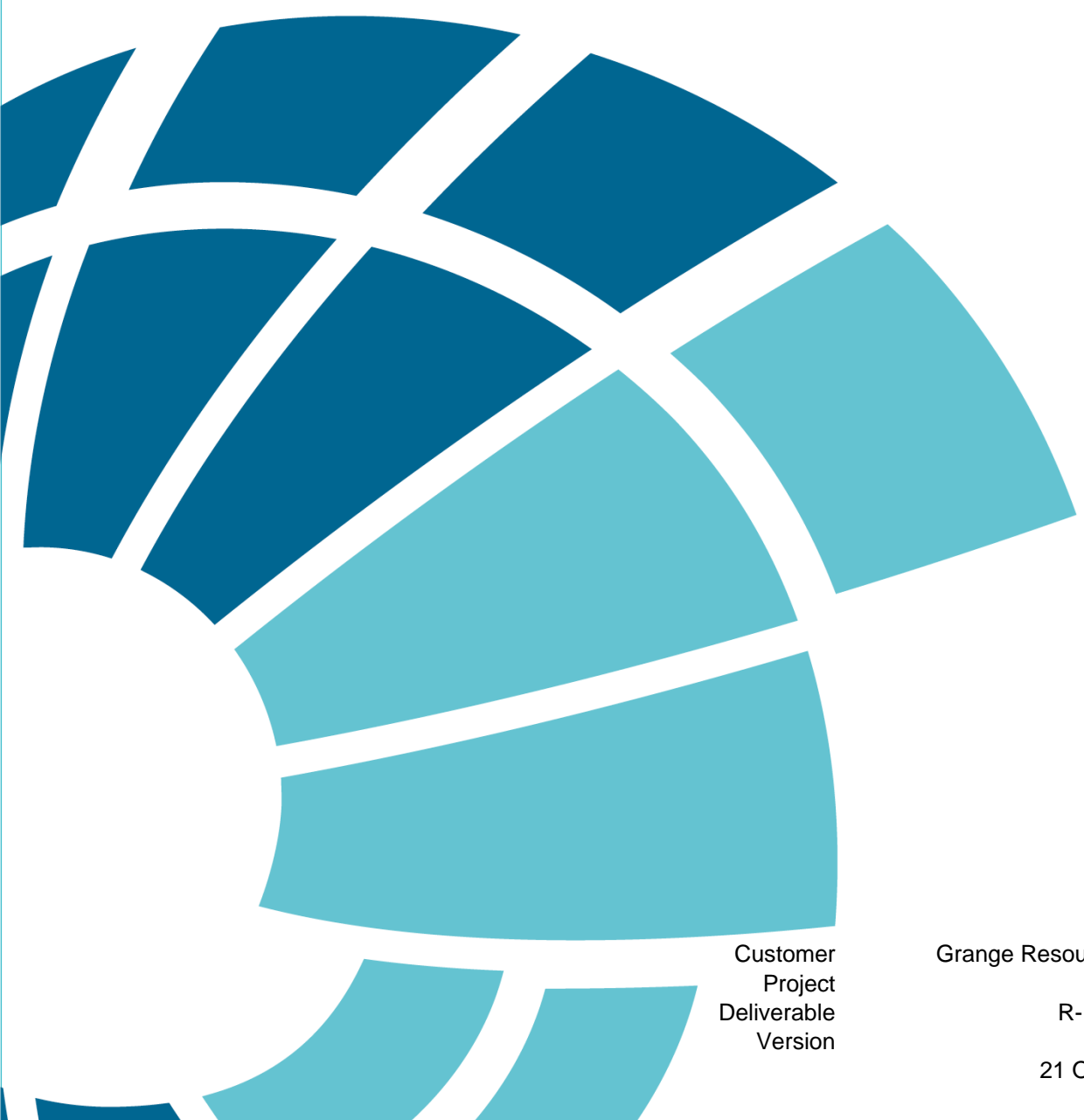


SouthDown Joint Venture Magnetite Transshipping Project – Marine Fauna Desktop Study



Customer
Project
Deliverable
Version

Grange Resources Limited
A10512.006
R-10512.006-6
0
21 October 2022

Document Control

Document Identification

Title	SouthDown Joint Venture Magnetite Transshipping Project – Marine Fauna Desktop Study
Project No	A10512.006
Deliverable No	R-10512.006-6
Version No	Rev0
Version Date	21 October 2022
Customer	Grange Resources Limited
Classification	BMT (OFFICIAL)
Synopsis	A marine fauna desktop assessment for King George Sound and Princess Royal Harbour, Albany, as part of the Southdown Transshipping Project
Author	Caroline Hart, Karina Inostroza
Reviewed By	Jonathan Anderson,
Project Manager	Jonathan Anderson

Amendment Record

The Amendment Record below records the history and issue status of this document.

Version	Version Date	Distribution	Record
A	15 November 2021	K Inostroza, BMT	1x .docx
B	30 November 2021	K Inostroza, BMT	1x .docx
C	11 February 2022	K Alexander, Technical Expert	1x .docx
D	18 February 2022	K Inostroza, BMT	1x .docx
0	21 October 2022	C Hart / J Anderson, BMT	1x .pdf

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Acronyms

BC Act	Western Australian Biodiversity Conservation Act 2016
DAWE	Australian Department of Agriculture, Water and the Environment
DBCA	Western Australian Department of Biodiversity, Conservation and Attractions
DPIRD	Department of Primary Industries and Regional Development
DWER	Western Australian Department of Water and Environmental Regulation
EIA	Environmental impact assessment
EP Act	Environmental Protection Act 1986
EPA	Environmental Protection Authority
EPBC Act	Commonwealth Environmental Protection and Biodiversity Conservation Act 1999
ERD	Environmental Review Document
KGS	King George Sound
MNES	Matters of National Environmental Significance
NSW	New South Wales
NT	Northern Territory
PRH	Princess Royal Harbour
Qld	Queensland
SA	South Australia
SDJV	Southdown Joint Venture
SPA	Southern Port Authority
WA	Western Australia

1 Introduction

1.1 Project background

The Port of Albany (hereafter, 'the Port') is on the southern coast of Western Australia with infrastructure in Princess Royal Harbour (PRH) and King George Sound (KGS; Figure 1.1). The Port is an industrial port operated by Southern Port Authority (hereafter, 'the Proponent') under the Port Authority Act 1999, exporting bulk products such as grain, woodchips and silica sand, and importing fertiliser, fuel and timber products.

The Port has undergone growth in the past decades to meet the potential shipping needs of the Southdown Magnetite Project run by the Southdown Joint Venture (SDJV; Grange Resources Limited and Sojitz Corporation). The SDJV proposes to construct and operate an open pit magnetite mine at the Southdown Magnetite deposit located ~90 km north-east of Albany, Western Australia (hereafter, 'the Proposal'). The Proposal will include pumping magnetite as a slurry via a 104 km-long buried pipeline to newly installed land-based facilities at the Port. The loadout facility will be located on unused land within the Port and will include the construction of a new loading facility at Berth 5, including a filtration plant, a concentrate stockpile, and conveyor system. These new facilities will be constructed and operated by the SDJV. The magnetite concentrate will then be loaded onto transshipping vessels and then barged to larger Cape size vessels (~175 thousand tonnes) located at anchorage sites D, W, Y and Z in KGS (Figure 1.1). The magnetite is intended for export to southeast Asia at a target rate of 5 million tonnes per annum concentrate for 30 years. Large vessels regularly transit through the shipping channel and KGS, however, the transshipping operations involved in the Proposal may have potential impacts and risks to marine fauna, and it is anticipated that approvals under the following state and federal legislation may be required.

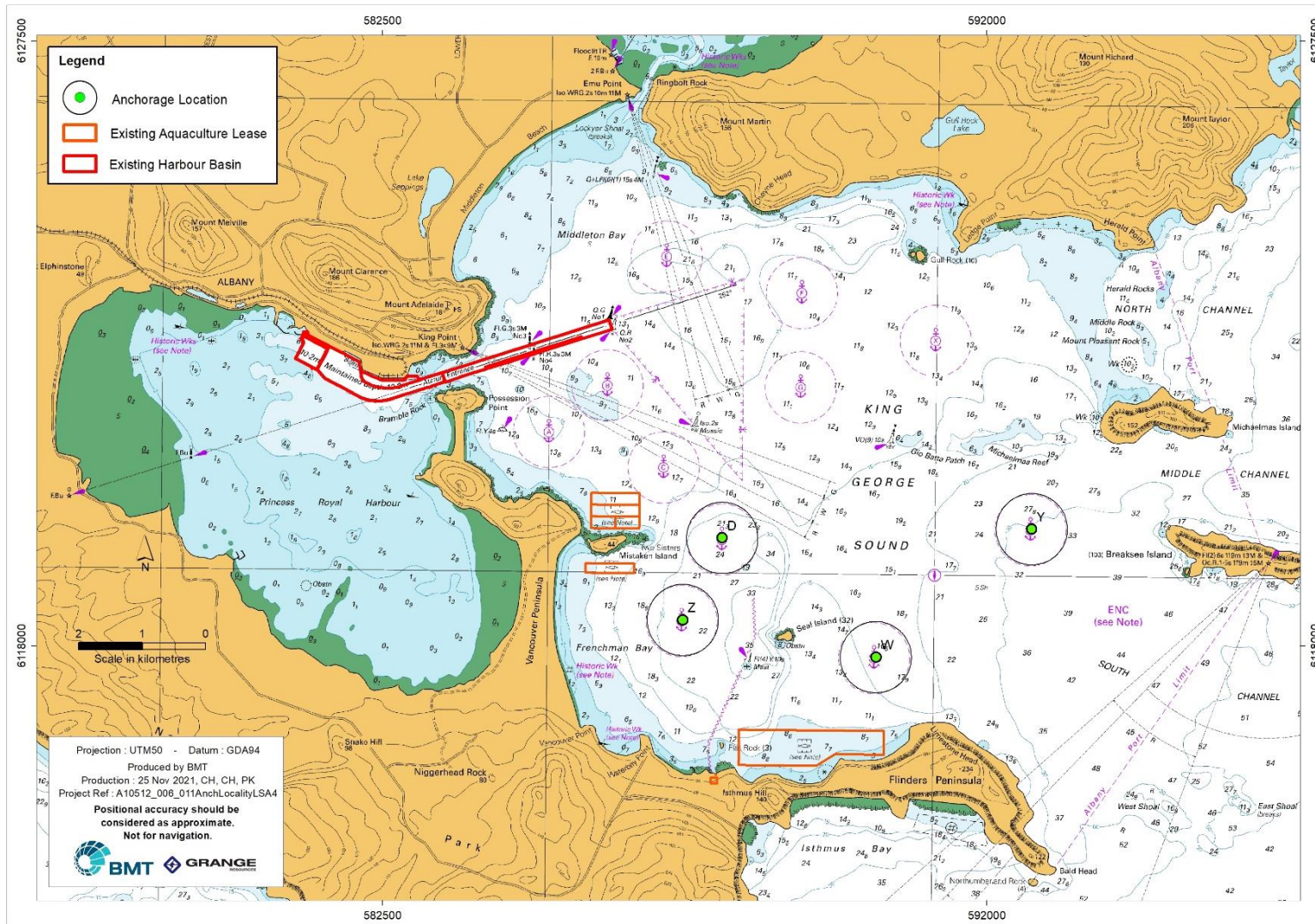


Figure 1.1 Port of Albany and proposed anchorage sites in King George Sound

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1.2 Environmental approval pathways

The Project proposal will be referred to the Environmental Protection Authority (EPA) under Section 38(1) of the Environmental Protection Act 1986 (EP Act) Part IV to determine the level of assessment. The EPA applies a Significance Framework to make decisions through the environmental impact assessment (EIA) process, based on the concept of significance established under the EP Act. One of the principles outlined in the EP Act is the conservation of biological diversity and ecological integrity, relevant to marine fauna.

1.3 Regional setting

The Port is located in the Great Southern region of Western Australia, ~420 km south-east of Perth. The region experiences a Mediterranean climate with mild, dry summers with average temperatures of 23°C, and mild, wet winters with average temperatures of 16°C (BoM 2021). The annual rainfall is high with an average maximum of 925 mm (BoM 2021). The region is dominated by easterly winds in summer and westerly winds in winter. Tides are relatively weak and vary from diurnal to semi-diurnal throughout the year with a spring tidal range of approximately 1.1 m.

The Port is located on the north shore of PRH, a large harbour with a narrow channel connecting with the marine waters of KGS. The PRH is shallow in depth with gently sloping sandy margins that supports subtidal *Posidonia australis*, *P. sinuosa* and *Amphibolis antarctica* seagrass meadows (Bastyan 1996). The shallow intertidal sandbanks and mudflats off the western and southern shores of PRH are rich feeding areas for water birds (Albany Port Authority 2007). The north-east of PRH does not support significant areas of shallow inter-tidal sandbanks and mudflats. The waters of PRH are generally well mixed vertically, weakly stratified, and has a salinity close to that of marine waters (35 ppt) (Mills & D'Adamo 1993, Waterways Commission 1995).

King George Sound is a salt-water environment that is well protected from the high-energy wave climate of the south-west. Freshwater plumes exiting Oyster Harbour often extend as far as Breaksea and Michaelmas Islands and occasionally beyond in winter during periods of high river flow (Hillman et al. 1991). Seagrass species of varying densities are also present in KGS in depths up to 16 m (Oceanica 2011). Numerous limestone reef systems (including Gio Batta Patch and Michaelmas Reef) exist in KGS that support macroalgal communities and a rich and diverse fauna consisting of encrusting sponges, bryozoans, ascidians and soft corals (EPA 2010). Commercial (purse-seine fishery for pilchards, and net fishing) and recreational fishing are permitted in KGS and PRH under the Fish Resources Management Act 1994. Other commercial fishing activities in KGS include trap, octopus and wetlining.

Existing aquaculture farms leased by the Department of Primary Industries and Regional Development (DPIRD) operate in Oyster Harbour and KGS. These sites are used to cultivate mussels (*Mytilus edulis*), rock oysters (*Saccostrea glomerata*) and Akoya pearl oysters (*Pinctada imbricata*), which are farmed by collecting wild spat that are then attached to long lines to grow-out to market size (Ecologia 2007, DPIRD 2021). The anchorage sites and transshipping operations are proposed to be developed within KGS adjacent to proposed aquaculture sites to the north and south of Mistaken Island.

1.4 Purpose of this document

The purpose of this document is to conduct a desktop assessment of available information to provide a comprehensive listing of marine fauna known or likely to occur within, or regularly pass through, the Proposal area (KGS and PRH). Where relevant, this report will document any known uses of the Proposal area by marine fauna (e.g., foraging, migrating, calving, nursing, spawning, roosting and nesting), and identify any critical windows of environmental sensitivity for marine fauna in the proximity of the Proposal area. The comprehensive listing will include the identification of:

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- Matters of National Environmental Significance (MNES) and Other Matters (species and communities) protected by the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999) relevant to the marine components of the Proposal
- marine species important to fisheries (commercial and recreational) that are likely to occur in the Proposal area.

This document forms part of an overarching Environmental Review Document (ERD) to support the assessment of the Proposal under the EPBC Act.

2 Conservation Significant Marine Fauna

2.1 Relevant legislation and guidelines

In line with relevant state and federal legislation, a comprehensive desktop review was conducted to identify conservation significant marine fauna species that are either known to occur within, likely to occur within, or regularly pass through the Proposal area. The relevant legislations and guidelines specific to marine fauna include:

- **Commonwealth EPBC Act 1999** – Protected marine fauna that are listed into categories Critically Endangered, Endangered, Vulnerable, Conservation Dependent, Extinct, or Extinct in the Wild. Migratory species identified in an international agreement approved by the Minister for Environment are categorized as MNES
- **Western Australian Biodiversity Conservation Act 2016 (BC Act)** – Threatened marine fauna categorised into Threatened Fauna conservation categories that align with those detailed in the EPBC Act
- **Department of Biodiversity, Conservation and Attractions (DBCA) Priority Species** – DBCA maintains a list of 'Priority' species (P1–P4) that are of conservation interest
- **Western Australian Fish Resources Management Act 1994** – Regulates fishing, aquaculture and other aquatic resources in WA.

2.2 Database searches

A range of database searches were performed to identify conservation significant marine fauna species that are either known to occur within, likely to occur within, or regularly pass through the Proposal area. These databases include:

- Australian Department of Agriculture, Water and the Environment (DAWE) Protected Matters Search Tool (DAWE 2021a)
- DBCA Threatened and Priority Fauna List
- Atlas of Living Australia.

The search parameters used in the DAWE Protected Matters Search Tool (DAWE 2021a) included PRH and the Port boundary limit in KGS that runs through Herald Point to Michaelmas Island to midway through Breaksea Island to Flinders Peninsula. For the Atlas of Living Australia search tool, KGS was searched with a 10 km radius.

The results of the database searches that list the conservation significant marine fauna species, which include marine mammals, marine reptiles, sharks and rays, finfish and marine birds, is provided in Table 2.1. It was also determined if the marine fauna species had a potential critical window of environmental sensitivity, based on the existing state of knowledge (Section 3), and if there was a likelihood of this occurring within the Proposal area (Table 2.1). Critical windows of environmental sensitivity may include times of the year or particular locations where key species or ecological communities or critical processes (e.g. feeding, breeding, nursing or resting) may be particularly vulnerable to pressures from anthropogenic activities (EPA 2021).

BMT (OFFICIAL)**EPBC Act 1999**

A Protected Matters Report (Annex A) search conducted on 8 November 2021 identified 120 species protected under the EPBC Act, including MNES and Other Matters Protected by the EPBC Act (Table 2.1).

Of the 120 species, 73 marine fauna species are protected as MNES, 39 of which are Threatened species (four Critically Endangered, 11 Endangered, 22 Vulnerable and 2 Conservation Dependent), and 34 of which are Migratory marine species (not including those Migratory marine species already listed under Threatened species; Table 2.1). The remaining 47 species are listed as Other Matters protected by the EPBC Act – 38 of which are Listed Marine Species, and nine of which are Whales and Other Cetaceans (not including those already listed under MNES; Table 2.2).

BC Act 2016

Five marine species potentially occurring in the Proposal area are listed under Schedule 1 – Fauna that are rare or are likely to become extinct as critically endangered fauna (Table 2.1). Four marine species are listed under Schedule 2 (fauna that are rare or are likely to become extinct as endangered fauna) and six marine species under Schedule 3 (fauna that are rare or are likely to become extinct as vulnerable fauna; Table 2.1). Thirty-nine marine birds potentially occurring in the Proposal area are listed under Schedule 5 in which migratory birds are protected under an internal agreement (Table 2.1). The full report generated from the Threatened and Priority Fauna List is provided in Annex B.

DBCA Priority Fauna

A search of Priority Fauna was completed on 9 November 2021. There were no marine fauna species protected as MNES listed as DBCA Priority Fauna that potentially occur in the Proposal area.

Atlas of Living Australia

A search for marine fish species reported a total of 266 species of fish from 114 families were within a 10 km radius of KGS.

2.3 Likelihood of occurrence assessment

The likelihood of conservation significant marine species identified in the database searches occurring at or adjacent to the Proposal area was determined through the assessment of the 1) habitat present in the Proposal area compared to the habitat typically associated with the species; and 2) typical species behaviour (e.g. foraging behaviour, migration, calving, nursing, spawning, roosting and nesting). The results of the assessment are presented in Table 2.1 and Table 2.2.

Table 2.1 Conservation significant marine fauna species identified in King George Sound and Princess Royal Harbour as defined by State and Commonwealth legislation

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Marine mammals (seals, whales, dolphins)						
Australian Sea Lion (<i>Neophoca cinerea</i>)	Endangered	Vulnerable	Breeding range generally extends from Houtman Abrolhos WA to The Pages Island in South Australia (SA). Prefer the sheltered side of islands to use as rookeries and haul-out sites and avoid exposed rocky headlands (Campbell 2005). Known breeding colony and haul-out site at Haul-off Rock ~80 km north-east of PRH. The waters around Bald Island east of Cheynes beach are identified as a Biologically Important Area for foraging by male Australian sea lions (DSEWPac 2011). Haul-out/resting sites located at Coffin Island adjacent to the proposal area and at Breaksea and Seal Islands within the proposal area. Foraging and feeding documented in KGS and PRH	Critical habitat found within the Proposal area year-round	Species or species habitat known to occur within area	Likely
Southern Right Whale (<i>Eubalaena australis</i>)	Endangered, migratory	Vulnerable (Schedule 3)	Principally found around the southern coastline between Sydney and Perth with major calving areas at Doubtful Island Bay in WA to Head of Bight in SA. Feeding habitat is thought to be in deeper offshore waters (Bannister et al. 1997). KGS and adjacent waters are regularly used for calving, nursing and resting (Bannister 2001)	Female-calf pairs and unaccompanied individuals present in the proposal area between May–October	Breeding known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Humpback Whale (Megaptera novaeangliae)	Vulnerable, migratory	Conservation Dependent (Schedule 6)	Known calving, migration and resting areas in between southern Kimberley to Albany. The migratory habitat is primarily coastal water <200 m in depth and within 20 km of the coast (DAWE 2021b). KGS and adjacent waters are used during the northern migration May–September	Timing of peak abundance in KGS and adjacent waters occurs between June–August. Sightings recorded from May–November	Species or species habitat known to occur within area	Likely
Blue Whale (Balaenoptera musculus) and Pygmy Blue Whale (Balaenoptera musculus brevicauda)	Endangered, migratory	Endangered (Schedule 2)	Blue whales, principally pygmy blue whales use coastal and offshore waters in the Albany area for migration and foraging. Pygmy blue whales migrate west along the southern WA coastline between January and June. Seasonally present in the proposal area and adjacent waters	Documented sighting records of individuals in KGS and adjacent waters annually between February and June	Species or species habitat known to occur within area	Likely
Sei Whale (Balaenoptera borealis)	Vulnerable, migratory	Endangered (Schedule 2)	Australian Antarctic and temperate cool waters are important feeding grounds (Horwood 1997), while breeding occurs in tropical and subtropical waters (DAWE 2021b). Movements and distributions of sei whales are unpredictable and not well documented	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Fin Whale (Balaenoptera physalus)	Vulnerable, migratory	Endangered (Schedule 2)	Fin whales migrate through WA waters, with earliest arrival of the animals recorded on the WA coast, at Cape Leeuwin in April (Aulich et al. 2019). Opportunistic sighting records evidence fin whales in coastal and offshore waters in the Albany region April-May. Observed in SA waters between	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat likely to occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			November and May, and acoustics have been heard off the Rottneest Trench between January and April 2000 (DAWE 2021b). Australian Antarctic waters are important feeding grounds, and there are no known mating or calving areas in Australian waters			
Bryde's Whale (<i>Balaenoptera edeni</i>)	Migratory	–	Found year-round in waters between 40° S and 40° N, primarily in temperatures exceeding 16.3 °C (DAWE 2021b). They are more likely to occur along the east and west coasts of Australia and possibly less abundant along the cooler southern coast	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Pygmy Right Whale (<i>Caperea marginata</i>)	Migratory	–	Distributed between 32° S and 47° S, but not uniformly spread around the Australian coast, with few WA records. Have primarily been recorded in areas associated with upwellings and with high zooplankton abundance (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Dusky Dolphin (<i>Lagenorhynchus obscurus</i>)	Migratory	–	Not well surveyed in Australian waters. The distribution is primarily assumed from 13 records. Given the lack of understanding of the species' distribution in Australian waters, no key localities have yet been identified (Bannister et al. 1996)	May use habitat during winter, however no calving areas found within the Proposal area	Species or species habitat may occur within area	Unlikely
Killer Whale/Orca (<i>Orcinus orca</i>)	Migratory	–	Considered a regular visitor to State waters in WA. The Bremer Sub-Basin, south-western Australia, ~160 km east of the proposal area supports the largest	No critical habitat or feeding grounds	Species or species habitat may occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			documented aggregation of killer whales in Australian waters. Opportunistic sighting in coastal and offshore waters adjacent to the proposal area	found within the Proposal area		
Marine reptiles						
Loggerhead Turtle (<i>Caretta caretta</i>)	Endangered, migratory	Endangered (Schedule 2)	Occurs in the waters of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia (Limpus 1995). In WA, nesting occurs from Shark Bay to the North West Cape (DAWE 2021b)	Unsuitable habitat (cold waters) found within the Proposal area	Breeding likely to occur within area	Unlikely
Green Turtle (<i>Chelonia mydas</i>)	Vulnerable, migratory	Vulnerable (Schedule 3)	Forage and migrate across tropical and temperate Australia. Forage benthic habitats such as tropical tidal and sub-tidal coral and rocky reef habitat or inshore seagrass beds. Key nesting areas are located in tropical waters in WA (DoEE 2017)	Documented sightings in KGS. Possible use of habitat for feeding but periods unknown, habitat not used for nesting	Species or species habitat may occur within area	Unlikely
Leatherback Turtle (<i>Dermochelys coriacea</i>)	Endangered, migratory	Vulnerable (Schedule 3)	Pelagic feeder found in tropical, subtropical and temperate waters throughout the world. No major nesting has been recorded in Australia although scattered isolated nesting occurs in Queensland (Qld) and the Northern Territory (NT) (DoEE 2017)	Possible use of habitat but periods unknown	Breeding likely to occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Sharks and rays						
Great white shark (Carcharodon carcharias)	Vulnerable, migratory	Vulnerable (Schedule 3)	White sharks are known to frequent coastal waters along the south coast as evidenced by acoustic detections (McAuley et al. 2017). Acoustic data collated since 2009 provides evidence for white sharks being present more consistently across seasons off the south coast of WA. These sharks' frequent regions with seal colonies (DAWE 2021b)	Acoustic detection at receivers in KGS at Frenchman's Bay and Middleton Beach evidence presence in the proposal area	Foraging, feeding or related behaviour known to occur within area	Likely
Grey nurse shark (<i>Carcharias taurus</i>)	Vulnerable	Vulnerable (Schedule 3)	The west coast population has a broad inshore distribution, primarily in sub-tropical to cool temperate waters. Numerous sightings have been reported between Albany and Esperance (Chidlow et al. 2006), hovering over the seabed, rocky caves and in the vicinity of inshore rocky reefs and islands (Pollard et al 1996)	No critical habitat found within the Proposal area, could occur offshore to the Proposal area however period unknown	Species or species habitat likely to occur within area	Unlikely
Whale shark (Rhincodon typus)	Vulnerable, migratory	Schedule 7	Known to occur throughout Australia excluding east of Cape Arid in WA to Melbourne in Victoria (DAWE 2021b), but most commonly seen in waters of northern WA. Ningaloo Reef is the main known aggregation site of Whale Sharks in Australian waters, which may be due to seasonal concentrations of krill and other zooplankton (Taylor 1996)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
School shark (<i>Galeorhinus galeus</i>)	Conservation Dependent	–	Occurs throughout the temperate coastal waters of southern Australia from Perth to Moreton Bay in southern Qld (Pogonoski et al. 2002). It is found over continental shelves to inshore areas, which are used as important birthing and nursery sites (TSSC 2009)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Reef Manta Ray (<i>Mobula alfredi</i>)	Migratory	–	Lives in tropical marine waters and occasionally in temperate seas between Bremer Bay in WA to the tropical north of the country to Sydney (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat known to occur within area	Unlikely
Giant Manta Ray (<i>Manta birostris</i>)	Migratory	–	Lives in tropical marine waters and occasionally in temperate seas between Bremer Bay in WA to the tropical north of the country and south to the southern coast of New South Wales (Australian Museum 2021a)	Species present in offshore waters in the Albany area seasonally (summer/early autumn). No critical habitat or feeding grounds found within the Proposal area	Species or species habitat known to occur within area	Unlikely
Oceanic Whitetip Shark (<i>Carcharhinus longimanus</i>)	Migratory	–	An oceanic deep-water species which sometimes comes close to shore, usually over water depths ~150 m (Fishbase 2021)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Mackerel Shark (<i>Lamna nasus</i>)	Migratory	–	Occurs in waters from southern Qld to south-west Australia (Last & Stevens 2009), typically occurring in oceanic waters off the continental shelf,	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			although they occasionally enter coastal waters (Francis et al. 2002).			
Finfish						
Southern Blue Fin Tuna (<i>Thunnus maccoyii</i>)	Conservation Dependent	–	A highly migratory species ranging between northern WA to central Qld. Southern bluefin tuna seasonally use the inshore waters of the Albany area. Juveniles (1–2 years) inhabit inshore waters in WA and SA (Honda et al. 2010). There is a single known spawning ground between Java and northern WA	Juveniles forage in inshore coastal waters in the Albany area seasonally (December–April) (Fujioka et al. 2010). No other critical habitat found within the Proposal area	Species or species habitat known to occur within area	Unlikely
Balston's Pygmy Perch (<i>Nannatherina balstoni</i>)	Vulnerable	Vulnerable (Schedule 3)	Restricted to near-coastal streams, lakes and wetlands between upper Margaret River and the Goodga River (near Albany), living for three years and breeding from early winter to late winter/early spring (DWER 2021)	Unsuitable habitat (freshwater) found within the Proposal area	Species or species habitat may occur within area	Unlikely
Birds – Wetland birds						
Great Knot (<i>Calidris tenuirostris</i>)	Critically Endangered, Migratory	Critically Endangered (Schedule 1)	Recorded around the entirety of the Australian coast, with a few scattered records inland. The species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. The species is much less common in south-west Australia (DAWE 2021B)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Red Knot (<i>Calidris canutus</i>)	Endangered, Migratory	Protected Migratory Birds Schedule 5	Common in all the main suitable habitats around the coast of Australia, but is less numerous in south-west Australia. It inhabits intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Species or species habitat known to occur within area	Likely
Northern Siberian Bar-tailed Godwit (<i>Limosa lapponica menzbieri</i>)	Critically Endangered	Critically Endangered (Schedule 1)	Has been recorded in the coastal areas of all Australian states. In WA it is widespread around the coast from Eyre to Derby. During the non-breeding period (it does not breed in Australia), the distribution is predominately along the north coasts of WA (Garnett et al. 2011). It occurs mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It has also been recorded in coastal sewage farms and saltworks, salt lakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats (Higgins & Davies 1996)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Species or species habitat known to occur within area	Likely
Bar-tailed Godwit (<i>Limosa lapponica</i>)	Migratory	Protected Migratory Birds Schedule 5	Has been recorded in coastal areas of all Australian states. The typical habitat of the godwit is primarily coastal habitats such as large intertidal sandflats, banks, mudflats,	Critical habitat or feeding grounds found adjacent to	Species or species habitat known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			estuaries, inlets, harbours, coastal lagoons and bays (DAWE 2021b)	the Proposal area in spring and summer		
Black-tailed Godwit (<i>Limosa limosa</i>)	Migratory	Protected Migratory Birds Schedule 5	The species is commonly found along coastal habitat: in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit; occasionally recorded on rocky coasts or coral islets. The use of habitat often depends on the stage of the tide. It is also found in shallow and sparsely vegetated, near-coastal, wetlands; such as saltmarsh, salt flats, river pools, swamps, lagoons and floodplains (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely
Curlew Sandpiper (<i>Calidris ferruginea</i>)	Critically Endangered, Migratory	Critically Endangered (Schedule 1)	Mainly occur on intertidal mudflats in sheltered coastal areas (e.g., estuaries, bays, inlets and lagoons), around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Species or species habitat known to occur within area	Likely
Marsh Sandpiper (<i>Tringa stagnatilis</i>)	Migratory	Protected Migratory Birds Schedule 5	Found on coastal and permanent or ephemeral inland wetlands throughout Australia of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and is also seen at sewage farms and saltworks (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Common Sandpiper (<i>Actitis hypoleucos</i>)	Migratory	Protected Migratory Birds Schedule 5	It is widespread along all coastlines and inland areas of Australia. It utilises a wide range of coastal and inland wetlands with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. It has been recorded in estuaries and deltas of streams, banks farther upstream, around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. Sandpipers forage in shallow water and on bare soft mud at the edges of wetlands and typically roosts on rocks or in roots or branches of vegetation, especially mangroves (Higgins & Davies 1996)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Species or species habitat known to occur within area	Likely
Terek Sandpiper (<i>Xenus cinereus</i>)	Migratory	Protected Migratory Birds Schedule 5	Has a primarily coastal distribution, with occasional records inland. It is more widespread and common in northern and eastern Australia than southern Australia. In WA, it is rarely seen on the south coast, only occasionally around Eyre and Albany. It mostly forages in the open, on soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely
Sharp-tailed Sandpiper (<i>Calidris acuminata</i>)	Migratory	Protected Migratory Birds Schedule 5	Preference for muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. They use intertidal mudflats in sheltered bays, inlets, estuaries	Critical habitat or feeding grounds found adjacent to the Proposal area	Roosting known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			or seashores, and swamps and creeks lined with mangroves. In WA, they are widespread from Cape Arid to Carnarvon, around coastal and subcoastal plains of Pilbara Region to south-west and east Kimberley Division (DAWE 2021b)			
Pectoral Sandpiper (<i>Calidris melanotos</i>)	Migratory	Protected Migratory Birds Schedule 5	In WA, the species is rarely recorded. It has been observed at the Nullarbor Plain, Reid, Stoke's Inlet, Grassmere Lake, Warden Lake, Dalyup and Yellilup Swamp, Swan River, Bengier Swamp, Guraga Lake, Wittecarra, Harding River, coastal Gascoyne, the Pilbara and the Kimberley (Higgins & Davies 1996). It prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Species or species habitat known to occur within area	Likely
Eastern Curlew (<i>Numenius madagascariensis</i>)	Critically Endangered, Migratory	Critically Endangered (Schedule 1)	It is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Curlews are recorded from Eyre to Peel Inlet (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Species or species habitat known to occur within area	Likely
Little Curlew (<i>Numenius minutus</i>)	Migratory	Protected Migratory	It spends the non-breeding season in northern Australia from Port Hedland in WA to the Qld coast. The species is recorded	Critical habitat or feeding grounds found adjacent to	Roosting likely to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
		Birds Schedule 5	in Australia between September and April and there are few winter records (Blakers et al. 1984). Sites of international importance within WA include: Roebuck Plains, Anna Plains, WA, Derby Sewage Ponds, and Parry floodplain, Wyndham (Bamford et al. 2008)	the Proposal area in spring and summer		
Lesser Sand Plover (<i>Charadrius mongolus</i>)	Endangered, Migratory	Protected Migratory Birds Schedule 5	Widespread in coastal regions in all states but primarily in northern and eastern Australia on large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely
Greater Sand Plover (<i>Charadrius leschenaultii</i>)	Vulnerable, Migratory	Protected Migratory Birds Schedule 5	It occurs in coastal areas in all states, though the greatest numbers occur in north-west Australia. They primarily occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, and sandy estuarine lagoons (Bamford 1988) and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Species or species habitat known to occur within area	Likely
Grey Plover (<i>Pluvialis squatarola</i>)	Migratory	Protected Migratory Birds Schedule 5	In non-breeding grounds in Australia, they occur almost entirely in coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons (DAWE 2021b)			
Double-banded Plover (<i>Charadrius bicinctus</i>)	Migratory	Protected Migratory Birds Schedule 5	Found in both coastal and inland areas on littoral, estuarine and fresh or saline terrestrial wetlands, and saltmarsh, grasslands and pasture (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely
Pacific Golden Plover (<i>Pluvialis fulva</i>)	Migratory	Protected Migratory Birds Schedule 5	In WA, the species is seldom recorded along the southern or south-western coastal region, but is more widespread along the Pilbara and Kimberley coasts between North-West Cape and the NT border (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely
Common Greenshank (<i>Tringa nebularia</i>)	Migratory	Protected Migratory Birds Schedule 5	Does not breed in Australia however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia. It occurs around most of the coast from Cape Arid in the south to Carnarvon in the north-west (Higgins & Davies 1996)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Species or species habitat known to occur within area	Likely
Sanderling (<i>Calidris alba</i>)	Migratory	Protected Migratory Birds Schedule 5	In WA they are found along most of the coast from Eyre to Derby, and also around Wyndham. They are more often recorded on the south and southwest coasts, north to southern Shark Bay (DAWE 2021b). They are seen on open sandy beaches exposed to open sea-swell, and on exposed sandbars and spits and shingle	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			banks, where they forage in the wave-wash zone and amongst wrack. They are also seen on beaches that may contain wave-washed rocky outcrops			
Swinhoe's Snipe (<i>Gallinago megala</i>)	Migratory	Protected Migratory Birds Schedule 5	Few definite records exist for this species in Australia. During the non-breeding season, it occurs in dense clumps of grass and rushes round the edges of fresh and brackish wetlands, including swamps, billabongs, river pools, small streams and sewage ponds. They are also found in drying claypans and inundated plains pitted with crab holes (Higgins & Davies 1996)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting likely to occur within area	Likely
Pin-tailed Snipe (<i>Gallinago stenura</i>)	Migratory	Protected Migratory Birds Schedule 5	Its distributions are not well understood, but there are confirmed records in south-west WA. During non-breeding period, it occurs most often in or at the edges of shallow freshwater swamps, ponds and lakes with emergent, sparse to dense cover of grass/sedge or other vegetation. It is also found in drier, more open wetlands such as claypans in more arid parts of species' range, and in sewage ponds; not normally in saline or inter-tidal wetlands (Higgins & Davies 1996)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting likely to occur within area	Likely
Red-necked Stint (<i>Calidris ruficollis</i>)	Migratory	Protected Migratory Birds Schedule 5	Distributed along most of the Australian coastline with large densities on the Victorian and Tasmanian coasts. It is mostly found in sheltered inlets, bays,	Critical habitat or feeding grounds found adjacent to	Roosting known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores (DAWE 2021b)	the Proposal area in spring and summer		
Ruddy Turnstone (<i>Arenaria interpres</i>)	Migratory	Protected Migratory Birds Schedule 5	Widespread along coastal areas, with occasional records of inland populations, from Tasmania to Darwin during its non-breeding period of the year (Bamford et al. 2008)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely
Grey-tailed Tattler (<i>Tringa brevipes</i>)	Migratory	Protected Migratory Birds Schedule 5	Has a primarily northern coastal distribution with few scattered records along the south coast near the Eyre Bird Observatory, Point Malcolm, Rossiter Bay, Shark Lake Nature Reserve and surrounding swampland. It is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats between Augusta and Cervantes (DAWE 2021b)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely
Osprey (<i>Pandion haliaetus</i>)	Migratory	–	The breeding range extends Australia-wide however, is rare to uncommon in southern WA. It occurs in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia, requiring extensive areas of open fresh, brackish or saline water for foraging (Marchant & Higgins 1993). Adults mostly	Critical habitat or feeding grounds found within the Proposal area. Active nests present in the area and foraging activity occurs in the area year-round	Breeding known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			reside around breeding territories. They forage more widely but continue to make intermittent visits to their breeding grounds outside of breeding season			
Whimbrel (Numenius phaeopus)	Migratory	Protected Migratory Birds Schedule 5	It is a regular migrant to Australia with a primarily coastal distribution and scattered inland records in all regions. It is found in all states but it has occasionally been seen on the south coast of WA. It is often found feeding and roosting on the intertidal mudflats of sheltered coasts and in harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, unvegetated mudflats. It is occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms (DAWE 2021b)	Possible critical habitat or feeding grounds found adjacent to the Proposal area	Roosting known to occur within area	Likely
Birds – Marine birds						
Southern Giant-Petrel (<i>Macronectes giganteus</i>)	Endangered, Migratory	Protected Migratory Birds Schedule 5	A marine bird that occurs in Antarctic to subtropical waters and is widespread throughout the Southern Ocean. It breeds on six subantarctic and Antarctic islands in Australian territory: Macquarie Island, Heard Island and McDonald Island in the Southern Ocean, and Giganteus Island, Hawker Island, and Frazier Island in the Australian Antarctic Territories (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Northern Giant Petrel (<i>Macronectes halli</i>)	Vulnerable, Migratory	Protected Migratory Birds Schedule 5	A marine and oceanic seabird that breeds in the sub-Antarctic, and visits areas off the Australian mainland mainly during the winter months (May–October)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Soft-plumaged Petrel (<i>Pterodroma mollis</i>)	Vulnerable	–	Generally found over temperate and subantarctic waters in southern Indian Ocean. The species is a regular and quite common visitor to southern Australian seas, but is more common in the west than in the south and south-east (Marchant & Higgins 1990). It is often sighted between June–September but sightings have occurred in most months	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Blue Petrel (<i>Halobaena caerulea</i>)	Vulnerable	–	It breeds on offshore stacks near Macquarie Island where 500–600 breeding pairs occur (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Shy Albatross (<i>Thalassarche cauta</i>)	Endangered, Migratory	Protected Migratory Birds Schedule 5	Most commonly observed over the shelf waters around Tasmania and south-eastern Australia (DAWE 2021b). Recorded in offshore waters adjacent to the proposal area	No critical habitat or feeding grounds found within the Proposal area	Foraging, feeding or related behaviour likely to occur within area	Unlikely
Northern Royal Albatross (<i>Diomedea sanfordi</i>)	Endangered, Migratory	Protected Migratory Birds Schedule 5	A marine, pelagic and aerial seabird (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Foraging, feeding or related behaviour likely to occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Tristan Albatross (<i>Diomedea dabbenena</i>)	Endangered, Migratory	Critically Endangered (Schedule 1)	A marine, pelagic seabird that forages in open water from Perth to the Nullarbor in SA, sleeping and resting on ocean waters when not breeding (Marchant & Higgins 1990)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Southern Royal Albatross (<i>Diomedea epomophora</i>)	Vulnerable, Migratory	Protected Migratory Birds Schedule 5	A marine and pelagic bird. In October during the non-breeding season, it has a wide and possibly circumpolar distribution ranging north to about 35°S. It is moderately common throughout the year in offshore waters of southern Australia, mostly off south-eastern New South Wales (NSW), Victoria and Tasmania. Off SA, they are mostly seen May–September	No critical habitat or feeding grounds found within the Proposal area	Foraging, feeding or related behaviour likely to occur within area	Unlikely
Black-browed Albatross (<i>Thalassarche melanophris</i>)	Vulnerable, Migratory	Protected Migratory Birds Schedule 5	Recorded sightings in offshore waters and in coastal waters within and adjacent to the proposal area. Sightings are common in the proposal area when strong frontal systems pass through the area. It is a marine species that inhabits Antarctic, subantarctic and temperate waters and occasionally enters the tropics. Individuals are mostly confined to subantarctic and Antarctic waters surrounding these islands in the breeding season	Critical habitat or feeding grounds found within the Proposal area	Species or species habitat known to occur within area. Foraging, feeding and related behaviour known to occur in the area	Likely
Wandering Albatross (<i>Diomedea exulans</i>)	Vulnerable, Migratory	Protected Migratory Birds Schedule 5	Recorded sightings in offshore waters adjacent to the proposal area. A marine, pelagic and aerial seabird (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Foraging, feeding or related behaviour likely to occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Sooty Albatross (<i>Phoebetria fusca</i>)	Vulnerable, Migratory	Protected Migratory Birds Schedule 5	Recorded sightings of occasional presence in offshore waters adjacent to the proposal area. A marine and pelagic seabird (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat likely to occur within area	Unlikely
White-capped Albatross (<i>Thalassarche steadi</i>)	Vulnerable, Migratory	–	A marine species that occurs in subantarctic and subtropical waters. It is most common off the coast of south-east Australia throughout the year (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Foraging, feeding or related behaviour likely to occur within area	Unlikely
Indian Yellow-nosed Albatross (<i>Thalassarche carteri</i>)	Vulnerable, Migratory	Protected Migratory Birds Schedule 5	It is a marine bird located in subtropical and warmer subantarctic waters. Forages mostly in the southern Indian Ocean where it is abundant off WA (Marchant & Higgins 1990). It occupies inshore and offshore waters particularly during calm seas and light winds. It also breeds on islands in the southern Indian Ocean (DAWE 2021b). Recorded sightings in offshore waters and in coastal waters within and adjacent to the proposal area. Sightings in the Proposal area are common when strong frontal systems pass over the area	Critical habitat or feeding grounds found within the Proposal area	Species or species habitat known to occur within area. Foraging, feeding or related behaviour known to occur within area	Likely
Antipodean Albatross (<i>Diomedea antipodensis</i>)	Vulnerable, Migratory	–	Marine, pelagic and aerial, sleeping and resting on ocean waters when not breeding (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Foraging, feeding or related behaviour likely to occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Campbell Albatross (<i>Thalassarche impavida</i>)	Vulnerable, Migratory	Protected Migratory Birds Schedule 5	Recorded sightings in offshore waters adjacent to the proposal area. A non-breeding visitor to Australian waters, most commonly seen foraging over the oceanic continental slopes off Tasmania, Victoria and NSW	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Australian Fairy Tern (<i>Sternula nereis nereis</i>)	Vulnerable	–	Occurs along the coasts of Victoria, Tasmania, SA and WA, as far north as the Dampier Archipelago. It nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. It has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine islands, wetlands and mainland coastline. The bird roosts on beaches at night (Higgins & Davies 1996). It may migrate within southern WA and Tasmania, where are seen less frequently during the winter months	No critical habitat or feeding grounds found within the Proposal area	Foraging, feeding or related behaviour known to occur within area	Unlikely
Bridled Tern (<i>Onychoprion anaethetus</i>)	Migratory	Protected Migratory Birds Schedule 5	Widespread and breed on offshore islands in western, northern and north-eastern Australia extending from Cape Leeuwin in the south- west to northern Australia. They forage in offshore, continental shelf waters and is only rarely recorded along mainland coasts (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Foraging, feeding or related behaviour likely to occur within area	Unlikely
Caspian Tern (<i>Hydroprogne caspia</i>)	Migratory	Protected Migratory	It has a widespread occurrence along the coastal and inland from the Great Australian Bight to the Dampier Peninsula.	No critical habitat or feeding grounds	Breeding known to occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
		Birds Schedule 5	It is mostly found in sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins. They also use artificial wetlands, including reservoirs, sewage ponds and saltworks. In offshore areas the species prefers sheltered situations, particularly near islands, and is rarely seen beyond reefs (DAWE 2021b)	found within the Proposal area		
Greater Crested Tern (<i>Thalasseus bergii</i>)	Migratory	Protected Migratory Birds Schedule 5	Has a widespread occurrence along the Australian coastline, breeding colonies on small offshore islands	No critical habitat or feeding grounds found within the Proposal area	Breeding known to occur within area	Unlikely
Fairy Prion (southern) (<i>Pachyptila turtur subantarctica</i>)	Vulnerable	–	Breeds on two rock stacks on Macquarie Island, on the nearby Bishop and Clerk Island, and a number of other subantarctic islands outside of Australia. There are 80 – 250 breeding pairs in Australia and a global population of 80 000 (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat likely to occur within area	Unlikely
Fork-tailed Swift (<i>Apus pacificus</i>)	Migratory	Protected Migratory Birds Schedule 5	Almost exclusively aerial, they mostly occur over inland plains but sometimes above foothills or in coastal areas (DAWE 2021b). This species is known to forage high above the tree canopy but is rarely recorded lower, so it is independent of terrestrial habitats	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat likely to occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Sooty Shearwater (<i>Ardenna grisea</i>)	Migratory	Protected Migratory Birds Schedule 5	It breeds on islands off NSW and Tasmania, and occurs off the coast of south-east Qld and is a moderately common migrant and visitor to Victoria and SA (Marchant & Higgins 1990). It forages in pelagic sub-tropical, sub-Antarctic and Antarctic water, and may forage inshore occasionally, especially during rough weather (DAWE 2021b)	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat may occur within area	Unlikely
Flesh-footed Shearwater (<i>Ardenna carneipes</i>)	Migratory	Protected Migratory Birds Schedule 5	A locally common visitor to waters of the continental shelf and continental slope off southern Australia. Pairs breed on 41 islands off the coast of south-western WA (Burbidge & Fuller 1996). Within the proposal area, nesting occurs on Breaksea Island, and on Shelter, Coffin and Eclipse Islands adjacent to the proposal area	Critical habitat and feeding grounds occur within the Proposal area. Arrive from northern hemisphere September–October for breeding. Young birds return to their natal island to breed	Breeding known to occur within area. Foraging known to occur in the area involving large aggregations of several hundred birds. Large rafting (resting) flocks common in the proposal area	Likely

Notes:

1. EPBC Act = Environment Protection and Biodiversity Conservation Act 1999, BC Act = Biodiversity Conservation Act 2016
2. Species listed under the BC Act fall under one of the following categories: Schedule 1 – Fauna that is rare or is likely to become extinct as critically endangered fauna, Schedule 2 – Fauna that is rare or is likely to become extinct as endangered fauna, Schedule 3 – Fauna that is rare or is likely to become extinct as vulnerable fauna, Schedule 4 – Fauna presumed to be extinct, 5 Schedule – Migratory birds protected under an international agreement, Schedule 6 – Fauna that is of special conservation need as conservation dependent fauna, and Schedule 7 – Other specifically protected fauna
3. – = no listing

Table 2.2 Other Matters identified in King George Sound and Princess Royal Harbour as defined by State and Commonwealth legislation

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Whales and Other Cetaceans						
Minke Whale (<i>Balaenoptera acutorostrata</i>)	Marine – Other	–	Known to occur as far north as 11° S in the western Pacific off Australia and up the west coast to similar low latitudes. The southern distribution extends down to ~41° S, but it is unlikely that this species normally migrates to such high latitudes of the Antarctic (Best 1985). It is more likely that it is distributed closer inshore. Annual migration patterns include seasonal presence in WA coastal waters	No critical habitat or feeding grounds found within the Proposal area. Occasional opportunistic sightings within and adjacent to the Proposal area	Species or species habitat known to occur within area	Likely
Common Dolphin (<i>Delphinus delphis</i>)	Marine – Other	–	Found in offshore waters, appearing in two main locations around Australia, with one cluster in the southern south-eastern Indian Ocean and in the Tasman Sea (DAWE 2021b). Occurrence within the proposal area documented year-round	A high ratio of dependent calves, and recorded births recorded in the proposal area. Spatially referenced behavioural observations show ecologically critical activities (calving, foraging) occur within the Proposal area	Species or species habitat known to occur within area Breeding known to occur within the area	Likely
Risso's Dolphin (<i>Grampus griseus</i>)	Marine – Other	–	Occurs on steep sections of the upper continental slope usually in waters deeper than 1000 m in tropical and warm temperate latitudes. They also show a	No critical habitat or feeding grounds found within the Proposal area.	Species or species habitat likely to occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			marked preference for warm temperate to tropical conditions, although they sometimes extend their range into cooler latitudes in summer, therefore generally found in waters with temperatures ranging between 15–30°C (DAWE 2021b)	Sightings are uncommon, single photographic record of presence within the Proposal area		
Bottlenose Dolphin (<i>Tursiops truncatus s. str.</i>)	Marine – Other	–	Primarily found in offshore waters in WA and within the region	Critical habitat in the Proposal area and area adjacent year-round	Species or species habitat likely to occur within area	Likely
Indian Ocean Bottlenose Dolphin (<i>Tursiops aduncus</i>)	Marine – Other	–	It is restricted to inshore areas such as bays and estuaries, nearshore waters, open coast environments, and shallow offshore waters including coastal areas around oceanic islands (Hale et al. 2000). They have been confirmed to occur in estuarine and coastal waters of eastern, western and northern Australia. Reside in WA waters year-round. Photo-identification (2017–2021) studies have confirmed that the Indo-Pacific bottlenose dolphins found in the proposal area are resident	Critical habitat in the Proposal area and area adjacent year-round. Spatially referenced behavioural observations show foraging, feeding, breeding and calving within the proposal area	Species or species habitat known to occur within area	Likely
New Zealand Fur-seal (<i>Arctocephalus forsteri</i>)	Marine – Other	Other specially protected fauna	Prefers rocky parts of islands with jumbled terrain and boulders (DAWE 2021b). This species has a breeding colony at Haul-off Rock, located ~80 km to the north-east of PRH. Also sighted on the northern side of Breaksea Island in KGS. In WA, all 20 known breeding colonies located on the	Critical habitat found within the Proposal area year-round. Foraging and haul-out occur within the proposal area year-round	Species or species habitat known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			south coast. Breeding colonies located adjacent to the proposal area at Eclipse, Bald and Coffin Islands, and Haul-off rock. Haul out areas within the proposal area include Breaksea and Seal Islands, and the rock wall within the Part exclusion zone			
Finfish						
Javelin Pipefish (<i>Lissocampus runa</i>)	Marine – Other	–	The Syngnathidae species generally live in protected bays and estuaries in temperate marine waters. They tend to camouflage themselves against algae, algal beds, rocky reefs and seagrass. The seadragons and seahorses can occur on kelp-covered rocky reefs ranging from shallow estuaries to deep offshore reefs (Australian Museum 2021c, Kuitert 2001)	Possible critical habitat in the Proposal area year-round	Species or species habitat may occur within area	Likely
Australian Smooth Pipefish (<i>Lissocampus caudalis</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Brush-tail Pipefish (<i>Leptoichthys fistularius</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Rhino Pipefish (<i>Histiogamphelus cristatus</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Spotted Pipefish (<i>Stigmatopora argus</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Widebody Pipefish (<i>Stigmatopora nigra</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Gale's Pipefish (<i>Campichthys galei</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Hairy Pipefish (<i>Urocampus carinirostris</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Mother-of-pearl Pipefish (<i>Vanacampus margaritifer</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Red Pipefish (<i>Notiocampus ruber</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Longsnout Pipefish (<i>Vanacampus poecilolaemus</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Bonyhead Pipefish (<i>Nannocampus subosseus</i>)	Marine – Other	–		Possible critical habitat in the		Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
				Proposal area year-round		
Port Phillip Pipefish (<i>Vanacampus phillipi</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Southern Pygmy Pipehorse (<i>Acentronura australe</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Sawtooth Pipefish (<i>Maroubra perserrata</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Upside-down Pipefish (<i>Heraldia nocturna</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Pugnose Pipefish (<i>Pugnaso curtirostris</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Gunther's Pipehorse (<i>Solegnathus lettiensis</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Leafy Seadragon (<i>Phycodurus eques</i>)	Marine – Other	P2 – Poorly known species		Possible critical habitat in the Proposal area year-round		Likely
Common Seadragon (<i>Phyllopteryx taeniolatus</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Short-head Seahorse (<i>Hippocampus breviceps</i>)	Marine – Other	–		Possible critical habitat in the Proposal area year-round		Likely
Birds – Marine birds						
Little Penguin (<i>Eudyptula minor</i>)	Marine – Other	–	It is distributed between Perth and the central coast of NSW and they feed at sea throughout the year (Australian Museum 2021d). Numerous colonies have been identified in WA, including the islands around KGS Michelmas Island, Mistaken Island, Seal Island and Breaksea Island (Cannell 2001). Colonies located at Shelter, Coffin and Eclipse Islands adjacent to the proposal area. Major colony located at Breaksea Island	Critical habitat and feeding grounds found within the Proposal area	Breeding known to occur within area. Foraging known to occur within the area	Likely
Fairy Prion (<i>Pachyptila turtur</i>)	Marine – Other	–	A small seabird known to occur in the south-west marine region. It occurs mainly offshore but are known to move inshore during stormy weather. Diet comprises	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat likely to occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
			primarily of crustaceans, fish and squid (BirdLife International 2021)			
Great Skua (<i>Stercorarius skua</i>)	Marine – Other	–	A large seabird that lives primarily offshore	No critical habitat or feeding grounds found within the Proposal area	Species or species habitat known occur within area	Unlikely
Pacific Gull (<i>Larus pacificus</i>)	Marine – Other	–	Prefers sandy or less often, rocky coasts and sandy beaches. In WA, it occurs occasionally in harbours but mostly on exposed coasts and offshore islands. It usually avoids human habitation but is occasionally seen on farmland and rubbish tips near the coast but rarely inland. It can be found roosting or loafing in elevated situations such as rocky headlands or on structures such as wharves and jetties	No critical habitat or feeding grounds found within the Proposal area	Breeding known to occur within area	Unlikely
White-bellied Sea-Eagle (<i>Haliaeetus leucogaster</i>)	Marine – Other	–	This species is normally seen perched high in a tree, or soaring over waterways and adjacent land. Birds form permanent pairs that inhabit territories throughout the year (Australian Museum 2021b)	No critical habitat or feeding grounds found within the Proposal area. Foraging and feeding behaviour known to occur in the proposal area	Species or species habitat known to occur within area	Unlikely
Great-winged Petrel (<i>Pterodroma macroptera</i>)	Marine – Other	–	Major breeding colonies at Coffin and Eclipse Islands adjacent to the proposal area. Minor colony at Breaksea Island within the proposal area	No critical habitat or feeding grounds found within the Proposal area. Breeding habitat	Breeding known to occur within area	Unlikely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
				within the proposal area (Breaksea Island)		
Silver Gull (<i>Chroicocephalus novaehollandiae</i>)	Marine – Other	–	Abundant across coastal Australia, including inland areas around waterways and rivers	No critical habitat or feeding grounds found within the Proposal area	Breeding known to occur within area	Unlikely
White-faced Storm-Petrel (<i>Pelagodroma marina</i>)	Marine – Other	–	Regular visitors to the south-west marine region, feeding on small fish, cephalopods and crustaceans along the edge of the continental shelf and over open waters (DSEWPC 2012b). In WA, they breed in the many islands offshore from the Houtman Abrolhos Islands to Daw Island off Esperance (Johnstone & Darnell 2008)	No critical habitat or feeding grounds found within the Proposal area	Breeding known to occur within area	Unlikely
Little Shearwater (<i>Puffinus assimilis</i>)	Marine – Other	–	Sedentary and shy seabird that feeds offshore, breeding in winter around the Kermadec Islands off southwest Australia	No critical habitat or feeding grounds found within the Proposal area	Foraging, feeding or related behaviour known to occur within area	Unlikely
Birds – Wetland Birds						
Hooded Dotterel (<i>Thinornis cucullatus</i>)	Marine – Other	–	Endemic to southern Australia where it typically inhabits sandy ocean beaches, nesting just above the high tide mark. In WA, it is also found on saline lakes	Possible critical habitat or feeding grounds found adjacent to the Proposal area, period unknown	Species or species habitat known to occur within area	Likely

Species (common and scientific name)	Conservation Status		Habitat Description	Period of habitat use within Proposal area	Presence/known use	Likelihood of interaction with Proposal
	EP Act	BC Act				
Red-capped Plover (<i>Charadrius ruficapillus</i>)	Marine – Other	–	Found in wetlands, especially in arid areas, and prefers saline and brackish waters (DAWE 2021b), foraging quickly along the ground (eBird 2021)	Critical habitat or feeding grounds found adjacent to the Proposal area in spring and summer	Roosting known to occur within area	Likely
Pied Stilt (<i>Himantopus himantopus</i>)	Marine – Other	–	Favours wetlands with open shallow water, often brackish; breeds on bare ground near water, often in noisy colonies and feeds by wading in water (eBird 2021)	Possible critical habitat or feeding grounds found adjacent to the Proposal area, period unknown	Roosting known to occur within area	Likely
Red-necked Avocet (<i>Recurvirostra novaehollandiae</i>)	Marine – Other	–	Usually seen on or near water both on the coast and inland. Wades in shallow water and readily swims in deeper water (eBird 2021)	Possible critical habitat or feeding grounds found adjacent to the Proposal area, period unknown	Roosting known to occur within area	Likely

Notes:

1. EPBC Act = Environment Protection and Biodiversity Conservation Act 1999, BC Act = Biodiversity Conservation Act 2016
2. Species listed under the BC Act fall under one of the following categories: Schedule 1 – Fauna that is rare or is likely to become extinct as critically endangered fauna, Schedule 2 – Fauna that is rare or is likely to become extinct as endangered fauna, Schedule 3 – Fauna that is rare or is likely to become extinct as vulnerable fauna, Schedule 4 – Fauna presumed to be extinct, 5 Schedule – Migratory birds protected under an international agreement, Schedule 6 – Fauna that is of special conservation need as conservation dependent fauna, and Schedule 7 – Other specifically protected fauna
3. – = no listing

3 State of Knowledge for Conservation Significant Marine Fauna

The likelihood of occurrence assessment determined that the following conservation significant marine species are known to occur or have a high potential to occur in the Proposal area:

- Four marine mammals (Australian sea lion, Southern Right Whale, Humpback Whale, Pygmy Blue Whale)
- Great White Shark
- twenty-seven wetland birds from 11 genera (*Actitis*, *Arenaria*, *Calidris*, *Charadrius*, *Gallinago*, *Limosa*, *Numenius*, *Pandion*, *Pluvialis*, *Tringa*, and *Xenus*), and
- three marine birds (Black-browed Albatross, Indian Yellow-nosed Albatross, Flesh-footed Shearwater).

3.1 Marine mammals

Four species of baleen whale are considered regular users of WA waters as their annual migration patterns include seasonal presence in coastal waters: the humpback (*Megaptera novaeangliae*), southern right (*Eubalaena australis*), pygmy blue (*Balaenoptera musculus breviceauda*) and dwarf minke (*Balaenoptera acutorostrata*) whale (State government, unpubl. data). The south coast, from Geographe Bay to Eucla, is recognised by the IUCN Marine Mammal Protected Areas Taskforce as an important area for marine mammals in terms of their biology, ecology and population structure (IUCN MMPATF 2021).

3.2 Australian sea lion

The Australian sea lion (*Neophoca cinerea*) is an endemic and endangered species that is found in Australian waters from the Houtman Abrolhos Islands in WA to The Pages in SA (Campbell 2005). They use offshore islands along the south coast of WA as breeding rookeries (Campbell 2005), and their year-round haul-out areas are primarily beaches and rocky shores (Orsini et al. 2006). A high rate of natal site fidelity (natal philopatry) among females suggests they have a restricted home range as well as limited gene flow with other regions (Campbell 2005). Although an average foraging range may extend up to 60 km from their birth colonies, male Australian sea lions have been documented with increased dispersal ranges between 97 and 180 km (Hamer et al. 2011, Goldsworthy et al. 2014). Australian sea lions are benthic foragers, diving up to 90 m deep and their prey consists of cephalopods, crustaceans and fish (Campbell 2005).

Due to the long and asynchronous breeding cycles, it is difficult to know population information across the ~32 breeding sites identified in WA (Goldsworthy et al. 2014, Goldsworthy et al. 2021). A recent assessment of Australian sea lion pup abundance (based on data from seven sites in WA and 23 sites in South Australia) shows an estimated decline in pup abundance of 64% between 1977 and 2019 (Goldsworthy et al. 2021).

Around Albany, Haul-off Rock is a Biologically Important Area for Australia sea lions (Sutton and Day 2021), a well-known breeding and haul-out site located ~80 km north east of PRH (Gales et al. 1994). Bald Island and Coffin Island, ~40 km and ~22 km east of the proposal area respectively, are important haul out locations. Seal Cove, located on the northern side of Breaksea Island, and Seal Island in KGS, have also been documented as a resting area for the New Zealand fur seals and Australian sea lions. Seal Cove is located on the border of Port limits therefore, sightings of individuals within the Proposal area may be frequent throughout the year. A low number of individuals have been sighted displaying

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foraging behaviour in KGS and PRH year-round. Any management should therefore be adaptive, in that it will be required if sea lions are observed in the Proposal area for haul out and/or foraging activities.

3.3 Southern Right Whale

The Southern Right Whale (*Eubalaena australis*) is listed as Endangered and as a Migratory species under the EPBC Act 1999. The Australian Southern Right Whale population is distributed along the southern coastline from Perth to Sydney. The southern coast between Cape Leeuwin (WA) and Ceduna (South Australia) is the main wintering and calving ground of Australia's western sub-population of southern right whales. In WA, individuals use coastal waters close to beaches along the coast between Twilight Cove in the east and Augusta in the west for calving, nursing, breeding and avoidance of predators. The feeding habitat is very poorly known, but it is assumed that the Southern Right Whale moves to deeper offshore waters in the Southern Ocean.

The rate of recovery has been monitored off southern Australia since 1993 in an annual survey led by WA Museum. The most recent population size estimate in Australia is ~3500 individuals, with the southwestern subpopulation comprising of ~3200 individuals with an increasing trend of ~6% (Bannister 2017, Smith et al. 2019, DAWE 2021b). Female southern right whales show calving site fidelity, generally returning to the same location to give birth and nurse offspring (DSEWPC 2012a). On average, southern right whales have a single calf every three years. KGS is a known resting, breeding and calving grounds of the Southern Right Whale, in which females approach the coast in waters to depths less than 10 m between May and October and remain in the calving grounds for 2–3 months. Southern Right Whales tend to remain near shore for long periods that lead to repeat sightings.

Due to their seasonal occurrence, recreational tourism is known to operate whale watching tours from Albany during late-autumn to mid-spring (late May to early October). Given that PRH and KGS are known critical habitats for the Southern Right Whales, any potential impacts that may arise due to the Proposal activities will be assessed and mitigated as part of the Environmental Review Document (ERD).

3.4 Humpback Whale

Humpback whales (*Megaptera novaeangliae*) are listed as Conservation Dependent and Migratory species under the EPBC Act 1999 and the Bonn Convention. Most populations of humpback whales have recovered strongly. There have been no recent assessments of the west coast Australian population however, their population is thought to be recovering at a rate of approximately 11% annually from pre-whaling population sizes (Bejder et al. 2015). Humpback whales migrate annually through WA waters between May and October with a high percentage of the population found between 1 and 5 nautical miles offshore. Along their migratory route, sheltered bays are used opportunistically as resting areas.

In Albany, timing of peak abundance occurs between June and August, with sighting of individuals recorded as early as March and as late as November. Humpback whales have been sighted in the shelter waters of KGS during their annual northern migration with newborn calves. This suggests that humpback whales may be giving birth within waters close to Albany. In recent years, a small number of neonates have been recorded annually within the Proposal area (Alexander, unpubl. data). A reasonably defined migration path exists near the Proposal area, traversing from Breaksea Island to Baldhead, then following the coastline from Limestone Head, around Frenchmans Bay to Mistaken Island and back out to sea past the islands.

3.5 Pygmy Blue Whale

Two blue whale species occur in southern Australia, the pygmy blue whale (*Balaenoptera musculus breviceauda*) and Antarctic blue whale (*B. musculus*). The total east Indian Ocean blue whale population estimated in 2010 was 662–1559 (McCauley & Jenner 2010). Blue whales, principally pygmy blue

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whales, use offshore and coastal waters in southern Australia for migration and foraging. The migratory habits of pygmy blue whales along the WA southern coastline are now reasonably well understood. Satellite tracking data from pygmy blue whales tagged off Western Australia and in the Bonney Upwelling off South Australia (Double et al. 2014, Owen et al. 2016) have identified migratory pathways of pygmy blue whales, extending from near King Island in southeast Australia up to the Banda and Molucca Seas. Two seasonally important aggregation areas have been identified: the Perth Canyon (WA) and the Bonney Upwelling, Eastern Great Australian Bight Upwelling (Kangaroo Island canyons). The south coast is an important corridor connecting these aggregation areas. Pygmy blue whales migrate west along the southern WA coastline between January and June. Photo identification and recorded sightings show blue whales transiting coastal waters in the Albany area including KGS from February to June (Alexander unpubl. data).

3.6 Sharks

Great White Shark

The great white shark (*Carcharodon carcharias*) is listed as a Vulnerable species under Commonwealth EP Act 1999 and WA BC Act 2016 due a declining population resulting from commercial fishing and mortality from nets and drumlines. Two populations exist in Australia, with the southern-western population extending from western Victoria to the WA coast and occupying temperate, cooler water (Bruce et al. 2018). Great white sharks occur along all of the southern WA coast and occasionally at least as far north as Karratha (DAWE 2021b).

Great white sharks are known to frequent inshore waters around rocky reefs, surf beaches and shallow coastal bays (less than 5 m) to outer continental shelf and slope areas (depths less than 100 m), frequenting waters in and around seal colonies (DAWE 2021b). Acoustic data collated since 2009 have shown great white sharks consistently present across seasons off the south coast of WA, including in the Albany area (McAuley et al. 2017). Presence in the Proposal area is evidenced by acoustic detections at receivers located at Frenchman's Bay and Middleton Beach in KGS (SharkSmart WA 2022). As there is a known breeding colony and haul-out site of Australian sea lions on Haul-off Rock (Gales et al. 1994), ~80 km north-east from PRH, it is probable for great white sharks to pass through the Proposal area.

Great white sharks have been caught by commercial fishers around the Proposal area (Malcolm et al. 2001). Catch and release of great white sharks for tagging purposes have also been undertaken within and adjacent to KGS.

3.7 Birds

Wetland birds

A range of wetland birds (both migratory and residential) have been reported in Australia utilising coastal habitats, including sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit, and occasionally on rocky coasts or coral islets. Some species are usually seen in flocks foraging near the edge of water or in shallow water depending on the tidal stage and roosting in adjacent freshwater habitats (DAWE 2021b).

On the southern end of PRH, Rushy Point in Little Grove is a native bushland adjacent a tidal mudflat. During spring and summer, this site has been known to attract a variety of species, with recorded observations of the migratory Bar-tailed Godwit (*Limosa lapponica*), Eastern Curlew (*Numenius madagascariensis*), Sandpipers (*Calidris ferruginea*, *Actitis hypoleucos*, *Calidris acuminata*), Great and Red Knot (*Calidris tenuirostris* and *C. canutus*), Plovers (*Charadrius mongolus*, *C. leschenaultia*, *Pluvialis squatarola*, *P. fulva*), Greenshank (*Tringa nebularia*), Sanderling (*Calidris alba*), and Red-necked Stint (*Calidris ruficollis*) (Birdlife 2013, eBird 2021). Sightings of the Osprey have also been documented in Rushy Point during spring (eBird 2021). Osprey sightings occur year-round within and adjacent to the

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Proposal area. Foraging and feeding behaviour have been documented within the Proposal area, and active nests are also located within the Proposal area. Although numerous sightings of wetland birds have been documented, it is unlikely that these wetland birds will occur in the nearshore marine environment of the Proposal area, and furthermore, these species are not known to use the Proposal area as a resting place.

Marine birds

The Black-browed Albatross (*Thalassarche melanophris*) and Indian Yellow-nosed Albatross (*T. carteri*) are large marine birds that are often seen foraging and feeding on fish, molluscs and crustaceans in offshore waters in the southern Indian Ocean and in coastal waters (DAWE 2021b). During the breeding season, the adults of both species are mostly confined to subantarctic and Antarctic waters surrounding their breeding islands (DAWE 2021b). Both albatross species have been previously sighted in the Proposal areas when a strong frontal system pass over the area. The Flesh-footed Shearwater (*Ardenna carneipes*) breeds between August and May on ~60 islands across the southern Indian Ocean, between Bunbury to east of South Australia (Powell et al. 2007). They nest and roost in burrows in the ground on offshore islands, and feed alone or in congregations with other shearwaters on small fish, cephalopods, and crustaceans (Gould et al. 1997). Although these three marine birds have been occasionally sighted in KGS and surroundings areas (eBird 2021), they are unlikely to remain in the nearshore marine environment of the Proposal area.

4 State of Knowledge for other Marine Fauna of Significance

4.1 Dwarf Minke Whale

Similar to other baleen whale species, dwarf minke whale (*Balaenoptera acutorostrata*) migration patterns include seasonal presence in WA coastal waters (State government, unpubl. data). Recorded opportunistic sightings show occasional dwarf minke whales present in coastal waters in the Albany area (Alexander, unpubl. data).

4.2 Common dolphin

In WA, common dolphins (*Delphinus delphis*) are considered a regular visitor to State waters. Recent genetic sampling off Albany and Esperance determined that common dolphins in KGS were genetically distinct from those sampled at other sites in southern Australia (Bilgmann et al. 2014, Barceló et al. 2021).

Within the Proposal area, vessel-based surveys and opportunistic photo identification between 2017 and 2020 documented consistent spatial and temporal use of KGS by common dolphins. Spatially referenced behavioural observations and photo identification have shown high site fidelity and the occurrence of ecologically critical activities (calving, foraging) within the Proposal area (Alexander 2020, unpubl. data).

4.3 Bottlenose dolphin

Two bottlenose dolphin species are known to occur in WA waters: Common bottlenose dolphins (*Tursiops truncatus*) and Indian Ocean Bottlenose Dolphin (*T. truncatus*). Common bottlenose dolphins generally occur in the offshore environment while Indo-Pacific bottlenose dolphins reside in WA coastal waters year-round, primarily found in nearshore areas with reefs, sand or seagrass (DAWE 2021b), or in water depths of less than 30 m (Reeves et al. 2002). In Australia, Indo-Pacific bottlenose dolphins show significant levels of residency, site fidelity and philopatry and occur in small discrete populations with restricted geographic ranges (Ross 2006). Resident populations in WA are known at Perth Mandurah and Bunbury and Albany.

In Albany, preliminary studies have confirmed that a small resident population of Indo-Pacific bottlenose dolphins use a range of habitats within the Proposal area year-round (Alexander 2020, unpubl. data). Photo-identification and spatially referenced behavioural observations show that ecologically critical activities such as foraging and calving occur within the Proposal area.

4.4 New Zealand fur seal

The Proposal area and adjacent waters provide foraging and haul-out habitat for New Zealand fur seals year-round. Breeding colonies are located at Haul-off Rock (Shaughnessy 1999), and Eclipse, Bald and Coffin Islands adjacent to the Proposal area. Within the Proposal area, these seals share the haul-out site Seal Cove on Breaksea Island in KGS with the Australian sea lion. They also regularly occupy haul-out sites on Seal Island in KGS, and the rock wall within the Albany Port exclusion zone in PRH. Foraging, feeding and related behaviours are regularly observed within the Proposal area.

4.5 Seahorses and Pipefish

The Syngnathidae family that consists of seahorses and pipefish, generally live in protected bays and estuaries (Australian Museum 2015c) in temperate marine waters (Kuitert 2000). They can camouflage themselves against macroalgae and macroalgal beds, rocky reefs and seagrass (Australian Museum 2015c; Kuitert 2000). The seadragons and seahorses can occur on kelp-covered rocky reefs (Australian Museum 2015c) ranging from shallow estuaries to deep offshore reefs (Kuitert 2000). The leafy sea dragon is endemic to waters off southern Australia and is listed as Priority Fauna by DBCA and

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is deemed 'in urgent need of further survey'. The pipefish occur in similar habitats, from seagrass beds and macroalgal areas on rocky reefs (Kuitert 2000).

Although there have no sightings documented of seahorses in Albany, the Proposal area contains suitable habitat for both seahorses and pipefish and seems likely they will occur within the Proposal area.

4.6 Little Penguin

Little penguins (*Eudyptula minor*) are distributed between Perth and the central coast of NSW, with Penguin Island holding the largest breeding population of ~700 pairs (DSEWPC 2012b). The next largest colony of little penguins is Breaksea Island in KGS, with approximately 500 individuals (Cannell 2001). Colonies are also present on Shelter (also known locally as Muttonbird Island), Coffin and Eclipse Islands adjacent to the Proposal area. These penguins breed in summer (November–December), however the penguins of Mistaken Island have been known to breed approximately six weeks later than those in the Perth region (B. Cannell, 2020, pers. comm.). Their diet generally consists of pilchards and anchovies; however, it can change depending on the availability of prey without affecting their breeding success (Chiaradia et al. 2003). Little penguins have also been reported on Michaelmas Island; however, there are no estimates of their abundance (Cannell 2001). The annual cycle of the penguins in the Albany region are not well known, however, aggregations of little penguins are regularly observed in KGS, and occasionally in PRH. Foraging and related behaviours have been documented in groups of little penguins within the Proposal area, therefore encounters within the Proposal area are considered likely.

4.7 Wetland birds

Four species of wetland birds that have no EPBC Act listing, are considered to possibly have critical habitat or feeding grounds adjacent to the Proposal area. Many of these birds favour wetland areas with open shallow saline and brackish waters, feeding either along the shore or wading in water (eBird 2021). Similar to the wetland birds reported in Section 0, some of these birds have been sighted during spring and summer at Rushy Point in Little Grove, a native bushland adjacent a tidal mudflat. It is unlikely that these wetland birds will occur in the nearshore marine environment of the Proposal area, and furthermore, these species are not known to use the Proposal area as a resting place.

5 Marine Species Important to Fisheries

5.1 Finfish

The Mediterranean climate and sheltered waters provided by PRH and KGS make it a popular place for recreational and commercial fishing activities. No marine park or reserve exists within the area. Recreationally, nearshore/estuarine and pelagic finfish species are targeted, while Blue Swimmer crabs and abalone form the invertebrate recreational catch (Gaughan & Santoro 2019).

Two of the predominant commercial fisheries that exist in the Proposal area include:

- South Coast Purse-Seine Managed Fishery that targets pilchards (*Sardinops sagax*) in KGS (Norriss & Blazeski 2020). The purse-seine fishery for pilchards comprises approximately 97% of the total fish catch in the Albany area
- South Coast Nearshore and Estuarine Managed Fishery that targets Australian herring (*Arripis georgianus*) in PRH (Duffy et al. 2020).

Pilchards are small pelagic fish that eat planktonic crustaceans, mollusc larvae and phytoplankton. They occupy a pivotal position of energy transfer in the food web as the main link between primary (phytoplankton) and secondary (zooplankton) production and larger predators (Department of Fisheries 2003). Pilchard spawning season in WA varies with location, however in Albany, there are two spawning seasons: June/July and December/January (Fletcher & Tregonning 1992). Commercial fishing for pilchards in Albany occurs in late summer and early autumn (J. Froud, pers. comm, Fisheries Management Officer, Department of Fisheries 7 June 2006). Few pilchard eggs and larvae have been found within KGS and PRH, suggesting that spawning occurs outside the Proposal area (Fletcher & Tregonning 1992).

5.2 Mussels and oysters

Another significant commercial fishery near the Proposal area is the aquacultural production of mussels (*Mytilus edulis*), rock oysters (*Saccostrea glomerata*) and Akoya pearl oysters (*Pinctada imbricata*) that current exist in Oyster Harbour and KGS. The farms in Oyster Harbour are exposed to elevated nutrient levels associated with nearby terrestrial run-off and provide mussels and oysters with the necessary planktonic food to promote growth (Gaughan & Santoro 2019). Wild spat is collected and then attached to long lines to grow-out to market size. Mussels and oysters are semi-sessile epibenthic bivalves that are anchored to a substrate via byssus threads secreted from glands in the animal's foot allowing a limited degree of movement.

There are current developments to increase the number of aquaculture zones in the Proposal area, specifically the proposed addition of two farm lease areas to the east of Vancouver Peninsula on the north and south of Mistaken Island, and one lease area north of Limekilns Point in Shoal Bay in PRH (DPIRD 2021). The activities resulting from the Proposal (i.e. underwater noise, wind-blown dust, light pollution) is not predicted to have an impact on proposed mussel and oyster farms. It is possible however, that wind-blown dust generated from the transshipping of magnetite concentrate to a cape size vessel may increase nearby water column turbidity and affect nearby proposed farms, specifically Mistaken Island. Although these shellfish are accustomed to increases in natural turbidity caused by wave and tidal actions, a sudden increase in water column turbidity may cause stress (Hutchinson et al. 2016). Therefore, measures to manage the potential increase of suspended solids in the water column should be considered in the ERD.

6 Summary and Conclusion

As part of the ERD to support the assessment of the Proposal under the EPBC Act, the purpose of this report was to conduct a desktop assessment of available information to provide a comprehensive listing of marine fauna known or likely to occur within, or regularly pass through, PRH and KGS, and where relevant document any known uses of the area by them (e.g. foraging, migrating, calving, nursing, spawning, roosting and nesting).

A total of 120 species were identified as MNES and Other Matters protected by the EPBC Act. Of these, five marine fauna species (Australian sea lion, Southern Right Whale, Humpback Whale, Pygmy Blue Whale and Great White Shark) and numerous wetland and marine bird species were identified to likely occur within the Proposal area. Other marine fauna (Other Matters) identified as potentially occurring within the Proposal area included the Dwarf Minke Whale, Common dolphin, Bottlenose dolphin, New Zealand fur seal (known to occur on Breaksea Island), seahorses and pipefish, Little Penguin, and four wetland birds. Marine species important to commercial and recreational fisheries that occur in PRH and KGS and potentially within the Proposal area included finfish species, mussels and oysters.

On review of the state of knowledge, the Proposal area is likely to contain critical habitat (foraging, calving, nursing and nesting) for the Australian sea lion, Southern Right Whale, Humpback whale, Pygmy Blue Whale, Bottlenose dolphin, and New Zealand fur seal. To effectively manage the potential risk of impacts to marine fauna associated with the proposed activities in the Proposal area, they should be assessed in the ERD in line with the EP Act. Once the mitigation measures are applied, the potential risk of significant impacts to MNES and Other Matters could be considered negligible.

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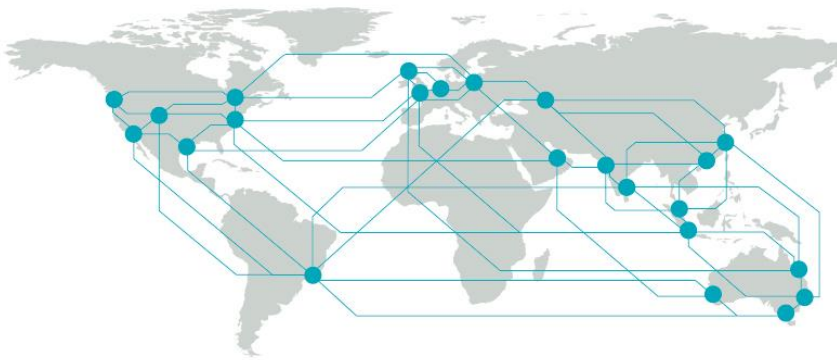
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Annex A Environment Protection and Biodiversity Conservation Act 1999 Protected Matters Search Tool Report

Annex B Department of Biodiversity, Conservation and Attractions Threatened and Priority Fauna List



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