



Roy Hill Port Expansion Project Flora and Vegetation Study





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Roy Hill Port Expansion Project

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1.0 Executive Summary

Roy Hill Infrastructure Pty Ltd (Roy Hill) operates port facilities at the Boodarie Multi-user Stockyard Area and South West Creek in the Inner Harbour of Port Hedland in the Pilbara region of Western Australia. The project was approved under Ministerial Statement 858 in 2011 and included a stockyard facility, rail loop, wharf and a ship-loading facility which began operating in 2017.

An amendment to the existing Ministerial Statement (MS858) will be issued under S45C under the *Environmental Protection Act 1986* (EP Act) for environmental approval of the proposed expansion works. Roy Hill also plans to conduct investigations in areas outside of the development envelope approved under MS858 that will necessitate some vegetation clearing. Biota Environmental Sciences (Biota) was commissioned to undertake a desktop study to assess the biological values of the area. The 54.5 ha survey area sits largely adjacent to the current MS858 development envelope, comprising 46.4 ha of terrestrial area and 8.1 ha under water.

The desktop study comprised searches of relevant databases, review of available literature and a likelihood of occurrence assessment for significant species of flora and fauna. Information on the existing environment, including soils, geology and land systems, was also compiled. The desktop study will also be used to inform the design of a follow-up field survey.

No significant vegetation communities or significant flora species are known to occur in the survey area. Two Priority flora species were assessed as being likely to occur in the survey area (*Tephrosia rosea* var. Port Hedland (A.S. George 1114) (P1) and *Gomphrena pusilla* (P2)) and two other species may occur (*Eragrostis crateriformis* and *Gomphrena leptophylla*, both P3). The field survey will confirm the occurrence of these species.

A total of 75 significant fauna species were identified from the locality through the desktop study, with 53 of these species assessed as having a moderate or high likelihood of occurrence in the survey area. The majority of these are bird species, particularly Migratory-listed shorebirds (some of which are also listed as Threatened fauna) and terns.

A primary feature of ecological significance in the survey area is the benthic communities and habitats, comprising mangrove communities, samphire shrublands and cyanobacterial mats, and Migratory-listed shorebirds, with parts of the survey area falling within the nationally-significant Port Hedland shorebird area. Care must be taken to avoid unnecessary direct or indirect impacts to these communities.

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2.0 Introduction

2.1 Project Background

Roy Hill operates port facilities at the Boodarie Multi-user Stockyard Area and South West Creek in the Inner Harbour of Port Hedland in the Pilbara region of WA (the “project”). The project was approved under Ministerial Statement 858 (MS858) in 2011 and included a stockyard facility, rail loop, wharf and a ship-loading facility which began operating in 2017.

Roy Hill plans to conduct geotechnical investigations in areas outside of the development envelope approved under MS858, which will necessitate some vegetation clearing. Biota was commissioned to undertake a desktop study to assess the flora, vegetation and fauna values of the area, which will inform a targeted flora and vegetation survey and a basic fauna survey that will be used to support an application for a Native Vegetation Clearing Permit (NVCP) and S45C.

2.2 Scope of the Study

The survey area comprises 54.5 ha of a proposed development envelope that sits outside of the current MS858 development envelope, and is located north and east of the existing stockyard, and along the south side of the conveyer that runs towards the shipping berth in South West Creek (the “survey area”; Figure 2.1). A total of 8.1 ha of the survey area, located at the shipping berth, is under water; the total terrestrial portion of the survey area is 46.4 ha in size.

To identify biological features of significance that may occur in the survey area, the desktop study reviewed information from a radius of 40 km (the “desktop study area”; Figure 2.1).

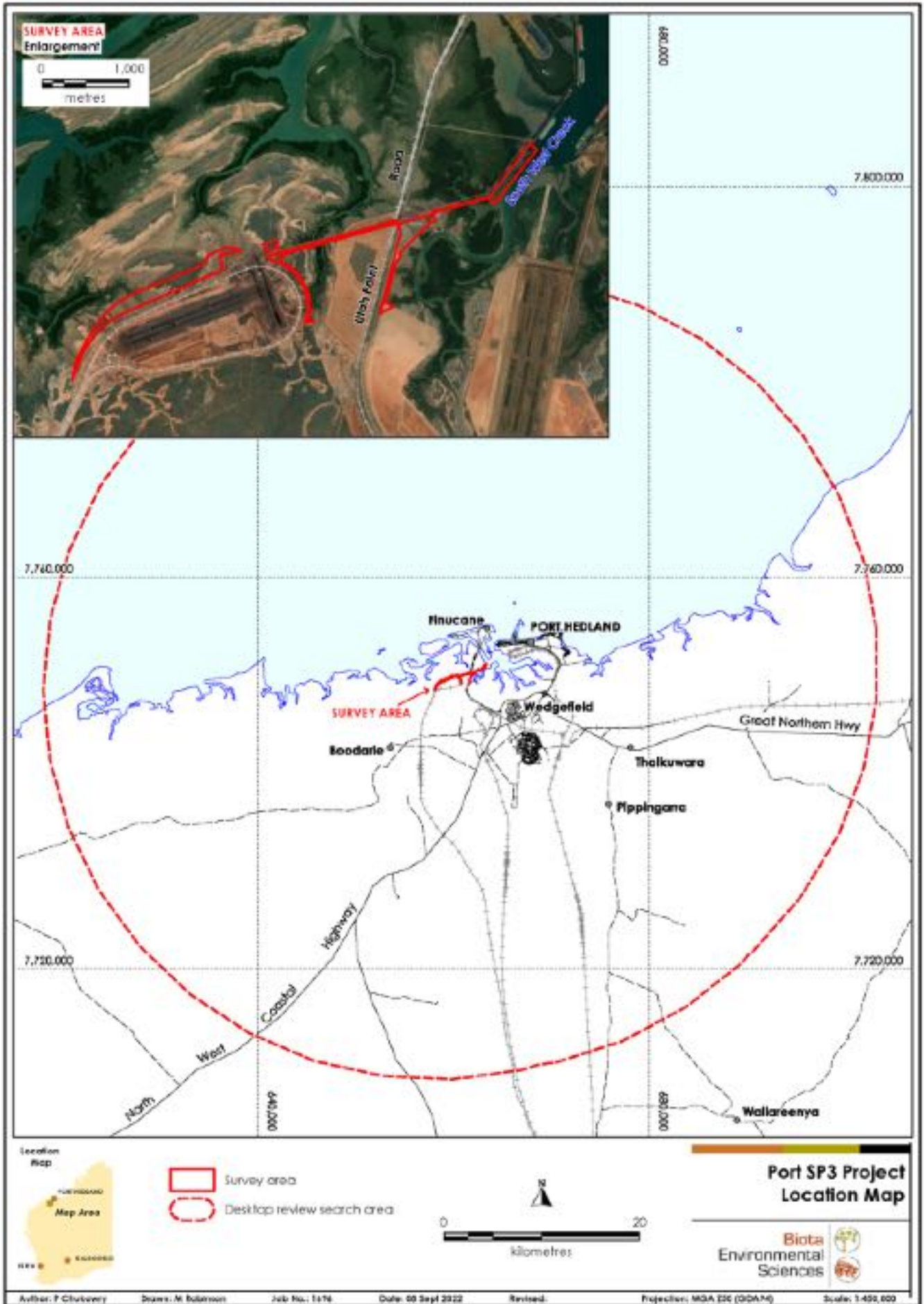


Figure 2.1: Location of the survey area and desktop study area.

3.0 Methodology

3.1 Desktop Study

The desktop study was undertaken to identify features of significance known from areas in close proximity to the survey area (i.e. within 20 km) or from the broader locality (within 40 km). The desktop study was also used to assess the level of biological survey work that had previously been completed in the survey area, to inform future survey work.

The desktop study incorporated regional information, previous biological surveys in the survey area, and the results of database searches. The results of the desktop study were used as the basis for compiling lists of significant flora and fauna species, and ecological communities of significance potentially occurring in the survey area.

3.1.1 Database Searches

The following databases were searched for records of fauna, flora and communities of significance previously recorded from the survey area, or known to occur in the locality¹:

1. The Department of Biodiversity, Conservation and Attractions (DBCAs) databases of Threatened Ecological Communities and Priority Ecological Communities (TECs and PECs), Declared Rare and Priority Flora, and Threatened Fauna. These data searches requested the return of records from a 40 km buffer around the survey area boundary (the DBCA subsequently returned results within a 50 km buffer). The threatened fauna database results had not been received at the time of reporting.
2. The NatureMap database: a joint project of the DBCA and the WA Museum comprising records (without location information) from the Fauna Survey Returns database, the WA Threatened Flora and Fauna Databases, the WA Herbarium and WA Museum Specimen databases, and the BirdLife Australia Atlas. A search was requested within a 40 km buffer around the survey area (Appendix 2).
3. The Atlas of Living Australia (ALA) (<http://www.ala.org.au>): a joint project between academic collecting institutions, private individual collectors and community groups. The atlas contains occurrence records, environmental data, images and the conservation status of species throughout Australia. The database search requested the return of flora and fauna records from a 40 km buffer around the survey area.
4. The Commonwealth EPBC Act Protected Matters Search Tool. The database search requested the return of records within a 40 km buffer around the survey area (Appendix 2).
5. eBird (<https://ebird.org/>) is a citizen science database of bird records from around the globe, managed by Cornell University and moderated by local experts. The search requested the return of records from a 40 km buffer around the survey area.
6. The Index of Biodiversity Surveys for Assessments (IBSA): a database consolidating data from land-based biodiversity surveys conducted to support assessments and compliance required under the *Environmental Protection Act 1986* and providing a publicly available online platform for data sharing. The search requested the return of previous surveys within a 40 km radius of the survey area.

¹ The search areas for each database included marine areas. Obligate marine mammal and reptile species inhabiting these areas were excluded from consideration. Erroneous records of species returned from the database searches (i.e. those that were outside of known ranges or would not occur in Australia) were also excluded (see notes in Appendix 4).

3.1.2 Literature Review

A review of publicly available previous surveys, desktop studies and literature pertaining to the project and the survey area was carried out. The following documents were reviewed, and the results of the review are summarised in Section 4.6:

- Roy Hill MS858 Mangrove Health Monitoring Program – Conformance Report 9 (Roy Hill 2021);
- Flora and Vegetation Reconnaissance Survey of Spoilbank Marina Project Area (Strategen-JBS&G 2020);
- Wodgina Gas Pipeline Detailed Flora and Vegetation Survey (360 Environmental 2018);
- Roy Hill Port Facility Power Line Port Hedland Ecological Assessment (GHD 2016);
- Roy Hill – Proposed Temporary Wharf Access Road – Mangrove Condition Survey (SKM 2013);
- Level 1 Terrestrial Fauna Survey for the Multi-user Iron Ore Export Facility: Port Infrastructure Project (Coffey 2011a);
- Environmental Referral Document North West Infrastructure Multi-user Iron Ore Export Facility: Port Infrastructure Project (Coffey 2011b);
- North West Iron Ore Alliance Port Survey Area Flora and Vegetation Impact Assessment (Woodman 2011a);
- North West Iron Ore Alliance Port Project Flora, Vegetation and Mangal studies (Woodman 2011b);
- Port Hedland Regional Flora and Vegetation Assessment (ENV 2011a);
- Port Hedland Regional Fauna Assessment (ENV 2011b);
- RHI Railway: Port Hedland Geotechnical Investigation Areas Targeted Flora Survey (Maia 2011);
- Boodarie Port Infrastructure, Port Hedland - Level 1 Vegetation and Flora Survey and Fauna Review (Biota 2010); and
- Preliminary Review of Indirect Impacts on Mangroves from Proposed Port Infrastructure (Oceanica 2010).

3.2 Assessment of Likelihood of Occurrence in the Survey Area

In order to determine which species of significance have the potential to occur in the survey area, the results of the database searches and previous surveys in the locality were examined while considering the known habitat preferences for each species. Habitats were defined according to the landforms apparent on aerial imagery, and taking into account existing information regarding the environment and results from previous surveys (Section 4.6).

The likelihood that significant flora and fauna species would occur in the survey area was then assessed using a set of rankings and criteria (Table 3.1). These criteria are used as guidance, and consideration was also given to:

- the documented distribution of the species;
- the proximity of the survey area to known populations;
- the species' ecology; and
- level of survey effort in the locality.

Throughout the remainder of this report, the term “close proximity” has been defined as being within 20 km of the survey area, while the broader “locality” comprises the area up to 40 km from the survey area.

Table 3.1: Ranking system used to assign the likelihood that a species would occur in the survey area.

Rank	Criteria
Recorded	1. The species has been recorded in the survey area previously.
Likely to occur (High likelihood of occurrence in the survey area)	1. There are existing records of the species in close proximity to the survey area; and <ul style="list-style-type: none"> • the species is strongly linked to a specific habitat, which is present in the survey area; or • the species has more general habitat preferences, and suitable habitat is present.
May occur (Moderate likelihood of occurrence in the survey area)	1. There are existing records of the species from the locality, however <ul style="list-style-type: none"> • the species is strongly linked to a specific habitat, of which only a small amount is present in the survey area; or • the species has more general habitat preferences, but only some suitable habitat is present in the survey area. 2. There is suitable habitat in the survey area, but the species is recorded infrequently in the locality.
Unlikely to occur (Low likelihood of occurrence in the survey area)	1. The species is linked to a specific habitat, which is absent from the survey area; or 2. Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search effort in suitable habitat; or 3. There is some suitable habitat in the survey area, however the species is very infrequently recorded in the locality, or the only records are historical (>40 years ago).
Would not occur (Negligible likelihood of occurrence in the survey area)	1. The species is strongly linked to a specific habitat, which is absent from the survey area; and/or 2. The species' range is very restricted and would not include the survey area.

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4.0 Desktop Study Results

4.1 IBRA Bioregion and Subregion

The Interim Biogeographic Regionalisation for Australia (IBRA) recognises 89 bioregions and 419 biological subregions for Australia (Department of the Environment and Energy 2019). The survey area lies within the Pilbara bioregion, which is a major centre for biodiversity within Western Australia, and within the Roebourne subregion. The Roebourne subregion (PIL4) is 2,008,983 ha and is described as:

“Quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia* spp. hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite. Islands are either Quaternary sand accumulations, or composed of basalt or limestone, or combinations of any of these three. Climate is arid (semi-desert) tropical with highly variable rainfall, falling mainly in summer. Cyclonic activity is significant, with several systems affecting the coast and hinterland annually” (Kendrick and Stanley 2003).

4.2 Land Systems

Land systems are composed of repeating patterns of topography, soils and vegetation, which are described as a series of land units (Christian and Stewart 1953). A total of 105 land systems were identified and mapped in the Pilbara bioregion by the then Department of Agriculture. Land systems mapping covering the survey area was prepared by van Vreeswyk et al. (2004). The survey area lies entirely within the Littoral land system (Table 4.1, Figure 4.1). The extent of this land system in the survey area is minimal and represents only 0.02% of its extent within the Pilbara.

Table 4.1: Land systems intersected by the survey area.

Data from van Vreeswyk et al. (2004).

Land System	Description	Extent of Land System in the Pilbara Bioregion	Extent of Land System in the Survey Area	Percentage of Land System in the Pilbara that Occurs in the Survey Area
Littoral (RGELIT)	Bare coastal mudflats with mangroves on seaward fringes, samphire flats, sandy islands, coastal dunes and beaches.	215,343.8 ha	46.4 ha	0.02%

4.3 Beard’s Vegetation

Beard (1975) mapped the vegetation associations of the Pilbara broadly at a scale of 1:1,000,000. The Pilbara bioregion is equivalent to Beard’s Fortescue Botanical District. The survey area intersects three mapping units defined by Beard (1975) within the Abydos Plain physiographic region:

- Abydos Plain 43 – Mangroves;
- Abydos Plain 127 – Tidal mud flats; and
- Abydos Plain 647 – Shrub-steppe (Table 4.2, Figure 4.1).

From 2007 to 2018, the DBCA and Department of Water and Environmental Regulation (DWER) published regular updates regarding the current and pre-European extents of each of Beard’s vegetation associations in WA. Based on the most recent data from 2018, the current extent of each of these mapping units in the Pilbara bioregion remains above 90% of their pre-European

extents, with the exception of Abydos Plain 43, which is at 86% of its pre-European extent. The extent of Abydos Plain 43 in the survey area represents approximately 0.2% of the current mapped extent of this unit.

Table 4.2: Beard's vegetation mapping units occurring in the survey area, and their pre-European and current extents.

Data from 2018 as provided by Government of Western Australia (2019).

Beards Vegetation Mapping Unit	Extent (ha)		Percent Remaining	Extent within the Survey Area (ha) (% of Current Mapped Extent)
	Pre-European	Current		
Abydos Plain 43	7,443.2	6,418.1	86%	12.5 (0.2%)
Abydos Plain 127	101,141.5	91,969.5	91%	26.1 (<0.1%)
Abydos Plain 647	188,742.1	184,615.8	98%	7.9 (<0.01%)

4.4 Geology and Soils

Surface geology of the Port Hedland area was mapped at a scale of 1:250,000 by the Geological Survey of Western Australia (1982). The survey area is underlain by floodplain, coastal dune and beach, and tidal flat deposits comprising silt, clay, mud, sand and gravel (Table 4.3, Figure 4.2).

Soil landscapes comprising a number of soil units were mapped by Northcote et al. (1960) to provide consistent descriptions of Australia's soils. The survey area occurs in soil unit Lh1, which is described as having calcareous earths on the landward side, with samphire flats and bare saline mud flats on the seaward side (Table 4.3, Figure 4.2).

Table 4.3: Geological units and soil units occurring in the survey area.

	Unit	Description	Extent within Survey Area (ha)
Geology	A1f	Floodplain deposits; sand, silt, clay, and gravel adjacent to main drainage channels.	0.2
	B1b	Coastal dunes and beach deposits; shelly sand containing <i>Anadara granosa</i> ; includes backshore deposits.	7.7
	Tf	Tidal flat deposits; silt and mud in intertidal and supratidal flats and lagoons.	36.4
	Tm	Coastal (tide-dominated) mud and silt on mangrove flats.	2.1
Soils	Lh1	Coastal plains mainly beyond marine flooding influence: main soils are pedal calcareous earths (Gc2.22) with some associated highly calcareous earths (Gc1.12). On the seaward side are firstly samphire flats (Gc1.1) and then bare saline mud (Uf). Calcareous dunes (Uc1.11) commonly occur on the seaward edge of the plains.	46.4

4.5 Conservation Reserves and Protected Areas in the Locality

There are no gazetted conservation reserves and no TECs within a 40 km radius of the survey areas, however three Environmentally Sensitive Areas (ESAs) are known to occur (Figure 4.3, Section 4.7.1). Information on the exact nature and name of these ESAs is not publicly available.

While not protected under legislation, the Eighty Mile Land System PEC also occurs in the area (see Section 4.7.1). In addition, Benthic Communities and Habitats (BCH) are recognised by the EPA as being fundamental to the maintenance of the biological diversity and ecological integrity of marine ecosystems, and special consideration is given to the protection of these habitats in EIA (EPA 2016a, 2016b). The survey area contains three BCH: samphire shrublands, cyanobacterial mats and mangrove shrublands/forest.

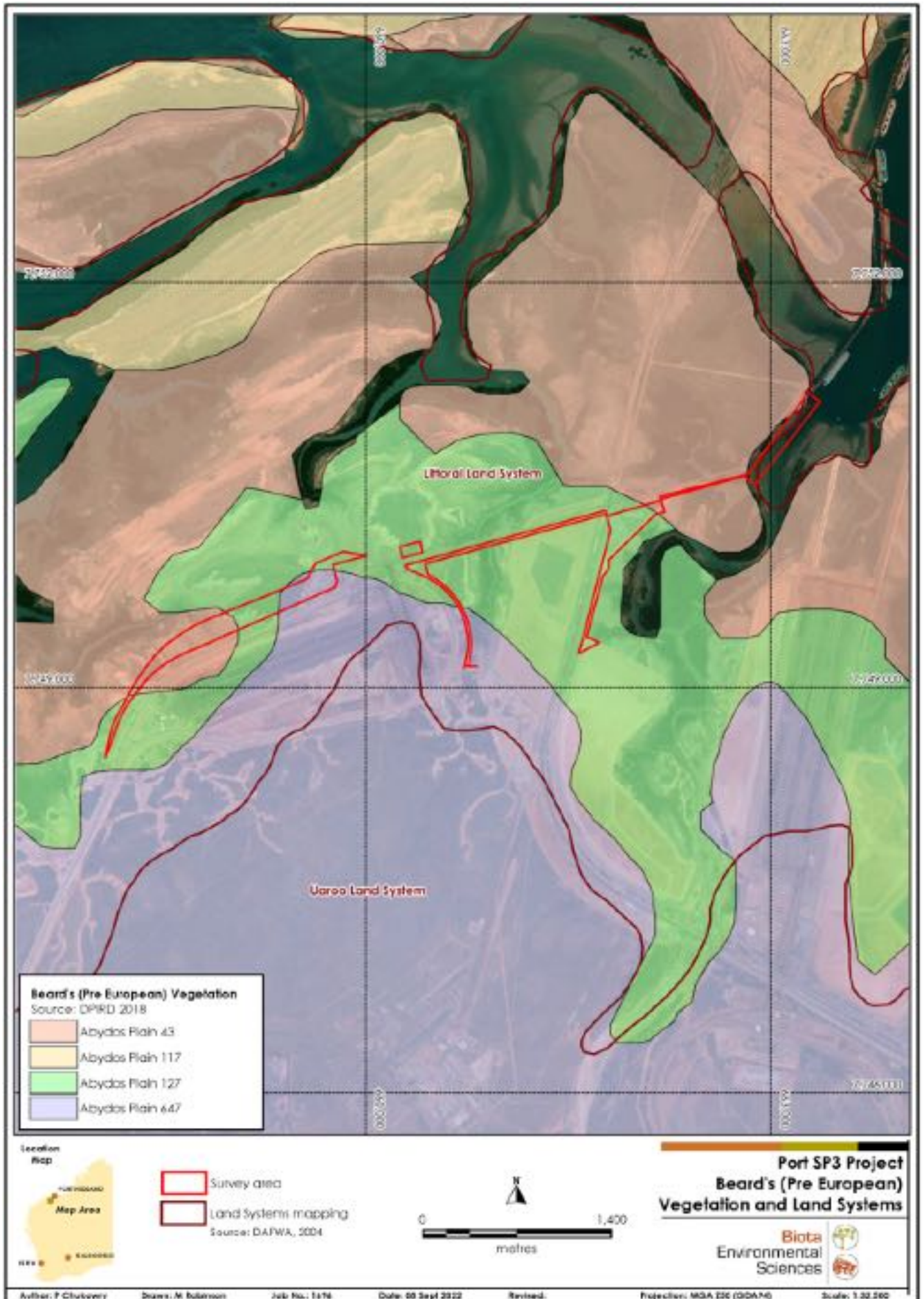


Figure 4.1: Land systems and Beard's vegetation units within the survey area and surrounds.

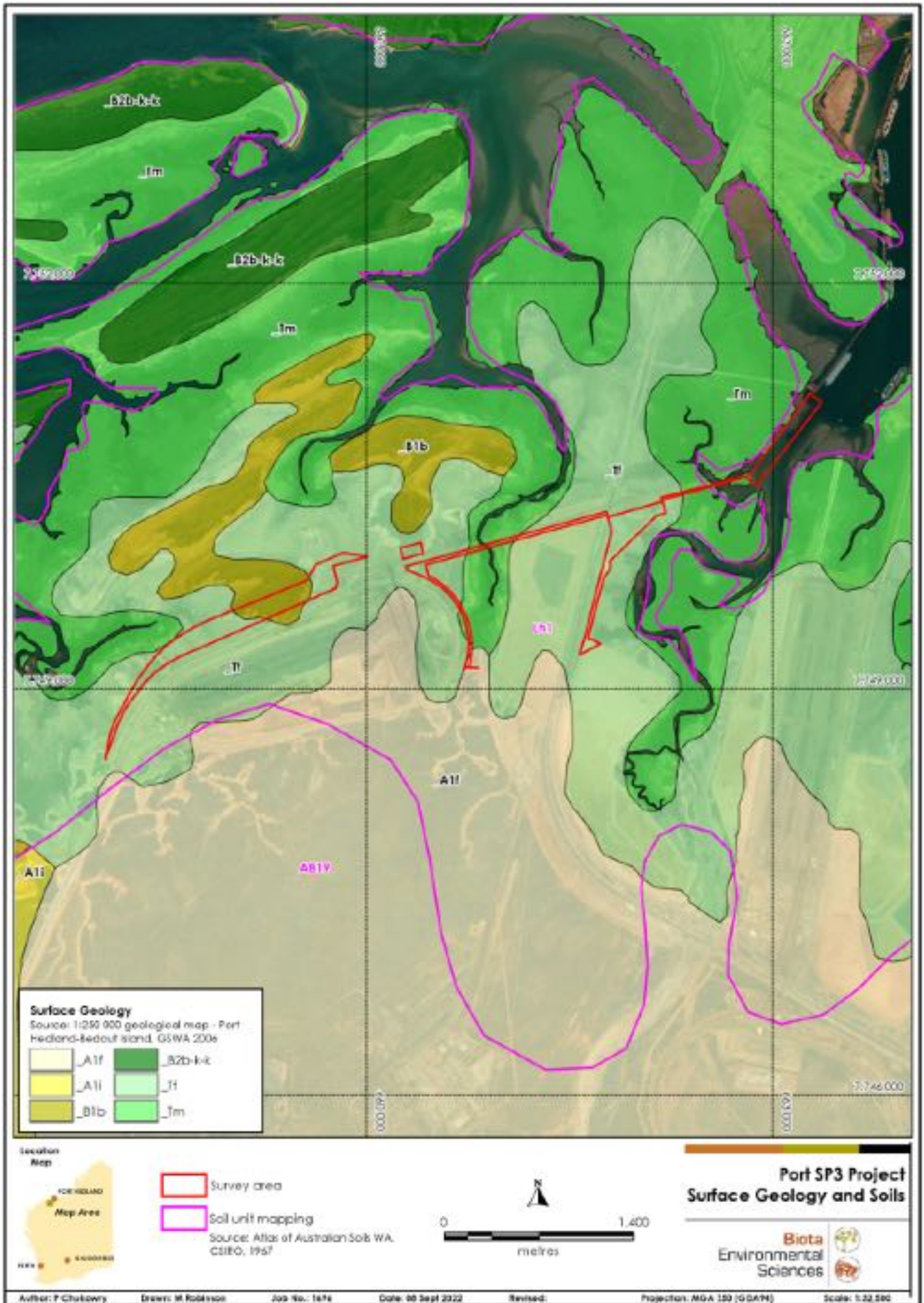


Figure 4.2: Geological units and soil units occurring within the survey area and surrounds.

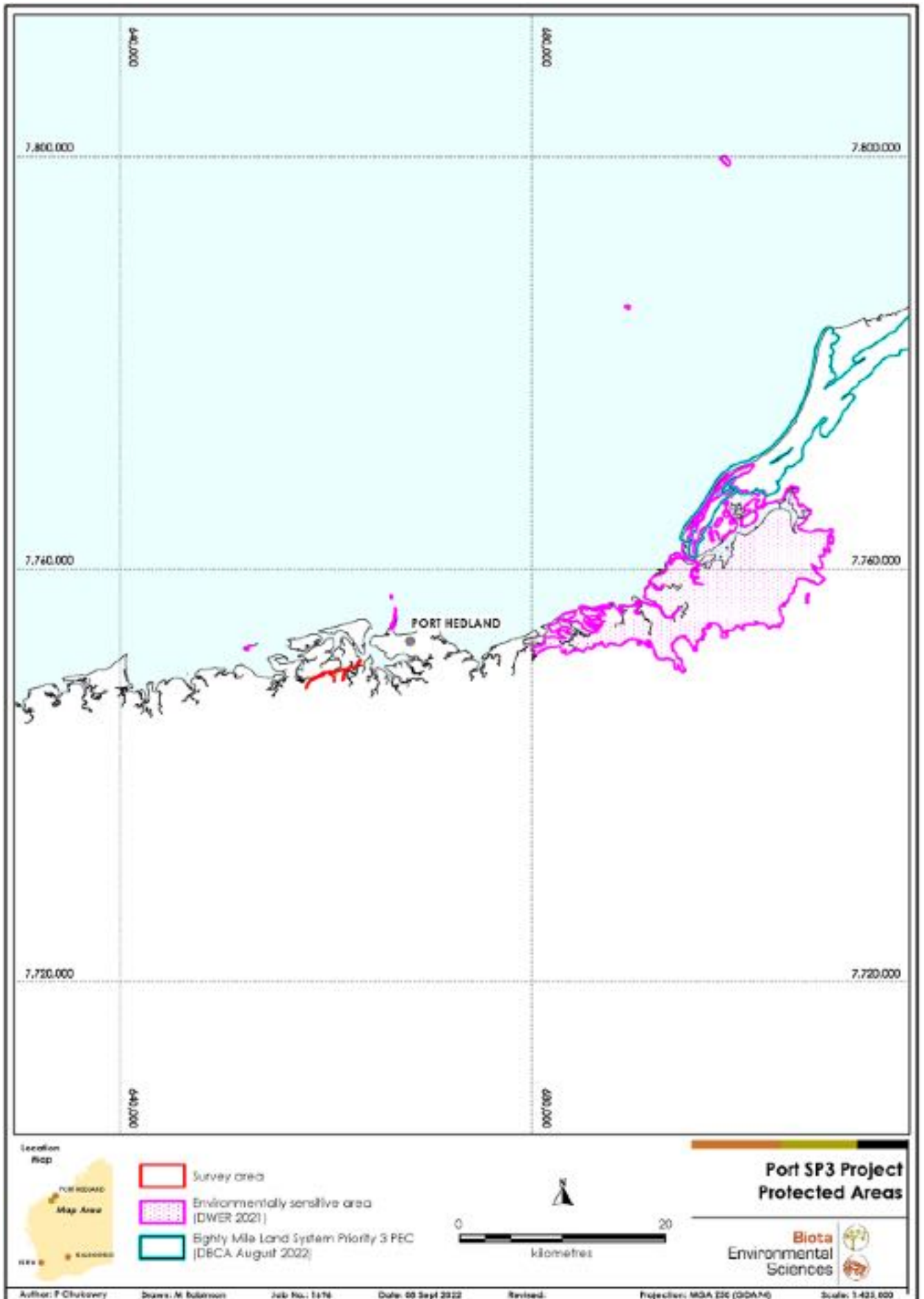


Figure 4.3: Protected areas in the vicinity of the survey area.

4.6 Previous Biological Surveys in the Locality

A summary of previous studies and surveys completed in the locality, including some encompassing the survey area, is presented in Table 4.4. As a significant number of studies have been conducted in the Port Hedland area, only the most relevant studies are summarised.

4.7 Significant Vegetation and Flora

4.7.1 Threatened and Priority Ecological Communities

TECs are described by the DBCA as biological assemblages occurring in a particular habitat, which are under threat of modification or destruction from various processes. TECs are significant at State level, being protected under the WA *Biodiversity Conservation Act 2016* (the BC Act), as well as having protection as ESAs under the EP Act. Some TECs are also protected at Commonwealth level under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). Further information regarding the classification of TECs is provided in Appendix 1. No TECs occur within 40 km of the survey area and none would be expected to occur, based on their distribution and composition.

PECs are ecological communities that are recognised to be of significance, but do not meet the criteria for listing as a TEC. There are five categories of PECs, none of which are currently protected under legislation (see Appendix 1). One occurrence of a PEC was identified in a search of the DBCA database as occurring within 40 km of the survey area:

- The Priority 3 'Eighty Mile Land System' PEC is described as "Beach foredunes, longitudinal coastal dunes and sandy plains with tussock grasslands and spinifex grasslands" (DBCA 2022). The nearest occurrence of this PEC is 34 km east-northeast of the survey area. Threats to this PEC include altered fire regimes, over grazing, erosion, and weed invasion by Buffel Grass (**Cenchrus ciliaris*) (DBCA 2022).

The Eighty Mile Land System PEC would not occur in the survey area; this land system does not extend as far west, and the habitats in the survey area primarily comprise mudflats, mangrove shrublands and sandy islands, without the presence of sand dunes or a beach.

Table 4.4: Summary of the literature review.

Project/Survey (Reference)	Survey Type † : Date	Size of Area	No. of Native Taxa	Features of Conservation Significance: TECs and PECs / Threatened and Priority Species	Stated Limitations of the Survey	Summary Relevant to this Study
Roy Hill MS858 Mangrove Health Monitoring Program - Conformance Report 9 (Roy Hill 2021)	Mangrove monitoring and compliance report: survey 20 – 21 May 2021.	Not stated - MS858	• Three mangrove species in conformance monitoring area: <i>Avicennia marina</i> , <i>Rhizophora stylosa</i> , <i>Ceriops australis</i> .	• NA	• NA	<ul style="list-style-type: none"> • 1.16 ha of total mangrove disturbance within MS858 (max. impact of 5 ha stated in MS858). • During current conformance period, no clearing of mangroves conducted and no observed decline of mangrove health. • Mangrove canopy cover remained relatively constant over time but has varied spatially between surveys. • Construction and operations activities have not impacted the integrity of mangrove communities. • No exceedance was recorded for the canopy density trigger value across any of the potential mangrove impact sites, tree condition was stable and considered healthy at most sites. • Conformance survey data show that the state of mangrove health has been maintained from the baseline monitoring program and remains 'healthy' following completion of construction and during operations.
Flora and vegetation Reconnaissance Survey of Spoilbank Marina Project Area (Strategen-JBS&G 2020)	Reconnaissance and targeted survey: 12 February 2020.	68.2 ha	28	<ul style="list-style-type: none"> • No TECs or PECs. • No Threatened or Priority flora. 	• None stated.	<ul style="list-style-type: none"> • Surveyed area contained low diversity of vascular flora species and high densities of aggressive weeds; survey was conducted in an area unlike the current survey area (i.e. public area heavily modified by human activity).
Wodgina Gas Pipeline Detailed Flora and Vegetation Survey (360 Environmental 2018)	Detailed survey: 9 – 16 June 2018.	243 ha	139	<ul style="list-style-type: none"> • No TECs or PECs. • One Priority flora species recorded: <ul style="list-style-type: none"> ◦ <i>Euphorbia clementii</i> (P3). • <i>Euploca mutica</i> and <i>Gymnanthera cunninghamii</i> (both P3) considered likely to occur based on desktop review. 	• None stated.	<ul style="list-style-type: none"> • Survey was conducted in habitats not present in the current survey area.
Roy Hill Port Facility Power Line Port Hedland Ecological Assessment (GHD 2016)	Level 1 survey: 9 June 2016.	27.1 ha	25	<ul style="list-style-type: none"> • No TECs or PECs. • No Threatened or Priority flora. • No significant fauna recorded, but no active fauna survey undertaken. • Airlie Island <i>Ctenotus</i> (<i>Ctenotus angusticeps</i>) and a number of Migratory-listed shorebirds may occur in the area. 	<ul style="list-style-type: none"> • Single season survey and some annual/ephemeral species may not have been present at the time of survey. • Conditions leading up to the survey were dry with inadequate rainfall. • Fauna survey limited to a habitat assessment and opportunistic observations. 	<ul style="list-style-type: none"> • Three fauna habitat types were identified, generally in good condition, but impacted by infrastructure development, and habitat along Finucane Island Road was degraded. • The assessment identified that no Commonwealth or State conservation listed fauna species are likely to be reliant on the area of habitat temporarily impacted by the project. • Project ranged between "not at variance" or "may be at variance" with the 10 Clearing Principles.
Roy Hill Proposed Temporary Wharf Access Road – Mangrove Condition Survey (SKM 2013)	Baseline mangrove condition survey: 6 – 8 February 2013.	Not stated - 1.2 km road corridor	NA	• NA	• NA	<ul style="list-style-type: none"> • 3.47 ha of mangroves mapped along proposed wharf access road, mostly comprising <i>Avicennia marina</i> open heath. • No attributes that make the area unique or worthy of greater protection than that afforded by current guidelines. • Area has undergone changes in regard to sedimentation; there is evidence of past mortality. • Likely the mangroves will recolonise naturally following the removal of proposed temporary wharf access road and the area will be rehabilitated but in an uncertain amount of time.
Port Hedland Regional Flora and Vegetation Assessment (ENV 2011a)	Level 2 survey: 30 April – 6 May 2011 and 20 June – 1 July 2011.	80,874 ha	332	<ul style="list-style-type: none"> • No TECs or PECs. • No Threatened flora. • Four Priority flora recorded: <ul style="list-style-type: none"> ◦ <i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095) (P3) ◦ <i>Gomphrena pusilla</i> (P2) ◦ <i>Euploca mutica</i> (P3) ◦ <i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114) (P1). 	• Minor access restrictions.	<ul style="list-style-type: none"> • Only two Priority species recorded near current survey area: <i>Gomphrena pusilla</i> and <i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114).

Project/Survey (Reference)	Survey Type † : Date	Size of Area	No. of Native Taxa	Features of Conservation Significance: TECs and PECs / Threatened and Priority Species	Stated Limitations of the Survey	Summary Relevant to this Study
Port Hedland Regional Fauna Assessment (ENV 2011b)	Level 1 single-phase: 11 – 20 July 2011.	80,874 ha	106 native fauna species (plus 2 introduced/naturalised)	<ul style="list-style-type: none"> • Three significant mammals and 27 significant birds recorded from study area or immediate vicinity. • Threatened or Priority species recorded: Far Eastern Curlew (CR; MI), Curlew Sandpiper (CR; MI), Great Knot (CR; MI), Bar-tailed Godwit (CR/VU; MI), Northern Quoll (EN), Red Knot (EN; MI), Lesser Sand Plover (EN; MI), Greater Sand Plover (VU; MI), <i>Ozimops cobourgianus</i> (P1), Western Pebble-mound Mouse (P4), Grey-tailed Tattler (MI; P4) • 18 additional bird species listed as Migratory. 	<ul style="list-style-type: none"> • None listed 	<ul style="list-style-type: none"> • Grey-tailed Tattler (MI; P4), Eastern Cattle Egret (MI), Eastern Osprey (MI), <i>Ozimops cobourgianus</i> (P3) mapped in close proximity to the current survey area.
Environmental Referral Document: Multi-user Iron Ore Export Facility: Port Infrastructure Project (Coffey 2011b)	NA – ERD compiled using the results of previous surveys.	350 ha dev. envelope	NA	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Key Environmental factors: <ul style="list-style-type: none"> ◦ BCH ◦ Surface water and coastal processes ◦ Dust ◦ Noise ◦ Management plans and measures to be implemented for all factors. • 3 mangrove communities in the project area. • 4.46 ha of permanent mangrove loss from project. • Cumulative loss of mangroves calculated to be 12.95% when combined with estimated historical losses and potential losses from known proposals and current project. • 87 ha of cyanobacterial mats and samphires impacted by project. • Minor potential impact on turtles during construction of project. Project is unlikely to have any impact on threatened or migratory marine species, and minimal impact of fish and crustaceans. • Disturbance of 290 ha of vegetation within the development envelope. • Risk of marine pest introduction is low.
Preliminary Review of Impacts to Mangroves (Oceanica 2010)	NA – desktop study on the indirect impacts of project on mangroves.	Not stated	NA	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Changes to surface flow from infrastructure will be managed with diversion drains, a V-drain and culverts. • Changes in tidal flows predicted to be minor and unlikely to cause significant ecological changes. Impacts likely to be minor realignment of tidal creeks, scour and guttering adjacent to revetment. • Indirect impacts on mangroves and cyanobacterial mats likely to be minor and have been mitigated by locating infrastructure where it avoids the majority of flows.
North West Iron Ore Alliance Port Project Flora, Vegetation and Mangal Studies (Woodman 2011b)	Level 2 survey: 28 July – 4 August 2010 & April 2011.	2,251 ha	172	<ul style="list-style-type: none"> • No TECs or PECs. • No Threatened flora. • Four Priority flora recorded: <ul style="list-style-type: none"> ◦ <i>Eragrostis crateriformis</i> (P3) ◦ <i>Gomphrena leptophylla</i> (P3) ◦ <i>Gomphrena pusilla</i> (P2) ◦ <i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114) (P1). • <i>Gymnanthera cunninghamii</i> (P3) known to occur in the area from desktop study. 	<ul style="list-style-type: none"> • Primary survey conducted outside of the recommended season and lower than average rainfall fell in the area during the wet season preceding the survey. • Access to mangal communities was restricted. 	<ul style="list-style-type: none"> • Size of impact was rated as 'High'. • Significance of vegetation was rated as 'Low'. • Degree of degradation within the area was rated 'Low'. • Impact on refugia was rated as 'Low'. • Impact on rare/priority flora, and other significant flora was rated 'Moderate'. • Impact on condition of remnant vegetation and ecological linkage was rated as 'Low'.

Project/Survey (Reference)	Survey Type † : Date	Size of Area	No. of Native Taxa	Features of Conservation Significance: TECs and PECs / Threatened and Priority Species	Stated Limitations of the Survey	Summary Relevant to this Study
North West Iron Ore Alliance Port Survey Area Flora and Vegetation Impact Assessment (Woodman 2011a)	NA – desktop study of impacts for area surveyed by Woodman (2011b).	2,251 ha	NA	<ul style="list-style-type: none"> As above. 	<ul style="list-style-type: none"> None stated. 	<ul style="list-style-type: none"> 17% of survey area would be impacted. 50% of <i>Eragrostis crateriformis</i> and 83% of <i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114) local populations would be impacted by proposal. Habitat area for <i>Gomphrena leptophylla</i> and <i>Goodenia pusilla</i> (3.6%) would also be impacted locally. Overall impact on vegetation rated as 'Moderate'.
RHI Railway: Port Hedland Geotechnical Investigation Areas Targeted Flora Survey (Maia 2011)	Targeted survey for significant flora: 17 – 19 January 2011.	3.5 ha	56	<ul style="list-style-type: none"> No TECs or PECs. No Threatened flora. No Priority flora species recorded, but <i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114) (P1) known to occur in the area from desktop study. 	<ul style="list-style-type: none"> None stated. 	<ul style="list-style-type: none"> Survey area in excellent condition; only two weed species recorded and minimal grazing. No features of significance recorded during the survey. Ecologically important algal mats present.
Boodarie Port Infrastructure, Port Hedland – Level 1 Vegetation and Flora Survey and Fauna Review (Biota 2010) and Boodarie Infrastructure Level 1 Flora, Vegetation and Fauna Survey, Port Hedland (Biota 2009)	Two-phase Level 1 survey: 12 – 15 January 2010	2,292 ha	100 flora; 23 native fauna (plus two introduced or naturalised species).	<p><u>Flora & Vegetation</u></p> <ul style="list-style-type: none"> No TECs or PECs. No Threatened flora. One Priority flora species recorded: <ul style="list-style-type: none"> <i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114) (P1). <i>Bulbostylis burbidgeae</i> (P4) considered likely to occur in area. No significant fauna species recorded. 	<ul style="list-style-type: none"> Suboptimal conditions at the time of survey. Mangroves were not considered in detail during the survey. No systematic sampling of fauna or detailed habitat descriptions were made. 	<ul style="list-style-type: none"> Survey area in excellent condition; only one weed species recorded. Vegetation of tidal flats, sandy islands and sandy coastal plain considered to be of moderate local significance due to susceptibility to disturbance and presence of <i>Triodia secunda</i>, which has limited distribution in the Pilbara. Ecologically important algal mats present. Primary impacts from the proposed development comprise clearing of vegetation, and introduction and spread of weeds. Unlikely that development of the Boodarie infrastructure areas will have a substantial impact on any communities or species of significance providing recommendations made in report followed.
Level 1 Terrestrial Fauna Survey for the Multi-user Iron Ore Export Facility: Port Infrastructure Project (Coffey 2011a)	Level 1 survey: 21 – 23 June 2010	Not stated	No field records included.	<ul style="list-style-type: none"> No field fauna records. 36 listed terrestrial vertebrate fauna species assessed as possibly occurring in the study area. 	<ul style="list-style-type: none"> Level 1 survey only; no systematic survey work undertaken and no field fauna records. 	<ul style="list-style-type: none"> Seven fauna habitats identified in study area. None of the 36 listed significant fauna species were anticipated to be significantly affected by the project at a regional level.
A Flora and Fauna Assessment of RGP5 DMMA A, Port Hedland Harbour (Biota 2008)	Level 1 survey: 26 – 27 February 2008	123.2 ha	24 flora species; 16 native fauna species (plus 2 introduced or naturalised).	<ul style="list-style-type: none"> Two fauna species of significance: Far Eastern Curlew (<i>Numenius madagascariensis</i>; CR; MI) and Eurasian Whimbrel (<i>Numenius phaeopus</i>; MI). No TECs or PECs. No Threatened or Priority flora. 	<ul style="list-style-type: none"> No systematic fauna survey work undertaken. Conditions not optimal for annual flora collection. Mangroves not assessed. 	<ul style="list-style-type: none"> Considered highly unlikely that the proposed activities at DMMA A would impact on any flora and fauna of high conservation significance. Samphire shrublands and <i>Triodia secunda</i> hummock grasslands were considered to be of moderate local conservation significance.
Outer Harbour Development Fauna Assessment (ENV 2009)	Level 2 survey: 12 October – 9 November 2007, 5 – 16 May 2008	20,303 ha	19 native mammals (plus 7 introduced mammals), 106 birds (plus 7 in immediate vicinity), 53 reptiles, 7 amphibians.	<ul style="list-style-type: none"> 25 significant fauna species recorded (based on current listings). Threatened or Priority species recorded: Far Eastern Curlew (CR; MI), Curlew Sandpiper (CR; MI), Great Knot (CR; MI), Bar-tailed Godwit (CR/VU; MI), Red Knot (EN; MI), Lesser Sand Plover (EN; MI), Greater Sand Plover (VU; MI), Fairy Tern (VU), <i>Ozimops cobourgianus</i> (P1), Grey-tailed Tattler (MI; P4) An additional 15 bird species listed as Migratory. 	<ul style="list-style-type: none"> Minor access restrictions. Trapping not possible in mangrove and tidal flats habitats. 	<ul style="list-style-type: none"> Six fauna habitats identified in study area. None of the 25 listed significant fauna recorded species were anticipated to be significantly affected by the project.

† Survey type: for surveys completed prior to issue of the most recent EPA flora and fauna survey guidance documents, "Level 1" and "Level 2" surveys of EPA (2004, 2010) are approximately equivalent to "reconnaissance/basic" and "detailed" surveys of EPA (2016c, 2020).

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4.7.2 Threatened and Priority Flora

Native flora and fauna species that are rare, threatened with extinction, or have high conservation value, are specially protected by law as Threatened species under the BC Act and/or the EPBC Act. In addition, the DBCA maintains a list of Priority species; these are those which have not been assigned statutory protection under the BC Act but are still considered to be of conservation priority, or are considered to be rare but not threatened and require monitoring (see Appendix 1 for details of significance categories recognised under the above frameworks).

The DBCA database search yielded the following significant flora and an assessment of their likelihood to occur in the survey area was carried out (see Appendix 3 for the detailed assessment):

- One Threatened species:
 - *Seringia exastia* (unlikely to occur).
- Three Priority 1 species:
 - *Atriplex eremitis* (unlikely to occur),
 - *Tephrosia rosea* var. Port Hedland (A.S. George 1114) (likely to occur), and
 - *Triodia chichesterensis* (would not occur).
- One Priority 2 species:
 - *Gomphrena pusilla* (likely to occur).
- Eight Priority 3 species:
 - *Abutilon* sp. Pritzelianum (S. van Leeuwen 5095) (unlikely to occur),
 - *Eragrostis crateriformis* (may occur),
 - *Euploca mutica* (unlikely to occur),
 - *Gomphrena cucullata* (unlikely to occur),
 - *Gomphrena leptophylla* (may occur),
 - *Gymnanthera cunninghamii* (unlikely to occur),
 - *Rothia indica* subsp. *australis* (unlikely to occur), and
 - *Sida* sp. Barlee Range (S. van Leeuwen 1642) (would not occur).
- Two Priority 4 species:
 - *Bulbostylis burbridgeae* (unlikely to occur); and
 - *Ptilotus mollis* (would not occur).

The locations of these species relative to the survey area are mapped in Figure 4.4.

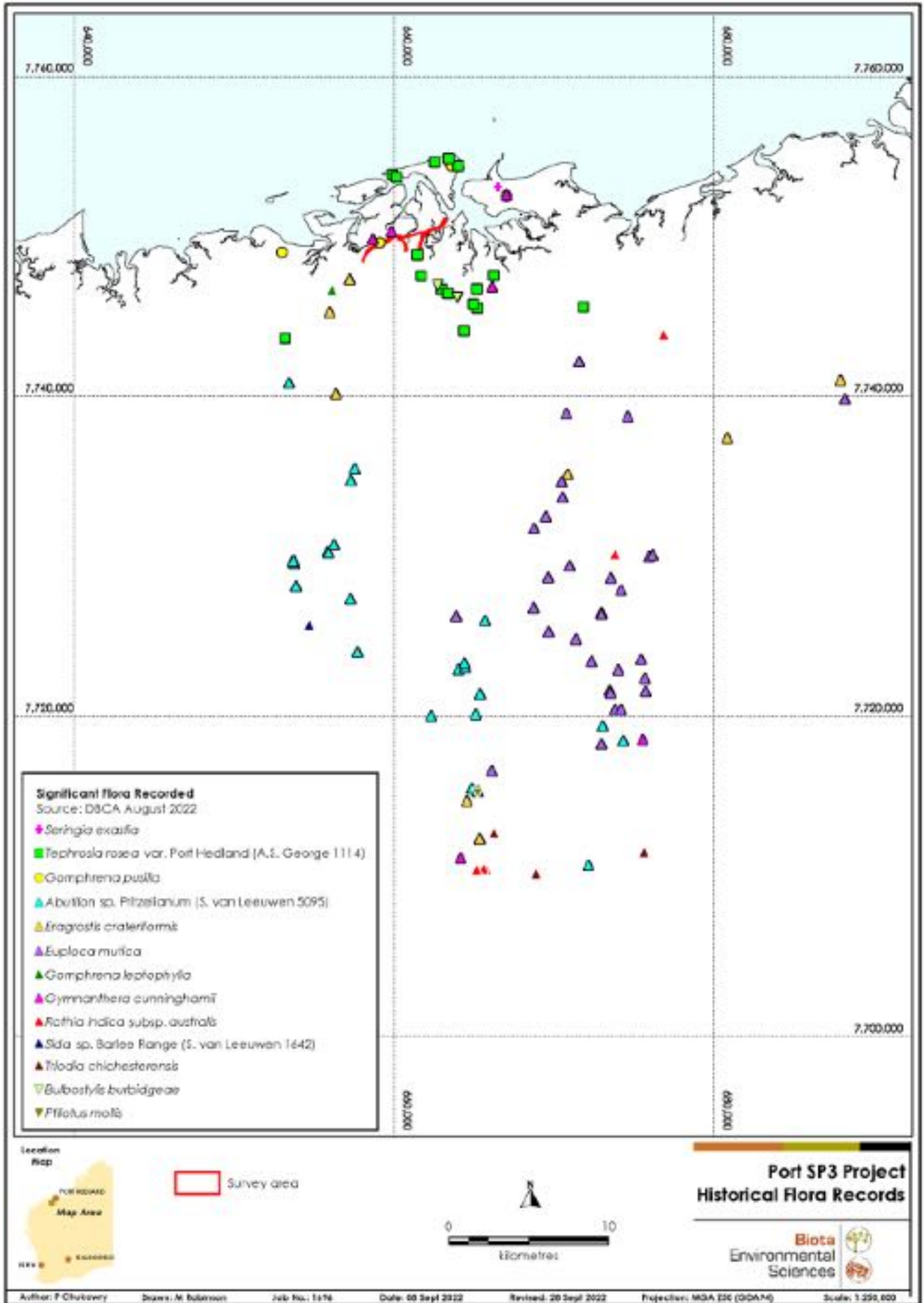


Figure 4.4: Historical significant flora records within 40 km of the survey area.

4.8 Significant Fauna

A total of 393 fauna species were identified from the locality during the desktop study, excluding obligate marine species (Table 4.5; Appendix 4). Of these, 75 are considered significant species; these are presented in Table 4.6, along with their preliminary likelihood of occurrence assessment. A more detailed assessment is included in Appendix 5, and locations of all available past records are mapped in Figure 4.5.

Table 4.5: Vertebrate species identified from the desktop study.

Fauna Group	Number of Species	Significant Species
Mammals	45	7 ¹
• Native terrestrial	(21)	(4 ¹)
• Introduced terrestrial	(9)	(-)
• Native bats	(15)	(3)
Birds	228	61 ²
• Native terrestrial	(226)	(61)
• Introduced	(2)	(-)
Reptiles	108	7
• Native terrestrial	(106)	(7)
• Introduced	(2)	(-)
Amphibians	12	-
Total	393	75

¹ Excluding Banded Hare-wallaby (*Lagostrophus fasciatus*): considered extinct on mainland and published historical distribution does not include the Pilbara.

² Excludes a total of four obligate marine species and vagrants.

Table 4.6: Significant vertebrate fauna previously recorded from the locality of the survey area.

Species	Common Name	State	C'wealth	Likelihood of Occurrence in Survey Area
MAMMALS				
<i>Dasyurus hallucatus</i>	Northern Quoll	EN	EN	Unlikely to occur
<i>Macrotis lagotis</i>	Bilby	VU	VU	Unlikely to occur
<i>Rhinonicteris aurantia</i> (Pilbara form)	Pilbara Leaf-nosed Bat	VU	VU	May occur
<i>Macroderma gigas</i>	Ghost Bat	VU	VU	May occur
<i>Ozimops cobourgianus</i>	Northern Coastal Free-tailed Bat	P1	-	Likely to occur
<i>Dasyercus blythi</i>	Brush-tailed Mulgara	P4	-	May occur
<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse	P4	-	Unlikely to occur
BIRDS				
<i>Numenius madagascariensis</i>	Far Eastern Curlew	CR; MI	CR; MI	Likely to occur
<i>Calidris tenuirostris</i>	Great Knot	CR; MI	CR; MI	Likely to occur
<i>Limosa lapponica</i>	Bar-tailed Godwit	CR; MI	EN; MI	Likely to occur
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR; MI	CR; MI	Likely to occur
<i>Pezoporus occidentalis</i>	Night Parrot	CR	EN	Unlikely to occur
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN; MI	EN; MI	Likely to occur
<i>Calidris canutus</i>	Red Knot	EN; MI	EN; MI	Likely to occur
<i>Rostratula australis</i>	Australian Painted-snipe	EN	EN	Unlikely to occur
<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU; MI	VU; MI	Likely to occur
<i>Sternula nereis</i>	Fairy Tern	VU	VU	Unlikely to occur
<i>Erythrotriorchis radiatus</i>	Red Goshawk	VU	VU	Unlikely to occur
<i>Falco hypoleucos</i>	Grey Falcon	VU	VU	May occur
<i>Tringa brevipes</i>	Grey-tailed Tattler	MI; P4	MI	Likely to occur
<i>Apus pacificus</i>	Pacific Swift	MI	MI	Likely to occur

Species	Common Name	State	C'wealth	Likelihood of Occurrence in Survey Area
<i>Cuculus optatus</i>	Oriental Cuckoo	MI	MI	May occur
<i>Pluvialis fulva</i>	Pacific Golden Plover	MI	MI	Likely to occur
<i>Pluvialis squatarola</i>	Grey Plover	MI	MI	Likely to occur
<i>Charadrius veredus</i>	Oriental Plover	MI	MI	Likely to occur
<i>Numenius phaeopus</i>	Eurasian Whimbrel	MI	MI	Likely to occur
<i>Numenius minutus</i>	Little Curlew	MI	MI	Likely to occur
<i>Limosa limosa</i>	Black-tailed Godwit	MI	MI	Likely to occur
<i>Arenaria interpres</i>	Ruddy Turnstone	MI	MI	Likely to occur
<i>Calidris pugnax</i>	Ruff	MI	MI	May occur
<i>Calidris falcinellus</i>	Broad-billed Sandpiper	MI	MI	Likely to occur
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MI	MI	Likely to occur
<i>Calidris subminuta</i>	Long-toed Stint	MI	MI	May occur
<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI	Likely to occur
<i>Calidris alba</i>	Sanderling	MI	MI	May occur
<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI	May occur
<i>Limnodromus semipalmatus</i>	Asian Dowitcher	MI	MI	May occur
<i>Gallinago stenura</i>	Pin-tailed Snipe	MI	MI	Unlikely to occur
<i>Gallinago megala</i>	Swinhoe's Snipe	MI	MI	Unlikely to occur
<i>Xenus cinereus</i>	Terek Sandpiper	MI	MI	Likely to occur
<i>Phalaropus lobatus</i>	Red-necked Phalarope	MI	MI	Unlikely to occur
<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI	Likely to occur
<i>Tringa totanus</i>	Common Redshank	MI	MI	Unlikely to occur
<i>Tringa stagnatilis</i>	Marsh Sandpiper	MI	MI	May occur
<i>Tringa glareola</i>	Wood Sandpiper	MI	MI	May occur
<i>Tringa nebularia</i>	Common Greenshank	MI	MI	Likely to occur
<i>Glareola maldivarum</i>	Oriental Pratincole	MI	MI	Likely to occur
<i>Anous stolidus</i>	Brown Noddy	MI	MI	Unlikely to occur
<i>Gelochelidon [nilotica] macrotarsa</i>	Australian [Gull-billed] Tern	MI	MI	Likely to occur
<i>Hydroprogne caspia</i>	Caspian Tern	MI	MI	Likely to occur
<i>Thalasseus bergii</i>	Greater Crested Tern	MI	MI	Likely to occur
<i>Onychoprion anaethetus</i>	Bridled Tern	MI	MI	Unlikely to occur
<i>Sternula albifrons</i>	Little Tern	MI	MI	Likely to occur
<i>Sterna dougallii</i>	Roseate Tern	MI	MI	May occur
<i>Sterna hirundo</i>	Common Tern	MI	MI	Likely to occur
<i>Chlidonias leucopterus</i>	White-winged Tern	MI	MI	Likely to occur
<i>Phaethon lepturus</i>	White-tailed Tropicbird	MI	MI	Unlikely to occur
<i>Fregata minor</i>	Great Frigatebird	MI	MI	Unlikely to occur
<i>Fregata ariel</i>	Lesser Frigatebird	MI	MI	May occur
<i>Sula dactylatra</i>	Masked Booby	MI	MI	Unlikely to occur
<i>Sula leucogaster</i>	Brown Booby	MI	MI	May occur
<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI	Unlikely to occur
<i>Pandion cristatus</i>	Eastern Osprey	MI	MI	Likely to occur
<i>Hirundo rustica</i>	Barn Swallow	MI	MI	Likely to occur
<i>Motacilla tschutschensis</i>	Eastern Yellow Wagtail	MI	MI	May occur
<i>Motacilla cinerea</i>	Grey Wagtail	MI	MI	Unlikely to occur
<i>Falco peregrinus</i>	Peregrine Falcon	OS	-	Likely to occur
<i>Elanus scriptus</i>	Letter-winged Kite	P4	-	Unlikely to occur
REPTILES				
<i>Caretta caretta</i>	Loggerhead Turtle	EN	EN; MI	Unlikely to occur

Species	Common Name	State	C'wealth	Likelihood of Occurrence in Survey Area
<i>Chelonia mydas</i>	Green Turtle	VU	VU; MI	May occur
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	VU	VU; MI	May occur
<i>Natator depressus</i>	Flatback Turtle	VU	VU; MI	May occur
<i>Dermochelys coriacea</i>	Leatherback Turtle	VU	VU; MI	Unlikely to occur
<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	VU	Unlikely to occur
<i>Ctenotus angusticeps</i>		P3	–	Likely to occur

Note: Excluding Banded Hare-wallaby (extinct on mainland); Southern Giant Petrel, Wilson's Storm-Petrel, Streaked Shearwater (all obligate marine in Australia); and Garganey (vagrant).

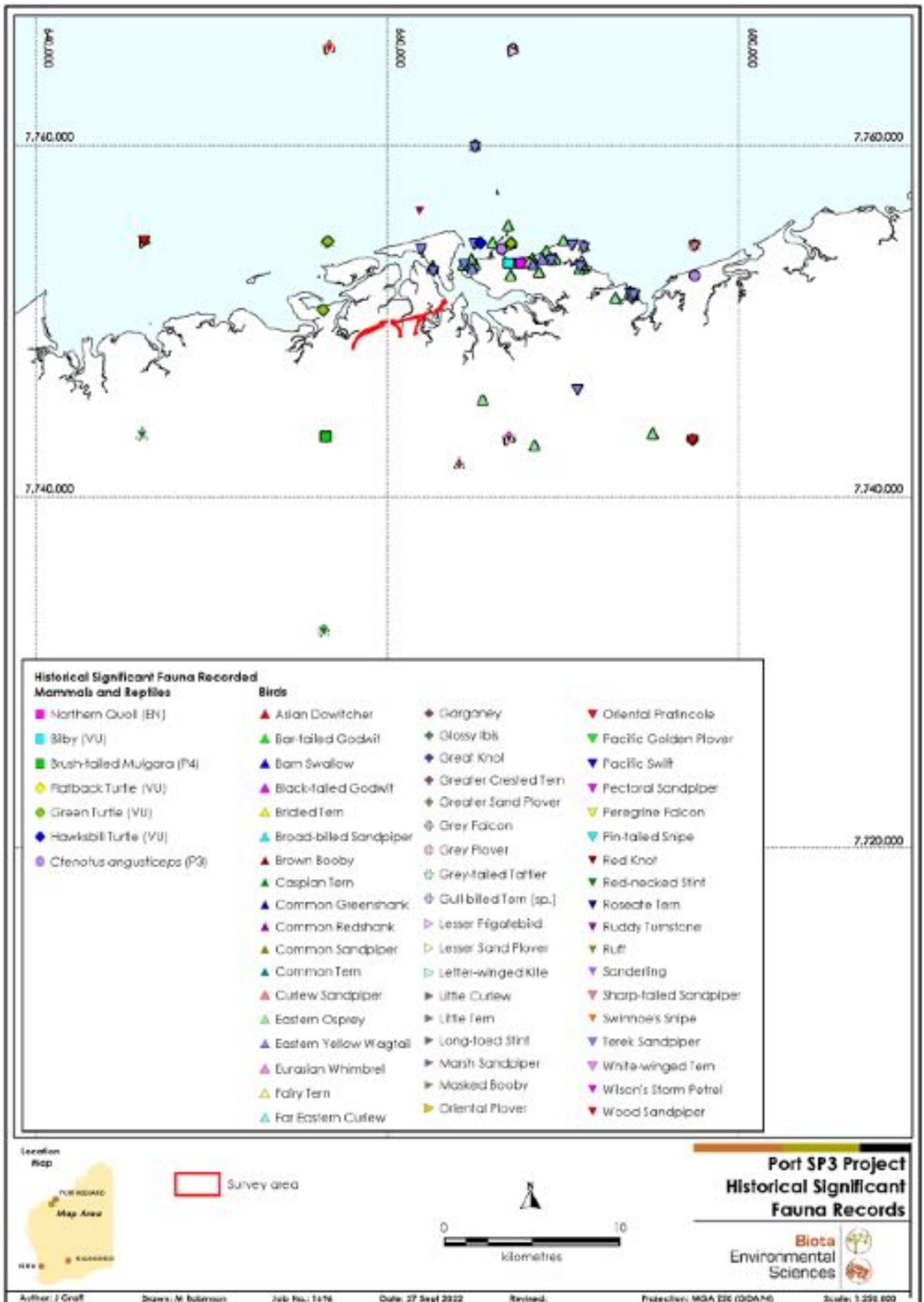


Figure 4.5: Historical significant fauna records within 40 km of the survey area.

Note: DBCA Threatened Fauna database records not included as not received at the time of reporting.

5.0 Discussion and Conclusions

Much of the survey area is located within the intertidal zone, and potential impacts to BCH should therefore be considered as per EPA (2016b). Health of the BCH in the survey area, particularly the areas of mangrove shrubland/forest and algal mats (samphires will be considered as a terrestrial vegetation type for this study due to its often inland distribution beyond the intertidal zone), will be strongly linked with the local marine and tidal processes. While some clearing is expected to occur within the survey area, only 1.16 ha of mangrove disturbance has occurred within MS858 to date, and approval was granted for a maximum impact area of 5 ha (Minister for Environment 2011).

5.1 Flora and Vegetation

Extensive past survey work has been completed in and around the survey area. Five to seven vegetation units (depending on the scale of mapping used in previous studies) have previously been described and mapped over the landforms present within the survey area. Vegetation in similarly intact areas has been observed to be in generally Excellent or Very Good condition, despite the presence of some weed species.

The results of this desktop study show that no listed significant flora species, TECs or PECs are known to occur within the survey area boundary. Following the likelihood of occurrence assessment, four Priority species are considered to have some potential to occur in the survey area: *Tephrosia rosea* var. Port Hedland (A.S. George 1114) (P1) and *Gomphrena pusilla* (P2) are likely to occur, and *Eragrostis crateriformis* and *Gomphrena leptophylla* (both P3) may occur. This assessment is based on records of flora collected prior to the construction of Roy Hill's port infrastructure; some individuals of the significant flora species recorded historically are unlikely to currently be present, reducing the likelihood that there would be additional individuals within the survey area. There would be no opportunity for new TEC or PEC occurrences within the survey area, as the area does not represent prospective habitat or occur within the distribution of any of the TECs or PECs known from the region.

The major biological constraint for the project comprises BCH (i.e. mangroves and cyanobacterial mats) present in the survey area. The spatial extent of BCH within the current survey area will be confirmed and mapped following the field survey. While some clearing is expected to occur within BCH in the survey area, care must be taken to avoid excessive or indirect impacts, and consideration must be given to the cumulative impacts on these communities.

5.2 Fauna

Extensive past fauna survey work has been undertaken in the region, including around the port area. Previous studies have mapped three to seven fauna habitats in the broader area, with a preliminary assessment of aerial imagery indicating four terrestrial fauna habitats are likely to occur within the survey area: mangroves, 'low' intertidal mudflats (exposed and inundated most tidal cycles), high intertidal mudflats and algal mats (only inundated on higher high tides), and islands of low coastal vegetation (e.g. samphire and spinifex vegetation).

The desktop study identified 75 significant fauna species as having been previously recorded in the region, of which the majority (61 species) are birds. Preliminary likelihood of occurrence assessments indicated that 34 of these species are likely to occur in the survey area, and 19 may occur (Appendix 5). The remaining 22 species are considered unlikely to occur.

The major constraint from a fauna perspective is likely to be the potential occurrence of migratory shorebirds, with 33 species recorded in the locality based on the desktop study, of which 22 species have been preliminarily assessed as likely to occur in the survey area. The Port Hedland area has also been identified as a nationally significant area for migratory shorebirds (Weller et al.

2020). The area of mudflat habitat directly affected is small compared to the overall extent available around the Port Hedland coast, but care must be taken to avoid indirect impacts on larger areas of mudflats, and consideration must be given to the cumulative impacts on the shorebird area.

6.0 References

- 360 Environmental (2018). Wodgina Gas Pipeline Detailed Flora and Vegetation Survey. Unpublished report prepared for Mineral Resources Ltd, July 2018, 360 Environmental, Perth, Western Australia.
- Beard, J. S. (1975). Vegetation Survey of Western Australia 1:1,000,000 Vegetation Series. Map Sheet 5 - Pilbara. University of Western Australia Press, Western Australia.
- Biota (2008). A Flora and Fauna Assessment of RGP5 DMMA A, Port Hedland Harbour. Unpublished report prepared for Sinclair Knight Merz, Biota Environmental Sciences, Western Australia.
- Biota (2009). Boodarie Infrastructure Level 1 Flora, Vegetation and Fauna Survey, Port Hedland. Unpublished report prepared for Hancock Prospecting, June 2009, Biota Environmental Sciences, Western Australia.
- Biota (2010). Boodarie Port Infrastructure, Port Hedland - Level 1 Vegetation and Flora Survey and Fauna Review. Unpublished report prepared for Hancock Prospecting, February 2010, Biota Environmental Sciences, Western Australia.
- Christian, C. S., and G. A. Stewart (1953). General Report on Survey of Katherine-Darwin Region, 1946. Australian Land Research Series 1, CSIRO.
- Coffey (2011a). Level 1 Terrestrial Fauna Survey for the Multi-User Iron Ore Export Facility: Port Infrastructure Project. Unpublished report prepared for North West Infrastructure, Coffey Environments Australia, Perth, Western Australia.
- Coffey (2011b). Multi-user Iron Ore Export Facility: Port Infrastructure Project Environmental Referral Document. Unpublished report prepared for North West Infrastructure, Coffey Environments Australia, Perth, Western Australia.
- DBCAs (2022). Priority Ecological Communities for Western Australia, Version 33. Species and Communities Program, Department of Biodiversity, Conservation and Attractions, 1 June 2022.
- Department of the Agriculture, Water and the Environment (2020). Australia's 15 National Biodiversity Hotspots [WWW Document]. Retrieved from <http://www.environment.gov.au/biodiversity/conservation/hotspots/national-biodiversity-hotspots>.
- Department of the Environment and Energy (2019). Australia's bioregions (IBRA) [WWW Document]. Retrieved from <https://www.environment.gov.au/land/nrs/science/ibra>.
- ENV (2009). Outer Harbour Development Fauna Assessment. Unpublished report RP001 for BHP Billiton Iron Ore, October 2009, ENV Australia, Perth, Western Australia.
- ENV (2011a). Port Hedland Regional Flora and Vegetation Assessment. Unpublished report prepared for BHP Billiton Iron Ore Pty Ltd, December 2011, ENV Australia, Perth, Western Australia.
- ENV (2011b). Port Hedland Regional Fauna Assessment. Unpublished report prepared for BHP Billiton Iron Ore Pty Ltd, December 2011, ENV Australia, Perth, Western Australia.
- EPA (2004). *EPA Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia*. Environmental Protection Authority, Western Australia.
- EPA (2016a). Environmental Factor Guideline: *Benthic Communities and Habitats*. Environmental Protection Authority, Western Australia.

- EPA (2016b). *Technical Guidance: Protection of Benthic Communities and Habitats*. Environmental Protection Authority, Western Australia.
- EPA (2016c). *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment*. Environmental Protection Authority, Western Australia.
- EPA (2020). *Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Environmental Protection Authority, Western Australia.
- EPA, and DEC (2010). *Technical Guide - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. eds B.M. Hyder, J. Dell and M.A Cowan, Environmental Protection Authority and the Department of Environment and Conservation, Perth, Western Australia.
- Geological Survey of Western Australia (1982). 1:250,000 Geological Map - Port Hedland-Bedout Island (SF/50-04 and part sheet SE/50-16), 2nd edition. Government of Western Australia, Department of Mines and Petroleum.
- GHD (2016). Roy Hill Port Facility Power Line Port Hedland Ecological Assessment. Unpublished report prepared for Horizon Power, GHD, Perth, Western Australia.
- Government of Western Australia (2019). *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019*. Department of Biodiversity, Conservation and Attractions, Perth, Western Australia.
- Kendrick, P., and F. Stanley (2003). Pilbara 4 (PIL4 - Roebourne synopsis). Pages 581–594 in J. E. May and N. L. McKenzie, editors. *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions*. Department of Conservation and Land Management, Western Australia.
- Maia (2011). RHI Railway: Port Hedland Geotechnical Investigation Areas Targeted Flora Survey. Unpublished report prepared for Roy Hill Infrastructure Pty Ltd, Maia Environmental Consultancy, Perth, Western Australia.
- Northcote, K. H., G. G. Beckmann, E. Bettenay, H. M. Churchward, D. C. Van Dijk, G. M. Dimmock, G. D. Hubble, R. F. Isbell, W. M. McArthur, G. G. Murtha, K. D. Nicolls, T. R. Paton, C. H. Thompson, A. A. Webb, and M. J. Wright (1960). *Atlas of Australian Soils: Sheets 1 to 10 with explanatory data*. CSIRO Australia and Melbourne University Press, Melbourne, Victoria.
- Oceanica (2010). Preliminary Review of Indirect Impacts on Mangroves from Proposed Port Infrastructure. Memo prepared for Roy Hill Infrastructure Pty Ltd, July 2010, Oceanica Marine and Estuarine Specialists, Perth, Western Australia.
- Roy Hill (2021). Roy Hill MS858 Mangrove Health Monitoring Program - Conformance Report 9. Unpublished internal report prepared by Roy Hill, August 2021, Roy Hill Infrastructure Pty Ltd, Perth, Western Australia.
- SKM (2011). Surface Water Impact Component of Environmental and Social Impact Assessment. Unpublished report prepared for North West Infrastructure, Sinclair Knight Merz, Perth, Western Australia.
- SKM (2013). Roy Hill Proposed Temporary Wharf Access Road - Mangrove Condition Survey. Unpublished report prepared for Roy Hill Infrastructure Pty Ltd, Sinclair Knight Merz, Perth, Western Australia.
- Strategen-JBS&G (2020). Flora and Vegetation Reconnaissance Survey of Spoilbank Marina Project Area. Unpublished report prepared for Pilbara Ports Authority, 21 October 2020, Strategen-JBS&G, Perth, Western Australia.
- van Vreeswyk, A. M. E., A. L. Payne, K. A. Leighton, and P. Hennig (2004). *Technical Bulletin No. 92: An inventory and condition survey of the Pilbara region, Western Australia*. Department of Agriculture, South Perth WA.

Weller, D., L. Kidd, C. Lee, S. Klose, R. Jaensch, and J. Driessen (2020). Australian National Directory of Important Migratory Shorebird Habitat. Prepared for Australian Government Department of Agriculture, Water and the Environment, BirdLife Australia, Melbourne, Victoria.

Woodman (2011a). North West Iron Ore Alliance Port Survey Area Flora and Vegetation Impact Assessment. Unpublished report prepared for Coffey Environments, July 2011, Woodman Environmental Consulting Pty Ltd, Perth, Western Australia.

Woodman (2011b). North West Iron Ore Alliance Port Project Flora, Vegetation and Mangal Studies. Unpublished report prepared for Coffey Environments, July 2011, Woodman Environmental Consulting Pty Ltd, Perth Western Australia.

Appendix 1

Framework for Significance Ranking of Species and Communities in WA



A. Definitions, Categories and Criteria for Threatened and Priority Ecological Communities

Species and Communities Branch, Department of Environment and Conservation, December 2010.

1. General Definitions

Ecological Community

A naturally occurring biological assemblage that occurs in a particular type of habitat.

Note: The scale at which biological communities are defined will often depend on the level of detail in the information source, therefore no particular scale is specified.

A **threatened ecological community** (TEC) is one which is found to fit into one of the following categories; "presumed totally destroyed", "critically endangered", "endangered" or "vulnerable".

Possible threatened ecological communities that do not meet survey criteria are added to the Department of Parks and Wildlife's Priority Ecological Community Lists under Priorities 1, 2 and 3. Ecological Communities that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

An **assemblage** is a defined group of biological entities.

Habitat is defined as the areas in which an organism and/or assemblage of organisms lives. It includes the abiotic factors (e.g. substrate and topography), and the biotic factors.

Occurrence: a discrete example of an ecological community, separated from other examples of the same community by more than 20 metres of a different ecological community, an artificial surface or a totally destroyed community.

By ensuring that every discrete occurrence is recognised and recorded future changes in status can be readily monitored.

Adequately Surveyed is defined as follows:

"An ecological community that has been searched for thoroughly in most likely habitats, by relevant experts."

Community structure is defined as follows:

"The spatial organisation, construction and arrangement of the biological elements comprising a biological assemblage" (e.g. *Eucalyptus salmonophloia* woodland over scattered small shrubs over dense herbs; structure in a faunal assemblage could refer to trophic structure, e.g. dominance by feeders on detritus as distinct from feeders on live plants).

Definitions of **Modification** and **Destruction** of an ecological community:

Modification: "changes to some or all of ecological processes (including abiotic processes such as hydrology), species composition and community structure as a direct or indirect result of human activities. The level of damage involved could be ameliorated naturally or by human intervention."

Destruction: "modification such that reestablishment of ecological processes, species composition and community structure within the range of variability exhibited by the original community is unlikely within the foreseeable future even with positive human intervention."

Note: Modification and destruction are difficult concepts to quantify, and their application will be determined by scientific judgement. Examples of modification and total destruction are cited below:

Modification of ecological processes: The hydrology of Toolibin Lake has been altered by clearing of the catchment such that death of some of the original flora has occurred due to dependence on fresh water. The system may be bought back to a semblance of the original state by redirecting saline runoff and pumping waters of the rising underground watertable away to restore the hydrological balance. Total destruction of downstream lakes has occurred due to hydrology being altered to the point that few of the original flora or fauna species are able to tolerate the level of salinity and/or water logging.

Modification of structure: The understorey of a plant community may be altered by weed invasion due to nutrient enrichment by addition of fertiliser. Should the additional nutrients be removed from the system the balance may be restored, and the original plant species better able to compete. Total destruction may

occur if additional nutrients continue to be added to the system causing the understorey to be completely replaced by weed species, and death of overstorey species due to inability to tolerate high nutrient levels. Modification of species composition: Pollution may cause alteration of the invertebrate species present in a freshwater lake. Removal of pollutants may allow the return of the original inhabitant species. Addition of residual highly toxic substances may cause permanent changes to water quality, and total destruction of the community.

Threatening processes are defined as follows:

"Any process or activity that threatens to destroy or significantly modify the ecological community and/or affect the continuing evolutionary processes within any ecological community."

Examples of some of the continuing threatening processes in Western Australia include: general pollution; competition, predation and change induced in ecological communities as a result of introduced animals; competition and displacement of native plants by introduced species; hydrological changes; inappropriate fire regimes; diseases resulting from introduced micro-organisms; direct human exploitation and disturbance of ecological communities.

Restoration is defined as returning an ecological community to its pre-disturbance or natural state in terms of abiotic conditions, community structure and species composition.

Rehabilitation is defined as the re-establishment of ecological attributes in a damaged ecological community although the community will remain modified.

2. Definitions and Criteria for Presumed Totally Destroyed, Critically Endangered, Endangered and Vulnerable Ecological Communities

ECOLOGICAL COMMUNITIES

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B):

- A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or
- B) All occurrences recorded within the last 50 years have since been destroyed

Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C):

- A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii):
 - i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years);
 - ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated.
- B) Current distribution is limited, and one or more of the following apply (i, ii or iii):

- i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years);
 - ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes;
 - iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes.
- C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C):

- A) The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii):
 - i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years);
 - ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated.
- B) Current distribution is limited, and one or more of the following apply (i, ii or iii):
 - i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years);
 - ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes;
 - iii) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes.
- C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C):

- A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.
- B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.

- C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.

3. Definitions and Criteria for Priority Ecological Communities

PRIORITY ECOLOGICAL COMMUNITY LIST

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community Lists under Priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as threatened ecological communities. Ecological Communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities

Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities

Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

- (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or;
- (ii) communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;
- (iii) communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

- (a) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.
- (b) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
- (c) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

B. Categories for Flora and Fauna Species

1. Western Australian Biodiversity Conservation Act 2016, and Priority Species Classification

In Western Australia, 'Threatened', 'Extinct' and 'Specially Protected' fauna and flora species are protected under the *Biodiversity Conservation Act 2016* (the BC Act), making it an offence to take or disturb these species without Ministerial approval. The definition of 'take' is broad, and includes killing, injuring, harvesting or capturing fauna, and gathering, cutting, destroying, harvesting or damaging flora.

Such species are classified within a framework of several categories.

Species of the highest conservation significance are designated as Threatened species and are protected under sections 19(1)(a), 19(1)(b) and 19(1)(c) of the BC Act. Species are listed within one of three categories:

- Critically endangered (CR), Endangered (EN), or Vulnerable (V), representing those species listed in Schedules 1 to 3 respectively of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* or the *Wildlife Conservation (Rare Flora) Notice 2018*.

Presumed extinct species are protected under sections 24 and 25 of the BC Act and are listed in one of two categories:

- Extinct (EX), representing those species listed in Schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* or the *Wildlife Conservation (Rare Flora) Notice 2018*; or
- Extinct in the wild (EW); there are currently no listed species under this category.

Specially protected species are protected under section 13(1) of the BC Act, and include species of special conservation interest, migratory species, cetaceans, species subject to international agreement, or species otherwise in need of special protection. Of these:

- Migratory species (MI) are those listed under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*;
- Species of special conservation interest (conservation dependent fauna) (CD) are those listed under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*; and
- Other specially protected fauna (OS) are those listed under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*;

In addition to the species formally designated as protected under the BC Act, the WA Department of Biodiversity, Conservation and Attractions (DBCA) also maintains a list of 'Priority species'.

Species that appear to be rare or threatened, but for which there is insufficient information to properly evaluate their conservation significance, are assigned to one of three Priority categories (Priority 1 to Priority 3), while species that are adequately known but require regular monitoring are assigned to Priority 4.

Note that of the above classifications, only 'Threatened', 'Extinct' and 'Specially Protected' species have statutory standing. The Priority flora and fauna classifications are employed by the WA DBCA to manage and classify their database of species considered potentially rare or at risk, but these categories have no legislative status.

Further explanations of the categories is provided in more detail in the following pages.

Insert DBCA 2020: Cons Codes for WA Flora and Fauna – pg1

Insert DBCA 2020: Cons Codes for WA Flora and Fauna – pg2

Insert DBCA 2020: Cons Codes for WA Flora and Fauna – pg3

Insert DBCA 2020: Cons Codes for WA Flora and Fauna – pg4

2. Commonwealth Environment Protection and Biodiversity Conservation Act 1999

Many of the species that are specially protected at State level are also listed as Threatened species at the Federal level, as one of the Matters of National Environmental Significance (MNES) identified under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). These may be classified as 'critically endangered', 'endangered', 'vulnerable' or 'lower risk', consistent with IUCN categories:

1. **Critically Endangered (CR):** a taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
2. **Endangered (EN):** a taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.
3. **Vulnerable (VU):** a taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.
4. **Lower Risk (LR):** a taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories:
 - **Conservation Dependent (CD).** Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation program targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.
 - **Near Threatened (NT).** Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.
 - **Least Concern (LC).** Taxa which do not qualify for Conservation Dependent or Near Threatened.

In addition, numerous Migratory species are listed as MNES under the EPBC Act (some of which are also listed as Threatened). Migratory species are those animals that migrate to Australia and its external territories, or pass through or over Australian waters during their annual migrations. The list of migratory species consists of those species listed under the following international conventions:

1. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention);
2. China-Australia Migratory Bird Agreement (CAMBA);
3. Japan-Australia Migratory Bird Agreement (JAMBA); and,
4. Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Marine species are also protected under the EPBC Act, and are listed to ensure the long-term conservation of the species. Marine species include all Australian sea snakes, seals, crocodiles, dugongs, marine turtles, seahorses and seabirds that naturally occur in the Commonwealth marine area.

Under the terms of the EPBC Act, an action (e.g. a project or development) is required to be referred to the Australian Government Environment Minister for approval if it has, will have, or is likely to have, a significant impact on an MNES. The term 'action' includes projects and developments subsequent to commencement of the Act, however there are a number of exemptions (e.g. projects in Commonwealth areas). According to Department of the Environment (2013), a 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts.

References:

Department of the Environment (2013). Matters of National Environmental Significance - Significant Impact Guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999*. Department of the Environment, Canberra, Australia.

Appendix 2

EPBC Protected Matters and NatureMap Database Search Results



contents

Appendix 3

Likelihood of Occurrence Assessment for Significant Flora Species



contents

Appendix 4

Fauna Species Potentially Occurring in the Survey Area



Mammals

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
Tachyglossidae										
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna			•						
Dasyuridae										
<i>Antechinomys laniger</i>	Kultarr			•	•					
<i>Dasyercus blythi</i>	Brush-tailed Mulgara, Ampurta	P4		•	•					
<i>Dasykaluta rosamondae</i>	Kaluta			•	•			•		
<i>Dasyurus hallucatus</i>	Northern Quoll	EN	EN	•	•	•				
<i>Ningauai timealeyi</i>	Pilbara Ningauai			•						
<i>Planigale</i> sp. ¹	Planigale sp./spp. ¹			•						
<i>Pseudantechinus woolleyae</i>	Woolley's Pseudantechinus			•						
<i>Sminthopsis macroura</i>	Stripe-faced Dunnart			•						
<i>Sminthopsis youngsoni</i>	Lesser Hairy-footed Dunnart			•	•			•		
Thylacomyidae										
<i>Macrotis lagotis</i>	Bilby, Dalgyte	VU	VU	•	•	•				
Macropodidae										
<i>Osphranter robustus</i> ²	Euro, Biggada			•	•		•	•		
<i>Osphranter rufus</i> ²	Red Kangaroo, Marlu			•					•	
<i>Petrogale rothschildi</i>	Rothschild's Rock-wallaby			•						
Muridae										
<i>Mus musculus</i> *	House Mouse*			•				•		
<i>Notomys alexis</i>	Spinifex Hopping-mouse			•				•		
<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse	P4		•						
<i>Pseudomys delicatulus</i>	Delicate Mouse			•						
<i>Pseudomys desertor</i>	Desert Mouse			•				•		
<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse			•	•			•		
<i>Pseudomys nanus</i>	Western Chestnut Mouse			•				•		
<i>Rattus rattus</i> *	Black Rat*			•						
<i>Zyzomys argurus</i>	Common Rock-rat			•				•		
Leporidae										
<i>Oryctolagus cuniculus</i> *	Rabbit*			•				•		
Pteropodidae										
<i>Pteropus alecto</i>	Black Flying-fox				•					

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Pteropus scapulatus</i>	Little Red Flying-fox							•		
Hipposideridae										
<i>Rhinonicteris aurantia</i> (Pilbara form)	Pilbara Leaf-nosed Bat	VU	VU	•		•				
Megadermatidae										
<i>Macroderma gigas</i>	Ghost Bat	VU	VU	•		•				
Emballonuridae										
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tailed Bat			•				•		•
<i>Taphozous georgianus</i>	Common Sheath-tailed Bat			•				•		•
Molossidae										
<i>Austronomus australis</i> ³	White-striped Free-tailed Bat			•						
<i>Chaerephon jobensis</i>	Greater Northern Free-tailed Bat			•	•			•		
<i>Ozimops cobourgianus</i> ⁴	Northern Coastal Free-tailed Bat	P1		•				•		
<i>Ozimops lumsdenae</i> ⁵	Northern Free-tailed Bat							•		
Vesperfilionidae										
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat			•				•		•
<i>Nyctophilus arnhemensis</i>	Arnhem Long-eared Bat			•	•			•		
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat			•	•			•		
<i>Scotorepens greyii</i>	Little Broad-nosed Bat			•				•		•
<i>Vespadelus finlaysoni</i>	Finlayson's Cave-bat			•	•			•		•
Canidae										
<i>Canis familiaris</i> ^{* 6}	Dog/Dingo ^{* 6}			•				•	•	•
<i>Canis familiaris dingo</i> ^{** 6}	Dingo ^{** 6}			•						
<i>Vulpes vulpes</i> [*]	Red Fox [*]			•	•		•	•		
Felidae										
<i>Felis catus</i> [*]	Cat [*]			•	•			•		•
Equidae										
<i>Equus ferus caballus</i> ^{* 7}	Horse ^{* 7}			•				•		
Bovidae										
<i>Bos primigenius taurus</i> ^{* 8}	European Cattle ^{* 8}			•			•	•	•	
<i>Capra aegagrus hircus</i> ^{* 9}	Goat ^{* 9}				•					

Note: Banded Hare-wallaby not included as considered extinct on the mainland, and published former (historical) distribution did not include the Pilbara.

* Introduced

¹ Planigales in Pilbara belong to two species awaiting formal description, formerly included within Long-tailed Planigale *P. ingrami* and Common Planigale *P. maculata*.

² Previously included in genus *Macropus*.

³ Previously included in genus *Tadarida*.

⁴ Formerly treated as subspecies of *Mormopterus loriae*.

⁵ Formerly included within *Mormopterus beccarii*.

⁶ Previously treated as *C. lupus familiaris* (Dog) and *C. lupus dingo* or *C. dingo* (Dingo), some previous records listed as such.

⁷ Previously treated as distinct species *E. caballus*.

⁸ Previously treated as distinct species *B. taurus*.

⁹ Previously treated as distinct species *C. hircus*.

Birds

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
Casuariidae											
<i>Dromaius novaehollandiae</i>	Emu			•	•	•			•	•	
Anatidae											
<i>Dendrocygna eytoni</i>	Plumed Whistling Duck			•	•	•			•		•
<i>Dendrocygna arcuata</i>	Wandering Whistling Duck			•	•	•					
<i>Cygnus atratus</i>	Black Swan			•	•	•			•		
<i>Tadorna tadornoides</i>	Australian Shelduck				•						
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck			•	•	•			•		
<i>Chenonetta jubata</i>	Maned Duck [Australian Wood Duck]			•	•	•					
<i>Spatula rhynchotis</i>	Australasian Shoveler			•	•	•					
<i>Anas superciliosa</i>	Pacific Black Duck			•	•	•			•		
<i>Anas gracilis</i>	Grey Teal			•	•	•			•		•
<i>Anas castanea</i>	Chestnut Teal				•	•					
<i>Aythya australis</i>	Hardhead			•	•	•			•		
Phasianidae											
<i>Coturnix ypsilophora</i>	Brown Quail			•	•	•			•		
Caprimulgidae											
<i>Eurostopodus argus</i>	Spotted Nightjar			•		•			•		
Podargidae											
<i>Podargus strigoides</i>	Tawny Frogmouth			•	•	•			•		
Aegothelidae											
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar			•					•		
Apodidae											
<i>Apus pacificus</i> ¹	Pacific Swift ¹	MI	MI		•	•	•				
Otididae											
<i>Ardeotis australis</i>	Australian Bustard			•	•	•			•		•
Cuculidae											
<i>Centropus phasianinus</i>	Pheasant Coucal			•	•	•			•		
<i>Chrysococcyx basalus</i>	Horsfield's Bronze Cuckoo			•	•	•			•		•
<i>Cacomantis pallidus</i>	Pallid Cuckoo			•	•	•			•		

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Cuculus optatus</i>	Oriental Cuckoo	MI	MI				•				
Columbidae											
<i>Columba livia</i> *	Rock Dove [Feral Pigeon]*			•	•	•					•
<i>Phaps chalcoptera</i>	Common Bronzewing			•	•	•					•
<i>Phaps histrionica</i>	Flock Bronzewing			•	•	•					
<i>Ocyphaps lophotes</i>	Crested Pigeon			•	•	•		•	•	•	•
<i>Geophaps plumifera</i>	Spinifex Pigeon			•	•	•		•	•	•	
<i>Geopelia cuneata</i>	Diamond Dove			•	•	•			•		
<i>Geopelia placida</i>	Peaceful Dove			•	•	•			•		•
<i>Geopelia humeralis</i>	Bar-shouldered Dove			•	•	•					
Rallidae											
<i>Hypotaenidia philippensis</i>	Buff-banded Rail			•	•	•					
<i>Porzana fluminea</i>	Australian Crake			•	•	•					
<i>Tribonyx ventralis</i>	Black-tailed Nativehen			•	•	•					
<i>Fulica atra</i>	Eurasian Coot			•	•	•					
<i>Porphyrio melanotus</i> ²	Australasian Swamphen ²			•	•	•					
<i>Zapornia pusilla</i>	Baillon's Crake					•					
Gruidae											
<i>Antigone rubicunda</i>	Brolga			•	•	•					
Podicipedidae											
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe			•	•	•			•		•
<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe			•	•	•					
Turnicidae											
<i>Turnix velox</i>	Little Buttonquail			•	•	•			•	•	
Burhinidae											
<i>Burhinus grallarius</i>	Bush Stone-curlew			•	•	•					•
<i>Esacus magnirostris</i>	Beach Stone-curlew			•	•	•					
Haematopodidae											
<i>Haematopus longirostris</i>	Pied Oystercatcher			•	•	•			•		
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher			•	•	•			•		
Recurvirostridae											
<i>Himantopus leucocephalus</i> ³	Pied Stilt ³			•	•	•	•				•
<i>Cladorhynchus leucocephalus</i>	Banded Stilt			•	•	•					•

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet			•	•	•	•				
Charadriidae											
<i>Vanellus tricolor</i>	Banded Lapwing										•
<i>Vanellus miles</i>	Masked Lapwing			•	•	•					
<i>Erythronyctes alba</i>	Red-kneed Dotterel			•	•	•					•
<i>Pluvialis fulva</i>	Pacific Golden Plover	MI	MI	•	•	•	•				
<i>Pluvialis squatarola</i>	Grey Plover	MI	MI	•	•	•	•		•		
<i>Charadrius ruficapillus</i>	Red-capped Plover			•	•	•	•		•	•	•
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN; MI	EN; MI	•	•	•	•		•		
<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU; MI	VU; MI	•	•	•	•		•		
<i>Charadrius veredus</i>	Oriental Plover	MI	MI	•	•	•	•		•		
<i>Euseiornis melanops</i>	Black-fronted Dotterel			•	•	•			•	•	•
Rostratulidae											
<i>Rostratula australis</i> ⁴	Australian Painted-snipe ⁴	EN	EN				•				
Scolopacidae											
<i>Numenius phaeopus</i>	Eurasian Whimbrel ⁵	MI	MI	•	•	•	•		•		
<i>Numenius minutus</i>	Little Curlew	MI	MI	•	•	•	•				
<i>Numenius madagascariensis</i>	Far Eastern Curlew ⁶	CR; MI	CR; MI	•	•	•	•		•		
<i>Limosa lapponica</i>	Bar-tailed Godwit ⁷	CR; MI	CR; MI	•	•	•	•		•		
<i>Limosa limosa</i>	Black-tailed Godwit	MI	MI	•	•	•	•				
<i>Arenaria interpres</i>	Ruddy Turnstone	MI	MI	•	•	•	•		•		
<i>Calidris tenuirostris</i>	Great Knot	CR; MI	CR; MI	•	•	•	•		•		
<i>Calidris canutus</i>	Red Knot	EN; MI	EN; MI	•	•	•	•		•		
<i>Calidris pugnax</i>	Ruff	MI	MI	•	•	•					
<i>Calidris falcinellus</i>	Broad-billed Sandpiper	MI	MI	•	•	•	•				
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MI	MI	•	•	•	•				
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR; MI	CR; MI	•	•	•	•		•		
<i>Calidris subminuta</i>	Long-toed Stint	MI	MI	•	•	•	•				
<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI	•	•	•			•		•
<i>Calidris alba</i>	Sanderling	MI	MI	•	•	•	•				
<i>Calidris minuta</i>	Little Stint				•	•					
<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI	•	•	•	•				
<i>Limnodromus semipalmatus</i>	Asian Dowitcher	MI	MI	•	•	•	•				

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Gallinago stenura</i>	Pin-tailed Snipe	MI	MI	•	•	•					
<i>Gallinago megala</i>	Swinhoe's Snipe	MI	MI		•	•					
<i>Xenus cinereus</i>	Terek Sandpiper	MI	MI	•	•	•	•		•		
<i>Phalaropus lobatus</i>	Red-necked Phalarope	MI	MI	•		•	•				
<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI	•	•	•	•		•		
<i>Tringa brevipes</i>	Grey-tailed Tattler	MI; P4	MI	•	•	•	•		•		
<i>Tringa totanus</i>	Common Redshank	MI	MI		•	•					
<i>Tringa stagnatilis</i>	Marsh Sandpiper	MI	MI	•	•	•	•		•		
<i>Tringa glareola</i>	Wood Sandpiper	MI	MI	•	•	•	•				
<i>Tringa nebularia</i>	Common Greenshank	MI	MI	•	•	•	•		•		
Glareolidae											
<i>Siltia isabella</i>	Australian Pratincole			•	•	•	•				
<i>Glareola maldivarum</i>	Oriental Pratincole	MI	MI	•	•	•	•				
Laridae											
<i>Anous stolidus</i>	Brown Noddy	MI	MI				•				
<i>Chroicocephalus novaehollandiae</i>	Silver Gull			•	•	•			•		•
<i>Gelochelidon [nilotica]⁸</i>	Gull-billed Tern ⁸	MI	MI	•	•	•			•		•
<i>Hydroprogne caspia</i>	Caspian Tern	MI	MI	•	•	•			•		•
<i>Thalasseus bergii</i>	Greater Crested Tern	MI	MI	•	•	•			•		
<i>Thalasseus bengalensis</i>	Lesser Crested Tern			•	•	•			•		
<i>Sternula albifrons</i>	Little Tern	MI	MI	•	•	•	•		•		
<i>Sternula nereis</i>	Fairy Tern	VU	VU	•	•				•		
<i>Onychoprion anaethetus</i>	Bridled Tern	MI	MI	•	•	•					
<i>Sterna dougallii</i>	Roseate Tern	MI	MI		•	•					
<i>Sterna hirundo</i>	Common Tern	MI	MI	•	•	•					
<i>Chlidonias hybrida</i>	Whiskered Tern			•	•	•			•		
<i>Chlidonias leucopterus</i>	White-winged Tern ⁹	MI	MI	•	•	•					
Phaethontidae											
<i>Phaethon lepturus</i>	White-tailed Tropicbird	MI	MI				•				
Ciconiidae											
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork			•	•	•					•
Fregatidae											
<i>Fregata minor</i>	Great Frigatebird	MI	MI				•				

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Fregata ariel</i>	Lesser Frigatebird	MI	MI	•	•	•	•		•		
Sulidae											
<i>Sula dactylatra</i>	Masked Booby	MI	MI		•						
<i>Sula leucogaster</i>	Brown Booby	MI	MI		•	•					
Anhingidae											
<i>Anhinga novaehollandiae</i> ¹⁰	Australasian Darter ¹⁰			•	•	•			•		
Phalacrocoracidae											
<i>Microcarbo melanoleucos</i>	Little Pied Cormorant			•	•	•			•		
<i>Phalacrocorax varius</i>	Australian Pied Cormorant ¹¹			•	•	•			•		•
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant			•	•	•					
<i>Phalacrocorax carbo</i>	Great Cormorant			•	•	•					
Threskiornithidae											
<i>Threskiornis molucca</i>	Australian White Ibis			•	•	•			•		
<i>Threskiornis spinicollis</i>	Straw-necked Ibis			•	•	•					•
<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI	•	•	•					
<i>Platalea regia</i>	Royal Spoonbill			•	•	•					
<i>Platalea flavipes</i>	Yellow-billed Spoonbill				•	•					
Ardeidae											
<i>Nycticorax caledonicus</i>	Nankeen Night Heron			•	•	•					
<i>Butorides striata</i>	Striated Heron			•	•	•			•		•
<i>Bubulcus coromandus</i> ¹²	Eastern Cattle Egret ¹²			•	•	•	•				•
<i>Ardea pacifica</i>	White-necked Heron			•	•	•					•
<i>Ardea alba</i>	Great Egret			•	•	•			•		
<i>Ardea intermedia</i>	Intermediate Egret			•	•						
<i>Egretta novaehollandiae</i>	White-faced Heron			•	•	•			•		
<i>Egretta garzetta</i>	Little Egret			•	•	•		•	•		
<i>Egretta sacra</i>	Pacific Reef Heron			•	•	•			•		
Pelecanidae											
<i>Pelecanus conspicillatus</i>	Australian Pelican			•	•	•			•		•
Pandionidae											
<i>Pandion cristatus</i> ¹³	Eastern Osprey ¹³	MI	MI	•	•	•	•		•		•
Accipitridae											
<i>Elanus axillaris</i> ¹⁴	Black-shouldered Kite			•	•	•			•		

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<i>Elanus scriptus</i>	Letter-winged Kite	P4			•	•					
<i>Lophoictinia isura</i>	Square-tailed Kite				•						
<i>Hieraaetus morphnoides</i>	Little Eagle			•	•	•			•		
<i>Aquila audax</i>	Wedge-tailed Eagle			•	•	•			•		
<i>Erythrotriorchis radiatus</i>	Red Goshawk	VU	VU				•				
<i>Accipiter fasciatus</i>	Brown Goshawk			•	•	•					
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk			•	•	•					
<i>Circus approximans</i>	Swamp Harrier			•	•	•		•		•	•
<i>Circus assimilis</i>	Spotted Harrier			•	•	•			•		•
<i>Milvus migrans</i>	Black Kite			•	•	•			•		•
<i>Haliastur sphenurus</i>	Whistling Kite			•	•	•			•	•	•
<i>Haliastur indus</i>	Brahminy Kite			•	•	•			•		•
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle			•	•	•	•		•	•	•
Tytonidae											
<i>Tyto javanica</i> ¹⁵	Eastern Barn Owl ¹⁵			•	•				•		
Strigidae											
<i>Ninox boobook</i> ¹⁶	Australian Boobook ¹⁶			•	•						
Alcedinidae											
<i>Dacelo leachii</i>	Blue-winged Kookaburra			•	•	•					•
<i>Todiramphus sordidus</i> ¹⁷	Torresian Kingfisher ¹⁷			•	•	•			•		
<i>Todiramphus sanctus</i>	Sacred Kingfisher			•	•	•			•		•
<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher			•	•	•			•		•
Meropidae											
<i>Merops ornatus</i>	Rainbow Bee-eater			•	•	•			•		•
Falconidae											
<i>Falco cenchroides</i>	Nankeen Kestrel			•	•	•			•	•	•
<i>Falco longipennis</i>	Australian Hobby			•	•	•			•		•
<i>Falco berigora</i>	Brown Falcon			•	•	•			•	•	•
<i>Falco hypoleucos</i>	Grey Falcon	VU	VU	•	•		•				
<i>Falco subniger</i>	Black Falcon				•	•					
<i>Falco peregrinus</i>	Peregrine Falcon	OS		•	•	•					
Cacatuidae											
<i>Nymphicus hollandicus</i>	Cockatiel			•	•	•			•	•	•

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Eolophus roseicapilla</i>	Galah			•	•	•			•		•
<i>Cacatua sanguinea</i>	Little Corella			•	•	•			•		•
Psittaculidae											
<i>Barnardius zonarius</i>	Australian Ringneck			•	•	•					•
<i>Pezoporus occidentalis</i>	Night Parrot	CR	EN				•				
<i>Melopsittacus undulatus</i>	Budgerigar			•	•	•			•	•	•
Ptilonorhynchidae											
<i>Chlamydera guttata</i> ¹⁸	Western Bowerbird ¹⁸			•	•						
<i>Climacteris melanurus</i>	Black-tailed Treecreeper			•							
Maluridae											
<i>Malurus assimilis</i> ¹⁹	Purple-backed Fairywren ¹⁹			•	•	•			•		•
<i>Malurus leucopterus</i>	White-winged Fairywren			•	•	•		•	•		•
<i>Amytornis whitei</i> ²⁰	Rufous Grasswren ²⁰										
Meliphagidae											
<i>Epthianura tricolor</i>	Crimson Chat			•	•	•					
<i>Epthianura aurifrons</i>	Orange Chat			•		•					
<i>Conopophila whitei</i>	Grey Honeyeater										
<i>Certhionyx variegatus</i>	Pied Honeyeater				•	•					
<i>Sugomel niger</i>	Black Honeyeater			•	•				•		
<i>Lichmera indistincta</i>	Brown Honeyeater			•	•	•			•		•
<i>Gavicalis virescens</i>	Singing Honeyeater			•	•	•		•	•		•
<i>Ptilotula keartlandi</i>	Grey-headed Honeyeater			•	•	•					
<i>Ptilotula penicillata</i>	White-plumed Honeyeater			•	•	•			•		•
<i>Manorina flavigula</i>	Yellow-throated Miner			•	•	•			•		•
Pardalotidae											
<i>Pardalotus rubricatus</i>	Red-browed Pardalote			•	•	•			•		•
<i>Pardalotus striatus</i>	Striated Pardalote			•	•	•					
Acanthizidae											
<i>Smicronis brevirostris</i>	Weebill			•	•	•					
<i>Gerygone fusca</i>	Western Gerygone				•	•					
<i>Gerygone tenebrosa</i>	Dusky Gerygone			•	•	•			•		
<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill				•						
Pomatostomidae											

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<i>Pomatostomus temporalis</i>	Grey-crowned Babbler			•		•					
<i>Pomatostomus superciliosus</i>	White-browed Babbler			•							
Artamidae											
<i>Artamus leucorhynchus</i>	White-breasted Woodswallow			•	•	•		•	•	•	•
<i>Artamus personatus</i>	Masked Woodswallow			•	•						
<i>Artamus superciliosus</i>	White-browed Woodswallow			•	•				•		
<i>Artamus cinereus</i>	Black-faced Woodswallow			•	•	•			•	•	•
<i>Gymnorhina tibicen</i>	Australian Magpie			•	•	•					
<i>Cracticus nigrogularis</i>	Pied Butcherbird			•	•	•					•
Campephagidae											
<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike			•	•	•			•	•	•
<i>Lalage tricolor</i> ²¹	White-winged Triller			•	•	•			•		•
Oreoicidae											
<i>Oreoica gutturalis</i>	Crested Bellbird			•	•	•					
Pachycephalidae											
<i>Pachycephala melanura</i>	Mangrove Golden Whistler			•	•	•			•		
<i>Pachycephala rufiventris</i>	Rufous Whistler			•		•					
<i>Pachycephala lanioides</i>	White-breasted Whistler			•	•	•			•		
<i>Colluricincla harmonica</i>	Grey Shrikethrush			•	•	•					•
Rhipiduridae											
<i>Rhipidura leucophrys</i>	Willie Wagtail			•	•	•			•	•	•
<i>Rhipidura albiscapa</i>	Grey Fantail			•	•						
<i>Rhipidura phasiana</i>	Mangrove Fantail ²²			•	•	•			•		
Monarchidae											
<i>Grallina cyanoleuca</i>	Magpie-lark			•	•	•			•		•
Corvidae											
<i>Corvus orru</i>	Torresian Crow			•	•	•			•	•	•
<i>Corvus bennetti</i>	Little Crow			•							
Petroicidae											
<i>Melanodryas cucullata</i>	Hooded Robin				•	•					
<i>Peneothello pulverulenta</i>	Mangrove Robin			•		•			•		
<i>Petroica goodenovii</i>	Red-capped Robin			•		•					
Alaudidae											

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<i>Mirafrja javanica</i>	Horsfield's Bush Lark			•	•	•			•		
Hirundinidae											
<i>Cheramoeca leucosterna</i>	White-backed Swallow			•	•	•					•
<i>Hirundo neoxena</i>	Welcome Swallow			•	•	•					
<i>Hirundo rustica</i>	Barn Swallow	MI	MI	•	•	•	•				
<i>Petrochelidon ariel</i>	Fairy Martin			•	•	•			•		•
<i>Petrochelidon nigricans</i>	Tree Martin			•	•	•			•		•
Acrocephalidae											
<i>Acrocephalus australis</i> ²³	Australian Reed Warbler ²³				•	•					
Locustellidae											
<i>Poodytes carteri</i>	Spinifexbird			•	•	•			•		•
<i>Poodytes gramineus</i>	Little Grassbird				•	•					
<i>Cincloramphus cruralis</i>	Brown Songlark			•	•	•			•	•	•
<i>Cincloramphus mathewsi</i>	Rufous Songlark			•	•	•			•		•
Zosteropidae											
<i>Zosterops luteus</i>	Canary White-eye ²⁴			•	•	•			•		•
<i>Zosterops lateralis</i>	Silveryeye				•						
Dicaeidae											
<i>Dicaeum hirundinaceum</i>	Mistletoebird				•	•					
Passeridae											
<i>Passer montanus</i> *	Eurasian Tree Sparrow*			•	•	•					
Estrildidae											
<i>Heteromunia pectoralis</i>	Pictorella Mannikin			•	•						
<i>Emblema pictum</i>	Painted Finch			•	•	•			•		
<i>Bathilda ruficauda</i>	Star Finch			•	•	•					
<i>Taeniopygia castanotis</i> ²⁵	Australian Zebra Finch ²⁵			•	•	•		•	•	•	•
Motacillidae											
<i>Motacilla tschutschensis</i> ²⁶	Eastern Yellow Wagtail ²⁶	MI	MI	•	•	•	•				
<i>Motacilla cinerea</i>	Grey Wagtail	MI	MI				•				
<i>Anthus australis</i> ²⁷	Australian Pipit ²⁷			•	•	•		•	•	•	

The following species have been excluded: Garganey *Spatula querquedula*, Eurasian Teal *Anas crecca*, White Wagtail *Motacilla alba* (all vagrants to Australia), Southern Giant Petrel *Macronectes giganteus*, Wilson's Storm-Petrel *Oceanites oceanicus*, Streaked Shearwater *Calonectris leucomelas* (all obligate marine species in Australia), Pacific Koel *Eudynamis orientalis*, Pacific Gull *Larus pacificus*, Large-billed Gerygone *Gerygone magnirostris*, Australian Raven *Corvus coronoides* (all significantly outside

known range – records either erroneous or involve vagrant individuals), and Red-capped Parrot *Purpureicephalus spurius* (endemic to south-west WA, aviary escapee or erroneous record).

* Introduced

¹ Previously referred to as Fork-tailed Swift, prior to taxonomic revision separating several species from *A. pacificus*.

² Previously treated as a subspecies of Purple Swamphen *P. porphyrio*.

³ Previously treated as a subspecies of Black-winged Stilt (*H. himantopus*).

⁴ Previously treated as a subspecies of (Greater) Painted Snipe (*R. benghalensis*).

⁵ Previously referred to as Whimbrel, prior to revision of Hudsonian Whimbrel as separate species.

⁶ Also known as Eastern Curlew.

⁷ Two subspecies in Australia, *menzbieri* (CR) and *baueri* (VU), field identification with certainty can be problematic but the majority in WA belong to *menzbieri*.

⁸ Two taxa in Australia, now treated as two species by many authorities, Australian [Gull-billed] Tern (*G. [nilotica] macrotarsa*) and [Common] Gull-billed Tern (*G. nilotica affinis*). Retained together here as many previous records do not indicate the taxon involved.

⁹ Also known as White-winged Black Tern

¹⁰ Previously treated as subspecies of [Oriental] Darter *A. melanogaster*.

¹¹ Also known as Pied Cormorant.

¹² Previously treated as subspecies of [Western] Cattle Egret *A. ibis*.

¹³ Previously treated as subspecies of [Western] Osprey *P. haliaetus*. May revert to this taxonomic treatment in near future.

¹⁴ Previously included within *E. caerulus* (now known as Black-winged Kite).

¹⁵ Previously treated as subspecies of Barn Owl *T. alba*.

¹⁶ Previously treated as Southern Boobook (*N. novaeseelandiae*) and Southern Boobook (*N. boobook*) prior to taxonomic revisions.

¹⁷ Previously treated as subspecies of Collared Kingfisher (*T. chloris*).

¹⁸ Treated as subspecies of Spotted Bowerbird (*C. maculata*) by some authorities.

¹⁹ Previously treated as subspecies of Variegated Fairywren (*M. lamberti*).

²⁰ Previously treated as subspecies of Striated Grasswren (*A. striatus*).

²¹ Previously treated as subspecies of *L. sueurii*.

²² Also known as Mangrove Grey Fantail.

²³ Previously treated as subspecies of Clamorous Reed Warbler *A. clamosus*.

²⁴ Also known as Yellow White-eye.

²⁵ Previously treated as subspecies of [Sunda] Zebra Finch *T. guttata*.

²⁶ Previously treated as subspecies of [Western] Yellow Wagtail *M. flava*.

²⁷ Previously treated as subspecies of Richard's Pipit *A. richardi* then Australasian Pipit *A. novaeseelandiae*.

Reptiles

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
Cheloniidae										
<i>Caretta caretta</i>	Loggerhead Turtle	EN	EN; MI			•				
<i>Chelonia mydas</i>	Green Turtle	VU	VU; MI	•	•	•				
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	VU	VU; MI	•	•	•				
<i>Natator depressus</i>	Flatback Turtle	VU	VU; MI	•	•	•				
Dermodochelyidae										
<i>Dermodochelys coriacea</i>	Leatherback Turtle	VU	EN; MI			•				
Carphodactylidae										
<i>Nephurus levis</i>				•	•			•		
Diplodactylidae										
<i>Diplodactylus laevis</i> ¹	Desert Fat-tailed Gecko ¹			•	•			•		
<i>Lucasium stenodactylus</i>	Western Sandplain Gecko			•	•			•		
<i>Lucasium woodwardi</i> ²	Pilbara Ground Gecko ²			•						
<i>Rhynchoedura ornata</i>	Western Beaked Gecko			•						
<i>Strophurus ciliaris</i>				•	•			•		
<i>Strophurus elderi</i>				•						
<i>Strophurus jeanae</i>				•	•					
<i>Strophurus wellingtonae</i>					•					
Gekkonidae										
<i>Gehyra gemina</i> ³	Plain Tree Gecko ³				•					
<i>Gehyra incognita</i> ⁴	Northern Pilbara Cryptic Gehyra ⁴				•					
<i>Gehyra macra</i> ⁵	Large Pilbara Rock Gehyra ⁵									
<i>Gehyra media</i> ⁵	Medium Pilbara Spotted Rock Gehyra ⁵				•					
<i>Gehyra montium</i> ⁴										
<i>Gehyra pilbara</i>				•	•					
<i>Gehyra punctata</i> ⁵				•	•			•		•
<i>Gehyra purpurascens</i> ⁴				•	•					
<i>Gehyra variegata</i> ⁴				•	•			•		•
<i>Hemidactylus frenatus</i> *	Asian House Gecko*			•	•					
<i>Heteronotia binoei</i>	Bynoe's Gecko			•	•			•		•
Pygopodidae										

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Delma butleri</i> ⁶				•	•			•		
<i>Delma pax</i>				•	•					
<i>Delma tincta</i>				•				•		
<i>Lialis burtonis</i>				•	•			•		
<i>Pygopus nigriceps</i>				•	•			•		
Agamidae										
<i>Ctenophorus caudicinctus</i>	Ring-tailed Dragon			•	•			•		•
<i>Ctenophorus isolepis</i>	Military Dragon			•	•			•		•
<i>Ctenophorus nuchalis</i>	Central Netted Dragon			•	•			•		•
<i>Ctenophorus reticulatus</i>	Western Netted Dragon			•	•					
<i>Diporiphora paraconvergens</i> ⁷	Grey-striped Western Desert Dragon ⁷			•	•					
<i>Diporiphora pindan</i> ⁷	Pindan Dragon ⁷			•						
<i>Diporiphora vescus</i> ⁷	Northern Pilbara Tree Dragon ⁷			•	•			•		
<i>Gowidon longirostris</i> ⁸	Long-nosed Dragon ⁸			•	•		•	•		•
<i>Lophognathus horneri</i> ⁹	Northern Tree Dragon ⁹			•	•					
<i>Pogona minor</i>				•	•			•		
Scincidae										
<i>Carlia munda</i>				•	•					•
<i>Carlia triacantha</i>				•				•		
<i>Cryptoblepharus buchananii</i> ¹⁰				•	•					
<i>Ctenotus angusticeps</i>		P3		•	•					
<i>Ctenotus colletti</i>					•					
<i>Ctenotus duricola</i>				•	•			•	•	
<i>Ctenotus dux</i>				•						
<i>Ctenotus grandis</i>				•				•		
<i>Ctenotus hanloni</i>				•	•					
<i>Ctenotus helenae</i> ¹¹				•	•			•		
<i>Ctenotus pantherinus</i>	Leopard Ctenotus			•	•			•		•
<i>Ctenotus piankai</i>				•	•			•		
<i>Ctenotus robustus</i>					•					
<i>Ctenotus rufescens</i>				•	•			•		
<i>Ctenotus saxatilis</i>	Rock Ctenotus			•				•		•
<i>Ctenotus serventyi</i>				•	•			•		

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Egernia epsisolus</i> ¹²	Eastern Pygmy Spiny-tailed Skink ¹²			•	•			•		•
<i>Eremiascincus isolepis</i>				•						
<i>Eremiascincus musivus</i>	Mosaic Desert Skink			•	•					•
<i>Eremiascincus pallidus</i> ¹³	Western Narrow-banded Skink ¹³			•	•			•		
<i>Lerista bipes</i>				•	•			•		•
<i>Lerista clara</i>				•	•					
<i>Lerista jacksoni</i>					•					
<i>Lerista muelleri</i>				•				•		
<i>Lerista timida</i>					•					
<i>Menetia greyii</i>				•	•			•		
<i>Morethia ruficauda</i>				•				•		•
<i>Notoscincus ornatus</i>					•					
<i>Tiliqua multifasciata</i>	Central Blue-tongue			•	•			•		
Varanidae										
<i>Varanus acanthurus</i>	Spiny-tailed Goanna			•	•			•		•
<i>Varanus brevicauda</i>	Short-tailed Pygmy Goanna			•				•		
<i>Varanus bushi</i>	Pilbara Mulga Goanna			•				•		
<i>Varanus eremius</i>	Pygmy Desert Goanna			•	•			•		
<i>Varanus giganteus</i>	Perentie			•				•		
<i>Varanus gouldii</i>	Bungarra or Sand Goanna			•	•			•		
<i>Varanus panoptes</i>	Yellow-spotted Goanna			•	•					
<i>Varanus pilbarensis</i>	Northern Pilbara Rock Goanna			•						
Typhlopidae										
<i>Anilius ammodytes</i>				•	•			•		
<i>Anilius grypus</i>				•	•			•		
<i>Anilius pilbarensis</i>				•	•					
<i>Indotyphlops braminus</i> *				•	•					
Pythonidae										
<i>Antaresia childreni</i> ¹⁴	Children's Python ¹⁴			•						
<i>Antaresia perthensis</i>	Pygmy Python			•	•			•		
<i>Aspidites melanocephalus</i>	Black-headed Python			•	•			•		•
<i>Aspidites ramsayi</i>	Woma			•	•			•		•
<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	VU			•				

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
Homalopsidae										
<i>Fordonia leucobalia</i>	White-bellied Mangrove Snake			•	•					
Elapidae										
<i>Acanthophis pyrrhus</i>	Desert Death Adder			•	•					
<i>Acanthophis wellsi</i>	Pilbara Death Adder			•				•		
<i>Brachyuropis approximans</i>				•				•		
<i>Demansia psammophis</i> ¹⁵	Yellow-faced Whipsnake ¹⁵			•	•			•		
<i>Demansia rufescens</i>	Rufous Whipsnake			•	•			•		
<i>Furina ornata</i>	Moon Snake			•	•					•
<i>Pseudechis australis</i>	Mulga Snake			•	•			•		
<i>Pseudonaja mengdeni</i> ¹⁶	Western Brown Snake ¹⁶			•	•			•		•
<i>Pseudonaja modesta</i>	Ringed Brown Snake			•	•			•		
<i>Simoselaps anomalus</i>	Desert Banded Snake			•	•			•		
<i>Suta fasciata</i>	Rosen's Snake				•					
<i>Suta punctata</i>	Spotted Snake			•	•					
<i>Aipysurus laevis</i>				•						
<i>Emydocephalus annulatus</i>				•						
<i>Ephalophis greyae</i>					•					
<i>Hydrelaps darwiniensis</i>				•	•					
<i>Hydrophis elegans</i>				•	•					
<i>Hydrophis ornatus</i>				•						
<i>Hydrophis stokesii</i>				•	•					

* Introduced

¹ Previously included within *D. conspicillatus*, animals in this area likely all referable to *D. laevis*.

² Previously treated as a subspecies of *L. stenodactylus*, most or all individuals in locality likely referable to *L. woodwardia*, but in proximity to the limit of *L. stenodactylus* published range so this species may also occur and has been retained in this list.

³ Previously included within *G. australis*.

⁴ Following revision of *G. variegata*, *G. montium* and *G. purpurescens* group, records from locality likely referable to *G. incognita* and *G. montium*, but *G. variegata* and *G. purpurescens* retained in list as distribution limits do approach locality.

⁵ All previously included within *G. punctata*, records from locality likely all referable to *G. macra* or *G. media*, but *G. punctata* retained in list as distribution limit does approach locality.

⁶ Includes *D. haroldi*.

⁷ Past records listed as *D. winneckeii* may be attributable to any of these three species.

⁸ Previously placed in genera *Amphibolurus* and *Lophognathus*.

⁹ Previously included within *L. gilberti*.

¹⁰ Previously included within *C. plagiocephalus*.

¹¹ Sometimes treated as conspecific with *C. inornatus*.

¹² Previously included within *E. depressa*.

¹³ Previously included within *E. fasciolatus*.

¹⁴ Previously treated as a distinct species, Stimson's Python *A. stimsoni*.

¹⁵ Some old records listed as *D. torquata*, synonymous with *D. psammophis torquata*.

¹⁶ Previously included within Northern Brown Snake *P. nuchalis*.

Amphibians

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
Pelodyadidae										
<i>Cyclorana australis</i>	Giant Frog			•	•			•		
<i>Cyclorana maini</i>	Sheep Frog			•	•			•		
<i>Litoria caerulea</i>	Green Tree Frog			•	•					•
<i>Litoria rothii</i>	Northern Laughing Tree Frog			•				•		
<i>Litoria rubella</i>	Little Red Tree Frog			•	•			•		•
Limnodynastidae										
<i>Neobatrachus aquilonius</i>	Northern Burrowing Frog			•	•					
<i>Neobatrachus sutor</i>	Shoemaker Frog			•						
<i>Notaden nichollsi</i>	Desert Spadefoot			•	•			•		
<i>Platyplectrum spenceri</i>	Centralian Burrowing Frog			•	•			•		
Myobatrachidae										
<i>Uperoleia glandulosa</i>	Glandular Toadlet			•	•					
<i>Uperoleia saxatilis</i> ¹	Pilbara Toadlet ¹			•				•		
<i>Uperoleia talpa</i>	Ratcheting Toadlet			•						

¹ Previously included within *U. russelli*.

Appendix 5

Likelihood of Occurrence Assessment for Significant Fauna Species



Content



Roy Hill Port Expansion Project Flora and Vegetation Study



Prepared for Roy Hill Pty Ltd

October 2022



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Roy Hill Port Expansion Project

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Appendix 1

Framework for Significance Ranking of Species and Communities in WA

Appendix 2

EPBC Protected Matters and NatureMap Database Search Results

Appendix 3

Likelihood of Occurrence Assessment for Significant Flora Species

Appendix 4

Fauna Species Potentially Occurring in the Survey Area

Appendix 5

Likelihood of Occurrence Assessment for Significant Fauna Species

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1.0 Executive Summary

Roy Hill Infrastructure Pty Ltd (Roy Hill) operates port facilities at the Boodarie Multi-user Stockyard Area and South West Creek in the Inner Harbour of Port Hedland in the Pilbara region of Western Australia. The project was approved under Ministerial Statement 858 in 2011 and included a stockyard facility, rail loop, wharf and a ship-loading facility which began operating in 2017.

An amendment to the existing Ministerial Statement (MS858) will be issued under S45C under the *Environmental Protection Act 1986* (EP Act) for environmental approval of the proposed expansion works. Roy Hill also plans to conduct investigations in areas outside of the development envelope approved under MS858 that will necessitate some vegetation clearing. Biota Environmental Sciences (Biota) was commissioned to undertake a desktop study to assess the biological values of the area. The 54.5 ha survey area sits largely adjacent to the current MS858 development envelope, comprising 46.4 ha of terrestrial area and 8.1 ha under water.

The desktop study comprised searches of relevant databases, review of available literature and a likelihood of occurrence assessment for significant species of flora and fauna. Information on the existing environment, including soils, geology and land systems, was also compiled. The desktop study will also be used to inform the design of a follow-up field survey.

No significant vegetation communities or significant flora species are known to occur in the survey area. Two Priority flora species were assessed as being likely to occur in the survey area (*Tephrosia rosea* var. Port Hedland (A.S. George 1114) (P1) and *Gomphrena pusilla* (P2)) and two other species may occur (*Eragrostis crateriformis* and *Gomphrena leptophylla*, both P3). The field survey will confirm the occurrence of these species.

A total of 75 significant fauna species were identified from the locality through the desktop study, with 53 of these species assessed as having a moderate or high likelihood of occurrence in the survey area. The majority of these are bird species, particularly Migratory-listed shorebirds (some of which are also listed as Threatened fauna) and terns.

A primary feature of ecological significance in the survey area is the benthic communities and habitats, comprising mangrove communities, samphire shrublands and cyanobacterial mats, and Migratory-listed shorebirds, with parts of the survey area falling within the nationally-significant Port Hedland shorebird area. Care must be taken to avoid unnecessary direct or indirect impacts to these communities.

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2.0 Introduction

2.1 Project Background

Roy Hill operates port facilities at the Boodarie Multi-user Stockyard Area and South West Creek in the Inner Harbour of Port Hedland in the Pilbara region of WA (the “project”). The project was approved under Ministerial Statement 858 (MS858) in 2011 and included a stockyard facility, rail loop, wharf and a ship-loading facility which began operating in 2017.

Roy Hill plans to conduct geotechnical investigations in areas outside of the development envelope approved under MS858, which will necessitate some vegetation clearing. Biota was commissioned to undertake a desktop study to assess the flora, vegetation and fauna values of the area, which will inform a targeted flora and vegetation survey and a basic fauna survey that will be used to support an application for a Native Vegetation Clearing Permit (NVCP) and S45C.

2.2 Scope of the Study

The survey area comprises 54.5 ha of a proposed development envelope that sits outside of the current MS858 development envelope, and is located north and east of the existing stockyard, and along the south side of the conveyer that runs towards the shipping berth in South West Creek (the “survey area”; Figure 2.1). A total of 8.1 ha of the survey area, located at the shipping berth, is under water; the total terrestrial portion of the survey area is 46.4 ha in size.

To identify biological features of significance that may occur in the survey area, the desktop study reviewed information from a radius of 40 km (the “desktop study area”; Figure 2.1).

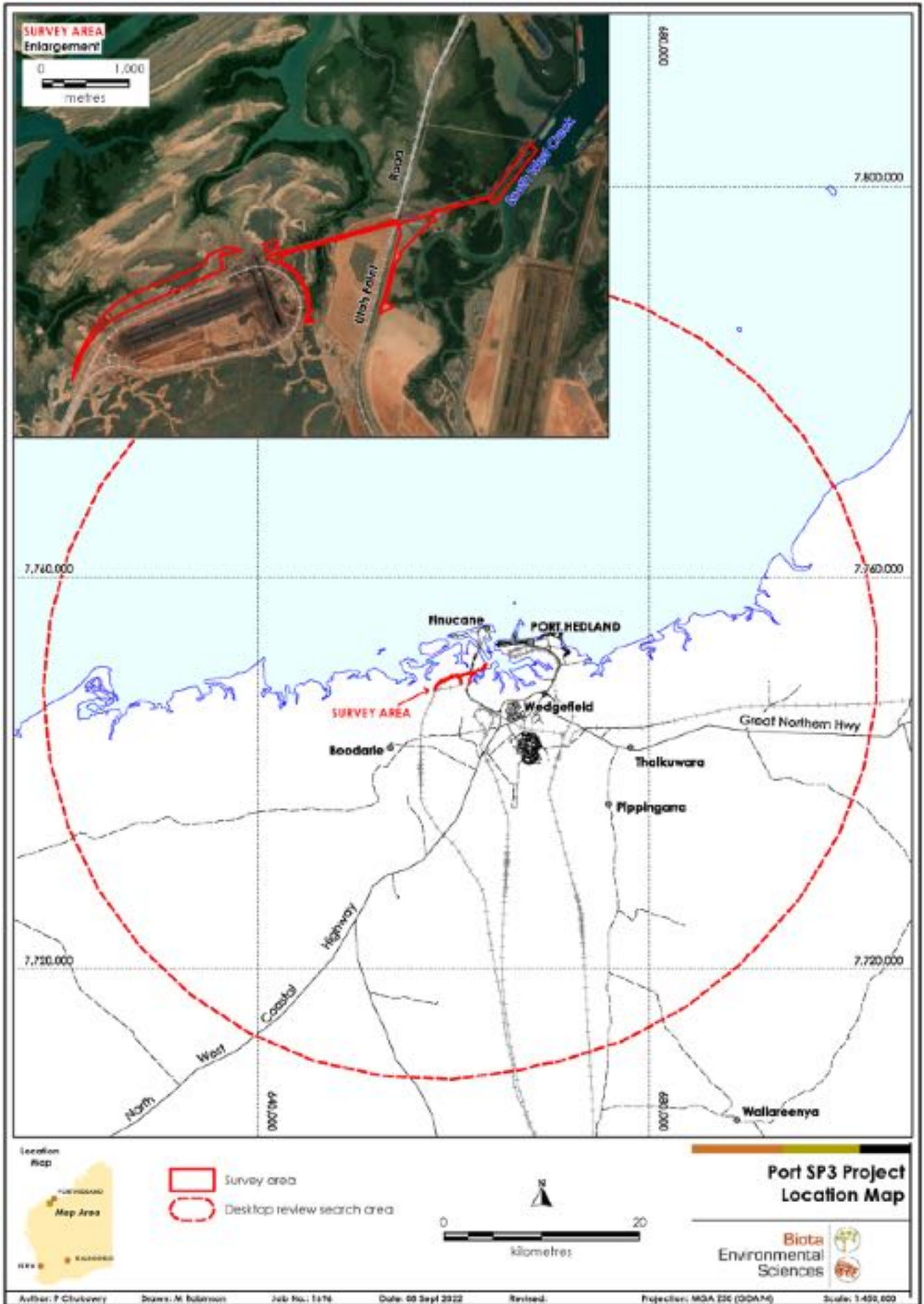


Figure 2.1: Location of the survey area and desktop study area.

3.0 Methodology

3.1 Desktop Study

The desktop study was undertaken to identify features of significance known from areas in close proximity to the survey area (i.e. within 20 km) or from the broader locality (within 40 km). The desktop study was also used to assess the level of biological survey work that had previously been completed in the survey area, to inform future survey work.

The desktop study incorporated regional information, previous biological surveys in the survey area, and the results of database searches. The results of the desktop study were used as the basis for compiling lists of significant flora and fauna species, and ecological communities of significance potentially occurring in the survey area.

3.1.1 Database Searches

The following databases were searched for records of fauna, flora and communities of significance previously recorded from the survey area, or known to occur in the locality¹:

1. The Department of Biodiversity, Conservation and Attractions (DBCA) databases of Threatened Ecological Communities and Priority Ecological Communities (TECs and PECs), Declared Rare and Priority Flora, and Threatened Fauna. These data searches requested the return of records from a 40 km buffer around the survey area boundary (the DBCA subsequently returned results within a 50 km buffer). The threatened fauna database results had not been received at the time of reporting.
2. The NatureMap database: a joint project of the DBCA and the WA Museum comprising records (without location information) from the Fauna Survey Returns database, the WA Threatened Flora and Fauna Databases, the WA Herbarium and WA Museum Specimen databases, and the BirdLife Australia Atlas. A search was requested within a 40 km buffer around the survey area (Appendix 2).
3. The Atlas of Living Australia (ALA) (<http://www.ala.org.au>): a joint project between academic collecting institutions, private individual collectors and community groups. The atlas contains occurrence records, environmental data, images and the conservation status of species throughout Australia. The database search requested the return of flora and fauna records from a 40 km buffer around the survey area.
4. The Commonwealth EPBC Act Protected Matters Search Tool. The database search requested the return of records within a 40 km buffer around the survey area (Appendix 2).
5. eBird (<https://ebird.org/>) is a citizen science database of bird records from around the globe, managed by Cornell University and moderated by local experts. The search requested the return of records from a 40 km buffer around the survey area.
6. The Index of Biodiversity Surveys for Assessments (IBSA): a database consolidating data from land-based biodiversity surveys conducted to support assessments and compliance required under the *Environmental Protection Act 1986* and providing a publicly available online platform for data sharing. The search requested the return of previous surveys within a 40 km radius of the survey area.

¹ The search areas for each database included marine areas. Obligate marine mammal and reptile species inhabiting these areas were excluded from consideration. Erroneous records of species returned from the database searches (i.e. those that were outside of known ranges or would not occur in Australia) were also excluded (see notes in Appendix 4).

3.1.2 Literature Review

A review of publicly available previous surveys, desktop studies and literature pertaining to the project and the survey area was carried out. The following documents were reviewed, and the results of the review are summarised in Section 4.6:

- Roy Hill MS858 Mangrove Health Monitoring Program – Conformance Report 9 (Roy Hill 2021);
- Flora and Vegetation Reconnaissance Survey of Spoilbank Marina Project Area (Strategen-JBS&G 2020);
- Wodgina Gas Pipeline Detailed Flora and Vegetation Survey (360 Environmental 2018);
- Roy Hill Port Facility Power Line Port Hedland Ecological Assessment (GHD 2016);
- Roy Hill – Proposed Temporary Wharf Access Road – Mangrove Condition Survey (SKM 2013);
- Level 1 Terrestrial Fauna Survey for the Multi-user Iron Ore Export Facility: Port Infrastructure Project (Coffey 2011a);
- Environmental Referral Document North West Infrastructure Multi-user Iron Ore Export Facility: Port Infrastructure Project (Coffey 2011b);
- North West Iron Ore Alliance Port Survey Area Flora and Vegetation Impact Assessment (Woodman 2011a);
- North West Iron Ore Alliance Port Project Flora, Vegetation and Mangal studies (Woodman 2011b);
- Port Hedland Regional Flora and Vegetation Assessment (ENV 2011a);
- Port Hedland Regional Fauna Assessment (ENV 2011b);
- RHI Railway: Port Hedland Geotechnical Investigation Areas Targeted Flora Survey (Maia 2011);
- Boodarie Port Infrastructure, Port Hedland - Level 1 Vegetation and Flora Survey and Fauna Review (Biota 2010); and
- Preliminary Review of Indirect Impacts on Mangroves from Proposed Port Infrastructure (Oceanica 2010).

3.2 Assessment of Likelihood of Occurrence in the Survey Area

In order to determine which species of significance have the potential to occur in the survey area, the results of the database searches and previous surveys in the locality were examined while considering the known habitat preferences for each species. Habitats were defined according to the landforms apparent on aerial imagery, and taking into account existing information regarding the environment and results from previous surveys (Section 4.6).

The likelihood that significant flora and fauna species would occur in the survey area was then assessed using a set of rankings and criteria (Table 3.1). These criteria are used as guidance, and consideration was also given to:

- the documented distribution of the species;
- the proximity of the survey area to known populations;
- the species' ecology; and
- level of survey effort in the locality.

Throughout the remainder of this report, the term “close proximity” has been defined as being within 20 km of the survey area, while the broader “locality” comprises the area up to 40 km from the survey area.

Table 3.1: Ranking system used to assign the likelihood that a species would occur in the survey area.

Rank	Criteria
Recorded	1. The species has been recorded in the survey area previously.
Likely to occur (High likelihood of occurrence in the survey area)	1. There are existing records of the species in close proximity to the survey area; and <ul style="list-style-type: none"> • the species is strongly linked to a specific habitat, which is present in the survey area; or • the species has more general habitat preferences, and suitable habitat is present.
May occur (Moderate likelihood of occurrence in the survey area)	1. There are existing records of the species from the locality, however <ul style="list-style-type: none"> • the species is strongly linked to a specific habitat, of which only a small amount is present in the survey area; or • the species has more general habitat preferences, but only some suitable habitat is present in the survey area. 2. There is suitable habitat in the survey area, but the species is recorded infrequently in the locality.
Unlikely to occur (Low likelihood of occurrence in the survey area)	1. The species is linked to a specific habitat, which is absent from the survey area; or 2. Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search effort in suitable habitat; or 3. There is some suitable habitat in the survey area, however the species is very infrequently recorded in the locality, or the only records are historical (>40 years ago).
Would not occur (Negligible likelihood of occurrence in the survey area)	1. The species is strongly linked to a specific habitat, which is absent from the survey area; and/or 2. The species' range is very restricted and would not include the survey area.

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4.0 Desktop Study Results

4.1 IBRA Bioregion and Subregion

The Interim Biogeographic Regionalisation for Australia (IBRA) recognises 89 bioregions and 419 biological subregions for Australia (Department of the Environment and Energy 2019). The survey area lies within the Pilbara bioregion, which is a major centre for biodiversity within Western Australia, and within the Roebourne subregion. The Roebourne subregion (PIL4) is 2,008,983 ha and is described as:

“Quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia* spp. hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite. Islands are either Quaternary sand accumulations, or composed of basalt or limestone, or combinations of any of these three. Climate is arid (semi-desert) tropical with highly variable rainfall, falling mainly in summer. Cyclonic activity is significant, with several systems affecting the coast and hinterland annually” (Kendrick and Stanley 2003).

4.2 Land Systems

Land systems are composed of repeating patterns of topography, soils and vegetation, which are described as a series of land units (Christian and Stewart 1953). A total of 105 land systems were identified and mapped in the Pilbara bioregion by the then Department of Agriculture. Land systems mapping covering the survey area was prepared by van Vreeswyk et al. (2004). The survey area lies entirely within the Littoral land system (Table 4.1, Figure 4.1). The extent of this land system in the survey area is minimal and represents only 0.02% of its extent within the Pilbara.

Table 4.1: Land systems intersected by the survey area.

Data from van Vreeswyk et al. (2004).

Land System	Description	Extent of Land System in the Pilbara Bioregion	Extent of Land System in the Survey Area	Percentage of Land System in the Pilbara that Occurs in the Survey Area
Littoral (RGELIT)	Bare coastal mudflats with mangroves on seaward fringes, samphire flats, sandy islands, coastal dunes and beaches.	215,343.8 ha	46.4 ha	0.02%

4.3 Beard's Vegetation

Beard (1975) mapped the vegetation associations of the Pilbara broadly at a scale of 1:1,000,000. The Pilbara bioregion is equivalent to Beard's Fortescue Botanical District. The survey area intersects three mapping units defined by Beard (1975) within the Abydos Plain physiographic region:

- Abydos Plain 43 – Mangroves;
- Abydos Plain 127 – Tidal mud flats; and
- Abydos Plain 647 – Shrub-steppe (Table 4.2, Figure 4.1).

From 2007 to 2018, the DBCA and Department of Water and Environmental Regulation (DWER) published regular updates regarding the current and pre-European extents of each of Beard's vegetation associations in WA. Based on the most recent data from 2018, the current extent of each of these mapping units in the Pilbara bioregion remains above 90% of their pre-European

extents, with the exception of Abydos Plain 43, which is at 86% of its pre-European extent. The extent of Abydos Plain 43 in the survey area represents approximately 0.2% of the current mapped extent of this unit.

Table 4.2: Beard's vegetation mapping units occurring in the survey area, and their pre-European and current extents.

Data from 2018 as provided by Government of Western Australia (2019).

Beards Vegetation Mapping Unit	Extent (ha)		Percent Remaining	Extent within the Survey Area (ha) (% of Current Mapped Extent)
	Pre-European	Current		
Abydos Plain 43	7,443.2	6,418.1	86%	12.5 (0.2%)
Abydos Plain 127	101,141.5	91,969.5	91%	26.1 (<0.1%)
Abydos Plain 647	188,742.1	184,615.8	98%	7.9 (<0.01%)

4.4 Geology and Soils

Surface geology of the Port Hedland area was mapped at a scale of 1:250,000 by the Geological Survey of Western Australia (1982). The survey area is underlain by floodplain, coastal dune and beach, and tidal flat deposits comprising silt, clay, mud, sand and gravel (Table 4.3, Figure 4.2).

Soil landscapes comprising a number of soil units were mapped by Northcote et al. (1960) to provide consistent descriptions of Australia's soils. The survey area occurs in soil unit Lh1, which is described as having calcareous earths on the landward side, with samphire flats and bare saline mud flats on the seaward side (Table 4.3, Figure 4.2).

Table 4.3: Geological units and soil units occurring in the survey area.

	Unit	Description	Extent within Survey Area (ha)
Geology	A1f	Floodplain deposits; sand, silt, clay, and gravel adjacent to main drainage channels.	0.2
	B1b	Coastal dunes and beach deposits; shelly sand containing <i>Anadara granosa</i> ; includes backshore deposits.	7.7
	Tf	Tidal flat deposits; silt and mud in intertidal and supratidal flats and lagoons.	36.4
	Tm	Coastal (tide-dominated) mud and silt on mangrove flats.	2.1
Soils	Lh1	Coastal plains mainly beyond marine flooding influence: main soils are pedal calcareous earths (Gc2.22) with some associated highly calcareous earths (Gc1.12). On the seaward side are firstly samphire flats (Gc1.1) and then bare saline mud (Uf). Calcareous dunes (Uc1.11) commonly occur on the seaward edge of the plains.	46.4

4.5 Conservation Reserves and Protected Areas in the Locality

There are no gazetted conservation reserves and no TECs within a 40 km radius of the survey areas, however three Environmentally Sensitive Areas (ESAs) are known to occur (Figure 4.3, Section 4.7.1). Information on the exact nature and name of these ESAs is not publicly available.

While not protected under legislation, the Eighty Mile Land System PEC also occurs in the area (see Section 4.7.1). In addition, Benthic Communities and Habitats (BCH) are recognised by the EPA as being fundamental to the maintenance of the biological diversity and ecological integrity of marine ecosystems, and special consideration is given to the protection of these habitats in EIA (EPA 2016a, 2016b). The survey area contains three BCH: samphire shrublands, cyanobacterial mats and mangrove shrublands/forest.

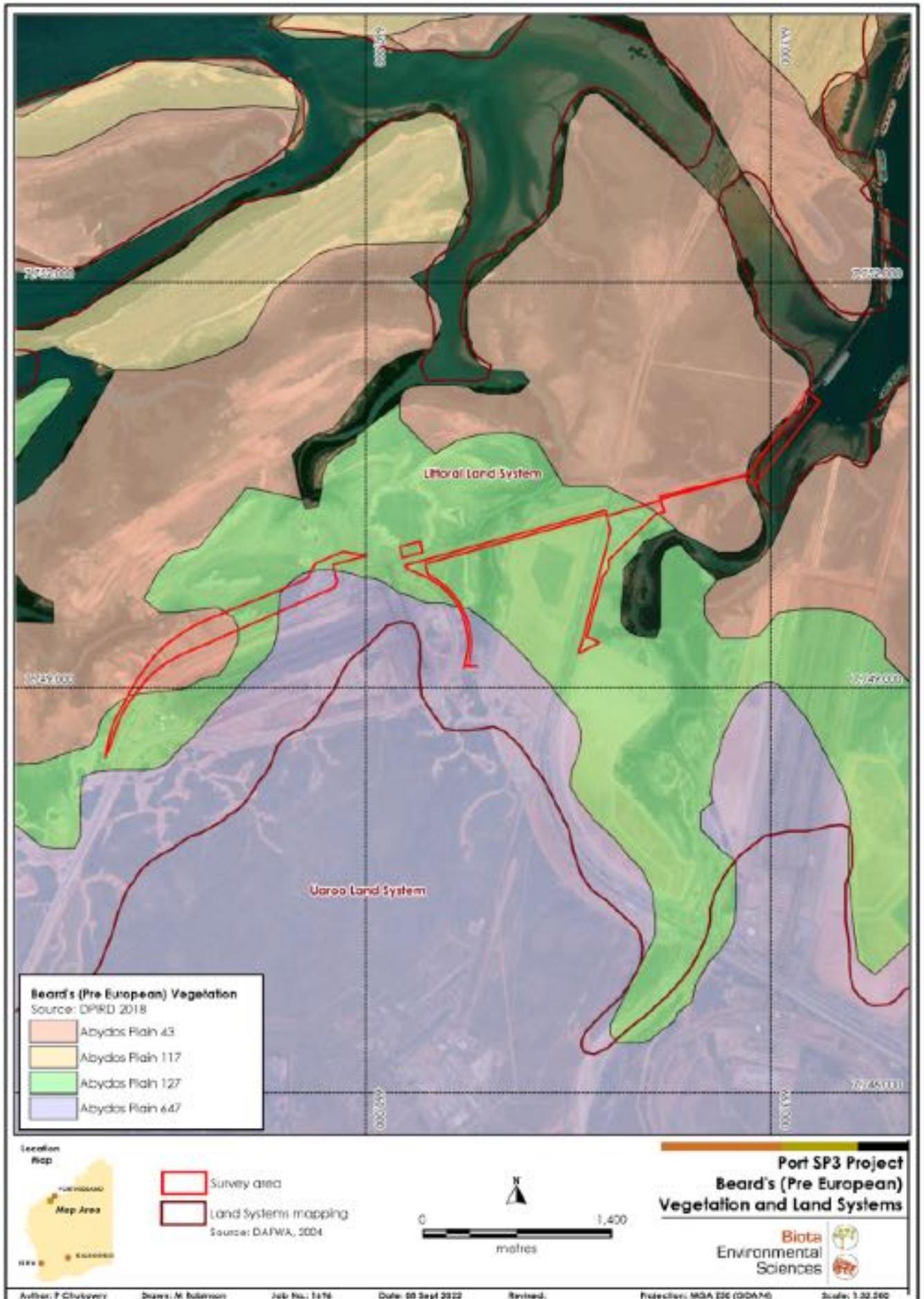


Figure 4.1: Land systems and Beard's vegetation units within the survey area and surrounds.

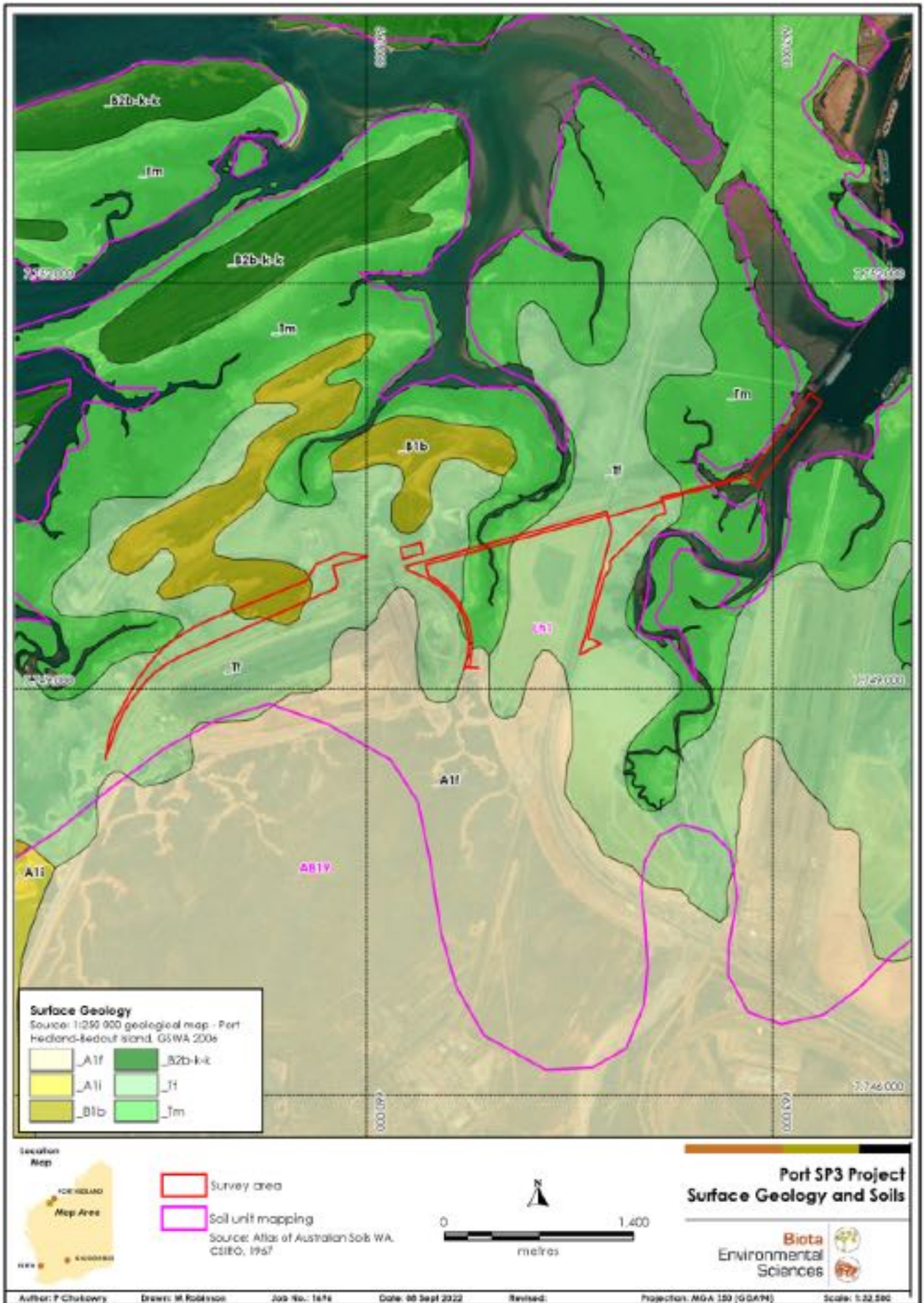


Figure 4.2: Geological units and soil units occurring within the survey area and surrounds.

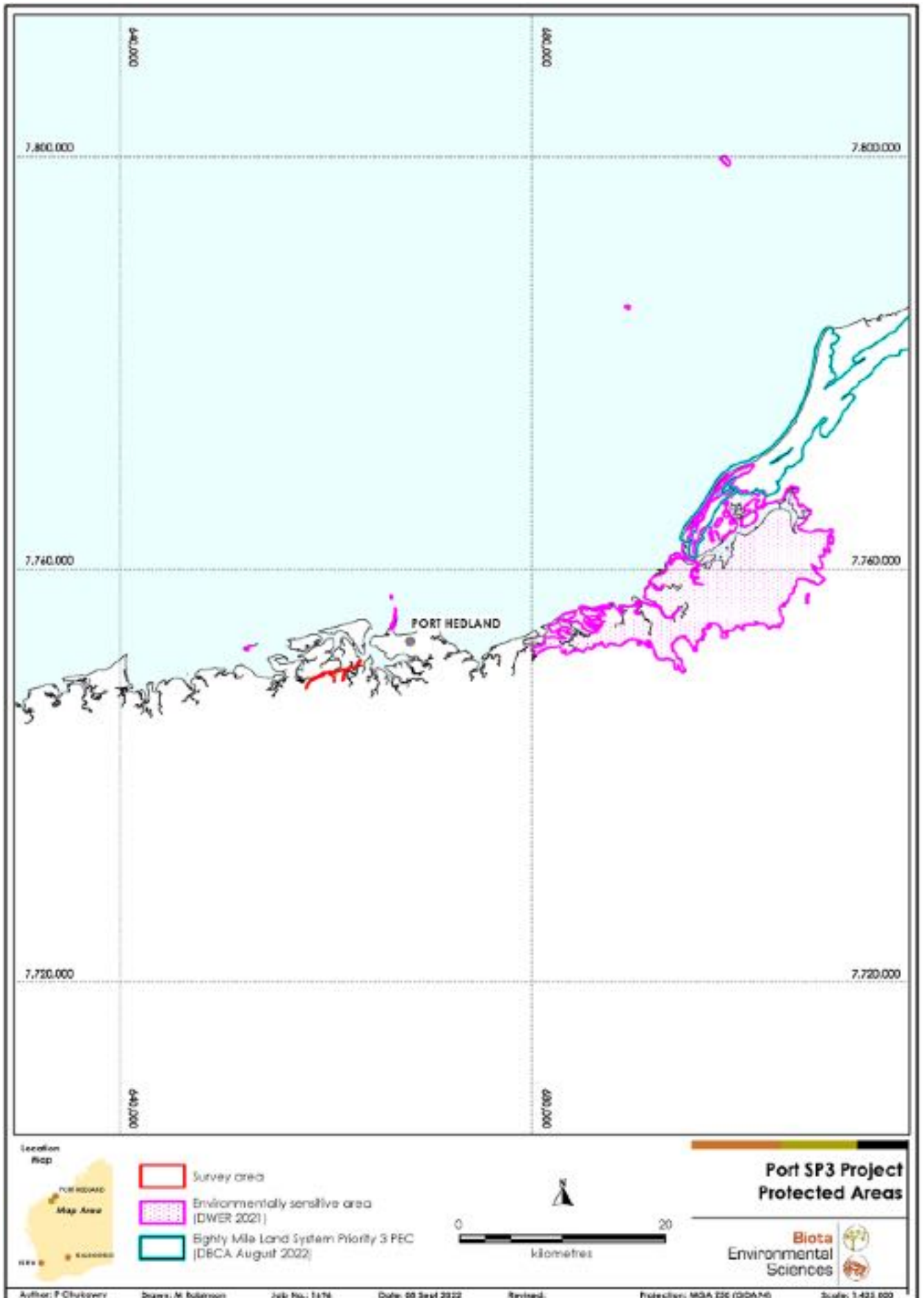


Figure 4.3: Protected areas in the vicinity of the survey area.

4.6 Previous Biological Surveys in the Locality

A summary of previous studies and surveys completed in the locality, including some encompassing the survey area, is presented in Table 4.4. As a significant number of studies have been conducted in the Port Hedland area, only the most relevant studies are summarised.

4.7 Significant Vegetation and Flora

4.7.1 Threatened and Priority Ecological Communities

TECs are described by the DBCA as biological assemblages occurring in a particular habitat, which are under threat of modification or destruction from various processes. TECs are significant at State level, being protected under the *WA Biodiversity Conservation Act 2016* (the BC Act), as well as having protection as ESAs under the EP Act. Some TECs are also protected at Commonwealth level under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). Further information regarding the classification of TECs is provided in Appendix 1. No TECs occur within 40 km of the survey area and none would be expected to occur, based on their distribution and composition.

PECs are ecological communities that are recognised to be of significance, but do not meet the criteria for listing as a TEC. There are five categories of PECs, none of which are currently protected under legislation (see Appendix 1). One occurrence of a PEC was identified in a search of the DBCA database as occurring within 40 km of the survey area:

- The Priority 3 'Eighty Mile Land System' PEC is described as "Beach foredunes, longitudinal coastal dunes and sandy plains with tussock grasslands and spinifex grasslands" (DBCA 2022). The nearest occurrence of this PEC is 34 km east-northeast of the survey area. Threats to this PEC include altered fire regimes, over grazing, erosion, and weed invasion by Buffel Grass (**Cenchrus ciliaris*) (DBCA 2022).

The Eighty Mile Land System PEC would not occur in the survey area; this land system does not extend as far west, and the habitats in the survey area primarily comprise mudflats, mangrove shrublands and sandy islands, without the presence of sand dunes or a beach.

Mangrove Health Monitoring Program - Conformance Report 9 (Roy Hill 2021)	and compliance report: survey 20 – 21 May 2021.	MS858	in conformance monitoring area: <i>Avicennia marina</i> , <i>Rhizophora stylosa</i> , <i>Ceriops australis</i> .			<ul style="list-style-type: none"> During condu Mang varieo Constr mang No ex across stable Confo been 'health
Flora and vegetation Reconnaissance Survey of Spoilbank Marina Project Area (Strategen-JBS&G 2020)	Reconnaissance and targeted survey: 12 February 2020.	68.2 ha	28	<ul style="list-style-type: none"> No TECs or PECs. No Threatened or Priority flora. 	<ul style="list-style-type: none"> None stated. 	<ul style="list-style-type: none"> Survey densit the cu activit
Wodgina Gas Pipeline Detailed Flora and Vegetation Survey (360 Environmental 2018)	Detailed survey: 9 – 16 June 2018.	243 ha	139	<ul style="list-style-type: none"> No TECs or PECs. One Priority flora species recorded: <ul style="list-style-type: none"> <i>Euphorbia clementii</i> (P3). <i>Euploca mutica</i> and <i>Gymnanthera cunninghamii</i> (both P3) considered likely to occur based on desktop review. 	<ul style="list-style-type: none"> None stated. 	<ul style="list-style-type: none"> Survey
Roy Hill Port Facility Power Line Port Hedland Ecological Assessment (GHD 2016)	Level 1 survey: 9 June 2016.	27.1 ha	25	<ul style="list-style-type: none"> No TECs or PECs. No Threatened or Priority flora. No significant fauna recorded, but no active fauna survey undertaken. Airlie Island <i>Ctenotus</i> (<i>Ctenotus angusticeps</i>) and a number of Migratory-listed shorebirds may occur in the area. 	<ul style="list-style-type: none"> Single season survey and some annual/ephemeral species may not have been present at the time of survey. Conditions leading up to the survey were dry with inadequate rainfall. Fauna survey limited to a habitat assessment and opportunistic observations. 	<ul style="list-style-type: none"> Three but im Island The as listed t tempo Projec the 10
Roy Hill Proposed Temporary Wharf Access Road – Mangrove Condition Survey (SKM 2013)	Baseline mangrove condition survey: 6 – 8 February 2013.	Not stated - 1.2 km road corridor	NA	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> 3.47 ha mostly No att than t Area h eviden Likely propo but in
Port Hedland Regional Flora and Vegetation Assessment (ENV 2011a)	Level 2 survey: 30 April – 6 May 2011 and 20 June – 1 July 2011.	80,874 ha	332	<ul style="list-style-type: none"> No TECs or PECs. No Threatened flora. Four Priority flora recorded: <ul style="list-style-type: none"> <i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095) (P3) <i>Campylopusillus</i> (P3) 	<ul style="list-style-type: none"> Minor access restrictions. 	<ul style="list-style-type: none"> Only t <i>pusilla</i>

				<ul style="list-style-type: none"> Threatened or Priority species recorded: Far Eastern Curlew (CR; MI), Curlew Sandpiper (CR; MI), Great Knot (CR; MI), Bar-tailed Godwit (CR/VU; MI), Northern Quoll (EN), Red Knot (EN; MI), Lesser Sand Plover (EN; MI), Greater Sand Plover (VU; MI), <i>Ozimops cobourgianus</i> (P1), Western Pebble-mound Mouse (P4), Grey-tailed Tattler (MI; P4) 18 additional bird species listed as Migratory. 		
Environmental Referral Document: Multi-user Iron Ore Export Facility: Port Infrastructure Project (Coffey 2011b)	NA – ERD compiled using the results of previous surveys.	350 ha dev. envelope	NA	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Key En <ul style="list-style-type: none"> BCH Surf Dust Nois Mar 3 man 4.46 h Cumu with e and c 87 ha Minor unlikel and m Disturk Risk of
Preliminary Review of Impacts to Mangroves (Oceanica 2010)	NA – desktop study on the indirect impacts of project on mangroves.	Not stated	NA	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Chang divers Chang signific tidal c Indirec minor the m
North West Iron Ore Alliance Port Project Flora, Vegetation and Mangal Studies (Woodman 2011b)	Level 2 survey: 28 July – 4 August 2010 & April 2011.	2,251 ha	172	<ul style="list-style-type: none"> No TECs or PECs. No Threatened flora. Four Priority flora recorded: <ul style="list-style-type: none"> <i>Eragrostis crateriformis</i> (P3) <i>Gomphrena leptophylla</i> (P3) <i>Gomphrena pusilla</i> (P2) <i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114) (P1). <i>Gymnanthera cunninghamii</i> (P3) known to occur in the area from desktop study. 	<ul style="list-style-type: none"> Primary survey conducted outside of the recommended season and lower than average rainfall fell in the area during the wet season preceding the survey. Access to mangal communities was restricted. 	<ul style="list-style-type: none"> Size of Signific Degre Impac Impac 'Mode Impac rated

Vegetation Impact Assessment (Woodman 2011a)	(2011b).					<ul style="list-style-type: none"> • Habitats would • Over
RHI Railway: Port Hedland Geotechnical Investigation Areas Targeted Flora Survey (Maia 2011)	Targeted survey for significant flora: 17 – 19 January 2011.	3.5 ha	56	<ul style="list-style-type: none"> • No TECs or PECs. • No Threatened flora. • No Priority flora species recorded, but <i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114) (P1) known to occur in the area from desktop study. 	<ul style="list-style-type: none"> • None stated. 	<ul style="list-style-type: none"> • Survey minim • No fee • Ecolog
Boodarie Port Infrastructure, Port Hedland – Level 1 Vegetation and Flora Survey and Fauna Review (Biota 2010) and Boodarie Infrastructure Level 1 Flora, Vegetation and Fauna Survey, Port Hedland (Biota 2009)	Two-phase Level 1 survey: 12 – 15 January 2010	2,292 ha	100 flora; 23 native fauna (plus two introduced or naturalised species).	<p><u>Flora & Vegetation</u></p> <ul style="list-style-type: none"> • No TECs or PECs. • No Threatened flora. • One Priority flora species recorded: <ul style="list-style-type: none"> ◦ <i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114) (P1). • <i>Bulbostylis burbidgeae</i> (P4) considered likely to occur in area. • No significant fauna species recorded. 	<ul style="list-style-type: none"> • Suboptimal conditions at the time of survey. • Mangroves were not considered in detail during the survey. • No systematic sampling of fauna or detailed habitat descriptions were made. 	<ul style="list-style-type: none"> • Survey • Veget • consid • disturb • distribu • Ecolog • Primar • veget • Unlikel • subst • provid
Level 1 Terrestrial Fauna Survey for the Multi-user Iron Ore Export Facility: Port Infrastructure Project (Coffey 2011a)	Level 1 survey: 21 – 23 June 2010	Not stated	No field records included.	<ul style="list-style-type: none"> • No field fauna records. • 36 listed terrestrial vertebrate fauna species assessed as possibly occurring in the study area. 	<ul style="list-style-type: none"> • Level 1 survey only; no systematic survey work undertaken and no field fauna records. 	<ul style="list-style-type: none"> • Seven • None • signific
A Flora and Fauna Assessment of RGP5 DMMA A, Port Hedland Harbour (Biota 2008)	Level 1 survey: 26 – 27 February 2008	123.2 ha	24 flora species; 16 native fauna species (plus 2 introduced or naturalised).	<ul style="list-style-type: none"> • Two fauna species of significance: Far Eastern Curlew (<i>Numenius madagascariensis</i>; CR; MI) and Eurasian Whimbrel (<i>Numenius phaeopus</i>; MI). • No TECs or PECs. • No Threatened or Priority flora. 	<ul style="list-style-type: none"> • No systematic fauna survey work undertaken. • Conditions not optimal for annual flora collection. • Mangroves not assessed. 	<ul style="list-style-type: none"> • Consid • impac • Sampl • consid
Outer Harbour Development Fauna Assessment (ENV 2009)	Level 2 survey: 12 October – 9 November 2007, 5 – 16 May 2008	20,303 ha	19 native mammals (plus 7 introduced mammals), 106 birds (plus 7 in immediate vicinity), 53 reptiles, 7 amphibians.	<ul style="list-style-type: none"> • 25 significant fauna species recorded (based on current listings). • Threatened or Priority species recorded: Far Eastern Curlew (CR; MI), Curlew Sandpiper (CR; MI), Great Knot (CR; MI), Bar-tailed Godwit (CR/VU; MI), Red Knot (EN; MI), Lesser Sand Plover (EN; MI), Greater Sand Plover (VU; MI), Fairy Tern (VU), <i>Ozimops cobourgianus</i> (P1), Grey-tailed Tattler (MI; P4) • An additional 15 bird species listed as Migratory. 	<ul style="list-style-type: none"> • Minor access restrictions. • Trapping not possible in mangrove and tidal flats habitats. 	<ul style="list-style-type: none"> • Six fau • None • to be

† Survey type: for surveys completed prior to issue of the most recent EPA flora and fauna survey guidance documents, "Level 1" and "Level 2" surveys of EPA (2004, 2010) are approximations of EPA (2016c, 2020).

4.7.2 Threatened and Priority Flora

Native flora and fauna species that are rare, threatened with extinction, or have high conservation value, are specially protected by law as Threatened species under the BC Act and/or the EPBC Act. In addition, the DBCA maintains a list of Priority species; these are those which have not been assigned statutory protection under the BC Act but are still considered to be of conservation priority, or are considered to be rare but not threatened and require monitoring (see Appendix 1 for details of significance categories recognised under the above frameworks).

The DBCA database search yielded the following significant flora and an assessment of their likelihood to occur in the survey area was carried out (see Appendix 3 for the detailed assessment):

- One Threatened species:
 - *Seringia exastia* (unlikely to occur).
- Three Priority 1 species:
 - *Atriplex eremitis* (unlikely to occur),
 - *Tephrosia rosea* var. Port Hedland (A.S. George 1114) (likely to occur), and
 - *Triodia chichesterensis* (would not occur).
- One Priority 2 species:
 - *Gomphrena pusilla* (likely to occur).
- Eight Priority 3 species:
 - *Abutilon* sp. Pritzelianum (S. van Leeuwen 5095) (unlikely to occur),
 - *Eragrostis crateriformis* (may occur),
 - *Euploca mutica* (unlikely to occur),
 - *Gomphrena cucullata* (unlikely to occur),
 - *Gomphrena leptophylla* (may occur),
 - *Gymnanthera cunninghamii* (unlikely to occur),
 - *Rothia indica* subsp. *australis* (unlikely to occur), and
 - *Sida* sp. Barlee Range (S. van Leeuwen 1642) (would not occur).
- Two Priority 4 species:
 - *Bulbostylis burbidgeae* (unlikely to occur); and
 - *Ptilotus mollis* (would not occur).

The locations of these species relative to the survey area are mapped in Figure 4.4.

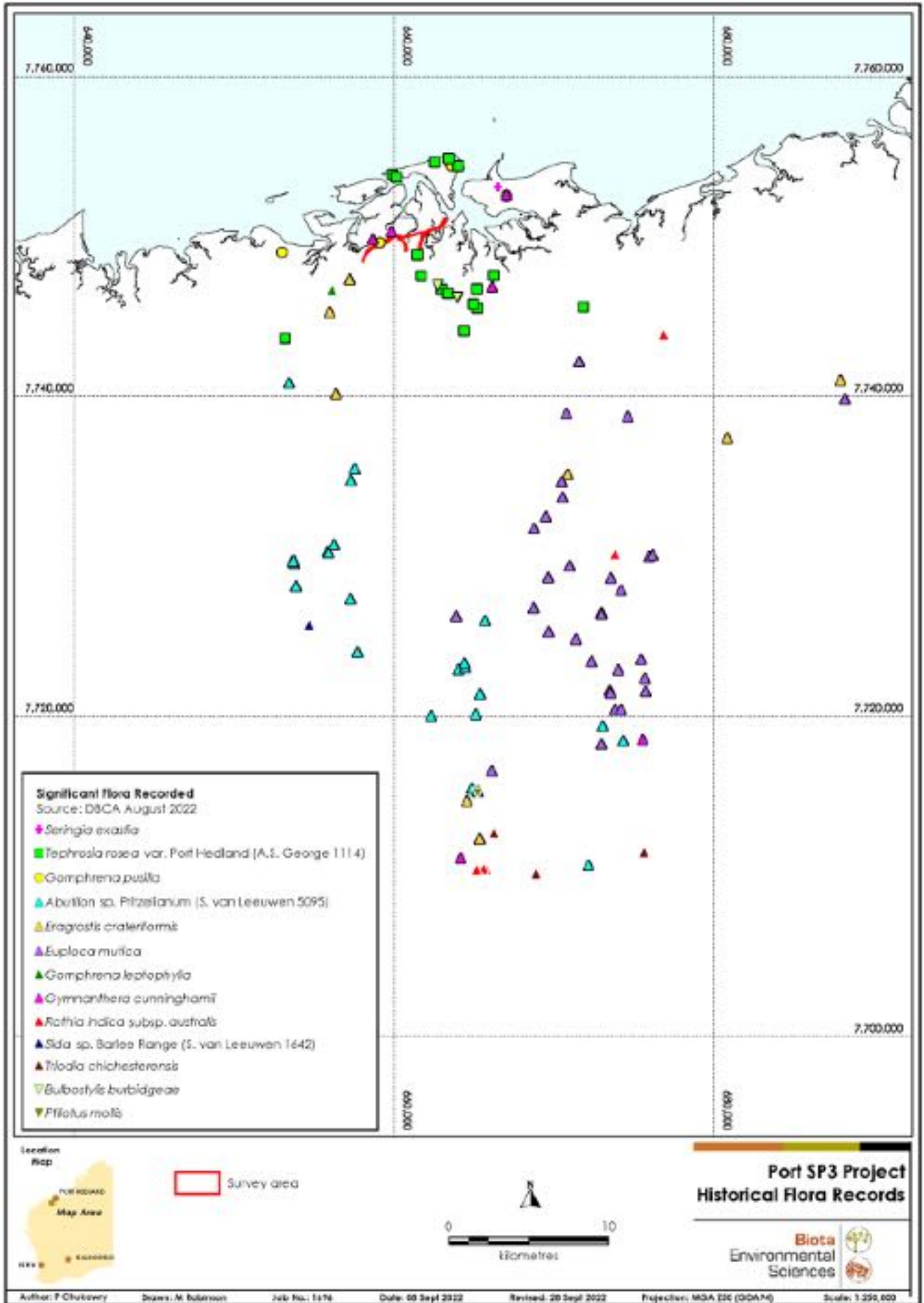


Figure 4.4: Historical significant flora records within 40 km of the survey area.

4.8 Significant Fauna

A total of 393 fauna species were identified from the locality during the desktop study, excluding obligate marine species (Table 4.5; Appendix 4). Of these, 75 are considered significant species; these are presented in Table 4.6, along with their preliminary likelihood of occurrence assessment. A more detailed assessment is included in Appendix 5, and locations of all available past records are mapped in Figure 4.5.

Table 4.5: Vertebrate species identified from the desktop study.

Fauna Group	Number of Species	Significant Species
Mammals	45	7 ¹
• Native terrestrial	(21)	(4 ¹)
• Introduced terrestrial	(9)	(-)
• Native bats	(15)	(3)
Birds	228	61 ²
• Native terrestrial	(226)	(61)
• Introduced	(2)	(-)
Reptiles	108	7
• Native terrestrial	(106)	(7)
• Introduced	(2)	(-)
Amphibians	12	-
Total	393	75

¹ Excluding Banded Hare-wallaby (*Lagostrophus fasciatus*): considered extinct on mainland and published historical distribution does not include the Pilbara.

² Excludes a total of four obligate marine species and vagrants.

Table 4.6: Significant vertebrate fauna previously recorded from the locality of the survey area.

Species	Common Name	State	C'wealth	Likelihood of Occurrence in Survey Area
MAMMALS				
<i>Dasyurus hallucatus</i>	Northern Quoll	EN	EN	Unlikely to occur
<i>Macrotis lagotis</i>	Bilby	VU	VU	Unlikely to occur
<i>Rhinonicteris aurantia</i> (Pilbara form)	Pilbara Leaf-nosed Bat	VU	VU	May occur
<i>Macroderma gigas</i>	Ghost Bat	VU	VU	May occur
<i>Ozimops cobourgianus</i>	Northern Coastal Free-tailed Bat	P1	-	Likely to occur
<i>Dasyercus blythi</i>	Brush-tailed Mulgara	P4	-	May occur
<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse	P4	-	Unlikely to occur
BIRDS				
<i>Numenius madagascariensis</i>	Far Eastern Curlew	CR; MI	CR; MI	Likely to occur
<i>Calidris tenuirostris</i>	Great Knot	CR; MI	CR; MI	Likely to occur
<i>Limosa lapponica</i>	Bar-tailed Godwit	CR; MI	EN; MI	Likely to occur
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR; MI	CR; MI	Likely to occur
<i>Pezoporus occidentalis</i>	Night Parrot	CR	EN	Unlikely to occur
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN; MI	EN; MI	Likely to occur
<i>Calidris canutus</i>	Red Knot	EN; MI	EN; MI	Likely to occur
<i>Rostratula australis</i>	Australian Painted-snipe	EN	EN	Unlikely to occur
<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU; MI	VU; MI	Likely to occur
<i>Sternula nereis</i>	Fairy Tern	VU	VU	Unlikely to occur
<i>Erythrotriorchis radiatus</i>	Red Goshawk	VU	VU	Unlikely to occur
<i>Falco hypoleucos</i>	Grey Falcon	VU	VU	May occur
<i>Tringa brevipes</i>	Grey-tailed Tattler	MI; P4	MI	Likely to occur
<i>Apus pacificus</i>	Pacific Swift	MI	MI	Likely to occur

Species	Common Name	State	C'wealth	Likelihood of Occurrence in Survey Area
<i>Cuculus optatus</i>	Oriental Cuckoo	MI	MI	May occur
<i>Pluvialis fulva</i>	Pacific Golden Plover	MI	MI	Likely to occur
<i>Pluvialis squatarola</i>	Grey Plover	MI	MI	Likely to occur
<i>Charadrius veredus</i>	Oriental Plover	MI	MI	Likely to occur
<i>Numenius phaeopus</i>	Eurasian Whimbrel	MI	MI	Likely to occur
<i>Numenius minutus</i>	Little Curlew	MI	MI	Likely to occur
<i>Limosa limosa</i>	Black-tailed Godwit	MI	MI	Likely to occur
<i>Arenaria interpres</i>	Ruddy Turnstone	MI	MI	Likely to occur
<i>Calidris pugnax</i>	Ruff	MI	MI	May occur
<i>Calidris falcinellus</i>	Broad-billed Sandpiper	MI	MI	Likely to occur
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MI	MI	Likely to occur
<i>Calidris subminuta</i>	Long-toed Stint	MI	MI	May occur
<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI	Likely to occur
<i>Calidris alba</i>	Sanderling	MI	MI	May occur
<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI	May occur
<i>Limnodromus semipalmatus</i>	Asian Dowitcher	MI	MI	May occur
<i>Gallinago stenura</i>	Pin-tailed Snipe	MI	MI	Unlikely to occur
<i>Gallinago megala</i>	Swinhoe's Snipe	MI	MI	Unlikely to occur
<i>Xenus cinereus</i>	Terek Sandpiper	MI	MI	Likely to occur
<i>Phalaropus lobatus</i>	Red-necked Phalarope	MI	MI	Unlikely to occur
<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI	Likely to occur
<i>Tringa totanus</i>	Common Redshank	MI	MI	Unlikely to occur
<i>Tringa stagnatilis</i>	Marsh Sandpiper	MI	MI	May occur
<i>Tringa glareola</i>	Wood Sandpiper	MI	MI	May occur
<i>Tringa nebularia</i>	Common Greenshank	MI	MI	Likely to occur
<i>Glareola maldivarum</i>	Oriental Pratincole	MI	MI	Likely to occur
<i>Anous stolidus</i>	Brown Noddy	MI	MI	Unlikely to occur
<i>Gelochelidon [nilotica] macrotarsa</i>	Australian [Gull-billed] Tern	MI	MI	Likely to occur
<i>Hydroprogne caspia</i>	Caspian Tern	MI	MI	Likely to occur
<i>Thalasseus bergii</i>	Greater Crested Tern	MI	MI	Likely to occur
<i>Onychoprion anaethetus</i>	Bridled Tern	MI	MI	Unlikely to occur
<i>Sternula albifrons</i>	Little Tern	MI	MI	Likely to occur
<i>Sterna dougallii</i>	Roseate Tern	MI	MI	May occur
<i>Sterna hirundo</i>	Common Tern	MI	MI	Likely to occur
<i>Chlidonias leucopterus</i>	White-winged Tern	MI	MI	Likely to occur
<i>Phaethon lepturus</i>	White-tailed Tropicbird	MI	MI	Unlikely to occur
<i>Fregata minor</i>	Great Frigatebird	MI	MI	Unlikely to occur
<i>Fregata ariel</i>	Lesser Frigatebird	MI	MI	May occur
<i>Sula dactylatra</i>	Masked Booby	MI	MI	Unlikely to occur
<i>Sula leucogaster</i>	Brown Booby	MI	MI	May occur
<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI	Unlikely to occur
<i>Pandion cristatus</i>	Eastern Osprey	MI	MI	Likely to occur
<i>Hirundo rustica</i>	Barn Swallow	MI	MI	Likely to occur
<i>Motacilla tschutschensis</i>	Eastern Yellow Wagtail	MI	MI	May occur
<i>Motacilla cinerea</i>	Grey Wagtail	MI	MI	Unlikely to occur
<i>Falco peregrinus</i>	Peregrine Falcon	OS	-	Likely to occur
<i>Elanus scriptus</i>	Letter-winged Kite	P4	-	Unlikely to occur
REPTILES				
<i>Caretta caretta</i>	Loggerhead Turtle	EN	EN; MI	Unlikely to occur

Species	Common Name	State	C'wealth	Likelihood of Occurrence in Survey Area
<i>Chelonia mydas</i>	Green Turtle	VU	VU; MI	May occur
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	VU	VU; MI	May occur
<i>Natator depressus</i>	Flatback Turtle	VU	VU; MI	May occur
<i>Dermochelys coriacea</i>	Leatherback Turtle	VU	VU; MI	Unlikely to occur
<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	VU	Unlikely to occur
<i>Ctenotus angusticeps</i>		P3	–	Likely to occur

Note: Excluding Banded Hare-wallaby (extinct on mainland); Southern Giant Petrel, Wilson's Storm-Petrel, Streaked Shearwater (all obligate marine in Australia); and Garganey (vagrant).

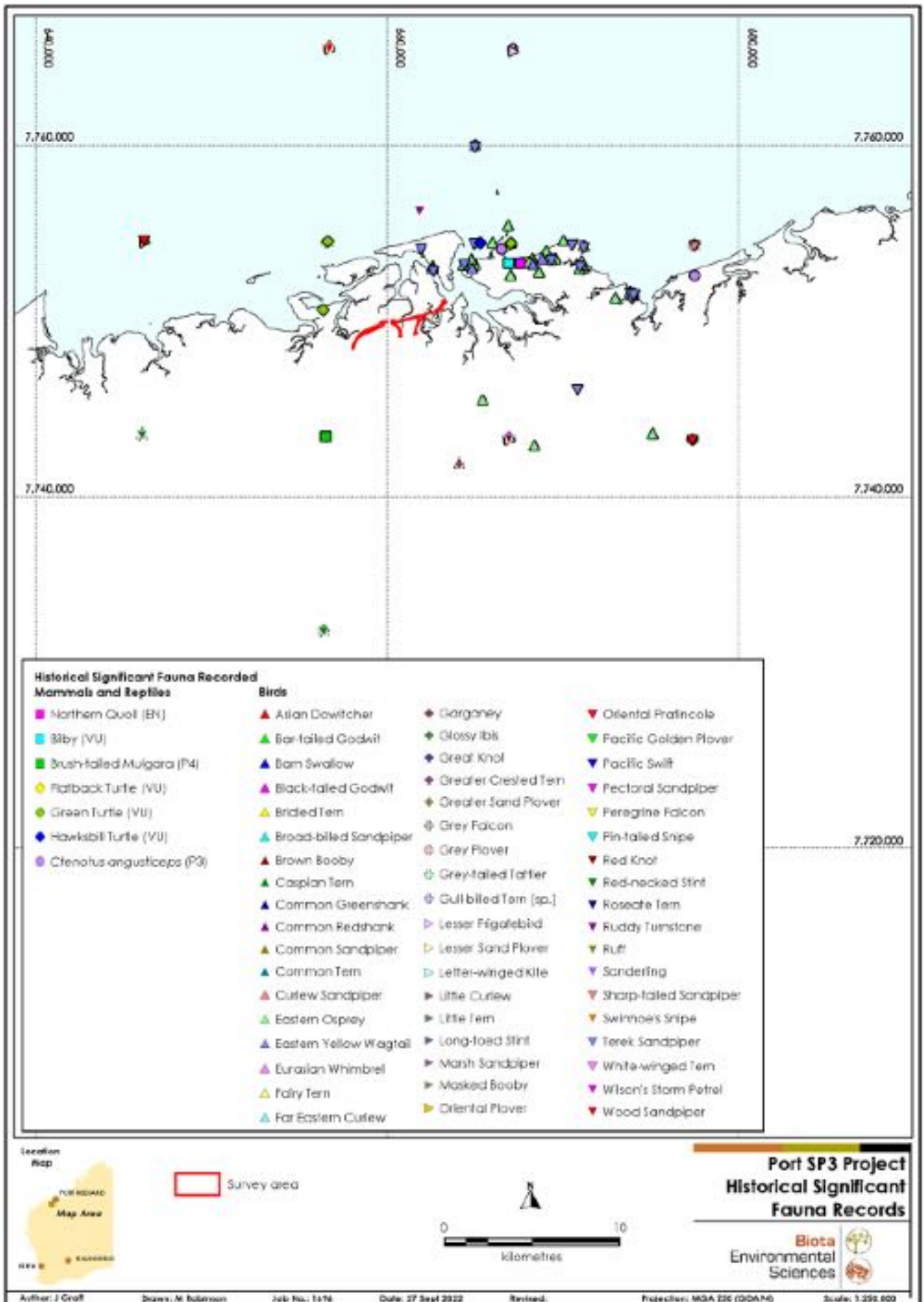


Figure 4.5: Historical significant fauna records within 40 km of the survey area.

Note: DBCA Threatened Fauna database records not included as not received at the time of reporting.

5.0 Discussion and Conclusions

Much of the survey area is located within the intertidal zone, and potential impacts to BCH should therefore be considered as per EPA (2016b). Health of the BCH in the survey area, particularly the areas of mangrove shrubland/forest and algal mats (samphires will be considered as a terrestrial vegetation type for this study due to its often inland distribution beyond the intertidal zone), will be strongly linked with the local marine and tidal processes. While some clearing is expected to occur within the survey area, only 1.16 ha of mangrove disturbance has occurred within MS858 to date, and approval was granted for a maximum impact area of 5 ha (Minister for Environment 2011).

5.1 Flora and Vegetation

Extensive past survey work has been completed in and around the survey area. Five to seven vegetation units (depending on the scale of mapping used in previous studies) have previously been described and mapped over the landforms present within the survey area. Vegetation in similarly intact areas has been observed to be in generally Excellent or Very Good condition, despite the presence of some weed species.

The results of this desktop study show that no listed significant flora species, TECs or PECs are known to occur within the survey area boundary. Following the likelihood of occurrence assessment, four Priority species are considered to have some potential to occur in the survey area: *Tephrosia rosea* var. Port Hedland (A.S. George 1114) (P1) and *Gomphrena pusilla* (P2) are likely to occur, and *Eragrostis crateriformis* and *Gomphrena leptophylla* (both P3) may occur. This assessment is based on records of flora collected prior to the construction of Roy Hill's port infrastructure; some individuals of the significant flora species recorded historically are unlikely to currently be present, reducing the likelihood that there would be additional individuals within the survey area. There would be no opportunity for new TEC or PEC occurrences within the survey area, as the area does not represent prospective habitat or occur within the distribution of any of the TECs or PECs known from the region.

The major biological constraint for the project comprises BCH (i.e. mangroves and cyanobacterial mats) present in the survey area. The spatial extent of BCH within the current survey area will be confirmed and mapped following the field survey. While some clearing is expected to occur within BCH in the survey area, care must be taken to avoid excessive or indirect impacts, and consideration must be given to the cumulative impacts on these communities.

5.2 Fauna

Extensive past fauna survey work has been undertaken in the region, including around the port area. Previous studies have mapped three to seven fauna habitats in the broader area, with a preliminary assessment of aerial imagery indicating four terrestrial fauna habitats are likely to occur within the survey area: mangroves, 'low' intertidal mudflats (exposed and inundated most tidal cycles), high intertidal mudflats and algal mats (only inundated on higher high tides), and islands of low coastal vegetation (e.g. samphire and spinifex vegetation).

The desktop study identified 75 significant fauna species as having been previously recorded in the region, of which the majority (61 species) are birds. Preliminary likelihood of occurrence assessments indicated that 34 of these species are likely to occur in the survey area, and 19 may occur (Appendix 5). The remaining 22 species are considered unlikely to occur.

The major constraint from a fauna perspective is likely to be the potential occurrence of migratory shorebirds, with 33 species recorded in the locality based on the desktop study, of which 22 species have been preliminarily assessed as likely to occur in the survey area. The Port Hedland area has also been identified as a nationally significant area for migratory shorebirds (Weller et al.

2020). The area of mudflat habitat directly affected is small compared to the overall extent available around the Port Hedland coast, but care must be taken to avoid indirect impacts on larger areas of mudflats, and consideration must be given to the cumulative impacts on the shorebird area.

6.0 References

- 360 Environmental (2018). Wodgina Gas Pipeline Detailed Flora and Vegetation Survey. Unpublished report prepared for Mineral Resources Ltd, July 2018, 360 Environmental, Perth, Western Australia.
- Beard, J. S. (1975). Vegetation Survey of Western Australia 1:1,000,000 Vegetation Series. Map Sheet 5 - Pilbara. University of Western Australia Press, Western Australia.
- Biota (2008). A Flora and Fauna Assessment of RGP5 DMMA A, Port Hedland Harbour. Unpublished report prepared for Sinclair Knight Merz, Biota Environmental Sciences, Western Australia.
- Biota (2009). Boodarie Infrastructure Level 1 Flora, Vegetation and Fauna Survey, Port Hedland. Unpublished report prepared for Hancock Prospecting, June 2009, Biota Environmental Sciences, Western Australia.
- Biota (2010). Boodarie Port Infrastructure, Port Hedland - Level 1 Vegetation and Flora Survey and Fauna Review. Unpublished report prepared for Hancock Prospecting, February 2010, Biota Environmental Sciences, Western Australia.
- Christian, C. S., and G. A. Stewart (1953). General Report on Survey of Katherine-Darwin Region, 1946. Australian Land Research Series 1, CSIRO.
- Coffey (2011a). Level 1 Terrestrial Fauna Survey for the Multi-User Iron Ore Export Facility: Port Infrastructure Project. Unpublished report prepared for North West Infrastructure, Coffey Environments Australia, Perth, Western Australia.
- Coffey (2011b). Multi-user Iron Ore Export Facility: Port Infrastructure Project Environmental Referral Document. Unpublished report prepared for North West Infrastructure, Coffey Environments Australia, Perth, Western Australia.
- DBCAs (2022). Priority Ecological Communities for Western Australia, Version 33. Species and Communities Program, Department of Biodiversity, Conservation and Attractions, 1 June 2022.
- Department of the Agriculture, Water and the Environment (2020). Australia's 15 National Biodiversity Hotspots [WWW Document]. Retrieved from <http://www.environment.gov.au/biodiversity/conservation/hotspots/national-biodiversity-hotspots>.
- Department of the Environment and Energy (2019). Australia's bioregions (IBRA) [WWW Document]. Retrieved from <https://www.environment.gov.au/land/nrs/science/ibra>.
- ENV (2009). Outer Harbour Development Fauna Assessment. Unpublished report RP001 for BHP Billiton Iron Ore, October 2009, ENV Australia, Perth, Western Australia.
- ENV (2011a). Port Hedland Regional Flora and Vegetation Assessment. Unpublished report prepared for BHP Billiton Iron Ore Pty Ltd, December 2011, ENV Australia, Perth, Western Australia.
- ENV (2011b). Port Hedland Regional Fauna Assessment. Unpublished report prepared for BHP Billiton Iron Ore Pty Ltd, December 2011, ENV Australia, Perth, Western Australia.
- EPA (2004). *EPA Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia*. Environmental Protection Authority, Western Australia.
- EPA (2016a). Environmental Factor Guideline: *Benthic Communities and Habitats*. Environmental Protection Authority, Western Australia.

- EPA (2016b). *Technical Guidance: Protection of Benthic Communities and Habitats*. Environmental Protection Authority, Western Australia.
- EPA (2016c). *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment*. Environmental Protection Authority, Western Australia.
- EPA (2020). *Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Environmental Protection Authority, Western Australia.
- EPA, and DEC (2010). *Technical Guide - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. eds B.M. Hyder, J. Dell and M.A Cowan, Environmental Protection Authority and the Department of Environment and Conservation, Perth, Western Australia.
- Geological Survey of Western Australia (1982). 1:250,000 Geological Map - Port Hedland-Bedout Island (SF/50-04 and part sheet SE/50-16), 2nd edition. Government of Western Australia, Department of Mines and Petroleum.
- GHD (2016). Roy Hill Port Facility Power Line Port Hedland Ecological Assessment. Unpublished report prepared for Horizon Power, GHD, Perth, Western Australia.
- Government of Western Australia (2019). *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019*. Department of Biodiversity, Conservation and Attractions, Perth, Western Australia.
- Kendrick, P., and F. Stanley (2003). Pilbara 4 (PIL4 - Roebourne synopsis). Pages 581–594 in J. E. May and N. L. McKenzie, editors. *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions*. Department of Conservation and Land Management, Western Australia.
- Maia (2011). RHI Railway: Port Hedland Geotechnical Investigation Areas Targeted Flora Survey. Unpublished report prepared for Roy Hill Infrastructure Pty Ltd, Maia Environmental Consultancy, Perth, Western Australia.
- Northcote, K. H., G. G. Beckmann, E. Bettenay, H. M. Churchward, D. C. Van Dijk, G. M. Dimmock, G. D. Hubble, R. F. Isbell, W. M. McArthur, G. G. Murtha, K. D. Nicolls, T. R. Paton, C. H. Thompson, A. A. Webb, and M. J. Wright (1960). *Atlas of Australian Soils: Sheets 1 to 10 with explanatory data*. CSIRO Australia and Melbourne University Press, Melbourne, Victoria.
- Oceanica (2010). Preliminary Review of Indirect Impacts on Mangroves from Proposed Port Infrastructure. Memo prepared for Roy Hill Infrastructure Pty Ltd, July 2010, Oceanica Marine and Estuarine Specialists, Perth, Western Australia.
- Roy Hill (2021). Roy Hill MS858 Mangrove Health Monitoring Program - Conformance Report 9. Unpublished internal report prepared by Roy Hill, August 2021, Roy Hill Infrastructure Pty Ltd, Perth, Western Australia.
- SKM (2011). Surface Water Impact Component of Environmental and Social Impact Assessment. Unpublished report prepared for North West Infrastructure, Sinclair Knight Merz, Perth, Western Australia.
- SKM (2013). Roy Hill Proposed Temporary Wharf Access Road - Mangrove Condition Survey. Unpublished report prepared for Roy Hill Infrastructure Pty Ltd, Sinclair Knight Merz, Perth, Western Australia.
- Strategen-JBS&G (2020). Flora and Vegetation Reconnaissance Survey of Spoilbank Marina Project Area. Unpublished report prepared for Pilbara Ports Authority, 21 October 2020, Strategen-JBS&G, Perth, Western Australia.
- van Vreeswyk, A. M. E., A. L. Payne, K. A. Leighton, and P. Hennig (2004). *Technical Bulletin No. 92: An inventory and condition survey of the Pilbara region, Western Australia*. Department of Agriculture, South Perth WA.

Weller, D., L. Kidd, C. Lee, S. Klose, R. Jaensch, and J. Driessen (2020). Australian National Directory of Important Migratory Shorebird Habitat. Prepared for Australian Government Department of Agriculture, Water and the Environment, BirdLife Australia, Melbourne, Victoria.

Woodman (2011a). North West Iron Ore Alliance Port Survey Area Flora and Vegetation Impact Assessment. Unpublished report prepared for Coffey Environments, July 2011, Woodman Environmental Consulting Pty Ltd, Perth, Western Australia.

Woodman (2011b). North West Iron Ore Alliance Port Project Flora, Vegetation and Mangal Studies. Unpublished report prepared for Coffey Environments, July 2011, Woodman Environmental Consulting Pty Ltd, Perth Western Australia.

Appendix 1

Framework for Significance Ranking of Species and Communities in WA



A. Definitions, Categories and Criteria for Threatened and Priority Ecological Communities

Species and Communities Branch, Department of Environment and Conservation, December 2010.

1. General Definitions

Ecological Community

A naturally occurring biological assemblage that occurs in a particular type of habitat.

Note: The scale at which biological communities are defined will often depend on the level of detail in the information source, therefore no particular scale is specified.

A **threatened ecological community** (TEC) is one which is found to fit into one of the following categories; "presumed totally destroyed", "critically endangered", "endangered" or "vulnerable".

Possible threatened ecological communities that do not meet survey criteria are added to the Department of Parks and Wildlife's Priority Ecological Community Lists under Priorities 1, 2 and 3. Ecological Communities that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

An **assemblage** is a defined group of biological entities.

Habitat is defined as the areas in which an organism and/or assemblage of organisms lives. It includes the abiotic factors (e.g. substrate and topography), and the biotic factors.

Occurrence: a discrete example of an ecological community, separated from other examples of the same community by more than 20 metres of a different ecological community, an artificial surface or a totally destroyed community.

By ensuring that every discrete occurrence is recognised and recorded future changes in status can be readily monitored.

Adequately Surveyed is defined as follows:

"An ecological community that has been searched for thoroughly in most likely habitats, by relevant experts."

Community structure is defined as follows:

"The spatial organisation, construction and arrangement of the biological elements comprising a biological assemblage" (e.g. *Eucalyptus salmonophloia* woodland over scattered small shrubs over dense herbs; structure in a faunal assemblage could refer to trophic structure, e.g. dominance by feeders on detritus as distinct from feeders on live plants).

Definitions of **Modification** and **Destruction** of an ecological community:

Modification: "changes to some or all of ecological processes (including abiotic processes such as hydrology), species composition and community structure as a direct or indirect result of human activities. The level of damage involved could be ameliorated naturally or by human intervention."

Destruction: "modification such that reestablishment of ecological processes, species composition and community structure within the range of variability exhibited by the original community is unlikely within the foreseeable future even with positive human intervention."

Note: Modification and destruction are difficult concepts to quantify, and their application will be determined by scientific judgement. Examples of modification and total destruction are cited below:

Modification of ecological processes: The hydrology of Toolibin Lake has been altered by clearing of the catchment such that death of some of the original flora has occurred due to dependence on fresh water. The system may be bought back to a semblance of the original state by redirecting saline runoff and pumping waters of the rising underground watertable away to restore the hydrological balance. Total destruction of downstream lakes has occurred due to hydrology being altered to the point that few of the original flora or fauna species are able to tolerate the level of salinity and/or water logging.

Modification of structure: The understorey of a plant community may be altered by weed invasion due to nutrient enrichment by addition of fertiliser. Should the additional nutrients be removed from the system the balance may be restored, and the original plant species better able to compete. Total destruction may

occur if additional nutrients continue to be added to the system causing the understorey to be completely replaced by weed species, and death of overstorey species due to inability to tolerate high nutrient levels. Modification of species composition: Pollution may cause alteration of the invertebrate species present in a freshwater lake. Removal of pollutants may allow the return of the original inhabitant species. Addition of residual highly toxic substances may cause permanent changes to water quality, and total destruction of the community.

Threatening processes are defined as follows:

"Any process or activity that threatens to destroy or significantly modify the ecological community and/or affect the continuing evolutionary processes within any ecological community."

Examples of some of the continuing threatening processes in Western Australia include: general pollution; competition, predation and change induced in ecological communities as a result of introduced animals; competition and displacement of native plants by introduced species; hydrological changes; inappropriate fire regimes; diseases resulting from introduced micro-organisms; direct human exploitation and disturbance of ecological communities.

Restoration is defined as returning an ecological community to its pre-disturbance or natural state in terms of abiotic conditions, community structure and species composition.

Rehabilitation is defined as the re-establishment of ecological attributes in a damaged ecological community although the community will remain modified.

2. Definitions and Criteria for Presumed Totally Destroyed, Critically Endangered, Endangered and Vulnerable Ecological Communities

ECOLOGICAL COMMUNITIES

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B):

- A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or
- B) All occurrences recorded within the last 50 years have since been destroyed

Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C):

- A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii):
 - i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years);
 - ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated.
- B) Current distribution is limited, and one or more of the following apply (i, ii or iii):

- i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years);
 - ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes;
 - iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes.
- C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C):

- A) The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii):
 - i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years);
 - ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated.
- B) Current distribution is limited, and one or more of the following apply (i, ii or iii):
 - i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years);
 - ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes;
 - iii) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes.
- C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C):

- A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.
- B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.

- C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.

3. Definitions and Criteria for Priority Ecological Communities

PRIORITY ECOLOGICAL COMMUNITY LIST

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community Lists under Priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as threatened ecological communities. Ecological Communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities

Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities

Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

- (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or;
- (ii) communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;
- (iii) communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

- (a) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.
- (b) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
- (c) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

B. Categories for Flora and Fauna Species

1. Western Australian Biodiversity Conservation Act 2016, and Priority Species Classification

In Western Australia, 'Threatened', 'Extinct' and 'Specially Protected' fauna and flora species are protected under the *Biodiversity Conservation Act 2016* (the BC Act), making it an offence to take or disturb these species without Ministerial approval. The definition of 'take' is broad, and includes killing, injuring, harvesting or capturing fauna, and gathering, cutting, destroying, harvesting or damaging flora.

Such species are classified within a framework of several categories.

Species of the highest conservation significance are designated as Threatened species and are protected under sections 19(1)(a), 19(1)(b) and 19(1)(c) of the BC Act. Species are listed within one of three categories:

- Critically endangered (CR), Endangered (EN), or Vulnerable (V), representing those species listed in Schedules 1 to 3 respectively of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* or the *Wildlife Conservation (Rare Flora) Notice 2018*.

Presumed extinct species are protected under sections 24 and 25 of the BC Act and are listed in one of two categories:

- Extinct (EX), representing those species listed in Schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* or the *Wildlife Conservation (Rare Flora) Notice 2018*; or
- Extinct in the wild (EW); there are currently no listed species under this category.

Specially protected species are protected under section 13(1) of the BC Act, and include species of special conservation interest, migratory species, cetaceans, species subject to international agreement, or species otherwise in need of special protection. Of these:

- Migratory species (MI) are those listed under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*;
- Species of special conservation interest (conservation dependent fauna) (CD) are those listed under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*; and
- Other specially protected fauna (OS) are those listed under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*;

In addition to the species formally designated as protected under the BC Act, the WA Department of Biodiversity, Conservation and Attractions (DBCA) also maintains a list of 'Priority species'.

Species that appear to be rare or threatened, but for which there is insufficient information to properly evaluate their conservation significance, are assigned to one of three Priority categories (Priority 1 to Priority 3), while species that are adequately known but require regular monitoring are assigned to Priority 4.

Note that of the above classifications, only 'Threatened', 'Extinct' and 'Specially Protected' species have statutory standing. The Priority flora and fauna classifications are employed by the WA DBCA to manage and classify their database of species considered potentially rare or at risk, but these categories have no legislative status.

Further explanations of the categories is provided in more detail in the following pages.



CONSERVATION CODES

For Western Australian Flora and Fauna

Threatened, Extinct and Specially Protected fauna or flora¹ are species² which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016*.

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T **Threatened species**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct species

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

EX Extinct species

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

1 Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

2 Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

3 Priority 3: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

4 Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

¹ The definition of flora includes algae, fungi and lichens

² Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

2. Commonwealth Environment Protection and Biodiversity Conservation Act 1999

Many of the species that are specially protected at State level are also listed as Threatened species at the Federal level, as one of the Matters of National Environmental Significance (MNES) identified under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). These may be classified as 'critically endangered', 'endangered', 'vulnerable' or 'lower risk', consistent with IUCN categories:

1. **Critically Endangered (CR):** a taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
2. **Endangered (EN):** a taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.
3. **Vulnerable (VU):** a taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.
4. **Lower Risk (LR):** a taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories:
 - **Conservation Dependent (CD).** Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation program targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.
 - **Near Threatened (NT).** Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.
 - **Least Concern (LC).** Taxa which do not qualify for Conservation Dependent or Near Threatened.

In addition, numerous Migratory species are listed as MNES under the EPBC Act (some of which are also listed as Threatened). Migratory species are those animals that migrate to Australia and its external territories, or pass through or over Australian waters during their annual migrations. The list of migratory species consists of those species listed under the following international conventions:

1. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention);
2. China-Australia Migratory Bird Agreement (CAMBA);
3. Japan-Australia Migratory Bird Agreement (JAMBA); and,
4. Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Marine species are also protected under the EPBC Act, and are listed to ensure the long-term conservation of the species. Marine species include all Australian sea snakes, seals, crocodiles, dugongs, marine turtles, seahorses and seabirds that naturally occur in the Commonwealth marine area.

Under the terms of the EPBC Act, an action (e.g. a project or development) is required to be referred to the Australian Government Environment Minister for approval if it has, will have, or is likely to have, a significant impact on an MNES. The term 'action' includes projects and developments subsequent to commencement of the Act, however there are a number of exemptions (e.g. projects in Commonwealth areas). According to Department of the Environment (2013), a 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts.

References:

Department of the Environment (2013). Matters of National Environmental Significance - Significant Impact Guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999*. Department of the Environment, Canberra, Australia.

Appendix 2

EPBC Protected Matters and NatureMap Database Search Results





EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 31-Aug-2022

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	32
Listed Migratory Species:	65

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	73
Commonwealth Heritage Places:	None
Listed Marine Species:	105
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	1

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	39
Key Ecological Features (Marine):	None
Biologically Important Areas:	10
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Buffer Status

EEZ and Territorial Sea

In buffer area only

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

Buffer Status

BIRD

[Calidris canutus](#)

Red Knot, Knot [855]

Endangered

Species or species habitat known to occur within area

In feature area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat known to occur within area

In feature area

[Calidris tenuirostris](#)

Great Knot [862]

Critically Endangered

Species or species habitat known to occur within area

In buffer area only

[Charadrius leschenaultii](#)

Greater Sand Plover, Large Sand Plover [877]

Vulnerable

Species or species habitat known to occur within area

In feature area

[Charadrius mongolus](#)

Lesser Sand Plover, Mongolian Plover [879]

Endangered

Species or species habitat known to occur within area

In buffer area only

[Erythrotriorchis radiatus](#)

Red Goshawk [942]

Vulnerable

Species or species habitat may occur within area

In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat known to occur within area	In feature area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
FISH			
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area	In feature area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat known to occur within area	In feature area

REPTILE

Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Aipysurus foliosquama Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area	In feature area
Liasis olivaceus barroni Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In feature area

SHARK

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area	In feature area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat likely to occur within area	In feature area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area	In feature area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area	In feature area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area	In buffer area only
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Breeding known to occur within area	In feature area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In feature area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sousa sahalensis as Sousa chinensis Australian Humpback Dolphin [87942]		Species or species habitat likely to occur within area	In feature area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In buffer area only
Hirundo rustica Barn Swallow [662]		Species or species habitat known to occur within area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In buffer area only
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area	In buffer area only
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area	In feature area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area	In buffer area only
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In buffer area only
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area	In buffer area only
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [51686]	WA	In buffer area only
Commonwealth Land - [51685]	WA	In buffer area only
Commonwealth Land - [51684]	WA	In buffer area only
Commonwealth Land - [51689]	WA	In buffer area only
Commonwealth Land - [51688]	WA	In buffer area only
Commonwealth Land - [50359]	WA	In buffer area only
Commonwealth Land - [51049]	WA	In buffer area only
Commonwealth Land - [51702]	WA	In buffer area only
Commonwealth Land - [51429]	WA	In buffer area only
Commonwealth Land - [51048]	WA	In buffer area only
Commonwealth Land - [50324]	WA	In buffer area only
Commonwealth Land - [50325]	WA	In buffer area only
Commonwealth Land - [50326]	WA	In buffer area only
Commonwealth Land - [50327]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51718]	WA	In buffer area only
Commonwealth Land - [51719]	WA	In buffer area only
Commonwealth Land - [51708]	WA	In buffer area only
Commonwealth Land - [51712]	WA	In buffer area only
Commonwealth Land - [51404]	WA	In buffer area only
Commonwealth Land - [51713]	WA	In buffer area only
Commonwealth Land - [51947]	WA	In buffer area only
Commonwealth Land - [51710]	WA	In buffer area only
Commonwealth Land - [51709]	WA	In buffer area only
Commonwealth Land - [51711]	WA	In buffer area only
Commonwealth Land - [50323]	WA	In buffer area only
Commonwealth Land - [51680]	WA	In buffer area only
Commonwealth Land - [51681]	WA	In buffer area only
Commonwealth Land - [51682]	WA	In buffer area only
Commonwealth Land - [51683]	WA	In buffer area only
Commonwealth Land - [51687]	WA	In buffer area only
Commonwealth Land - [51717]	WA	In buffer area only
Commonwealth Land - [51714]	WA	In buffer area only
Commonwealth Land - [51716]	WA	In buffer area only
Commonwealth Land - [51715]	WA	In buffer area only
Commonwealth Land - [51700]	WA	In buffer area only
Commonwealth Land - [51403]	WA	In buffer area only
Commonwealth Land - [51703]	WA	In buffer area only
Commonwealth Land - [51054]	WA	In buffer area only
Commonwealth Land - [51678]	WA	In buffer area only
Commonwealth Land - [51705]	WA	In buffer area only
Commonwealth Land - [51052]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51055]	WA	In buffer area only
Commonwealth Land - [51050]	WA	In buffer area only
Commonwealth Land - [51053]	WA	In buffer area only
Commonwealth Land - [51707]	WA	In buffer area only
Commonwealth Land - [51704]	WA	In buffer area only
Commonwealth Land - [51706]	WA	In buffer area only
Commonwealth Land - [51668]	WA	In buffer area only
Commonwealth Land - [51720]	WA	In buffer area only
Commonwealth Land - [51666]	WA	In buffer area only
Commonwealth Land - [51667]	WA	In buffer area only
Commonwealth Land - [51051]	WA	In buffer area only
Commonwealth Land - [51669]	WA	In buffer area only
Commonwealth Land - [51694]	WA	In buffer area only
Commonwealth Land - [51673]	WA	In buffer area only
Commonwealth Land - [51672]	WA	In buffer area only
Commonwealth Land - [51675]	WA	In buffer area only
Commonwealth Land - [51674]	WA	In buffer area only
Commonwealth Land - [51677]	WA	In buffer area only
Commonwealth Land - [51676]	WA	In buffer area only
Commonwealth Land - [51679]	WA	In buffer area only
Commonwealth Land - [51670]	WA	In buffer area only
Commonwealth Land - [51671]	WA	In buffer area only
Commonwealth Land - [50349]	WA	In buffer area only
Commonwealth Land - [51695]	WA	In buffer area only
Commonwealth Land - [51692]	WA	In buffer area only
Commonwealth Land - [51693]	WA	In buffer area only
Commonwealth Land - [51698]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51699]	WA	In buffer area only
Commonwealth Land - [51696]	WA	In buffer area only
Commonwealth Land - [51697]	WA	In buffer area only
Commonwealth Land - [51691]	WA	In buffer area only
Commonwealth Land - [51690]	WA	In buffer area only

Listed Marine Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area overfly marine area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In buffer area only
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Hirundo rustica Barn Swallow [662]		Species or species habitat known to occur within area overfly marine area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat likely to occur within area	In feature area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Stiltia isabella Australian Pratincole [818]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area	In buffer area only
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Fish			
Acentronura larsonae Helen's Pygmy Pipehorse [66186]		Species or species habitat may occur within area	In buffer area only
Bulbonaricus brauni Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area	In feature area
Campichthys tricarinatus Three-keel Pipefish [66192]		Species or species habitat may occur within area	In feature area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area	In feature area
Choeroichthys latispinosus Muiron Island Pipefish [66196]		Species or species habitat may occur within area	In buffer area only
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area	In feature area
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area	In feature area
Doryrhamphus multiannulatus Many-banded Pipefish [66717]		Species or species habitat may occur within area	In buffer area only
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area	In feature area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area	In feature area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In feature area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area	In feature area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In feature area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area	In feature area
Halicampus spinostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area	In feature area
Haliichthys taeniophorus Ribbioned Pipehorse, Ribbioned Seadragon [66226]		Species or species habitat may occur within area	In feature area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In feature area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area	In feature area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In feature area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In feature area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In feature area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area	In feature area
Phoxocampus belcheri Black Rock Pipefish [66719]		Species or species habitat may occur within area	In buffer area only
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In feature area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In feature area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In feature area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In feature area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area	In feature area
Mammal			
Dugong dugon Dugong [28]		Species or species habitat known to occur within area	In feature area
Reptile			
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area	In feature area
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Aipysurus duboisii Dubois' Seasnake [1116]		Species or species habitat may occur within area	In feature area
Aipysurus eydouxii Spine-tailed Seasnake [1117]		Species or species habitat may occur within area	In feature area
Aipysurus foliosquama Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area	In feature area
Aipysurus tenuis Brown-lined Seasnake [1121]		Species or species habitat may occur within area	In feature area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area	In feature area
Chitulia ornata as Hydrophis ornatus Spotted Seasnake, Ornate Reef Seasnake [87377]		Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area	In feature area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area	In feature area
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area	In feature area
Ephalophis greyi North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area	In feature area
Hydrelaps darwiniensis Black-ringed Seasnake [1100]		Species or species habitat may occur within area	In feature area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area	In feature area
Hydrophis macdowelli as Hydrophis mcdowelli Small-headed Seasnake [75601]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Leioselasma czeblukovi as Hydrophis czeblukovi Fine-spined Seasnake, Geometrical Seasnake [87374]		Species or species habitat may occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In feature area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area	In feature area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Breeding known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Sousa sahalensis as Sousa chinensis Australian Humpback Dolphin [87942]		Species or species habitat likely to occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Habitat Critical to the Survival of Marine Turtles

Scientific Name	Behaviour	Presence	Buffer Status
Aug - Sep			
Natator depressus Flatback Turtle [59257]	Nesting	Known to occur	In feature area

Extra Information

Nationally Important Wetlands			[Resource Information]
Wetland Name	State	Buffer Status	
Leslie (Port Hedland) Saltfields System	WA	In buffer area only	

EPBC Act Referrals					[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status	
Port Hedland Solar Project	2022/09241		Assessment	In buffer area only	

Controlled action				
Additional Rail Infrastructure between Herb Elliott Port Facility and Cloudbreak Mine Site	2010/5513	Controlled Action	Post-Approval	In buffer area only
Development of a Quarry Operation to extract gravel, sand and pindan material	2012/6636	Controlled Action	Post-Approval	In buffer area only
Great Northern Pipeline - 630 km buried gas pipeline	2009/5257	Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
North Star Magnetite Project	2012/6689	Controlled Action	Post-Approval	In buffer area only
Poondano Iron Ore Project	2010/5759	Controlled Action	Post-Approval	In buffer area only
Port Hedland Outer Harbour Development and associated marine and terrestrial in	2008/4159	Controlled Action	Post-Approval	In feature area
Port Hedland Spoilbank Marina, WA	2019/8520	Controlled Action	Post-Approval	In buffer area only
Roy Hill to Port Hedland Rail Line and Associated Infrastructure	2010/5424	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
150m Boodarie Gas Lateral Pipeline	2014/7116	Not Controlled Action	Completed	In buffer area only
Construction of a Commodities Berth, Wharf and Associated Infrastructure	2008/4129	Not Controlled Action	Completed	In feature area
Development of iron ore resources in eastern Pilbara region, including port at P	2004/1562	Not Controlled Action	Completed	In feature area
Horizon Power South Hedland Transmission Line, WA	2012/6551	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Iron Bridge Port Facility, Port Hedland, WA	2015/7565	Not Controlled Action	Completed	In buffer area only
Pilbara Bulk Ore Transport System Project, WA	2016/7637	Not Controlled Action	Completed	In buffer area only
Pilbara Transmission Project, Pilbara, WA	2018/8349	Not Controlled Action	Completed	In buffer area only
Pippingarra Quarry Expansion Works	2012/6461	Not Controlled Action	Completed	In buffer area only
Port Hedland Channel Risk and Optimisation Project, WA	2017/7915	Not Controlled Action	Completed	In feature area
Port Hedland Power Station Conversion Project	2011/6080	Not Controlled Action	Completed	In buffer area only
Project Highclere Geophysical Survey	2021/9023	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Rail and Port Facilities	2001/474	Not Controlled Action	Completed	In feature area
Relocation of approx. 670m of the Pilbara Energy Pipeline	2013/6756	Not Controlled Action	Completed	In buffer area only
South Hedland Power Station WA	2011/5929	Not Controlled Action	Completed	In buffer area only
Telfer Gold Mine Project - Mine and Borefield Extensions and Upgrade of Storage	2002/787	Not Controlled Action	Completed	In buffer area only
Telfer Gold Mine Project - Power Supply and Infrastructure Corridor	2002/786	Not Controlled Action	Completed	In buffer area only
Walkway Lighting Upgrade	2009/4965	Not Controlled Action	Completed	In buffer area only
Wodgina Lithium Mine Expansion, Pilbara, NT	2018/8194	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Additional Rail Infrastructure	2012/6314	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Atlas Boodarie Link Project, WA	2012/6506	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Dredging of marine sediment to enable construction of eight berths and a turnin	2010/5678	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Marine Geotechnical Drilling Program	2008/4012	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Nelson Point Dredging	2009/4920	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Offshore Fibre Optic Cable Network Construction & Operation, Port Hedland WA to Darwin NT	2014/7223	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Port Headland Outer Harbour Pre-construction Pilling program	2012/6341	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Port of Port Hedland channel marker replacement project, WA	2017/8010	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Realignment of the Great Northern Highway	2010/5793	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
upgrade of 3 community recreation sites	2005/2349	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Referral decision

Outer Harbour Development and associated marine and terrestrial infrastructure	2008/4148	Referral Decision	Completed	In feature area
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Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
Marine Turtles			
Caretta caretta			
Loggerhead Turtle [1763]	Foraging	Known to occur	In buffer area only
Chelonia mydas			
Green Turtle [1765]	Foraging	Known to occur	In buffer area only
Eretmochelys imbricata			
Hawksbill Turtle [1766]	Foraging	Known to occur	In buffer area only
Natator depressus			
Flatback Turtle [59257]	Foraging	Known to occur	In buffer area only
Natator depressus			
Flatback Turtle [59257]	Internesting buffer	Known to occur	In feature area
Natator depressus			
Flatback Turtle [59257]	Nesting	Known to occur	In buffer area only

Seabirds

Ardenna pacifica			
Wedge-tailed Shearwater [84292]	Breeding	Known to occur	In feature area

Scientific Name	Behaviour	Presence	Buffer Status
Fregata ariel Lesser Frigatebird [1012]	Breeding	Known to occur	In feature area
Whales			
Balaenoptera musculus brevipinna Pygmy Blue Whale [81317]	Distribution	Known to occur	In feature area
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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Department of Agriculture Water and the Environment

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Canberra City ACT 2601 Australia

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KINGDOM	CLASS	TAXON	WA CONSERVATION STATUS
Animalia	ALGA	<i>Lobophora</i> sp.	
Animalia	ALGA	<i>Turbinaria</i> spp	
Animalia	AMPHI	<i>Cyclorana australis</i>	
Animalia	AMPHI	<i>Cyclorana maini</i>	
Animalia	AMPHI	<i>Litoria caerulea</i>	
Animalia	AMPHI	<i>Litoria rothii</i>	
Animalia	AMPHI	<i>Litoria rubella</i>	
Animalia	AMPHI	<i>Neobatrachus aquilonius</i>	
Animalia	AMPHI	<i>Neobatrachus sutor</i>	
Animalia	AMPHI	<i>Notaden nichollsi</i>	
Animalia	AMPHI	<i>Platyplectrum spenceri</i>	
Animalia	AMPHI	<i>Uperoleia glandulosa</i>	
Animalia	AMPHI	<i>Uperoleia russelli</i>	
Animalia	AMPHI	<i>Uperoleia talpa</i>	
Animalia	BIRD	<i>Accipiter cirrocephalus</i>	
Animalia	BIRD	<i>Accipiter fasciatus</i>	
Animalia	BIRD	<i>Accipiter fasciatus</i> subsp. <i>fasciatus</i>	
Animalia	BIRD	<i>Actitis hypoleucos</i>	MI
Animalia	BIRD	<i>Aegotheles cristatus</i>	
Animalia	BIRD	<i>Anas gracilis</i>	
Animalia	BIRD	<i>Anas rhynchotis</i>	
Animalia	BIRD	<i>Anas superciliosa</i>	
Animalia	BIRD	<i>Anhinga melanogaster</i>	
Animalia	BIRD	<i>Anhinga melanogaster</i> subsp. <i>novaeollandiae</i>	
Animalia	BIRD	<i>Anhinga novaeollandiae</i>	
Animalia	BIRD	<i>Anthus australis</i>	
Animalia	BIRD	<i>Aquila audax</i>	
Animalia	BIRD	<i>Ardea garzetta</i>	
Animalia	BIRD	<i>Ardea ibis</i>	
Animalia	BIRD	<i>Ardea intermedia</i>	
Animalia	BIRD	<i>Ardea modesta</i>	
Animalia	BIRD	<i>Ardea novaeollandiae</i>	
Animalia	BIRD	<i>Ardea pacifica</i>	
Animalia	BIRD	<i>Ardeotis australis</i>	
Animalia	BIRD	<i>Arenaria interpres</i>	MI
Animalia	BIRD	<i>Arenaria interpres</i> subsp. <i>interpres</i>	
Animalia	BIRD	<i>Artamus cinereus</i>	
Animalia	BIRD	<i>Artamus cinereus</i> subsp. <i>melanops</i>	
Animalia	BIRD	<i>Artamus leucorhynchus</i>	
Animalia	BIRD	<i>Artamus leucorhynchus</i> subsp. <i>leucopygialis</i>	
Animalia	BIRD	<i>Artamus personatus</i>	
Animalia	BIRD	<i>Artamus superciliosus</i>	
Animalia	BIRD	<i>Aythya australis</i>	
Animalia	BIRD	<i>Barnardius zonarius</i>	
Animalia	BIRD	<i>Burhinus grallarius</i>	
Animalia	BIRD	<i>Butorides striata</i>	
Animalia	BIRD	<i>Butorides striatus</i>	
Animalia	BIRD	<i>Cacatua roseicapilla</i>	
Animalia	BIRD	<i>Cacatua roseicapilla</i> subsp. <i>assimilis</i>	
Animalia	BIRD	<i>Cacatua sanguinea</i>	
Animalia	BIRD	<i>Cacatua sanguinea</i> subsp. <i>westralensis</i>	
Animalia	BIRD	<i>Cacomantis pallidus</i>	
Animalia	BIRD	<i>Calidris acuminata</i>	MI
Animalia	BIRD	<i>Calidris alba</i>	MI
Animalia	BIRD	<i>Calidris canutus</i>	EN
Animalia	BIRD	<i>Calidris ferruginea</i>	CR
Animalia	BIRD	<i>Calidris melanotos</i>	MI
Animalia	BIRD	<i>Calidris ruficollis</i>	MI
Animalia	BIRD	<i>Calidris subminuta</i>	MI
Animalia	BIRD	<i>Calidris tenuirostris</i>	CR
Animalia	BIRD	<i>Centropus phasianinus</i>	
Animalia	BIRD	<i>Certhionyx niger</i>	
Animalia	BIRD	<i>Charadrius leschenaultii</i>	VU
Animalia	BIRD	<i>Charadrius melanops</i>	
Animalia	BIRD	<i>Charadrius mongolus</i>	EN
Animalia	BIRD	<i>Charadrius ruficapillus</i>	
Animalia	BIRD	<i>Charadrius veredus</i>	MI
Animalia	BIRD	<i>Chenonetta jubata</i>	
Animalia	BIRD	<i>Cheramoeca leucosterna</i>	
Animalia	BIRD	<i>Cheramoeca leucosternus</i>	
Animalia	BIRD	<i>Chlidonias leucopterus</i>	MI
Animalia	BIRD	<i>Chroicocephalus novaeollandiae</i>	
Animalia	BIRD	<i>Chrysococcyx basalis</i>	
Animalia	BIRD	<i>Cincloramphus cruralis</i>	
Animalia	BIRD	<i>Cincloramphus mathewsi</i>	
Animalia	BIRD	<i>Circus approximans</i>	
Animalia	BIRD	<i>Circus assimilis</i>	
Animalia	BIRD	<i>Cladorhynchus leucocephalus</i>	
Animalia	BIRD	<i>Climacteris melanura</i>	
Animalia	BIRD	<i>Climacteris melanura</i> subsp. <i>wellsi</i>	
Animalia	BIRD	<i>Colluricincla harmonica</i>	
Animalia	BIRD	<i>Columba livia</i>	
Animalia	BIRD	<i>Coracina novaeollandiae</i>	
Animalia	BIRD	<i>Corvus bennetti</i>	
Animalia	BIRD	<i>Corvus coronoides</i>	
Animalia	BIRD	<i>Corvus orru</i>	
Animalia	BIRD	<i>Corvus orru</i> subsp. <i>ceciliae</i>	
Animalia	BIRD	<i>Coturnix ypsilophora</i>	
Animalia	BIRD	<i>Cracticus nigrogularis</i>	
Animalia	BIRD	<i>Cracticus tibicen</i>	
Animalia	BIRD	<i>Cuculus pallidus</i>	
Animalia	BIRD	<i>Cygnus atratus</i>	
Animalia	BIRD	<i>Dacelo leachii</i>	

Animalia	BIRD	<i>Dendrocygna arcuata</i>	
Animalia	BIRD	<i>Dendrocygna eytoni</i>	
Animalia	BIRD	<i>Dromaius novaehollandiae</i>	
Animalia	BIRD	<i>Egretta garzetta</i>	
Animalia	BIRD	<i>Egretta novaehollandiae</i>	
Animalia	BIRD	<i>Egretta sacra</i>	
Animalia	BIRD	<i>Elanus axillaris</i>	
Animalia	BIRD	<i>Elanus caeruleus</i>	
Animalia	BIRD	<i>Elanus caeruleus subsp. axillaris</i>	
Animalia	BIRD	<i>Euseyornis melanops</i>	
Animalia	BIRD	<i>Emblema pictum</i>	
Animalia	BIRD	<i>Eolophus roseicapillus</i>	
Animalia	BIRD	<i>Eopsaltria pulverulenta</i>	
Animalia	BIRD	<i>Ephippiorhynchus asiaticus</i>	
Animalia	BIRD	<i>Epthianura aurifrons</i>	
Animalia	BIRD	<i>Epthianura tricolor</i>	
Animalia	BIRD	<i>Eremiornis carteri</i>	
Animalia	BIRD	<i>Erythronyctes alba</i>	
Animalia	BIRD	<i>Esacus magnirostris</i>	
Animalia	BIRD	<i>Esacus neglectus</i>	
Animalia	BIRD	<i>Eurostopodus argus</i>	
Animalia	BIRD	<i>Falco berigora</i>	
Animalia	BIRD	<i>Falco berigora subsp. berigora</i>	
Animalia	BIRD	<i>Falco cenchroides</i>	
Animalia	BIRD	<i>Falco hypoleucos</i>	VU
Animalia	BIRD	<i>Falco longipennis</i>	
Animalia	BIRD	<i>Falco peregrinus</i>	OS
Animalia	BIRD	<i>Fregata ariel</i>	MI
Animalia	BIRD	<i>Fulica atra</i>	
Animalia	BIRD	<i>Gallinago stenura</i>	MI
Animalia	BIRD	<i>Gallirallus philippensis</i>	
Animalia	BIRD	<i>Gallirallus philippensis subsp. mellori</i>	
Animalia	BIRD	<i>Gavialis virescens</i>	
Animalia	BIRD	<i>Gelochelidon nilotica</i>	MI
Animalia	BIRD	<i>Gelochelidon nilotica subsp. affinis</i>	
Animalia	BIRD	<i>Geopelia cuneata</i>	
Animalia	BIRD	<i>Geopelia humeralis</i>	
Animalia	BIRD	<i>Geopelia striata</i>	
Animalia	BIRD	<i>Geopelia striata subsp. placida</i>	
Animalia	BIRD	<i>Geophaps plumifera</i>	
Animalia	BIRD	<i>Gerygone tenebrosa</i>	
Animalia	BIRD	<i>Glareola maldivarum</i>	MI
Animalia	BIRD	<i>Grallina cyanoleuca</i>	
Animalia	BIRD	<i>Grus rubicunda</i>	
Animalia	BIRD	<i>Haematopus fuliginosus</i>	
Animalia	BIRD	<i>Haematopus longirostris</i>	
Animalia	BIRD	<i>Haliaeetus leucogaster</i>	
Animalia	BIRD	<i>Haliastur indus</i>	
Animalia	BIRD	<i>Haliastur sphenurus</i>	
Animalia	BIRD	<i>Heteromunia pectoralis</i>	
Animalia	BIRD	<i>Hieraaetus morphnoides</i>	
Animalia	BIRD	<i>Himantopus himantopus</i>	
Animalia	BIRD	<i>Hirundo ariel</i>	
Animalia	BIRD	<i>Hirundo neoxena</i>	
Animalia	BIRD	<i>Hirundo nigricans</i>	
Animalia	BIRD	<i>Hirundo rustica</i>	MI
Animalia	BIRD	<i>Hydroprogne caspia</i>	MI
Animalia	BIRD	<i>Lalage tricolor</i>	
Animalia	BIRD	<i>Larus novaehollandiae</i>	
Animalia	BIRD	<i>Lichenostomus keartlandi</i>	
Animalia	BIRD	<i>Lichenostomus penicillatus</i>	
Animalia	BIRD	<i>Lichenostomus virescens</i>	
Animalia	BIRD	<i>Lichmera indistincta</i>	
Animalia	BIRD	<i>Limicola falcinellus</i>	MI
Animalia	BIRD	<i>Limicola falcinellus subsp. sibiricus</i>	
Animalia	BIRD	<i>Limnodromus semipalmatus</i>	MI
Animalia	BIRD	<i>Limosa lapponica</i>	MI
Animalia	BIRD	<i>Limosa lapponica subsp. menzbieri</i>	CR
Animalia	BIRD	<i>Limosa limosa</i>	MI
Animalia	BIRD	<i>Malacorhynchus membranaceus</i>	
Animalia	BIRD	<i>Malurus lamberti</i>	
Animalia	BIRD	<i>Malurus lamberti subsp. assimilis</i>	
Animalia	BIRD	<i>Malurus leucopterus</i>	
Animalia	BIRD	<i>Manorina flavigula</i>	
Animalia	BIRD	<i>Melopsittacus undulatus</i>	
Animalia	BIRD	<i>Merops ornatus</i>	
Animalia	BIRD	<i>Microcarbo melanoleucos</i>	
Animalia	BIRD	<i>Milvus migrans</i>	
Animalia	BIRD	<i>Milvus migrans subsp. affinis</i>	
Animalia	BIRD	<i>Mirafra javanica</i>	
Animalia	BIRD	<i>Motacilla flava subsp. similima</i>	
Animalia	BIRD	<i>Neochmia ruficauda</i>	
Animalia	BIRD	<i>Neochmia ruficauda subsp. subclarescens</i>	
Animalia	BIRD	<i>Ninox novaeseelandiae</i>	
Animalia	BIRD	<i>Numenius madagascariensis</i>	CR
Animalia	BIRD	<i>Numenius minutus</i>	MI
Animalia	BIRD	<i>Numenius phaeopus</i>	MI
Animalia	BIRD	<i>Nycticorax caledonicus</i>	
Animalia	BIRD	<i>Nycticorax caledonicus subsp. hilli</i>	
Animalia	BIRD	<i>Nymphicus hollandicus</i>	
Animalia	BIRD	<i>Oceanites oceanicus</i>	MI
Animalia	BIRD	<i>Ocyphaps lophotes</i>	
Animalia	BIRD	<i>Onychoprion anaethetus</i>	MI
Animalia	BIRD	<i>Oreoica gutturalis</i>	

Animalia	BIRD	<i>Pachycephala lanioides</i>	
Animalia	BIRD	<i>Pachycephala melanura</i>	
Animalia	BIRD	<i>Pachycephala rufiventris</i>	
Animalia	BIRD	<i>Pandion cristatus</i>	MI
Animalia	BIRD	<i>Pandion haliaetus</i>	
Animalia	BIRD	<i>Pandion haliaetus subsp. cristatus</i>	
Animalia	BIRD	<i>Pardalotus rubricatus</i>	
Animalia	BIRD	<i>Pardalotus striatus</i>	
Animalia	BIRD	<i>Passer montanus</i>	
Animalia	BIRD	<i>Pelecanus conspicillatus</i>	
Animalia	BIRD	<i>Peneoenanthe pulverulenta</i>	
Animalia	BIRD	<i>Petrochelidon ariel</i>	
Animalia	BIRD	<i>Petrochelidon nigricans</i>	
Animalia	BIRD	<i>Petroica goodenovii</i>	
Animalia	BIRD	<i>Phalacrocorax carbo</i>	
Animalia	BIRD	<i>Phalacrocorax melanoleucos</i>	
Animalia	BIRD	<i>Phalacrocorax sulcirostris</i>	
Animalia	BIRD	<i>Phalacrocorax varius</i>	
Animalia	BIRD	<i>Phalaropus lobatus</i>	MI
Animalia	BIRD	<i>Phaps chalcoptera</i>	
Animalia	BIRD	<i>Phaps histrionica</i>	
Animalia	BIRD	<i>Philomachus pugnax</i>	MI
Animalia	BIRD	<i>Platalea regia</i>	
Animalia	BIRD	<i>Platycercus spurius</i>	
Animalia	BIRD	<i>Platycercus zonarius</i>	
Animalia	BIRD	<i>Plegadis falcinellus</i>	MI
Animalia	BIRD	<i>Pluvialis fulva</i>	MI
Animalia	BIRD	<i>Pluvialis squatarola</i>	MI
Animalia	BIRD	<i>Podargus strigoides</i>	
Animalia	BIRD	<i>Poliocephalus poliocephalus</i>	
Animalia	BIRD	<i>Pomatostomus superciliosus</i>	
Animalia	BIRD	<i>Pomatostomus temporalis</i>	
Animalia	BIRD	<i>Porphyrio porphyrio</i>	
Animalia	BIRD	<i>Porzana fluminea</i>	
Animalia	BIRD	<i>Ptilonorhynchus guttatus</i>	
Animalia	BIRD	<i>Ptilonorhynchus maculatus</i>	
Animalia	BIRD	<i>Ptilonorhynchus maculatus subsp. guttatus</i>	
Animalia	BIRD	<i>Ptilotula penicillata</i>	
Animalia	BIRD	<i>Ptilotula penicillatus</i>	
Animalia	BIRD	<i>Recurvirostra novaehollandiae</i>	
Animalia	BIRD	<i>Rhipidura albiscapa</i>	
Animalia	BIRD	<i>Rhipidura leucophrys</i>	
Animalia	BIRD	<i>Rhipidura phasiana</i>	
Animalia	BIRD	<i>Smicromis brevirostris</i>	
Animalia	BIRD	<i>Sterna albifrons subsp. sinensis</i>	
Animalia	BIRD	<i>Sterna bengalensis</i>	
Animalia	BIRD	<i>Sterna caspia</i>	
Animalia	BIRD	<i>Sterna hirundo</i>	MI
Animalia	BIRD	<i>Sterna hybrida</i>	
Animalia	BIRD	<i>Sterna hybrida subsp. javanica</i>	
Animalia	BIRD	<i>Sterna leucoptera</i>	
Animalia	BIRD	<i>Sterna nereis</i>	
Animalia	BIRD	<i>Sterna nilotica</i>	
Animalia	BIRD	<i>Sternula albifrons</i>	MI
Animalia	BIRD	<i>Stiltia isabella</i>	
Animalia	BIRD	<i>Tachybaptus novaehollandiae</i>	
Animalia	BIRD	<i>Tachybaptus novaehollandiae subsp. novaehollandiae</i>	
Animalia	BIRD	<i>Taeniopygia guttata</i>	
Animalia	BIRD	<i>Thalasseus bengalensis</i>	
Animalia	BIRD	<i>Thalasseus bergii</i>	MI
Animalia	BIRD	<i>Threskiornis malucca</i>	
Animalia	BIRD	<i>Threskiornis spinicollis</i>	
Animalia	BIRD	<i>Todiramphus chloris</i>	
Animalia	BIRD	<i>Todiramphus chloris subsp. pilbara</i>	
Animalia	BIRD	<i>Todiramphus pyrrhopygia</i>	
Animalia	BIRD	<i>Todiramphus pyrrhopygius</i>	
Animalia	BIRD	<i>Todiramphus sanctus</i>	
Animalia	BIRD	<i>Tribonyx ventralis</i>	
Animalia	BIRD	<i>Tringa brevipes</i>	MI & P4
Animalia	BIRD	<i>Tringa cinerea</i>	
Animalia	BIRD	<i>Tringa glareola</i>	MI
Animalia	BIRD	<i>Tringa nebularia</i>	MI
Animalia	BIRD	<i>Tringa stagnatilis</i>	MI
Animalia	BIRD	<i>Turnix velox</i>	
Animalia	BIRD	<i>Tyto alba subsp. delicatula</i>	
Animalia	BIRD	<i>Tyto delicatula</i>	
Animalia	BIRD	<i>Vanellus miles</i>	
Animalia	BIRD	<i>Xenus cinereus</i>	MI
Animalia	BIRD	<i>Zosterops luteus</i>	
Animalia	FISH	? ?	
Animalia	FISH	<i>Abudefduf bengalensis</i>	
Animalia	FISH	<i>Acanthopagrus australis</i>	
Animalia	FISH	<i>Acanthopagrus latus</i>	
Animalia	FISH	<i>Amniataba caudavittata</i>	
Animalia	FISH	<i>Amphiprion clarkii</i>	
Animalia	FISH	<i>Apogon rueppellii</i>	
Animalia	FISH	<i>Arrhamphus sclerolepis</i>	
Animalia	FISH	<i>Atelomycterus sp.</i>	
Animalia	FISH	<i>Bathygobius fuscus</i>	
Animalia	FISH	<i>Batrachomoeus dahl</i>	
Animalia	FISH	<i>Butis butis</i>	
Animalia	FISH	<i>Caranx ignobilis</i>	
Animalia	FISH	<i>Caranx sp.</i>	
Animalia	FISH	<i>Centrogenys vaigiensis</i>	

Animalia	FISH	<i>Cephalopholis boenak</i>	
Animalia	FISH	<i>Chiloscyllium punctatum</i>	
Animalia	FISH	<i>Choerodon cyanodus</i>	
Animalia	FISH	<i>Dactyloptena papilio</i>	
Animalia	FISH	<i>Drepane punctata</i>	
Animalia	FISH	<i>Eleutheronema tetradactylum</i>	
Animalia	FISH	<i>Epinephelus areolatus</i>	
Animalia	FISH	<i>Epinephelus malabaricus</i>	
Animalia	FISH	<i>Epinephelus quoyanus</i>	
Animalia	FISH	<i>Filicampus tigris</i>	
Animalia	FISH	<i>Gerres subfasciatus</i>	
Animalia	FISH	<i>Glossamia aprion</i>	
Animalia	FISH	<i>Halophryne diemensis</i>	
Animalia	FISH	<i>Herklotsichthys koningsbergeri</i>	
Animalia	FISH	<i>Herklotsichthys lippa</i>	
Animalia	FISH	<i>Hyporhamphus quoyi</i>	
Animalia	FISH	<i>Hyporhamphus sp.</i>	
Animalia	FISH	<i>Ichthyoscopus spinosus</i>	
Animalia	FISH	<i>Kathala axillaris</i>	
Animalia	FISH	<i>Labracinus sp.</i>	
Animalia	FISH	<i>Leiopotherapon unicolor</i>	
Animalia	FISH	<i>Leptobrama muelleri</i>	
Animalia	FISH	<i>Liza vaigiensis</i>	
Animalia	FISH	<i>Lophiocharon trisignatus</i>	
Animalia	FISH	<i>Lufjanus carponotatus</i>	
Animalia	FISH	<i>Megalops cyprinoides</i>	
Animalia	FISH	<i>Monodactylus argenteus</i>	
Animalia	FISH	<i>Mugil cephalus</i>	
Animalia	FISH	<i>Nematalosa vlaminghi</i>	
Animalia	FISH	<i>Omobranchus sp.</i>	
Animalia	FISH	<i>Opistognathus inornatus</i>	
Animalia	FISH	<i>Ostracion sp.</i>	
Animalia	FISH	<i>Paraplotosus albilabris</i>	
Animalia	FISH	<i>Parascorpaena picta</i>	
Animalia	FISH	<i>Pentapodus porosus</i>	
Animalia	FISH	<i>Periophthalmodon freycineti</i>	
Animalia	FISH	<i>Periophthalmus novaeguineensis</i>	
Animalia	FISH	<i>Periophthalmus sp.</i>	
Animalia	FISH	<i>Pristis zijsron</i>	VU
Animalia	FISH	<i>Protonibeia diacanthus</i>	
Animalia	FISH	<i>Rastrelliger serventyi (invalid)</i>	
Animalia	FISH	<i>Rendahlia joubertensis</i>	
Animalia	FISH	<i>Rhynchostracion nasus</i>	
Animalia	FISH	<i>Salarias sexfilum</i>	
Animalia	FISH	<i>Salarias sp.</i>	
Animalia	FISH	<i>Scaevius milii</i>	
Animalia	FISH	<i>Scomberoides commersonianus</i>	
Animalia	FISH	<i>Scomberomorus semifasciatus</i>	
Animalia	FISH	<i>Selenotoca multifasciata</i>	
Animalia	FISH	<i>Sillago analis</i>	
Animalia	FISH	<i>Sillago schomburgkii</i>	
Animalia	FISH	<i>Strongylura strongylura</i>	
Animalia	FISH	<i>Synanceia horrida</i>	
Animalia	FISH	<i>Synodus sageneus</i>	
Animalia	FISH	<i>Terapon jarbua</i>	
Animalia	FISH	<i>Yongeichthys nebulosus</i>	
Animalia	FISH	<i>Zabidius novemaculeatus</i>	
Animalia	INVERT	'Leicacandona' 'mookae' (PSS)	
Animalia	INVERT	<i>Acariformes sp.</i>	
Animalia	INVERT	<i>Achnantheidium minutissima (K?i?½sz.) Czarnecki</i>	
Animalia	INVERT	<i>Aganippe myg207</i>	
Animalia	INVERT	<i>Allodessus bistrigatus</i>	
Animalia	INVERT	<i>Alona 'davidi vermiculata'</i>	
Animalia	INVERT	<i>Amphora veneta K?i?½sz.</i>	
Animalia	INVERT	<i>Aname ellenae</i>	
Animalia	INVERT	<i>Aname sp.3</i>	
Animalia	INVERT	<i>Anax papuensis</i>	
Animalia	INVERT	<i>Anisops canaliculatus</i>	
Animalia	INVERT	<i>Anisops gratus</i>	
Animalia	INVERT	<i>Anisops nasutus</i>	
Animalia	INVERT	<i>Anisops thienemanni</i>	
Animalia	INVERT	<i>Anomoeoneis brachysira (Br?i?½b.) Grun.</i>	
Animalia	INVERT	<i>Anomoeoneis sphaerophora (Ehr.) Pflizer</i>	
Animalia	INVERT	<i>ant sp.</i>	
Animalia	INVERT	<i>Araneae ident. sp.</i>	
Animalia	INVERT	<i>Arcella sp. P1</i>	
Animalia	INVERT	<i>Areacandona 'iuno' (PSS)</i>	
Animalia	INVERT	<i>Areacandona 'jessicae' (PSS)</i>	
Animalia	INVERT	<i>Areacandona 'krypte' (PSS)</i>	
Animalia	INVERT	<i>Areacandona 'yuleae' (PSS)</i>	
Animalia	INVERT	<i>Arthrohabdus paucispinus</i>	
Animalia	INVERT	<i>Aulacoseira ambigua</i>	
Animalia	INVERT	<i>Austracantha minax</i>	
Animalia	INVERT	<i>Austrolestes analis</i>	
Animalia	INVERT	<i>Bennelongia australis OrdX (PSW)</i>	
Animalia	INVERT	<i>Bennelongia strellyensis</i>	
Animalia	INVERT	<i>Berosus nr josephenae (was Pilbara sp 3) (PSW)</i>	
Animalia	INVERT	<i>Berosus pulchellus</i>	
Animalia	INVERT	<i>Boeckella triarticulata</i>	
Animalia	INVERT	<i>Boreosaragus sp1</i>	
Animalia	INVERT	<i>Buddelundia '14'</i>	
Animalia	INVERT	<i>Buddelundia sp. 10</i>	
Animalia	INVERT	<i>Buddelundia sp. 13</i>	
Animalia	INVERT	<i>Buddelundia sp. 14RE</i>	

Animalia	INVERT	<i>Buddelundia</i> sp. 16
Animalia	INVERT	<i>Buddelundia</i> sp. 17
Animalia	INVERT	<i>Buddelundia</i> sp. 19
Animalia	INVERT	<i>Buddelundia</i> sp. 44
Animalia	INVERT	<i>Buddelundia</i> sp. nov. 10
Animalia	INVERT	<i>Buddelundia</i> sp. nov. 14
Animalia	INVERT	<i>Buddelundia</i> sp. nov. 17
Animalia	INVERT	<i>Buddelundia</i> sp. nov. 19
Animalia	INVERT	<i>Buddelundia</i> sp. nov. 31
Animalia	INVERT	<i>Caloneis pulchra</i> Messikommer
Animalia	INVERT	<i>Caloneis silicula</i> (Ehr.) Cl.
Animalia	INVERT	<i>Camponotus</i> cf. <i>evae</i> Forel (sp. JDM 1116)
Animalia	INVERT	<i>Camponotus discors</i> Forel
Animalia	INVERT	<i>Camponotus feldae</i> Forel
Animalia	INVERT	<i>Campylo discus clypeus</i> Ehr.
Animalia	INVERT	<i>Carenum</i> sp10
Animalia	INVERT	<i>Carenum</i> sp8
Animalia	INVERT	<i>Ceriodaphnia cornuta</i>
Animalia	INVERT	<i>Chaoborus punctilliger</i>
Animalia	INVERT	<i>Chlaenius australis</i>
Animalia	INVERT	<i>Cloeon</i> sp.
Animalia	INVERT	<i>Coelopynia pruinosa</i>
Animalia	INVERT	<i>Cormocephalus strigosus</i>
Animalia	INVERT	<i>Craticula cuspidata</i> (Grun. ex. Van Heurck) Mann
Animalia	INVERT	<i>Craticula halophila</i> (Grun. ex. Van Heurck) Mann
Animalia	INVERT	<i>Cryptochironomus griseidorsum</i>
Animalia	INVERT	<i>Culex</i> (<i>Culex</i>) <i>annulirostris</i>
Animalia	INVERT	<i>Cybister tripunctatus</i>
Animalia	INVERT	<i>Cymbella affinis</i> K??i ₂ /zt.
Animalia	INVERT	<i>Cypretta baylyi</i>
Animalia	INVERT	<i>Cypricercus salinus</i>
Animalia	INVERT	<i>Daphnia carinata</i>
Animalia	INVERT	<i>Daphnia</i> cf. <i>cephalata</i>
Animalia	INVERT	<i>Dasyheleinae</i> sp. P1 (PSW)
Animalia	INVERT	<i>Diacyclops einlei</i>
Animalia	INVERT	<i>Diacyclops humphreysi humphreysi</i>
Animalia	INVERT	<i>Diacyclops scanloni</i>
Animalia	INVERT	<i>Diacyclops sobepronatus</i>
Animalia	INVERT	<i>Dineutus australis</i>
Animalia	INVERT	<i>Diplacodes bipunctata</i>
Animalia	INVERT	<i>Diploneis pseudovalis</i> Hust.
Animalia	INVERT	<i>Ecnomus pilbarensis</i>
Animalia	INVERT	<i>Elaphoidella humphreysi</i>
Animalia	INVERT	<i>Encentricophorus sarasini</i>
Animalia	INVERT	<i>Enochrus</i> sp.
Animalia	INVERT	<i>Eodiaptomus lumholtzi</i>
Animalia	INVERT	<i>Eolimna subminiscula</i> (Grun.) Lange-Bertalot
Animalia	INVERT	<i>Eretes australis</i>
Animalia	INVERT	<i>Ethmostigmus curtipes</i>
Animalia	INVERT	<i>Ethmostigmus parkeri</i>
Animalia	INVERT	<i>Euchlanis dilatata</i>
Animalia	INVERT	<i>Eunotia bilunaris</i> (Ehr.) Mills.
Animalia	INVERT	<i>Eunotia pectinatus</i> (Dillw.) Rabh.
Animalia	INVERT	<i>Flosculariidae</i> sp.
Animalia	INVERT	<i>Fragilaria capucina</i> Desm.
Animalia	INVERT	<i>Fragilaria capucina</i> var. <i>vaucheriae</i> (K??i ₂ /zt.) lange-bertalot
Animalia	INVERT	<i>Fragilaria ulna</i> (Nitz.) Lange Bertalot
Animalia	INVERT	<i>Glyptophysa</i> sp
Animalia	INVERT	<i>Gnathaphanus aridus</i>
Animalia	INVERT	<i>Gnathaphanus multipunctatus</i>
Animalia	INVERT	<i>Gomphonema parvulum</i> (K??i ₂ /zt.) K??i ₂ /zt.
Animalia	INVERT	<i>Graynulla</i> sp. 5
Animalia	INVERT	<i>Halicyclops</i> (<i>Rochacyclops</i>) <i>calm</i>
Animalia	INVERT	<i>Haliphus</i> sp.
Animalia	INVERT	<i>Hantzschia amphioxys</i> (Ehr.) Grun.
Animalia	INVERT	<i>Hemicordulia tau</i>
Animalia	INVERT	<i>Hexarthra</i> cf. <i>brandorffi</i> (PSW)
Animalia	INVERT	<i>Holoplatys meda</i>
Animalia	INVERT	<i>Humphreyscandona waldockae</i>
Animalia	INVERT	<i>Hydra</i> sp.
Animalia	INVERT	<i>Hydrachna</i> sp. 4/5 (PSW)
Animalia	INVERT	<i>Hydraena barbipes</i>
Animalia	INVERT	<i>Hydrobiidae</i> sp P1 (not <i>assimineid</i>) (PSW)
Animalia	INVERT	<i>Hydroglyphus basalis</i>
Animalia	INVERT	<i>Hydroglyphus grammopterus</i> (=trilineatus)
Animalia	INVERT	<i>Hydroglyphus leai</i>
Animalia	INVERT	<i>Hydroglyphus orthogrammus</i>
Animalia	INVERT	<i>Hyphydrus lyratus</i>
Animalia	INVERT	<i>Ilyodromus</i> sp. PB
Animalia	INVERT	<i>Indolpium</i> sp.
Animalia	INVERT	<i>Insulodrilus angela</i>
Animalia	INVERT	<i>Insulodrilus lacustris</i> s.l. <i>Pilbara</i> type 2/3 = WA35 (PSS)
Animalia	INVERT	<i>Iridomyrmex anceps</i> (Roger)
Animalia	INVERT	<i>Iridomyrmex chasei</i> Forel
Animalia	INVERT	<i>Iridomyrmex hartmeyer</i> gp sp. JDM 327
Animalia	INVERT	<i>Iridomyrmex</i> sp. JDM 133
Animalia	INVERT	<i>Ischnura aurora aurora</i>
Animalia	INVERT	<i>Isidorella egraria</i>
Animalia	INVERT	<i>Isocypris williamsi</i> (ex <i>Ilyodromus</i> sp. 413)
Animalia	INVERT	<i>Keratella procurva</i>
Animalia	INVERT	<i>Keratella tropica</i>
Animalia	INVERT	<i>Knoelle clara</i>
Animalia	INVERT	<i>Kwonkan myg007</i>
Animalia	INVERT	<i>Laccophilus clarki</i>

Animalia	INVERT	<i>Laccophilus sharpi</i>
Animalia	INVERT	<i>Lampona ampeinna</i>
Animalia	INVERT	<i>Lamponina scutata</i>
Animalia	INVERT	<i>Larsia albiceps</i>
Animalia	INVERT	<i>Latonopsis australis</i>
Animalia	INVERT	<i>Latrodectus hasseltii</i>
Animalia	INVERT	<i>Lychas 'adonis'</i>
Animalia	INVERT	<i>Lychas 'harveyi'</i>
Animalia	INVERT	<i>Lychas annulatus</i>
Animalia	INVERT	<i>Lychas annulatus' Glauert, 1925</i>
Animalia	INVERT	<i>Lychas bituberculatus</i>
Animalia	INVERT	<i>Lychas harveyi</i>
Animalia	INVERT	<i>Lychas i₂/ai₂/ai₂/bituberculatusi₂/ai₂/ai₂/2</i>
Animalia	INVERT	<i>Lycidas sp. 11</i>
Animalia	INVERT	<i>Macrochaetus altamirai</i>
Animalia	INVERT	<i>Masasteron tealei</i>
Animalia	INVERT	<i>Megaporus sp.</i>
Animalia	INVERT	<i>Mellitidae sp. 1 (PSS)</i>
Animalia	INVERT	<i>Mesocyclops brooksi</i>
Animalia	INVERT	<i>Microcerberidae sp.</i>
Animalia	INVERT	<i>Microcyclops varicans</i>
Animalia	INVERT	<i>Micronecta gracilis</i>
Animalia	INVERT	<i>Micronecta n. sp. P3 (PSW)</i>
Animalia	INVERT	<i>Micronecta robusta</i>
Animalia	INVERT	<i>Minasteron minusculum</i>
Animalia	INVERT	<i>Moina micrura s.l.</i>
Animalia	INVERT	<i>Monomorium disetigerum Heterick</i>
Animalia	INVERT	<i>Monopylephorus n. sp. WA29 (ex Pristina WA3) (PSS)</i>
Animalia	INVERT	<i>Morebilus diversus</i>
Animalia	INVERT	<i>Navicula cryptocephala K??i₂/2tz.</i>
Animalia	INVERT	<i>Navicula kriegerii</i>
Animalia	INVERT	<i>Navicula molestiformis Hust.</i>
Animalia	INVERT	<i>Nedsia sp.</i>
Animalia	INVERT	<i>Nematoda sp. P2/P4 (PSW)</i>
Animalia	INVERT	<i>Nilobezzia sp.</i>
Animalia	INVERT	<i>Nilobezzia sp. P2 (PSW)</i>
Animalia	INVERT	<i>Nitzschia constricta (Greg.) Grun.</i>
Animalia	INVERT	<i>Nitzschia filiformis (W. Sm.) Van Heurck</i>
Animalia	INVERT	<i>Nitzschia linearis (Ag.) W. Sm.</i>
Animalia	INVERT	<i>Nitzschia microcephala Grun.</i>
Animalia	INVERT	<i>Nitzschia palea (K??i₂/2tz.) W. Sm.</i>
Animalia	INVERT	<i>Nitzschia sigma (K??i₂/2tz.) W. Sm.</i>
Animalia	INVERT	<i>No invertebrates</i>
Animalia	INVERT	<i>Nomindra leeuwenii</i>
Animalia	INVERT	<i>Ochetellus flavipes (Kirby)</i>
Animalia	INVERT	<i>Odontomachus ruficeps Smith</i>
Animalia	INVERT	<i>Oecefis sp. Pilbara 5 (PSW)</i>
Animalia	INVERT	<i>Orfhetrum caledonicum</i>
Animalia	INVERT	<i>Ostracoda (unident.)</i>
Animalia	INVERT	<i>Ozestheria packardi</i>
Animalia	INVERT	<i>Pachycondyla (Brachyponera) lutea (Mayr)</i>
Animalia	INVERT	<i>Pantala flavescens</i>
Animalia	INVERT	<i>Paracladopelma sp. P2 (nr M2) (PSW)</i>
Animalia	INVERT	<i>Paracymus spenceri</i>
Animalia	INVERT	<i>Parastenocaris jane</i>
Animalia	INVERT	<i>Paratrechina braueri glabrior (Forel)</i>
Animalia	INVERT	<i>Paratrechina minutula (Forel)</i>
Animalia	INVERT	<i>Pescecylops sp. P1</i>
Animalia	INVERT	<i>Pheidole sp. JDM 1176</i>
Animalia	INVERT	<i>Pheidole sp. JDM 536</i>
Animalia	INVERT	<i>Phorticosomus gularis</i>
Animalia	INVERT	<i>Phorticosomus sp2</i>
Animalia	INVERT	<i>Phreodrilid with dissimilar ventral chaetae</i>
Animalia	INVERT	<i>Phreodrilid with similar ventral chaetae</i>
Animalia	INVERT	<i>Pilbarascutigera incola</i>
Animalia	INVERT	<i>Pinnularia divergens W. Sm.</i>
Animalia	INVERT	<i>Pinnularia subrostrata (A. Cl.) Cl.-Euler</i>
Animalia	INVERT	<i>Polyarthra dolichoptera</i>
Animalia	INVERT	<i>Polypedilum leei</i>
Animalia	INVERT	<i>Polypedilum watsoni</i>
Animalia	INVERT	<i>Procladius paludicola</i>
Animalia	INVERT	<i>Pseudocloeon hypodelum (ex Baetid genus3 WA sp. 2) (PSW)</i>
Animalia	INVERT	<i>pseudoscorpion austrohorus</i>
Animalia	INVERT	<i>pseudoscorpion Genus 7/4</i>
Animalia	INVERT	<i>pseudoscorpion indolpium</i>
Animalia	INVERT	<i>pseudoscorpion sp.</i>
Animalia	INVERT	<i>Ptygura sp.</i>
Animalia	INVERT	<i>Regimbartia attenuata</i>
Animalia	INVERT	<i>Reimeria sinutata</i>
Animalia	INVERT	<i>Rhagada cf. richardsonii</i>
Animalia	INVERT	<i>Rhagada sp. (juv)</i>
Animalia	INVERT	<i>Rhopalodia gibba (Ehr.) O. Mull.)</i>
Animalia	INVERT	<i>Rhytidoponera tyloxys Brown & Douglas</i>
Animalia	INVERT	<i>Saldidae sp.</i>
Animalia	INVERT	<i>Scolopendra laeta</i>
Animalia	INVERT	<i>Scolopendra morsitans</i>
Animalia	INVERT	<i>Spinasteron arenarium</i>
Animalia	INVERT	<i>Spongillidae sp.</i>
Animalia	INVERT	<i>Stauroneis anceps Ehr.</i>
Animalia	INVERT	<i>Stauroneis phoenicenteron (Nitz.) Ehr.</i>
Animalia	INVERT	<i>Stauroneis producta</i>
Animalia	INVERT	<i>Stenaspidius sp. nov. nr. albosetosus</i>
Animalia	INVERT	<i>Sternopriscus sp.</i>
Animalia	INVERT	<i>Stygonitocrella bispinosa</i>

Animalia	INVERT	<i>Stygonitocrella trispinosa</i>	
Animalia	INVERT	<i>Stygonitocrella unispinosa</i>	
Animalia	INVERT	<i>Supunna</i> sp.1	
Animalia	INVERT	<i>Supunna</i> sp.13	
Animalia	INVERT	<i>Surirella striatula</i> Turp.	
Animalia	INVERT	<i>Tanytarsus</i> sp. P4 (PSW)	
Animalia	INVERT	<i>Tasmanocoenis arcuata</i>	
Animalia	INVERT	<i>Tasmanocoenis</i> sp. E (PSW)	
Animalia	INVERT	<i>Testudinella patina</i>	
Animalia	INVERT	<i>Tetramorium spininode</i> Bolton	
Animalia	INVERT	<i>Tetramorium striolatum</i> Viehmeyer	
Animalia	INVERT	<i>Thermocyclops decipiens</i>	
Animalia	INVERT	<i>Tramea stenoloba</i>	
Animalia	INVERT	<i>Trichocerca braziliensis</i>	
Animalia	INVERT	<i>Trichocerca similis</i>	
Animalia	INVERT	<i>Trichocycclus gnalooma</i>	
Animalia	INVERT	<i>Triplectides australis</i>	
Animalia	INVERT	<i>Tubificidae</i> WA24 (PSS)	
Animalia	INVERT	<i>Tyrannochthonius aridus</i>	
Animalia	INVERT	<i>Urodacus armatus</i>	
Animalia	INVERT	<i>Urodacus hoplurus</i>	
Animalia	MAMMAL	<i>Antechinomys laniger</i>	
Animalia	MAMMAL	<i>Bos taurus</i>	
Animalia	MAMMAL	<i>Canis familiaris</i>	
Animalia	MAMMAL	<i>Canis lupus</i>	
Animalia	MAMMAL	<i>Canis lupus</i> subsp. dingo	
Animalia	MAMMAL	<i>Canis lupus</i> subsp. familiaris	
Animalia	MAMMAL	<i>Chaerephon jobensis</i>	
Animalia	MAMMAL	<i>Chalinolobus gouldii</i>	
Animalia	MAMMAL	<i>Dasyercus blythi</i>	P4
Animalia	MAMMAL	<i>Dasyercus cristicauda</i>	P4
Animalia	MAMMAL	<i>Dasyercus</i> sp.	
Animalia	MAMMAL	<i>Dasykaluta rosamondae</i>	
Animalia	MAMMAL	<i>Dasykaluta rosemondade</i>	
Animalia	MAMMAL	<i>Dasyurus hallucatus</i>	EN
Animalia	MAMMAL	<i>Dugong dugon</i>	OS
Animalia	MAMMAL	<i>Equus caballus</i>	
Animalia	MAMMAL	<i>Felis catus</i>	
Animalia	MAMMAL	<i>Lagostrophus fasciatus</i> subsp. fasciatus	VU
Animalia	MAMMAL	<i>Macroderma gigas</i>	VU
Animalia	MAMMAL	<i>Macropus robustus</i>	
Animalia	MAMMAL	<i>Macropus robustus</i> subsp. erubescens	
Animalia	MAMMAL	<i>Macropus rufus</i>	
Animalia	MAMMAL	<i>Macrotis lagotis</i>	VU
Animalia	MAMMAL	<i>Mormopterus (Ozimops) cobourgianus</i>	
Animalia	MAMMAL	<i>Mormopterus loriae</i> subsp. cobourgiana	
Animalia	MAMMAL	<i>Mus musculus</i>	
Animalia	MAMMAL	<i>Ningauai timealeyi</i>	
Animalia	MAMMAL	<i>Notomys alexis</i>	
Animalia	MAMMAL	<i>Nyctophilus arnhemensis</i>	
Animalia	MAMMAL	<i>Nyctophilus geoffroyi</i>	
Animalia	MAMMAL	<i>Oryctolagus cuniculus</i>	
Animalia	MAMMAL	<i>Osphranter robustus</i>	
Animalia	MAMMAL	<i>Ozimops cobourgianus</i>	
Animalia	MAMMAL	<i>Petrogale rothschildi</i>	
Animalia	MAMMAL	<i>Planigale ingrami</i>	
Animalia	MAMMAL	<i>Pseudantechinus woolleyae</i>	
Animalia	MAMMAL	<i>Pseudomys chapmani</i>	P4
Animalia	MAMMAL	<i>Pseudomys delicatulus</i>	
Animalia	MAMMAL	<i>Pseudomys desertor</i>	
Animalia	MAMMAL	<i>Pseudomys hermannsburgensis</i>	
Animalia	MAMMAL	<i>Pseudomys nanus</i>	
Animalia	MAMMAL	<i>Rattus rattus</i>	
Animalia	MAMMAL	<i>Rhinonictis aurantius</i>	
Animalia	MAMMAL	<i>Saccolaimus flaviventris</i>	
Animalia	MAMMAL	<i>Scotorepens greyii</i>	
Animalia	MAMMAL	<i>Sminthopsis macroura</i>	
Animalia	MAMMAL	<i>Sminthopsis youngsoni</i>	
Animalia	MAMMAL	<i>Sousa chinensis</i>	
Animalia	MAMMAL	<i>Tachyglossus aculeatus</i>	
Animalia	MAMMAL	<i>Tadarida australis</i>	
Animalia	MAMMAL	<i>Taphozous georgianus</i>	
Animalia	MAMMAL	<i>Tursiops aduncus</i>	
Animalia	MAMMAL	<i>Tursiops</i> sp.	
Animalia	MAMMAL	<i>Vespadelus finlaysoni</i>	
Animalia	MAMMAL	<i>Vulpes vulpes</i>	
Animalia	MAMMAL	<i>Zyzomys argurus</i>	
Animalia	REPTILE	<i>Acanthophis</i> GT NOTHERN species	
Animalia	REPTILE	<i>Acanthophis pyrrhus</i>	
Animalia	REPTILE	<i>Acanthophis wellsei</i>	
Animalia	REPTILE	<i>Aipysurus laevis</i>	
Animalia	REPTILE	<i>Amphibolurus gilberti</i>	
Animalia	REPTILE	<i>Amphibolurus longirostris</i>	
Animalia	REPTILE	<i>Antaresia perthensis</i>	
Animalia	REPTILE	<i>Antaresia stimsoni</i>	
Animalia	REPTILE	<i>Antaresia stimsoni</i> subsp. stimsoni	
Animalia	REPTILE	<i>Aspidites melanocephalus</i>	
Animalia	REPTILE	<i>Aspidites ramsayi</i>	
Animalia	REPTILE	<i>Brachyuropsis approximans</i>	
Animalia	REPTILE	<i>Carlia munda</i>	
Animalia	REPTILE	<i>Carlia triacantha</i>	
Animalia	REPTILE	<i>Chelonia mydas</i>	VU
Animalia	REPTILE	<i>Chelonia</i> sp.	
Animalia	REPTILE	<i>Cryptoblepharus buchananii</i>	

Animalia	REPTILE	<i>Cryptoblepharus plagiocephalus</i>	
Animalia	REPTILE	<i>Ctenophorus caudicinctus</i>	
Animalia	REPTILE	<i>Ctenophorus caudicinctus</i> subsp. <i>caudicinctus</i>	
Animalia	REPTILE	<i>Ctenophorus isolepis</i>	
Animalia	REPTILE	<i>Ctenophorus isolepis</i> subsp. <i>isolepis</i>	
Animalia	REPTILE	<i>Ctenophorus nuchalis</i>	
Animalia	REPTILE	<i>Ctenophorus reticulatus</i>	
Animalia	REPTILE	<i>Ctenotus angusticeps</i>	P3
Animalia	REPTILE	<i>Ctenotus duricola</i>	
Animalia	REPTILE	<i>Ctenotus duricola</i> /piankai	
Animalia	REPTILE	<i>Ctenotus dux</i>	
Animalia	REPTILE	<i>Ctenotus grandis</i>	
Animalia	REPTILE	<i>Ctenotus grandis</i> subsp. <i>titan</i>	
Animalia	REPTILE	<i>Ctenotus hanloni</i>	
Animalia	REPTILE	<i>Ctenotus helenae</i>	
Animalia	REPTILE	<i>Ctenotus pantherinus</i>	
Animalia	REPTILE	<i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i>	
Animalia	REPTILE	<i>Ctenotus piankai</i>	
Animalia	REPTILE	<i>Ctenotus rufescens</i>	
Animalia	REPTILE	<i>Ctenotus saxatilis</i>	
Animalia	REPTILE	<i>Ctenotus serventyi</i>	
Animalia	REPTILE	<i>Delma butleri</i>	
Animalia	REPTILE	<i>Delma haroldi</i>	
Animalia	REPTILE	<i>Delma pax</i>	
Animalia	REPTILE	<i>Delma tincta</i>	
Animalia	REPTILE	<i>Demansia psammophis</i>	
Animalia	REPTILE	<i>Demansia psammophis</i> subsp. <i>cupreiceps</i>	
Animalia	REPTILE	<i>Demansia rufescens</i>	
Animalia	REPTILE	<i>Demansia torquata</i>	
Animalia	REPTILE	<i>Diplodactylus conspicillatus</i>	
Animalia	REPTILE	<i>Diporiphora paraconvergens</i>	
Animalia	REPTILE	<i>Diporiphora pindan</i>	
Animalia	REPTILE	<i>Diporiphora vescus</i>	
Animalia	REPTILE	<i>Diporiphora winneckeii</i>	
Animalia	REPTILE	<i>Egernia depressa</i>	
Animalia	REPTILE	<i>Emydocephalus annulatus</i>	
Animalia	REPTILE	<i>Eremiascincus fasciolatus</i>	
Animalia	REPTILE	<i>Eremiascincus isolepis</i>	
Animalia	REPTILE	<i>Eremiascincus musivus</i>	
Animalia	REPTILE	<i>Eremiascincus pallidus</i>	
Animalia	REPTILE	<i>Eretmochelys imbricata</i> subsp. <i>bissa</i>	
Animalia	REPTILE	<i>Fordonia leucobalia</i>	
Animalia	REPTILE	<i>Furina ornata</i>	
Animalia	REPTILE	<i>Gehyra pilbara</i>	
Animalia	REPTILE	<i>Gehyra punctata</i>	
Animalia	REPTILE	<i>Gehyra purpurascens</i>	
Animalia	REPTILE	<i>Gehyra variegata</i>	
Animalia	REPTILE	<i>Gehyra variegata</i> /purpurascens	
Animalia	REPTILE	<i>Hemidactylus frenatus</i>	
Animalia	REPTILE	<i>Heteronotia binoei</i>	
Animalia	REPTILE	<i>Hydrelaps darwiniensis</i>	
Animalia	REPTILE	<i>Hydrophis elegans</i>	
Animalia	REPTILE	<i>Hydrophis ornatus ocellatus</i>	
Animalia	REPTILE	<i>Hydrophis stokesii</i>	
Animalia	REPTILE	<i>Lerista bipes</i>	
Animalia	REPTILE	<i>Lerista clara</i>	
Animalia	REPTILE	<i>Lerista muelleri</i>	
Animalia	REPTILE	<i>Lialis burtonis</i>	
Animalia	REPTILE	<i>Lophognathus gilberti</i>	
Animalia	REPTILE	<i>Lophognathus longirostris</i>	
Animalia	REPTILE	<i>Lucasium 'woodwardi'</i>	
Animalia	REPTILE	<i>Lucasium stenodactylum</i>	
Animalia	REPTILE	<i>Menetia greyii</i>	
Animalia	REPTILE	<i>Morethia ruficauda</i>	
Animalia	REPTILE	<i>Morethia ruficauda</i> subsp. <i>exquisita</i>	
Animalia	REPTILE	<i>Natator depressus</i>	VU
Animalia	REPTILE	<i>Nephurus levis</i>	
Animalia	REPTILE	<i>Nephurus levis</i> subsp. <i>pilbarensis</i>	
Animalia	REPTILE	<i>Pogona minor</i>	
Animalia	REPTILE	<i>Pogona minor</i> subsp. <i>minima</i>	VU
Animalia	REPTILE	<i>Pogona minor</i> subsp. <i>minor</i>	
Animalia	REPTILE	<i>Pogona minor</i> subsp. <i>mitchelli</i>	
Animalia	REPTILE	<i>Pseudechis australis</i>	
Animalia	REPTILE	<i>Pseudonaja mengdeni</i>	
Animalia	REPTILE	<i>Pseudonaja modesta</i>	
Animalia	REPTILE	<i>Pseudonaja nuchalis</i>	
Animalia	REPTILE	<i>Pygopus nigriceps</i>	
Animalia	REPTILE	<i>Ramphotyphlops ammodytes</i>	
Animalia	REPTILE	<i>Ramphotyphlops braminus</i>	
Animalia	REPTILE	<i>Ramphotyphlops grypus</i>	
Animalia	REPTILE	<i>Ramphotyphlops</i> GT NOTHERN species	
Animalia	REPTILE	<i>Ramphotyphlops pilbarensis</i>	
Animalia	REPTILE	<i>Rhynchoedura ornata</i>	
Animalia	REPTILE	<i>Simoselaps anomalus</i>	
Animalia	REPTILE	<i>Strophurus ciliaris</i> subsp. <i>aberrans</i>	
Animalia	REPTILE	<i>Strophurus ciliaris</i> subsp. <i>ciliaris</i>	
Animalia	REPTILE	<i>Strophurus elderi</i>	
Animalia	REPTILE	<i>Strophurus jeanae</i>	
Animalia	REPTILE	<i>Suta punctata</i>	
Animalia	REPTILE	<i>Tiliqua multifasciata</i>	
Animalia	REPTILE	<i>Varanus acanthurus</i>	
Animalia	REPTILE	<i>Varanus brevicauda</i>	
Animalia	REPTILE	<i>Varanus bushi</i>	
Animalia	REPTILE	<i>Varanus eremius</i>	

Animalia	REPTILE	<i>Varanus giganteus</i>	
Animalia	REPTILE	<i>Varanus gouldii</i>	
Animalia	REPTILE	<i>Varanus panoptes</i>	
Animalia	REPTILE	<i>Varanus pilbarensis</i>	
Fungi	FUNGUS	<i>Anthraco cystis paraneurachnis</i>	
Fungi	FUNGUS	<i>Cercospora ipomoeae</i>	
Fungi	FUNGUS	<i>Corioliopsis brunneo-leuca</i>	
Fungi	FUNGUS	<i>Ganoderma steyaertanum</i>	
Fungi	FUNGUS	<i>Macalpinomyces eriachnes</i>	
Fungi	FUNGUS	<i>Polyporus hartmannii</i>	
Fungi	FUNGUS	<i>Triodiomyces altitilis</i>	
Fungi	FUNGUS	<i>Triodiomyces lituanus</i>	
Fungi	LICHEN	<i>Xanthoparmelia taractica</i>	
Plantae	ALGA	<i>Acanthophora spicifera</i>	
Plantae	ALGA	<i>Anadyomene plicata</i>	
Plantae	ALGA	<i>Asparagopsis taxiformis</i>	
Plantae	ALGA	<i>Caulerpa brachypus</i>	
Plantae	ALGA	<i>Caulerpa chemnitzia</i>	
Plantae	ALGA	<i>Caulerpa cylindracea</i>	
Plantae	ALGA	<i>Caulerpa lamoурouxii</i>	
Plantae	ALGA	<i>Caulerpa lentillifera</i>	
Plantae	ALGA	<i>Caulerpa racemosa forma laxa</i>	
Plantae	ALGA	<i>Caulerpa sertularioides</i>	
Plantae	ALGA	<i>Chaetomorpha melagonium</i>	
Plantae	ALGA	<i>Dichotomaria obtusata</i>	
Plantae	ALGA	<i>Dictyosphaeria cavernosa</i>	
Plantae	ALGA	<i>Galaxaura rugosa</i>	
Plantae	ALGA	<i>Gelidiella acerosa</i>	
Plantae	ALGA	<i>Heterosiphonia crassipes</i>	
Plantae	ALGA	<i>Neomeris bilimbata</i>	
Plantae	ALGA	<i>Neomeris van-bosseae</i>	
Plantae	ALGA	<i>Sebdenia flabellata</i>	
Plantae	ALGA	<i>Udotea argentea</i>	
Plantae	ALGA	<i>Udotea glaucescens</i>	
Plantae	DICOT	<i>Abutilon lepidum</i>	
Plantae	DICOT	<i>Abutilon otocarpum</i>	
Plantae	DICOT	<i>Abutilon oxycarpum</i> subsp. <i>Prostrate</i> (A.A. Mitchell PRP 1266)	
Plantae	DICOT	<i>Abutilon</i> sp. <i>Dioicum</i> (A.A. Mitchell PRP 1618)	
Plantae	DICOT	<i>Abutilon</i> sp. <i>Pritzelianum</i> (S. van Leeuwen 5095)	P3
Plantae	DICOT	<i>Acacia acradenia</i>	
Plantae	DICOT	<i>Acacia ancistrocarpa</i>	
Plantae	DICOT	<i>Acacia bivenosa</i>	
Plantae	DICOT	<i>Acacia bivenosa</i> x <i>sclerosperma</i> subsp. <i>sclerosperma</i>	
Plantae	DICOT	<i>Acacia colei</i>	
Plantae	DICOT	<i>Acacia colei</i> var. <i>colei</i>	
Plantae	DICOT	<i>Acacia dictyophleba</i>	
Plantae	DICOT	<i>Acacia inaequilatera</i>	
Plantae	DICOT	<i>Acacia maitlandii</i>	
Plantae	DICOT	<i>Acacia melleodora</i>	
Plantae	DICOT	<i>Acacia orthocarpa</i>	
Plantae	DICOT	<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>	
Plantae	DICOT	<i>Acacia robeorum</i>	
Plantae	DICOT	<i>Acacia sabulosa</i>	
Plantae	DICOT	<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	
Plantae	DICOT	<i>Acacia</i> sp.	
Plantae	DICOT	<i>Acacia sphaerostachya</i>	
Plantae	DICOT	<i>Acacia stellaticeps</i>	
Plantae	DICOT	<i>Acacia synchronicia</i>	
Plantae	DICOT	<i>Acacia trachycarpa</i>	
Plantae	DICOT	<i>Acacia tumida</i> var. <i>pilbarensis</i>	
Plantae	DICOT	<i>Adriana tomentosa</i>	
Plantae	DICOT	<i>Adriana tomentosa</i> var. <i>tomentosa</i>	
Plantae	DICOT	<i>Aegiceras corniculatum</i>	
Plantae	DICOT	<i>Aerva javanica</i>	
Plantae	DICOT	<i>Aeschynomene indica</i>	
Plantae	DICOT	<i>Albizia lebbeck</i>	
Plantae	DICOT	<i>Alternanthera angustifolia</i>	
Plantae	DICOT	<i>Alternanthera nana</i>	
Plantae	DICOT	<i>Alysicarpus muelleri</i>	
Plantae	DICOT	<i>Amaranthus pallidiflorus</i>	
Plantae	DICOT	<i>Ammannia muelleri</i>	
Plantae	DICOT	<i>Ammannia multiflora</i>	
Plantae	DICOT	<i>Amyema preissii</i>	
Plantae	DICOT	<i>Argemone ochroleuca</i> subsp. <i>ochroleuca</i>	
Plantae	DICOT	<i>Atriplex semilunaris</i>	
Plantae	DICOT	<i>Avicennia marina</i>	
Plantae	DICOT	<i>Avicennia marina</i> subsp. <i>marina</i>	
Plantae	DICOT	<i>Bergia henschalii</i>	
Plantae	DICOT	<i>Bergia pedicellaris</i>	
Plantae	DICOT	<i>Bergia trimeria</i>	
Plantae	DICOT	<i>Blumea tenella</i>	
Plantae	DICOT	<i>Boerhavia coccinea</i>	
Plantae	DICOT	<i>Boerhavia repleta</i>	
Plantae	DICOT	<i>Bonamia alatisemina</i>	
Plantae	DICOT	<i>Bonamia erecta</i>	
Plantae	DICOT	<i>Bonamia linearis</i>	
Plantae	DICOT	<i>Bonamia media</i>	
Plantae	DICOT	<i>Bonamia oblongifolia</i>	P3
Plantae	DICOT	<i>Bonamia</i> sp.	
Plantae	DICOT	<i>Bruguiera exaristata</i>	
Plantae	DICOT	<i>Byblis filifolia</i>	
Plantae	DICOT	<i>Byblis</i> sp.	
Plantae	DICOT	<i>Cajanus cinereus</i>	
Plantae	DICOT	<i>Cajanus marmoratus</i>	

Plantae	DICOT	<i>Cajanus pubescens</i>
Plantae	DICOT	<i>Calandrinia pentavalvis</i>
Plantae	DICOT	<i>Calandrinia pumila</i>
Plantae	DICOT	<i>Calandrinia</i> sp. <i>Pinga</i> (T.R. Lally TRL 722)
Plantae	DICOT	<i>Calandrinia stagnensis</i>
Plantae	DICOT	<i>Calandrinia tepperiana</i>
Plantae	DICOT	<i>Calotis hispidula</i>
Plantae	DICOT	<i>Canavalia rosea</i>
Plantae	DICOT	<i>Capparis spinosa</i> subsp. <i>nummularia</i>
Plantae	DICOT	<i>Carissa lanceolata</i>
Plantae	DICOT	<i>Cassutha capillaris</i>
Plantae	DICOT	<i>Centipeda minima</i>
Plantae	DICOT	<i>Ceriops australis</i>
Plantae	DICOT	<i>Ceriops tagal</i>
Plantae	DICOT	<i>Chrysocephalum apiculatum</i> subsp. <i>pilbarensis</i>
Plantae	DICOT	<i>Citrullus amarus</i>
Plantae	DICOT	<i>Cleome uncifera</i> subsp. <i>uncifera</i>
Plantae	DICOT	<i>Cleome viscosa</i>
Plantae	DICOT	<i>Clerodendrum tomentosum</i> var. <i>lanceolatum</i>
Plantae	DICOT	<i>Cliforia ternatea</i>
Plantae	DICOT	<i>Coccinia grandis</i>
Plantae	DICOT	<i>Codonocarpus cotinifolius</i>
Plantae	DICOT	<i>Conyza bonariensis</i>
Plantae	DICOT	<i>Corchorus camarvonensis</i>
Plantae	DICOT	<i>Corchorus elachocarpus</i>
Plantae	DICOT	<i>Corchorus incanus</i>
Plantae	DICOT	<i>Corchorus incanus</i> subsp. <i>incanus</i>
Plantae	DICOT	<i>Corchorus laniflorus</i>
Plantae	DICOT	<i>Corchorus tridens</i>
Plantae	DICOT	<i>Corchorus trilocularis</i>
Plantae	DICOT	<i>Corchorus walcottii</i>
Plantae	DICOT	<i>Corymbia aspera</i>
Plantae	DICOT	<i>Corymbia candida</i>
Plantae	DICOT	<i>Corymbia candida</i> / <i>flavescens</i>
Plantae	DICOT	<i>Corymbia candida</i> subsp. <i>lausifolia</i>
Plantae	DICOT	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>
Plantae	DICOT	<i>Corymbia flavescens</i>
Plantae	DICOT	<i>Corymbia hamersleyana</i>
Plantae	DICOT	<i>Corymbia zygophylla</i>
Plantae	DICOT	<i>Crotalaria cunninghamii</i>
Plantae	DICOT	<i>Crotalaria dissitiflora</i> subsp. <i>benthamiana</i>
Plantae	DICOT	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>
Plantae	DICOT	<i>Crotalaria ramosissima</i>
Plantae	DICOT	<i>Crotalaria spectabilis</i> subsp. <i>spectabilis</i>
Plantae	DICOT	<i>Cucumis maderaspatanus</i>
Plantae	DICOT	<i>Cucumis variabilis</i>
Plantae	DICOT	<i>Cullen lachnostachys</i>
Plantae	DICOT	<i>Cullen leucanthum</i>
Plantae	DICOT	<i>Cullen leucochaites</i>
Plantae	DICOT	<i>Cullen martinii</i>
Plantae	DICOT	<i>Cullen stipulaceum</i>
Plantae	DICOT	<i>Cyanthillium cinereum</i> var. <i>cinereum</i>
Plantae	DICOT	<i>Dentella asperata</i>
Plantae	DICOT	<i>Desmodium filiforme</i>
Plantae	DICOT	<i>Desmodium scorpiurus</i>
Plantae	DICOT	<i>Desmodium</i> sp.
Plantae	DICOT	<i>Dissochordia paradoxa</i>
Plantae	DICOT	<i>Distimake davenportii</i>
Plantae	DICOT	<i>Distimake dissectus</i> var. <i>dissectus</i>
Plantae	DICOT	<i>Dodonaea coriacea</i>
Plantae	DICOT	<i>Dolichandrone occidentalis</i>
Plantae	DICOT	<i>Drosera burmanni</i>
Plantae	DICOT	<i>Drosera indica</i>
Plantae	DICOT	<i>Dysphania plantaginella</i>
Plantae	DICOT	<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>
Plantae	DICOT	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>
Plantae	DICOT	<i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>
Plantae	DICOT	<i>Eucalyptus victrix</i>
Plantae	DICOT	<i>Euphorbia alsiniflora</i>
Plantae	DICOT	<i>Euphorbia australis</i>
Plantae	DICOT	<i>Euphorbia australis</i> var. <i>australis</i>
Plantae	DICOT	<i>Euphorbia australis</i> var. <i>subtomentosa</i>
Plantae	DICOT	<i>Euphorbia biconvexa</i>
Plantae	DICOT	<i>Euphorbia coghlanii</i>
Plantae	DICOT	<i>Euphorbia myrtoides</i>
Plantae	DICOT	<i>Euphorbia psilosperma</i>
Plantae	DICOT	<i>Euphorbia</i> sp.
Plantae	DICOT	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>
Plantae	DICOT	<i>Euphorbia tirucalli</i>
Plantae	DICOT	<i>Euphorbia trigonosperma</i>
Plantae	DICOT	<i>Euphorbia vaccaria</i> var. <i>vaccaria</i>
Plantae	DICOT	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>
Plantae	DICOT	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>
Plantae	DICOT	<i>Ficus aculeata</i> var. <i>indecora</i>
Plantae	DICOT	<i>Ficus brachypoda</i>
Plantae	DICOT	<i>Flaveria trinervia</i>
Plantae	DICOT	<i>Frankenia ambita</i>
Plantae	DICOT	<i>Frankenia pauciflora</i>
Plantae	DICOT	<i>Glossostigma diandrum</i>
Plantae	DICOT	<i>Glycine</i> sp.
Plantae	DICOT	<i>Glycine tomentella</i>
Plantae	DICOT	<i>Gomphrena affinis</i> subsp. <i>pilbarensis</i>
Plantae	DICOT	<i>Gomphrena canescens</i> subsp. <i>canescens</i>
Plantae	DICOT	<i>Gomphrena celosioides</i>

Plantae	DICOT	<i>Gomphrena cunninghamii</i>	
Plantae	DICOT	<i>Gomphrena leptoclada</i>	
Plantae	DICOT	<i>Gomphrena leptoclada</i> subsp. <i>leptoclada</i>	
Plantae	DICOT	<i>Gomphrena leptophylla</i>	P3
Plantae	DICOT	<i>Gomphrena pusilla</i>	P2
Plantae	DICOT	<i>Gomphrena sordida</i>	
Plantae	DICOT	<i>Gonocarpus ephemerus</i>	
Plantae	DICOT	<i>Goodenia armiflora</i>	
Plantae	DICOT	<i>Goodenia forrestii</i>	
Plantae	DICOT	<i>Goodenia lamprosperma</i>	
Plantae	DICOT	<i>Goodenia microptera</i>	
Plantae	DICOT	<i>Goodenia muelleriana</i>	
Plantae	DICOT	<i>Goodenia nuda</i>	P4
Plantae	DICOT	<i>Goodenia stobbsiana</i>	
Plantae	DICOT	<i>Gossypium australe</i>	
Plantae	DICOT	<i>Gossypium hirsutum</i>	
Plantae	DICOT	<i>Grevillea pyramidalis</i>	
Plantae	DICOT	<i>Grevillea wickhamii</i> subsp. <i>hispidula</i>	
Plantae	DICOT	<i>Gymnanthera cunninghamii</i>	P3
Plantae	DICOT	<i>Hakea lorea</i> subsp. <i>lorea</i>	
Plantae	DICOT	<i>Haloragis gossei</i>	
Plantae	DICOT	<i>Heliotropium conocarpum</i>	
Plantae	DICOT	<i>Heliotropium crispatum</i>	
Plantae	DICOT	<i>Heliotropium cunninghamii</i>	
Plantae	DICOT	<i>Heliotropium muticum</i>	P3
Plantae	DICOT	<i>Heliotropium pachyphyllum</i>	
Plantae	DICOT	<i>Heliotropium</i> sp.	
Plantae	DICOT	<i>Hemichroa diandra</i>	
Plantae	DICOT	<i>Hibiscus austrinus</i> var. <i>austrinus</i>	
Plantae	DICOT	<i>Hibiscus brachychlaenus</i>	
Plantae	DICOT	<i>Hibiscus goldsworthii</i>	
Plantae	DICOT	<i>Hibiscus leptocladus</i>	
Plantae	DICOT	<i>Hybanthus aurantiacus</i>	
Plantae	DICOT	<i>Hypertelis cerviana</i>	
Plantae	DICOT	<i>Indigofera parviflorum</i>	
Plantae	DICOT	<i>Indigofera boviparda</i> subsp. <i>boviparda</i>	
Plantae	DICOT	<i>Indigofera colutea</i>	
Plantae	DICOT	<i>Indigofera hirsuta</i>	
Plantae	DICOT	<i>Indigofera hochstetteri</i>	
Plantae	DICOT	<i>Indigofera linifolia</i>	
Plantae	DICOT	<i>Indigofera linnaei</i>	
Plantae	DICOT	<i>Indigofera monophylla</i>	
Plantae	DICOT	<i>Indigofera oblongifolia</i>	
Plantae	DICOT	<i>Indigofera rugosa</i>	
Plantae	DICOT	<i>Indigofera sessiliflora</i>	
Plantae	DICOT	<i>Indigofera trita</i>	
Plantae	DICOT	<i>Ipomoea muelleri</i>	
Plantae	DICOT	<i>Ipomoea pes-caprae</i>	
Plantae	DICOT	<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>	
Plantae	DICOT	<i>Ipomoea polymorpha</i>	
Plantae	DICOT	<i>Jatropha gossypifolia</i>	
Plantae	DICOT	<i>Leptosema anomalum</i>	
Plantae	DICOT	<i>Leucaena leucocephala</i>	
Plantae	DICOT	<i>Melaleuca argentea</i>	
Plantae	DICOT	<i>Melaleuca lasiandra</i>	
Plantae	DICOT	<i>Melhantha oblongifolia</i>	
Plantae	DICOT	<i>Mitrasacme connata</i>	
Plantae	DICOT	<i>Mitrasacme exserta</i>	
Plantae	DICOT	<i>Mollugo molluginea</i>	
Plantae	DICOT	<i>Muellerolimon salicorniaceum</i>	
Plantae	DICOT	<i>Myoporum montanum</i>	
Plantae	DICOT	<i>Neobassia astrocarpa</i>	
Plantae	DICOT	<i>Neptunia dimorphantha</i>	
Plantae	DICOT	<i>Neptunia monosperma</i>	
Plantae	DICOT	<i>Nicotiana benthamiana</i>	
Plantae	DICOT	<i>Nicotiana occidentalis</i> subsp. <i>occidentalis</i>	
Plantae	DICOT	<i>Operculina aequisejala</i>	
Plantae	DICOT	<i>Osbornia octodonta</i>	
Plantae	DICOT	<i>Owenia reticulata</i>	
Plantae	DICOT	<i>Parkinsonia aculeata</i>	
Plantae	DICOT	<i>Passiflora foetida</i> var. <i>hispida</i>	
Plantae	DICOT	<i>Peplidium aithocheilum</i>	
Plantae	DICOT	<i>Peplidium muelleri</i>	
Plantae	DICOT	<i>Petalostylis labicheoides</i>	
Plantae	DICOT	<i>Phyllanthus exilis</i>	
Plantae	DICOT	<i>Phyllanthus maderaspatensis</i>	
Plantae	DICOT	<i>Physalis angulata</i>	
Plantae	DICOT	<i>Pimelea ammocharis</i>	
Plantae	DICOT	<i>Pittosporum angustifolium</i>	
Plantae	DICOT	<i>Pluchea ferdinandii-muelleri</i>	
Plantae	DICOT	<i>Pluchea rubelliflora</i>	
Plantae	DICOT	<i>Pluchea tetranthera</i>	
Plantae	DICOT	<i>Polycarpaea corymbosa</i>	
Plantae	DICOT	<i>Polycarpaea corymbosa</i> var. <i>corymbosa</i>	
Plantae	DICOT	<i>Polycarpaea involucrata</i>	
Plantae	DICOT	<i>Polycarpaea longiflora</i>	
Plantae	DICOT	<i>Polygala galeocephala</i>	
Plantae	DICOT	<i>Polygala saccopectala</i>	
Plantae	DICOT	<i>Polygala</i> sp.	
Plantae	DICOT	<i>Polymeria ambigua</i>	
Plantae	DICOT	<i>Polymeria</i> sp.	
Plantae	DICOT	<i>Portulaca australis</i>	
Plantae	DICOT	<i>Portulaca decipiens</i>	
Plantae	DICOT	<i>Portulaca oleracea</i>	

Plantae	DICOT	<i>Portulaca pilosa</i>	
Plantae	DICOT	<i>Portulaca</i> sp.	
Plantae	DICOT	<i>Pseudognaphalium luteoalbum</i>	
Plantae	DICOT	<i>Pterocaulon intermedium</i>	
Plantae	DICOT	<i>Pterocaulon sphacelatum</i>	
Plantae	DICOT	<i>Ptilotus appendiculatus</i>	
Plantae	DICOT	<i>Ptilotus arthrolasius</i>	
Plantae	DICOT	<i>Ptilotus astrolasius</i>	
Plantae	DICOT	<i>Ptilotus axillaris</i>	
Plantae	DICOT	<i>Ptilotus calostachyus</i>	
Plantae	DICOT	<i>Ptilotus divaricatus</i>	
Plantae	DICOT	<i>Ptilotus exaltatus</i>	
Plantae	DICOT	<i>Ptilotus fusiformis</i>	
Plantae	DICOT	<i>Ptilotus mollis</i>	P4
Plantae	DICOT	<i>Ptilotus nobilis</i>	
Plantae	DICOT	<i>Ptilotus polystachyus</i>	
Plantae	DICOT	<i>Ptilotus villosiflorus</i>	
Plantae	DICOT	<i>Pupalia lappacea</i>	
Plantae	DICOT	<i>Rhagodia eremaea</i>	
Plantae	DICOT	<i>Rhizophora stylosa</i>	
Plantae	DICOT	<i>Rhynchosia minima</i>	
Plantae	DICOT	<i>Rotala diandra</i>	
Plantae	DICOT	<i>Rothia indica</i> subsp. <i>australis</i>	P3
Plantae	DICOT	<i>Salsola australis</i>	
Plantae	DICOT	<i>Scaevola amblyanthera</i>	
Plantae	DICOT	<i>Scaevola amblyanthera</i> var. <i>centralis</i>	
Plantae	DICOT	<i>Scaevola browniana</i> subsp. <i>browniana</i>	
Plantae	DICOT	<i>Scaevola crassifolia</i>	
Plantae	DICOT	<i>Sclerolaena bicornis</i> var. <i>bicornis</i>	
Plantae	DICOT	<i>Sclerolaena glabra</i>	
Plantae	DICOT	<i>Sclerolaena hostilis</i>	
Plantae	DICOT	<i>Sclerolaena</i> sp.	
Plantae	DICOT	<i>Senna bicapsularis</i>	
Plantae	DICOT	<i>Senna curvistyla</i>	
Plantae	DICOT	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	
Plantae	DICOT	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	
Plantae	DICOT	<i>Senna notabilis</i>	
Plantae	DICOT	<i>Senna occidentalis</i>	
Plantae	DICOT	<i>Senna stricta</i>	
Plantae	DICOT	<i>Senna venusta</i>	
Plantae	DICOT	<i>Seringia elliptica</i>	
Plantae	DICOT	<i>Seringia nephrosperma</i>	
Plantae	DICOT	<i>Sesbania cannabina</i>	
Plantae	DICOT	<i>Sesbania formosa</i>	
Plantae	DICOT	<i>Sesuvium portulacastrum</i>	
Plantae	DICOT	<i>Sida clementii</i>	
Plantae	DICOT	<i>Sida echinocarpa</i>	
Plantae	DICOT	<i>Sida fibulifera</i>	
Plantae	DICOT	<i>Sida rohlenae</i>	
Plantae	DICOT	<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	
Plantae	DICOT	<i>Sida</i> sp.	
Plantae	DICOT	<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)	
Plantae	DICOT	<i>Sida</i> sp. <i>Rabbit Flat</i> (B.J. Carter 626)	
Plantae	DICOT	<i>Sida trichopoda</i>	
Plantae	DICOT	<i>Solanum diversiflorum</i>	
Plantae	DICOT	<i>Solanum phlomoides</i>	
Plantae	DICOT	<i>Stackhousia intermedia</i>	
Plantae	DICOT	<i>Stemodia grossa</i>	
Plantae	DICOT	<i>Stemodia lathraia</i>	
Plantae	DICOT	<i>Streptoglossa cylindriceps</i>	
Plantae	DICOT	<i>Streptoglossa macrocephala</i>	
Plantae	DICOT	<i>Streptoglossa odora</i>	
Plantae	DICOT	<i>Streptoglossa</i> sp.	
Plantae	DICOT	<i>Stylium desertorum</i>	
Plantae	DICOT	<i>Stylosanthes guianensis</i> var. <i>guianensis</i>	
Plantae	DICOT	<i>Stylosanthes hamata</i>	
Plantae	DICOT	<i>Suaeda arbusculoides</i>	
Plantae	DICOT	<i>Surreya diandra</i>	
Plantae	DICOT	<i>Swainsona pterostylis</i>	
Plantae	DICOT	<i>Symphytotrichum squamatum</i>	
Plantae	DICOT	<i>Synaptantha tillaeacea</i> var. <i>tillaeacea</i>	
Plantae	DICOT	<i>Tecticornia auriculata</i>	
Plantae	DICOT	<i>Tecticornia halocnemoides</i>	
Plantae	DICOT	<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	
Plantae	DICOT	<i>Tecticornia indica</i>	
Plantae	DICOT	<i>Tecticornia indica</i> subsp. <i>bidens</i>	
Plantae	DICOT	<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	
Plantae	DICOT	<i>Tecticornia pterygosperma</i> subsp. <i>denticulata</i>	
Plantae	DICOT	<i>Tephrosia leptoclada</i>	
Plantae	DICOT	<i>Tephrosia rosea</i>	
Plantae	DICOT	<i>Tephrosia rosea</i> var. <i>clementii</i>	
Plantae	DICOT	<i>Tephrosia rosea</i> var. <i>clementii</i> / <i>rosea</i> var. <i>Port Hedland</i> (A.S. George 1114)	
Plantae	DICOT	<i>Tephrosia rosea</i> var. <i>Fortescue creeks</i> (M.I.H. Brooker 2186)	
Plantae	DICOT	<i>Tephrosia rosea</i> var. <i>Port Hedland</i> (A.S. George 1114)	P1
Plantae	DICOT	<i>Tephrosia rosea</i> var. <i>rosea</i>	
Plantae	DICOT	<i>Tephrosia rosea</i> var. <i>venulosa</i>	
Plantae	DICOT	<i>Tephrosia simplicifolia</i>	
Plantae	DICOT	<i>Tephrosia</i> sp. <i>B Kimberley Flora</i> (C.A. Gardner 7300)	
Plantae	DICOT	<i>Tephrosia</i> sp. <i>Bungaroo Creek</i> (M.E. Trudgen 11601)	
Plantae	DICOT	<i>Tephrosia</i> sp. <i>clay soils</i> (S. van Leeuwen et al. PBS 0273)	
Plantae	DICOT	<i>Tephrosia</i> sp. <i>D Kimberley Flora</i> (R.D. Royce 1848)	
Plantae	DICOT	<i>Threlkeldia diffusa</i>	
Plantae	DICOT	<i>Tinospora smilacina</i>	
Plantae	DICOT	<i>Trianthema cusackianum</i>	

Plantae	DICOT	<i>Trianthema pilosum</i>	
Plantae	DICOT	<i>Trianthema portulacastrum</i>	
Plantae	DICOT	<i>Trianthema sp.</i>	
Plantae	DICOT	<i>Trianthema triquetrum</i>	
Plantae	DICOT	<i>Trianthema turgidifolia</i>	
Plantae	DICOT	<i>Trianthema turgidifolium</i>	
Plantae	DICOT	<i>Tribulopsis angustifolia</i>	
Plantae	DICOT	<i>Tribulus hirsutus</i>	
Plantae	DICOT	<i>Tribulus occidentalis</i>	
Plantae	DICOT	<i>Trichodesma zeylanicum</i>	
Plantae	DICOT	<i>Trichosanthes cucumerina var. cucumerina</i>	
Plantae	DICOT	<i>Tridax procumbens</i>	
Plantae	DICOT	<i>Trigastrotheca molluginea</i>	
Plantae	DICOT	<i>Triumfetta appendiculata</i>	
Plantae	DICOT	<i>Triumfetta chaetocarpa</i>	
Plantae	DICOT	<i>Triumfetta propinqua</i>	
Plantae	DICOT	<i>Triumfetta ramosa</i>	
Plantae	DICOT	<i>Uvedalia linearis var. linearis</i>	
Plantae	DICOT	<i>Wahlenbergia tumidifruca</i>	
Plantae	DICOT	<i>Waltheria indica</i>	
Plantae	DICOT	<i>Zornia albiflora</i>	
Plantae	DICOT	<i>Zornia chaetophora</i>	
Plantae	DICOT	<i>Zornia muelleriana</i>	
Plantae	FERN	<i>Marsilea drummondii</i>	
Plantae	FERN	<i>Marsilea hirsuta</i>	
Plantae	FERN	<i>Marsilea sp.</i>	
Plantae	FERN	<i>Marsilea spp.</i>	
Plantae	LIVERWORT	<i>Riccia crystallina</i>	
Plantae	MONOCOT	<i>Andropogon gayanus</i>	
Plantae	MONOCOT	<i>Aristida conforta</i>	
Plantae	MONOCOT	<i>Aristida holathera var. holathera</i>	
Plantae	MONOCOT	<i>Aristida hygrometrica</i>	
Plantae	MONOCOT	<i>Aristida inaequiglumis</i>	
Plantae	MONOCOT	<i>Bothriochloa ewartiana</i>	
Plantae	MONOCOT	<i>Bulbostylis barbata</i>	
Plantae	MONOCOT	<i>Bulbostylis burbridgeae</i>	P4
Plantae	MONOCOT	<i>Bulbostylis turbinata</i>	
Plantae	MONOCOT	<i>Cenchrus ciliaris</i>	
Plantae	MONOCOT	<i>Cenchrus setaceus</i>	
Plantae	MONOCOT	<i>Cenchrus setiger</i>	
Plantae	MONOCOT	<i>Centrolepis banksii</i>	
Plantae	MONOCOT	<i>Chloris barbata</i>	
Plantae	MONOCOT	<i>Chloris virgata</i>	
Plantae	MONOCOT	<i>Chrysopogon fallax</i>	
Plantae	MONOCOT	<i>Commelina ensifolia</i>	
Plantae	MONOCOT	<i>Corynotheca micrantha</i>	
Plantae	MONOCOT	<i>Corynotheca pungens</i>	
Plantae	MONOCOT	<i>Corynotheca sp.</i>	
Plantae	MONOCOT	<i>Cymbopogon bombycinus</i>	
Plantae	MONOCOT	<i>Cynodon radiatus</i>	
Plantae	MONOCOT	<i>Cyperus blakeanus</i>	
Plantae	MONOCOT	<i>Cyperus bulbosus</i>	
Plantae	MONOCOT	<i>Cyperus castaneus var. brevimucronatus</i>	
Plantae	MONOCOT	<i>Cyperus concinnus</i>	
Plantae	MONOCOT	<i>Cyperus conicus</i>	
Plantae	MONOCOT	<i>Cyperus iria</i>	
Plantae	MONOCOT	<i>Cyperus polystachyos</i>	
Plantae	MONOCOT	<i>Cyperus squarrosus</i>	
Plantae	MONOCOT	<i>Dactyloctenium aegyptium</i>	
Plantae	MONOCOT	<i>Dactyloctenium radicans</i>	
Plantae	MONOCOT	<i>Digitaria brownii</i>	
Plantae	MONOCOT	<i>Digitaria ciliaris</i>	
Plantae	MONOCOT	<i>Diplachne fusca</i>	
Plantae	MONOCOT	<i>Diplachne fusca subsp. fusca</i>	
Plantae	MONOCOT	<i>Echinochloa colona</i>	
Plantae	MONOCOT	<i>Eleocharis atropurpurea</i>	
Plantae	MONOCOT	<i>Elytrophorus spicatus</i>	
Plantae	MONOCOT	<i>Enneapogon lindleyanus</i>	
Plantae	MONOCOT	<i>Enneapogon polyphyllus</i>	
Plantae	MONOCOT	<i>Enneapogon purpurascens</i>	
Plantae	MONOCOT	<i>Enneapogon robustissimus</i>	
Plantae	MONOCOT	<i>Enteropogon ramosus</i>	
Plantae	MONOCOT	<i>Eragrostis crateriformis</i>	P3
Plantae	MONOCOT	<i>Eragrostis cumingii</i>	
Plantae	MONOCOT	<i>Eragrostis dielsii</i>	
Plantae	MONOCOT	<i>Eragrostis elongata</i>	
Plantae	MONOCOT	<i>Eragrostis eriopoda</i>	
Plantae	MONOCOT	<i>Eragrostis falcata</i>	
Plantae	MONOCOT	<i>Eragrostis pilosa</i>	
Plantae	MONOCOT	<i>Eragrostis speciosa</i>	
Plantae	MONOCOT	<i>Eriachne aristidea</i>	
Plantae	MONOCOT	<i>Eriachne benthamii</i>	
Plantae	MONOCOT	<i>Eriachne ciliata</i>	
Plantae	MONOCOT	<i>Eriachne festucaeae</i>	
Plantae	MONOCOT	<i>Eriachne glauca</i>	
Plantae	MONOCOT	<i>Eriachne glauca var. glauca</i>	
Plantae	MONOCOT	<i>Eriachne helmsii</i>	
Plantae	MONOCOT	<i>Eriachne melicaceae</i>	
Plantae	MONOCOT	<i>Eriachne obtusa</i>	
Plantae	MONOCOT	<i>Eriachne pulchella</i>	
Plantae	MONOCOT	<i>Eriachne sp.</i>	
Plantae	MONOCOT	<i>Eriachne sulcata</i>	
Plantae	MONOCOT	<i>Eulalia aurea</i>	
Plantae	MONOCOT	<i>Fimbristylis dichotoma</i>	

Plantae	MONOCOT	<i>Fimbristylis littoralis</i>
Plantae	MONOCOT	<i>Fimbristylis microcarya</i>
Plantae	MONOCOT	<i>Fimbristylis neilsonii</i>
Plantae	MONOCOT	<i>Fimbristylis oxystachya</i>
Plantae	MONOCOT	<i>Fimbristylis rara</i>
Plantae	MONOCOT	<i>Halodule uninervis</i>
Plantae	MONOCOT	<i>Iseilema membranaceum</i>
Plantae	MONOCOT	<i>Lamarckia aurea</i>
Plantae	MONOCOT	<i>Lipocarpha microcephala</i>
Plantae	MONOCOT	<i>Murdannia graminea</i>
Plantae	MONOCOT	<i>Panicum decompositum</i>
Plantae	MONOCOT	<i>Paspalidium clementii</i>
Plantae	MONOCOT	<i>Paspalidium rarum</i>
Plantae	MONOCOT	<i>Paspalum fasciculatum</i>
Plantae	MONOCOT	<i>Perotis rara</i>
Plantae	MONOCOT	<i>Schizachyrium fragile</i>
Plantae	MONOCOT	<i>Schoenoplectiella laevis</i>
Plantae	MONOCOT	<i>Schoenoplectiella lateriflora</i>
Plantae	MONOCOT	<i>Schoenoplectus laevis</i>
Plantae	MONOCOT	<i>Schoenoplectus lateriflorus</i>
Plantae	MONOCOT	<i>Setaria dielsii</i>
Plantae	MONOCOT	<i>Setaria sphacelata</i>
Plantae	MONOCOT	<i>Setaria surgens</i>
Plantae	MONOCOT	<i>Sorghum plumosum</i>
Plantae	MONOCOT	<i>Sorghum stipoides</i>
Plantae	MONOCOT	<i>Spinifex longifolius</i>
Plantae	MONOCOT	<i>Sporobolus actinocladius</i>
Plantae	MONOCOT	<i>Sporobolus australasicus</i>
Plantae	MONOCOT	<i>Sporobolus virginicus</i>
Plantae	MONOCOT	<i>Thalassia hemprichii</i>
Plantae	MONOCOT	<i>Themeda avenacea</i>
Plantae	MONOCOT	<i>Triodia epactia</i>
Plantae	MONOCOT	<i>Triodia lanigera</i>
Plantae	MONOCOT	<i>Triodia longiceps</i>
Plantae	MONOCOT	<i>Triodia secunda</i>
Plantae	MONOCOT	<i>Triraphis mollis</i>
Plantae	MONOCOT	<i>Urochloa holosericea subsp. velutina</i>
Plantae	MONOCOT	<i>Whiteochloa cymbiformis</i>
Plantae	MONOCOT	<i>Xerochloa imberbis</i>
Plantae	MONOCOT	<i>Yakirra australiensis</i>
Plantae	MONOCOT	<i>Yakirra majuscula</i>
Protozoa	ALGA	<i>Colpomenia sinuosa</i>
Protozoa	ALGA	<i>Dictyopteria australis</i>
Protozoa	ALGA	<i>Dictyota ciliolata</i>
Protozoa	ALGA	<i>Hormophysa cuneiformis</i>
Protozoa	ALGA	<i>Hydroclathrus clathratus</i>
Protozoa	ALGA	<i>Lobophora variegata</i>
Protozoa	ALGA	<i>Spatoglossum macrodontum</i>
Protozoa	ALGA	<i>Stoechoospermum polypodioides</i>

Appendix 3

Likelihood of Occurrence Assessment for Significant Flora Species



Taxon	Habit and Habitat (WA Herbarium 2022)	Source					Likelihood of Occurrence in Survey Area Based on Desktop Study (NR = nearest record)
		DBCA TPFL	WAH	Nature Map	Woodman (2011b)	Biota (2010)	
Threatened							
<i>Seringia exastia</i>	Erect, compact hairy shrub to 90 cm tall with a purple calyx. Occurs in dune swales in deep red sand (Pindan soil), <i>Triodia</i> hummock grasslands and <i>Acacia</i> shrublands.	-	✓	✓	-	-	Unlikely to occur: Minimal suitable habitat present and only 1 WAH record in the locality, 4 km NE of survey area.
Priority 1							
<i>Atriplex eremitis</i>	Erect, perennial shrub to 40 cm tall with grey foliage, found on edges of clay pans, coastal areas and saline areas.	✓	✓	-	-	-	Unlikely to occur: Only 1 WAH and 1 DBCA TPFL record, located >40 km away.
<i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114)	Erect to spreading large shrub with pink flowers. Occurs on red to orange sand on coastal dunes and sandy plains.	-	✓	✓	✓	✓	Likely to occur: Suitable habitat present, and 24 WAH records within 10 km of survey area. NR 380 m S.
<i>Triodia chichesterensis</i>	Hummock grass with grey-green to blue-green leaves and hairy leaf sheaths. Occurs on flat plains to hillslopes with red brown clay loams to sandy soils.	-	✓	✓	-	-	Would not occur: Distribution does not extend to coastal areas; 4 WAH records located 37-50 km away. NR 37 km S.
Priority 2							
<i>Gomphrena pusilla</i>	Slender annual herb to 20 cm tall with white flowers. Occurs on fine beach sand behind foredunes and on limestone.	-	✓	✓	✓	-	Likely to occur: Suitable habitat present and 5 WAH records within 5 km. NR 80 m N.
Priority 3							
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	Shrub with orange-yellow flowers to 1.5 m tall, growing on sand plains and dunes.	✓	✓	✓	-	-	Unlikely to occur: Suitable habitat unlikely to be present. 31 WAH records within 40 km, 15 of these within 20 km, but all located further inland. NR 9 km SW.
<i>Eragrostis crateriformis</i>	Annual grass growing to 40 cm tall, found on clayey loam or clay on creek banks and depressions.	-	✓	✓	✓	-	May occur: Suitable habitat potentially present and 11 WAH records in locality; 2 of which are <5 km away. NR 1.3 km SW.
<i>Euploca mutica</i>	Grey-green perennial herb to 30 cm tall, growing on red-brown sandplains.	-	✓	✓	-	-	Unlikely to occur: 35 WAH records within 40 km, including 9 within 20 km, however suitable habitat unlikely to be present. NR 12 km SE.
<i>Gomphrena cucullata</i>	Spreading or erect annual herb to 25 cm tall with white to purple flowers, growing on red sandy loam and clayey sand on floodplains.	✓	-	-	-	-	Unlikely to occur: Only 1 DBCA TPFL record located >40 km away.

Taxon	Habit and Habitat (WA Herbarium 2022)	Source					Likelihood of Occurrence in Survey Area Based on Desktop Study (NR = nearest record)
		DBCA TPFL	WAH	Nature Map	Woodman (2011b)	Biota (2010)	
<i>Gomphrena leptophylla</i>	Annual, herb to 15 cm tall with white flowers. Occurs on sand, sandy to clayey loam on open flats, sandy creek beds, edges of salt pans and stony hillsides.	-	✓	✓	✓	-	May occur: Some suitable habitat present; single WAH record from the database searches, 2.6 km SW of the survey area.
<i>Gymnanthera cunninghamii</i>	Erect shrub growing 1-2 m tall with cream-yellow-green flowers. Found in sandy soils.	✓	✓	✓	✓	-	Unlikely to occur: Limited suitable habitat appears to be present; 3 WAH records and 1 DBCA TPFL record within 5 km. NR 370 m N, however the location of the two closest records are questionable (they share the same date, but are respectively described as 1 km W and 8.3 km E of Boodarie Landing, yet are only 1.3 km apart).
<i>Rothia indica</i> subsp. <i>australis</i>	Prostrate annual herb growing to 30 cm tall, densely covered in spreading hairs. Occurs in sandy soils on sandhills and sandy flats.	-	✓	✓	-	-	Unlikely to occur: Some suitable habitat may be present but only 5 WAH records returned from the database searches, mostly located further inland. NR 15 km SE.
<i>Sida</i> sp. Barlee Range (S. van Leeuwen 1642)	Low shrub to 50 cm tall growing in skeletal red soil pockets on steep slopes and other rocky ironstone areas.	-	✓	✓	-	-	Would not occur: No suitable habitat in the survey area.
Priority 4							
<i>Bulbostylis burbridgeae</i>	Erect to spreading sedge, up to 25 cm tall with brown flowers. Growing on granitic soils, granite outcrops and cliff bases.	-	✓	✓	-	-	Unlikely to occur: 2 WAH records <5 km away however preferred habitat unlikely to occur in survey area. NR 2.3 km S.
<i>Ptilotus mollis</i>	Compact perennial shrub to 50 cm tall with soft grey foliage and white-pink, flowers. Grows on stony hills and scree slopes.	-	✓	✓	-	-	Would not occur: No suitable habitat in survey area.

Appendix 4

Fauna Species Potentially Occurring in the Survey Area



Mammals

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
Tachyglossidae										
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna			•						
Dasyuridae										
<i>Antechinomys laniger</i>	Kultarr			•	•					
<i>Dasyercus blythi</i>	Brush-tailed Mulgara, Ampurta	P4		•	•					
<i>Dasykaluta rosamondae</i>	Kaluta			•	•			•		
<i>Dasyurus hallucatus</i>	Northern Quoll	EN	EN	•	•	•				
<i>Ningauai timealeyi</i>	Pilbara Ningauai			•						
<i>Planigale</i> sp. ¹	Planigale sp./spp. ¹			•						
<i>Pseudantechinus woolleyae</i>	Woolley's Pseudantechinus			•						
<i>Sminthopsis macroura</i>	Stripe-faced Dunnart			•						
<i>Sminthopsis youngsoni</i>	Lesser Hairy-footed Dunnart			•	•			•		
Thylacomyidae										
<i>Macrotis lagotis</i>	Bilby, Dalgyte	VU	VU	•	•	•				
Macropodidae										
<i>Osphranter robustus</i> ²	Euro, Biggada			•	•		•	•		
<i>Osphranter rufus</i> ²	Red Kangaroo, Marlu			•					•	
<i>Petrogale rothschildi</i>	Rothschild's Rock-wallaby			•						
Muridae										
<i>Mus musculus</i> *	House Mouse*			•				•		
<i>Notomys alexis</i>	Spinifex Hopping-mouse			•				•		
<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse	P4		•						
<i>Pseudomys delicatulus</i>	Delicate Mouse			•						
<i>Pseudomys desertor</i>	Desert Mouse			•				•		
<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse			•	•			•		
<i>Pseudomys nanus</i>	Western Chestnut Mouse			•				•		
<i>Rattus rattus</i> *	Black Rat*			•						
<i>Zyzomys argurus</i>	Common Rock-rat			•				•		
Leporidae										
<i>Oryctolagus cuniculus</i> *	Rabbit*			•				•		
Pteropodidae										
<i>Pteropus alecto</i>	Black Flying-fox				•					

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Pteropus scapulatus</i>	Little Red Flying-fox							•		
Hipposideridae										
<i>Rhinonicteris aurantia</i> (Pilbara form)	Pilbara Leaf-nosed Bat	VU	VU	•		•				
Megadermatidae										
<i>Macroderma gigas</i>	Ghost Bat	VU	VU	•		•				
Emballonuridae										
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tailed Bat			•				•		•
<i>Taphozous georgianus</i>	Common Sheath-tailed Bat			•				•		•
Molossidae										
<i>Austronomus australis</i> ³	White-striped Free-tailed Bat			•						
<i>Chaerephon jobensis</i>	Greater Northern Free-tailed Bat			•	•			•		
<i>Ozimops cobourgianus</i> ⁴	Northern Coastal Free-tailed Bat	P1		•				•		
<i>Ozimops lumsdenae</i> ⁵	Northern Free-tailed Bat							•		
Vesperfilionidae										
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat			•				•		•
<i>Nyctophilus arnhemensis</i>	Arnhem Long-eared Bat			•	•			•		
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat			•	•			•		
<i>Scotorepens greyii</i>	Little Broad-nosed Bat			•				•		•
<i>Vespadelus finlaysoni</i>	Finlayson's Cave-bat			•	•			•		•
Canidae										
<i>Canis familiaris</i> ^{* 6}	Dog/Dingo ^{* 6}			•				•	•	•
<i>Canis familiaris dingo</i> ^{** 6}	Dingo ^{** 6}			•						
<i>Vulpes vulpes</i> [*]	Red Fox [*]			•	•		•	•		
Felidae										
<i>Felis catus</i> [*]	Cat [*]			•	•			•		•
Equidae										
<i>Equus ferus caballus</i> ^{* 7}	Horse ^{* 7}			•				•		
Bovidae										
<i>Bos primigenius taurus</i> ^{* 8}	European Cattle ^{* 8}			•			•	•	•	
<i>Capra aegagrus hircus</i> ^{* 9}	Goat ^{* 9}				•					

Note: Banded Hare-wallaby not included as considered extinct on the mainland, and published former (historical) distribution did not include the Pilbara.

* Introduced

¹ Planigales in Pilbara belong to two species awaiting formal description, formerly included within Long-tailed Planigale *P. ingrami* and Common Planigale *P. maculata*.

² Previously included in genus *Macropus*.

³ Previously included in genus *Tadarida*.

⁴ Formerly treated as subspecies of *Mormopterus loriae*.

⁵ Formerly included within *Mormopterus beccarii*.

⁶ Previously treated as *C. lupus familiaris* (Dog) and *C. lupus dingo* or *C. dingo* (Dingo), some previous records listed as such.

⁷ Previously treated as distinct species *E. caballus*.

⁸ Previously treated as distinct species *B. taurus*.

⁹ Previously treated as distinct species *C. hircus*.

Birds

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
Casuariidae											
<i>Dromaius novaehollandiae</i>	Emu			•	•	•			•	•	
Anatidae											
<i>Dendrocygna eytoni</i>	Plumed Whistling Duck			•	•	•			•		•
<i>Dendrocygna arcuata</i>	Wandering Whistling Duck			•	•	•					
<i>Cygnus atratus</i>	Black Swan			•	•	•			•		
<i>Tadorna tadornoides</i>	Australian Shelduck				•						
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck			•	•	•			•		
<i>Chenonetta jubata</i>	Maned Duck [Australian Wood Duck]			•	•	•					
<i>Spatula rhynchotis</i>	Australasian Shoveler			•	•	•					
<i>Anas superciliosa</i>	Pacific Black Duck			•	•	•			•		
<i>Anas gracilis</i>	Grey Teal			•	•	•			•		•
<i>Anas castanea</i>	Chestnut Teal				•	•					
<i>Aythya australis</i>	Hardhead			•	•	•			•		
Phasianidae											
<i>Coturnix ypsilophora</i>	Brown Quail			•	•	•			•		
Caprimulgidae											
<i>Eurostopodus argus</i>	Spotted Nightjar			•		•			•		
Podargidae											
<i>Podargus strigoides</i>	Tawny Frogmouth			•	•	•			•		
Aegothelidae											
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar			•					•		
Apodidae											
<i>Apus pacificus</i> ¹	Pacific Swift ¹	MI	MI		•	•	•				
Otididae											
<i>Ardeotis australis</i>	Australian Bustard			•	•	•			•		•
Cuculidae											
<i>Centropus phasianinus</i>	Pheasant Coucal			•	•	•			•		
<i>Chrysococcyx basalus</i>	Horsfield's Bronze Cuckoo			•	•	•			•		•
<i>Cacomantis pallidus</i>	Pallid Cuckoo			•	•	•			•		

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Cuculus optatus</i>	Oriental Cuckoo	MI	MI				•				
Columbidae											
<i>Columba livia</i> *	Rock Dove [Feral Pigeon]*			•	•	•					•
<i>Phaps chalcoptera</i>	Common Bronzewing			•	•	•					•
<i>Phaps histrionica</i>	Flock Bronzewing			•	•	•					
<i>Ocyphaps lophotes</i>	Crested Pigeon			•	•	•		•	•	•	•
<i>Geophaps plumifera</i>	Spinifex Pigeon			•	•	•		•	•	•	
<i>Geopelia cuneata</i>	Diamond Dove			•	•	•			•		
<i>Geopelia placida</i>	Peaceful Dove			•	•	•			•		•
<i>Geopelia humeralis</i>	Bar-shouldered Dove			•	•	•					
Rallidae											
<i>Hypotaenidia philippensis</i>	Buff-banded Rail			•	•	•					
<i>Porzana fluminea</i>	Australian Crake			•	•	•					
<i>Tribonyx ventralis</i>	Black-tailed Nativehen			•	•	•					
<i>Fulica atra</i>	Eurasian Coot			•	•	•					
<i>Porphyrio melanotus</i> ²	Australasian Swamphen ²			•	•	•					
<i>Zapornia pusilla</i>	Baillon's Crake					•					
Gruidae											
<i>Antigone rubicunda</i>	Brolga			•	•	•					
Podicipedidae											
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe			•	•	•			•		•
<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe			•	•	•					
Turnicidae											
<i>Turnix velox</i>	Little Buttonquail			•	•	•			•	•	
Burhinidae											
<i>Burhinus grallarius</i>	Bush Stone-curlew			•	•	•					•
<i>Esacus magnirostris</i>	Beach Stone-curlew			•	•	•					
Haematopodidae											
<i>Haematopus longirostris</i>	Pied Oystercatcher			•	•	•			•		
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher			•	•	•			•		
Recurvirostridae											
<i>Himantopus leucocephalus</i> ³	Pied Stilt ³			•	•	•	•				•
<i>Cladorhynchus leucocephalus</i>	Banded Stilt			•	•	•					•

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet			•	•	•	•				
Charadriidae											
<i>Vanellus tricolor</i>	Banded Lapwing										•
<i>Vanellus miles</i>	Masked Lapwing			•	•	•					
<i>Erythronyx cinctus</i>	Red-kneed Dotterel			•	•	•					•
<i>Pluvialis fulva</i>	Pacific Golden Plover	MI	MI	•	•	•	•				
<i>Pluvialis squatarola</i>	Grey Plover	MI	MI	•	•	•	•		•		
<i>Charadrius ruficapillus</i>	Red-capped Plover			•	•	•	•		•	•	•
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN; MI	EN; MI	•	•	•	•		•		
<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU; MI	VU; MI	•	•	•	•		•		
<i>Charadrius veredus</i>	Oriental Plover	MI	MI	•	•	•	•		•		
<i>Eseyornis melanops</i>	Black-fronted Dotterel			•	•	•			•	•	•
Rostratulidae											
<i>Rostratula australis</i> ⁴	Australian Painted-snipe ⁴	EN	EN				•				
Scolopacidae											
<i>Numenius phaeopus</i>	Eurasian Whimbrel ⁵	MI	MI	•	•	•	•		•		
<i>Numenius minutus</i>	Little Curlew	MI	MI	•	•	•	•				
<i>Numenius madagascariensis</i>	Far Eastern Curlew ⁶	CR; MI	CR; MI	•	•	•	•		•		
<i>Limosa lapponica</i>	Bar-tailed Godwit ⁷	CR; MI	CR; MI	•	•	•	•		•		
<i>Limosa limosa</i>	Black-tailed Godwit	MI	MI	•	•	•	•				
<i>Arenaria interpres</i>	Ruddy Turnstone	MI	MI	•	•	•	•		•		
<i>Calidris tenuirostris</i>	Great Knot	CR; MI	CR; MI	•	•	•	•		•		
<i>Calidris canutus</i>	Red Knot	EN; MI	EN; MI	•	•	•	•		•		
<i>Calidris pugnax</i>	Ruff	MI	MI	•	•	•					
<i>Calidris falcinellus</i>	Broad-billed Sandpiper	MI	MI	•	•	•	•				
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MI	MI	•	•	•	•				
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR; MI	CR; MI	•	•	•	•		•		
<i>Calidris subminuta</i>	Long-toed Stint	MI	MI	•	•	•	•				
<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI	•	•	•			•		•
<i>Calidris alba</i>	Sanderling	MI	MI	•	•	•	•				
<i>Calidris minuta</i>	Little Stint				•	•					
<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI	•	•	•	•				
<i>Limnodromus semipalmatus</i>	Asian Dowitcher	MI	MI	•	•	•	•				

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Gallinago stenura</i>	Pin-tailed Snipe	MI	MI	•	•	•					
<i>Gallinago megala</i>	Swinhoe's Snipe	MI	MI		•	•					
<i>Xenus cinereus</i>	Terek Sandpiper	MI	MI	•	•	•	•		•		
<i>Phalaropus lobatus</i>	Red-necked Phalarope	MI	MI	•		•	•				
<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI	•	•	•	•		•		
<i>Tringa brevipes</i>	Grey-tailed Tattler	MI; P4	MI	•	•	•	•		•		
<i>Tringa totanus</i>	Common Redshank	MI	MI		•	•					
<i>Tringa stagnatilis</i>	Marsh Sandpiper	MI	MI	•	•	•	•		•		
<i>Tringa glareola</i>	Wood Sandpiper	MI	MI	•	•	•	•				
<i>Tringa nebularia</i>	Common Greenshank	MI	MI	•	•	•	•		•		
Glareolidae											
<i>Siltia isabella</i>	Australian Pratincole			•	•	•	•				
<i>Glareola maldivarum</i>	Oriental Pratincole	MI	MI	•	•	•	•				
Laridae											
<i>Anous stolidus</i>	Brown Noddy	MI	MI				•				
<i>Chroicocephalus novaehollandiae</i>	Silver Gull			•	•	•			•		•
<i>Gelochelidon [nilotica]⁸</i>	Gull-billed Tern ⁸	MI	MI	•	•	•			•		•
<i>Hydroprogne caspia</i>	Caspian Tern	MI	MI	•	•	•			•		•
<i>Thalasseus bergii</i>	Greater Crested Tern	MI	MI	•	•	•			•		
<i>Thalasseus bengalensis</i>	Lesser Crested Tern			•	•	•			•		
<i>Sternula albifrons</i>	Little Tern	MI	MI	•	•	•	•		•		
<i>Sternula nereis</i>	Fairy Tern	VU	VU	•	•				•		
<i>Onychoprion anaethetus</i>	Bridled Tern	MI	MI	•	•	•					
<i>Sterna dougallii</i>	Roseate Tern	MI	MI		•	•					
<i>Sterna hirundo</i>	Common Tern	MI	MI	•	•	•					
<i>Chlidonias hybrida</i>	Whiskered Tern			•	•	•			•		
<i>Chlidonias leucopterus</i>	White-winged Tern ⁹	MI	MI	•	•	•					
Phaethontidae											
<i>Phaethon lepturus</i>	White-tailed Tropicbird	MI	MI				•				
Ciconiidae											
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork			•	•	•					•
Fregatidae											
<i>Fregata minor</i>	Great Frigatebird	MI	MI				•				

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Fregata ariel</i>	Lesser Frigatebird	MI	MI	•	•	•	•		•		
Sulidae											
<i>Sula dactylatra</i>	Masked Booby	MI	MI		•						
<i>Sula leucogaster</i>	Brown Booby	MI	MI		•	•					
Anhingidae											
<i>Anhinga novaehollandiae</i> ¹⁰	Australasian Darter ¹⁰			•	•	•			•		
Phalacrocoracidae											
<i>Microcarbo melanoleucos</i>	Little Pied Cormorant			•	•	•			•		
<i>Phalacrocorax varius</i>	Australian Pied Cormorant ¹¹			•	•	•			•		•
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant			•	•	•					
<i>Phalacrocorax carbo</i>	Great Cormorant			•	•	•					
Threskiornithidae											
<i>Threskiornis molucca</i>	Australian White Ibis			•	•	•			•		
<i>Threskiornis spinicollis</i>	Straw-necked Ibis			•	•	•					•
<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI	•	•	•					
<i>Platalea regia</i>	Royal Spoonbill			•	•	•					
<i>Platalea flavipes</i>	Yellow-billed Spoonbill				•	•					
Ardeidae											
<i>Nycticorax caledonicus</i>	Nankeen Night Heron			•	•	•					
<i>Butorides striata</i>	Striated Heron			•	•	•			•		•
<i>Bubulcus coromandus</i> ¹²	Eastern Cattle Egret ¹²			•	•	•	•				•
<i>Ardea pacifica</i>	White-necked Heron			•	•	•					•
<i>Ardea alba</i>	Great Egret			•	•	•			•		
<i>Ardea intermedia</i>	Intermediate Egret			•	•						
<i>Egretta novaehollandiae</i>	White-faced Heron			•	•	•			•		
<i>Egretta garzetta</i>	Little Egret			•	•	•		•	•		
<i>Egretta sacra</i>	Pacific Reef Heron			•	•	•			•		
Pelecanidae											
<i>Pelecanus conspicillatus</i>	Australian Pelican			•	•	•			•		•
Pandionidae											
<i>Pandion cristatus</i> ¹³	Eastern Osprey ¹³	MI	MI	•	•	•	•		•		•
Accipitridae											
<i>Elanus axillaris</i> ¹⁴	Black-shouldered Kite			•	•	•			•		

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Elanus scriptus</i>	Letter-winged Kite	P4			•	•					
<i>Lophoictinia isura</i>	Square-tailed Kite				•						
<i>Hieraaetus morphnoides</i>	Little Eagle			•	•	•			•		
<i>Aquila audax</i>	Wedge-tailed Eagle			•	•	•			•		
<i>Erythrotriorchis radiatus</i>	Red Goshawk	VU	VU				•				
<i>Accipiter fasciatus</i>	Brown Goshawk			•	•	•					
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk			•	•	•					
<i>Circus approximans</i>	Swamp Harrier			•	•	•		•		•	•
<i>Circus assimilis</i>	Spotted Harrier			•	•	•			•		•
<i>Milvus migrans</i>	Black Kite			•	•	•			•		•
<i>Haliastur sphenurus</i>	Whistling Kite			•	•	•			•	•	•
<i>Haliastur indus</i>	Brahminy Kite			•	•	•			•		•
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle			•	•	•	•		•	•	•
Tytonidae											
<i>Tyto javanica</i> ¹⁵	Eastern Barn Owl ¹⁵			•	•				•		
Strigidae											
<i>Ninox boobook</i> ¹⁶	Australian Boobook ¹⁶			•	•						
Alcedinidae											
<i>Dacelo leachii</i>	Blue-winged Kookaburra			•	•	•					•
<i>Todiramphus sordidus</i> ¹⁷	Torresian Kingfisher ¹⁷			•	•	•			•		
<i>Todiramphus sanctus</i>	Sacred Kingfisher			•	•	•			•		•
<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher			•	•	•			•		•
Meropidae											
<i>Merops ornatus</i>	Rainbow Bee-eater			•	•	•			•		•
Falconidae											
<i>Falco cenchroides</i>	Nankeen Kestrel			•	•	•			•	•	•
<i>Falco longipennis</i>	Australian Hobby			•	•	•			•		•
<i>Falco berigora</i>	Brown Falcon			•	•	•			•	•	•
<i>Falco hypoleucos</i>	Grey Falcon	VU	VU	•	•		•				
<i>Falco subniger</i>	Black Falcon				•	•					
<i>Falco peregrinus</i>	Peregrine Falcon	OS		•	•	•					
Cacatuidae											
<i>Nymphicus hollandicus</i>	Cockatiel			•	•	•			•	•	•

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Eolophus roseicapilla</i>	Galah			•	•	•			•		•
<i>Cacatua sanguinea</i>	Little Corella			•	•	•			•		•
Psittaculidae											
<i>Barnardius zonarius</i>	Australian Ringneck			•	•	•					•
<i>Pezoporus occidentalis</i>	Night Parrot	CR	EN				•				
<i>Melopsittacus undulatus</i>	Budgerigar			•	•	•			•	•	•
Ptilonorhynchidae											
<i>Chlamydera guttata</i> ¹⁸	Western Bowerbird ¹⁸			•	•						
<i>Climacteris melanurus</i>	Black-tailed Treecreeper			•							
Maluridae											
<i>Malurus assimilis</i> ¹⁹	Purple-backed Fairywren ¹⁹			•	•	•			•		•
<i>Malurus leucopterus</i>	White-winged Fairywren			•	•	•		•	•		•
<i>Amytornis whitei</i> ²⁰	Rufous Grasswren ²⁰										
Meliphagidae											
<i>Epthianura tricolor</i>	Crimson Chat			•	•	•					
<i>Epthianura aurifrons</i>	Orange Chat			•		•					
<i>Conopophila whitei</i>	Grey Honeyeater										
<i>Certhionyx variegatus</i>	Pied Honeyeater				•	•					
<i>Sugomel niger</i>	Black Honeyeater			•	•				•		
<i>Lichmera indistincta</i>	Brown Honeyeater			•	•	•			•		•
<i>Gavicalis virescens</i>	Singing Honeyeater			•	•	•		•	•		•
<i>Ptilotula keartlandi</i>	Grey-headed Honeyeater			•	•	•					
<i>Ptilotula penicillata</i>	White-plumed Honeyeater			•	•	•			•		•
<i>Manorina flavigula</i>	Yellow-throated Miner			•	•	•			•		•
Pardalotidae											
<i>Pardalotus rubricatus</i>	Red-browed Pardalote			•	•	•			•		•
<i>Pardalotus striatus</i>	Striated Pardalote			•	•	•					
Acanthizidae											
<i>Smicronis brevirostris</i>	Weebill			•	•	•					
<i>Gerygone fusca</i>	Western Gerygone				•	•					
<i>Gerygone tenebrosa</i>	Dusky Gerygone			•	•	•			•		
<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill				•						
Pomatostomidae											

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler			•		•					
<i>Pomatostomus superciliosus</i>	White-browed Babbler			•							
Artamidae											
<i>Artamus leucorhynchus</i>	White-breasted Woodswallow			•	•	•		•	•	•	•
<i>Artamus personatus</i>	Masked Woodswallow			•	•						
<i>Artamus superciliosus</i>	White-browed Woodswallow			•	•				•		
<i>Artamus cinereus</i>	Black-faced Woodswallow			•	•	•			•	•	•
<i>Gymnorhina tibicen</i>	Australian Magpie			•	•	•					
<i>Cracticus nigrogularis</i>	Pied Butcherbird			•	•	•					•
Campephagidae											
<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike			•	•	•			•	•	•
<i>Lalage tricolor</i> ²¹	White-winged Triller			•	•	•			•		•
Oreoicidae											
<i>Oreoica gutturalis</i>	Crested Bellbird			•	•	•					
Pachycephalidae											
<i>Pachycephala melanura</i>	Mangrove Golden Whistler			•	•	•			•		
<i>Pachycephala rufiventris</i>	Rufous Whistler			•		•					
<i>Pachycephala lanioides</i>	White-breasted Whistler			•	•	•			•		
<i>Colluricincla harmonica</i>	Grey Shrikethrush			•	•	•					•
Rhipiduridae											
<i>Rhipidura leucophrys</i>	Willie Wagtail			•	•	•			•	•	•
<i>Rhipidura albiscapa</i>	Grey Fantail			•	•						
<i>Rhipidura phasiana</i>	Mangrove Fantail ²²			•	•	•			•		
Monarchidae											
<i>Grallina cyanoleuca</i>	Magpie-lark			•	•	•			•		•
Corvidae											
<i>Corvus orru</i>	Torresian Crow			•	•	•			•	•	•
<i>Corvus bennetti</i>	Little Crow			•							
Petroicidae											
<i>Melanodryas cucullata</i>	Hooded Robin				•	•					
<i>Peneothello pulverulenta</i>	Mangrove Robin			•		•			•		
<i>Petroica goodenovii</i>	Red-capped Robin			•		•					
Alaudidae											

Species	Common name	State	C'wealth	DBCA	ALA	eBird	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Mirafrja javanica</i>	Horsfield's Bush Lark			•	•	•			•		
Hirundinidae											
<i>Cheramoeca leucosterna</i>	White-backed Swallow			•	•	•					•
<i>Hirundo neoxena</i>	Welcome Swallow			•	•	•					
<i>Hirundo rustica</i>	Barn Swallow	MI	MI	•	•	•	•				
<i>Petrochelidon ariel</i>	Fairy Martin			•	•	•			•		•
<i>Petrochelidon nigricans</i>	Tree Martin			•	•	•			•		•
Acrocephalidae											
<i>Acrocephalus australis</i> ²³	Australian Reed Warbler ²³				•	•					
Locustellidae											
<i>Poodytes carteri</i>	Spinifexbird			•	•	•			•		•
<i>Poodytes gramineus</i>	Little Grassbird				•	•					
<i>Cincloramphus cruralis</i>	Brown Songlark			•	•	•			•	•	•
<i>Cincloramphus mathewsi</i>	Rufous Songlark			•	•	•			•		•
Zosteropidae											
<i>Zosterops luteus</i>	Canary White-eye ²⁴			•	•	•			•		•
<i>Zosterops lateralis</i>	Silvereye				•						
Dicaeidae											
<i>Dicaeum hirundinaceum</i>	Mistletoebird				•	•					
Passeridae											
<i>Passer montanus</i> *	Eurasian Tree Sparrow*			•	•	•					
Estrildidae											
<i>Heteromunia pectoralis</i>	Pictorella Mannikin			•	•						
<i>Emblema pictum</i>	Painted Finch			•	•	•			•		
<i>Bathilda ruficauda</i>	Star Finch			•	•	•					
<i>Taeniopygia castanotis</i> ²⁵	Australian Zebra Finch ²⁵			•	•	•		•	•	•	•
Motacillidae											
<i>Motacilla tschutschensis</i> ²⁶	Eastern Yellow Wagtail ²⁶	MI	MI	•	•	•	•				
<i>Motacilla cinerea</i>	Grey Wagtail	MI	MI				•				
<i>Anthus australis</i> ²⁷	Australian Pipit ²⁷			•	•	•		•	•	•	

The following species have been excluded: Garganey *Spatula querquedula*, Eurasian Teal *Anas crecca*, White Wagtail *Motacilla alba* (all vagrants to Australia), Southern Giant Petrel *Macronectes giganteus*, Wilson's Storm-Petrel *Oceanites oceanicus*, Streaked Shearwater *Calonectris leucomelas* (all obligate marine species in Australia), Pacific Koel *Eudynamis orientalis*, Pacific Gull *Larus pacificus*, Large-billed Gerygone *Gerygone magnirostris*, Australian Raven *Corvus coronoides* (all significantly outside

known range – records either erroneous or involve vagrant individuals), and Red-capped Parrot *Purpureicephalus spurius* (endemic to south-west WA, aviary escapee or erroneous record).

* Introduced

¹ Previously referred to as Fork-tailed Swift, prior to taxonomic revision separating several species from *A. pacificus*.

² Previously treated as a subspecies of Purple Swamphen *P. porphyrio*.

³ Previously treated as a subspecies of Black-winged Stilt (*H. himantopus*).

⁴ Previously treated as a subspecies of (Greater) Painted Snipe (*R. benghalensis*).

⁵ Previously referred to as Whimbrel, prior to revision of Hudsonian Whimbrel as separate species.

⁶ Also known as Eastern Curlew.

⁷ Two subspecies in Australia, *menzbieri* (CR) and *baueri* (VU), field identification with certainty can be problematic but the majority in WA belong to *menzbieri*.

⁸ Two taxa in Australia, now treated as two species by many authorities, Australian [Gull-billed] Tern (*G. [nilotica] macrotarsa*) and [Common] Gull-billed Tern (*G. nilotica affinis*). Retained together here as many previous records do not indicate the taxon involved.

⁹ Also known as White-winged Black Tern

¹⁰ Previously treated as subspecies of [Oriental] Darter *A. melanogaster*.

¹¹ Also known as Pied Cormorant.

¹² Previously treated as subspecies of [Western] Cattle Egret *A. ibis*.

¹³ Previously treated as subspecies of [Western] Osprey *P. haliaetus*. May revert to this taxonomic treatment in near future.

¹⁴ Previously included within *E. caerulus* (now known as Black-winged Kite).

¹⁵ Previously treated as subspecies of Barn Owl *T. alba*.

¹⁶ Previously treated as Southern Boobook (*N. novaeseelandiae*) and Southern Boobook (*N. boobook*) prior to taxonomic revisions.

¹⁷ Previously treated as subspecies of Collared Kingfisher (*T. chloris*).

¹⁸ Treated as subspecies of Spotted Bowerbird (*C. maculata*) by some authorities.

¹⁹ Previously treated as subspecies of Variegated Fairywren (*M. lamberti*).

²⁰ Previously treated as subspecies of Striated Grasswren (*A. striatus*).

²¹ Previously treated as subspecies of *L. sueurii*.

²² Also known as Mangrove Grey Fantail.

²³ Previously treated as subspecies of Clamorous Reed Warbler *A. clamosus*.

²⁴ Also known as Yellow White-eye.

²⁵ Previously treated as subspecies of [Sunda] Zebra Finch *T. guttata*.

²⁶ Previously treated as subspecies of [Western] Yellow Wagtail *M. flava*.

²⁷ Previously treated as subspecies of Richard's Pipit *A. richardi* then Australasian Pipit *A. novaeseelandiae*.

Reptiles

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
Cheloniidae										
<i>Caretta caretta</i>	Loggerhead Turtle	EN	EN; MI			•				
<i>Chelonia mydas</i>	Green Turtle	VU	VU; MI	•	•	•				
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	VU	VU; MI	•	•	•				
<i>Natator depressus</i>	Flatback Turtle	VU	VU; MI	•	•	•				
Dermodochelyidae										
<i>Dermodochelys coriacea</i>	Leatherback Turtle	VU	EN; MI			•				
Carphodactylidae										
<i>Nephurus levis</i>				•	•			•		
Diplodactylidae										
<i>Diplodactylus laevis</i> ¹	Desert Fat-tailed Gecko ¹			•	•			•		
<i>Lucasium stenodactylus</i>	Western Sandplain Gecko			•	•			•		
<i>Lucasium woodwardi</i> ²	Pilbara Ground Gecko ²			•						
<i>Rhynchoedura ornata</i>	Western Beaked Gecko			•						
<i>Strophurus ciliaris</i>				•	•			•		
<i>Strophurus elderi</i>				•						
<i>Strophurus jeanae</i>				•	•					
<i>Strophurus wellingtonae</i>					•					
Gekkonidae										
<i>Gehyra gemina</i> ³	Plain Tree Gecko ³				•					
<i>Gehyra incognita</i> ⁴	Northern Pilbara Cryptic Gehyra ⁴				•					
<i>Gehyra macra</i> ⁵	Large Pilbara Rock Gehyra ⁵									
<i>Gehyra media</i> ⁵	Medium Pilbara Spotted Rock Gehyra ⁵				•					
<i>Gehyra montium</i> ⁴										
<i>Gehyra pilbara</i>				•	•					
<i>Gehyra punctata</i> ⁵				•	•			•		•
<i>Gehyra purpurascens</i> ⁴				•	•					
<i>Gehyra variegata</i> ⁴				•	•			•		•
<i>Hemidactylus frenatus</i> *	Asian House Gecko*			•	•					
<i>Heteronotia binoei</i>	Bynoe's Gecko			•	•			•		•
Pygopodidae										

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Delma butleri</i> ⁶				•	•			•		
<i>Delma pax</i>				•	•					
<i>Delma tincta</i>				•				•		
<i>Lialis burtonis</i>				•	•			•		
<i>Pygopus nigriceps</i>				•	•			•		
Agamidae										
<i>Ctenophorus caudicinctus</i>	Ring-tailed Dragon			•	•			•		•
<i>Ctenophorus isolepis</i>	Military Dragon			•	•			•		•
<i>Ctenophorus nuchalis</i>	Central Netted Dragon			•	•			•		•
<i>Ctenophorus reticulatus</i>	Western Netted Dragon			•	•					
<i>Diporiphora paraconvergens</i> ⁷	Grey-striped Western Desert Dragon ⁷			•	•					
<i>Diporiphora pindan</i> ⁷	Pindan Dragon ⁷			•						
<i>Diporiphora vescus</i> ⁷	Northern Pilbara Tree Dragon ⁷			•	•			•		
<i>Gowidon longirostris</i> ⁸	Long-nosed Dragon ⁸			•	•		•	•		•
<i>Lophognathus horneri</i> ⁹	Northern Tree Dragon ⁹			•	•					
<i>Pogona minor</i>				•	•			•		
Scincidae										
<i>Carlia munda</i>				•	•					•
<i>Carlia triacantha</i>				•				•		
<i>Cryptoblepharus buchananii</i> ¹⁰				•	•					
<i>Ctenotus angusticeps</i>		P3		•	•					
<i>Ctenotus colletti</i>					•					
<i>Ctenotus duricola</i>				•	•			•	•	
<i>Ctenotus dux</i>				•						
<i>Ctenotus grandis</i>				•				•		
<i>Ctenotus hanloni</i>				•	•					
<i>Ctenotus helenae</i> ¹¹				•	•			•		
<i>Ctenotus pantherinus</i>	Leopard Ctenotus			•	•			•		•
<i>Ctenotus piankai</i>				•	•			•		
<i>Ctenotus robustus</i>					•					
<i>Ctenotus rufescens</i>				•	•			•		
<i>Ctenotus saxatilis</i>	Rock Ctenotus			•				•		•
<i>Ctenotus serventyi</i>				•	•			•		

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
<i>Egernia epsisolus</i> ¹²	Eastern Pygmy Spiny-tailed Skink ¹²			•	•			•		•
<i>Eremiascincus isolepis</i>				•						
<i>Eremiascincus musivus</i>	Mosaic Desert Skink			•	•					•
<i>Eremiascincus pallidus</i> ¹³	Western Narrow-banded Skink ¹³			•	•			•		
<i>Lerista bipes</i>				•	•			•		•
<i>Lerista clara</i>				•	•					
<i>Lerista jacksoni</i>					•					
<i>Lerista muelleri</i>				•				•		
<i>Lerista timida</i>					•					
<i>Menetia greyii</i>				•	•			•		
<i>Morethia ruficauda</i>				•				•		•
<i>Notoscincus ornatus</i>					•					
<i>Tiliqua multifasciata</i>	Central Blue-tongue			•	•			•		
Varanidae										
<i>Varanus acanthurus</i>	Spiny-tailed Goanna			•	•			•		•
<i>Varanus brevicauda</i>	Short-tailed Pygmy Goanna			•				•		
<i>Varanus bushi</i>	Pilbara Mulga Goanna			•				•		
<i>Varanus eremius</i>	Pygmy Desert Goanna			•	•			•		
<i>Varanus giganteus</i>	Perentie			•				•		
<i>Varanus gouldii</i>	Bungarra or Sand Goanna			•	•			•		
<i>Varanus panoptes</i>	Yellow-spotted Goanna			•	•					
<i>Varanus pilbarensis</i>	Northern Pilbara Rock Goanna			•						
Typhlopidae										
<i>Anilius ammodytes</i>				•	•			•		
<i>Anilius grypus</i>				•	•			•		
<i>Anilius pilbarensis</i>				•	•					
<i>Indotyphlops braminus</i> *				•	•					
Pythonidae										
<i>Antaresia childreni</i> ¹⁴	Children's Python ¹⁴			•						
<i>Antaresia perthensis</i>	Pygmy Python			•	•			•		
<i>Aspidites melanocephalus</i>	Black-headed Python			•	•			•		•
<i>Aspidites ramsayi</i>	Woma			•	•			•		•
<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	VU			•				

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
Homalopsidae										
<i>Fordonia leucobalia</i>	White-bellied Mangrove Snake			•	•					
Elapidae										
<i>Acanthophis pyrrhus</i>	Desert Death Adder			•	•					
<i>Acanthophis wellsi</i>	Pilbara Death Adder			•				•		
<i>Brachyuropsis approximans</i>				•				•		
<i>Demansia psammophis</i> ¹⁵	Yellow-faced Whipsnake ¹⁵			•	•			•		
<i>Demansia rufescens</i>	Rufous Whipsnake			•	•			•		
<i>Furina ornata</i>	Moon Snake			•	•					•
<i>Pseudechis australis</i>	Mulga Snake			•	•			•		
<i>Pseudonaja mengdeni</i> ¹⁶	Western Brown Snake ¹⁶			•	•			•		•
<i>Pseudonaja modesta</i>	Ringed Brown Snake			•	•			•		
<i>Simoselaps anomalus</i>	Desert Banded Snake			•	•			•		
<i>Suta fasciata</i>	Rosen's Snake				•					
<i>Suta punctata</i>	Spotted Snake			•	•					
<i>Aipysurus laevis</i>				•						
<i>Emydocephalus annulatus</i>				•						
<i>Ephalophis greyae</i>					•					
<i>Hydrelaps darwiniensis</i>				•	•					
<i>Hydrophis elegans</i>				•	•					
<i>Hydrophis ornatus</i>				•						
<i>Hydrophis stokesii</i>				•	•					

* Introduced

¹ Previously included within *D. conspicillatus*, animals in this area likely all referable to *D. laevis*.

² Previously treated as a subspecies of *L. stenodactylus*, most or all individuals in locality likely referable to *L. woodwardia*, but in proximity to the limit of *L. stenodactylus* published range so this species may also occur and has been retained in this list.

³ Previously included within *G. australis*.

⁴ Following revision of *G. variegata*, *G. montium* and *G. purpurescens* group, records from locality likely referable to *G. incognita* and *G. montium*, but *G. variegata* and *G. purpurescens* retained in list as distribution limits do approach locality.

⁵ All previously included within *G. punctata*, records from locality likely all referable to *G. macra* or *G. media*, but *G. punctata* retained in list as distribution limit does approach locality.

⁶ Includes *D. haroldi*.

⁷ Past records listed as *D. winneckeii* may be attributable to any of these three species.

⁸ Previously placed in genera *Amphibolurus* and *Lophognathus*.

⁹ Previously included within *L. gilberti*.

¹⁰ Previously included within *C. plagiocephalus*.

¹¹ Sometimes treated as conspecific with *C. inornatus*.

¹² Previously included within *E. depressa*.

¹³ Previously included within *E. fasciolatus*.

¹⁴ Previously treated as a distinct species, Stimson's Python *A. stimsoni*.

¹⁵ Some old records listed as *D. torquata*, synonymous with *D. psammophis torquata*.

¹⁶ Previously included within Northern Brown Snake *P. nuchalis*.

Amphibians

Species	Common name	State	C'wealth	DBCA	ALA	EPBC	DMMA A 2008	Outer Harbour 2009	Boodarie 2009	Port Hedland 2011
Pelodyadidae										
<i>Cyclorana australis</i>	Giant Frog			•	•			•		
<i>Cyclorana maini</i>	Sheep Frog			•	•			•		
<i>Litoria caerulea</i>	Green Tree Frog			•	•					•
<i>Litoria rothii</i>	Northern Laughing Tree Frog			•				•		
<i>Litoria rubella</i>	Little Red Tree Frog			•	•			•		•
Limnodynastidae										
<i>Neobatrachus aquilonius</i>	Northern Burrowing Frog			•	•					
<i>Neobatrachus sutor</i>	Shoemaker Frog			•						
<i>Notaden nichollsi</i>	Desert Spadefoot			•	•			•		
<i>Platyplectrum spenceri</i>	Centralian Burrowing Frog			•	•			•		
Myobatrachidae										
<i>Uperoleia glandulosa</i>	Glandular Toadlet			•	•					
<i>Uperoleia saxatilis</i> ¹	Pilbara Toadlet ¹			•				•		
<i>Uperoleia talpa</i>	Ratcheting Toadlet			•						

¹ Previously included within *U. russelli*.

Appendix 5

Likelihood of Occurrence Assessment for Significant Fauna Species



Species	Common name	State	C'wealth	Preferred Habitat	Preferred Habitat in Survey Area	Occurrence in Locality	Likelihood of Occurrence in Survey Area (Pre-survey)
Mammals							
<i>Dasyurus hallucatus</i>	Northern Quoll	EN	EN	Rocky habitat, particularly rocky gorges and gullies, breakaways and hills. Also occurs in association with drainage lines.	No	Over 500 records within 40 km in the NatureMap database.	Unlikely to occur
<i>Macrotis lagotis</i>	Bilby, Dalgyte	VU	VU	Primarily hummock grassland and <i>Acacia</i> shrubland, usually on sandplains.	No	28 records within 40 km in the NatureMap database	Unlikely to occur
<i>Lagostrophus fasciatus</i>	Banded Hare-wallaby	VU	VU	Extant island populations occupy shrublands on sandplains and dunes, little information on preferred habitat on mainland prior to extinction	No	Considered to be extinct on mainland, and published former distribution does not include the Pilbara	Would not occur
<i>Rhinonictes aurantia</i> (Pilbara form)	Pilbara Leaf-nosed Bat	VU	VU	Occurrence influenced by the availability of suitable roost caves that offer high humidity and a stable temperature. Restricted to caves with semi-permanent or permanent water nearby, usually in rocky habitat. Foraging typically occurs over open grasslands in gorges, low hills and plains.	Foraging only	Five records within 40 km in the NatureMap database	May occur
<i>Macroderma gigas</i>	Ghost Bat	VU	VU	Roost in caves, rock crevices and old mines, foraging in wide variety of habitats with distribution influenced by the availability of suitable caves for roost sites.	Foraging only	61 records within 40 km in the NatureMap database	May occur
<i>Ozimops cobourgianus</i>	Northern Coastal Free-tailed Bat	P1		Mangrove specialist, restricted to mangrove forests, adjacent areas of monsoon forest and coastal woodland.	Yes	Seven records records within 40 km in the NatureMap database	Likely to occur
<i>Dasyercus blythi</i>	Brush-tailed Mulgara, Ampurta	P4		Spinifex (<i>Triodia</i>) grasslands on sandplains, gibber plains.	Marginal	Over 200 records within 40 km in the NatureMap database	May occur
<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse	P4		Typically on stony hillsides with hummock grasslands.	No	One record within 40 km in the NatureMap database	Unlikely to occur
Birds							
<i>Numenius madagascariensis</i>	Far Eastern Curlew	CR; MI	CR; MI	Coastal and estuarine intertidal mudflats and sandflats, adjacent sandy beaches and mangrove fringes	Yes	33 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Calidris tenuirostris</i>	Great Knot	CR; MI	CR; MI	Coastal and estuarine intertidal flats, adjacent sandy beaches and rocky shorelines	Yes	28 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Limosa lapponica</i>	Bar-tailed Godwit	CR; MI	CR; MI	Coastal and estuarine intertidal flats, adjacent sandy beaches and rocky shorelines	Yes	57 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR; MI	CR; MI	Coastal and estuarine intertidal flats, adjacent sandy beaches and rocky shorelines; shallow fresh and brackish wetlands	Yes	35 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Pezoporus occidentalis</i>	Night Parrot	CR	EN	Arid or semi-arid spinifex grasslands with large, established and unburnt hummocks. Foraging habitat includes areas of chenopods and high-productivity grasslands.	No	No records within 40 km.	Unlikely to occur
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN; MI	EN; MI	Coastal and estuarine intertidal flats, sandy beaches	Yes	22 records within 40 km in the NatureMap database, records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Calidris canutus</i>	Red Knot	EN; MI	EN; MI	Coastal and estuarine intertidal flats, adjacent sandy beaches and rocky shorelines	Yes	15 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Rostratula australis</i>	Australian Painted-snipe	EN	EN	Vegetated wetlands and surrounds, usually freshwater.	No	No records within 40 km.	Unlikely to occur
<i>Macronectes giganteus</i>	Southern Giant Petrel	MI	EN; MI	Pelagic and coastal waters off southern Australia, occasionally entering bays and harbours	No	No records within 40 km.	Would not occur

Species	Common name	State	C'wealth	Preferred Habitat	Preferred Habitat in Survey Area	Occurrence in Locality	Likelihood of Occurrence in Survey Area (Pre-survey)
<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU; MI	VU; MI	Coastal and estuarine intertidal flats, sandy beaches	Yes	40 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Sternula nereis</i>	Fairy Tern	VU	VU	Sheltered coasts and estuaries, with sandy beaches, sandbars, offshore islands with sandy beaches	Yes	Two records within 40 km in the NatureMap database, offshore or coastal. Extralimital based on published distributions.	Unlikely to occur
<i>Erythrotriorchis radiatus</i>	Red Goshawk	VU	VU	Open forest and woodland, especially along watercourses with tall eucalypts and melaleucas	No	No records within 40 km, though species now known to visit Pilbara region	Unlikely to occur
<i>Falco hypoleucos</i>	Grey Falcon	VU	VU	Lightly wooded plains and tree-lined watercourses.	Yes	Four records within 40 km in the NatureMap database.	May occur
<i>Tringa brevipes</i>	Grey-tailed Tattler	MI; P4	MI	Coastal and estuarine intertidal flats, less commonly sandy beaches, rocky shorelines, mangrove fringes, near-coastal wetlands	Yes	58 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Spatula querquedula</i>	Garganey	MI	MI	Freshwater wetlands and sewage treatment ponds	No	Single individual recorded several times in 2019 near South Hedland	Unlikely to occur
<i>Apus pacificus</i>	Pacific Swift	MI	MI	Aerial over most habitats, particularly coastal and near coastal plains	Yes	Several records within 40 km in the eBird and ALA databases	Likely to occur
<i>Cuculus optatus</i>	Oriental Cuckoo	MI	MI	Dense to open woodlands and forest, especially riparian areas, rainforest patches, vine thickets, mangroves	Yes	No records within 40 km, but known to be a rare visitor to Pilbara, particularly coastal areas and is both cryptic in habits and present over summer when survey effort is generally significantly lower.	May occur
<i>Pluvialis fulva</i>	Pacific Golden Plover	MI	MI	Intertidal mudflats, reef flats, adjacent sandy beaches, near-coastal grasslands and wetlands	Yes	15 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Pluvialis squatarola</i>	Grey Plover	MI	MI	Coastal and estuarine intertidal flats, sandy beaches and adjacent rocky shorelines	Yes	21 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Charadrius veredus</i>	Oriental Plover	MI	MI	Open plains, bare, rolling country, muddy or sandy wastes near inland swamps or intertidal mudflats; bare claypans, margins of coastal marshes; grassy airfields, sportsfields, lawns and coastal dune areas	Yes	Eight records within 40 km in the NatureMap database, several records within 10 km of survey area in eBird database.	Likely to occur
<i>Numenius phaeopus</i>	Eurasian Whimbrel	MI	MI	Coastal and estuarine intertidal flats, tidal creeks and mangroves, less commonly sandy beaches and rocky shorelines	Yes	62 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Numenius minutus</i>	Little Curlew	MI	MI	Short grassland plains and bare country, roosts on sandy beaches and mudflats or margins of wetlands	Yes	26 records within 40 km in the NatureMap database.	Likely to occur
<i>Limosa limosa</i>	Black-tailed Godwit	MI	MI	Coastal and estuarine intertidal mudflats, shallow freshwater wetlands.	Yes	Six records within 40 km in the NatureMap database, several records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Arenaria interpres</i>	Ruddy Turnstone	MI	MI	Coastal and estuarine intertidal flats, sandy beaches esp. with extensive tide wrack, rocky shorelines	Yes	87 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Calidris pugnax</i>	Ruff	MI	MI	Shallow freshwater wetlands and wetland margins including sewage ponds. Elsewhere also uses wet grasslands and farmland, but generally rare on intertidal flats	Marginal	Two records within 40 km in the NatureMap database	May occur
<i>Calidris falcinellus</i>	Broad-billed Sandpiper	MI	MI	Coastal and estuarine intertidal flats, coastal salt lakes, shallow margins of freshwater lakes	Yes	15 records within 40 km in the NatureMap database, several records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MI	MI	Shallows and margins of coastal and inland wetlands, preferring freshwater, less commonly coastal and estuarine intertidal mudflats	Yes	33 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur

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<i>Calidris subminuta</i>	Long-toed Stint	MI	MI	Muddy fringes of freshwater wetlands (especially vegetated), occasionally estuarine mudflats	Marginal	15 records within 40 km in the NatureMap database, several records within 10 km of survey area in eBird database.	May occur
<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI	Coastal and estuarine intertidal flats, muddy fringes of freshwater wetlands, less commonly on sandy beaches and rocky coastlines	Yes	63 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Calidris alba</i>	Sanderling	MI	MI	Sandy ocean beaches, less commonly tidal sand or reef flats	Marginal	17 records within 40 km in the NatureMap database, multiple records within 10 km of survey area in eBird database.	May occur
<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI	Shallows and margins freshwater wetlands, occasionally coastal or estuarine intertidal flats	Marginal	Two records within 40 km in the NatureMap database.	May occur
<i>Limnodromus semipalmatus</i>	Asian Dowitcher	MI	MI	Coastal and estuarine intertidal flats, adjacent sandy beaches	Yes	Six records within 40 km in the NatureMap database.	May occur
<i>Gallinago stenura</i>	Pin-tailed Snipe	MI	MI	Shallow, well-vegetated freshwater wetlands, damp grasslands	No	Three records within 40 km in the NatureMap database, and one in eBird database. Specimen from Port Hedland listed in ALA database	Unlikely to occur
<i>Gallinago megala</i>	Swinhoe's Snipe	MI	MI	Shallow, well-vegetated freshwater wetlands, damp grasslands	No	One record within 40 km in eBird database, and additional record in ALA database	Unlikely to occur
<i>Xenus cinereus</i>	Terek Sandpiper	MI	MI	Coastal and estuarine intertidal flats, adjacent sandy beaches and rocky shorelines	Yes	24 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Phalaropus lobatus</i>	Red-necked Phalarope	MI	MI	Primarily open seas in this region, when ashore favours natural salt lakes, artificial salt ponds/salt ponds, and sewage treatment ponds, sometimes freshwater wetlands	Marginal	Five records within 40 km in the NatureMap database.	Unlikely to occur
<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI	Margins of coastal and inland wetlands, including mangroves/mangrove creeks, rocky shorelines, river banks, but less often intertidal flats	Yes	46 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Tringa totanus</i>	Common Redshank	MI	MI	Most Australian records from coastal and estuarine tidal flats, or roosting on adjacent sandy beaches or rocky shorelines. Uses a broad range of wetland habitats overseas.	Yes	One record within 10 km in eBird database from 1995, two others within 40km in eBird and ALA databases.	Unlikely to occur
<i>Tringa stagnatilis</i>	Marsh Sandpiper	MI	MI	Shallow freshwater wetlands and wetland margins, less commonly intertidal mudflats		28 records within 40 km in the NatureMap database.	May occur
<i>Tringa glareola</i>	Wood Sandpiper	MI	MI	Shallow freshwater wetlands and wetland margins	Marginal	22 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	May occur
<i>Tringa nebularia</i>	Common Greenshank	MI	MI	Coastal and estuarine intertidal flats, mangrove fringes, shallow freshwater wetlands and wetland margins, less commonly on sandy beaches	Yes	61 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Glareola maldivarum</i>	Oriental Pratincole	MI	MI	Primarily forages on the wing over open country, roosts on bare ground near water (e.g. tidal flats, sandy beaches, margins of freshwater wetlands)	Yes	17 records within 40 km in the NatureMap database, several in eBird database.	Likely to occur
<i>Anous stolidus</i>	Brown Noddy	MI	MI	Warm tropical and subtropical seas, breeding on offshore islands and foraging offshore	No	No records within 40 km.	Unlikely to occur
<i>Gelochelidon [nilotica]</i>	Gull-billed Tern	MI	MI	Australian: Coasts and estuaries, particularly in vicinity of intertidal flats, inland wetlands, grasslands and open country (sometimes far from water). Breeding primarily on large ephemeral wetlands inland. Common: coasts and estuaries, often in vicinity of tidal mudflats, near-coastal wetlands	Yes	23 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database inc. both species.	Likely to occur

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<i>Hydroprogne caspia</i>	Caspian Tern	MI	MI	Sheltered coasts, offshore islands, estuaries and large inland wetlands	Yes	70 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Thalasseus bergii</i>	Greater Crested Tern	MI	MI	Inshore seas, coasts, estuaries and tidal creeks, preferring clear waters	Yes	25 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Onychoprion anaethetus</i>	Bridled Tern	MI	MI	Offshore waters, breeding on offshore and near-coastal islands and rock stacks	No	Two records within 40 km in the NatureMap database. Records coastal within 10 km of survey area in eBird database.	Unlikely to occur
<i>Sternula albifrons</i>	Little Tern	MI	MI	Sheltered seas, estuaries, mangrove creeks, sandy beaches and offshore islands.	Yes	19 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Sterna dougallii</i>	Roseate Tern	MI	MI	Blue-water seas, coasts and islands	Marginal	One record within 10 km offshore in eBird and ALA database	May occur
<i>Sterna hirundo</i>	Common Tern	MI	MI	Sheltered seas, coasts, estuaries	Yes	Eight records within 40 km in the NatureMap database, several records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Chlidonias leucopterus</i>	White-winged Tern	MI	MI	Estuaries, sheltered seas, freshwater wetlands, sewage ponds, flooded samphire flats	Yes	36 records within 40 km in the NatureMap database, records in coastal areas within 10 km of survey area in eBird database.	Likely to occur
<i>Oceanites oceanicus</i>	Wilson's Storm Petrel	MI	MI	Primarily over offshore waters at or beyond continental shelf edge, in some areas regularly found over inshore waters	No	Two records within 40 km in the NatureMap database. Records offshore within 10 km of survey area in eBird database.	Would not occur
<i>Calonectris leucomelas</i>	Streaked Shearwater	MI	MI	Offshore waters over continental slope to continental shelf edge, less commonly coastal waters and waters beyond continental shelf edge	No	Common visitor further offshore but no records along coast	Would not occur
<i>Phaethon lepturus</i>	White-tailed Tropicbird	MI	MI	Offshore waters, breeding on offshore islands	No	No records within 40 km.	Unlikely to occur
<i>Fregata minor</i>	Great Frigatebird	MI	MI	Aerial over tropical seas, usually well offshore, breeding on offshore islands	No	No records within 40 km.	Unlikely to occur
<i>Fregata ariel</i>	Lesser Frigatebird	MI	MI	Aerial over coasts and seas, breeding on offshore islands	Marginal	16 records within 40 km in the NatureMap database, multiple records along coast and offshore within 10 km of survey area in eBird database.	May occur (overflying)
<i>Sula dactylatra</i>	Masked Booby	MI	MI	Primarily offshore waters of tropical seas, breeds on offshore islands	No	One record within 10 km in ALA database from 1975, but location generalised +/- 10 km	Unlikely to occur
<i>Sula leucogaster</i>	Brown Booby	MI	MI	Inshore and offshore waters of tropical seas, breeds on offshore islands	Marginal	One record within 40 km in the NatureMap database. Four records within 10 km of survey area around coast and harbour in eBird database.	May occur
<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI	Well-vegetated wetlands and floodplains, occasionally dry grasslands	No	Four records within 40 km in the NatureMap database.	Unlikely to occur
<i>Pandion cristatus</i>	Eastern Osprey	MI	MI	Estuaries, coasts and offshore islands, less commonly large inland wetlands	Yes	69 records within 40 km in the NatureMap database, multiple records around coast within 10 km of survey area in eBird database.	Likely to occur
<i>Hirundo rustica</i>	Barn Swallow	MI	MI	Open country with low vegetation, often near water or manmade structures	Yes	24 records within 40 km in the NatureMap database, multiple records within 10 km of survey area in eBird database.	Likely to occur
<i>Motacilla tschutschensis</i>	Eastern Yellow Wagtail	MI	MI	Short grass and bare ground, margins of swamps and marshes, sewage ponds.	Yes	Six records within 40 km in the NatureMap database, records within 10 km of survey area in eBird database.	May occur
<i>Motacilla cinerea</i>	Grey Wagtail	MI	MI	A variety of habitats near water	Yes	No records within 40 km.	Unlikely to occur

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<i>Falco peregrinus</i>	Peregrine Falcon	OS		Found in most habitats. Prefers coastal and inland cliffs, or open woodlands near water.	Yes	Three records within 40 km in the NatureMap database, one within 10 km of survey area in eBird database.	Likely to occur
<i>Elanus scriptus</i>	Letter-winged Kite	P4		Arid and semi-arid grasslands and open country, roosting and breeding in trees. Irruptive, and after good seasons wandering individuals may appear far from their core range	Marginal	Two records within 40 km in the ALA and eBird databases	Unlikely to occur
Reptiles							
<i>Caretta caretta</i>	Loggerhead Turtle	EN	EN; MI	Tropical and warm temperate waters. Breed on insular and mainland sandy beaches and foredunes in temperate and subtropical areas.	Marginal	No records within 40 km	Unlikely to occur
<i>Chelonia mydas</i>	Green Turtle	VU	VU; MI	Tropical and warm temperate waters. Breed on sandy beaches and foredunes, favouring higher wave-energy beaches	Marginal	Three records within 40 km in the NatureMap and ALA databases.	May occur
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	VU	VU; MI	Tropical and warm temperate waters, favouring rocky bottoms and coral reefs. Breed on insular and mainland sandy beaches in tropical and subtropical areas	Marginal	One record within 40 km in the NatureMap and ALA databases.	May occur
<i>Natator depressus</i>	Flatback Turtle	VU	VU; MI	Tropical coastal waters	Marginal	Over 2,000 records within 40 km in the NatureMap database	May occur
<i>Dermochelys coriacea</i>	Leatherback Turtle	VU	EN; MI	Oceans and coastal waters, extending into much colder waters than other sea turtles	Marginal	No records within 40 km	Unlikely to occur
<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	VU	Primarily rocky gorges, escarpments, and outcrops, especially near waterholes where it may find suitable prey - but will travel long distances and use other habitats in passing	No	No records within 40 km	Unlikely to occur
<i>Ctenotus angusticeps</i>		P3		On mainland, coastal saltmarsh vegetation on mudflats, often near mangroves and with numerous crabholes	Yes	16 records within 40 km in the NatureMap database.	Likely to occur