



Marine Fauna Management Plan

Port Maximisation Project

Mid West Ports Authority

298 Marine Terrace, Geraldton WA 6530

Prepared by:

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Basis of Report

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Acronyms and Abbreviations

Acronym/abbreviation	Definition
AMS	Adaptive management strategy
BC Act	Western Australia <i>Biodiversity Conservation Act 2016</i>
BC Reg	Western Australia <i>Biodiversity Conservation Regulations 2018</i>
BCH	Benthic communities and habitats
CD	Chart datum
DBCA	Department of Biodiversity and Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DE	Development Envelope
DEMMP	Dredge Environmental Monitoring and Management Plan
DWER	Department of Water and Environmental Regulation
EIA	Environment impact assessment
EMP	Environmental management plan
EP Act	<i>Environmental Protection Act 1986</i>
EP Reg	<i>Environmental Protection Regulations 1987</i>
EPAS	Environmental Protection Authority Services
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GTE	Government Trading Enterprises
FRM Act	Western Australia <i>Fisheries Resources Management Act 1994</i>
KTP	Key Threatening Process
MCEMP	Marine Construction Environmental Management Plan
MFO	Marine fauna observer
The Minister	Commonwealth Minister for the Environment and Water
MNES	Matters of National Environmental Significance
MS	Ministerial Statement
MWPA	Mid West Ports Authority
OEMP	Operational Environmental Management Plan
PA Act	Western Australia <i>Port Authorities Act 1999</i>
PMaXP	Geraldton Port Maximisation Project
The Plan	The PMaXP Marine Fauna Management Plan
The Port	Port of Geraldton
SPRAT	Species Profiles and Threats
TAP	Threat abatement plan
TEC	Threatened ecological community
TSHD	Trailing suction hopper dredge
TSSC	Threatened Species Scientific Committee



Acronym/abbreviation	Definition
ZoHI	Zone of High Impact
ZoMI	Zone of Moderate Impact



1.0 Introduction

1.1 Project overview

The Port Maximisation Project (PMaxP) is an infrastructure project aimed at modernising and optimising the capacity of the Mid West Ports Authority (MWPA) managed Port of Geraldton (the Port) through the upgrade of existing facilities and construction of both new and replacement facilities. The key components of the PMaxP (refer **Figure 1-1**) include:

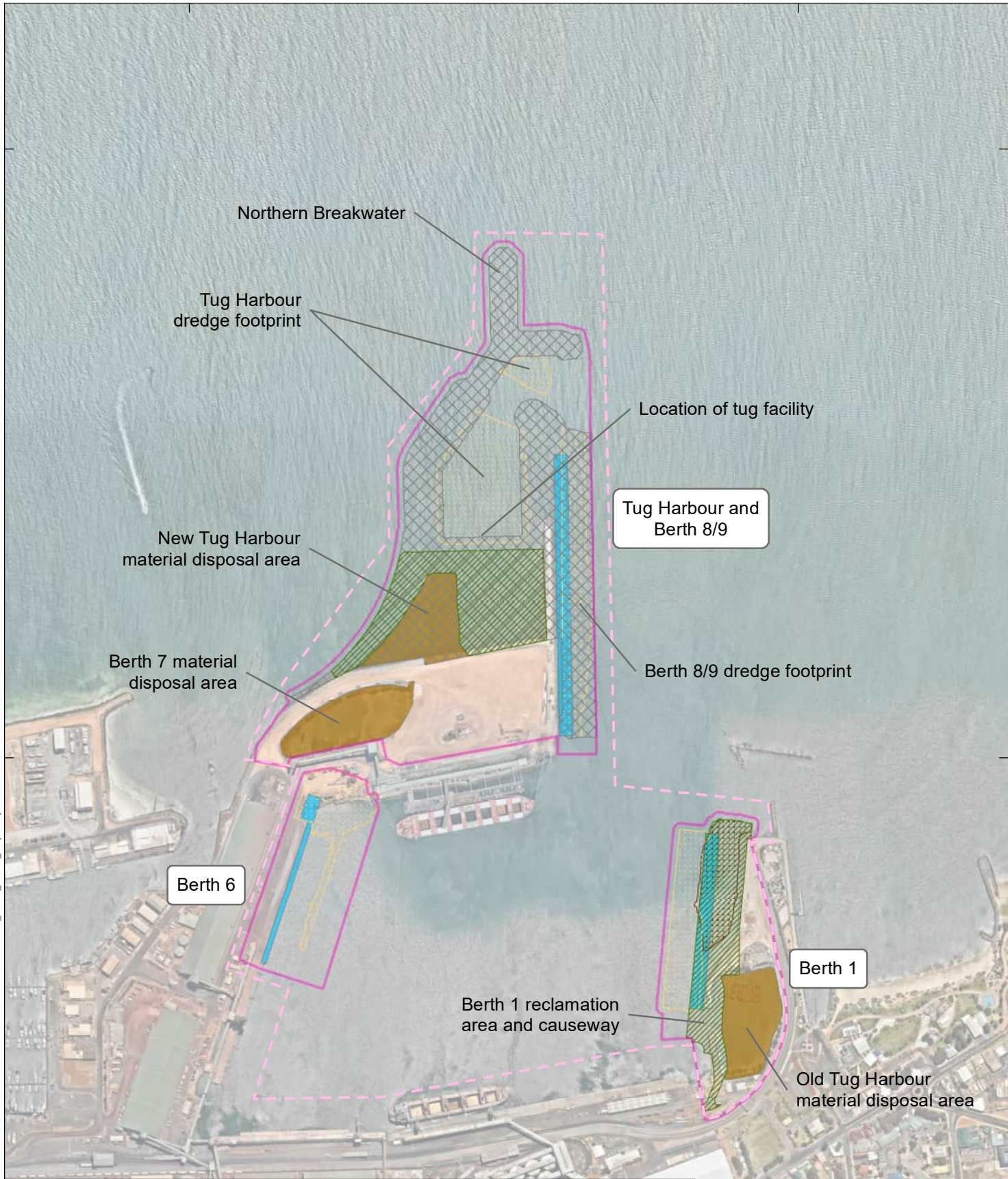
- Replacement tug harbour;
- Replacement Berth 1;
- Extension of Berth 6; and
- New Berth 8/9.

This plan addresses construction phase impacts of the PMaxP only. Marine fauna interactions during ongoing Port operations are addressed in the existing *Port of Geraldton Australian Sea Lion Management Plan* (Mid West Ports Authority, 2025).

The key components of the PMaxP require maintenance and capital dredging, reclamation and the installation of marine infrastructure, including piling activities. The specifics relating to each key component are outlined in **Table 1-1**.

Table 1-1 The PMaxP key component activities

Key component	Associated activities
Replacement tug harbour	<ul style="list-style-type: none"> • Construction of a new breakwater extending north ~450 m into Champion Bay using a progressive rock tipping method • Capital dredging of ~31,000 m³ to a design depth of -7.0 m chart datum (CD) using a trailing suction hopper dredge and subsequent reclamation using suitable dredged material, and • A combination of vibratory and impact piling for the construction of up to two jetties within the harbour.
Replacement Berth 1	<ul style="list-style-type: none"> • Maintenance dredging of ~18,000 m³ and subsequent reclamation using suitable dredged material • Capital dredging of ~23,000 m³ to deepen the berth pocket to -13.4 mCD using a hydro-hammer and long-arm excavator • Reclamation and construction of a causeway and new enclosed pond for future dredged materials, and • A combination of vibratory and impact piling for the construction of a wharf deck.
Extension of Berth 6	<ul style="list-style-type: none"> • Capital dredging of ~98,000 m³ to a design depth of -13.4 mCD using a hydro-hammer and long-arm excavator, including the removal of the existing rock armour wall and subsequent reclamation using suitable dredged material, and • A combination of vibratory and impact piling for the extension of the wharf deck.
New Berth 8/9	<ul style="list-style-type: none"> • Capital dredging of ~88,000 m³ to a design depth of -13.4 mCD using hydro-hammer and long-arm excavator and subsequent reclamation using suitable dredged material, and • A combination of vibratory and impact piling for the construction of a wharf deck.



LEGEND

- Proposal Footprint (38ha)
- Development Envelope (75ha)
- Wharf decks
- Material disposal areas
- Capital dredge footprints
- Berth 1 maintenance dredge footprint
- Reclamation areas
- New Tug Harbour and Berth 8/9 footprint



Scale: 1:8,500 at A4
 Coordinate System: GDA2020 MGA Zone 50

Date Drawn: 27/02/2025
 Project Number: 675.072500

Data Source:
 Nearmap, 23 February 2024



PROPOSAL LAYOUT

FIGURE 1-1

1.2 Project schedule

The PMaxP construction staging is outlined in **Table 1-2** and depicted in **Figure 1-2**.

Table 1-2 PMaxP schedule

Construction stage	Location	Detail
1a-NTH	New tug harbour	Construction of outer seawall (rock revetment scheduled for completion by end of Stage 1) Concurrent with Berth 1 (Stages 1a-c)
1b-NTH		Construction of inner seawalls (outer seawall is substantially completed prior to inner seawall construction) Concurrent with Berth 1 (Stages 1a-c)
1a-B1	Berth 1	Maintenance dredging at the northern extent of the B1 footprint (~3 days by trailing suction hopper dredge [TSHD]); concurrent with tug harbour
1b-B1		Causeway and piling (impact and vibratory) and preparatory works for wharf deck; concurrent with tug harbour
1c-B1		Capital dredging (~2 weeks by back-hoe dredge [BHD] and hydrohammer, if required); concurrent with tug harbour
2	Berth 6	Capital dredging (~12 weeks by BHD and hydrohammer, if required) *outer seawall is substantially complete (i.e. rock armouring in place) prior to B6 capital dredging Piling to be undertaken after completion of dredging
	New tug harbour	Piling for the construction of jetties
3	Berth 8/9	Capital dredging and piling (future works)
	New tug harbour	Capital dredging (~2 weeks by TSHD)

The first stage of construction (Stage 1a-B1) involves maintenance dredging at Berth 1 (B1) concurrent with the commencement of the new tug harbour outer seawall construction (Stage 1a-NTH). The B1 maintenance dredge, completed by a trailing suction hopper dredge, is not expected to impact sea lion's ability to utilise any of their preferred haul out locations as the underwater soundscape would be comparable to what is already experienced through commercial shipping activity. Routine maintenance dredging has been undertaken previously at the Port without incident.

Construction of the tug western outer seawall (Stage 1a-NTH) continues as Berth 1 piling commences (Stage 1b-B1) followed by the construction of the tug harbour inner seawalls (Stage 1b-NTH). Capital dredging at B1 (Stage 1c-B1) is undertaken after completion of the tug harbour outer seawall. The underwater acoustic modelling indicates that Seal Rocks is within a zone of modelled TTS for sea lions, but terrestrial acoustic modelling for the same activity indicates that there would not be any impact, nor behavioural shift for any sea lions hauled out on Seal Rocks. Further, the impact piling is only expected to occur up to two (intermittent) hours per day and during these works, the other two preferred Port haul out locations (B6/B7) remain available under current conditions.

It is further noted that capital dredging and piling has been undertaken at the Port without reported incidents to marine fauna.

The construction is scheduled such that the new tug harbour outer seawall is at a suitable stage of completion (i.e. rock armouring in place) to allow haul-out prior to the commencement of works at Berth 6 and piling within the new tug harbour (Stage 2). Berth 7 will also remain available as haul-out habitat, along with the new rock revetment beneath Berth 1 which is scheduled to be completed prior to the Berth 6 works commencing.

The dredging and piling at Berth 8/9 and capital dredging within the tug harbour are scheduled some time in the future, once other new infrastructure is already in-situ, creating additional, viable haul-out habitat.

To summarise, major noise-producing construction activities (piling / rock breaking) at the presented staged areas are not scheduled to occur concurrently, therefore suitable haul out habitat remains available at the Berth 7 Northern Breakwater throughout any works that may affect Seal Rocks utilisation. Further, Seal Rocks (hatched) will not be physically impacted during the implementation of PMaxP and will always remain as available haul-out habitat. The terrestrial acoustic assessment completed for PMaxP indicates that there is no minimum distance from piling or dredging activities that will cause any temporary or permanent threshold shift to ASL hauled out on Seal Rocks. The area around Seal Rocks will be managed as a shutdown zone for piling and rock breaking activity at Berth 1 and Berth 8/9 to ensure there is no physical harm to sea lions that enter the water from Seal Rocks.



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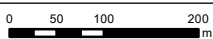
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LEGEND

- Development Envelope
- Australian Sea-lion haul-out sites (MWPA pers. comm.)

Construction stage

- 1a-NTH
- 1b-NTH
- 1a-B1
- 1b-B1
- 1c-B1
- 2
- 3



Scale: 1:8,000 at A4
 Coordinate System: GDA2020 MGA Zone 50

Date Drawn: 24/07/2025
 Project Number: 675.072500

Data Source:
 Nearmap, 23 February 2024



PMAXP CONSTRUCTION STAGING AND AUSTRALIAN SEA-LION HAUL-OUT SITES

FIGURE 1-2

1.3 Purpose of this plan

The PMaxP Marine Fauna Management Plan (MFMP; this Plan) details the framework to manage marine fauna interactions during the construction phase¹ of the PMaxP for impacts associated with the activities outlined in **Table 1-1**. The MFMP aims to provide detailed, practical, industry-approved and/or scientifically recognised management measures to achieve environmental objectives and meet outcome-based conditions for marine fauna.

The MFMP also details monitoring and reporting requirements to determine the effectiveness of the MFMP and confirm that residual impacts on marine fauna as a result of the PMaxP do not exceed or deviate from those predicted in the Environmental Impact Assessment: Geraldton Port Maximisation Project (EIA) (SLR Consulting Australia Pty Ltd, 2025).

1.4 Legislative context

The MFMP has been developed with consideration to Commonwealth, State and local legislative requirements and guidelines, including:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- Western Australia *Environmental Protection Act 1986* (EP Act) and *Environmental Protection Regulations 1987* (EP Reg)
- Western Australia *Biodiversity Conservation Act 2016* (BC Act)
- Western Australia *Fisheries Resources Management Act 1994* (FRM Act), and
- Western Australia *Port Authorities Act 1999* (PA Act).
- Environmental Protection Authority (EPA) technical guidance (see **Section 2.3**).

1.4.1 *Environment Protection and Biodiversity Conservation Act 1999*

The EPBC Act sets out the framework to protect and manage Matters of National Environmental Significance (MNES). The MNES relevant to PMaxP is conservation-listed marine fauna (one threatened species and three migratory species) that can potentially be impacted by the PMaxP and are considered in this MFMP. Under the EPBC Act, proponents must seek Commonwealth approval for proposed actions that might have a significant impact on MNES. The approval decision issued by the Minister for the Environment and Water (the Minister) may also accompany conditions of approval for the Minister to approve the proposed action.

The EPBC Act also includes provisions for the development of conservation advice for threatened species or ecological communities and recovery plans, where the Minister determines it is required.

Key threatening processes (KTPs) are listed under the EPBC Act where the process is one that threatens or may threaten the survival, abundance or evolutionary development of a native species or ecological communities. Threat abatement plan (TAPs) are commissioned by the Minister when the Threatened Species Scientific Committee (TSSC) recommends it. The TAP for the impacts of marine debris on vertebrate wildlife of Australia's coasts and oceans (Department of the Environment and Energy, 2018) is relevant to the PMaxP.

¹ Marine fauna interactions during operation are not managed through the implementation of this plan but are covered in the MPWA Port Operational Management Plan and Sea Lion Management Plan (see **Section 1.1**).

1.4.2 Environment Protection Act 1986 and Environmental Protection Regulations 1987

Part IV of the EP Act is the primary legislation that governs EIA and environmental protection in WA. The EP Reg administers the details of the EP Act. Environmental impact assessments in Western Australia are assessed by the EPA Services (EPAS) division of the Department of Water and Environmental Regulation (DWER) which has prepared administrative procedures for the purposes of establishing the practices of EIA. It is recognised that the implementation of the PMaxP may result in significant impacts to environmental factors as defined by the EPA and hence, a referral under Part IV of the EP Act was deemed necessary.

Environmental management plans (EMPs) may accompany a Part IV referral submission or be a requirement as an implementation condition under a Ministerial Statement (MS). It is noted that EPA's preference is for outcomes-based conditions where practical, where an outcomes-based EMP is required, following the EPA technical guidance. These guiding documents were considered in the preparation of this MFMP and are listed in **Section 2.3**.

1.4.3 Biodiversity Conservation Act 2016

The BC Act protects biodiversity conservation matters includes threatened species, communities, processes and critical habitats. Authorisation under the BC Act is required for any disturbance of threatened species or modification of threatened ecological communities (TECs). The PMaxP has the potential to impact seven conservation-listed species and one Priority 3(i) ecological community. One of the conservation-listed species is endangered, and six are migratory.

1.4.4 Fisheries Resources Management Act 1994

The FRM Act regulates fishing, aquaculture and other aquatic resources in Western Australia. The PMaxP proposal footprint occurs within the areas of several managed fisheries and a recreational fishing bioregion.

1.4.5 Port Authorities Act 1999

The *Port Authorities Act 1999* (PA Act) governs Western Australia's port authorities, covering their functions, responsibilities, concept of operations and related matters. Under the Act, the port authorities may operate as Government Trading Enterprises (GTE), with appropriate accountability to the State Government. MWPA is a GTE and operates under the Act and associated regulations.

1.5 Roles and responsibilities

The roles and responsibilities for the implementation of the MFMP are as follows:

- “Proponent (Principal)” is responsible for:
 - Overall implementation of the MFMP and contractor compliance
 - Overall compliance with relevant legal requirements under approval conditions
 - The provision of a safe environment for PMaxP activities
 - Reporting environmental performance to key stakeholders
 - Preparing environmental monitoring reports
 - Environmental compliance reporting in accordance with the approval conditions, and

- Reporting all environmental non-compliance in accordance with the approval conditions.
- “Contractors” are responsible for:
 - Completing construction activities
 - Managing subcontractors and their commitments to the MFMP
 - Implementing the MFMP
 - Preparing and implementing environmental management plans in accordance with the MFMP
 - Ensuring adequate training and awareness of all personnel
 - Ensuring all equipment is maintained and operational in accordance with manufacturers’ specifications, and
 - Reporting, including all environmental incidents to the Proponent within 24 hours.
- “All personnel” including the proponent and contractors and are obliged to comply with the requirements of this MFMP and any relevant legal requirements under approval conditions while exercising duty of care to the environment at all times.



2.0 Scope and rationale

The MFMP identifies and details management measures, monitoring and reporting requirements to be implemented during construction of the PMaxP to meet the EPA objective for marine fauna, the MWPA environmental objectives (see **Section 2.2**) associated with marine fauna, and the outcome-based conditions for marine fauna (see **Section 2.1**).

The MFMP also includes an adaptive management strategy (AMS) that allows for the evolution of management arrangements in the event marine fauna interactions are found to be unacceptably high and the proposed management measures do not meet targets and/or environmental outcomes.

The key environmental factor this MFMP addresses is marine fauna.

2.1 Part IV referral environmental outcomes and conditions

The Part IV referral is currently under assessment so there are no Ministerial conditions yet.

Interim management measures proposed in the EIA to determine residual impacts on marine fauna have been included here to inform the MFMP framework:

- Manage risks of vessel strike and interactions with equipment such that the residual impacts to marine fauna do not exceed those predicted in the EIA. Industry-approved management measures that have been developed and successfully implemented in other ports to manage vessel strikes are to be incorporated into the MFMP.
- Manage risks of surface and underwater noise and vibration to marine mammals such that the residual impacts to marine fauna do not exceed those predicted in the EIA. Results from the noise and vibration modelling, the Australian National Guidelines for Whale and Dolphin Watching (Department of the Environment and Energy, 2017a), Schedule 5 of the *Western Australia Biodiversity Conservation Regulations 2018* (BC Reg) and industry best practices are incorporated in the MFMP.
- Manage interactions between construction personnel and marine fauna such that the residual impacts to marine fauna do not exceed those predicted in the EIA.
- Development and implementation of monitoring and reporting to determine the effectiveness of the MFMP and whether the AMS process is triggered.

2.2 Environmental objectives and outcomes

The relevant environmental objectives and outcomes are described in **Table 2-1**.



Table 2-1 Relevant environmental objectives and outcomes

Reference	Objectives	Outcomes
EPA marine fauna objective	To protect marine fauna so that biological diversity and ecological integrity are maintained	<ul style="list-style-type: none"> • Permanent (irreversible) BCH loss limited to Zone of High Impact (ZoHI; 19 ha) • Temporary (reversible) BCH impact limited to Zone of Moderate Impact (ZoMI; 75 ha) • PMaxP will not result in a release of contaminants that can cause harm to the marine environment • No significant impacts to key marine fauna or commercially and recreationally important marine species as a result of the PMaxP.
MWPA's environmental objective	The MWPA aligns its environmental objectives with the EPA's objectives under five themes of Sea, Land, Water, Air, and People.	
The Commonwealth's objectives for the protection of marine fauna are specified in species recovery plans and TAPs. One recovery plan, conservation plan and TAP are relevant to this MFMP.	<ul style="list-style-type: none"> • Investigate and mitigate other potential threats to Australia Sea-lion populations, including disease, vessel strike, pollution and tourism (Department of Sustainability, Environment, Water, Population and Communities, 2013). • Seabirds and their habitats are identified, protected and managed in Australia (Commonwealth of Australia, 2020). • Contribute to the long-term prevention of the incidence of marine debris (Department of the Environment and Energy, 2018). 	



2.3 Relevant studies, guidelines and policies

The relevant documents used to inform the development of this MFMP include:

- Environmental Factor Guideline: Marine Fauna (EPA, 2016)
- Instructions: How to prepare *Environmental Protection Act 1986* Part IV environmental management plans (EPA, 2024)
- Environmental Management Plan Guidelines (DCCEEW, 2024)
- Port of Geraldton Australian Sea Lion Management Plan (Mid West Ports Authority, 2025)
- Environmental Impact Assessment: Geraldton Port Maximisation Project (SLR Consulting Australia Pty Ltd, 2025)
- Matters of National Environmental Significance Assessment: Geraldton Port Maximisation Project (SLR Consulting Australia Pty Ltd, 2024a)
- Underwater Noise Modelling Study: Geraldton Port Maximisation Project, Western Australia (SLR Consulting Australia Pty Ltd, 2024b)
- Australian Sea Lion In-air Noise Exposure (Curtin University, 2024)
- Noise Modelling Report (Acoustic Engineering Solutions, 2024)
- Sediment Transport Modelling Report: Geraldton Port Maximisation Project (RHDHV, 2024)
- Hydrodynamic and Plume Dispersion Modelling Report: Geraldton Port Maximisation Project (RHDHV, 2025)
- Schedule 5 of the Western Australia Biodiversity Conservation Regulation 2018
- Australian National Guidelines for Whale and Dolphin Watching (Department of the Environment and Energy, 2017a)
- National Strategy for Reducing Vessel Strike on Cetaceans and Other Marine Megafauna (Department of the Environment and Energy, 2017b)
- EPBC Act Policy Statement 2.1 – Interactions between offshore seismic exploration and whales (Department of the Environment, Water, Heritage and the Arts, 2008)
- 2023 Guidelines for the Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Aquatic Species (International Maritime Organisation, 2023)
- Threat Abatement Plan for the impacts of marine debris on vertebrate wildlife of Australia's coasts and oceans (Department of the Environment and Energy, 2018)
- Recovery Plan for the Australian Sea-lion (*Neophoca cinerea*) (Department of Sustainability, Environment, Water, Population and Communities, 2013)
- Conservation Advice: *Neophoca cinerea*, Australian Sea-lion (TSSC, 2020)
- Wildlife Conservation Plan for Seabirds (Commonwealth of Australia, 2020), and
- Listing Advice: *Megaptera novaeangliae*, Humpback Whale (TSSC, 2022).



2.4 Key assumptions and uncertainties

Residual impacts managed by this MFMP are based on consideration of the likely worst-case scenario of potential impacts as a result of the PMaxP and therefore presents a precautionary estimate of the potential impacts on marine fauna. The management measures detailed in this MFMP are designed to be practicable and developed from the relevant guidelines outlined in **Section 2.3** and industry best-practice. This assumes the measures recommended in the referenced guidelines have been successfully implemented in the management of marine fauna interactions.

2.5 Receiving environment

2.5.1 Location

The Port is located at the southern extent of Champion Bay, approximately 420 km north of Perth. The area in and around Geraldton is considered to have a high biodiversity value. The marine environment in and around the Proposal Footprint consists of the natural and modified foreshores of the Port and coastal waters of the West Coast Bioregion.

2.5.2 Environmental conditions and habitats

Champion Bay is a highly dynamic environment that is exposed to strong storm swell from the western quarter in winter and strong southerly winds in spring and summer producing northerly longshore currents, and light winds in autumn. Champion Bay is also occasionally affected by marine heat waves, rare cyclones, and occasional river inflows. Natural environmental conditions have shaped some of the marine habitats found in and around the Proposal Footprint (**Table 2-2**). The foreshores in and around the Proposal Footprint and benthic habitats in the Port and the existing shipping channel are highly modified from historical development and Port activities.

Table 2-2 Marine habitats in and around the Proposal Footprint and their associated marine fauna

Marine habitat	Associated marine fauna
Intertidal soft sediment (sandy beaches)	Shore/wading birds, pinnipeds, epifauna and infauna.
Intertidal rocky reef (natural or artificial)	Shore/wading birds, pinnipeds and epifauna
Bare subtidal soft sediment	Epifauna and infauna
Seagrass meadows	Marine mammals, bony fish (superclass Osteichthyes), cartilaginous fish (superclass Chondrichthyes), epifauna and infauna
Reef complex (macroalgae, seagrass, filter feeders and/or hard coral)	
Coastal waters	Marine mammals, bony fish (superclass Osteichthyes), cartilaginous fish (superclass Chondrichthyes) and plankton

Biologically Important Areas that occur within and adjacent to the Proposal Footprint are detailed in **Table 2-3** and illustrated in **Figure 2-1**.

Table 2-3 Biologically Important Areas and their associated species, life cycle and times of the year (source: Commonwealth of Australia, 2015)

Species	BC Act status	EPBC Act status	Life cycle	Time of the year
Caspian Tern <i>Hydroprogne caspia</i>	Migratory	Migratory	Foraging (provisioning young)	-
Humpback Whale <i>Megaptera novaeangliae</i>	Migratory Conservation dependent	Migratory	Migration (north and south) Can be up to 30 nm offshore on northern migration and close inshore on southern migration.	Northbound peak mid-June to mid-July Southbound peak late September to mid-October
Australia Sea-lion <i>Neophoca cinerea</i>	Endangered	Endangered	Foraging (male)*	All year

*Based on the definition of the BIA; advice from Department of Biodiversity, Conservation and Attractions (DBCA) is that based on current data it is not possible to exclude females, but their presence in and adjacent to the Port is unconfirmed. Further, information on the Species Profiles and Threats (SPRAT) database indicates that females may forage up to ~60 km from natal sites (Campbell *et al.* 2008) and hence may be found in and adjacent to the Port.

There are no critical habitats declared in the Register of Critical Habitat under the EPBC Act in or around the Proposal Footprint. The artificially erected nesting post at Berth 2 and the waters in and around the Port are considered critical breeding and foraging habitat for the Osprey (*Pandion haliaetus*), listed as migratory under the EPBC Act and the BC Act. No other conservation-listed species is likely to breed or use the habitats in and around the Proposal Footprint for critical life stages.



2.5.3 Marine fauna

Comprehensive data searches and literature reviews were undertaken as part of the PMaxP EIA, including historical survey/monitoring data, and a likelihood of occurrence assessment was completed (see EIA). It was concluded that seven key species² may be encountered (medium to high likelihood of occurrence) during the construction of the PMaxP; four seabirds and three marine mammals:

- Caspian Tern (*Hydroprogne caspia*) – foraging habitat
- Osprey (*Pandion haliaetus*) – breeding and foraging habitat
- Roseate Tern (*Sterna dougallii*) – potential foraging habitat
- Crested Tern (*Thalasseus bergii*) – potential foraging habitat
- Humpback Whale (*Megaptera novaeangliae*) – migration passage
- Australian Sea-lion (*Neophoca cinerea*) – haul-out and potential foraging habitat, and
- Indo-Pacific Bottlenose Dolphin (*Tursiops aduncus*) – potential foraging habitat.

Marine reptiles, elasmobranchs and shore/wading birds were considered to have a low likelihood of occurrence. Identification and ecology of key species that may be encountered (medium to high likelihood of occurrence) are detailed in species profiles in **Appendix C**.

2.5.3.1 Managed fisheries

The Proposal Footprint is located within several managed fisheries. These and the key targeted species are outlined in **Table 2-4**.

Table 2-4 Managed fisheries and the key target species

Managed fishery	Key target species
Area 4 and Area 8 of Abalone Managed Fishery (no abalone fishing permitted currently north of the Moore River)	Roe's Abalone (<i>Haliotis roei</i>) Greenlip Abalone (<i>H. laevigata</i>) Brownlip Abalone (<i>H. rubra conicopora</i>)
Abrolhos Islands and Mid-West Trawl Managed Fishery	Saucer Scallop (<i>Amusium balloti</i>) Western King Prawn (<i>Penaeus latisulcatus</i>)
Schedule 2 (Area 3 – Gascoyne-West Coast) of Mackerel Managed Fishery (designated fishing between 1 March to 30 September)	Spanish Mackerel (<i>Scomberomorus commerson</i>) Broad Barred Spanish Mackerel (<i>S. semifasciatus</i>)
Marine Aquarium Managed Fishery	Targeting over 250 species in classes Osteichthyes and Chondrichthyes Some licences also cover the harvesting of coral, live rock/sand, invertebrates, seagrass and macroalgae
Schedule 2 (Zone 1) of Octopus Interim Managed Fishery (use of traps from 1 April to 30 November)	<i>Octopus djinda</i>

² Conservation-listed species or species of commercial/recreational significance.

Managed fishery	Key target species
West Coast Demersal Gillnet and Demersal Longline Interim Managed Fishery	Gummy Shark (<i>Mustelus antarcticus</i>) Dusky Shark (<i>Carcharhinus obscurus</i>) Whiskery Shark (<i>Furgaleus macki</i>) Sandbar Shark (<i>C. plumbeus</i>)
Specimen Shell Managed Fishery	Over 200 molluscs (phylum Mollusca)
West Coast Deep Sea Crustacean Fishery (Proposal Footprint in prohibited fishing area)	Snow Crabs (<i>Chaceon albus</i>) King Crabs (<i>Pseudocarcinus gigas</i>) Spiny Crabs (<i>Hypothalassia acerba</i>)
Schedule 2 (Mid-West Area) of West Coast Demersal Scalefish Managed Fishery	Targeting over 100 species including the most important two species: West Australian Dhufish (<i>Glaucosoma herbraicum</i>) Pink Snapper (<i>Chrysophrysauatus auratus</i>)
Schedule 2 (Zone B) in West Coast Rock Lobster Managed Fishery	Western Rock Lobster (<i>Panulirus cygnus</i>)

The Proposal Footprint also forms part of the West Coast recreational fishing bioregion (Department of Primary Industries and Regional Development (DPIRD), 2022). The most common finfish species (and % representation of the bioregion total catch) are School Whiting (*Sillago vittata*; 14%), Australian Herring (*Arripis georgianus*, 8%), Pink Snapper (*Chrysophrys auratus*; 3%), Silver Trevally (*Pseudocarnax dentax*; 2%) and King George Whiting (*Siliginodes punctatus*; 2%). The most common invertebrate species are Western Rock Lobster (26%), Blue swimmer Crab (*Portunis pelagicus*; 20%) and squid (class Cephalopoda; 4%). These eight species/taxa accounted for 79% of the total catch (by numbers) on the West Coast in 2020/21.

The MFMP is focused on managing impacts to the conservation-listed species identified above. Impacts to commercially and recreationally important species are difficult to mitigate but residual impacts as a result of the PMaxP are not expected to be substantial, the majority of impacted habitats are highly disturbed and sub-optimal, and the Proposal Footprint is only a very small portion of the various managed fisheries areas (see EIA). However, some management actions in the MFMP are likely to mitigate impacts to commercially and recreationally important and other native or transient marine species.

2.6 Relationship to other plans

The MFMP is specific in managing interactions with key marine fauna and commercially and recreationally important marine species during the construction of the PMaxP such that the environmental outcomes proposed in the EIA (see **Table 2-1** and **Table 3-3**) and environmental objectives outlined in **Section 2.2** are met. To address all potential residual impacts on marine fauna and their associated environmental outcomes, the MFMP should be implemented in unison with the following EMPs:

- Marine Construction Environmental Management Plan: Geraldton Port Maximisation Project (MCEMP) provides the overarching environmental management framework for the construction activities of the PMaxP, and
- Dredge Environmental Monitoring and Management Plan: Geraldton Port Maximisation Project (DEMMP) provides the monitoring and management framework to mitigate impacts to water, sediment quality and benthic communities and habitats (BCH) and, in turn, marine fauna habitat, during the PMaxP construction.



3.0 Risk assessment

A risk assessment was completed to evaluate and manage risks to marine fauna as a result of PMaxP activities. Impacts on marine fauna as a result of PMaxP activities were evaluated before and after the application of management measures. The likely worst-case scenario was used for each key potential impact to determine the risk rating to encompass a thorough assessment and offer protection for all key marine fauna. The *Environmental Management Plan Guidelines* (DCCEEW, 2024) risk matrix was used and is outlined in **Table 3-1** and **Table 3-2**.

Table 3-1 Likelihood and consequence criteria (source: DCCEEW, 2024)

Likelihood	Criteria
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances
Consequence	Criteria
Minor	Minor incident of environmental damage that can be reversed
Moderate	Geographically isolated but substantial instances of environmental damage that could be reversed with intensive efforts
High	Substantial instances of environmental damage that could be reversed with intensive efforts
Major	Major loss of environmental amenity and real danger of it continuing
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage

Table 3-2 Risk ratings (source: DCCEEW, 2024)

Likelihood	Consequence				
	Minor	Moderate	High	Major	Critical
Highly likely	Medium	High	High	Severe	Severe
Likely	Low	Medium	High	High	Severe
Possible	Low	Medium	Medium	High	Severe
Unlikely	Low	Low	Medium	High	High
Rare	Low	Low	Low	Medium	High

3.1 Key construction impacts and risk assessment

The key construction impacts and associated construction activities that have the potential to impact key marine fauna, unmitigated and residual risk ratings and environmental outcomes are outlined in **Table 3-3**. The management strategies and controls that will be implemented to reduce these impacts are detailed in **Section 4.2**.

Other potential impacts have also been identified in the EIA. However, only impacts outlined in **Table 3-3** were considered relevant to marine fauna.



Table 3-3 Key potential impacts on marine fauna, environmental outcomes and risk ratings

Key potential impacts	Impacting activities	Extent, frequency and/or intensity	Environmental outcomes	Unmitigated risk assessment**			Management actions	Residual risk rating		
				Likelihood	Consequence	Risk rating		Likelihood	Consequence	Risk rating
Permanent loss or modification of BCH beyond the ZoHI ³	<ul style="list-style-type: none"> Dredging Piling and marine infrastructure installation Reclamation 	<ul style="list-style-type: none"> Permanent loss/modification of BCH including seagrass meadows, macroalgae low-relief reefs, low-relief mosaics and bare soft sediment beyond the ZoHI 	Permanent (irreversible) BCH loss limited to Zone of High Impact (ZoHI; 19 ha)	Possible	Moderate	Medium	Section 4.2.1 MFH01 to MFH07	Unlikely	Moderate	Low
Permanent loss of Australian Sea-lion haul-out habitat	<ul style="list-style-type: none"> Piling and marine infrastructure installation Reclamation 	<ul style="list-style-type: none"> Modification of existing Australian Sea-lion haul-out locations beyond the Proposal Footprint that would result in a permanent loss of haul-out habitat 	No net loss of Australian Sea-lion haul-out habitat as a result of the PMaxP	Possible	Moderate	Medium	Section 4.2.1 MFH08 to MFH10	Unlikely	Moderate	Low

³ The MFMP manages any unforeseen, potential impacts beyond what is determined in the EIA.



Key potential impacts	Impacting activities	Extent, frequency and/or intensity	Environmental outcomes	Unmitigated risk assessment**			Management actions	Residual risk rating		
				Likelihood	Consequence	Risk rating		Likelihood	Consequence	Risk rating
Elevated turbidity and increased sedimentation resulting in temporary modification of BCH beyond the Zone of Moderate Impact (ZoMI) ³	<ul style="list-style-type: none"> Dredging Piling Reclamation 	<ul style="list-style-type: none"> Temporary modification of subtidal habitats from elevated turbidity outside the ZoMI Temporary modification of BCH from sedimentation outside the ZoMI 	Temporary (reversible) BCH impact limited to Zone of Moderate Impact (ZoMI; 75 ha)~	Possible	Moderate	Medium	Section 4.2.1 MFH01 to MFH06	Unlikely	Moderate	Low
Mobilisation of contaminants and spills	<ul style="list-style-type: none"> Dredging Piling and marine infrastructure installation Reclamation 	<ul style="list-style-type: none"> Potential mobilisation of contaminants during dredging and piling beyond the tolerance of marine fauna Accidental chemical spills during any marine construction activities 	PMaxP will not result in a release of contaminants that can cause harm to the marine environment (including marine fauna)~	Unlikely	High	Medium	Section 4.2.5 MFA01	Rare	High	Low



Key potential impacts	Impacting activities	Extent, frequency and/or intensity	Environmental outcomes	Unmitigated risk assessment**			Management actions	Residual risk rating			
				Likelihood	Consequence	Risk rating		Likelihood	Consequence	Risk rating	
Elevated underwater noise and vibrations	<ul style="list-style-type: none"> Dredging Piling 	<ul style="list-style-type: none"> Permanent or temporary hearing loss from exposure to underwater noise and vibrations, particularly for marine mammals and certain species of commercially and recreationally important bony fish and invertebrates⁴, during dredging and piling 	No significant impacts to key marine fauna as a result of the PMaxP	Highly likely	Major	Severe	Section 4.2.4 MFN01 to MFN10	Rare	High	Low	
Elevated onshore noise	<ul style="list-style-type: none"> Piling and marine infrastructure installation 	<ul style="list-style-type: none"> Permanent or temporary hearing loss from exposure to onshore noise and vibrations, particularly on seabirds, raptors and the Australia Sea-lion during piling 		Likely	Minor	Low		Section 4.2.4 MFN01 to MFN04, MFN10	Likely	Minor	Low
Increased vessel collision risk	<ul style="list-style-type: none"> Dredging Piling and marine infrastructure installation 	<ul style="list-style-type: none"> An increased risk of injury or mortality from vessel strike, particularly for marine mammals, from increased vessel activities during construction 		Possible	High	Medium			Section 4.2.2 MFV01 to MFV08	Rare	High

⁴ There are no current underwater noise and vibration threshold values for invertebrates however, the Proposal Footprint only forms a very small portion of the areas managed fisheries for species such as *P. cygnus* and *O. cf. tetricus* and with the temporary nature of impacts, it is unlikely to substantially affect populations.



Key potential impacts	Impacting activities	Extent, frequency and/or intensity	Environmental outcomes	Unmitigated risk assessment**			Management actions	Residual risk rating		
				Likelihood	Consequence	Risk rating		Likelihood	Consequence	Risk rating
Increased risk of entanglement or entrapment	<ul style="list-style-type: none"> Dredging Piling and marine infrastructure installation 	<ul style="list-style-type: none"> An increased risk of injury or mortality from entanglement or entrapment during dredging and piling 		Possible	High	Medium	Section 4.2.3 MFE01 to MFE07	Rare	High	Low
Introduction/spread of marine pests	<ul style="list-style-type: none"> Dredging Piling and marine infrastructure installation 	<ul style="list-style-type: none"> The degradation of retained habitat, competition and predation from the introduction/spread of marine pests 	Permanent (irreversible) BCH loss limited to Zone of High Impact (ZoHI; 19 ha)~	Possible	High	Medium	Sections 4.2.1 MFH07 Section 4.2.5 MFA02	Rare	High	Low

**Risk ratings are based on unmitigated impact scenarios (i.e. without the implementation of management actions)

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4.0 Management and monitoring

4.1 Management targets

Marine fauna management targets have been set based on the environmental outcomes outlined in **Table 3-3**. These targets are defined in **Table 4-1**.

Table 4-1 Marine fauna management targets

Key potential impacts	Impact activities	Environmental outcomes	Management targets
Temporary/permanent loss or modification of habitat	<ul style="list-style-type: none"> Dredging Piling and marine infrastructure installation Reclamation 	<ul style="list-style-type: none"> Permanent (irreversible) BCH loss limited to Zone of High Impact (ZoHI; 19 ha)~ 	No permanent reduction in the area of marine fauna habitat outside the Proposal Footprint as a result of the PMaxP~
			No permanent modification of marine fauna habitat outside the Proposal Footprint and the ZoHI as a result of the PMaxP~
Elevated turbidity and sedimentation	<ul style="list-style-type: none"> Dredging Piling Reclamation 	<ul style="list-style-type: none"> Permanent (irreversible) BCH loss limited to Zone of High Impact (ZoHI; 19 ha) Temporary (reversible) BCH impact limited to Zone of Moderate Impact (ZoMI; 75 ha)~ 	No permanent reduction in the area of marine fauna habitat outside the Proposal Footprint as a result of the PMaxP~
			No permanent modification of marine fauna habitat outside the ZoHI as a result of the PMaxP~
Mobilisation of contaminants and spills	<ul style="list-style-type: none"> Dredging Piling and marine infrastructure installation Reclamation 	<ul style="list-style-type: none"> PMaxP will not result in a release of contaminants that can cause harm to the marine environment (including marine fauna)~ 	No permanent impacts to key marine fauna and commercially and recreationally important marine fauna species from alterations to water or sediment quality~
			No chemical spills attributed to the construction of PMaxP~
Elevated underwater noise and vibrations	<ul style="list-style-type: none"> Dredging Piling 	<ul style="list-style-type: none"> No significant impacts to key marine fauna or commercially and recreationally important species as a result of the PMaxP 	No breaches of marine fauna observer protocols during dredging and piling
Elevated onshore noise	<ul style="list-style-type: none"> Piling and marine infrastructure installation 	<ul style="list-style-type: none"> No significant impacts to key marine fauna as a result of the PMaxP 	No breaches of marine fauna observer protocols during dredging and piling

Key potential impacts	Impact activities	Environmental outcomes	Management targets
Increased vessel collision risk	<ul style="list-style-type: none"> Dredging Piling and marine infrastructure installation 		No injury or mortality to any marine megafauna as a result of vessel strike from the construction of the PMaxP
Increased risk of entanglement or entrapment	<ul style="list-style-type: none"> Dredging Piling and marine infrastructure installation 		No incidences of marine fauna entanglement or entrapment as a result of the PMaxP
Introduction/spread of marine pests	<ul style="list-style-type: none"> Dredging Piling and marine infrastructure installation 	<ul style="list-style-type: none"> Permanent (irreversible) BCH loss limited to Zone of High Impact (ZoHI; 19 ha)~ 	No incidence of newly introduced/spread of marine pests as a result of the PMaxP~

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4.2 Marine fauna management actions

This section details management actions for the identified impacting pathways. For some of the actions, a marine fauna observer (MFO) will be utilised to enforce the management action to ensure the management target is met. A MFO is a person dedicated to observing marine fauna for a given construction activity. During rock placement related to the seawall construction, a minimum of one MFO will be required. During dredging and piling, a minimum of two MFOs will be required, with at least one of those being suitably qualified. A suitably qualified MFO is a person who has been trained and has had at least two years of field experience in marine mammal identification and behaviour, distance estimation, and is capable of making accurate identifications and observations of marine megafauna as defined in this MFMP.

4.2.1 Marine fauna habitat management

Management targets		<i>Permanent (irreversible) BCH loss limited to Zone of High Impact (ZoHI; 19 ha)~</i>		
		<i>No incidence of newly introduced/spread of marine pests as a result of the PMaxP~</i>		
Impacting activities		Dredging		
		Piling and marine infrastructure installation		
		Reclamation		
Actions		Timing	Reporting	Responsibility
MFH01	Develop and implement the MCEMP ⁵	Pre-construction	N/A	Contractor

⁵ The MCEMP and DEMMP are the primary EMPs to manage marine fauna habitat related to BCH. The specific actions outlined, and any associated maps, are detailed and included in the MCEMP and DEMMP.

MFH02	Develop and implement the DEMMP ⁵	Pre-construction	N/A	Contractor
MFH03	Demarcation of management (shutdown and observation) zones and impact areas on a sensitive areas map as a minimum and using marker buoys were practicable (see MCEMP and DEMMP for details) ⁵	Pre-construction	As per MCEMP and DEMMP reporting requirements	Contractor
MFH04	No seabed disturbance (including jet/propellor wash and anchoring) beyond the DE (see MCEMP and DEMMP for details) with anchoring as directed by the Harbour Master ⁵	Construction	N/A	Contractor
MFH05	Implementing vessel speed limit in shutdown zones (see MCEMP and DEMMP for details) ⁵	Construction	N/A	Contractor
MFH06	Implement the strategic use of silt curtains and booms where it is possible, safe and effective and would not cause damage to BCH outside of the Proposal Footprint or present a risk of entanglement to marine fauna (see MCEMP and DEMMP for details) ⁵	Construction	As per MCEMP and DEMMP reporting requirements	Contractor
MFH07	Manage the introduction and spread of marine pests as per the MCEMP and the DEMMP and compliance with the 2023 Guidelines for the Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Aquatic Species (Resolution MEPC.378(80)) (International Maritime Organisation, 2023), following direct consultation with DPIRD Vessel Management via vessel.management@dpird.wa.gov.au	Construction	As per MCEMP and DEMMP reporting requirements	Contractor
MFH08	Minimise access to Australian Sea-lion haul-out sites where works are scheduled for the respective areas (e.g. B6, B8/9)	Construction	In the daily activities report as per the MCEMP	Contractor

MFH09	Removal of all barriers installed to minimise access to Australian Sea-lion haul-out sites upon completion of works in respective areas (i.e. B6, B8/9) before barriers to haul-out sites at other locations will be installed	Construction	In the daily activities report as per the MCEMP	Contractor
MFH10	Aim to increase suitable Australian Sea-lion haul-out habitat during detailed design	Detailed design	Design drawings	Principal
MH11	No modification without lawful authority from DBCA to the existing Osprey nesting post	Construction	N/A	Principal
Key potential impacts	Unmitigated risk rating	Residual risk rating		
		Likelihood	Consequence	Risk rating
Permanent loss or modification of BCH	Medium	Unlikely	Moderate	Low
Permanent loss of Australian Sea-lion haul-out habitat	Medium	Unlikely	Moderate	Low
Elevated turbidity and sedimentation (resulting in temporary modification of BCH)	Medium	Unlikely	Moderate	Low

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4.2.2 Vessel strike management

Management targets		<i>No injury or mortality to any marine megafauna as a result of vessel strike from the construction of the PMaxP</i>		
Impacting activities		Dredging		
		Piling and marine infrastructure installation		
Actions		Timing	Reporting	Responsibility
MFV01	Construction vessel crews to complete training and inductions on procedures to minimise collision risk to marine fauna covered in the MFMP	Pre-construction Construction	As per training register in the MCEMP	Contractor

MFV02	Construction vessel crews to complete daily toolbox talks to identify the collision risk based on daily sea and weather conditions	Construction	As per training register in the MCEMP	Contractor
MFV03	A dedicated marine fauna observer (MFO) to be actively observing on each construction vessel or landside location with sufficient view of the construction vessel transit area and direct 2-way communication with the vessel(s) (see Section 4.3.2 for MFO protocols)	Construction	N/A	Contractor
MFV04	Any marine megafauna ⁶ sighting should be immediately reported to all PMaxP construction vessels operating at that time	Construction	Report sightings in a marine fauna observation log (MFOL; proforma attached in Appendix A)	Contractor
MFV05	Vessel crews to use appropriate and safe avoidance manoeuvres and/or stop the vessel/place into neutral if whales are observed or reported within 300 m and Australian Sea-lions and dolphins are observed or reported within 100 m of the vessel to avoid a collision	Construction	N/A	Contractor
MFV06	Vessels speeds are not to exceed 8 knots while transiting in and around the Port (nearshore waters), unless marine megafauna has been sighted (refer MFV05)	Construction	N/A	Contractor
MFV07	Vessels are not to approach any marine megafauna	Construction	N/A	Contractor
MFV08	Adherence to the Western Australia BC Reg Separation Distances in managing vessel strike risks to marine megafauna	Construction	N/A	Contractor

⁶ Marine megafauna includes all marine mammals (cetaceans and pinnipeds) and reptiles (turtles)

Key potential impacts	Unmitigated risk rating	Residual risk rating		
		Likelihood	Consequence	Risk rating
Increased vessel collision risk	Medium	Rare	High	Low

4.2.3 Entanglement and entrapment management

Management targets		<i>No incidences of marine fauna entanglement or entrapment as a result of the PMaxP</i>		
Impacting activities		Dredging		
		Piling and marine infrastructure installation		
Actions		Timing	Reporting	Responsibility
MFE01	Vessel crews to complete training and inductions on procedures to avoid entanglement and entrapment of marine fauna covered in the MFMP	Pre-construction Construction	As per training register in the MCEMP	Contractor
MFE02	Vessel crews to complete daily toolbox talks to identify the risk of entanglement and entrapment based on daily sea and weather conditions	Construction	As per training register in the MCEMP	Contractor
MFE03	Waste must be appropriately disposed of offsite ⁷ and not in the marine environment or in an area where there is a risk of it entering the marine environment	Construction	As per waste management reporting in the MCEMP	Contractor
MFE04	Provision of waste disposal containers and designated, bunded and covered stockpiles for the disposal of waste	Construction	As per waste management reporting in the MCEMP	Contractor
MFE05	Any accidental release of waste into the marine environment must be reported immediately and recovered	Construction	As per waste management and incident reporting in the MCEMP	Contractor
MFE06	Construction vessels to manage mooring lines to avoid loops, especially in lighter ropes	Construction	N/A	Contractor
MFE07	Trailing suction hopper dredge (TSHD) to incorporate a deflector head, grate, or similar	Construction	N/A	Contractor

⁷ Off the construction site of the PMaxP

Key potential impacts	Unmitigated risk rating	Residual risk rating		
		Likelihood	Consequence	Risk rating
Increased risk of entanglement or entrapment	Medium	Rare	High	Low

4.2.4 Noise and vibration management

Management targets		<i>Underwater noise and vibrations do not exceed modelled levels within respective modelled areas</i>		
Impacting activities		Dredging		
		Piling and marine infrastructure installation		
Actions		Timing	Reporting	Responsibility
MFN01	Construction personnel to complete training and inductions on procedures to minimise impacts of noise and vibration to marine fauna covered in the MFMP	Pre-construction Construction	As per training register in the MCEMP	Contractor
MFN02	Construction personnel to complete daily toolbox talks to identify the risk of noise and vibration based on daily sea and weather conditions	Construction	As per training register in the MCEMP	Contractor
MFN03	Piling and rock breaking to be carried out during daylight hours only (i.e. half hour before sunrise to half hour after sunset)	Construction	N/A	Contractor
MFN04	Carry out 30 minutes of observations prior to the start of piling within the respective observation zones ⁸ for the location of the works (see Section 4.3.2)	Construction	Report observations in a MFOL (proforma attached in Appendix A)	Contractor

⁸ Observation and shutdown zones have been determined based on the maximum extent of temporary threshold shift (TTS) modelled for the low-frequency (LF) cetacean group and the mid-frequency (MF) cetacean and other marine carnivores (OW) at each works location from the Underwater Noise Modelling Study: Geraldton Port Maximisation Project, Western Australia (SLR Consulting Australia Pty Ltd, 2024b)

MFN05	Implement a 30-minute soft start at lower hammer energy before ramping up to full energy at the commencement of any rock breaking or impact piling ⁹ or when these activities have ceased for more than 30 minutes.	Construction	N/A	Contractor
MFN06	Continue marine megafauna observations throughout underwater construction activities in the respective observation zones ⁷ for the duration of piling at each location (see Section 4.3.2)	Construction	N/A	Contractor
MFN07	A warning is to be issued to the construction crew to prepare for the cessation of underwater construction activities if marine megafauna is observed in the respective observation zones ⁷ (see Section 4.3.2)	Construction	Report observations in a MFOL (proforma attached in Appendix A)	Contractor
MFN08	If marine megafauna is observed in the water within the respective shutdown zones ⁷ , underwater construction activities must cease immediately and can only commence/recommence once the megafauna is observed outside the shutdown zone ⁷ swimming away or not seen for at least 20 minutes (see Section 4.3.2)	Construction	Report sightings in a MFOL (proforma attached in Appendix A)	Contractor
MFN09	Where Australian Sea-lions are hauled-out within the respective shutdown zones ⁷ , Australian Sea-lion activity must be monitored and piling to cease if any individuals enter the water and can only commence / recommence once the Australian Sea-lion/s is/are observed outside the shutdown zone ⁷ swimming away or not seen for at least 20 minutes (see Section 4.3.2)	Construction	Report sightings in a MFOL (proforma attached in Appendix A)	Contractor
MFN10	Maintain positive communications between the marine fauna observers and construction crew	Construction	N/A	Contractor
MFN11	Conduct acoustic validation monitoring during the commencement of piling at B1 to validate modelled impact distances	Once only at commencement	Technical memorandum via email	Contractor

⁹ The soft-start procedure does not apply to pile dynamic analysis (PDA) testing, which is required to confirm the piles meet design criteria and involves striking the pile with the hammer at full power. The PDA testing will not commence if marine megafauna are observed within the shutdown zone within the 30 minutes prior.



Key potential impacts	Unmitigated risk rating	Residual risk rating		
		Likelihood	Consequence	Risk Rating
Elevated underwater noise and vibrations impacting marine fauna	Severe	Rare	High	Low
Elevated onshore noise	Low	Likely	Minor	Low

4.2.5 Additional marine fauna management

Management targets		<i>No permanent impacts to key marine fauna and commercially and recreationally important marine fauna species from alterations to water or sediment quality</i>		
		<i>No chemical spills to be attributed to the construction of PMaxP</i>		
		<i>No incidence of newly introduced/spread of marine pests as a result of the PMaxP~</i>		
Impacting activities		Dredging		
		Piling and marine infrastructure installation		
Actions		Timing	Reporting	Responsibility
MFA01	Implement fuel and chemical refilling and storage management as per the MCEMP and DEMMP	Construction	As per MCEMP and DEMMP reporting requirements	Contractor
MFA02	Implement marine pest management as per the MCEMP and DEMMP	Construction	As per MCEMP and DEMMP reporting requirements	Contractor
MFA03	Remain consistent with the Port of Geraldton Australian Sea Lion Management Plan (Mid West Ports Authority, 2025)	Construction	As per Port of Geraldton Australian Sea Lion Management Plan (Mid West Ports Authority, 2025)	Principal Contractor
MFA04	Maintain a minimum distance of 10 m from marine fauna on land	Construction	Report sightings in a MFOL (proforma attached in Appendix A)	Contractor

MFA05	A dedicated MFO must be present for the placement of rock during seawall construction and stop works if there is a risk of injury to any observed marine megafauna in the vicinity of rock placement	Construction	Report sightings in a MFOL (proforma attached in Appendix A)	Contractor
Key potential impacts	Unmitigated risk rating	Residual risk rating		
		Likelihood	Consequence	Risk rating
Mobilisation of contaminants and spills	Medium	Rare	High	Low
Introduction/spread of marine pests	Medium	Rare	High	Low

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4.3 Monitoring commitments

4.3.1 Australian Sea-lion monitoring

Mid West Ports Authority (MWPA) currently maintain an Australian Sea-lion monitoring program based on advice from DBCA. This program is described in Section 4.1 of the *Port of Geraldton Australian Sea Lion Management Plan* (Mid West Ports Authority, 2025) and is expected to continue throughout PMaxP construction and beyond in consultation with DBCA. All monitoring data will be provided to DBCA.

4.3.2 Marine fauna observer protocols for dredging and piling

A minimum of two MFOs (at least one suitably qualified and experienced) will be stationed at appropriate locations with visibility across the entire marine observation zone for all vessel movements and the full duration of any activity predicted to generate underwater noise (see **Table 4-2**). The observation and shutdown zones are derived from the maximum TTS onset from cumulative exposure distances from the *Underwater Noise Modelling Study: Geraldton Port Maximisation Project, Western Australia* (SLR Consulting Australia Pty Ltd, 2024b) summarised in **Appendix B**. The application of these distances is illustrated in the schematic in **Figure 4-1**. Although vibratory piling was also modelled, impact piling distances were employed as these provide the highest level of protection for marine megafauna. The distances in **Table 4-2** are to be calculated from the noise source and the shutdown zone is to include the entirety of the waters surrounding Seal Rocks if it impinges in part (i.e. if ASL are hauled out on Seal Rocks they are deemed to be within the observation zone but if they enter the water they will be within the shutdown zone).

The qualified MFO will be required to submit the following to MWPA prior to commencing operations on the PMaxP:

1. Full names and contact details
2. Details of training and qualifications, and
3. Details of previous MFO experience.

Shifts will be allocated to avoid observer fatigue and protect MFO health and safety and will be assigned based on the length of the activity and any other factors that may impact MFO performance and wellbeing. Station locations and shifts will be confirmed based on activity location, weather and sea conditions and visibility at least 60 minutes before the

commencement of the activity. Appropriate additional or alternative observation measures may be employed if weather and sea conditions impede visibility across the entire observation zone from station locations.

If marine megafauna becomes injured or is found distressed, the main priority is to assess their condition and determine the most appropriate and safe intervention method in consultation with DBCA. If deceased marine megafauna is encountered, the carcasses of dead marine fauna will, where possible be necropsied and then disposed of appropriately following consultation with DBCA. The method of disposal will be determined largely by the size of the carcass. Some carcasses may be kept for scientific purposes (e.g. museums or other authorised research institutions). DBCA will be consulted to ensure all relevant procedures have been carried out (e.g. the incident has been recorded with adequate detail).

All marine fauna interaction events will be recorded in the MFO observation log (see **Appendix A**). In the event of an incident involving marine megafauna, an incident report detailing the time, location, species and the incident circumstances, will be prepared and provided to DBCA and any other relevant authorities.

Table 4-2 Observation and shutdown zones for each marine megafauna group and activity (source: SLR Consulting Pty Ltd, 2024b)

Activity	Zone	Low frequency cetaceans (whales)	Medium frequency cetaceans (dolphins) / marine reptiles (marine turtles) ¹⁰	Otariid pinnipeds (eared sea-lions and seals)
Tug Harbour impact piling	Observation (m)	720	520	520
	Shutdown (m)	220	20	20
Tug Harbour trailing suction hopper dredge (TSHD)	Observation (m)	1,109	545	510
	Shutdown (m)	609	45	10
Berth 1 impact piling	Observation (m)	2,595	684	630
	Shutdown (m)	2,095	184	130
Berth 1, Berth 6 [^] , Berth 8/9 hydrohammer rock breaking	Observation (m)	4,713	896	708
	Shutdown (m)	4,213	396	208
Berth 1, Berth 6, Berth 8/9 backhoe dredge (BHD)	Observation (m)	1,129	620	515
	Shutdown (m)	629	120	15
Berth 1 TSHD (maintenance dredge)	Observation (m)	1,414	545	510
	Shutdown (m)	914	45	10
Berth 6 impact piling	Observation (m)	1,242	538	511
	Shutdown (m)	742	38	11
Berth 8/9 impact piling	Observation (m)	2,412	705	680
	Shutdown (m)	1,912	205	180

[^]Berth 6 was not modelled for rock breaking as the activity at the location of Berth 1 was considered the most impactful. Conservatively, the greater values have been adopted for this activity at Berth 6.

¹⁰ Included as a precautionary measure only



5.0 Reporting and review

Compliance reporting requirements specific to the management actions in this MFMP are outlined in **Table 5-1**.

Table 5-1 Compliance reporting requirements

Report	Content	Timeframe	Responsibility	Review
Marine fauna observation log	To record all activities relating to the site establishment, pre-start observations and marine fauna sightings during construction (MFOL; proforma attached in Appendix A)	Completed within 12h of action/observation	Contractor	MWPA
Marine fauna observations summary report	To summarise all marine fauna observations after the completion of works at each location (i.e. Berth 1, 6, 8/9 and Tug Harbour), evaluate Project performance in achieving management targets and detail any recommended amendments to the management actions (if any)	Completed within 30-days from the completion of works at each location	Contractor	MWPA
Incident report	To record any incidents or near-misses involving marine fauna***	Completed and submitted to MWPA as soon as practicable and within 24h of incident/near miss	Contractor	MWPA
Non-compliance report	To identify, justify and record the consequence of non-compliance of one or more management actions, describe the proposed corrective actions and to detail any recommended amendments to the management actions (if any)	Completed and submitted to MWPA as soon as practicable and within 24h of known non-compliance	Contractor	MWPA
Non-compliance investigation report	Detail findings of investigations into any non-compliance reported in a non-compliance report	Completed within 30 days from the recorded non-compliance	Contractor	MWPA

***key marine fauna contacts in the event of an incident include the Wildcare Helpline on (08) 9474 9055 and/or the WA Seabird Rescue on (08) 6102 8464, whichever is applicable.

5.1 Adaptive management and reviews

The Principal will complete audits of all contractors' performance in compliance with the management targets and actions in the MFMP.

This MFMP is a working document subject to revision based on the following triggers:

- Upon receipt of approval conditions from DWER and the Department of Climate Change, Energy, the Environment and Water (DCCEEW)
- Prior to the commencement of construction activities

- Whenever construction activities deviate from those defined at the time of preparation of the MFMP, including the outcome of the acoustic validation monitoring (see MFN11)
- When the risk to marine fauna deviates from the Environmental Impact Assessment: Geraldton Port Maximisation Project (SLR Consulting Australia Pty Ltd, 2025), including unexpected sightings, and
- Following any non-compliance or incident/near miss.

Any edits to this MFMP must be recorded in a change register with the appropriate version control. Any revisions to the MFMP will be submitted to the relevant regulator(s) for approval.

6.0 References

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Appendix A Marine fauna observation log

Marine Fauna Management Plan

Port Maximisation Project

Mid West Ports Authority

SLR Project No.: 675.072500.00001

5 August 2025



Appendix B Acoustic modelling summary

Marine Fauna Management Plan

Port Maximisation Project

Mid West Ports Authority

SLR Project No.: 675.072500.00001

5 August 2025

Table B1 Modelled underwater noise impact distances (source: SLR Consulting Pty Ltd, 2024b)

Species Group (relevant conservative significant species)	Impact piling (TTS)	Impact piling (PTS)	Hydro hammer – rock breaking (TTS)	Hydro hammer – rock breaking (PTS)	Trailing suction hopper dredge (TTS)	Trailing suction hopper dredge (PTS)	Back-hoe dredge (TTS)	Back-hoe dredge (PTS)
Low frequency cetaceans (humpback whales)	B1: 2,095 m B6: 742 m B8/9: 1,912 m Tug: 220 m	B1: 541 m B6: 227 m B8/9: 814 m Tug: 70 m	B1: 4,213 m	B1: 495 m	B1 (maintenance): 914 m Tug: 609 m	B1 (maintenance): 45 m Tug: 40 m	B1: 629 m	B1: 30 m
Mid-frequency cetaceans (Indo-Pacific bottlenose dolphins)	B1: 97 m B6: 38 m B8/9: 205 m Tug: 20 m	B1: 22 m B6: – B8/9: 35 m Tug: –	B1: 396 m	B1: 30 m	B1 (maintenance): 15 m Tug: 15 m	–	B1: 120 m	B1: 5 m
OW Otariids pinnipeds (Australian sea lions)	B1: 130 m B6: 11 m B8/9: 180 m Tug: 20 m	B1: 16 m B6: – B8/9: 20 m Tug: –	B1: 208 m	B1: 10 m	B1 (maintenance): 10 m Tug: 10 m	–	B1: 15 m	–
Marine reptiles (turtles)	B1: 184 m B6: 27 B8/9: 155 m Tug: 10 m	B1: 22 m B6: – B8/9: 10 m Tug: –	B1: 69 m	–	B1 (maintenance): 55 m Tug: 45 m	–	B1: 10 m	–
“-“ denotes no predicted impact								



Appendix C Key marine fauna profiles

Marine Fauna Management Plan

Port Maximisation Project

Mid West Ports Authority

SLR Project No.: 675.072500.00001

5 August 2025

C.1 Caspian Tern (*Hydroprogne caspia*)

C.1.1 Conservation status

EPBC Act – migratory

BC Act - migratory

C.1.2 Identification

The Caspian Tern is the largest tern in Australia, with long, slender backswept wings and a slightly forked tail. The heavy bill is red with a dusky tip (Birdlife Australia, 2024). When breeding this species is white, except for a black crown from bill to nape and a short shaggy black crest. The mantle and upper wings are grey, and the flight feathers are darker. The eye is dark brown, and legs are black. When not breeding, the crown is finely streaked white. The sexes are similar. Immature birds are similar to non-breeding adults. Younger birds are mottled grey and brown.

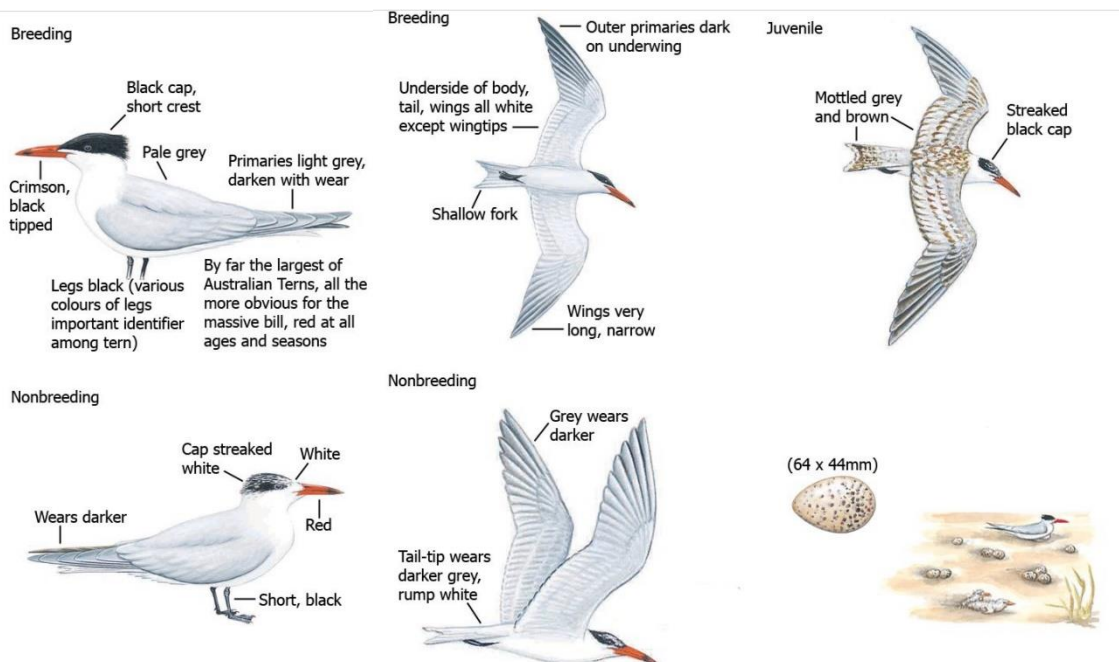


Photo 1 Caspian Tern identification (source: Morcombe’s Birds of Australia)

C.1.3 Ecology and habitat

The area in and around the Proposal Footprint forms part of the foraging (provisioning young) BIA for the Caspian Tern (**Figure 2-1**). This species is likely to be encountered in the air, foraging over the water or on land. Breeding occurs from Recherche Archipelago to Dirk Hartog Island and Faure Island in Shark Bay as well as the Pilbara region, albeit more rarely (Department of Climate Change, Energy, the Environment and Water, 2024). They are not known to breed in or around the Proposal Footprint but are known to forage, feeding primarily on fish and, on occasion, eggs and young or other birds, carrion, aquatic invertebrates, flying insects and earthworms. They forage diurnally, mostly early to mid-morning and shallow plunge to catch prey. They are sometimes known to shelter behind sand dunes or coastal lakes during rough weather. Caspian Terns are generally residents to breeding areas and exhibit seasonal patterns in non-breeding areas.

Table A-1: Seasonal sensitivities of the Caspian Tern in the Proposal Footprint

Lifecycle	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Foraging												



C.2 Osprey (*Pandion haeliatus*)

C.2.1 Conservation status

EPBC Act – migratory

BC Act – migratory, cetacean

C.2.2 Identification

The Osprey is a medium-sized fish-eating raptor (bird of prey) (Birdlife Australia, 2024). It has dark brown upperparts contrasting with pale underparts. There is a black band through the eye, separating the white throat from the pale crown. The Osprey has a rather small head and neck and typically swivels its head around or sways its head from side to side. When it is perched, there is a short, bristly crest. The eyes are placed well forward on the head. The fingered wings in flight are narrow and angled distinctively. There are dark carpal patches on the underwing (at the bend in the wing). The beak is strongly hooked, and the legs are powerful. The female is similar to the male but is larger and has a fuller, darker breast band. The Osprey is also called the Fish Hawk or White-headed Osprey.

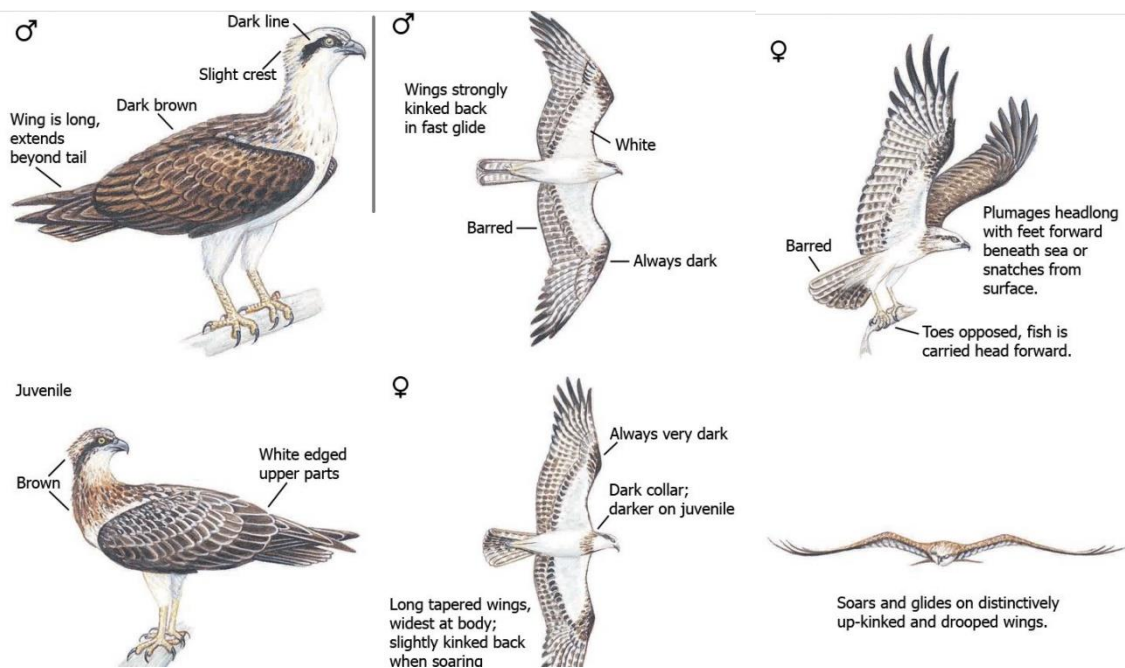


Photo 2 Osprey identification (source: Morcombe's Birds of Australia)

C.2.3 Ecology and habitat

The Osprey is known to nest at an artificially erected nesting post at Berth 2 as well as other nearby nesting posts, including Point Moore, Grey's Beach, Separation Point and Drummond Cove. This species is likely to be encountered foraging in the air or perched in and around the Proposal Footprint. This species is also known to breed in significant numbers on the Houtman Abrolhos (Johnstone & Coate, 2023). The Osprey is mostly found along coastal areas but occasionally travel inland along major waterways (Department of Climate Change, Energy, the Environment and Water, 2024). Foraging waters need to be open and extensive, although they prefer some element of elevation (e.g. cliffs) as part of their habitat. The Osprey mainly feeds on fish but may take molluscs, crustaceans, insects, reptiles, birds and mammals on occasion and foraging diurnally, albeit records of this species hunting at night also exist.

Table A-2: Seasonal sensitivities of the Osprey in the Proposal Footprint

Lifecycle	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Foraging												
Breeding												



C.3 Roseate Tern (*Sterna dougallii*)

C.3.1 Conservation status

EPBC Act – migratory

BC Act - migratory

C.3.2 Identification

The Roseate Tern is a small-medium tern, with a wingspan of 67-76 cm (Department of Climate Change, Energy, the Environment and Water, 2024). The Roseate Tern has a slender, pointed, black bill, which develops a red base in the breeding season. The upper wings are grey, and the underside is white. Adults have long, flexible tail streamers and orange-red legs. Adults have long, flexible tail streamers and orange-red legs.

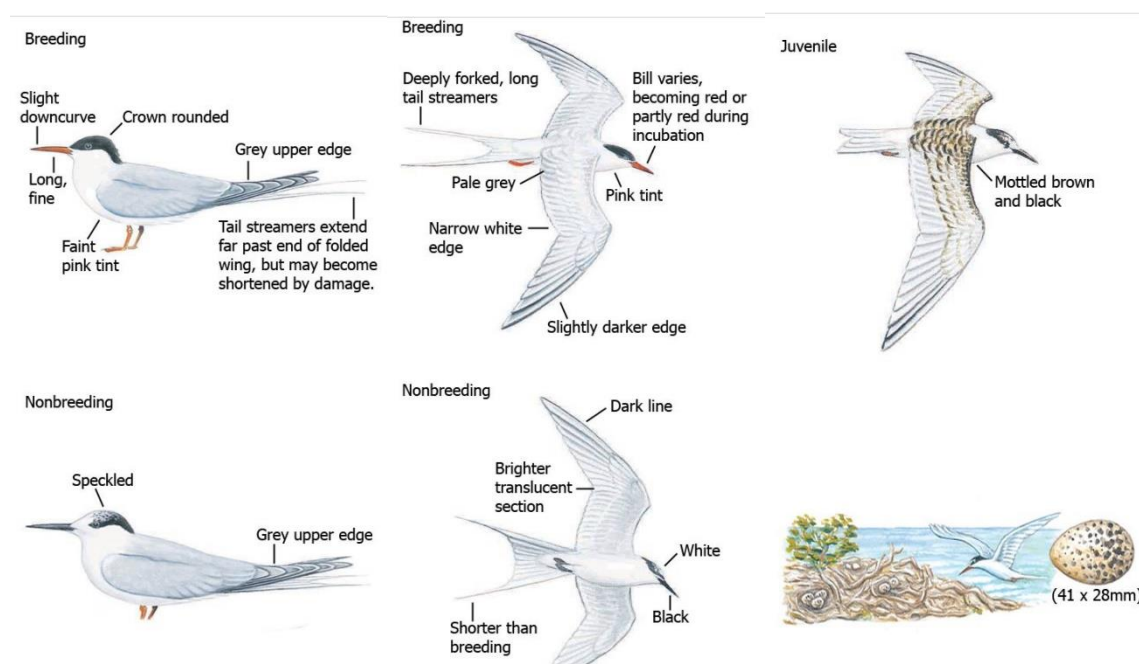


Photo 3 Roseate Tern identification (source: Morcombe's Birds of Australia)

C.3.3 Ecology and habitat

The largest breeding colony in Western Australia has been recorded on the Houtman Abrolhos (Department of Climate Change, Energy, the Environment and Water, 2024) and individuals have recently been recorded off Back Beach. This species may be resident or dispersive from breeding sites with large annual variations in the number of breeding pairs. The Roseate Tern prefers offshore islands and waters and may only be observed in inshore areas near the mainland on occasion, where breeding colonies occur in nearby islands. This species forages mostly on the rising tide, diurnally on fish but may also take crustaceans. This species is likely to be encountered in the air, foraging over the water or on land.

Table A-3: Seasonal sensitivities of the Roseate Tern in the Proposal Footprint

Lifecycle	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Foraging												



C.4 Crested Tern (*Thalasseus bergii*)

C.4.1 Conservation status

EPBC Act – migratory

BC Act - migratory

C.4.2 Identification

A large tern with a very long yellow bill and a black cap that does not extend down to the bill. Juveniles have more black on the back and wings.

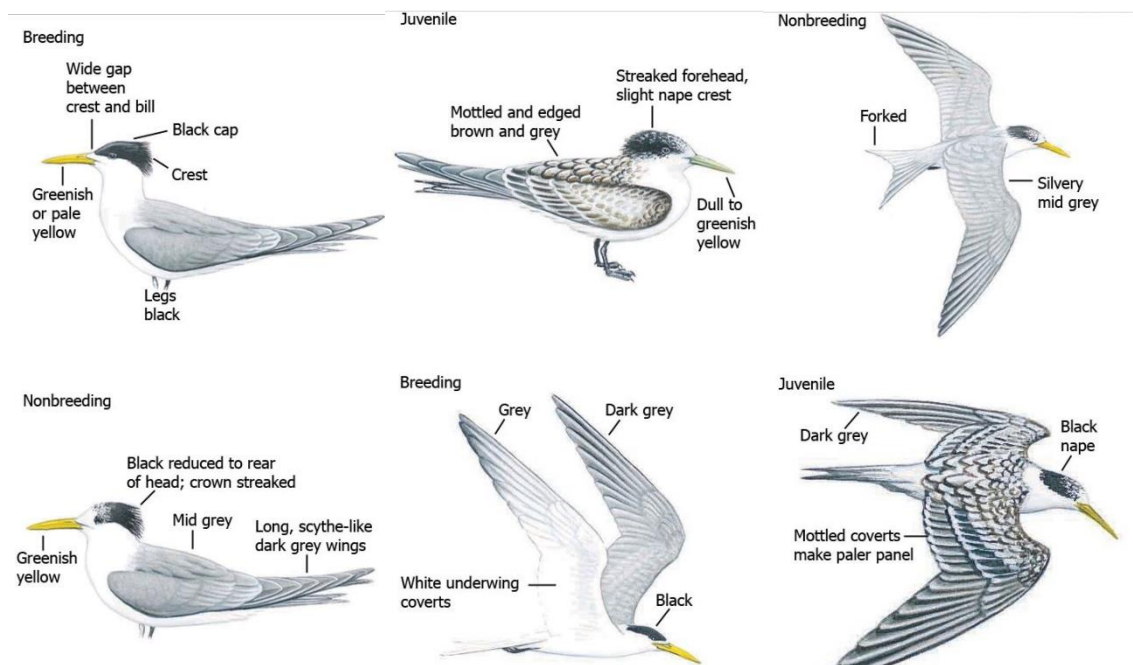


Photo 4 Crested Tern identification (source: Morcombe’s Birds of Australia)

C.4.3 Ecology and habitat

This species is not known to breed in and around the Proposal Footprint but is known to disperse widely outside of the breeding season. This species is often seen around the Geraldton area, in particular on the Houtman Abrolhos and has been recently recorded off Back Beach on the mainland. This species is likely to be encountered in the air, foraging over the water or on land. The Crested Tern dives from about five to eight metres in the air to gather small fish such as Sardines (Family Clupeidae) and Australian Anchovies (*Engraulis australis*) from the surface of the water (Government of South Australia, n.d.).

Table A-4: Seasonal sensitivities of the Crested Tern in the Proposal Footprint

Lifecycle	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Foraging												

C.5 Humpback Whale (*Megaptera novaeangliae*)

C.5.1 Conservation status

EPBC Act – migratory

BC Act – migratory, species of special conservation interest ¹¹

C.5.2 Identification

The Humpback Whale has distinctive knobby protuberances on the head and long flippers making this one of the most easily recognised of the large baleen whales. Its name is derived from the hump under the dorsal fin, which is particularly noticeable when the whale arches its back to dive. This is one of the most studied of the great whales as individuals can be recognised by characteristic black and white patterns especially on the underside of the tail.

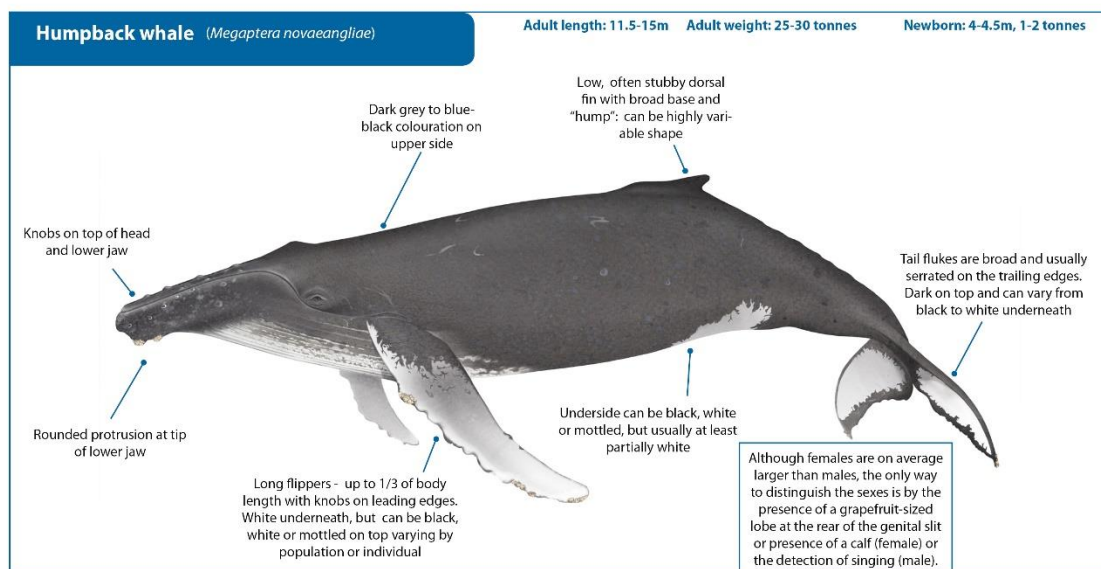


Photo 5 Humpback Whale identification (source: International Whaling Commission)

C.5.3 Ecology and habitat

The area in and around the Proposal Footprint is mapped as migration BIA (north and south) for the Humpback Whale (**Figure 2-1**), where there is predicted to be a bottleneck along the migratory route which forces the Humpback Whale closer to shore. Migration is generally

¹¹ Species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened and published under Schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

further offshore northbound and closer inshore southbound and is observed in the Geraldton area between late May and early December. with the peak of the northern migration in mid-late July and the southern migration between late August and mid-September (TSSC, 2015). The Humpback Whale is not predicted to feed, calf or rest in the waters in and around the Proposal Footprint and may only pass by during migration.

Table A-5: Seasonal sensitivities of the Humpback Whale in the Proposal Footprint

Lifecycle	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Migration							^	^	^			

^Peak activity



C.6 Australian Sea-lion (*Neophoca cinerea*)

C.6.1 Conservation status

EPBC Act – endangered

BC Act – endangered

C.6.2 Identification

This species has a stocky body, a large head, thick neck and short narrow flippers. The Australian Sea-lion has small external ears and single coat of fur with a blunter snout than other fur seals. The male of this species is dark brown with a mane-like yellow area and the top of the head. The female is silver-grey to fawn on the back and creamy-coloured underneath. Juveniles are chocolate brown with a pale fawn crown until moulting.



Photo 6 Australia Sea-lion identification (source: Australian Museum)

C.6.3 Ecology and habitat

The area in and around the Proposal Footprint forms part of the foraging BIA (**Figure 2-1**) for males for the largest population in Western Australia. Local colonies of the Australia Sea-lion are estimated to be about 150 individuals at the Houtman Abrolhos, approximately 48 km offshore from the Proposal Footprint, where breeding occurs. This species feeds on a variety of prey including cephalopods, fish, sharks, rock lobsters and sea birds and have been known to interact with fishing vessels and aquaculture (Department of Climate Change, Energy, the Environment and Water, 2024). Little is known about the males' feeding behaviour however, females and juveniles have been recorded diving almost continuously through the day and night. Individuals are known to regularly haul-out at select sites in and around the Port. These visitors are likely from the Houtman Abrolhos colony but may also include visitors from Beagle Island and North Fisherman Island (Campbell, et al., 2007), and are anecdotally, a mix of males and females. There are a number of preferred haul-out sites

in and around the Port that are frequently occupied by Australian Sea-lion individuals throughout the year, including Seal Rocks, underneath Berth 6 and along the existing northern breakwater.

Table A-6: Seasonal sensitivities of the Australian Sea-lion in the Proposal Footprint

Lifecycle	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Foraging*												
Haul-out*												

*Presence driven by a-seasonal breeding cycle



C.7 Indo-Pacific Bottlenose Dolphin (*Tursiops aduncus*)

C.7.1 Conservation status

EPBC Act – not MNES

BC Act – migratory

C.7.2 Identification

This species has a sleek frame glistening iridescent blues and greys (Whale and Dolphin Conservation, 2024). Well-known for their toothy “grins”, the Indo-Pacific Bottlenose Dolphins have a longer beak than the common bottlenose dolphin, as well as a more distinctive dorsal fin. Despite looking very similar, they also have a more streamlined, slender frame bearing different shading and, in some cases, a speckly underbelly too.

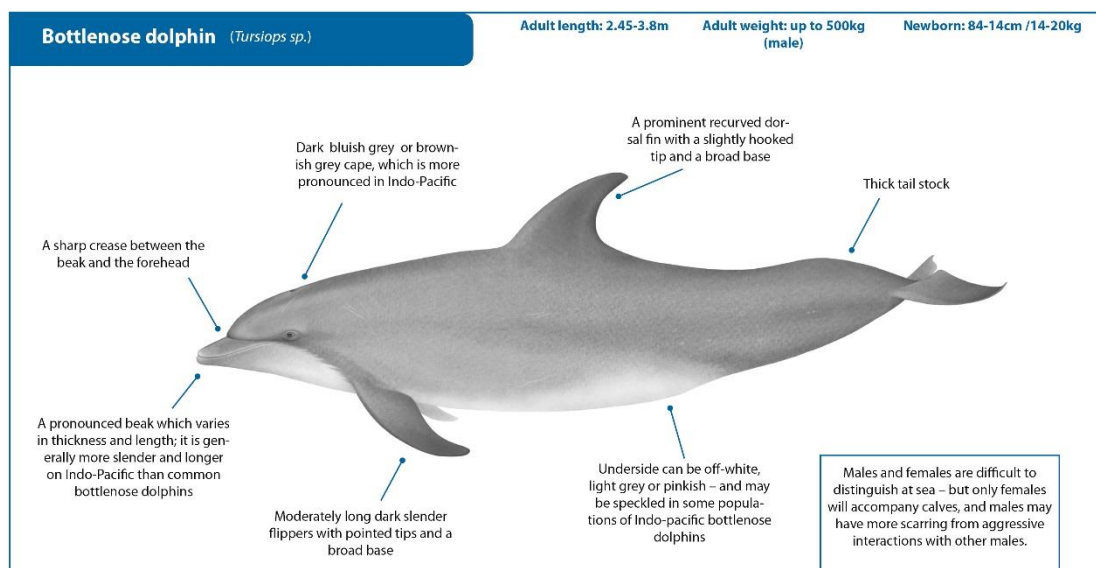


Photo 7 Indo-Pacific Bottlenose Dolphin identification (source: International Whaling Commission)

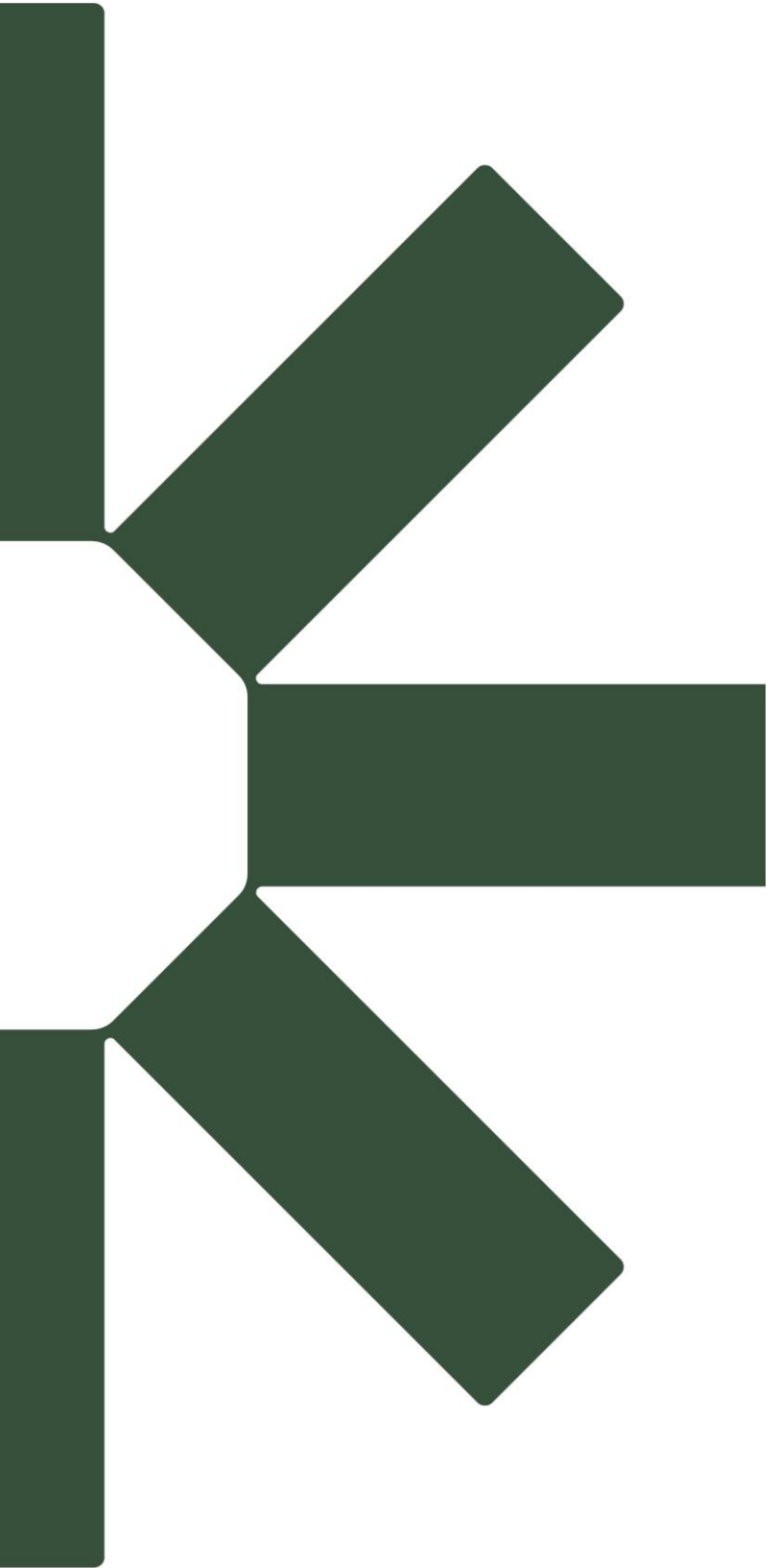
C.7.3 Ecology and habitat

This species is known from four main regions Around Australia: (1) eastern Indian Ocean; (2) Tasman Sea; (3) Coral Sea; and (4) Arafura/Timor Seas (Department of Climate Change, Energy, the Environment and Water, 2024). This species is known to have high site fidelity and inhabits inshore areas such as bays and estuaries and shallow offshore areas around islands. This species and the Common Bottlenose Dolphin (*Tursiops truncatus*) are residents of Shark Bary, approximately 550 km north of the Proposal Footprint, and have been studied and monitored extensively. There is potential that occurrences of this species in and around the Proposal Footprint may be local to the Geraldton area or have travelled from other locations in the eastern Indian Ocean region, such as Shark Bay. The Indo-Pacific Bottlenose Dolphin predominantly feeds on fish and cephalopods and have been known to take advantage of commercial fishing activities. It is unlikely that the area in and around the Proposal Footprint forms optimal breeding habitat for this species due to the ambient level of disturbance from the operating Port.

Table A-7: Seasonal sensitivities of the Indo-Pacific Bottlenose Dolphin in the Proposal Footprint

Lifecycle	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Foraging												





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