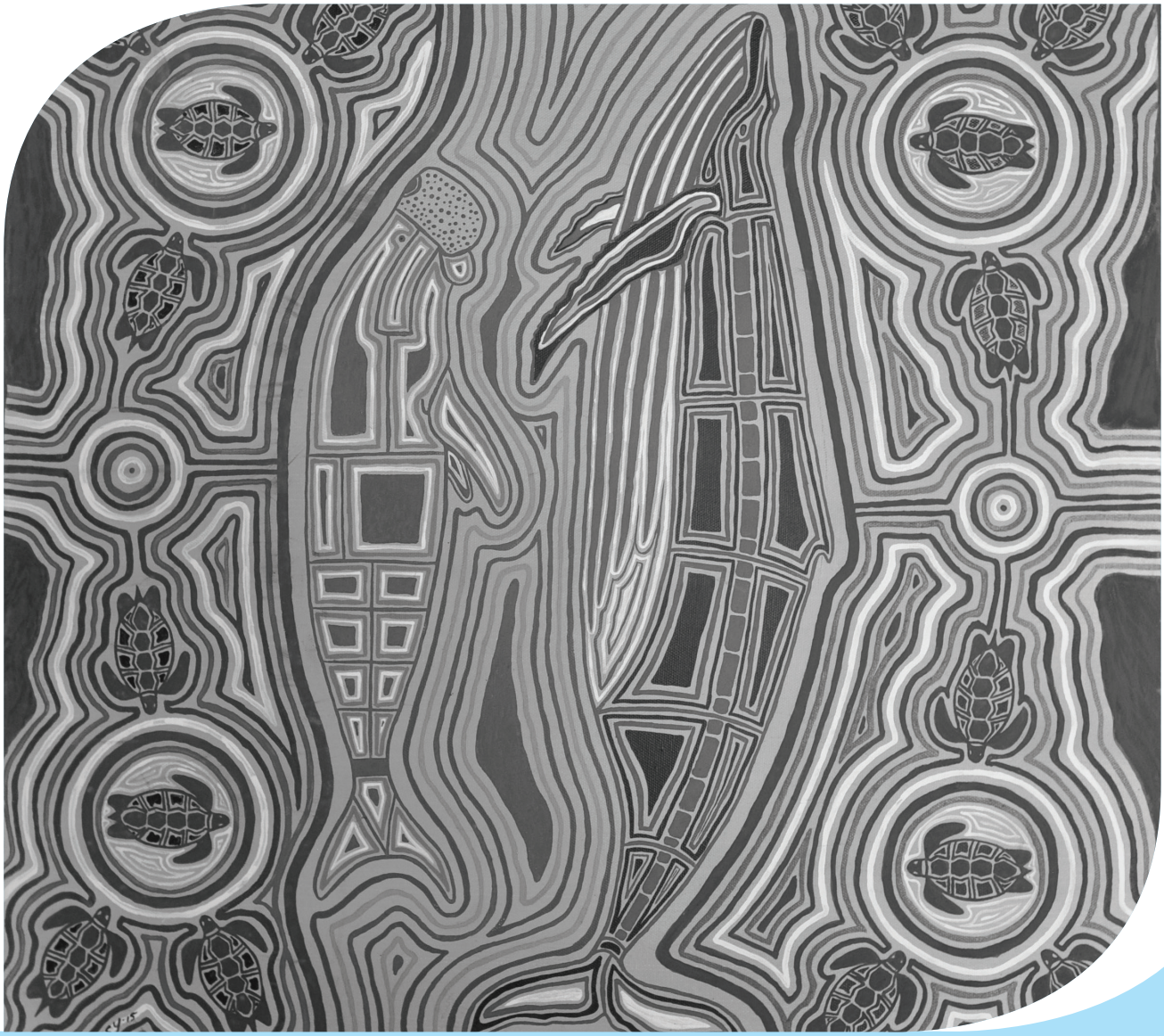
GOVERNMENT OF WESTERN AUSTRALIA

PLAN FOR OUR PARKS
SECURING 5 MILLION HECTARES OVER 5 YEARS

Proposed Bardi Jawi Marine Park

indicative joint management plan

2020



GOVERNMENT OF WESTERN AUSTRALIA

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

Bardi Jawi Niimidiman Aboriginal Corporation RNTBC

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This management plan was prepared by the Conservation and Parks Commission through the agency of the Department of Biodiversity, Conservation and Attractions (DBCA) in consultation with Bardi and Jawi Traditional Owners.

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

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

Questions regarding this plan should be directed to:
Aboriginal Engagement, Planning and Lands Branch
Parks and Wildlife Service
Department of Biodiversity, Conservation and Attractions
Locked Bag 104
Bentley Delivery Centre WA 6983
Email: marineplanning@dbca.wa.gov.au

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This document is available in alternative formats on request.

Front cover photos
Main: *Artwork – Russell 'Wossy' Davey Jooda*.
Top left: Bardi Jawi Rangers. *Photo – Roanna Goater/DBCA*
Top right: Customary fishing. *Photo – Ian Meechan*
Section header: Hunter Creek. *Photo – Roanna Goater/DBCA*

Proposed Bardi Jawi Marine Park

Indicative joint management plan

2020

Invitation to comment

This indicative joint management plan has been released for a five-month period to provide the public with an opportunity to comment on how the Proposed Bardi Jawi Marine Park is proposed to be managed over the next ten years.

To ensure your submission is as effective as possible:
• be clear and concise
• refer your points to the page numbers or specific sections in the plan
• say whether you agree or disagree with any or all of the management objectives, strategies and zones – clearly state your reasons, particularly if you disagree
• give sources of information where possible
• suggest alternatives for those aspects of the plan with which you disagree.

The indicative joint management plan will be reviewed in light of the submissions, according to the criteria outlined below. A summary of public submissions will be made available along with the final management plan.

The indicative joint management plan may be amended if a submission:
• provides additional information of direct relevance to management
• indicates a change in (or clarifies) government legislation or management policy
• proposes strategies that would better achieve management objectives
• indicates omissions, inaccuracies or a lack of clarity.

The indicative joint management plan may not be amended if a submission:
• clearly supports proposals in the plan or makes general or neutral statements
• refers to issues beyond the scope of the plan
• refers to issues that are already noted within the plan or already considered during its preparation
• is one among several widely divergent viewpoints received on the topic but the approach in the plan is still considered the best option
• contributes options that are not feasible (generally due to conflict with legislation or government policy)
• is based on unclear or factually incorrect information.

Submissions are welcome during the public comment period and can be made:
• online at www.dbca.wa.gov.au/haveyoursay
• or by writing to: Buccaneer Plan Coordinator – Aboriginal Engagement, Planning and Land Unit, Department of Biodiversity, Conservation and Attractions, Planning Branch, Locked Bag 104, Bentley Delivery Centre, WA 6983.

Amboorin amboonoo angallala jard booroo

People, together let's look after Country good

All people are welcome to Bardi and Jawi Country. We ask that you help us to look after Country by respecting the environment and our culture.

We have used, relied on, enjoyed and protected country over thousands of years and continue to do so today. Bardi and Jawi sea Country has always been, and continues to be, an essential part of Bardi and Jawi spiritual, social and physical existence. The Law created religiously significant features in the sea that the *madjamadjin* (law bosses) are required to protect. Traditional stories explain the creation of the salt water and certain sea creatures. Supernatural sea creatures such as the shark *Looloolo* have always existed to protect Bardi and Jawi people in their sea-faring life. Bardi and Jawi people have always and continue to engage in shore fishing, collecting sea food from the intertidal zone, hunting *odorr* (dugong) and *goorlil (*turtle) in the shallows and from rafts (with the *goorlil* and *odorr* being shared in accordance with traditional law). Pearl shell has also always been collected and used as a resource for ceremony and trade.

We would like to pay tribute to past generations of Bardi and Jawi elders. Their knowledge of language, law and culture has been handed down to the elders of today, who are trying to pass on that knowledge to younger generations. This plan recognises that Bardi and Jawi have ownership of their land and islands because of the old people who fought for recognition of country and their people. The knowledge they passed on is essential to the way elders want their country to be seen and they want their cultural practices retained now and forever. This plan recognises cultural knowledge and aims to maintain it through looking after law and Country. By looking after Country the right way, we continue to look after Bardi and Jawi Law, language and culture.

Bardi and Jawi Traditional Owners and Country. Photos – top right and bottom right, Catriona Webster, KLC, middle right, Ian Meechan, all others, Roanna Goater, DBCA

Contents

Figures

Table

Maps

Bardi Jawi Rangers on Country. Photos – Roanna Goater.

1. The management plan

1.1 Purpose of the plan

This indicative joint management plan details how the proposed Bardi Jawi Marine Park will be jointly managed by Bardi and Jawi Traditional Owners and the Department of Biodiversity, Conservation and Attractions (DBCA) to enhance nature conservation, preserve and promote culture and heritage, and support and provide for compatible recreational and commercial use for future generations. This plan takes into account the values, aspirations and management objectives articulated in the Bardi Jawi Indigenous Protected Area Management Plan 2013-2023 (Bardi Jawi IPA Plan).

Once the proposed marine park is gazetted under the *Conservation and Land Management Act 1984* (CALM Act) as a class A reserve over the subtidal and intertidal areas of Bardi and Jawi Sea Country, the application of the final joint management plan and attached Joint Management Agreement (JMA) will deliver:

- the establishment of a Joint Management Body (JMB);
- the establishment of a joint management framework for the proposed marine park between DBCA and Bardi and Jawi Niimidiman Aboriginal Corporation RNTBC (BJNAC) in accordance with the requirements of the Section 56A JMA for Bardi and Jawi Conservation Estate;
- promotion and support for the continued exercise of Bardi and Jawi peoples' native title rights recognising their ongoing connection to, and responsibility for, Bardi and Jawi Sea Country;
- preservation and promotion of Bardi and Jawi culture and heritage values of the proposed marine park;
- the establishment of a framework to allow for ongoing sustainable multiple use;
- the establishment of seven management programs (management frameworks, education and interpretation, public participation, patrol and enforcement, management intervention and visitor services, research and monitoring) with prioritised strategies to help achieve management objectives for the proposed marine park;
- a conservation framework built on both western science and traditional knowledge and practice to help ensure the critical ecological components and processes of the marine environment in the Bardi Jawi 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; and
- the continuation and enhancement of cultural, recreational and commercial uses for the benefit and enjoyment of Bardi and Jawi Traditional Owners, the community and visitors.

1.2 Development of the plan

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

1.3 Structure of the plan

The plan sets a vision for the area and identifies key cultural, ecological, social and 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 indicative joint management plan will be replaced by a final joint management plan following a public consultation period. The final joint management plan will guide management of the proposed marine park for 10 years, or until a new joint management plan is prepared under the CALM Act. Any amendments required during the life of the plan requires a statutory two-month public comment period and approvals from the Minister for Environment, Minister for Fisheries and Minister for Mines and Petroleum.

2. Introduction

The proposed Bardi Jawi Marine Park is situated in the west Kimberley region of Western Australia surrounding the northern part of the Dampier Peninsula and the western islands of the Buccaneer Archipelago (Map 1). It falls within the boundaries of the Bardi and Jawi native title determination[1], covering Bardi and Jawi Sea Country up to the mean spring high tide mark (Map 2). For thousands of years Bardi and Jawi people have depended on and looked after their Country and it remains a place of exceptional value. Bardi Jawi and Bardi and Jawi is used interchangeably depending on the context.

The establishment of the proposed Bardi Jawi 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 proposed Bardi Jawi Marine Park will add a further 204,000 hectares to the Kimberley marine reserves and will contribute to the National Representative System of Marine Protected Areas. Bardi and Jawi Traditional Owners and the State Government are committed to the conservation and sustainable use of Bardi and Jawi Sea Country and the proposed marine park will be jointly managed and jointly vested with the BJNAC and Conservation and Parks Commission (Commission). Management of the proposed marine park will complement the existing and on-going management of Bardi and Jawi Country by Bardi and Jawi Traditional Owners and the Bardi Jawi Rangers.

Bardi and Jawi people are *gaarra* (saltwater) people. Bardi people are from the mainland of the Dampier Peninsula and islands immediately offshore from *Ardyaloon* (One Arm Point). Jawi people are from the islands further east, including *Iwany* (Sunday Island). Both Bardi and Jawi people share and practise the same law. The whole of Bardi and Jawi Country is culturally significant from the different plants and animals that live there to the many significant sites and places which are interconnected through songlines and stories that refer to mythological beings and places far afield. Bardi and Jawi Sea Country is used consistently by Bardi and Jawi people for hunting and fishing for food, cultural activities and business.

Bardi and Jawi Sea Country is home to a diverse range of marine life. Fringing *marnany* (reefs) have formed around the coast and between the many islands of the Buccaneer Archipelago, withstanding a tidal range in excess of 11m, the highest in Australia. 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 Bardi and Jawi Sea Country and beyond to give birth to their young and dugongs visit the proposed marine park in the cooler months from May to July.

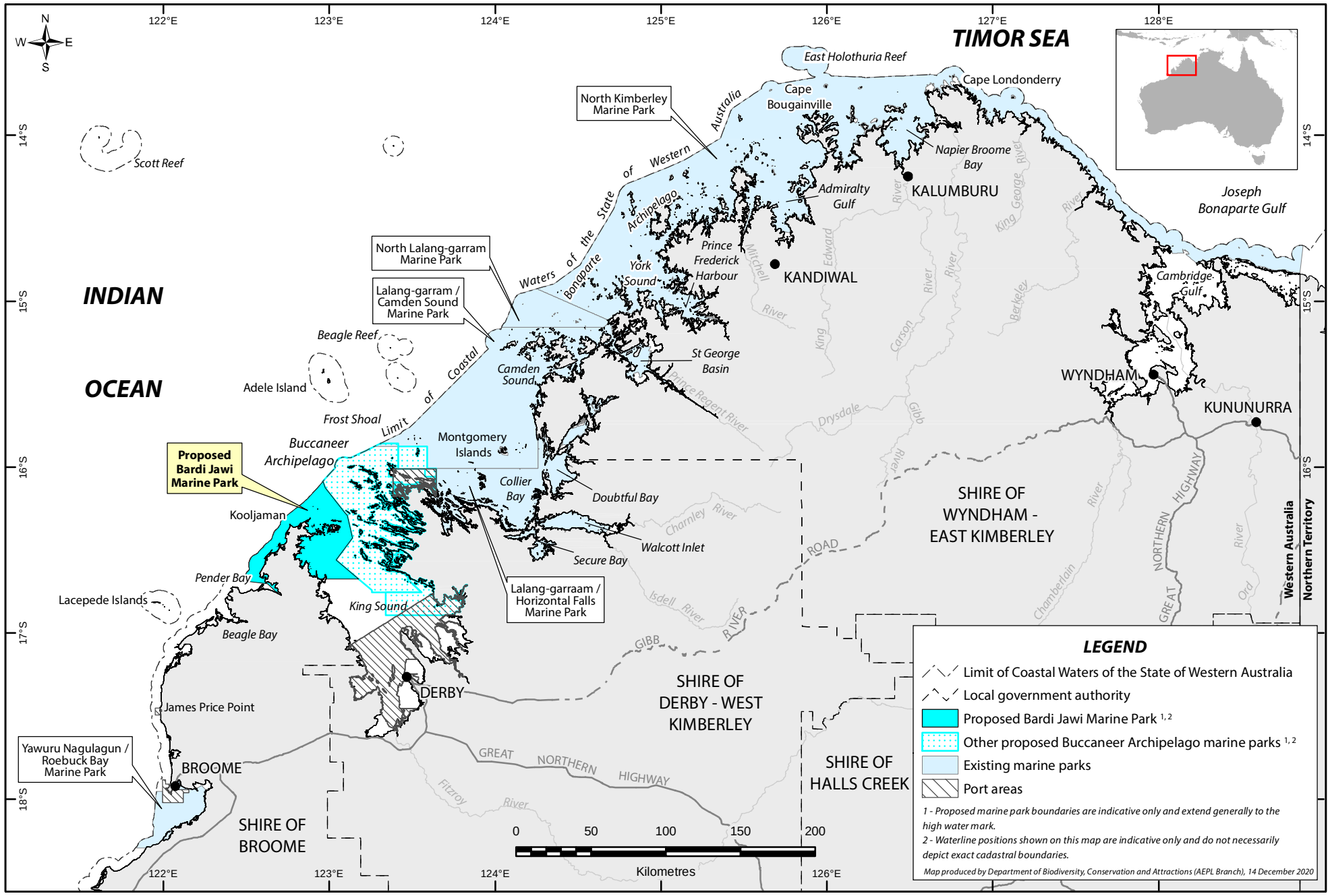
[1] Native Title Tribunal file number WCD2005/003. See http://www.nntt.gov.au/searchRegApps/NativeTitleRegisters/Pages/NNTR_details.aspx?NNTT_Fileno=WCD2005/003

The natural values of the Dampier Peninsula and Buccaneer Archipelago coupled with the vibrant Aboriginal culture in the region is attracting an increasing number of local and international visitors. Popular activities include fishing, boating, cultural tours and wildlife watching. Visitation to the region is predicted to rise by at least 76% in the first 10 years following the sealing of the Cape Leveque road (KPP Business Development 2018). The establishment of the proposed marine park in the area is important to ensure the exceptional natural and cultural values which attract visitors to the area are protected for current and future generations to enjoy.

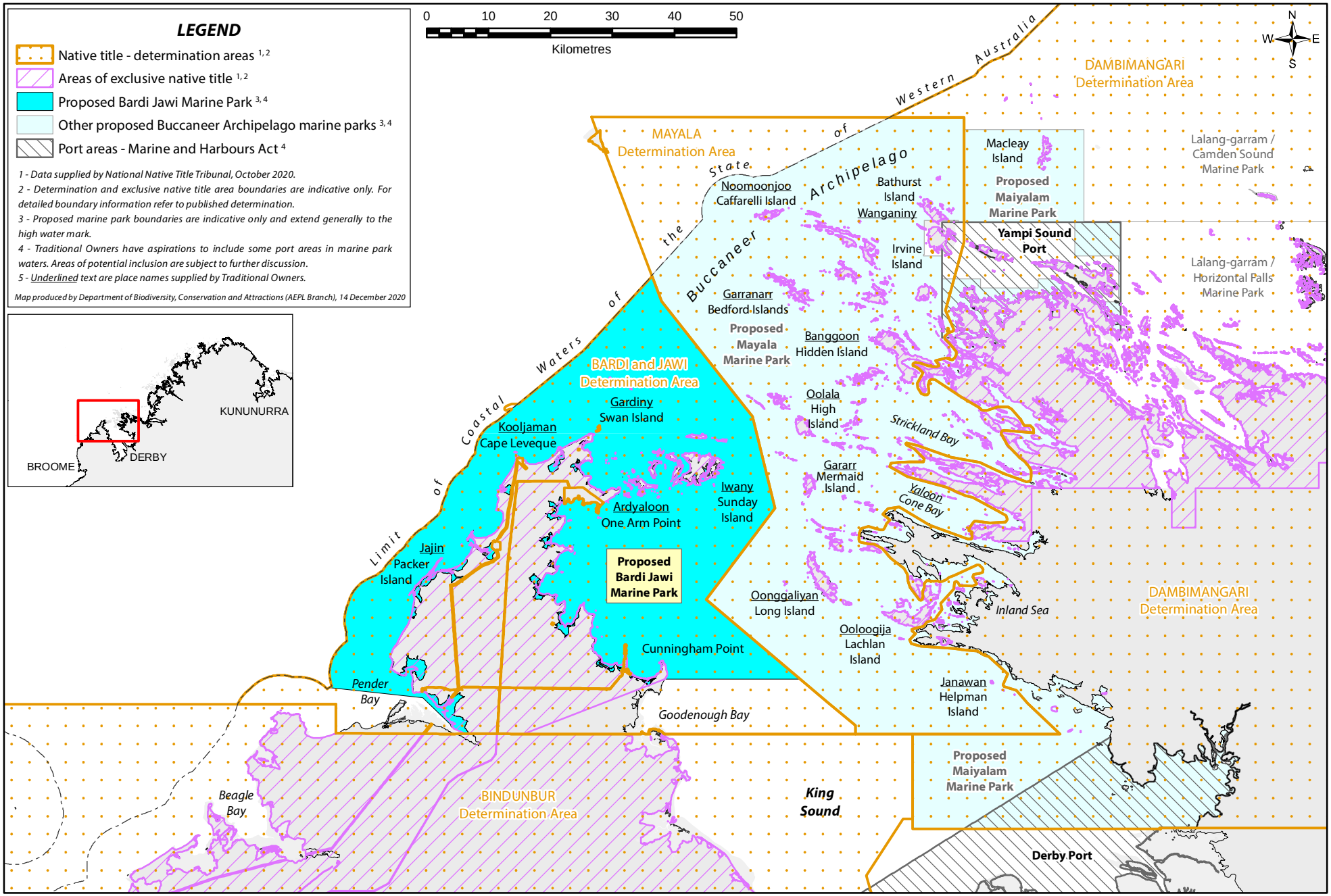
The warm tropical waters of the proposed marine park provide optimal conditions for commercial activities such as pearling, aquaculture and commercial fishing. It is likely that these industries will continue to develop and expand as the region develops. Careful management is required to ensure activities remain sustainable and the economic potential of these industries is realised without significantly affecting the exceptional values of Bardi and Jawi Sea Country. The proposed marine park will provide important social and economic outcomes for Bardi and Jawi people by providing enhanced opportunities for Bardi and Jawi involvement and employment in land and sea management, in addition to promoting culture-based tourism and involvement in commercial activities occurring in the proposed marine park.

This indicative management plan takes into account the values, aspirations and management objectives articulated in the *Bardi Jawi IPA Plan* and has been prepared alongside the proposed Mayala Marine Park indicative joint management plan and the proposed Lalang-gaddam amended and indicative joint management plan to ensure consistency of management arrangements. It aims to conserve and enhance the outstanding cultural and ecological values of Bardi and Jawi Country whilst supporting sustainable recreational and commercial use for the benefit of present and future generations as development and visitation in the region continues to grow.

Kooljaman. Photo – Michael Higgins, DBCA.



MAP 1: Locality of the proposed Bardi Jawi Marine Park.



MAP 2: Native title determination areas within and adjacent to the proposed Bardi Jawi Marine Park.

3. Bardi and Jawi Country

3.1 Bardi and Jawi people and Country

The Bardi Jawi Native Title Claim was determined in 2005, granting Bardi and Jawi people exclusive possession over 1037 square kilometres of Aboriginal Reserve and Unallocated Crown Land. Non-exclusive possession was granted over the intertidal zones and nearby reefs. The original native title determination in 2005 was followed by an appeal, won in 2010, which saw an increase in land and intertidal areas held by Bardi and Jawi people, to approximately 3047 km^2 including *Iwany* (Sunday Island) and some adjacent islands. The latter decision also grants native title rights to 2m below the mean low water mark.

Originally, Bardi and Jawi speaking people lived on different areas of Country. Jawi were islander people while Bardi lived on the mainland. They share the same kinship system, social organisation, and the same Law. Bardi and Jawi Country is divided into seven clan areas and within each area a number of *booroo (*camp ground, home, place*)* which refers to areas handed down through the father's line (Bowern 2012).

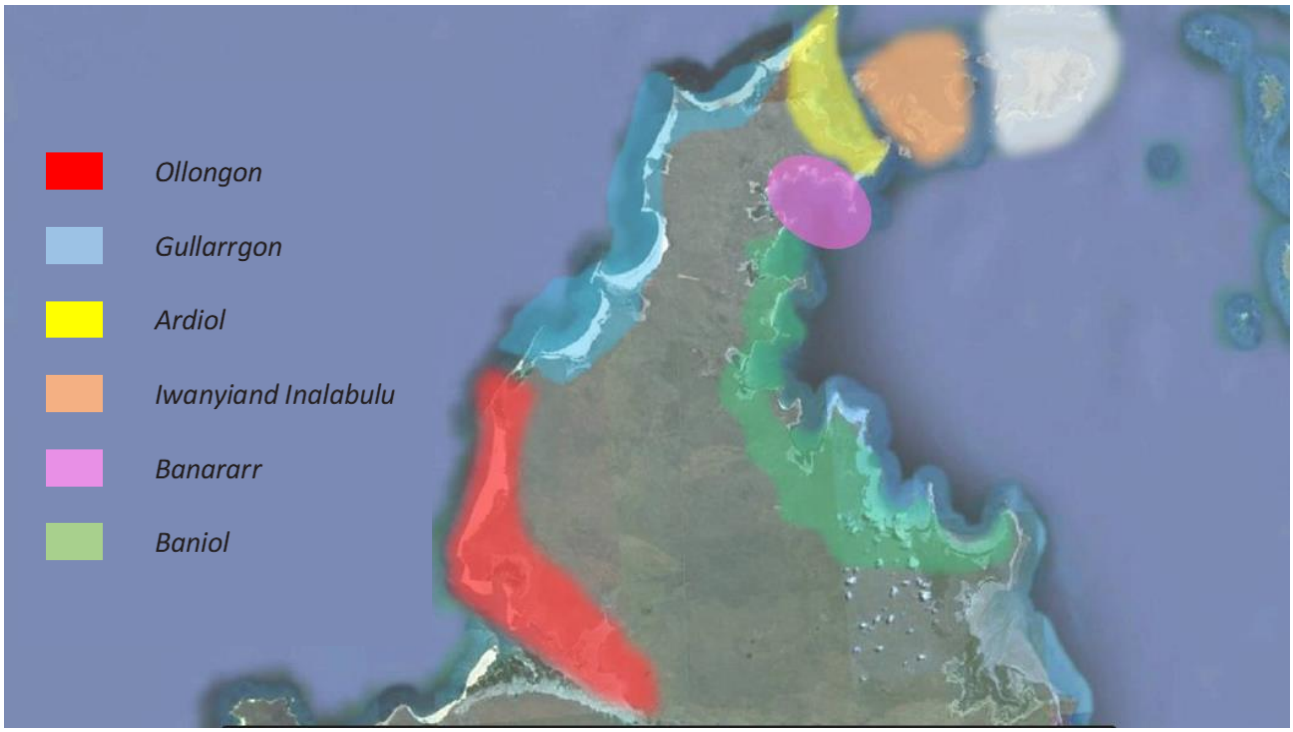


Figure 2. The location of the seven clan areas in Bardi and Jawi Country.

Bardi and Jawi people's identity and existence is intimately connected to the sea. For Bardi and Jawi people, their Country is more than a simple geographic location, it includes all living things, incorporating people, plants, animals, seasons, stories, and spirits. It is both a place of belonging and a way of believing. In Bardi and Jawi belief, powerful and creative ancestral beings roamed the sea, creating islands, reefs, sandbanks and marine species which are recalled in songs and stories (Willing 2011). This creative period is generally referred to as the Dreaming or Dreamtime among English speakers. Once their creations were completed, these Dreamtime beings moved into the

sky-world or become features of this world, remaining a permanent presence on Earth within special places along with the stories and evidence of their deeds. Many Bardi and Jawi creation stories involve the cultural hero *Galaloong,* who travelled down the Dampier Peninsula, naming places and giving law (Bowern 2016). Along with *Galaloong,* there are other ancestral Dreaming beings associated with Bardi and Jawi culture. One of them, *Looloolo*, associated with saltwater, manifests as a shark that helps guide people if they are in trouble whilst travelling or hunting on Sea Country (Frank Davey, pers. comm. in Vigilante *et al.* 2013).

Fish trap. Painting – Cecelia Tigan (2011).

Through the actions of ancestral beings in the creative period, *rai* 'spirit beings' were placed in Country (land and sea) at various locations. Bardi and Jawi people hold the belief that before birth, they existed as *rai*. *Rai* are considered to be good or neutral spirits. For Bardi and Jawi people, their Country, inhabited by *rai*, constitutes the physical and the spiritual source of their very identity as human beings (Vigilante *et al.* 2013). *Rai* spirits can cause trouble for strangers who visit or camp in the wrong place or visit areas without being introduced in the proper way (Vigilante *et al*. 2013).

The relationship between Bardi and Jawi 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 Bardi and Jawi people have faced, they have maintained their strong connection to Country and their story is one of resilience, adaptation and survival.

In 1899, a mission was established on *Iwany* (Sunday Island) in Jawi Country. Jawi people had lived on *Iwany* and other islands in their Country for thousands of years and although they were still able to live on Country, the mission significantly changed their way of life. The Sunday Island

Mission was sustained by shelling work. Aboriginal people from Sunday Island Mission spent several weeks camped on various islands during the holiday times collecting trochus shell throughout the Buccaneer Archipelago (Vigilante *et al.* 2013). When it closed in the 1960s many Bardi and Jawi people had to move away from their traditional homelands. The majority of people moved to Derby, while some moved to other areas on the mainland following work. Others moved to the *Lombadina* mission which ran between 1917 to the 1970s. In the 1970s a strong effort was made by Bardi and Jawi people to establish the community of *Ardyaloon* (One Arm Point) and move from Derby back to Country.

Today, both groups live on the mainland peninsula, where the larger communities and outstations are situated with services provided to the local people. Sea Country remains consistently used by Bardi and Jawi people in what today is very much a hybrid economy. Traditional cultural laws and protocols are still followed and customary activities still take place regularly, but Bardi and Jawi people now also depend on their Country for job and business opportunities.

In 2011, the West Kimberley region was included in the Australian National Heritage List for its nationally significant natural, Aboriginal and historical values, including part of Bardi and Jawi Country because of the history of the *gaalwa* (double log raft) and the use of *goowarn* (pearl shell) for ceremonial purposes and trading far afield (Environment 2018). Before motorised vessels were available, Bardi and Jawi people travelled between the coast and islands using *gaalwa,* double log rafts made of mangrove wood. Logs for making these rafts were obtained either directly from the large mangrove swamps located on the eastern shore of King Sound or in trade with Dambeemangarddee and Mayala people. A coastal trading network existed along the Kimberley coast and Jawi people on *Iwany* (Sunday Island) were middle-men in this network, trading rafts and raft poles to Bardi people based on the Dampier Peninsula mainland in exchange for spears (Tindale 1974 in Vigilante *et al.* 2013).

Bardi Jawi Rangers. Photo – Bardi Jawi Rangers.

3.2 Bioregional setting

The Integrated Marine and Coastal Regionalisation of Australia (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 proposed marine park spans sections of three bioregions; the Kimberley Bioregion, the King Sound Bioregion and the Canning Bioregion (Map 3). The Kimberley Bioregion extends from Cape Leveque within Bardi and Jawi Country to Cape Londonderry in Balanggarra Country. This region is characterised by rocky shores, mudflats, fringing reefs and mangroves. It is a low-energy ria 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 Canning Bioregion extends from Cape Leveque to Eighty Mile Beach and generally has moderately clear inshore waters, and wave energy that varies from moderate along some parts of the Dampier Peninsula to low within the broad shelving embayments. The shore principally comprises long beaches between rocky headlands. Mangroves are well developed in the upper parts of the bays and along tidal creeks and subtidal *noomool* (seagrass) beds are extensive in this bioregion (Thackway and Cresswell 1998).

The diverse environmental characteristics of the proposed marine park supports a large array 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 are yet to be discovered in the Kimberley region. 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 recognised in a global context (Halpern *et al*. 2008).

Tidal movement in Bardi and Jawi Sea Country is among the largest in the world. There are typically two high and two low tides each day, with a range of close to 11 metres. The huge tides and complex currents created between the islands are exceptional and the region is regarded as one of the most difficult marine areas to navigate in Australia. Bardi and Jawi people have a detailed knowledge and classification system of tides that enabled them to navigate the treacherous waters on *gaalwa* and this knowledge continues to assist them today (Vigilante *et al.* 2013). The detailed cultural knowledge of the tides is expressed in *Ilma,* the traditional song and dance practice of Bardi and Jawi people (Vigilante *et al.* 2013). Ocean temperature in the region range 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 Peninsula has a dry tropical climate with an average annual rainfall of 600–750 mm. Most rain falls during the wet season. Due to the seasonality of the rainfall it is common to refer to two predominant seasons, with these being the ’wet’ (lasting through the summer and early Autumn months) and ‘dry’ season (that last for approximately seven months). Bardi and Jawi people have a far more nuanced relationship with the climate and understanding of seasonal patterns, recognising six different seasons (*Mangal, Ngaladancy, Irralboo, Barrgana, Jalalay* and *Lalin*) which are distinguished by wind and rainfall direction and intensity, ripening of fruits, and appearance and the disappearance and ‘fatness’ of fish and animals.

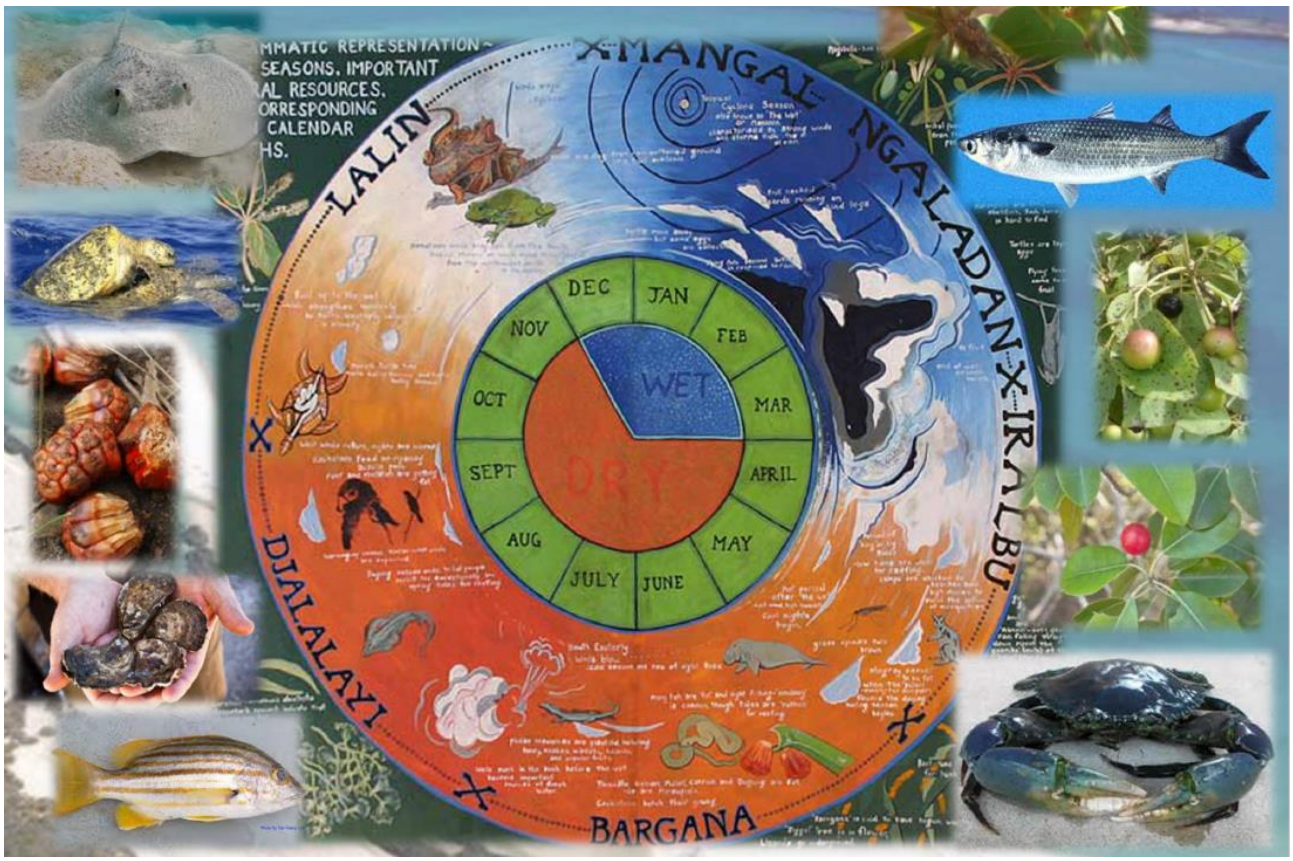
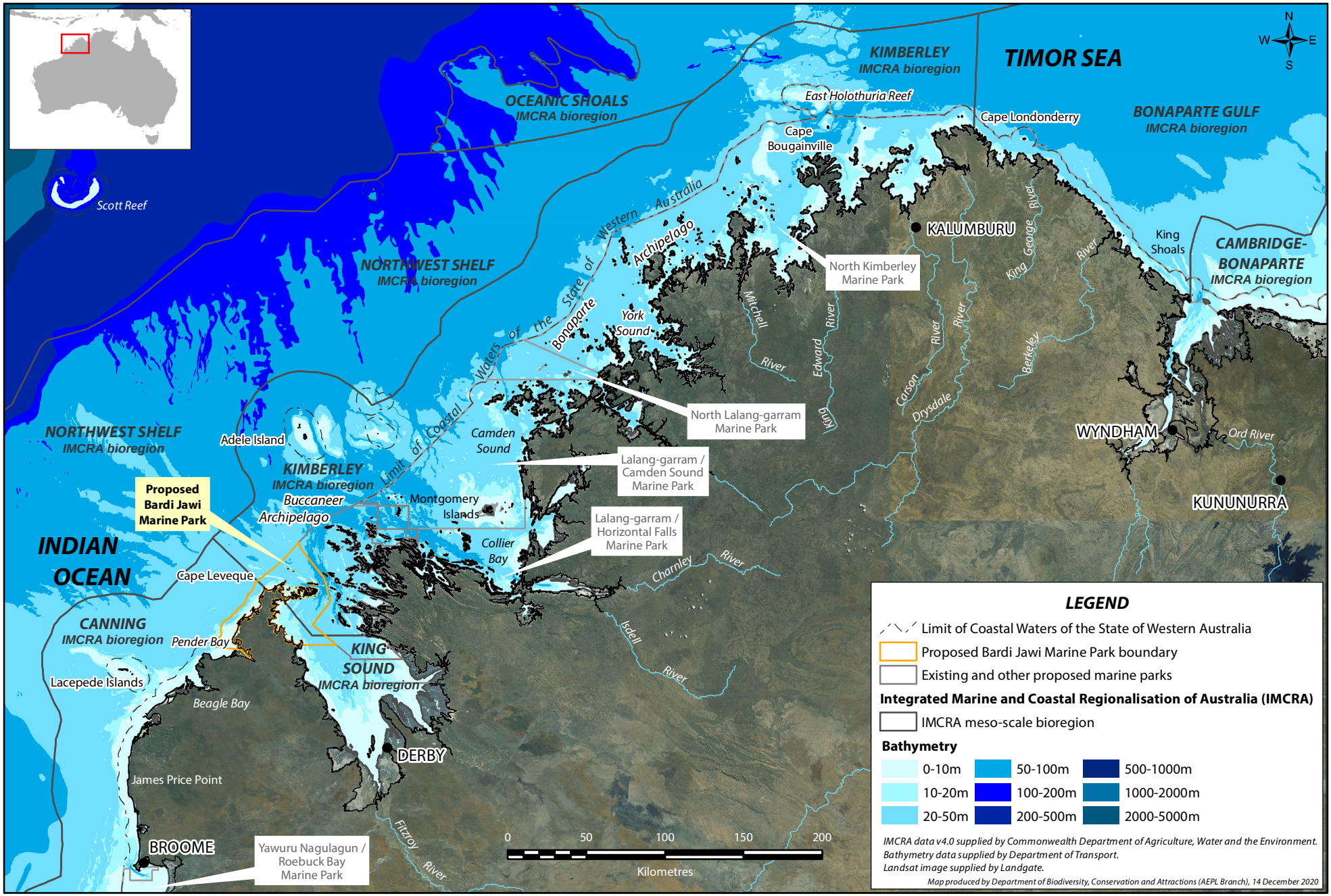


Figure 3. Bardi Jawi Seasonal Calendar.

The main communities on Bardi and Jawi Country are *Djarindjin*, *Lombadina* and *Ardyaloon* (One Arm Point), although people also live in outstations spread along the coastline of the Dampier Peninsula. These communities depend on the surrounding Sea Country for fishing, hunting, cultural, recreational and economic activities. Economic activities which take place in the area mostly comprise tourism, pearling, aquaculture and commercial fishing. The Dampier Peninsula has one of the highest concentrations of Aboriginal-owned tourism businesses in Australia and Bardi and Jawi people are keen to further expand on the tourism potential of their Sea Country by establishing Bardi and Jawi owned tourism ventures.

The nearest towns to the proposed marine park are Derby and Broome, with populations of approximately 3,300 and 16,000 people, respectively (Australian Bureau of Statistics 2016). Both towns experience considerable population fluctuations due to transitional residency and tourism. Broome's population rises significantly in the peak tourist season (May-August) and an estimated 33,000-36,000 visitors a year currently visit the Dampier Peninsula by road (KPP Business Development 2018). Residents of these towns travel to the area to enjoy excellent fishing, to relax and enjoy the spectacular scenery and to visit popular camping spots.

Due to the limited amount of pressures in the area, the ecological values of the proposed marine park are generally considered to be in a good condition. Management will focus on maintaining the condition of the area. Current pressures in the area include the impacts of climate change (see section 11) and unmanaged recreational fishing and tourism activities (see section 9.3 & 9.2). Visitor numbers to the Dampier Peninsula are expected to increase following the sealing of the Cape Leveque road, which is the primary road access. At the lowest growth scenario, there is predicted to be a 76 percent increase in visitors to the Dampier Peninsula in the first 10 years. At the highest growth scenario there will be a 91.5% increase in visitor traffic in the first 10 years (KPP Business Development 2018).



MAP 3: Marine bioregions and the proposed Bardi Jawi Marine Park.

3.3 Definition of area and tenure

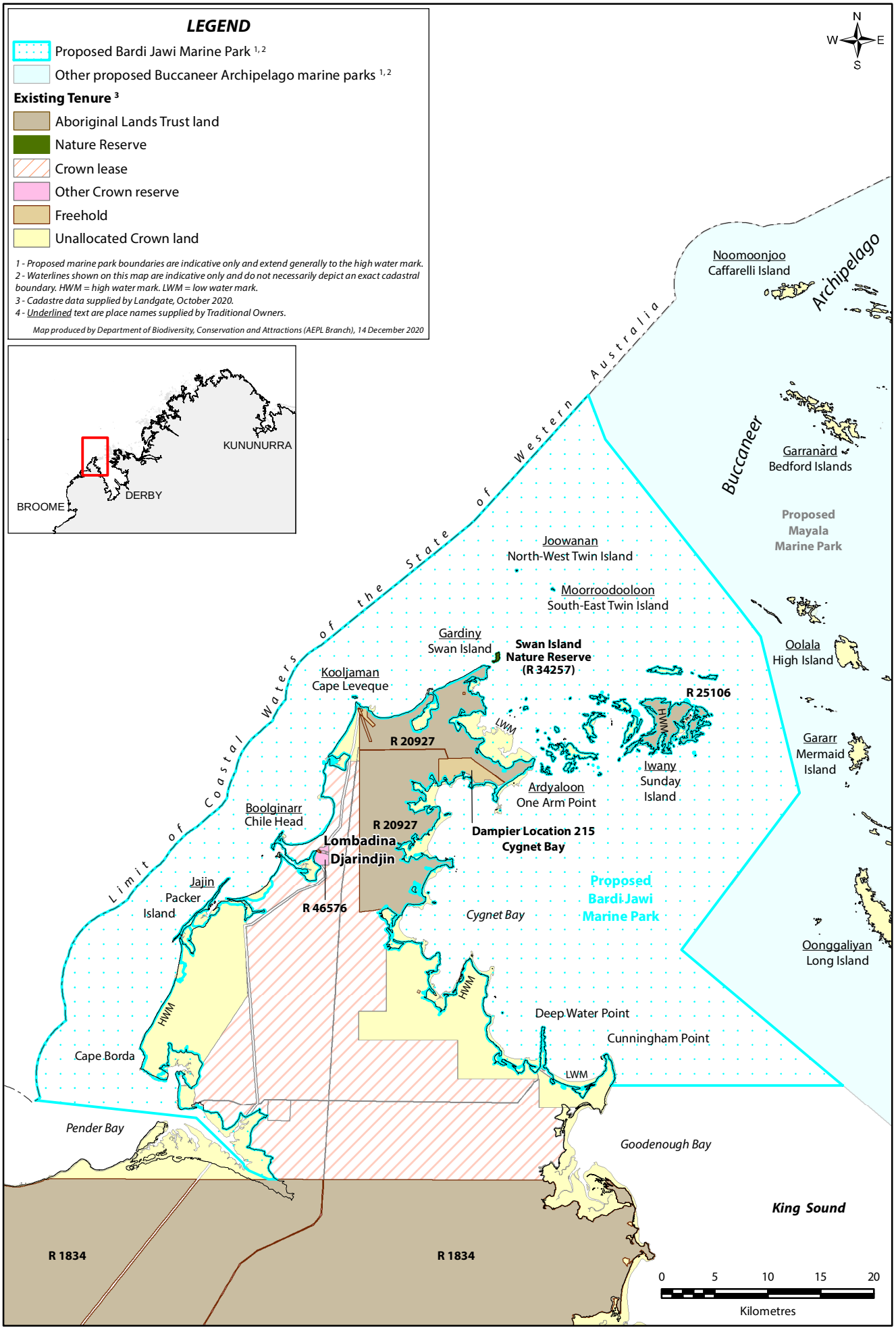
The proposed Bardi Jawi Marine Park is situated in the north of Western Australia and covers approximately 204,000 hectares. It includes all Bardi and Jawi Sea Country surrounding the northern part of the Dampier Peninsula and the western islands of the Buccaneer Archipelago, including *Iwany* (Sunday Island). The southern boundary of the proposed marine park is situated approximately 160kms north of Broome.

The proposed marine park extends around the tip of the Dampier Peninsula from Pender Bay on the western side of the Dampier Peninsula to Cunningham Point on the eastern side of the Peninsula. The eastern boundary of the proposed marine park follows the Bardi Jawi determination boundary and borders the proposed Mayala Marine park. The western boundary of the marine park extends out to the seaward limit of Western Australian waters (three nautical miles from the territorial baseline). The proposed marine park will include 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 for the proposed marine park and surrounding tenure is shown in Map 4.

It is proposed that the marine park will be gazetted as a Class A marine park and jointly vested in the BJNAC 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.

This indicative joint management plan also includes the proposed management arrangements for the Swan Island Nature Reserve which is located on *Gardiny* (Swan Island) to the north of Swan Point on the northern tip of the Dampier Peninsula.

Mangroves. Photo – Ian Meechan.



MAP 4: Tenure within and adjacent to the proposed Bardi Jawi Marine Park.

4. Management Setting

4.1 Legislative context

An Indigenous Land Use Agreement (ILUA) between the State Government and Bardi and Jawi native title holders is required to provide for the valid creation of the proposed marine park in accordance with the Native Title Act and for the proposed marine park to be jointly managed and jointly vested. An ILUA was agreed on 19 November 2020 and will enable the valid reservation of the proposed marine park, including the intertidal areas.

Subject to enactment of the necessary CALM Act amendments, the proposed marine park will be jointly vested with the Commission and BJNAC and managed in accordance with the provisions of the CALM Act, the *Fish Resources Management Act 1994* (FRM Act), 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. Joint vesting of the proposed marine park will mean that the BJNAC 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.

The creation of the proposed marine park will help 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 creation of the proposed marine park will also contribute 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 Bardi and Jawi's cultural and spiritual relationship with Country, the establishment of the proposed jointly managed marine park also addresses Bardi and Jawi's rights as stipulated in the United Nations Declaration on the Rights of Indigenous Peoples.

The proposed marine park lies within the west Kimberley region which is included in the Australian National Heritage List for nationally significant natural, Aboriginal and historical values (Environment, 2018). National Heritage places and the values they contain are afforded protection under the *Environmental Protection and Biodiversity Conservation Act 1991* (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).

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. Bardi and Jawi Traditional Owners have determined native title rights and interests based on strong and ongoing cultural connections over their land and saltwater Country. This indicative 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. Determined native title rights within the proposed 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 proposed marine park, customary activities such as fishing and hunting are also provided for under the BC Act. The FRM Act recognises customary fishing activities and is subject to the Native Title Act where an Aboriginal person is experiencing or enjoying a native title right or interest for the purpose of satisfying personal, domestic or non-commercial communal needs.

Exclusive possession native title has been determined in Bardi and Jawi Country across most of the mainland and people wishing to visit these areas will need to obtain permission from Bardi and Jawi Traditional Owners prior to their visit.

4.2 Joint management

In recognition of the significant cultural values and ongoing connection and responsibilities to the area by Bardi and Jawi Traditional Owners, the proposed marine park will be jointly managed by DBCA and the BJNAC.

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

Joint management will be given effect under the CALM Act through a section 56A JMA between Traditional Owners and DBCA. For formal joint management to occur, the final joint management plan requires the Chief Executive Officer of DBCA to jointly manage the park.

Joint management can commence once the JMA has been signed and attached to the final management plan. The JMA will establish a JMB (formed of Bardi and Jawi representatives nominated by BJNAC and staff from DBCA) to manage the marine park in accordance with the agreement and the CALM Act. The JMB will oversee management of the proposed marine park, make management decisions, provide strategic input into how management strategies are implemented, and monitor implementation of the plan.

DBCA recognises the aspiration of Bardi and Jawi Traditional Owners that the day-to-day management of the proposed marine park should be undertaken by Bardi and Jawi people in the future. DBCA will support Bardi and Jawi Traditional Owners and BJNAC to continue to build their capacity to take on greater responsibility and accountability for the management of the proposed 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 BJNAC and other agencies and stakeholders.

4.3 Connectivity and holistic management

This plan has been guided by the values, aspirations and management objectives articulated in the Bardi Jawi IPA Plan, management programs under the IPA and the Bardi Jawi Ranger Program. This plan sets out a strategic approach and priorities for looking after, enjoying and using Bardi and Jawi Country sustainably for future generations. It has been prepared in conjunction with the indicative joint management plan for the proposed Mayala Marine Park and the amended and indicative joint management plan for the Lalang-gaddam Marine Park to ensure consistency and efficiency of management arrangements across the neighbouring proposed marine parks and sea countries. It is intended that the cooperative arrangement between DBCA, Bardi, Jawi, Mayala and Dambeemangarddee Traditional Owner groups will continue through to the implementation and operational stage of the proposed marine parks with annual joint meetings.

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

A Memorandum of Understanding has been developed between the Minister for Environment and the Minister for Fisheries to establish principles of cooperation and integration between DBCA and the Department of Primary Industries and Regional Development (DPIRD) in the management of the State's marine parks and reserves. Collaborative operational plans will be developed to ensure efficient and effective delivery of a range of programs where there is shared agency responsibility or mutual interests, including education, compliance, research and monitoring. The use of formal and informal mechanisms for communication and engagement between park managers and key stakeholders will also be important throughout the life of the plan to ensure effective ongoing and adaptive management.

A Memorandum of Understanding has also been developed between DBCA and Parks Australia for the management of existing State and Commonwealth Marine Parks in Western Australia. 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 proposed Bardi Jawi Marine Park, which abuts a Multiple Use Zone and a small section of a Habitat Protection Zone in the Commonwealth Kimberley Marine Park.

4.3.1 Dampier Peninsula Project

The Dampier Peninsula project was established to maximise the social and economic opportunities for Aboriginal business and communities arising from the sealing of the Broome-Cape Leveque Road; and to mitigate potential impacts through partnering with the Traditional Owners and community councils to protect the unique social, cultural and environmental values of the area.

The establishment of the proposed Bardi Jawi Marine Park in partnership with Bardi and Jawi Traditional Owners has been developed alongside the Dampier Peninsula project. Management arrangements for the proposed marine park are complementary to those proposed in the Dampier Peninsular planning strategy, to ensure the vision for the peninsula (see below) is realised across both land and Sea Country within Bardi and Jawi Country.

Dampier Peninsula planning strategy vision.

'To develop a future that protects and promotes our culture, our lifestyle and the environment and offers economic opportunities that would improve the quality of life for stakeholders with a direct interest on the Dampier Peninsula'.

4.4 Management context

To guide management and meet the vision of the proposed marine park, **management objectives** and **management strategies** have been developed for the proposed 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 Bardi and Jawi joint management partners through the JMB will have the primary responsibility for coordinating and implementing the management of the proposed marine park by applying prioritised management strategies across seven **management programs**. Management strategies will be prioritised in the final joint management plan. In the tables in the next sections, which summarise the proposed management strategies, other agencies or bodies may be listed in brackets after the proposed strategy. These agencies or bodies may be required to provide support, as necessary, to implement the action within the scope of their statutory responsibilities. Where an agency or body is required to take a lead role in strategy implementation, their name (or acronym) is in bold. For all other strategies, DBCA and Bardi and Jawi will lead the management through the JMB.

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 proposed 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 indicative joint management plan they have been addressed under separate headings of Caring for culture, Caring for Country and people on Country to help with the development of clear management objectives and management strategies and allow for transparent and accountable management audit and review processes. The most significant values will be prioritised for monitoring.

Pressures: A pressure is an activity, whether it be anthropogenic or natural, which affects or has the potential to affect the condition of a value. If not managed correctly, some activities which are considered a value of the proposed 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 managers. However, given climate change is considered to be the biggest emerging threat to the values of the proposed marine park, strategies to understand, monitor and adapt to climate change impacts are proposed in section 11 and contribute to broader regional climate change strategies.

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

- the biological intensity of the pressure - pressures that impact lower trophic levels (i.e. primary producers such as *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 now or 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 proposed identify what the primary aims of management will be and reflect the statutory requirements of the CALM Act. Where a significant pressure/s on an ecological value has been identified, the management objective addresses the specific pressure/s. When there is not an obvious existing pressure or threat, the management objective provides broader direction to management in relation to protecting the value from the most likely future pressures. Management objectives for social values address, where appropriate, the effect of the activity on the other values of the reserves and the complementary interests of other statutory management arrangements or activities that exist in the reserves.

Management strategies: Management strategies provide direction on how the management objectives will be achieved. Management strategies within the plan are prioritised as high (H), medium (M) or low (L) to indicate their relative importance. Management strategies considered to be critical to achieving the strategic goals of the management plan are presented as 'high-key management strategies' (H-KMS). The prioritisation of strategies is based on the best available information and may change during the life of the plan. For all strategies, DBCA is the lead agency, guided by the JMB. Other organisations and departments such as DPIRD will also play an integral role in the management of the proposed 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:** It is proposed that management of the proposed 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, Bardi and Jawi people and their culture, and management of the proposed 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 proposed 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 proposed 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 measures are required, a monitoring program should also determine the rate of recovery of an affected area or value.

Key Performance Indicators (KPIs): A set of 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, Bardi and Jawi 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 proposed (or will be developed during the early phase of the implementation of the management plan) for each of the cultural and ecological values, plus several of the social and economic values. Some of the performance measures listed in this plan are indicative only and will be further developed or, where necessary, revised during the design and implementation of monitoring programs.

Management targets: Management targets represent the end points of management. The long-term targets provide specific benchmarks to assess the success or otherwise of management strategies within the life of the plan. The management targets for the marine park's ecological values are often set to maintain ecosystem integrity and functioning. 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 proposed marine park and will provide guidance for ongoing management.

Bardi and Jawi people and their partners working together to conserve and maintain healthy Sea Country by using traditional cultural knowledge and practice coupled with contemporary science for the enjoyment and benefit of present and future generations.

5.2 Strategic objectives

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

Caring for culture

To uphold and respect Bardi and Jawi people's culture and knowledge of Sea Country and protect and conserve the value of Sea Country to the culture and heritage of Bardi and Jawi people.

Caring for Country

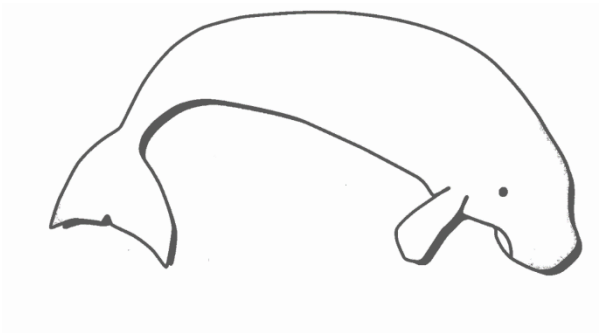
To protect and conserve biodiversity and ecological health.

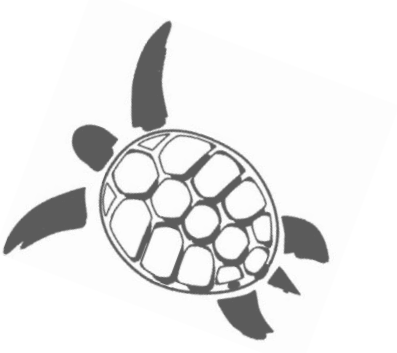
People on Country

To support and enhance a sustainable balance between community use, recreation, tourism and other commercial activities within the proposed marine park.

Understanding Country

To encourage collaborative research and monitoring to increase understanding of the values of the proposed marine park through research and monitoring to guide, adapt and improve management.





6. Caring for Culture

Strategic objective: To uphold and respect Bardi and Jawi people's culture and knowledge of Sea Country and protect and conserve the value of Sea Country to the culture and heritage of Bardi and Jawi people.

Bardi and Jawi people's traditional Country in the proposed marine park is recognised through determined native title rights and interests based on strong and ongoing cultural connections to the area. Bardi and Jawi people have been practising their culture for thousands of years and to this day they continue to live by the cultural protocols handed down from their ancestors. Bardi and Jawi's continuing practice of culture over thousands of years has created a deep connection to Country which includes belonging to and caring for Country.

Although it is recognised that everything on Country is interconnected, for the purpose of this indicative joint management plan and ease of proposed management arrangements the management of cultural values are addressed under the separate headings of:

- Relationship to Country
- Looking after Country
- Language and Traditional Ecological Knowledge
- Enjoyment of Country and Customary Activities.

This section draws from the values described in the *Bardi Jawi IPA Plan* and management of the proposed marine park will complement the objectives and aspirations of the Bardi Jawi IPA plan.

Mangrove creeks and intertidal sand and mudflat are extensive in Bardi and Jawi Country. Photo – Roanna Goater.

6.1 Relationship to Country (KPI)

Bardi and Jawi people have a deep and spiritual connection to Country and maintain reciprocal and respectful relationships with Country. In Bardi and Jawi belief, ancestral beings once roamed the sea, creating *iinalang* (islands), *marnany* (reefs) and sandbanks and marine species which are recalled in song and stories (Willing 2011). Many Bardi and Jawi creation stories involve the culture hero *Galaloong,* who travelled down the Dampier Peninsula, naming places, and giving law (Bowern 2016). For Bardi and Jawi people, their Country, inhabited by *rai*, is more than just the physical land to which they belong, it constitutes the physical and the spiritual source of their very identity as human beings (Vigilante *et al*. 2013).

It is vital that visitors and workers respect Bardi and Jawi culture and follow cultural protocols. According to traditional law, Bardi and Jawi have a responsibility to keep visitors on Country safe as *rai* spirits can cause trouble for strangers who visit or camp in the wrong place or visit areas without being introduced in the proper way (Vigilante *et al.* 2013). Management strategies are proposed in section 9.2 to help ensure the safety of visitors to the proposed Bardi Jawi Marine Park.

Traditional Owners on Country. Photo – Roanna Goater.

Bardi and Jawi people have always shared their cultural lives and continue to practise their culture. Law ceremonies are held and run by the *Majamajin* (law bosses) and supported by the rest of the community, to keep the law strong. Ceremonies take place in significant sites such as Law grounds, which are respected by Bardi and Jawi people for that purpose. Bardi and Jawi people want to support and sustain these practices. Some parts of Law are kept secret, but others are public ceremonies in which women and families play a major part (KLC/Bardi Jawi, 2013). Certain family groups have cultural authority to speak for different clan areas. Every Bardi and Jawi person belongs to a piece of Country which they are related to through the kinship system. That person is

entrusted with the knowledge and responsibility to care for their land, providing a deep sense of identity, purpose and belonging. There are seven named clan areas within Bardi and Jawi Country, and within each area a number of *booroo (camp ground, home, place)* which refers to areas handed down through the father's line (Bowern 2012). Bardi and Jawi people still live by the cultural protocols handed down from their ancestors. This includes following protocols for sharing of food and resources in accordance with traditional law.

Summary of management arrangements for relationship to Country (KPI)		
Requirements	• Recognition and respect of Bardi and Jawi people's connection to Country. • Governance arrangement for management reflective of Bardi and Jawi cultural governance. • Equal involvement of Bardi and Jawi people in planning and management of the proposed marine park. • Ensuring activities in the proposed marine park do not significantly affect the rights of Bardi and Jawi people to have ongoing cultural connection to Country. • Culturally appropriate visitation.	
Pressures	• The inability to access Country. • Erosion of traditional knowledge. • Culturally inappropriate visitation.	
Management objectives	• To uphold Bardi and Jawi's connection to Country and ensure activities in the proposed marine park do not adversely affect opportunities for Bardi and Jawi people to have ongoing cultural connection to Country. • To promote increased understanding and respect for Bardi and Jawi living cultural landscape and concepts of the proposed marine park.	
		Management program
Management strategies	Support Bardi and Jawi people to maintain their connection to Country, through on-Country trips, employment and enterprise development.	Management framework
	Support Bardi and Jawi people 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
	Develop cultural awareness training material and implement training for government employees and / or contractors working in the proposed marine park.	Education and interpretation
	Assess the nature and level of impact from human activities within the proposed marine park that may inhibit the promotion of the area as part of a living cultural landscape and implement management strategies to mitigate or stop any impacts as appropriate.	Research
	Support Bardi and Jawi to define a framework to ensure the right cultural processes are used for assessment and approval of proposals in the proposed marine park.	Management framework
	Support Bardi and Jawi to develop protocols for visitors on Bardi and Jawi Country and educate visitors about appropriate behaviour, respecting privacy and access restrictions where applicable.	Education and interpretation
Performance measure	To be determined by JMB.	
Target	To be determined by JMB.	
Reporting	To be determined by JMB.	

6.2 Looking after Country (KPI)

Bardi and Jawi people carry the responsibilities of their ancestors to manage and speak for Country which has been recognised in Australian Law through a native title determination process.

The interdependence between Bardi and Jawi people and Country is based on respect. Country sustains and provides for Bardi and Jawi people and in return Bardi and Jawi people manage and sustain it through culture and ceremony. This goes to the heart of maintaining good *liyan* with Country. It is because of this close connection, that when the land is disrespected, damaged or destroyed, there can be serious consequences for Bardi and Jawi people and their families.

The Bardi Jawi Rangers were established in 2006 to manage Bardi and Jawi land and Sea Country in such a way as to sustain Traditional Owners' livelihoods and connection to Country. Rangers' work covers cultural and natural resource management, including Sea Country monitoring, fire management, weed control, education and biodiversity monitoring, monsoon vine thicket protection, traditional knowledge transfer, cultural site protection and wildlife surveys. The Bardi Jawi Rangers follow the management objectives and strategies set in the Bardi Jawi IPA plan and management arrangements for the proposed marine park will complement existing management arrangements.

Bardi Jawi Oorany Rangers. Photo – Ian Meechan.

6.2.1 Cultural sites

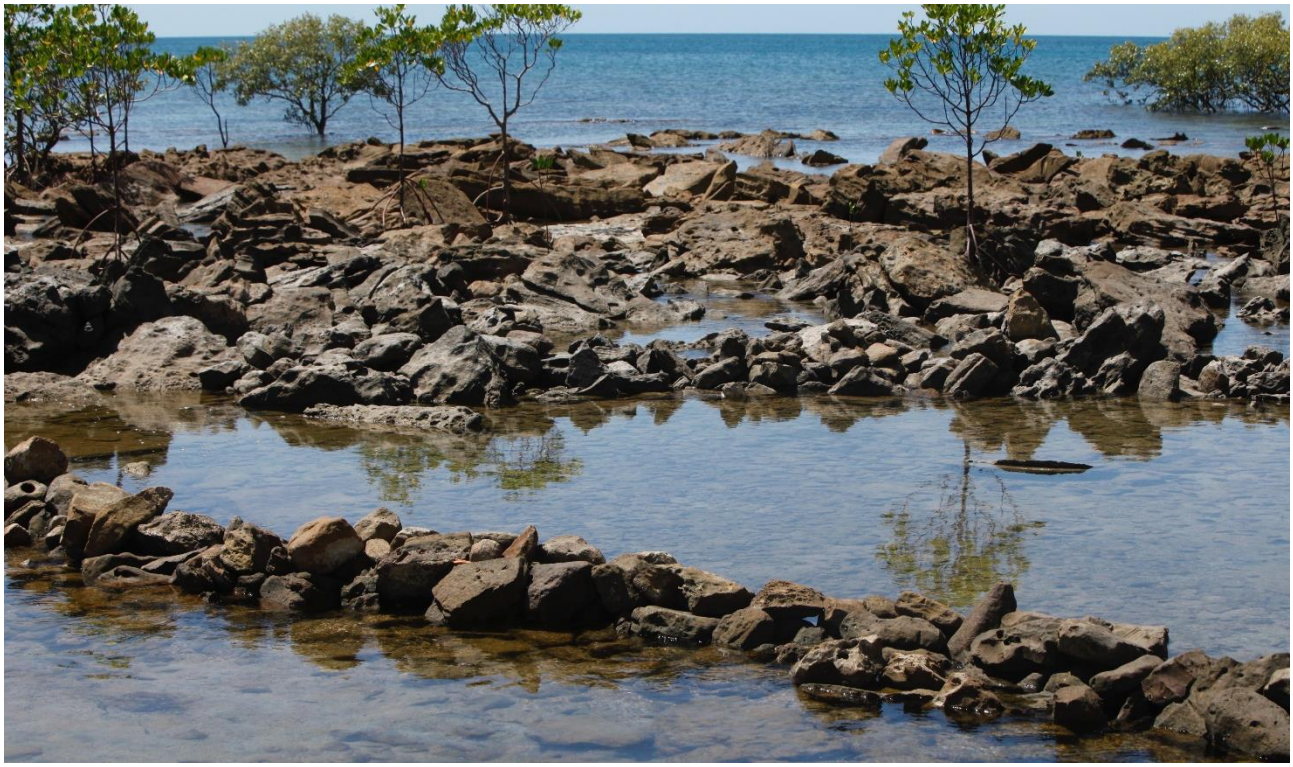
An important aspect of looking after Country is protecting sacred and significant sites to uphold their cultural integrity. The proposed Bardi Jawi Marine Park contains many places of cultural and spiritual importance to Bardi and Jawi people. Many significant sites associated with law are interconnected through songlines and stories that refer to mythological beings and places far afield (KLC/Bardi Jawi, 2013). Some sites are only for men while others belong to women who, traditionally, would meet to pass on knowledge and gather food (KLC/Bardi Jawi, 2013). The law grounds are looked after by the Majamajin (law bosses) and are found throughout Bardi and Jawi Country, on different family *booroo* or home places.

Bardi and Jawi people want to make sure that sacred and significant sites are not damaged by visitors and that all Traditional Owners have knowledge about important places (KLC/Bardi Jawi, 2013). Some 'open' sites are important for fishing and camping, or *Lalin* places (where people go hunting for married turtles) (KLC/Bardi Jawi, 2013). It is part of cultural responsibility that Traditional Owners visit all important places and regularly check that they haven't been disturbed and are still healthy.

Unmanaged visitation is the biggest threat to cultural sites. Most people who visit Bardi and Jawi 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. It is important for Bardi and Jawi people that elders who have passed away are not disturbed and their resting places are respected.

The majority of significant sites and places and their associated meaning are poorly known to the wider Australian society. Many occur on land, but many are sea-related. Registered sites include those with artefacts, ceremonial and mythological paintings, fish traps, burial grounds, man-made structures and middens. There are also likely to be many sites that are not currently registered due to Traditional Owners sometimes not wanting to disclose these places in case of drawing unwanted attention to the site. All Aboriginal heritage sites, registered and unregistered, are protected under the *Aboriginal Heritage Act 1972* and it is an offence to alter an Aboriginal site unless permission is granted in accordance with the Act. If proposed management actions may disturb an Aboriginal site, an assessment is required before the operation proceeds. DBCA and Bardi and Jawi joint management partners will work with the Department of Aboriginal Affairs and the BJNAC to ensure Aboriginal sites are not damaged. DBCA will comply with the State Government's Cultural Heritage Due Diligence Guidelines when actions are proposed. Cultural heritage sites are protected under the *Heritage of Western Australia Act 1990* and cultural values listed in the National Heritage Listing are protected under the EPBC Act.

Management of this value will focus on promoting the recognition of Bardi and Jawi's cultural responsibilities within the proposed marine park and ensuring cultural sites are maintained and visitors are educated about culturally appropriate visitation. Specific strategies relating to the management of biological resources of cultural significance such as *marnany* (reefs), *goorlil* (turtles) and *odorr* (dugongs) are described in section 7.



Fish trap. Photo – Ian Meechan.

Summary of management arrangements for looking after Country (KPI)		
Requirements	• Recognition and acceptance of Bardi and Jawi people's rights as native title holder to speak for and look after Country. • Respect for culturally significant sites. • Ensuring culturally appropriate visitation. • Ensuring information shared by the tourism industry and others is culturally appropriate and factually correct. This includes taking and sharing of photographs and commercial video material.	
Pressures	• Lack of respect and understanding of culture. • Loss of traditional knowledge. • Lack of resources to manage Country. • Inappropriate and uncontrolled visitation including use of drones and sharing of imagery.	
Management objectives	• To facilitate and maintain the opportunity for Bardi and Jawi people to care for Country and keep it healthy so that future generations can continue to experience Country. • To conserve and protect sites of cultural significance.	
		Management program
Management strategies	Ensure marine park management is consistent with cultural laws and protocols.	Management framework
	Ensure cultural elders and younger generations are involved in the management of the proposed marine park.	Management framework
	Support BJNAC to explore and implement tailored training, education and mentoring to enable Bardi and Jawi people to fulfil positions of employment relating to the management of the proposed marine park.	Management framework
	Support BJNAC to build their capacity in the management of the proposed marine park and work collaboratively to develop succession plans, career pathways and support networks.	Management framework
	Ensure the management programs for the marine park complement and integrate with those developed and implemented for other areas of Bardi and Jawi Country such as the Bardi Jawi IPA plan.	Management framework
	Ensure cultural heritage sites in the marine park are protected, particularly significant and sensitive sites at risk.	Management framework
	Assess the use and condition of cultural sites and implement further strategies to improve the spiritual and physical condition of them where possible.	Research
	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.	Research
	In collaboration with Bardi and Jawi Traditional Owners develop and apply commercial operator licence conditions to ensure culturally sensitive and appropriate visitation in the proposed marine park especially for cultural heritage sites.	Management framework
	Implement regulations to restrict or control access to areas within the proposed marine park that Bardi and Jawi Traditional Owners consider unsuitable for visitation (through commercial operator licences, by regulation or other mechanism as relevant).	Management framework
	Collaborate with Bardi and Jawi Rangers to patrol, educate and enforce zoning and management arrangements particularly for the special purpose zones (cultural protection) and restricted access areas.	Patrol and enforcement

	In collaboration with Bardi and Jawi Traditional Owners and BJNAC, develop visitor management protocols.	Management intervention and visitor services
Performance measure	To be determined by JMB.	
Target	To be determined by JMB.	
Reporting	To be determined by JMB.	

6.3 Language and traditional knowledge (KPI)

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 (Kimberley Language Resources Centre1999). 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).

Originally Bardi and Jawi spoke different languages. Sadly, much of the Jawi language has been lost due to displacement. Recent generations of Jawi Traditional Owners have grown up speaking Bardi and Jawi people have adopted Bardi language which is used in this plan. Bardi language reflects a deep understanding of the land and sea and the plants and animals which inhabit Bardi and Jawi Sea Country. Booroo (places) and significant sites have Bardi and Jawi names, and the language is often better suited than English to describing features of Country (KLC/Bardi Jawi, 2013). The *Ardiyooloon Bardi Ngaanka One Arm Point Bardi Dictionary (1999)* has recorded many Bardi words and is a reflection of Bardi people's determination to promote and maintain their language.

Elders hold a wealth of traditional knowledge and when younger Bardi and Jawi people speak for Country they only do so with the authority of the elders (KLC/Bardi Jawi, 2013). Bardi and Jawi people's knowledge comes from their long association and living relationship with Country as it has changed over thousands of years. As Saltwater people, Bardi and Jawi's traditional knowledge relates to the abundant marine resources that are found in Bardi and Jawi Country. Like other aspects of Bardi and Jawi life and resource harvesting, knowledge of marine resources is underpinned by the six seasons and the life cycles of individual species. Cultural rules and responsibilities established from this knowledge provide guidance on the use of Country, such as when particular species should be harvested.

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

Summary of management arrangements for language and traditional knowledge (KPI)		
Requirements	• Increased understanding and support for Bardi and Jawi's traditional ecological knowledge and its application to park management. • The maintenance of knowledge transfer within the Bardi and Jawi community. • Recognition of Bardi and Jawi language.	
Pressures	• Lack of knowledge transfer to the younger generation. • Limited recognition and use of Bardi or Jawi names for places	
Management objectives	• To apply language and traditional knowledge and integrate it with conservation science management in education about the proposed marine park.	
		Management program
Management strategies	Undertake and support research to gain a better understanding of Bardi and Jawi traditional knowledge applicable to the marine park and develop a database to capture this knowledge.	Research
	Investigate opportunities and develop a process for integrating Bardi and Jawi's traditional ecological knowledge, and knowledge holders, with conservation science and management applicable to the proposed marine park.	Research
	Where possible, use Bardi and Jawi place names and Bardi and Jawi language in signage, educational material, reporting and naming facilities.	Education and interpretation
	Work with Bardi and Jawi to support Bardi and Jawi's language program where relevant to the proposed marine park.	Management framework
	Continue to support the transfer of traditional knowledge through on Country learning opportunities.	Management framework
Performance measure	To be determined by JMB.	
Target	To be determined by JMB.	
Reporting	To be determined by JMB.	

6.4 Enjoyment of Country and customary activities (KPI)

A key aspect of caring for Country and ensuring Bardi and Jawi culture and knowledge is passed on to future generations is the undertaking of customary activities. Customary activities include hunting and fishing for food, visiting important cultural places, gathering bush fruits and making medicines, managing Country through fire at the right time of year, looking after important saltwater species such as *goorlil* (turtles) and *odorr* (dugongs) and engaging in ceremonial events. Following the seasonal calendar to ensure customary activities are carried out at the right time of year is critical to Bardi and Jawi people to ensure their customary activities are sustainable and their Country stays healthy.

As the recognised native title holders of Bardi and Jawi Country, Bardi and Jawi people have the right to enjoy their Country and maintain their customary practices. Providing appropriate areas in the proposed marine park where Bardi and Jawi people can continue to undertake cultural

activities and responsibilities for Country in privacy is an important requirement of the proposed marine park. It is proposed that access restrictions will be used in some areas of the proposed marine park where visitation by marine park users is not culturally appropriate.

Customary activities, including hunting, fishing, gathering and use of resources for personal, domestic and communal needs, will be permitted in all zones of the proposed marine park. Access to marine resources is vital to the health and well-being of Bardi and Jawi people. Hunting and fishing sustain Bardi and Jawi people in what today is very much a hybrid economy, where a large percentage of their diet still comes from the saltwater due to the nutritional and cost benefit value of fishing and hunting on their own Sea Country.

Fish are caught by Bardi and Jawi people from the shore and from boats. Bardi and Jawi people mostly fish with handlines, *goolijarrg* (traditional spears), and modern spear guns. Rods for trolling and bottom fishing are becoming more popular.

Bardi and Jawi people use many plant resources for cultural and everyday purposes. *Banyjoord* and *ilngam* are the two fish poisons available in Bardi Jawi country and are used to teach children and visitors the old ways of fishing. Both types of poison are from tubers which can be dug up when the above-ground plant is present. The tuber is crushed, mixed with wet sand and placed in rock pools, where fish can easily be speared once the poison starts to affect them.

Using and making spears is a feature of saltwater people's lifestyle and choosing the right spear to cut from a standing *wanggay* (pindan wattle tree) to make a *goolajarrg* (small fishing spear) or using the *manawa*n tree to make a *jarrar* (turtle and dugong spear) is an important cultural skill. Today these spears are modified with wire and fishing line wrapped around sharpened steel points, but the skill in choosing the tree, straightening the shaft and accurately spearing targets continues to be essential to a saltwater person.

Spearing in the mangroves. Photo – Ian Meechan.

Customary activities such as fishing, and hunting are provided for under the CALM Act and BC Act. The FRM Act recognises customary fishing activities and is subject to the Native Title Act where an Aboriginal person is expressing a native title right or interest for the purpose of satisfying personal, domestic or non-commercial communal needs. The final joint management plan will 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 Bardi and Jawi's cultural protocols, Parks and Wildlife Service Policy No. 86 Aboriginal customary activities and DPIRD's customary fishing policy. The document Guide to Aboriginal customary activities on Parks and Wildlife managed lands and waters provides guidance to Aboriginal people who wish to practise customary activities in the proposed marine park. Management will focus on providing for, recognising and maintaining the rights of Bardi and Jawi people to enjoy Country and undertake customary practices.

Summary of management arrangements for enjoyment of Country and customary activities (KPI)		
Requirements	• Recognition of, and support for, Bardi and Jawi people's rights as native title holders to enjoy Country and maintain customary practices. • High water quality, healthy biological communities and functioning ecosystems. • Access and privacy for undertaking customary activities. • Sharing of marine resources within a sustainable traditional framework.	
Pressures	• Climate change (refer to section 11). • Disturbance and lack of privacy caused by increased visitation.	
Management objectives	• Recognition of and support for the right of Bard Jawi people to continue customary practices and to benefit from their Country, consistent with the purpose of the proposed marine park.	
		Management program
Management strategies	Support Bardi and Jawi people to continue to carry out customary activities, including customary fishing and hunting, in the proposed marine park.	Management framework
	Develop and implement education and interpretation programs to inform users of the proposed marine park about Bardi and Jawi rights, as the recognised Traditional Owners, to enjoy Bardi and Jawi Country and maintain their customary practices.	Education and interpretation
	Support BJNAC to continue the development of sustainable use protocols for customary fished and hunted marine wildlife e.g. *goorlil* (turtles), *odorr* (dugongs), *aarli* (fish) and *barnamb* (rays).	Management framework
	Support Bardi and Jawi and other Traditional Owner groups where relevant to develop a customary fishing and hunting guide in collaboration with BJNAC and Bardi and Jawi elders.	Management framework
	Develop mechanisms to feedback information to the Bardi and Jawi Community on the condition of customary hunted animals such as green turtles and dugongs to support cultural and marine management decisions and facilitate the development and implementation of sustainable management arrangements for customary hunting.	Management framework
Performance measure	To be determined by JMB.	
Target	To be determined by JMB.	
Reporting	To be determined by JMB.	

7. Caring for Country (biocultural and ecological values)

Strategic objective: To protect and conserve biodiversity and ecological health

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/or the role they play in maintaining ecosystem integrity. As most plants and animals on Country are important to Bardi and Jawi people, these values are also referred to as biocultural values. Maintaining the current condition of the ecological and biocultural values, both for their intrinsic value and for the cultural, recreational and commercial benefits they provide, is a key focus for management of the proposed 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 (coral) communities are among the most productive and species-rich ecosystems on earth and the Kimberley displays rich coral fauna, in both species and genera (Wilson 2013). More research is required to assess the diversity of *marrgoorr* species in the Kimberley region, but current estimates are likely to be substantial underestimates (Richards *et al.* 2017). Preliminary studies have shown that a significant proportion of near-shore, shallow water filter-feeding species may be new to science (Kimberley Marine Research Station 2017).

Inshore *marnany* (reef) communities in the Kimberley are highly divergent from the offshore 'oceanic' *marnany* communities, strongly indicating that these regions are independent in an ecological and evolutionary sense (Richards *et al.* 2017). Radiocarbon dating of *marrgoorr* collected from the Buccaneer Archipelago showed that *marrgoorr* growth commenced in the Kimberley almost immediately after the continental shelf was flooded by rising sea levels at the end of the last ice age some 12 to 15 thousand years ago (Collins *et al.* 2016).

Marnany in the Kimberley region of Australia experience the greatest tidal variation of any tropical location in the world, despite which fringing *marnany* line the shores of almost all the *iinalang* (islands) in the Kimberley Bioregion (Wilson 2013). Research suggests the main season of spawning on inshore Kimberley reefs is during autumn, but with second multi-specific spawning also occurring during spring (Gilmour *et al.* 2016).

An unusual feature of the *marnany* in the region is the elevation of their *marnany* flats. *Marnany* normally grow vertically until they reach sea level when they then will alternate their grow direction and spread out laterally into deeper water. The *marnany* that have been studied in the area have grown vertically above the mean low water level limit and up to the mean high tide height, by creating terraces of coralline algae. This means they spend half their time exposed above the level of the tide (Richards and O'Leary 2015). This is particularly evident at *Jalan* (Tallon) reef where water can be seen cascading off the reef as the tide falls (Richards and O'Leary 2015). Water that

is impounded behind terraces generally forms a shallow, raised lagoon that feeds a series of cascades at low tide.

Marrgoorr and *marnany* communities are very important to Bardi and Jawi people as they provide sustenance and are culturally significant. They are important food gathering places and hunting grounds. The many pools and channels on reefs such as *Jalan* contain fish, oysters and other shellfish which are harvested by Bardi and Jawi people. Bardi and Jawi people continue to use the resources of the *marnany* today, by walking out on the low tide and collecting seafood and medicines and gaining access to rock pools with trapped fish.

Water temperature around these *marnany* ranges from an average 22ºC in the dry season to an average 26ºC in the wet, and corals are sensitive to fluctuations in temperature (KLC/Bardi Jawi 2013). A bleaching event was recorded on some nearshore *marnany* in the summer of 2016, when temperatures were elevated (McCulloch *et al.* 2017). This was the first time that many Bardi and Jawi people can recall such an event.

Julam Reef. Painting – Ashley Hunter

Summary of management arrangements for *marrgoorr* (coral) and *marnany* (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. • Physical disturbance from reef walking and anchoring. • Trophic (knock on) effects to other fauna and flora caused by fishing. • Commercial coral collecting. • Decrease in water quality. • Smothering of corals by sand.	
Current major pressure	Climate change impacts (refer to section 11).	
Management objectives	To ensure that *marrgoorr* and *marnany* communities are not significantly impacted by reef walking and other human activities within the marine park.	
		Management program
Management strategies	Undertake and/or support research on *marrgoorr* and *marnany* communities in the proposed marine park.	Research
	Monitor the condition of *marrgoorr* and *marnany* communities and the pressures acting on them in the proposed marine park.	Monitoring
	Implement management strategies to mitigate or stop human activities within the marine park which are negatively impacting the condition of *marrgoorr* and *marnany* communities.	Management intervention and visitor services
	Regulate foot access to intertidal *marnany* and other areas unsuitable for visitation (through commercial operator licences, by regulation or other mechanisms as relevant).	Management framework
	Map significant *marrgoorr* and *marnany* communities which could become opportunities for monitoring areas and future tourism snorkelling locations.	Research
	Educate users of the marine park about the ecological importance of *marrgoorr* (coral) and *marnany* (reef) communities and the potential detrimental effects of indiscriminate *marnany* (reef) walking, collecting, anchoring and boating activities on communities.	Education and interpretation
Performance measure	• Diversity. • Total coral cover. • Community composition. • Colony size distribution.	
Target	• No significant decline in diversity or total coral cover as a result of human activity. • No significant change in community composition or colony size distribution as a result of human activity.	
Reporting	3-5 years.	

7.2 Mangroves, creeks and saltmarsh 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 birds. Mangroves are also important for cultural heritage.

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). Mangrove lined creeks and bays have formed around many of the islands and coastal headlands in the proposed Bardi Jawi Marine Park. The sheltered embayments along the west coast of Dampier Peninsula, particularly Pender Bay, support extensive mangrove systems (Kenneally *et al.* 1996). These mangroves are typically complex in their zonation and floristic composition although they are less species-rich than those of the north Kimberley where rainfall is higher (Wilson 1994). Of the 18 species of mangroves recorded in the Kimberley, 12 have been recorded from the Dampier Peninsula (Pedretti and Paling 2001, Willing 2011). Bardi and Jawi don't have a collective name for all mangroves, but rather refer to mangroves by the individual species such as *joolboo* (kapok mangrove, *Camptostemon schultzii*), *biindoon* (spotted-leaved red mangrove, *Rhizophora stylosa*), *ngoorrngoo*l (white mangrove, *Avicennia marina*) and *gaarrayoon alarrgarr* (*Osbornia octodonta*).

Mangrove systems are important customary fishing areas for Bardi and Jawi people for collection of bait, crabs and for fishing. Young Bardi and Jawi men often swim through mangroves with spear guns in search of *joordoo* (mullet), *barbal* (rabbitfish) and *jirral (trevally).* Bardi and Jawi men climb into mangrove trees to await *baboor* (garfish) and *jamal*al (long-tom) which they spear when these fish swim under shady branches. Wood from mangroves is traditionally used for making harpoons, spear and fishing boomerangs, shields, rafts and shelters (Willing 2011).

Saltmarsh communities generally fringe the landward side of mangroves in Bardi and Jawi Country. The plants in these marshes can survive extended dry periods when the soil becomes extremely saline.

Mangroves and saltmarsh are protected under the BC Act and native vegetation clearing provisions of the EP Act.

Mangrove creek. Photo – Roanna Goater, DBCA.

Summary of management arrangements for mangroves, creeks and saltmarsh communities (KPI)		
Current status	• Mangroves are assumed to be in a generally undisturbed condition.	
Existing and potential pressures	• Direct (e.g. removal of individuals) and indirect (e.g. changes to community structure) impacts from recreational and commercial fishing (see sections 9.3 & 9.4). • Decrease in water and sediment quality (see section 7.4). • Climate change impacts such as rising sea level, warming of air and sea temperatures, alteration of rainfall patterns and more intense cyclones and storms. • Vehicle damage.	
Current major pressure	• Climate change impacts (refer to section 11).	
Management objectives	• To ensure mangrove communities are not significantly impacted by human activities in the proposed marine park.	
		Management program
Management strategies	Undertake and/or support research to characterise the diversity, density, abundance and distribution of mangrove and saltmarsh communities in the proposed marine park.	Research
	Monitor the condition of mangrove and saltmarsh communities and the pressures acting on them within the proposed marine park.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities in the proposed marine park which are negatively impacting the condition of mangrove and saltmarsh communities in the proposed marine park.	Management intervention and visitor services
	Educate users of the important ecological role and cultural value of mangrove and saltmarsh communities and the potential impacts of human activities, particularly vehicle damage.	Education and interpretation
Performance measure	• Diversity. • Aerial extent. • 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 (seagrass) meadows and *laanyji* (macroalgae) 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 *goorlil* (turtle). They enhance the habitat value of benthic habitats by increasing structural complexity and stabilising soft substrates. They vary seasonally in response to water temperature, day length, reproductive cycles, physical disturbance and regrowth.

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). Subtidal *noomool* beds are extensive around

the western side of the Dampier Peninsular in the Canning Bioregion (Thackway & Cresswell, 1998). They are generally short-lived and dominated by species with fast turnover times and high rates of reproduction, that often disappear during the wet season (Kendrick et al., 2018). *Noomool* beds are the main focus for Bardi and Jawi men hunting turtle and dugong who stalk them as they forage. *Barnamb* (stingrays) and *minimboor* (mullet) are also caught using spears when they become trapped in the *noomool* beds which form shallow lagoons during low tide (Willing, 2011).

The *Iwany* (Sunday Island) Group stands out as having particularly extensive and diverse *noomool* meadows with eight species being recorded in the raised lagoons of the islands (Kendrick, et al., 2017). The high rates of growth and consumption of the *noomool* and *laanyji* in the lagoons, show how important the *noomool* beds are for marine herbivores such as green turtles and rabbitfish (*Siganus lineatus*). The *noomool* which have been studied in the Iwany (Sunday Island) group are living at the limit of their temperature tolerance and further studies of their vulnerability to climate change are needed (Kendrick, et al., 2017).

More than 270 species of macroalgae have been recorded in the Kimberley, most of which are red algae (Huisman & 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 fish) or food.

Laanyji in particular is affected in the south east time (*Barrgana*) cold season when the south east winds blow strongly sometimes for weeks at a time. This can remove a lot of l*aanyji* from the reefs in Bardi Jawi Sea Country and cause it to be deposited on the shores during spring tides.

The full distribution of *noomool* and *laanyji* in the proposed 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. • Damage from vessel activity (e.g. anchoring, propeller scour). • Decrease in water and sediment quality (e.g. nutrient and toxicant inputs from development).	
Current major pressure	• Climate change impacts (refer to section 11).	
Management objectives	• To ensure the diversity, abundance and condition of *noomool* and *laanyji* communities are not significantly impacted by human activities within the marine park.	
		Management program
Management strategies	Undertake and/or support research to characterise the diversity, density, abundance and distribution of *noomool* and *laanyji* communities in the proposed marine park.	Research
	Monitor the condition of *noomool* and laanyji communities and the pressures acting on them within the proposed marine park.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition *noomool* and *laanyji* communities in the proposed marine park.	Management intervention and visitor services

	Educate users of the important ecological role of *noomool* and *laanyji* communities and the potential impacts of human activities, particularly vessel mooring, and nutrient and pollution inputs on these communities.	Education and interpretation
Performance measure	Indicators to be developed but may include: • Total cover. • Diversity. • Community composition. • Seagrass biomass. • Macroalgae density. • Macroalgae canopy height.	
Target	• No significant decline in total cover, diversity, *noomool* biomass, laanyji density or laanyji canopy height as a result of human activity. • No significant change in community composition as a result of human activity.	
Reporting	3-5 years.	

7.4 Water and sediment quality (KPI)

Water and sediment quality are essential to maintain healthy ecosystems. Oceanographic processes, including water temperature, currents, winds, wave action and tidal flow, influence the water and sediment quality by impacting on transport, dispersal and mixing of sediments, biota and pollutants. 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.

Poor water and sediment quality are the most serious known pollution issues affecting Australia's coastal and marine environments (Department of Agriculture, Water and Environment 2020). Most pollutants come from land-based activities (WWF 2018). In addition to degrading habitats, pollution can directly threaten marine fauna. Due to the limited amount of anthropogenic land use adjacent to the proposed marine park, marine pollution is considered to be a low risk to the values of the proposed marine park. Although the risk of a serious marine pollution emergency such as a large oil spill is considered low, the nature of the habitats (e.g. large intertidal areas) and species that depend on these habitats means the consequences of such an event could be significant. The ubiquitous impacts of climate change will increasingly influence the temperature and current flow of Kimberley waters.

The Environmental Protection Authority (EPA) has a responsibility to protect the quality of the marine environment in Western Australia. The framework for fulfilling this role is set out in the Environmental Assessment Guideline for Protecting the Quality of Western Australia's Marine Environment (EPA, 2015).

7.4.1 Sewage discharge

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

The proposed marine park will be classified as zone 1 unless areas for sewage discharge are designated under the CALM Regulations.

7.4.2 Marine debris

Marine debris (including litter) 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 proposed 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 proposed marine park. Currently Bardi Jawi Rangers undertake beach surveillance for marine debris through funding from the Commonwealth Department of Agriculture.

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 marine pests in coastal waters, although marine pests and pathogens can also potentially be spread on the hulls of commercial and recreational vessels transiting through the region. The Australian Government Department of Agriculture, Water and the Environment is responsible for marine pest biosecurity. Part of the Department of Agriculture, Water and the Environment's charter is to ensure that foreign vessels ballast water has been managed in accordance with the *Australian Ballast Water Management Requirements* before permitting discharge inside Australia's territorial sea. Australian ballast water management requirements are consistent with International Maritime Organisation (IMO) guidelines for minimising the risk of translocation of harmful aquatic species in ships' ballast water. In general, ballast water exchange should be conducted at least 200nm from nearest land and in waters 200m deep. For voyages that cannot practically meet these requirements ballast water exchange must occur at least 12 nm from the nearest land and in water at least 50 m deep. DPIRD also carries out inspections of vessels from interstate and overseas for marine pests.

7.4.4 Oil spills

Although the risk of a serious marine oil pollution event is considered low, the nature of the habitats and fauna that depend on high water quality (e.g. large intertidal areas 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 proposed marine park.	
Existing and potential pressures	• Climate change impacts (e.g. increased water temperature). • Marine debris (including microplastics). • Toxicants (e.g. anti-fouling agents, ballast/bilge water discharge). • Increased nutrients (e.g. sewage discharge). • Major pollution events (e.g. oil spills). • Development activities (e.g. development or expansion of existing infrastructure).	
Current major pressure	• Climate change impacts gradually increasing water temperature.	
Management objectives	• To ensure that water and sediment quality are not significantly impacted by human activities in the proposed marine park.	
		Management program
Management strategies	Undertake and/or support research on water and sediment quality in the proposed marine park.	Research
	Monitor the condition of water and sediment quality within the proposed marine park including establishing baselines for water and sediment quality variables and identifying the pressures acting on it.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities within the proposed marine park which are negatively impacting water and sediment quality.	Management intervention and visitor services
	If required, designate areas for vessel sewage discharge and incorporate into education, patrol and enforcement programs to enforce sewage discharge arrangements.	Management intervention and visitor services
	As part of on-Country work, patrol the shoreline and waters of the marine park for litter and marine debris and remove and record as necessary, and seek support of partners and marine park users to do the same.	Patrol and enforcement
	Work with relevant departments, marine park users and stakeholders to address sources of marine debris and abandoned infrastructure in the proposed marine park to reduce the amount of floating, submerged and beached debris and pollution entering the proposed marine park.	Management intervention and visitor services
	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
	Develop and implement a biosecurity, detection and mitigation program [DPIRD].	Management Framework
Performance measure	Indicators to be developed but may include: • Seawater temperature. • Nutrient concentration. • Pathogen concentration. • Total suspended sediments.	
Target	• No significant change in performance measures as a result of human activity.	
Reporting	3-5 years.	

7.5 Geomorphology including beaches

Cape Leveque marks the southern limit of the Kimberley ria coast and the beginning of the very different low relief and sandy coastal types typical of the coast of the IMCRA Canning Bioregion. The large tidal range associated with the coastal geomorphology creates significant areas of intertidal habitat along the coast. Sand dunes, long sandy beaches and a series of deep V-shaped bays are a key feature of the Dampier Peninsula (Marine Parks and Reserves Selection Working Group 1994). Kimberley coast is the largest rocky coast in Australia and is of global geo-heritage significance (Semeniuk and Brocx 2011). In Bardi and Jawi belief, powerful and creative ancestral beings roamed the sea, creating the geomorphological features seen today including the beaches backed by aeolian (wind-blown) sand dunes, reefs and islands. There are currently no major pressures on geomorphology in the proposed marine park, however there are some localised disturbances where compaction from vehicles occurs.

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. • Climate change impacts including rising sea level and increased severity of tropical cyclones and storms. • 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
Management strategies	Undertake and/ or support research to characterise the geomorphic features and processes in the proposed marine park.	Research
	Monitor the condition of geomorphology and the pressures acting on it within the proposed marine park.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities within the proposed marine park which are negatively impacting the condition of geomorphology.	Management intervention and visitor services
	Ensure that coastal infrastructure and resource development proposals for the area that have the potential to disturb the geomorphology of the proposed marine park are appropriately assessed in accordance with the EP Act.	Management Framework
Performance measure	Indicators to be developed but may include: • Aerial coastline position. • Mean High Water mark.	
Target	• No significant change in performance measures as a result of human activity.	
Reporting	5-10 years.	

7.6 Subtidal filter-feeding communities

Subtidal filter-feeding communities provide important habitat and food for many species. These communities are generally comprised of Poriferans (sponges), Tunicates (sea squirts) and Anthozoans (soft and hard corals). They are generally found in areas with strong currents and hard underwater surfaces (e.g. rocky sea floor), although some types such as sea pens are found in soft sediment habitats.

There is little information on the filter feeding communities in the proposed Bardi Jawi Marine Park, although a survey conducted in 2009 at Packer Island identified 25 species of Porifera, 13 species of Ascidiacea and 19 species of Cnidaria. The same survey conducted at Perpendicular Head identified 11 species of Porifera, nine species of Ascidiacea and 18 species of Cnidaria (Keesing *et al.* 2011).

Filter feeding communities are protected under the BC Act and FRM Act. Filter feeding communities in the proposed marine park are likely to be undisturbed, particularly as the entirety of the proposed marine park is closed to prawn trawling and limited dredging has taken place.

Summary of management arrangements for subtidal filter feeding communities		
Current status	• Unknown, but assumed to be in a generally undisturbed condition.	
Existing and potential pressures	• Decrease in water and sediment quality (see section 7.4). • Damage from anchoring. • Trophic effects of fishing. • 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 proposed marine park.	
		Management program
Management strategies	Undertake and support research to characterise the diversity, density, abundance and distribution of filter feeding communities in the proposed marine park.	Research
	Monitor the condition of subtidal filter feeding communities and the pressures acting on them within the proposed marine park.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities within the proposed marine park which are impacting the condition of subtidal filter feeding communities.	Management intervention and visitor services
Performance measure	Indicators to be developed but may include: • Diversity. • Total cover. • Community composition.	
Target	• No significant decline in diversity or total cover as a result of human activity. • No significant change in community composition as a result of human activity.	
Reporting	3-5 years.	

7.7 Intertidal sand and mud flat communities and *oombans* (freshwater soaks)

Although often bare of vegetation, intertidal sand and mudflat areas are colonised by assemblages of microorganisms and burrowing macro-invertebrates, which play a crucial role in primary production and nutrient cycling. 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, and for resident and migratory shorebirds.

Extraordinarily wide intertidal sand flats are one of the most notable features along the open ocean shore of the west coast of the Dampier Peninsula. Some of these are more than a kilometre wide at low spring tide. The flats are remarkably rich with dense and diverse populations of bivalved molluscs and other burrowing invertebrates (Marine Parks and Reserves Selection Working Group 1994)

Oomban (freshwater soaks) appear in intertidal sand and mudflats, beaches and salt creeks. *Oomban* are culturally significant and important to Bardi and Jawi people and some have songs associated with them. Although, Bardi and Jawi no longer depend on their water supply for their survival, *oomban* still require careful management to ensure they do not become overgrown.

Intertidal sand and mudflat flora and fauna are protected under the BC Act and FRM Act. Development proposals that may impact on intertidal sand and mudflat communities may be subject to an environmental impact assessment in accordance with the EP Act. The intertidal sand and mudflat communities of the marine park are likely to be generally undisturbed. There are currently no major pressures on these communities within the park.

Oomban (freshwater soak). Painting – Bernadette Angus (2011).

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 (see section 11). • Direct (e.g. removal of individuals) and indirect (e.g. changes to community structure) impacts from recreational and commercial fishing. • Sewage discharge, oil spills, introduction of marine pests and pollutants from vessels if shipping activity increases in the area.	
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 proposed marine park.	
		Management program
Management strategies	Undertake and/ or support research to characterise the diversity, community composition and condition of intertidal sand and mudflat communities and *oombans* in the proposed marine park.	Research
	Monitor the condition of intertidal sand and mudflat communities and *oombans* and the pressures acting on them within the marine park.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of *oombans* and intertidal sand and mudflat communities.	Management intervention and visitor services
Performance measure	Indicators to be developed but may include: • Diversity. • Species abundance. • Community composition.	
Target	• No significant decline in diversity or species abundance as a result of human activity. • No significant change in community composition as a result of human activity.	
Reporting	3-5 years.	

7.8 *Goorlil* (marine turtles) (KPI)

The *noomool* (seagrass), *marnany* (reefs), soft bottom habitats and *jaarla* (sandy beaches) within the marine park are known to support foraging and nesting *goorlil* (turtles). *Goorlil* species identified in the Kimberley include 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).

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

An inventory of *goorlil* nesting beaches across 12,000km of coastline in the Kimberley region found that the Dampier Peninsula marks a changeover point from summer nesting to winter nesting for *bawanjan* (flatback turtle) (Tucker *et al.* 2014). *Bawanjan* nesting occurs to the south west of the peninsula in the summer, but in the winter flatback nesting occurs to the east of the peninsula including within King Sound. Green turtles nest to the east of the peninsula in the summer (Tucker *et al.* 2014).

Goorlil is second only to *aarli* (fish) as an important form of dietary protein for the Bardi and Jawi people. Because *goorlil* is much more numerous and available than *odorr* (dugong), it can be hunted all year round. The green turtle is mostly the only species taken because of its high quality as food. Because of this, Bardi and Jawi use different words when referring to green turtles, including *ankoorrbin* (small) and *aanngal* (young). Hunting for *goorlil* is very much a part of Bardi and Jawi life, especially amongst younger Bardi and Jawi men. Experienced hunters know how to select a good *goorlil* to hunt from the shape, colour and pattern on its shell, the way it swims and the noise it makes when breathing. A good turtle is rich with fat (KLC/Bardi Jawi, 2013).

During *lalin*, the hot build-up time, *oondood* (married/ mating) *goorlil* are hunted, and the female *goorlil* is especially prized for her undeveloped eggs and the rich flavour of the meat. *Goorlil* meat is distributed according to the hunters' relationships. Bardi and Jawi people want to maintain this deep knowledge and continue their traditional practices (KLC/Bardi Jawi, 2013). Bardi and Jawi Traditional Owners have also expressed a need to balance hunting turtles for food with sustainability, which is outlined in the Bardi Jawi IPA Plan.

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 turtles for Aboriginal customary purposes.

Goorlil. Photo – Roanna Goater.

Summary of management arrangements for goorlil (marine turtles) (KPI)		
Current status	• Research suggests populations of *goorlil* are healthy in the proposed marine park.	
Existing and potential pressures	• Disturbance from human interaction (e.g. boat strike, noise, nest disturbance). • Loss or degradation of critical habitat (e.g. *noomool* (seagrass)). • Entanglement in and ingestion of marine debris. • Unsustainable customary take. • Climate change impacts from rising sea level and increased cyclone severity may increase the risk of tidal inundation of nests. Higher temperatures 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 immediately adjacent to the proposed marine park. • To manage customary harvesting of *goorlil* for cultural and ecological sustainability.	
		Management program
Management strategies	Undertake and/or support research to characterise natural variability, movement patterns and critical habitats for *goorlil* within the marine park.	Research
	Monitor the condition of *goorlil* and the pressures acting on them within the marine park.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities or predators within the marine park which are negatively impacting on the condition of *goorlil*.	Management intervention and visitor services
	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
	Educate users of the proposed marine park on how to reduce damage to *goorlil* habitat and individuals.	Education and interpretation
	Refer to section 6.4 for strategies relating to customary take.	
Performance measure	• Species abundance of resident *goorlil*. • Population structure of resident *goorlil*. • Spatial distribution of resident *goorlil*. • Mortality of resident *goorlil*. • Species abundance of nesting *goorlil*. • Spatial distribution of nesting *goorlil*. • Hatchling production. • Hatchling mortality.	
Target	• No significant decline in hatchling production or species abundance of resident or nesting *goorlil* as a result of human activity. • No significant change in population structure of resident *goorlil* or distribution extent of resident or nesting *goorlil* as a result of human activity. • No significant increase in mortality of resident turtles 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 *jaarla* (beaches), bays, *marnany* (reefs), mangrove creeks and *iinalang* (islands) of the proposed marine park provide rich habitats for *aarli* (fish*)*. *Aarli* is the most important food for the Bardi and Jawi people, for its nutritional value and because it is the most available food on Country. Fishing is a major feature of Bardi and Jawi lifestyle, undertaken by young and old. Fish are sought when they are at their fattest, with the highest nutritional value. Fishing is guided by the seasonal calendar to ensure *aarli* targeted are caught at the right time of year. The most sought-after species of *aarli* are the g*oolan* (small bluebone), b*arrambarr* (large bluebone), *jirral* and *yawilil* (trevally, numerous species), *joordoo* (mullet) *joorloo* (spanish flag), *barrbal* (yellowlined spinefoot), m*aarrarn* (mangrove jack), b*iindarral* (coral trout), b*iidib* (rock cod), *birrinyan* (queenfish), *gambarl* (surgeonfish), *gooloorrganjoon* (mackerel) and *barnamb* (stingray).

Many *aarli* have a planktonic life stage which synchronises with tides and seasonal water circulations and conditions. Some rely on both estuarine and marine waters to complete their life cycle, while others rely on the protective structure of habitats such as algae, *noomool* (seagrass) and mangroves. Many components of the marine ecosystems found in the proposed Bardi Jawi Marine Park are therefore likely to be important for finfish reproduction and development.

At present there is limited information about *aarli* diversity and assemblages in the proposed marine park, however, the diversity of habitats within the marine park is likely to result in a high diversity of *aarli* species. DPIRD is responsible for the management of fishing and fishing impacts in the proposed marine park. Several *aarli* species likely to be found in the marine park are afforded protection under the FRM Act.

Joorroo (sharks) and *barnamb* (rays) are diverse in the Kimberley and include threatened and protected species such as *jabiyang* (sawfish) and *biibanan* (manta rays, *Manta birostris*). Many *joorroo* are apex predators and play an important ecological role in the marine environment and their presence in natural abundances is an indication of a healthy ecosystem. The more potentially dangerous species, *marrgaliny* (hammerhead, *Sphyrnidae* sp.), *gandarr* (tiger shark, G*aleocerdo cuvier*) and *arragool* (bronze whaler shark, *Carcharhinus brachyurus*) are treated with respect.

Some *joorroo* and *barnamb* in Bardi and Jawi Country are associated with stories while others are sought for food. Bardi people traditionally prized the liver of two *joorroo* species for food; the blacktip reef shark (*Carcharhinus melanopterus*), and the gummy shark (*Mustelus antarcticus)* which is now rarely eaten (Willing 2011). Two species of *barnamb* are mostly frequently hunted; *jangarr* which are hunted from boats in the wet season and *yawiny* which are speared on foot in pools among the mangroves at low tide.

Looloolo, a dreaming ancestor associated with saltwater, is said to manifest as a shark that helps guide people if they are in trouble whilst travelling or hunting on Sea Country (Frank Davey in Vigilante 2013)

“Two sharks shared everything they got between each other, and one day Mardgaliny got greedy and never gave Looloolo any fat turtle meat. So Looloolo got angry and they had a fight, and Looloolo got a shield and hit Mardgaliny over the head, and it got stuck. That is why we have the hammerhead shark today, and call Marrgaliny after the shield, Mardga.” (as told by Edward James, IPA Plan)

The main pressure on *aarli* in the proposed marine park is fishing. *Aarli* are assumed to be in a generally good condition in the proposed marine park and will be conserved through a

representative system of sanctuary zones (see Section 12.2),special purpose zones (cultural protection), sustainable recreation and commercial fishing management strategies (see section 9.3 and 9.4) and relevant research, monitoring and education strategies.

Threats to *joorroo* and *barnamb* include fishing, entanglement, inappropriate interaction such as feeding sharks, loss and degradation of habitats, pollution and reduced access to prey resources. *Joorroo* and *barnamb* are particularly vulnerable to overfishing as they are often slow growing, late maturing, long-lived with slow reproductive rates.

Mardgaliny and Loolooloo. Painting – Edward James (2011).

Summary of management arrangements for *aarli* (fish) including *joorroo* (sharks) and *barnamb*s (rays) (KPI)		
Current status	• *Aarli* communities in the proposed marine park are assumed to be in a generally good condition. The current status of *joorroo* and *barnamb* populations in the marine park is not well understood.	
Existing and potential pressures	• Recreational and commercial fishing, including incidental catch, bycatch and local depletion of some targeted species. • Loss and degradation of critical habitat (i.e. nursery areas, aggregation areas). • Entanglement in and ingestion of marine debris. • Climate change impacts may affect habitat and food availability.	
Current major pressure	• Commercial and recreational fishing. • Climate change (see section 11).	
Management objectives	• To ensure non-targeted *aarli, joorroo* and *barnamb* species are not significantly impacted by human activities within the proposed marine park. • To manage targeted *aarli*, *joorroo* and *barnamb* species for cultural and ecological sustainability.	
		Management program
Management strategies	Undertake and /or support research to characterise *aarli* diversity, abundance, natural variability, 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
	Monitor the condition of *aarli*, *joorroo* and *barnamb* and the pressures acting on them in the marine park [DPIRD for targeted species].	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition *aarli*, *joorroo* and *barnamb* and sustainability of targeted species [DPIRD for targeted species].	Management intervention and visitor services
	Refer to additional strategies in sections 6.4, 9.3 and 9.4.	
Performance measure	• Diversity. • Target species abundance. • Target species size distribution. • Protected species abundance. • Community composition.	
Target	**Sanctuary zones** • No significant decline in diversity, target species abundance, target species size structure or protected species abundance as a result of human activity. • No significant change in community composition as a result of human activity. **SPZ Cultural Protection and General Use Zones** • No significant decline in species richness or protected species abundance as a result of human activity. • No significant change in community composition as a result of human activity. • No change in target species abundance or target species biomass beyond ecologically sustainable levels as a result of human activity (to be determined in consultation with DPIRD).	
Reporting	3-5 years.	

7.10 *Odorr* (dugongs) (KPI)

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

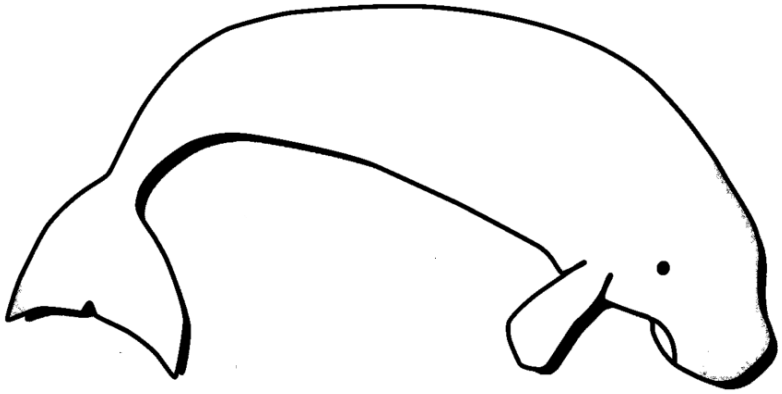
Since 2007, the Bardi Jawi Rangers have participated in satellite tracking of *odorr* to improve the understanding of local migration patterns, educate the community and gain more support for species conservation. *Odorr* in the Kimberley can move large distances over short periods of time. To date there 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 for thousands of years. *Odorr* always played a major role in Bardi and Jawi culture, and their use has been well documented. *Odorr* hunting takes place in the cooler months, typically May to July, when they appear in Bardi and Jawi Country. The annual harvest of *odorr* can fluctuate widely, probably the availability of seagrass along the Kimberley coast (KLC/Bardi Jawi 2013).

Experienced hunters avoid hunting pregnant *odorr* or mothers with young calves. Most Bardi and Jawi people believe that the introduction of outboard motors has made *odorr* increasingly wary of boats. Chasing an *odorr* during a hunt is not favoured by older hunters, who say it reduces the quality of the meat. Not surprisingly, many older men advocate for a return to *galaway* (sculling) and want to see younger hunters learn and use this technique (KLC/Bardi Jawi 2013).

In the days before dinghies and outboard motors, Bardi and Jawi men were adept at hunting *odorr* and *goorlil* (turtle) from their *gaalwa* (mangrove wood rafts) with *jadarr* (wooden spears). *Galaway*, (the sculling technique), tends to be favoured by older men; it requires much more skill, the hunter using only a paddle and his judgement of the tide and current to locate himself close enough to an animal to be able to take a shot. This style of hunting is much closer to the traditional method. Another change has been the introduction of fridges and freezers, allowing the meat to be kept fresh for longer. Consequently, hunters are often approached by relatives in Broome and further afield for a share of meat from Country for their families. This has widened the distribution circle and put more pressure on skilful hunters and the species (KLC/Bardi Jawi 2013).

All *odorr* (dugongs) in Australian waters are protected under the 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* appear in typically low densities and are patchily distributed.	
Existing and potential pressures	• Disturbance from human interaction (e.g. boat strike, noise). • Loss or degradation of critical habitat (e.g. *noomool* (seagrass) (see section 7.3). • Entanglement in and ingestion of marine debris. • Disease. • Unsustainable customary take. • Climate change impacts may alter movement patterns and survival rates. Impacts on *noomool* (seagrasses) (e.g. from warming events and increased intensity of cyclones) are predicted to 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 proposed marine park. • To manage customary harvesting of *odorr* for cultural and ecological sustainability.	
		Management program
Management strategies	Undertake and/or support research on the abundance, distribution, natural variability and habitat requirements of *odorr* in the proposed marine park.	Research
	Monitor the condition of *odorr* and the pressures acting on them within the marine park.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities or predators within the marine park which are negatively impacting on the condition of *odorr*.	Management intervention and visitor services
	Maintain records of the incidence of boat collisions with *odorr.*	Monitoring
	Refer to section 6.4 for strategies relating to customary take.	
Performance measure	• Abundance. • Spatial distribution.	
Target	• No significant decline in *odorr* abundance as a result of human activity. • No significant change in *odorr* distribution as a result of human activity. • Management targets for sustainable customary harvesting of *odorr* to be developed in collaboration with relevant Joint Management partners.	
Reporting	3-5 years.	

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

Humpback whales are known to inhabit the waters of the proposed 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 north west of Western Australia. Pender Bay has been recognised as an important calving, breeding, feeding (inferred), resting and staging area (Blake *et al.* 2011). A study has found that humpback whale activity is concentrated at Pender Bay for longer durations than other areas of the Kimberley (Thums *et al.* 2018).

A number of *bayalbarr (dolphin)* species are known to inhabit the proposed Bardi Jawi Marine Park. Snubfin dolphins (*Orcaella heinsohni*) and humpback dolphins *(Sousa chinensis*) 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).

Research has found that Cygnet Bay is regularly used by a small number of snubfin and humpback *bayalbarr*. Genetic analysis of snubfin dolphins has found that there is limited gene flow between snubfin dolphins sampled at Cygnet Bay and Roebuck Bay, about 250kms to the south (Brown *et al.* 2016). A significant difference was found between snubfin dolphin between Cygnet Bay and Cone Bay, which are about 60kms apart (Brown *et al.* 2016). Pender Bay, which has extensive mangrove growth, is also a significant area for bottlenose dolphins (*Tursiops* sp.), Indo-Pacific bottlenose dolphins and Australian snubfin dolphins (DEWHA 2008).

Populations of *miinimbi* and *bayalbarr* in the proposed marine park are likely to be healthy. Threats to *miinimbi* and *bayalbarr* include physical disturbance from vessel strike, entanglement, inappropriate interaction, loss and degradation of habitats, pollution and reduced access to prey resources.

All *miinimbi* and *bayalbarr* are protected under the BC Act and EPBC Act. A licence is required for marine tourism operators wishing to interact with *miinimbi* and *bayalbarr* in the proposed marine park and wildlife viewing is controlled by a code of conduct which includes minimum approach distances, maximum boat speeds and restrictions on the use of lights in the vicinity of wildlife. Restrictions also apply to recreational activities. For example, all vessels must stay 100 metres away from a *miinimbi* (whale), 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.

Humpback whale. Photo – Josh Baker.

Summary of management arrangements for *miinimbi* (whales) and *bayalbarr* (dolphins)		
Current status	• The population of humpback *miinimbi* is considered to be healthy. Little is known about other *miinimbi* species inhabiting the proposed 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). • Entanglement in and ingestion of marine debris. • Climate change impacts may affect movement patterns and food availability.	
Current major pressure	• None identified.	
Management objectives	• To ensure *miinimbi* and *bayalbarr* are not significantly impacted by human activities in the proposed marine park.	
		Management program
Management strategies	Undertake and/or support research to characterise *miinimbi* and *bayalbarr* diversity, abundance, natural variability and critical habitats within the marine park.	Research
	Monitor the condition of *miinimbi* and *bayalbarr* and the pressures acting on them within the marine park.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of *miinimbi* and *bayalbarr*.	Management intervention and visitor services
	Facilitate large whale disentanglement response training for relevant departmental staff and Bardi Jawi Rangers.	Management Framework
	Educate users about ways to minimise disturbance to *miinimbi* (whales) and *bayalbarr* (dolphins), including rules for whale watching.	Education and interpretation
	Maintain a record of stranding and mortalities of *miinimbi* (whales) and *bayalbarr* (dolphins) in the proposed marine park.	Monitoring
Performance measure	• Diversity. • Key species abundance. • Key species spatial distribution.	
Target	• No significant decline in diversity or key species abundance as a result of human activity. • No significant change to key species distribution as a result of human activity.	
Reporting	2-3 years.	

7.12 Linygurra (estuarine crocodiles)

Linygurra (estuarine crocodiles) 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 showed 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 less mature recovery. It is likely that the Kimberley populations will continue to increase in abundance and size structure (Halford and Barrow 2017). Anecdotal sightings of crocodiles in Bardi and Jawi Country are reported to be increasing.

Visitors to the proposed marine park are advised to be mindful of the risk that estuarine crocodiles pose to their safety. Interactions with *linygurra,* such as illegally feeding them, are inappropriate and can have serious effects. A 'Be Crocwise' safety campaign was launched by the department in 2017 to increase knowledge and awareness of appropriate behaviour in crocodile risk areas.

Estuarine crocodiles are protected under the BC Act and the EPBC Act. Management will focus on gaining a better understanding of populations and critical habitats in the proposed marine park and reducing the risk of interactions with users of the proposed marine park.

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. • Entanglement in and ingestion of marine debris. • Climate change impacts from rising sea level and increased cyclone severity may increase the risk of tidal inundation of nests. Higher temperatures could affect reproductive processes and food resources. • Illegal hunting.	
Current major pressure	• None identified.	
Management objectives	• To ensure *linygurra* are not significantly impacted by human activities in the proposed marine park.	
		Management program
Management strategies	Undertake and/or support research on the abundance and condition of *linygurra* in the proposed marine park.	Research
	Monitor the condition of *linygurra* and the pressures acting on them within the marine park.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of *linygurra*.	Management intervention and visitor services
	Educate users about known and potential distributions of *linygurra* and of the risk of feeding them and ensure compliance.	Education and interpretation
Performance measure	• Abundance. • Size distribution.	
Target	• No significant decline in the abundance of *linygurra* as a result of human activity. • No significant decline in the size distribution of *linygurra* 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 birds 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 area for maintaining populations of *garrabal* (birds) 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 only limited information about populations and the distribution of sea and shore *garrabal* in the proposed marine park.

Large populations of breeding colonies of roseate terns (*Sterna dougallii)* have been reported on *Joowanan* and *Moorroodooloon* (Twin Islands) and they feed on fish in the proposed marine park. Bardi and Jawi traditionally collected the eggs of *giido* (oystercatchers) and *garril* (terns) from the Twin Islands during *barrgana* season (July to June).

Many of the sea and shorebirds within the marine park are the subject of international treaties. All birds are protected under the BC Act with some species also protected under the EPBC Act. Some migratory species are also subject to international treaties and Australia has an obligation to protect species listed under those treaties.

Summary of management arrangements for sea and shore *garrabal* (birds)		
Current status	• The current condition of sea and shore garrabal 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. • Loss or degradation of critical habitat (e.g. coastal vegetation, intertidal sand and mudflats). • Entanglement in and ingestion of marine debris. • Climate change impacts including increased temperatures and increased intensity of storm and cyclone events.	
Current major pressure	• None identified.	
Management 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 proposed marine park.	
		Management program
Management strategies	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
	Monitor the condition of sea and shore *garrabal* and the pressures acting on them within the marine park.	Monitoring
	Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of sea and shore *garrabal*.	Management intervention and visitor services
Performance measure	• Species abundance. • Breeding success.	
Target	• No significant decline in the abundance of sea and shore *garrabal* species as a result of human activity. • No significant decline in breeding success of sea and shore *garrabal* species as a result of human activity.	
Reporting	3-5 years.	

Crested terns foraging around the Twin Islands. Photo – Roanna Goater, DBCA.

7.14 Invertebrates

Marine invertebrates are those marine animals without a backbone and include trochus, crabs, squid, cuttlefish, shellfish, corals, sponges, anemones, sea squirts, urchins and marine worms. Management arrangements for habitat forming invertebrates such as corals and sponges have been described in sections 7.1 and 7.6 and benthic invertebrate fauna strongly associated with intertidal sand and mudflats are discussed in section 7.7.

There is little known about the invertebrate populations of the proposed marine park, although a survey conducted on soft-sediment habitats in 2009 at Packer Island identified 21 species of Crustacea, six species of Crinoidea (feather stars), 21 species of Mollusca and 22 species of Echinodermata. In a similar survey at Perpendicular Head, 16 species of Crustacea, five species of Mollusca and 20 species of Echinodermata were identified (Keesing *et al.* 2011).

Invertebrates which are particularly sought after by Bardi and Jawi people for food include *ngarrangg* (mud crabs), rock oysters, clams and trumpet shell. Bardi and Jawi people also use some invertebrates for bait.

Bardi, Jawi and Mayala Traditional Owners commercially harvest trochus for sale both locally and overseas. It is a small fishery based on a single species (*Trochus niloticus*). The fishery's low impact collection methods result in minimal impact on reef habitat and the wider ecosystem generally, and there is no bycatch in the fishery (Gaughan 2020) (see 9.4 section for more information).

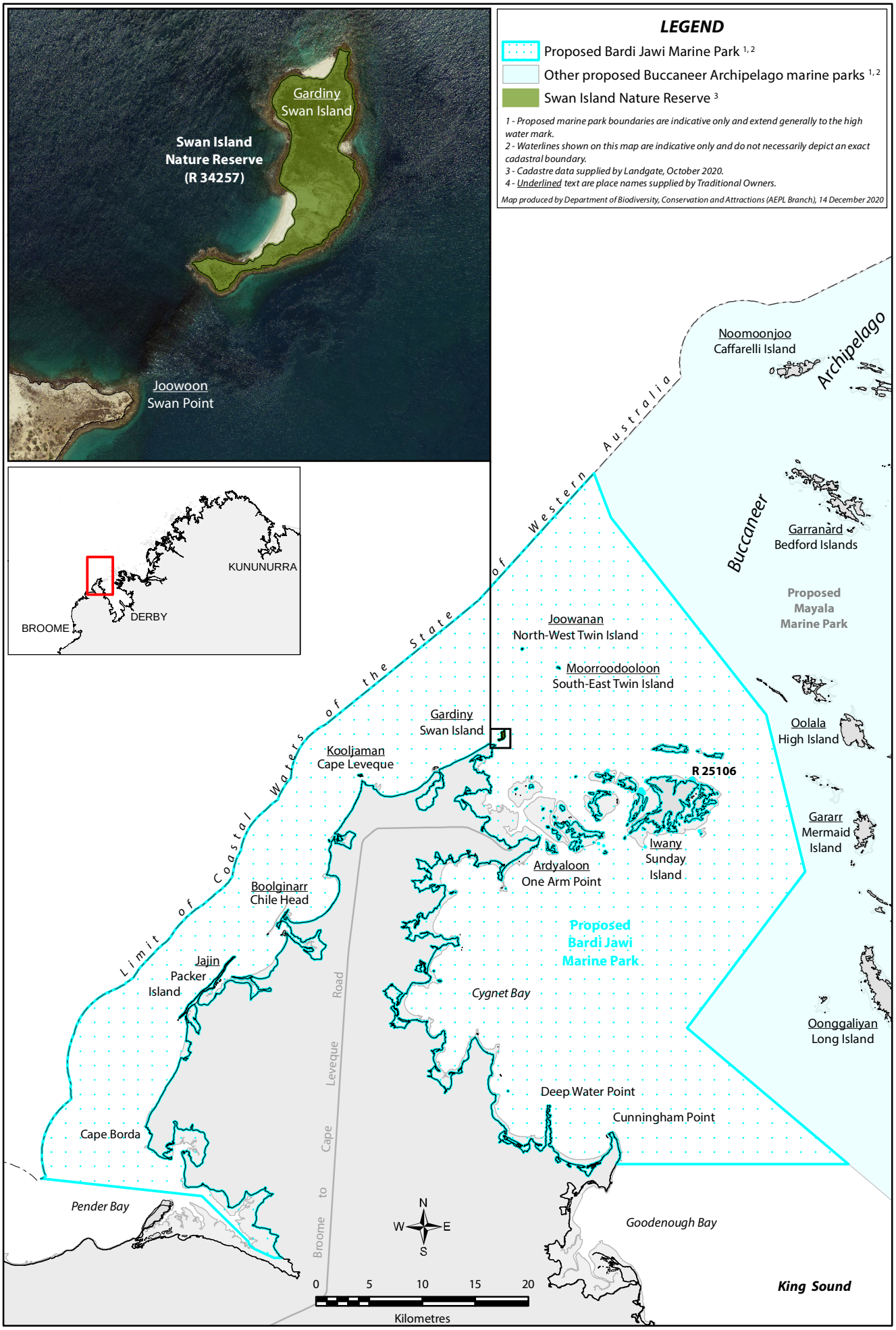
Under the FRM Act, DPIRD is responsible for the management of the recreational and commercial take of invertebrate species using strategies such as bag and size limits, closures and quotas.

Summary of management arrangements for invertebrates		
Current status	• The current condition of invertebrate populations in the marine park is unknown.	
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. • Degradation of critical habitat as a result of human activities (e.g. reef walking, development and aquaculture). • Climate change impacts such as changes in the intensity of cyclones and storms.	
Current major pressure	• Climate change (see section 11).	
Management objectives	• To ensure non-targeted invertebrate species are not significantly impacted by human activities within the proposed marine park. • To manage targeted invertebrate species for cultural and ecological sustainability.	
		Management program
Management strategies	Undertake and/or support research to characterise the diversity, abundance, natural variability, distribution and habitat requirements of invertebrates within the marine park and to understand the ecological role of targeted invertebrate species and the consequences of their removal [DPIRD for targeted species].	Research
	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
	Implement management strategies to mitigate or stop any impacts from human activities within the marine park which are negatively impacting the condition of invertebrates [DPIRD for targeted species].	Management intervention and visitor services
	Refer to additional strategies in sections 6.4, 9.3 and 9.4.	
Performance measure	Indicators to be developed but may include: • Community richness. • Target species abundance. • Introduced species abundance. • Community composition.	
Target	**Sanctuary Zones** • No significant decline in community richness, or target species abundance as a result of human activity. • No significant increase in the abundance of introduced species as a result of human activity. • No significant change in community composition as a result of human activity. **SPZ Cultural Protection and General Use Zones:** • No Significant decline in community richness as a result of human activity • No significant increase in the abundance of introduced species as a result of human activity. • No significant change in community composition as a result of human activity. • No change in target species abundance beyond ecologically sustainable levels as a result of human activity (to be determined in consultation with DPIRD).	
Reporting	3-5 years.	

8. Swan Island Nature Reserve

Gardiny (Swan Island) is an approximately 18ha reserve located to the north east of Swan Point on the tip of the Dampier Peninsula (Map 5). In 1976, the Swan Island Nature Reserve (Reserve 34257) was gazetted as a nesting place for the lesser frigatebird and reserved as a Class A nature reserve for the purpose of conservation of flora and fauna. Since its gazettal as a nature reserve, Bardi and Jawi people have held a long-term aspiration to reclaim management of the island. It is proposed that the Swan Island Nature Reserve will be jointly managed with Bardi and Jawi Traditional Owners and vested in the Commission. Despite being initially reserved to protect the breeding population of the lesser frigatebird, nesting no longer occurs on the island for unknow reasons. The nature reserve will continue to protect nesting turtles. The nature reserve will not be accessible to visitors.

Summary of management arrangements for Swan Island Nature Reserve		
Current status	• Assumed to be in a near natural state with the exception of the area which was cleared for the lighthouse and associated infrastructure.	
Existing and potential pressures	• Fire. • Introduced animals and plants. • Climate change.	
Current major pressure	• None identified.	
Management objectives	• To identify, protect and conserve the natural and cultural values of Swan Island.	
		Management program
Management strategies	Undertake or support baseline surveys of native plants, animals and ecological communities.	Research
	Ensure cultural heritage values, cultural knowledge and cultural laws and protocols inform land management.	Management Framework
	Rename the Swan Island Nature Reserve to its traditional name.	Management Framework
	Implement restrictions on visitor access as required for cultural or environmental reasons.	Management Framework
Performance measure	To be determined by the JMB.	
Target	To be determined by the JMB.	
Reporting	To be determined by the JMB.	



MAP 5: Swan Island Nature Reserve locality and tenure.

9. People on Country (social and economic values)

Strategic objective: To support and enhance a sustainable balance between community use, recreation, tourism and other commercial activities within the proposed marine park.

9.1 Bardi and Jawi economic development opportunities

This indicative joint management plan recognises Bardi and Jawi 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 proposed marine park will contribute to long-term employment for Bardi and Jawi Traditional Owners on-Country through the provision of jobs associated with the proposed marine park, including direct employment and fee for service work for management purposes.

Summary of management arrangements for Bardi and Jawi economic development opportunities		
Requirements	• High environmental and aesthetic quality.	
Management objectives	• To enable Bardi and Jawi Traditional Owners to realise livelihoods and achieve economic benefits from their Sea Country, consistent with the purpose of the proposed marine park.	
		Management program
Management strategies	Identify opportunities to provide a range of employment, business and career development opportunities that are culturally appropriate and relevant to the management of the proposed marine park.	Management Framework
	Work with stakeholders to facilitate Bardi and Jawi employment opportunities in industries such as the tourism industry.	Management Framework
	Wherever possible, seek to employ or train Bardi and Jawi people in roles relating to the management of the proposed marine park.	Management Framework
	Support BJNAC to attract funding to assist with management of the proposed marine park	Management Framework
	Encourage and support Bardi and Jawi people to develop and enhance business opportunities on Country.	Management Framework

9.2 Visitation, tourism and visitor safety

The proposed 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 proposed marine park, develop an appreciation of the cultural and ecological values, and support conservation outcomes, whilst creating economic benefits for the region.

The types of tourism operating in and immediately surrounding the proposed marine park includes coastal camps, cultural tours and the expedition cruise boat industry, which operates multiday tours between Broome and Wyndham. Tourists generally visit the region between April and October to enjoy the climate, wildlife, remote seascapes, cultural sites and fishing. Kimberley tourism has been growing in recent years with visitor numbers reaching an average record high of 593,000 in 2017 (KDC 2019). Approximately 33,000-36,000 visitors a year currently visit the Dampier Peninsula by road (KPP Business Development 2018).

Tourism at Kooljaman. Photo – Roanna Goater, DBCA.

Bardi and Jawi are keen to expand on the tourism potential of their Country to create jobs for Bardi and Jawi people on Country, whilst promoting cultural understanding and respect by immersing tourists in a cultural experience. The tourism potential of Bardi and Jawi Country will be further enhanced by the sealing of the Cape Leveque road. At least a 76 percent increase in visitors to the Dampier Peninsula in the first 10 years of the road being sealed is predicted (KPP Business Development 2018). Management arrangements proposed in this plan will help to fulfil the tourism potential of the area whilst ensuring the protection of the values which tourists seek. Once established, visitors to the proposed marine park will be encouraged to sign up to a voluntary marine park pass before visiting the proposed marine park. It is intended that this will educate visitors on culturally appropriate visitation, marine park values and management arrangements.

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 activities are managed in accordance with Parks and Wildlife Policy No. 18 – Recreation, tourism and visitor services. DBCA's *Commercial Operator Handbook* provides specific information for commercial businesses operating in a marine park or reserve.

9.2.1 Mooring and anchoring

With an expected increase in commercial and recreational vessels visiting and operating in the proposed 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, moorings 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 marine parks.

9.2.2 Visitor safety

Visitor risk management is an important focus for the department and Bardi and Jawi Traditional Owners. Bardi and Jawi Traditional Owners are concerned for the safety and wellbeing of visitors to their Country. The remote nature of the proposed marine park, combined with the large intertidal areas, strong tides and currents, occurrence of *linygurra* (estuarine crocodiles), extreme weather conditions including tropical cyclones, pose risks to visitors. This is particularly dangerous for visitors who may be inexperienced in, or unprepared for, such conditions.

As visitation to the proposed marine park is likely to increase during the life of the proposed 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.

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

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

9.2.3 Visitor access

There are a number of areas in Bardi and Jawi Country where access may be restricted to non-Traditional Owners using CALM Regulations for various reasons including protecting highly significant cultural areas such as lore 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 proposed sanctuary zones or the proposed special purpose zones (cultural protection). Access may be granted to non-Traditional Owners if authorisation is acquired.

Summary of management arrangements for visitation, tourism and visitor safety		
Current status	• High environmental and aesthetic quality (e.g. minimal debris, undeveloped marine and coastal areas). • Equitable access to natural values of the marine park. • Provision of areas free of human impacts for nature appreciation.	
Management objectives	• To 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 proposed marine park. • To maintain the cultural, ecological and social values of the proposed marine park that are important for nature-based cultural tourism.	
		Management program
Management strategies	Conduct a visitor survey to gather data on use of the proposed marine park including visitor numbers, locations and anchoring points to understand potential impacts and direct monitoring programs.	Management intervention and visitor services
	Develop a visitor plan, including development of a voluntary visitor pass, for the proposed marine park to plan for sustainable and culturally appropriate visitor usage.	Management intervention and visitor services
	Work with Bardi and Jawi people and commercial operators to promote culturally appropriate visitation and facilitate the establishment of high-quality commercial tourism operations that: • Increase visitor enjoyment and safety • Demonstrate a commitment to protect and promote the park's cultural, natural, recreation and tourism values • Ensure staff and passengers behave appropriately and respectfully at cultural sites • Conduct operations according to Parks and Wildlife Service policy and licence conditions [Tourism WA] • Foster community stewardship of the proposed marine park • Reduce impacts on sites • Enhance visitor's cultural experiences.	Education and interpretation
	Promote opportunities for sustainable recreation and tourism, including the provision of visitor facilities if required.	Management intervention and visitor services
	Ensure promotion and marketing of the proposed marine park is consistent with Bardi and Jawi's aspirations and cultural protocols.	Management intervention and visitor services
	Encourage the establishment of Bardi and Jawi owned commercial tourism businesses in the proposed marine park.	Management intervention and visitor services
	Assess the need for a mooring and anchoring plan in the proposed marine park and implement if required.	Management intervention and visitor services
	Maintain a quantitative and qualitative spatial database of human use in the proposed marine park.	Management intervention and visitor services
	Conduct periodic visitor risk assessment in the proposed marine park as required and mitigate identified issues [AMSA, DoT, DPIRD].	Management intervention and visitor services
	Educate proposed marine park users of the risks in the proposed marine park including, strong currents, cyclones and crocodiles.	Education and interpretation

	Work with relevant agencies to prepare for and respond to emergencies situations e.g. search and rescue. Work with relevant agencies and industry bodies to adapt and improve existing mapping programs or apps reflecting marine park risks and zoning. Undertake a review of shipping activity in the proposed marine park to determine the need for navigational measures such as compulsory pilotage, speed limit and/or designation of shipping routes [DoT].	Management Framework Education and interpretation Management framework
Performance measure	• Visitor satisfaction (e.g. experiences and expectations) as determined by the Visitor Monitoring Program. • The total number of serious visitor safety incidents per capita decreases compared to baseline levels.	
Target	• Visitor satisfaction is 85% or above within 5 years • Number of visitor safety incidents reported to DBCA and/or the JMB.	
Reporting	To be determined by JMB.	

9.3 Recreational fishing

Recreational fishing is highly valued by the Kimberley community and is experiencing significant growth in the region driven by increased tourism and recognition of the quality of the regions' sport and game fishing. *Birrinyan* (queenfish), *jirral* and *yawilil* (trevally), *joorloo* (spanish flag), and *biindarral* (coral trout) are the main targeted fish on the western coast of the Dampier Peninsula. The mangrove lined creeks and channels in the proposed marine park also provide excellent fishing for threadfin salmon, *iingalan* (barramundi*, Lates calcarifer*), and *maarrar*n (mangrove jack).

The potential pressures associated with recreational fishing in the proposed 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 Bardi and Jawi people welcome culturally appropriate recreational fishing, they have concerns about the potential impacts of recreational fishing activity in the proposed marine park on their ability to continue to access healthy fish stocks for customary use. Recreational fishing in the proposed 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.

The primary role of marine park management in relation to recreational fishing is to conserve fish stocks and maintain the ecological values that support target *aarli* (fish) and invertebrate populations and ensure that recreational fishing activities in the marine park are sustainable and culturally appropriate. Recreational fishing will continue to be managed under the FRM Act within an ecosystem-based fisheries management approach. The JMB will work closely with DPIRD to ensure appropriate management arrangements for recreational fishing are in place. Zones which prohibit extractive activities such as recreational fishing will be used to ensure ecologically important and representative areas of ecosystems are protected from a variety of pressures including recreational fishing.

Summary of management arrangements for recreational fishing		
Requirements	• High water quality. • Maintenance of critical habitats for recreationally targeted *aarli* (fish) species. • Maintenance of recreationally targeted *aarli* (fish) stocks. • Access to suitable and culturally appropriate recreational fishing areas within the proposed marine park.	
Management objectives	• To maintain the ecological values of the proposed marine park that support recreational fishing. • To ensure that, in collaboration with the community and DPIRD, recreational fishing is managed in a manner consistent with maintaining the marine park's cultural and ecological values while providing for social uses and enjoyment. • To work collaboratively with agencies, stakeholders and the community to maintain and promote safe and enjoyable recreational fishing opportunities in the proposed marine park.	
		Management program
Management strategies	Educate recreational fishers on the zoning scheme, fisheries regulations and any restrictions that may apply to their activities in the marine park [DPIRD].	Education and interpretation
	Investigate whether the take of recreationally targeted species is sustainable in the marine park and undertake adaptive management actions if required [DPIRD].	Research
	Conduct research to determine if ecosystem effects from recreational fishing occur in the marine park and undertake adaptive management actions if required [DPIRD].	Research
	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
	Work with BJNAC and elders to develop, communicate and promote a Bardi and Jawi-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
	Engage with recreational fishers to seek information on management issues in the proposed marine park and seek feedback on management responses.	Management intervention and visitor services.

9.4 Commercial fishing

Commercial fisheries that operate within the boundaries of the proposed marine park include the Kimberley Gillnet and Barramundi Managed Fishery, which operates in the nearshore and estuarine zone of the proposed marine park; a small Trochus Fishery run by Bardi and Jawi and Mayala 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 proposed marine park included the Northern Demersal Scalefish Fishery, the Marine Aquarium Fishery, the Specimen Shell Managed Fishery and the Beche de mer Fishery. The Joint Authority Northern Shark Fishery has been inactive since 2008 and the whole of the proposed marine park lies within a permanent prawn and fish trawl closure area.

When conducted sustainably, commercial fishing has social and economic benefits. 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 department and joint management partners will work with DPIRD to ensure the continued sustainability of commercial fishing practices in the proposed 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. • Maintenance of critical habitats for commercially targeted *aarli* (fish) species. • Maintenance of commercially targeted *aarli* (fish) stocks. • 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 proposed marine park which are important to the continuation of commercial fishing industries. • To ensure that, in collaboration with the industry and DPIRD, commercial fishing is managed in a manner that is consisted with maintaining the values of the proposed marine park.	
		Management program
Management strategies	Work with commercial fishers, through peak stakeholder bodies, to ensure operations are conducted in a culturally sensitive manner [DPIRD].	Management Framework
	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
	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
	Investigate the extent and significance of interactions between commercial fishing and marine mammals and other protected species and address as required [DPIRD].	Research
	Ensure Bardi and Jawi are kept informed and where possible involved in the monitoring and management measures for commercial fish stocks in the marine park [DPIRD].	Monitoring

9.5 Aquaculture

Two aquaculture leases occur in Bardi and Jawi Country (Map 6). The Ardyaloon hatchery was established to address declining stocks of *Trochus niloticus* and to create a commercially sustainable industry harvesting the shell. The hatchery has been successful in restocking juvenile trochus to support community members commercially fishing for the species and for sale to the Australian aquarium industry (Ardyaloon Hatchery 2020).

DPIRD will continue to manage aquaculture in the proposed marine park. Aquaculture will be permitted in general use zones of the proposed marine park and managed under the FRM Act. The primary role of management in relation to aquaculture in the proposed 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 proposed marine park upon which the industry depends.

Summary of management arrangements for aquaculture		
Requirements	• High water quality. • Access to suitable and culturally appropriate locations within the proposed marine park, subject to environmental assessment where consistent with the objectives of the proposed marine park.	
Management objectives	• To maintain the ecological values of the proposed marine park which are important to the continuation of a viable aquaculture industry. • 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 proposed marine park.	
		Management program
Management strategies	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
	Work with the Aquaculture Council of Western Australia, DPIRD and other relevant stakeholders to ensure environmental best practice aquaculture management is applied in the proposed marine park.	Management Framework
	Work with aquaculture companies and DPIRD to help them conduct operations in a culturally sensitive manner.	Management Framework

9.6 Pearling

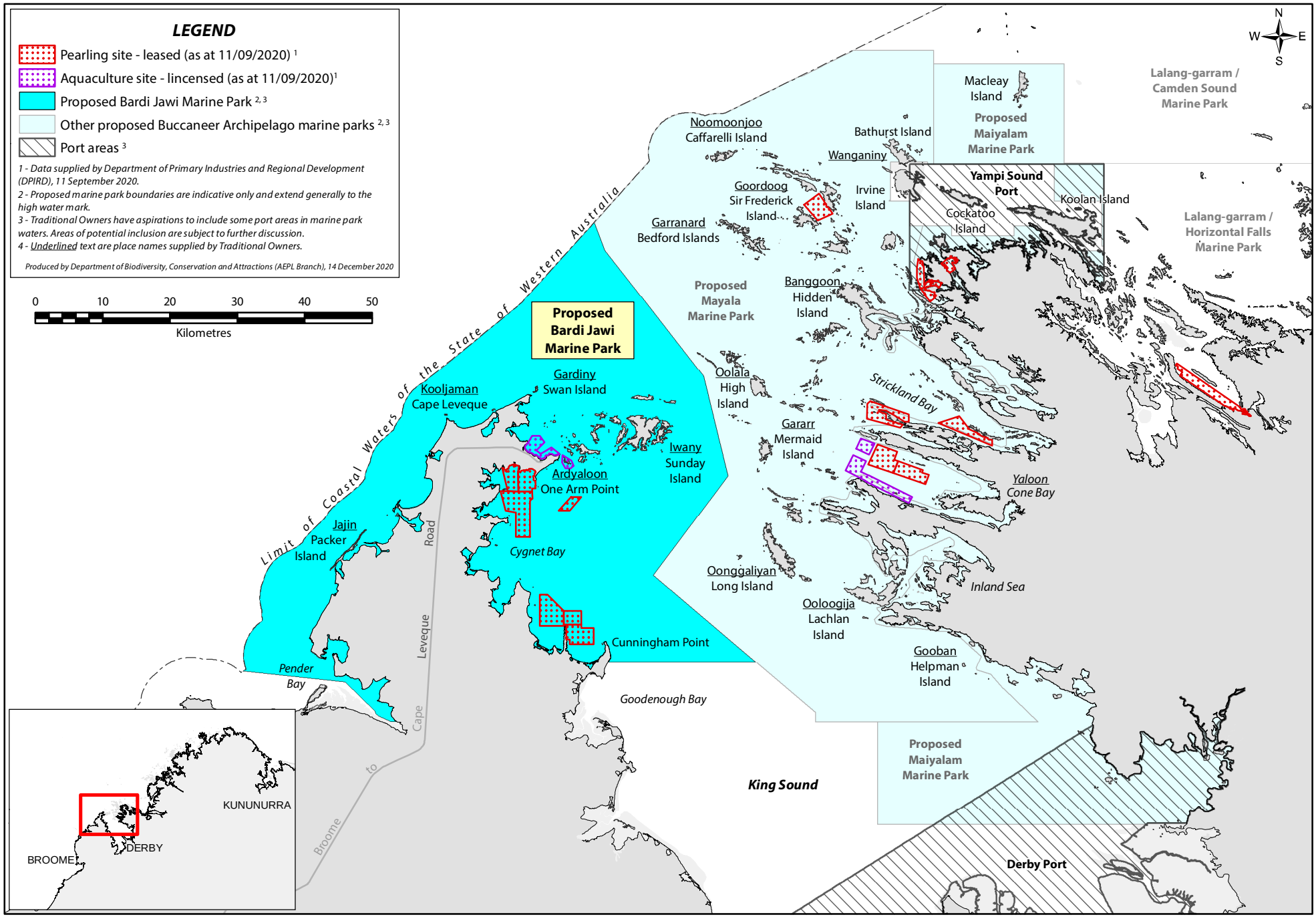
The Kimberley is one of the most important regions for pearl oyster production due to the remote and pristine conditions of the area, and pearling has long been an important industry for the Kimberley. At its peak, the pearling industry was one of the most valuable aquaculture sectors in northern Australia, generating $200 million revenue per year. Aboriginal people along the west Kimberley coast, including Bardi and Jawi people, collected pearl shells for use in rituals, ceremonies and for trade long before the arrival of Europeans. This trade originated from the north-west Kimberley and spread across the Australian continent as far as Yalata in South Australia (MIAC RNTBC 2019). Shell was collected for buttons then trade moved to culturing pearls.

There are six pearl farms and leases within the proposed Bardi Jawi Marine Park (Map 6). Maintaining the excellent environmental conditions such as the high-water quality in the proposed marine park will be critical to the success of the pearling and aquaculture industries. Research into the environmental impacts of pearling in the Kimberley 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).

The primary role of management in relation to pearling in the proposed marine park will be to work with the pearling industry to ensure activities are culturally, socially and ecologically sustainable and appropriate, and to help maintain the environmental conditions of the proposed marine park upon which the industry depends. Pearling activities including 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 proposed 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.

Summary of management arrangements for pearling		
Requirements	• High water quality • Access to suitable and culturally appropriate locations within the proposed marine park, subject to environmental assessment (including access between leases for pearl industry vessels) and where consistent with the objectives of the proposed marine park.	
Management objectives	• To maintain the ecological values of the proposed marine park which are important to the continuation of a viable pearling industry. • 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 proposed marine park.	
		Management program
Management strategies	Ensure that pearling authorisations are consistent with the management plan and include appropriate monitoring programs, lighting, navigational marking and site utilisation conditions [DPIRD, DoT].	Management Framework
	Work with the Pearl Producers Association, DPIRD and other relevant stakeholders to ensure environmental best practice management is applied in the proposed marine park.	Management Framework
	Work with pearling companies and DPIRD to help them conduct operations in a culturally sensitive manner.	Management Framework

MAP 6: Pearling and aquaculture sites within and adjacent to the proposed Bardi Jawi Marine Park.



9.7 Maritime heritage

At least one shipwreck is known in the waters of the proposed marine park, however there are likely to be more. Twenty six vessels have been reported lost in the King Sound region of which only two have been identified. The SS *Karrakatta*, a 1251 tonne steamship, was wrecked near Swan Point in 1901. It was carrying a cargo of mail, wool and timber, as well as passengers on its regular route between Western Australian and Singapore when it struck an uncharted rock. All aboard were saved but the wreck was never recovered due to its hazardous position and rapid deterioration caused by the large tidal currents (WA Museum 2020).

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. • To increase awareness of maritime heritage within the local community and among visitors.	
		Management program
Management strategies	Identify sites with maritime heritage value within the proposed marine park and develop and implement plans of management for identified sites [WAM, Heritage Council of WA].	Research
	Provide interpretive information to enhance visitor enjoyment of and, where appropriate, to mitigate or stop impacts on maritime heritage values in the proposed marine park.	Education and interpretation

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 proposed 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 and 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 JMB for advice.

9.8.2 Mining

There are no mining tenements in the proposed Bardi Jawi Marine Park. The establishment of the proposed marine park will have implications for approvals for resource exploration or development activities within any future mining tenements directly intersecting or overlapping the marine park boundary.

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 proposed mining (including exploration) activities within the marine park boundary. The granting of a mining lease or general-purpose lease will require the approval of both Houses of Parliament. Areas within and adjacent to the proposed marine park may be affected by proposed zoning arrangements. Any mining related activities within the marine park boundary, including exploration, will require approvals pursuant to Section 24A of the *Mining Act 1978.*

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 proposed special purpose zones (cultural protection) in the proposed 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 Regulation 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 *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

9.8.3 Seismic testing

Seismic testing is used to explore for oil and gas. Marine seismic surveys can increase noise levels while they are in progress, and have the potential to impact marine life by disrupting communication, navigation and eating habits, as well as damaging fish with air bladders, destroying eggs and larvae, and causing fish and other marine species such as whales to temporarily migrate away from the affected area. Any seismic surveys in the proposed 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 proposed activities.	
Management objectives	• To ensure industry, development and associated activities are managed in a manner consistent with the objectives of the proposed marine park.	
		Management program
Management strategies	Provide formal advice to the Commission and EPA for the environmental assessment of proposed mineral, petroleum and pipeline activities in and adjacent to the marine park. [DMIRS, DPIRD, Office of the Environmental Protection Authority (OEPA)].	Management Framework
	Provide advice on the assessment, setting of conditions, and monitoring and reporting requirements for mineral, petroleum and pipeline activities consistent with management objectives and management targets for values of the marine park. [DMIRS, OEPA].	Management Framework
	Consider the quality of the remote seascapes of the marine park in site planning and assessment of development proposals.	Management Framework

10. Understanding Country

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

10.1 Research

Developing an increased understanding of the cultural, ecological and social values of the proposed marine park will be critical to effective management. The joint management arrangements for the proposed 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 provides social, economic, cultural and environmental benefits for all (Austin *et al.* 2019). 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 proposed marine park informed by traditional ecological knowledge will help to inform management practices and decisions and ensure the proposed marine park is effectively managed. A comprehensive research program should be designed to fill knowledge gaps relevant to management.

External organisations carrying out research within the proposed marine park will require a licence to be issued so the department can:

- 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.

Permits may also be required from DPIRD if research is undertaken on *aarli* (fish) as defined in the FRM Act.

In culturally sensitive areas, Bardi and Jawi may deem it appropriate for Bardi and Jawi advisers to accompany researchers whilst carrying out their work. Findings from the research should be made available in full to BJNAC 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 proposed marine park are detailed in sections 6-9.

Summary of management arrangements for research		
Requirements	• Suitable access to the marine park for cultural, ecological and social research. • Access to representative sites in areas free of human impacts for scientific reference sites and in areas with human activities for impact reference sites.	
Management objectives	• To obtain increased understanding of the biodiversity, biocultural and cultural values and key ecological process and socio-economic uses within the proposed marine park to inform management. • To promote research that improves knowledge of the values of the proposed marine park to inform management decisions. • To maximise the integration of conservation science with traditional ecological knowledge in all aspects of research in the proposed marine park.	
		Management program
Management strategies	Prepare a research program which considers the research strategies and priorities listed in this indicative joint management plan and/or emerging priorities nominated by the JMB [DPIRD].	Research
	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.	Research
	Develop scientific and research protocols and partnership agreement frameworks through the JMB that support genuine scientific and research partnerships with MIAC.	Research
	Identify and communicate high priority research projects which address key knowledge gaps to appropriate external organisations and funding bodies.	Research
	Facilitate or support research in the proposed marine park, including projects by external organisations, by providing assistance where possible [DPIRD].	Research
	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 BJNAC [DPIRD].	Research
	Liaise with industry, other government agencies and non-government organisations to access information held on ecological research in the area.	Research
	Ensure research findings by external organisations are shared with BJNAC and the department.	Research
	Encourage involvement of Bardi and Jawi people in research projects where possible.	Research
	Where possible, support two-way science programs in schools.	Research
Performance measure	• Prioritised research plans have been developed and approved by the JMB and research activities, as detailed in the plan, have been implemented.	
Target	• Preparation and implementation of a research plan. • Number of current and completed research projects.	
Reporting	To be determined.	

10.2 Monitoring

Long-term monitoring of the conditions of the values of the marine environment and the pressures that impact the condition of 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, 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.

Once established, the proposed Bardi Jawi Marine Park will be included into the Marine Monitoring Program. In addition to DBCA and Bardi and Jawi Traditional Owners, other organisations that may be involved in the monitoring of the proposed marine park include DPIRD for fisheries related aspects, the North Australian Indigenous Land and Sea Management Alliance, CSIRO, Australian Institute of Marine Science, universities and community groups where appropriate.

Monitoring of the proposed Bardi Jawi 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 proposed 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. • Access to representative sites in areas free of human impacts for scientific reference sites and in areas with human activities for impact reference sites.	
Management objectives	• To monitor key cultural, ecological and social values in the proposed marine park within a 'condition-pressure-management response' framework, to provide a basis to assess, adapt and improve management.	
		Management program
Management strategies	Prepare a monitoring program which considers the strategies and priorities listed in this indicative joint management plan and/or emerging priorities nominated by the JMB.	Monitoring
	Investigate opportunities and develop a process to integrate traditional ecological knowledge with monitoring, where appropriate.	Monitoring

	Facilitate knowledge transfer and uptake of monitoring findings to adaptive marine park management, planning and policy, and where relevant report on conservation achievements and challenges [DPIRD].	Monitoring
	Provide necessary information and support for assessments of management plan implementation by the Commission [DPIRD].	Monitoring
	Liaise with industry, other government agencies and non-government organisations to access information held on ecological monitoring in the area.	Monitoring
	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. ISWAG/KISSP protocols are supported.	Monitoring
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 a monitoring plan. • Length of time-series monitoring data. • Number of values, including KPIs, currently being monitored.	
Reporting	To be determined.	

Bardi Jawi Rangers monitoring *goorli* (turtle). Photo – Bardi Jawi Rangers.

11. Climate Change

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 (IPCC 2019). The ecological impact of climate change effects including increased temperatures and frequency of episodic events such as heatwaves can range from species shifting their geographic ranges, seasonal activities and migration patterns to 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 on.

Bardi and Jawi Traditional Owners are particularly concerned about the potential effects of climate change on g*oorlil* (turtles), *odorr* (dugongs), *aarli* (fish), *marnany*, *oola* (traditional water places) and significant sites. Bardi and Jawi people have always observed seasonal indicators to tell them what is happening in the natural environment, when to hunt and for what species. Bardi and Jawi are concerned about how climate change may impact the health of Sea Country, the application of traditional knowledge and their cultural sites.

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 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 increase ecosystem health, thereby increasing resilience to external pressures such as climate change. Although, marine protected areas can contribute to reducing the global effects of climate change, they are not impervious to the effects of climate change themselves and it 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 proposed Bardi Jawi Marine Park, but climate change is considered the greatest emerging pressure on the health of the ecological, cultural and social values. Sea surface temperature in the Kimberley is predicted to rise by 2.2-4.0°C by 2030, which is likely to exacerbate heat stress and threaten the persistence of intertidal communities (Kendrick, *et al*. 2018). Climate change impacts are already being recorded in the Kimberley region and the frequency of such events is predicted to increase. A bleaching event of *marrgoorr* (corals) in the nearshore region of the proposed marine park was recorded in the summer of 2016 (McCulloch *et al.* 2017) followed by some more incidents of bleaching in early 2020 (DBCA unpublished).

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 proposed marine park will focus on:

- increasing knowledge and understanding of the effects of climate change on the values of the proposed marine park;

- monitoring the effects of climate change on the values and pressures of the proposed 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 the effects of climate change on the values of the proposed marine park and increase the resilience of values to climate change.	
		Management program
Management strategies	Support or provide necessary information to contribute to climate forecast models to help predict the impacts of climate change on the values of the proposed marine park.	Research
	Educate marine park users of impacts of climate change on marine park values and encourage them to reduce their carbon emissions where possible.	Education and interpretation
	Support international and national climate change initiatives where relevant for marine park research or adaptive management.	Management Framework
	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
	Assess areas, habitats, species etc. which are most at risk to the effects of climate change and increase their resilience by reducing other pressures where possible.	Research
	Ensure that impacts of climate change are considered in monitoring programs of the KPIs for the proposed marine park.	Monitoring

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 proposed 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 proposed marine park in a collaborative setting.

Summary of management arrangements for administration and governance		
Management objectives	• To ensure the proposed 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
Management strategies	Implement all legal provisions necessary to establish and jointly manage the proposed marine park including execution of the JMA, gazettal of the zoning scheme under the CALM Act and gazettal of orders under the FRM Act.	Management framework
	Promote culturally inclusive hiring processes by inviting BJNAC nominated JMB representative/s to participate in hiring processes for positions related to the proposed marine park.	Management framework
	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
	Work with the BJNAC and Bardi and Jawi Traditional Owners to develop charter tour operator licence conditions to manage charter fishing access in special purpose zones (cultural protection) to ensure the activity is compatible with the purpose of protecting the land and waters to the culture and heritage of Traditional Owners.	Management framework
	Develop materials to aid communication of the management plan to the Bardi and Jawi community and support BJNAC and JMB in the implementation of the plan.	Management framework
	Develop and maintain appropriate staff structures, funding, operational equipment, including vessels, and infrastructure to adequately implement the joint management plan and JMA.	Management framework
	Ensure the objectives detailed in the JMA are applied to all management activities in the marine park.	Management framework

	Develop and implement a monitoring and evaluation framework to assess joint management effectiveness for the proposed marine park.	Management framework
	Work with neighbouring land and water managers to reduce impacts on the values of the proposed marine park.	Management framework
	Develop collaborative operational plans for implementation of relevant strategies in the plan [DPIRD].	Management framework
	Pursue external funding opportunities to implement strategies in the joint management plan.	Management framework
	Provide licences and permits with appropriate conditions where required [DPIRD, Commission].	Management framework
	Undertake routine inspections and maintenance of department managed infrastructure in the marine park.	Management framework
	Facilitate regional annual meetings between the JMBs of Bardi, Jawi, Mayala and Lalang-gaddam marine park.	Management framework
	Develop and implement a monitoring and evaluation framework to assess joint management governance.	Management framework
	Continue to 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

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 proposed 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 provide economic, recreational and cultural benefits for local communities, as well as environmental benefits. Where possible and appropriate, the development of the proposed 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 proposed zoning scheme complements other existing and proposed marine parks in the Kimberley region and was designed in collaboration with the proposed Maiyalam Marine Park and proposed Mayala Marine Park (Map 7).

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

The zoning scheme for the Proposed Bardi Jawi Marine Park is shown in Map 8 and a summary of the activities permitted in each zone is presented in Table 1. The zoning scheme comprises:

- 10 special purpose zones (cultural protection) covering approximately 54,000 hectares or 26% of the park
- 3 sanctuary zones covering approximately 43,000 hectares or 21% of the park
- general use in the remainder of the park, covering approximately 107,000 hectares or 53% of the park.

The designation of special purpose zones (cultural protection) is dependent on the enactment of amendments to the CALM Act to update the purpose of marine parks 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.

Fish trap. Photo – Ian Meechan

LEGEND

Port area - Marine and Harbours Act [1]

Proposed marine parks in the Buccaneer Archipelago [1, 2, 3, 4, 5]

Proposed marine park boundaries

Proposed sanctuary zone

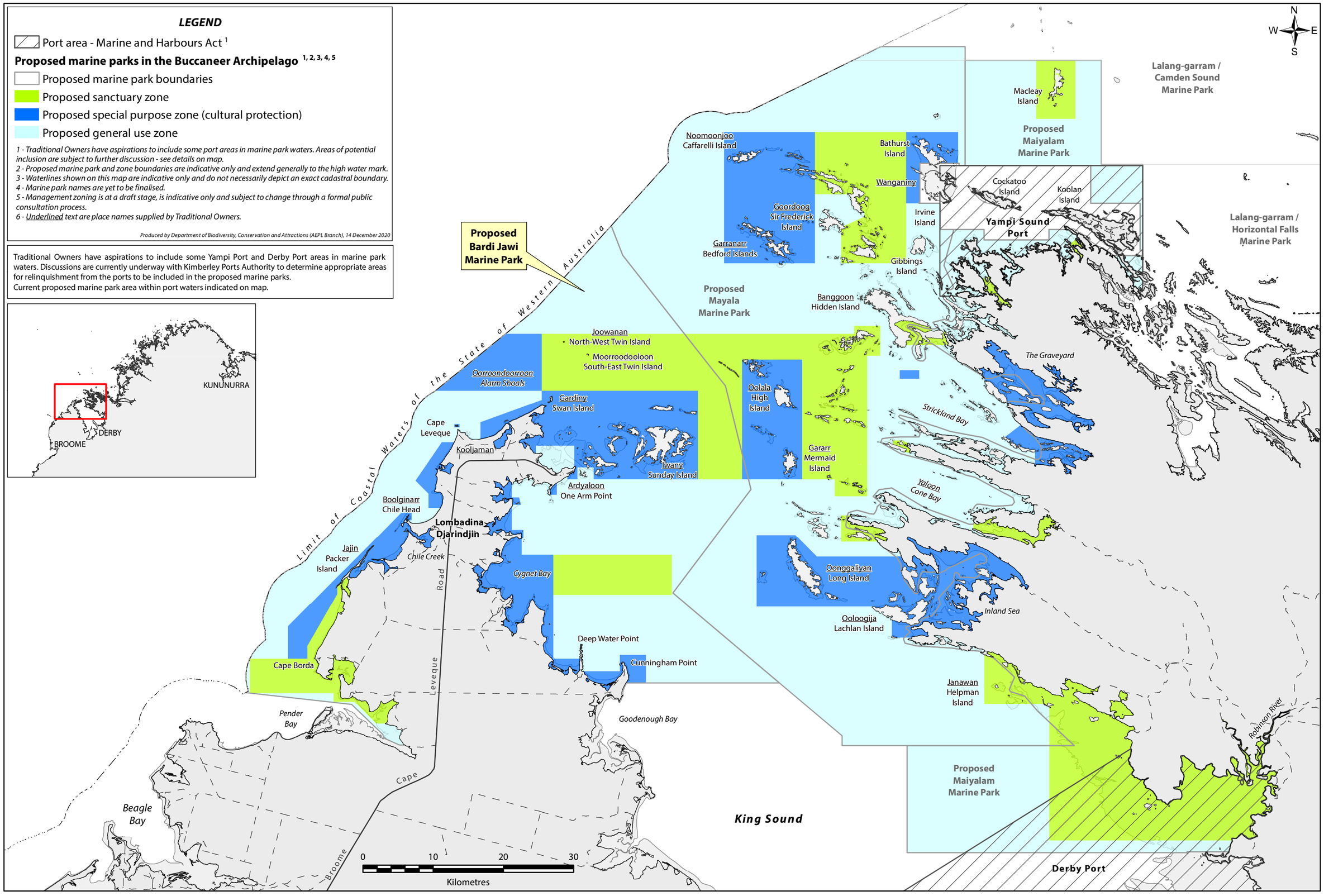
Proposed special purpose zone (cultural protection)

Proposed general use zone

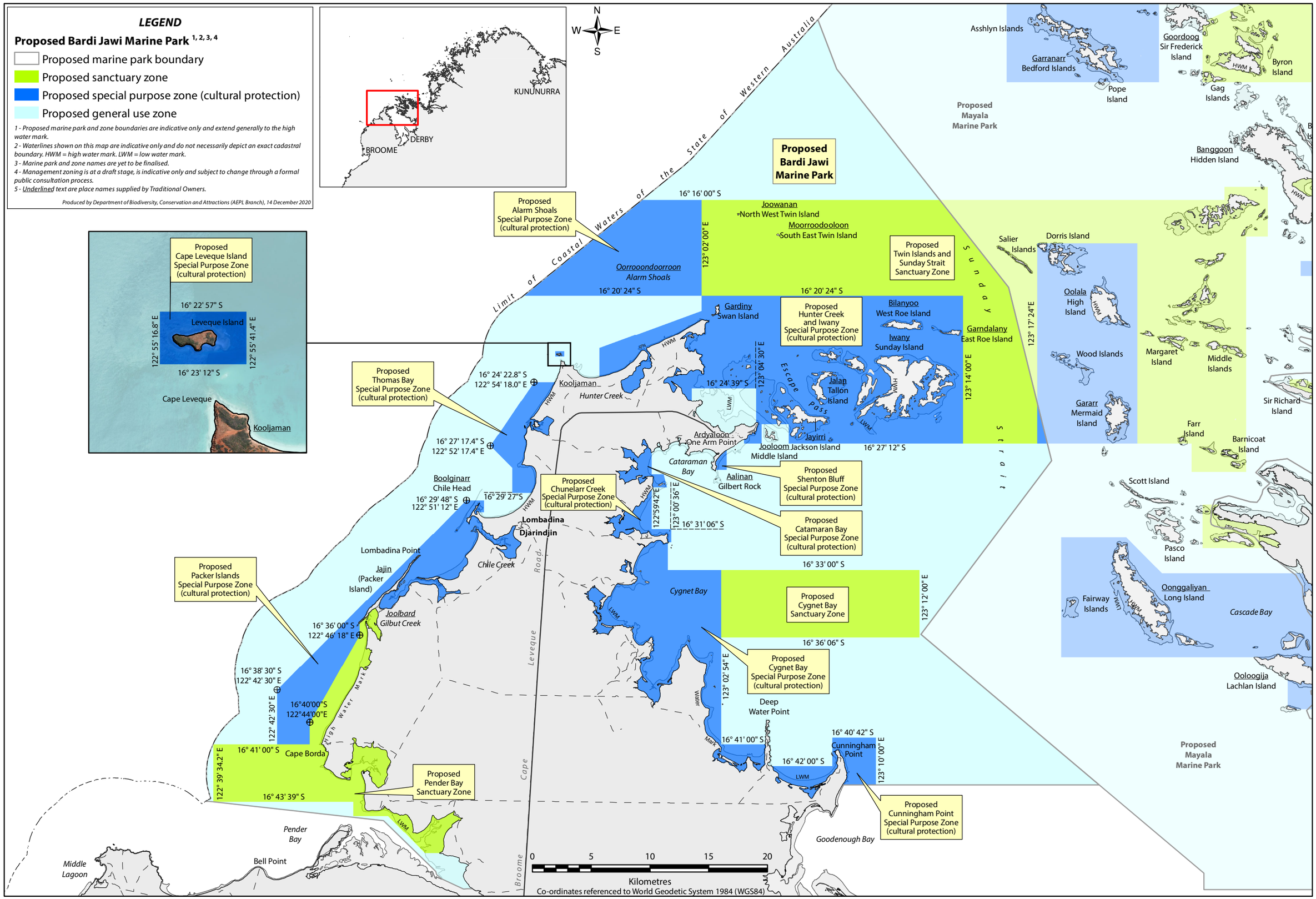
1 - Traditional Owners have aspirations to include some port areas in marine park waters. Areas of potential inclusion are subject to further discussion - see details on map.
2 - Proposed marine park and zone boundaries are indicative only and extend generally to the high water mark.
3 - Waterlines shown on this map are indicative only and do not necessarily depict an exact cadastral boundary.
4 - Marine park names are yet to be finalised.
5 - Management zoning is at a draft stage, is indicative only and subject to change through a formal public consultation process.
6 - Underlined text are place names supplied by Traditional Owners.

Produced by Department of Biodiversity, Conservation and Attractions (AEPL Branch), 14 December 2020

Traditional Owners have aspirations to include some Yampi Port and Derby Port areas in marine park waters. Discussions are currently underway with Kimberley Ports Authority to determine appropriate areas for relinquishment from the ports to be included in the proposed marine parks.
Current proposed marine park area within port waters indicated on map.



MAP 7: Overview map of proposed zoning for the proposed marine parks in the Buccaneer Archipelago.



MAP 8: Proposed zoning for the proposed Bardi Jawi Marine Park.

12.2.2 Special purpose zones (cultural protection)

The proposed special purpose zones (cultural protection) will play an important role in protecting the value of Bardi and Jawi Country to the culture and heritage of Bardi and Jawi 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 Bardi and Jawi people. These areas may contain tangible values such as *baarngaboor* (seasonal camping areas), areas important for customary food and other resources and culturally significant features such as 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 Bardi and Jawi 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.

Bardi and Jawi, people have used, relied on, enjoyed and protected Country over thousands of years and continue to do so today. The proposed 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 proposed marine park, customary activities are more likely to be carried out in the proposed special purpose zones (cultural protection) compared to other areas in the proposed marine park.

The areas which are proposed to be protected in Bardi and Jawi Country as special purpose zones (cultural protection) are regularly used by Traditional Owners, including for customary fishing and hunting. Many of these areas are adjacent to outstations or near communities and the management arrangements for the proposed marine park complement current land management arrangements.

As the Traditional Owners, custodians of Country and custodians of knowledge of Country Bardi and Jawi people have provided advice on the known or potential impacts from activities so that compatibility with these proposed special purpose zones (cultural protection) 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 and sea to the culture and heritage of Bardi and Jawi 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 Bardi and Jawi 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 proposed marine park are asked to

respect Traditional Owners' requests for privacy while they are undertaking customary activities in these proposed 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 Bardi and Jawi 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.

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. Traditional Owners consider that recreational fishing undertaken as part of a fishing tour is compatible, provided the activity is subject to a CALM Act licence where conditions can be applied to regulate the activity. Licencing will ensure that charter tour operations, including charter fishing, are carried out in a culturally appropriate manner and that operators and customers follow cultural protocols.

Proposed Packer Island Special Purpose Zone (Cultural Protection)

The conservation purpose of the proposed Packer Island Special Purpose Zone (Cultural Protection) will be to protect the value of the land[2] and waters to the culture and heritage of Bardi and Jawi people. This zone recognises the high cultural value and continuing use of the area by Bardi and Jawi people, particularly people who are in the *Ollongon* clan. The zone will protect the rocky reefs and mangrove creeks in the Canning Bioregion which are highly valued for customary fishing and hunting purposes and support a wide variety of culturally significant marine fauna including *goorlil* (turtles), *aarli* (fish), *joorroo* (sharks) and *barnamb* (rays).

Proposed Thomas Bay Special Purpose Zone (Cultural Protection)

The conservation purpose of the proposed Thomas Bay Special Purpose Zone (Cultural Protection) will be to protect the value of the land and waters to the culture and heritage of Bardi and Jawi people. This zone recognises the high cultural value of the area and high use of the area for customary activities by Bardi and Jawi people, particularly people who are in the *Gullarrgon* clan. The zone will protect the rocky reefs and mangrove creeks in the Canning Bioregion which are highly valued for customary fishing and hunting purposes. Visitors to the area are asked to respect the Traditional Owners request for privacy in this area, particularly when they are undertaking customary activities. Fishing is a major feature of Bardi and Jawi lifestyle, undertaken by young and old, and the protected and clear waters of the creek system in this zone is regularly used by the local families who come together to spend time on Country and pass down knowledge to the younger generation in a safe environment. This zone will protect culturally and ecologically significant marine fauna including *bayalbarr* (dolphins) *goorlil* (turtles), *aarli* (fish), *joorroo* (sharks) and *barnamb* (rays).

Proposed Cape Leveque Island Special Purpose Zone (Cultural Protection)

The conservation purpose of the proposed Cape Leveque Island Special Purpose Zone (Cultural Protection) will be to protect the value of the land and waters to the culture and heritage of Bardi

[2] Land as defined in the CALM Act.

and Jawi people, particularly people who are in the *Gullarrgon* clan. This zone recognises the cultural importance of Cape Leveque Island, which includes the intertidal area surrounding the island. Cape Leveque Island is a culturally significant site and should not be visited. Walking on the intertidal reef surrounding the island is not culturally appropriate and regulations are proposed to be used to prohibit such activity. Additionally to it being culturally inappropriate to walk on the reef from Kooljaman to Cape Leveque Island, the large tidal range and strong currents makes it a safety risk. Bardi and Jawi people understand this area is valued for recreational fishing, and this can still be carried out on the reefs surrounding the island in the adjacent proposed general use zone.

Cape Leveque Island. Photo – Roanna Goater, DBCA.

Proposed Alarm Shoals Special Purpose Zone (Cultural Protection)

The conservation purpose of the proposed Alarm Shoals Special Purpose Zone (Cultural Protection) is to protect the value of the land and waters to the culture and heritage of Bardi and Jawi people. This area of Country has such high cultural significance that, in alignment with cultural protocols, only Bardi and Jawi men should visit this area.

Proposed Hunter Creek and Iwany (Sunday Island) Special Purpose Zone (Cultural Protection)

The conservation purpose of the proposed Hunter Creek and *Iwany* (Sunday Island) Special Purpose Zone (Cultural Protection) will be to protect the value of the land and waters to the culture and heritage of Bardi and Jawi people. This zone recognises the continuing use of the area for customary activities by Bardi and Jawi people, particularly those in the *Gullarrgon, Ardiol, Iwanyiand Inalabulu* and *Jawi* clans. The zone extends from Kooljaman beach to East Roe Island and includes the Sea Country surrounding *Jayirri* (Jackson Island), *Jalan* (Tallon Island) and *Iwany* which contain important *baarngaboor* (seasonal camping areas) and cultural sites and are regularly used by Bardi and Jawi people. This zone will protect important biocultural values including mangrove lined creeks, coral reefs, seagrass beds, seaweeds and sandy lagoons which support populations of culturally important fauna including *goorlil* (turtles), *odorr* (dugongs) and a wide diversity of *aarli* (fish). The reefs which will be protected surrounding *Jalan* are ecologically important and geomorphologically important. This zone will protect the seagrass meadows surrounding *Iwany* and *Jalan* which are rich in both species and meadow size.

Iwany (Sunday) Island. Photo – Roanna Goater, DBCA.

Proposed Shenton Bluff Special Purpose Zone (Cultural Protection)

The conservation purpose of the proposed Shenton Bluff Special Purpose Zone (Cultural Protection) will be to protect the value of the land and waters to the culture and heritage of Bardi and Jawi people. This is a highly significant cultural site in the *Banararr* clan area.

Proposed Catamaran Bay Special Purpose Zone (Cultural Protection)

The conservation purpose of the proposed Catamaran Bay Special Purpose Zone (Cultural Protection) will be to protect culturally important mangrove creek areas in the King Sound Bioregion. This area is regularly used by Bardi and Jawi Traditional Owners who regularly carry out customary activities here, particularly those in the *Banararr* clan, including fishing and collecting oysters.This zone will protect many significant cultural sites, including fish traps. Bardi and Jawi people know the mangrove creeks in this area provide important nursery areas for *aarli* (fish) and wish to protect these creeks for future generations.

Mangroves in the proposed Catamaran Bay Special Purpose Zone. Photo – Roanna Goater, DBCA.

Proposed Chunelarr Creek Special Purpose Zone (Cultural Protection)

The conservation purpose of the proposed Chunelarr Creek Special Purpose Zone (Cultural Protection) will be to protect the value of the land and waters to the culture and heritage of Bardi and Jawi people. This area is regularly used by Bardi and Jawi Traditional Owners, particularly the clan, who regularly carry out customary activities here including fishing, collecting oysters and hunting for green turtles and *odorr* (dugong). Significant cultural sites which will also be protected in this zone include a fish trap. This proposed zone will provide protection for creek, mangrove and saltmarsh communities in the King Sound Bioregion which are ecologically and culturally important. This zone will also contribute to the protection of snubfin and bottlenose *bayalbarr* (dolphins) which frequently forage in the area. Bardi and Jawi people know the creeks in this area provide important nursery areas for *aarli* (fish) and wish to protect these creeks for future generations.

Proposed Cygnet Bay Special Purpose Zone (Cultural Protection)

The conservation purpose of the proposed Cygnet Bay Special Purpose Zone (Cultural Protection) will be to protect the value of the land and waters to the culture and heritage of Bardi and Jawi people. This area is regularly used by Bardi and Jawi Traditional Owners, particularly the *Baniol* clan, who regularly carry out customary activities here including fishing and collecting oysters. This zone will protect significant cultural sites including *oombans* (freshwater soaks) and fish traps. This proposed zone will provide protection to creek, mangrove and saltmarsh communities in the King Sound Bioregion which are ecologically and culturally important. This zone will also contribute to the protection of snubfin and bottlenose *bayalbarr* (dolphins) and flatback turtles which frequently forage in the Cygnet Bay area. Bardi and Jawi people know the creeks in this area provide important nursery areas for *aarli* (fish) and wish to protect these creeks for future generations.

Proposed Cunningham Point Special Purpose Zone (Cultural Protection)

The conservation purpose of the proposed Cunningham Point Special Purpose Zone (Cultural Protection) will be to protect the value of the land and waters to the culture and heritage of Bardi and Jawi people. This area is regularly used by Bardi and Jawi Traditional Owners, particularly the *Baniol* clan, who regularly carry out customary activities here including fishing and collecting oysters. This proposed zone will provide protection to important creek, mangrove and saltmarsh communities in the King Sound Bioregion which are ecologically and culturally important. Bardi and Jawi people know the creeks in this area provide important nursery areas for *aarli* (fish) and wish to protect these creeks for future generations.

12.2.3 Proposed sanctuary zones

The proposed sanctuary zones play a central role in protecting areas of critical habitat to maintain the healthy functioning of the complex ecosystems that make up the marine park. Sanctuary zones 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.

Proposed Pender Bay Sanctuary Zone

The proposed Pender Bay Sanctuary Zone will protect representative examples of marine habitats including mangrove habitat, intertidal sand and mudflats, seagrass beds and subtidal soft coral and sponge habitat in the Canning Bioregion. This proposed zone supports a rich diversity of fauna and species of special conservation interest. Research conducted through WAMSI found Pender Bay to be consistently important for humpback whales throughout the migration season, where the highest abundances of humpback whales and habitat suitability was detected compared to other sites in the Kimberley region. Not only is Pender Bay an important staging area, results of the research suggested that calving and breeding may also occur there (Thums *et al.* 2018). Pender Bay is also a biologically important area for bottlenose dolphins (*Tursiops* spp.), Indo-Pacific humpback dolphins (*Sousa chinensis*) and Australian snubfin dolphins (*Orcaella heinsohni*) (DEWHA 2008). Dugongs are also regularly observed foraging in Pender Bay between May and July.

Proposed Twin Islands and Sunday Strait Sanctuary Zone

The proposed Twin Islands and Sunday Strait Sanctuary Zone extends from The Twin Islands in Bardi and Jawi Country to Shirley Islands in the proposed Mayala 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 2017). This proposed zone will protect representative examples of marine biodiversity from deep subtidal habitats (50-100m) to shallow (0-10m) intertidal habitats including coral reefs in the Kimberley Bioregion. Large colonies of roseate terns (*Sterna dougallii*) nest on North West and South East Twin Islands and feed in the surrounding waters of this proposed sanctuary zone.

Proposed Cygnet Bay Sanctuary Zone

The proposed Cygnet Bay Sanctuary Zone will protect examples of representative habitat in the King Sound Bioregion. This zone will protect subtidal habitats in depths up to 50m. The Cygnet Bay area is a biologically significant areas for dolphins.

12.2.4 Proposed general use zones

All areas in the proposed 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, pearling and aquaculture. 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 through the JMB, Commission and other stakeholders.

12.2.5 Permitted uses

The activities and permitted uses table (Table 1) summarises the range of permitted activities across the different zone types in the proposed 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 Western Australian marine parks.

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

Table 1: Summary of permitted uses for the proposed Bardi Jawi Marine Park.

Activity	Proposed Sanctuary zones	Proposed Special Purpose Zones (Cultural Protection)	Proposed General use zones
Customary			
Customary activities (e.g. hunting and fishing)	Yes [a]	Yes [a]	Yes [a]
Commercial			
Commercial fishing (other than trochus collection)	No	No	Yes [b]
Commercial trochus collection	No	Yes	Yes
Pearling and associated activities	No	No	Yes
Aquaculture	No	No	Yes
Scenic flights (charter) [c]	Yes	Yes	Yes
Ground disturbing mining and petroleum exploration and development [d]	No	No	Assess
Non-ground-disturbing activities including geophysical surveys, geological mapping, sampling and geochemical surveys [e]	No	No	Assess
Ship loading and other mining related infrastructure (e.g. ship loading docks, cabling or pipelines)	No	No	Assess
General marine infrastructure (e.g. groynes, jetties and boat launching facilities)	No	Assess	Assess
Artificial structures (e.g. artificial reefs)	No	No	Assess
Dredging and dredge spoil dumping	No	Assess [f]	Assess
Charter tour operators – fishing [c]	No	Yes [g]	Yes

Activity	Proposed Sanctuary zones	Proposed Special Purpose Zones (Cultural Protection)	Proposed General use zones
Charter tour operators – non-extractive (e.g. wildlife viewing) [c]	Yes [g]	Yes [g]	Yes
Wildlife/fish feeding [h]	No	No	No
Recreational			
Boating (motorised and non-motorised)	Yes [g]	Yes [g]	Yes
Nature appreciation and wildlife viewing	Yes [g]	Yes [g]	Yes
Recreational fishing	No	No [i]	Yes
Other use			
Access	Yes [g]	Yes [g]	Yes
Vessel transit	Yes [g]	Yes [g]	Yes
Navigation aids	Yes	Yes	Yes
Research and monitoring [c]	Yes [g]	Yes [g]	Yes
Anchoring (soft bottom only)	Yes [g]	Yes [g]	Yes
Mooring	Assess	Assess	Yes
Seaplane, helicopter and remotely piloted aircraft (drone) launching and landing [j]	Assess	Assess	Assess
Vessel sewage discharge and de-ballasting	No	No	Yes [k]

Permitted activities provisions

[a] 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.
[b] Prawn trawling is restricted in the proposed marine park through a permanent inshore closure managed by DPIRD.
[c] Licence or permit required under the *Conservation and Land Management Act 1984* and/ or *Fish Resources Management Act 1994.*
[d] Ground-disturbing mining and petroleum exploration and development activities include any activity that disturbs the land, seabed and/or subsoil within the proposed marine park (e.g. drilling).
[e] Geophysical surveys will be assessed by the Department of Mines, Industry Regulation and Safety.
[f] 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.
[g]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.
[h] Commercial operates seeking to conduct wildlife or fish feeding activities will require lawful authority under their commercial operator's licence provided by the department and will need to comply with regulations under the *Fisheries Resources Management Act 1994*).
[i] Recreational fishing is only permitted on a charter or guided tour.
[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.

1 2.3 Community stewardship and compliance

Education and public participation will help to increase public awareness and understanding of the values and management issues in the proposed 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, Bardi Jawi Rangers (employed directly by the department or contracted) and DPIRD will be necessary in the proposed marine park. It will also be important that users of the proposed 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 proposed marine park and achieve a high level of compliance with regulations, permitted uses and other management arrangements within the proposed marine park.	
		Management program
Management strategies	Develop an education and interpretation program which communicates: a. the importance of the marine park's values b. the purposes of management zones and regulations c. appropriate behaviour to reduce human impacts and ensure public safety d. Bardi and Jawi native title rights and visitor protocols on sea and land; and e. considers all education and interpretation strategies listed in the management plan.	Education and interpretation
	Install zone markers and educational signage for the marine park where appropriate.	Education and interpretation
	Encourage voluntary compliance and peer enforcement of regulations [DPIRD, DoT].	Education and interpretation
	Develop and implement a public participation program for the marine park, which encourages community involvement in management through a range of opportunities including in education, research and monitoring.	Public participation
	Facilitate cross-authorisation of enforcement officers as appropriate including training Bardi Jawi Rangers in CALM Act compliance with the intention of them obtaining the status of honorary enforcement officers pursuant to the CALM Act.	Management framework
	Ensure marine park users, including researchers, obtain and comply with appropriate formal permissions.	Patrol and enforcement
	Develop, monitor and maintain a database of compliance statistics and adapt management strategies to address any non-compliance issues.	Patrol and enforcement
	Develop and implement a collaborative patrol and enforcement program [DPIRD].	Patrol and enforcement
	Consider the need for temporary restrictions (e.g. speed limits) and/or additional measures where necessary to protect marine park values [DoT].	Patrol and enforcement
	Investigate and implement, where necessary, mechanisms to restrict vehicle access in the proposed marine park to designated areas only.	Patrol and enforcement

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.

Annual reviews

The prioritised management strategies outlined in the management plan will be implemented by the joint management partners, primarily through the collaboration of DBCA's West Kimberley District, Marine Science Program, the Bardi Jawi Rangers and other specialist branches guided by the JMB. The JMB with the assistance of Bardi Jawi Rangers, the West Kimberley District and DPIRD will prepare an annual review of the implementation of the management plan for consideration by the BJNAC and the Commission. 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, BJNAC will also provide an update to the Bardi and Jawi Community on the implementation of the management plan and condition of Country.

Periodic assessments

The Commission has a statutory responsibility to periodically assess the implementation and effectiveness of management plans. The JMB, BJNAC 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 healthy Country assessments under the healthy Country plan. This outcome-based approach provides a robust framework to support adaptive marine park management.

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 plan co-designed 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 Minster 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 effectively assess and evaluate management effectiveness.	
		Management program
Management strategies	Develop and implement a performance assessment process that is consistent with DBCA and Commission policy and ensure results are reported back to the Bardi and Jawi Community [Commission, JMB].	Management Framework
	Provide necessary information and support for the performance assessment process [JMB, DPIRD].	Monitoring
	Support the JMB and BJNAC to conduct periodic reviews of the effectiveness of plan implementation in meeting cultural, capacity building and other priority objectives.	Monitoring.

Bardi Jawi Rangers on the ranger boat *Almban*. Photo – Roanna Goater, DBCA.

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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, fish traps, intertidal stone arrangements, increase sites, ceremonial sites and others.
- the protection of areas important for culturally significant species such as g*oorlil* (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 language glossary

Bardi Language	**English Translation**
Habitats	
Laanyji	Macroalgae
Marnany	Reef
Marrgoorr	Coral
Noomool	Seagrass
Animals	
Aarli	Fish
Alngir	Trochus
Barnamb	Ray
Bayalbarr	Dolphin
Garrabal	Bird
Goorlil	Turtle
Joorroo	Shark
Linygurra	Estuarine Crocodile
Miinimbi	Whale
Odorr	Dugong
Other	
booroo	Campground, home, place
Gaalwa	Double log raft
Galaloong	Cultural hero
Ilma	Traditional song and dance
Iinalang	Islands
Liyan	Feelings
Looloooloo	Big grey shark
Majamajin	Law bosses
Oomban	Freshwater soak