GOVERNMENT OF WESTERN AUSTRALIA

PLAN FOR OUR PARKS
SECURING 5 MILLION HECTARES OVER 5 YEARS

# Mayala Marine Park

## Joint management plan 2022
Management plan 100

Department of **Biodiversity, Conservation and Attractions**
**Conservation and Parks Commission**

GOVERNMENT OF WESTERN AUSTRALIA

Mayala

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



NB: The spelling of some of the language words for country 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):
Ooloogijii (Lachlan Island). Photo – Michael Higgins, DBCA.
Barrali (Henrietta Island). Photo – Michael Higgins, DBCA.
Marrgoorr (coral). Photo – Roanna Goater, DBCA.
Marnany (reef) in Oobayal (Inland Sea). Photo – Roanna Goater, DBCA.
Greenhalgh Island. Photo – Michael Higgins, DBCA.
Tawny nurse shark. Photo – Roanna Goater, DBCA.
Mangroves. Photo – Michael Higgins, DBCA.

Mayala artwork:
Herbert Marshall

# Balab jiya aarrood ngan jaard booroo
# Welcome to Country

We ask that you, as a visitor or partner, have *wiini* (respect) for Mayala people, Country, culture and protocols. Your *wiini* is the backbone to help support our vision to look after and use Country sustainably so Country is always alive, healthy and rich for current and future generations to enjoy.

We acknowledge our apical ancestors who fought hard for recognition of Mayala Country, and those families who took over from them and supported them, and our Elders who were passionate about passing on knowledge for caring for Country. We honour all their memories through this plan.

This marine park is another tool for us to look after and protect Country and culture.

Culture is a big word and can mean different things to different people. For Mayala it means carrying on what our old people taught us and sharing this with our generations to come so that Mayala people remain strong with *gorna liyan* (good feeling) and the Country remains healthy.

*Aamboon aamboon angarriya* (coming together). We invite partners to work with us and invest in our priorities and actions to achieve Mayala's vision for Country.

'Culture is belonging to this place. It's doing things like our ancestors did and remembering the way our ancestors lived.'

Violet Carter, Alexis Vincent, Lorna Hudson and Alma Ejai enjoying Country.
Photo – Roanna Goater, DBCA.

Margaret Island. Photo - Roanna Goater


Janella Issac and Mitchell Tigan. Photo - Rowena Mouda.

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Lachlan Island. Photo – Michael Higgins, DBCA.

# 1. The management plan

## 1.1 Purpose of the plan

This joint management plan details how the Mayala Marine Park will be jointly managed by Mayala Traditional Owners and the Department of Biodiversity, Conservation and Attractions (DBCA) 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 Mayala Country Plan.

The main outcomes of this joint management plan are listed below.

- The establishment of the marine park as a Class A reserve over the subtidal and intertidal areas of Mayala Sea Country.
- The establishment of a Joint Management Body (JMB).
- The establishment of a joint management framework for the marine park between the DBCA and Mayala Inninalang Aboriginal Corporation (MIAC) in accordance with the requirements of a Section 56A Joint management Agreement (JMA) under the *Conservation and Land Management Act* 1984 (CALM Act) for Mayala Conservation Estate.
- Promotion and support for the continued exercise of Mayala peoples' native title rights recognising their ongoing connection to, and responsibility for Mayala Sea Country.
- Preservation and promotion of Mayala culture and heritage values of the marine park.
- The establishment of a framework to allow for ongoing sustainable multiple use.
- Promotion and support to build the capacity of Mayala people and MIAC to progressively take on greater responsibility and accountability for management of the marine park.
- The establishment of seven management programs (management framework, 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 and practice to help ensure the ecological components and processes of the marine environment in the Mayala Marine Park are conserved and the existing and potential pressures on the values are appropriately managed.
- Contribution to the fulfilment, support and promotion of Australia's responsibilities under several international conventions such as the Convention on Biological Diversity, 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 Mayala Traditional Owners, the community and visitors.

## 1.2 Development of the plan

This joint management plan has been prepared by Mayala Traditional Owners and DBCA in consultation with Bardi Jawi and Dambeemangarddee (formerly spelt Dambimangari) Traditional Owners, the Kimberley Land Council (KLC) and incorporating input from stakeholders. To achieve a successful co-design process, Mayala nominated representatives to form a negotiation committee to work closely with DBCA and KLC to develop this plan. Many Mayala 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 Mayala Country Plan where applicable.

## 1.3 Structure of the plan

This plan sets a vision for the area and identifies key cultural, ecological and socio-economic values and the pressures and potential pressures acting on them. It provides strategic direction and applies seven management programs to be implemented through management strategies (see section 4.4). 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.

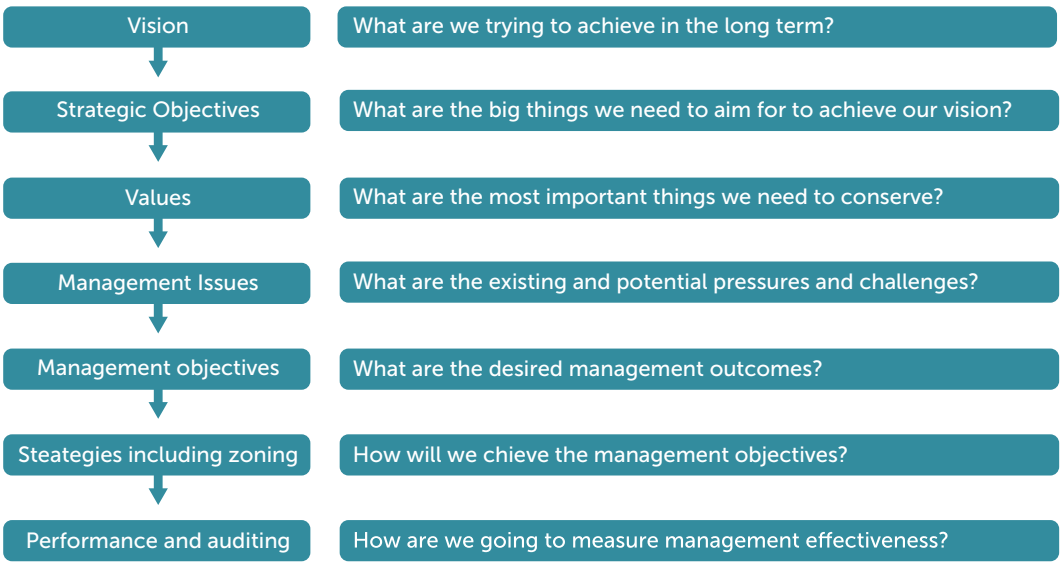



Figure 1: Structure of the plan

## 1.4 Term of the plan

This joint management plan will guide management of the 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 require a statutory public comment period and approvals from the Minister for Environment, Minister for Fisheries and Minister for Mines and Petroleum.

# 2. Introduction

The Mayala Marine Park is located in the west Kimberley region of Western Australia within Mayala people's native title determination area (Maps 1 and 2). For tens of thousands of years Mayala people have depended on and looked after their Sea Country, and it remains a place of exceptional value.

The establishment of the Mayala Marine Park is part of the Plan for Our Parks initiative, which will create five million hectares of new national and marine reserves across Western Australia. The Mayala Marine Park adds a further 315,000 hectares to the Kimberley marine reserves, contributing to the National Representative System of Marine Protected Areas. The State Government and the Mayala Traditional Owners are committed to the conservation and sustainable use of the area and the marine park is jointly managed and proposed to be jointly vested with MIAC and the Conservation and Parks Commission (Commission).

Mayala are true saltwater people who have a unique island culture and deep knowledge of the complex currents and tides in their Sea Country. *Mayala Baaliboor* (Mayala Country) comprises an extensive network of hundreds of islands, submerged lands, seabeds and saltwater (MIAC 2019). Mayala people carry the responsibilities of their ancestors to manage their Country as their ancestors did to keep it rich, alive and healthy.

All parts of *Mayala Baaliboor* - whether it be reef, seabed, water, tides, plants, freshwater or animals, along with *Mayalayoon ambooriny* (Mayala people), are important and undivided. There are sacred sites and stories on land and in the sea that are evidence of Mayala's long association with Country through the rise and fall of sea levels over tens of thousands of years. Although *Mayala Baaliboor* is undivided, for the purpose of this joint management plan, all references to *Mayala Baaliboor* throughout the plan should be interpreted as Sea Country only, up to the mean spring high tide mark. No terrestrial areas are included within the marine park. However, this plan also includes the Tanner Island Nature Reserve, which is also jointly managed by Mayala and DBCA, as described in section 8.

Mayala *Baaliboor* is home to a diverse range of marine life. Fringing *marnany* (reefs) have formed around the many islands of the Buccaneer Archipelago, withstanding a tidal range exceeding 11m, the highest in Australia (Richards *et al*. 2017). The wide intertidal areas are home to vast numbers of plants and animals, all adapted to the unique coastal environment of the Kimberley. Mangrove lined creeks and *noomool* (seagrass) meadows create important nursery areas for *aarli* (fish), and *goorlil* (turtles) are regularly seen foraging and nesting in the area. Sea Country is forever changing with the seasons and tides. From June to November each year *miinimbi* (humpback whales, *Megaptera novaeangliae*) migrate from Antarctic feeding grounds to Mayala Sea Country and beyond to give birth to their young, and *odorr* (dugongs) visit the marine park in the cooler months from May to July.

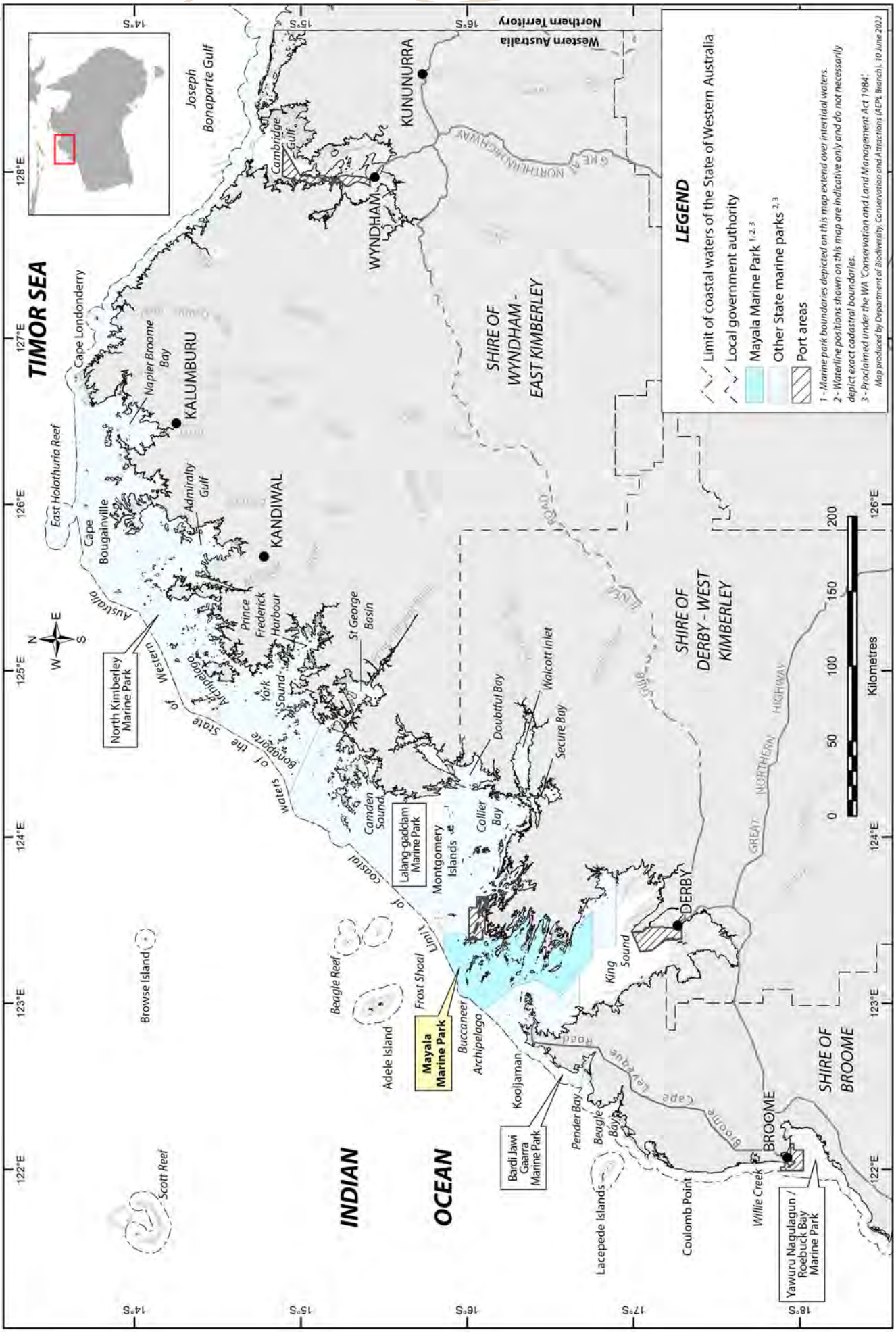
The extraordinary natural values of the area coupled with the vibrant Aboriginal culture in the region is attracting an increasing number of local and international visitors. Popular activities include fishing, boating and wildlife watching. The establishment of the Mayala Marine Park is important to ensure the exceptional natural and cultural values which visitors seek are protected for current and future generations to enjoy.

The warm tropical waters of the marine park also provide optimal conditions for commercial activities such as pearling, aquaculture and commercial fishing.  It is likely that these industries will continue to develop and expand as the region develops and careful management is required to ensure the economic potential of these industries is realised without significantly affecting the exceptional values of Mayala Sea Country. The marine park will provide important social and economic outcomes for Mayala people by providing opportunities for Mayala involvement and employment in land and sea management. Mayala involvement in commercial activities in the marine park will be encouraged particularly in eco and culture-based tourism.

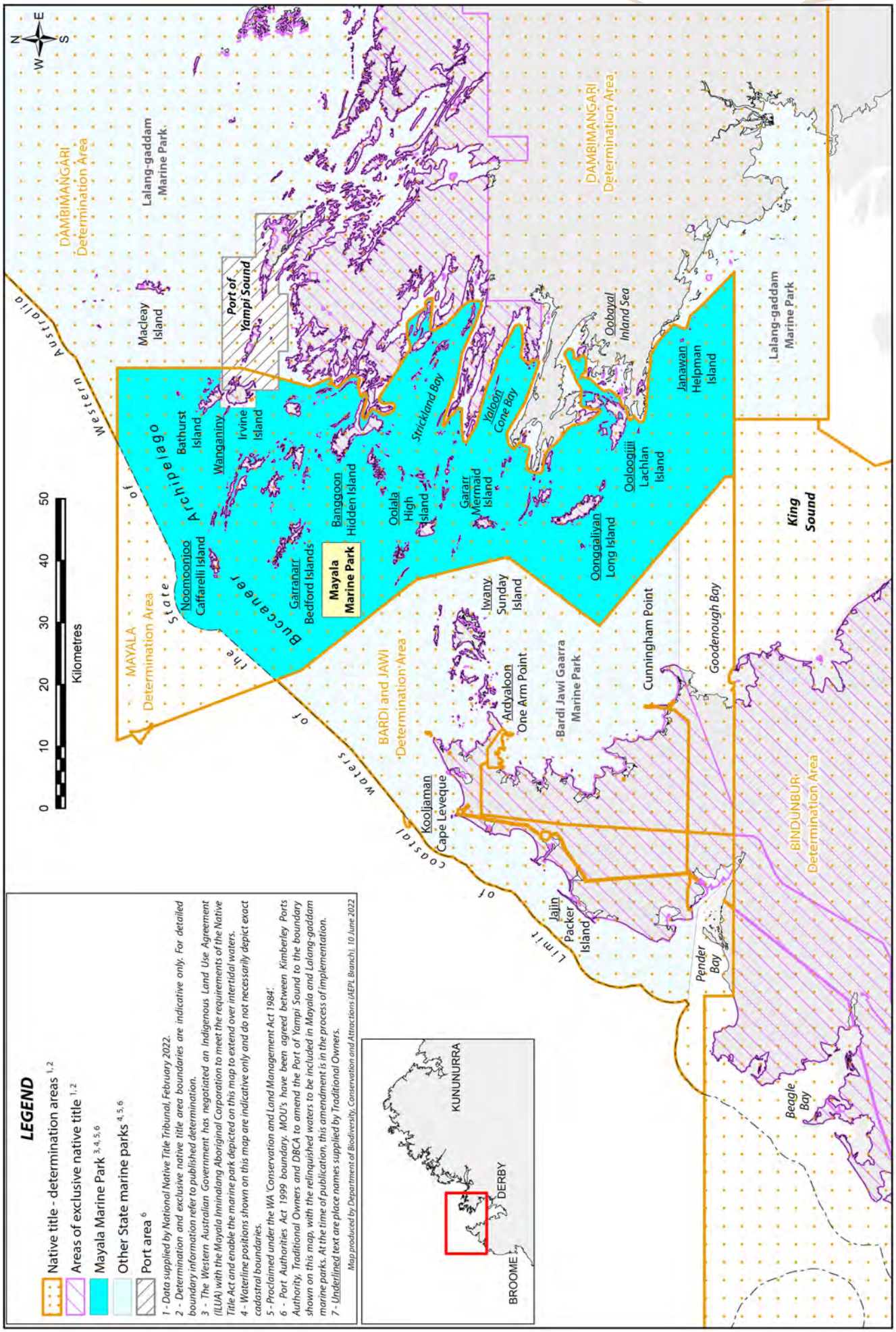
This management plan takes into account the values, aspirations and management objectives articulated in the Mayala Country Plan and has been prepared alongside the Bardi Jawi Gaarra Marine Park Joint Management Plan and the Lalang-gaddam Marine Park Joint Management Plan to ensure consistency of management arrangements across the adjacent parks.

The establishment of the marine park will contribute to the conservation and enhancement of the outstanding cultural, ecological, recreational and commercial values in the area, for the benefit of present and future generations as development and visitation in the region continues to grow.


Lorna Hudson on Margaret Island. Photo – Roanna Goater, DBCA.




Map 1: Locality of Mayala Marine Park




Map 2: Native title determination areas within and adjacent to Mayala Marine Park

# 3. Mayala Baaliboor (*Mayala Country*)

## 3.1 *Mayalayoon ambooriny* (people) and Mayala *Baaliboor* (Country)

Mayala are true saltwater people who have a unique island culture. Like their ancestors, they continue to use both bush and sea resources within their Country. *Mayala Baaliboor* (Mayala Country) comprises all the islands, the sea, submerged lands, seabeds and saltwater. *Mayala Baaliboor* is rich, alive and healthy. Mayala's Native Title consent was determined on 4 October 2018. The name for Mayala comes from the spinifex grass that grows on the islands.

The interconnectivity of *Mayalayoon ambooriny* (Mayala people), *Mayala Baaliboor* and of all things on Mayala Country – plants, animals, Lore, ceremony, places, people and time, are undivided. It includes everything now and 'across time'. One part of Country cannot be separated out from another, or one species from another, or people from Country or species. *Loo* (tidal currents) connects Country and links together Mayala people and Country. Tidal streams that flow between islands are named, and some people have personal connection to some *loo* (currents), as part of their Country with corresponding rights of use.

Mayala Traditional Owners on *Janawan* (Helpman Island). Photo – Roanna Goater, DBCA.

Mayala Elders Lorna Hudson and Alma Ejai. Photo – Roanna Goater, DBCA.

It is Mayala's belief that the power and creative energy of ancestral beings shaped their Country, and these ancestral beings continue to reside within special places, along with the stories and evidence of their deeds and the spirits of their unborn children. All of Mayala Country holds meaning and Mayala maintain reciprocal and respectful relationships with Country. Within Mayala Country there are special places including ceremony places, traditional burial sites and graveyards, stone arrangements, places of historic remembrances and Lore sites with restricted access. Running through Mayala Country, there are old trading routes and story lines connecting clan estates. Ochres and clays used for ceremonial purposes, seasonal camping areas and *aarli* (fish) traps are still used today.

Residing on small islands with little game and few large mammals or freshwater sources, Mayala people lived primarily off the sea. They adapted tools and technology to harvest sea resources for survival, using the currents, tides and stars to navigate through Country. Mayala people, often in family groups, travelled on *biyal-biyal* (also known as *gaalwa*, double log rafts), using the powerful tides and rips to transport them between islands and the coast. The rafts were adapted for different situations, some were used for hunting, some were designed for short trips and others were made to transport large groups of people. Baler shells were used to carry water on long journeys. Their intricate knowledge of the tides, currents and stars allowed them to navigate between areas during day and night.

Historically Mayala have close family and kinship ties to the Bardi and Jawi people to the west, the *Oongarong* and *Oomiida* peoples of the Yampi Peninsula to the East, and *Arrawanyin* and *Yawi-jabayi* peoples between Koolan and Montgomery Islands to the north. A coastal trading network existed along the Kimberley coast and Mayala people were an integral part of this network, trading logs for making rafts with spears from the mainland (Tindale 1974 in Vigilante *et al.* 2013).

The relationship between Mayala people and Country is one of reciprocity and respect - Country sustains and provides for the people, and the people sustain and manage Country through culture and ceremony. Despite the many challenges and changes that Mayala people have faced, they have maintained their strong connection to Country and their story is one of resilience, adaptation and survival.

## 3.2 Bioregional setting

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 a National Representative System of Marine Protected Areas (NRSMPA). The marine park spans across two Integrated Marine and Coastal Regionalisation of Australia (IMCRA) bioregions; the Kimberley Bioregion and the King Sound Bioregion (Map 3). The Kimberley Bioregion extends from Cape Leveque in Bardi Jawi Country to Cape Londonderry in Balanggarra Country. This region is characterised by rocky shores, mudflats, fringing *marnany* (reefs) and 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 Sea Country is home to a diverse range of plants and animals - some endemic to the area and others which are threatened and endangered in other parts of Australia or globally. It is believed that there are many species yet to be discovered by western science. The Kimberley region remains one of the last relatively undeveloped coastal areas left in the world and the scientific and conservation significance of the area is becoming increasingly well recognised (Halpern *et al.* 2008, Richards et al 2015).

Edeline Island. Photo – Roanna Goater, DBCA.

The marine park is characterised by extreme tidal ranges and strong tidal currents and at some inshore locations, tidal amplitudes can reach in excess of 11 m during spring tides (Richards *et al.* 2017). The huge tides and complex currents created between the islands and in Sunday Strait are exceptional and the region is regarded as one of the most difficult marine areas to navigate in Australia. On extreme tides, as the water moves between the narrow passages of the islands it can create powerful tidal streams of up to 10 knots, back water currents, dangerous *jiidid* (whirlpools) and tidal overfalls.

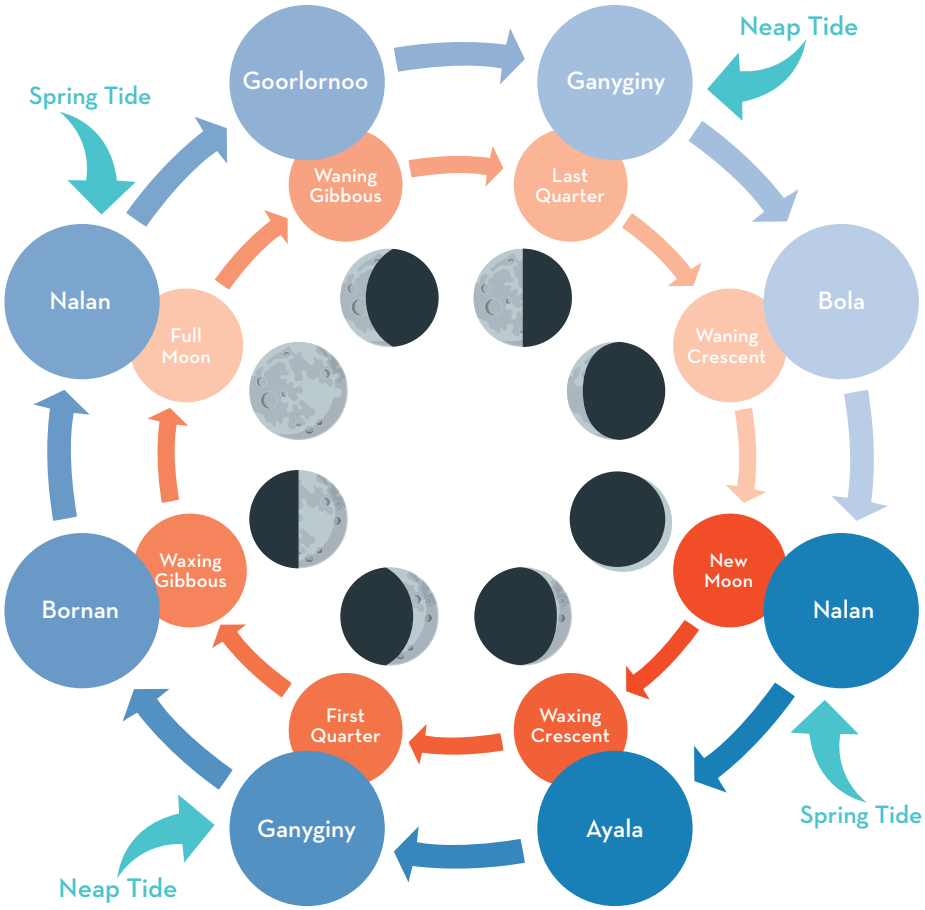



Figure 2: Mayala tidal cycle diagram.

Mayala people have extensive knowledge of the complex tides and tidal currents in the region and describe how there are two different tidal currents either side of the Sunday Strait. The two tides in Sunday Strait divides the **Jawi** *Inalaboor* (small islands in Jawi Country**) and** *Mayalaboor* (Mayala Country). One tide from Sunday Island side and one from Mayala Country run into the other, with the Mayala tide coming in first.

Ocean temperature in the region ranges from 22-33°C with higher localised temperature in nearshore coastal waters. The average sea surface temperature of coastal waters in the Kimberley is 28.5°C (Wilson 2013). The Kimberley region has an extensive river and stream network influenced primarily by tropical monsoonal rainfall. Due to the seasonality of the rainfall, it is common to refer to two predominant seasons, with these being the "wet" (which lasts through the summer and early Autumn months) and 'dry' season (lasting for approximately seven months). Mayala people have a far more nuanced relationship with the climate and understanding of seasonal patterns, recognising six different seasons: *Ngaladan, Irralboo, Barrgana, Jalalay, Lalin* and *Mangala* (Figure 3).

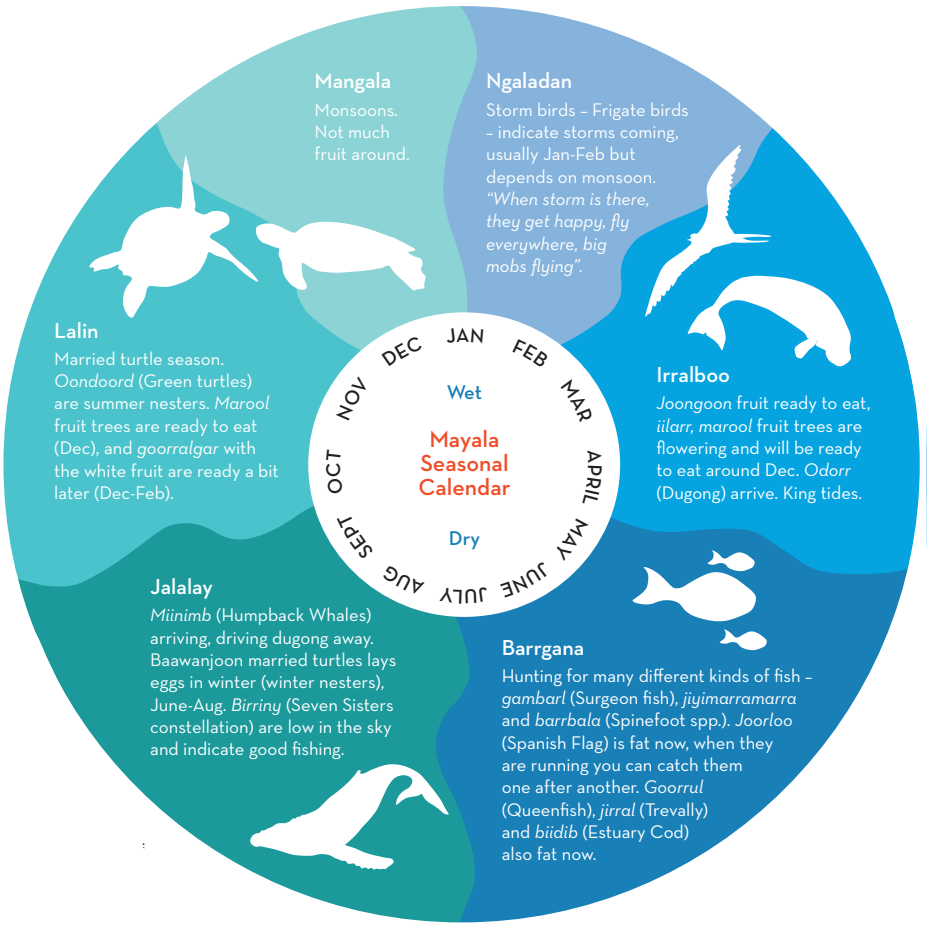
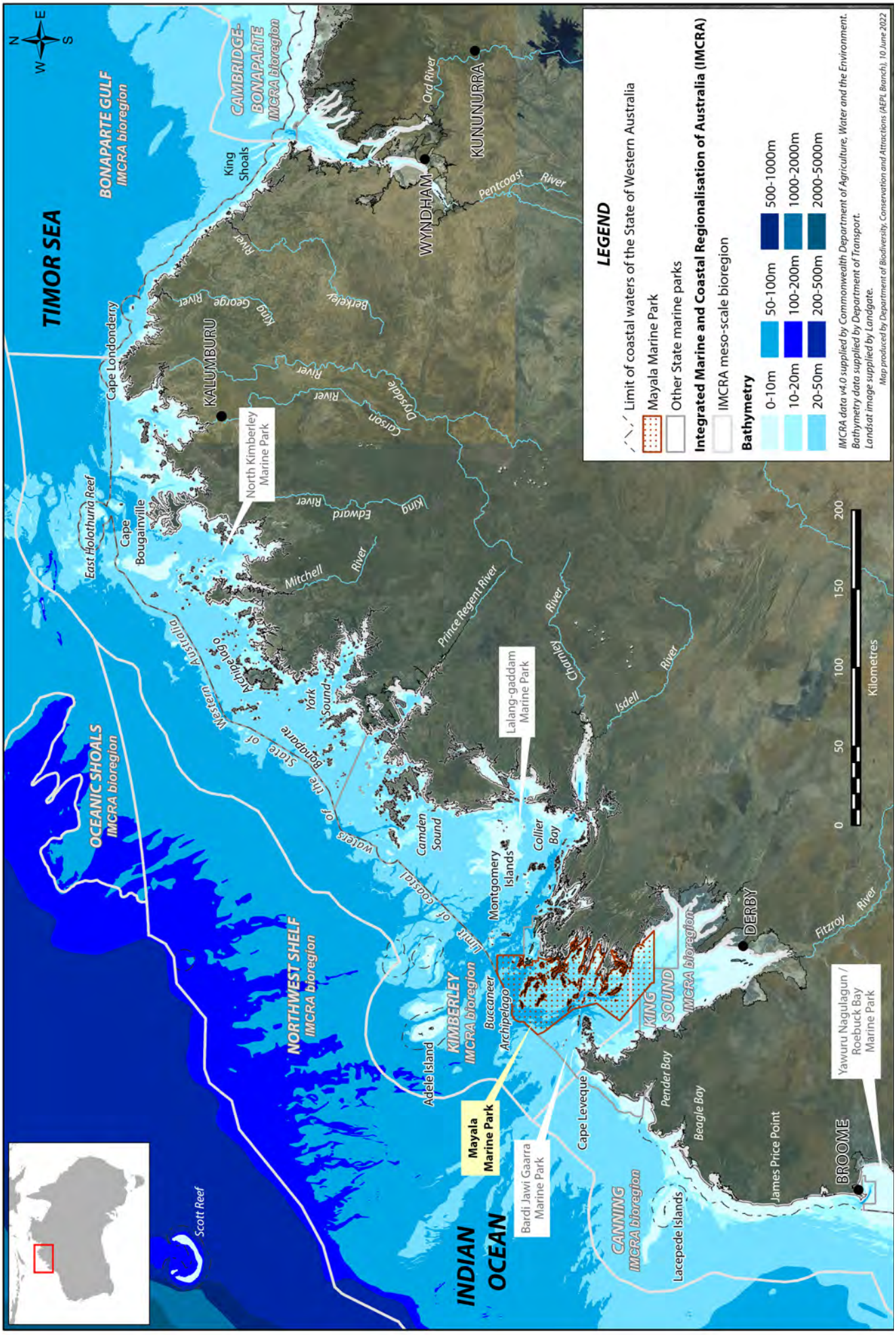



Figure 3: Mayala seasonal calendar

There are no permanent communities on the islands adjacent to the marine park. Although Mayala people don't permanently live on Country, families and individuals still retain close personal connections with their Country and visit regularly for day trips and camping. The nearest community to the marine park is Ardyaloon (One Arm Point) which is home to approximately 400 people. The nearest towns are Derby and Broome, with populations of approximately 3,300 and 16,000 people respectively (Australian Bureau of Statistics 2016). Approximately 47% of the residents of Derby are Aboriginal, 28% of the residents of Broome are Aboriginal, and 86% of the residents of the Dampier Peninsula (1,100 people) are Aboriginal (Australian Bureau of Statistics 2016). Both towns experience considerable population fluctuations due to transitional residency and tourism. There are no major developments in the marine park and commercial activity is currently limited to tourism, commercial fishing, aquaculture and pearling. Irvine Island and Bathurst Island which lie within the waters of the marine park contain significant mineral resources that are of interest to the mining sector. Mining tenements overlay both of these islands. Adjacent to the marine park in Dambeemangarddee Country, an active iron ore mine is in operation on Koolan Island, and mining on Cockatoo Island for iron ore is likely to recommence in the near future.

Due to the limited amount of development and commercial activity, the ecological values of the marine park are considered to be in a good condition. However, pressures are increasing as human activity along the Kimberley coast increases. The sealing of the road to Cape Leveque on the Dampier Peninsula in Bardi Jawi Country is expected to greatly increase the number of boats and people accessing Mayala Country. Pressures in the area include the impacts of climate change (see section 11), fishing (see sections 9.3 and 9.4) and unmanaged tourism activities (see section 9.2).




Map 3: Marine bioregions and Mayala Marine Park

## 3.3 Definition of area and tenure

The Mayala Marine Park is located in the Kimberley Region of Western Australia and covers approximately 315,000 hectares within the Mayala determination area, adjacent to the Shire of Derby-West Kimberley. It includes the majority of Mayala Sea Country including subtidal and intertidal areas around many of the islands of the Buccaneer Archipelago and within *Oobayal* (Inland Sea), *Yaloon* (Cone Bay) and *Barrali* (Strickland Bay). The Mayala Marine Park is bordered to the west by the Bardi Jawi Gaarra Marine Park and bordered to the east by the Lalang-gaddam Marine Park. The northern boundary of the marine park is aligned with the limit of coastal waters of Western Australia and also borders the Commonwealth's Kimberley Marine Park. The Mayala Marine Park extends southwards to the limit of the Mayala determination area. The Port of Yampi Sound abuts the north-eastern boundary of the Mayala Marine Park near Irvine Island. The western part of the Port of Yampi Sound lies within the Mayala determination area and is an area of high cultural significance to Mayala people.

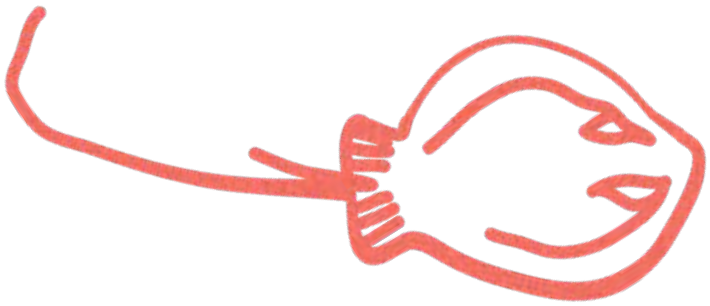
The marine park includes intertidal areas to the high-water mark subject to adjacent tenure and addressing native title requirements under the Commonwealth *Native Title Act 1993* (Native Title Act). The outer boundary of the marine park and surrounding tenure is shown in map 4.

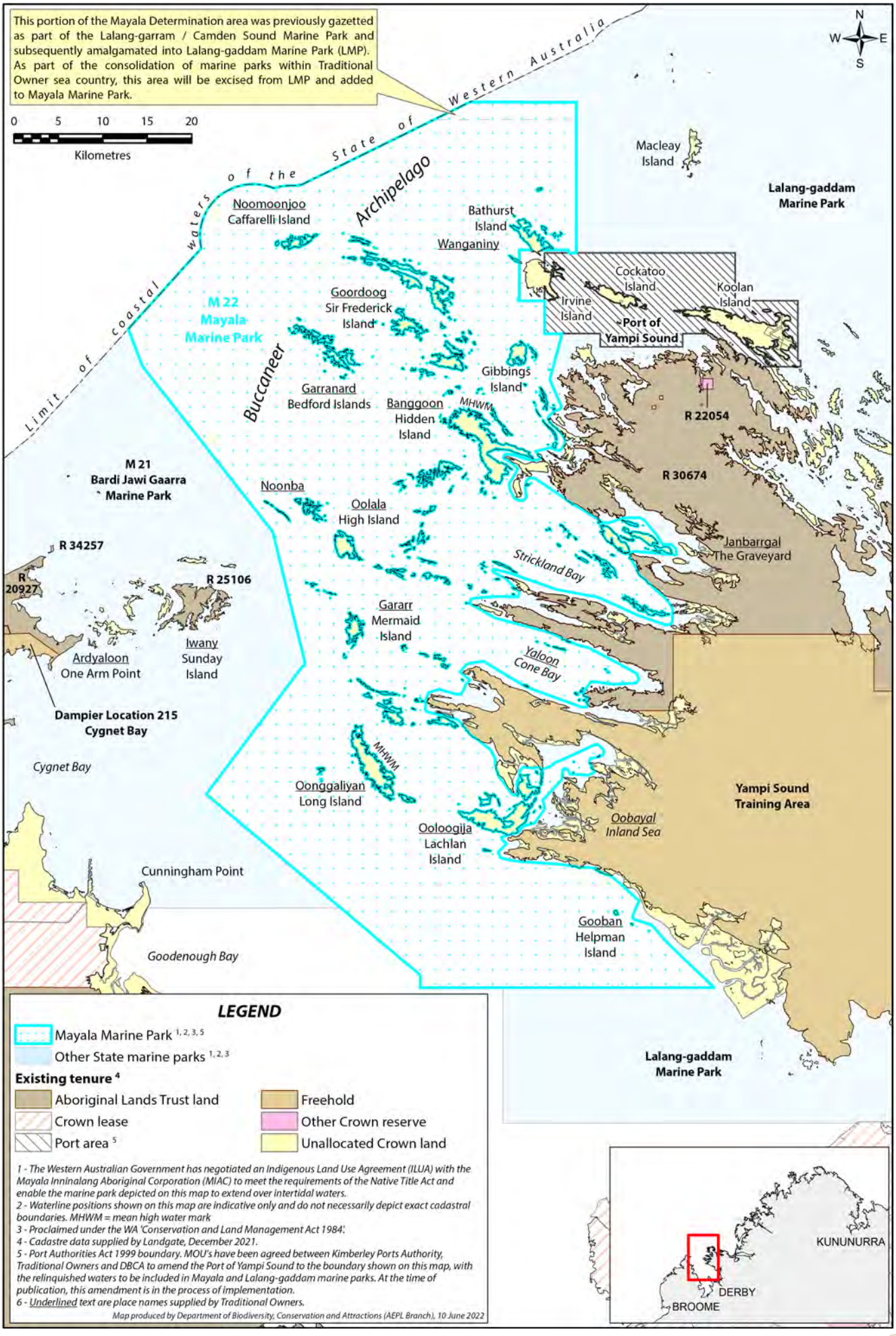
The marine park is gazetted as a Class A marine park and is proposed to be jointly vested in the MIAC and the Commission. Class A reservation provides the highest security of tenure, requiring the approval of Parliament to amend or cancel a reserve's purpose or significantly alter its boundary. By contrast, 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 mining lease for iron ore overlies Irvine Island and surrounding waters and this tenement area is not included in the marine park. However, as the waters surrounding Irvine Island are of exceptional cultural and ecological significance, they would make a significant contribution to a marine park in this area. If these waters were to be considered for inclusion in the future, DBCA would work with Mayala Traditional Owners and mining tenement holders to seek consent for reservation of these waters into the marine park.  Responsibility for the abutting Port of Yampi Sound lies with the Kimberley Ports Authority (KPA).

This joint management plan also includes the management arrangements for the Tanner Island Nature Reserve which is located to the south of Irvine Island.

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. As part of the consolidation of marine parks within Traditional Owner sea country, this area will be excised from Lalang-gaddam Marine Park and added to Mayala Marine Park.






Map 4: Tenure within and adjacent to Mayala Marine Park

# 4. Management Setting

## 4.1 Legislative context

An Indigenous Land Use Agreement (ILUA) between the State Government and Mayala native title holders to enable the valid reservation of the jointly managed and jointly vested marine park including the intertidal areas was registered with the National Native Title Tribunal on 6 June 2021.

Amendments are currently proposed to be made to the CALM Act to allow for joint vesting of conservation estate. Subject to enactment of the necessary CALM Act amendments, the marine park will be jointly vested with the Commission and the MIAC. Joint vesting of the marine park means that the MIAC will not only share the responsibility of making management decisions through the 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 will be 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 fulfil Australia's responsibilities under several international conventions, including the Convention on Biological Diversity, and will support 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 system of marine reserves. Through indigenous participation in decision-making, and by maintaining Mayala's cultural and spiritual relationship with Country, the establishment of the jointly managed marine park also addresses Mayala'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 *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), including sections 15B and 15C. The associated values will be 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. Mayala Traditional Owners have determined native title rights and interests based on strong and ongoing cultural connections over their land and saltwater Country. This management plan does not provide any additional restrictions on the exercising of native title rights other than those 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; and
- take and use water.

Within the marine park, customary activities such as fishing and hunting are also 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 has been determined above the high-water mark on the majority of the islands adjacent to the marine park and people wishing to visit these areas will need to obtain permission from Mayala Traditional Owners prior to their visit.

## 4.2 Joint management

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

Joint management of the marine park is an ongoing and adaptive process which requires Mayala and DBCA to actively work together and share decision making to manage the marine park. Joint management provides the structure to bring together appropriate resources, 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 the saltwater Country will underpin management decisions for the marine park, and Mayala Traditional Owners will be 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 with representatives from MIAC and DBCA to manage the marine park in accordance with the agreement, final joint management plan and the CALM Act. The JMB will oversee management of the marine park, make management decisions, provide strategic input into how management strategies are implemented, monitor implementation of the joint management 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 Mayala Traditional Owners that the day-to-day management of the marine park should be undertaken by Mayala people in the future. DBCA will support Mayala Traditional Owners and MIAC to continue to build their capacity to take on greater responsibility and accountability for the management of the marine park 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 MIAC and other agencies and stakeholders.


On-Country joint planning trip – Michael Higgins, DBCA.

## 4.3 Connectivity and holistic management

This plan has been guided by the values, aspirations and management objectives articulated in the *Mayala Country Plan*. It sets out a strategic approach and priorities for looking after, enjoying and using Mayala Sea Country sustainably for future generations. It has been prepared in conjunction with the joint management plan for the Bardi Jawi Gaarra Marine Park and the joint management plan for the Lalang-gaddam 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 operation of the marine parks.

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. In addition, Mayala's intention is to pursue an Indigenous Protected Area over Mayala Native Title determination area, including the marine park. Mayala also intend to establish a Protected Area Management Committee to ensure consistent governance and management over all the protected areas in Mayala Country.


Mayala, Bardi and Jawi Traditional Owners on a collaborative on-Country joint planning trip. Photo – Mitchell Castellarin

A Memorandum of Understanding 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 been developed between DBCA and Parks Australia for existing State and Commonwealth Marine Parks in Western Australia. The Commonwealth Kimberley Marine Park which includes some of Mayala Sea Country abuts the Mayala Marine Park to the north. It is likely that the collaborative management arrangements which are in place across existing Commonwealth and State marine parks in the Kimberley will be extended to include the Mayala Marine Park, which abuts a Habitat Protection Zone in the Commonwealth Kimberley Marine Park. A Memorandum of Understanding with the KPA to ensure complementary management arrangements for cross-boundary pressures and values has been developed.

## 4.4 Management context

To guide management and meet the vision of the marine park, **management objectives** and **management strategies** have been developed for the marine park to address management issues including 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 DBCA West Kimberley District Office and Mayala joint management partners through the JMB have the primary responsibility for coordinating and implementing the management of the marine park 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 joint management plan they have been addressed under separate headings of Caring for Culture, Caring for Country and People on Country. The categorisation of the values supports the development of clear management objectives and management strategies and allows 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 become 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 listed in section 11.

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 *marrgoorr* (coral) and 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; and
- 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 will be and reflect the statutory requirements of the CALM Act and the cultural responsibilities of Mayala 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.

The prioritisation of the management strategies is based on the best available information and may change during the life of the plan. To prioritise the management strategies, a joint workshop was held between Mayala and Bardi Jawi representatives and key DBCA staff. Management strategies considered to be foundational and critical to achieving the strategic objectives of the management plan are presented as high-key management strategies (H-KMS). All other strategies are prioritised as high (H), medium (M) and low (L) or as required to indicate their relative importance. All strategies apart from those which are 'as required' are intended to be implemented over the life of this plan. High priority strategies are those that need to be started as soon as possible (within the first 5 years), medium priority strategies, are those that need to be started within the first 8 years and low priority strategies are those that should be started when possible but within the 10-year life span of the plan. Some strategies were considered a principle to be applied throughout the implementation of the joint management 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, Mayala people and their 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 will be 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 detection of detrimental impacts and provides the trigger for corrective management action (where possible) before cultural, ecological and social values of a marine reserve become significantly degraded. Where changes have occurred and remediation measure 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 Commission, DBCA, Mayala 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 provided 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 will be further developed or 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. 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 management 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 will provide guidance for ongoing management.

**Joint management partners working together, in harmony, with neighbouring groups and stakeholders to look after and use Country sustainably so Country is always alive, healthy and rich for current and future generations to enjoy.**

## 5.2 Strategic objectives

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

### Caring for Culture

Mayala knowledge remains strong, Mayala cultural rights are protected and the value of Mayala *Baaliboor* (Mayala Country) to Mayala people is protected and conserved.

### Caring for Country

To care for country, keep it healthy and protect and conserve biodiversity and biocultural diversity and ecological integrity.

### People on Country

To support and enhance safe and sustainable customary, recreational and commercial uses of Mayala *Baaliboor* (Mayala Country) and resources.

### Understanding Country

To encourage collaborative research and monitoring which benefits Mayala *Baaliboor* (Mayala Country) and people by increasing knowledge and understanding of the values of the park to guide, adapt and improve joint management.

# 6. Caring for Culture

## Strategic objective:
## Mayala knowledge remains strong, Mayala cultural rights are protected and the value of Mayala Baaliboor (Mayala Country) to Mayala people is protected and conserved.

Mayala people's traditional Country in the marine park is recognised through determined native title rights and interests based on strong and ongoing cultural connections to the area. Culture can mean different things to different people. For Mayala it means carrying on what their ancestors taught them and sharing this with generations to come so that Mayala people remain strong and their Country remains healthy. Mayala people have been practising their culture for thousands of years and to this day Mayala people continue to live by the cultural protocols handed down from *milonjoon* (long, long time ago). Mayala's continuing practice of culture over thousands of years has created a deep connection to Country which includes belonging to and caring for Country.

Campfire on Gararr (Mermaid Island). Photo – Samille Mitchell, DBCA.

Although it is recognised that everything is connected (all parts of Country - whether it be reef, seabed, water, tides, plants, freshwater or animals, along with *Mayalayoon ambooriny* (Mayala people), are undivided) for the purpose of this joint management plan and ease of management arrangements the management of cultural values are addressed under the separate headings of:

- Country is alive;
- Looking after Mayala *Baaliboor* (Mayala Country);
- Traditional knowledge, practice and language; and
- Practicing and maintaining culture.

This section draws from the values described in the *Mayala Country Plan* and management of the marine park will complement the *Mayala Country Plan*.

## 6.1 Country is alive (KPI)

Mayala people have a deep and spiritual connection to Country and maintain reciprocal and respectful relationships with Country. The living force of Country has existed forever and Mayala people are part of the living cultural landscape. It is important for Mayala people to visit Country regularly and perform the right practices and speak to Country. Country that is not regularly visited by its Traditional Owners is said to get lonely or in the case of shelters and caves along estuarine river systems, hide themselves from Traditional Owners. Access to and maintaining connection to Country is integral to the culture and well-being of Mayala Traditional Owners.

'Being on Country feeds our spirit, our liyan, and enables us to care for Country, teach our children to hunt and be safe in the big tides and dangerous currents between the islands.' MIAC 2019

Certain family groups have cultural authority to speak for different areas. *Loo* (tidal currents) connects Country and links together Mayala people and Country. Tidal streams that flow between the islands are named, and some people have personal connection to some *loo*, as part of their Sea Country with corresponding rights of use. Mayala's relationship with Country is how they make sense of the world, how they understand it, and how they know that it is interconnected. Although the majority of Mayala people don't live on Country, families and individuals still retain close personal connections with their Country.

The inability to access Country is a great risk to cultural values. The management arrangements for this value will focus on helping to facilitate and support opportunities for Mayala people to access and maintain their connection to Country and educating visitors to Country about Mayala culture and respectful behaviour.

'Like a *ajibankoor* (willy-willy), it [culture] picks everything up and brings it together and leaves the path clear.'


Mayala Traditional Owners on Country. Photo – Catriona Webster, KLC

| Summary of management arrangements for Country is alive (KPI) | | | |
|---|---|---|---|
| **Requirements** | • Recognition and respect of Mayala people's connection to Country.<br>• Governance arrangement for management reflective of Mayala cultural governance.<br>• Equal involvement of Mayala people in planning and management of the marine park.<br>• Maintained or improved access and privacy for Mayala people to conduct customary activities on Country.<br>• Culturally appropriate visitation and respectful behaviour by all visitors. | | |
| **Pressures** | • The inability of Mayala people to access Country.<br>• Erosion of traditional knowledge.<br>• Culturally inappropriate visitation. | | |
| **Management objectives** | • To uphold Mayala's connection to Country and promote economic opportunities.<br>• To promote increased understanding and respect for Mayala living cultural landscape and concepts of the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 Mayala people to visit their saltwater Country to maintain their connection to Country, through on-country trips, employment and enterprise development. | Management framework | H-KMS |
| | 2. Support Mayala to develop and implement cultural awareness communication tools, emphasising the importance of cultural and heritage values for both Traditional Owners and the wider community. | Education and interpretation | H-KMS |
| | 3. Design and develop management tools to address the impacts of human activities that may prevent cultural fulfilment to uphold Traditional Owner cultural rights and obligations. | Management framework | H-KMS |
| | 4. Support Mayala to define a framework to ensure the right cultural processes are used for assessment and approval of proposals in the marine park. | Management framework | H-KMS |
| | 5. Assess and monitor human activities that impact on the continuity of cultural fulfilment and upholding the cultural rights and obligations to continue the enjoyment of Country. | Monitoring | H |
| | 6. Develop cultural awareness training material and implement training for government employees and / or contractors working in the marine park. | Education and interpretation | H |
| | 7. Support Mayala to develop protocols for visitors on Mayala Country and educate visitors about appropriate behaviour, respecting privacy and access restrictions where applicable [DPIRD]. | Education and interpretation | H |
| | | | |
| **Performance measure** | Indicators will include:<br>• MIAC level of satisfaction that opportunities for ongoing cultural connection of Mayala people are not significantly disrupted because of management activities (or a lack of appropriate activities) in the marine park.<br>• Living cultural landscape information is incorporated into education and interpretation programs for the marine park. | | |

| | |
|---|---|
| **Target** | • MIAC is satisfied that opportunities for ongoing cultural connection of Mayala people to Country are maintained.<br>• MIAC is satisfied that visitors have been provided with opportunities to increase their understanding that the marine park forms part of the living cultural landscape.<br>• Within five years 50% of surveyed users of the Mayala Marine Park are aware that the area forms part of the living cultural landscape of Mayala Country. |
| **Reporting** | Annual, or as required. |

## 6.2 Looking after Mayala *Baaliboor* (Mayala Country) (KPI)

Mayala people carry the responsibilities of their ancestors to manage their Country as they did, so that it always remains alive, healthy and rich. This responsibility, to manage and speak for Country, has been recognised in Australian Law through a native title determination process. The physical environment and plants and animals have been inseparable from traditional law, culture, language and knowledge since Creation Time and this concept is integral to the maintenance and protection of Country. Mayala law has kept Country and Mayala people alive since *milonjoon* (long ago) and Mayala people are here because of their ancestors and their care for Mayala Country. As future keepers of Country, Mayala elders wish to teach their young people about their cultural responsibilities alongside new ways of learning and caring for Country.

Mayala people continue to live by their cultural protocols handed down from *milonjoon* and their cultural responsibilities are still just as relevant in today's world. This includes protecting, preserving and managing areas, sites, objects and biological resources of significance associated with their Country and the traditional knowledge pertaining to them. Living cultural heritage embodies the living, active relationship of Traditional Owners with Country. It is part of their cultural responsibility that Traditional Owners visit all important places and regularly check that they haven't been disturbed and are still healthy.

Mitchell Tigan and Janella Isaac. Photo – Roanna Goater, DBCA.

### 6.2.2 Cultural sites

The marine park contains many places of cultural and spiritual importance. Although all of Mayala Country holds meaning there are some sites of extreme importance within the wider landscape of cultural significance. Mayala have sacred sites and stories on land and in the sea that are evidence of their long association with Country through the rise and fall of sea levels over tens of thousands of years. There are special places for ceremonies, traditional burial sites, graveyards, places of historic remembrances or sites for stone tools, middens, ochres and clays used for ceremonial purposes, engravings, stone arrangements, *aarli* (fish) traps, law sites with restricted access, story lines connecting clan estates, events, seasonal camping areas and trading routes. Sitting, talking and experiencing these places enables Mayala people to feel close to their ancestors.

The majority of these cultural sites and their associated meaning are poorly known to the wider Australian society. Most occur on land, but many are sea-related. Registered sites include those with artefacts, ceremonial and mythological paintings, *aarli* (fish) traps, burial grounds, quarrying, man-made structures and middens. There are also likely to be many sites that are not currently registered. All Aboriginal heritage sites, registered and unregistered, are protected under the *Aboriginal Cultural Heritage Act 2021* and it is an offence to alter an Aboriginal site unless permission is granted in accordance with the Act. Cultural values listed in the National Heritage Listing are protected under the EPBC Act.

If management actions may disturb an Aboriginal site, an assessment is required before the operation proceeds. DBCA and Mayala joint management partners will work with the Department of Planning, Lands and Heritage and the MIAC to ensure Aboriginal sites are not damaged. DBCA will comply with the State Government's Cultural Heritage Due Diligence Guidelines when actions are proposed.

Significant sites need protecting to uphold their cultural integrity. Respectful behaviour when on Country is integral to keeping culture alive and keeping cultural sites healthy. There are rules for appropriate behaviour within Mayala Country and when visiting important cultural places. Under these cultural rules and obligations, Mayala people are responsible for the safety and wellbeing of visitors to their Country.

Unmanaged visitation is the biggest threat to cultural sites. Most people who visit Mayala Country do not intend to do the wrong thing, however, some visitors unknowingly damage cultural sites or go to places where it's not appropriate. Much of the access to adjacent exclusive native title areas is through the marine park, and this should be considered during the development of communication material and when setting commercial operator licence conditions. Under the Native Title Act visitors need to seek permission from Traditional Owners prior to entering adjacent exclusive native title areas.

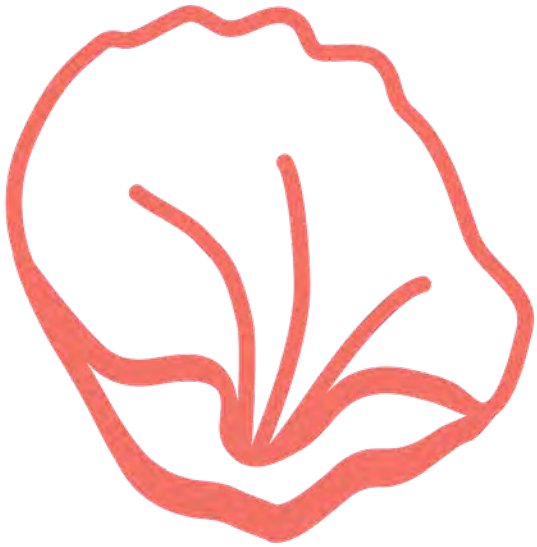
Management of this value will focus on promoting the recognition of Mayala's cultural responsibilities within the marine park and supporting Mayala to restore their cultural governance and decision making and building understanding and respect for Mayala's cultural responsibilities for Country. Including youth in activities on Country will help to build long term capacity and management of Country by Mayala people. Young Mayala people are the future decision makers. Ensuring cultural sites are maintained and visitors are educated about culturally appropriate visitation will also be a focus of management. Specific strategies relating to the management of culturally significant values such as *aarli* (fish), *goorlil* (turtles) and *odorr* (dugongs) are described in section 7.

Alec Isaac preparing oysters. Photo - Samille Mitchell, DBCA

| Summary of management arrangements for Looking after Mayala *Baaliboor* (KPI) | | | |
|---|---|---|---|
| **Requirements** | • Recognition and respect of Mayala people's rights as native title holder to speak for and look after Country.<br>• Recognition and respect for Mayala law and custom and cultural sites.<br>• Ensuring culturally appropriate visitation.<br>• 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 to access Country.<br>• Lack of understanding and respect for culture.<br>• Loss of traditional knowledge.<br>• Lack of resources to manage Country.<br>• Inappropriate and uncontrolled visitation including use of drones and sharing of imagery. | | |
| **Management objectives** | • To facilitate and maintain the opportunity for Mayala people to care for Country and keep it healthy so that future generations can continue to experience Country.<br>• To conserve and protect sites of cultural significance. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 | Principle |
| | 2. Ensure Elders and younger generations are involved in the management of the marine park. | Management framework | Principle |
| | 3. Support Mayala MIAC to establish on-country ranger teams, bases and outposts. | Management framework | H-KMS |
| | 4. Work with Mayala people to conduct a mapping exercise to document Mayala Sea Country and intertidal zones to assist other management programs (and share where appropriate). | Management framework | H-KMS |
| | 5. Develop and implement tools to measure and monitor effects of visitor and management activities on cultural heritage values and sites and implement strategies to address issues where appropriate. | Monitoring | H-KMS |
| | 6. In collaboration with Mayala Traditional Owners, develop and apply commercial operator licence conditions to ensure culturally sensitive and appropriate visitation in the marine park especially for cultural heritage sites. | Management framework | H-KMS |

| | | Management program | Priority |
|---|---|---|---|
| **Management strategies**<br>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. Implement regulations to restrict or control access to areas within the marine park that Mayala Traditional Owners consider unsuitable for visitation (through commercial operator licences, by regulation or other mechanism as relevant) [DPIRD]. | Management framework | H-KMS |
| | 8. Support MIAC to explore and implement, tailored training, education and mentoring to enable Mayala people to fulfil positions of employment relating to the management of the marine park [DPIRD]. | Management framework | H |
| | 9. Assess the use and condition of cultural sites and implement further strategies to improve the spiritual and physical condition of them where possible. | Research | H |
| | 10. Support Mayala MIAC to communicate and regulate protocols for access to Mayala islands. | Management framework | H |
| | 11. Ensure cultural heritage sites in the marine park are protected, particularly significant and sensitive sites at risk. | Management framework | H |
| | 12. Support MIAC 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 | M |
| | 13. Develop a transition plan to build Mayala's capacity to take on management of the ranger team and conduct periodic reviews of progress. | Management framework | M |

| | |
|---|---|
| **Performance measure** | Indicators will include:<br>• MIAC level of satisfaction that they have been able to undertake their role as protectors and managers of their Country and culture in the context of jointly managed conservation estate. |
| **Target** | MIAC is satisfied that they have been able to undertake their role as protectors and managers of their Country and culture in the context of jointly managed conservation estate. |
| **Reporting** | Annual, or as required. |



## 6.3 Traditional knowledge, practice and language (KPI)

Mayala Traditional Owners, especially the Elders, collectively hold an extensive body of cultural and ecological knowledge that has been developed over thousands of years. This knowledge comes from their long association and living relationship with Country as it has changed over generations. Mayala continue to use their intimate knowledge of the environment, seasons, currents and tidal movements to navigate safely through Country, hunt and harvest marine resources and gather tools, bait, materials and medicine. Knowing the Country and observing the changes through the seasonal and daily cycles is critical knowledge and a crucial skill for survival. Mayala's traditional knowledge and management practices are empirical, reliable and valuable, but endangered.

In accordance with traditional law, Mayala people are responsible and obliged to transfer knowledge to the younger generation. Knowledge is typically passed down through stories and song, ceremonies, being on Country and through everyday life. Loss of traditional knowledge is a great risk to cultural values. Mayala Traditional Owners are keen to use modern technology to document, and make available as appropriate, traditional knowledge, including language, to ensure the longevity of their culture and heritage and help inform the management of the marine park.

Cathy McCarthy and Violet Carter naming zones. Photo – Roanna Goater, DBCA.

Language is more than just a means to communicate, it is an essential characteristic that makes people and communities unique and plays a central role in a sense of identity. Language also carries meaning beyond the words themselves and is an important platform within which much cultural knowledge and heritage is passed on (AIATSIS 2019). If language is lost, then knowledge is lost. Integrating both Indigenous peoples' knowledge and western scientific knowledge is a key element for ensuring the best outcomes for management and conservation (Austin et al. 2017).

*Oowini* is the traditional language of Mayala island Country however, from a history of missions and displacement from Country, the old people today were the last to hear *Oowini* spoken. Recent generations of Mayala Traditional Owners have grown up speaking Bardi, and Mayala have adopted Bardi language which is used in this plan when *Oowini* terms are not known. Mayala are committed to reviving the languages of Mayala Country and honouring traditional language through naming places or facilities.

'Sitting at the intersection of Nyulnyulan and Worrorran family groups of languages, it was crucial for Mayala survival to be able to communicate and maintain good relations with people from these groups. Oowini, Jawi, Bardi, Oomiida and Oongarong were spoken in the region within and around Mayala. Oowini is the traditional language of Mayala island Country, and through Native Title Mayala people have connections through one of their apical ancestors to Oomiida language. Oowiini originated from the islands where as Oongarong and Oomiida were identified as coastal languages.' (MIAC, 2019).

Management of this value will focus on gaining a better understanding of traditional knowledge applicable to the planning area and investigating opportunities for integration of knowledge and language with contemporary conservation science and management.

| Summary of management arrangements for traditional knowledge, practice and language (KPI) | | | |
|---|---|---|---|
| **Requirements** | • Increased understanding of and support for Mayala's traditional ecological knowledge and its application to park management.<br>• The maintenance of knowledge transfer within the Mayala community.<br>• Recognition of Mayala languages including the adoption of the Bardi language. | | |
| **Pressures** | • Lack of knowledge transfer to the younger generation.<br>• Inability of Mayala people to access Country.<br>• Loss of *Oowini* language.<br>• Limited recognition and use of Mayala or Bardi names for Mayala places. | | |
| **Management objectives** | • To apply language and traditional knowledge and integrate it with conservation science, management and in education about the marine park.<br>• To assist in waking up *Oowini* language. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br><br>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. Where possible use Mayala and Bardi languages for place names, in signage, educational material, reporting and when naming facilities [DPIRD]. | Education and interpretation | Principle |
| | 2. Continue to support the transfer of traditional knowledge through on country learning opportunities, including supporting Mayala people to visit their saltwater country with younger generations to support cross-generational exchange of information. | Management framework | Principle |
| | 3. Undertake and support research to gain a better understanding of Mayala traditional knowledge applicable to the marine park [DPIRD]. | Research | H-KMS |
| | 4. Investigate opportunities and develop a process for integrating Mayala traditional knowledge, and knowledge holders, into marine park management [DPIRD]. | Research | H-KMS |
| | | | |
| **Performance measure** | Indicators will include:<br>• MIAC level of satisfaction that traditional knowledge is being consulted and, where relevant, integrated into the management of the marine park. | | |
| **Target** | MIAC is satisfied traditional ecological knowledge is integrated into management of the marine park. | | |
| **Reporting** | Annual, or as required. | | |

## 6.4 Practicing and maintaining culture (KPI)

For Mayala people, undertaking customary activities on their traditional lands is central to maintaining the culture and heritage of the land. As the recognised native title holders of Mayala Country, Mayala people have the right to enjoy Mayala Country and maintain their customary practices. In particular, this refers to rights of access to Country, to work on Mayala Country, use the resources of Mayala Country, pass on knowledge to future generations, continue customary practices, benefit from Mayala Country and create opportunities for Mayala people. Being on Country and carrying out these customary practices reinforces and continues Mayala's strong relationship to Country.

'Noomoorr are the traffic lights of the ocean – the signs of tidal movements and changes that indicate where to go and when to go. Mayala continue to use their intimate knowledge of the environment, seasons, currents and tidal movements and noomoorr to navigate safely through Country, hunt and harvest marine resources and gather tools, bait, materials and medicine. Timing is crucial. People must know how to hunt and when to go. Getting it wrong could cost you your life. The different phases during each tidal cycle are useful for different activities, including when and where to hunt or harvest shellfish, fish, odorr (dugong), turtle, bush fruits, yams, medicine and tools' (MIAC, 2019).

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.

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 will be managed in accordance with Mayala 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 minimize 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. Customary hunting of *goorlil* (turtle), *odorr* (dugongs) and *linygurra* (saltwater crocodiles) which are otherwise protected, is permitted by Mayala people in the marine park. *Goorlil* (turtles) and *odorr* (dugong) are important cultural foods for Mayala people. Eating these foods is said to feed their *liyan* (spirit). Seasonal indicators tell Mayala people when to hunt for different species and visit different areas. Indicators cross over between land and Sea Country and are embedded in Mayala cultural stories, practices and law.  Management of this value will focus on providing for, recognising and maintaining the rights of Mayala people to enjoy Country and undertake customary practices.

Customary fishing. Photos – Roanna Goater, DBCA.

| Summary of management arrangements for practicing and maintain culture (KPI) | | | |
|---|---|---|---|
| **Requirements** | • Recognition of, and support for, Mayala people's rights to enjoy Country and maintain customary practices.<br>• High water quality, healthy biological communities and functioning ecosystems.<br>• Access and privacy for undertaking cultural activities (e.g. traditional hunting, visiting/ managing sites etc).<br>• Sharing of marine resources within a sustainable traditional framework. | | |
| **Pressures** | • Inability to access Country.<br>• Climate change (refer to section 11).<br>• Disturbance and lack of privacy caused by increased visitation.<br>• Commercial activities impacting on Mayala's ability to carry out cultural activities in private or fish/hunt/gather resources. | | |
| **Management objectives** | Recognition of and support for the right of Mayala people to continue customary practices and to benefit from their Country, consistent with the purpose of the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 Mayala people to continue to carry out customary activities, including customary fishing and hunting, in the marine park [DPIRD- in relation to fish]. | Management framework | Principle |
| | 2. As part of the education and interpretation plan develop mechanisms to inform users of the marine park about Mayala rights, as the recognised Traditional Owners, to enjoy Mayala Country and maintain their customary practices [DPIRD]. | Education and interpretation | H-KMS |
| | 3. Work with Mayala people and other Traditional Owner groups to develop sustainable management arrangements for customary hunting of marine wildlife (e.g. *Goorlil* (turtles), *odorr* (dugongs), *joorroo* (sharks) and *barnamb* (rays) etc.) and develop a customary fishing/ hunting guide [DPIRD]. | Management framework | H |
| | 4. Develop mechanisms to feedback information from research and monitoring programs to the Mayala Community on the condition of customary hunted animals such as *goorlil* (turtles) and *odorr* (dugongs), to support cultural and marine management decisions and facilitate the development and implementation of sustainable management arrangements for customary hunting. | Management framework | M |
| | | | |
| **Performance measure** | Indicators will include:<br>• MIAC 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** | MIAC is satisfied that they have been able to continue customary practices and benefit from Country consistent with the purpose of the marine park. | | |
| **Reporting** | Annual, or as required. | | |

Violet Carter. Photo – Daniel Barrett-Lennard, DBCA.

# 7. Caring for Country (biocultural and ecological values)

### Strategic objective:
### To care for Country, keep it healthy and protect and conserve biodiversity, biocultural diversity and ecological integrity.

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 (i.e. representative, rare or unique) and the role they play in maintaining ecosystem integrity. As all plants and animals on Country are important to Mayala people, these values are also referred to as biocultural values. 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 will be a strong focus for the implementation of the management plan and will be designed to fill key knowledge gaps.

## 7.1 *Marrgoorr* (coral) and *marnany* (reef) communities (KPI)

*Marrgoorr marnany* (coral reefs) are among the most productive and species-rich ecosystems on earth and the Kimberley displays rich *marrgoorr* fauna, in both species and genera, of any North-West Shelf Bioregion (Wilson 2013).

Coral. Photo – Roanna Goater, DBCA.

Most islands in the marine park are surrounded by extensive intertidal *marnany* (reef) platforms. Mayala people consider islands connected by these *marnany* platforms as one island and they are named in this way. For example, *Diiji* is the name for Pascoe and Hazel Islands and the interconnecting reef platform (MIAC 2019). More research is required to assess the diversity of *marrgoorr* species in the Kimberley region as current species numbers are likely to be substantially underestimated (Richards *et al*. 2017).

Research has found that inshore reef populations in the Kimberley are highly divergent from the offshore 'oceanic' *marnany* populations, strongly indicating that these regions are independent in an ecological and evolutionary sense (Richards et al. 2017). Radiocarbon dating of marrgoorr collected from marnany cores in the Buccaneer Archipelago discovered that *marrgoorr* 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 12-15 thousand years ago (Collins et al. 2016). *Marnany* in the inshore Kimberley region of Australia experience the greatest tidal variation of any tropical location in the world. Despite this, fringing *marnany* line the shores of almost all the *iinalang* (big islands) in the Kimberley Bioregion (Wilson 2013). Research suggests the main season of spawning on inshore Kimberley reefs is during autumn, but with secondary multi-specific spawning also occurring during spring (Gilmour et al. 2016).

Another unusual feature of the Buccaneer Archipelago is the elevation of *marnany* flats. *Marnany* normally grow vertically until they reach sea level where they then alternate their growth direction and spread out laterally into deeper water. The *marnany* that have been studied in the Buccaneer Archipelago have grown vertically above the mean low water level limit and up to the mean tide height, by creating terraces of coralline algae. This results in the *marnany* flats being above the level of the tide for half the time (Richards and O'Leary 2015).

The *marnany* in the marine park hold particular cultural significance to Mayala people. *Marnany* provide rich food sources such as *niwarda* (small rock oyster), *jalnggoon* (large rock oysters), *alngir* (trochus), *goowarn* (pearl oysters) pearl shell and many kinds of *aarli* (fishes) as well as a place to hunt *goorlil* (turtle) and collect useful materials such as *amboorl* (baler shell) and *ngoolnga* (trumpet shell) used for carrying water.  Collection of *goowarn* (Pinctada maxima pearl shell) or *alngir* (trochus) is favoured during *irralboo* and *jalalay* seasons (March-April and July-September) when the low tides expose large *marnany* areas and the winds are generally favourable for small boats.

*Marnany* in the Kimberley are generally considered to be in good condition although Mayala have noticed that the *marnany* appear less healthy than they were in the past. Mayala report that the *marnany* have fewer octopus, blue crab and *alngir* (trochus), and are threatened by *marrgoorr* bleaching through climate change. Detailed physiological measurements have shown that *marrgoorr* 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 *marrgorr* in the nearshore region of the Kimberley was recorded in the summer of 2016 (McCulloch *et al.* 2017). As the pressure of climate change will be 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 *marrgoorr and marnany* (coral and reef) communities (KPI) | | | |
|---|---|---|---|
| **Current status** | *Marrgoorr* and *marnany* are generally in good condition, however bleaching events have been reported in some areas of the Kimberley and may have occurred in the marine park. | | |
| **Existing and potential pressures** | • Climate change impacts including increased severity and frequency of warming events, ocean acidification, and increasing cyclone and storm intensity.<br>• Physical disturbance from reef walking, anchoring and vessels.<br>• Trophic (knock on) effects to other fauna and flora caused by fishing.<br>• Commercial *marrgoorr* (coral) collecting.<br>• Decrease in water quality. | | |
| **Current major pressure** | • Localised direct damage associated with reef walking.<br>• Climate change impacts (refer to section 11). | | |
| **Management objectives** | To ensure that *marrgoorr* (coral) and *marnany* (reef) communities are not significantly impacted by reef walking and other human activities within the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 the diversity and condition of *marrgoorr* (coral) and *marnany* (reef) communities in the marine park [DPIRD]. | Research | H |
| | 2. Monitor the condition of *marrgoorr* (coral) and *marnany* (reef) communities and the pressures acting on them in the marine park [DPIRD]. | Monitoring | H |
| | 3. Regulate foot access to intertidal *marnany* (reef) and other areas unsuitable for visitation (through commercial operator licence conditions, by regulation or other mechanisms as relevant). | Management framework | H |
| | 4. Educate users of the reserves about the ecological importance of *marrgoorr* (coral) and *marnany* (reef) communities and the potential detrimental effects of in discriminant *marnany* (reef) walking, collecting, anchoring and boating activities on communities [DPIRD]. | Education and interpretation | H |
| | | | |
| **Performance measure** | Indicators will include:<br>• Diversity.<br>• Total *marrgoorr* (coral) cover.<br>• Community composition.<br>• Colony size distribution. | | |
| **Target** | • No significant decline in diversity or total *marrgoorr* (coral) cover as a result of human activity.<br>• No significant change in community composition or colony size distribution as a result of human activity. | | |
| **Reporting** | 3-5 years. | | |

Exposed reef in *Oobayal* (Inland Sea) area. Photo – Roanna Goater, DBCA.

## 7.2 Mangrove communities (KPI)

Mangroves are important primary producers of ecological and economic importance. They help to stabilise coasts and control erosion by trapping and binding sediment and provide habitat and refuge areas for a variety of *aarli* (fish), invertebrates and *garrabal* (birds).

The mangroves of the Kimberley are recognised for being a rare system of mangroves set in a tropical, largely macrotidal environment (Cresswell and Semeniuk 2011). There are 18 species of mangroves in Australia and all are found in the Kimberley region. Ten of these are only found in the Kimberley as species diversity declines in more southern latitudes (Pendretti and Paling 2001). Most Kimberley mangrove research has focussed on the mainland coast rather than the islands. Little is known about the diversity of mangroves surrounding the islands in the Mayala Marine Park, however, a similar suite of species could be expected there.

Mayala have been sustainably using resources from mangroves for thousands of years. The wood from particular mangroves were used by Mayala people to make *biyal-biyals* (mangrove double log rafts, also called *gaalwas*). Navigation by *biyal-biyal* allowed Mayala to ride the incoming or outgoing tides and currents day or night to travel between the islands and to hunt or harvest marine resources. Mangrove communities themselves are also important customary fishing areas.

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

Mangroves. Photo – Peter Nicholas, DBCA.

| Summary of management arrangements for mangrove communities (KPI) | | | |
|---|---|---|---|
| **Current status** | Mangroves are assumed to be in a generally undisturbed condition. | | |
| **Existing and potential pressures** | • Direct (e.g. removal of trees) and indirect (e.g. changes to community structure) impacts from recreational and commercial fishing (see sections 9.3 & 9.4).<br>• Decrease in water and sediment quality (see section 7.4). | | |
| **Current major pressure** | Climate change impacts such as rising sea level, warming of air and sea temperatures, alteration of rainfall patterns and more intense cyclones and storms. (refer to section 11). | | |
| **Management objectives** | To ensure mangrove communities are not significantly impacted by human activities in the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 the diversity, density, abundance and distribution of mangrove communities in the marine park.<br>2. Monitor the condition of mangrove communities and the pressures acting on them within the marine park.<br>3. Educate users of the important ecological role of mangrove communities and the potential impacts of human activities, particularly vessel wash on these communities [DPIRD]. | Research<br>Monitoring<br>Education and interpretation | H<br>H<br>H |
| | | | |
| **Performance measure** | Indicators will include:<br>• Diversity.<br>• Aerial extent.<br>• Canopy density. | | |
| **Target** | No significant decline in performance measures as a result of human activity. | | |
| **Reporting** | 3-5 years. | | |

## 7.3 *Noomool* (seagrass) and *laanyji* (macroalgae) communities (KPI)

*Noomool* and *laanyji* are important components of shallow tropical marine environments, providing energy, nutrients and food for a number of endangered and culturally significant fauna, particularly the *odorr* (dugong) and green turtle (*Chelonia mydas*). They enhance the habitat value of benthic habitats by increasing structural complexity and stabilising soft substrates and can store considerable quantities of carbon (Kendrick *et al.* 2016). They vary seasonally in response to water temperature, day length, reproductive cycles, physical disturbance and regrowth. *Noomool* and *laanyji* are protected under the BC Act and FRM Act.

Twelve species of *noomool* have been recorded in the Kimberley. This diversity is considered to be 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). Subtidal *noomool* meadows are generally short-lived and dominated by species with fast turnover times and high rates of reproduction, often disappearing during the wet season (Kendrick *et al.* 2017).

The Sunday Island Group which is within the neighbouring Bardi Jawi Gaarra Marine Park stands out as having particularly extensive and diverse *noomool* (seagrass) meadows with eight species being recorded in the raised lagoons of the islands (Kendrick *et al.* 2017). Research into growth and consumption rates of the *noomool* and *laanyji* in the area also showed how important the *noomool* beds are for marine herbivores such as green turtle and rabbitfish (*Siganus lineatus*). Given the proximity of the Sunday Island group to the Mayala Marine Park, similar levels of diversity and growth and consumption rates could be expected in Mayala Sea Country. A study into the structure and connectivity of *noomool* in the Kimberley found that *Gararr* (Mermaid) and Riptide Islands act as important stepping-stones for *noomool* dispersal between the Sunday Islands and the Buccaneer Archipelago (Berry *et al.* 2017).

*Marnany* (reef) with *laanyji* (algae). Photo – Peter Nicholas, DBCA.

While *noomool* in the marine park is generally in an undisturbed state, some species such as *Thalassia hemprichii* are growing at the southern limit of their distribution; 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 *laanyji* have been recorded in the Kimberley, most of which are red algae (Huisman and Sampey 2014). This is fairly typical of the diversity of *laanyji*, and many of these species are small, epiphytic algae. Species of the genus *Sargassum* are abundant in inshore habitats, and can be important habitat (for example, they shelter juvenile *aarli* (fish) or food (Depczynski *et al.* 2017).

The full distribution of *noomool* and *laanyji* in the marine park is still to be determined.

| Summary of management arrangements for *noomool* (seagrass) and *laanyji* (macroalgae) communities (KPI) | | | |
|---|---|---|---|
| **Current status** | Little known but assumed to be in a generally undisturbed condition. | | |
| **Existing and potential pressures** | • Climate change impacts from warming temperatures and more severe cyclones and storms.<br>• Damage from vessel activity (e.g. anchoring, propeller scour).<br>• Decrease in water and sediment quality (e.g. nutrient and toxicant inputs). | | |
| **Current major pressure** | Climate change impacts (refer to section 11). | | |
| **Management objectives** | To ensure the diversity, abundance and condition of *noomool* (seagrass) and *laanyji* (macroalgae) communities are not significantly impacted by human activities within the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br><br>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 the diversity, abundance and distribution of *noomool* (seagrass) and *laanyji* (algae) communities in the marine park. | Research | H |
| | 2. Monitor the condition of *noomool* (seagrass) and *laanyji* (macroalgae) communities and the pressures acting on them within the marine park. | Monitoring | H |
| | 3. Educate users of the important ecological role of *noomool* (seagrass) and *laanyji* (macroalgae) communities and the potential impacts of human activities, particularly vessel mooring, and nutrient and pollution inputs on these communities [DPIRD]. | Education and interpretation | H |
| | | | |
| **Performance measure** | Indicators to be developed but may include:<br>• Total cover.<br>• Diversity.<br>• Community composition.<br>• Noomool (seagrass) biomass.<br>• Laanyji (macroalgae) density.<br>• Laanyji (macroalgae) canopy height<br>• Seed bank density | | |
| **Target** | • No significant decline in total cover, diversity, noomool (seagrass) biomass, macroalgae density or macroalgal canopy height as a result of human activity.<br>• No significant change in community composition as a result of human activity. | | |
| **Reporting** | 3-5 years. | | |

## 7.4 Water and sediment quality (KPI)

Mayala Sea Country includes all the saltwater and submerged lands (both permanently submerged and tidally): *gaarr-gaarr* (ripples), *loo* (tidal streams or currents), *galoorr* (foam), *jardagarr* (sandbars), *niimir* (drop offs or deep holes in the sea, so deep you can't see the bottom), *jiidid* (whirlpools) and *ooloowa* (spouts).

High water and sediment quality are essential to the maintenance of healthy ecosystems. Oceanographic processes, including *loo* (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 likely to be of high quality however, 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 proposed 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).

*Loo* and *jiidid* (currents and whirlpools). Photo – Michael Higgins, DBCA.

Poor water quality 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 derive from land-based activities (WWF 2018). In addition to degrading habitats, pollution can directly threaten marine fauna and flora. 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 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).

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 the State Government by the Company. The event is not known to have affected the adjacent Dambeemangarddee **or Mayala sea country.**

### 7.4.1 Sewage discharge

The *Strategy for Management of Sewage Discharge from Vessels into the Marine Environment* (Department of Transport 2009) outlines guidelines for marine sewage discharge in Western Australian waters. 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) 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.

### 7.4.2 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. Management will focus on preventing marine debris entering the marine environment through education and removing the debris that is found in the marine park.

### 7.4.3 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 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 Agriculture, Water and the Environment's charter is to ensure that foreign ballast water has been managed in accordance with the *Australian Ballast Water Management Requirements* before permitting its 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 *marrgoorr* (coral), giant clams, and other benthos has been detected on Kimberley inshore *marrgoorr marnany* (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.

### 7.4.4 Oil spills

Although the risk of a serious marine oil pollution is considered low, the nature of the habitats and fauna that depend on high water quality (e.g. large intertidal areas, magroves and rare 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, the 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.

| **Summary of management arrangements for water and sediment quality (KPI)** | | | |
|---|---|---|---|
| **Current status** | Water and sediment quality is likely to be high throughout the marine park. | | |
| **Existing and potential pressures** | • Climate change impacts (e.g. increased water temperatures, riverine input from increased terrestrial monsoonal runoff – increased turbidity).<br>• Marine debris (including microplastics).<br>• Toxicants (e.g. anti-fouling agents, ballast/bilge water discharge).<br>• Increased nutrients (e.g. sewage discharge).<br>• Major pollution events (e.g. oil spills).<br>• Mining (e.g. oil and gas exploration and development, including drilling and pipelines).<br>• Development activities (e.g. development or expansion of existing infrastructure). | | |
| **Current major pressure** | Climate change impacts gradually increasing water temperatures. | | |
| **Management objectives** | To ensure that water and sediment quality are not significantly impacted by human activities in the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 biosecurity, mitigation and monitoring program [DPIRD]. | Management framework | H-KMS |
| | 2. Undertake and/or support research on water and sediment quality in the marine park, including establishing baselines for water and sediment quality variables. | Research | H |
| | 3. Monitor the condition of water and sediment quality within the marine park and the pressures acting on it. | Monitoring | H |
| | 4. Designate areas for vessel sewage discharge and incorporate into education, patrol and enforcement programs to enforce sewage discharge arrangements. | Management intervention and visitor services | H |
| | 5. 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 | H |
| | 6. 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]. | Management intervention and visitor services | H |
| | 7. Map the areas of the marine park that are highly sensitive to oil and chemical spills and ensure that this information is accessible to the State Marine Oil Pollution Coordination Group [DoT]. | Management framework | H |
| | 8. Educate users of the importance of good water and sediment quality, and the potential impacts human activities, particularly nutrient and pollution inputs can have on these communities. | Education and interpretation | M |

| | |
|---|---|
| **Performance measure** | Indicators to be developed but may include:<br>• Seawater temperature.<br>• Nutrient concentration.<br>• Pathogen presence and/or concentration.<br>• Total suspended sediments. |
| **Target** | No significant change in performance measures as a result of human activity. |
| **Reporting** | 3-5 years. |

## 7.5 Geomorphology including beaches

The Kimberley coast is the largest rocky coast in Australia and is of global geo-heritage significance (Brocx and Semeniuk 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 (Brocx and Semeniuk 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.

Mayala people believe, powerful and creative ancestral beings roamed the Country, creating the geomorphological features seen today including the beaches, islands, and reefs. Small isolated sandy beaches occur on many of the islands in Mayala Country. *Ngalangalangarr* (Silica Beach) is unique in the Kimberley as it is composed of white silica sand and is one of the tourism hotspots in the marine park. Many beaches in the marine park are important cultural camping areas and hold particular significance to Mayala people.

Geomorphology of the Mayala Marine Park. Photo – Mark Pagano, DPIRD.

| Summary of management arrangements for geomorphology (including beaches) | | | |
|---|---|---|---|
| **Current status** | The current status is assumed to be in a generally undisturbed condition. | | |
| **Existing and potential pressures** | • Establishment of coastal infrastructure and mining activities.<br>• Climate change impacts including rising sea levels and increased severity of tropical cyclones and storms.<br>• Uncontrolled visitation. | | |
| **Current major pressure** | None currently identified. | | |
| **Management objectives** | 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**<br>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 the geomorphic features and processes in the marine park and their associated ecological functions.<br>2. Monitor the condition of geomorphology and the pressures acting on it within the marine park.<br>3. 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 EP Act. | Research<br>Monitoring<br>Management framework | M<br>L<br>As required |
| | | | |
| **Performance measure** | Indicators to be developed but may include:<br>• Aerial coastline position.<br>• Mean High Water mark. | | |
| **Target** | No significant change in performance measures as a result of human activity. | | |
| **Reporting** | 5-10 years. | | |

## 7.6 Subtidal filter-feeding communities

Subtidal filter-feeding communities provide important habitat structure and food for many species. These communities generally comprise of species from phyla and classes such as Porifera (sponges), Tunicata (sea squirts) and Anthozoa (soft and hard corals and anemones). They 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 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 & Sampey 2014). Although there is little information on the filter feeding communities in the Mayala Marine Park a survey conducted within the neighbouring Lalang-gaddam Marine Park, which is also within the Kimberley Bioregion, recorded abundant and diverse sponges, crustaceans, echinoderms and soft *marrgoorr* (corals) in localised areas associated with hard substrate, while areas of sand were typically sparse in biota (Heyward *et al*. 2018). The areas associated with the highest level of diversity were generally associated with seabed channels from the Holocene transgression reflecting former river channels and drowned valleys which create rapid changes in depth, slope and aspect over relatively short distances. Similar patterns of benthic communities recorded in the Lalang-gaddam Marine Park are likely to be recorded in the Kimberley Bioregion of the Mayala Marine Park.

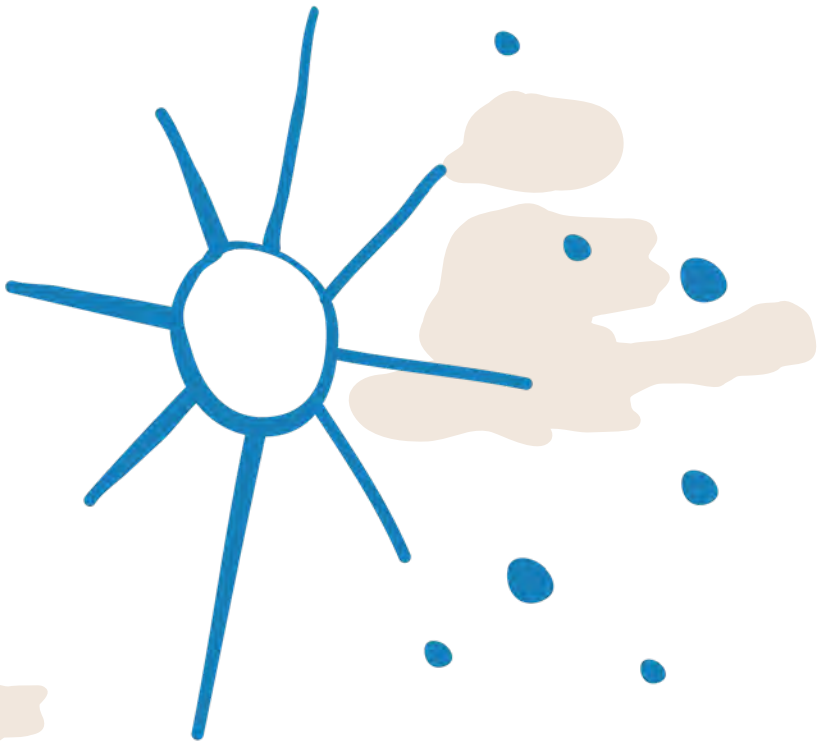
Filter feeding communities are protected under the BC Act and FRM Act.

| Summary of management arrangements for subtidal filter feeding communities | | | |
|---|---|---|---|
| **Current status** | Unknown, but assumed to be in a generally undisturbed condition, particularly as the entirety of the marine park is closed to prawn trawling and limited dredging has taken place. | | |
| **Existing and potential pressures** | • Decrease in water and sediment quality (see section 7.4).<br>• Damage from anchoring.<br>• Trophic effects of fishing.<br>• Climate change increasing the severity and frequency of warming events and the severity of tropical cyclones (see section 11). | | |
| **Current major pressure** | None currently identified. | | |
| **Management objectives** | To ensure that filter feeding communities are not significantly impacted by human activities within the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 support research to characterise the diversity, density, abundance and distribution of filter feeding communities in the marine park [DPIRD]. | Research | M |
| | 2. Educate users of the important ecological role of subtidal filter feed communities and the potential impacts that human activities can have on these communities [DPIRD]. | Education and interpretation | M |
| | 3. Monitor the condition of subtidal filter feeding communities and the pressures acting on them within the marine park [DPIRD]. | Monitoring | L |
| | | | |
| **Performance measure** | Indicators to be developed but may include:<br>• Diversity.<br>• Total cover.<br>• Community composition. | | |
| **Target** | • No significant decline in diversity or total cover as a result of human activity.<br>• No significant change in community composition as a result of human activity. | | |
| **Reporting** | 3-5 years. | | |

## 7.7 Intertidal sand and mudflat communities

Although often bare of vegetation, intertidal sand and mudflat areas are colonised by assemblages of microorganisms and burrowing macro-organisms, 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 *aarli* (fish) and other organisms which swim over the area at high tide, as well as for resident and migratory shorebirds. The large tidal range in the region creates large expanses of intertidal sand and mudflats. Some sandbanks are sacred and significant to Mayala people.

Intertidal sand and mudflat flora and fauna are protected under the BC Act and FRM Act. The intertidal sand and mudflat communities of the marine park are likely to be generally undisturbed. No major pressures have been identified for intertidal and mudflat communities in the marine park.



| 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 more severe cyclones and storms.<br>• Direct (e.g. removal of individuals) and indirect (e.g. changes to community structure) impacts from recreational and commercial fishing.<br>• Decrease in water quality (see section 7.4). | | |
| **Current major pressure** | None currently identified. | | |
| **Management objectives** | To ensure that intertidal sand and mudflat communities are not significantly impacted by human activities within the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 the diversity, community composition and condition of intertidal sand and mudflat communities in the marine park [DPIRD]. | Research | M |
| | 2. Monitor the condition of intertidal sand and mudflat communities and the pressures acting on them within the marine park [DPIRD]. | Monitoring | M |
| | 3. Educate users of the important ecological role of subtidal filter feed communities and the potential impacts that human activities can have on these communities [DPIRD]. | Education and interpretation | M |
| | | | |
| **Performance measure** | Indicators to be developed but may include:<br>• Diversity.<br>• Species abundance.<br>• Community composition. | | |
| **Target** | • No significant decline in diversity or species abundance as a result of human activity.<br>• No significant change in community composition as a result of human activity. | | |
| **Reporting** | 3-5 years. | | |

## 7.8 *Goorlil* (marine turtles) (KPI)

*Noomool* (seagrass) beds, *marrgoorr marnany* (coral reef), soft bottom habitats and sandy beaches within the marine park support foraging and nesting of *goorlil*. *Goorlil* species identified in the Kimberley are green turtles (*Chelonia mydas*), flatback turtles (*Natator depressus*), loggerhead turtles (*Caretta caretta*), hawksbill turtles (*Eretmochelys imbricata*), leatherback turtles (*Dermochelys coriacea*) and olive ridley turtles (*Lepidochelys olivacea*) (Masini *et al*. 2009) and it is likely all occur in the marine park.

Research has indicated that green and flatback *goorlil* nest in significant numbers along the Kimberley coast with minor records of nesting olive ridley and hawksbill *goorlil* (Department of Parks and Wildlife 2013 and Whiting *et al.* 2018). Nesting occurs at many widely scattered beaches and high-density rookeries are distributed throughout the Kimberley. The largest density of nesting flatbacks within the marine park has been recorded on *Janawan* (Helpman Island) but small-scale nesting beaches have been identified throughout the marine park (Whiting *et al.* 2018).

*Goorlil* are an important food source for Mayala people who hunt green *goorlil* and harvest green and flatback *goorlil* eggs on nesting beaches throughout Mayala Country. Other species of turtles are not considered good eating and are therefore not generally hunted. There are many different words for green turtle depending on how they are described. *Oondoord* is the term used when the green turtle has mated, *garralgoon* is a female green turtle and *miida* is a male green turtle.

All marine *goorlil* species found in Western Australian waters are protected under the state BC Act and the commonwealth EPBC Act. The BC Act provides for the sustainable harvesting of *goorlil* for Aboriginal customary purposes.

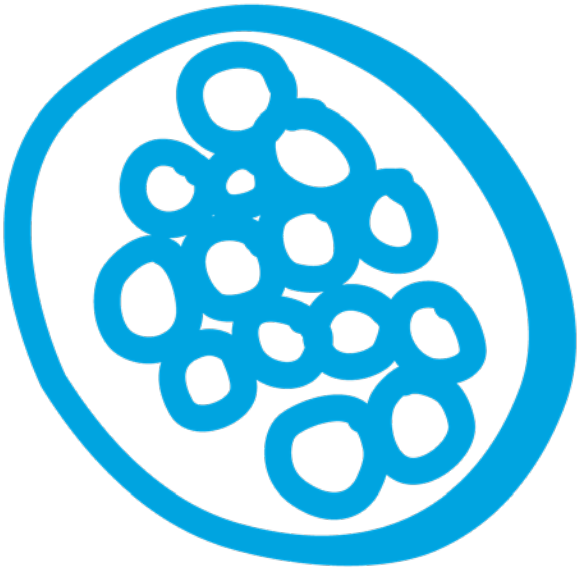
Lorna Hudson with *goorlil* (turtle) tracks on *Wijiwarra* (Dunvert island). Photo – Roanna Goater, DBCA.

| Summary of management arrangements for *goorlil* (marine turtles) (KPI) | | | |
|---|---|---|---|
| **Current status** | Research suggests *goorlil* are in good condition in the marine park. | | |
| **Existing and potential pressures** | • Disturbance from human interaction (e.g. boat strike, noise, nest disturbance and artificial light).<br>• Loss or degradation of critical habitat (e.g. noomool (seagrass) and nesting beaches).<br>• Entanglement in and ingestion of marine debris.<br>• Unsustainable customary take.<br>• 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. | | |
| **Current major pressure** | Climate change (see section 11) | | |
| **Management objectives** | • To ensure goorlil are not significantly disturbed by human activities occurring within and on the boundary of the marine park<br>• To manage customary harvesting of goorlil for cultural and ecological sustainability | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 management of *goorlil* in the marine park supports 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 | Principle |
| | 2. Undertake and/or support research to characterise natural variability, movement patterns and critical habitats for *goorlil* within the marine park. | Research | H |
| | 3. Monitor the condition of *goorlil* and the pressures acting on them within the marine park. | Monitoring | H |
| | 4. Educate users of the marine park on how to reduce damage to *goorlil* habitat and impacts on individuals and to respect cultural practice. | Education and interpretation | H |
| | 5. Refer to section 6.4 for strategies relating to customary take. | | |
| **Summary of management arrangements for *goorlil* (marine turtles) (KPI) cont.** | | | |
| **Performance measure** | Indicators will include:<br>• Species abundance of resident *goorlil*.<br>• Population structure of resident *goorlil*.<br>• Spatial distribution of resident *goorlil*.<br>• Mortality of resident *goorlil*.<br>• Species abundance of nesting *goorlil*.<br>• Spatial distribution of nesting *goorlil*.<br>• Hatchling production.<br>• Hatchling mortality. | | |
| **Target** | • No significant decline in hatchling production, or species abundance of resident or nesting goorlil as a result of human activity.<br>• No significant change in population structure of resident goorlil, or distribution extent of resident or nesting goorlil as a result of human activity.<br>• No significant increase in mortality of resident goorlil or hatchlings as a result of human activity. | | |
| **Reporting** | Annual or as required. | | |

## 7.9 *Aarli* (fish) including *joorroo* (sharks) and *barnamb* (rays) (KPI)

The broad range of habitats in the marine park including *marrgoorr marnany* (corals reefs), *noomool* (seagrass) and mangroves creeks each support a unique and diverse array of *aarli* (fish) communities. It is therefore important that the full range of habitats in the marine park are protected. The diversity of habitats within the marine park is likely to result in a high diversity of *aarli* species. The Kimberley region supports some of the highest diversity and abundance of fish 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). Environmental factors such as seasonal changes, diurnal cycles, tidal ranges and variations in nutrient loads have been shown to influence the assemblage structure of *aarli* in the Kimberely region (Travers *et al.* 2012, 2018). Mangrove associated *aarli*, for example, have been shown to be strongly influenced by tidal amplitude, salinity, and distance to reefs (Bradley *et al.* 2021). This has important implications for management of *aarli* within the Kimberley region, which exhibits complex hydrological conditions.

Australian waters are rich in *joorroo* (shark) and *barnamb* (ray) fauna with over 320 species recorded (MacNeil *et al* 2020). Many *joorroo* are apex predators and play an important ecological role in the marine environment. Their presence in natural abundances is an indication of a healthy ecosystem. *Joorroo* and *barnamb* are diverse in the Kimberley and include threatened and protected species such as sawfish, *marrgaliny* (hammerhead sharks, *Sphyrna* sp.) and manta rays (*Mobula* sp.). 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). 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 dwarf sawfish (*Pristis clavate*) and green sawfish (*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).



*Loolooloo* (whale sharks) are the protector, guardian of the sea. It is an important animal. We call it iwala, old uncle. When people were chasing *goorlil* (turtle), they could dive down and talk in language to *loolooloo*. There are many stories about *loolooloo* rescuing or helping people. One time, some men were hunting *goorlil* turtle and lost their raft, the *loolooloo* come up and took them with their *goorlil* (turtle) to beach. When it dropped them on the beach the men put *balalagood* (Acacia sp.) and a pearl shell on top of the head of the whale shark, which was a customary thank you for *loolooloo*. Then it swam away.

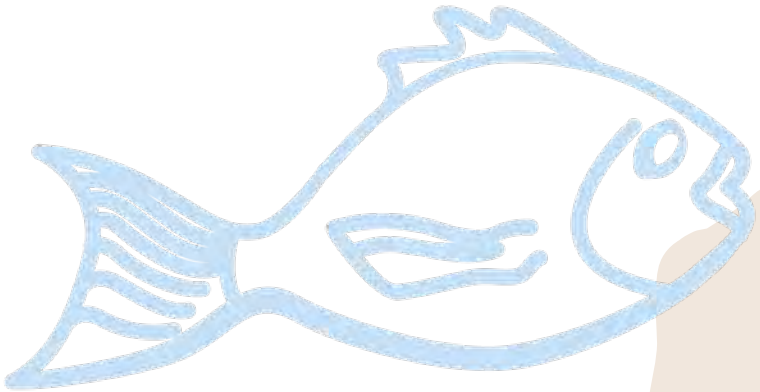
The main pressures on *aarli* in the marine park are fishing and climate change. *Aarli* are assumed to be in a generally good condition in the marine park. While DPIRD is responsible for the management of *aarli* and aquatic resources throughout the State, within the marine park a representative system of sanctuary zones, special purpose zones (cultural protection), 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 address marine park values. Threats to *joorroo* and *barnamb* include fishing, entanglement, inappropriate interaction such as feeding *joorroo*, loss and degradation of habitats, pollution and reduced access to prey resources. *Joorroo* (sharks) and *barnamb* (rays) are particularly vulnerable to overfishing as they are often slow growing, late maturing, long-lived with slow reproductive rates.

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.

Tawny nurse shark. Photo – Roanna Goater, DBCA.

| Summary of management arrangements for *aarli* (fish) including *joorroo* (sharks) and *barnamb* (rays) | | | |
|---|---|---|---|
| **Current status** | *Aarli* communities in the marine park are assumed to be in a generally good condition.<br>*Joorroo* and *barnamb* 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.<br>• Loss and degradation of critical habitat (i.e. nursery areas, aggregation areas).<br>• Entanglement in and ingestion of marine debris.<br>• Climate change impacts on habitat and food availability.<br>• Feeding of *aarli* (fish) and *joorroo* (sharks) by visitors.<br>• Tourism<br>• Illegal foreign fishing | | |
| **Current major pressure** | • Fishing<br>• Climate change (see section 11). | | |
| **Management objectives** | • To ensure non-targeted (those not targeted by recreational and commercial *fishers) aarli*, *joorroo* and *barnamb* species are not significantly impacted by human activities within the marine park.<br>• To manage targeted (those targeted by recreational and commercial fishers) *aarli*, *joorroo*, and *barnamb* species for cultural and ecological sustainability. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 *aarli*, *joorroo* and *barnamb* diversity, abundance, biomass/size frequency, movement patterns and critical habitats within the marine park and to understand the ecological role of targeted *aarli* species and the consequences of their removal [**DPIRD** for targeted species]. | Research | H |
| | 2. Monitor the condition of *aarli* (fish), *joorroo* (sharks and *barnamb* (ray) stocks and the pressures acting on them in the marine park [**DPIRD** for targeted species]. | Monitoring | H |
| | 3. Educate users about recreational fishing rules and the ecological importance *of* aarli (fish), *joorroo* (sharks) and *barnamb* (rays) [**DPIRD**] | Education and interpretation | H |
| | Refer to additional strategies in sections 6.4, 9.3 and 9.4. | | |

| Summary of management arrangements for *aarli* (fish) including *joorroo* (sharks) and *barnamb* (rays) conti. | |
|---|---|
| **Performance measure** | Indicators will include:<br>• Diversity.<br>• Species abundance.<br>• Species size distribution.<br>• Protected species abundance.<br>• Community composition |
| **Target** | **Sanctuary zones**[2]<br>• No significant decline in diversity, species abundance, target species size structure or protected species abundance as a result of human activity.<br>• No significant change in community composition as a result of human activity.<br>**Special purpose zones (cultural protection), special purpose zones (biocultural conservation) and general use zones**<br>• No significant decline in species richness or protected species abundance as a result of human activity in the marine park.<br>• No significant change in community composition as a result of human activity in the marine park.<br>• 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 *Odorr* (dugongs) (KPI)

*Odorr* (dugong) are an important species in marine ecosystems and are of high cultural significance. *Odorr* often aggregate in shallow protected bays and mangrove channels. They primarily feed on *Halophila* seagrass and migrate depending on seasonality and food availability. Northern Western Australia has one of the largest remaining *odorr* populations in the world, extending from the Northern Territory border south to Shark Bay. The estimated number of *odorr* in the Kimberley region is 12,600 (Bayliss and Hutton 2017).

*Odorr* are particularly important to Mayala people as they are an important *arli goolil* (meat of the sea). Mayala traditional knowledge informs that *odorr* are fat when the easterly winds blow and arrive during Irralboo season around March/April. When the *miinimbi* (whales) arrive in Jalalay (July-September) they know the *odorr* have gone and it's time to get ready for *goorlil (*turtles). To date there have been limited anthropogenic threats to *odorr* in the Kimberley, making the area an important global stronghold for the species (Bayliss and Hutton 2017). Cultural harvesting of *odorr* has been carried out sustainably for thousands of years.

All *odorr* in Australian waters are protected under the state BC Act and the Commonwealth EPBC Act. The BC Act provides for the sustainable harvesting of *odorr* for Aboriginal customary purposes.

| Summary of management arrangements for *odorr* (dugongs) (KPI) | | | |
|---|---|---|---|
| **Current status** | *Odorr* are considered to be in good condition appearing in low density and fragmented groups. | | |
| **Existing and potential pressures** | • Disturbance from human interaction (e.g. boat strike, noise).<br>• Loss or degradation of critical habitat (e.g. noomool (seagrass) (see section 7.3).<br>• Entanglement in and ingestion of marine debris.<br>• Disease.<br>• Unsustainable customary take.<br>• Climate change impacts may alter movement patterns and survival rates. Impacts on noomool (seagrasses) (e.g. from warming events and increased intensity of cyclones) will have flow on effects for odorr population. | | |
| **Current major pressure** | Climate change (see section 11) | | |
| **Management objectives** | • To ensure odorr are not significantly impacted by human activities in the marine park.<br>• To manage customary harvesting of odorr for cultural and ecological sustainability. | | |
| **Management strategies**<br>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 the abundance, distribution, natural variability and habitat requirements of *odorr* in the marine park.<br>2. Monitor the condition of *odorr* and the pressures acting on them within the marine park.<br>3. Educate users about ways to minimise disturbance to odorr and respect cultural practice<br>4. Maintain records of the incidence of boat collisions with *odorr.*<br>Refer to section 6.4 for strategies relating to customary take. | Research<br>Monitoring<br>Education and interpretation<br>Monitoring | H<br>H<br>H<br>M |
| | | | |
| **Performance measure** | Indicators will include:<br>• Abundance.<br>• Spatial distribution/home range. | | |
| **Target** | • No significant decline in odorr abundance as a result of human activity.<br>• No significant change in odorr distribution as a result of human activity.<br>• Management targets for sustainable customary harvesting of odorr to be developed in collaboration with relevant Joint Management partners. | | |
| **Reporting** | 3-5 years. | | |

Rocky Headland. Photo - Michael Higgins, DBCA

## 7.11 *Miinimbi* (whales) and *bayalbarr* (dolphins)

A wide variety of *miinimbi* and *bayalbarr* are known to inhabit the Mayala Marine Park. Humpback *miinimbi* (*Megaptera novaengliae*) are known to inhabit the waters of the marine park in large numbers between June and November each year. The Western Australian humpback whale population, known as Breeding Group D, is the largest humpback whale population in the world. Since they were protected in Australian waters in 1963 and worldwide in 1965 the group D population has recovered from an estimated low of 800 individuals to current estimates close to 33,000 (Salgado-Kent *et al.* **2012**). The group migrates from summer feeding grounds in Antarctic waters to the coastal calving areas of the Kimberley.

Humpback whales. Photo – Roanna Goater, DBCA.

*Miinimbi* – come through during *Lalin*, hot weather time. The presence of the *miinimbi* tell us to get ready for *married* (mating) *goorlil* (turtle) time. Mothers and babies stay in sheltered waters, the fathers are out in deeper water keeping tiger sharks away. The mothers breach with babies to show them off to the fathers way out in deeper water, introducing them, showing them.

Australian snubfin dolphins (*Orcaella heinsohni*) and Australian humpback dolphins (*Sousa sahulensis*) are broadly distributed throughout coastal waters of the Kimberley and have been recorded in a variety of shallow-water (≤ 30m) habitats, including tidal inlets and creeks; sheltered bays with mangroves; exposed stretches of open rocky coast; and shallow sand and mud habitats extending up to 35 km offshore (Brown *et al.* 2016, Bouchet *et al*. 2021). Research on coastal *bayalbarr* indicates that they have high sight-fidelity and limited gene flow (Parra *et al*. 2006).

Research has found that *Yaloon* (Cone Bay) and Cygnet Bay in the neighbouring Bardi Jawi Gaarra Marine Park are regularly used by a small number of snubfin and humpback dolphins. Within Yaloon, humpback dolphins are regularly found in the vicinity of the *aarli* (fish) farms adjacent to Turtle Island and among the sea cages whilst the snubfin dolphins are more frequently observed in the inner reaches of the bay closer to mangrove areas (Brown *et al.* 2016). Genetic analysis of snubfin *bayalbarr* found that there is limited gene flow between populations at

Cygnet Bay and Roebuck Bay (approximately 250km south). No significant genetic difference was found between snubfin dolphins between Cygnet Bay and Cone Bay (approximately 60km apart) (Brown *et al.* 2016). By contrast, there appeared to be strong partitioning of snubfin dolphins sampled at Cone Bay and those at Yampi Sound, in the Maiyalam Marine Park a location about 55 km along the coast to the northeast (Brown *et al.* 2016).

All *miinimbi* and *bayalbarr* are protected under the BC Act and Commonwealth EPBC Act. A licence is required for marine tourism operations, 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. For example, all vessels must stay 100 metres away from a *miinimbi*, or if a *miinimbi* approaches a vessel the motor must be in neutral or be driven at less than five knots away from the *miinimbi.* Restrictions also exist on recreational and commercial drone flying around marine mammals.

| **Summary of management arrangements for *miinimbi* (whales) and *bayalbarr* (dolphins)** | | | |
|---|---|---|---|
| **Current status** | Humpback whales are considered to be in good condition. Little is known about other *miinimbi* species inhabiting the marine park. Populations of snubfin dolphins are considered to be in good condition, although little is known about other *bayalbarr* species. | | |
| **Existing and potential pressures** | • Disturbance from human interaction (e.g. boat strike, noise).<br>• Entanglement in and ingestion of marine debris.<br>• Climate change impacts may affect movement patterns and food availability. | | |
| **Current major pressure** | None identified. | | |
| **Management objectives** | To ensure *miinimbi* (whales) and *bayalbarr* (dolphins) are not significantly impacted by human activities in the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 *miinimbi* and *bayalbarr* diversity, abundance, natural variability and critical habitats within the marine park. | Research | H |
| | 2. Monitor the condition of *miinimbi* and *bayalbarr* and the pressures acting on them within the marine park. | Monitoring | H |
| | 3. Facilitate large *miinimbi* disentanglement response training for relevant departmental staff and Mayala rangers. | Management framework | H |
| | 4. Educate users about ways to minimise disturbance to *miinimbi* and *bayalbarr*, including rules for *miinimbi* watching. | Education and interpretation | H |
| | 5. Maintain a record of stranding and mortalities of *miinimbi* and *bayalbarr* in the marine park. | Monitoring | M |
| | | | |
| **Performance measure** | Indicators will include:<br>• Diversity.<br>• Key species abundance.<br>• Key species spatial distribution. | | |
| **Target** | • No significant decline in diversity or key species abundance as a result of human activity.<br>• No significant change to key species distribution as a result of human activity. | | |
| **Reporting** | 2-3 years. | | |

## 7.12 *Linygurra* (estuarine crocodiles)

*Linygurra* are apex predators which have been protected in Australia since the 1970s after 30 years of unregulated hunting drove their numbers to extreme lows. Genetic studies of *linygurra* have identified that West Kimberley populations are genetically distinct from Northern Territory populations (Halford and Barrow 2017). The overall number of estuarine *linygurra* in the Kimberley region is still unknown however a recent study conducted in the Prince Regent and Roe-Hunter river systems in the neighbouring Lalang-gaddam Marine Park have shown that populations are recovering. The relative lack of larger *linygurra* found in studied rivers of the Kimberley compared to those in the Norther Territory indicates a maturing population recovery. It is therefore likely that the Kimberley populations will continue to increase in abundance and size structure (Halford and Barrow 2017)

*Linygurra* are protected under the BC Act and the EPBC Act. Management strategies to reduce the risk of interactions between Linygurra and users of the marine park are described in section 9.2.

*Linygurra* (Estuarine crocodile). Photo – Roanna Goater, DBCA.

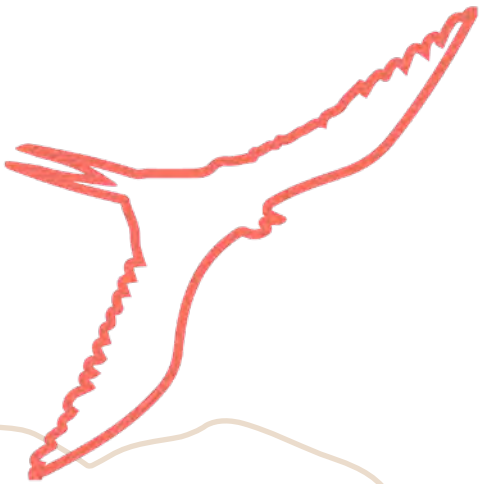
| Summary of management arrangements for *Linygurra* (estuarine crocodiles) | | | |
|---|---|---|---|
| **Current status** | *Linygurra* are considered to be increasing. | | |
| **Existing and potential pressures** | • Disturbance from human interaction and altered behaviour through feeding.<br>• Entanglement in and ingestion of marine debris.<br>• 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.<br>• Illegal hunting. | | |
| **Current major pressure** | None identified. | | |
| **Management objectives** | To ensure *linygurra* (estuarine crocodiles) are not significantly impacted by human activities in the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 *linygurra* (estuarine crocodiles) and the pressures acting on them within the marine park.<br>2. Undertake and/or support research on the abundance, and condition of *linygurra* (estuarine crocodiles) in the marine park.<br>3. Educate users about known and potential distributions of *linygurra* (estuarine crocodiles) and of the risk of feeding them and ensure compliance. | Monitoring<br>Research<br>Education and interpretation | M<br>M<br>M |
| | | | |
| **Performance measure** | Indicators will include:<br>• Abundance.<br>• Size distribution.<br>• Spatial distribution/home range | | |
| **Target** | • No significant decline in the abundance of estuarine *linygurra* (estuarine crocodiles) as a result of human activity.<br>• No significant decline in the size distribution of *linygurra* (estuarine crocodiles) as a result of human activity. | | |
| **Reporting** | 5-10 years. | | |

# 7.13 Sea and shore *garrabal* (birds)

Seabirds are generally those *garrabal* (birds) that forage at sea for the greater part of their lives. Shorebirds are *garrabal* that commonly feed by wading in shallow water or saturated substrate along the shores of lakes, rivers and sea. The islands of the Kimberley region are an important asset for maintaining populations of *garrabal* which are threatened on mainland Australia due to human pressures and feral predators. As no comprehensive surveys have been performed in the area, there is limited information about populations and the distribution of sea and shore *garrabal* in the marine park.

All *garrabal* 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 obligations to protect species listed under those treaties.

| **Summary of management arrangements for sea and shore *garrabal* (birds)** | | | |
|---|---|---|---|
| **Current status** | The current status of sea and shore *garrabal* (birds) populations in the marine park is unknown. | | |
| **Existing and potential pressures** | • Disturbance to feeding, roosting and nesting activity by people, vessels and low flying aircraft.<br>• Loss or degradation of critical habitat (e.g. coastal vegetation, intertidal sand and mudflats).<br>• Entanglement in and ingestion of marine debris.<br>• Climate change impacts including increased temperatures and increased intensity of storm and cyclone events. | | |
| **Current major pressure** | None identified. | | |
| **Management objectives** | To ensure that sea and shore *garrabal* (birds) that inhabit or migrate through the marine park are not significantly impacted by human activities in the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 ways to minimise disturbance to sea and shorebirds including the use of drones. | Education and interpretation | H |
| | 2. Undertake and/or support research to characterise sea and shore *garrabal* diversity, abundance, natural variability, movement patterns and critical habitats within the marine park. | Research | M |
| | 3. Monitor the condition of sea and shore *garrabal* and the pressures acting on them within the marine park. | Monitoring | M |



| Summary of management arrangements for sea and shore *garrabal* (birds) cont | |
|---|---|
| **Performance measure** | Indicators will include:<br>• Species abundance.<br>• Breeding success<br>• Seasonal distribution. |
| **Target** | • No significant decline in the abundance of shorebird species as a result of human activity.<br>• No significant decline in breeding success of shorebird species as a result of human activity. |
| **Reporting** | 3-5 years. |

## 7.14 Invertebrates

Marine invertebrates are those marine animals without a backbone and include crustaceans, squid, cuttlefish, other shellfish, *marrgoorr* (corals), sponges, *wanbiny* (sea jellies), anemones, sea squirts, echinoderms and marine worms. Habitat forming invertebrates such as *marrgoorr* (corals), sponges and sea squirts have been described under filter feeding communities in section 7.6 and benthic invertebrate fauna strongly associated with intertidal sand and mudflats are discussed in section 7.7. Invertebrates have important functions within the ecosystem as a food source for other invertebrates, *aarli* (fish) and migratory *garrabal (birds)*, as well as in nutrient cycling.

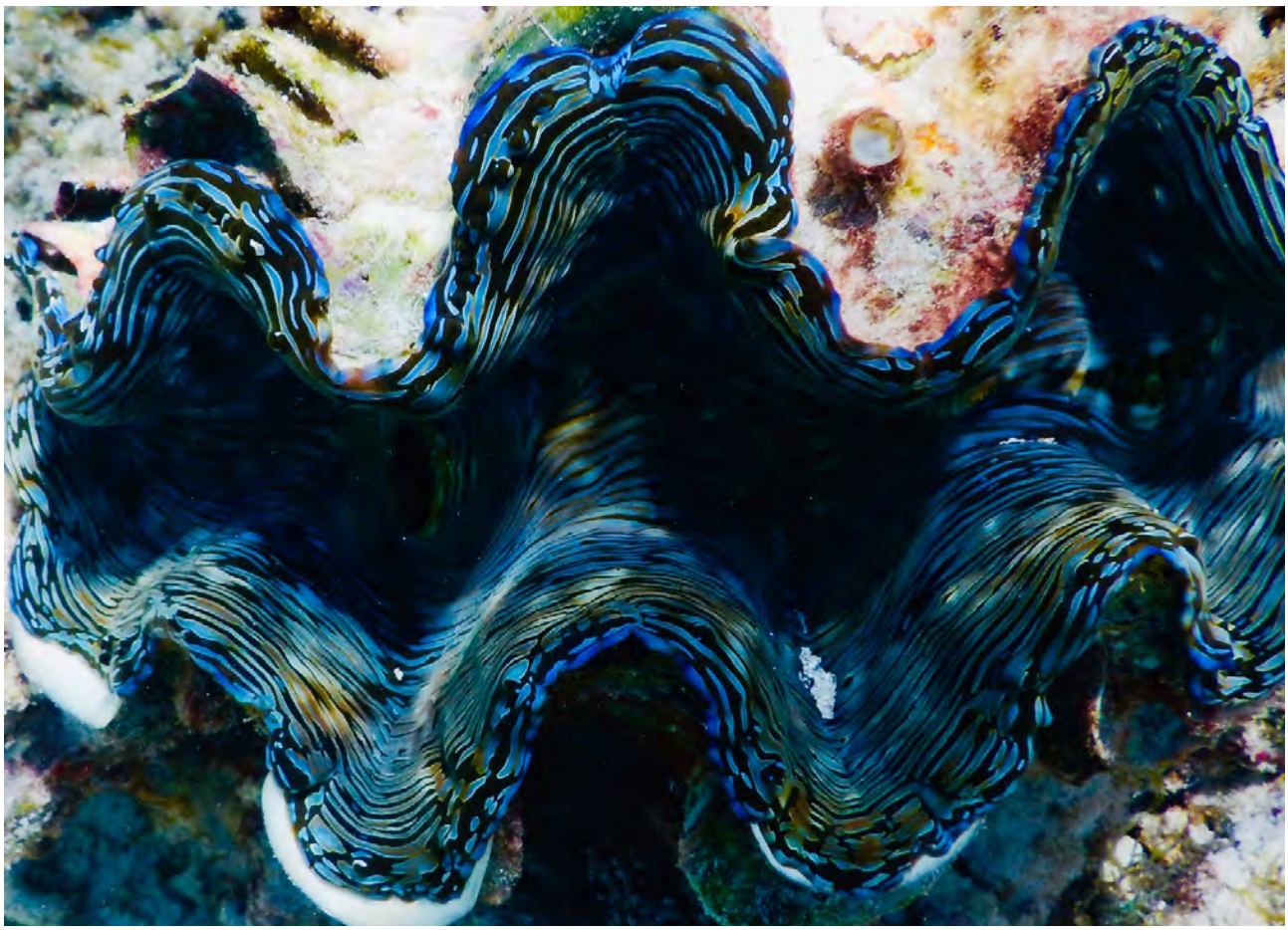
Invertebrates that are particularly valued by Mayala people include *ngarrangg* (mud crabs), rock oysters and *alngir* (*Trochus niloticus*). *Alngir* extend throughout the northern waters of King Sound. Mayala collect *alngir* from inter-tidal reef platforms by hand at low tide. Long journeys were made by *biyal-biyal* (raft) to *Noomoonjoo* (Caffarelli Island) to collect *alngir* and other resources as far as Brue Reef.

To this day, Mayala with Bardi Jawi Traditional Owners still collect trochus and commercially harvest it for sale both locally and overseas. It is a small fishery based on a single species. Following implementation of management arrangements in 1998-1999 by DPIRD (then Department of Fisheries), combined with reduced market demand, the trochus fishery has remained sustainable. The fishery's low impact collection methods result in minimal impact on reef habitat and wider ecosystem generally, and there is no bycatch in the fishery (Gaughan 2020) (see 9.4 section for more information).

Due to the range of habitats and depths the marine park is likely to host a diverse array of invertebrate communities, however knowledge of these communities is very limited. 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 but assumed to be in good condition. | | |
| **Existing and potential pressures** | • Recreational, customary and commercial fishing, including targeted fishing (e.g. prawns, crabs, squid, octopus, lobster, oysters), live shell collecting (e.g. specimen shells and hermit crabs), bait collection, bycatch and local depletion of some targeted species.<br>• Degradation of critical habitat as a result of human activities (e.g. reef walking).<br>• Climate change impacts such as changes in the intensity of cyclones and storms.<br>• Illegal foreign fishing | | |
| **Current major pressure** | • Climate change (see section 11).<br>• Fishing | | |
| **Management objectives** | • To ensure non-targeted invertebrate species are not significantly impacted by human activities within the marine park.<br>• To manage targeted invertebrate species for cultural and ecological sustainability. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 ways to minimise disturbance to and taking of invertebrates [DPIRD]. | Education and interpretation | H |
| | 2. Undertake and/or support research to characterise the diversity, abundance, 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 | M |
| | 3. Monitor the condition of invertebrates susceptible to localised depletion in the marine park and take remedial action if human activities are impacting these species [**DPIRD** for targeted species]. | Monitoring | M |
| | Refer to additional strategies in sections 6.4, 9.3 and 9.4 | | |
| **Summary of management arrangements for invertebrates cont.** | | | |
| **Performance measure** | Indicators to be developed but may include:<br>• Community richness.<br>• Target species abundance.<br>• Introduced species abundance.<br>• Community composition<br>• Others to be developed by DPIRD for targeted invertebrates. | | |
| **Target** | **Sanctuary zones**[3]<br>• No significant decline in community richness, or target species abundance as a result of human activity.<br>• No significant increase in the abundance of introduced species as a result of human activity.<br>• No significant change in community composition as a result of human activity.<br>**SPZ (cultural protection), SPZ (biocultural conservation) and general use zones**<br>• No significant decline in community richness as a result of human activity.<br>• No significant increase in the abundance of introduced species as a result of human activity.<br>• No significant change in community composition as a result of human activity.<br>• 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.

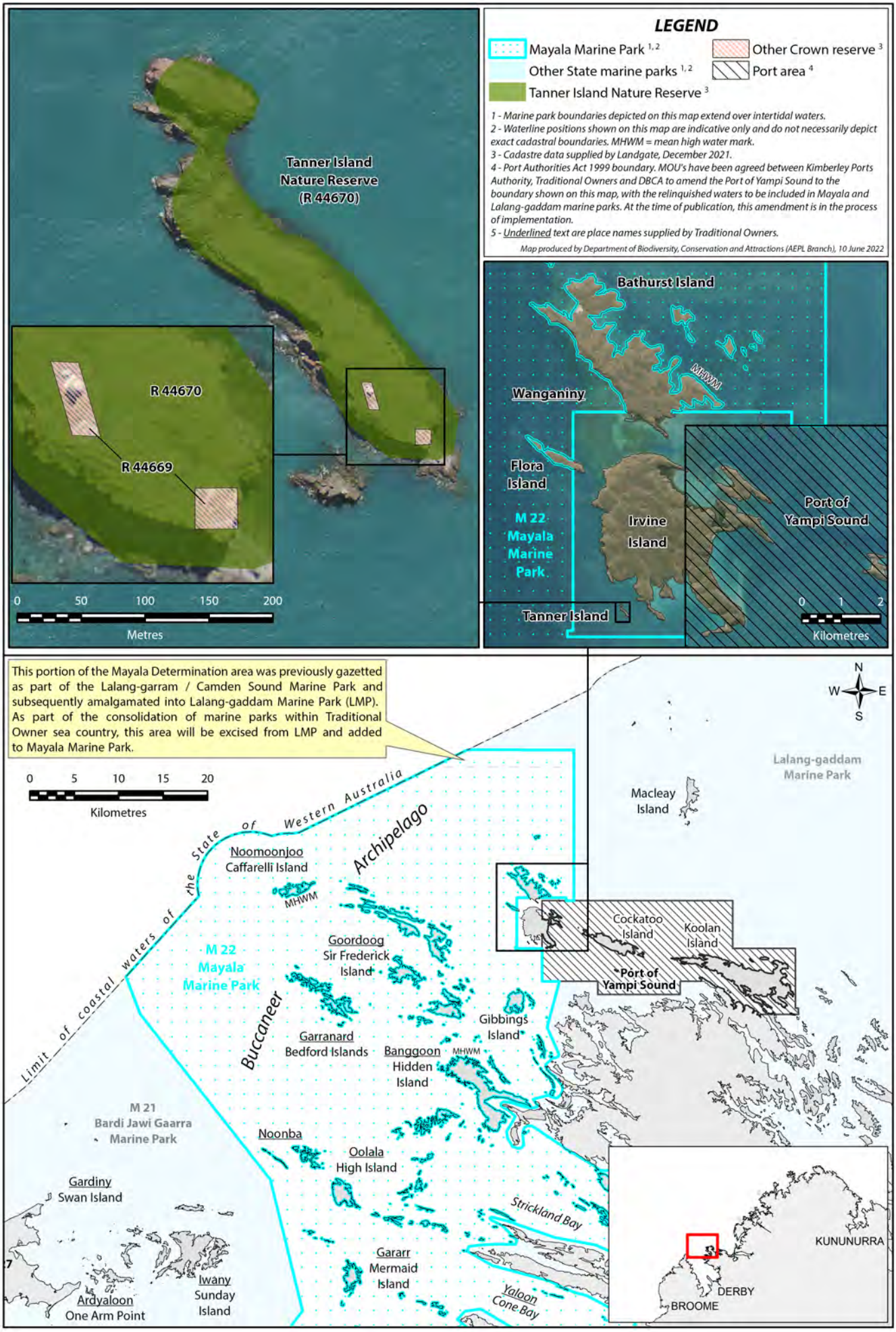


Giant clam (Tridacna sp.)  Photo – Roanna Goater, DBCA.

# 8. Tanner Island Nature Reserve

Tanner Island Nature Reserve (reserve 44670) is a 1.18 hectare reserve located to the south west of Irvine Island (map 5). It was designated in 2000 as a Class A nature with the purpose of conservation of flora and fauna. It is that the Tanner Island Nature Reserve will be jointly managed with Mayala Traditional Owners and will continue to be vested in the Commission, under the CALM Act. Infrastructure on the island is limited to a lighthouse and associated facilities. Little information is known about the island's biodiversity and whether it is a bird nesting area.

| Summary of management arrangements for Tanner Island Nature Reserve | | | |
|---|---|---|---|
| **Current status** | Assumed to be in a near natural state with the exception of the area that was cleared for the lighthouse and associated infrastructure. | | |
| **Existing and potential pressures** | • Fire.<br>• Introduced animals and plants.<br>• Climate change. | | |
| **Current major pressure** | None identified. | | |
| **Management objectives** | To identify, protect and conserve the natural and cultural values of Tanner Island. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 cultural heritage values, cultural knowledge and cultural laws and protocols inform land management. | Management framework | Principle |
| | 2. Undertake or support baseline surveys of native plants, animals and ecological communities. | Research | H |
| | 3. Rename the Tanner Island Nature Reserve to its traditional name. | Management framework | H |
| | 4. Implement restrictions on visitor access as required for cultural or environmental reasons (through commercial operator licences, by regulation or other mechanisms as relevant). | Management Framework | M |
| | | | |
| **Performance measure** | To be determined by the JMB. | | |
| **Target** | To be determined by the JMB. | | |
| **Reporting** | To be determined by the JMB. | | |




Map 5: Tanner Island Nature Reserve locality and tenure

# 9. People on-Country (social and economic values)

## Strategic objective: To support and enhance safe and sustainable customary, recreational and commercial uses of Mayala Baaliboor (Mayala Country) and resources.

## 9.1 Mayala economic development opportunities

This joint management plan recognises that Mayala Traditional Owners have a need and inter-generational obligation to maintain family livelihoods and sustain existence from their land and saltwater Country and its resources. Identification and development of commercial opportunities and investments that can deliver incomes and capacity to sustain Traditional Owners living on Country will be an early and ongoing strategic park management focus.

The creation of the marine park will contribute to the provision of long-term employment for Mayala 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.

| Summary of management arrangements for Mayala Economic Development Opportunities | | | |
|---|---|---|---|
| **Requirements** | High environmental and aesthetic quality. | | |
| **Management objectives** | To enable Mayala 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**<br>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 a range of employment, business and career development opportunities that are culturally appropriate and relevant to the management of the marine park [DPIRD]. | Management framework | H-KMS |
| | 2. Support MIAC to attract funding to assist with management of the marine park. | Management framework | H-KMS |
| | 3. Seek to employ or upskill Mayala people in roles relating to the marine park [DPIRD]. | Management framework | H-KMS |
| | 4. Work with stakeholders to facilitate Mayala employment opportunities in industries such as the tourism industry. | Management framework | H |
| | 5. Encourage and support Mayala people to develop and enhance existing business opportunities on Country [DPIRD]. | Management framework | H |

## 9.2 Visitation, tourism and visitor safety

The marine park features spectacular scenery, diverse wildlife and cultural heritage which provide excellent opportunities for nature-based and cultural recreational activities and tourism experiences. Recreation and tourism will allow people to experience the marine park, develop an appreciation of the cultural and ecological values, and support conservation outcomes, whilst creating economic benefits for the region.

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 10% of the region's economic output, with visitation to the area's unique natural environment a major attraction (REMPLAN 2020). Sealing the Dampier Peninsula access road is expected to greatly increase the number of boats and people accessing the marine park, and successful management of this aspect of tourism will be vital to ensuring the excellent condition of the marine park values is maintained into the future.


Expedition cruise boat. Photo – Roanna Goater, DBCA.

One of the most common forms of tourism in the Kimberley region is the expedition cruise boat industry which operates multiday tours in the dry season between Broome and Wyndham. This is popular with visitors coming to enjoy wildlife watching, cultural sites, fishing and scenic sights. Vessels range from small fishing and sight-seeing tour boats to large expedition cruise ships carrying hundreds of passengers. The number and capacity of commercial tour vessels is forecast to increase in the near future.

Recreation and tourism activities provide excellent opportunities for people to experience the park and learn about the spectacular cultural and ecological values. However, if tourism is carried out inappropriately, it has the potential to reduce the quality of the features visitors seek to experience. Examples include visitors not respecting cultural protocol, damaging cultural sites, interacting inappropriately with wildlife and physically disturbing and/or damaging marine habitats such as *marrgoorr marnany* (coral reefs). Unmanaged tourism in Mayala Country is a major concern to Mayala people. Visitors to the marine park will be encouraged to sign up to a voluntary marine park pass before visiting the marine park. It is intended that this will educate visitors on culturally appropriate visitation, marine park values and management arrangements.

Mayala are keen to encourage culturally appropriate tourism on Country. They would like to expand on the tourism potential of their Country by establishing Mayala run tourism companies and through joint ventures. This will create jobs for Mayala people on Country, whilst promoting cultural understanding and respect by immersing tourists in a cultural experience. Management arrangements in this plan will help to fulfil the tourism potential of the area whilst ensuring the protection of the values which tourists seek.

The CALM Act and CALM Regulations require commercial businesses operating in marine parks and reserves 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 DBCA Policy No. 18 – Recreation, tourism and visitor services. DBCA's *Commercial Operator Handbook - Marine* provides specific information for commercial businesses operating in a marine park or reserve.

### 9.2.1 Mooring and anchoring

Management of moorings and anchoring is a key aspect of managing increasing vessel use in Western Australia's marine parks. With an expected increase in commercial and recreational vessels visiting and operating in the marine park, it is expected that mooring and anchoring activities will increase over time. 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. Refer to the department's Policy Statement 59: Mooring Policy for further information regarding the management of moorings within the marine parks. If required, a mooring and anchoring plan may be developed for the marine park.

### 9.2.2 Visitor safety

Visitor risk management is an important focus for DBCA and Mayala Traditional Owners. Mayala people are concerned for the safety of all people on Country, especially tourists. The remoteness of the marine park, strong tides and currents, occurrence of *linygurra* (estuarine crocodiles), extreme weather conditions, and tropical cyclones pose risks to visitors. This is particularly dangerous for visitors who may be inexperienced in, or unprepared for, such conditions. Mayala people are particularly concerned about tourists accessing areas when conditions are dangerous or unsafe. Areas with strong currents and whirlpools should only be crossed on the right tide, with the right knowledge of how to cross then and with a suitable vessel.

Visitors to the marine park are advised to be mindful of the risk that *linygurra* (estuarine crocodiles) pose to their safety and the effects of inappropriate interactions with them such as illegally feeding *linygurra*. 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 *linygurra* (estuarine crocodiles) risk areas.

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

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

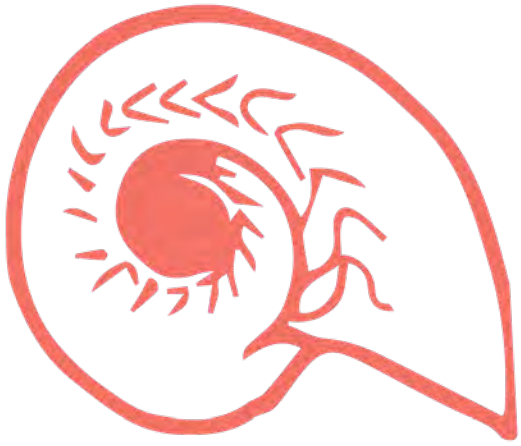
- minimises the potential for incidence of injury to visitors on lands and waters managed by DBCA
- encourages appropriate behaviour by visitors on lands and waters managed by the department that will reduce the risks posed by their activities
- aligns with industry standards and best practice principles,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

### 9.2.3 Visitor access

There are a number of areas in Mayala Baaliboor where access may be restricted to non-traditional owners using CALM Regulations for various reasons including protecting highly significant cultural areas such as law grounds, safety reasons, providing privacy for Traditional Owners engaging in cultural practices and for other cultural reasons. The use of regulations to restrict vessel access will be limited to areas within the sanctuary zones or special purpose zones (cultural protection). Access may be granted to non-traditional owners if authorisation is acquired. The location of the restricted access areas will be confirmed during the development of the visitor management plan.



| Summary of management arrangements for visitation, tourism and visitor safety | | | |
|---|---|---|---|
| **Requirements** | • High environmental and aesthetic quality (e.g. minimal debris, undeveloped marine and coastal areas).<br>• Equitable access to natural values of the marine park.<br>• Provision of areas free of human impacts for nature appreciation. | | |
| **Management objectives** | • To provide for nature-based and cultural tourism activities and ensure that they are managed in a manner that is consistent with maintaining the cultural, ecological and social value of the marine park.<br>• To maintain the cultural, ecological and social values of the marine park that are important for nature-based and cultural tourism.<br>• To minimise risks to visitors and encourage appropriate behaviour. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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. Encourage the establishment of Mayala owned commercial tourism business in the marine park [DPIRD]. | Management intervention and visitor services | Principle |
| | 2. Ensure promotion and marketing of the marine park is consistent with Mayala's aspirations and cultural protocols. | Management intervention and visitor services | Principle |
| | 3. In collaboration with Mayala Traditional Owners and MIAC, develop a visitor management plan. | Management intervention and visitor services | H-KMS |
| | 4. Work with Mayala people and commercial operators to promote culturally appropriate visitation and facilitate the establishment of high-quality commercial tourism operations that:<br>• Increase visitor enjoyment and safety<br>• Demonstrate a commitment to protect and promote the park's cultural, natural, recreation and tourism values<br>• Ensure staff and passengers behave appropriately and respectfully at cultural sites<br>• Ensure staff and passengers respect and adhere to Mayala protocols for visitation on land and sea<br>• Conduct operations according to departmental policy and licence conditions (Tourism WA)<br>• Foster community stewardship of the marine park<br>• Reduce impacts on sites.<br>• Enhance visitor's cultural experience [DPIRD]. | Management intervention and visitor services | H-KMS |
| | 5. Develop a voluntary visitor pass, for the marine park to plan for sustainable and culturally appropriate visitor usage. | Management intervention and visitor services | H |

| | | | |
|---|---|---|---|
| | 6. Conduct a visitor survey to gather data on visitor numbers, locations, anchoring points etc. to understand potential impacts and to aid the development of monitoring programs and a mooring and anchoring plan. | Management intervention and visitor services | H |
| | 7. Promote opportunities for sustainable recreation and tourism, including the provision of visitor facilities if required. | Management intervention and visitor services | H |
| | 8. Assess the need for a mooring and anchoring plan in the marine park and implement if required. | Management intervention and visitor services | H |
| | 9. Maintain a quantitative and qualitive spatial data bases of human use in the marine park. | Management intervention and visitor services | H |
| | 10. Conduct periodic visitor risk assessment in the marine park as required and mitigate identified issues [AMSA, DoT, DPIRD]. | Management intervention and visitor services | H |
| | 11. Facilitate *linygurra* (estuarine crocodile) handling and removal training for relevant departmental staff and Mayala rangers. | Management framework | H |
| | 12. Educate marine park users about protocols and regulations for the use of drones in the marine park to minimise impacts and disturbance to marine park values. | Education and interpretation. | H |
| | 13. Work with relevant agencies to prepare for and respond to emergencies. | Management Framework | M |
| | 14. Work with relevant agencies and industry bodies to adapt and improve existing mapping programs or apps reflecting marine park risks and zoning [DPIRD, DoT, WAPOL, AMSA]. | Education and interpretation | M |
| | 15. Undertake a review of shipping activity in the marine park to determine the need for navigational measures such as compulsory pilotage, speed limit and/or designation of shipping routes [DoT]. | Management framework | M |
| | 16. Educate marine park users of the risks in the marine park e.g. strong currents, cyclones and *linygurra* (estuarine crocodiles). | Education and interpretation | L |
| | | | |
| **Performance measure** | • Visitor satisfaction (e.g. experiences and expectations) as determined by the Visitor Monitoring Program.<br>• Number of visitor safety incidents reported to DBCA and/or the JMB | | |
| **Target** | • Visitor satisfaction is 85 percent or above within five years.<br>• No increase in the total number of serious visitor safety incidents per capita compared to baseline levels. | | |
| **Reporting** | To be determined by JMB | | |

## 9.3 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 Mayala Marine Park and surrounds provides a diversity of fishing experiences, including a range of species and habitats not available in the waters directly adjacent to Broome or Derby. For fishers from Derby in particular, the Buccaneer Archipelago offers blue water fishing and a completely different experience to that on offer in the brown, turbid water close to the town. Whether it is spending time with family and friends, connecting with nature or teaching kids about boating and fishing, the local recreational fishers have advised they have a deep connection with Mayala Sea Country. Approximately 61 percent of the marine park is available for unguided recreational fishing. A further 18 percent of the marine park is available for fishing through a traditional owner supported tourism operation.

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). Whilst Mayala people welcome culturally appropriate recreational fishing, they have concerns about the potential impacts of recreational fishing activity in the marine park on their ability to continue to access healthy *aarli* (fish) stocks for customary use. 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 and culturally sustainable for all to enjoy.

There are some areas in the marine park which are of high cultural significance and valued highly by the local Derby community 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 *marnany* (reefs) and 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 including recreational fishing will be 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) will also be applied which limit extractive activities for cultural reasons (refer to zoning section).

While DPIRD is responsible for the management of *aarli* (fish) and aquatic resources throughout WA, 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 *aarli* (fish) are sustainably managed into the future, in line with cultural values.

| Summary of management arrangements for recreational fishing | | | |
|---|---|---|---|
| **Requirements** | • High water quality.<br>• Maintenance of critical habitats for recreationally targeted aarli (fish) species.<br>• Maintenance of recreationally targeted aarli (fish) stocks.<br>• 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.<br>• 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.<br>• To work collaboratively (with agencies, stakeholders and the community) to maintain and promote safe and enjoyable recreational fishing opportunities in the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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. Work with MIAC and Elders to develop, communicate and promote a Mayala-led sustainable fishing protocol including traditional seasonal calendars and access restrictions for dissemination to recreational fishers, fishing clubs and commercial tour operators **[DPIRD].** | Education and interpretation | H-KMS |
| | 3. Educate recreational fishers on the zoning scheme, fisheries regulations and any restrictions that may apply to their activities in the marine park, seek information on management issues in the marine park and seek feedback on management responses. **[DPIRD]**. | Education and interpretation | H |
| | 4. Conduct and/or support research to determine if ecosystem effects from recreational fishing occur in the marine park and undertake adaptive management actions if required **[DPIRD].** | Research | H |
| | 5. Monitor recreational fishing catch and effort in the marine park and report the results to DBCA and the Commission for the periodic reviews of the implementation of the management plan. **[DPIRD]**. | Monitoring | H |
| | 6. Investigate whether populations of recreationally targeted species are sustainable in the marine park and undertake adaptive management actions if required **[DPIRD]**. | Research | M |

## 9.4 Commercial fishing

Commercial fisheries that operate within the boundaries of the marine park include the Kimberley Gillnet and Barramundi Managed Fishery which operates in the nearshore and estuarine zone of the marine park; a small Bardi Jawi and Mayala managed Trochus Fishery based on the collection of a single target species, *Tectus niloticus*; the mackerel managed fishery; and a developing mud crab fishery. Other fisheries licenced to operate in the marine park included the Northern Demersal Scale Fishery, the Marine Aquarium Fishery, the Specimen Shell Managed Fishery and the Beche de mer Fishery. The Joint Authority Northern Shark Fishery is licensed to operate in the marine park but has been inactive since 2008 and the whole of the marine park lies within a permanent prawn and fish trawl closure area.

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

| **Summary of management arrangements for commercial fishing** | | | |
|---|---|---|---|
| **Requirements** | • High water quality.<br>• Maintenance of critical habitats for commercially targeted aarli (fish) and invertebrate species.<br>• Maintenance of commercially targeted aarli (fish) stocks.<br>• Access to suitable and culturally appropriate 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.<br>• 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**<br><br>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 Mayala are kept informed and involved in the monitoring and management measures for commercial fishing stocks in the marine park **[DPIRD].** | Monitoring | Principle |
| | 2. Work with commercial fishers, through peak stakeholder bodies to ensure operations are conducted in a culturally sensitive manner **[DPIRD].** | Management framework | H |
| | 3. Conduct research to determine if ecosystem effects from commercial fishing occur in the marine park and undertake adaptive management actions if required **[DPIRD].** | Research and monitoring | H |
| | 4. Monitor commercial fishing catch and effort in the marine park to inform periodic reviews of the implementation of the management plan and make data available to MIAC/JMB **[DPIRD].** | Monitoring | M |
| | 5. Investigate the extent and significance of interactions between commercial fishing and marine mammals and other protected species and address as required [DPIRD]. | Research | H |

## 9.5 Aquaculture

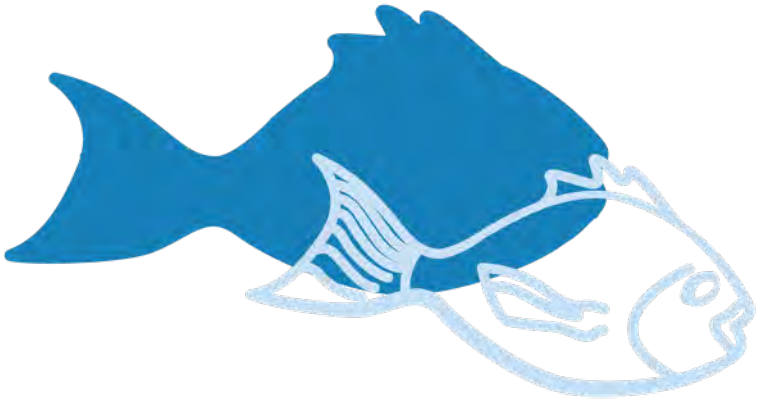
The high water quality and high tidal range in the marine park has created ideal conditions for aquaculture. In August 2014 the Minister for Fisheries declared the Kimberley Aquaculture Development Zone (KADZ); the first aquaculture development zone to be established in Western Australia. The establishment of the 2000 ha 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 licensed to operate in the KADZ (map 6 shows the location of the aquaculture leases).

Aquaculture operations. Photo – Michael Higgins, DBCA.

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 *aarli* (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.

DPIRD will continue to manage aquaculture in the marine park. Aquaculture will be permitted in general use zones of the marine park and managed under the FRM Act. The primary role of management in relation to aquaculture in the marine park will be to work with the aquaculture industry to ensure activities are culturally, socially and ecologically sustainable and appropriate and to help maintain the excellent environmental conditions of the marine park upon which the industry depends.

| Summary of management arrangements for aquaculture | | | |
|---|---|---|---|
| **Requirements** | • High water quality.<br>• Access to suitable and culturally appropriate locations within the marine park, subject to environmental assessment and 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 a viable aquaculture industry.<br>• To ensure that, in collaboration with the industry and DPIRD, aquaculture is managed in a manner that is consistent with maintaining the values of the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 aquaculture authorisations are consistent with the management plan and include appropriate monitoring programs, lighting, navigational marking and site utilisation conditions [DPIRD, DoT]. | Management framework | H-KMS |
| | 2. Work with the Aquaculture Council of Western Australia and aquaculture proponents to ensure environmental best practice aquaculture management is applied in the marine park **[DPIRD].** | Management framework | H |
| | 3. Work with aquaculture companies and DPIRD to help them conduct operations in a culturally sensitive manner **[DPIRD].** | Management framework | H |



## 9.6 Pearling

*Goowarn* (pearl oyster) is significant in Mayala Country and is a cultural species which has significant stories associated with it. *Goowarn* has been traded for more than 20,000 years through Indigenous trade ways. More recently carved and decorated pearl shell with riiji (sacred designs) has been traded. This trade originated from the north-west Kimberley and spread across the Australian continent as far as Yalata in South Australia (MIAC 2019).

The pearl shell beds in Mayala Country are renowned as some of the best in the world. Non-indigenous take of shell in the past was used for making buttons before trade moved to culturing pearls.

Pearl shell riiji by Mr Tigan

At its peak, the pearling industry was one of the most valuable aquaculture sectors in northern Australia, generating $200 million revenue per year. The Kimberley is one of the most important regions for pearl oyster production due to the remote and pristine conditions of the area and pearling has long been an important part of the Kimberley. At the time of writing there were five pearl leases within the Mayala Marine Park.

Maintaining the excellent environmental conditions including the high-water quality in the marine park is critical to the success of the pearling industry. Research into the environmental impacts of pearling concluded that, in general, the industry is environmentally benign, producing a high value product with minimal environmental disruption (Enzer Marine Environmental Consulting 1998; McCallum and Prince 2009). 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) However, activities associated with pearling need to be carefully managed to avoid negative impacts on the ecological, culture and social values of the marine park.

The primary role of management in relation to pearling in the marine park will be to work with the pearling industry to ensure pearling activities are culturally, socially and ecological sustainable and to help maintain the environmental conditions of the marine park upon which the industry depends. Pearling includes ancillary activities such as vessel transit, shell cleaning and aircraft access, which are currently permitted in the area will continue to be permitted in general use areas in the marine park. Ancillary activities related to the pearling operations will be permitted in sanctuary and special purpose (cultural protection) zones if deemed compatible with the conservation purpose of the zone.

DPIRD will continue to manage pearling in the marine park. Pearling leases that exist prior to the establishment of a marine park have a right of renewal and cannot be displaced by the creation of the marine park. New proposals for leases will be assessed on a case-by-case basis by DPIRD in liaison with DBCA/Joint Management Body, the Commission and other stakeholders. The Minister for Environment's approval is required before the Minister for Fisheries grants a new pearl lease area within a marine park.

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

| Summary of management arrangements for pearling | | | |
|---|---|---|---|
| **Requirements** | • High water quality.<br>• Access to suitable and culturally 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 objectives** | • To maintain the ecological values of the marine park which are important to the continuation of a viable pearling industry.<br>• To ensure that, in collaboration with the industry and DPIRD, pearling is managed in a manner that is consistent with maintaining the values of the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 pearling authorisations are consistent with the management plan and include appropriate monitoring programs, lighting, navigational marking and site utilisations conditions [**DPIRD**, DoT]. | Management framework | H-KMS |
| | 2. Work with pearling proponents and other relevant stakeholders to ensure environmental best practice management is applied in the marine park **[DPIRD].** | Management framework | H |
| | 3. Work with pearling companies and DPIRD to help them conduct operations in a culturally sensitive manner [DPIRD]. | Management framework | H |

## 9.7 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).

Saltwater people in Australia were the first to experience early European exploration of the continent. When colonisers first came mapping the coast, Mayala people lit fires tracking their journey, so people ahead knew there were strangers on their Country. From the 1860s, pearlers who bypassed Broome began arriving on luggers in search of new areas for pearl shell in the King Sound region. The pearl shell beds in Mayala Country were renowned as some of the best in the world. Work was dangerous and many lost their lives in the quest for pearl shells. Pearler graves can be found on some islands in Mayala Country.

Twenty-six vessels have been reported lost in the King Sound region, of which only two have been discovered. Therefore, it is likely the marine park will contain undiscovered shipwrecks. 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 historic sites. | | |
| **Management objectives** | • To ensure that, in collaboration with the Western Australian Museum, human activity does not significantly affect historical sites or shipwrecks in the marine park.<br>• To increase awareness of maritime heritage within the local community and among visitors. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 sites with maritime heritage value within the marine park and development and implement plans of management for identified sites (WAM, Heritage Council of WA).<br>2. Provide interpretive information to enhance visitor enjoyment of, and where appropriate to mitigate or stop impacts on, maritime heritage values in the marine park. | Research<br>Education and interpretation | M<br>L |

# 9.8 Industry, resources and development

## 9.8.1 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 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 under the EP Act. Such environmental impact assessments within or near the marine parks will generally be referred to the department, the Commission and the JMB for advice.

## 9.8.2 Mining

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 the establishment of the marine park. 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*, will be 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 compatible with the conservation purposes of the special purpose zone (cultural protection) and special purpose zone (biocultural conservation) in the marine park and therefore mining and petroleum exploration and production can only occur in general use zones. The environmental and cultural impacts of mining and petroleum exploration or production proposals within or adjacent to the marine park will be subject to evaluation through the normal assessment and approvals process under Western Australian and Commonwealth legislation. Mineral, petroleum and pipeline activities are regulated by the Department of Mines, Industry Regulations and Safety (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 Environmental Protection Authority.

*Wanganiny* (Irvine, Bathurst and Flora islands and surrounding Sea Country) hold high cultural significance to Mayala and other Traditional Owners. The islands also contain significant mineral resources, particularly for iron ore.

A mining lease has been granted on and around Irvine Island and this tenement area is excluded from the marine park. An exploration licence has been granted over Bathurst Island and surrounding waters. Previous exploration work indicates that hematite mineralised Yampi Formation is present on Bathurst Island. Further work is required to determine whether an iron ore resource exists on the island, and whether mining could be feasible, including assessing the environmental and cultural impact, the viability of the resource and related infrastructure requirements. An exploration licence application covers Flora Island and surrounding waters.

The establishment of a class A marine park around Bathurst and Flora islands affords the highest level of protection to the significant environmental and cultural values of *Wanganiny* Sea Country. The intertidal and marine area surrounding Bathurst and Flora islands is zoned special purpose (cultural protection), and mining is not permitted in these areas.

Should mining of Bathurst and/or Flora islands receive all the necessary approvals, including native title consent, portions of the marine park surrounding the islands may be required for mining-related infrastructure, including a possible seawall and deep-water port. This management plan recognises that amendments to the boundary or zoning of the class A marine park may be required to enable mining and/or mining related infrastructure on Bathurst and Flora islands. Amendments to the zoning would require an amendment to this management plan. Any amendments to the boundary of the marine park will require an Act of Parliament.

The waters surrounding Irvine Island are also of exceptional cultural and ecological significance and would make a significant contribution to the marine park. If these waters were to be considered for inclusion in the future, DBCA will work with Mayala native title holders, mining tenement holders and other stakeholders on the matter.

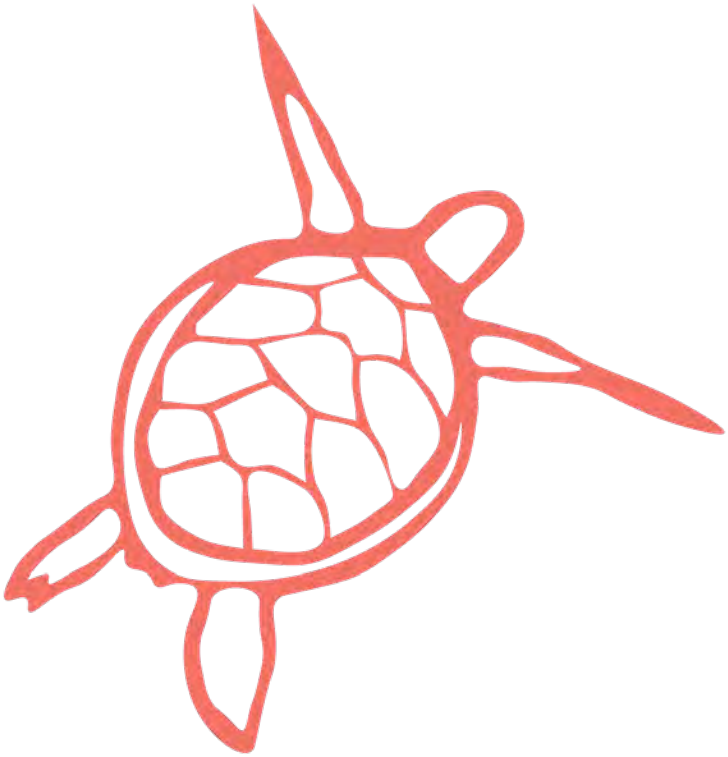
### 9.8.3 Seismic testing

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 communication, navigation and foraging habits, as well as damaging *aarli* (fish) with air bladders, affecting animal hearing and causing *aarli* (fish) and other marine species such as cetaceans to temporarily migrate away from the affected area. Any seismic survey 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 risks of behavioural changes.

### 9.8.4 Coastal infrastructure and ports

The DoT and 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. | | | |
|---|---|---|---|
| **Requirements** | Access to suitable and culturally appropriate locations for current and activities. | | |
| **Management objectives** | To ensure industry, development and associated activities are managed in a manner consistent with the objectives of the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 a memorandum of understanding (MoU) with KPA to ensure complementary management arrangements. | Management framework | H |
| | 2. Provide formal advice to the Commission, the EPA and/or the Minister for Environment relating to mineral, petroleum and pipeline activities in and adjacent to the marine park. [DMIRS, DWER]. | Management framework | As required |
| | 3. 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, Office of the Environmental Protection Authority]. | Management framework | As required |
| | 4. Consider the quality of the remote seascapes of the marine park in site planning and assessment of development proposals. | Management framework | As required |



# 10. Understanding Country

**Strategic objective:**
**To encourage collaborative research and monitoring which benefits Mayala *Baaliboor* (Mayala Country) and people by increasing knowledge and understanding of the values of the park to guide, adapt and improve joint management.**

## 10.1 Research

Developing an increased understanding of the cultural, ecological and social values of the marine park will be critical to effective management. The joint management arrangements for the marine park will rely significantly on the capacity of western science and Indigenous knowledge to work together. This will ensure the best available knowledge-base for making decisions about Saltwater Country that provide social, economic, cultural and environmental benefits for all (Austin *et al.* 2017). The Kimberley Indigenous Saltwater Science Project (KISSP) has produced a range of documents that seek to build capacity for collaborative management of Kimberley Saltwater Country.

Research in the marine park informed by traditional ecological knowledge will help to inform management practices and decisions and ensure the marine park is effectively managed. A comprehensive research program should be designed to fill knowledge gaps relevant to management.

Research within the marine park will require a licence issued by DBCA. This will enable DBCA to:

- maintain an understanding of research effort;
- direct research effort, where necessary, so it is relevant to management;
- collaborate with researchers where possible; and
- share 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 *aarli* (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 *aarli* (fish) or the use of prohibited fishing gear.

In culturally sensitive areas, Mayala may deem it appropriate for Mayala advisers to accompany researchers in their work. Findings from the research will be required to be made available in full to MIAC and the JMB for review and any culturally sensitive matter deemed 'unsuitable for public view' omitted from publication.

Research strategies specific to particular values of the marine park are detailed in sections 6 to 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 and monitoring.<br>• Access to representative sites in areas free of human impacts for scientific reference sites and in areas with human activities for impact reference sites where required. | | |
| **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.<br>• To promote research that improves knowledge of the values of the marine park to inform management decisions.<br>• To maximise the integration of conservation science with traditional ecological knowledge in all aspects of research in the marine park. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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. Encourage and promote involvement of Mayala people in research projects where possible [DPIRD]. | Research | Principle |
| | 2. Ensure that new knowledge from research and monitoring is communicated to MIAC and the Mayala community [DPIRD]. | Research | Principle |
| | 3. Prepare a research plan which is informed by existing research and considers the research strategies and priorities listed in this joint management plan and/or emerging priorities nominated by the JMB [DPIRD]. | Research | H-KMS |
| | 4. Develop a communication framework to guide the communication of science and knowledge to MIAC and the Mayala community. | Research | H-KMS |
| | 5. Collate and review existing research information to inform development of a research plan | Research | H-KMS |
| | 6. Identify and communicate high priority research projects which address key knowledge gaps to appropriate external organisations and funding bodies. | Research | H-KMS |
| | 7. Develop and implement protocols (where possible utilising or adapting existing protocols) to ensure research is culturally appropriate, commences only with appropriate permissions and that information shared by Traditional Owners is used in a culturally appropriate manner [DPIRD]. | Research | H-KMS |
| | 8. Develop scientific and research protocols and partnership agreement frameworks through the JMB that support genuine scientific and research partnerships with MIAC [DPIRD]. | Research | H-KMS |
| | 9. Where possible, support two-way science programs in schools. | Research | L |
| | 10. Facilitate or support research in the marine park, including projects by external organisations, by providing assistance where possible [DPIRD]. | Research | As required |
| | 11. Ensure granting and renewal of permits relating to scientific research is consistent with the management plan and complies with DBCA's Science Policy (No.28) and associated guidelines and any protocols developed with MIAC [DPIRD]. | Research | As required |
| | | | |
| **Performance measure** | Research plans have been developed and approved by the JMP and research activities, as detailed in the plan, have been implemented. | | |
| **Target** | • Preparation and implementation of a research plan.<br>• Undertake and completed research projects. | | |
| **Reporting** | To be determined. | | |

## 10.2 Monitoring

Long-term monitoring of the condition of values of the marine environment and the pressures that impact those values is essential to evaluate management effectiveness and inform an adaptive management approach. Monitoring enables the detection of detrimental impacts and can determine trigger points for corrective management action before cultural, ecological or social values of a marine park 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. The detection of human induced changes requires an understanding of what is 'natural' as a benchmark and this information should be progressively established through ongoing monitoring of sanctuary areas, or low impact sites, and through the research program.

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

In addition to DBCA and Mayala Traditional Owners, other organisations that may be involved in the monitoring of the marine park include DPIRD for *aarli* (fish) and pearl oysters (as defined in the FRM Act and Pearling Act 1990), the North Australian Indigenous Land and Sea Management Alliance, The Commonwealth Scientific and Industrial Research Organisation, Australian Institute of Marine Science, universities and community groups where appropriate.

Monitoring of the Mayala 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 against defined management targets. Sections 6, 7 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 objectives. Additional strategies may be required throughout the life of the joint management 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.

| Summary of management arrangements for monitoring | | | |
|---|---|---|---|
| **Requirements** | • Access to suitable areas within the marine park for monitoring purposes.<br>• Access to representative sites in areas free of human impacts for scientific reference sites and in areas with human activities for impact reference sites where required. | | |
| **Management objectives** | To monitor key cultural, ecological and social values in the marine park within a 'condition-pressure-management response' framework, to provide a basis to assess, adapt and improve management. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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. Facilitate knowledge transfer and uptake of research and monitoring findings to adaptive marine park management, planning and policy, and where relevant report on conservation achievements and challenges [DPIRD]. | Monitoring | Principle |
| | 2. Encourage monitoring in the marine park which aligns with Mayala and departmental priorities. | Monitoring | Principle |
| | 3. Collate and review existing monitoring information and techniques to inform the development of a monitoring plan | Monitoring | H-KMS |
| | 4. Prepare a monitoring plan which considers the strategies and priorities listed in this joint management plan and/or emerging priorities nominated by the JMB. | Monitoring | H-KMS |
| | 5. Develop a cultural values monitoring framework (and data storage and access process) to guide these activities in a joint management context, with respect to cultural Law and governance. | Monitoring | H-KMS |
| | 6. Develop and implement protocols to ensure monitoring is culturally appropriate and that any cultural information shared is used in a culturally appropriate manner e.g. supporting ISWAG/ KISSP protocols. | Monitoring | H-KMS |
| | 7. Investigate opportunities and develop a process to integrate traditional ecological knowledge with monitoring, where appropriate. | Monitoring | H-KMS |
| | 8. Liaise with industry, other government agencies and non-government organisations to access information held on ecological monitoring in the area. | Monitoring | H |
| | 9. Provide necessary information and support for assessments of management plan implementation by the Commission [DPIRD]. | Monitoring | As required |
| | | | |
| **Performance measure** | A prioritised monitoring plan has been developed and approved by the JMB, and monitoring activities, are being implemented. | | |
| **Target** | • Preparation and implementation of monitoring plan.<br>• Ongoing and completed monitoring projects.<br>• Number of values, including KPIs, 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 climate change 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 *marrgoorr* (coral) bleaching events, decreased ocean productivity, altered habitats, and greater incidence of disease or mortality (Hoegh-Guldberg and 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 habitats such as *joorlboo* mangroves and *noomool* (seagrass) can help to ensure that carbon is not released as a result of the loss and degradation of those areas, while maintaining these critical habitats. 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 Mayala Marine Park, but climate change is considered the greatest emerging pressure on the health of the ecological, cultural and social values (Boschetti *et al.* 2020). Sea surface temperatures in the Kimberley are 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). Modelling has predicted that climate variability will become more intense, such as extreme El Nino and La Nina and there will be more frequent and stronger marine heatwaves in the region (Feng *et al.* 2017). Sea level is also predicted to rise in the region at a rate of a few centimetres per decade (Feng *et al.* 2017).

Coral bleaching in the Kimberley. Photo – Claire Ross, DBCA.

Climate change impacts are already being recorded in the Kimberley region and the frequency of such events is predicted to increase. A *marrgoorr* (coral) bleaching event in the near shore region of the Kimberley adjacent to the marine park was recorded in the summer of 2016 (McCulloch *et al.* 2017, Le Nohaïc et al. 2017). This was followed by further incidents of bleaching in 2020 (DBCA, unpublished).

Mayala people are worried about the impacts of climate change on *marnany* (reef) health, *goorlil* (turtle) eggs, *goorlil* nesting beaches, and water places along the coastal areas, and the knock-on effect of how Mayala people will relate to Country. 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. Mayala people have experienced climate change since *milonjoon* (a long time ago) and drawing on traditional ecological knowledge and Indigenous science will be vital to understanding the effects of climate change on the values of the marine park.

Research and monitoring programs contribute to our understanding of the effects of climate change, as well as 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 marine 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 and;
- undertaking local adaptive management.

| **Summary of management arrangements for climate change** | | | |
|---|---|---|---|
| **Management objectives** | To increase understanding of climate change on the marine park and increase the resilience of values to climate change. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 international and national climate change initiatives where relevant in marine park research and adaptive management. | Management framework | Principle |
| | 2. Ensure that impacts of climate change are considered in monitoring programs of the KPI's for the marine park. | Monitoring | Principle |
| | 3. Assess areas, habitats and species which are most at risk from the effects of climate change and increase their resilience by reducing other pressures where possible [DPIRD]. | Research | H-KMS |
| | 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-KMS |
| | 5. 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 | L |
| | 6. Support or provide necessary information to contribute to climate forecast models to help predict the impacts of climate change on the values of the marine park. | Research | As required |

# 12. Plan implementation and operation

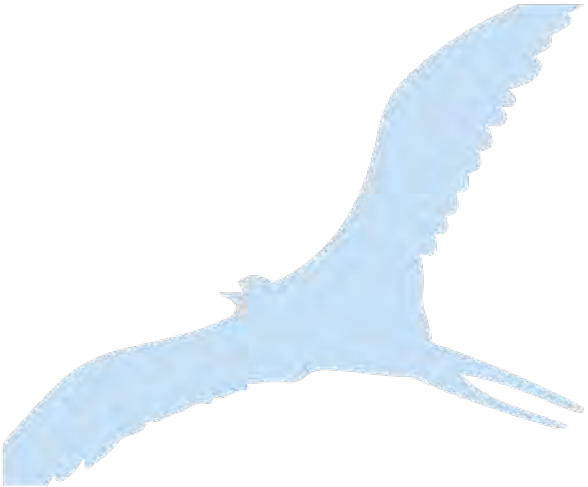
Sections 6 to 11 outline the management objectives, strategies, performance measures and targets required to achieve the strategic objectives for the marine park. To successfully implement these strategies a number of supporting management strategies are required to effectively administer the park, support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

| Summary of management arrangements for administration and governance | | | |
|---|---|---|---|
| **Management objectives** | 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 a collaborative setting. | | |
| | | **Management program** | **Priority** |
| **Management strategies**<br>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 objectives detailed in the JMA are applied to all management activities in the marine park. | Management framework | Principle |
| | 2. Collaborate with and provide advice to agencies, stakeholders and adjacent land managers, where necessary, to ensure the protection of marine park values and complementary management of adjacent reserves | Management framework | Principle |
| | 3. Implement all legal provisions necessary to establish and jointly manage the marine park including execution of the JMA, gazettal of the zoning scheme under the CALM Act and gazettal of orders under the FRM Act [DPIRD]. | Management framework | H-KMS |
| | 4. Develop governance tools to support effective and efficient decision-making by the JMB, including terms of references, code of conduct and conflict resolution policy [DPIRD-subject to funding]. | Management framework | H-KMS |
| | 5. Develop and maintain appropriate staff structures, funding, operational equipment including vessels and infrastructure to adequately implement the joint management plan and JMA. | Management framework | H-KMS |
| | 6. Develop and maintain understanding of and support for the marine park governance, management plan and activities by the local Mayala community. | Management framework | H-KMS |
| | 7. Investigate the need for, and if required, support MIAC to develop procedures to guide the JMB on what cultural decisions need to be referred to MIAC. | Management framework | H-KMS |
| | 8. Develop and maintain an understanding about the delegation of authority from the MIAC to JMB and vice versa, in relation to advice given to external parties and marine park management decisions, consistent with the joint management plan | Management framework | H-KMS |
| | 9. Promote culturally inclusive hiring processes by inviting MIAC nominated JMB representative/s to participate in hiring processes for positions related to the marine park. | Management framework | H-KMS |
| | 10. Provide licences and permits with appropriate conditions where required [DPIRD, Commission]. | Management framework | H-KMS |

| | | | |
|---|---|---|---|
| **Management strategies**<br><br>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. | 11. Develop annual work plans. | Management framework | H-KMS |
| | 12. Develop collaborative operational plans for the implementation of relevant strategies in the plan [DPIRD]. | Management framework | H-KMS |
| | 13. Work with the MIAC and Mayala Traditional Owners to develop commercial tour operator licence conditions to manage access in special purpose zones (cultural protection) to ensure activities including fishing are compatible with the purpose of protecting the land and waters to the culture and heritage of Traditional Owners. | Management framework | H-KMS |
| | 14. Facilitate regional annual meetings between the JMBs of Mayala, Bardi Jawi and Lalang-gaddam marine parks. | Management framework | H-KMS |
| | 15. In accordance with DPIRD's responsibilities under the FRM Act, Pearling Act, 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 |
| | 16. Develop materials to aid communication of the management plan to the Mayala community and support MIAC and JMB in the implementation of the plan [DPIRD]. | Management framework | H |
| | 17. Pursue external funding opportunities to implement strategies in the joint management plan. | Management framework | H |
| | 18. DPIRD to provide advice to and attend JMB meetings as required [DPIRD]. | Management framework | H |
| | 19. Undertake routine inspections and maintenance of department managed infrastructure in the marine park, particularly zone markers and signage. | Patrol and enforcement | M |
| | 20. Undertake a five-year review of the permitted activities in the special purpose zones [DPIRD]. | Management framework | M |
| | 21. Consider the need for temporary or longer-term restrictions e.g. speed limits and/or additional measures where necessary to protect threatened species, ecological communities, and natural features or for safety reasons [DoT]. | Management framework | As required |



## 12.2 Zoning and permitted activities

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

Multiple use zoning and other management strategies work together to protect and manage the values and uses of the area. Zoning is a key strategy for protecting the health and resilience of the marine park, while supporting ongoing tourism and recreation, commercial activities and fishing.

The CALM Act requires marine parks to be zoned as one or a combination of sanctuary, recreation, special purpose or general use zones. The zones provide for varying levels of conservation, recreational and commercial use. Through multiple-use zoning, marine parks will provide economic, recreational and cultural benefits for local communities, as well as environmental benefits. Where possible and appropriate, the development of the marine park zoning seeks to accommodate existing uses.

The national guidelines for establishing marine protected areas recommend that the 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).

To complement the bioregional framework, a network-based approach was taken, to ensure the zoning scheme complements other existing and marine parks in the Kimberley region and was designed in collaboration with the Maiyalam Marine Park and Bardi Jawi Gaarra Marine Park (map 8).

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

The zoning scheme for the Mayala Marine Park is shown in Maps 6-11 and a summary of the activities permitted in each zone is presented in Table 1. The zoning scheme comprises of:

- Six special purpose zones (cultural protection) covering approximately 56,100 hectares or 18 percent of the park
- Five special purpose zones (biocultural conservation) covering approximately 9,400 hectares or three percent of the park
- Four sanctuary zones covering approximately 67,600 hectares or 21 percent of the park
- general use in the remainder of the park, covering approximately 182,900 hectares or 58 percent of the park.

To ensure consistency and efficiency of management arrangements across the neighbouring Bardi Jawi Gaarra, Mayala and Lalang-gaddam marine parks, some zones extend across two or three 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 either the Bardi Jawi Gaarra or Lalang-gaddam marine park joint management plans.

### 12.2.2 Special purpose zones (cultural protection)

The special purpose zones (cultural protection) will play an important role in protecting the value of Mayala Country to the culture and heritage of Mayala people.

The conservation purpose of the special purpose zones (cultural protection) will be to protect and conserve culturally sensitive geographical areas and features that are significant to Mayala people. These areas may contain tangible values such as *baarngaboor* (clear open space for camping), areas important for customary food and other resources and culturally significant features such as *aarli* (fish) traps, cultural sites, *marnany* (reefs), *noomool* (seagrass) beds and 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 the Mayala people their Country is more than a simple geographic location, it includes all living things, incorporating people, plants, animals, seasons, stories, and spirits and they 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.

Mayala 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. While Mayala people do not permanently live on Country, the areas which are to be protected in special purpose zone (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, Mayala people have provided advice on the known or potential impacts from activities so that compatibility with these special purpose zones (cultural protection) zones can 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[4] and sea to the culture and heritage of Mayala 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 Mayala people will be prohibited. This includes most forms of commercial 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 Mayala people. Collecting trochus shell was a customary activity undertaken by the Traditional Owners in the past 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.

4 - Land as defined under the CALM Act.

Recreational fishing not undertaken as part of a fishing tour is not considered to be compatible with the conservation purpose of this zone type because it will 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 activity is compatible, provided the activity is subject to a CALM Act licence where conditions can be applied to regulate the activity to address cultural concerns. Licencing will ensure that commercial tourism operations 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 enactment of amendments to the CALM Act to include 'allowing only that level of recreational and commercial activity which is consistent with the protection and conservation of the value of the marine park to the culture and heritage of Aboriginal persons' in the purpose of marine parks.

**Oonggaliyan Special Purpose Zone (cultural protection) – Long Island**

The conservation purpose of the Oonggaliyan Special Purpose Zone (cultural protection) is to conserve the value of the land and waters to the culture and heritage of Mayala people. This zone recognises the significant cultural value of the *Oonggaliyan* area. The *loo* (currents) which connects people to Country is very significant in this zone, particularly around *Oonggaliyan* which runs on both sides of the island. The *Oonggaliyan* area contains many cultural sites both in the water and on *Oonggaliyan* itself and the special purpose zone (cultural protection) will contribute to protection of the cultural sites which are found within the marine park.

**Ooloogijii Special Purpose Zone (cultural protection) – Lachlan Island**

The conservation purpose of the Ooloogijii Special Purpose Zone (cultural protection) is to conserve the value of the land and waters to the culture and heritage of Mayala people. This zone recognises the significant cultural value of the *Ooloogijii* area. There are cultural stories associated with this area which has traditional been used for a variety of customary activities including shelling, fishing and hunting. The *Ooloogijii* area contains the two hills that are the place of the *Goolaman* story. Culturally important features which will be protected in this zone include *marnany* (reefs) and mangroves. The *marnany* and mangroves which will be protected in this zone support a wide diversity of culturally and ecologically significant marine fauna including *goorlil* (turtles), *joorroo* (sharks) and *barnamb* (rays). Mayala and Dambeemangarddee people know the area provides important nursery areas for *aarli* (fish) and wish to protect these areas for future generations.

This is a story about the importance of communication as a key survival tool: the fate of not being able to communicate was serious. Two men meet by chance across a chasm. One man, Goolinan, was from Oonggaliyan and shouted a question in Oowini across the gap. The other man was Ngarinyin and doesn't answer, because he doesn't speak that language. He yells back something in Ngarinyin, which the Oowini man doesn't understand. Then they both turn into two hills, which are still there today. (MIAC 2019)

The talking hills. Photo – Roanna Goater, DBCA.

**Gararr and Oolala Special Purpose Zone (cultural protection) – Mermaid and High Islands**

The conservation purpose of the Gararr and Oolala Special Purpose Zone (cultural protection) is to conserve the value of the land and waters to the culture and heritage of Mayala people. This area of Mayala Country holds sacred meaning to Mayala people and has strong family connections. The islands are important seasonal camping areas, and the surrounding waters are important for customary activities including fishing and hunting. Culturally significant features which will be protected in this zone include reefs and *noomool* (seagrass) beds which provide a foraging area for *goorlil* (turtle) and *odorr* (dugongs). The marine environment surrounding Tide Rip and *Gararr* (Mermaid) Islands act as important 'stepping-stones' for facilitating genetic exchange of *marrgoorr* (corals) and *noomool* (seagrass) in the region, where the Sunday Strait acts as a barrier for dispersal of seed and larvae dispersal (McMahon *et al.* 2017). The protection of these culturally and ecologically significant *marrgoorr marnany* (coral reef) and *noomool* (seagrass) habitats will likely enhance resilience and adaptation over multiple generations (McMahon *et al.* 2017).

**Gaarroogoorrood Special Purpose Zone (cultural protection) - Strickland Bay**

The conservation purpose of the Gaarroogoorrood Special Purpose Zone (cultural protection) is to conserve the value of the land and waters to the culture and heritage of Mayala people. Significant cultural stories are associated with this area. This zone extends into the intertidal areas of *Dambeemangarddee* Country providing protection to culturally important features such as mangrove creeks and mudflat areas across both Mayala and *Dambeemangarddee* Sea Country. Mayala and *Dambeemangarddee* people know the area is an important nursery area for *aarli* (fish). Important cultural resources are found in this area and consequently this area has traditionally been used for customary fishing and hunting.

*Aalinggoon*, he came down here into Strickland Bay from the mainland, down. He came into the bay and lives beneath the sea. He comes out every full moon, when it's a big tide. As he floats on his back, as he drifts, the scales fall off his back, and turned into *goowarn* as they drifted down to the seabed below. The tides came and chucked them everywhere, on the reefs, all around the islands. This way he always gives us more shells. This is a power. This is part of our ceremony.
*Aubrey Tigan Galawa*

An unnamed island in *Gaarroogoorrood* (Strickland Bay). Photo – Roanna Goater, DBCA.

**Wanganiny Special Purpose Zone (cultural protection) – Bathurst Island**

Bathurst and Irvine islands are joined by a *marnany* (reef) platform and have one Mayala name; *Wanganiny*. *Wanganiny* is a highly significant site. The waters surrounding Irvine Island are excluded from the marine park. The conservation purpose of the Wanganiny Special Purpose Zone (cultural protection) is to conserve the value of the land and waters to the culture and heritage of Mayala people. The culturally and ecologically significant values that this zone will protect include a diverse and significant *marrgoorr* (coral) *marnany (*reef) system. This zone also supports a rich diversity of fauna and species of special conservation interest including *miinimbi* (whales), *goorlil* (turtles), *alngir* (trochus) and a diverse array of *aarli* (fish).

**Garranarr Special Purpose Zone (cultural protection) – Bedford Island Group**

The conservation of the Garranarr Special Purpose Zone (cultural protection) is to conserve the value of the land and waters to the culture and heritage of Mayala people. The islands are connected under the water and Mayala Lore and cultural knowledge identifies sacred sites in the sea. There are islands that are now *marnany* (reefs) and evidence of camps and pathways under the water which are connected and celebrated. To this day, the islands in this area are important seasonal camping and gathering places. *Alngir* (trochus) has customarily been collected in this area. Long journeys were made by biyal-biyal to *Garranarr* and *Noomoonjoo* (Caffarelli Island) and later by motorboat to collect trochus and other resources. The culturally and ecologically significant features which will be protected in this zone include important *marrgoorr* (coral) *marnany (*reef) and *noomool* (seagrass) beds which act as important 'stepping-stones' for facilitating genetic exchange of *marrgoorr* (corals) and *noomool* (seagrass) in the region.

### 12.2.3 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 mangroves. This zone type continues 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 Mayala Country to the culture and heritage of Mayala people by protecting important 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. These regulations will be developed by the JMB and DPIRD in consultation with stakeholders.

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, 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.

**Oobayal Special Purpose Zone (biocultural conservation) - Inland Sea**

The conservation purpose of the Oobayal Special Purpose Zone (biocultural conservation) is to provide for the conservation of ecologically and culturally important marine ecosystems in the area. This zone recognises the significant cultural value of the *Oobayal* (Inland Sea) area. There are cultural stories associated with this area which has traditional been used for a variety of customary activities including shelling, fishing and hunting. The *Oobayal* area contains the two hills that are the place of the *Goolaman* story. Culturally important features which will be protected in this zone include *marnany* (reefs) and mangroves. The *marnany* and mangroves which will be protected in this zone support a wide diversity of culturally and ecologically significant marine fauna including *goorlil* (turtles), *joorroo* (sharks) and *barnamb* (rays). Mayala and Dambeemangarddee people know the area provides important nursery areas for *aarli* (fish) and wish to protect these areas for future generations. This zone continues to allow for low impact recreational and commercial activities.

**Gaarroogoorrood Special Purpose Zone (biocultural conservation) - Strickland Bay**

The conservation purpose of the Gaarroogoorrood Special Purpose Zone (biocultural conservation) is to provide for the conservation of ecologically and culturally important marine ecosystems in the area. This zone extends into the intertidal areas of *Dambeemangarddee* Country providing protection to culturally important features such as mangrove creeks and mudflat areas across both Mayala and *Dambeemangarddee* Sea Country. Mayala and *Dambeemangarddee* people know the area is an important nursery area for *aarli* (fish). Important cultural resources are found in this area and consequently this area has traditionally been used for customary fishing and hunting. This zone continues to allow for low impact recreational and commercial activities. Significant cultural stories are associated with this area.

**Janbarrgal Special Purpose Zone (biocultural conservation) - Graveyards**

The conservation purpose of the Janbarrgal Special Purpose Zone (biocultural conservation) is to provide for the conservation of ecologically and culturally important marine ecosystems in the area. Culturally significant pearl shell beds are exposed during the low spring tides on reefs surrounding islands. It is a traditional place for collecting pearl shell and where many hard hat pearl divers lost their lives. Protecting the pearl shell beds in the Graveyard area is important for its environmental, historic and Lore significance. Other culturally and ecologically significant features which will be protected include reef and mangroves which provide habitat for a variety of *aarli* (fish), invertebrates, *joorroo* (sharks) and *barnamb* (rays). This zone continues to allow for low impact recreational and commercial activities.

**Galayngoorr Special Purpose Zone (biocultural conservation) - Byron Island**

The conservation purpose of the Galayngoorr Special Purpose Zone (biocultural conservation) is to provide for the conservation of ecologically and culturally important marine ecosystems in the area. The fringing *marnany* (reefs) surrounding the outer islands within this zone will be protected in addition to mangroves and beaches. This zone supports a rich diversity of fauna and species of special conservation interest including *miinimbi* (whales), *goorlil* (turtles) and a diverse array of *aarli* (fish) and invertebrates. This zone continues to allow for low impact recreational and commercial activities.

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

The conservation purpose of Oobagooma Special Purpose Zone (biocultural conservation) is to provide for the conservation of ecologically and culturally important marine ecosystems in the area. The majority of this zone is in the Lalang-gaddam Marine Park. This zone protects important mangrove systems and intertidal mudflats in the King Sound Bioregion. This zone continues to allow for low impact recreational and commercial activities.

### 12.2.4 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. For Mayala people, many ecological values also have a particular cultural significance, and the sanctuary zones will also contribute to the protection and conservation of Mayala cultural heritage values including culturally important reef and mangrove areas.

Sanctuary zones protect critical habitats and aggregation sites, and 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. Research may include Traditional Owners assessing commercial opportunities for present and future sustainable livelihoods, and future reviews of the plan will assess the need for zoning revisions to enable these opportunities to be realised.

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 barramundi (*Lates calcarifer*), snappers (e.g. *Lutjanus* spp) and emperor (e.g. *Lethrinus* spp.) and for relatively sedentary species such as reef fishes (e.g. *Choerodon* spp., *Scarus* spp. and *Cheilinus* spp.).

**Janawan Sanctuary Zone - Helpman Island**

The Janawan Sanctuary Zone protects representative habitats in the King Sound Bioregion and the largest density of nesting flatback *goorlil* (turtle) within the marine park (Whiting *et al*. 2018). Significant genetic differentiation of flatback turtles has been exhibited among many sites within Western Australia, and throughout their range. The Janawan Sanctuary Zone will contribute to the protection of a group of flatback turtles whose nesting sites include Helpman Island, Raft Point and, Traverse Island in Dambeemangarddee Country and which are genetically different from other groups in the Kimberley (Whiting *et al.* 2018). The Janawan Sanctuary Zone extends into the intertidal areas in Dambeemangarddee Country providing for connectivity between the island and intertidal areas mangrove and mudflat areas of *Dambeemangarddee* Country. The *loo* (currents) around *Janawan* are very important to Mayala people who traditionally used the *noormoor* (saltwater highway) to travel north.

**Boolngoorroo Sanctuary Zone - Margaret and Shirley Islands**

The Boolngoorroo Sanctuary Zone will protect representative examples of marine habitats of the Buccaneer Archipelago in the Kimberley Bioregion from deep subtidal habitats (50-100 m) to shallow (0-10 m) intertidal habitats including *marrgoorr marnany* (coral reefs) and *noomool* (seagrass). This sanctuary zone extends into the Bardi Jawi Gaarra Marine Park protecting habitats on both sides of the Sunday Strait which has been shown to act as a barrier to the dispersal of seeds and larvae (McMahon *et al.* 2017). This zone will also protect *goorlil* (turtle) nesting beaches which are found on the islands within the marine park. 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 *jiidid* (whirlpools), overfalls and rips. Whirlpool Passage is a three mile 'S' bend passage which has tidal flows in excess of 10 knots and can have large and deep *jiidid* (whirlpools). It should only be crossed at the right tide.

**Janbarrgal Sanctuary Zone – Graveyards**

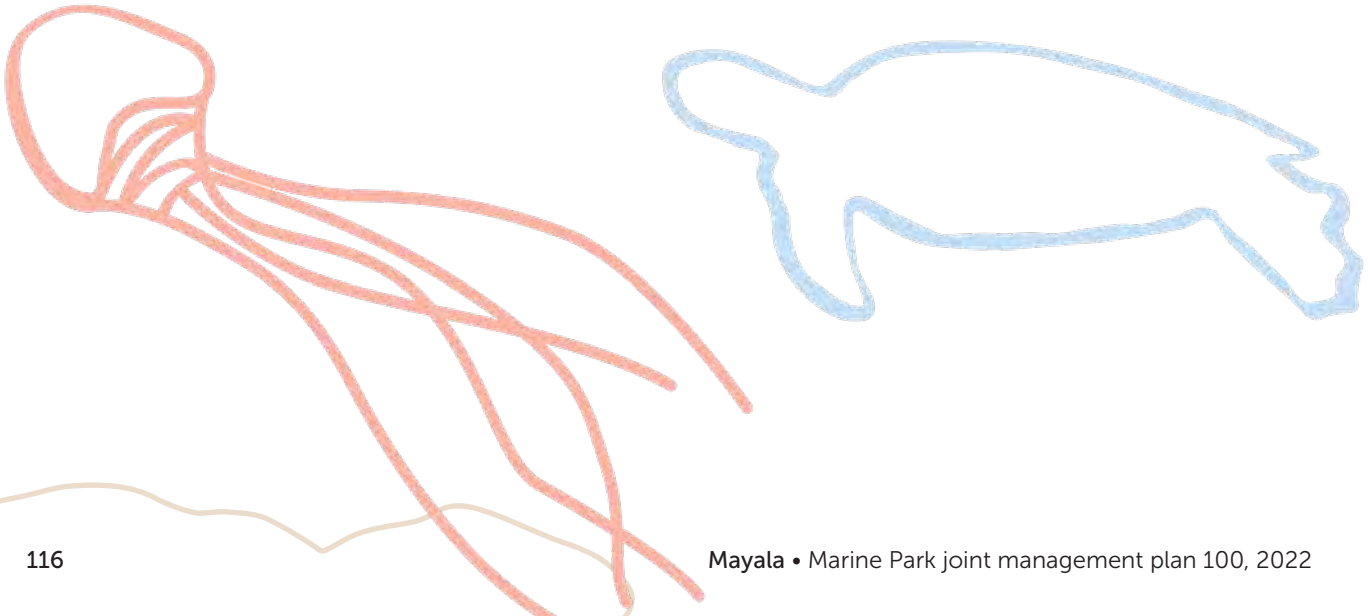
The Janbarrgal (Graveyards) Sanctuary Zone sanctuary zone protects important habitats within the Graveyards area. Traditional knowledge passed down through generations shows that this area contains important *noomool* (seagrass) for *odorr* (dugongs). Protecting this area in a sanctuary zone is important for both ecological and cultural reasons. Other values which are protected include *aarli* (fish), invertebrates, *joorroo* (sharks) and *barnamb* (rays).

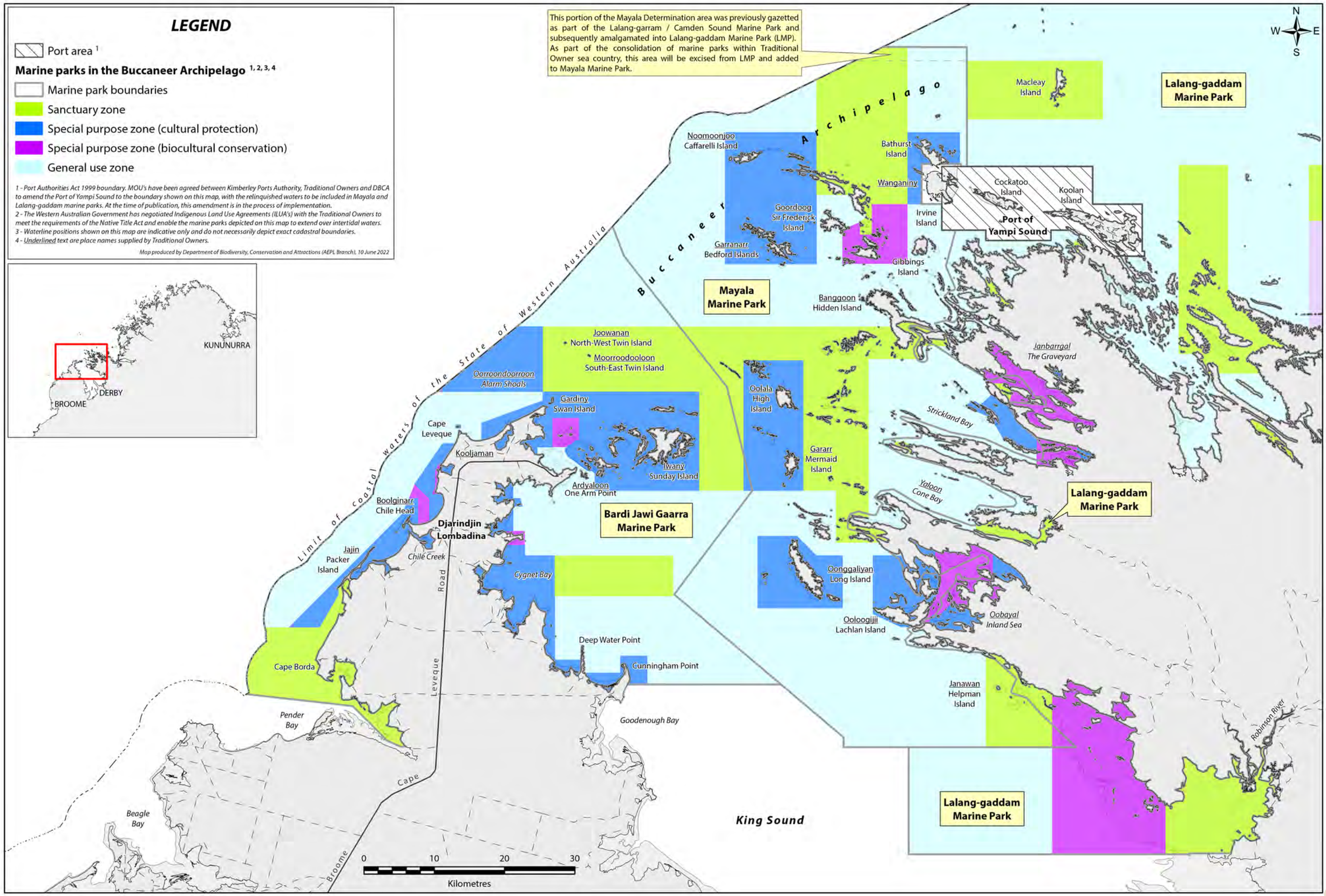
**Yawalgi Sanctuary Zone - Longitude Islands**

The Yawalgi Sanctuary Zone protects representative marine habitats of the outer islands of the Buccaneer Archipelago from deep (50-100 m) subtidal areas to shallow intertidal habitats. The fringing *marnany* (reefs) surrounding the outer islands within this zone will be protected in addition to mangroves and beaches. This zone supports a rich diversity of fauna and species of special conservation interest including *miinimbi* (whales), *goorlil* (turtles) and a diverse array of *aarli* (fish) and invertebrates.

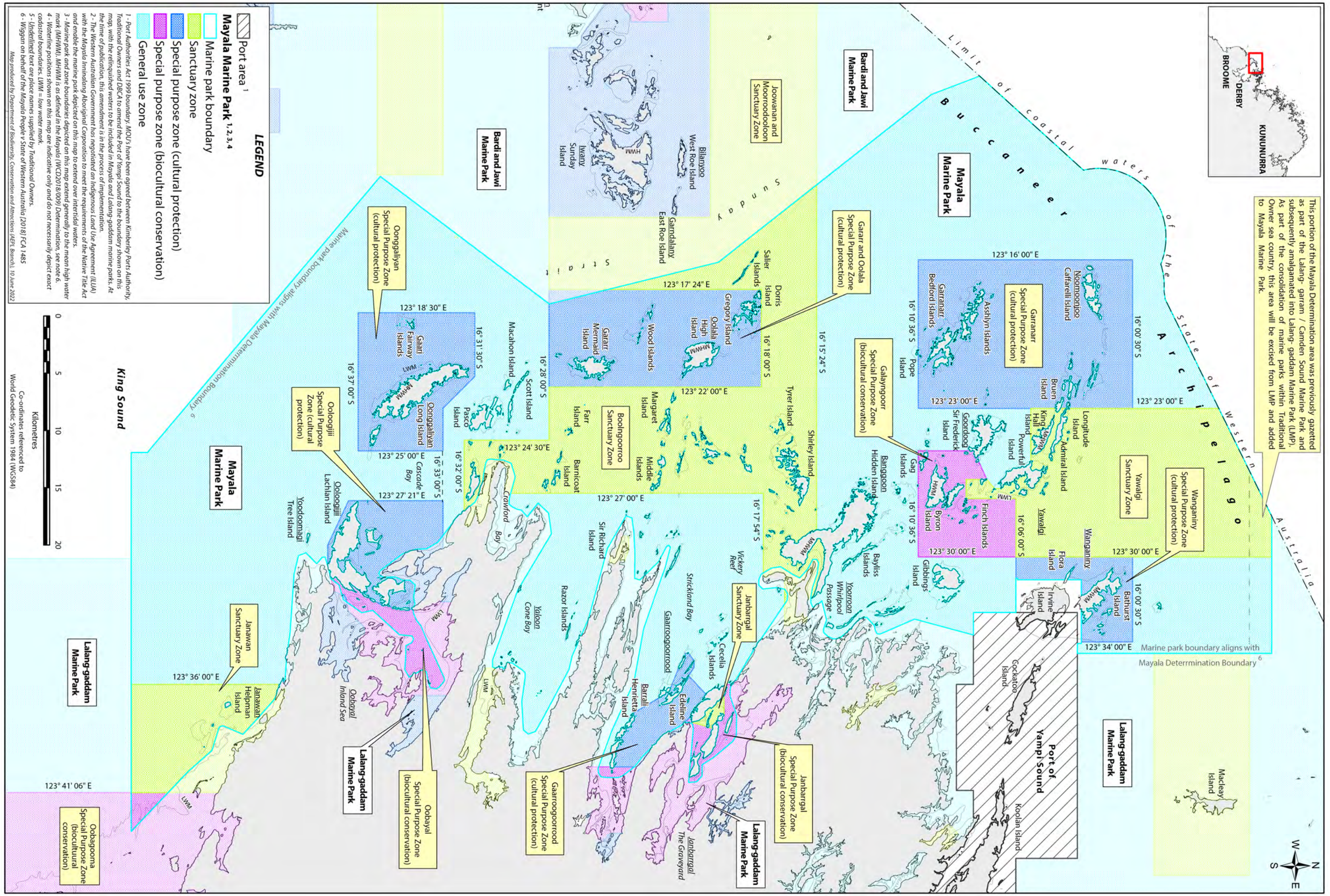
## 12.2.5 General use zones

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.

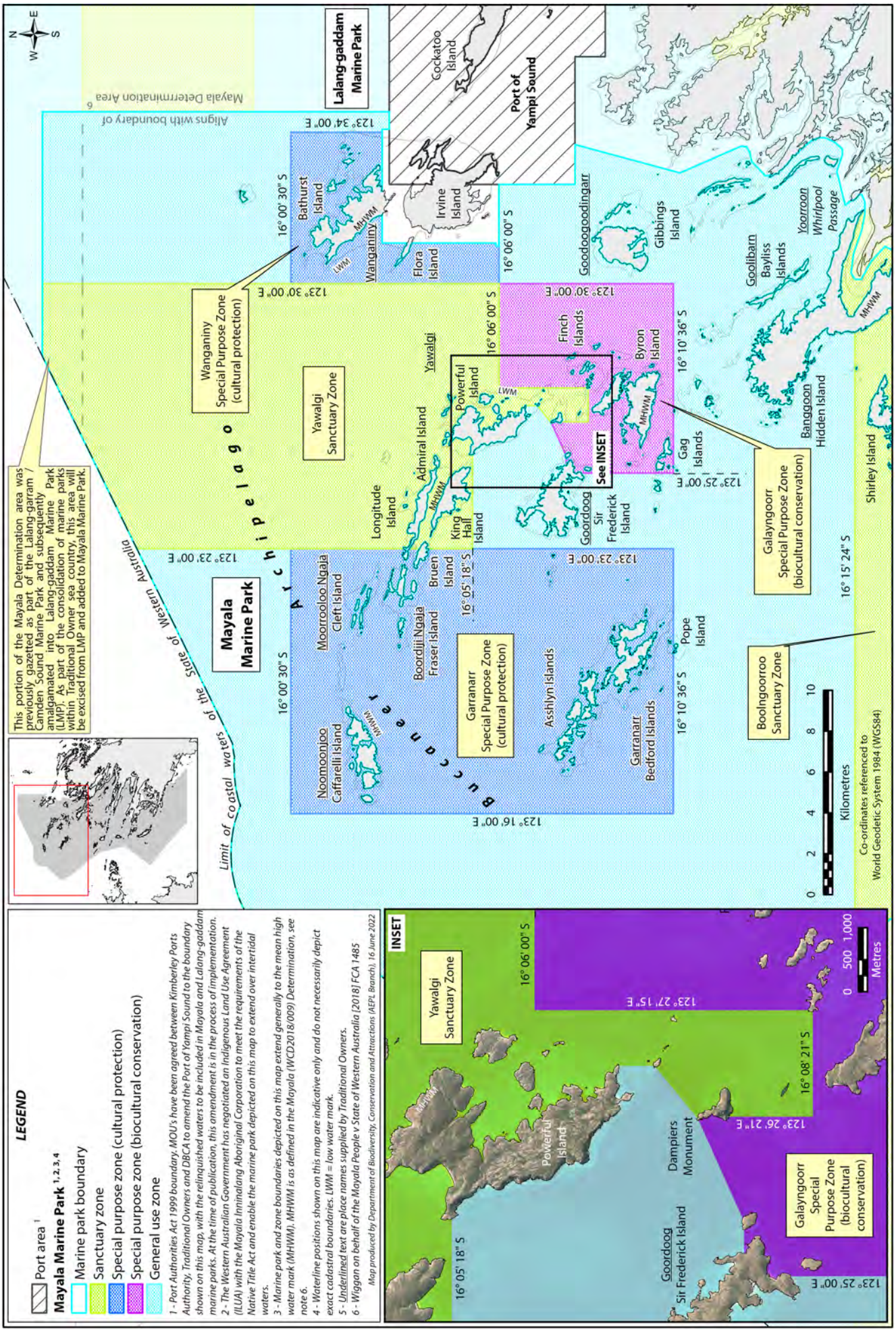




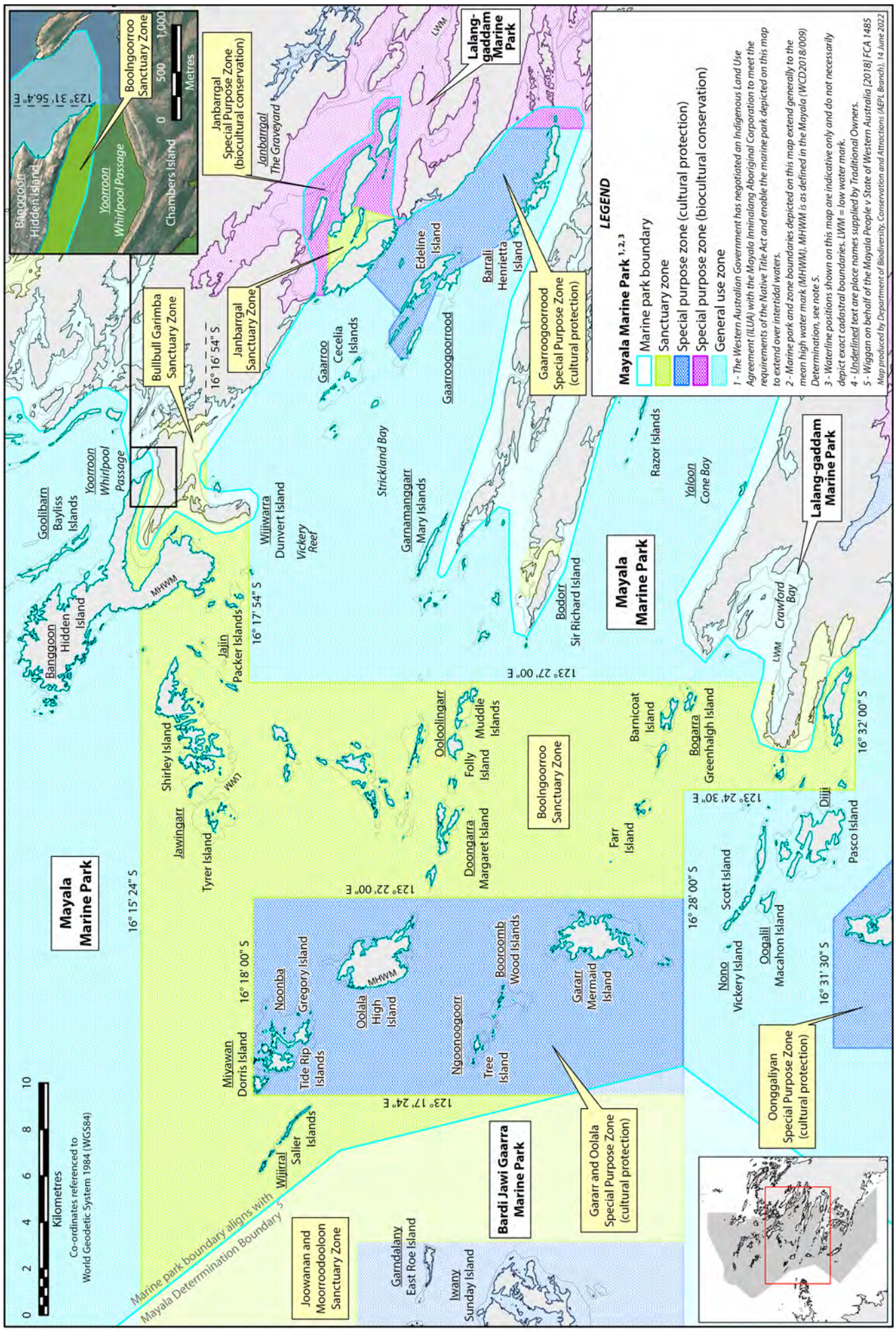

Map 6: Overview map of zoning for marine parks in the Buccaneer Archipelago



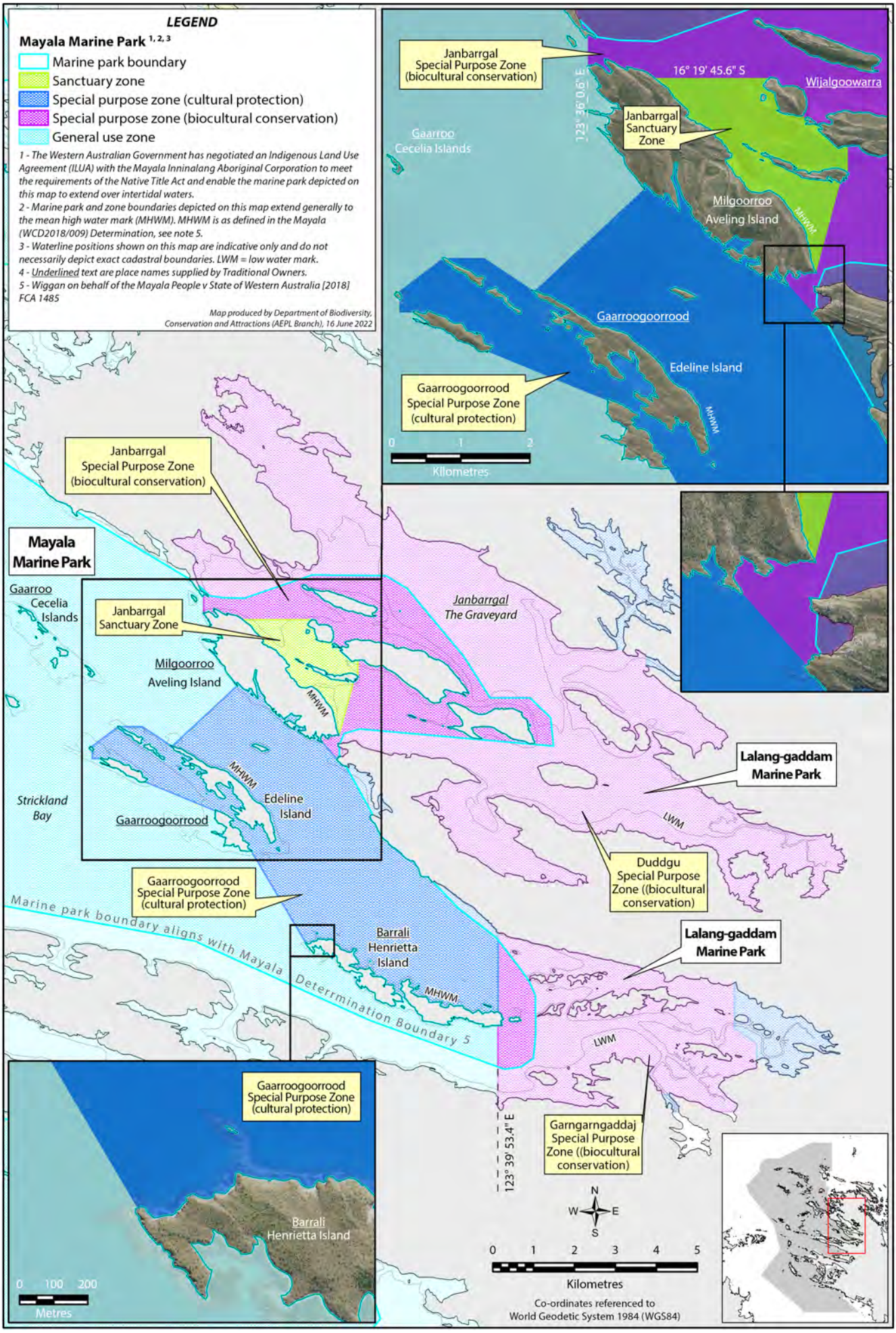

Map 7: Zoning for Mayala Marine Park



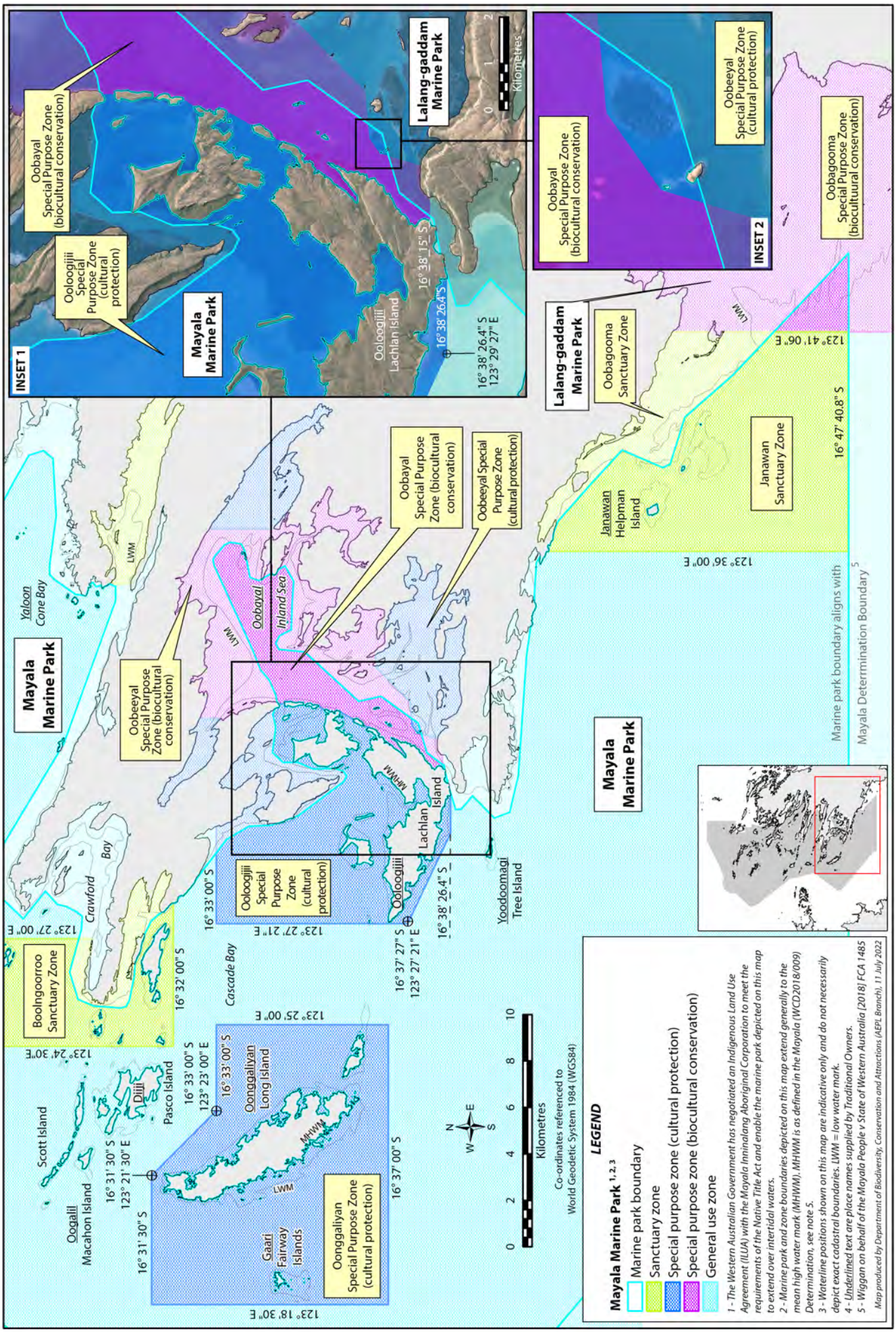

Map 8: Zoning for Mayala Marine Park – Yawlalgi area




Map 9: Zoning for Mayala Marine Park – Boolngoorrooib area




Map 10: Zoning for Mayala Marine Park – Strickland Bay area




Map 11: Zoning for Mayala Marine Park – Cascade Bay area


Mayala Traditional Owners on Country. Photo – Ash Mumford, KLC

### 12.2.6 Permitted uses

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

In accordance with the CALM Act, a licence is required to carry out some activities (e.g. commercial tourism and research) in State marine parks.

The implementation of the management plan may include 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.

A review of the permitted activities for the special purpose zones will be undertaken in five years to determine whether after research and development some potential low impact economic development opportunities could be considered compatible with the purpose of the special purpose zones. Any changes to the permitted activities and uses table for the special purpose zones will require a statutory two-month public comment period and approvals from the Minister for Environment, Minister for Fisheries and Minister for Mines and Petroleum.

## Table 1: Summary of permitted uses for the Mayala Marine Park.

| Activity | Sanctuary zones [a] | Special Purpose Zones (Cultural Protection) [a] | Special Purpose Zones (Biocultural Conservation) | General use zones |
|---|---|---|---|---|
| **Customary** | | | | |
| Customary activities (e.g. hunting and fishing) | Yes [b] | Yes [b] | Yes [b] | Yes [b] |
| **Commercial** | | | | |
| Commercial trochus collection [c] | No | Yes | Yes | Yes |
| Commercial mackerel fishing [c] | No | No | Yes | Yes |
| Commercial specimen shell fishing [c] | No | No | Yes | Yes |
| Commercial crab fishing [c] | No | No | Yes | Yes |
| Commercial sea cucumber fishing [c] | No | No | Yes | Yes |
| Commercial fishing (other than trochus, mackerel, specimen shell, crab and sea cucumber) [c] | No | No | No | Yes [d] |
| Pearling and associated activities [c] | No | No | No | Yes |
| Aquaculture [c] | No | No | No | Yes |
| Scenic flights (charter) [c] | Yes | Yes | Yes | Yes |
| Ground disturbing mining and petroleum exploration and development [e] | No | No | No | Assess |
| Non-ground-disturbing activities including geophysical surveys, geological mapping, sampling and geochemical surveys [f] | No | No | No | Assess |
| Ship loading and other mining related infrastructure (e.g. ship loading docks, cabling or pipelines) | No | No | No | Assess |
| General marine infrastructure (e.g. groynes, jetties and boat launching facilities) | No | Assess | Assess | Assess |
| Artificial structures (e.g. artificial reefs) | No | No | No | Assess |
| Dredging and dredge spoil dumping | No | Assess [g] | Assess [g] | Assess |
| Commercial tour operators – fishing [c] | No | Yes | Yes | Yes |
| Commercial tour operators – non-extractive (e.g. wildlife viewing) [c] | Yes | Yes | Yes | Yes |
| Wildlife/fish feeding | No | No | No | No |
| **Recreational** | | | | |
| Boating (motorised and non-motorised) | Yes | Yes | Yes | Yes |
| Nature appreciation and wildlife viewing | Yes | Yes | Yes | Yes |
| Recreational fishing [c – if from a boat] | No | No [h] | Yes [i] | Yes |

| Activity | Sanctuary zones [a] | Special Purpose Zones (Cultural Protection) [a] | Special Purpose Zones (Biocultural Conservation) | General use zones |
|---|---|---|---|---|
| **Other use** | | | | |
| Access | Yes | Yes | Yes | Yes |
| Vessel transit | Yes | Yes | Yes | Yes |
| Navigation aids | Yes | Yes | Yes | Yes |
| Research and monitoring [c] | Yes | Yes | Yes | Yes |
| Anchoring (soft bottom only) | Yes | Yes | Yes | Yes |
| Mooring | Assess | Assess | Assess | Yes |
| Seaplane, helicopter and remotely piloted aircraft (drone) launching and landing [j] | Assess | Assess | Assess | Assess |
| Vessel sewage discharge and de-ballasting | No | No | No | Yes [k] |

## Permitted activities provisions

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

[b] Customary take is confined to native title holders as determined under the *Native Title Act 1993* or where native title holders have provided consent to another Aboriginal person or group.

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

[d] Prawn trawling is restricted in the marine park through a permanent inshore closure managed by DPIRD.

[e] 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).

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

[g] 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.

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

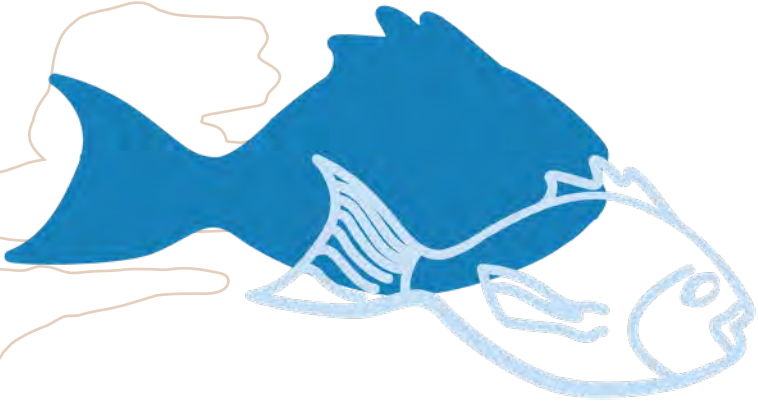
[i] Additional regulations on recreational fishing under the *Fish Resources Management Act 1994* are likely to occur in special purpose zones (biocultural conservation).

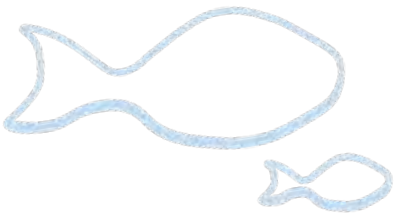
[j] Lawful authority must be obtained to launch, land or touchdown in an aircraft on CALM Act lands and waters.

[k] Only in gazetted sewage discharge areas.

## 12.3 Community stewardship and compliance

Education and public participation will help to increase public awareness and understanding of the values and management issues in the marine park. 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 users comply with management arrangements when they understand why they are implemented, it is important to monitor compliance and mitigate inappropriate or illegal behaviour. To achieve this, an appropriate level of 'field' presence by DBCA, Mayala rangers (employed directly by the department or contracted) and DPIRD will be 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 objectives** | 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**<br><br>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 users, including researchers, obtain and comply with appropriate formal permissions [DPIRD]. | Patrol and enforcement | Principle |
| | 2. Encourage voluntary compliance and peer enforcement of regulations [DPIRD, DoT]. | Education and interpretation | Principle |
| | 3. Develop an education and interpretation program which communicates:<br>• the importance of the marine park's values<br>• the purposes of management zones and regulations<br>• appropriate behaviour to reduce human impacts and ensure public safety<br>• Mayala native title rights and visitor protocols on sea and land; and<br>• considers all education and interpretation strategies listed in the management plan [DPIRD]. | Education and interpretation | H-KMS |
| | 4. Develop and implement a collaborative patrol and enforcement plan [DPIRD]. | Patrol and enforcement | H-KMS |
| | 5. Monitor, promote and enforce compliance with fisheries and marine park legislation, including illegal foreign fishing **[DPIRD]** | Patrol and enforcement | H-KMS |
| | 6. Install zone markers and educational signage for the marine park where appropriate [DPIRD]. | Education and interpretation | H |
| | 7. Noting remoteness of the marine park, where possible develop and implement a public participation plan for the marine park which encourages community involvement in management through a range of opportunities including education, research and monitoring. | Public participation | H |
| | 8. Develop, monitor and maintain a database of compliance statistics and adapt management strategies to address any non-compliance issues [DPIRD]. | Patrol and enforcement | H |
| | 9. Facilitate cross-authorisation of enforcement officers as appropriate including training Mayala rangers in CALM Act compliance with the intention of them obtaining the status of honorary enforcement officers pursuant to the CALM Act. | Management framework | M |
| | 10. Facilitate training of Mayala Rangers in FRM Act compliance, to engage in DPIRD compliance activities **[DPIRD]** | Management framework | M |

# 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 collaboration of DBCA's West Kimberley District, DBCA's Marine Science Program, Mayala rangers (when established) and other specialist branches guided by the JMB. The JMB with assistance of the West Kimberley District, Mayala rangers (when established) and DPIRD will prepare an annual review of the implementation of the management plan for consideration by the MIAC 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, MIAC will also provide an update to the Mayala 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, MIAC 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 Mayala Country plan. This outcome-based approach provides a robust framework to support adaptive marine park management.

## 13.3 Revision of the management plan

The joint management 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. If such a revision does not occur by the end of the plan's specified lifespan, the plan will remain in force 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 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**<br>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 suitable in a joint management setting that is consistent with DBCA and Commission policy and ensure results are reported back to the Mayala Community [Commission]. | Management framework | H-KMS |
| | 2. Through the JMB, support MIAC to conduct periodic reviews of the effectiveness of plan implementation in meeting cultural, capacity building and other priority objectives [DPIRD]. | Monitoring | H-KMS |
| | 3. Develop and implement a monitoring and evaluation framework to assess joint management effectiveness for the marine park [DPIRD]. | Management framework | H |
| | 4. Provide necessary information and support for the performance assessment process [DPIRD]. | Monitoring | As required |
| | 5. Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the values of the marine park [DPIRD]. | Management intervention and visitor services | As required |

Mayala Traditional Owners on Country. Photo – Catriona Webster, KLC

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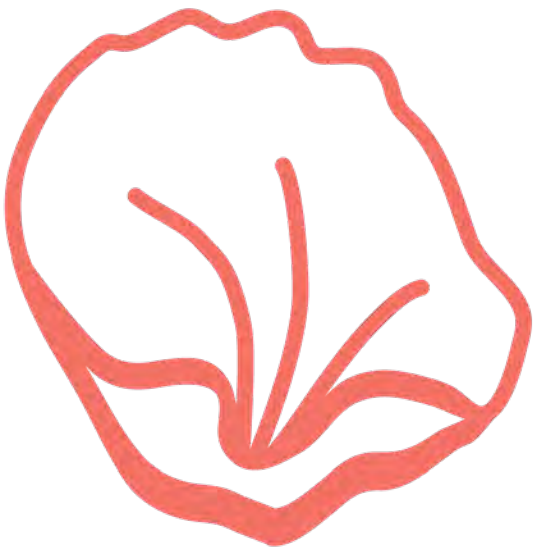

# Appendix 1- Design Principles

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

**Adequacy:** The network 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, plants and the behaviour of 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 *marnany* (reefs), beaches and mangrove communities. Important sites may also include important dreaming sites, *aarli* (fish) traps, intertidal stone arrangements, increase sites, ceremonial sites and others.
- the protection of areas important for culturally significant species such as *Goorlil* (turtles), *odorr* (dugongs), *miinimbi* (whales) and *bayalbarr* (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 – Bardi (Mayala's adopted language) language glossary

| Bardi Language | Meaning |
|---|---|
| *Ajibankoor* | Willy-willy |
| *Arli goolil* | Meat of the sea |
| *Arrawanyin* | Clan |
| *Baaliboor* | Country |
| *Baarngaboor* | Clear open space for camping |
| *Balab jiya aarrood ngan jaard booroo* | Welcome to Country |
| *biyal-biyal / gaalwa* | Double log rafts |
| *Boolngoorroo* | In the middle |
| *Aamboon aamboon angarriya* | Coming together |
| *Gaarr-gaarr* | Ripples |
| *Galoorr* | Foam |
| *Gorna liyan / Liyan gorna* | Spirit, feeling good and strong in yourself |
| *Jiidid* | Whirlpools |
| *Jardagarr* | Sandbars |
| *Inalaboor* | Small islands |
| *Iinalang* | Big islands |
| *Loo* | Tidal currents |
| *Mayala Baaliboor* | Mayala Country |
| *Mayalayoon ambooriny* | Mayala people |
| *Mayalaboor* | Mayala place/ country |
| *Milimilonjoon* | Long, long time ago |
| Niimir | Drop offs or deep holes in the sea, so deep you can't see the bottom |
| *Noomoorr* | Saltwater highway, travelling routes on the tides and currents, including timing |
| *Ooloowa* | Water spouts |
| *Oomiida* | Clan / language of that clan |
| *Oongarong* | Clan / language of that clan |
| *Oowinin* | Language of Mayala island people |
| *Riiji* | Sacred of special designs carved into pearl shell |
| *Wiini* | Respect |
| *Yawi-jabayi* | Clan |
| **Habitats** | |
| *Laanyji* | Macroalgae – Big brown seaweed that grows on the reefs and can be seen floating in clumps |
| *Marnany* | Reef |
| *Marrgoorr* | Coral |
| *Noomool* | Seagrass |

| Animals | |
|---|---|
| *Aarli* | Fish |
| *Alngir* | Trochus |
| *Amboorl* | Baler shell |
| *Balalagood* | *Acacia sp.* |
| *Barnamb* | Ray |
| *Bayalbarr* | Dolphin |
| *Garrabal* | Bird |
| *Goorlil* | Turtle |
| *Goowarn* | Pearl oyster |
| *Jalnggoon* | Large rock oyster |
| *Joorroo* | Shark |
| *Linygurra* | Estuarine Crocodile |
| *Loolooloo* | Whaleshark |
| *Marrgaliny* | Hammerhead shark |
| *Miinimbi* | Whale |
| *Ngarrangg* | Mudcrabs |
| *Ngoolnga* | Trumpet shell |
| *Niwarda* | Small rock oyster |
| *Odorr* | Dugong |
| *Oondoord* | When the green turtle has mated, they are attached the Female (Garralgoon) and Miida (Male) |
| **Places** | |
| *Barrali* | Henrietta island |
| *Biidib* | Margaret and Shirley Islands |
| *Diiji* | Pascoe and Hazel Islands and the interconnecting reef platform |
| *Gaarroogoorrood* | Strickland Bay |
| *Galayngoorr* | Passage between *Malgi* (Gagg) and *Booloongoodiny* (Single Pole Tower Island) |
| *Gararr* | Mermaid Island |
| *Garranarr* | Bedford Island |
| *Janawan* | Helpman Island |
| *Janbarrgal* | Graveyards |
| *Ngalangalangarr* | Silica beach |
| *Noomoonjoo* | Caffarelli Island |
| *Oobayal* | Inland Sea |
| *Ooloogija* | Lachlan Island |
| Oolala | High Island |
| *Oonggaliyan* | Long Island |
| *Wanganiny* | Irvine/ Bathurst Islands inclusive of interconnecting reef platform |
| *Yaloon* | Cone Bay |
| *Yawalgi* | Byron / Longitude / Powerful / Admiral Island Group |
| *Yoorroon* | Whirlpool Passage |
| **Seasons** | |
| *Ngaladan* | Approximately Jan-Feb (but depends on monsoon) |
| *Irralboo* | Approximately March- April |
| *Barrgana* | Approximately May- July |
| *Jalalay* | Approximately July- September |
| *Lalin* | Approximately October - November |
| *Mangala* | Approximately November- December |

Barnicoat Island. Photo - Michael Higgins, DBCA