Proposed Camden Sound Marine Park

indicative management plan

2010

Department of
Environment and Conservation

MPRA
MARINE PARKS &
RESERVES AUTHORITY

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Public submission on the indicative management plan

Prior to gazettal of a proposed marine park, the *Conservation and Land Management Act 1984* requires the release of an indicative management plan to allow an opportunity for the community to provide feedback, suggest alternatives and generally have a say on how the proposed marine park will be managed over the next ten years.

Your suggestions and comments on the indicative management plan are welcomed during the three-month public comment period. To ensure your submission is as effective as possible, please:

- make it clear and as concise as possible
- list your points according to the subject sections (and page numbers) in the indicative management plan
- describe briefly each subject or issue you wish to discuss
- say whether you agree or disagree with the information presented – clearly state your reasons and give sources of information where possible
- suggest alternatives to deal with any issues with which you disagree.

Each submission is important, but those that provide reasons for your concern or support are most useful. A summary of submissions will be published along with the final management plan, including an indication of how the plan was amended or not.

The indicative management plan *may* be amended if a submission:

1. provides additional resource information of direct relevance to management
2. provides additional information on affected user groups of direct relevance to management
3. indicates a valid change in (or clarifies) government legislation, management commitment or management policy
4. proposes strategies that would better achieve management goals and objectives
5. indicates omission, inaccuracies or a lack of clarity.

The indicative management plan *may not* be amended if a submission:

1. clearly supports the draft proposal
2. offers a neutral statement or no change is sought
3. addresses issues beyond the scope of the plan
4. makes points that are already in the plan
5. is one amongst several widely divergent viewpoints received on the topic and the recommendation of the indicative management plan is still considered the best option;
6. contributes options which are not possible (generally due to some aspect of existing legislation, or government or departmental policy)
7. is unclear
8. includes details that are not necessary or appropriate for inclusion in a document aimed at providing management direction over a ten year period.

There are two main ways that a submission on the indicative management plan can be made:

1. download the 'Have your say' questionnaire from www.dec.wa.gov.au and post (no stamp required) to

   Proposed Camden Sound Marine Park
   Have Your Say
   Department of Environment and Conservation
   Marine Policy and Planning Branch
   Reply paid 83569
   Bentley Delivery Centre WA 6983

   or email to haveyoursay@dec.wa.gov.au

The closing date for submissions on this plan is 1 February 2011.

This indicative management plan may be cited as:

Department of Environment and Conservation (2010) *Proposed Camden Sound Marine Park indicative management plan 2010*
Prepared by the Marine Policy and Planning Branch for the Marine Parks and Reserves Authority, Fremantle, Western Australia

Cover photo courtesy of Micheline Jenner of the Centre for Whale Research

Minister's foreword

This indicative management plan for the proposed Camden Sound Marine Park provides information about the proposal to establish and manage the first marine park in the Kimberley marine bioregion, and the second largest marine park in Western Australia. The conservation of Camden Sound was raised during the consultation phase of the government's Kimberley Science and Conservation Strategy and by the Marine Parks and Reserves Authority which will be legally entrusted with the marine park. As a result, on 3 October 2009 the Hon Colin Barnett, Premier of Western Australia and I announced that the first marine park along the Kimberley coast would be established in the Camden Sound area. The marine park will help support the continuing recovery of the world's humpback whale population, as well as protecting a wide diversity of marine habitats and wildlife of the Kimberley. The wild and magnificent Camden Sound area is recognised by the Liberal-National Government as a place worthy of special protection.

I acknowledge the Aboriginal traditional owners of the Camden Sound area, the *Dambimangari*, who are the custodians of culture, knowledge and place and have a strong ongoing connection with their land and sea country. The *Uunguu* people have interests over a part of St George Basin and are also respectfully acknowledged, along with the *Mayala* people. The government is committed to working with traditional owners to ensure that the Aboriginal culture and heritage of the area is maintained. The proposed Camden Sound Marine Park will be managed under joint management arrangements with the traditional owners.

The management arrangements detailed within this indicative management plan provide specific conservation measures for humpback whales. A humpback whale calving area, covering approximately 1,680 square kilometres, will become a special purpose zone (whale conservation). Recognising the importance of this special purpose zone for a vulnerable life stage of calves, vessels will be required to have a minimum approach distance of 500 metres from humpback mothers and calves, rather than the 100 metres minimum approach distance that applies in the rest of Western Australia's waters for humpback whales and cetaceans in general. The increased approach distances also apply in the two sanctuary zones. There will also be increased approach distances for aircraft over this zone. Vessel speeds may also be limited in the vicinity of whales in calving areas. These measures provide for some of the most stringent whale interaction regulations in Australia. Specific research and monitoring will be undertaken to underpin a five-year review of the adequacy of management arrangements for humpback whale conservation, particularly with respect to the special purpose zone (whale conservation).

In addition to humpback whales, the proposed Camden Sound Marine Park contains a wide range of species with special conservation status including dugongs, saltwater crocodiles, several species of marine turtles, sawfish and dolphins. It also includes a wide range of habitats and special features. These include the spectacular Montgomery Islands reef, fringing coral reef systems, rocky shoals, and the St George Basin estuary system with its extensive mangrove forests and links to the Prince Regent River.

The proposed Camden Sound Marine Park will cover approximately 7,062 square kilometres (or 706,200 hectares). This area represents a significant expansion to the area originally envisaged for the marine park when it was announced, so as to include the ecologically important waters surrounding the Montgomery Islands reef and St George Basin estuarine system. The proposed marine park, inclusive of these areas, will provide for a large, diverse and spectacular part of the Kimberley region to be protected, while providing for sustainable use and enjoyment including nature-based tourism, fishing and pearling.

I invite you to provide comments on this indicative management plan during the three-month public submission period. Your comments will be considered during the preparation of a final management plan which will enhance the conservation management of a remarkable area of the Kimberley.

Hon Donna Faragher JP MLC
MINISTER FOR ENVIRONMENT; YOUTH

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Executive summary

This indicative management plan for the proposed Camden Sound Marine Park provides information about the proposal to establish and manage the first marine park in the Kimberley marine bioregion. It is located about 300 kilometres north of Broome and covers approximately 7,062 square kilometres (or 706,200 hectares). The proposed marine park is located within the wild and remote Kimberley, one of the most biologically significant regions in the world. The Prince Regent Nature Reserve lies adjacent to the proposed marine park waters in St George Basin. The landscape of the area adjacent the proposed marine park is relatively undisturbed and has significant cultural and natural values. The proximity of the proposed marine park to these important areas provides opportunities for management at the landscape/ seascape scale.

Whales and marine biodiversity

The Liberal-National Government is committed to the establishment of the Camden Sound Marine Park in the remote and wild Kimberley region. The marine park will recognise and provide special management arrangements for this remarkable place as the principal calving habitat of the humpback whale (*Megaptera novaeangliae*) population that migrates annually along Western Australia's coast. The creation of the marine park will help support the recovery of this species.

The creation of the Camden Sound Marine Park will make a major contribution to the state's marine parks and reserves system by providing for a large, diverse and spectacular part of the Kimberley to be protected, while providing for sustainable use and enjoyment. The proposed marine park will enhance conservation of a range of marine biodiversity values of the Kimberley marine bioregion. It contains a range of species listed as having special conservation status including marine turtles, snub-fin and Indo-Pacific humpback dolphins, dugong, saltwater crocodiles and several species of sawfish. It also includes a wide range of marine habitats and associated marine life. These include coral reef communities, rocky shoals, and the extensive mangrove forests and marine life of the St George Basin and Prince Regent River. The outstanding Montgomery Islands reef will also be included in the proposed marine park, subject to clarification of land tenure and native title issues.

Reflecting the current state of knowledge, the key biodiversity values of the proposed marine park are presented within this indicative management plan within two broad themes: ***habitat*** – comprising both geomorphic habitat (such as rocky shores and platforms) and biological habitat (such as seagrass) and ***species of special conservation interest*** – comprising those species which are listed as having special conservation status (such as humpback whales) as well as species which are extracted for human use (such as targeted finfish).

Special measures for humpback whale conservation

- *Gazettal of a special purpose zone (whale conservation) covering approximately 1,680 square kilometres of the proposed marine park.*
- *Increased vessel minimum approach distance from humpback mothers and calves to 500 metres in the special purpose zone (whale conservation), special purpose zone (wilderness fishing) and sanctuary zones rather than the 100 metre minimum approach distance currently in place throughout the rest of Western Australia's coastal waters for humpback whales and cetaceans in general. Increased aircraft minimum approach distance will ensure helicopters and fixed wing aircraft do not fly below 500 metres (1,650 feet) above a humpback mother and calf.*
- *To reduce the potential for disturbance of humpback mothers and calves, trawling will be excluded from the proposed special purpose zone (whale conservation).*
- *Further research will be undertaken to improve knowledge about the habitats of the area; use of Camden Sound by humpback whales; and potential interactions/ impacts of human activities with whales in the marine park.*

- *A five-year review of the adequacy of the management plan will be undertaken by the Marine Parks and Reserves Authority (MPRA) supported by the Department of Environment and Conservation and other agencies, focusing particularly on whale conservation and interactions with recreational and commercial uses. This will determine the effectiveness of management arrangements to achieve enhanced whale protection, particularly with respect to the special purpose zone (whale conservation). It will also provide the basis to revise the management plan and arrangements if necessary.*

Proposed marine park zoning

Sanctuary zones

'No-take' sanctuary zones are proposed at the Champagny Island group and the Montgomery Islands reef. They contain representative examples of a range of coral reef systems with abundant and diverse marine life. These zones cover approximately 936 square kilometres of the proposed marine park.

Special purpose zone (whale conservation)

A large special purpose zone (whale conservation) is proposed. Special management arrangements will enhance protection of humpback mothers and calves in an important humpback whale calving area of Camden Sound. This zone covers approximately 1,680 square kilometres of the proposed marine park.

Special purpose zone (wilderness fishing)

A large special purpose zone (wilderness fishing) is proposed to surround the Montgomery Islands reef. The zone is to be accessible to recreational fishers and boaters and managed to preserve the areas natural condition and ecological value. This zone allows for recreational fishing that requires fishers to consume their catch prior to leaving the zone. Commercial fishing is not permitted. This zone covers approximately 412 square kilometres of the proposed marine park.

Special purpose zone (pearling)

A large special purpose zone (pearling) centred on Augustus Island is proposed that recognises the longest operating and largest cluster of pearling operations in Western Australia based at Kuri Bay. A zone of the same purpose is also proposed within a protected embayment of Pyrene Island. These zones covers approximately 577 square kilometres of the proposed marine park.

General use zone

Extensive areas of general use zone are proposed, including St George Basin, the western offshore waters, and nearshore waters south of Hall Point. These cover approximately 3,457 square kilometres of the proposed marine park.

An outcome-based approach

The indicative management plan provides for biodiversity conservation and a range of current and potential future uses through use of a zoning scheme, designation of permitted uses, and management actions specified in seven management programs. The indicative management plan recognises a wide range of human values and uses including nature-based recreation and tourism, Aboriginal cultural connection, commercial and recreational fishing, pearling, and scientific research. A strong emphasis is placed on adaptive management through annual, periodic, and ten year assessments by the MPRA against specified management targets. Further scientific research will be undertaken to assist the MPRA carry out a five-year review of the adequacy of management arrangements for enhanced humpback whale conservation, particularly within the special purpose zone (whale conservation).

Joint management with traditional owners

Aboriginal people with traditional and familial connection to St George Basin, Camden Sound and Montgomery Islands reef are custodians of place, knowledge and culture. Three native title claims have been registered in the area of the proposed marine park. The *Dambimangari* claim overlies the majority of the proposed marine park, with a section of the *Uunguu* claim overlying a small portion of St George Basin and the *Malaya* claim just overlapping the proposed marine park in the south-west corner. The indicative management plan specifies that joint management arrangements are to be developed with the traditional owners.

Nature-based recreation and tourism

The Kimberley commercial expedition cruise industry consists of more than 30 vessels operating multi-day cruises between Broome, Wyndham, Darwin and Cairns and currently forms the largest component of the area's coastal tourism activities. There has been a significant increase in the number of operators over the past five to ten years and in 2006 it was found that about two-thirds of commercial operators in the industry were based in Broome. Cruise passengers participate in activities such as fishing, sightseeing and appreciation of Aboriginal cultural sites. Creation of the marine park will enhance opportunities for and appropriate management of nature-based tourism in this area.

Ecosystem-based fisheries management

About ten commercial fisheries are currently authorised to operate in the proposed marine park, although a number of these do not regularly use the area. Recreational and commecial fisheries will continue to be managed by the Department of Fisheries under an ecosystem-based fisheries management system. Fishing opportunities remain available in the majority of the proposed marine park but are not permitted in the two proposed sanctuary zones. In addition, trawling will be excluded from the special purpose zone (whale conservation) to reduce potential disturbance to humpback mothers and calves. Western Australia is the largest pearl producer in Australia with the industry typically contributing over $200 million per annum to the Western Australian economy. A large special purpose zone (pearling) is proposed in the north of the marine park centred around Augustus Island and an operating base at Kuri Bay.

Mining resources

At present there are two mining exploration licences issued within the area of the proposed marine park. These licenses allow for exploration of iron ore and gold/copper deposits respectively, and are subject to statutory approvals processes.

Part A – Introduction

1. Marine parks and reserves: special marine places

Marine parks and reserves have been progressively established in Western Australia since 1987. Marine parks and reserves help to conserve marine biodiversity and provide special places for people to enjoy, appreciate, and learn about the spectacular marine life of Western Australia.

There are three types of marine conservation reserves that can be established in Western Australia under the *Conservation and Land Management Act 1984* (CALM Act):

- marine park
- marine nature reserve
- marine management area.

The *Integrated marine and coastal regionalisation for Australia*, developed by the state and federal governments, provides a biological regionalisation of all Australian marine waters (Australian Government 2006). At present, Western Australia has 13 CALM Act marine reserves consisting of 10 marine parks, two marine management areas and one marine nature reserve across eight of the state's 19 marine bioregions. The proposed Camden Sound Marine Park will be the first CALM Act marine reserve in the coastal waters of the Kimberley marine bioregion. It provides for representation of a wide range of marine habitats and marine life of this part of the Kimberley.

Under the CALM Act, marine parks and reserves are vested in the Marine Parks and Reserves Authority (MPRA). The MPRA has a statutory function under the CALM Act to prepare marine park and reserve management plans through the Department of Environment and Conservation (DEC) and to assess the implementation of management plans. The MPRA also provide independent advice to the Minister for Environment in relation to marine parks and reserves and may prepare policies to guide management.

A set of over-arching objectives have been adopted by the MPRA for Western Australia's marine parks and reserves:

- ***Conservation*** – Maintain and enhance marine biodiversity and ecological integrity
- ***Science and education*** – Encourage and promote scientific research and education
- ***Community participation*** – Encourage and promote community involvement in and support for marine parks and reserves
- ***Recreation*** – Provide equitable and sustainable opportunities for recreational use and enjoyment where appropriate
- ***Commercial*** – Provide equitable and sustainable opportunities for commercial use and benefits where appropriate.

Establishment of the proposed Camden Sound Marine Park and its zoning scheme requires the concurrence of the Minister for Environment, Minister for Fisheries, and Minister for Mines and Petroleum, following three months of public consultation on this indicative management plan.

The proposed Camden Sound Marine Park is to be established as a class A reserve which means that the boundaries of the reserve require the tabling of a reservation order in both Houses of Parliament.

Class A vesting provides high security to marine park tenure. By contrast, the zoning scheme and management plan can be amended after a public consultation period with the approval of the Minister for Environment, Minister for Fisheries and Minister for Mines and Petroleum. This can allow for adaptive management approaches to be formulated if considered necessary.

2. Management setting – an overview

The government is committed to enhancing the conservation of biodiversity within the proposed marine park with a particular emphasis on providing special management arrangements for humpbacks and their newborn calves at their most vulnerable stage of life. The management arrangements also recognise the value of the proposed marine park for a range of recreational and commercial uses. This indicative management plan provides management direction for how the first marine park in the Kimberley marine bioregion, and the second largest marine park in Western Australia, will be managed.

Phillip Parker King, one of Australia's greatest maritime explorers, anchored in Camden Sound in 1821 after threading his way through shoaling reefs and extreme tidal conditions which on occasions saw his ship running backwards or being caught in tidal whirlpools. Much of the mapping prepared by King during his voyage is still in use today and while navigation charts are easily available to the modern mariner, many areas in the Kimberley remain uncharted.

King named Camden Sound for the first Marquess of Camden, John Jeffrey Pratt, an English nobleman and politician who was a generous patron of the New South Wales colony in the early 1800s. Many of the names in the area were bestowed by King in recognition of friends, family and important people of the time. Montgomery Islands were named for Andrew Montgomery the surgeon on his 1821 voyage. St George Basin and other features with the preface 'saint' were named in appreciation of King finding refuge and freshwater after a harrowing leg of his Kimberley journey. Other names of French origin, such as Champagny, were bestowed by the French explorer Nicholas Baudin who passed by the area in 1802.

2.1 Key calving habitat for humpback whales

Humpback whales (*Megaptera novaeangliae*) are a regular sight to seafarers along our coast as they follow their annual long-distance northward and southward migrations to breeding and feeding grounds. Humpback numbers were reduced to the brink of extinction in the 1800s and 1900s when they were hunted extensively throughout the world's oceans resulting in elimination of an estimated 95 per cent of the world population. In Australia, it is estimated that humpback whales were reduced to 3.5–5 per cent of pre-whaling abundance by the 1960s. Research in the 1990s indicated that humpback whales were increasing in number by approximately 10 per cent in that decade. The number of humpback whales continues to increase although the population is still in recovery.

Humpback whales continue to require special protection at state and federal levels to maintain their recovery. Special protection measures are not unique to Western Australia but are occurring world-wide in a concerted effort to protect this giant of the sea. As a major contribution to this effort, the state government is committed to the establishment of the Camden Sound Marine Park in the state's remote and wild Kimberley (Figure 1) to recognise and provide special management arrangements for this extraordinarily important place as the principal calving habitat of the humpback whale population (known globally as Group D) that migrates annually along Western Australia's coast.

A close bond exists between a humpback mother and calf. Photo – Micheline Jenner

The world's first whale 'sanctuary' was established in Western Australia's coastal waters in 1914 from Norwegian Bay north of Coral Bay to Point Cloates. This 'sanctuary' was established to protect a humpback whale calving region from land-based whaling operators. The management plan for the region, which was essentially a fisheries management plan, included provisions for licensing whalers working in the waters, limitations on the number of whaling vessel catcher boats and prohibitions on the killing of humpback mothers and calves. Unfortunately, over time the intent of the 'sanctuary' was supplanted by an increase in pelagic whaling vessels (factory vessels) which were not subject to the management arrangements put in place for land-based operations (Holt 1983).

It wasn't until the establishment of the internationally recognised Indian Ocean Whale Sanctuary in 1979 and the Southern Ocean Whale Sanctuary in 1994 that humpback whales were once again provided some level of protection from whaling during their migration through the Southern and Indian oceans (interpreted from Holt 1983 and Bannister *et al* 1996). All whales around Australia's coast are now totally protected from whaling under international, national and state legislation and policy.

The proposed Camden Sound Marine Park will become a complementary measure for humpback whale protection and will contribute significantly to the continued recovery of this species.

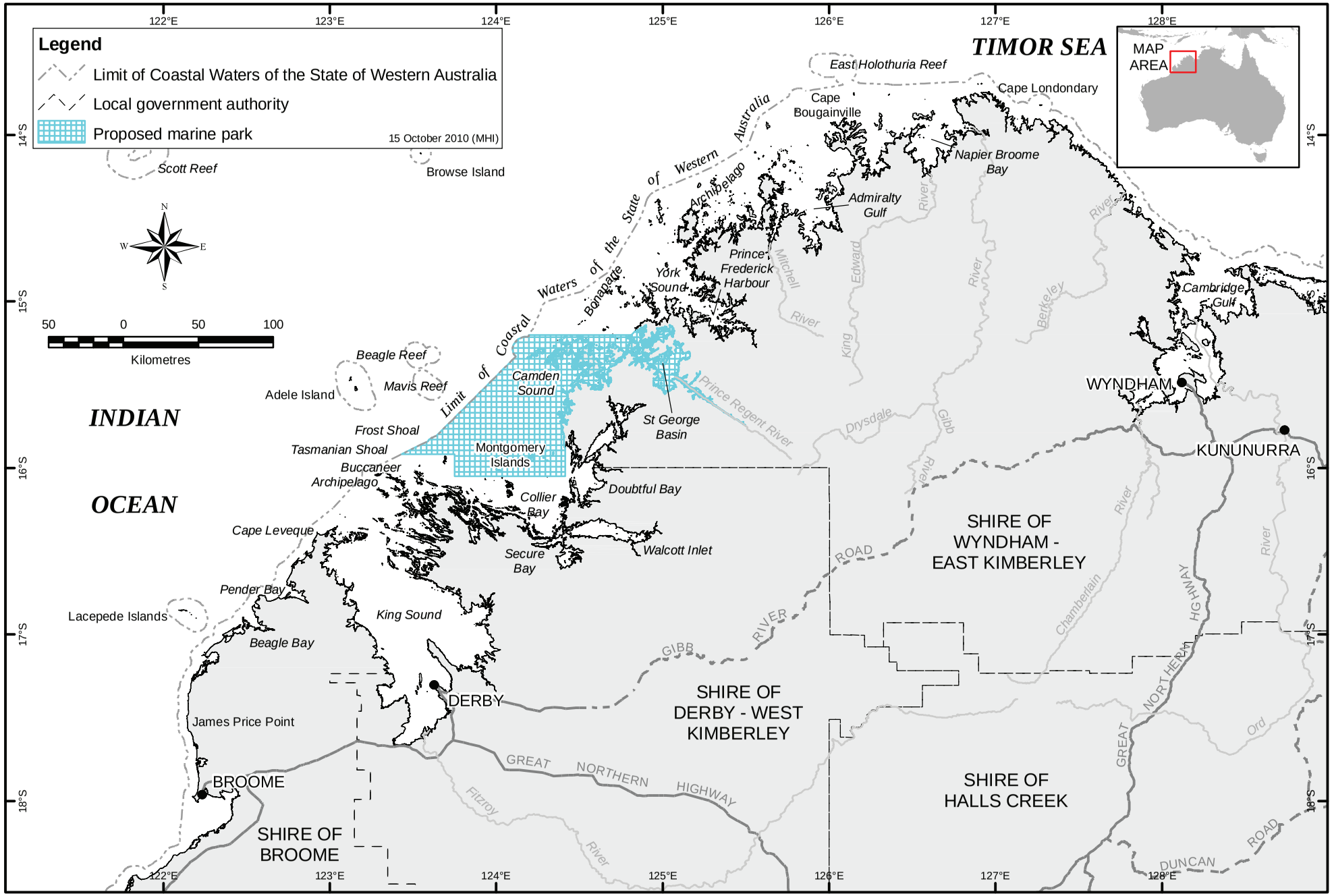


Figure 1: Locality of the proposed Camden Sound Marine Park.

2.2 Geographic and geological setting

The Camden Sound area is located within a remote and isolated part of the central Kimberley region of Western Australia, about 300 kilometres north of Broome (Figure 1). It lies entirely adjacent to the shores of the Shire of Wyndham-East Kimberley. The closest population centre is the town of Derby which lies approximately 200 kilometres to the south within the Shire of Derby-West Kimberley.

The proposed marine park encompasses a large marine embayment surrounded by the Kimberley mainland to its east; Augustus Island – the largest island in the Kimberley – in its north; an elaborate arrangement of islands and reefs to its north-west and west including Wildcat Reef; and a complex bathymetry of shoals, rock platforms and soft sediments to its south, including the waters surrounding the vast and distinctive Montgomery Islands reef. The proposed marine park also includes St George Basin, a large tide and flood influenced estuarine inlet containing a complex arrangement of habitat types. St George Basin is a known breeding area of one of the largest reptiles on earth, the saltwater crocodile (*Crocodylus porosus*) and supports some of Australia's most extensive mangrove systems.

Geologically, the rocks forming the Kimberley mainland and islands consist of sandstones and basalt lava flows belonging to the King Leopold Sandstone, Carson Volcanics and Warton Sandstone of the 1800-million-year-old Kimberley Group. These formations were deposited in shallow seas, deltas and river braid-plains of the ancient Kimberley Basin.

St George Basin is a 'valley' between the MacDonald Range, Marigui Promontory, Mount Trafalgar and Mount Waterloo. It is a marine and estuarine environment heavily influenced by freshwater flow from the Prince Regent River which runs almost entirely straight along a fault or fracture through the King Leopold Sandstone. The basin and river contain some of Australia's most spectacular coastal scenery, with sandstone cliff lines falling directly to the sea. The Prince Regent River is influenced by tidal movements for the greater part of its length.

Camden Sound is a drowned valley of the western section of the Kimberley's MacDonald Range. The small and large islands that occur in Camden Sound are remnant emergent features formed by the ancient sandstone and basalt rock formations with subtidal features offering a complex arrangement of habitat throughout the area. The coastal sections are constantly eroding due to sea movement against the coast and rain run-off down gullies and rivers, which represent the most deeply eroded portions of the terrestrial landscape.

Montgomery Islands reef, in the south, is a unique geomorphic feature of the Kimberley. The reef consists of relatively young sediments of Quaternary to Recent age including calcareous coral and shell material overlying what is currently thought to be a substrate of sandstone. However, palaeontologists believe that Montgomery Islands reef may overlie ancient limestones containing fossil stromatolites. Fossil conical stromatolite structures have been recorded at Montgomery Islands reef in the High Cliffy Island group which are estimated to be between 500-million and 1800-million-years-old. The stromatolites in the High Cliffy Island group belong to the taxon *Conophyton* and possibly represent a new species not known, so far, anywhere else in the western Kimberley (*Grey pers. comm.*).

The Montgomery Islands lie in the centre of the reef platform and host extensive mangrove forests. The edges of the reef below low water mark and the surrounding waters, which are included in the proposed marine park, host a remarkable diversity of both sessile and mobile marine life. This marine life is adapted to daily tidal movement and flow of warmed water and prey off the inundated reef top. Tides in the proposed marine park can exceed 10 metres in amplitude. The deeper subtidal habitats are likely to be dominated by mud and sand. The reef platform drains continually on the low tide, but rarely empties resulting in a shallow lagoon lying between the rim and the central islands. The spectacle of massive structures 'emerging from the sea', the water cascading off the reef top as the tide rushes out, and the abundant range of wildlife that is regularly observed makes the Montgomery Islands reef a significant tourism attraction of the Kimberley.

In the north of the proposed marine park, a series of islands, rocky shoals, and coral reefs are found, including those around Augustus and Jungulu islands, as well as offshore reefs more than 50 kilometres from the mainland. Marine life in the northern part of the proposed marine park associated with reef is considered to be of outstanding diversity and in good condition.

High Cliffy Islands on the rim of the Montgomery Islands reef. Photo – Dr Steve Blake

The proposed marine park is located within the wild and remote Kimberley, one of the most biologically significant regions of the world. The Prince Regent Nature Reserve lies adjacent to the proposed marine park waters in St George Basin. The landscape of the area adjacent the proposed marine park is relatively undisturbed and has significant cultural and natural values. The proximity of the proposed marine park to these important areas provides opportunities for management at the landscape/seascape scale.

2.3 Surrounding land tenure and native title

The land area of the Kimberley, in the most part, consists of Crown reserves including national parks and nature reserves with many Crown reserves held in trust for Aboriginal people under the *Aboriginal Affairs Planning Authority Act 1972* (Figure 2).

Reserve 23079 and Reserve 15530 are vested in the Aboriginal Affairs Planning Authority and administered by the Aboriginal Lands Trust for the 'use and benefit of Aborigines'. Reserve 23079 extends to the low water mark in most cases, but to the high water mark at Montgomery Islands reef. Reserve 15530 extends to the high water mark.

Aboriginal people with traditional and familial connection to the Camden Sound area are custodians of place, knowledge and culture. Three native title claims have been registered in the area of the proposed marine park. The *Dambimangari* claim overlies the majority of the proposed marine park, with a section of the *Uunguu* claim overlying a small portion of St George Basin and the *Mayala* claim overlying a small portion of the south-western extremity of the proposed marine park (Figure 3).

Reservation of intertidal areas between the low water mark and high water mark is a 'future act' under the federal *Native Title Act 1993* as intertidal areas are identified as an 'onshore place.' As the proposed marine park consists of extensive intertidal areas containing habitat and species of considerable marine conservation value, it will be important for DEC to work with native title claimants/holders to develop management arrangements, potentially through the registration of an Indigenous land use agreement. This may allow intertidal areas to be included as part of the marine park or alternatively managed as if part of the marine park. A draft native title determination has recently been issued for the *Dambimangari* claim with a final determination expected in 2010.

The extent of the inclusion of the Montgomery Islands reef within the proposed marine park is subject to the outcomes of native title determination, the development, in due course, of an Indigenous land use agreement with native title claimants/holders and the clarification of complex land tenure issues relating to the verification of high and low water marks.

A framework that provides improved opportunities for joint management with native title claimants/holders under the CALM Act throughout Western Australia is being developed and DEC will seek the inclusion of native title claimants/holders in the management of the proposed Camden Sound Marine Park.

Reserve 27164 is vested in the Conservation Commission of Western Australia and managed by DEC as the Prince Regent Nature Reserve for the purpose of 'conservation of flora and fauna'. The nature reserve extends to the low water mark. In 1978 the Prince Regent Nature Reserve was listed as a World Biosphere Reserve under the United Nations Educational, Scientific and Cultural Organisations (UNESCO) Man and the Biosphere Program. A biosphere reserve is not established through legal reservation but does provide international recognition of the value of the area to conservation, sustainable use, environmental research and education.

Reserve 45499 is located on Degerando Island, at the southern point of the Champagny Island group. This reserve is for the purpose of 'navigation, communication, meteorology and survey'. This reserve is located within Reserve 23079. A number of small islands in the area remain unallocated Crown land, that is, they are not vested to a management body. Unallocated Crown Land is administered under the *Land Administration Act 1997*.

The proposed marine park encompasses an area of approximately 7,062 square kilometres. The seaward boundary of the proposed marine park extends to the limit of Western Australia's coastal waters. It is intended that the marine park is established to the high water mark wherever possible. For intertidal areas subject to native title, the consent of the traditional owners will be required before these areas can be included or managed as marine park. As such, initial gazettal of the marine park will be to the low water mark in most places.

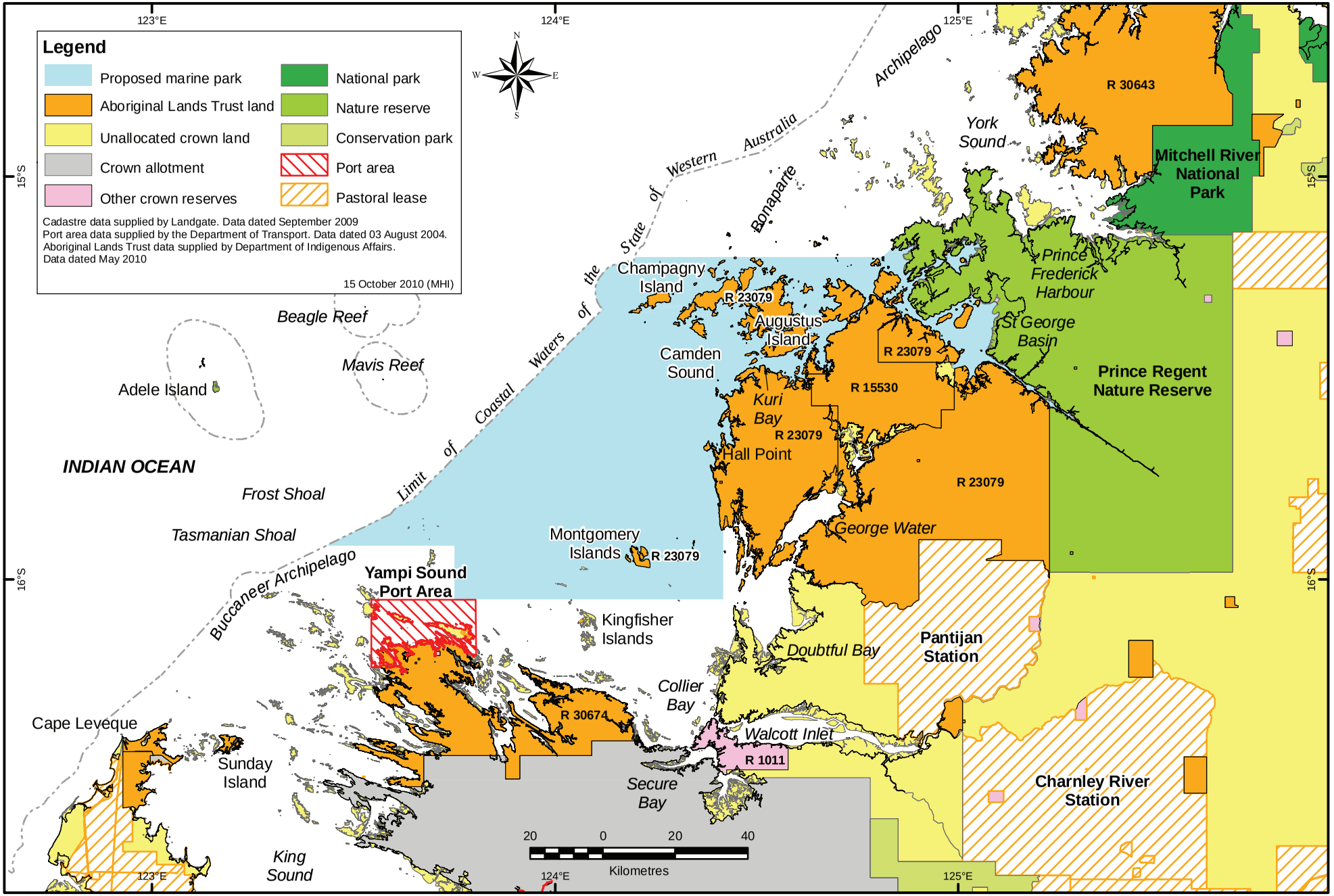


Figure 2: Tenure within and adjacent to the proposed Camden Sound Marine Park.

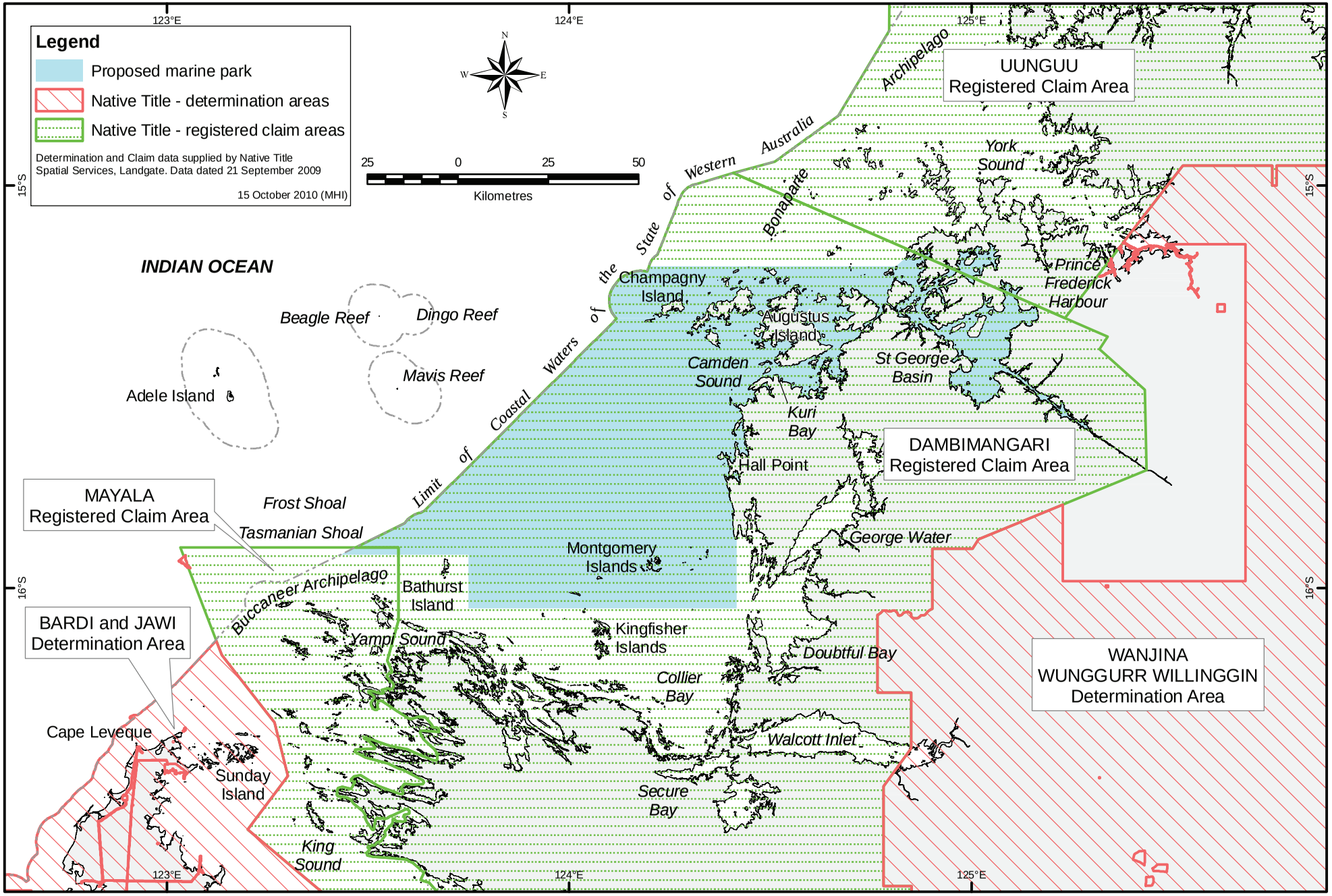


Figure 3: Native Title claim and determination areas within and adjacent to the proposed Camden Sound Marine Park.

Part B – Values

3. A vision for a special place

A resting humpback whale. Photo – Micheline Jenner

A protected place for whales and other marine life to breed and thrive for present and future generations of people to visit and enjoy.

4. Human values and uses

Marine parks are created to provide for the conservation and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest while providing opportunities for nature-based recreation, tourism and commercial uses where appropriate. Within this setting, a range of human values and uses are recognised and will continue consistent with management targets set for habitats and species of conservation interest in the proposed marine park.

It is recognised that conservation estate, such as a marine park, has the capacity to satisfy an important portion of public demand for outdoor recreation and nature-based tourism, and in so doing contributes significantly to the social, psychological, physical and economic wellbeing of the community (DEC 2006). Management of use and visitation in the proposed marine park is guided principally by the zoning scheme and permitted uses (sections 7 and 8), the management programs and actions (Section 9) and the management targets specified in Table 7, as well as by the provisions of the CALM Act and *Wildlife Conservation Act 1950* (Wildlife Conservation Act) in association with other government legislation relating to marine management (Section 11 and Appendix 2). DEC's policy No. 18 *Recreation, tourism and visitor services* provides specific guidance for recreation, tourism and visitor services within CALM Act reserves (DEC 2006).

Existing use and visitation within the proposed marine park is generally seasonal, with the greatest use occurring during the northern dry season, between April and October.

4.1 Aboriginal cultural connection

Aboriginal people have strong cultural connections to the Camden Sound area. In the past, Aboriginal people living in the area travelled by mangrove raft to the offshore islands to collect food from man-made fish traps and natural reefs. Turtle, dugong and crocodile were also hunted for food. Under a provision of the Wildlife Conservation Act, Aboriginal people are still able to hunt these species for food in keeping with their traditional and cultural practice.

Forty-seven Aboriginal heritage sites are registered in the area of the proposed marine park (Department of Indigenous Affairs 2009). Most occur on land, but many are sea-related. Registered sites include those with artefacts, ceremonial and mythological paintings, fish traps, burial grounds, quarrying, man-made structures and middens. Many sites were and are traditional camping grounds and are associated with freshwater, or have ceremonial or cultural relevance. There are likely to be many sites that are not currently registered. All Aboriginal heritage sites, registered and unregistered, are protected under the *Aboriginal Heritage Act 1972*. Current impacts on sites by tourism operators are of significant concern to Aboriginal people (Scherrer *et al* 2008).

It is recognised that the proposed marine park contains a number of Aboriginal heritage and cultural sites that are currently being visited as tourist attractions. It will be particularly important for licensed commercial tour operators to build sustainable relationships with Aboriginal people who represent visited areas to ensure an appropriate level of respect is maintained.

4.2 Nature-based recreation and tourism

Rapid growth in the tourism industry within the Kimberley has occurred in recent years resulting in some concern by government agencies, tourism operators, Aboriginal people and community about the lack of appropriate tourism and environmental management processes in the area (Scherrer *et al*, 2008).

Tourism vessel at 'The River', Montgomery Islands reef. Photo – Dr Steve Blake

Large luxury cruising vessels occasionally anchor in the Montgomery Islands reef area and offer a tour of the reef to passengers. These tours may involve over 40 people at a time accessing the reef at low tide. Luxury cruise liners do not currently enter other parts of the proposed marine park and are restricted by water depth.

The majority of smaller commercial cruise vessels pass through the proposed marine park primarily stopping at Montgomery Islands reef, Camden Harbour, St George Basin and the Prince Regent River (King's Cascade). Overnight anchoring occasionally occurs in Camden Harbour or in St George Basin and Prince Regent River.

Montgomery Islands reef and King's Cascade were two of the most popular sites for visitation by commercial expedition cruises in 2006 (TNS Social Research 2006). Passengers participate in activities such as fishing, sightseeing and on-land exploring including appreciation of Aboriginal cultural sites.

Under the *Fish Resources Management Act 1994* (Fish Resources Management Act), all aquatic tourism (such as extractive, non-extractive boat and non-boat-based operations) is required to be licensed. However, in a marine park, non-extractive aquatic tourism operators must be licensed by DEC under the CALM Act and do not require a licence under the Fish Resources Management Act.

Recreational fishing licences are required for a number of recreational fishing activities including fishing from a powered vessel, catching rock lobster and the use of a net. Throw nets only are permitted in the Kimberley and no recreational set or haul netting is permitted.

Remote and magnificent Kimberley land and seascapes provide opportunities for recreational fishers to enjoy wilderness fishing experiences in the proposed marine park (see Department of Fisheries 2005). This plan proposes that recreational wilderness fishing experiences may be enhanced by restricting fishing in one area of the proposed marine park to prohibit commercial fishing and only allow recreational fishers to consume their catch on site – that is no take away.

A small scale commercial aquatic tourism fishing business is based at *Wiggingarra Butt Butt* (Freshwater Cove) on the mainland adjacent Montgomery Islands reef. This fishing venture provides safari type accommodation. Freshwater Cove is accessible only by sea plane, helicopter and boat. The business is managed in partnership with Aboriginal people and fishing activity is undertaken within a 15-kilometre radius of Freshwater Cove, including occasional visits to Montgomery Islands reef. Fishing is an important activity for visitors to the area with anglers targeting a range of species including barramundi (*Lates calcarifer*), mackerel, trevally, grouper and shark.

Visitation to the proposed marine park is expected to increase over time as the Kimberley region's reputation as a premier nature-based tourism destination grows. Use and visitation will require careful management to ensure that the biodiversity values of the proposed marine park are conserved.

4.3 Maritime heritage

Sites of maritime heritage significance are of general interest to many people visiting the Kimberley as the area has a rich history of exploration and use.

There are three distinct overlapping phases of maritime cultural activity identified in the Camden Sound area:

- Aboriginal activities (from prehistoric period until present)
- South East Asian seafaring activity and trepang (beche de mer) harvesting (c. 17th – 20th century)
- European exploration and activities (pre and post colonisation of Western Australia) (Souter *pers. comm.*).

Two shipwrecks are known to have occurred in the proposed marine park: the *Calliance* and the *Enchantress*. There may be other, as yet unrecorded, shipwrecks and underwater cultural heritage in this area including pearling luggers and colonial coastal vessels (Souter *pers. comm.*). Camden Harbour is a favoured destination for commercial expedition cruises because of its points of interest in relation to heritage. It is also a relatively safe anchorage for visiting vessels. Further details about the two known shipwrecks are provided at Appendix 4.

4.4 Commercial fishing

It is estimated that commercial fisheries operating in the whole Kimberley region have an annual economic value to fishers of about $11.5 million annually and employ about 180 people (Department of Fisheries 2008). A number of commercial fisheries are licensed to operate within the waters of the proposed marine park. These include Marine Aquarium Fishery, Specimen Shell Fishery, Beche de mer Fishery, Mud Crab Fishery, Kimberley Prawn Managed Fishery, Mackerel Interim Managed Fishery, Kimberley Gill Net and Barramundi Managed Fishery, Northern Demersal Scalefish Managed Fishery, Western Australian North Coast Shark and Joint Authority Northern Shark Fisheries. In addition, the Australian Government-managed Western Tuna and Billfish Fishery is entitled to operate in these waters. While these fisheries are authorised to operate in the waters of the proposed marine park many do not regularly fish this area.

Under the CALM Act, commercial fishing is permitted in a marine park general use zone and a special purpose zone if it is compatible with the specified purpose subject to any restrictions applied under the Fish Resources Management Act. The Department of Fisheries will continue to manage fisheries in the marine park. To reduce the potential for trawling to disturb humpback whales and their calves, trawling will not be permitted in many areas of the proposed marine park. Further information about commercial fisheries operating in the proposed marine park is provided at Appendix 3.

4.5 Pearling

Western Australia is the largest pearl producer in Australia. During the mid 1990s the industry contributed more than $200 million per annum to the Western Australian economy in the value of exports (Department of Fisheries 2009). The industry is also a major contributor to the regional economy through wages, gear purchases, fuel and other provisions that are required for its operation.

Successful pearling requires high water quality and involves hanging the pearl oysters in panels in the water column to keep them flushed with nutrients and to carry wastes away. Research undertaken by the University of Newcastle concluded through multiple lines of evidence that benthic conditions beneath pearling operations in the Kimberley coast are within the bounds of natural variability as compared with areas not used for pearling (Jelbart *et al* 2009). Pearling operators liaise closely with the Department of Fisheries in evaluating the potential risk of marine-borne disease and/or introduced marine pests being transported into areas of operation.

Pinctada maxima – Western Australia's native pearl making oyster. Photo – DEC

There are 13 pearling leases within the proposed marine park (Figure 4) and an application is pending for a new lease near Pyrene Island to the north-west of Jungulu Island.

The Minister for Fisheries has issued a pearl transport exemption area notice for the pearling group operating in the proposed marine park which allows pearl oysters and gear to be transferred between leases to maximise the growth of pearls. The 'transport exemption zone' allows the industry to moor boats and process pearl oysters outside lease areas, and provides for other activities that support pearling operations.

Pearling leases are not exclusive use areas. Other users can move through the lease area provided they do not interfere with pearling gear or pearl oysters. Navigation markers must be placed around the working area of the lease to enable safe navigation (Department of Fisheries 2009). DEC will work with the lessees and Department of Fisheries to facilitate other park users having access to these areas for appropriate permitted activities.

Both the CALM Act and *Pearling Act 1990* provide for pearling in marine parks and reserves. The Acts specify that pearling is permitted in a marine park general use zone and/or special purpose zone if it is compatible with the specified purpose of the special purpose zone. Pearling leases which exist prior to the establishment of a marine park have a right of renewal and cannot be displaced by the creation of a marine park. New proposals for pearling leases will be assessed on a case-by-case basis by Department of Fisheries in liaison with DEC, the MPRA and other stakeholders. The Minister for Environment's approval is required before the Minister for Fisheries grants a new pearl lease area within a marine park.

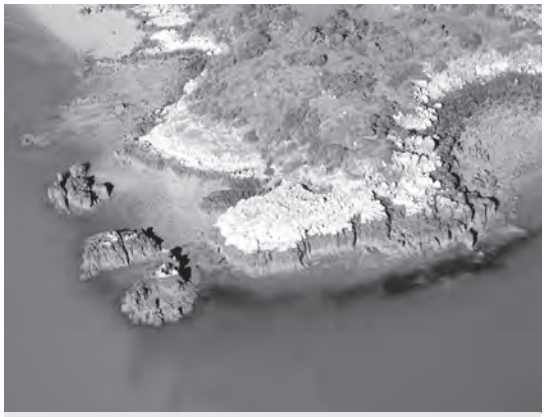
4.6 Mineral resources

Mining has not occurred within the proposed marine park and there are no petroleum tenements within the area of the proposed marine park. At present there are two exploration licences issued within the proposed marine park (Figure 5). These licences allow exploration for iron ore or gold/copper deposits. There is potential for geothermal developments in this region and these will need to be given appropriate consideration on a case-by-case basis.

Seismic surveys may be permitted in a marine park, subject to environmental impact assessment processes. Management of seismic survey, so as to avoid or minimise potential risks to cetaceans, involves use of precautionary measures aimed at preventing injury and minimising the risk of behavioural

changes. These are generally required under state and federal government approvals processes (Australian Government 2008).

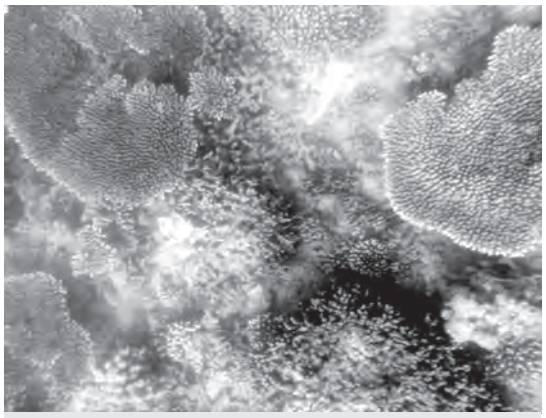
The CALM Act specifies that mining and petroleum exploration and/or production is permitted in a marine park general use zone and/or special purpose zone if it is compatible with the specified purpose of a special purpose zone.



Intertidal rocky shores of Camden Sound. Photo – Ben Tannock

4.7 Research opportunity

New and exciting information is revealed almost every time a scientific survey is undertaken in the wild and remote Kimberley region with new fish, sponges, coral reef species and other marine wildlife being recorded in recent years. Understanding of the extent, diversity and nature of the Kimberley's ecological systems has increased in recent years but knowledge of these systems is still limited.



The undersea wonders of the Kimberley – subtidal corals near Jungulu Island. Photo – Dr Andrew Heyward

The proposed Camden Sound Marine Park contains a range of species of special conservation status, including the humpback whale, Australian snubfin (*Orceaella heinsohni*) and Indo-Pacific humpback (*Sousa chinensis*) dolphins, marine turtles and dugong. There is a wide range of research opportunities and gaps in knowledge that need to be addressed. These include gaining a better understanding of habitats and species of the marine park, particularly use by humpback whales for calving and potential interactions/impacts with recreational and commercial activities. Specific research will be undertaken over the first five years of the plan to support a review of the adequacy of management arrangements, particularly with respect to protection of humpback whales and their calves (see sections 9.1 and 9.6).

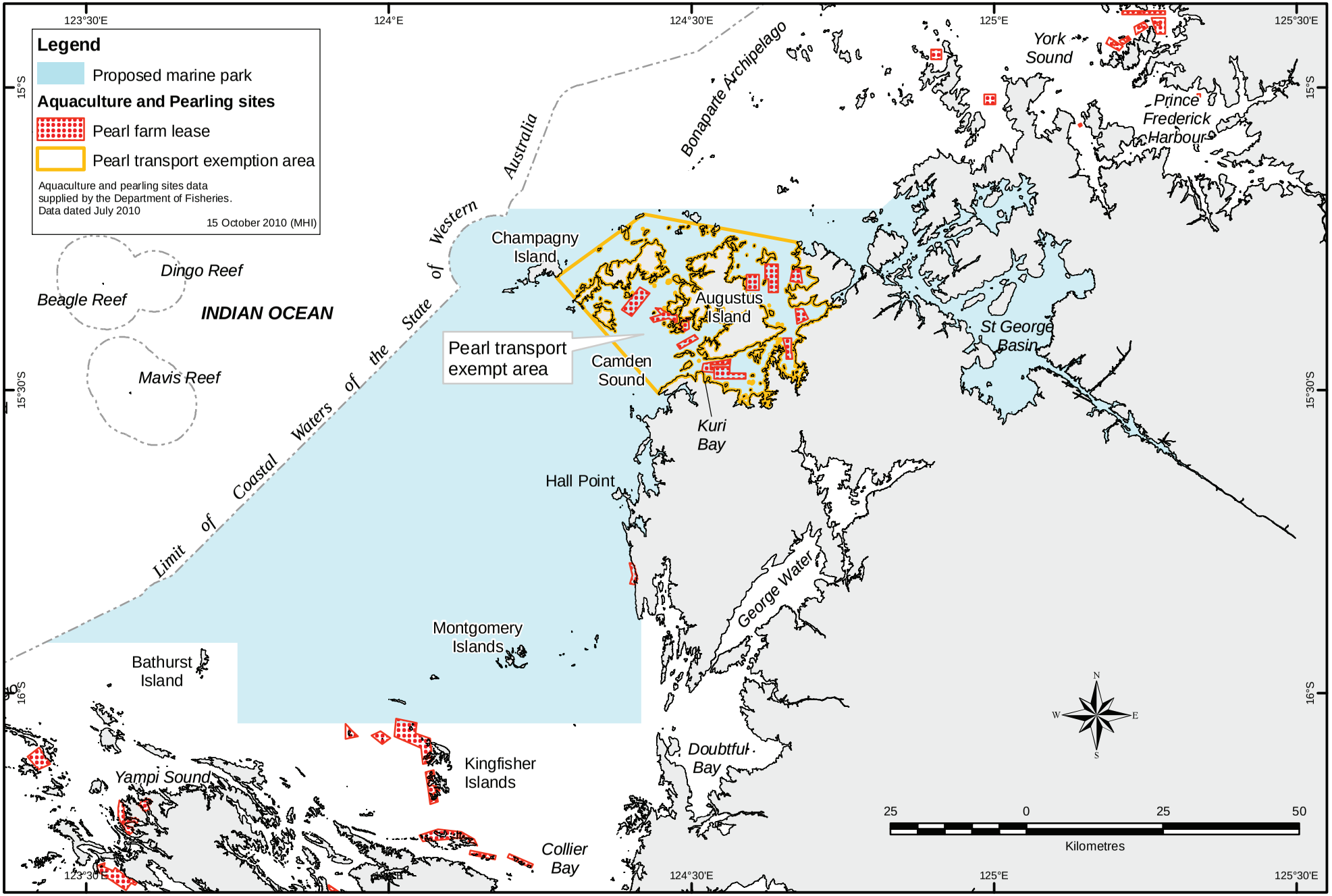


Figure 4: Aquaculture and pearling sites within and adjacent to the proposed Camden Sound Marine Park.

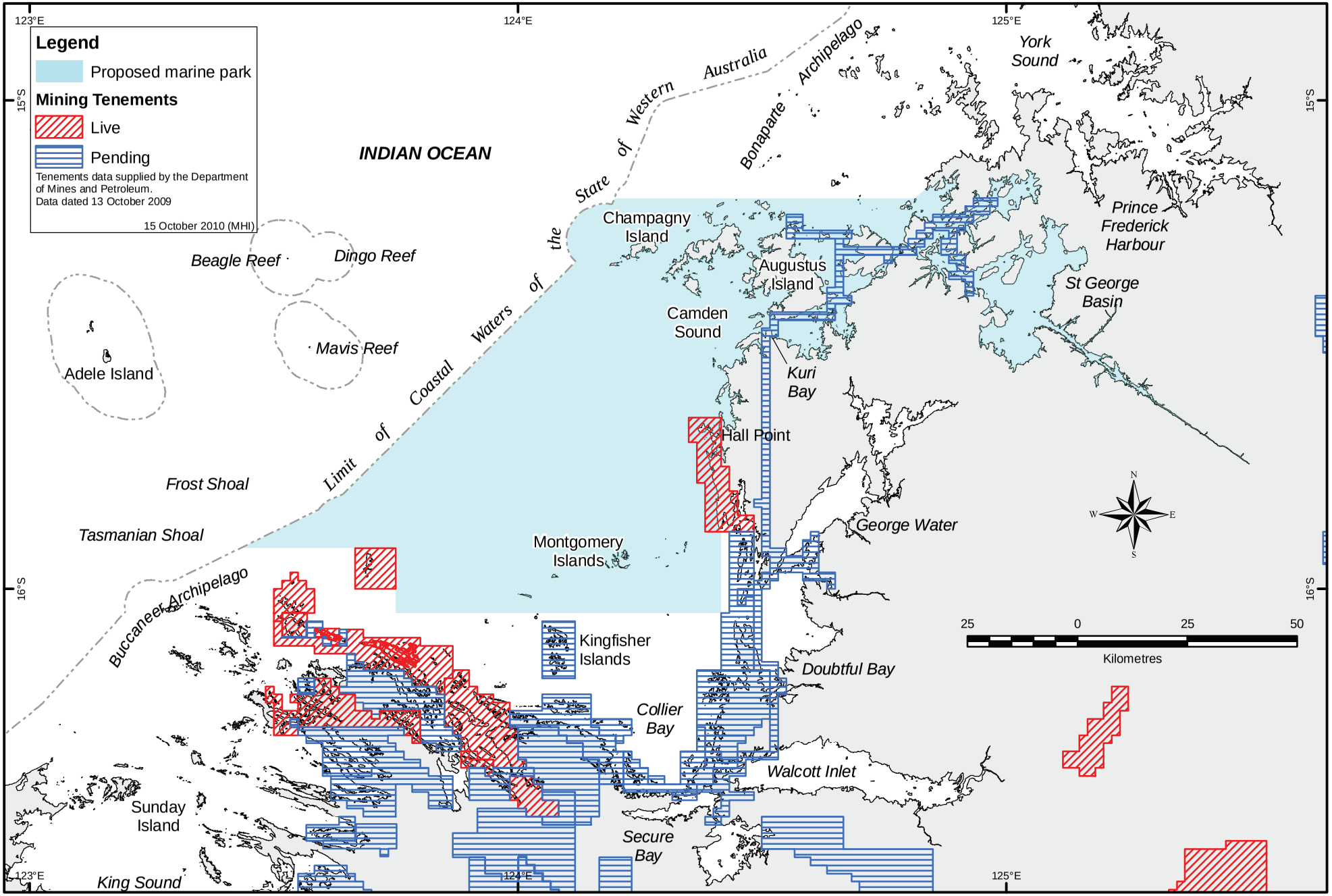


Figure 5: Mining tenements within and adjacent to the proposed Camden Sound Marine Park.

5. Biodiversity values

The key biodiversity values of the proposed marine park are presented within this indicative management plan within two broad themes: *species of special conservation interest* – comprising those species which are listed as having special conservation status (such as the humpback whale) as well as species which are extracted for human use (such as targeted finfish) and *habitat* – comprising both geomorphic habitat (such as rocky shores and platforms) and biological habitat (such as mangroves and seagrass).

The proposed marine park's biodiversity values will be managed to maintain the park's naturally high levels of biodiversity within specified management targets. For all biodiversity values, the management intent is the maintenance of the natural diversity of native species and high levels of natural abundance, and restoring populations where this is feasible. Particular emphasis will be placed on the conservation of all biodiversity values (including whale calving habitat) within sanctuary zones and the protection of humpback whale mothers and calves in the special purpose zone (whale conservation).

5.1 Species of special conservation interest

Whales

Whale species recorded in the proposed marine park include the humpback whale (*Megaptera novaeangliae*), minke (*Balaenoptera acutorostrata*), false killer (*Pseudorca crassidens*) (Jenner *pers. comm.*) indicating that the proposed marine park includes habitat for both baleen and toothed whales. Additionally, a small number of specially protected whale species that occur in the Kimberley marine bioregion may also be found in the proposed marine park at times. It is unlikely that these whales will be resident for long periods as their preferred breeding and feeding areas may be located outside the proposed marine park.

Humpback mother and calf travelling together.
Photo – Dr Steve Blake

Conservation status of whales found or likely to occur in the proposed marine park			
Species	**Western Australia (WC Act)**	**Australia-wide (EPBC Act)**	**World-wide (IUCN 2009)**
Humpback *(Megaptera novaeangliae*)	Rare or likely to become extinct	Vulnerable to extinction	Least concern
Minke (*Balaenoptera acutrorostrata*)		Endangered	Endangered
False killer (*Pseudorca crassidens*)	Not listed	Not listed	Data deficient

Humpback whales are known to inhabit the proposed marine park in large numbers between June and November each year (Jenner *et al* 2001). The Western Australian humpback whale grouping, known as *Breeding Group D*, migrates from Antarctic feeding grounds to breeding grounds along the Western Australian coast and is the largest humpback whale population in the world. Research, that has been underway in the Kimberley since the early 1990s, has identified the Camden Sound area as the principal calving habitat for this population (Jenner *et al* 2001). It is estimated that the Western Australian humpback whale population may now be 22,000 to 25,000 whales with most of these whales likely to visit calving grounds along the Western Australian coast each season (Jenner *pers. comm.*). Humpback

whales are provided special protection at state, national and international levels. The humpback whale population is estimated to have increased by 10 per cent since the 1990s and is still recovering to a pre-whaling state.

The proposed marine park is the principal nursery area in the Kimberley marine bioregion for new born humpback whales. Here, water temperatures during the calving season can reach 28 degrees Celsius, which is approximately two degrees warmer than the surrounding areas. Newborn humpbacks are only four to five metres in length at birth and are almost completely lacking in insulating blubber. Humpback mothers use the Camden Sound area to quickly build up their calf's protective blubber layer so that the metabolic strain for a warm-blooded mammal living in water is minimal during their first few critical weeks of life (Jenner *pers. comm.*).

The complex shoreline, depth and seafloor profile of the proposed marine park is thought to provide numerous hiding places for humpback mothers and calves as they seek protection from predators and aggressive bull humpback whales intent on mating. The warm, shallow water and complex shoreline makes this region an ideal calving and nursery area for this protected species. The principal calving area is thought to include the shallow waters of the eastern shorelines of the proposed marine park (Jenner *pers. comm.*).

Humpback whale raising its tail to dive. Photo – Micheline Jenner

Two other known areas of importance for humpback whale aggregation in the Kimberley are the Frost and Tasmanian Shoals to the north of King Sound, and an area to the north west of the Lacepede Islands along the Dampier Peninsula. These places are known to be high density staging and resting stations on the humpback whale migration route (Jenner *pers. comm.*). Calves can also be born in these areas but preliminary research suggests that newborn calf numbers appear to be lower in these areas than in the Camden Sound area (Jenner *pers. comm.*). The Tasmanian and Frost Shoals lie outside Western Australia's coastal waters but within the Commonwealth *Australian Whale Sanctuary* (Australian Government 2005) and whales in the vicinity of the Lacepede Islands can be found both in state and federal waters.

Dolphins

Mangrove-lined shores have been found to be feeding habitat for the recently identified Australian snubfin dolphin, the Indo-Pacific humpback dolphin and the bottlenose dolphin (*Tursiops truncatus*). Dolphins also appear to favour areas where a greater complexity of habitat is found (Thiele *pers. comm.*). A study undertaken by an independent researcher has found that Deception Bay, the inlets of Augustus Island, Kuri Bay and Prince Regent River are particularly important to these species (Thiele *pers. comm.*). It is expected that spinner dolphins (*Stennella longirostris longirostris*) also occur in the area but may be more transient.

Conservation status of dolphins found in the proposed marine park			
Species	**DEC priority code[1]**	**Australia-wide (EPBC Act)**	**World-wide (IUCN 2009)**
Australian snubfin (*Orceaella heinsohni*)	Priority 4 fauna – in need of monitoring	Protected, status being assessed	Near threatened
Indo-Pacific humpback (*Sousa chinensis*)			
Spinner (*Stennella longirostris longirostris*)			Data deficient

Australian snubfin dolphin. Photo – Dr Deborah Thiele

A dugong up for breath. Photo – Dave Holley

Dugongs

Globally, the dugong has a distribution that spans at least 37 countries. While most populations have declined and become fragmented, Australia is considered to be the core of the world's population (Chapman 2008).

Conservation status of the dugong			
Species	**Western Australia (WC Act)**	**Australia-wide (EPBC Act)**	**World-wide (IUCN 2009)**
Dugong (*Dugong dugon*)	Specially protected	Not listed	Vulnerable to extinction

Under the Wildlife Conservation Act and *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (Environmental Protection and Biodiversity Conservation Act), Aboriginal people may hunt dugong to provide food for themselves and immediate family but restrictions can be imposed if a dugong population becomes threatened by hunting.

DEC coordinates the implementation of the *Draft dugong management program for Western Australia* to ensure that human activities are not detrimental to the long-term conservation and viability of the dugong throughout its range in Western Australian waters (DEC 2008). Dugongs are known to be numerous around Montgomery Islands reef and are likely to occur in other parts of the proposed marine park.

[1]*In addition to species listed with a special conservation status, DEC maintains a list of priority taxa that may require monitoring and evaluation of its population status.*

Marine turtles

Of the world's seven recognised species of marine turtle, four are known to breed on the coast and islands of northern Western Australia: the flatback (*Natator depressus*), green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*) and loggerhead (*Caretta caretta*). The olive ridley (*Lepidochelys olivacea*) and leatherback (*Dermochelys coriacea*) turtles forage in, and migrate through, Western Australian waters. Marine turtles are numerous in the proposed marine park. It is not known if, or to what extent, nesting occurs on island or mainland beaches.

Conservation status of marine turtles found or likely to occur in the proposed marine park

Species	Western Australia (WC Act)	Australia-wide (EPBC Act)	World-wide (IUCN 2009)
Leatherback (*Dermochelys coriacea*)	Rare or likely to become extinct	Vulnerable to extinction	Critically endangered
Flatback (*Natator depressus*)			Data deficient
Green (*Chelonia mydas*)			Endangered
Hawksbill (*Eretmochelys imbricata bissa*)			Critically endangered
Loggerhead (*Caretta caretta*)		Endangered	Endangered
Olive ridley (*Lepidochelys olivacea*)			

Under the Wildlife Conservation Act and Environmental Protection and Biodiversity Conservation Act, Aboriginal people may hunt turtle to provide food for themselves and their immediate family but restrictions can be imposed if a turtle population becomes threatened by hunting.

DEC coordinates the implementation of the state's *Draft marine turtle recovery plan* to stop further decline of marine turtle populations and to facilitate their recovery throughout their range in Western Australia (DEC 2009). This plan complements the *Recovery plan for marine turtles in Australia* that has been prepared under the Environmental Protection and Biodiversity Conservation Act (Environment Australia 2003).

A marine turtle searching for prey near mangroves. Photo – DEC

Saltwater crocodiles

Saltwater crocodiles are known to breed in the mangroves and tributaries of St George Basin and Prince Regent River. Particularly large crocodiles are found at the Montgomery Islands reef (Tannock *pers. comm.*). Saltwater crocodiles were hunted to near extinction for their skins and as a food source in the late 1800s and 1900s.

Conservation status of the saltwater crocodile			
Species	**Western Australia (WC Act)**	**Australia-wide (EPBC Act)**	**World-wide (IUCN 2009)**
Saltwater crocodile (*Crocodylus porosus*)	Specially protected	Not listed	Not listed

Under the Wildlife Conservation Act and Environmental Protection and Biodiversity Conservation Act, Aboriginal people may hunt saltwater crocodile to provide food for themselves and their immediate family but restrictions can be imposed if a crocodile population becomes threatened by hunting. Saltwater crocodiles are managed as a trade commodity under the *Management plan for the commercial harvest and farming of crocodiles in Western Australia 2009–2013* (DEC 2009b).

Finfish

Two hundred and twenty-eight species of finfish were recorded during a survey of the central Kimberley coast in 1997, with 23 species being new records for the Kimberley (Walker 1997). Gobies, damsel fish and wrasse fishes were found to be the groups with the largest range of species recorded. The diversity of finfishes, in the Kimberley, was found to increase in relation to water clarity, water depth and diversity of habitat (Morrison and Hutchins 1997).

Many finfish have a planktonic life stage which synchronise with tides and seasonal water circulations and conditions. Some rely on both estuarine and marine waters to complete their life cycle, and others rely on the protective structure of habitats such as algae, seagrass and mangroves resulting in all parts of the marine environment being important for finfish reproduction and development.

Most research on marine finfish in the Kimberley has been undertaken by the Department of Fisheries and focuses on species of commercial and recreational fishing interest (Department of Fisheries 2009).

At present there is limited information about finfish diversity and assemblages in the proposed marine park. However, the diversity of habitat within the proposed marine park is likely to result in a high diversity of finfish species.

Of the seven known species of sawfish found in the world, four are found in the north of Western Australia and are expected to occur in the proposed marine park. Sawfish have slow rates of growth and low numbers of offspring which means they may become threatened if not appropriately managed. Sawfish in Western Australia are vulnerable to gillnet fishing and trawling in upper reaches of estuaries and in rivers (Department of the Environment, Water, Heritage and the Arts 2009). However, they are often released alive and Department of Fisheries has declared them totally protected fish under the Fish Resources Management Act, meaning they cannot be caught by commercial or recreational fishers.

Barramundi. Photo – Department of Fisheries

Conservation status of finfish found or likely to occur in the proposed marine park				
Species	**Western Australia (WC Act)**	**Western Australia (FRM Act)**	**Australia-wide (EPBC Act)**	**World-wide (IUCN 2009)**
Green sawfish *(Pristis zijsron)*	Rare or likely to become extinct	Totally protected fish	Not listed	Critically endangered
Freshwater sawfish *(Pristis microdon)*	Not listed		Vulnerable to extinction	
Dwarf sawfish *(Pristis clavate)*				
Narrow sawfish *(Anoxypristis cuspidate)*			Not listed	
Potato cod *(Epinephelus tukula)*				Not listed
Queensland groper *(Epinephelus lanceolatus)*				
Humphead maori wrasse *(Cheilinus undulates)*				
Billfish (marlins, sailfish and spearfish)		Commercially protected		

Sharks and rays

Sharks and rays are known to be common in the Camden Sound area. The largest of all rays, the manta ray (*Manta birostris*) frequents the area indicating that planktonic life is abundant. Sharks are important high order predators, with species such as the hammerhead shark (*Sphyrna* spp.), tiger shark (*Galeocerdo cuvier*), blacktip shark (*Carcharhinus* spp.) and lemon shark (*Negaprion acutidens*) likely to be common. Ninety-four species, representing approximately 19 per cent of the world's known shark species, occur in northern Australia and a high proportion of these are likely to be found in the proposed marine park. The cookie-cutter shark (*Isistius brasiliensis*) is found throughout Western Australian waters and migrates from deep water to near the surface at night. Bite marks from cookie-cutter sharks can be seen on the skin of humpback whales.

Conservation status of sharks likely to occur in the proposed marine park				
Species	**Western Australia (WC Act)**	**Western Australia (FRM Act)**	**Australia-wide (EPBC Act)**	**World-wide (IUCN 2009)**
Cookie-cutter shark (*Isistius brasiliensis*)	Not listed	Commercially protected (except in commercial target shark fisheries)	Not listed	Least concern
Zebra horn shark (*Heterodontus zebra*)				
Tasselled wobbegong (*Eucrossorhinus dasypogon*)				Near threatened
Northern wobbegong (*Orectolobus wardi*)				Least concern
Speartooth shark (*Glyphis sp*)		Totally protected	Critically endangered	Not listed

The *National plan of action for the conservation and management of sharks* provides nationally endorsed advice and guidance as to how the conservation and management of sharks can be integrated into management arrangements for target and non-target fisheries by the jurisdictions responsible for those fisheries (Australian Government 2004).

The round shape of the cookie-cutter shark bite can clearly be seen on humpback whales. Photo – Dr Steve Blake

Seabirds and shorebirds

The Kimberley region is important on an international scale for seabirds and migratory and resident shorebirds but the significance of the proposed marine park for seabirds and shorebirds is largely unknown. Jabiru (*Ephippiorhynchus asiaticus*) and magpie geese (*Anseranas semipalmate*) are often seen in the tidal flats of St George Basin and Phillip Parker King recorded oyster catchers and sandpipers there in 1821 (King 1827) but the area has not been extensively surveyed.

Mangroves and their associated invertebrate-rich mudflats tend to be important habitat for migratory shorebirds from the northern hemisphere such as sandpipers (*Calidris* spp.), curlews (*Numenius* spp.) and whimbrels (*Numenius phaeopus*). Many other bird species may also be found in mangrove habitat including mangrove fantails (*Rhipidura phasiana*), broad-billed flycatchers (*Myiagra ruficollis*) and red-head honeyeaters (*Myzomela erythrocephala*). Striated herons (*Ardeola striatus*), black-necked storks (*Ephippiorhynchus asiaticus*) and brahminy kites (*Milvus indus*) nest in the dense mangrove foliage and seek prey around the roots of mangrove trees.

It is expected that seabirds or shorebirds listed as threatened under the Wildlife Conservation Act, Environmental Protection and Biodiversity Conservation Act or listed on the IUCN Red List of Threatened Species occur within the proposed marine park. In addition, a number of migratory species

may occur that are subject to migratory bird agreements between Australia and Japan, China and the Republic of Korea (JAMBA, CAMBA and ROKAMBA respectively).

Molluscs

Two hundred and ninety-two species of molluscs were recorded during a 1997 survey of the central Kimberley coast (Walker et al 1997). This survey did not include mangrove habitat. Molluscs are believed to be less diverse in inshore habitat because of tidal scouring, potential for desiccation and seasonal freshwater washing during the wet. Oysters may be common in some areas of rocky intertidal habitat.

Crustaceans

Eighty-nine species of crab, 80 species of shrimp and 19 species of barnacle were recorded during a survey of the central Kimberley coast (Walker 1997). A number of species had limited range with one species recorded being found only in Northern Australia (Hewitt 1997). Turbid inshore waters limit the presence of crustaceans and species diversity was highest at places which had a greater diversity of habitat (Hewitt 1997). Mud crabs (*Scylla serrata*) are common throughout the proposed marine park mainly associated with mangrove habitat.

St George Basin is a known nursery area for banana and king prawns. Commercial trawl fishing does not occur in this inlet to protect juvenile stock. During the wet, the prawns move offshore into mud habitat where they are targeted by fishers. To reduce the potential for disturbance of humpback whales and calves, trawling will not be permitted in some areas of the marine park identified as important for whale conservation.

Echinoderms

There is little information available on echinoderms in the proposed marine park. However, sea cucumbers (beche de mer) are found in sand areas throughout the Kimberley and form the basis of a small commercial fishery. Sea stars are likely to be abundant.

Sea snakes

Tropical sea snake. Photo – John Huisman

Very little is known about the basic ecology, movement patterns, life history strategies, reproductive biology and population genetics of most species of sea snakes (CRC Reef Research Centre 2009). However, sea snakes are known to be relatively long-lived animals with low reproductive outputs meaning that populations may take a long time to recover if depleted (Great Barrier Reef Marine Park Authority 2009). There are over 20 species of sea snake recorded in Western Australia (Australian Government 2008). All are protected under the provisions of the Wildlife Conservation Act and Environmental Protection and Biodiversity Conservation Act but are not listed for special protection. Sea snakes are likely to be numerous in the proposed marine park and may be strongly associated with coral habitat where prey species may be more abundant.

There is some concern that trawl fishing may impact the long-term sustainability of populations as sea snakes can form a significant portion of bycatch for this type of fishing (Evans 2009).

Methods for monitoring changes in the status of Australia's diverse and highly endemic assemblages of sea snakes are not well established.

Sponges

Sponge dominated areas have been recorded as occurring on and below reef edges between the mainland and small nearshore islands (Blakeway 1997; Heyward *pers. comm.*). Preliminary assessment indicates that many sponges may be undescribed and hence are likely to be new to science.

5.2 Habitats

The Indonesian Throughflow is a warm, low nutrient, low salinity system of currents that carries water westward from the Pacific to the Indian Ocean through the deep passages and straits of the Indonesian Archipelago. This warm tropical water influences the character of the inshore and southward flowing Leeuwin Current along the Western Australian coast, which in turn facilitates the movement of tropical species southward along the coast into sub-tropical and temperate waters. Distribution of marine life in the proposed marine park, and the Kimberley as a whole, is influenced by a range of factors including geomorphology, habitat types, tides and currents. The large tidal range, which can exceed 10 metres in amplitude produces strong tidal flows and influences the habitats and marine life of the area.

The intertidal area of the Kimberley is globally unique and has significant conservation value as there is nowhere else in the world where hypertidal seashores extend over such a large, complex and relatively untouched area of the tropics. The intertidal areas and their associated species and communities are influenced by the strong tidal movements. The monsoonal influxes of freshwater and land-derived nutrients are likely to have created distinctive tropical marine ecosystems.

The complex shorelines and embayments of the proposed marine park provide a wide range of habitats and biodiversity as well as resting and calving areas for humpback whales and feeding areas for dolphins and other marine species.

The following description of habitats represents an overview of current knowledge.

Geomorphic habitats

Soft substrate – Mud

Mud provides habitat for benthic in-fauna such as burrowing invertebrates and fish. Mud hosts an abundance of microalgae and bacteria which contribute to the productivity of burrowing, demersal and pelagic marine animals, including the commercially caught banana and tiger prawns. It is believed that soft substrate – mud is a widely distributed benthic habitat within the proposed marine park.

Humpback whales are known to cover themselves in the sticky mud of Camden Sound, possibly to assist in the healing of wounds gained during mating battles (Jenner *pers. comm.*).

Soft substrate – Sand

Sand habitat within the proposed marine park is mainly associated with shorelines and inlets. Sand may consist of a variety of sediment coarseness, and may be littered with dead shell, rock and/or coral material. Sea cucumbers may be found in abundance ingesting sand to filter out microscopic food.

Small, isolated pocket beaches occur throughout the proposed marine park on both mainland and island shores. Beach deposits examined on some islands in the Kimberley are composed of skeletal carbonate sand (Brooke 1997) but may also consist

Sandy beach backed by rock. Photo – DEC

of sediments from inland areas carried to the sea by rivers and gullies. Generally, sand habitat is backed by dense mangrove stands or rocky cliffs.

Beaches may be highly influenced by tide and weather conditions and may overlie rock which may result in beaches being ephemeral in nature. Some beaches may be utilised by turtles for nesting.

Hard substrate – Rocky shores, platforms and shoals

A large portion of the proposed marine park consists of intertidal and subtidal bare rock as an extension of the rocky mainland. Bare rock may be swept clean of marine life by strong tidal movements and regular sand inundation. Tidal movement of water may result in rock 'islands' forming between sand and/or mud bottom and provide substrate for a diversity of marine life such as sponges and corals.

Fringing reef. Photo – DEC

Rock may offer crevices and protective shelter for mobile species unable to resist strong tidal movements, or those seeking shelter from predators. Intertidal shoaling rock is common in the waterways of the proposed marine park and may be difficult to detect at high tide. Intertidal rock habitats may host a variety of molluscs such as oysters, limpets, periwinkles, chitons and crustaceans such as rock crabs and barnacles. Intertidal rock habitats can be exposed for many hours during low tides, subjecting sessile fauna and flora to desiccation (drying out), rainfall and high levels of solar radiation.

The intertidal and subtidal reef platforms of Champagny Islands and Wild Cat Reef are expected to reveal many coral and sponge species that may be new to science and may host species not found in other areas of the proposed marine park due to their distance from shore.

Biological habitats

Seawater

Seawater provides the primary supporting environment or habitat of all marine life and provides for strong ecological connectivity. The salinity of seawater can be influenced by rainwater run-off from rivers and gullies with sediment rich run-off affecting water clarity, nutrient levels, ecological function and bathymetry. Cyclones and storms also have a major influence on the seawater characteristics of the area.

Phytoplankton (microscopic plants) and zooplankton (microscopic animals), as the base of the marine food chain, are dependent on seawater as their primary habitat. Seawater facilitates transport of these and many larger organisms. Many marine species are dependent on the currents and tidal movements of seawater and its characteristics for the distribution of seed, eggs, larvae and juveniles. Even the large humpback whale is known to wait for beneficial tidal conditions before moving into, or out of Camden Sound (Jenner *et al* 2001).

The tidal movements and currents of the Camden Sound area are expected to be complex given the diverse seafloor bathymetry (depth profile), rocky shoals, islands and other emergent features. The understanding of the bathymetry, currents and other aspects of the oceanography of the area is incomplete.

Macroalgae

Various types of macroalgae occur on rock platforms intermingled with coral and sponge. There is a lack of information regarding the marine benthic flora of north-west Western Australia and no comprehensive marine flora list for the region (Huisman 2004). However, about 70 algae species were collected during a survey of intertidal reefs on the central Kimberley coast in 1997 (Walker 1997).

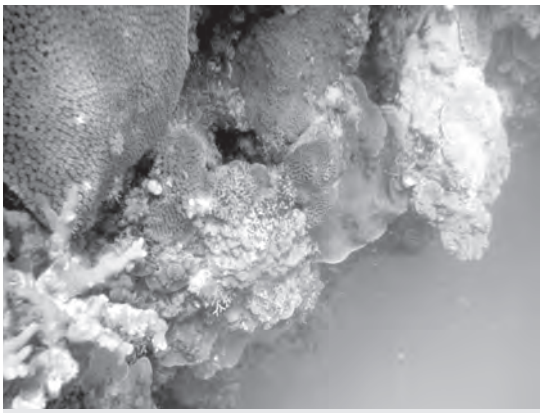
Algae in the Kimberley has adapted to survival during low tides and high temperature conditions by colonising rock that holds water. Algae is an important habitat on exposed reef as it provides shade for marine life that remain on the reef top, including species trapped in rock pools during low tides.

Macroalgae provides shade for marine life on Montgomery Islands reef. Photo – Dr Andrew Heyward

The diversity and abundance of algae may be low in the Kimberley, due to extreme tidal exposure and highly turbid waters reducing light penetration and resulting in a smother of fine, previously suspended sediments (Walker 1997). However, the role of algae appears crucial to the growth of reefs in the highly turbid waters of the Kimberley coast and islands (Brooke 1997). *Sargassum spp.* and coralline algae may be dominant.

Seagrass

Western Australia has the highest diversity of seagrass in the world with 12 known species from the tropics, including one endemic, *Cymodocea angustata*. Seagrass is a direct source of food for species such as green turtles and dugongs. Seagrass may also act as a nursery for crustaceans such as prawns and juvenile finfish such as the commercially caught barramundi and threadfin salmon.



Coral growing in the subtidal zone of Montgomery Islands reef. Photo – Dr Andrew Heyward

Surveys of the intertidal areas of the Kimberley have shown that seagrass is present in the region (Prince 1986; Walker and Prince 1987; Walker 1995 and 1997; Walker *et al*, 1996) but there remains a paucity of information for the proposed marine park. Seagrass was found to be well developed in areas where sediments are relatively fine and stable, such as inter-reef areas, during a recent survey undertaken off Broome (Fry *et al* 2008).

Coral reefs

In recent years, it has become clear that the Kimberley contains a fringing coral reef province that is much larger than previously thought to exist there and which rivals some of the largest reef systems (Masini *et al* 2009). Maximum coral cover and diversity in the Kimberley occurs in the fringing reefs and sheltered bays, and in rock pools on more exposed intertidal rock habitats (Blakeway 1997).

Coral habitat, including gorgonians and whips, is present on rocky substrate throughout the proposed marine park, varying in size and depth and probably in a constant state of growth. Corals occur in the subtidal around Montgomery Islands reef, and in the many rock pools on the platform where it is shaded from the sun by algae or rock ledges.

A large reef lies between Jungulu and Augustus islands which has extensive corals on its edges (Masini *pers. comm.*). An initial survey of this reef by the Australian Institute for Marine Science in 2009 indicates moderate coral diversity and cover, particularly around the outer edges of the reef, with few corals across the intertidal reef top which is dominated by algae and sand (Heyward 2009). The large size of the reef suggests it provides significant habitat and feeding value for coral-associating marine plants and animals. A large fringing intertidal reef also occurs at the Champagny Islands across a variable depth range on both the seaward and lee side of the islands. Coral reef found in the northern part of the proposed marine park

is likely to be influenced by hydrological and tidal processes unique to the adjacent St George Basin and the Prince Regent River system.

Mangroves

Mangroves provide habitat for a wide range of birds, molluscs, crustaceans, sea stars and fish such as mud skippers, gobies and larger finfish species such as barramundi and mangrove jack (*Lutjanus argentimaculatus*). Mangrove communities are rich and diverse primary producers. Decomposing leaves provide food for microscopic organisms, which in turn provide for a variety of other animals. Mangrove forests also act as a nursery for many marine wildlife and provide a rich source of food.

Mud crabs favour soft muddy bottoms where sediments remain wet amongst mangroves. Stilt rooted mangroves are important roosting areas for black flying-foxes (*Pteropus alecto*) and other bat species in the Kimberley. Saltwater crocodiles, while being found throughout the area, often associate with mangrove habitat.

Part C – Management framework and actions

6. Outcome-based approach

The legislative basis for management of the marine park, led by DEC in collaboration with other government agencies, is outlined in Section 11 and Appendix 2.

With use and visitation likely to increase in the proposed marine park over the next decade and beyond, the establishment of zoning and the setting of management objectives, management actions, performance measures and management targets will guide a collaborative and outcome-based management approach which provides for sustainable use of the proposed marine park. This will also be supported by five-year review of the management plan.

6.1 Five-year review

Further to the standard annual, periodic and ten-year assessment of the implementation of the management plan undertaken by the MPRA under its audit policy (MPRA 2008), this indicative management plan provides an explicit commitment for the MPRA, supported by DEC and other agencies as necessary, to assess the implementation of the approved management plan (final management plan) after five years in operation under section 26B of the CALM Act. The five-year review of the adequacy of the management plan in achieving biodiversity conservation and other objectives listed in the plan will focus particularly on humpback whale conservation. This will be underpinned by scientific research and new information. This research will assist in determining the effectiveness of management in achieving enhanced protection of humpback mothers and calves, particularly within the special purpose zone (whale conservation). It will also provide the basis to revise the management plan and management arrangements if necessary.

7. Proposed marine park zoning

The CALM Act designates four zone types that can be applied to a marine park, either singly or in combination:

- Sanctuary zone (no-take areas where extractive activities are excluded)
- Special purpose zone (specifies a priority purpose)
- Recreation zone (provides for conservation and recreational activities including nature-based commercial operations)
- General use zone (provides for conservation while allowing equitable and sustainable recreational and commercial use)

Marine park zoning is legally established under the CALM Act with supporting arrangements relating to fishing established under the Fish Resources Management Act.

The proposed marine park encompasses an area calculated to the high water mark of approximately 7,062 square kilometres and includes four zone types (Figure 6).

Sanctuary zones

Two ‘no-take’ sanctuary zones are proposed to provide the highest level of protection for biodiversity at the Champagny Island group and the Montgomery Islands reef. They contain representative examples

of a range of coral systems with abundant and diverse marine life. The proposed Champagny Sanctuary Zone is located approximately 50 kilometres from the mainland, and provides a rare opportunity for the rich biodiversity of tropical offshore island and reef systems to be included in the state's marine parks and reserve system. The proposed Montgomery Reef Sanctuary Zone contains one of the most outstanding geological features of the Kimberley and is abundant in marine wildlife. The extent of the inclusion of the Montgomery Islands reef within the proposed marine park is subject to the outcomes of native title determination, the development in due course, of an indigenous land use agreement with native title claimants/holders and the clarification of complex land tenure issues relating to the verification of high and low water marks.

Special purpose zone (whale conservation)

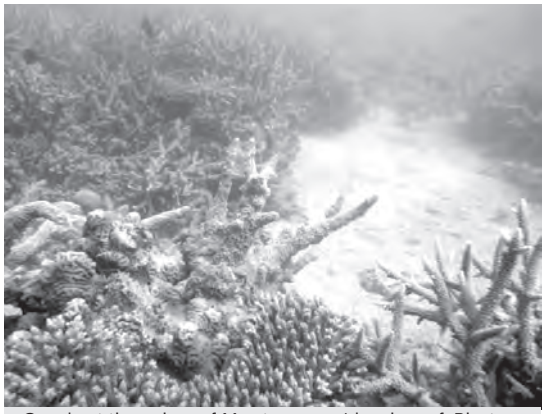
A large special purpose zone (whale conservation) is proposed. Special management measures will enhance protection of humpback mothers and calves in an important humpback whale calving area of Camden Sound as well as in sanctuary zones.

Special purpose zone (wilderness fishing)

A large special purpose zone (wilderness fishing) is proposed to surround the Montgomery Islands reef. The zone will preserve the areas natural condition and ecological value, while allowing for restricted recreational fishing that requires fishers to consume their catch prior to leaving the zone.

Special purpose zones (pearling)

A large special purpose zone (pearling) centred on Augustus Island is proposed to recognise the longest operating and largest cluster of pearling leases in Western Australia based at Kuri Bay. It remains accessible for other users of the park for appropriate activities while continuing to contribute to biodiversity conservation. A zone of the same purpose is also proposed within a protected embayment of Pyrene Island.



Corals at the edge of Montgomery Islands reef. Photo – Dr Andrew Heyward

General use zones

Extensive areas of general use zone are proposed, including St George Basin and the western waters of the proposed marine park for biodiversity conservation while providing opportunities for a wide range of recreational and commercial uses where appropriate.

Table 1: Sanctuary zone description

Montgomery Reef Sanctuary Zone	
Approximate area	352 square kilometres (approximate area to high water mark)
Special features, habitats and species associations	Montgomery Reef Sanctuary Zone is located in the south of the proposed marine park and gives recognition to one of the most outstanding geological marine features of the Kimberley bioregion. This enormous intertidal reef is fundamentally linked with the ecological function of the surrounding waters which are rich in coral, sponge, algae, seagrass, turtles, finfishes, sharks, dugongs, saltwater crocodiles and seabirds. The saltwater crocodiles of Montgomery Islands reef are thought to be the largest in the Kimberley. Seabirds nesting on Montgomery Islands, including white breasted sea eagles, forage on the reef top and surrounding waters. This zoning aims to provide a high level of protection for representative examples of the reef and associated species and communities, free of extractive disturbance. The zone provides for passive recreation and tourism.
Champagny Sanctuary Zone	
Approximate area	584 square kilometres (approximate area to high water mark)
Special features, habitats and species associations	Champagny Sanctuary Zone is located in the north-west of the proposed marine park and surrounds a number of islands in the vicinity of Champagny Island. It is inclusive of Wildcat Reef on the western most extent of the marine park. Champagny Island Sanctuary Zone is located over 50 kilometres (approximately 30 nautical miles) from the mainland and represents a unique opportunity for inclusion of a representative tropical offshore island/reef grouping within state coastal waters which generally only extend to three nautical miles offshore. Many coral and sponge species surveyed in this area are expected to be new to science. This zoning aims to provide a high level of protection for representative examples complex habitat and its associated species and communities, free of extractive disturbance. The zone provides for passive recreation and tourism.
Approximate total area of sanctuary zones	**936 square kilometres**

Table 2: Special purpose zone (whale conservation) description

Camden Sound Special Purpose Zone (whale conservation)	
Approximate area	1,680 square kilometres (approximate area to high water mark)
Special features, habitats and species associations	Camden Sound Special Purpose Zone (whale conservation) gives special recognition and management focus to a large portion of the Camden Sound area utilised by humpback whales for calving, nursing and resting. It also allows for enhanced biodiversity conservation for a diverse range of marine habitats and wildlife including coral reefs, mangroves, rocky shores, dolphins, dugongs, saltwater crocodiles and turtles.
Approximate total area of special purpose zone (whale conservation)	**1,680 square kilometres**

Table 3: Special purpose zone (wilderness fishing) description

Montgomery Reef Special Purpose Zone (wilderness fishing)	
Approximate area	412 square kilometres (approximate area to high water mark)
Special features, habitats and species associations	Montgomery Reef Special Purpose Zone (wilderness fishing) gives special recognition and management focus to the waters surrounding Montgomery Islands reef which host a wide range of biodiversity including extensive corals, and other marine life, including many threatened species such as dugongs, turtles and saltwater crocodiles. Management for the zone will focus on the preservation of the areas' natural condition and ecological value, while allowing for restricted recreational fishing that requires fishers to consume their catch prior to leaving the zone.
Approximate total area of special purpose zone (wilderness fishing)	**412 square kilometres**

Table 4: Special purpose zone (pearling) description

Kuri Bay Special Purpose Zone (pearling)	
Approximate area	572 square kilometres (approximate area to high water mark)
Special features, habitats and species associations	Kuri Bay Special Purpose Zone (pearling) gives special recognition and management focus to a large portion of the Camden Sound area used by pearling operators under authority from Department of Fisheries. This zone supports around 68 square kilometres of pearling leases in one of the oldest pearling areas in Australia. It experiences significant tidal flow in the narrow straits between islands making it ideal for pearl production using Western Australia's indigenous oyster shell *Pinctada maxima*. Australian snub-fin dolphins, Indo-Pacific humpback dolphins, humpback whales, turtles and sawfish have been recorded in this zone and extensive mangrove and subtidal reef is associated with the islands and mainland. The area provides for biodiversity conservation while recognising the importance of the area for pearling.
Pyrene Special Purpose Zone (pearling)	
Approximate area	5 square kilometres (approximate area to high water mark)
Special features, habitats and species associations	Pyrene Special Purpose Zone (pearling) gives special recognition and management focus to a small area where pearling operators have a pearl lease pending. This area provides for biodiversity conservation while recognising the importance of the area for pearling.
Approximate total area of special purpose zones (pearling)	**577 square kilometres**

Table 5: General use zone description

Hall Point General Use Zone	
Approximate area	282 square kilometres (approximate area to high water mark)
Special features, habitats and species associations	Hall Point General Use Zone contains tidal mud flats, mangroves, extensive intertidal fringing reef backing on to rocky cliffs and sandy beaches. This area of general use zone provides for biodiversity conservation, while also providing opportunities for recreation and commercial uses. These include existing commercial fishing and mining exploration licences.
Western Shoals General Use Zone	
Approximate area	2,119 square kilometres (approximate area to high water mark)
Special features, habitats and species associations	Western Shoals General Use Zone encompasses to the transit route used by humpback whales on their journey in to and out of the Camden Sound area. This route links to an important staging and resting area for humpback whales at the Frost and Tasmanian Shoals which are located mostly in Commonwealth-managed waters. Rock shoals and complex bathymetry in this general use zone are important habitats for marine life seeking shelter from predators or from the extreme daily tidal movement. This area provides for biodiversity conservation while allowing for a range of recreational and commercial uses, including large vessel transit to and from Yampi Sound Port.
St George General Use Zone	
Approximate area	1,056 square kilometres (approximate area to high water mark)
Special features, habitats and species associations	St George General Use Zone gives recognition to the many island and reef habitats within St George Basin, one of the most ecologically significant estuarine environments in the Kimberley. The zone also includes the tidally influenced waters of the relatively undisturbed Prince Regent River system. The eastern part of this zone lies adjacent the Prince Regent Nature Reserve and provides for integrated conservation management of the coast and sea. The entire area of the St George Basin is known to include complex feeding habitat preferred by the Australian snubfin and Indo-Pacific humpback dolphins which are being monitored in relation to their conservation status. The western parts of this zone north of Jungulu and Augustus islands contain a range of reef systems and islands. This zone provides for biodiversity conservation while allowing for a range of recreational and commercial uses.
Approximate total area of general use zones	**3,457 square kilometres**

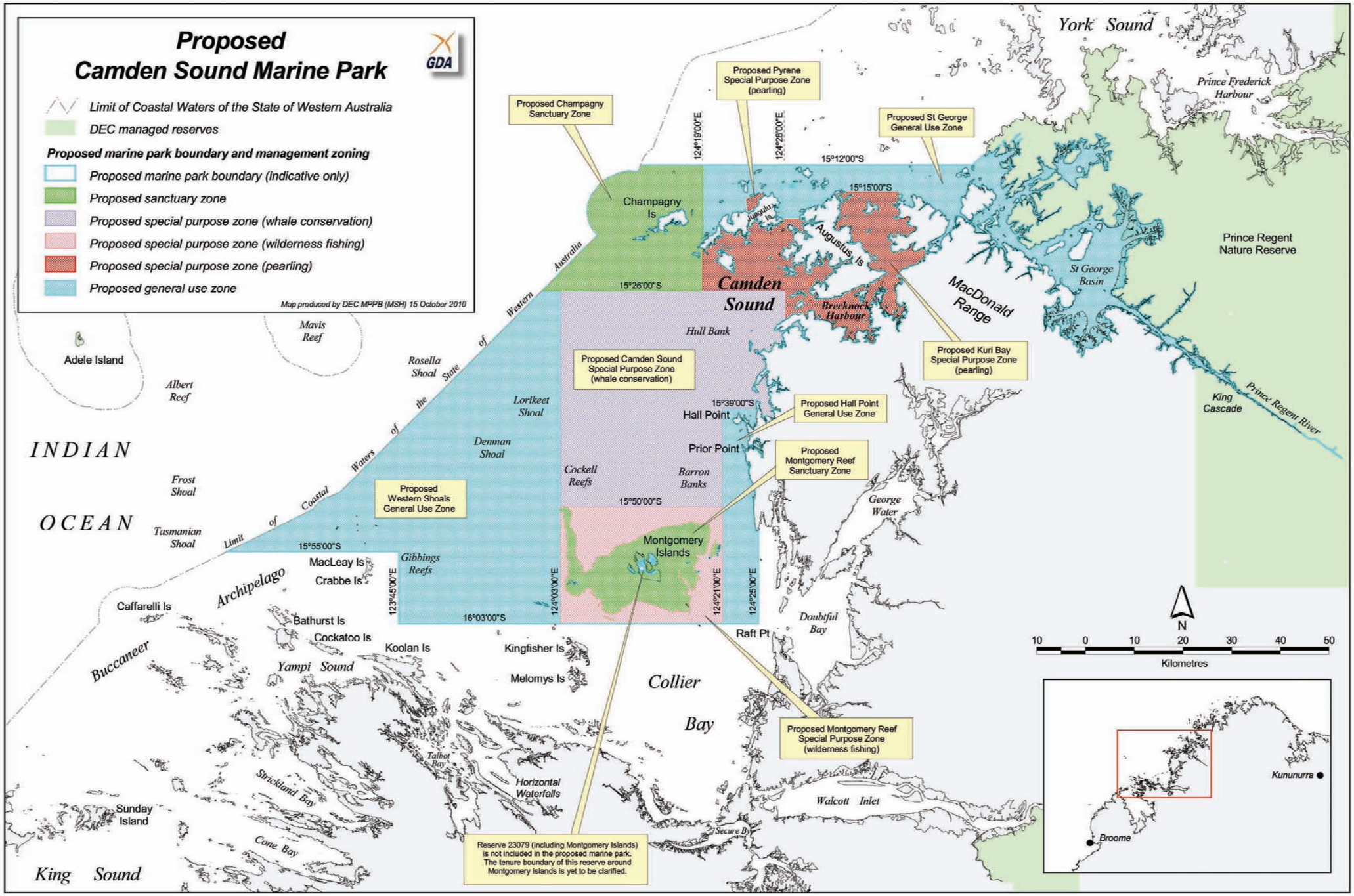


Figure 6: Proposed Camden Sound Marine Park zoning scheme.

8. Permitted uses

Figure 6 presents the zoning scheme for the proposed marine park. Table 6 below provides supporting information specifying the permitted uses within each zone of the proposed marine park subject to the relevant legislation and the applicable statutory approval processes. A use listed with ‘assess’ means that the use will be assessed in accordance with relevant legislation in the context of the objectives and management targets specified for the proposed Camden Sound Marine Park. Accompanying provisions to each permitted use (identified in brackets after each activity) are detailed overleaf.

Table 6: Permitted uses in the proposed marine park

Permitted use					
Important: Ensure cross-referencing with permitted use provisions below	**General use zone**	**Special purpose zone (pearling)**	**Special purpose zone (whale conservation)**	**Special purpose zone (wilderness fishing)**	**Sanctuary zone**
Commercial use [A]					
Commercial fishing [a,b,c,d,g,h,k,n,o]	**Yes**	**Yes**	**Yes (except trawling)**	No	No
Fly-over charters [g,n,o]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Pearling [a.b.c,d,g,h,n,o]	**Yes**	**Yes**	No	No	No
Aquaculture [a,b,c,d,e,g,h,n,o]	**Yes**	**Yes**	No	No	No
Seismic survey [a,b,e,f,g,k,n,o]	**Yes**	**Assess**	No	No	No
Mineral or petroleum exploration, drilling and production [a,b,c,d,e,f,g,h,k,n,o]	**Yes**	**Assess**	No	No	No
Cabling or pipelines [a,b,e,g,k]	**Yes***	**Assess***	No	No	No
Dredging and dredge spoil dumping [a,b,e,g,k,n,o]	**Yes**	**Assess**	No	No	No
Groynes, jetties or revetment [a,b,e,g,k]	**Yes***	**Yes***	No	No	No
Artificial structures [a,e,g,k]	**Yes***	**Assess***	No	No	No
Bioprospecting [a,b,c,e,f,g, k,n,o]	**Yes**	**Assess**	No	No	No
Coral, live rock and sand collection [a,b,c,f,g,k,n,o]	**Assess**	No	No	No	No
Specimen shell collecting [a,b,c,f,g,k,n,o]	**Yes**	**Yes**	**Yes**	No	No
Crocodile hunting	No	No	No	No	No
Recreational use [A]					
Charter boat fishing [a,b,c,d,g,h,m,n,o]	**Yes**	**Yes**	**Yes**	**Yes**	No
Boating (motorised and non-motorised) [a,b,d,g,h,n,o]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Swimming, snorkelling and diving [b,g,n,o]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Shore and boat fishing (line, net and crab) [c,g,h,m,n,o]	**Yes**	**Yes**	**Yes**	**Yes**	No
Spearfishing [a,b,c,g,k,m,n,o]	**Yes**	**Yes**	**Yes**	**Yes**	No
Customary fishing [A]					
Customary Aboriginal hunting and fishing [a,b,c,g,k,n,o,p]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Other use [A]					
Navigation aids [d]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Vessel transit [d,g,n,o]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Research and monitoring [a,b,c,g,k,n,o]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Anchoring (soft-bottom only) [g,h]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Mooring [a,d,g,h]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Wildlife interaction [a,b,g,k,n,o]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Sea plane landing [a,b,d,g,h,k,n,o]	**Yes**	**Yes**	No	**Yes**	No
Vessel sewage discharge [g,j]	**Yes**	**Yes**	No	No	No
Wildlife feeding	No	No	No	No	No

**See MPRA Artificial structures policy at www.mpra.wa.gov.au*

Permitted use provisions **Important:** *Ensure cross-referencing of provisions against permitted use above*	
[A]	**Use is permitted subject to management targets (Section 9.7, Table 7)**
a	Subject to the CALM Act and *Conservation and Land Management Regulations 2002* (CALM Regulations)
b	Subject to the Wildlife Conservation Act and *Wildlife Conservation Regulations 1970* (WC Regulations)
c	Subject to the Fish Resources Management Act and Fish Resources Management Regulations
d	Subject to the Marine Act and Navigable Waters Regulations
e	Subject to the Environmental Protection Act and Environmental Protection Regulations
f	Subject to the Mining Act
g	Use may be restricted if shown to be incompatible with the management targets of the marine park
h	Anchoring and mooring may be restricted
j	Not within 500 m of shore, or within marinas, harbours or boat launching areas. Discharge not permitted in Sampson Inlet. Kuri Bay, the 'River' at Montgomery Islands reef, Camden Harbour and Prince Regent River/Cascades
k	Subject to the Environmental Protection and Biodiversity Conservation Act and other relevant Commonwealth legislation and policy
m	Fish caught and retained in the Montgomery Reef Special Purpose Zone (wilderness fishing) must be consumed prior to leaving the zone
n	Subject to gazetted Wildlife Conservation (closed season for humpback cows and calves) Notice
o	Subject to gazetted Wildlife Conservation (closed season for marine mammals) Notice 1998
p	Subject to the Native Title Act
Assess	Use will be assessed by relevant agencies in accordance with legislation

9. Management programs and actions

Collaborative management of the proposed marine park will occur across seven marine park management programs:

- management frameworks
- visitor services and user infrastructure
- education and interpretation
- community participation
- patrol and enforcement
- research
- monitoring.

Management program actions aim to support the achievement of management objectives and the management targets of the proposed marine park. The agency with primary responsibility for implementation of a management action appears first in the bracketed list following the strategy. Other agencies listed provide support, as necessary, to implement the action within the scope of their statutory roles and responsibilities (see Appendix 2). Management actions within the management plan are prioritised as high (H), medium (M), or low (L). Management actions considered to be critical to achieving a management objective are presented as high priority key management strategies (H-KMS).

Operational responsibility for the implementation of a final management plan will primarily be coordinated by DEC's West Kimberley District Office in Broome supported by relevant state government agencies and the community.

9.1 Management frameworks

This management program includes legal, administrative, financial and human resource management requirements; the provision of policy, technical and operational advice; and support services to the MPRA and government.

Management framework objective
To ensure the marine park has appropriate legal, administrative, financial and human resource frameworks in place so that appropriate management can be applied within a collaborative setting.
Management actions
1. Implement all legal provisions necessary to establish and manage the marine park, including CALM Act classified waters notice and Fish Resources Management Act fisheries management orders (DEC, DoF, DoT, DMP) **(H-KMS)** 2. Develop and implement joint collaborative operational plans (DEC, DoF) **(H-KMS)** 3. Undertake a review of the adequacy of management arrangements in the proposed marine park with a particular focus on humpback whales and the special purpose zone (whale conservation). This will inform the five year review by the MPRA supported by DEC and other agencies (MPRA, DEC, DoF) **(H-KMS)** 4. With the consent of native title claimants/holders develop an indigenous land use agreement to enable the intertidal area to be included within the marine park or to enable the intertidal area to be managed as if it were marine park (see Section 2.2) (DEC, DIA, ONT) **(H-KMS)** 5. Ensure the setting of conditions for new developments and operations are consistent with management program objectives and management targets for biodiversity values (DEC, DoF, DMP, DoT, OEPA, MPRA) **(H)** 6. Develop a maritime incident response plan, specific to the marine park that complements the state's marine oil spill response plan (DEC, DoT, DoF) **(H)** 7. Ensure the provision of necessary information and support for assessments of the implementation of the management plan by the MPRA (DEC, DoF, DoT, DMP) **(H)** 8. Seek the declaration of Kimberley waters as a particularly sensitive sea area to enable compulsory pilotage and designation of shipping routes (DoT, AMSA, DEC) **(M)** 9. Revise the boundary of the pearling 'transport exempt area' to lie within the Kuri Bay Special Purpose Zone (pearling) if necessary (DoF, DEC) **(M)** 10. Apply the provisions of the sate's *Management plan for the commercial harvest and farming of crocodiles in Western Australia* (DEC 2009) (DEC, DEWHA) **(M)**

Performance measure	Management target
Implement management actions	As per timeframe in Appendix 5

9.2 Visitor services and user infrastructure

The visitor services and user infrastructure program provides for recreational and commercial services and infrastructure where these are compatible with the management objectives and targets.

Licences, leases and permits

An ever-increasing number of visitors to Western Australia experience marine parks and reserves using the services of commercial operators. The CALM Act and Wildlife Conservation Regulations 2002 (Wildlife Conservation Regulations) require commercial businesses operating within marine parks and reserves to be issued with a commercial operations licence by DEC specifying conditions and the payment of a licence charge. Commercial licences are granted where the activity is of a transient nature or usually involve no permanent infrastructure within a marine park or reserve. Most commercial licences are related to tourism. Commercial licensing may be a new requirement for some commercial businesses operating within the proposed marine park for both on-water cruising and fly over tours.

Leases may be granted under the CALM Act for the use of a specific area of a marine park or reserve for a specific purpose. Applications for a lease to be issued under the CALM Act are carefully considered. DEC may only grant a licence or lease for commercial activities consistent with this management plan and with the approval of the Minister for Environment. DEC's *Tour operator handbook – marine* provides specific information for commercial businesses operating in a marine park or reserve (DEC 2009).

See www.dec.wa.gov.au/commercial_licensing for more information on commercial licensing and leases.

Under the CALM Act and Wildlife Conservation Act, a licence is required to take flora or fauna in a marine park or reserve for scientific or other prescribed purposes. A licence can be issued to an individual, and any authorised persons listed can take fauna (for the same purpose) under the supervision of the licensee. Applications are processed by DEC's Nature Protection Branch in consultation with DEC's Species and Communities Branch, Marine Science Program and the relevant DEC district office.

Commercial operators are required to hold a wildlife interaction licence in order to interact with whales, whale sharks, dolphins or dugongs. Licences are issued by DEC under the Wildlife Conservation Regulations and strict conditions apply to each type of licence.

Licences must also be issued by the Department of Fisheries under the Fish Resources Management Act for commercial fishing, aquatic tourism (see section 4.2), pearling, and some forms of recreational fishing including fishing from a powered vessel, rock lobster fishing, and the use of throw nets.

Wildlife Conservation (Closed season) Notices

A *Wildlife Conservation (Closed season for marine mammals) Notice* was gazetted in 1998 to provide for the management of human interactions with marine mammals including whales, dugongs and dolphins. This closed season for marine mammals notice will remain in force in the general use zone and special purpose zone (pearling) of the proposed marine park. The closed season for marine mammals notice specifies that a vessel may approach a whale to a distance of 100 metres outside an arc of 30 degrees to the whales direction of travel both in front and behind. In addition, aircraft may approach a whale (or any other marine mammal) to a distance of 300 metres but no closer. If a whale approaches a vessel, the vessels master must switch off the vessels motor, or put it into neutral and if able move the vessel away from the whale at a speed of less than five knots.

In recognition of the proposed marine park's importance for humpback whale calving, a closed season notice specifying special management arrangements in regard to vessel and aircraft interactions with humpback mothers and calves will be introduced in the special purpose zone (whale conservation), special purpose zone (wilderness fishing) and sanctuary zones of the proposed marine park. The provisions of this notice will provide some of the most stringent management arrangements for humpback whale interaction in Australia (see figures 7 and 8).

Mooring and anchoring

Moorings can play an important role in protecting areas such as coral and seagrass habitat as moorings can act to minimise the need for anchoring, thereby reducing indiscriminate anchor damage. Moorings can also facilitate better access to locations of interest, focus activity in areas that can be more readily managed, and provide an improved level of security and safety for vessels.

A mooring and anchoring plan will be prepared for the proposed marine park including the identification of areas in which moorings are acceptable or necessary from an environmental, equity and safety perspective; the number of moorings allowable; and types of moorings permitted. There are a number of existing moorings in the proposed marine park, all of which are associated with pearling operations. Pearl lines are 'moored' to the seafloor within pearl leases. Moorings for pearling operations are generally anchored into mud substrate.

Vessel management

Vessel management in the proposed marine park will remain the statutory responsibility of the Department of Transport. Access and speed restrictions apply to vessels when in the vicinity of whales, as specified under wildlife conservation (closed season) notices issued discussed above. The Department of Transport may assist DEC to implement other access and speed restrictions where these are determined to be necessary for conservation of biodiversity values. This would be done with due regard to vessel safety.

Visitor risk management

DEC has a genuine concern for visitor welfare and a moral and legal responsibility to consider the personal safety and welfare of visitors to the lands and waters for which it has responsibility. DEC's policy no. 53 *Visitor risk management policy* provides guidance to minimise the likelihood and undesirable consequences of misadventure or injury through the implementation of management measures.

The remote nature of the proposed marine park and the many navigational hazards that exist within the area pose a significant risk to the unwary visitor. Animals such as sharks and crocodiles also pose a significant risk if visitors are unaware of their presence. While many hazards exist naturally DEC will undertake a periodic assessment of visitor risk associated with the marine park and mitigate identified risk wherever possible.

Visitor services and user infrastructure objective
To provide world-class commercial and recreational opportunities for users and visitors to the proposed marine park while conserving marine biodiversity with a particular emphasis on the protection of humpback whale mothers and calves.
Management actions
1. Gazette a Wildlife Conservation (closed season for humpback cows and calves) Notice under the provisions of the Wildlife Conservation Act applicable to the special purpose zone (whale conservation), special purpose zone (wilderness fishig) and sanctuary zones specifying provisions such as: • a person in control of a vessel must not move it closer than 500 metres to humpback mothers and calves and should maintain that distance • a vessel within 500 metres of a humpback cow and calf should manoeuvre at a speed that creates minimal wake, but if for reasons of safety a vessel must accelerate beyond no wake speed, that vessel must seek to manoeuvre in a direct line to a distance greater than 500 metres from the cow and calf as soon as practicable • only one vessel, at a distance of 500 metres, can interact with a humpback cow and calf at any one time in the special purpose zone (whale conservation) and sanctuary zones • if a humpback cow and calf approach a vessel, that vessel must be operated in neutral gear for the duration of the encounter with due consideration to navigation and vessel safety • a vessel must not remain in the vicinity of a humpback cow and calf for more than 20 minutes and only at a distance of 500 metres or greater • no in-water interaction is permitted with humpback mothers and calves • helicopters may not hover above humpback mothers and calves • helicopters and fixed wing aircraft must remain at an altitude above 1,650 feet (500 metres) and a horizontal distance of 500 metres from humpback mothers and calves • a person may not make, or cause to be made, a noise that is likely to frighten or otherwise cause distress to a whale because of its loudness or suddenness or for any other reason

Management actions continued

- a person may not play back a recording of sounds made under water in a manner that is likely to be heard by a whale (DEC) **(H-KMS)**[2].

2. Commercially licenced tourism vessels may be exempt from some conditions of the proposed Wildlife Conservation (closed season for humpback cows and calves) Notice if engaged in endorsed research and monitoring programs for humpback whale mothers and calves (DEC) **(H)**
3. Ensure the granting and renewal of commercial tour vessel licences in relation to marine park access and wildlife interaction is consistent with the management plan permitted use table, management targets and wildlife conservation closed season notices (DEC, MPRA) **(H)**
4. Licence conditions for commercial tour vessels engaged in whale watching consistent with the wildlife conservation closed season notices should include a requirement for operators to collect basic information on whale position and behaviour to assist humpback whale research and monitoring (DEC) **(H)**
5. Access by vessel or aircraft to localised high use humpback whale calving and nursing areas (see Research actions) may be restricted if these areas are found to be sensitive to these activities (DEC, DoF, DoT) **(H)**
6. Sea plane landings should not occur in the special purpose zone (whale conservation) between June and November unless absolutely necessary for safety reasons (DEC, CASA, DoT) **(H)**
7. Ensure the granting and renewals of licences and leases relating to pearling operations within the marine park is consistent with the management plan permitted use table and management targets (DoF, DEC, MPRA) **(H)**
8. Ensure the granting and renewal of authorisations for commercial fishing operations within the marine park is consistent with the management plan permitted use table and management targets (DoF, DEC, MPRA) **(H)**
9. Ensure the authorisation of maritime developments within the marine park is consistent with the management plan permitted use table and management targets (EPA, DEC, MPRA, DMP, DEWHA) **(H)**
10. Consult as necessary in regard to the issuing and renewal of licences, leases and permits under the WC Act, CALM Regulations, Fish Resources Management Act and Pearling Act (DEC, DoF, MPRA) **(H)**
11. Advise commercial tour operators that sites protected under the *Maritime Archaeological Act 1973*, *Historic Shipwrecks Act 1976 and Aboriginal Heritage Act 1976* should not be disturbed (DEC, TWA, DoF, DIA, WAM) **(H)**
12. Minimise vessel speed in the proposed marine park to reduce risk of vessels colliding with whales with consideration given to vessel safety issues (DoT, DEC, DoF, TWA) **(H)**
13. Maintain a quantitative and qualitative spatial database of human use within the proposed marine park (DEC, DoF) **(M)**
14. Ensure the implementation of EPBC Act Policy Statement 2.1 – *Interaction between offshore seismic exploration and whales* (Australian Government 2008) within and adjacent to the proposed marine park (DEC, DEWHA, DMP, OEPA, MPRA) **(M)**
15. Restrict access to sites considered unsuitable for visitation by native title claimants and/or holders through commercial licences (DEC, DIA) **(M)**
16. Prepare a mooring and anchoring plan (DEC, DoT, DoF, MPRA) **(M)**

[2]*Wording used in the proposed Wildlife Conservation (closed season for humpback cows and calves) Notice will be finalised by the states Parliamentary Counsel's Office, and may not be exactly as presented here.*

Management actions continued	
17. Implement and administer the mooring and anchoring plan (DEC, DoT) **(M)**	
18. Conduct periodic visitor risk assessments in the marine park as required and mitigate identified issues (DEC) **(M)**	
19. Facilitate training that enhances knowledge of maritime and terrestrial heritage site management (DEC, DIA, WAM, Heritage Council of WA, TWA) **(M)**	
20. Encourage commercial tour operators to maintain an appropriate level of respect for Aboriginal heritage sites which may be culturally sensitive (DEC, DIA) **(M)**	
21. Ensure appropriate liaison regarding the introduction or maintenance of navigation infrastructure within the proposed marine park (DoT, DEC) **(L)**	
22. Develop and implement codes of practice as necessary to ensure responsible use of the proposed marine park (DEC) **(L)**	
Performance measures	**Management target**
Implement management actions	As per timeframe in Appendix 5

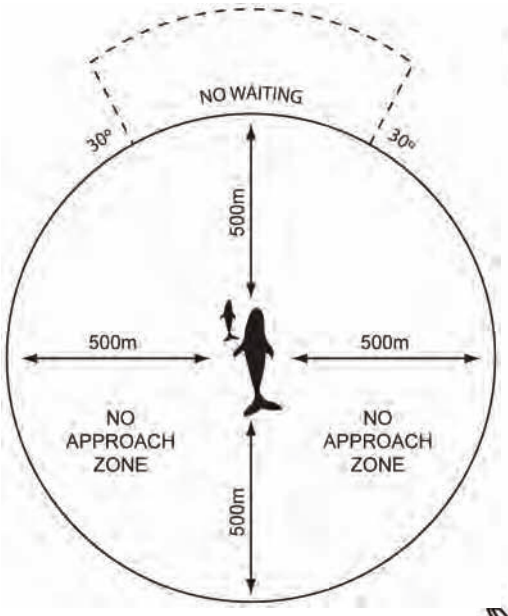


Figure 7: Proposed vessel minimum approach distances in the special purpose zone (whale conservation) and sanctuary zones of the proposed marine park.

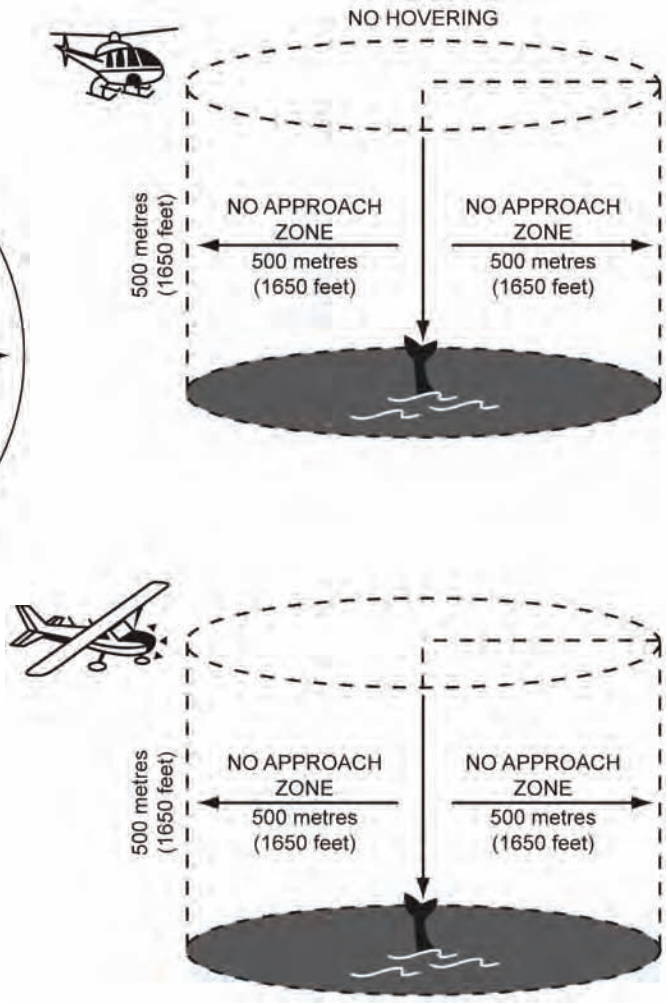


Figure 8: Proposed aircraft approach distances in the special purpose zone (whale conservation) and sanctuary zones of the proposed marine park.

9.3 Education and interpretation

The provision of interpretative material and delivery of education is critical to ensuring an increased understanding of the values of the proposed marine park and help to develop a sense of community stewardship.

Education and interpretation objective
To foster a high level of community understanding and appreciation of the proposed marine park's values, as well as support for management.
Management actions
1. Develop and implement an education and interpretation plan designed to raise awareness of: • the importance of biodiversity values especially those identified with management targets that form the key performance indicators, and with emphasis on humpback whales • appropriate behaviours within zones to reduce human impacts and ensure public safety. and as guided by DEC's Education Branch (DEC, DoF, DoT, DMP, TWA) **(H-KMS)** 2. Implement the education and interpretation plan, including delivery of interpretative materials and presentations to the community, commercial tour operators and businesses with an interest in the marine park (DEC, TWA, DoF) **(H-KMS)** 3. Obtain input and guidance from native title claimants/holders about marine-related Aboriginal culture and interests (DEC, DIA) **(H-KMS)** 4. Provide education and interpretive information about the proposed marine park and its management arrangements to fishing, boat and yacht clubs operating in Broome, Derby, Wyndham and Darwin (DEC, TWA, DoF) **(M)** 5. Promote the marine park to the Broome and Derby communities such that 50 per cent of these communities are aware of the marine park within three years (DEC, DoF, TWA, DIA, DoT, DMP, DoP, DoW) **(M)** 6. Promote the marine park to visitors such that 50 per cent of visitors are aware of the marine park within ten years (DEC, DoF, TWA, DIA, DoT, DMP, DoP, DoW) **(M)** 7. Promote the marine park to the Broome and Derby communities such that 70 per cent of these communities are aware of the marine park within ten years (DEC, DoF, TWA, DIA , DoT, DMP, DoP, DoW) **(M)**

Performance measure	Management target
Implement management actions	As per timeframe in Appendix 5

9.4 Community participation

It is clear that the community has a strong interest in the conservation of the area, and particularly in ensuring the protection of the place as a globally important area for humpback whale calving. It is important that the community is presented with opportunities to be informed and contribute to the management of the proposed marine park.

In 2009, a community-initiated festival was held for the first time in Broome to celebrate the arrival of the humpback whale to coastal waters. The festival provided an opportunity for the community to share information about whales and contribute to the conservation management of the species. This is an example of how community can participate in promoting the biodiversity values and sustainable use of the proposed marine park.

A community-based advisory committee or other engagement mechanisms will provide input to the ongoing management of the marine park. While a community advisory committee has no decision making authority, it can provide advice to DEC, Department of Fisheries and the MPRA to help raise awareness and assist with implementation.

Community participation objective
To have meaningful community participation in the management of the proposed marine park.
Management actions
1. Prepare and implement a community participation plan which encourages involvement in management through a range of opportunities (DEC) **(H-KMS)** 2. Develop joint management arrangements with traditional owners (DEC, DoF, DIA) **(H-KMS)** 3. Facilitate community participation in the management of the marine park through appropriate engagement mechanisms (DEC, DoF, DIA) **(M)** 4. Maintain a database of community participation (DEC) **(M)** 5. Aim to increase the level of community participation in the management of the marine park annually (DEC) **(L)**

Performance measure	Management target
Implement management actions	As per timeframe in Appendix 5

9.5 Patrol and enforcement

Overall, the majority of users visiting the Kimberley coast display a strong commitment to ensuring their use does not have a significant impact on the environment. This is particularly the case for commercial cruise operators whose businesses rely very specifically on the outstanding natural and cultural values and features of the region.

DEC, in liaison with Department of Fisheries, will implement a collaborative patrol and enforcement program. DEC will also encourage commercial tour operators and visitors to the proposed marine park to self regulate in accordance with the management plan and voluntarily report any inappropriate or unlawful activity.

Patrol and enforcement objective
To have a high level of compliance for management arrangements specified for the proposed marine park.
Management actions
1. Develop and implement a collaborative patrol and enforcement plan (DEC, DoF) **(H-KMS)** 2. Monitor compliance of the Wildlife Conservation (closed season for humpback cows and calves) Notice within the Special purpose zone (whale conservation) and sanctuary zones (DEC, DoF) **(H-KMS)** 3. Ensure the implementation of the *Strategy for the management of sewage discharge from vessels into the marine environment* (Department for Planning and Infrastructure 2004) and thereby prohibit the discharge of sewage from vessels in the sanctuary zone, all areas within 500 metres of the shore and in Kuri Bay, Camden Harbour, Sampson Inlet St George Basin/Prince Regent River, and 'The River' at Montgomery Islands reef. (DoT, DEC) **(H)** 4. Encourage commercial tour operators and visitors to self regulate in accordance with the management plan and voluntarily report any inappropriate or unlawful activity (DEC) **(H)** 5. Ensure marine park visitors obtain and comply with appropriate regulations, licences and permits (DEC, DoF) **(H)** 6. Maintain a database of compliance statistics and issues which is available for management assessment (DEC, DoF) **(M)** 7. Patrol the shoreline and waters of the marine park for marine debris and remove as necessary (DEC, DoF) **(M)**

Performance measure	Management target
Implement management actions	As per timeframe in Appendix 5

9.6 Research

Understanding the marine ecosystems and human use of the proposed marine park is critical to ensuring the maintenance of its habitats and species. Research undertaken by independent cetacean scientists has identified the proposed marine park as a place of major significance for humpback whale calving and breeding (Jenner *et al* 2001). This finding has been complemented by voluntary community-based research coordinated by a whale watching business operating out of Broome. This research has helped to confirm the importance of the area as a significant place for humpback whale calving and has helped raise the level of community interest in the area. The Australian Institute of Marine Science visited Camden Sound and Montgomery Islands reef in 2008 and 2009 to collect scientific information. Surveys conducted to date have identified 280 species of coral across 55 genera. Many species yet to be identified are expected to be new to science (Heyward *pers. comm.*).

Consistent with the outcome-based approach, further research will be undertaken to support a review of the adequacy of management arrangements in the marine park particularly with regard to humpback whales and the special purpose zone (whale conservation). This will inform the five year assessment of the implementation of the management plan by the MPRA supported by DEC and other agencies.

DEC's Marine Science Program is primarily responsible for facilitating research in the state's marine parks and reserves to provide information necessary to support appropriate management. Department of Fisheries' Research Division undertake research into the status of fish stocks over large spatial scales and contribute valuable information regarding the status of species targeted by the commercial and recreational fishing sector.

Research objective
To implement a collaborative and cost effective research program to improve knowledge and understanding of humpback whales, other important biodiversity values and human use in the proposed marine park.
Management actions
1. Prepare a collaborative marine research plan with a focus on addressing key gaps in knowledge for threatened species and species of special conservation significance with management targets that form key performance indicators (DEC, DoF) **(H-KMS)** 2. Undertake further research to assist with a five year review of the adequacy of management arrangements in the marine park, particularly with regard to humpback whales and the special purpose zone (whale conservation) (DEC) **(H-KMS)** 3. Establish habitat mapping and characterisation for the proposed marine park to support management (DEC) **(H-KMS)** 4. Spatially and qualitatively characterise the use of the proposed marine park by humpback whales, including the identification of high use humpback whale calving and nursing areas (DEC) **(H-KMS)** 5. Spatially and qualitatively characterise human use of the proposed marine park by recreational and commercial users (DEC, DoF) **(H-KMS)** 6. Investigate the extent and significance of interactions of commercial fishing with humpback whales and other specially protected species (DEC, DoF) **(H-KMS)** 7. Facilitate knowledge transfer and uptake to marine park management, planning and policy (DEC, DoF) **(H-KMS)** 8. Implement research components of the *Humpback whale recovery plan* (Australian Government 2005), *Draft dugong management program for Western Australia* (DEC 2008) and the *Draft marine turtle recovery plan for Western Australia* (DEC 2009) with respect to the marine park (DEC, DoF) **(H)** 9. Ensure the granting and renewals of permits relating to scientific research is consistent with the management plan permitted use table, management targets and wildlife conservation closed season notices as appropriate (DEC, DoF) **(H)** 10. Maintain a database of ecological and socio-economic research relevant to management (DEC) **(M)** 11. Undertake a comprehensive archaeological survey for marine-related Aboriginal activity in association with native title claimants and/or holders (DIA, DEC) **(M)** 12. Further investigate the Aboriginal heritage values relating to the proposed marine park through consultation and in-field surveys conducted with native title claimants and/or holders (DIA, DEC) **(M)** 13. Provide logistical and financial support to researchers where possible (DEC, DoF) **(M)**

Performance measure	Management target
Implement management actions	As per timeframe in Appendix 5

9.7 Monitoring

Monitoring against management targets is essential in evaluating management effectiveness and informing an adaptive management response. Monitoring within the marine park will focus on the condition of key biodiversity values with management targets identified as key performance indicators as necessary. It will also be important to monitor human-use patterns, trends and interactions in the proposed marine park.

DEC's Marine Science Program is primarily responsible for delivering monitoring in the state's marine parks and reserves, and will work in liaison with DEC's West Kimberley District office and other science

providers. Department of Fisheries' Research Division monitor the status of species targeted by the commercial and recreational sector to ensure stocks are maintained at sustainable levels. Department of Fisheries annually report on the state of Western Australia's commercial and recreational fisheries. Department of Fisheries also monitor biosecurity issues such as introduced marine pests and diseases.

It has been reported that by the end of the century, climate induced change may be the dominant driver of biodiversity loss and changes in ecosystem services globally (Millenium Ecosystem Assessment 2005). It is currently unknown what range of species will be most affected by climate induced change, and when this may occur. It is also not clear what management approaches are possible to protect species affected by climate change.

Monitoring objective	
To implement a collaborative and cost effective marine monitoring program to provide for adaptive management and to inform assessment of management effectiveness within the proposed marine park.	
Management actions	
1. Prepare a collaborative and cost effective marine monitoring plan (DEC, DoF, DIA, WAM) **(H-KMS)** 2. Progressively implement the marine monitoring plan with a primary focus on determining if management targets have been achieved for key performance indicators (Table 7) (DEC) **(H-KMS)** 3. Implement monitoring components of the *Humpback whale recovery plan* (Australian Government 2005), *Draft dugong management program for Western Australia* (DEC 2008) and the *Draft marine turtle recovery plan for Western Australia* (DEC 2009) with respect to the marine park (DEC, DoF) **(H)** 4. Ensure an appropriate level of monitoring is undertaken by developers operating with approval in or adjacent to the marine park (OEPA, MPRA, DEC, DoF, DoT, DMP, TWA) **(H)** 5. Consider the potential implications of climate change when developing a marine monitoring program (DEC, DoF) **(M)** 6. Apply management targets, presented in this management plan, to habitat identified through new spatial characterisation of the habitats of the proposed marine park (DEC, MPRA) **(M)** 7. Ensure biosecurity issues are considered during the development of the marine monitoring plan (DoF, DEC) **(M)**	
Performance measure	**Management target**
Implement management actions	As per timeframe in Appendix 5

Table 7: Performance measures, management targets and key performance indicators

Species of special conservation interest						
Whales (KPI)	**Performance measures**	**Management targets**				
		Sanctuary zone	**Special purpose zone (wilderness fishing)**	**Special purpose zone (whale conservation)**	**Special purpose zone (pearling)**	**General use zone**
	Abundance of humpback whales	Maintained at, or increased from, 2010 levels				
	Humpback whale calving success	Maintained at, or increased from, 2010 levels				
	Diversity of species	Maintained at 2010 levels				
Dolphins (KPI)	**Performance measures**	**Management targets**				
		Sanctuary zone	**Special purpose zone (wilderness fishing)**	**Special purpose zone (whale conservation)**	**Special purpose zone (pearling)**	**General use zone**
	Abundance of key species	Maintained at, or increased from, 2010 levels				
	Diversity of species	Maintained at 2010 levels				
Finfish (KPI)	**Performance measures**	**Management targets**				
		Sanctuary zone	**Special purpose zone (wilderness fishing)**	**Special purpose zone (whale conservation)**	**Special purpose zone (pearling)**	**General use zone**
	Abundance of key species	Abundance to be at 'natural levels'[3]	To be determined in consultation with DoF			
	Size composition of key species	Composition to be at 'natural levels'		To be determined in consultation with DoF		
	Abundance of protected species	Maintained at, or increased from, 2010 levels				
	Diversity of species	Maintained at 2010 levels				

[3] *'Natural levels refer to the level of species composition or abundance that is undisturbed or unexploited by human activities'*

Species of special conservation interest continued						
Sharks and rays (KPI)	**Performance measures**	**Management targets**				
		Sanctuary zone	**Special purpose zone (wilderness fishing)**	**Special purpose zone (whale conservation)**	**Special purpose zone (pearling)**	**General use zone**
	Abundance of key species	Abundance to be at 'natural levels'	To be determined in consultation with DoF			
	Size composition of key species	Composition to be at 'natural levels'		To be determined in consultation with DoF		
	Abundance of totally protected and commercially protected sharks	Maintained at, or increased from, 2010 levels				
	Diversity of species	Maintained at, or increased from, 2010 levels				
• **Dugongs** • **Turtles** • **Saltwater crocodiles** • **Sea snakes** • **Seabirds and shorebirds**	**Performance measures**	**Management targets**				
		Sanctuary zone	**Special purpose zone (wilderness fishing)**	**Special purpose zone (whale conservation)**	**Special purpose zone (pearling)**	**General use zone**
	Abundance of key species	Maintained at, or increased from, 2010 levels				
	Diversity of species	Maintained at 2010 levels				
Geomorphic habitat						
• **Mud** • **Sand** • **Rocky shores, platforms and shoals**	**Performance measures**	**Management targets**				
		Sanctuary zone	**Special purpose zone (wilderness fishing)**	**Special purpose zone (whale conservation)**	**Special purpose zone (pearling)**	**General use zone**
	Areal extent of habitat	No disturbance, except for essential marine park infrastructure (such as moorings) approved by the appropriate regulatory authority.		No disturbance, except in designated areas approved by the appropriate regulatory authority. Where approved, the cumulative disturbance is not to exceed 1% of the total area of habitat type within each of these zones.		

<table>
<tr><th colspan="6">Biological habitat</th></tr>
<tr><td rowspan="3">• Mud
• Sand
• Rocky shores, platforms and shoals</td><td rowspan="2">Performance measures</td><td colspan="5">Management targets</td></tr>
<tr><td>Sanctuary zone</td><td>Special purpose zone (wilderness fishing)</td><td>Special purpose zone (whale conservation)</td><td>Special purpose zone (pearling)</td><td>General use zone</td></tr>
<tr><td>Water quality: bacterial concentration in seawater</td><td colspan="4">Present at no higher than natural levels</td><td>Below recommended levels (ANZECC & ARMCANZ 2000) 500m from shore but present at no higher than natural levels in Kuri Bay, Camden Harbour, Sampson Inlet and ‘The River’.</td></tr>
<tr><td>Marine debris: Mass (kilogram) of litter</td><td colspan="5">Not present</td></tr>
<tr><td rowspan="3">Coral (KPI)</td><td rowspan="2">Performance measures</td><td colspan="5">Management targets</td></tr>
<tr><td>Sanctuary zone</td><td>Special purpose zone (wilderness fishing)</td><td>Special purpose zone (whale conservation)</td><td>Special purpose zone (pearling)</td><td>General use zone</td></tr>
<tr><td>Distribution and biomass</td><td colspan="2">Maintained at 2010 levels</td><td colspan="3">No disturbance, except in designated areas approved by the appropriate regulatory authority. Where approved, the cumulative disturbance is not to exceed 1% of the total area of coral habitat within each of these zones.</td></tr>
<tr><td>Diversity of species</td><td colspan="5">Maintained at 2010 levels</td></tr>
</table>

Biological habitat continued						
Mangrove (KPI)	**Performance measures**	**Management targets**				
		Sanctuary zone	**Special purpose zone (wilderness fishing)**	**Special purpose zone (whale conservation)**	**Special purpose zone (pearling)**	**General use zone**
	Distribution and biomass	Maintained at 2010 levels		No disturbance, except in designated areas approved by the appropriate regulatory authority. Where approved, the cumulative disturbance is not to exceed 1% of the total area of coral habitat within each of these zones.		
	Diversity of species	Maintained at 2010 levels				
• **Macroalgae** • **Seagrass**	**Performance measures**	**Management targets**				
		Sanctuary zone	**Special purpose zone (wilderness fishing)**	**Special purpose zone (whale conservation)**	**Special purpose zone (pearling)**	**General use zone**
	Distribution and biomass	Maintained at 2010 levels		No disturbance, except in designated areas approved by the appropriate regulatory authority. Where approved, the cumulative disturbance is not to exceed 1% of the total area of the habitat type within each of these zones.		
	Diversity of species	Maintained at 2010 levels				
Human values and uses						
Nature-based recreation & tourism (KPI)	**Performance measures**	**Management targets**				
		Sanctuary zone	**Special purpose zone (wilderness fishing)**	**Special purpose zone (whale conservation)**	**Special purpose zone (pearling)**	**General use zone**
	Range of visitor opportunities	Maintained and consistent with permitted uses, zoning and management targets				
	Visitor awareness of marine park	A high level of visitor awareness				
	Visitor satisfaction of experiences in the marine park	A high level of visitor satisfaction				

Human values and uses continued						
Aboriginal culture & Heritage	**Performance measures**	**Management targets**				
		Sanctuary zone	**Special purpose zone (wilderness fishing)**	**Special purpose zone (whale conservation)**	**Special purpose zone (pearling)**	**General use zone**
	To be developed in consultation with native title claimants/ holders	To be developed in consultation with native title claimants/holders				

Table 7 provides the generic performance measures, management targets and key performance indicators by which the proposed Camden Sound Marine Park will be managed and assessed. Performance measures are variables or components that will be routinely assessed to evaluate management effectiveness. Such evaluations may draw on qualitative and/or quantitative monitoring information. Management targets, shown here, represent the intent of the management for the proposed marine park and a desired condition or status to be achieved for each performance measure. Specific management targets associated with the specified biodiversity values and performance measures will be developed as key performance indicators (KPIs) of overall management effectiveness. This provides the basis for adaptive management, whereby management is altered if necessary to meet desired outcomes.

In the case of this management plan, Table 7 indicates the intent for managing the proposed marine park. However, more detailed and specific measures of performance and/or management targets will be developed prior to finalisation of the plan. The achievement of management targets indicated in the table may in some cases be influenced by activities outside the marine park and as a result, management will remain cognisant of off-reserve activities that may influence the outcomes proposed here for the park.

10. Joint management with Aboriginal people

DEC will work with the traditional owners to establish joint management of the proposed Camden Sound Marine Park. The management and implementation arrangements will be developed over time with the consent of the traditional owners and may involve the registration of one or more indigenous land use agreements under the Native Title Act. These arrangements will be developed to help acknowledge and protect Aboriginal culture and heritage including the ongoing connection to land and sea country.

11. Implementation through collaboration

Management of the proposed marine park will be implemented through a collaborative management approach led and coordinated by DEC. The aim of collaborative management is to ensure integration and cohesion of the specific statutory responsibilities held by a number of government agencies.

DEC, under the Minister for Environment, is responsible for the implementation of the CALM Act, CALM Regulations, Wildlife Conservation Act and Wildlife Conservation Regulations. The Wildlife Conservation Act and Wildlife Conservation Regulations provide for the conservation and protection of all wildlife. DEC, under the Minister for Environment, has primary responsibility for facilitating the preparation and implementation of management plans for Western Australia's marine parks and reserves under the CALM Act on behalf of the MPRA.

The Department of Fisheries, under the Minister for Fisheries, is responsible for the management and regulation of aquaculture, pearling and commercial and recreational fishing in all state waters including marine parks and reserves under the Fish Resources Management Act, Fish Resources Management Regulations 1995 and Pearling Act. This includes temporal and spatial fishing closures, quota systems, licensing and bag and size limits to maintain the state's targeted fish stocks at sustainable levels. Department of Fisheries also administer the *Fishing and Related Industries Compensation (Marine Reserves) Act 1997* which provides the mechanism by which the holder of an existing authorisation for commercial fishing, aquaculture and/or fish processing may seek compensation if the commercial value of the authorisation is diminished through the establishment of a marine park or reserve.

DEC and Department of Fisheries undertake their operational marine management roles and responsibilities in close collaboration. Cross-authorisation of officers working within marine parks and reserves, and sharing of resources such as patrol vessels, is an important part of the collaborative management approach.

The Department of Mines and Petroleum, under the Minister for Mines and Petroleum, is the state's lead agency in attracting private investment in resource exploration and development through the provision of geoscientific information on minerals and energy resources, and management of an equitable and secure titles systems for the mining, petroleum and geothermal industries under the *Mining Act 1978* and *Petroleum (Submerged Lands) Act 1982*. It also carries primary responsibility for regulating these extractive industries and dangerous goods in Western Australia.

The Department of Transport, under the Minister for Transport, manages and regulates boating inclusive of vessel and operator licensing, setting of safety standards, navigation requirements, licensing of jetties and maritime structures, and provision of strategic coordination of marine incidents such as shipwreck and pollution at sea. Department of Transport responsibilities are carried out in accordance with the Navigable Waters Regulations 1983, Shipping and Pilotage (Mooring Control Areas) Regulations 1983; *Western Australian Marine Act 1982; Marine and Harbours Act 1981; Western Australian Marine (Sea Dumping) Act 1981; Marine Navigational Aids Act 1973; Shipping and Pilotage Act 1967; Lights (Navigation Protection) Act 1938;* and the *Jetties Act 1926.*

Other agencies have a range of responsibilities and expertise with respect to marine conservation, sustainable use and cultural heritage. These include the Western Australian Museum, Department of Planning, Tourism Western Australia, the Office of Native Title, and the Department of Indigenous Affairs. DEC will foster a collaborative approach to implementation of the management plan and its programs. A more detailed outline of agency functions and responsibilities is outlined in Appendix 2.

Part D – Appendices

Appendix 1 Acronyms

ANZECC	Australia and New Zealand Environment and Conservation Council
CALM Act	*Conservation and Land Management Act 1984*
CALM Regulations	*Conservation and Land Management Regulations 2002*
CAMBA	China – Australia Migratory Bird Agreement
CASA	Civil Aviation Safety Authority
DEC	Department of Environment and Conservation
DEWHA	Commonwealth Department of Environment, Water, Heritage and the Arts
DIA	Department of Indigenous Affairs
DoF	Department of Fisheries
DoT	Department of Transport
DoW	Department of Water
DMP	Department of Mines and Petroleum
OEPA	Office of the Environmental Protection Authority
EPBC Act	Commonwealth *Environmental Protection and Biodiversity Act 1999*
FRM Act	*Fish Resources Management Act 1994*
H	High
H-KMS	High – Key management strategy
IUCN	International Union for the Conservation of Nature and Natural Resources
JAMBA	Japan-Australia Migratory Bird Agreement
KPI	Key performance indicator
L	Low
M	Medium
MPRA	Marine Parks and Reserves Authority
ONT	Office of Native Title
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
WAM	Western Australian Museum
TWA	Tourism Western Australia

Appendix 2 Collaborative management and agency functions

Management of the proposed marine park will be implemented through a collaborative management approach led and coordinated by Department of Environment and Conservation (DEC). The aim of collaborative management is to ensure integration and cohesion of the specific statutory responsibilities held by a number of government agencies.

DEC, under the Minister for Environment, is responsible for the implementation of the CALM Act, Conservation and Land Management Regulations 2002 (CALM Regulations), *Wildlife Conservation Act 1950* (WC Act) and *Wildlife Conservation Regulations 1970* (WC Regulations). The WC Act and WC Regulations provide for the conservation and protection of all wildlife. DEC, under the Minister for Environment, has primary responsibility for facilitating the preparation and implementation of management plans for Western Australia's marine parks and reserves under the CALM Act on behalf of the MPRA.

Marine parks and reserves are managed primarily by DEC under the CALM Act and Regulations on behalf of the MPRA through the implementation of seven management programs as outlined in Section 9. Under the CALM Act, the Authority is required to audit the implementation of management plans and provide ongoing advice to DEC and the Minister for Environment regarding development of the state's marine parks and reserves system. DEC and the MPRA also develop and implement necessary strategic policy to guide management of Western Australia's marine parks and reserves.

The **Department of Fisheries**, under the Minister for Fisheries, is responsible for the management and regulation of aquaculture, pearling and commercial and recreational fishing in all state waters including marine parks and reserves under the Fish Resources Management Act, Fish Resources Management Regulations and Pearling Act. This includes temporal and spatial fishing closures, quota systems, licensing and bag and size limits to maintain the state's targeted fish stocks at sustainable levels. Department of Fisheries also administer the *Fishing and Related Industries Compensation (Marine Reserves) Act 1997* which provides the mechanism by which the holder of an existing authorisation for commercial fishing, aquaculture and/or fish processing may seek compensation if the commercial value of the authorisation is diminished through the establishment of a marine park or reserve.

The **Department of Transport**, under the Minister for Transport, manages and regulates boating inclusive of vessel and operator licensing, setting of safety standards, navigation requirements, licensing of jetties and maritime structures, and provision of strategic coordination of marine incidents such as shipwreck and pollution at sea. The Department of Transport responsibilities are carried out in accordance with the Navigable Waters Regulations 1983, Shipping and Pilotage (Mooring Control Areas) Regulations 1983, *Western Australian Marine Act 1982, Marine and Harbours Act 1981, Western Australian Marine (Sea Dumping) Act 1981, Marine Navigational Aids Act 1973, Shipping and Pilotage Act 1967, Lights (Navigation Protection) Act 1938 and the Jetties Act 1926*.

The **Department of Mines and Petroleum**, under the Minister for Mines and Petroleum, is the state's lead agency in attracting private investment in resource exploration and development through the provision of geoscientific information on minerals and energy resources, and management of an equitable and secure titles systems for the mining, petroleum and geothermal industries under the *Mining Act 1978* and *Petroleum (submerged lands) Act 1982*. It also carries primary responsibility for regulating these extractive industries and dangerous goods in Western Australia, including the collection of royalties, and ensuring that safety, health and environmental standards are consistent with relevant state and Commonwealth legislation, regulations and policies.

The **Office of the Environmental Protection Authority**, under the Minister for Environment, has responsibility for parts of the *Environmental Protection Act 1986* dealing with environmental impact assessments, policy development and compliance monitoring of Ministerial conditions. The Office of the

Environmental Protection Authority responsibilities include provision of advice to the Minister on the environmental acceptability of development proposals and management plans, formulation environmental protection policies to protect specific parts of the environment, and provision of public statements about matters of environmental importance.

The **Department of Indigenous Affairs**, under the Minister for Indigenous Affairs, facilitates the protection of Aboriginal heritage and culture, provides policy direction on issues affecting Aboriginal people holds and protects cultural information on behalf of Aboriginal people and facilitates engagement of Aboriginal people in discussions and information sharing in accordance with the *Aboriginal Heritage Act 1972*. Under the *Aboriginal Affairs Planning Authority Act 1972* the Aboriginal Affairs Planning Authority and Aboriginal Affairs Advisory Council provide consultative and other services for the economic, social and cultural advancement of persons of Aboriginal descent in Western Australia. Under this Act the Aboriginal Lands Trust administers the management of reserves vested to the Aboriginal Affairs Planning Authority, supported by the Department of Indigenous Affairs.

The **Western Australian Museum**, under the Minister for Culture and the Arts, facilitates the protection of pre-1900 shipwrecks and maritime artefacts in Western Australia's state coastal waters, inclusive of those within marine parks and reserves in accordance with the *Maritime Archaeology Act 1973*. The Western Australian Museum also undertake or participate in surveys of marine biodiversity and manage, administer and maintain the States collection of marine biological reference material.

The **Department of Water**, under the Minister for Water, provides scientific advice and technical data to industry and government on the status of water, usage, conservation, technology and the viability of new source development. The Department of Water responsibilities include provision of advice regarding catchment management practices which may improve the quality of water entering marine parks and reserves, and other marine, estuarine and freshwater environments. The Department of Water operates in accordance with a number of acts including the *Waterways Conservation Act 1976* and the *Land Drainage Act 1925*.

The **Department of Planning**, under the Minister for Planning, has statewide responsibility for planning for future communities through planning for cities and towns and the transport routes that connect people and places. Department of Planning also facilitate non-statutory and statutory planning for coastal areas throughout the state in consultation with local governments and community.

Tourism Western Australia, under the Minister for Tourism, is responsible for promoting Western Australia as an attractive holiday, event, convention and incentive travel destination, nationally and overseas and enhancing the tourism industry, infrastructure and product base. Tourism Western Australia works closely with DEC in promoting marine parks and reserves as a tourism product. Tourism's direct contribution to Western Australia's gross state product is estimated at $3.7 billion per annum (CRC for Sustainable Tourism 2009).

The **Office of Native Title**, under the Attorney General of Western Australia, provides advice and seeks clarification on native title issues. The Native Title Act provides guidance in regard to the establishment of marine parks and reserves in relation to the interests of native title claimants or holders.

The **Commonwealth Department of Environment, Water, Heritage and the Arts**, under the Commonwealth Minister for Environment, Heritage and the Arts, administers the requirements of the Environmental Protection and Biodiversity Conservation Act which aims to provide for the protection of matters of national environmental significance, namely the ecological character of internationally important wetlands, nationally listed threatened species and ecological communities, listed migratory species, the value of world and national heritage places and Commonwealth marine waters extending from three nautical miles from shore to 200 nautical miles from shore. The department also administer the *Historic Shipwrecks Act 1976* which protects historic wrecks and associated relics that are more than 75 years old.

The Department of Environment, Water, Heritage and the Arts is currently facilitating bioregional marine planning processes for Commonwealth waters for the North West bioregion from Kalbarri to the Western Australian/Northern Territory border; and for the South West bioregion from Kalbarri to Kangaroo Island (South Australia) The Western Australian and Commonwealth governments have agreed to develop complementary conservation measures where it is appropriate and feasible to do so. The Commonwealth Government has identified an area for further assessment adjoining the proposed marine park.

The **Commonwealth Department of Agriculture, Fisheries and Forestry**, under the Commonwealth Minister for Agriculture, Fisheries and Forestry, develops and implements policies and programs to ensure Australia's fisheries are competitive, profitable and sustainable. It supports Australia's domestic fisheries and aquaculture through research, quarantine, fish health and food safety programs, market access and trade negotiations, business development and management assistance and policy development. The Australian Fisheries Management Authority operates under Department of Agriculture, Fisheries and Forestry and implements the reporting framework for Commonwealth licenced fisheries including assessment of their sustainability.

The **Shire of Wyndham-East Kimberley** is the local government responsible for community planning for 121,000 square kilometres of the Kimberley region, inclusive of the towns of Kununurra and Wyndham. The shire is primarily guided by its *Local planning strategy* which provides support for the conservation of the marine environment and the establishment of multiple-use marine parks and reserves (Shire of Wyndham East Kimberley 2006).

Appendix 3 Overview of authorised commercial fisheries in the proposed Camden Sound Marine Park

Beche de mer Fishery

The Beche de mer Fishery has been operating since the mid 1990s, principally from vessels operating from Darwin. The area of the proposed marine park is fished intermittently every two years. Effort is known to be particularly concentrated around Augustus Island and the Montgomery Islands reef. The fishery targets 'sandfish' (*Holothuria scabra*) and 'red fish' (*Actinopyga echinites*). An average of 12 tonnes per year was recorded as caught between 1995 and 2006 (Department of Fisheries 2009).

Mud crab Fishery

There appears to be minimal commercial mud crab fishing in the area of the proposed marine park, with only six years of fishing recorded between 1991 and 2009. Catches have averaged between 28 and 664 kilograms with the last known catch of 140 kilograms in 2004. The majority of recent commercial mud crab fishing has occurred in York Sound, King Sound, Admiralty Gulf and Cambridge Gulf outside the waters of the proposed marine park.

Kimberley Prawn Managed Fishery

Less than 10 per cent of the total Kimberley Prawn fishing activity operates in the waters of the proposed marine park. However, the proposed marine park includes approximately 40 percent of the favoured fishing grounds. These main prawn fishing grounds overlap with the high priority calving grounds on the eastern side of Camden Sound. Bycatch reduction devices (grids and secondary devices to assist turtles and fish escaping) are compulsory in the Kimberley Prawn Managed Fishery and reduce the catch of protected and other species. Trawling is primarily focused on muddy habitats, and this reduces the impacts of this fishery on structurally complex habitats. Non-retained bycatch, such as turtles, sawfish, sea snakes and syngnathids can be caught by trawlers (Evans 2009). However, Department of Fisheries, the Australian Fisheries Management Authority and commercial fishers continue to develop management arrangements to reduce bycatch under an ecosystem-based management framework.

To reduce the potential for trawling activity to disturb humpback whales and calves, trawling will not be permitted in the special purpose zone (whale conservation). Trawling is also not permitted in the marine park's sanctuary zones as these are no-take areas, and the special purpose zone (wilderness fishing) as this zone will be exclusive to recreational fishers who can eat their catch before leaving the zone.

Mackerel Interim Managed Fishery

Four vessels currently undertake surface trolling for Spanish mackerel (*Scomberomorus spp.*) in nearshore waters around island and reef systems in the Kimberley region. This fishery is highly targeted with virtually no bycatch. Some effort is expended within the proposed marine park to the north and north east of Champagny Island.

Kimberley Gillnet and Barramundi Managed Fishery

This fishery operates in near-shore waters around creek and river systems, and around coastal headlands. The fishery uses gillnets to target barramundi in the proposed marine park and threadfin salmon (*Eleutheronema tetradactylum* and *Polydactylus macrochir*) in the waters to the south. There are currently seven licences in the fishery: two operate from Broome, one from Derby, one from Cockatoo Island and four more generally along the Kimberley coast. The fishery is managed through a limited number of licences, and operates in accordance with an agreement with the vessel-based commercial tourism industry to minimise interaction which ensures commercial fishers do not operate in areas regularly visited by tourism operators.

Northern Demersal Scalefish Managed Fishery

This fishery targets snapper, emperor and grouper species through the use of hand lines. Four fishers are currently licensed to operate within the proposed marine park but minimal effort is expended within the proposed marine park.

Joint Authority Northern Shark Fishery

This fishery is under the jurisdiction of the Western Australian Fisheries Joint Authority (Commonwealth and state Ministers responsible for fisheries management) but is managed under state law by the Department of Fisheries. The fishery uses long lines and pelagic and demersal gillnets. Gill netting in this fishery could be a potential risk to whales and other marine species such as turtles. In the recent past the fishery has operated primarily with long lines which, more specifically, target large shark species. However, due to sustainability issues with the take of large shark species, consideration has been given to migrating the fishery to gillnets to enable the targeting of smaller sharks that occur in higher numbers. Due to a range of issues this change has not been progressed and currently the Western Australian and Commonwealth governments are in discussion about this fishery.

Western Australian North Coast Shark Fishery

The North Coast Shark Fishery is managed in conjunction with the Joint Authority Northern Shark Fishery with most operators having authorisations for both fisheries. This fishery operates in the area between North West Cape and Koolan Island. While the majority of the fishery was closed some years ago, a number of fishers are authorised to fish under an exemption in the area between Broome and Koolan Island and may not occur within the proposed marine park. Currently, the fishery is at a very low level of activity. The Western Australian and Commonwealth governments are in discussion about this fishery.

Marine Aquarium Fish Managed Fishery

The Marine Aquarium Fish Managed Fishery targets more than 250 species of fish but fishermen also take coral, live rock, algae, seagrass and invertebrates. It is primarily a dive-based fishery that uses hand-held nets to capture the desired target species from boats up to 8 metres in length. While the fishery operates

throughout all Western Australian waters, catches are relatively low in volume due to the special handling requirements of live fish. Fishing operations are heavily weather-dependent due to the small vessels used and the potentially hazardous conditions (for example waves and swell) encountered. In addition, human constraints (such as physiological effects of decompression) limit the amount of effort exerted in the fishery, the depth of water and the offshore extent where collections can occur (Department of Fisheries 2009).

Specimen Shell Managed Fishery

The Specimen Shell Managed Fishery is based on the collection of individual shells for the purposes of display, collection, cataloguing, classification and sale. Up to 550 different shellfish species are collected by hand by divers operating from small boats in shallow coastal waters. The fishery operates in Western Australian waters between the high water mark and the 200 m isobath along the entire coastline.

This is a limited entry fishery with 32 licences in the fishery (but many are not active). In 2008, the total number of specimen shells collected was 13,355, distributed over a wide range of species. In the past five years, more than 535 separate species of molluscs have been collected, with an average of more than 200 species per year – the majority in very low numbers (Department of Fisheries 2009).

Appendix 4 Shipwreck history of the Calliance and Enchantress

In 1864, the *Calliance*, which was used to transport settlers and livestock from Melbourne to Camden Harbour, struck an unmarked reef near Adele Island. The ship limped into Camden Harbour with all aboard but was blown ashore. Ballast rocks lying across the intertidal area are all that remain of the wreck today. The settlement at Camden Harbour claimed nine lives and was abandoned after only ten months due to the harsh conditions experienced by settlers. Building remains can still be seen and seven gravesites are located on Sheep Island. The area was also used as a Royal Australian Air Force encampment during World War II. The Shire of Wyndham-East Kimberley has recorded Camden Harbour as a place of considerable significance in its municipal heritage inventory (O'Brien Planning Consultants 1997). Heritage sites at Camden Harbour are protected under the *Heritage of Western Australia Act 1990* and the *Maritime Archaeology Act 1973* and should not be disturbed.

In August 1874, the 35 metre schooner *Enchantress* struck a reef off Champagny Island while travelling from Darwin to Cossack. The vessel which had come to Australia via Singapore, where it had called to recruit divers, was engaged in pearling. The *Enchantress* had commenced collecting pearl shell from as far north as Darwin, gradually moving south to Camden Sound. After striking the reef, the ship struggled into Brecknock Harbour where it became completely wrecked. A confrontation between survivors and Aboriginal people resulted in the loss of several lives (Henderson 1988). The wreck is believed to lie at the entrance to Brecknock Harbour where a freshwater spring is located (Souter 2009). The wreck site of the *Enchantress* is protected under the Commonwealth *Historic Shipwrecks Act 1976* and should not be disturbed if found.

Appendix 5 Operational schedule for implementation of management actions across seven management programs

This operational schedule details the timeframe in which management actions will be implemented. Management actions are presented for each of the seven management programs. Timeframes assist in the assessment of management plan implementation.

	Management action to be completed within this timeframe
	Management action to be completed on an ongoing basis.

Management program actions	Year									
	1	2	3	4	5	6	7	8	9	10
Management frameworks										
Use and visitor infrastructure										
Education and interpretation										
Community participation										
Patrol and enforcement										
Research										
Monitoring										

To be completed within final management plan

Part E – References

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