoididae (frogfish)	<i>Batrachomoeus</i>
	<i>Batrachomoeus trispinosus</i>
	<i>Halophryne diemensis</i>
	<i>Halophryne ocellatus</i>
Antennariidae (anglerfishes)	<i>Lophiocharon trisignatus</i>
	<i>Tathicarpus butleri</i>
	<i>Tetrabrachium ocellatum</i>
Bregmacerotidae (unicorn codlets)	<i>Bregmaceros</i>
Ophidiidae (cuskeels)	<i>Dinematichthys</i>
	<i>Sirembo</i>
Exocoetidae (flying fishes)	<i>Cheilopogon</i>
	<i>Parexocoetus mento</i>
Hemiramphidae (garfish or halfbeaks)	<i>Arrhamphus sclerolepis</i>
	<i>Hemiramphus far</i>
	<i>Hyporhamphus neglectissimus</i>
	<i>Hyporhamphus quoyi</i>
	<i>Zenarchopterus buffonis</i>
	<i>Zenarchopterus gilli</i>
Belonidae (longtoms or needlefish)	<i>Strongylura strongylura</i>
	<i>Strongylura caudimaculata</i>
Melanotaeniidae (rainbowfishes)	<i>Melanotaenia nigrans</i>
	<i>Atherina nigrans</i>
	<i>Pseudomugil cyanodorsalis</i>
Atherinidae (hardyheads)	<i>Alanetta mugiloides</i>
	<i>Atherinomorus endrachtensis</i>
	<i>Hypoatherina temminckii</i>
	<i>Pranesus</i>
Holocentridae (squirrelfishes)	<i>Adioryx ruber</i>
	<i>Myripristis violaceus</i>

Family	Genus species
Veliferidae (veilfins)	<i>Velifer</i>
Fistulariidae (flutemouths)	<i>Fistularia</i>
	<i>Fistularia commersonii</i>
Centriscidae (razorfishes)	<i>Centriscus</i>
Syngnathidae (pipefishes)	<i>Choeroichthys brachysoma</i>
	<i>Haliichthys taeniophorus</i>
	<i>Micrognathus micronotopterus</i>
	<i>Syngnathoides biaculeatus</i>
	<i>Trachyrhamphus bicoarctata</i>
	<i>Trachyrhamphus intermedius</i>
	<i>Trachyrhamphus longirostris</i>
Scorpaenidae (scorpionfishes)	<i>Dendrochirus</i>
	<i>Hypodytes carinatus</i>
	<i>Inimicus</i>
	<i>Minous versicolor</i>
	<i>Parascorpaena picta</i>
	<i>Pterois lunulata</i> ?
	<i>Scorpaenodes</i>
	<i>Scorpaenopsis</i>
	<i>Synanceia horrida</i>
Triglidae (gurnards)	unidentified: 2 lots
Aploactinidae (velvetfishes)	<i>Adventor elongatus</i>
Platycephalidae (flatheads)	<i>Elates ransonetti</i>
	<i>Inegocia japonica</i>
	<i>Papilloculiceps nematophthalmus</i>
	<i>Platycephalus indicus</i>
	<i>Suggrundus bosschei</i>
	<i>Suggrundus celebicus</i>
	<i>Suggrundus harrisii</i> ?
	<i>Suggrundus japonica</i>
	<i>Suggrundus rodericensis</i> ?
	<i>Suggrundus staigeri</i>
Dactylopteridae (flying gurnards)	<i>Dactyloptena</i>
	<i>Dactyloptena papilio</i>
Pegasidae (seamoths)	<i>Parapegasus natans</i>
Ambassidae (glass-perchlets)	<i>Ambassis commersoni</i>

Family	Genus species
Centropomidae (giant perches)	<i>Ambassis nalua</i>
	<i>Hypopterus macropterus</i>
	<i>Lates calcarifer</i>
	<i>Psammoperca vaigiensis</i>
Serranidae (groupers)	<i>Centrogenys vaigiensis</i>
	<i>Cephalopholis boenack</i>
	<i>Cromileptes altivelis</i>
	<i>Epinephelus</i>
	<i>Epinephelus bleekeri</i>
	<i>Epinephelus caeruleopunctatus</i>
	<i>Epinephelus fasciatus</i>
	<i>Epinephelus quoyanus</i>
	<i>Epinephelus sexfasciatus</i>
	<i>Epinephelus suillus</i>
	<i>Epinephelus tauvina</i>
	<i>Plectropomus maculatus</i>
	<i>Congrogadus subducens</i>
Pseudochromidae (dottybacks)	<i>Pseudochromis</i>
	<i>Pseudochromis fuscus</i>
	<i>Pseudochromis punctatus</i>
	<i>Pseudochromis wilsoni</i>
	<i>Amniataba caudovittata</i>
Teraponidae (grunters)	<i>Pelates quadrilineatus</i>
	<i>Pelates sexlineatus</i>
	<i>Terapon</i>
	<i>Terapon jarbua</i>
	<i>Terapon puta</i>
	<i>Terapon theraps</i>
	<i>Priacanthus macracanthus</i>
Priacanthidae (bulls'-eyes)	<i>Priacanthus tayenus</i>
Apogonidae (cardinalfishes)	<i>Apogon sp.</i>
	<i>Apogon albimaculosus</i>

Family

Genus species

	<i>Apogon brevicaudatus</i>
	<i>Apogon coccineus</i>
	<i>Apogon cooki</i>
	<i>Apogon crassiceps</i>
	<i>Apogon darnleyensis</i>
	<i>Apogon ellioti</i>
	<i>Apogon opercularis</i>
	<i>Apogon poecilopterus</i>
	<i>Apogon quadrifasciatus</i>
	<i>Apogon ruppellii</i>
	<i>Apogon victoriae</i>
	<i>Archamia fucata</i>
	<i>Fowleria aurita</i>
	<i>Glossamia aprion</i>
	<i>Gymnapogon cf. philippinus</i>
	<i>Pseudamia n.sp.</i>
Sillaginidae (whiting)	<i>Sillago</i>
	<i>Sillago analis</i>
	<i>Sillago maculata</i>
	<i>Sillago sihama</i>
Lactariidae (milk trevally)	<i>Lactarius lactarius</i>
Rachycentridae (cobia)	<i>Rachycentron canadus</i>
Echeneidae (remoras)	<i>Echeneis naucrates</i>
	<i>Remora remora</i>
Carangidae (trevallies)	<i>Alepes</i>
	<i>Carangoides caeruleopinnatus</i>
	<i>Carangoides chrysophrys</i>
	<i>Carangoides hedlandensis</i>
	<i>Carangoides humerosus</i>
	<i>Carangoides talamparoides</i>
	<i>Caranx bucculentus</i>
	<i>Caranx ignobilis</i>
	<i>Caranx para</i>
	<i>Caranx sexfasciatus</i>
Carangidae (trevallies)	<i>Gnathanodon speciosus</i>
	<i>Megalaspis cordyla</i>

Family

Genus species

	<i>Scomberoides</i>
	<i>Scomberoides commersonianus</i>
	<i>Scomberoides tala</i>
	<i>Scomberoides tol</i>
	<i>Selaroides leptolepis</i>
	<i>Seriolina nigrofasciata</i>
	<i>Trachinotus bailloni</i>
	<i>Ulua aurochs</i>
Parastromatidae (pomfrets)	<i>Parastromateus niger</i>
Menidae (moonfish)	<i>Mene maculata</i>
Leiognathidae (ponyfish)	<i>Equula equula</i>
	<i>Equula interrupta</i>
	<i>Gazza minuta</i>
	<i>Leiognathus</i>
	<i>Leiognathus bindus</i>
	<i>Leiognathus decorus</i>
	<i>Leiognathus cf berbis</i>
	<i>Leiognathus novaehollandiae</i>
	<i>Leiognathus splendens</i>
	<i>Secutor insidiator</i>
	<i>Secutor ruconius</i>
Lutjanidae (snappers)	<i>Caesio cuning</i>
	<i>Lutjanus</i>
	<i>Lutjanus argentimaculatus</i>
	<i>Lutjanus carponotatus</i>
	<i>Lutjanus erythropterus</i>
	<i>Lutjanus fulvus</i>
	<i>Lutjanus vaigiensis</i>
	<i>Lutjanus lemniscatus</i>
	<i>Lutjanus russelli</i>
	<i>Lutjanus sanguineus</i>
	<i>Lutjanus vitta</i>
	<i>Mesoprion yapilli</i>
Nemipteridae (threadfin bream)	<i>Nemipterus hexodon</i>
	<i>Nemipterus marginatus</i>

Family	Genus species
	<i>Nemipterus peronii</i>
	<i>Scaevius millii</i>
	<i>Scolopsis</i>
	<i>Scolopsis monogramma</i>
	<i>Scolopsis temporalis</i>
Gerrididae (silver biddies)	<i>Gerres</i>
	<i>Gerres abbreviatus</i>
	<i>Gerres filamentosus</i>
Haemulidae (sweetlips)	<i>Plectorhynchus</i>
	<i>Plectorhynchus chaetodontoides</i>
	<i>Plectorhynchus pictus</i>
	<i>Plectorhynchus polytaenia</i>
	<i>Pomadasys</i>
	<i>Pomadasys kaakan</i>
	<i>Pomadasys maculatus</i>
	<i>Pomadasys trifasciatus</i>
Lethrinidae (emperors)	<i>Lethrinus</i>
	<i>Lethrinus choerorhynchus</i>
Sparidae (bream)	<i>Chrysophrys auratus</i> (record probably L= <i>Acarthopagrus berda</i>)
Sciaenidae (jewfish)	<i>Atrobucca</i>
	<i>Johnius</i>
	<i>Johnius johnius</i>
	<i>Nibea</i>
Mullidae (goatfish)	<i>Mulloidichthys</i>
	<i>Upeneus sp.</i>
	<i>Upeneus sulphureus</i>
	<i>Upeneus sundaicus</i>
Pempheridae (sweepers)	<i>Leptobrama muelleri</i>
Ephippidae (batfishes)	<i>Platax orbicularis</i>
	<i>Zabidius novamaculeatus</i>
Scatophagidae (scats)	<i>Selenotoca multifasciata</i>
Rhinoprenidae (threadfin scat)	<i>Rhinoprenes pentanemus</i>
Chaetodontidae (butterflyfishes)	<i>Chaetodon aureofasciatus</i>
	<i>Chaetodontoplus duboulayi</i>

Family**Genus species**

Pomacentridae (damselfishes)

Chelmon marginalis
Chelmon muelleri
Euxiphipops sexstriatus
Heniochus acuminatus
Parachaetodon ocellatus
Abudefduf bengalensis
Abudefduf septemfasciatus
Amphiprion ocellaris
Amphiprion rubrocinctus
Dischistodus fasciatus
Neopomacentrus cyanomos
Neopomacentrus filamentosus
Neopomacentrus violascens
Pomacentrus littoralis
Pomacentrus milleri
Stegastes
Stegastes obreptus
Acanthocepola abbreviata

Cepolidae (bandfishes)

Mugilidae (mullet)
Oedalechilus labiosus
Oedalechilus kesteveni
Liza
Liza alata
Liza melinoptera
Liza vaigiensis
Valamugil
Valamugil buchanani
Valamugil cunnesius
Valamugil seheli

Sphyraenidae (barracudas)

Sphyraena
Sphyraena barracuda

Family	Genus species
	<i>Sphyraena jello</i>
	<i>Sphyraena obtusata</i>
	<i>Sphyraenella</i>
Polynemidae (threadfins)	<i>Polydactylus</i>
	<i>Polynemus</i>
	<i>Polynemus heptadactylus</i>
	<i>Polynemus multiradiatus</i>
	<i>Polynemus sheridani</i>
	<i>Polynemus sexfilis</i>
Labridae (wrasses)	<i>Choerodon cyanodus</i>
	<i>Choerodon vitta</i>
	<i>Choerodon schoenleinii</i>
	<i>Halichoeres</i>
	<i>Halichoeres dussumieri</i>
	<i>Halichoeres melanochir</i>
	<i>Halichoeres melanurus</i>
	<i>Labroides dimidiatus</i>
	<i>Thalassoma lunare</i>
Scaridae (parrotfishes)	<i>Scarus</i>
	<i>Scarus ghobban</i>
Opistognathidae (jawfishes)	<i>Opistognathus castelnaui</i>
	<i>Opistognathus darwinensis</i>
	<i>Opistognathus latitabunda</i>
	<i>Opistognathus papuensis</i>
Mugiloididae (grubfishes)	<i>Parapercis</i>
Uranoscopidae (stargazers)	<i>Ichthyoscopus fasciatus</i>
	<i>Uranoscopus</i>
	<i>Uranoscopus cognatus</i>
Blenniidae (blennies)	<i>Atrosalarias fuscus</i>
	<i>Cirripectes filamentosus</i>
	<i>Istiblennius</i>
	<i>Laiphognathus multimaculatus</i>
	<i>Meiacanthus grammistes</i>
	<i>Omobranchus ferox</i>
Blenniidae (blennies)	<i>Omobranchus germaini</i>
	<i>Omobranchus punctatus</i>

Family

Genus species

	<i>Omobranchus rotundiceps</i>
	<i>Omobranchus verticalis</i>
	<i>Omox biporos</i>
	<i>Petroscirtes mitratus</i>
	<i>Petroscirtes variabilis</i>
	<i>Salarias</i>
Notograptidae (eel-blennies)	<i>Notograptus</i>
	<i>Notograptus guttatus</i>
Tripterygiidae (triplefins)	<i>Enneapterygius</i> n.sp.
	<i>Enneapterygius</i> n.sp.
	<i>Enneapterygius</i> n.sp.
	<i>Helcogramma striata</i>
Callionymidae (dragonets)	<i>Callionymus</i>
	<i>Callionymus belcheri belcheri</i>
	<i>Callionymus enneactis</i>
	<i>Callionymus grossi</i>
	<i>Callionymus pleurostictus</i>
Gobiidae (gobies)	<i>Acentrogobius cf caninus</i>
	<i>Acentrogobius viridipunctatus</i>
	<i>Amblyeleotris gymnocephala</i>
	<i>Amblygobius bynoensis</i>
	<i>Amblygobius phalaena</i>
	<i>Amoya gracilis</i>
	<i>Bathygobius</i>
	<i>Bathygobius fuscus</i>
	<i>Bathygobius laddi</i>
	<i>Bathygobius</i> sp.9
	<i>Bryaninops amplus</i>
	<i>Callogobius cf okinawae</i>
	<i>Callogobius</i> sp.15
	<i>Cryptocentroides insignis</i>
	<i>Cryptocentrus</i>
	<i>Cryptocentrus cf strigilliceps</i>
	<i>Cryptocentrus russus</i>
Gobiidae (gobies)	<i>Drombus</i>
	<i>Drombus triangularis</i>

Family

Genus species

Eviota prasina

Eviota queenslandica

Eviota storthynx

Eviota sigillata

Favonigobius melanobranchus

Gnatholepis

Gobiodon

Gobiodon histrio

Gobiodon okinawae

Gobiodon sp.3 ?

Gobiodon sp.4 ?

Gobiopsis aporia

Gobius voigtii

Istigobius nigroocellatus

Istigobius ornatus

Istigobius perspicillatus

Macrodontogobius wilburi

Mugilogobius sp.5

Mugilogobius stigmaticus

Mugilogobius

Oxyurichthys

Oxyurichthys papuensis ?

Oxyurichthys tentacularis

Palutris

Pandaka lidwilli

Parachaeturichthys polynema

Parioglossus philippinus

Priolepis nuchifasciatus

Pseudogobius

Ptereleotris microlepis

Silhouettea hoesei

Valenciennea n.sp.

Valenciennea muralis

Valenciennea puellaris

Yongeichthys criniger

Mogurnda mogurnda

Gobiidae (gobies)

Eleotrididae (gudgeons)

Family

Oxudercidae (mudskippers)

Amblyopidae (worm gobies)

Acanthuridae (surgeonfishes)

Siganidae (rabbitfishes)

Trichiuridae (cutlassfishes)

Scombridae (tunas)

Istiophoridae (spearfishes)

Psenopsidae (ruffes)

Psettodidae (Queensland halibut)

Bothidae (right-eyed flounders)

Pleuronectidae (left-eyed flounders)

Soleidae (soles)

Cynoglossidae (tongue soles)

Genus species

Periophthalmus argentilineatus

Brachyamblyopus

Ctenotrypauchen microcephalus

Trypauchenichthys

Trypauchenichthys typus

Acanthurus grammoptilus

Siganus cf. doliatus

Siganus fuscescens

Siganus nebulosus

Siganus virgata

Trichiurus

Euthynnus affinis

Rastrelliger kanagurta

Scomberomorus

Scomberomorus queenslandicum

Scomberomorus semifasciatum

Istiophorus platypterus

Makaira indica

Psenopsis

Psettodes erumei

Arnoglossus

Grammatobothus polyophthalmus

Pseudorhombus

Pseudorhombus arsius

Pseudorhombus elevatus

Pseudorhombus russelli

Brachypleura novaezeelandiae

Aesopia heterorhinos

Aseraggodes

Dexillichthys muelleri

Paradicula setifer

Pardachirus pavoninus

Zebrias quagga

Cynoglossus

Cynoglossus bilineatus

Family	Genus species
	<i>Cynoglossus puncticeps</i>
	<i>Paraplagusia blochi</i> ?
Triacanthidae (tripodfishes)	<i>Triacanthus</i>
	<i>Triacanthus biaculeatus</i>
	<i>Tripodichthys</i>
	<i>Tripodichthys angustifrons</i>
	<i>Trixiphichthys weberi</i>
Monacanthidae (leatherjackets)	<i>Anacanthus barbatus</i>
	<i>Monacanthus chinensis</i>
	<i>Paramonacanthus</i>
	<i>Pervagor</i>
Ostraciidae (boxfishes)	<i>Ostracion cubicus</i>
	<i>Rhynchostracion nasus</i>
	<i>Rhynchostracion rhinorhynchus</i>
Tetraodontidae (pufferfishes)	<i>Amblyrhynchotes</i>
	<i>Arothron</i>
	<i>Arothron alboreticulatus</i>
	<i>Arothron manilensis</i>
	<i>Chelonodon</i>
	<i>Chelonodon patoca</i>
	<i>Lagocephalus</i>
	<i>Lagocephalus gloveri</i>
	<i>Lagocephalus lunaris</i>
	<i>Lagocephalus scleratus</i>
	<i>Lagocephalus spadiceus</i>
	<i>Tetraodon</i>
	<i>Torquigener tuberculiferus</i>
	<i>Torquigener whitleyi</i>
Diodontidae (spiny pufferfishes)	<i>Diodon liturosus</i>
	<i>Tragulichthys jaculiferus</i>

Family	Genus species	Common Name
Reptiles		
Crocodylidae	<i>Crocodylus porosus</i>	Estuarine or Saltwater Crocodile
Chelonidae	<i>Caretta caretta</i>	Loggerhead Turtle
	<i>Chelonia depressa</i>	Flatback Turtle
	<i>Chelonia mydas</i>	Green Turtle
	<i>Eretmochelys imbricata</i>	Hawksbill Turtle
	<i>Lepidochelys olivacea</i>	Pacific Ridley (Olive Ridley Turtle)
Dermochelyidae	<i>Dermochelys coriacea</i>	Leathery or Luth Turtle
Hydrophiidae	<i>Acalyptophis peronii</i>	
	<i>Aipysurus apraefrontalis</i>	
	<i>Aipysurus duboisii</i>	
	<i>Aipysurus eydouxii</i>	
	<i>Aipysurus laevis</i>	
	<i>Astrotia stokesii</i>	Stoke's Sea Snake
	<i>Disteira kingii</i>	
	<i>Disteira major</i>	
	<i>Emydocephalus annulatus</i>	
	<i>Enhydrina schistosa</i>	Beaked Sea Snake
	<i>Hydrelaps darwiniensis</i>	
	<i>Hydrophis atriceps</i>	
	<i>Hydrophis czeblukovi</i>	
	<i>Hydrophis elegans</i>	
	<i>Hydrophis inornatus</i>	
	<i>Hydrophis medowelli</i>	
	<i>Hydrophis ornatus</i>	
	<i>Hydrophis pacificus</i>	
	<i>Lapemis hardwickii</i>	
	<i>Parahydrophis mertoni</i>	
	<i>Pelamis platurus</i>	Yellow-bellied Sea Snake
Mammals		
Dugongidae	<i>Dugong dugon</i>	Dugong