GOVERNMENT OF WESTERN AUSTRALIA

PLAN FOR OUR PARKS
SECURING 5 MILLION HECTARES OVER 5 YEARS

Lalang-gaddam Marine Park

Joint Management Plan 2022

Management plan 98

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

Conservation and Parks Commission

dambimangari Aboriginal Corporation

Lalang-gaddam Marine Park

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Warning: This plan shows photographs of Aboriginal people, mentions names and/or refers to quotations from Aboriginal people who may have passed away.

NB: The spelling of some of the traditional language words for places and species of plants and animals may vary.

Questions regarding this plan should be directed to:

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Front cover photos (top to bottom):
Yowjab (Montgomery Reef). Photo – Will Robbins, DBCA.
Oobeeyal (Inland Sea). Photo – Michael Higgins, DBCA.
Exposed *waddaroo* (coral) reef. Photo – Will Robbins, DBCA.
Jindirm (mangroves). Photo – Roanna Goater, DBCA.
Duddgoo (Graveyards). Photo – Michael Higgins, DBCA.

Aardbulaardoo Ngaieye (welcome everyone), to the Lalang-gaddam Marine Park, part of Dambeemangarddee Country

We want to tell you about who we are, so that you know when you travel through the marine park. Many people now refer to us as Dambeemangarddee people, historically you may have seen it spelt as 'Dambimangari'. Dambimangari was how the word in our language was spelt when it was transcribed through the modern Australian western system as our native title was legally determined by consent in 2001. We are choosing to spell the word how it is correctly pronounced, which is Dambeemangarddee, this is how the word appears in this document. In our language, *dambeema* means home, Dambeemangarddee means all the people who are from that home.

Dambeemangarddee people is a title that has in recent times been used when discussing the Dambeemangarddee native title holders. Our culture goes back more than 56,000 years, Dambeemangarddee as our collective title, goes back less than twenty. The name of our tribe and language is *Worrdorrda*. This is the proper name of our tribe, and it is how you will see us referred to most times in books (often spelt as *Worrorra/Worora)*.

We honour our old people from the Wanjina Wunggurr Dambeemangarddee, Wanjina Wunggurr Wilingin and Wanjina Wunggurr Uunguu who stood strong in our fight for native title. We remember the strength of our ancestors who passed their traditional knowledge on to us, fought for our rights and laid the foundation for our generation to look after our Country in traditional and modern ways. Our Lalang-gaddam Marine Park Joint Management Plan is a modern way for us to remember our elders and ancestors. Please take care in Dambeemangarddee Country, respect the environment and respect the culture when you spend time in the Lalang-gaddam Marine Park.

Okenia Island. Photo - Will Robbins, DBCA

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1. The management plan

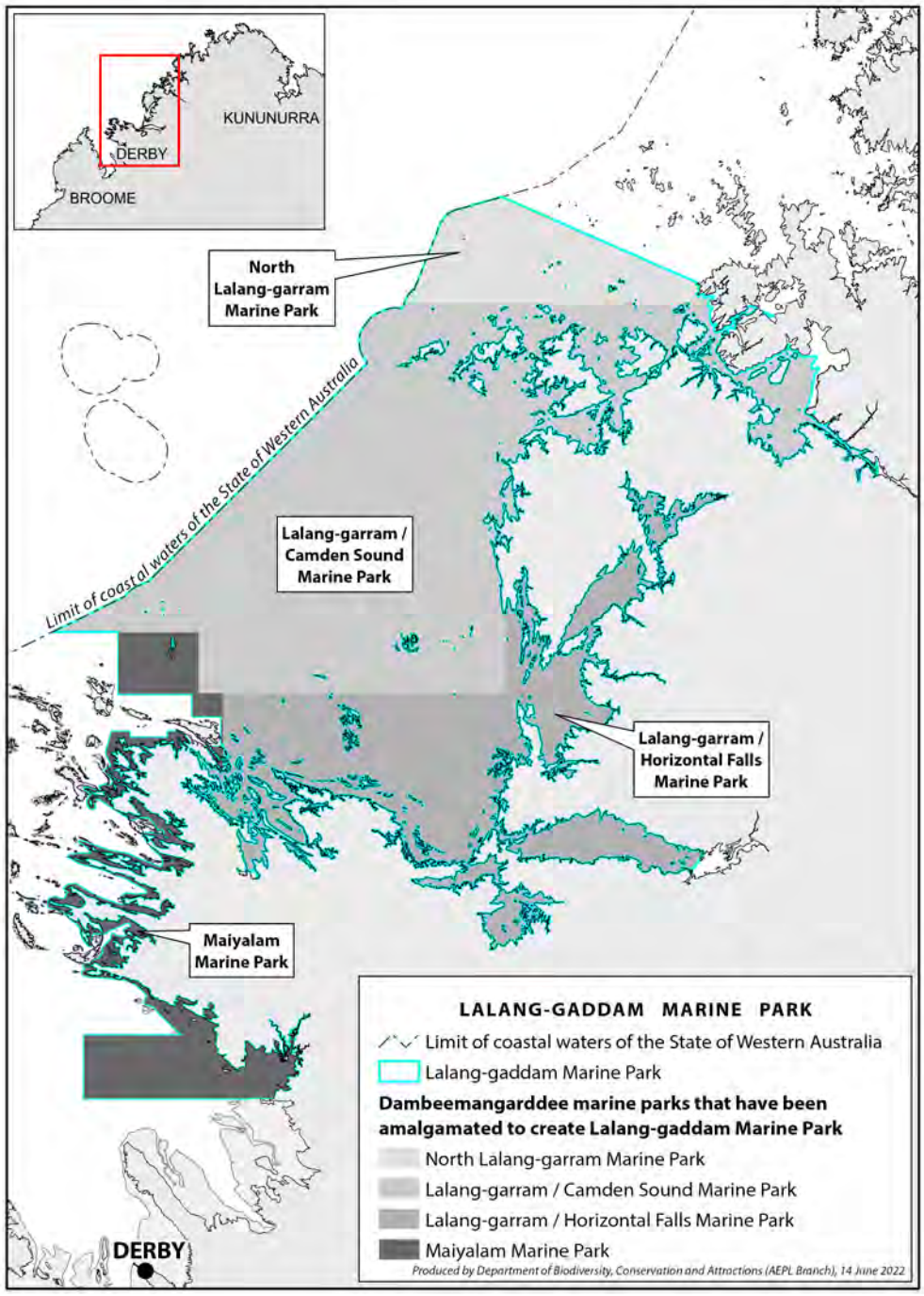
1.1 Purpose of the plan

This plan has been prepared in partnership with Dambeemangarddee Traditional Owners with input from stakeholders. It details how the Lalang-gaddam Marine Park is jointly managed to enhance nature conservation, preserve and promote culture and heritage, and support compatible recreational and commercial use for future generations. This plan takes into account the values, aspirations and management objectives articulated in the *Dambimangari Healthy Country Plan 2012-2022.*

The main outcomes of this joint management plan and attached joint management agreements (JMAs) are listed below.

- The establishment of the Lalang-gaddam Marine Park as a Class A reserve over the subtidal and intertidal areas of Dambeemangarddee Sea Country.
- The establishment of a Joint Management Body (JMB) for the entirety of Dambeemangarddee Sea Country.
- The continued application of a joint management framework between the Department of Biodiversity, Conservation and Attractions (DBCA) and Dambimangari Aboriginal Corporation (DAC) in accordance with the requirements of a Section 56A Joint Management Agreement (JMA) under the Conservation and Land Management Act 1984 (CALM Act) for Dambimangari Conservation Estate.
- Promotion and support for the exercise of Dambeemangarddee people's native title rights recognising their ongoing connection to, and responsibility for Dambeemangarddee Sea Country.
- Preservation and promotion of Dambeemangarddee culture and heritage values.
- The establishment of a framework to allow for ongoing sustainable multiple use.
- Promotion and support to build the capacity of Dambeemangarddee people and the DAC to progressively take on greater responsibility and accountability for management of the marine park.
- The establishment of seven management programs (management frameworks, education and interpretation, public participation, patrol and enforcement, management intervention and visitor services, research and monitoring) with prioritised strategies to help achieve management objectives for the marine park.
- A conservation framework, built on both western science and traditional knowledge, to help ensure the critical ecological components and processes of the marine environment throughout Dambeemangarddee Sea Country are conserved and the existing and potential pressures on the values are appropriately managed.
- Contribution to the fulfilment of Australia's responsibilities under several international conventions, such as the Convention on Biological Diversity, and supports the International Union for the Conservation of Nature's Protected Areas Program and the United Nations Declaration on the Rights of Indigenous Peoples.
- Contribution to the National Representative System of Marine Protected Areas.
- The continuation and enhancement of cultural, recreational and commercial uses for the benefit and enjoyment of Dambeemangarddee Traditional Owners, the community and visitors.

The Lalang-gaddam Marine Park has been formed from the amalgamation of four marine parks in Dambeemangarddee Sea Country; the Lalang-garram / Camden Sound Marine Park, the Lalang-garram / Horizontal Falls Marine Park, the North Lalang-garram Marine Park and the Maiyalam Marine Park. This plan has replaced the *Lalang-garram / Camden Sound Marine Park management plan 73* and the *Lalang-garram / Horizontal Falls and North Lalang-garram Marine Parks joint management plan 2016 management plan 88.*



Map 1: Dambeemangarddee marine parks that have been amalgamated to create Lalang-gaddam Marine Park

1.2 Development of the plan

This joint management plan has been prepared by Dambeemangarddee Traditional Owners and DBCA incorporating input from stakeholders. Many Dambeemangarddee Traditional Owners have contributed to this plan by sharing cultural knowledge, traditional ecological knowledge and generously giving their time. Decision making for the management arrangements in this plan has been underpinned by traditional knowledge in conjunction with the latest research on the area and information from stakeholders. The plan has been designed to support the values, aspirations and management objectives articulated in the *Dambimangari Healthy Country Plan 2012-2022* where applicable.

1.3 Structure of the plan

This plan sets a vision for the area and identifies key cultural, ecological, social and economic values and the existing and potential pressures on them. It provides strategic direction and applies seven management programs to be implemented through management strategies. It is an outcome-based plan that provides a robust framework to support adaptive management which sets targets and performance measures to track progress against the stated management objectives over the life of the management plan. The key components of the management framework are shown in Figure 1.

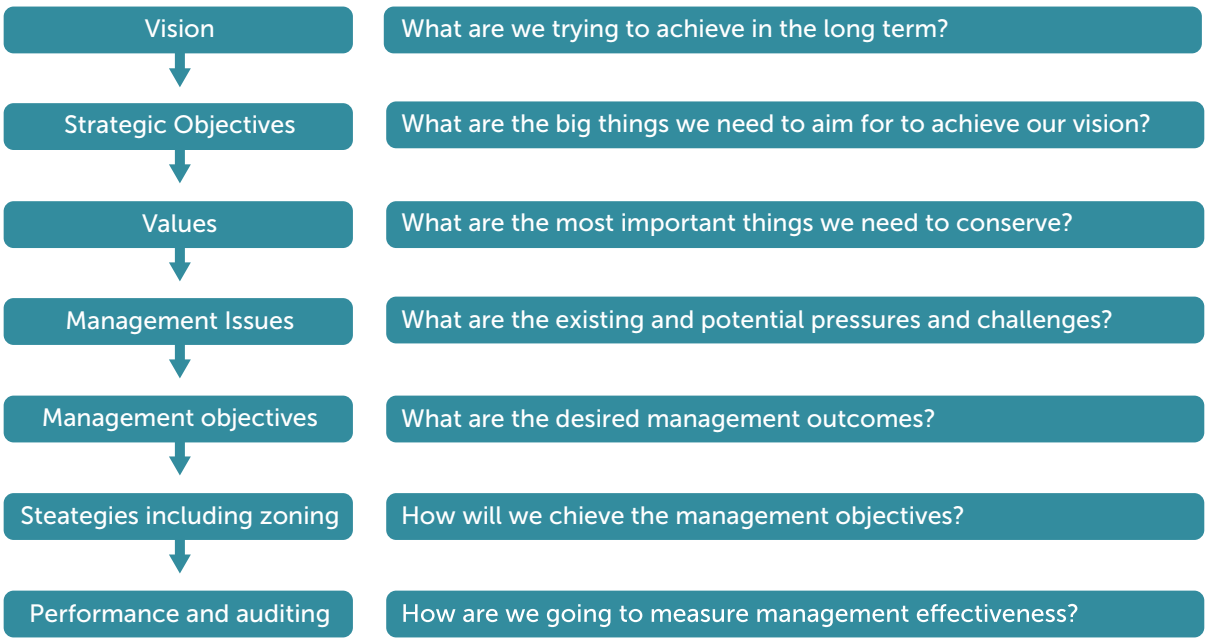


Figure 1: Structure of the plan

1.4 Term of the plan

This plan will guide management of the Lalang-gaddam Marine Park for 10 years, or until a new joint management plan is prepared under the CALM Act. Any amendments required during the life of the plan requires a statutory public comment period and approvals from the Minister for Environment, Minister for Fisheries and Minister for Mines and Petroleum.

2. Introduction

The Lalang-gaddam Marine Park is located within Dambeemangarddee people's native title determination area along Western Australia's Kimberley coast (Map 2 and 3). For tens of thousands of years Dambeemangarddee people have depended on and looked after their traditional land and Sea Country and the area remains one of the last relatively undamaged coastal areas left in the world (Halpern 2008 and Richards *et al*. 2015). The State Government and Dambeemangarddee Traditional Owners remain committed to the conservation and sustainable use of the area and the Lalang-gaddam Marine Park will continue to be jointly managed by Dambeemangarddee Traditional Owners and DBCA.

'Our community has a strong vision for looking after our country. We want to make sure our traditional knowledge is alive and strong and that all plants, animals and cultural sites are looked after' (Leah Umbagai, DAC).

Wotjulum area. Photo – Chloe Rings, DBCA.

The diverse seascapes of the Lalang-gaddam Marine Park include fringing *waddaroo* (coral reefs), *jindirm* (mangrove) lined creeks and bays, spectacular gorges and estuarine systems and *galaab* (beaches). The Lalang-gaddam Marine Park will protect the world-renowned *Garaanngaddim* (Horizontal Falls), and *Yowjab* (Montgomery Reef), two of the most significant tourist attractions along the Kimberley coast.

Dambeemangarddee people have continuing rights and responsibilities for this area. Under traditional law, Dambeemangarddee people have responsibility to look after country and keep it healthy. Every rock, plant, *jaiya* (fish), river and beach are important to Dambeemangarddee people (DAC 2012). Everything is connected and tightly interlinked, and Dambeemangarddee people consider the cultural and natural values of land and saltwater to be one and the same. For Traditional Owners there is a rich body of oral narratives about the era when the land, the seas, the heavens and all within were created and named. This time is referred to as '*La Lai*", a complex and multi-faceted concept that is sometimes simplified when translated into the modern Australian vernacular using terms such as Dreaming, Dreamtime or Aboriginal Law. All of the land and Sea Country in the marine park holds special significance.

Within Dambeemangarddee country there are significant cultural sites including rock art, burial sites, middens, stone arrangements, hunting places, water sources, camping areas and important mythological areas. These cultural sites are evidence of the very long historical connections to, and the use and occupation of the land and sea by the ancestors of today's Traditional Owners.

The extraordinary natural values of the area coupled with the vibrant Aboriginal culture in the region is attracting an increasing number of local and international tourists. The marine park provides a stunning setting for visitors to learn about the continuing rich cultural heritage values of the area. Visitors can also experience the awe-inspiring *Garaanngaddim* (Horizontal Falls), one of the most significant tourist attractions along the Kimberley coast, watch wildlife in the natural environmental and fish for *ilerdda* (barramundi, *Lates calcarifer*) in *jindirm* (mangrove) lined creeks.

The pristine, warm tropical waters of the marine park provide optimal conditions for commercial activities such as pearling, aquaculture and commercial fishing. It is likely that these industries will continue to expand as the region develops and careful management is required to ensure activities remain sustainable and the economic potential of these industries is realised without significantly affecting the exceptional values of the Lalang-gaddam Marine Park.

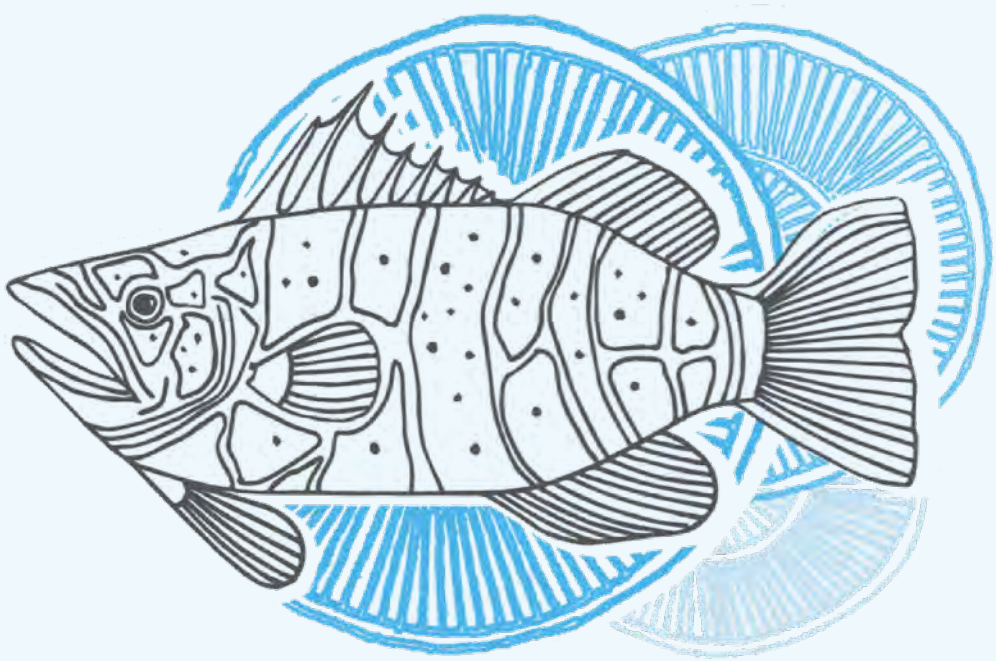
The Lalang-gaddam Marine Park will achieve important social and economic outcomes for the Dambeemangarddee community by providing increased opportunities for Dambeemangarddee people to be employed in positions relating to the management of the marine park. Increasing DAC's capacity in land and sea management, promoting culture-based tourism and supporting Dambeemangarddee involvement in commercial activities occurring in the marine park is important for the Dambeemangarddee community.

This plan takes into account the values, aspirations and management objectives articulated in the Dambimangari Healthy Country Plan and has been prepared alongside the Mayala Marine Park joint management plan and the Bardi Jawi Gaarra Marine Park joint management plan to ensure consistency of management arrangements across the adjacent marine parks. It aims to conserve and enhance the outstanding cultural, ecological, recreational and commercial values of the area, for the benefit of present and future generations as development and visitation in the region continues to grow.

2.1 Name and logo of the marine park

Senior Dambeemangarddee woman, Mrs Janet Oobagooma, suggested that the name for the marine park include the name '*Lalang-gaddam*' which evokes the saltwater as a spiritual place as well as a place of natural abundance. *Lalang-gaddam* is the word in *Worrorra* (one of the Dambeemangarddee native title group languages) that evokes 'the ocean' in its most general sense. It respects the idea of 'saltwater' without meaning just one place or one part of country.

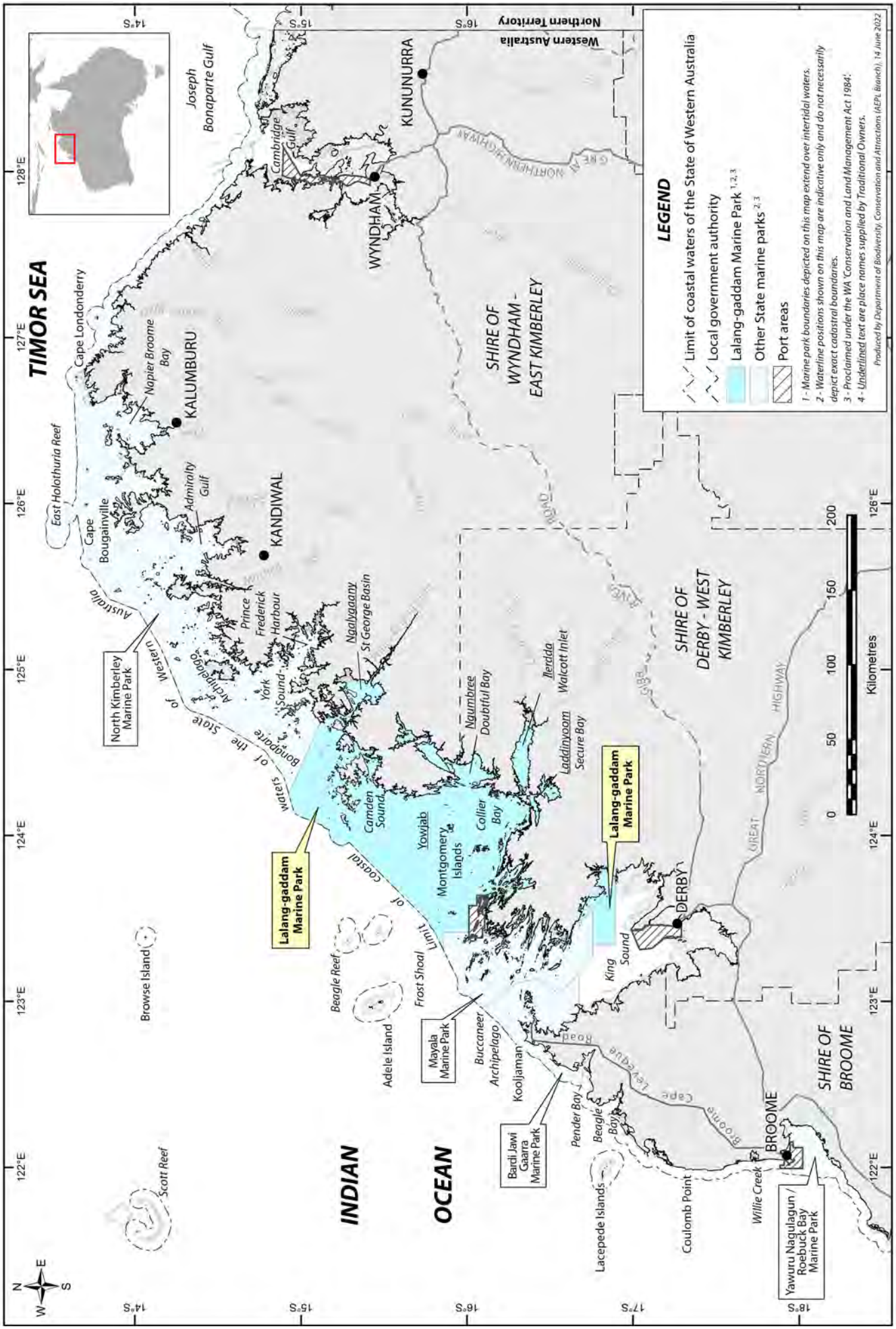
The logo for the marine park drawn by Dambeemangarddee artist Leah Umbagai depicts *Jimbiridj* (rock cod) and *Ngarlanggarnanya* (baler shell) and represents a La Lai creation event.



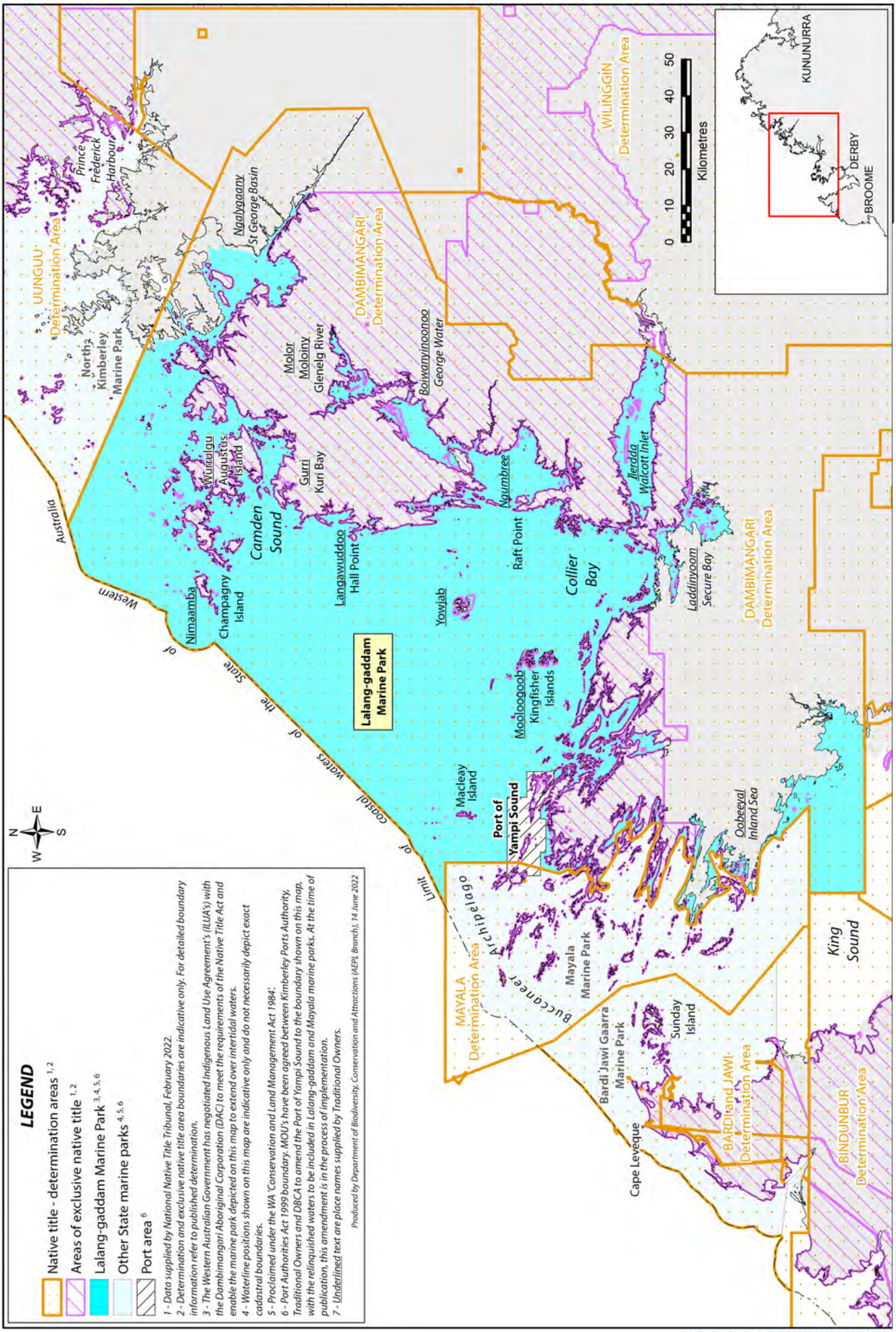
Jimbiridj (rock cod) and *Ngarlanggarnanya* (baler shell) are female Wandjina in their animal forms. They enter *Ngalygaany* (St Georges Basin) from the west and begin to swim upstream, creating the features of *Malandoom* (Prince Regent River) as they go, making all the creeks, going around in circles and opening up all the areas.

Ngarlanggarnanya gets puffed out in *Ngalygaany* and says 'I think I'll stay here, at the foot of *Ngayaang-gananya* (Mt Trafalgar), but you go ahead and find your family'. To make room for *Ngarlanggarnanya*, a number of *Wandjina* in the form of *Gandjeelaadj* (blue crab), and *Beelbaba* (flat-head fish) decide to lift up *Ngayaang-gananya* and move it north of the basin to its present location. The big hole left behind after moving the mountain becomes the home of *Ngarlanggarnanya*, who now manifests as *Goomalamala* (St Andrews Island).

After *Ngarlanggarnanya* became tired and made her home in *Nyalygaany*, *Jimbrididj* continued swimming upstream. At the place known today as *Maamboolbadda* (Kings Cascade), *Jimbiridj* was forced to stop abruptly by the *Jooweebanj*, a La Lai Bowerbird. As *Jimbiridj* 'put on the brakes', she was thrust against the soft mud. In this way she created the step-like formation called *Maamboolbadda* where today fresh-water cascades over from a stream atop the plateau where *Jooweebanj* now lives, and *Jimbiridj* is at the bottom with *Goiyoiya* (crocodile) (Blundell et al. 2017).



Map 2: Locality of Lalang-gaddam Marine Park



Map 3: Native title determination areas within and adjacent to Lalang-gaddam Marine Park

3. Dambeemangarddee country

3.1 Dambeemangarddee people and country

Dambeemangarddee people have traditional country in the area of the marine park recognised through determined native title rights and interests based on strong and ongoing cultural connections to the area. Dambeemangarddee's Native Title consent was determined in May 2011. Dambeemangarddee Traditional Owners are saltwater people who, like their ancestors, continue to use both bush and sea resources within their country. Dambeemangarddee people are a tribe that belong to the *Wandjina* and *Unggudja* cultural block, along with their neighbouring tribes of *Wanabal, Gaambera* and *Ngarinyin*. This is a multi-layered belief and law system under the supreme *Wandjina* ancestors– God-like spirits and the *Unggudja*– the life-force that pervades the cosmos and also the primordial creator Snake.

'The Unggudja life force is the essence of all living things — including Wandjina, humans, animals and plants — and it permeates the land and the sea, including the mountains, rivers and stone formations that characterise the topography of the country. Unggudja also refers to the 'child-spirits' that men 'find' in a dream and then pass to their wives in a further dream before a child can be born. These child-spirits generally take the form of an animal, a plant, a substance such as honey or wax, or in some cases an inanimate object' (DAC et al. 2017).

Yowjab (Montgomery Reef) – Photo – Will Robbins.

For Dambeemangarddee people their country is more than a simple geographic location with a particular topography, flora, fauna and aesthetic qualities. The lives of the Dambeemangarddee Traditional Owners are characterised by richly constructed, deeply embedded, complex reciprocal relationships between themselves, their country and *La Lai* (the Dreaming).

Dambeemangarddee country covers an area of about 27,900km^2 between "*Ungaddang* at the bottom of Kimbolton to *Malandoom* in the Prince Regent area" (DAC 2012). Much of Dambeemangarddee country is also included in the Dambeemangarddee Indigenous Protected Area (IPA). Exclusive possession native title occurs above the high-water mark around much of the coast and islands adjacent to the marine park, and people wishing to visit these areas must obtain a visitor pass from Dambeemangarddee Traditional Owners before their visit. Visitors to Aboriginal Lands Trust (ALT) reserves also need to obtain permission for entry from the ALT.

Dambeemangarddee country is divided into nine clan areas. Currently, there are few Dambeemangarddee Traditional Owners who are able to live full time on their traditional lands, however families and individuals still retain close personal connections with their country and visit regularly for day trips and camping as well as semi-permanent residence at remote outstations such as *Yaloon* (Cone Bay). The Dambimangari Indigenous Ranger Program undertakes marine operations on their ranger vessel, *Manambadda*. They are a regular presence in the Lalang-gaddam Marine Park, undertaking a range of land and sea management projects, such as surveying for exotic marine pests and weeding and cleaning up land areas.

Today, many Dambeemangarddee people live in the Mowanjum Community, south of Derby, within the Derby town itself, or in other places in Western Australia, including Perth (DAC 2016). Prior to this, and post European settlement, many Dambeemangarddee people lived in European built missions at Kunmunya from the 1920s and then at Wotjalum in the 1950s (Mowanjum Aboriginal Community and Mowanjum Artists Spirit of the Wandjina Aboriginal Corporation 2008).

In the last ten years, Dambeemangarddee Traditional Owners have established a number of ongoing projects on their traditional lands, including the Dambeemangarddee Indigenous Ranger Program and a number of joint ventures and partnerships with industry, government and the scientific community. Through DAC, Dambeemangarddee Traditional Owners are also exploring new projects and opportunities based on their significant natural and cultural assets to help build a successful and sustainable future for Dambeemangarddee people (DAC 2016).

'Dambeemangarddee country is a very special place. There are not many places in the word where most of the animals remain as they were thousands of years ago. All the animals have their own songs and stories, some have their images in caves or in stone arrangements. The old people from long ago knew the songs and also created new ones from meeting their ancestors in their dreams' (DAC 2012).

Julawaddaa (turtle) monitoring. Photo – Daniel Barrow, DBCA.

More information about Dambeemangarddee Traditional Owners and visiting Dambeemangarddee land and Sea Country, including obtaining a visitor pass can be found at www.dambimangari.com.au

Mudflats, Rothsay. Photo - Will Robbins, DBCA

3.2 Bioregional setting

The Lalang-gaddam Marine Park is located in the far northwest of Australia's tropical north, in the Kimberley region of Western Australia, incorporating all of Dambeemangarddee Sea Country. It is an area of outstanding natural beauty.

The marine park spans two Integrated Marine and Coastal Regionalisation of Australia (IMCRA) bioregions; the Kimberley Bioregion and the King Sound Bioregion (Map 4). The IMCRA is a framework developed using western science for classifying Australia's marine environment into ecological bioregions at a scale useful for regional planning. These bioregions are used as the basis for the development of National Representative System of Marine Protected Areas (NRSMPA). The marine park spans two Integrated Marine and Coastal Regionalisation of Australia (IMCRA) bioregions; the Kimberley Bioregion and the King Sound Bioregion (Map 4). The Kimberley Bioregion extends from Cape Leveque to Cape Londonderry. This region is characterised by rocky shores, mudflats, fringing reefs and *jindirm* (mangroves). It is a low-energy ria (a submerged river valley) coast with deep embayments and many islands. The King Sound Bioregion lies between Point Osborne and Shenton Bluff and comprises an open gulf encompassing the Fitzroy Estuary, Stokes Bay and Cygnet Bay.

The Lalang-gaddam Marine Park features dramatic, rugged ridges incised by steep valleys and a convoluted coastline of estuaries, bays and offshore islands. The wellknown *Garaanngaddim* (Horizontal Falls) is a waterfall-like effect created when powerful tidal currents rush through two narrow coastal gorges. For the Dambeemangarddee Traditional Owners the falls are one aspect of the manifest power of their Sea Country – the *Unggudja* (creator snake). Beneath the waves, the marine park has a complex bathymetry, with depths changing quickly from channels to shoals. Fringing and platform reefs are a common feature of the marine park and *Yowja*b (Montgomery Reef), a huge submerged rock platform, is of particular cultural significance to the Dambeemangarddee people.

Waddaddam (Coppermine Creek). Photo – Liz Vaughan/Francis Woolagoodja, DAC.

The area's tropical monsoonal climate has distinctive wet and dry seasons. Dambeemangarddee Traditional Owners further recognise and understand the seasons in terms of complex interactions between plants, animals, fish, tides and climatic conditions. For instance, when spinifex is flowering Dambeemangarddee people know that the sea mullet are fat and good to eat. When the weather is cold the tides are 'slow and heavy'.

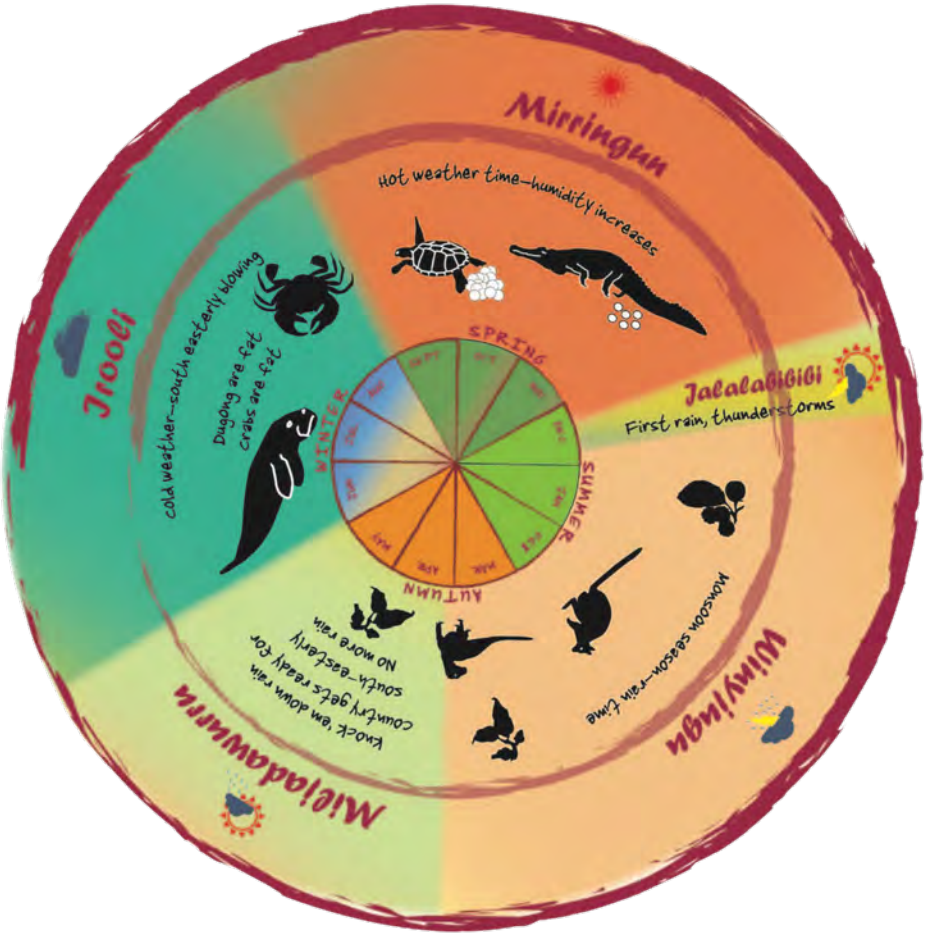


Figure 2: Dambeemangarddee seasonal calendar

The wet season rains create lush green growth and impressive waterfalls. Widespread river systems that feed into *Ilerdda* (Walcott Inlet) and Doubtful Bay flush large amounts of nutrients into the Lalang-gaddam Marine Park and help sustain the abundant wildlife (Warren Barunga pers. comm. 2014, 2016). These terrestrial derived nutrients are dispersed through large tides and strong currents of up to 3m per second. Nutrients are also brought into the marine park from the deep ocean when tidal and open ocean dynamics interact to encourage upwelling. The variability in water movement and nutrient sources results in complex patterns of primary production within the marine park (Hipsey *et al*. 2016).

The Lalang-gaddam Marine Park experiences one of the largest tidal ranges in Australia, with tides in excess of 11m (Short 2011). The large tides result in extensive intertidal areas with diverse ecosystems such as *waddaroo* (coral reefs), *jindirm* (mangroves) and mudflat communities (Waples 2007). For the Dambeemangarddee Traditional Owners the intertidal area is an important part of their identification as saltwater people. The subtidal habitats and communities of the marine park include diverse filter-feeding communities of sponges and hard and soft *waddaroo* (corals).

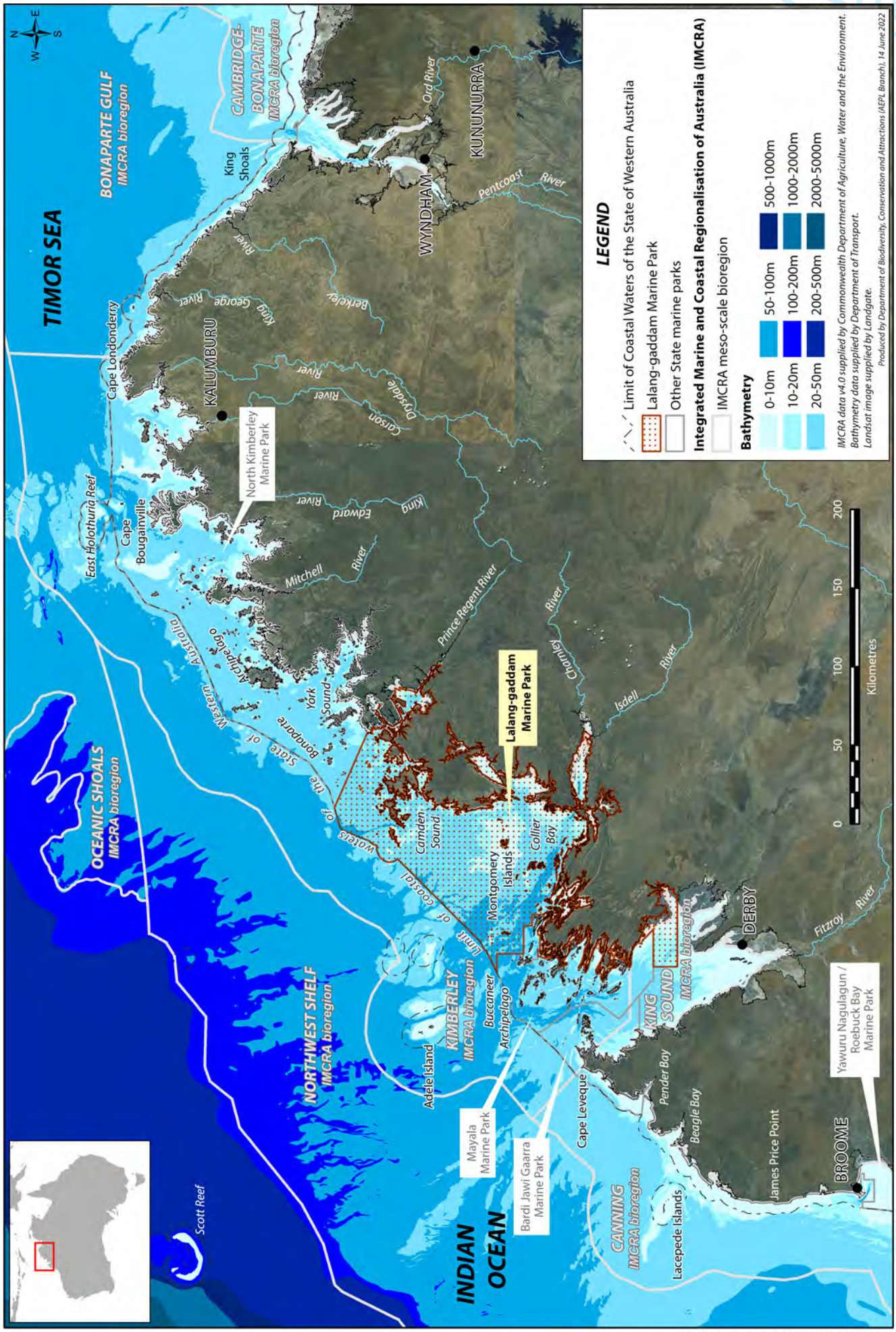
The intertidal and subtidal habitats of the marine parks provide critical foraging and nursery areas for a wide range of threatened, protected and culturally important species such as waliny (dugong), julawaddaa (turtle), goiyoiya (estuarine crocodile), ngunuubange (whale), jigeedany (dolphin) and migratory sea banarddee (birds) (Mustoe and Edmunds 2008). The marine park also falls within an area of the Kimberley identified as the principal calving habitat for humpback whale group D, the largest humpback whale population in the world (Jenner et al. 2001; Costin and Sandes 2009).

The nearest towns to the marine park are Derby and Broome, with populations of approximately 3,300 and 16,000 people respectively (Statistics, 2016). Approximately 47 percent of the residents of Derby are Aboriginal, 28 percent of the residents of Broome are Aboriginal, and 86 percent of the residents of the Dampier Peninsula (1,100 people) are Aboriginal (Statistics, 2016). Most visitors to the marine park arrive by boat or seaplane. Vehicle access is limited to seasonal and infrequently used four-wheel drive tracks.

There are no major developments in the marine park and commercial activities are currently limited to tourism, commercial fishing, pearling and aquaculture. Adjacent to the park, Koolan Island and Cockatoo Island which contain iron ore mines represent significant industrial locations.

Whilst the marine park is considered to be in a good condition, existing and potential pressures in the area include the impacts of climate change (see section 11), fishing (see section 8.2 and 9.2) and unmanaged tourism activities (see section 8.1). Increases in commercial tourism and improvements in boating will provide the opportunity for more visitors to access and appreciate the marine park in the future.

Mooloogoob (Kingfisher Island). Photo – Will Robbins.



Map 4: Marine bioregions and Lalang-gaddam Marine Park

3.3 Definition of area and tenure

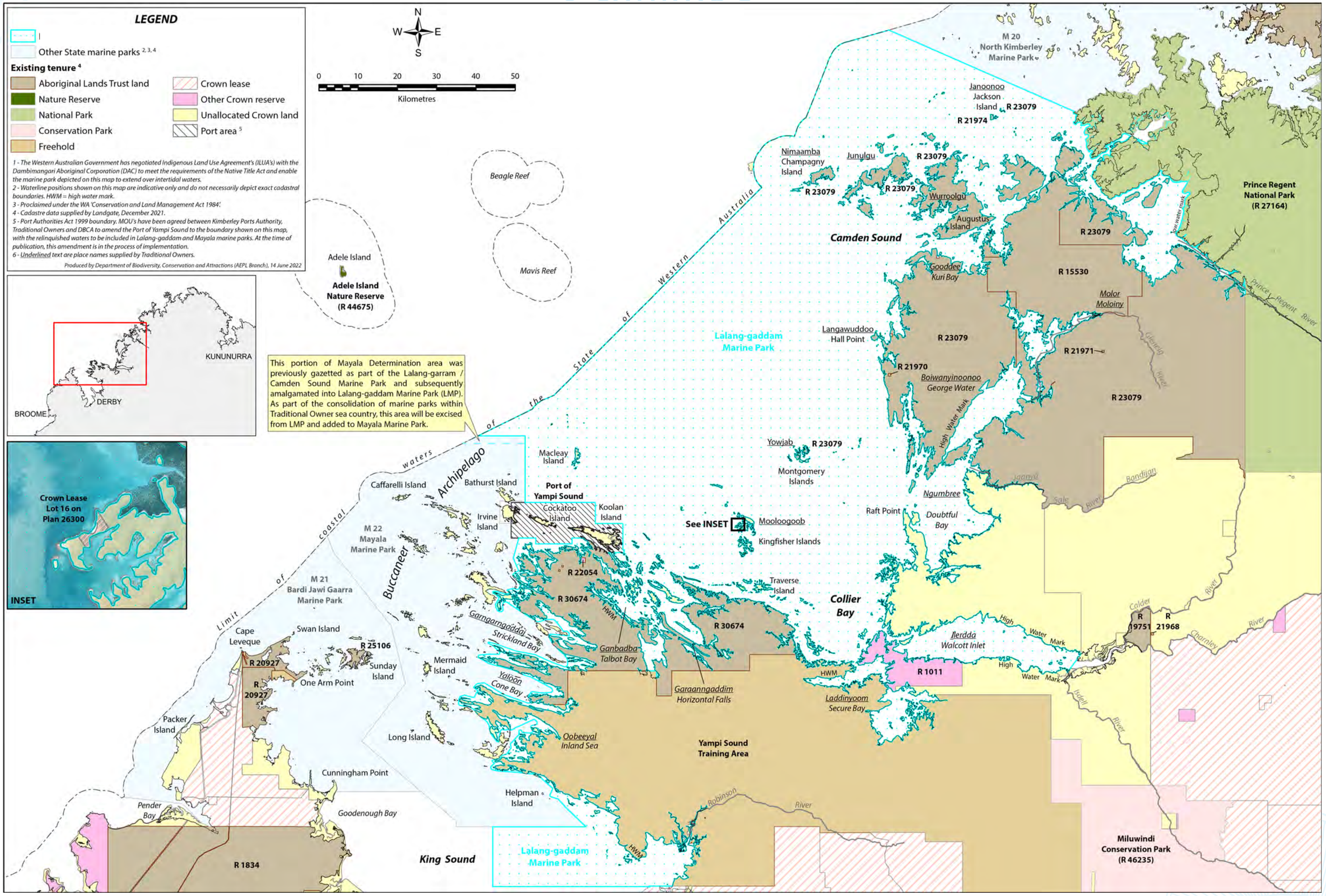
The Lalang-gaddam Marine Park is located in the Kimberley region of Western Australia and covers approximately 1,308,500 hectares within the Dambimangari determination area adjacent to the Shire of Derby-West Kimberley and the Shire of Wyndham East Kimberley. It includes the majority of Dambeemangarddee Sea Country from Cape Wellington and St George Basin in the northeast to *Unarloo* (Robinson River) in the southwest. The Lalang-gaddam Marine Park borders the Mayala Marine Park and Port of Yampi Sound to the west and the North Kimberley Marine Park to the northeast. The marine park aligns with the limit of coastal waters of Western Australia to the northwest, bordering the Commonwealth's Kimberley Marine Park.

The Lalang-gaddam Marine Park includes intertidal areas to the high-water mark, subject to adjacent tenure and addressing native title requirements under the *Native Title Act 1993* (Native Title Act). The outer boundary of the marine park and tenure is shown in map 4. The Dambimangari IPA, included in the National Reserve System, covers much of the terrestrial area adjacent to the marine park.

The Lalang-gaddam Marine Park is gazetted as a Class A marine park and proposed to be jointly vested in DAC and the Conservation and Parks Commission (Commission). Class A reservation provides the highest security of tenure, required the approval of Parliament to amend or cancel a reserve's purpose or significantly alter its boundary. 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.

A small portion of the Mayala Determination area was previously gazetted as part of the Lalang-garram / Camden Sound Marine Park and subsequently amalgamated into Lalang-gaddam Marine Park (LMP). As part of the consolidation of marine parks within Traditional Owner Sea Country, this area will be excised from the marine park and added to Mayala Marine Park.

A Memorandum of Understanding (MoU) has been agreed between Kimberley Ports Authority, Dambeemangarddee Traditional Owners and DBCA to amend the Port of Yampi Sound to the boundary shown on this map, with the relinquished waters to be included in the marine park. At the time of publication, this amendment is in the process of implementation.



Map 5: Tenure within and adjacent to Lalang-gaddam Marine Park

4. Management setting

4.1 Legislative context

The Lalang-gaddam Marine Park was created by amalgamating four marine parks in Dambeemangarddee Sea Country; the Lalang-garram / Camden Sound, Lalang-garram / Horizontal Falls, North Lalang-garram and the Maiyalam marine parks (map 1). Separate Indigenous Land Use Agreements (ILUAs) were developed for each of the marine parks to provide for the valid reservation of the marine parks including the intertidal areas in accordance with the Native Title Act. The ILUA for the Lalang-garram / Camden Sound, the Lalang-garram / Horizontal Falls and North Lalang-garram marine parks was registered on 21 Feb 2017 and the ILUA for the Maiyalam Marine Park was registered on 9 June 2021. It was Dambeemangarddee's request that the marine parks and management plans be amalgamated.

All the ILUAs provide the commitment that the marine parks are jointly managed. Amendments are currently proposed to be made to the CALM Act to allow for joint vesting of conservation estate. Subject to enactment of these amendments, the entirety of the Lalang-gaddam Marine Park will be jointly vested with the Commission and DAC. Joint vesting of the marine park means that the DAC will not only share the responsibility of making management decisions, through the joint management body (JMB) but will also share the overall responsibility with the Commission of making sure the marine park fulfils its purpose. Prior to the joint vesting of the marine park, it is solely vested in the Commission.

The marine park is managed in accordance with the provisions of the CALM Act, the *Fish Resources Management Act 1994* (FRM Act)[1], the *Conservation and Land Management Regulations 2002* (CALM Regulations*),* the *Biodiversity Conservation Act 2016* (BC Act), DBCA policy and other relevant legislation and cultural protocols mentioned throughout this plan.

The marine park helps fulfill Australia's responsibilities under several international conventions including, the Convention on Biological Diversity and supports the International Union for the Conservation of Nature's Protected Areas Program. The marine park also contributes to the National Representative System of Marine Protected Areas by conserving important marine ecosystems and protecting marine biodiversity through a comprehensive, adequate and representative systems of sanctuary zones. Through Indigenous participation in decision-making, and by maintaining Dambeemangarddee's cultural and spiritual relationship with country, the marine park also addresses Dambeemangarddee's rights as stipulated in the United Nations Declaration on the Rights of Indigenous Peoples.

The marine park lies within the west Kimberley region which is included in the Australian National Heritage List for nationally significant natural, Aboriginal and historical values (Environment, 2018). National Heritage places and the values they contain are afforded protection under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), including sections 15B and 15C. The associated values are managed in accordance with the EPBC Act and regulations. Further information on the West Kimberley National Heritage listed place can be found on the Australian Government's Department of Environment website: (www.environment.gov.au/heritage/places/national/west-kimberley).

1 - The Aquatic Resources Management Act 2016 (ARM Act) will replace the Fish Resources Management Act 1994 and the Pearling Act 1990, to become the primary legislation used to manage fishing, aquaculture, pearling and aquatic resources in Western Australia.

4.1.1 Native title and customary activities

The Native Title Act provides a framework for the recognition and protection of rights and interests under traditional laws and customs. Dambeemangarddee Traditional Owners have determined native title rights and interests based on strong and ongoing cultural connections over their land and saltwater country. This plan does not provide any additional restrictions on the exercise of native title rights save to the extent otherwise agreed by native title holders and in accordance with the CALM Act, BC Act, FRM Act and CALM Regulations. Determined native title rights within the marine park include the right to:

- enter, travel and remain on the waters
- hunt, fish, gather and use resources for personal, domestic and communal needs
- undertake cultural activities
- take and use water.

Within the marine park, customary activities such as fishing and hunting are provided for under the management plan. The FRM Act recognises customary fishing rights and the CALM Act and BC Act provide for the undertaking of customary activities

Exclusive possession native title occurs above the high-water mark around much of the coast and islands adjacent to the marine park, and people wishing to visit these areas will need to obtain permission from Dambeemangarddee Traditional Owners before their visit. Visitors can do this by obtaining a visitor pass which provides access to a schedule of popular landmarks, available on the Dambimangari website dambimangari.com.au. Visitation to some sites require individuals to be accompanied by an accredited Traditional Owner guide in addition to the requirement to obtain a pass.

Visitors to ALT reserves also need to obtain permission for entry from the ALT. For more information, visit the visitor location schedule on the Dambimangari website.

4.2 Joint management

In recognition of the significant cultural values and Dambeemangarddee's ongoing connection and responsibilities to the area, the marine park is jointly managed by DBCA and the DAC.

Joint management of the marine park is an ongoing and adaptive process which requires Dambeemangardee people and DBCA to actively work together and share decision making to manage the marine park. Joint management provides the structure to bring appropriate resources together by combining traditional knowledge and practices with western techniques to achieve the cultural, ecological and social management objectives set out in this joint management plan. Traditional knowledge and understanding of Sea Country underpin management decisions for the marine park, and Dambeemangarddee Traditional Owners are actively involved in managing the area.

Joint management is given effect under the CALM Act through the signed section 56A JMA which is attached to this plan. For formal joint management to occur, the final joint management plan requires the Chief Executive Officer of DBCA to jointly manage the park.

The JMA enables the establishment of a JMB (formed of Dambeemangarddee representatives nominated by DAC and staff from DBCA) to manage the marine park in accordance with the agreement and the management plan. The JMB will oversee management of the marine park, make management decisions, provide strategic input into how management strategies are implemented; and monitor implementation of the plan and provide advice in accordance with the agreement and the CALM Act. Although a JMA has not been signed with Department of Primary Industries and Regional Development (DPIRD) it is intended that DPIRD will be an informal joint management partner for all matters relating to fisheries, pearling and aquaculture related matters, in accordance with DPIRD's responsibilities under the FRM Act 1994, *Pearling Act 1990*, and ARM Act 2016 (when implemented).

DBCA recognises the aspiration of Dambeemangarddee Traditional Owners that the day-to-day management of the marine park should be undertaken by Dambeemangarddee people in the future. DBCA will continue to support Dambeemangarddee Traditional Owners and DAC to continue to build their capacity to take on greater responsibility and accountability for the management of the marine park. This will be achieved through training, employment and succession planning, regular reviews of joint management arrangements and operational procedures, the securing of funding for Sea Country management and supporting collaborative work between DAC and other agencies and stakeholders.

Dambeemangarddee Ranger Edmund Jungine and DBCA senior ranger Daniel Barrow working on-country.
Photo – Darren Stevens, DBCA.

4.3 Connectivity and holistic management

This plan has been guided by the values, aspirations and management objectives articulated in the Dambimangari Healthy Country Plan, the North Kimberley Saltwater Country Plan, management programs under the IPA and the Indigenous Ranger Program. This plan sets out a strategic approach and priorities for looking after, enjoying and using Dambeemangarddee country sustainably for future generations. It has been prepared in conjunction with the joint management plan for the Mayala Marine

Park and the joint management plan for the Bardi Jawi Gaarra Marine Park to ensure consistency and efficiency of management arrangements across the neighbouring marine parks and Sea Countries. It is intended that the cooperative arrangement between DBCA, Bardi, Jawi, Mayala and Dambeemangarddee Traditional Owner groups will continue through to the implementation and operational stage of the marine parks with annual joint meetings.

This plan forms an integral part of a suite of complementary management mechanisms within and adjacent to the marine park including heritage protection, fisheries management, wildlife protection, industry regulation, pollution control, environmental impact assessment processes, maritime transport and safety measures and community cooperation and participation.

A MoU has been in place between the Minister for Environment and the Minister for Fisheries since 2018 to establish principles of cooperation and integration between DBCA and the DPIRD in the management of the State's marine parks and reserves.

Consistent with the MoU, DPIRD were involved in the co-design process of the marine park and joint management plan, and it is intended that DPIRD will continue to be involved in the implementation and operation of the joint management of the marine park as an informal partner.

Collaborative operational plans are developed to ensure efficient and effective delivery of a range of programs where there is shared agency responsibility or mutual interests, including education, interpretation and public participation, and patrol and enforcement. The use of formal and informal mechanisms for communication and engagement between park managers and key stakeholders will also be important throughout the life of the plan to ensure effective ongoing and adaptive management.

A Memorandum of Understanding has also been developed between DBCA and Parks Australia for the management of existing State and Commonwealth marine parks in Western Australia. The collaborative management arrangements which are in place across existing Commonwealth and State marine parks in the Kimberley will continue to apply.

4.4 Management context

To guide management and meet the vision of the marine park, management objectives and management strategies have been developed to address management issues such as current and future pressures on values, data deficiencies and safety concerns. The use of key performance indicators, performance measures and management targets reflect an outcome-based "best practice" approach from which the effectiveness of management can be better assessed.

The JMB will have the primary responsibility for coordinating and guiding the management of the marine park. DAC and DBCA staff through joint management arrangements will implement the management plan by applying prioritised management strategies across seven management programs.

The key terms used in the management summary tables in this plan are defined below. Not all the management summary tables relate to a particular value, have pressures associated with them or will be monitored and therefore not all the summary tables will contain all the key terms.

Values: The values of the marine park are defined as the cultural, ecological, biocultural, social and economic features and activities which are important to the area. Many of the values are tightly linked, but for the purpose of this plan they have been addressed under separate headings of Caring for culture, Caring for country, People on country and Using resources from country. The categorisation of the values supports the development of clear management objectives and management strategies and allow for transparent and accountable management audit and review processes. The most significant values will be prioritised for monitoring.

Pressures: A pressure is an activity, whether it be anthropogenic or natural, which affects or has the

potential to affect the condition of a value. If not managed correctly, some activities which are considered a value of the marine park can also be a pressure. For the purposes of developing management priorities, pressures on the values are confined to current pressures; pressures likely to occur during the life of the management plan; and pressures considered to be manageable within a marine conservation reserve context. This excludes most global pressures which are largely outside the control of marine park managers. However, given climate change is the biggest threat to the values of the marine park, strategies to understand, monitor and adapt to climate change impacts are in section 11 and contribute to broader regional climate change strategies.

The relative level of risk posed by existing and/or potential pressures on ecological and biocultural values has been assessed by considering the following factors:

- the biological intensity of the pressure - pressures that impact lower trophic levels (i.e. primary producers such as waddaroo (coral) and jindirm (mangrove) communities are often of greater concern than pressures on higher trophic levels
- the temporal scale of the pressure - ongoing pressures are generally of greater management concern than pressures that are short-lived
- the spatial scale of the pressure - pressures that occur over a greater spatial extent are often of greater management concern than localised pressures
- the social consequence - acknowledges that different pressures have different social, economic, cultural and political consequences. A high socio-economic, cultural or political consequence is often of greater management concern
- the probability of a pressure occurring within the timeframe of the management plan.

The cumulative impacts of pressures are complex to understand and predict. It is important to ensure economic growth across marine sectors is sustainable by recognising the limits which naturally healthy, biodiverse, and biologically productive ecosystems have in sustaining human activities. Whilst one pressure may not have a significant impact on a value alone, if there are multiple pressures acting on a value, the combined pressure can cause a significant detrimental impact. Monitoring will be carried out to assess the condition of the values in the marine park. If the condition of a value has significantly decreased as a result of human activities in the area, adaptive management will be carried out.

Management objectives: The management objectives identify what the primary aims of management are and reflect the statutory requirements of the CALM Act and the cultural responsibilities of Dambeemangarddee Traditional Owners. Where a significant pressure/s on an ecological value has been identified, the management objective addresses the specific pressure/s. When there is not an obvious existing pressure or threat, the management objective provides broader direction to management in relation to protecting the value from the most likely future pressures. Management objectives for social values address, where appropriate, the effect of the activity on the other values of the reserves and the complementary interests of other statutory management arrangements or activities that exist in the reserves.

Management strategies: Management strategies provide direction on how the management objectives will be achieved. Management strategies within the plan are prioritised as high (H), medium (M) or low (L) to indicate their relative importance. Management strategies considered to be critical to achieving the strategic goals of the management plan are presented as 'high-key management strategies' (H-KMS). The prioritisation of strategies is based on the best available information and may change during the life of the plan.

Joint management partners are the lead for all strategies. Other organisations and departments such as DPIRD will also play an integral role in the management of the marine park. Where other organisations are required to support implementation of a management strategy, their name is listed in brackets next to the strategy. Where an agency or body is required to take a lead role in strategy implementation, their name (or acronym) is in bold in the management tables.

- **Management programs:** Management of the marine park will occur across seven marine park management programs. This ensures a coordinated and prioritised approach is taken to implement strategies. The seven management programs are consistent across all marine parks in the State and are the basis for budgeting and annual reporting.
- **Management frameworks:** This includes the legal, administrative, financial, and human resource requirements, the provision of policy, and technical and operational advice.
- **Education and interpretation:** The provision of interpretative material and delivery of community education is critical to ensuring public awareness and understanding of conservation, Dambeemangarddee people and culture, and management of the marine park.
- **Public participation:** Public participation helps to build and sustain community support that is critical for effective implementation of the management plan.
- **Patrol and enforcement:** There is a need to monitor the level of compliance and take action to stop inappropriate or illegal behaviour in the marine park.
- **Management intervention and visitor services:** 'Intervention' comprises direct management actions required to achieve conservation outcomes and/or to provide for enjoyable visitor experiences. These can be either proactive (preventative) or reactive (restorative) management actions and include provision of visitor facilities to enable access and/or reduce site disturbance and environmental impacts, rehabilitation, of degraded areas and visitor risk management.
- **Research:** Developing a greater understanding of the cultural, ecological and social values of the marine park is critical to effective management.
- **Monitoring:** Long term monitoring of the condition of the marine environment (and/ or the pressures that may impact on it) are essential to assess the effectiveness of marine reserve management. Monitoring enables the early detection of detrimental impacts and provides the trigger for corrective management action before cultural, ecological and social values of a marine reserve become significantly degraded. Where changes have occurred and remediation measures are required, a monitoring program should also determine the rate of recovery of an affected area or value.

Key Performance Indicators (KPIs): A set of key performance indicators (KPIs) have been specified for selected values to measure the overall effectiveness of management in relation to the strategic objectives of the marine park. These key values reflect the highest conservation and management priorities of the Conservation and Parks Commission, DBCA, Dambeemangarddee Traditional Owners and the community and form an important part of the audit process (see section 13). Each KPI comprises three components: performance measures, targets and reporting requirements. The KPIs are presented at the end of the relevant management summary tables.

Performance measures: Performance measures are indicators of management effectiveness in achieving the marine park's objectives and targets. They are in place (or will be developed during the early phase of the implementation of the management plan) for each of the cultural and ecological values, plus several of the social and economic values. Some of the performance measures listed in this plan are indicative only and will be further developed or where necessary, revised during the design and implementation of monitoring programs.

Management targets: Management targets represent the end points of management. The long-term targets provide specific benchmarks to assess the success or otherwise of management strategies within the life of the plan. The management targets for the marine park's ecological values are often set to maintain ecosystem integrity and functioning (e.g. no loss as a result of human activity). The targets for some active social and economic values are qualitative (e.g. visitor satisfaction), whilst others are process-based and stated as 'Implementation of management strategies within agreed timeframe'. For the purposes of this plan, 'significant change' refers to a statistically significant change beyond the limits of natural variability. Specific limits for each ecological value will be determined as long-term monitoring datasets develop.

5. Aspirations

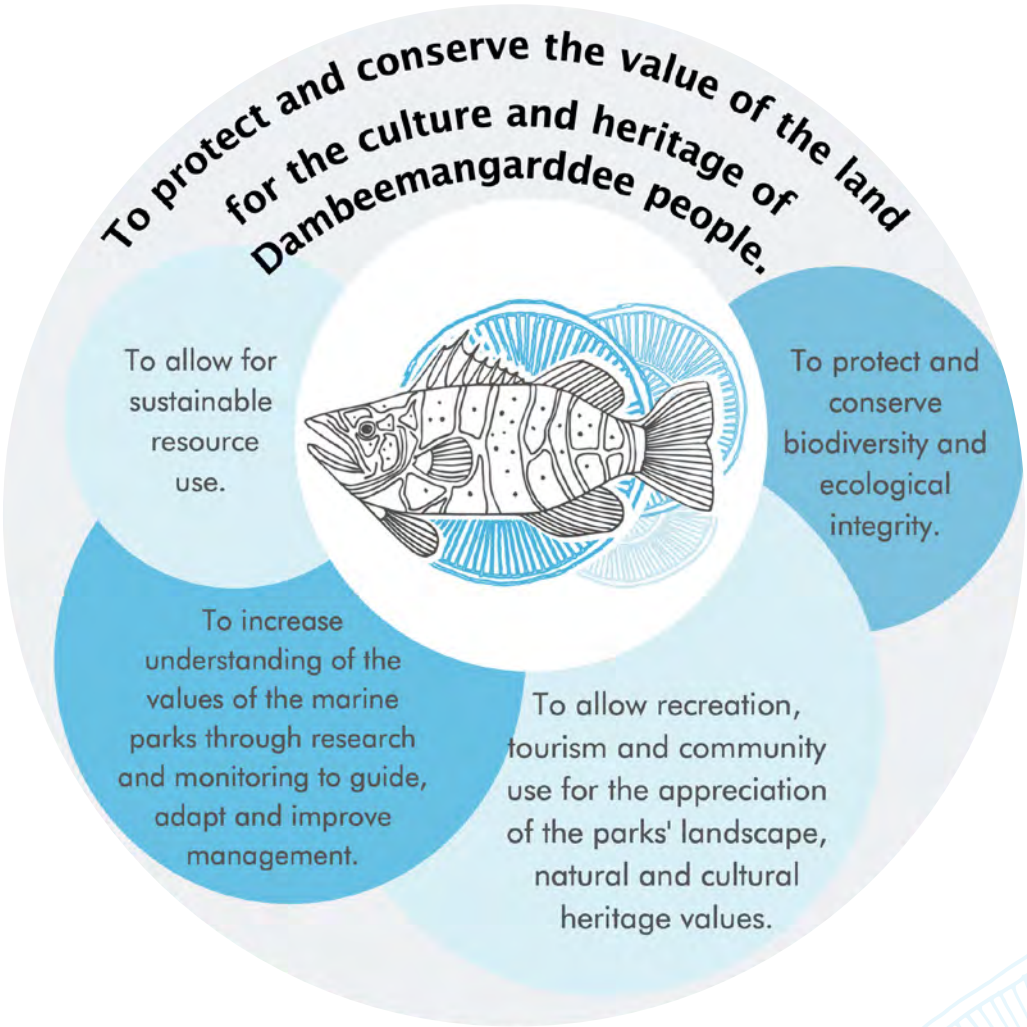
5.1 Vision

The vision statement represents the aspirations for the conservation and protection of the cultural and ecological values and sustainable use of the marine park and provides guidance for ongoing management.

The continuing rich cultural heritage and outstanding natural values of the marine park will be jointly managed for conservation, visitor enjoyment and shared use with Dambeemangarddee people.

5.2 Strategic objectives

The strategic objectives of this plan support the goals of Dambeemangarddee people, as articulated in their Healthy Country Plan, and provide more specific direction over the long term to realise the vision of the marine park.



6. Caring for culture

Strategic objective:
To protect and conserve the value of the land to the culture and heritage of Dambeemangarddee people

6.1 Cultural connection and cultural laws and protocols (KPI)

Dambeemangarddee people have a deep spiritual connection to country through their continuing body of knowledge, and oral traditions of La Lai. Aboriginal people had a complex system of law long before the arrival of Europeans. For Dambeemangarddee people, customary law and protocols are connected to the sharing systems of Wurnan and Wurdoo and provide rules on how to interact with the land, kinship and community. These law systems were created during La Lai by the Wandjina.

'The values and beliefs from La Lai underpinned a way of life based on sustainable principles and practical rules for living – how to look after country, how to hunt and fish properly and how to behave with family members' (DAC 2016).

Dambeemangarddee children learn about customary laws and protocols from their families and others in the Dambeemangarddee community, and by observing customs and ceremonies, including traditional narratives, songs and dances. Cultural laws and protocols may relate to specific areas or sites, or different plants and animals. The laws and protocols may also be specific to an individual, family or clan group, and may also be different for men and women. In some cases, Dambeemangarddee people may share information about cultural laws and protocols so marine park management can be complementary, and so visitors to the marine park can behave in a culturally appropriate manner. For example, through marine park management there are restrictions in place for walking on intertidal *waddaroo* (coral) reef systems.

Summary of management arrangements for cultural connection and cultural laws and protocols (KPI)			
Requirements	• Recognition and acceptance of Dambeemangarddee people's connection to country. • Equal involvement of Dambeemangarddee people in planning and management of the marine park. • Maintained or improved access and privacy for Dambeemangarddee people to conduct customary activities on country. • Respectful behaviour by all visitors.		
Pressures	• The inability of Dambeemangarddee people to access country. • Culturally inappropriate visitation.		
Management objectives	To ensure that cultural laws and protocols are understood and respected in the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Ensure marine park management is consistent with cultural laws and protocols.	Management framework	H-KMS
	2. Support Dambeemangarddee people to visit their Sea Country with younger generations to enable cross-generational exchange of information and maintain connection to country within the Dambeemangarddee community.	Management framework	H-KMS
	3. Support Dambeemangarddee people to undertake cultural planning to record the culture and heritage values of the park and inform management.	Management framework	H
	4. Support DAC to ensure visitors, government employees and/or contractors working in the marine park are aware of cultural laws and protocols by developing and implementing cultural awareness communication tools, training and materials.	Education and interpretation	H
	5. Monitor the level of satisfaction of Dambeemangarddee Traditional Owners that they have been able to maintain connection to country.	Monitoring	H
Performance measure	Dambeemangarddee Traditional Owner level of satisfaction that they have been able to maintain connection to country.		
Target	Dambeemangarddee Traditional Owners are satisfied that they have been able to maintain connection to country.		
Reporting	Annually or as required.		

6.2 Looking after Country (KPI)

Wandjina and *Unggud* gave Dambeemangarddee the law and responsibility to look after our Country and over thousands of years Dambeemangarddee ancestors have looked after country the traditional way. This responsibility, to manage and speak for country, has been recognised in Australian Law through a native title determination process. These days Dambeemangarddee people live in two worlds—the traditional world and the western world and this is also reflected in how they look after country. Looking after country includes visiting important cultural places, monitoring animal and plant resources, and making sure that reefs, *galaab* (beaches) and islands on Sea Country are healthy.

The Dambeemangarddee Rangers were established to manage Dambeemangarddee land and Sea Country in such a way as to sustain Traditional Owners' livelihoods and connection to country. Rangers' work covers cultural and natural resource management, including marine *julawaddaa* (turtle) monitoring, fire management, sea patrols, wildlife surveys and observations, training and skills development, and search and rescue. The rangers follow the management objectives and strategies set in the Healthy Country Plan and management arrangements for the marine park will complement existing management arrangements.

Dambeemangarddee Traditional Owners and DBCA have been jointly looking after their Sea Country since the first JMA was signed in 2016. As the custodians of Dambeemangarddee country, Dambeemangarddee people want to ensure that their obligation and responsibility to look after country is properly reflected in the management of the marine park. This includes ensuring that Dambeemangarddee people are actively involved in the day-to-day management of the marine park and that there are continued opportunities for Dambeemangarddee people to upskill, be employed in positions relating to the management of the marine park and for members of the Dambeemangarddee community including elders and the younger generations to be involved in on-country trips.

'We must do much more training so that more Dambeemangarddee people are skilled up and have an opportunity to make a living from looking after their country' (DAC, 2012).

Yaloon (Cone Bay) Creek. Photo – Roanna Goater.

Cultural sites

A central part of looking after country is protecting sacred and significant sites. Cultural sites that are extremely important to Dambeemangarddee people, such as rock art sites, stone arrangements, burial sites and important camping *galaab* (beaches), tell different narratives about creation and how the earth was formed. Visiting these sites helps Dambeemangarddee Traditional Owners maintain connection to country and their ancestors (DAC 2012). Not all sites of cultural importance in the marine park have been recorded. Ongoing work by Dambeemangarddee Traditional Owners has identified a number of sites across their land and Sea Country, including intertidal areas. Recording the location of sites allows them to be managed and maintained. All Aboriginal heritage sites, registered and unregistered, are protected under the *Aboriginal Cultural Heritage Act 2021*.

Stone arrangements

There are many stone arrangements of high cultural significance to Dambeemangarddee people in and around the islands and mainland. Visitors must take care to not displace or move any rocks or stones when visiting the park and Dambeemangarddee country.

Stone arrangements. Photo – Kim Doohan/John Bornman and DAC.

Stone arrangements are found in the intertidal areas of the marine park and in adjacent lands. They are not always obvious to an untrained eye. Stone arrangements vary from individual stones to hundreds of stones over many tens of metres or in large piles; from small distinctive stones to geoglyphs in complex monumental formations and some are standing and others lie flat. Stone arrangements are part of the history of the Dambeemangarddee Traditional Owners indicating resource use, fishing and hunting techniques, wind breaks, funerary and occupation sites as well as La Lai narratives. No stones should be removed or relocated from where they are found – you might be damaging an important historic monument and committing an offence under state heritage laws. (DAC pers. comm. 2015).

Summary of management arrangements for looking after country (KPI)			
Requirements	• Recognition and acceptance of Dambeemangarddee people's rights to speak for and look after country. • Recognition and respect for Dambeemangarddee law and custom and cultural sites • Culturally appropriate visitation. • Ensuring information shared by the tourism industry and others is culturally appropriate and factually correct. This includes taking and sharing of photographs.		
Pressures	• The inability of Dambeemangarddee people to access country. • Lack of understanding and respect for culture. • Loss of traditional knowledge. • Lack of resources to manage country. • Inappropriate and uncontrolled visitation including use of drones and sharing of imagery.		
Management objectives	• To support DAC to increase Dambeemangarddee's involvement in the day-to-day management and operation of the marine park to enhance Dambeemangarddee's ability to look after country and keep it healthy. • To conserve and protect sites of cultural significance.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Continue to support DAC to explore and implement tailored training, education and mentoring to fulfil positions of employment relating to the management of the marine park [DPIRD].	Management framework	H-KMS
	2. Support DAC to build their capacity in the management of the marine park and work collaboratively to develop succession plans, career pathways and support networks.	Management framework	H-KMS
	3. Support DAC to review and adapt operational staff structures to be able to undertake a greater role in the day-to-day park management.	Management framework	H-KMS
	4. Support DAC to secure long term funding for positions of employment by Dambeemangarddee people relating to the marine park.	Management framework	H
	5. Monitor the level of satisfaction of Dambeemangarddee Traditional Owner's that they have been able to undertake their role as protectors and managers of country and culture in the context of the jointly managed marine park.	Monitoring	H
	6. In collaboration with Dambeemangarddee Traditional Owners, develop and apply commercial tour operator licence conditions to ensure culturally sensitive and appropriate visitation to cultural heritage sites.	Management intervention and visitor services	H
	7. Develop and implement tools to measure and monitor effects of visitor and management activities on cultural heritage, sites and ecological values; and implement strategies to address issues where appropriate.	Monitoring	H
	8. Work with Dambeemangarddee people and commercial operators to promote culturally appropriate visitation.	Management intervention and visitor services	H

	9. Support Dambeemangarddee to develop protocols for visitors to Dambeemangarddee Sea Country and educate visitors about appropriate behaviour, respecting privacy and access restrictions where applicable [DPIRD].	Education and interpretation	H
	10. Consider information from cultural mapping projects initiated by Traditional Owners and utilise this to help inform management actions and responses in relation to Aboriginal cultural and heritage values.	Research	M
Performance measure	• Dambeemangarddee Traditional Owners level of satisfaction that they have been able to undertake their role as protectors and managers of country and culture in the context of the jointly managed marine park. • Physical disturbance to sites and areas.		
Target	• Dambeemangarddee Traditional Owners are satisfied that they have been able to undertake their role as protectors and managers of country and culture in the context of the jointly managed marine park. • All sites and areas which have cultural and gender access restrictions are communicated and observed. • No new signs of physical disturbance to specified sites and areas within three years of the release of the plan.		
Reporting	Annually or as required.		

Dambeemangarddee Rangers on country. Photo – Liz Vaughan/Francis Woolagoodja, DAC

6.3 Traditional knowledge and language (KPI)

Dambeemangarddee Traditional Owners, particularly the elders, hold an extensive body of cultural and ecological knowledge that has been passed down over thousands of years. To further help preserve Dambeemangarddee culture and traditional knowledge, Dambeemangarddee Traditional Owners are also working with elders and researchers to prepare language materials, cultural heritage maps, databases, family trees and other reference material so that future generations can maintain their cultural connections and understand their country and ancestry (DAC 2016).

There are many opportunities for integrating western scientific research with the traditional ecological knowledge of Traditional Owners. Collaborative research projects have been, and will continue to be, undertaken between Traditional Owners and biological and social scientists.

The recording of tangible and intangible traditional knowledge, Traditional Owner understanding of the natural environment, and the location of sites of significance, provide ongoing research opportunities. Local Indigenous information about ecological systems and how these change over time is beneficial to long-term planning and adaptive strategies for the management of the marine park.

Summary of management arrangements for traditional knowledge and language (KPI)			
Requirements	• Increased understanding and support for Dambeemangarddee's traditional ecological knowledge and its application to park management. • The maintenance of knowledge transfer within the Dambeemangarddee community. • Recognition of Dambeemangarddee languages.		
Pressures	• Lack of knowledge transfer to the younger generation. • Inability to access country. • Limited recognition and use of Dambeemangarddee names for places.		
Management objectives	• To apply language and traditional knowledge and integrate it with conservation science and management of the marine park • To maintain oral traditional knowledge.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Undertake and/ or support research to facilitate the systematic recording of oral knowledge by elders and Traditional Owners whilst on-country.	Research	H
	2. Monitor the level of satisfaction that traditional ecological knowledge is integrated into management of the marine park.	Monitoring	H
	3. Investigate opportunities and develop a process to integrate Dambeemangarddee traditional ecological knowledge with contemporary research and monitoring, where appropriate [DPIRD].	Research	M
	4. Work with DAC to change formal names of key sites and areas back to their traditional names (e.g. changing Raft Point to *Ngumbree*) and ensure traditional names are used in signage, education material, documents, maps and when naming facilities relating to the marine park [DPIRD].	Management framework	M
	5. Support and undertake research to better understand Dambeemangarddee traditional knowledge applicable to the marine park [DPIRD].	Research	M
Performance measure	Dambeemangarddee Traditional Owner level of satisfaction that traditional ecological knowledge is integrated into management of the marine park.		
Target	Dambeemangarddee Traditional Owners are satisfied that traditional ecological knowledge is integrated into management of the marine park.		
Reporting	Annually or as required.		

6.4 Customary use (KPI)

Customary activities are an important part of both Dambeemangarddee and wider Aboriginal culture. Access to and maintaining connection to country is integral to the culture and well-being of Traditional Owners. Through customary activities, Dambeemangarddee people maintain their traditional relationships with their land and saltwater country, share knowledge, participate in traditional practices and access and look after significant places.

Under traditional law Dambeemangarddee people have an obligation to care for country and ensure their culture is passed on to future generations. They do this through customary activities which include hunting for food, visiting important cultural places, making medicines, keeping rock art fresh, passing on *La Lai* narratives, managing country through fire at the right time of year and engaging in artistic and ceremonial events.

Within the marine park, customary activities such as fishing and hunting are provided for under the management plan. Customary activities are subject to arrangements consistent with the CALM Act and the BC Act and customary fishing is recognised in the FRM Act.

'It is our cultural responsibility to visit all these important places regularly to check that they haven't been disturbed and are still healthy. We believe it gives happiness and comfort to our ancestors' spirits by visiting, working, protecting, and living on the land. It also reconnects us to that country. Living and breathing on country gives life and life is health' (DAC 2012).

Smoking ceremony at *Yaloon*. Photo – Roanna Goater, DBCA.

This joint management plan does not provide any additional restrictions on the exercising of native title rights than otherwise agreed by native title holders and in accordance with the CALM Act and CALM Regulations. Customary activities are managed in accordance with Dambeemangarddee cultural protocols and DBCA Policy No. 86 Aboriginal customary activities. DPIRD will work with Traditional Owners to co-design customary fishing management arrangements.

Examples of traditional sea resource management practices include seasonal closures, community sharing of food resources to minimise waste, protocols governing who may take and consume particular species from certain areas, and agreements on total allowable catches in an effort to avoid

overexploitation (Depczynski *et al.* 2019). The document *Guide to Aboriginal customary activities on Parks and Wildlife- managed lands and waters 2020* provides guidance to Aboriginal people who wish to practise customary activities in the marine park.

Summary of management arrangements for customary use (KPI)			
Requirements	• Recognition of, and support for, Dambeemangarddee people's rights as native title holders to enjoy country and maintain customary practices. • High water quality, healthy biological communities and functioning ecosystems. • Access and privacy for undertaking cultural activities (e.g. traditional hunting, visiting/ managing sites etc). • Sharing of marine resources within a sustainable traditional framework.		
Pressures	• Inability to access country. • Climate change (refer to section 11). • Increased visitation. • Commercial activities impacting on Dambeemangarddee's ability to carry out cultural activities in private or fish/hunt/gather resources.		
Management objective	To uphold Traditional Owner connection to country including spiritual and cultural values and customary use.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Support Dambeemangarddee people to continue to carry out customary activities, including customary fishing and hunting, in the marine park. [DPIRD]	Management framework	H
	2. Support Dambeemangarddee people to manage sustainable populations of marine wildlife (e.g. *julawaddaa* (turtle), *waliny* (dugongs), sharks, rays etc.) [DPIRD – in relation to fish].	Management framework	H
	3. Work with Dambeemangarddee people to ensure that monitoring programs provide information to facilitate the development and implementation of sustainable management arrangements for customary take [DPIRD].	Monitoring	H
	4. Monitor the level of satisfaction of Dambeemangarddee people that they have been able to continue customary practices and benefit from country consistent with the purpose of the marine park.	Monitoring	H
	5. Develop mechanisms to feedback information to the Dambeemangarddee Community on the health of customary hunted animals such as *jaiya* (fish), *julawaddaa* (turtles) and *waliny* (dugongs) to support cultural and marine management decisions and facilitate the development and implementation of sustainable management arrangements for customary hunting [DPIRD].	Management framework	M
Performance measure	Dambeemangarddee Traditional Owner level of satisfaction that they have been able to continue customary practices and benefit from country consistent with the purpose of the marine park.		
Target	Dambeemangarddee Traditional Owners are satisfied that they have been able to continue customary practices and benefit from country consistent with the purpose of the marine park.		
Reporting	Annually or as required.		

7. Caring for country (biocultural and ecological) values

Strategic objective:
To protect and conserve biodiversity and ecological health

Cultural and ecological values in Dambeemangarddee Sea Country are enmeshed in a rich tapestry of oral traditions and material manifestations of land and sea forms, rock art and stone arrangements.

Ecological values are the intrinsic physical, chemical, geological and biological characteristics of an area. These values can be significant in terms of the biodiversity they represent (representative, rare or unique) and the role they play in maintaining ecosystem integrity. Maintaining the current condition of the ecological values, both for their intrinsic value and for the cultural, recreational and commercial benefits they provide, is a key focus for management of the marine park. A knowledge base of biodiversity, key ecological processes and human-induced pressures on these values is required to support effective adaptive management. Research is a strong focus for the implementation of the management plan and will be designed to fill key knowledge gaps.

Particular animals and habitats are culturally important to Dambeemangarddee Traditional Owners, and many animals have their own songs and oral traditions. Some animals, such as the owl, emu, kangaroo, *ilerdda* (barramundi) and rock cod have particular significance to Dambeemangarddee people as sacred animals relating to *La Lai* (Blundell and Woolagoodja 2005).

Exposed reef in the Lalang-gaddam Marine Park. Photo – Will Robbins, DBCA.

A number of coastal and marine plants and animals have been important to Dambeemangarddee people as a food resource for thousands of years. In the past, Dambeemangarddee Traditional Owners travelled by mangrove rafts and dugout canoe to offshore islands to collect food. *Jaiya* (saltwater fish), *julawaddaa* (turtle), *waliny* (dugong), *ganbaneddee* (crabs) and *marlinju* (oysters) continue to be important food sources for Dambeemangarddee people. Dambeemangarddee people are working to ensure the continuing health of their country and the sustainable use of resources (DAC 2016).

The deep understanding and traditional ecological knowledge that Dambeemangarddee people have of plants, animals, the seasons and landscape features can also greatly inform scientific research and conservation programs in Dambeemangarddee country. In recent years Dambeemangarddee Traditional Owners have worked in partnership with a range of organisations to conduct research and field surveys for a number of important marine species such as *julawaddaa* (turtle), *waliny* (dugong) and *goiyoiya* (estuarine crocodile).

7.1 Geomorphology

The Kimberley coast is the largest rocky coast in Australia and is of global geo-heritage significance (Semeniuk & Brocx, 2011). It is comprised of a large-scale ria (submerged river valley) coast with a well-developed and intricately indented rocky shoreline; local nearshore islands; and a distinct group of coastal sediments (Semeniuk & Brocx, 2011). Many islands of the Buccaneer Archipelago reflect the folded rocks of the Yampi/Talbot area which contain rock types from the Kimberley Basin and other metamorphic rocks and granites found in in the Yampi fold belt of the Southern Kimberley (Scott, 2012). The complex nature of the geomorphic features are a strong driver of the habitat diversity and biological richness that the area is known for.

According to the ancient oral accounts of the Dambeemangarddee Traditional Owners the formation of some significant geomorphic features derived from particular events that occurred in the *La Lai*. Evidence of those events is now seen in the rocky (predominantly sandstone) coast featuring a diverse range of land and seascapes including waterfalls, groups of islands and huge tides. For example, the rocky shores are the tangible evidence of a major battle between many *Wandjina*, some from the mainland and others from the sea. The standing eroded sandstone pillars are the final transformation of those *Wandjina* (DAC 2012, pers. comm.).

The small and large islands occurring in the marine park are remnant features formed by ancient sandstone and basalt rock formations, with subtidal features offering a complex arrangement of habitat throughout the area. The coastal terrain is constantly eroding due to coastal processes and flood run-off down gullies and rivers, which comprise the most deeply eroded portions of the terrestrial landscape.

For the Dambeemangarddee Traditional Owners *Yowjab* (the Montgomery Islands and reef) continues to be a very special and vital part of their country. The ecological complexity of this living system is reflected in the traditional narratives that explain how the reef and islands were created and named. According to the Dambeemangarddee, they were created by the actions of *Wandjina* in their human and nonhuman forms, such as marine creatures, coastal *banarddee* (birds) and the *Unggudja* (Snake). In one account, all the *La Lai* Crabs and some of the sea *banarddee* (birds) moved rocks from the mainland and created *Ngalaan-nguddoo* (High Cliffy Island). Another of the islands, one that supported Traditional Owners' ancestors as a homeland, has permanent freshwater and is named *Wilijarlu*, which means 'the lung' (of the reef). Once completing their creations, the *Wandjina*, in all their forms, went back to their caves where they can be seen today as painted images (DAC 2012, pers. comm.).

Summary of management arrangements for geomorphology			
Current status	Geomorphology is assumed to be in a generally undisturbed condition.		
Existing and potential pressures	• Establishment of coastal infrastructure. • Climate change impacts from rising sea levels and increased severity of tropical cyclones and storms. • Uncontrolled visitation.		
Current major pressure	None currently identified.		
Management objective	To ensure that the seabed structural complexity, geomorphic processes and coastal landforms are not significantly impacted by human activities within the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Ensure that coastal infrastructure and resource development proposals for the area that have the potential to disturb the geomorphology of the marine park are appropriately assessed in accordance with the Environment Protection Act 1986 (EP Act).	Management framework	H
	2. Monitor the condition of geomorphology and the pressures acting on it within the marine park.	Monitoring	L
	3. Undertake and/ or support research to characterise the geomorphic features and processes in the marine park and their associated ecological functions.	Research	L
	4. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of geomorphology.	Management intervention and visitor services	L
Performance measures	Indicators to be developed but may include: • Aerial coastline position. • Mean High Water mark.		
Target	No significant change in performance measures as a result of human activity.		
Reporting	5-10 years.		

7.2 Water and sediment quality (KPI)

Water and sediment quality are essential to maintain healthy ecosystems. Oceanographic processes including, water temperature, currents, winds, wave action and tidal flow, influence the water and sediment quality by impacting on transport, dispersal and mixing of sediments, biota and pollutants. Marine environmental quality refers to the level of contaminants in water, sediments or biota or to changes in the physical or chemical properties of waters and sediments relative to a natural state (EPA 2016a, 2016b). The relative lack of human population and development in the marine park, combined with strong oceanic mixing and circulation, means that water and sediments are generally of a high quality. Increased development, shipping and recreational and tourism activities poses a risk to water quality on a local scale if not managed adequately.

Large-scale oceanography in the Kimberley region is highly seasonal and influenced by several ocean processes (Masini et al. 2009). Local currents in the marine park are tidal and wind driven. Productivity is driven primarily by tidal movement and terrestrial runoff (DEWHA 2007). The ubiquitous impacts of climate change will increasingly influence the temperature and current flow of Kimberley waters.

Nearshore waters in the Kimberley region are generally turbid, with increasing water clarity further from the coast. The turbid zone can extend out as far as the 100m depth contour but varies depending on the season and location. The boundary between turbid and clear water generally occurs around the 60m depth contour (DEWHA 2007).

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) form the base of the marine food chain. Seawater facilitates transport of these and many larger organisms. Many marine species are dependent on the currents and tidal movements of seawater 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).

'All animals from the sea are healthy when the saltwater they are living in is healthy and clean. We worry about pollution in the sea' (DAC 2012)

Poor water and sediment quality are the most serious known pollution issues affecting Australia's coastal and marine environments (Department of Agriculture, Water and Environment 2020). Most pollutants come from land-based activities (WWF 2018). In addition to degrading habitats, pollution can directly threaten marine fauna. Due to the limited amount of anthropogenic land use adjacent to the marine park, marine pollution is considered a low risk to the values of the marine park.

The Environmental Protection Authority (EPA) has a responsibility to protect the quality of the marine environment in Western Australia. The framework for fulfilling this role is set out in the Environmental Assessment Guideline for Protecting the Quality of Western Australia's Marine Environment (EPA, 2016a).

7.2.1 Sewage discharge

The Strategy for Management of Sewage Discharge from Vessel into the Marine Environment (Department of Transport, 2009) outlines guidelines for marine sewage discharge. Three zones apply in state coastal waters:

Zone 1- no discharge

Zone 2- discharge only using approved treatment systems

Zone 3- open for discharge of untreated vessel sewage.

Sanctuary zones, special purpose zones (cultural protection), special purpose zones (biocultural conservation), special purpose zone (whale conservation), special purpose zone (wilderness conservation) and all waters in the marine park within 500 m of land, islands and aquaculture activities are designated as Zone 1 areas (no sewage discharge). Sewage discharge is permitted in the remainder of the marine park through the gazettal of designated areas under the CALM Regulations.

7.2.2 Marine debris

Marine debris can reduce water quality and cause injury and fatality to wildlife by ingestion of, or entanglement in the debris. The waters and coastline of the marine park are relatively free of marine debris, apart from in some areas where above natural levels accumulation of debris and hard rubbish has been recorded characterised by pearling buoys, floats, and ropes particularly in Camden Harbour and Talbot Bays. Abandoned infrastructure and hard rubbish dumps are also present on adjacent lands. Management will focus on preventing marine debris entering the marine environment through education and removing the debris that is found in the marine park.

7.2.3 Biosecurity

Biosecurity is the management of the risk of animal and plant pests and diseases entering, emerging, establishing or spreading in the marine environment. Ballast water is a major potential source of introduced marine pests in coastal waters, although marine pests and pathogens can also potentially be spread on the hulls of commercial and recreational vessels transiting through the region. The Australian Government Department of Agriculture, Water and the Environment is responsible for marine pest biosecurity. Part of the Department of Agriculture, Water and the Environment's charter is to ensure that foreign vessels ballast water has been managed in accordance with the *Australian Ballast Water Management Requirements* before permitting discharge inside Australia›s territorial sea. Australian ballast water management requirements are consistent with International Maritime Organisation (IMO) guidelines for minimising the risk of translocation of harmful aquatic species in ships' ballast water. DPIRD also carries out inspections of vessels from interstate and overseas for marine pests.

An invasive cyanobacterio sponge *Terpios hoshinota* which encrusts live *waddaroo* (coral), giant clams, and other benthos has been detected on Kimberley inshore *waddaroo* (coral) reefs and poses a risk to the health of the reef systems (Fromont *et al.* 2019). Given its invasive potential, reef health and monitoring surveys should include this species.

7.2.4 Pollution and oil spill events

Although the risk of a serious marine oil pollution event is considered low, the nature of the habitats and fauna that depend on high water quality (e.g. large intertidal areas, mangroves and rare and protected species) means the consequences of such an event could be significant. As the lead agency for developing State policy to prevent and respond to such events, Department of Transport (DoT) prepared the Oil Spill Contingency Plan 2015. The aim of this plan is to outline the management arrangements for the prevention of, preparation for, response to and recovery from a marine oil pollution emergency to minimise the impacts of marine oil pollution from vessels, offshore petroleum activities and other sources in WA State waters.

Adjacent to the marine park are the iron ore mines on Koolan Island and Cockatoo Island, which lie within the waters of the port of Yampi Sound. In 2014, the Koolan Island seawall partially collapsed, flooding the iron ore mine's Main Pit with seawater. Its inundation was assessed and reported to State Government by the Company. The event is not known to have affected the water and sediment quality of Dambeemangarddee or Mayala Sea Country.

Summary of management arrangements for water and sediment quality			
Current status	Water quality is considered to be good due to the remoteness from point source pollution.		
Existing and potential pressures	• Climate change impacts (e.g. riverine input from increased terrestrial monsoonal runoff and increased turbidity). • Marine debris (including microplastics). • Toxicants (e.g. anti-fouling agents, ballast/bilge water discharge). • Increased nutrients (e.g. sewage discharge). • Major pollution events (e.g. oil spills). • Mining (e.g. oil and gas exploration and development, including drilling and pipelines). • Development activities (e.g. development or expansion of existing infrastructure).		
Current major pressure	None currently identified.		
Management objective	To ensure that water and sediment quality is not significantly impacted by human activities within the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Undertake and/or support research on water and sediment quality in the marine park.	Research	H
	2. Monitor the condition of water and sediment quality within the marine park including establishing baselines for water and sediment variables and identifying the pressures acting on them.	Monitoring	H
	3. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting water and sediment quality.	Management intervention and visitor services	H
	4. Where required, support the development and implementation of Parks and Wildlife's maritime incident response plans, which support the State Emergency Management Plan for Marine Oil Pollution [DoT].	Management framework	H
	5. Develop and implement biosecurity, mitigation and detection programs [DPIRD].	Management framework	H

Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	6. Investigate and designate suitable areas for vessel sewage discharge and if required, incorporate into education, patrol and enforcement programs to enforce sewage discharge arrangements [DoT]. 7. Work with relevant departments, marine park users and stakeholders to address sources of marine debris and abandoned infrastructure in the marine park to reduce the amount of floating, submerged and beached debris and pollution entering the marine park [DPIRD]. 8. As part of on-country work, patrol the shoreline and waters of the marine park for marine debris and remove and record as necessary and seek support of partners and marine park users to do the same [DPIRD]	Patrol and enforcement Management intervention and visitor services Management intervention and visitor services	H H M
Performance measures	Indicators to be developed but may include: • Seawater temperature. • Nutrient concentration. • Pathogen concentration. • Total suspended sediments.		
Target	No significant change in performance measures as a result of human activity.		
Reporting	3-5 years.		

7.3 *Waddaroo* (coral and reef communities) (KPI)

Waddaroo are among the most productive and species-rich ecosystems on earth and the Kimberley has the richest *waddaroo* fauna, in both species and genera, of any North-West Shelf Bioregion (Wilson 2013). *Waddaroo* provide food, and shelter for a wide variety of other marine flora and fauna. *Waddaroo* reefs also provide protection of coastlines through accumulation and cementation of sediments and dissipation of wave energy.

Many of the islands in the marine park are surrounded by fringing *waddaroo* reefs. Current estimates suggest that Kimberley *waddaroo* are probably more diverse than currently reported (Richards *et al.* 2017). Inshore reef communities in the Kimberley are highly divergent from the offshore 'oceanic' reef populations, strongly indicating that these regions are independent in an ecological and evolutionary sense (Richards *et al.* 2017). Radiocarbon dating of *waddaroo* collected from reef cores in the Buccaneer Archipelago discovered that *waddaroo* growth commenced in the Kimberley almost immediately after the continental shelf was flooded by rising sea levels that followed the end of the last ice age some 12 to 15 thousand years ago (Collins *et al*. 2016).

Coral reef exposed during low tide in the Lalang-gaddam Marine Park. Photo – Will Robbins, DBCA.

Reefs in the Kimberley experience the greatest tidal variation of any tropical location in the world but despite this, fringing reefs line the shores of almost all the islands in the Kimberley Bioregion (Wilson 2013).

*Yowja*b (Montgomery Reef) platform drains continually on the low tide, but rarely empties, resulting in a shallow lagoon lying between the platform rim and the central islands. The rim of the reef is comprised primarily of rhodoliths rather than *waddaroo* (Wilson and Blake 2011). The spectacle of massive structures emerging from the sea and the water cascading off the reef top as the tide rushes out makes *Yowja*b (Montgomery Reef) a significant tourism attraction in the Kimberley. According to Dambeemangarddee tradition, the tidal movement of water in the reef system is associated with the tears of a *Wandjina* Woman and 'the eyes' of the Creator Snake (*Unggudja).* The *Unggudja*'s eyes were 'poked' by the Woman who was waiting for her son to return from hunting in the reef; he did not return. The people were living on the islands and hunting *julawaddaa* (turtle). The Woman was sad and crying, which is why the saltwater rushes into and off the reef complex (DAC 2012 pers. comm.)

Waddaroo are important hunting grounds for Dambeemangarddee people. *Yowja*b (Montgomery Reef), is a particularly important reef for Dambeemangarddee people and is one of the key locations where they hunt for *julawaddaa* (turtle), *waliny* (dugong) and find many important *jaiya* (fish) and reef medicines.

"When we come home with a good catch, we know that our ancestors are happy and looking after us, providing for us." (DAC 2012)

Waddaroo reefs in the Kimberley are generally considered to be in good condition although climate change poses the greatest risk to these vital ecosystems (see section 11). Detailed physiological measurements have shown that *waddaroo* are highly susceptible to heat stress and bleaching despite being adapted to a naturally extreme temperature environment (McCulloch *et al*. 2017). The first documented bleaching event of *waddaroo* in the nearshore region of the Kimberley was recorded in the summer of 2016 (McCulloch *et al.* 2017) with bleaching occurring again in 2020 (DBCA, unpublished). As the pressure of climate change is largely outside the control of the managers of the marine park, strategies to better understand, monitor and adapt to climate change are provided separately in section 11.

Summary of management arrangements for *waddaroo* (coral reefs) (KPI)			
Current status	Good condition - waddaroo systems are healthy and thriving, however localised bleaching events are being intermittently recorded.		
Existing and potential pressures	• Climate change impacts including increased severity and frequency of warming events, increased ocean temperatures, ocean acidification and increasing cyclone and storm intensities. • Physical disturbance from reef walking and anchoring. • Trophic (knock on) effects to other fauna and flora caused by fishing. • Recreational collecting of non-coralline species. • Commercial waddaroo (coral) collecting. • Decrease in water quality.		
Current major pressures	• Localised direct damage associated with reef walking • Climate change (refer to section 11).		
Management objective	To ensure that waddaroo (coral reef) communities are not significantly impacted by reef walking and other human activities within the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Monitor the condition of waddaroo communities and the pressures acting on them within the marine park [DPIRD].	Monitoring	H
	2. Implement management strategies to mitigate or stop any human activities within the marine park which are negatively impacting the condition of waddaroo communities [DPIRD].	Management intervention and visitor services	H
	3. Regulate foot access to intertidal areas considered unsuitable for visitation e.g. intertidal waddaroo reefs (through commercial operator licences, by regulation or other mechanisms as relevant) [DPIRD].	Management intervention and visitor services	H
	4. Undertake and/or support research into waddaroo communities in the marine park [DPIRD].	Research	M
Performance measures	• Diversity. • Total *waddaroo* cover. • Community composition. • Colony size distribution.		
Targets	• No significant decline in diversity or total waddaroo cover as a result of human activity • No significant change in community composition or colony size distribution as a result of human activity.		
Reporting	3-5 years.		

7.4 *Julum* (seagrass) and *jirdarm* (macroalgae) communities (KPI)

Julum (seagrass) beds and *jirdarm* (macroalgae) play an important ecological role in coastal ecosystems; they are a source of primary production, a food source for many species including *waarlee* (green turtle) and *waliny* (dugong) and provide nursery areas for a range of species (Orth *et al*. 2006; Masini *et al*. 2009). Both *julum* and *jirdarm* enhance the habitat value of benthic habitats by increasing structural diversity and stabilising soft substrates (Kendrick *et al.* 2017). They vary seasonally in response to temperature, day length, reproductive cycles, disturbance and regrowth.

Twelve species of *julum* have been recorded in the Kimberley. This diversity is considered high and comparable to other tropical locations such as Indonesia, Malaysia and the Philippines (Kendrick *et al*. 2017; Huisman and Sampey 2014). Turtle grass (*Thalassia hemprichii*) and paddle weed (*Halophila ovalis*) are the most common species found in the region (McMahon *et al*. 2017). *Julum* occur in between reef platforms in *Ganbadba* (Talbot Bay). Some species such as *Thalassia hemprichii* are growing at the southern limit of their distribution; these populations are known to have lower genetic diversity compared to northern populations (Hernawan et al. 2016) and are therefore more susceptible to disturbance and environmental change – making them important sentinels of impact (Pederson *et al.* 2016).

More than 270 species of *jirdarm* (macroalgae) have been recorded in the Kimberley, most of which are red algae (Huisman and Sampey 2014). This is fairly typical of the diversity of *jirdarm*, and many of these species are small, epiphytic algae. Species of the genus *Sargassum* are abundant in inshore habitats and can be important habitat (e.g. they shelter juvenile fish) or food (Depczynski *et al*. 2017).

The extent of *julum* and *jirdarm* in the marine park is still to be determined and diversity and densities of phytoplankton and benthic microalgae in the marine park are not well understood.

Summary of management arrangements for *julum* (seagrass beds) and *jirdarm* (macro algae) (KPI)			
Current status	Unknown, however *julum* and *jirdarm* assumed to be in a relatively undisturbed condition.		
Existing and potential pressures	• Climate change impacts from warming temperatures and more severe cyclones and storms. • Damage from vessel activity (e.g. anchoring, propeller scour). • Decrease in water and sediment quality (e.g. increased turbidity, nutrient and toxicant inputs).		
Current major pressure	Climate change and its associated impacts on water temperature and meteorology (i.e. storm events).		
Management objective	To ensure the diversity, abundance and health of *julum* and *jirdarm* communities are not significantly impacted by human activities within the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Implement management strategies to mitigate or stop human activities within the marine park which are negatively impacting the condition of *julum* and *jirdarm* communities in the marine park [DPIRD]. 2. Monitor the condition of *julum* and *jirdarm* communities and the pressures acting on them within the marine park. 3. Undertake and/or support research on the characterisations of the diversity, density, abundance, and distribution of *julum* and *jirdarm* communities in the marine park.	Management intervention and visitor services. Monitoring Research	H H M
Performance measures	Indicators to be developed but may include: • Total cover • Diversity • Community composition • *Julum* (seagrass) biomass • *Jirdarm* (macroalgae) density • *Jirdarm* (macroalgae) canopy height • Seed bank density.		
Target	• No significant decline in total cover, diversity, *julum* (seagrass) biomass, *jirdarm* (macroalgae) density or *jirdarm* (macroalgae) canopy height as a result of human activity. • No significant change in community composition as a result of human activity.		
Reporting	3-5 years.		

7.5 *Jindirm* (mangrove) and *galow* (saltmarsh) communities (KPI)

Jindirm (mangroves). Photo – Ellen D'Cruz, DBCA.

Jindirm (mangroves) provide nutrients to surrounding waters and provide important habitat and nursery areas for a wide range of species including commercially valuable *jaiya* (fish) and invertebrates (Bridgewater and Cresswell, 1999). The marine park contains extensive *jindirm* and some of the largest mapped areas of *galow* (saltmarsh) in the Kimberley Bioregion (Dyall *et al*. 2005; Cresswell and Semeniuk 2011).

Jindirm of the Kimberley are recognised for being a rare system of *jindirm* (mangrove) set in a tropical, largely macrotidal environment (Cresswell and Semeniuk 2011). There are 18 species of *jindirm* in Australia and all are found in the Kimberley region. Ten of the 18 species are only found in the Kimberley as species diversity declines in more southern latitudes (Pedretti and Paling 2001). Extensive *jindirm* forests occur throughout the coastal fringes of the marine park particularly in the St George Basin, Prince Regent River area, Walcott Inlet, Secure Bay and the *Unarloo* (Robinson River) area. *Jindirm* lined creeks, provide important areas for customary fishing and hunting. Different *jindirm* species traditionally have different uses. Some were traditionally used for making rafts and others provide bush fruits.

Jindirm and *galow* are protected under the BC Act and native vegetation clearing provisions of the EP Act. *Jindirm* are particularly vulnerable to oil pollution and these areas should be given a high priority for protection in the event of an oil spill.

Summary of management arrangements for *jindirm* (mangroves) and *galow* (saltmarsh) (KPI)			
Current status	*Jindirm* are thought to be in good condition with increased coverage and density recorded between 1990-2020. Little is known about the status of *galow* in the marine park.		
Existing and potential pressures	• Decrease in water and sediment quality (see section 7.2). • Climate change impacts such as rising sea level, warming of air and sea temperatures, alteration of rainfall patterns and more intense cyclones and storms.		
Current major pressure	Climate change and its associated impacts on meteorology (i.e. storm events) (see section 11).		
Management objective	To ensure that *jindirm* and *galow* communities are not significantly impacted by human activities in the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Monitor the condition of *jindirm* and *galow* communities and the pressures acting on them within the marine park.	Monitoring	H
	2. Implement management strategies to mitigate or stop human activities in the marine park which are negatively impacting the condition of *jindirm* and *galow* communities in the marine park [DPIRD].	Management intervention and visitor services	H
	3. Undertake and / or support research to characterise the diversity, density, abundance, and distribution of *jindirm* and *galow* communities in the marine park.	Research	M
Performance measures	• Diversity • Aerial extent • Canopy densit.		
Target	No significant decline in performance measures as a result of human activity		
Reporting	3-5 years		

7.6 Subtidal filter-feeding communities

Subtidal filter-feeding communities obtain nutrients from suspended detritus and plankton in the water column. They play an important ecological role by providing nursery or recruitment habitat, food for other organisms and in cycling nutrients (Keesing *et al.* 2011; Bell 2008). These communities are generally found in areas with strong water currents and hard underwater surfaces (e.g. rocky sea floor), although some types such as sea pens are found in soft sediment habitats (Bryce *et al*. 2018).

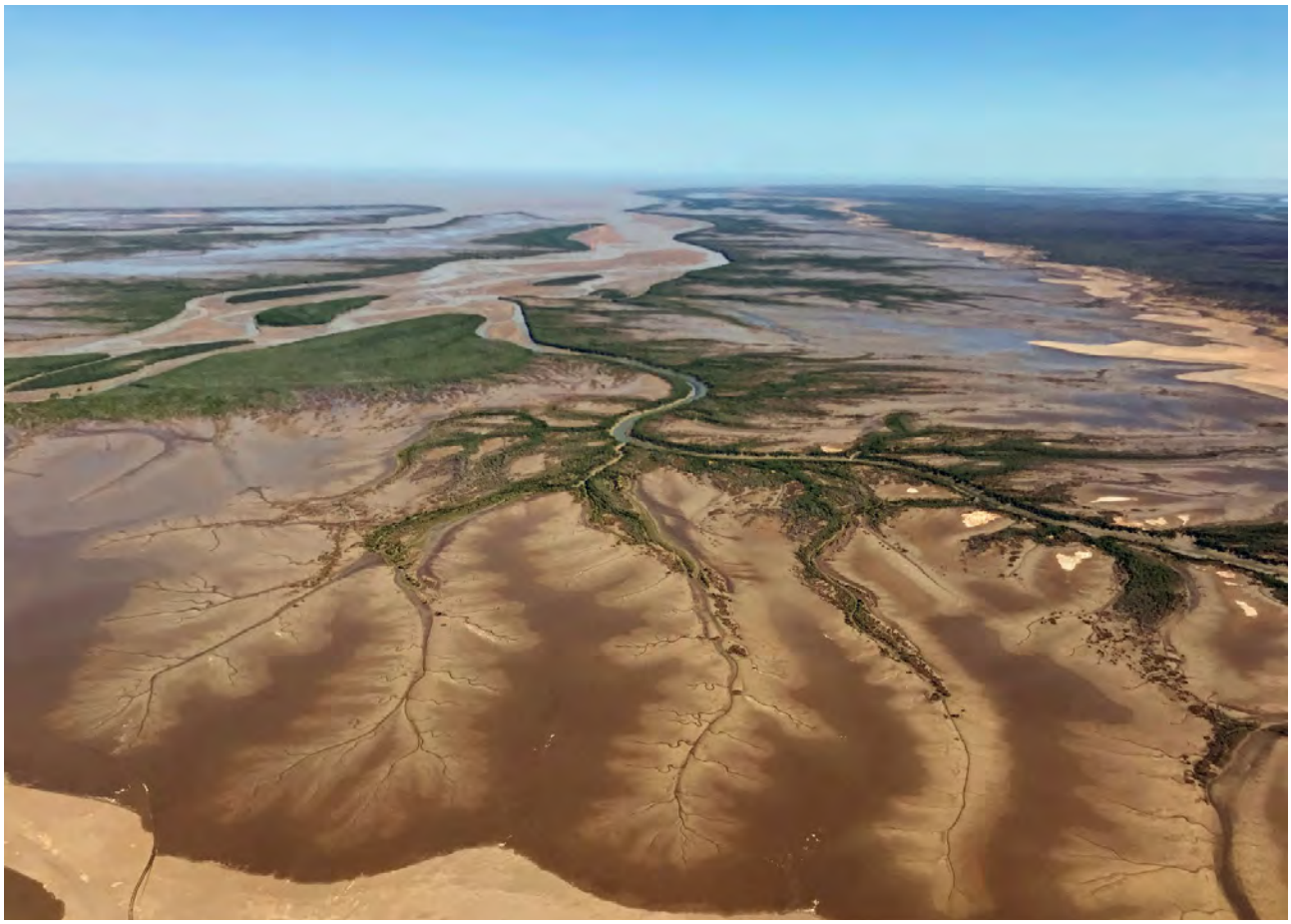
The Kimberley region has a high sponge diversity with 342 species recorded in the area. Most species are widespread throughout the Indo-Pacific and approximately one third are endemic to Australia (Fromont and Sampey 2014). A benthic habitat survey conducted in the marine park found that localised areas of hard ground supported key seabed habitats with abundant and diverse biota including sponges (which contributed overwhelming to the majority of biomass sampled), crustaceans, echinoderms and soft *waddaroo* (corals). The more abundant sponge and soft *waddaroo* (coral) communities are predominantly located around the island archipelago at the northern end of the marine park (Heyward 2018). Filter-feeding communities also occur in *Ilerdda* (Walcott Inlet), *Ganbadba* (Talbot Bay), *Mooloogoob* (Kingfisher Islands), *Moolgoodna* (Booby Island) and Doubtful Bay. Filter feeding communities are protected under the BC Act and FRM Act.

Summary of management arrangements for subtidal filter feeding communities			
Current status	Unknown, but assumed to be in a generally undisturbed condition, apart from areas where trawling is permitted.		
Existing and potential pressures	• Decrease in water and sediment quality (see section 7.2). • Damage from trawling, anchoring. • Trophic effects of fishing. • Climate change increasing the severity and frequency of warming events, storms and the severity of tropical cyclones (see section 11).		
Current major pressures	• Climate change (see section 11). • Trawling.		
Management objective	To ensure that filter feeding communities are not significantly impacted by human activities within the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Monitor the condition of subtidal filter feeding communities and the pressures acting on them within the marine park [DPIRD].	Monitoring	M
	2. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are impacting the condition of geomorphology.	Management intervention and visitor services	M
	3. Undertake and /or support research to characterise the diversity, density, abundance, and distribution of filter feeding communities in the marine park [DPIRD].	Research	L
Performance measures	Indicators to be developed but may include: • Diversity • Total cover • Community composition		
Targets	• No significant decline in diversity or total cover as a result of human activity. • No significant change in community composition as a result of human activity.		
Reporting	3-5 years		

7.7 Intertidal sand and mudflat communities

Intertidal sand and mudflats are extensive in the marine park. Although typically bare of vegetation, intertidal sand and mudflat areas are colonised by assemblages of microorganisms, which play a crucial role in primary production and nutrient cycling (Miththapala 2013). Invertebrates that live on the surface of the sand or mud, and burrow into the substrate, regularly turn over and oxygenate the sediment. The abundance of invertebrate life found on intertidal sand and mudflats provides a valuable food source for larger *jaiya* (fish) and other organisms which swim over the area at high tide, and for resident and migratory shore *banarddee* (birds). The tidal mudflats of *Ilerdda* (Walcott Inlet) are particularly notable as they can be up to 5km wide and support a rich intertidal invertebrate community (Zell 2003).

Intertidal sand and mudflat flora and fauna are protected under the BC Act and FRM Act. Development proposals that may impact on intertidal sand and mudflat communities may be subject to an environmental impact assessment in accordance with the EP Act.



Intertidal mudflats. Photo – Will Robbins, DBCA.

Summary of management arrangements for intertidal sand and mudflat communities			
Current status	Unknown but assumed to be in a generally undisturbed condition.		
Existing and potential pressures	• Climate change impacts such as greater heat stress, sea level rise and increased turbidity due to more severe cyclones and storms. • Direct (e.g. removal of individuals) and indirect (e.g. changes to community structure) impacts from recreational and commercial fishing. • Decrease in water quality (see section 7.4).		
Current major pressure	None identified.		
Management objective	To ensure that sand and mudflat communities are not significantly impacted by human activities within the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of intertidal sand and mudflat communities. 2. Monitor the condition of intertidal sand and mudflat communities and the pressures acting on them within the marine park [DPIRD]. 3. Undertake and/or support research to characterise the diversity and community composition of intertidal sand and mudflat communities in the marine park [DPIRD].	Management intervention and visitor services Monitoring Research	M M L
Performance measures	Indicators to be developed but may include: • Diversity. • Species abundance. • Community composition.		
Targets	• No significant decline in diversity or species abundance as a result of human activity. • No significant change in community composition as a result of human activity.		
Reporting	3-5 years.		

7.8 *Julawaddaa* (marine turtles) (KPI)

The presence of *julum* (seagrass), *waddaroo* (coral) reefs, soft bottom habitats and sandy *galaab* (beaches) within the marine park are known to support foraging and nesting of turtles in the marine park. *Julawaddaa* species identified in the Kimberley include *waarlee* (green turtle, *Chelonia mydas*), *galagalaarddee* (flatback turtle, *Natator depressus*), *mangiddee* (loggerhead turtle, *Caretta caretta*), *nowurralya* (hawksbill turtle, *Eretmochelys imbricata*), leatherback turtle (*Dermochelys coriacea*) and olive ridley turtle (*Lepidochelys olivacea*) (Masini *et al.* 2009).

Research has indicated that *waarlee (*green) and *galagalaarddee* (flatback turtles) nest in significant numbers along the Kimberley coast with minor records of olive ridley and hawksbill *julawaddaa* (turtle) nesting (Department of Parks and Wildlife 2013 and Whiting *et al.* 2018). Nesting occurs at many widely scattered *galaab* (beaches) but also involves mass nesting at high-density rookeries. Small-scale nesting *galaab* (beaches) have been identified throughout the marine park.

Julawaddaa are an important food source for Dambeemangarddee people. *Waarlee* (green turtle) is most sought after for its good eating. Negligible take of other species occurs. All marine *julawaddaa* species found in Western Australian waters are protected under the BC Act and the Commonwealth EPBC Act. The BC Act provides for the sustainable harvesting of *julawaddaa* for Aboriginal customary purposes.

'We have many traditional stories for julawaddaa (turtle) and waliny (dugong) and their cultural use is interwoven with our traditional lifestyles. Healthy saltwater Country is important for them and we must work together to make sure that julawaddaa and waliny are plentiful for generations to come' (DAC 20)

Summary of management arrangements for *julawaddaa* (marine turtles) (KPI)	
Current status	Research suggests populations of *julawaddaa* are healthy in the marine park.
Existing and potential pressures	• Disturbance from human interaction (e.g. boat strike, noise, nest disturbance, artificial light). • Loss or degradation of critical habitat (e.g *julum* (seagrass)). • Entanglement in and ingestion of marine debris. • Unsustainable customary take. • Climate change impacts from rising sea level and increased cyclone severity may increase the risk of tidal inundation of nests. Higher temperatures affect hatchling demography and food resources. • Predation on eggs and hatchlings.
Current major pressure	Climate change (see section 11).
Management objectives	• To ensure *julawaddaa* are not significantly disturbed by human activities occurring within and immediately adjacent to the marine park. • To manage customary harvesting of *julawaddaa* for cultural and ecological sustainability.

		Management program	Priority
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Monitor the condition of *julawaddaa* and the pressures acting on them within the marine park.	Monitoring	H
	2. Implement management strategies to mitigate or stop any impacts from human activities or predators within the marine park which are negatively impacting on the condition of *julawaddaa*.	Management intervention and visitor services	H
	3. Ensure that management of *julawaddaa* in the marine park aligns with relevant international and regional agreements (e.g. Convention of Migratory Species of Wild Animals and MoU on the Conservation and Management of Marine Turtles and their Habitats of Indian Ocean and South-East Asia).	Management framework	H
	4. Refer to customary hunting strategies (section 6.4) to develop sustainable management arrangements for customary hunting of *julawaddaa*.	Management framework	H
	5. Undertake and/or support research to characterise natural variability, movement patterns and critical habitats for *julawaddaa* within the marine park.	Research	M
Performance measures	• Species abundance of resident *julawaddaa*. • Population structure of resident *julawaddaa*. • Spatial distribution of resident *julawaddaa*. • Mortality of resident *julawaddaa*. • Species abundance of nesting *julawaddaa*. • Spatial distribution of nesting *julawaddaa*. • Hatchling production. • Hatchling mortality.		
Targets	• No significant decline in hatchling production, or species abundance of resident or nesting *julawaddaa* as a result of human activity. • No significant change in population structure of resident *julawaddaa*, or distribution extent of resident or nesting julawaddaa as a result of human activity. • No significant increase in mortality of resident *julawaddaa* or hatchlings as a result of human activity.		
Reporting	Annual or as required.		

7.9 *Jaiya* (fish) including sharks and rays (KPI)

The *galaab* (beaches), bays, reefs, *jindirm* (mangrove) creeks and islands of the marine park provide rich habitats for *jaiya* (fish). The Kimberley region supports some of the highest diversity and abundance of *jaiya* in Australia (Moore & Morrison 2009, Moore et al. 2014, 2020). Over 1500 species have been recorded in the area and it is home to nearly half of all species found in Western Australia (Moore *et al*. 2014, 2020). The species composition, diversity and abundance of finfish in the Kimberley has been found to be related to water clarity, season, tidal range, water depth, productivity and diversity of habitat (Morrison and Hutchins 1997, Travers *et al.* 2012, 2018, Bradley *et al. 2021*).

Surveys of finfish in the creek systems of *Ganbadba* (Talbot Bay) by DPIRD in 2017, 2018 and 2019 identified a diverse variety of *jaiya* (fish) species, with common species including *ilerdda* (barramundi), blue threadfin (*Eleutheronema tetradactylum*), sevenspot archerfish (*Toxotes chatareus*) and bony bream (*Nematalosa erebi*) (Harry, pers comm. 2020).

The significance of *jaiya* in this region is well known by the Dambeemangarddee Traditional Owners whose ancestors have recorded this value in the form of rock art, oral traditions, and stone arrangements. There are *Wandjina* who are specifically identified with the ocean and ocean species and phenomena including *jaiya*. One of the epic narratives of Dambeemangarddee people concerns the rock cod who, among many other things, is said to have created the complex of creeks and tributaries of the St George Basin in the Prince Regent region that form part of the diverse *jaiya* breeding habitat of the marine park.

Many species are targeted by commercial and recreational fishers, particularly *ilerdda* (barramundi) and *doolja* (mangrove jack, *Lutjanus argentimaculatus*). DPIRD is responsible for the sustainable management of fisheries in the marine park and across the State using an ecosystem-based fisheries management approach. Several finfish species likely to be found in the marine park are afforded protection under the FRM Act.

Sharks are important high order predators. Ninety-four species, representing approximately 18 percent of the world's known shark species, occur in northern Australia and a high proportion of these are likely to be found in the marine park. Shark species which have been recorded in the marine park include the great hammerhead shark (*Sphyrna mokarran*), medium sized whaler sharks (*Carcharhinus* spp.), tawny nurse shark (*Nebrius ferrugineus*) and lemon shark (*Negaprion acutidens*) (Harry, pers comm. 2020 and Robbins pers comm. 2020).

The Kimberley along with the northern Pilbara are important refuges for sawfish, with four of the world's seven species found here (Morgan *et al.* 2011).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 (Morgan *et al.* 2011). Sawfishes are considered the most threatened group of marine fishes, with all species on the IUCN Red List as Critically Endangered or Endangered. Freshwater sawfish are pupped in the macrotidal estuary of King Sound during the wet season and migrate into the Fitzroy River estuary and then into the non-tidal, freshwater reaches of the river (Lear *et al*. 2019). Analysis of data and research from satellite tagging of both *Pristis clavata* and *Pristis zijsron* suggests they have limited, tidally influenced, movements and occupy a restricted range of only a few square kilometres within the coastal fringe (Stevens *et al.* 2008).

All species of sawfish are protected under the FRM Act, meaning that they cannot be taken by recreational or commercial fishers. If caught as bycatch they are to be released alive when possible.

Rays are also common in the marine park. The largest of all rays, the oceanic manta ray (*Mobula birostris*) frequents the area regularly, particularly in the *Ganbadba* (Talbot Bay) area indicating that plankton is abundant.

Summary of management arrangements for *jaiya* (fish) including sharks and rays (KPI)			
Current status	*Jaiya* communities in the marine park are assumed to be in a generally good condition. Shark and ray populations in the Kimberley are in good condition but location specific information for the marine park is not available.		
Existing and potential pressures	• Fishing, including incidental catch, bycatch and local depletion of some targeted species. • Loss and degradation of critical habitat (i.e. nursery areas, aggregation areas). • Entanglement in and ingestion of marine debris. • Climate change impacts on habitat and food availability. • Tourism. • Illegal foreign fishing.		
Current major pressures	• Climate change (see section 11). • Fishing (see sections 8.2 & 9.2).		
Management objectives	• To ensure non-targeted (those not targeted by recreational and commercial fishers) *jaiya*, shark and ray species are not significantly impacted by human activities within the marine park. • To manage targeted (those targeted by recreational and commercial fishers) *jaiya*, shark and ray species for cultural and ecological sustainability.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Undertake and /or support research to characterise *jaiya*, shark and ray diversity, abundance, biomass/ size frequency, movement patterns and critical habitats within the marine park and to understand the ecological role of targeted *jaiya*, species and the consequences of their removal [**DPIRD** for targeted species].	Research	H
	2. Monitor the condition of *jaiya*, shark and rays and the pressures acting on them in the marine park [**DPIRD** for targeted species].	Monitoring	H
	3. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of *jaiya* and sustainability of targeted *jaiya* [**DPIRD** for marine park compliance, including education and other activities]	Management intervention and visitor services	H
Performance measures	• Diversity. • Species abundance. • Species size distribution. • Protected species abundance. • Community composition.		

Targets	**Sanctuary zones**[2] • No significant decline in diversity, target species abundance, target species size structure or protected species abundance as a result of human activity. • No significant change in community composition as a result of human activity. **All other zones** • No significant decline in species richness or protected species abundance as a result of human activity. • No significant change in community composition as a result of human activity. • No change in target species abundance or target species biomass beyond ecologically sustainable levels as a result of human activity (to be determined in consultation with DPIRD).
Reporting	3-5 years

2 - Refer to section 12 for the location of zones and permitted activities and uses.

7.10 *Waliny* (dugongs) (KPI)

Waliny (dugong) often aggregate in protected shallow bays and *jindirm* (mangrove) channels. They primarily feed on *Halophila* (*Julum*, seagrass) and migrate depending on food availability. Australia is considered to be the core of the world's remaining *waliny* population (Marsh *et al*. 2002). The estimated number of *waliny* in the Kimberley region is 12,600 ± 601 (7.5 percent Standard Error) (Bayliss and Hutton 2017).

Waliny have been sighted throughout the Lalang-gaddam Marine Park including in *Gandbadba* (Talbot Bay), Collier Bay, around *Mooloogoob* (Kingfisher Island), Doubtful Bay, *Yowja*b (Montgomery Reef) and in *Ilerdda* (Walcott Inlet) (Bayliss pers. comm. 2016). They generally appear in low density and are patchily distributed.

Waliny are an important food in the traditional diets of Dambeemangarddee people and *Ganbadba* (Talbot Bay) is a culturally significant area for *waliny* (*DAC*, pers. comm. 2014). Dambeemangarddee have many traditional stories for *waliny* and their cultural use is interwoven with Dambeemangarddee's traditional lifestyle.

All *waliny* in Australian waters are protected under the BC Act and the Commonwealth EPBC Act. The BC Act provides for the sustainable harvesting of *waliny* for Aboriginal customary purposes *Waliny* are also identified as a key management target in the Dambimangari Healthy Country Plan.

Summary of management arrangements for *waliny* (dugongs) (KPI)			
Current status	*Waliny* are assumed to be in good condition.		
Existing and potential pressures	• Disturbance from human interaction (e.g. boat strike, noise). • Loss or degradation of critical habitat (e.g. *julum* (seagrass)) (see section 7.4). • Entanglement in and ingestion of marine debris. • Disease. • Unsustainable customary take. • Climate change impacts may alter movement patterns. Impacts on *julum* (seagrass) (e.g. from warming events and increased intensity of cyclones) would have flow on effects for waliny population.		
Current major pressure	Climate change (refer to section 11).		
Management objectives	• To ensure *waliny* are not significantly impacted by human activities in the marine park. • To manage customary harvesting of *waliny* for cultural and ecological sustainability.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Undertake and/or support research to characterise natural variability, movement patterns and critical habitats for *waliny* within the marine park.	Research	M
	2. Monitor the condition of *waliny* and the pressures acting on them within the marine park.	Monitoring	H
	3. Maintain records of the incidence of boat collisions with *waliny*.	Monitoring	L
	4. Refer to customary hunting strategies in section 6.4 to develop sustainable management arrangements for customary hunting of *waliny*.		

Performance measures	• Abundance • Spatial distribution
Targets	• No significant decline in *waliny* abundance as a result of human activity. • No significant change in *waliny* distribution as a result of human activity. • Management targets for sustainable customary harvesting of *waliny* to be developed in collaboration with Dambeemangarddee people.
Reporting	3-5 years

7.11 *Ngunubange* (whales) (KPI)

Ngunubange (whale) species recorded in the marine park include the humpback whale (*Megaptera novaeangliae*), which is a threatened species and the minke *ngunubange* (*Balaenoptera acutorostrata*); (Jenner 2009, pers. comm.) indicating that the marine park includes suitable habitat for both baleen and toothed species. Additionally, a small number of other specially protected *ngunubange* species occurring in the Kimberley Bioregion are sometimes seen in the marine park.

Senior Traditional Owners Donny Woolagoodja and Janet Oobagooma explained how their ancestors have always known how important their Sea Country is to *ngunubange* and other marine species. Their ancestors told them how *Langawuddoo* (Hall Point) is the *ngunubange* 'Dreaming place'. They know that *ngunubange* come to this area to breed. They know, and it is enshrined in one of their creation narratives, that people and *ngunubange* in close proximity can cause problems for both the *ngunubange* and the humans (DAC 2012, pers. comm.).

The Traditional Owners have always maintained a healthy respect for *ngunubange* and there are ceremonials songs and dances associated with them. Senior Traditional Owners recall that when living at the Kunmunya mission their old people made a large *ngunubange* like figure out of spinifex grass and bushvine twine and were dancing with it (DAC 2012, pers. comm.). Mrs Janet Oobagooma also explained that *ngunubange* are more active when there is a lot of wind and that younger *ngunubange* learn about sexual activity by observing their mother's mating. Images of *ngunubange* and *waliny* (dugong) are also found in cave galleries in coastal regions (DAC 2012, pers. comm.).

Breeching humpback. Photo – Daniel Barrow.

Humpback whales are known to inhabit the marine park in large numbers between June and November each year (Salgado-Kent *et al*. 2012) with peak occurrence from mid-July to early October. The Western Australian humpback whale population (known as Breeding Group D) is the largest humpback whale population in the world. This group migrates from Antarctic feeding grounds to breeding grounds along the Western Australian coast. Research in the Kimberley since the early 1990s has identified the Camden Sound area as an important calving habitat for this population (Jenner *et al.* 2001; Thums *et al.* 2018). Here, water temperatures during the calving season can reach 28 degrees Celsius, which is approximately two degrees warmer than the surrounding areas and the complex shoreline, depth and seafloor profile of the marine park are thought to provide numerous hiding places for humpback cows and calves as they seek protection from predators and aggressive bull humpbacks intent on mating.

All *ngunubange* species are protected under the BC Act and EPBC Act. A licence is required for marine tourism operators wishing to interact with *ngunubange* in the marine park and wildlife viewing is controlled by a code of conduct which includes minimum approach distances, maximum boat speeds and restrictions on the use of lights in the vicinity of wildlife. Restrictions also apply to recreational activities. All vessels must stay 100 metres away from a *ngunubange* or if a ngunubange approaches a vessel the motor must be in neutral or be driven at less than five knots away from the *ngunubange*. Restrictions also exist on recreational and commercial drones flying around marine mammals.

Summary of management arrangements for *ngunubange* (whales) (KPI)			
Current status	Humpback whale populations are considered to be good condition, little is known about other *ngunubange* species.		
Existing and potential pressures	• Disturbance from human interaction (e.g. boat strike, noise). • Entanglement in and ingestion of marine debris. • Climate change impacts may affect movement patterns and food availability.		
Current major pressure	None identified.		
Management objective	To ensure *ngunubange* are not significantly impacted by human activities in the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold	1. Spatially and qualitatively characterise the use of the marine park by humpback whales including the identification of high-use humpback whale calving and nursing areas.	Research	H-KMS
	2. Monitor the condition of *ngunubange* and the pressures acting on them within the marine park.	Monitoring	H-KMS
	3. Implement components of the humpback whale recovery plan (Australian Government 2005) and other relevant species conservation plans/strategies with respect to the marine park.	Management framework	H
	4. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of *ngunubange* which could include: • considering the need and options for temporal closures to vessels or vessel speed restrictions during the core *ngunubange* visitation period in the special purpose zone (whale conservation). • restricting access to localised high-use humpback whale calving and nursing areas by vessel or aircraft if humpback whales are found to be sensitive to these activities [DoT]. • restrict access to seaplane landings in the special purpose zone (whale conservation) between June and November unless absolutely necessary for safety reasons [DBCA, DoT, Civil Aviation Safety Authority].	Management intervention and visitor services	H
	5. Ensure the implementation of EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales (Australian Government 2008a) within and adjacent to the marine park [DBCA, DMIRS, Office of the Environmental Protection Authority (OEPA), Conservation and Parks Commission].	Management intervention and visitor services	M
Performance measures	Indicators to be developed but may include: • Diversity • Key species abundance • Key species spatial distribution.		
Targets	• No significant decline in diversity or key species abundance as a result of human activity. • No significant change to key species distribution as a result of human activity.		
Reporting	3-5 years		

7.12 *Jigeedany* (dolphins) (KPI)

The marine park provides habitat for a range of *jigeedany* (dolphin) species including for the Australian snubfin dolphins (*Orcaella heinsohni*); the false killer whale (*Pseudorca crassidens*) the Australian humpback dolphin (*Sousa sahulensis*) and the Indo-pacific bottlenose *jigeedany* (*Tursiops aduncus*). Research has shown that snubfin dolphins appear to favour shallow areas closer to freshwater inputs (Bouchet *et al.* 2021). Research on the genetic connectivity of *jigeedany* across the Kimberley indicates that they have high sight-fidelity and limited gene flow (Brown *et al*. 2014; Brown *et al.* 2017, DBCA 2021).

It has been found that Deception Bay, the inlets of Augustus Island, *Gooddee* (Kuri Bay), and *Malandoom* (Prince Regent River) are particularly important to these species (Bouchet *et al*. 2021). It is expected that spinner *jigeedany* (*Stenella longirostris*) also occur in the area but may be more transient. Dambeemangarddee Rangers are contributing their traditional ecological knowledge of the tides, currents and seas to monitor the snubfin dolphins in particular to determine population numbers in Prince Regent River (DAC 2012; DBCA 2020; DBCA, 2021).

All *jigeedany* are protected under the BC Act and EPBC Act. A licence is required for marine tourism operators wishing to interact with *jigeedany* in the marine park and wildlife viewing is controlled by a code of conduct which includes minimum approach distances, maximum boat speeds and restrictions on the use of lights in the vicinity of wildlife.

'All year round we see many different *jigeedany* (dolphins) hunting for fish and playing around. Often there are common dolphins and humpback dolphins in the blue open water. Closer to shore, in murky water near inlets and *jindirm* (mangrove/mangal), you will find the shy snubfin dolphins foraging' (DAC 2012).

Snubfin dolphin in the Lalang-gaddam Marine Park. Photo – Holly Raudino.

Summary of management arrangements for *Jigeedany* (dolphins) (KPI)			
Current status	*Jigeedany* populations in Prince Regent River are considered in a good condition with no population declines recorded. Little is known about *jigeedany* in other areas of the marine park.		
Existing and potential pressures	• Disturbance from human interaction (e.g. boat strike, noise). • Entanglement in and ingestion of marine debris. • Climate change impacts may affect movement patterns and food availability.		
Current major pressure	None identified		
Management objectives	To ensure jigeedany are not significantly impacted by human activities in the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Monitor the condition of *jigeedany* and the pressures acting on them within the marine park. 2. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of *jigeedany*. 3. Undertake research to characterise *jigeedany* diversity, abundance, natural variability and critical habitats within the marine park.	Monitoring Management intervention and visitor services Research	H H M
Performance measures	• Diversity • Key species abundance • Key species spatial distribution		
Targets	• No significant decline in diversity or key species abundance as a result of human activity. • No significant change to key species distribution as a result of human activity.		
Reporting	2-3 years		

7.13 *Goiyoiya* (estuarine crocodiles)

Goiyoiya (estuarine crocodile) are apex predators which are found through the marine park in estuarine environments, nearshore waters, oceanic waters and on islands (Semeniuk *et al.* 2011). They have been protected since the late 1960s in Australia after 30 years of unregulated hunting drove their numbers to extreme lows.

Goiyoiya breed in the *jindirm* (mangroves) and tributaries of St George Basin and Prince Regent River. Genetic studies of *goiyoiya* have identified that West Kimberley populations are completely separated from Northern Territory populations. The abundance of *goiyoiya* in the Kimberley region is still unknown however a recent study conducted in the Prince Regent and Roe-Hunter River systems have shown that populations are recovering (Halford and Barrow 2017). The lack of larger *goiyoiya* in the Kimberley compared to in the Northern Territory is likely to mean that the population will continue to increase in abundance and size structure (Halford and Barrow 2017).

Goiyoiya (estuarine crocodile). Photo – Roanna Goater.

Goiyoiya (estuarine crocodiles) are protected under the BC Act and the EPBC Act. Management strategies to reduce the risk of interactions between *goiyoiya* and users of the marine park is described in section 8.1.

Summary of management arrangements for *goiyoiya* (estuarine crocodiles)			
Current status	Abundance of *goiyoiya* (estuarine crocodiles) has increased in recent decades.		
Existing and potential pressures	• Disturbance from human interaction and altered behaviour through feeding. • Entanglement in and ingestion of marine debris. • Climate change impacts from rising sea level and increased cyclone severity may increase the risk of tidal inundation of nests. Higher temperatures could affect reproductive processes and food resources. • Illegal hunting. • Commercial fishing.		
Current major pressure	Climate change (see section 11).		
Management objective	To ensure goiyoiya are not significantly impacted by human activities in the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Educate users about known and potential distribution of *goiyoiya* and of the risk of feeding or interacting with them to ensure compliance. 2. Monitor the condition of *goiyoiya* and the pressures acting on them within the marine park. 3. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of *goiyoiya*. 4. Undertake and/or support research on the abundance and condition of *goiyoiya* in the marine park.	Education and interpretation Monitoring Management intervention and visitor services Research	H M M L
Performance measures	• Abundance • Size distribution • Spatial distribution/home range		
Targets	• No significant decline in the abundance of goiyoiya as a result of human activity. • No significant decline in the size distribution of goiyoiya as a result of human activity.		
Reporting	5-10 years		

7.14 Sea and shore *banarddee* (birds)

The Kimberley region is important internationally for sea *banarddee* (birds), and migratory and resident shore *banarddee*. Some *banarddee* species are important to Dambeemangarddee people for cultural reasons and as a food source.

Sea and shore *banarddee* are found in high numbers on the mudflats of Ilerdda (Walcott Inlet) and Ruby Falls (Willing pers. comm. 2013). Sea and shore *banarddee*, including black-necked stork or 'jabiru' (Ephippiorhynchus asiaticus) and magpie goose (Anseranas semipalmata), are also seen in the tidal flats of St George Basin. *Moolgoodna* (Booby Island) is classified by Birdlife International as an Important Bird Area because it supports more than one percent of the world's population of brown boobies (Sula leucogaster), with up to 2000 breeding pairs. About 500 pairs of crested terns (Thalasseus bergii) also nest on the island (BirdLife International 2015). The waters surrounding *Moolgoodna* (Booby Island) are important foraging grounds for nesting sea *banarddee* (birds), including the brown booby, which generally feeds on squid and a range of surface dwelling *jaiya* species, such as flying *jaiya* and anchovies (Department of the Environment 2016).

All *banarddee* are protected under the BC Act with some species also protected under the EPBC Act. Some migratory species are also subject to international treaties and Australia has an obligation to protect species listed under those treaties.

Caspian Terns. Photo – Will Robbins.

Summary of management arrangements for sea and shore *banarddee* (birds)			
Current status	Unknown, but assumed to be in good condition.		
Existing and potential pressures	• Disturbance to feeding, roosting and nesting activity by people, vessels and low flying aircraft and drones. • Loss or degradation of critical habitat (e.g. coastal vegetation, intertidal sand and mudflats). • Entanglement in and ingestion of marine debris. • Climate change impacts including increased temperatures and increased intensity of storm and cyclone events.		
Current major pressure	None identified.		
Management objective	To ensure that sea and shore *banarddee* that inhabit or migrate through the marine park are not significantly impacted by human activities in the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of sea and shore *banarddee*. 2. Monitor the condition of sea and shore *banarddee* and the pressures acting on them within the marine park. 3. Undertake and/or support research to characterise the diversity, abundance, natural variability, distribution and habitat requirements of sea and shore *banarddee* in the marine park.	Management intervention and visitor services Monitoring Research	M M L
Performance measure	• Species abundance • Breeding success • Seasonal distribution		
Target	• No significant decline in the abundance of shore *banarddee* (bird) species as a result of human activity. • No significant decline in breeding success of shore *banarddee* (bird) species as a result of human activity.		
Reporting	3-5 years		

7.15 Invertebrates

Marine invertebrates are those marine animals without a backbone and include *ganbaneddee* (crabs), other crustaceans, squid, cuttlefish, other shellfish, *waddaroo* (coral), sponges, *wanbiny* (sea jellies), anemones, sea squirts, echinoderms, and marine worms. Invertebrates have important functions within the ecosystem as a food source for other invertebrates, *jaiya* (fish) and *banarddee* (birds) as well as in nutrient cycling. Habitat forming invertebrates such as sponges and sea squirts have been described under filter feeding communities in section 7.6.

There is little known about the invertebrate populations of the marine park, but a survey conducted in 1997 in the central Kimberley coast recorded 292 species of molluscs, 89 species of *ganbaneddee* (crab), 80 species of shrimp and 19 species of barnacle (Walker 1997).

St George Basin is a known nursery area for banana prawns (*Penaeus merguiensis*) and king prawns (*Penaeus latisulcatus*). This area is closed to commercial trawl fishing to protect juvenile stock. Additional known nursery areas for prawns within the marine park include parts of Brunswick Bay, York Sound and Collier Bay. Tiger prawns occur in inshore areas of structured habitats such as *Julum* (seagrass) and *jirdarm* (macroalgalae) communities. During the wet season, the prawns move offshore into mud habitat where they are targeted by fishers. To reduce the potential for disturbance of humpback whales and calves from trawling vessels, trawling is not permitted in the special purpose zone (whale conservation).

Sea cucumbers (trepang) are found in sand areas throughout the Kimberley and form the basis of a small commercial fishery. *Marlinju* (oysters) and other molluscs are important to the Dambeemangarddee people for cultural reasons and as a food source.

Intertidal rocky shoals are common in the waterways and host a variety of molluscs such as *marlinju* (oysters), limpets, periwinkles, and chitons, as well as crustaceans such as rock *ganbaneddee* (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.

Under the FRM Act, DPIRD is responsible for the sustainable management of the recreational and commercial take of invertebrate species using strategies such as bag and size limits, closures, and quotas.

Summary of management arrangements for invertebrates	
Current status	The current status of invertebrate populations in the marine park is unknown.
Existing and potential pressures	• Recreational, customary and commercial fishing for prawns, *ganbaneddee* (crabs), squid, octopus, lobster, *marlinju* (oysters), live shell (e.g. specimen shells and hermit *ganbaneddee* (crabs)), bait collection. • Degradation of critical habitat as a result of human activities (e.g. reef walking). • Climate change impacts such as changes in the intensity of cyclones and storms. • Introduced pests. • Illegal foreign fishing.
Current major pressures	• Climate change (see section 11). • Fishing (see sections 8.2 and 9.2).
Management objectives	• To ensure non-targeted (those not targeted by recreational and commercial fishers) invertebrate species are not significantly impacted by human activities within the marine park. • To manage targeted invertebrate species (those targeted by recreational and commercial fishers) for cultural and ecological sustainability.

		Management program	Priority
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Monitor the condition of invertebrates and the pressures acting on them in the marine park [**DPIRD**] for target species.	Monitoring	M
	2. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of invertebrates and sustainability targeted invertebrates [**DPIRD** for targeted species].	Management intervention and visitor services	M
	3. Undertake and/or support research to characterise the diversity, abundance, natural variability, distribution and habitat requirements of invertebrates within the marine park and to understand the ecological role of targeted invertebrate species and the consequences of their removal [**DPIRD** for targeted species].	Research	L
Performance measures	Indicators to be developed but may include: • Community richness. • Target species abundance. • Introduced species abundance. • Community composition. • Others to be developed by DPIRD for targeted invertebrates.		
Targets	**Sanctuary Zones**[3] • No significant decline in community richness, or target species abundance as a result of human activity. • No significant increase in the abundance of introduced species as a result of human activity. • No significant change in community composition as a result of human activity. **All other zones:** • No significant decline in community richness as a result of human activity. • No significant increase in the abundance of introduced species as a result of human activity. • No significant change in community composition as a result of human activity. • No change in target species abundance beyond ecologically sustainable levels as a result of human activity (to be determined in consultation with DPIRD).		
Reporting	3-5 years		

3 - Refer to section 12 for the location of zones and permitted activities and uses.

8. People on country – recreation and tourism values

Strategic objective:
To allow recreation, tourism and community use for the appreciation of the park's landscape, natural and cultural heritage values.

8.1 Visitation, tourism and visitor safety

The spectacular scenery, diverse wildlife and cultural values of Lalang-gaddam Sea Country provides excellent opportunities for natural and cultural based tourism experiences and recreational activities and the marine park is gaining increasing recognition and popularity as a tourist destination.

Kimberley tourism has been growing in recent years with visitor numbers reaching an average record high of 593,000 in 2017 (KDC 2019). Tourism makes a significant contribution to the Kimberley region's economy and generates approximately $563 million annually or ten percent of the region's economic output, with visitation to the area's unique natural environment a major attraction (REMPLAN 2020). The completion of a sealed road to Cape Leveque will enable additional recreational boat access to the marine park. Visitation to the region is predicted to rise by 40 percent in the two years following the sealing of the Broome-Cape Leveque Road.

The most common form of tourism in the marine park is expedition cruising with multi-day tours operating in the dry season between Broome and Wyndham, and Broome and the Northern Territory. Vessels range from small fishing and sight-seeing tour boats to large expedition cruise ships. Future visitation to the area is expected to see growth and diversification in the types of marine tourism opportunities being offered. This includes house boats, sea plane activity and the use of small, high-speed vessels to cover large distances for day tours. It is anticipated that demand for visitor facilities will increase, such as land-based infrastructure at key sites (on Dambeemangarddee-managed lands), and marine-based commercial tourism facilities such as fixed-point floating accommodation and visitor facilities.

One of the major drawcards of the Lalang-gaddam Marine Park is the world-renowned *Garaanngaddim* (Horizontal Falls), where tourists either ride the tidal currents by boat or view the impressive feature on scenic flights. Other popular sites in the marine park include *Yowja*b (Montgomery Reef), and *Maamboolbadda* (Kings Cascade) in the Prince Regent River. Other highly desirable and 'bucket-list' destinations adjacent to the marine park include cultural sites such as the rock art gallery at *Ngumbree* (Raft Point), and the freshwater place at *Badjadoo* (Camp Creek). Any visitation to these areas above the high-water mark, although accessed via the Lalang-gaddam Marine Park, must be done with permission from DAC.

If not managed properly, increasing levels of marine tourism and recreation have the potential to impact on the sensitive environment and culturally significant places in the marine park and may detract from the sense of remoteness and wilderness sought by visitors. The CALM Act and CALM Regulations require commercial businesses operating in the marine park to have a commercial operations licence and abide by the conditions outlined in the DBCA's *Commercial Operator Handbook*. Recreation and tourism are managed in accordance with Parks and Wildlife *Policy No. 18 – Recreation, tourism and visitor services*. DBCA's *Operator Handbook* provides specific information for commercial businesses operating in a marine park or reserve

A visitor plan has been developed for the majority of the marine park to ensure sustainable and culturally appropriate visitor usage that retains the pristine natural qualities while supporting an outstanding visitor experience. It is a guiding document for decision making in relation to visitor access, managing the wilderness experience and tourism operations within the marine park and will be subject to regular review by the JMB.

8.1.1 Mooring and anchoring

Management of moorings and anchoring is a key consideration in managing increasing vessel use in Western Australia's marine parks. The predicted increase in commercial and recreational vessels visiting and operating in the marine park is expected to increase mooring and anchoring activities. The marine park allows for mooring and anchoring activities, however if not installed and maintained correctly, mooring may cause irreversible damage to the surrounding habitat and pose a risk to marine park users and property. The department has a policy for moorings (*Policy Statement 59: Mooring Policy)*. If required, a mooring and anchoring plan may be developed for the marine park.

8.1.2 Visitor safety

Visitor risk management is an important focus for DBCA and Dambeemangarddee Traditional Owners. Under traditional law, Dambeemangarddee Traditional Owners are responsible for the safety and wellbeing of visitors to their country. The remoteness of the park, the strong tides and the chance of tropical cyclones pose risks to visitors who may be inexperienced in or unprepared for such conditions. *Garaanngaddim* (Horizontal Falls) can create treacherous conditions that are dangerous to navigate. Boats have overturned and people have had to be rescued when trying to ride the falls on inappropriate vessels or when unfamiliar with the conditions. In the peak tourism season the large number of vessels and seaplanes which visit the confined area at any one time creates an additional navigational hazard. Seaplanes require calm water to land, and wake and wash from vessels can create unsafe conditions.

> Dambeemangarddee country sees many visitors each year. A visitor is anyone who is not a Dambeemangarddee Traditional Owner. Visitors may be tourists, locals fishing along the coastline, mining people, government workers and many more. Dambeemangarddee Traditional Owners often don't know them, and the country does not know them either. We are responsible for the safety of visitors and bear the consequences of accidents and disturbance of our cultural sites. When visitors come, we talk to country to introduce them and smoke them to keep bad spirits away (DAC 2012).

Dambeemangarddee people welcome visitors to their traditional country, including visiting the *Garaanngaddim* (Horizontal Falls), however, it is part of Dambeemangarddee traditional cultural laws and protocols not to travel through the Falls when the tides are rushing through. To help promote safe and culturally appropriate visitation, Dambeemangarddee Traditional Owners have developed a code of conduct[4] for visitors to Dambeemangarddee country.

Visitors to the marine park are advised to be mindful of the safety risk that g*oiyoiya* (estuarine crocodiles) pose and of the implications that can be caused by inappropriate interactions such as illegally feeding them. In 2017 DBCA adopted the 'Be Crocwise' safety campaign used in the Northern Territory and Queensland to increase knowledge and awareness of appropriate behaviour in *goiyoiya* (estuarine crocodile) risk areas.

As visitation to the marine park is likely to increase during the life of the plan, an ongoing visitor risk management program will be undertaken to identify potential hazards and actions taken to minimise these. Risks to visitors are managed under the framework of the department's *Policy Statement No. 53 – Visitor Risk Management Policy*.

4 - https://www.dambimangari.com.au/code-conduct/

The policy seeks to ensure that the department implements visitor risk management procedures and practices through a consistent and integrated approach that:

- minimises the potential for incidence of injury to visitors on lands and waters managed by the department
- encourages appropriate behaviour by visitors on lands and waters managed by the department that will reduce the risks posed by their activities
- aligns with industry standards and best practice principles, and
- will enable departmental staff to effectively manage visitor risk.

Other departments and organisations which have a shared responsibility for visitor safety in the marine park include:

- DoT, which is responsible for installing and maintaining navigation aids and other boating safety measures in all state waters (the department's policy No. 59 provides direction on the control and management of moorings within marine parks and reserves).
- The Australian Maritime Safety Authority (AMSA) which is responsible for ensuring domestic commercial vessels comply with the requirements of the *Marine Safety (Domestic Commercial Vessel) National Law Act 2012.*

8.1.3 Visitor access

There are a number of areas in Dambeemangarddee country where access may be restricted to non-traditional owners using CALM Regulations for various reasons, including protecting highly significant cultural areas such as cultural sites, safety reasons or for other cultural reasons. The use of regulations to restrict vessel access will be limited to areas within the sanctuary zones or the special purpose zones (cultural protection). Access may be granted to non-traditional owners if authorisation is acquired.

Summary of management arrangements for visitation, tourism and visitor safety			
Requirements	• Culturally appropriate visitation. • High aesthetic quality of the environment (e.g. minimal debris, undeveloped marine and coastal areas). • Equitable access to natural values of the marine park. • Provision of areas free of human impacts for nature appreciation.		
Management objectives	• To promote visitor access to and enjoyment of the marine park while maintaining the outstanding cultural and natural values. • To maintain the cultural, ecological and social values of the marine park that are important for nature-based and cultural tourism. • To minimise risks to visitors and encourage appropriate behaviour.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Work with Dambeemangarddee people and commercial operators to promote culturally appropriate visitation.	Education and interpretation	H-KMS
	2. Implement regulations to restrict or control access to areas within the marine park that are unsuitable for visitation for ecological, cultural or safety reasons (through commercial operator licences, by regulation or other mechanism as relevant).	Management framework	H-KMS
	3. Expand the visitor plan to cover the entirety of the Lalang-gaddam Marine Park and prioritise and implement strategies.	Management framework	H-KMS

	4. Ensure that the granting and renewal of commercial operations licences and leases in relation to marine park access and wildlife interaction is consistent with the plan, permitted use table, management targets and BC Act.	Management intervention and visitor services	H
	5. Undertake a review of shipping activity in the marine park to determine the need for navigational measures such as compulsory pilotage, speed limits and/or designation of shipping routes [DoT].	Management intervention and visitor services	H
	6. Develop information to ensure that visitors are aware of the cultural values of the marine park and are aware of cultural laws and protocols regarding visitor risk and safety.	Education and interpretation	H
	7. Ensure that monitoring programs assess the effectiveness of the park's management arrangements for visitor safety and satisfaction and adapt management strategies as required.	Monitoring	H
	8. Conduct periodic visitor risk assessments in the marine park as required and mitigate identified issues [AMSA, DoT, DPIRD].	Management intervention and visitor services	H
	9. Establish and maintain a quantitative and qualitative spatial database of human use within the marine park.	Management intervention and visitor services	H
	10. Ensure maritime safety guidelines are followed [AMSA, DoT].	Management intervention and visitor services	H
	11. Facilitate *goiyoiya* (estuarine crocodile) handling and removal training for relevant departmental staff and Mayala rangers.	Management framework	H
	12. Investigate the need for additional mechanisms to ensure the safety of seaplanes and vessels operating within the marine park. [AMSA, DoT].	Management intervention and visitor services	M
	13. Work with stakeholders to maintain ongoing, safe access for visitors to *Garaanngaddim* (Horizontal Falls). [DPIRD, DoT].	Management intervention and visitor services	M
	14. Work with relevant agencies to prepare for and respond to emergencies [DPIRD, DoT, AMSA, WAPOL].	Management intervention and visitor services	M
	15. Assess the need for a mooring and anchoring plan and prepare and implement if necessary.	Management Intervention and visitor services	M
	16. If required and appropriate, promote opportunities for sustainable recreation and tourism, including the provision of visitor facilities if required.	Management intervention and visitor services	M
Performance measures	• Visitor satisfaction (e.g. experiences and expectations) as determined by the Visitor Monitoring Program • Number of visitor safety incidents reports to DBCA and/ or JMB		
Targets	• Visitor satisfaction is 85 percent or above within five years. • No increase in the total number of serious visitor safety incidents per capita compared to baseline levels.		
Reporting	Every 5 years		

Garaanngaddim (Horizontal Falls)

Garaanngaddim (Horizontal Falls). Photo – Todd Quartermaine, DBCA.

'One of the greatest wonders of the natural world' – Sir David Attenborough

The impressive *Garaanngaddim* (Horizontal Falls) in the Buccaneer Archipelago is one of the major attractions of the Kimberley. *Garaanngaddim* is like no other; instead of flowing vertically the 'waterfall' is created when the massive tides in the area flow through two narrow gaps in the McLarty Range in *Ganbadba* (Talbot Bay). Water builds up on one side of the narrow cliff passages faster than it can flow through them, creating a height difference of up to 4m on a spring tide. Visitors come to experience the sheer power of the Kimberley tides or to view the water rushing through the rugged cliffs from the air. The area is culturally significant to Dambeemangarddee people and features in their traditional Dreamtime narratives.

Garaanngaddim is one of the extremely important cultural sites for the Dambeemangarddee Traditional Owners. It is a potentially dangerous place and has to be treated with respect and consideration to ensure safe passage of those who choose to enter (DAC pers. comm. 2015).

Dambeemangarddee Traditional Owners recognise that tourists enjoy the thrill of venturing through the falls when the tide is rushing, however, for the Traditional Owners the respectful time to travel through the falls is in neaps or during the calm water time. As senior traditional owners have explained, the rushing tide is 'the *Unggudja* (Snake) itself' and that travelling through the falls at full rushing tide is when 'the *Unggudja* is travelling'. Traditional Owners say that it is both disrespectful and dangerous to travel when the falls are rushing and further, 'the *Unggudja* is damaged every time people drive through the gap' (DAC pers. comm. 2015).

8.2 Recreational fishing

Recreational fishing in the marine park is highly valued by the Kimberley community and tourists alike for the quality of its sport and game fishing. Fishing is a key part of the Kimberly lifestyle and is central to how people live. The Lalang-gaddam Marine Park and surrounds provide a diversity of fishing experiences, including a range of species and habitats not available in the waters directly adjacent to Broome or Derby. Whether it is spending time with family and friends, connecting with nature or teaching kids about boating and fishing, the local recreational fishers have a deep connection with Dambeemangarddee Sea Country.

Approximately 80 percent of the marine park is available for unguided recreational fishing. A further 0.3 percent of the marine park is available for fishing through a Traditional Owner supported tourism operation. Targeted species include *ilerdda* (barramundi, *Lates calcarifer*), spanish mackerel (*Scomberomorus commerson)*, giant trevally (*Caranx ignoblis)*, grouper and shark species.

The potential pressures associated with recreational fishing in the marine park include by-catch of unwanted non-target species, overfishing of targeted species and associated impacts on other ecological values (i.e. from litter, discarded/ broken off fishing gear and disturbance of sensitive habitats). Recreational fishing in the marine park is predicted to increase as visitation to the region grows and will need to be carefully monitored to ensure it remains ecologically sustainable and is culturally appropriate for all to enjoy.

There are some areas in the marine park which are of high cultural significance and also valued highly by non-traditional owners for recreational fishing. Some of these areas have been zoned as a special purpose zone (biocultural conservation). The purpose of these zones is to provide for the conservation of ecologically and culturally important marine ecosystems such as *waddaroo* (reefs) and *jindirm* (mangroves) whilst continuing to allow for low impact recreational and commercial activities. The JMB will work with DPIRD, Traditional Owners and stakeholders to develop some additional fisheries regulations for these zones to ensure that recreational fishing carried out in these zones is culturally appropriate.

Sanctuary zones which prohibit extractive activities such as recreational fishing are used to ensure ecologically important and representative areas of ecosystems are protected from a variety of pressures including recreational fishing. Special purpose zones (cultural protection) are also to be applied which limit extractive activities for cultural reasons (refer to the section 12.3.1).

While DPIRD is responsible for the management of *jaiya* (fish) and aquatic resources throughout the State, within the marine park a representative system of sanctuary zones, special purpose zones (cultural protection) and special purpose zones (biocultural conservation) (see section 12.2), regulations under the FRM Act and relevant research, monitoring and education strategies will be used to collectively to address marine park values.

The JMB will work closely with DPIRD to ensure appropriate management arrangements for recreational fishing are in place to ensure *jaiya* (fish) are sustainably managed into the future, in line with cultural values.

Summary of management arrangements for recreational fishing			
Requirements	• High water quality. • Maintenance of critical habitats for recreationally targeted *jaiya* (fish) species. • Maintenance of recreationally targeted *jaiya* (fish) stocks. • Access to suitable and culturally appropriate recreational fishing areas within the marine park.		
Management objectives	• To maintain the ecological values of the marine park that support recreational fishing. • To ensure that, in collaboration with the community and DPIRD, recreational fishing is managed in a manner consistent with maintaining the marine park's cultural and ecological values while providing for social uses and enjoyment. • To work collaboratively (agencies, stakeholders and community) to maintain and promote quality recreational and customary fishing opportunities in the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Through a collaborative approach with Traditional Owners, Recfishwest and recreational fishers, develop fishing regulations for the SPZ (biocultural conservation) which help ensure recreational fishing is culturally appropriate **[DPIRD]**.	Management framework	H-KMS
	2. Educate recreational fishers on the zoning scheme and any restrictions that may apply to their activities in the marine park [DPIRD].	Education and interpretation	H
	3. Conduct research to determine if ecosystem effects from recreational fishing occur in the marine park and undertake adaptive management actions if required. **[DPIRD]**.	Research	M
	4. Investigate whether populations of recreationally targeted species are sustainable in the marine park and undertake adaptive management actions if required **[DPIRD]**.	Monitoring	M
	5. Monitor spatial and temporal patterns in recreational fishing activity and catch and report the results to DBCA and the Conservation and Parks Commission for the periodic reviews of the implementation of the management plan **[DPIRD]**.	Monitoring	M

Recreational fishing in the marine park. Photo – Carolyn Thomson-Dans.

8.3 Maritime heritage

There are three distinct overlapping phases of maritime cultural activity identified in the marine park:

- Aboriginal activities
- Macassan seafaring activity and trepang (sea cucumber) harvesting (c. 17th–20th century)
- European exploration and activities (pre and post colonisation of Western Australia).

Phillip Parker King, a maritime explorer, anchored in Camden Sound in 1821 after threading through reef shoals and extreme tidal conditions, which occasionally caused his ship to run backwards or be caught in tidal whirlpools. Some of the maps prepared by King during his voyage are still in use today. While navigation charts are easily available to the modern mariner for most coastal areas, many areas in the Kimberley remain uncharted. Many of the names in the area were bestowed by King in recognition of friends, family and important people of the time.

The mudflats of the *Molor Moloiyn* (Glenelg River) are where Charles Kingsford Smith was forced to make an emergency landing in the monoplane Southern Cross in March 1929. The incident was named 'Coffee Royal' after the mix of coffee and brandy the crew drank whilst waiting for eventual rescue by Traditional Owners from the Kunmunya Mission (Willing pers. Comm. 2013). There is no wreckage associated with this landing, however, there is a monument relating to the landing in the adjacent Dambeemangarddee IPA (within ALT reserve). Visitors can request permission to access and view the monument from Dambeemangarddee Traditional Owners and the ALT.

Two shipwrecks are known to have occurred in the marine park: the Calliance and the Enchantress. There may be other unrecorded shipwrecks and underwater maritime heritage in this area, including pearling luggers and colonial coastal vessels. From the 1860s, pearlers who bypassed Broome began arriving on luggers in search of new areas for pearl shell in the King Sound region. Pearling work was dangerous, and many lost their lives in the quest for pearl shells. Pearler graves can be found on some islands in Dambeemangarddee country. Pre-1900 shipwrecks are protected under the *Maritime Archaeology Act 1973* and all shipwrecks over 75 years old are protected under the Commonwealth *Historic Shipwrecks Act 1976*. The Western Australian Museum is responsible for managing historic shipwrecks.

Summary of management arrangements for maritime heritage			
Requirements	Identification and protection of maritime heritage sites.		
Management objectives	• Identify sites with maritime heritage in the marine park to facilitate long term management. • Provide visitor facilities and or interpretive information to enhance visitor enjoyment of, and where appropriate to mitigate or stop impacts on, maritime heritage values in the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Advise commercial tour operators that it is prohibited to disturb sites protected under the Maritime Archaeological Act 1973, Historic Shipwrecks Act 1976 and Heritage Act 2018. 2. Provide information to enhance visitor enjoyment of, and reduce impacts on, European heritage and other maritime sites if required.	Management Intervention and Visitor Services Education and interpretation	M L

9. Using resources from country - economic values

Strategic objective: To allow for sustainable resource use

9.1 Dambeemangarddee economic development opportunities

This management plan recognises Traditional Owners have a need and inter-generational obligation to obtain family livelihoods and sustain existence from their interconnected land and Sea Country and its resources. Identification and development of commercial opportunities and investments that can deliver incomes and capacity to sustain Traditional Owners living on and enjoying country is an early and ongoing strategic management focus.

The marine park will contribute to the provision of long-term employment for Dambeemangarddee Traditional Owners on country through the provision of jobs associated with the marine park including direct employment and fee for service work for management purposes. Through DAC, Dambeemangarddee Traditional Owners are also exploring new projects and opportunities based on their significant natural and cultural assets to help build a successful and sustainable future for Dambeemangarddee people (DAC 2016).

'We need to make sure that any development on our country fits with our vision to care for country. If they are low impact developments this may mean long term opportunities for us, like jobs, contracts, training and infrastructure. We must look at business opportunities that are good for our people and support them getting back on country without damaging the health of our country' (DAC 2016).

Summary of management arrangements for Dambeemangarddee economic development opportunities			
Requirements	High environmental and aesthetic quality.		
Management objective	To enable Dambeemangarddee Traditional Owners to realise livelihoods and achieve economic benefits from their Sea Country, consistent with the purpose of the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold	1. Identify opportunities to provide employment, business and training for Dambeemangarddee people on-country to help look after country and maintain connection to country [DPIRD].	Management framework	H
	2. Work with stakeholders to facilitate Dambeemangarddee employment opportunities in industries such as the tourism industry.	Management framework	H
	3. Encourage and support Dambeemangarddee people to develop business opportunities on country [DPIRD].	Management framework	H

9.2 Commercial fishing

Commercial fisheries operating in the marine park include the Kimberley Gillnet and Barramundi Managed Fishery, Kimberley Prawn Managed Fishery, the Mackerel Managed Fishery and a developing Mud Crab Fishery. Other fisheries licensed to operate in the marine park includes the Northern Demersal Scalefish Fishery, the Marine Aquarium Fishery, the Specimen Shell Managed Fishery and the Beche de mer Fishery. The Joint Authority Northern Shark Fishery has been inactive since 2008. While these fisheries are authorised to operate in the waters of the marine park, many do not regularly fish this area.

When conducted sustainably, commercial fishing has social and economic benefits. Unsustainable fishing practices can result in bycatch, habitat damage and destruction, ecosystem degradation, altered food web dynamics and a decline in *jaiya* (fish) stocks. Commercial fishing in Western Australia is managed by DPIRD under the FRM Act using an ecosystem-based fisheries management approach. The department and joint management partners will work with DPIRD to ensure the continued sustainability of commercial fishing practices in the marine park. Zones which prohibit extractive activities, including commercial fishing, are used to ensure ecologically important and representative areas of ecosystems are protected from pressures including commercial fishing.

Summary of management arrangements for commercial fishing			
Requirements	• High water quality. • Maintenance of critical habitats for commercially targeted species. • Maintenance of stocks of commercially targeted species. • Access to suitable areas for commercial fishing within the marine park, where consistent with the objectives of the marine park.		
Management objectives	• To maintain the ecological values of the marine park which are important to the continuation of commercial fishing industries. • To ensure that, in collaboration with the industry and DPIRD, commercial fishing is managed in a manner that is consisted with maintaining the values of the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Ensure the granting and renewal of authorisations for commercial fishing operations within the marine park are consistent with the plan, permitted use table and management targets **[DPIRD]**.	Management intervention and visitor services	H
	2. Educate commercial fishers on the zoning scheme and any restrictions that may apply to their activities in the marine park [DPIRD].	Education and interpretation	H
	3. Work with commercial fishers, through peak stakeholder bodies to ensure operations are conducted in a culturally sensitive manner **[DPIRD]**.	Management intervention and visitor services	H
	4. Monitor commercial fishing catch and effort in the marine park to inform periodic reviews of the implementation of the management plan **[DPIRD]**.	Monitoring	H
	5. Implement management strategies to mitigate or stop any significant impacts from commercial fishing activities within the marine park which are negatively impacting the values of the marine park **[DPIRD]**.	Management intervention and visitor services	H
	6. Conduct research to determine if ecosystem effects from commercial fishing occur in the marine park and investigate the extent and significance of interactions between commercial fishing and marine mammals and other protected species and provide information to managers **[DPIRD]**.	Research	M

9.3 Pearling and aquaculture

The excellent water quality and high tidal range of the Lalang-gaddam Marine Park creates ideal conditions for pearling and aquaculture. Successful pearling requires high water quality as it involves hanging the pearl oysters in panels in the water column to keep them flushed with nutrients and to remove wastes. Western Australia's pearling industry is one of Australia's most valuable, with the Kimberley one of the key regions for pearl oyster production in the State. Long before the arrival of Europeans, Aboriginal people along the west Kimberley coast collected the large pearl shell (*Pinctada maxima*) for use in rituals and ceremonies. It is the most widely distributed item in Aboriginal Australia, traded across two-thirds of the continent (SEWPC 2012).

There are 16 pearling leases within the marine park and 1 aquaculture lease. In August 2014 the Minister for Fisheries declared the Kimberley Aquaculture Development Zone (KADZ); the first aquaculture development zone to be established in Western Australia. The establishment of the 2000ha zone, situated in Cone Bay provides opportunities for existing aquaculture operations to expand and new aquaculture operations to be created to provide economic benefits to the local community and Indigenous enterprises through job opportunities and regional economic diversification. Currently two companies are licenced to operate in the KADZ.

Research undertaken by the University of Newcastle concluded that benthic conditions beneath pearling operations in Kimberley coastal waters are within the bounds of natural variability compared with areas not used for pearling (Jelbart *et al.* 2009). The intensity and type of environmental impacts from aquaculture activities are dependent on the species farmed, the intensity of production and on the farm location. Finfish culture involves an addition of solids and nutrients to the marine environment which can cause a build-up of organic material beneath *jaiya* (fish) farms and can impact on the flora and fauna of an area. Additional threats include impacts from farm discharges and waste products, the escaping of organisms and transmission of disease.

Pearling and aquaculture operators liaise closely with DPIRD in evaluating the potential risk of marine-borne disease and introduced marine pests being transported into areas of operation. The Minister for Fisheries has issued a pearl transport exemption area notice for the pearling group operating in the 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.

DPIRD will continue to manage pearling and aquaculture in the marine park under the *Pearling Act 1990* and FRM Act, and once implemented under *Aquatic Resources Management Act* (ARM Act)[5]. Pearling and aquaculture are permitted in marine park general use zones and special purpose zones if the activities are compatible with the specified conservation purpose of the zone. Pearling and aquaculture leases that 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 leases will be assessed on a case-by-case basis by DPIRD in liaison with DBCA, the Commission and other stakeholders. The Minister for Environment's approval is required before the Minister for Fisheries grants a new pearl or aquaculture lease area within a marine park. In addition, the pearling industry adheres to ministerial policy guidelines issued under the *Pearling Act 1990* and other non-statutory arrangements such as the Pearling Industry Code of Conduct.

The *Pinctada maxima* pearl oyster resource will be the first to transition to the new management framework under the *Aquatic Resources Management Act 2016*, when the new Act commences.

5 - The Aquatic Resources Management Act 2016 (ARM Act) will replace the Fish Resources Management Act 1994 and the Pearling Act 1990, to become the primary legislation used to manage fishing, aquaculture, pearling and aquatic resources in Western Australia.

Summary of management arrangements for pearling and aquaculture			
Requirements	• High water quality. • Equitable access to appropriate locations within the marine park, subject to environmental assessment (including access between leases for pearl industry vessels) and where consistent with the objectives of the marine park.		
Management objective	• To maintain the ecological values of the marine park which are important to the continuation of a viable aquaculture and pearling industry. • To ensure that, in collaboration with the industry and DPIRD, aquaculture and pearling is managed in a manner that is consistent with maintaining the values of the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Ensure any boundary revision of the pearling 'transport exempt area' is consistent with the special purpose zone (pearling) [**DPIRD**].	Management framework	M
	2. Ensure the granting and renewals of licences and leases relating to pearling and aquaculture operations within the marine park is consistent with the management plan permitted use table and management targets [**DPIRD**, Commission].	Management intervention and visitor services	M
	3. Work with the pearling industry to ensure continued access through the Garaanngaddim (Horizontal Falls) for recreational and commercial vessels [DPIRD, DoT].	Management intervention and visitor services	M
	4. Work with the aquaculture industry to better understand and mitigate the potential impacts of aquaculture on the values of the marine park, particularly regarding risks to the natural stocks of ilerdda (barramundi) in the marine park and report results back to marine park managers [**DPIRD**].	Research	M

9.4 Industry, resources and development

9.4.1 Infrastructure

During the life of the management plan there may be proposals to install or construct infrastructure associated with commercial and recreational activities in or adjacent to the marine park. These could be major developments such as ship loading facilities or minor works such as the installation of moorings or navigation markers. The nature of the development will determine the appropriate level of assessment. DoT and the Department of Planning, Lands and Heritage are responsible for planning and development of coastal infrastructure. Environmentally significant infrastructure associated with mineral, petroleum exploration and development and industrial developments may be subject to environmental impact assessment by the Environmental Protection Authority (EPA) under the EP Act. Such environmental impact assessments within or near the marine parks will generally be referred to DBCA, the Commission and the JMB for advice.

9.4.2 Mineral resources

The establishment of the marine park has implications for approval of resource exploration or development activities within existing mining tenements directly intersecting or overlapping the marine park boundary. Current granted tenements within the marine park boundary will continue following park establishment, however, where marine parks are established, any mining related activities within the marine park boundary, including exploration, will require new approvals pursuant to Section 24A of the *Mining Act 1978.* The consent of the Minister for Mines, with the concurrence of the Minister for Environment and prior recommendations of the Minister for Fisheries and the Minister charged with the administration of the *Marine and Harbours Act 1981*, is required for all current and mining (including exploration) activities within the marine park boundary. The grant of a mining lease or general-purpose lease will require the approval of both Houses of Parliament. Additionally, areas within and adjacent to the marine park may be affected by zoning arrangements.

The CALM Act specifies that mining and petroleum exploration and production is permitted in a marine park general use zone or special purpose zone if it is compatible with the specified purpose of that zone. Mining is not considered to be compatible with the conservation purpose of the special purpose zone (recreation and conservation), special purpose zone (whale conservation), special purpose zone (wilderness conservation) or special purpose zone (cultural protection) or special purpose zone (biocultural conservation). The environmental and cultural impacts of mining and petroleum exploration or production proposals within or adjacent to the marine park is subject to evaluation through the normal assessment and approvals process under Western Australian and Commonwealth legislation. Mineral, petroleum and pipeline activities are regulated by DMIRS under the *Mining Act 1978*, *Offshore Minerals Act 2003*, the *Petroleum and Geothermal Energy Resources Act 1967,* the *Petroleum (Submerged Lands) Act 1982* and *Petroleum Pipelines Act 1969.* In some cases, development may also trigger assessments under the EPBC Act and/or referral to the EPA.

Some islands and coastal areas adjacent to marine park are rich in mineral deposits such as iron-ore and copper. Mining tenements (live and pending) overlay parts of the marine park surrounding these areas. Koolan Island was one of the first iron ore mines in Australia, established more than 50 years ago and boasts Australia's highest-grade hematite ore reserves which average 65.5 percent iron content. Mining was interrupted in late 2014 when the Main Pit on Koolan Island flooded but continued in satellite pits until early 2016. Production and sales of high-grade hematite recommenced in April 2019 following a two-year seawall reconstruction and mine refurbishment program. Cockatoo Island also contains high-grade iron ore and has been mined since the 1940s. Operation ceased in 2012, however is projected to be a viable and profitable mining operation again should mining re-commence on the island.

The Yampi Sound area is highly significant to Dambeemangarddee people, who have native title determination over the area. An MoU has been agreed with the Kimberley Ports Authority to relinquish parts of the Port of Yampi Sound which are surplus to the requirement of current or future port or mining operations to be relinquished from port waters and included into the marine park. The majority of the mining tenement which overlies Koolan Island and the surrounding port waters is retained in port waters and is not included in the marine park.

9.4.3 Seismic testing

Seismic testing is used to explore for oil and gas. Marine seismic surveys can increase background noise levels twofold while they are in progress, and have the potential to impact marine life by disrupting cetacean communication, navigation and foraging habits, damaging *jaiya* (fish) with air bladders, destroying eggs and larvae, and causing *jaiya* (fish) and other marine species to temporarily migrate away from the affected area. Any seismic survey proposed in the marine park will be subject to evaluation as part of the applicable State and Commonwealth government approval process. Management of seismic surveys to avoid or minimise potential risks to cetaceans involves using precautionary measures aimed at preventing injury and minimising the risks of behavioural changes.

9.4.4 Coastal infrastructure and ports

DoT and the Department of Planning, Lands and Heritage are responsible for planning and development of coastal infrastructure, while port authorities are autonomous bodies operating under the *Port Authorities Act 1999*. This Act requires port authorities to protect the environment of the port and minimise the impact of port activities on the environment. Environmental risks associated with shipping and ports are managed through a range of state and national legislation, and international agreements.

Summary of management arrangements for industry resources and development			
Management objective	To ensure industry and associated activities are managed in a manner consistent with the objectives of the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Consider the quality of the remote seascapes of the marine park in site planning and assessment of development proposals.	Management Intervention and Visitor Services	H
	2. Provide advice on the assessment, setting of conditions, and monitoring and reporting requirements for mineral, petroleum and pipeline activities consistent with management objectives and management targets for values of the marine park. [DMIRS, OEPA].	Management framework	H
	3. Ensure ongoing access to the marine park for the enjoyment of country and customary practices is considered during any development proposal.	Management framework	H
	4. Ensure an appropriate level of monitoring is undertaken by developers operating with approval in or adjacent to the marine park [OEPA, Commission, DOT, DMIRS].	Monitoring	H
	5. Develop a memorandum of understanding (MoU) with KPA to ensure complementary management arrangements.	Management framework	H
	6. Ensure the setting of conditions for new developments and operations are consistent with management program objectives and management targets for ecological values [DBCA, Commission].	Management framework	M
	7. Provide formal advice to the Commission and EPA for the environmental assessment of proposed mineral, petroleum and pipeline activities in and adjacent to the marine park. [DMIRS, DPIRD, OEPA].	Management framework	M
	8. Ensure appropriate liaison regarding the introduction or maintenance of navigation infrastructure within the marine park [DoT, DBCA].	Management Intervention and Visitor Services	L
	9. Where mining, petroleum and pipeline activities have been approved, allow access for mining, petroleum and pipeline activities (e.g. ship loading facilities) within the Ganbadba Sanctuary Zone, Traverse Island Special Purpose Zone (recreation and conservation) and general use zones where required [DMIRS, DoT].	Management framework	L

10. Understanding country

Strategic objective:
To increase understanding of the values of the marine park through research and monitoring to guide, adapt and improve management

10.1 Research

Developing a sound understanding of the ecological, cultural and social values of the marine park is essential for effective management. The joint management arrangements for the marine park will rely significantly on western science and Indigenous knowledge working together. This will ensure the best available knowledge base for making decisions about Dambeemangarddee country that provide social, economic, cultural and environmental benefits for all (Austin *et al*. 2019). The Kimberley Indigenous Saltwater Science Project (KISSP) undertaken by the Western Australian Marine Science Institution (WAMSI) has produced a range of documents that seek to build capacity for collaborative management of Kimberley saltwater country. Research projects should be developed to address key knowledge gaps for ecological, cultural and social values that are most relevant to the management of the marine park.

DBCA'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. The program will work in liaison with the JMB to ensure that cultural values and traditional knowledge is used in the development of collaborative research plans.

DPIRD's Aquatic Science and Assessment division undertakes research into the status of *jaiya* (fish) stocks over multiple spatial scales and contributes valuable information regarding the status of species targeted by the commercial and recreational fishing sector. DPIRD also undertakes research into ecosystem and habitat characteristics to inform broader ecosystem-based fisheries management within the Kimberley region, including the marine parks that lie within it.

10.1.1 Permits

Organisations that intend to carry out research within the Lalang-gaddam Marine Park will require a permit. This will ensure that the JMB:

- can maintain a record of research carried out in the marine park and nature reserve,
- directs research effort where it is needed so that it is most relevant to management,
- collaborates with researchers where possible, and
- communicates research outcomes with others.

Additional permits or special permission may also be required from DBCA to take flora and fauna and from DPIRD to carry out research on *jaiya* (fish) (as defined in the FRM Act) in the marine park, particularly if the activity would otherwise be prohibited, such as the take of protected *jaiya* (fish) or the use of prohibited fishing gear.

Cultural research within the park needs to take into account Indigenous Cultural Intellectual Property and World Intellectual Property Organisation Principles. In culturally sensitive areas, Dambeemangarddee Traditional Owners may deem it appropriate for advisers to accompany researchers in their work. Findings from the research should be made available in full to DAC and the JMB for review and any culturally sensitive matter deemed 'unsuitable for public view' omitted from publication.

Specific management strategies for ecological and social values implemented under the research program are described in sections 7,8 and 9. A summary of the generic management objectives, strategies and targets for the research program are described in the table below.

Summary of management arrangements for research			
Requirements	• Suitable access to the marine park for cultural, ecological and social research. • Access to representative sites in areas free of human impacts for scientific reference sites and in areas with human activities for impact reference sites.		
Management objectives	• To obtain increased understanding of the biodiversity, biocultural and cultural values and key ecological process and socio-economic uses within the marine park to inform management. • To promote research that improves knowledge of the values of the marine park to inform management decisions. • To maximise the integration of conservation science with traditional knowledge in all aspects of research within the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. In consultation with Dambeemangarddee Traditional Owners prepare a collaborative prioritised marine research plan that: • utilises existing traditional knowledge and cultural values • includes further research on Indigenous cultural values • integrates research on traditional knowledge and cultural values with Western science programs; • addresses key gaps in knowledge for ecological values of the marine park, including threatened species and species of special conservation significance.	Research	H-KMS
	2. Ensure granting and renewal of permits relating to scientific research is consistent with the management plan [DPIRD].	Research	H-KMS
	3. Spatially and qualitatively characterise human use of the marine park by recreational and commercial users [DPIRD].	Research	H-KMS
	4. Ensure outcomes from the research plan are used to prepare and implement a coordinated and prioritised long-term monitoring plan and are incorporated into adaptive marine park management [DPIRD].	Research	H-KMS
	5. Develop scientific and research protocols and partnership agreement frameworks through the JMB that support genuine scientific/research partnerships with DAC [DPIRD].	Research	H
	6. Develop and implement protocols to ensure research is culturally appropriate and that information shared by Dambeemangarddee Traditional Owners is used in a culturally appropriate manner [DPIRD].	Research	H
	7. Provide opportunities for Dambeemangarddee Traditional Owners including rangers and departmental staff to be involved and trained in research applicable to the management of the marine park.	Research	H

Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	8. Ensure findings of research by external organisations is shared with Dambeemangarddee Traditional Owners, DBCA and DPIRD.	Research	H
	9. Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	Research	M
	10. Identify and communicate high priority research projects which address key knowledge gaps to appropriate external organisations and funding bodies [DPIRD].	Research	M
	11. Facilitate or support research in the park, including projects by external organisations, by providing assistance where possible [DPIRD].	Research	M
	12. Liaise with industry, other government agencies and non-government organisations to access information held on ecological research in the area [DPIRD].	Research	L
	13. Investigate mechanisms to work with commercial operators engaged in wildlife viewing to collect basic information e.g. position and behaviour to assist with research and monitoring.	Research	L
Performance measure	Research plans have been developed and approved by the JMB, and research activities as detailed in the plan have been implemented.		
Targets	• Preparation and implementation of marine park research plans. • Number of current and completed research projects. • Number of values, including high priority values currently being researched.		
Reporting	To be determined.		

Shorisha Ozies, Karis Erceg and Daphne measuring turtle tracks. Photo – Daniel Barrow.

10.2 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 cultural and ecological values with management targets identified as KPIs. Traditional knowledge will also be used in monitoring and adaptive management of the marine park. It will also be important to monitor human-use patterns, trends and interactions in the marine park, and the protection and maintenance of cultural values and activities.

DBCA, in collaboration with joint management partners around the State is progressively implementing the Marine Monitoring Program (MMP), a systematic marine monitoring program in the State's marine parks and reserves, to improve understanding of management effectiveness, and to inform future research, monitoring and decision making.

DBCA's Marine Science Program coordinates the Marine Monitoring Program in collaboration with the JMB, DBCA's West Kimberley District and other science providers. DPIRD's Aquatic Science and Assessment division monitors *jaiya* (fish) and aquatic resources throughout the State, including within marine parks to ensure stocks are maintained at sustainable levels. It reports on the state of Western Australia's commercial and recreational fisheries annually, and also monitors biosecurity issues such as introduced marine pests and diseases.

Monitoring of the Lalang-gaddam Marine Park will focus on determining trends in key ecological, cultural and social values within a 'condition-pressure management response' framework that measures the 'health' of values and the key pressures acting on them against defined management targets. Sections 7, 8 and 9 details the performance indicators for the key cultural, ecological and social values of the marine park. Where required, interim management targets will be developed or further refined to reflect meaningful short-term steps in achieving the longer-term management targets and reserve objectives. Additional strategies may be required throughout the life of the plan to ensure effective management of marine park values. Where new strategies are required, and it is appropriate to do so, key stakeholder consultation will occur prior to implementation.

Mangrove survey in the Lalang-gaddam Marine Park. Photo – Daniel Barrow, DBCA.

Summary of management arrangements for monitoring	
Requirements	• Access to suitable areas within the marine park for monitoring purposes. • Access to representative sites in areas free of human impacts for scientific reference sites and in areas with human activities for impact reference sites.
Management objective	To monitor key cultural, ecological and social values in the marine park within a 'condition-pressure-management response' framework, to provide knowledge to assess, adapt and improve management.

Summary of management arrangements for monitoring cont		Management program	Priority
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Develop and implement a prioritised collaborative and coordinated monitoring program that; • assesses the effectiveness of the zoning scheme and management arrangements for protection of the park values, with a focus on condition, pressure and response indicators and metrics for high priority values. • assesses the nature, level and potential impacts of pressures (from human activities and external pressures such as climate change), including the provision of early warning of critical changes in pressures on park values. • provides a better understanding of the dynamic nature of undisturbed marine ecosystems as reference points for comparisons with altered environments. • uses traditional knowledge and where possible provides capacity building and employment opportunities for Traditional Owners. • meets Commission requirements for assessing the implementation of the plan [DPIRD].	Monitoring	H-KMS
	2. Support Dambeemangarddee People to develop and apply longer term management targets and performance measures for Aboriginal culture and heritage values.	Monitoring	H
	3. Provide necessary information and support for assessments of management plan implementation by the Commission [DPIRD].	Management framework	H
	4. Develop and apply management targets to cultural, ecological and socio-economic values identified through the research and monitoring programs.	Monitoring	M
	5. Ensure records are kept of any stranded marine fauna.	Monitoring	M

Performance measure	Monitoring plans have been developed and approved by the JMB, and monitoring activities as detailed in the plan are being implemented.
Targets	• Preparation and implementation of marine park monitoring plans. • Number of values, including high priority values currently being monitored.
Reporting	To be determined.

11. Climate change

Climate change refers to changes in weather patterns (i.e. temperature, rainfall) and associated changes in oceans, land surfaces and ice sheets, occurring over a period of decades or longer (CSIRO & BoM 2015, Australian Academy of Science 2020). The effects of ocean warming and sea level rise due to climate change are currently impacting the marine environment globally and is considered to be one of the greatest threats to marine life (Intergovernmental Panel on Climate Change 2019). The ecological impact of climate change including increased temperatures and frequency of episodic events such as heatwaves in the marine environment can range from species shifting their geographic ranges, seasonal activities and migration patterns to *waddaroo* (coral) bleaching events, decreased ocean productivity and greater incidence of disease (Hoegh-Guldberg & Bruno, 2010). This can in turn affect cultural and social values by changing the ecological health of the marine resources upon which customary, recreational and commercial activities rely.

Establishing marine protected areas can contribute to maintaining climate change resilience and rebuilding ecological and social resilience (IUCN, 2017). Protection of coastal carbon-rich habitats such as *jindirm* (mangrove) and *julum* (seagrass) help to ensure that carbon is not released from the loss and degradation of those areas. Additionally, effective management of human use and local pressures can help to maintain or increase ecosystem health thereby increasing resilience to external pressures such as climate change. Although marine protected areas can contribute to reducing local stressors, they do not protect against the impacts of climate change, which is one of the biggest challenges that marine protected area managers face.

Little is known about the current impact of climate change on the values of the Lalang-gaddam Marine Park but climate change is considered to be the greatest pressure on the health of the ecological, cultural and social values of the park (Boschetti *et al.* 2020). Sea-surface temperature in the Kimberley is predicted to rise by 2.2-4.0°C by 2030, which is likely to exacerbate heat stress and threaten the persistence of intertidal communities (Kendrick *et al.* 2018). Climate change impacts are already being recorded in the Kimberley region and the frequency of such events are predicted to increase. A *waddaroo* (coral) bleaching event in the near shore region of the Kimberley close to the marine park was recorded in the summer of 2016 (McCulloch *et al.* 2017, Le Nohaïc *et al.* 2017). This was followed by some more incidents of bleaching in 2020 (DBCA, unpublished).

Research and monitoring programs have an important role to play in understanding the effects of climate change and the development of effective adaptive management responses. Management to reduce the impacts of climate change on the marine park will focus on:

- increasing knowledge and understanding of the effects of climate change on the values of the park
- monitoring the effects of climate change on the values and pressures of the marine park
- increasing the health and resilience of ecosystems through the sound management of human uses and local pressures (see sections 6-9)
- undertaking local adaptive management.

Summary of management arrangements for climate change			
Management objective	To increase understanding of climate change on the marine park and increase the resilience of values to climate change.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Undertake research to better understand the emerging and predicted impacts of climate change on ecological and biocultural values.	Research	H
	2. Educate marine park users about the effects of climate change on the values of the marine park and encourage users to reduce their carbon emissions where possible.	Education and interpretation	H
	3. Support international and national climate change initiatives and where possible develop regional and local level adaptive management responses for the protection of park values, informed by research and monitoring outcomes.	Management framework	H
	4. Monitor marine park values and the climate-related pressures acting on them to inform the development of local and regional level adaptive management responses for the protection of park values.	Monitoring	H
	5. Assess areas, habitats and species which are most at risk to the effects of climate change and increase their resilience by reducing other pressures where possible [DPIRD].	Research	H

Waddaroo (coral) bleaching in the Kimberley. Photo – Claire Ross, DBCA.

Jindirm (mangroves) at Three Ways - Photo Will Robbins, DBCA

12. Plan implementation and operation Sections

Sections 6 to 11 outline the management objectives, strategies, performance measures and targets required to achieve the strategic objectives of the marine park. To successfully implement these strategies a number of supporting management strategies are required to effectively administer the park, support overall management and ensure compliance with management arrangements.

12.1 Administration and governance

The following strategies will ensure appropriate legal, administrative, financial, governance, human resources and data management arrangements are in place to effectively implement and operate the marine park in a collaborative setting. A five-year review will be undertaken and if the management plan is to be amended, the proposed changes will be released for public comment. This plan will remain in place until a new plan is approved.

Summary of management arrangements for administration and governance			
Management objective	To ensure the marine park has appropriate legal, administrative, financial, operational and human resource frameworks in place so that it is effectively jointly managed in partnership with Dambeemangarddee Traditional Owners and in a collaborative setting with other agencies.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Implement all legal provisions necessary to establish and jointly manage the marine park, including registration of ILUAs; execution of JMAs; reservation of intertidal areas within the marine park; gazettal of a CALM Act classified waters notice; and FRM Act fisheries management orders. [DBCA, DPIRD, DoT, DMIRS].	Management framework	H-KMS
	2. Work with DAC and Dambeemangarddee Traditional Owners to develop commercial tour operator licence conditions to manage access in special purpose zones (cultural protection) to ensure activities including fishing is compatible with the purpose of protecting the value of the land and waters to the culture and heritage of Traditional Owners.	Management framework	H-KMS
	3. Develop and implement joint collaborative operational plans [**DPIRD**].	Management framework	H-KMS
	4. Ensure the objectives detailed in the JMAs are applied to all management activities in the marine park.	Management framework	H-KMS
	5. Develop and maintain appropriate staff structures and operational equipment, including vessels and infrastructure to implement the plan and JMA effectively [DPIRD (subject to funding)].	Management framework	H-KMS
	6. In accordance with DPIRD's responsibilities under the FRM Act, *Pearling Act 1990*, and ARM Act (when implemented), develop a framework for DPIRDs involvement in the joint management of the marine park including mechanisms for DPIRD to attend JMB meetings [DPIRD].	Management framework	H-KMS

Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	7. Consult as necessary in regard to the issuing and renewal of licences, leases and permits under the BC Act, CALM Regulations, FRM Act and *Pearling Act 1990* [DPIRD].	Management framework	H
	8. Where possible, work with neighbouring land and water managers to reduce environmental impacts on marine park values such as regulating sewage discharge [KPA, DoT].	Management framework	H
	9. Develop induction materials for new JMB members and DBCA staff to acquaint them with the marine park and the role of the JMB.	Management framework	H
	10. Develop and implement a monitoring and evaluation framework to assess joint management effectiveness for the marine park [DPIRD].	Management framework	H
	11. Provide licences and permits with appropriate conditions where required [DPIRD, the Commission, JMB].	Management framework	H
	12. Undertake and/or support feasibility studies for establishing and using seasonal land-based camps for marine park operations.	Management framework	H
	13. Undertake a five-year review (within five years of the date of the CALM Act s62 classified waters notice for the amalgamated parks) of the adequacy of management arrangements, including the zoning scheme, for the marine park [DPIRD].	Management framework	H
	14. DPIRD to provide advice to the JMB and attend meetings as required **[DPIRD]**.	Management framework	H

12.2 Zoning

The implementation of an appropriate zoning scheme is an important strategy for the conservation of marine biodiversity, increased recognition and protection of culturally significant areas and customary practices and the management of human use in the marine park. Importantly the application of the zoning scheme should not be viewed in isolation but as one tool in a suite of complementary tools available to marine park managers to achieve desired ecological, cultural and social outcomes.

12.2.1 Zoning design

The national guidelines for establishing marine protected areas recommend that IMCRA bioregions form the basis for reserve design, with one or more examples of conservation features (e.g. habitats and ecosystems) found in each bioregion represented in highly protected zones (Australian and New Zealand Environment and Conservation Task Force on Marine Protected Areas, 1999). The Lalang-gaddam Marine Park spans two bioregions; the Kimberley Bioregion and the King Sound Bioregion. To complement the bioregional framework, a network-based approach was taken, considering existing marine parks in the Kimberley region.

The zoning scheme for Lalang-gaddam Marine Park includes:

- 19 sanctuary zones covering approximately 255,340 hectares or 20 percent of the marine park
- three special purpose zones (cultural protection) covering approximately 4,160 ha or <1 percent of the marine park
- four special purpose zone (biocultural conservation) covering approximately 36,200 or 3 percent of the marine park

- three special purpose zones (recreation and conservation) covering approximately 27,210 ha or 2 percent of the marine park
- one special purpose zone (pearling) covering approximately 57,710 hectares or 4 percent of the marine park
- one special purpose zone (whale conservation) covering approximately 168,260 hectares or 13 percent of the marine park
- one special purpose zone (wilderness conservation) covering approximately 24,800 hectares or 2 percent of the marine park
- general use as the remainder of the park covering 715,000 ha or 55 percent of the park.

Maps 6-15 show the zoning scheme for the Lalang-gaddam Marine Park and a summary of the activities permitted in each zone is presented in Table 1.

Design of the zoning scheme was guided by a set of principles which aim to provide for natural, cultural, recreation, tourism and other sustainable use values (see Appendix 1).

The zoning scheme is based on a comprehensive, adequate and representative (CAR) approach. It aims to protect ecologically and culturally important high priority values such as *jindirm* (mangroves), *waddaroo* (coral) reefs, *julawaddaa* (turtles) and *waliny* (dugongs), with consideration of the level of current and projected future pressures on these values. The zoning is designed to provide connectivity from upstream estuarine environments out to deeper water and offshore islands and provide complementarity to adjacent reserves.

For Dambeemangarddee people, many ecological or natural values also have particular cultural significance. The sanctuary zoning will protect and conserve Aboriginal cultural heritage values including culturally important *waddaroo* (coral) reefs, *galaab* (beaches) known to be important access points for *julawaddaa* (turtles) nesting, important nursery areas for *jaiya* (fish) and other marine fauna in *jindirm* (mangrove) and estuarine systems, and aggregation areas for culturally important marine fauna such as *julawaddaa* (turtles), *waliny* (dugongs), *ngunubange* (whales) and *jigeedany* (dolphins). The inclusion of these areas in sanctuary zones will contribute to meeting Dambeemangarddee aspirations to protect Sea Country and align with objectives and targets identified in the Dambimangari Healthy Country Plan. The zoning scheme also provides for ongoing customary uses such as fishing and hunting.

The zoning scheme recognises and allows for recreation and tourism and allows for ongoing sustainable use by considering the needs of other park users such as commercial and recreational fishers. The inclusion of sanctuary zones in the Lalang-gaddam Marine Park creates important opportunities for education, research and monitoring. By comparing sanctuary zones (as benchmarks) to other areas with similar habitats/ecosystems that allow extractive use a better understanding can be gained of local and regional pressures on the marine environment over time.

Where possible, the zoning scheme has been designed to be easy for users to understand and comply with e.g. creating zones with straight line boundaries which align with degrees of longitude and latitude and/or aligning boundaries with prominent features on the coast or islands.

Ultimately the zoning scheme aims to ensure the park is managed to maintain ecosystem function and increase ecosystem resilience. The sanctuary zones play a central role in this, by creating 'no take' areas to support the healthy functioning of the complex ecosystems that make up the park.

To ensure consistency and efficiency of management arrangements across the neighbouring Bardi Jawi Gaarra, Mayala and Lalang-gaddam Marine Parks and Sea Countries, some zones extend across the parks. The different parts to the zone may have different names depending on which marine park it is in, reflecting the different language groups. If zone descriptions are not available in this management plan for small sections of a zone, please refer to the Mayala Marine Park Joint Management Plan.

12.2.2 Sanctuary Zones

The sanctuary zones play a central role in protecting areas of critical habitat to maintain the healthy functioning of the complex ecosystems that make up the marine park. Sanctuary zones act as benchmarks to compare to other areas with similar habitats and ecosystems that are subject to extractive use. This allows managers to gain a better understanding of local and regional pressures on the marine environment over time. As such, sanctuary zones provide important opportunities for education, research and monitoring. For Dambeemangarddee People, many ecological values also have a particular cultural significance and the sanctuary zoning will also contribute to the protection and conservation of Dambeemangarddee cultural heritage values including culturally important *waddaroo* (reefs) and *jindirm* (mangroves). Sanctuary zones can help to increase ecosystem health by reducing pressures on the ecosystems protected, thereby increasing resilience to external pressures such as climate change. Modelling by Boschetti *et al.* 2020 has shown that sanctuary zones in the Kimberley can be particularly beneficial increasing resilience of climate change to exploited fauna such as *ilerdda* (barramundi), snappers (e.g. Lutjanus spp) and Emperors (e.g Lethrinus spp) and for relatively sedentary species such as reef fishes (e.g. Choerodon spp, Scarus spp, Cheilinus spp).

Unarloo Sanctuary Zone – Robinson River

The Unarloo Sanctuary Zone protects representative habitats in the King Sound Bioregion including important intertidal areas, large expanses of *jindirm* (mangroves) and intertidal mudflats. The zone will also protect important animals including *ganbaneddee* (crabs), *jaiya* (fish) and *julawaddaa* (turtles). The *jindirm* (mangroves) of the Unarloo Sanctuary Zone provide an important nursery area for a variety of *jaiya* which depend solely on *jindirm* (mangroves) for their recruitment (Depyczynski *et al.* 2017). Additionally, research on sawfish in the King Sound region have shown that the tidal creeks of King Sound are important to *Glyphis* sp (Thorburn and Morgan 2004). The Unarloo Sanctuary zone will protect sawfish from entanglement in commercial fishing nets which has been identified as the main threat to sawfish populations in the Kimberley region (Stevens *et al*. 2008).

Jindirm (mangroves). Photo – Michael Higgins, DBCA.

Oobagooma Sanctuary Zone

The Oobagooma Sanctuary Zone protects representative habitats in the King Sound Bioregion including important intertidal areas, large expanses of *jindirm* (mangroves) and intertidal mudflats. The zone will also protect important animals including *ganbaneddee* (crabs), *jaiya* (fish) and *julawaddaa* (turtles). The zone adjoins with the Janawan sanctuary zone in the Mayala Marine Park which will protect *galagalaarddee* (flatback) turtle nesting on Helpman Island, the most significant *julawaddaa* (turtle) nesting area in the Mayala Marine Park (Whiting *et al.* 2018).

Dijee Sanctuary Zone – Pecked Island

The Dijee Sanctuary Zone protects representative examples of *waddaroo* (coral) reef, *julum* (seagrass) habitats and *jindirm* (mangrove) habitat in the Kimberley Bioregion. This area provides important habitat for foraging *julawaddaa* (turtles) and *waliny* (dugongs). Visitors are advised to take care when visiting this sanctuary zone, particularly around 'Hell's Gate' where the large tidal range rushing through this narrow passage creates large and dangerous whirlpools, overfalls and rips.

Yaloon Sanctuary Zone – Cone Bay

The Yaloon Sanctuary Zone protects representative examples *jindirm* (mangrove) and intertidal sand and mudflats which provides habitat for a variety of ecologically and culturally important marine animals including *julawaddaa* (turtles) and *goiyoiya* (estuarine crocodiles).

Bordo Sanctuary Zone – Sir Richard Pass

The Bordo Sanctuary Zone protects representative examples of a *waddaroo* coral (reef) and *julum* (seagrass) habitats for culturally important marine animals including *jaiya* (fish) and *julawaddaa* (turtles). A large blue hole in the reef, which is of cultural and ecological significance is protected in this zone.

Bordo (Sir Richard Pass). Photo – Liz Vaughan/Francis Woolagoodja, DAC.

Bullbull Garimba Sanctuary Zone – Whirlpool Passage

The Bullbull Garimba Sanctuary Zone which extends into the Mayala Marine Park protects important intertidal *waddaroo* (coral) reef habitat in the Kimberley Bioregion. *Bullbull Garimba* (Whirlpool passage) is a three mile 'S' bend passage which has tidal flows in excess of 10 knots and can have large and deep whirlpools.

Bullbull Garimba (Whirlpool Passage). Photo – Liz Vaughan/Francis Woolagoodja, DAC.

Waddaddam Sanctuary Zone – Coppermine Creek

The Waddaddam Sanctuary Zone protects representative examples of marine biodiversity including *jindirm* (mangroves), *waddaroo* (reefs) and intertidal mudflats in the Kimberley Bioregion. The designation of the Coppermine Creek Sanctuary Zone is dependent on the relinquishment of the port waters from the Port of Yampi Sound.

Waddaddam (Coppermine Creek) Photo – Michael Higgins, DBCA.

Ganangudee Eewule Sanctuary Zone – Dog Leg Creek

The Ganangudee Eewule Sanctuary Zone protects representative examples of marine biodiversity including *jindirm* (mangroves) and intertidal mudflats in the Kimberley Bioregion. The designation of the Ganangudee Eewule Sanctuary Zone is dependent on the relinquishment of the port waters from the Port of Yampi Sound.

Arbeeday Sanctuary Zone – Macleay Island

The Arbeeday Sanctuary Zone protects representative examples of marine biodiversity in the Kimberley Bioregion including fringing *waddaroo* (coral) and *jirdarm* (algal) reefs. The marine environment surrounding Macleay Island is important for species of soft *waddaroo* (coral) such as gorgonians and sea whips and has a high diversity of molluscs.

Ganbadba Sanctuary Zone – Talbot Bay

Ganbadba Sanctuary Zone protects features of the Buccaneer Archipelago and representative examples of habitats from deep subtidal (50 – 100m) to shallow (<10m) intertidal habitats including *jindirm* (mangrove communities), fringing *waddaroo* (coral) reefs and *julum* (seagrass beds) in *Ganbadba* (Talbot Bay). This zone supports a rich diversity of fauna and species of special conservation interest such as *julawaddaa* (turtles), *waliny* (dugongs) and *jigeedany* (dolphins). Indo-Pacific humpback and snubfin dolphins forage, breed and calve in *Ganbadba* (WWF, 2009). Ganbadba Sanctuary Zone includes the ecologically important and geomorphologically unique Turtle Reef, a terracing *jirdarm* (algal) reef over 25km^2, which has a diverse *waddaroo* (coral) community, rhodolith beds and *julum* (seagrass) patches (Wilson et al. 2011; Kordi et al. 2016). Reef walking will not be permitted on Turtle Reef. The zone also protects part of an unusual shelf canyon which is not found extensively elsewhere in the Kimberley Bioregion. Many reefs, *galaab* (beaches) and islands in *Ganbadba* are culturally important to Dambeemangarddee people and are inhabited by culturally important animals such as *julawaddaa* (turtles) and *waliny* (dugongs) (*DAC* 2012). Ganbadba Sanctuary Zone provides for conservation, recreation and tourism in an area valued by the public for its aesthetic qualities, appealing physical landscape and recreational opportunities (Strickland-Munro et al. 2014).

Garaanngaddim Sanctuary Zone - Horizontal Falls/Poulton Creek

Garaanngaddim Sanctuary Zone protects the shallow (0-10m) bay behind *Garaanngaddim* (Horizontal Falls) and includes representative areas of *jindirm* (mangrove communities) which are ecologically and culturally important nursery areas, and shallow filter-feeding communities including sponges and soft *waddaroo* (corals). The area is culturally significant to Dambeemangarddee people and features in their oral traditions for the creation of *Garaanngaddim*. Garaanngaddim Sanctuary Zone provides for conservation, recreation and tourism in an area valued for its tourism, aesthetic qualities and appealing physical landscape (Strickland-Munro et al. 2014).

Garaanngaddim (Horizontal Falls). Photo – Chloe Rings, DBCA.

Mooloogoob Sanctuary Zone - Kingfisher Island

Mooloogoob Sanctuary Zone extends from *Mooloogoob* (Kingfisher Island), the northern island of *Mooloogoob* (the Kingfisher Islands group) to Muir Island in the north-west of the zone. The zone protects offshore island forming habitats including an ecologically and culturally significant fringing platform *waddaroo* (coral) reef system extending between *Mooloogoob* and Muir islands. The reef systems surrounding the islands also include *jirdarm* (macroalgae), and soft *waddaroo* (coral) and other filter-feeding communities. Reef walking will not be permitted on intertidal reefs in this zone. The waters surrounding the islands are ecologically and culturally important for *julawaddaa* (turtles) and *waliny* (dugongs), and humpback whales can be spotted in the area during the calving season between June and November (Costin and Sandes, 2009). The intertidal areas include *galaab* (beaches) which are important access points for *julawaddaa* (turtles) nesting in adjacent supratidal areas and one of the most diverse *Jindirm* (mangrove) communities on islands surveyed in the Kimberley, with 10 species recorded (Wilson, 2013). *Jindirm* (mangroves) on the island provide an important habitat for a variety of wildlife such as the collared kingfisher (*Todiramphus chloris sordidus*) (Johnstone pers. comm. 2015). The intertidal area surrounding the islands is highly significant to Dambeemangarddee people with many culturally important sites.

Ilerdda Sanctuary Zone - Walcott Inlet

Ilerdda Sanctuary Zone encompasses the largest mapped tidal delta in the Kimberley Bioregion. The zone in *Ilerdda* (Walcott Inlet) includes representative examples of *jindirm* (mangrove) and *galow* (saltmarsh) communities, intertidal mudflats and subtidal filter-feeding communities. It includes part of a unique flood delta and an inshore deep water (50-100m) channel. The *Ilerdda galow* (saltmarsh) system is the largest mapped in the Kimberley (Dyall et al. 2005) and covers approximately 7,900ha. The inlet's extensive intertidal mudflats are up to 5km wide and support a large number of migratory water *banarddee* (birds) including whimbrels (*Numenius phaeopus*) and grey-tailed tattlers (*Tringa brevipes*) (Willing pers. comm. 2013). Dambeemangarddee people know that *Ilerdda* is important for *ngunubange* (whales), *jigeedany* (dolphins), *waliny* (dugongs) and *julawaddaa* (turtles). The turbid coastal waters of the inlet are also likely to provide favourable habitat for sawfish. *Ilerdda* is a culturally important area for mud crabs and an important breeding area for *ilerdda* (barramundi). *Ilerdda* Sanctuary Zone provides for conservation, recreation and tourism.

Ngumbree Sanctuary Zone - Doubtful Bay/Ruby Falls

Ngumbree Sanctuary Zone protects representative areas of shallow (0-10m) habitats, including one of the most significant *jindirm* (mangrove) and intertidal sand and mudflat communities in the marine park. The zone, located in Doubtful Bay includes mudflat habitats which are an important feeding area for migratory waders and manta rays are commonly seen in the area (Willing pers. comm. 2013, 2016). The area is culturally significant to the Dambeemangarddee people and there are oral narratives associated with sites within the *jindirm* (mangrove) system. Dambeemangarddee people know that the area is important as a nursery for mud crabs and for snubfin dolphins that travel into the smaller creek systems within the estuary to eat *jaiya* (fish) (*DAC* pers. comm. 2016). The zone provides for conservation, recreation and tourism in an area popular with commercial operators because of its natural features and access to the adjacent popular swimming hole at Ruby Falls.

Ganjaal Sanctuary Zone - Storr Island/Doubtful Bay/George Water

Ganjaal Sanctuary Zone protects the waters in Doubtful Bay and *Boiwanyinoonoo* (George Water) surrounding Storr Island. *Ganjaal* is the name for Storr Island and the area where *Jaanya* (the Sale River) enters Doubtful Bay. The zone includes representative areas of shallow to deeper water habitats including fringing *waddaroo* (coral) reefs, subtidal filter-feeding communities, estuary channels and tidal sandflats. The zone contains a number of sites important to Dambeemangarddee people including culturally important platform reefs and extensive sandflat habitats. *Ngumbree* and *Boiwanyinoonoo* are known as highly productive parts of Dambeemangarddee Sea Country receiving freshwater inputs and nutrients from the land and are known as important nursery areas for prawns and fish.

Diddinyja Sanctuary Zone- Gairdner River

Diddinyja is the name for the area of *Molor Moloiyn* (Gairdner River) within the sanctuary zone which relates to the *jindirm* (mangrove) and intertidal areas. Diddinyja Sanctuary Zone provides representative examples of *jindirm* (mangrove), *galow* (saltmarsh) and intertidal mudflat communities, and is an important breeding area for *goiyoiya* (estuarine crocodiles) (*DAC* pers. comm. 2016). *Molor Moloiyn* (Gairdner River), adjacent to ALT Reserve 23079 and part of the Dambeemangarddee IPA, is particularly important to Dambeemangarddee people and is an important nursery area for *jaiya* (fish) such as *ilerdda* (barramundi) and mud crabs (Dambeemangarddee Traditional Owners, pers. comm. 2014, 2016).

Deewai Sanctuary Zone - Lower section of Three Ways

Deewai Sanctuary Zone protects an ecologically and culturally significant area of dense, shallow *jindirm* (mangrove) habitat. Dambeemangarddee people know the area as an important nursery area for *jaiya* (fish) and breeding area for *banarddee* (birds). Important cultural resources such as 'sugar bag' or wild honey can be found in the hollows of some *jindirm* (mangroves) trees. Dambeemangarddee people have also identified the *jindirm* (mangroves) in this area as an important refuge for fauna including snakes and possums.

Yowjab Sanctuary Zone - Montgomery Reef area

Yowjab Sanctuary Zone protects one of the most outstanding geological marine features of the Kimberley Bioregion, and the abundant and diverse marine life supported by its *waddaroo* (coral) and rhodolith reef system. This enormous intertidal reef is fundamentally linked with the ecological function of the surrounding waters which are rich in *waddaroo* (coral), sponge, *jirdarm* (algae), *julum* (seagrass), *julawaddaa* (turtles), finfish, sharks, *waliny* (dugongs), *goiyoiya* (estuarine crocodile) and sea *banarddee* (birds). Sea *banarddee* (birds) nesting on *Yowja*b (Montgomery Reef), including white breasted sea eagles, forage on the reef top and surrounding waters. *Yowjab* (Montgomery Reef area) is one of many areas of high cultural significance to the Dambeemangarddee Traditional Owners who are 'saltwater country' people who used both the land and sea. This zoning provides a high level of protection for representative examples of the reef and associated species and assemblages, free of extractive disturbance. The zone provides for passive recreation and tourism

Memendba Sanctuary Zone – Champagny Island

Memendba Sanctuary Zone surrounds a number of islands in the vicinity of Champagny Island. Memendba Sanctuary Zone is located more than 50 kilometres (approximately 30 nautical miles) 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. It includes a series of offshore reefs more than 50 kilometres from the mainland on the westernmost extent of the marine park. Marine life in the northern part of the marine park is considered to be of outstanding diversity and in good condition. Many *waddaroo* (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 of complex habitats and associated species and communities in an area free of extractive disturbance. The zone provides for passive recreation and tourism

12.2.3 Special purpose zones (cultural protection)

The special purpose zones (cultural protection) play an important role in protecting the value of Dambeemangarddee country to the culture and heritage of Dambeemangarddee people. The conservation purpose of the special purpose zones (cultural protection) is to protect and conserve culturally sensitive geographical areas and features that are significant to Dambeemangarddee people. These areas may contain tangible values such as seasonal camping areas, areas important for customary food and other resources and culturally significant features such as cultural sites, *waddaroo* (reefs), *julum* (seagrass) beds and *jindirm* (mangrove) communities. They may also contain intangible values such as those related to Law, ceremony and oral histories. Achieving protection of cultural and heritage values will require protection of environmental values as there is often a high level of interdependence and correlation between them. For Dambeemangarddee People, their country is more than a simple geographic location, it includes all living things, incorporating people, plants, animals, seasons, stories, and spirits. Dambeemangarddee people carry the responsibilities of their ancestors to manage and speak for country, which has been recognised in Australian Law through a native title determination process. Inappropriate access and/or use of country can have significant consequences under Aboriginal Law.

Dambeemangarddee People have used, relied on, enjoyed and protected country over thousands of years and continue to do so today. The special purpose zones (cultural protection) will protect the areas within their country which are of the greatest cultural significance. While cultural and heritage values apply across the whole of the marine park, customary activities are more likely to be carried out in the special purpose zones (cultural protection) compared to other areas in the marine park. Although Dambeemangarddee People do not permanently live on country, the areas protected in special purpose zones (cultural protection) hold high cultural significance and continue to be visited and used.

As the Traditional Owners, custodians of country and custodians of knowledge of country, Dambeemangarddee People provided advice on the known or potential impacts from activities so that compatibility with these special purpose zones (cultural protection) zones could be determined. In general, all forms of extractive commercial and recreational use are considered incompatible, with the exception of some activities that can be adequately managed to minimise any detrimental effects to the value of the land[6] and sea to the culture and heritage of Dambeemangarddee People. This includes the commercial trochus fishery and tourism operations (including charter fishing) managed through licences or other authorisations. Activities that cannot be adequately managed to ensure they do not have an unacceptable impact on the conservation purpose of protecting the value of the land and sea to the culture and heritage of Dambeemangarddee people are prohibited. This includes most forms of commercial fishing, recreational fishing recreational fishing not undertaken as part of a fishing tour, pearling and aquaculture, as well as other non-fishery related uses such as oil and gas exploration and mining.

Commercial and recreational activities that have an unacceptable impact on the cultural and heritage values are considered incompatible and excluded due to culturally inappropriate land use, culturally inappropriate access, culturally inappropriate behaviours or a lack of appropriate cultural protocols followed in these areas. Visitors and users of the marine park are asked to respect Traditional Owners' requests for privacy while they are undertaking customary activities in these zones.

The commercial trochus fishery is considered to be compatible with the protection of the value of the lands and waters to the culture and heritage of Dambeemangarddee People. Collecting trochus shell was a customary activity undertaken by the Traditional Owners and in recent times has been accepted as a commercial activity in the area by Traditional Owners. The commercial trochus fishery is different to other forms of commercial fishing, which will unacceptably affect the cultural values of the area and associated customary practices by targeting culturally significant species, or risk catching / harming culturally significant species through by-catch.

6 - Land as defined in the CALM Act.

Recreational fishing not undertaken as part of a fishing tour or tourism activity is not considered to be compatible with the conservation purpose of this zone type because it can be disruptive to cultural activities and lead to culturally inappropriate access, particularly to areas important for customary food and other resources. However, the Traditional Owners consider that recreational fishing undertaken as part of a tourism operation, is compatible, provided the activity is subject to a CALM Act licence where licence conditions can be applied to regulate the activity. Licencing will ensure that commercial tour operations, including fishing, are carried out in a culturally appropriate manner and that operators and customers follow cultural protocols.

The designation of special purpose zones (cultural protection) is dependent on the passing of amendments to the CALM Act to update the purpose of marine parks to also have the purpose of allowing only that level of recreational and commercial activity which is consisted with the protection and conservation of the value of the marine park to the culture and heritage of Aboriginal persons.

Oobeeyal Special Purpose Zone (cultural protection) - Inland Sea

The Oobeeyal Special purpose Zone (cultural protection) is formed of 4 parts in Dambeemangardee country and 1 in Mayala country. The part of this zone in Mayala country is called the Ooloogijii Special Purpose Zone. The conservation purpose of the Oobeeyal Special Purpose Zone (cultural protection) is to conserve the value of the land and waters to the cultural and heritage of Dambeemangarddee People. The zone recognises the high cultural value of the area. There are cultural stories associated with this area which has traditionally been used for a variety of customary activities including fishing and hunting. Biocultural values which are protected in this zone include ecologically and culturally important *waddaroo* (reefs) and *jindirm* (mangroves) which provide nursery areas for *jaiya* (fish) and are also important areas for customary activities.

Exposed *waddaroo* (reefs) and *jindirm* (mangroves) in *Oobeeyal* (Inland Sea). Photo – Roanna Goater, DBCA

Garngarngaddaj Special Purpose Zone (cultural protection) - Strickland Bay

This zone is formed of two parts, split by the Garngarngaddaj Special Purpose Zone (cultural protection). The conservation purpose of the Garngarngaddaj Special Purpose Zone (cultural protection) is to conserve the value of the land and waters to the culture and heritage of Dambeemangarddee People. This zone recognises the high cultural value of the area. Significant cultural stories are associated with this area. This zone provides protection to *jindirm* (mangrove) creeks and intertidal mudflat areas across both Dambeemangarddee and Mayala Sea Country. Dambeemangarddee people know the *Garngarngaddaj* (Strickland Bay) area is an important nursery area for *jaiya* (fish and important cultural resources can be found in the hollows of some *jindirm* (mangroves).

Duddgoo Special Purpose Zone (cultural protection) - Graveyards area

The conservation purpose of the Duddgoo Special Purpose Zone (cultural protection) is to conserve the value of the land and waters to the culture and heritage of Dambeemangarddee People. This zone recognises the high cultural value of the area. Large pearl shell beds are exposed during the low spring tides on reefs surrounding islands. Other biocultural values which are protected include *waddaroo* (reefs) and *jindirm* (mangroves) which provide habitat for a variety of *jaiya* (fish) invertebrates, sharks and rays.

12.2.4 Special purpose zones (biocultural conservation)

The purpose of the special purpose zones (biocultural conservation) is to provide for the conservation of ecologically and culturally important marine ecosystems such as *marnany* (reefs) and *jindirm* (mangrove) whilst continuing to allow for low impact recreational and commercial activities.
The special purpose zones (biocultural conservation) will play an important role in protecting the value of Dambeemangarddee country to the culture and heritage of Dambeemangarddee people by protecting important ecological and biocultural values from high impact commercial activities.

To ensure that recreational fishing in these zones does not impact significantly on the important cultural values of these areas, additional fishing regulations will be put in place under the FRM Act. The additional fishing regulations will help to ensure that recreational fishing is carried out in a culturally appropriate manner.

The low impact commercial fishing operations which are deemed to be compatible with the conservation of the cultural and ecological values of the special purpose zones (biocultural conservation) are trochus collection, mackerel fishing, specimen shell fishing, *ganbaneddee* (crab) fishing and sea cucumber fishing. All other commercial fishing, pearling, aquaculture activities are considered to be incompatible with the conservation purpose of this zone and are not permitted.

Oobagooma Special Purpose Zone (biocultural conservation) – Dam and Kimbolton Creeks

The conservation purpose of the Oobagooma special purpose zone (biocultural conservation) is to conserve the ecologically and culturally important marine ecosystems in the area. This zone continues to allow for low impact recreational and commercial activities. This zone will protect habitats in the King Sound Bioregion including important intertidal areas, large expanses of *jindirm* (mangroves) and intertidal mudflats. The zone will also protect important animals including *ganbaneddee* (crabs), *jaiya* (fish) and *julawaddaa* (turtles). A small section of this zone is within the Mayala Marine Park.

Oobeeyal Special Purpose Zone (biocultural conservation) – Inland Sea

The conservation purpose of the *Oobeeyal* (Inland Sea) Special Purpose Zones (biocultural conservation) is to conserve ecologically and culturally important marine ecosystems in the area. This zone continues to allow for low impact recreational and commercial activities. This zone recognises the high cultural value of the area. There are cultural stories associated with this area which has traditionally been used for a variety of customary activities including fishing and hunting. Biocultural values which are protected in this zone

include ecologically and culturally important *waddaroo* (reefs) and *jindirm* (mangroves) which provide nursery areas for *jaiya* (fish) and are also important areas for customary activities. This zone stretches into the Mayala Marine Park and the Mayala part of the zone is called the Oobayal Special Purpose Zone (biocultural conservation), reflecting the different spelling between the languages.

Garngarngaddaj Special Purpose Zone (biocultural conservation) – Strickland Bay

The conservation purpose of the Garngarngaddaj Special Purpose Zone (biocultural conservation) is to conserve ecologically and culturally important marine ecosystems. This zone continues to allow for low impact recreational and commercial activities. This zone recognises the high cultural value of the area. Significant cultural stories are associated with this area. This zone provides protection to *jindirm* (mangrove) creeks and intertidal mudflat areas across both Dambeemangarddee and Mayala Sea Country. Dambeemangarddee people know the *Garngarngaddaj* (Strickland Bay) area is an important nursery area for *jaiya* (fish) and important cultural resources can be found in the hollows of some *jindirm* (mangroves).

Duddgoo Special Purpose Zone (biocultural conservation) – Graveyards

The conservation purpose of the Duddgoo Special Purpose Zone (biocultural conservation) is to conserve ecologically and culturally important marine ecosystems in the area. This zone continues to allow for low impact recreational and commercial activities. This zone recognises the high cultural value of the area. Large pearl shell beds are exposed during the low spring tides on reefs surrounding islands. Other biocultural values which are protected include *waddaroo* (reefs) and *jindirm* (mangroves) which provide habitat for a variety of *jaiya* (fish) invertebrates, sharks and rays.

12.2.5 Special purpose zones (recreation and conservation)

The conservation purpose of the special purpose zones (recreation and conservation) is to protect ecologically and culturally important marine ecosystems, including *jindirm* (mangrove), *waddaroo* (coral) reef and intertidal communities. Recreational and tourism activities are permitted. Commercial gillnet fishing, prawn trawling and ground-disturbing mineral and petroleum exploration and development are considered to be incompatible with the conservation purpose of this zone.

Traverse Island Special Purpose Zone (recreation and conservation) – Traverse Island, Woninjaba Islands/Melomys Island

Traverse Island Special Purpose Zone (recreation and conservation) extends from the coast to Mooloogoob Sanctuary Zone, with the eastern side of the zone extending to the southern border of Lalang-gaddam Marine Park. The zone includes Traverse Island, the Woninjaba Islands and Melomys Island, the southern island of *Mooloogoob* (the Kingfisher Islands group). The zone includes a transect from the coast to offshore, encompassing habitats at different depths, from *jindirm* (mangrove) communities and fringing *waddaroo* (coral) reef communities to deep water channels and deep subtidal habitats. The Traverse and Woninjaba islands include *galaab* (beaches) important for *julawaddaa* (turtles) (Whiting pers. comm. 2015) and sea *banarddee* (bird) nesting. The coastal area around the mainland and Melomys Island contains culturally important sites and reefs and *galaab* (beaches) which are associated with the events of *La Lai* (*DAC* 2012). The conservation purpose of this special purpose zone is to conserve ecologically and culturally important marine ecosystems, including *jindirm* (mangrove), *waddaroo* (coral) reef and intertidal communities. This zone continues to allow for recreational and tourism activities. Commercial gillnet fishing, prawn trawling and ground-disturbing mineral and petroleum exploration and development are considered to be incompatible with the conservation purpose of this zone.

Mooloogoob Special Purpose Zone (recreation and conservation) – Kingfisher Islands

The Mooloogoob Special Purpose Zone (recreation and conservation) is located on the south-west corner of *Moologoob* (Kingfisher Islands) within the Moologoob Sanctuary Zone, adjacent to Crown Lease Lot 16 on Plan 26300. The zone includes shallow (<10m) intertidal habitats including *jindirm* (mangrove) communities and a culturally important sandy beach which is a known access point for nesting *julawaddaa* (turtles). The conservation purpose of this special purpose zone is to conserve ecologically and culturally important marine ecosystems, such as *jindirm* (mangrove) communities. This zone continues to allow for recreational and tourism activities. Planning is currently underway for the development of tourist accommodation facilities in the adjacent Crown lease area. Commercial gillnet fishing, prawn trawling and ground-disturbing mineral and petroleum exploration and development are considered to be incompatible with the conservation purpose of this zone.

Jaanya Special Purpose Zone (recreation and conservation) – Sale River

The Jaanya Special Purpose Zone (recreation and conservation) includes shallow water habitats including intertidal flats, *jindirm* (mangroves) and tidal sands. Species of special conservation interest such as snubfin dolphins reside in *Jaanya* (Sale River) (Willing pers. comm. 2013). The river contains culturally important sites and the whole river system has particular cultural significance to Dambeemangarddee people (*DAC* 2012). *Jaanya* is also known as an important location among commercial tourism operators for wildlife spotting (Scherrer et al. 2008). The conservation purpose of this special purpose zone (recreation and conservation) is to conserve ecologically and culturally important marine and intertidal ecosystems, including habitat for snubfin dolphins. This zone continues to allow for recreation and tourism activities. Commercial gillnet fishing, prawn trawling and ground-disturbing mineral and petroleum exploration and development are considered to be incompatible with the conservation purpose of this zone.

12.2.6 Special purpose zone (whale conservation)

Nyiningjit Special Purpose Zone (whale conservation) – Camden Sound

Nyiningjit Special Purpose Zone (whale conservation) provides management measures that enhance protection in a large portion of the Camden Sound area that is used by humpback whales for calving, nursing and resting. The conservation purpose of this zone is to conserve the diverse range of marine habitats and wildlife including *waddaroo* (coral) reefs, *jindirm* (mangrove), rocky shores, *jigeedany* (dolphins), *waliny* (dugongs), g*oiyoiya* (estuarine crocodiles) and *julawaddaa* (turtles).

12.2.7 Special purpose zone (wilderness conservation)

Jungulu Special Purpose Zone (wilderness conservation) – Jungulu and Augustus islands

Jungulu Special Purpose Zone (wilderness conservation) lies in water north of Jungulu and Augustus islands and includes a series of smaller islands, rocky shoals and coral reefs found in this area. Marine life in the northern part of the marine park is considered to be of outstanding diversity and in good condition. Many *waddaroo* (coral) and sponge species surveyed in this area are expected to be new to science. The conservation purpose of this zone is to conserve representative examples of marine biodiversity to preserve, as closely as possible, the near-natural condition of the habitats, species and natural processes of this remote area. No extractive uses are permitted other than highly restricted recreational fishing where special fishing rules apply that allow a personal possession limit of one fish, or two fillets of *jaiya* (fish) (baitfish excepted).

12.2.8 Special purpose zone (pearling)

Gooddee Special Purpose Zone (pearling) – Kuri Bay

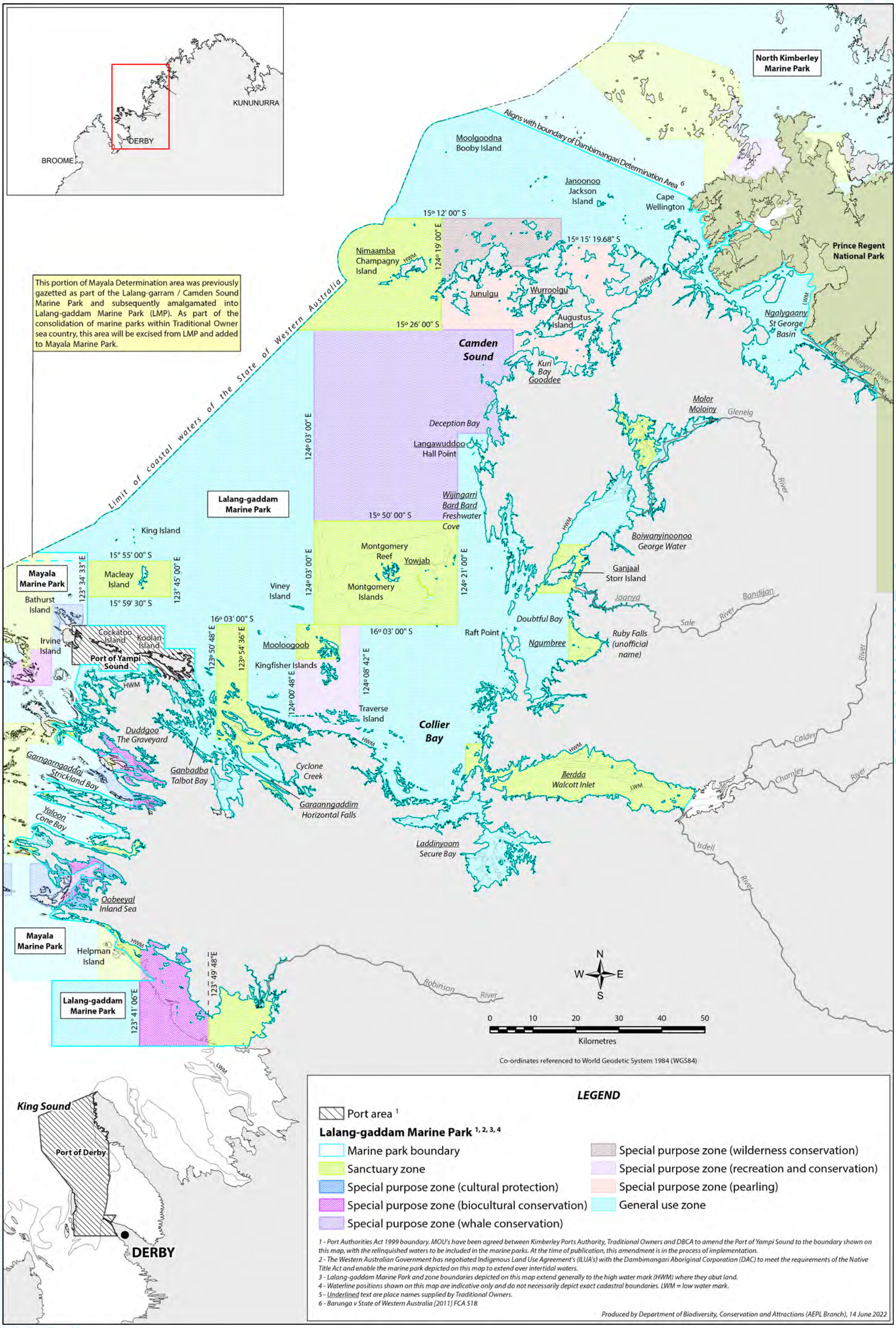
Gooddee Special Purpose Zone (pearling) is located around Augustus Island, has been established to recognise the longest operating and largest cluster of pearling leases in Western Australia. It also provides a significant contribution to the conservation of representative examples of marine biodiversity, including reef systems, as well as a suite of other habitats, species and natural processes. This zone provides management focus to the *Gooddee* (Kuri Bay) area used by pearling operators under authority from DPIRD. This zone supports about 68 square kilometres of pearling leases. It experiences significant tidal flow in the narrow straits between islands making it ideal for pearl production using Western Australia's oyster shell *Pinctada maxima*. The conservation purpose of this zone is to protect Australian snubfin dolphins, Indo-Pacific humpback dolphins, humpback whales, *julawaddaa* (turtles) and sawfish and extensive *jindirm* (mangrove) and subtidal reef. The importance of the area for pearling is recognised by this zone and it remains accessible for other users of the park for appropriate activities.

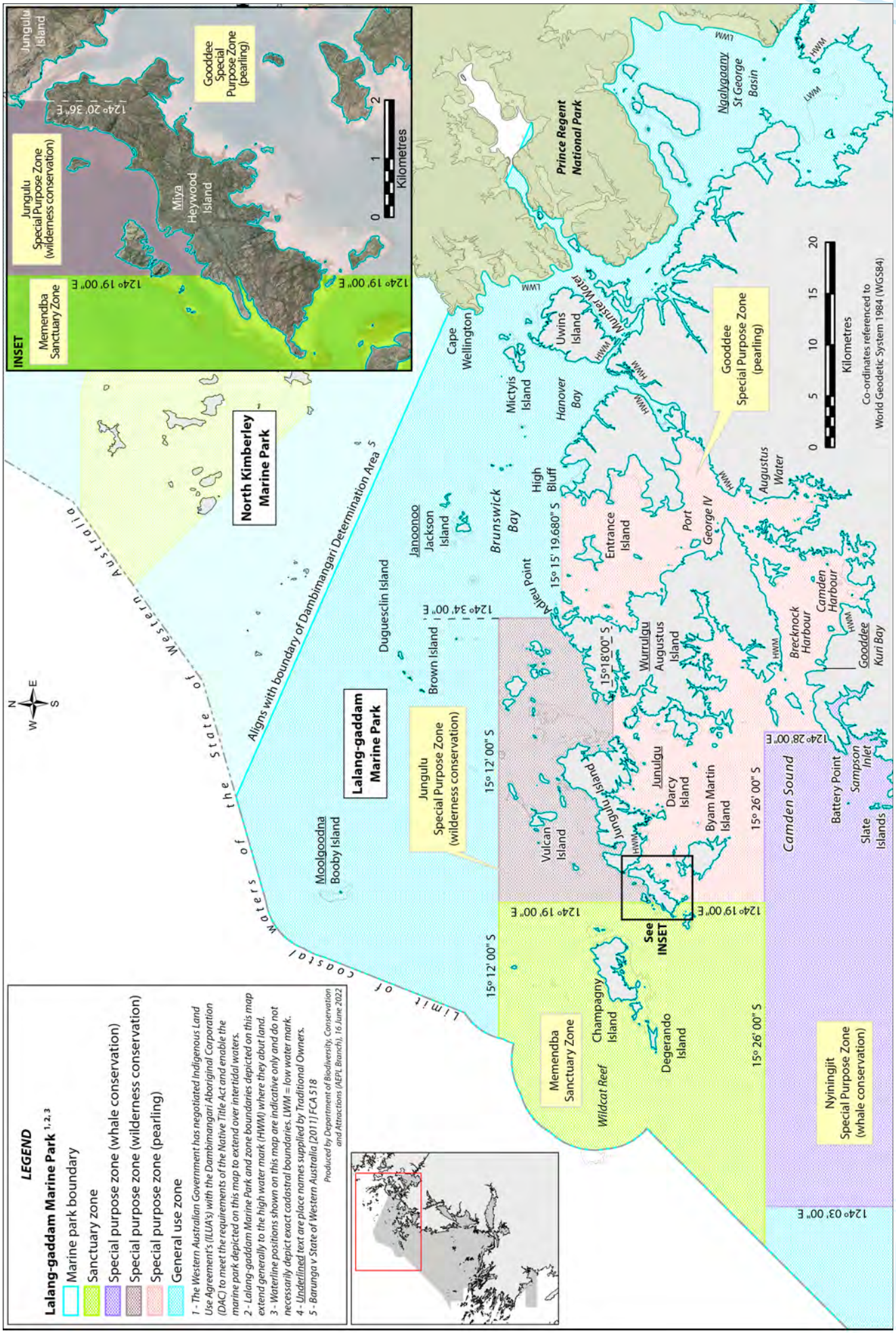
12.2.9 General use zones

All areas in the marine park not included in sanctuary or special purpose zones are zoned as general use. Management of general use areas is provided for through mechanisms under the CALM Act and CALM Regulations, as well as the implementation of management strategies. The general use areas provide for biodiversity conservation and a range of activities including recreational and commercial fishing, aquaculture and pearling. Pearling and aquaculture leases that 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 DPIRD in liaison with DBCA, the Commission and other stakeholders.

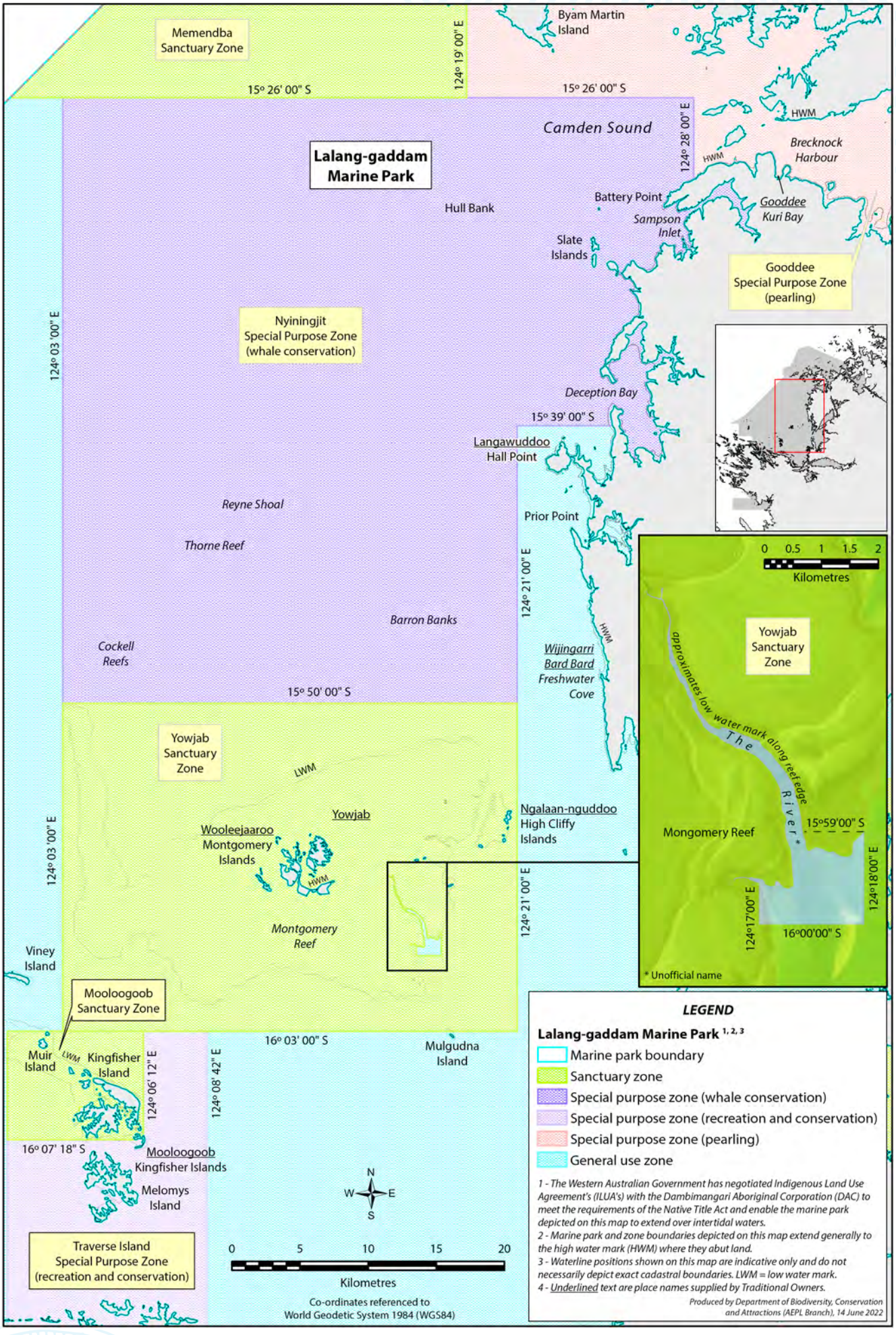
Oobagooma area (Dam Creek). Photo-Michael Higgins

Map 6: Zoning for Lalang-gaddam Marine Park

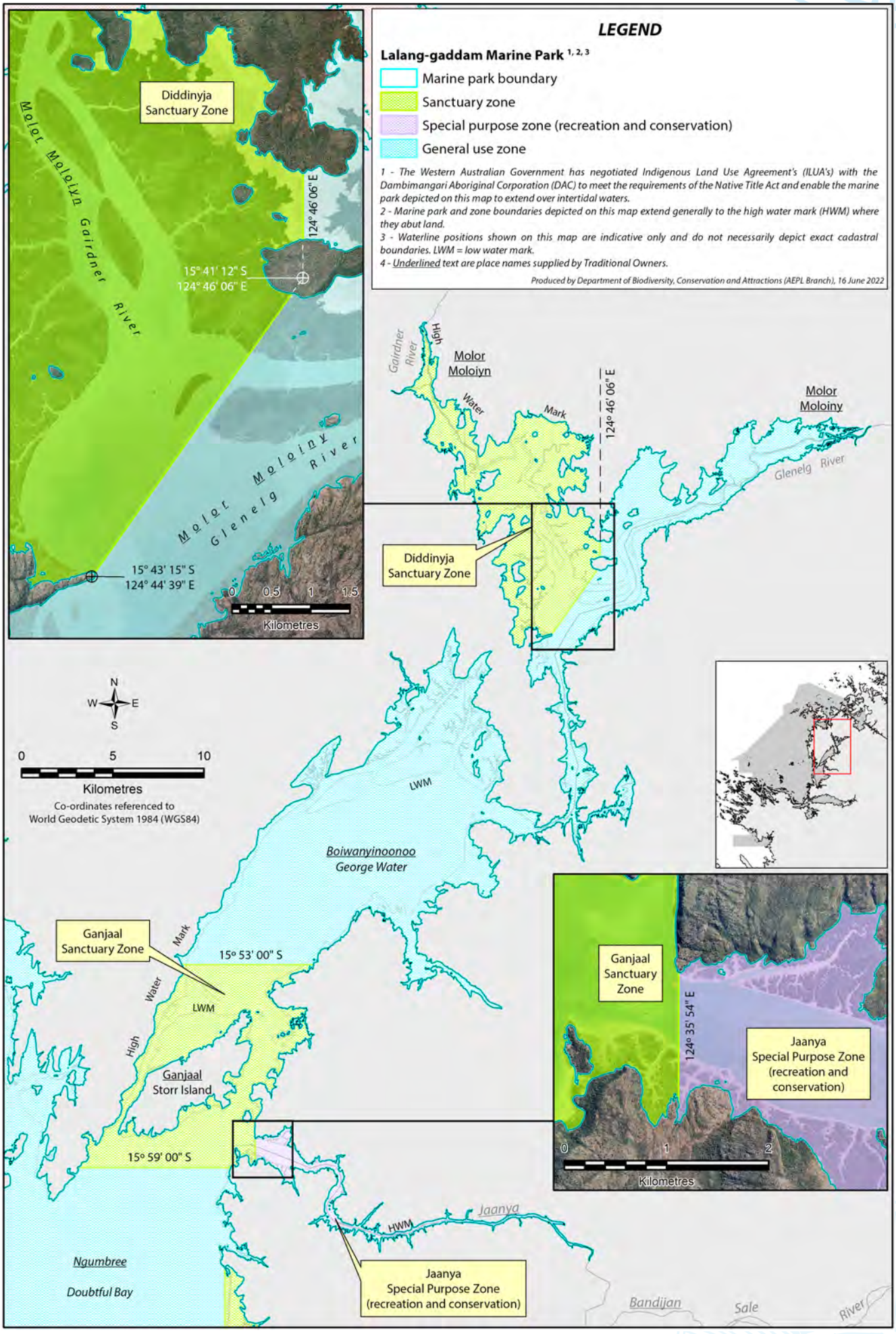




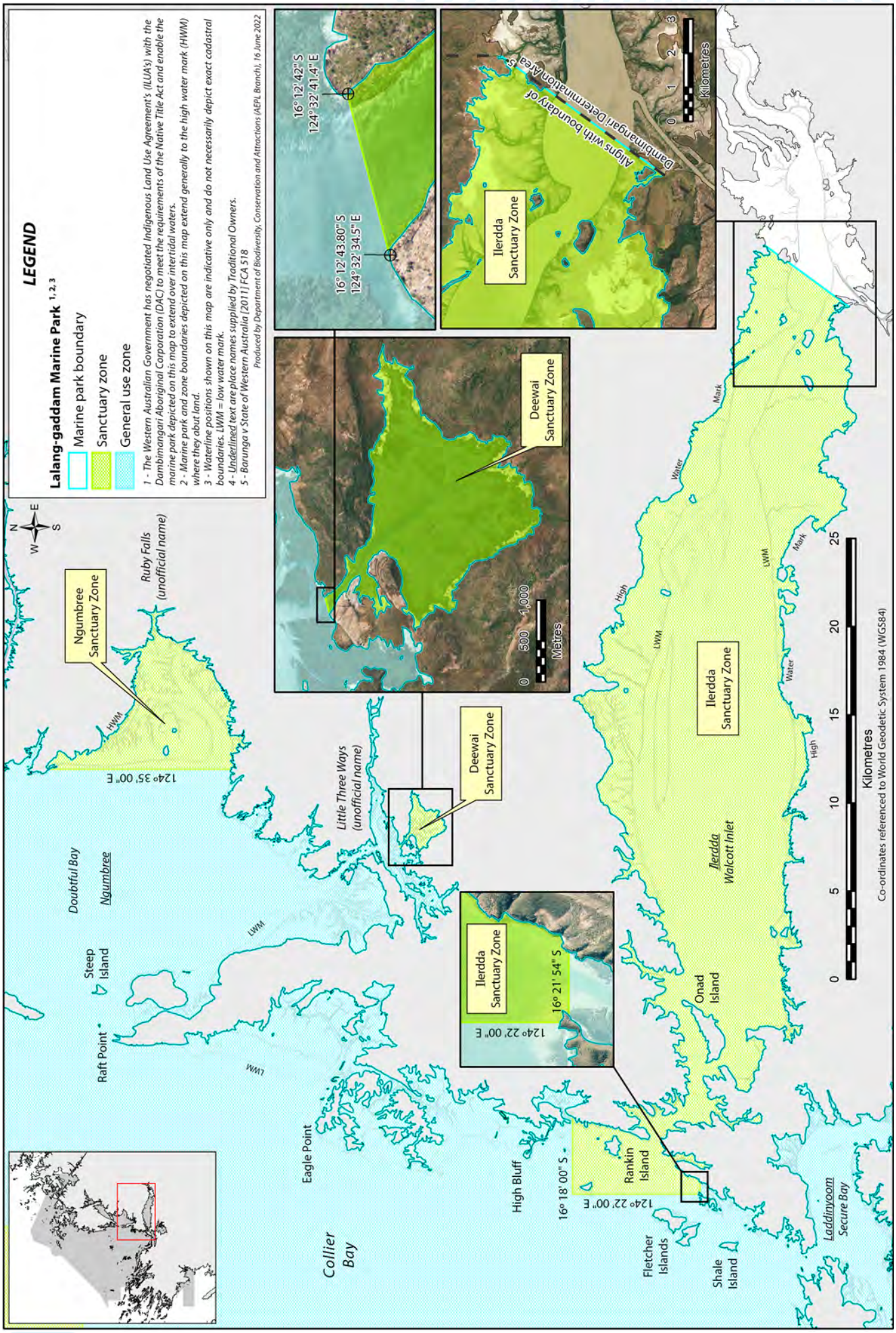
Map 7: Zoning for Lalang-gaddam Marine Park - Augustus Island area



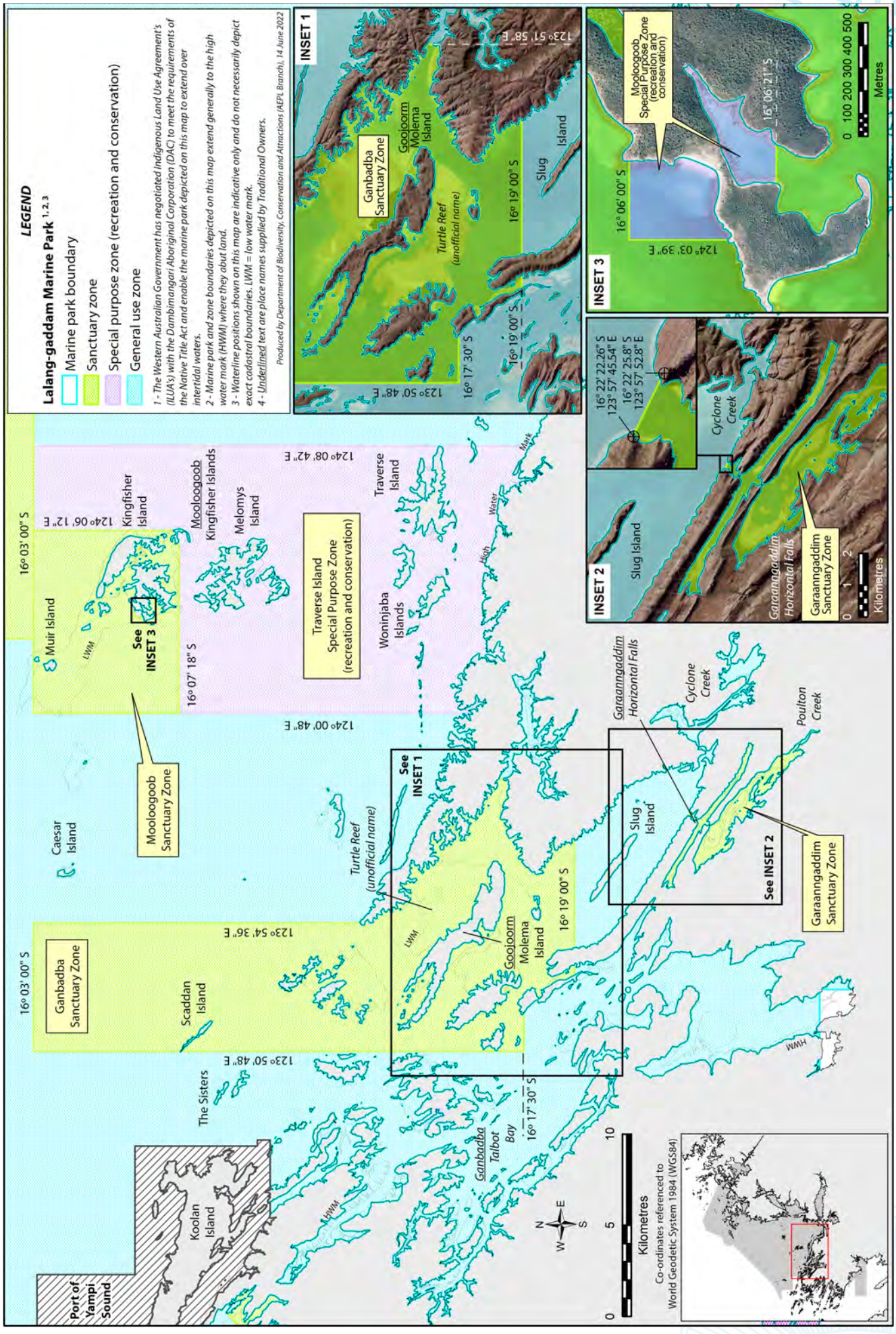
Map 8: Zoning for Lalang-gaddam Marine Park - *Yowjab* (Montgomery Island and reef) area



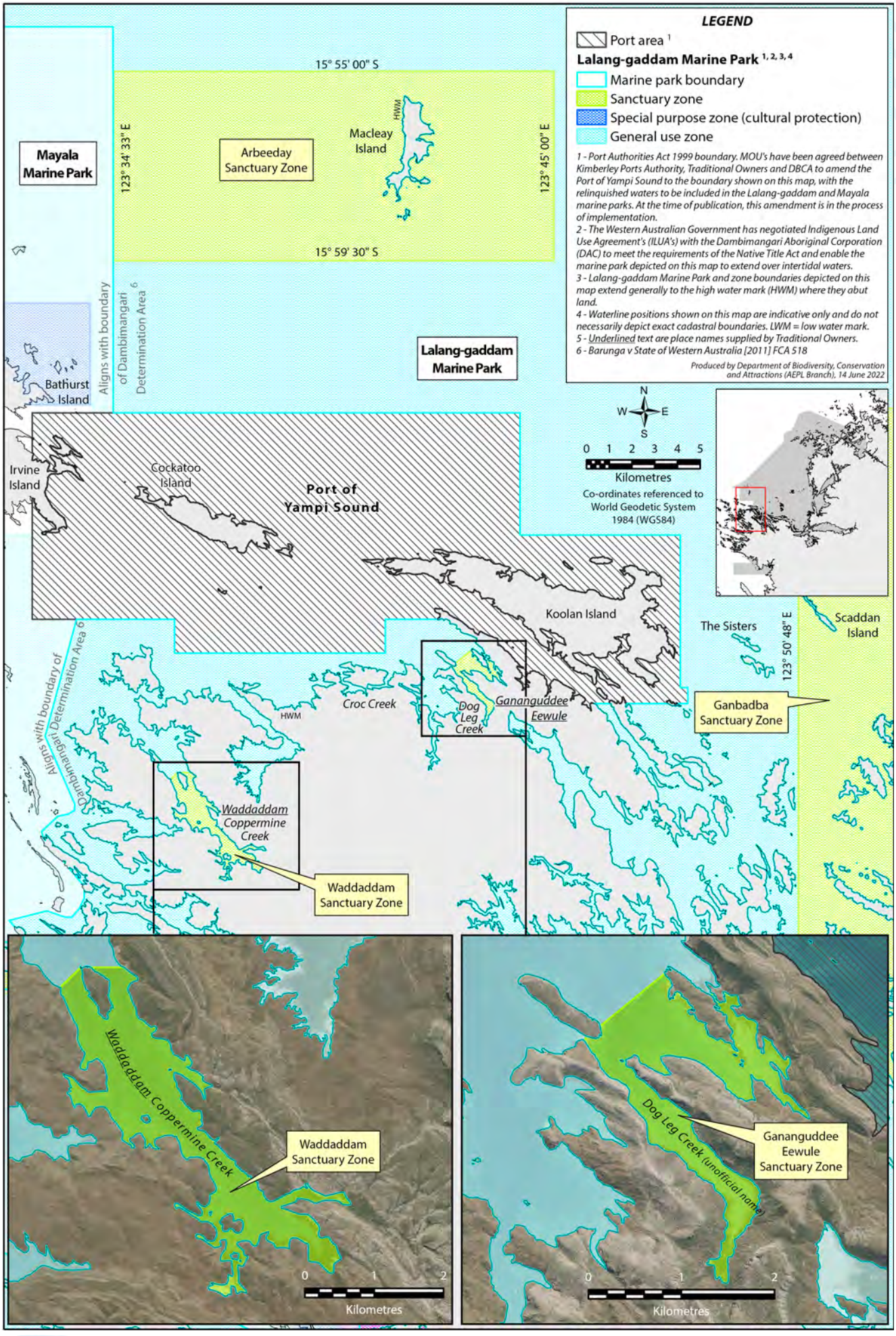
Map 9: Zoning for Lalang-gaddam Marine Park - *Boiwanyinoonoo* (George Water) area



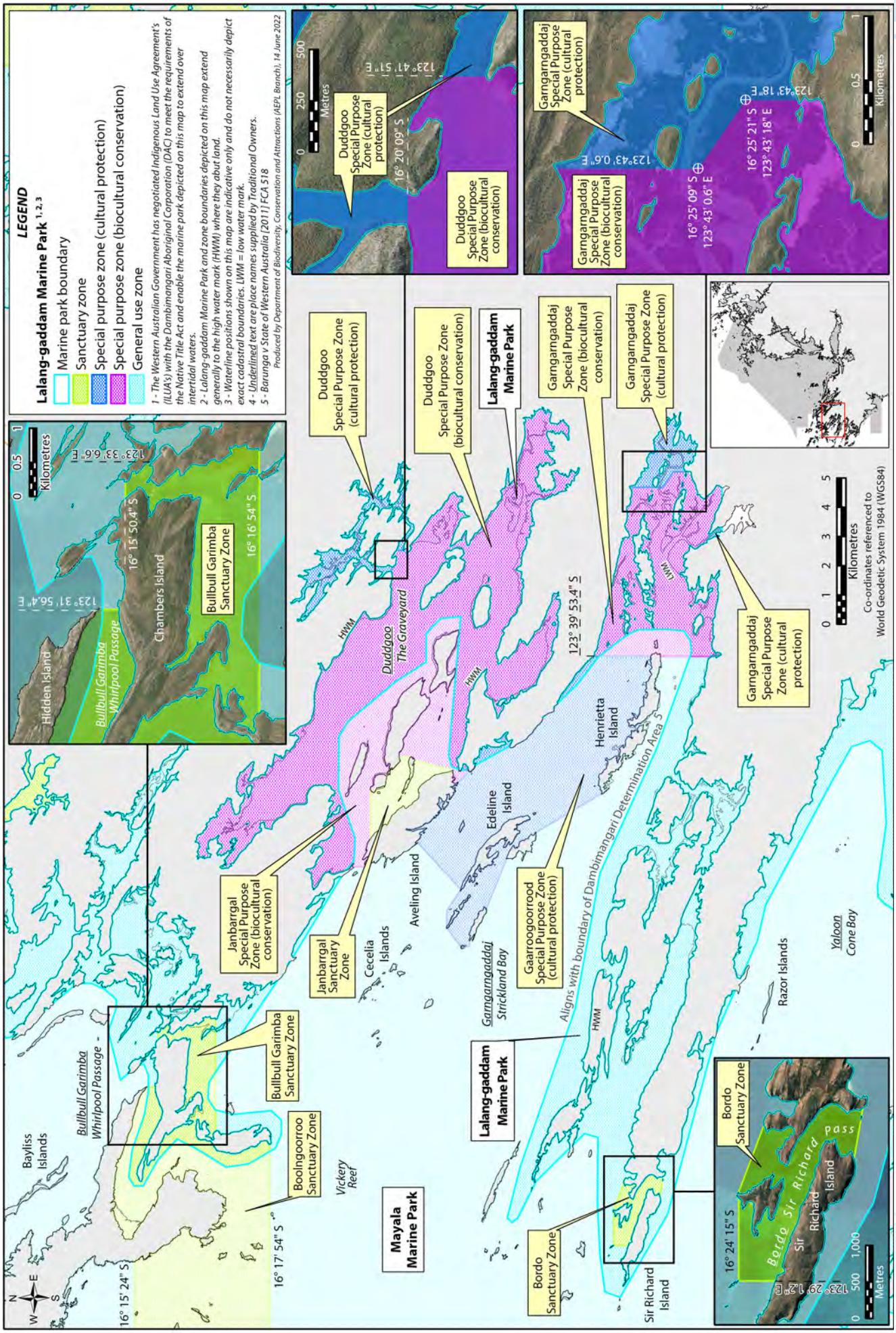
Map 10: Zoning for Lalang-gaddam Marine Park – *Ilerdda* (Walcott Inlet) area



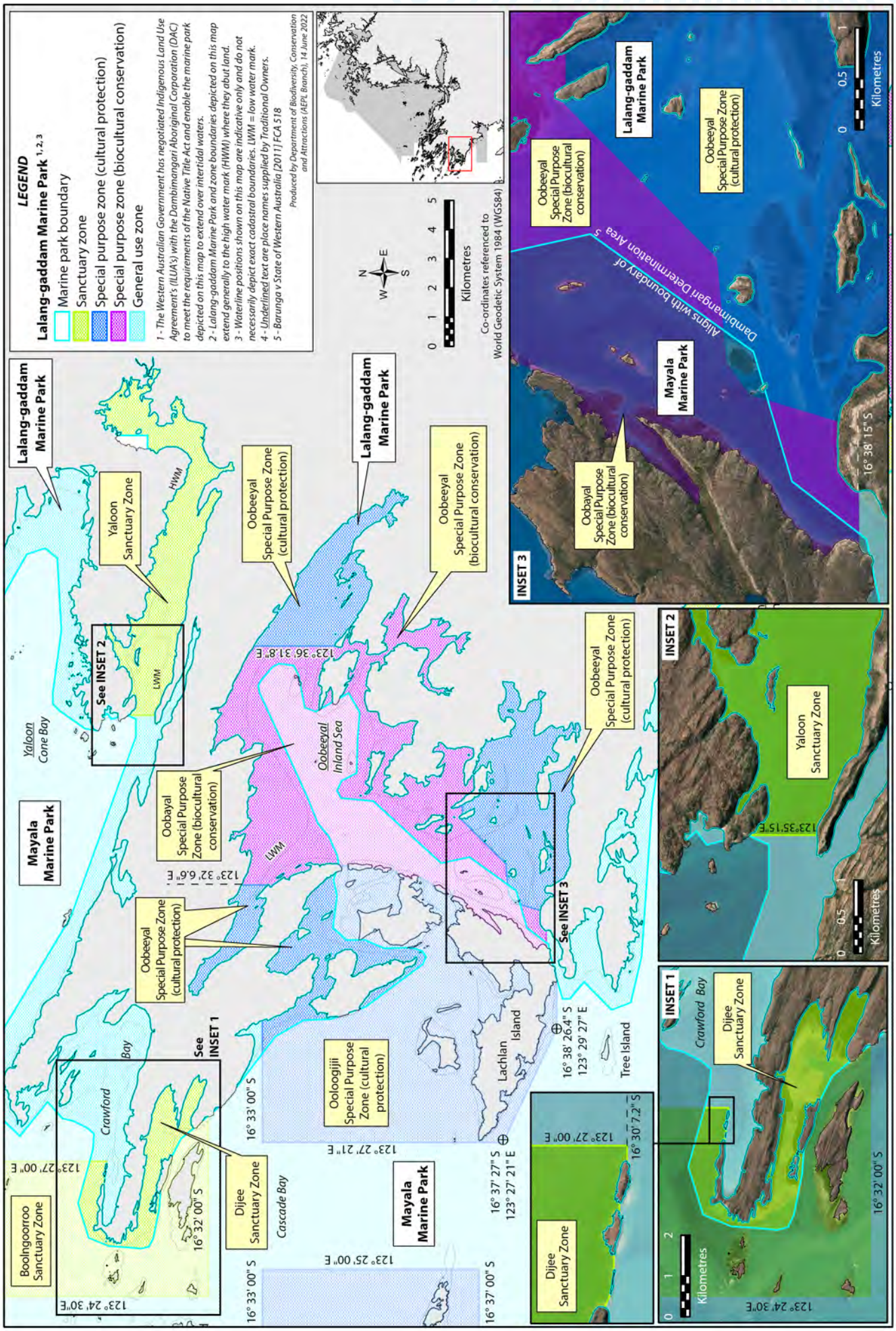
Map 11: Zoning for Lalang-gaddam Marine Park – *Ganbadba* (Talbot Bay) and *Mooloogoob* (Kingfisher Islands) area



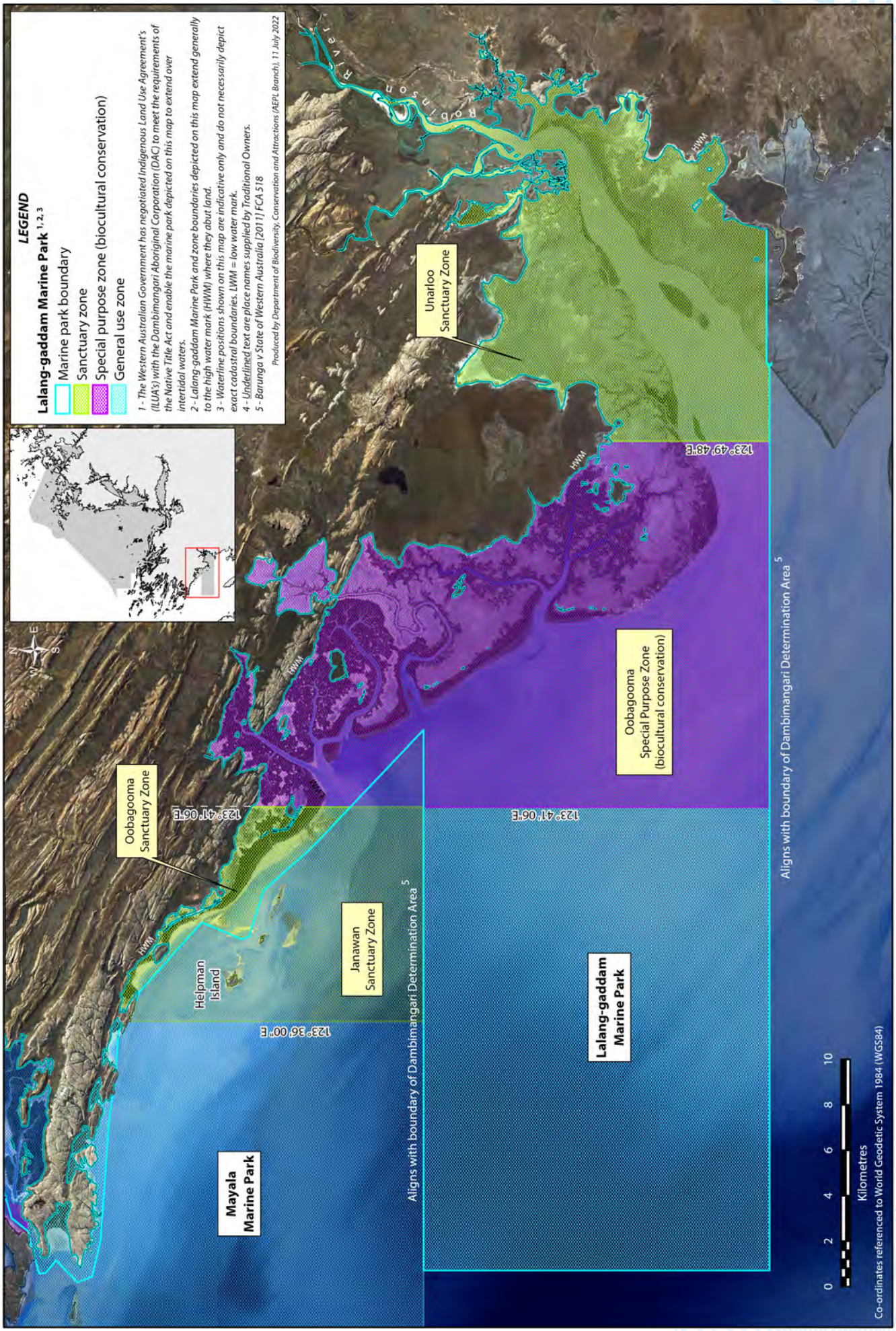
Map 12: Zoning for Lalang-gaddam Marine Park – Yampi Sound area



Map 13: Zoning for Lalang-gaddam Marine Park – *Duddgoo* (Graveyards) area



Map 14: Zoning for Lalang-gaddam Marine Park – *Oobeeyal* (Inland Sea) area



Map 15: Zoning for Lalang-gaddam Marine Park – *Unarloo* (Robinson River) and *Oobagooma* (Dam Creek and Kimbolton Creek) area

12.2.10 Permitted uses

The permitted uses table (Table 1) summarises the range of permitted activities across the zone types of the marine park. Users should be aware that many of the listed activities are also regulated under complementary legislation and regulations. Examples include regulations regarding wildlife interactions, the disposal of sullage, and size and bag limits for recreational fishing.

The CALM Act and BC Act require some activities (e.g. commercial tourism and research) to obtain a licence to operate in marine parks.

The implementation of the final joint management plan may require management actions such as temporal closures. Development of such management actions will aim to limit the impacts on the permitted activities whilst meeting the management objectives. An activity marked as 'assess' indicates an assessment is required by the appropriate agencies in accordance with relevant legislation and the management objectives and targets in this plan.

Table 1. Summary of permitted uses for the Lalang-gaddam Marine Park

Activity	Sanctuary zones [a, b]	Special purpose zone (cultural protection) [a]	Special purpose zone (biocultural conservation)	Special purpose zone (recreation and conservation)	Special purpose zone (pearling)	Special purpose zone (whale conservation)	Special purpose zone (wilderness conservation)	General use zones
Customary								
Customary activities (e.g. hunting and fishing)	Yes [c]	Yes [c]	Yes [c]	Yes [c]	Yes [c]	Yes [c]	Yes [c]	Yes [c]
Commercial								
Commercial gillnet fishing [d]	No	No	No	No	Yes	Yes	No	Yes
Commercial prawn trawling [d,e]	No	No	No	No	Yes	No	No	Yes
Commercial specimen shell collecting [d]	No	No	Yes	Yes	Yes	Yes	No	Yes
Commercial trochus collecting [d]	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Commercial mackerel fishing [d]	No	No	Yes	Yes	Yes	Yes	No	Yes
Commercial crab fishing [d]	No	No	Yes	Yes	Yes	Yes	No	Yes
Commercial sea cucumber fishing [d]	No	No	Yes	Yes	Yes	Yes	No	Yes
Commercial fishing (other than gillnet, prawn trawl, specimen shell and trochus) [d]	No	No	No	Yes	Yes	Yes	No	Yes
Coral, live rock and sand collection [d]	No	No	No	No	No	No	No	Yes
Pearling and associated activities [d]	No	No	No	Assess	Yes	No	No	Yes
Aquaculture [d]	No	No	No	Assess	Yes	No	No	Yes
Scenic flights (charter) / fly over charters [d]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Activity	Sanctuary zones [a, b]	Special purpose zone (cultural protection) [a]	Special purpose zone (biocultural conservation)	Special purpose zone (recreation and conservation)	Special purpose zone (pearling)	Special purpose zone (whale conservation)	Special purpose zone (wilderness conservation)	General use zones
Mining or petroleum activities that disturb the land, seabed or subsoil [f]	No	No	No	No	Assess	No	No	Assess
Non-ground-disturbing activities including geophysical surveys, geological mapping, sampling and geochemical surveying [g]	Assess	No	No	Assess	Assess	No	No	Assess
Ship loading and other mining related infrastructure (e.g. ship loading docks, cabling or pipelines)	Assess [h]	No	No	Assess [h]	Assess	No	No	Assess
General marine infrastructure (e.g. groynes or jetties)	No	Assess	Assess	Assess	Yes	No	No	Assess
Artificial structures (e.g. artificial reefs)	No	No	No	Assess	Assess	No	No	Assess
Bioprospecting	No	No	No	No	Yes	Yes	No	Yes
Dredging and dredge spoil dumping	No	Assess [i]	Assess [i]	Assess [i]	Assess	No	No	Assess
Recreational								
Boating (motorised and non-motorised)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nature appreciation and wildlife viewing /interaction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recreational fishing [d – if from a boat]	No	No [j]	Yes [k]	Yes	Yes	Yes	Yes [l]	Yes
Other use								
Vessel transit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Navigation aids	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Research and monitoring [d]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Anchoring (soft bottom only)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mooring	Assess	Assess	Yes	Assess	Yes	Assess	Yes	Yes
Seaplane, helicopter and launching and landing [m]	Assess	Assess	Assess	Assess	Yes	No	No	Assess
Remotely piloted aircraft (drone) launching and landing [m]	Assess	Assess	Assess	Assess	Yes	No	No	Assess
Vessel sewage discharge and de-ballasting	No	No	No	Yes [n]	Yes [n]	No	No	Yes [n]

Permitted activities provisions

[a] Access may be restricted, in specific areas within sanctuary or special purpose zones (cultural protection) if deemed necessary to protect cultural or ecological values. Existing shipping channels will be maintained.

[b]Seasonal restrictions to vessels such as speed limits may apply in some areas (e.g. Ganbadba Sanctuary Zone) during *walin*y (dugong) calving season.

[c] Customary take is confined to Traditional Owners, subject to the rights and interests provided by the Native Title Act and/or Indigenous Land Use Agreements (ILUAs), or where Traditional Owners have provided consent to another Aboriginal person or group.

[d] Licence or permit required under the *Conservation and Land Management Act 1984* and/ or *Fish Resources Management Act 1994*.

[e] Prawn trawling is restricted in some areas of the marine park through a permanent inshore closure managed by DPIRD. The Collier Bay closure restricts prawn trawling within George Water, Doubtful Bay, Walcott Inlet, Secure Bay and the southern extent of Collier Bay (Fletcher 2014).

[f] Ground-disturbing mining and petroleum exploration and development activities include any activity that disturbs the land, seabed and/or subsoil within the marine park (e.g. drilling).

[g] Geophysical surveys will be assessed by the Department of Mines, Industry Regulation and Safety.

[h] Ship loading and other mining related infrastructure such as cabling and pipelines will only be assessed for the Ganbadba Sanctuary Zone, Traverse Island Special Purpose Zone (recreation and conservation) and general use areas. Should mining infrastructure be approved, consideration may be given to either amending the boundaries of the zone or excising the area from the marine park. Mining infrastructure is not permitted in any other sanctuary or special purpose zones.

[i] Activities permitted if activity is shown to be compatible with the specified purpose of the zone. Only small-scale dredging for the purpose of public access and safety will be considered.

[j] Recreational fishing is only permitted as part of a tourism operation.

[k] Additional regulations on recreational fishing under the *Fish Resources Management Act 1994* are likely to occur in special purpose zones (biocultural conservation).

[l] Special fishing rules apply. Personal possession limit of one *jaiya* (fish), or two fillets of *jaiya* (fish) (baitfish excepted).

[m] Lawful authority must be obtained to launch, land or touchdown in an aircraft on CALM Act lands and waters.

[n] Only in gazetted sewage discharge areas.

12.3 Community stewardship and compliance

Education and public participation help to increase the communities' understanding of the values of the marine park, leading to responsible use and enhanced protection. As most visitors arrive aboard commercial vessels or planes, there is an opportunity to deliver key messages via commercial operators. Increased understanding helps to ensure appropriate behaviour and develop a sense of community stewardship and lead to better protection and management of the park. While most visitors to marine parks comply with management regulations when they understand why strategies are in place, managers need to monitor the level of compliance and take action where necessary regarding inappropriate or illegal behaviour. To achieve this, an appropriate level of 'field' presence by DBCA, Dambeemangarddee Rangers (employed directly by the department or contracted) and DPIRD is necessary in the marine park. It will also be important that users of the marine park also play self-regulatory and peer surveillance roles.

Summary of management arrangements for community stewardship and compliance			
Management objective	To enhance community understanding of and support for the marine park and achieve a high level of compliance with regulations, permitted uses and other management arrangements within the marine park.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Develop and implement a collaborative education and compliance program to maximise compliance with the management plan and to encourage tour operators, visitors on private vessels and commercial fishing, pearling and mining operators to report any inappropriate or unlawful activity [DPIRD].	Patrol and enforcement	H-KMS
	2. Monitor, promote and enforce compliance with fisheries and marine park legislation, including illegal foreign fishing [**DPIRD**]	Patrol and enforcement	H-KMS
	3. Collaboratively develop and implement an education and interpretation plan to raise awareness and stewardship of the marine park which includes: • information on ecological and cultural values • information on cultural protocols • the zoning and other management arrangements • the condition of the park • safety and any relevant regulations, policies and guidelines relating to management. [DPIRD].	Education and interpretation	H
	4. Ensure marine park users, including commercial operators, are aware of and comply with relevant legislation for the protection of marine mammal and other wildlife interaction policies and guidelines.	Education and interpretation	H
	5. Facilitate cross-authorisation of enforcement officers as appropriate including training Dambeemangarddee Rangers in CALM Act compliance with the intention of obtaining the status of honorary enforcement officers pursuant to the CALM Act.	Patrol and enforcement	H
	6. Facilitate training of Dambeemangarddee rangers in FRM Act compliance, to enable Dambeemangarddee rangers to engage in DPIRD compliance activities [**DPIRD**].	Patrol and enforcement	H
	7. Ensure marine park visitors obtain and comply with appropriate regulations, licences and permits [DPIRD].	Patrol and enforcement	H
	8. Maintain a database of compliance statistics and adapt management strategies to address any non-compliance issues. [DPIRD].	Patrol and enforcement	H
	9. Develop and implement codes of practice as necessary to ensure responsible use of the marine park [DPIRD].	Education and interpretation	M
	10. Install and maintain zone markers and educational signage for the marine park where appropriate [DPIRD].	Education and interpretation	M
	11. Promote the plan among commercial tour operators and visitors to inform them about their responsibilities and encourage them to voluntarily report any inappropriate or unlawful activity [DPIRD].	Patrol and enforcement	M
	12. Noting remoteness of the marine park, when opportunities arise, facilitate public participation in the management of the marine park, and maintain a database of public participation.	Public participation	L

13. Assessing management effectiveness

Progress in implementing the management plan and in assessing management effectiveness against stated objectives will be regularly reviewed through a formal process consisting of annual performance assessment reports and periodic and ten-year reviews of the management plan.

13.1 Annual reviews

The prioritised management strategies outlined in the management plan will be implemented by joint management partners, primarily through the annual works programs of DBCA's West Kimberley District, Marine Science Program, and other specialist branches guided by the JMB. The JMB with assistance of the West Kimberley District, and DPIRD will prepare an annual review of the implementation of the management plan for consideration by DAC and the Commission, which will oversee the management of the marine park. Key parts of the annual review will include:

- progress in implementing management plan strategies
- assessment of the condition of values, the pressures acting on values, management response and management effectiveness
- identifying issues affecting implementation
- resource allocation.

As part of the annual review process, DAC will also provide an update to the Dambeemangarddee Community on the implementation of the management plan and condition of country.

13.2 Periodic assessments

The Commission has a statutory responsibility to periodically assess the implementation and effectiveness of management plans. The JMB, DAC and DBCA will provide information from monitoring and other operational programs to the Commission to enable an assessment of the plan's implementation. Monitoring by the Commission will also be informed by the Dambimangari Healthy Country Plan. This outcome-based approach provides a robust framework to support adaptive marine park management.

13.3 Revision of the management plan

The plan will guide joint management of the marine park for 10 years, or until a statutory revision is undertaken and a new joint management plan is prepared. A five-year review (within five years of the date of the CALM Act s62 classified waters notice for the marine park) will be undertaken. If the management plan is to be amended, the proposed changes will be released for public comment. This plan will remain in place in its original form unless it is revoked by the Minister for Environment or a new co-designed plan is approved. Full public consultation will occur at the time of revision, and endorsement of a revised joint management plan will be sought from the JMB and the Commission, and approval of the Minister for Environment following concurrence from the Minister for Mines and Petroleum and Minister for Fisheries.

Summary of management arrangements for assessing management effectiveness			
Management objectives	To assess and evaluate management effectiveness.		
		Management program	**Priority**
Management strategies Joint management partners are the lead for all strategies. Supporting agencies are listed in brackets. If agencies are required to take a lead role, their name is in bold.	1. Develop and implement a performance assessment process that is consistent with DBCA and Commission policy and ensure results are reported back to the Dambeemangarddee Community [Commission].	Monitoring	H-KMS
	2. Provide necessary information and support for the performance assessment process [DPIRD].	Monitoring	H
	3. Support the JMB and DAC to conduct periodic reviews of the effectiveness of plan implementation in meeting cultural, capacity building and other priority objectives [DPIRD].	Monitoring	H

Exposed coral on Jackson Island. Photo – Will Robbins, DBCA.

14. References and appendices

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Appendix 1 – Design principles

Comprehensiveness: The full range of ecosystems and communities (e.g. all of the different habitat types) are represented within the marine park.

Adequacy: The marine park includes enough of each component of biodiversity (e.g. enough of each particular habitat type) to allow populations, species and communities associated with each component to remain healthy.

Representativeness: Biodiversity features should be represented across their natural range and variability, for example habitats and communities should be represented across a range of depths and across different wave exposures.

Ecological importance: The protection of ecologically important features such as known nursery, foraging, breeding and calving areas; areas that are unique, unusual or highly productive; and areas that are important for or where known aggregations occur of rare, threatened or protected species.

Connectivity and complementarity: Connectivity includes the way tides, currents and the behaviour of plants and animals combine to connect neighbouring and more widely separated ecosystems in the marine environment (DEH 2009). Population connectivity depends on the magnitude of immigration and migration within and between populations and has the potential to profoundly influence the resilience of communities to natural and anthropogenic disturbances. Complementarity assists with connectivity by connecting protected areas. Complementarity can help increase management effectiveness and provide ecosystem linkages between the land and sea (DEH 2008).

Protect and conserve Aboriginal cultural heritage: The protection of cultural heritage values can involve:

- the protection of culturally important sites or areas such as *waddaroo* (reefs), *galaab* (beaches) and *jindirm* (mangrove) communities. Important sites may also include important dreaming sites, *jaiya* (fish) traps, intertidal stone arrangements, increase sites, ceremonial sites and others.
- the protection of areas important for culturally significant species such as *julawaddaa* (turtles), *waliny* (dugongs), *ngunubange* (whales) and *jigeedany* (dolphins)
- providing for ongoing customary activities such as fishing and hunting
- providing consistency (where culturally appropriate) with cultural laws and protocols through zoning and other management arrangements.

Provide for ongoing ecologically sustainable use: The zoning scheme should:

- consider the existing use of the marine environment and the current management arrangements in place
- promote opportunities for recreation and appreciation of the marine environment
- promote opportunities for education and research
- provide for cultural, natural and maritime heritage values
- be designed so that it is easy for users to understand and comply with zoning and management arrangements.

Appendix 2 – Worrdorrda language glossary

Table 1: List of traditional language used in the Lalang-gaddam Marine Park Joint Management Plan

Language used in plan	Meaning
Aardbulaardoo Ngaieye	Welcome everyone
Dambeemangarddee	Clan/tribe name
La Lai	Dreaming
Unggud	Creator snake
Unggudja	Life force/child spirits
Wandjina	Supreme creator
Wanjina Uunguu	Clan/tribe name
Wanjina Wilingin	Clan/tribe name
Wanjina Wunggurr	Clan/tribe name
Lalang-gaddam	Saltwater in broadest sense
Place names	
Boiwanyinoonoo	George Water
Bordo	Sir Richard Pass
Bullbull Garimba	Whirlpool passage
Dijee	Pecked Island
Diddinyja	Name for the area of Molor Moloiyn (Gairdner River)
Duddgoo	Graveyard area
Garngarngaddaj	Strickland Bay
Ganangudee Eewule	Dog leg creek
Ganbadba	Talbot Bay
Ganjaal	Storr Island
Garaanngaddim	Horizontal Falls
Goomalamala	St Andrews Island
Ilerdda	Walcott Inlet
Langawuddoo	Hall Point
Malandoom	Prince Regent area
Maamboolbadda	Kings Cascade
Molor Moloiny	Glenelg River
Molor Moloiyn	Gairdner River
Mooloogoob	Kingfisher Islands
Moolgoodna	Booby Island
Ngalaan-nguddoo	High Cliffy Island
Ngalygaany	St Georges Basin
Ngumbree	Raft point
Oobeeyal	Inland Sea
Ungaddang	Bottom of Kimbolton
Waddaddam	Coppermine Creek
Wooleejaaroo	Montgomery Reef islands
Yaloon	Cone Bay
Yowjab	Area including and surrounding Montgomery Reef

Language used in plan	Meaning
Habitats	
Galaab	Beaches
Galow	Saltmarshes
Jirdarm	Seaweed
Jindirm	Mangroves
Julum	Seagrass
Waddaroo	Coral
Wanbiny	Sea jellies
Animals	
Banarddee	Birds
Beelbaba	Flat-head fish
Galagalaarddee	Flatback turtle
Gandjeelaadj	Blue Crab
Ganbaneddee	Crabs
Goiyoiya	Estuarine crocodile
Ilerdda	Barramundi
Jaiya	Fish
Jigeedany	Dolphin
Jimbiridj	Rock cod
Julawaddaa	Turtles
Marlinju	Oysters
Mangiddee	Loggerhead turtle
Ngarlanggarnanya	Baler shell
Ngunubange	Whale
Waarlee/Gulaarddee	Green turtle
Waliny	Dugong