



Onslow Salt Parking Area Biological Survey



Biota
Environmental
Sciences



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Onslow Salt Parking Area NVCP Survey

Contents

1.0	Executive Summary	7
2.0	Introduction	9
2.1	Background	9
2.2	Scope of the Study	9
3.0	Regional Context to the Study	11
3.1	IBRA Bioregion and Subregion	11
3.2	Land Systems	11
3.3	Geology and Soils	13
3.4	Beard's Vegetation Units	13
3.5	Conservation Reserves and Protected Areas	13
4.0	Methodology	17
4.1	Desktop Study	17
4.2	Assessment of Likelihood of Occurrence in the Survey Area	17
4.3	Field Survey	18
4.4	Flora Specimen Identification, Nomenclature and Data Entry	21
4.5	Limitations	22
5.0	Desktop Study Results	23
5.1	Previous Surveys in the Locality	23
5.2	Vegetation and Flora	29
5.3	Fauna	31
6.0	Vegetation and Flora Results	35
6.1	Vegetation	35
6.2	Flora	35
7.0	Terrestrial Fauna Results	39
8.0	Conclusions	45
8.1	Significant Vegetation	45
8.2	Significant Flora	45
8.3	Introduced Flora	45
8.4	Significant Fauna	45
8.5	Assessment Against the Ten Clearing Principles	45
9.0	References	49

Appendix 1

Framework for Conservation Significance Ranking of Species

Appendix 2

EPBC Act Protected Matters Database Search Results

Appendix 3

Significant Flora Species Recorded within

40 km and their Likelihood of Occurrence

Appendix 4

Vegetation Structural Classes and Condition Scale

Appendix 5

Raw Site Data

Appendix 6

Vascular Flora Species List

Appendix 3

Significant Fauna Species Recorded within 40 km and their Likelihood of Occurrence

Tables

Table 3.1:	Land systems intersected by the survey area.	11
Table 3.2:	Geological and soil units occurring within the survey area.	13
Table 3.3:	Beard's vegetation mapping units occurring in the survey area and their pre-European and current extent in the Cape Range and Roebourne subregions combined.	13
Table 4.1:	Ranking system used to assign the likelihood that a species would occur in the survey area.	18
Table 4.2:	Summary of personnel and qualifications.	18
Table 4.3:	Potential constraints and limitations of the biological assessment.	22
Table 5.1:	Summary of the major flora and vegetation surveys completed within 40 km of the survey area.	24
Table 5.2:	Summary of previous fauna surveys conducted within 40 km of the survey area.	27
Table 7.1:	Bird species recorded in the survey area.	39
Table 7.2:	Significant vertebrate fauna with moderate to high likelihood of occurrence in survey area.	39
Table 8.1:	Assessment of vegetation within the survey area against the ten clearing principles.	46

Figures

Figure 2.1:	Location of the survey area.	10
Figure 3.1:	Land systems of the survey area.	12
Figure 3.2:	Geological and soil units occurring within the survey area and surrounds.	14
Figure 3.3:	Beard's vegetation units occurring within the survey area and surrounds.	15
Figure 3.4:	Conservation reserves in the vicinity of the survey area.	16
Figure 4.1:	Total monthly rainfall for the Onslow Salt recording station for August 2021 to August 2022, compared to the long-term monthly median rainfall for the Bureau Onslow Airport station (1916-2022).	19
Figure 4.2:	Location of relevés within the survey area.	20
Figure 5.1:	Previous records of Priority flora within 40 km of the survey area.	30
Figure 5.2:	Previous records of significant mammals and reptiles within 40 km of the survey area.	32
Figure 5.3:	Previous records of significant birds within 40 km of the survey area.	33
Figure 6.1:	Vegetation mapping and Priority flora locations in the survey area.	36
Figure 6.2:	Vegetation condition mapping.	37

1.0 Executive Summary

Onslow Salt plans to construct a parking area within the site of its existing operations in Onslow, in northwest Western Australia. The 3.16 ha site of the proposed car park is located approximately 2 km southwest of the Onslow townsite, on the border of mining tenements G8SA and G11SA.

Biota Environmental Sciences was commissioned to undertake a desktop study and biological survey to identify vegetation, flora and fauna values of the area, and prepare an assessment against the 10 clearing principles listed in Schedule 5 of the *Environmental Protection Act 1986*.

One vegetation type (D1: *Acacia coriacea* subsp. *coriacea*, *Trichodesma zeylanicum* var. *grandiflorum* tall open shrubland over *Crotalaria cunninghamii* subsp. *cunninghamii*, (*Tephrosia rosea* var. *clementii*) shrubland over **Cenchrus ciliaris* tussock grassland and *Triodia epactia* very open hummock grassland) was described and mapped in the survey area. It does not represent any listed significant vegetation. The vegetation condition of the survey area was rated as Very Good.

A total of 33 native vascular flora species from 26 genera and 16 families were recorded during the survey. In total, five individuals of one Priority 3 species, *Abutilon* sp. *Pritzelianum* (S. van Leeuwen 5095), were recorded at both of the relevé locations sampled during the survey. No other Priority flora species are considered likely to occur.

Three weed species were recorded from the study area, **Aerva javanica*, **Cenchrus ciliaris* and **Tribulus terrestris*. None of these are listed WONS or declared pests under the *WA Biosecurity and Agriculture Management Act 2007*.

One fauna habitat was mapped over the survey area, mixed shrubland on consolidated coastal sand dunes. It is unlikely to represent critical habitat for significant fauna species. Based on the desktop study and an on-ground assessment of the habitat within the survey area during the field survey, 13 significant vertebrate fauna species were assessed as having a moderate ('May occur') or high ('Likely to occur') likelihood of occurrence within the survey area:

- Grey Falcon *Falco hypoleucos*: BC Act and EPBC Act Vulnerable;
- Pacific [Fork-tailed] Swift *Apus pacificus*: BC Act and EPBC Act Migratory;
- Oriental Plover *Charadrius veredus*: BC Act and EPBC Act Migratory;
- Little Curlew *Numenius minutus*: BC Act and EPBC Act Migratory;
- Oriental Pratincole *Glareola maldivarum*: BC Act and EPBC Act Migratory;
- Australian [Gull-billed] Tern *Gelochelidon [nilotica] macrotarsa*: BC Act and EPBC Act Migratory;
- Common Gull-billed Tern *Gelochelidon nilotica*: BC Act and EPBC Act Migratory;
- Osprey *Pandion haliaetus*: BC Act and EPBC Act Migratory;
- Barn Swallow *Hirundo rustica*: BC Act and EPBC Act Migratory;
- *Lerista planiventralis maryani*: DBCA Priority 1;
- Short-tailed Mouse *Leggadina lakedownensis*: DBCA Priority 4; and
- North-west Coastal Free-tailed Bat *Ozimops cobourgianus* DBCA Priority 4.

An assessment against the 10 clearing principles indicates that the proposal may be at variance with Principle A.

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2.0 Introduction

2.1 Background

Onslow Salt Pty Ltd (Onslow Salt) plans to apply to the Department of Mines, Industry Regulation and Safety (DMIRS) for a Native Vegetation Clearing Permit (NVCP) in order to clear native vegetation to construct a parking area within its existing operations in Onslow, in northwest Western Australia. The 3.16 ha site of the proposed parking area (hereafter the "survey area") is located approximately 2 km southwest of the Onslow townsite, on the border of mining tenements G8SA and G11SA (Figure 2.1).

Biota Environmental Sciences (Biota) was commissioned to undertake a biological assessment to identify vegetation, flora and fauna values of the survey area.

2.2 Scope of the Study

The main objective of the study was to determine if there are any significant flora or fauna species, or vegetation communities that could represent constraints to the development of the survey area or require specific management. To meet this objective, a desktop study and field survey were conducted followed by the preparation of this report to support the NVCP application.

The key items of this scope comprised:

- A review of existing information within the desktop study area (comprising an area of 40 km from the centre of the survey area) to establish the biogeographical context of the survey area.
- A review of literature pertaining to previous surveys completed in the locality.
- Searches of relevant databases for biological features of significance.
- A discussion of database search results to determine whether significant fauna, flora and vegetation communities may occur in the survey area; specifically Threatened or Priority listed flora or fauna species, and Threatened Ecological Communities (TECs), Priority Ecological Communities (PECs) or other Environmentally Sensitive Areas (ESAs).
- Description and mapping of dominant vegetation units within the survey area (including a description of dominant species, structure and vegetation condition).
- Identification of any locally significant vegetation units within the survey area, where relevant.
- Compilation of a list of all vascular flora species recorded in the survey area.
- Recording populations of any significant flora, including Threatened and Priority species and any other species of interest, where encountered.
- Recording any introduced flora species (weeds) encountered in the survey area.
- Recording any opportunistic sightings of fauna whilst conducting the flora and vegetation assessment.

The results of the desktop study and field survey will be used to prepare an assessment of the proposed project against the 10 clearing principles, as required for an NVCP application.

The biological survey was conducted in accordance with the following guidelines:

1. Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA 2020);
2. Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016a);
3. Technical Guidance: Sampling of Short Range Endemic Invertebrate Fauna (EPA 2016b); and
4. A guide to the assessment of applications to clear native vegetation under Part V Division 2 of the *Environmental Protection Act 1986* (EP Act) (Department of Environment Regulation 2014).

The field survey was most closely aligned with a "targeted" flora survey and a "basic" fauna survey as per EPA guidance (2016a, 2020).

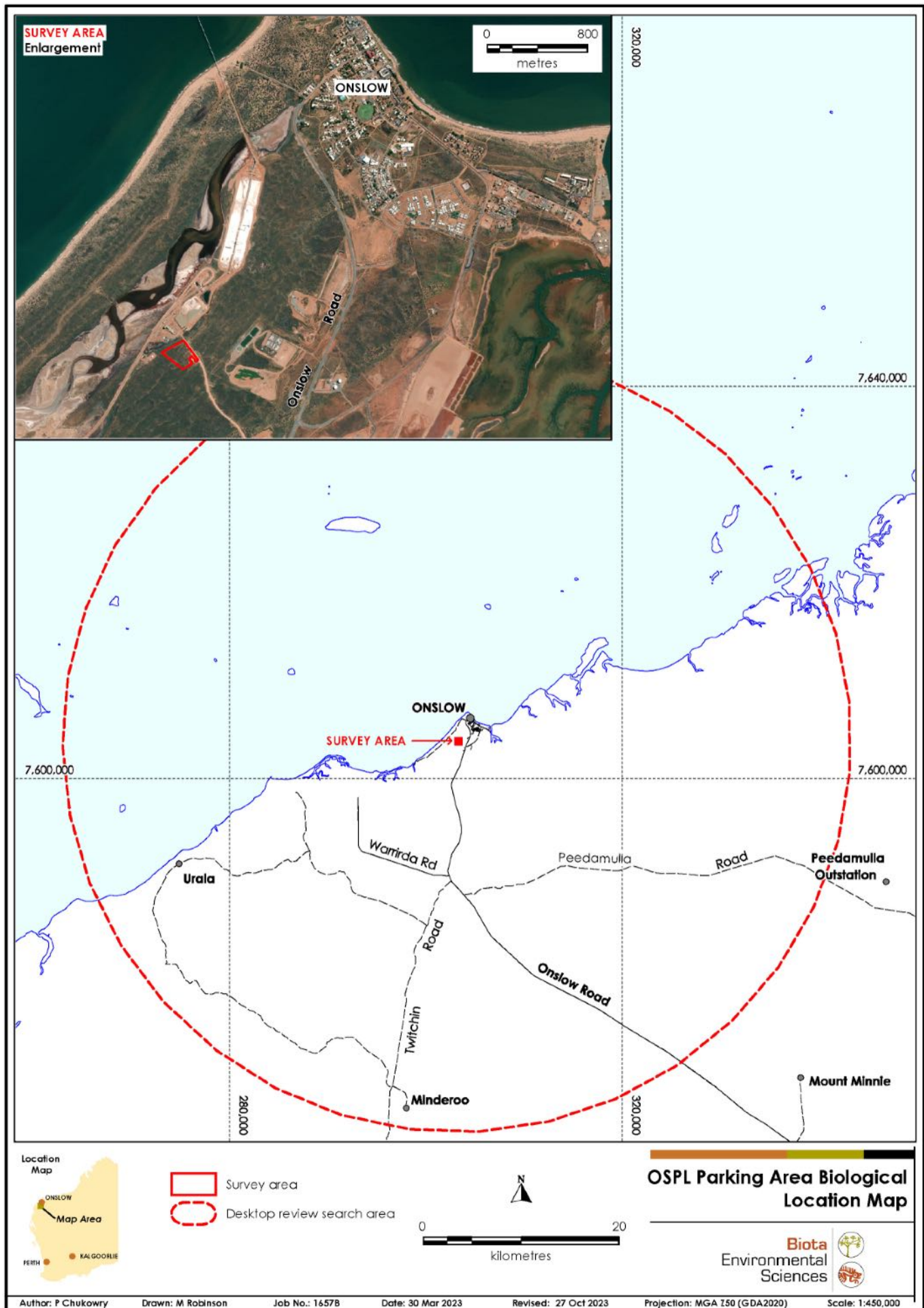


Figure 2.1: Location of the survey area.

3.0 Regional Context to the Study

3.1 IBRA Bioregion and Subregion

The Interim Biogeographic Regionalisation of Australia (IBRA7) recognises 89 bioregions for Australia (Department of the Environment and Energy 2019). The survey area lies within the Cape Range subregion of the Carnarvon bioregion (CAR). It is also situated near the western boundary of the Roebourne subregion of the Pilbara bioregion (PIL).

The Cape Range subregion (CAR1) is 2,547,911 ha and is described as:

“Cape Range and Giralia dunefields form the northern part of Carnarvon Basin. Rugged tertiary limestone ranges and extensive areas of red aeolian dunefield, Quaternary coastal beach dunes and mud flats. Acacia shrublands over Triodia on limestone (Acacia stuartii or A. bivenosa) and red dunefields, Triodia hummock grasslands with sparse Eucalyptus trees and shrubs on the Cape Range. Extensive hummock grasslands (Triodia) on the Cape Range and eastern dune-fields. Tidal mudflats of sheltered embayments of Exmouth Gulf support extensive mangroves. Beach dunes with Spinifex communities. An extensive mosaic of saline alluvial plains with samphire and saltbush low shrublands along the eastern hinterland of Exmouth Gulf. Islands of the Muiron, Barrow, Lowendal and Montebello groups are limestone-based. Climate is arid, semi-desert to sub-tropical climate, with variable summer and winter rainfall. Cyclonic activity can be significant, and cyclonic systems may affect the coast and hinterland annually” (Kendrick and Mau 2003).

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).

3.2 Land Systems

Land systems mapping for the survey area has been prepared by Agriculture WA (Payne et al. 1987, 1988, van Vreeswyk et al. 2004). The survey area intersects the Dune land system (Table 3.1 and Figure 3.1), which is widespread in the locality.

Table 3.1: Land systems intersected by the survey area.

Land System	Description	Total Area of Land System in Cape Range and Roebourne Subregions (ha)	Area of Land System in the Survey Area (ha)	Percentage of Total Land System within the Survey Area (%)
Dune (RGEDUN)	Dune fields supporting soft spinifex grasslands.	43,986.6	3.16	<0.01

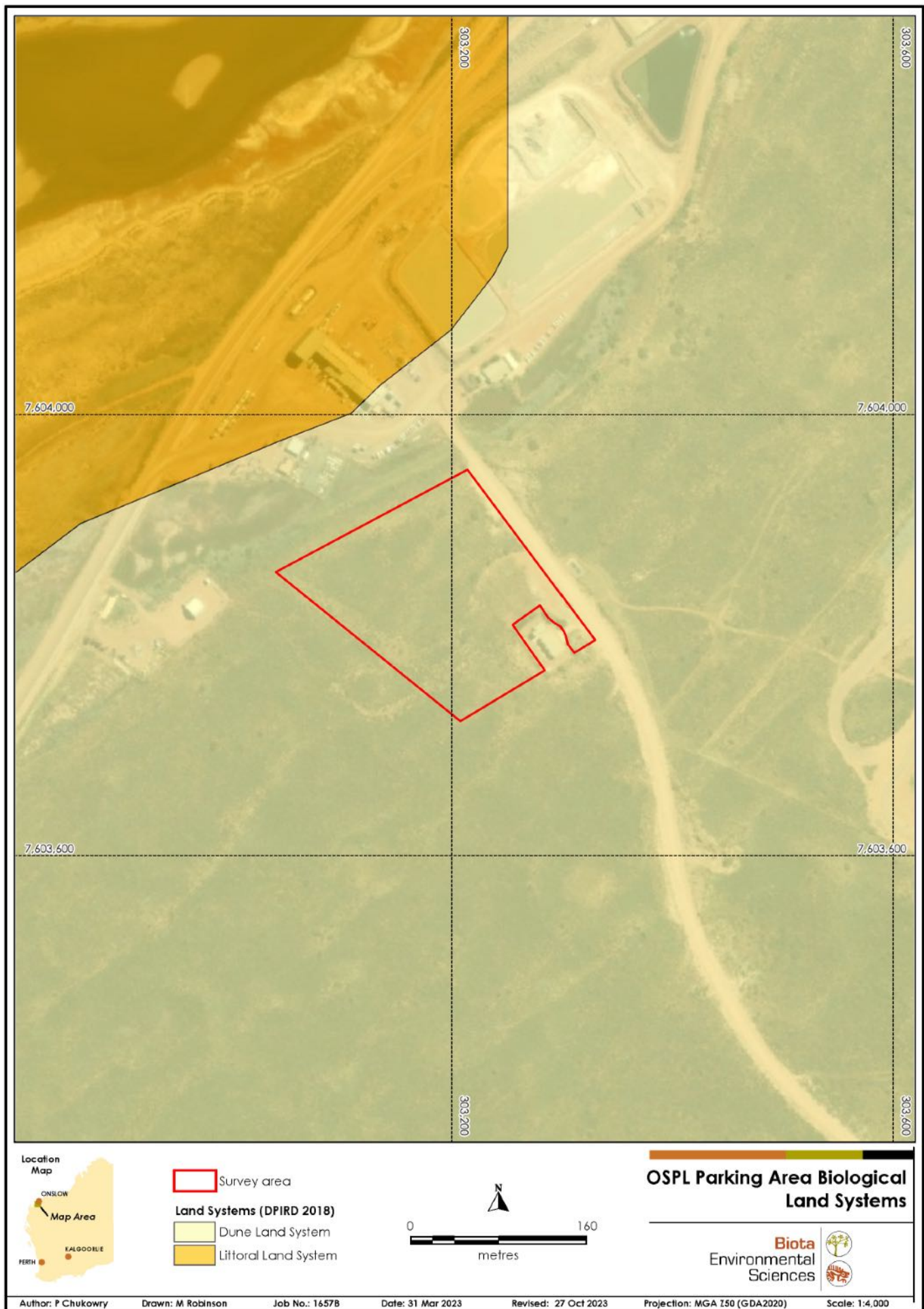


Figure 3.1: Land systems of the survey area.

3.3 Geology and Soils

Surface geology was mapped at a scale of 1:250,000 by the Geological Survey of Western Australia and Geoscience Australia (2008). The survey area is approximately 1.2 km from the coast and comprises coastal dunes underlain by consolidated quartzose calcarenite (Table 3.2, Figure 3.2).

One soil unit, SV8, was mapped at a scale of 1:2,000,000 for the survey area by Agriculture Western Australia (1967). This soil unit comprises mainly saline loams and sands (Table 3.2, Figure 3.2).

Table 3.2: Geological and soil units occurring within the survey area.

	Unit	Description	Extent within Survey Area (ha)
Geology	Qs	Beaches and coastal dunes-light grey, unconsolidated and poorly consolidated quartzose calcarenite.	3.16
Soils	SV8	Salt flats, tidal swamps, and coastal dune sands: chief soils are saline loams (Um1.3) and (Um1.4) with shelly sands (Uc1.11, Uc1.13). Small areas of calcareous earths (Gc) and shallow loams (Um) are associated with marls.	3.16

3.4 Beard's Vegetation Units

Beard (1975a, 1975b) described and mapped the vegetation of the Pilbara and northern Carnarvon bioregion at a scale of 1:1,000,000. The survey area intersects one unit mapped over the Cape Yannare Coastal Plain (CYCP) by Beard (Table 3.3 and Figure 3.3):

- CYCP 117: Hummock grasslands, grass steppe; soft spinifex.

This vegetation unit is widespread in the Cape Range subregion and has been subject to clearing. However, given the broad scale of Beard's mapping, these units provide only limited information about the vegetation occurring in the survey area (see Section 6.1 for a more detailed description of the vegetation).

Table 3.3: Beard's vegetation mapping units occurring in the survey area and their pre-European and current extent in the Cape Range and Roebourne subregions combined.

Beards Vegetation Mapping Unit	Extent within Cape Range and Roebourne Subregions (ha)		Percent Remaining	Extent within the Survey area (ha) (% of Current Mapped Extent in the Cape Range and Roebourne Subregions)
	Pre-European	Current		
CYCP 117	63,387.3	57,809.6	91.2%	3.16 (0.0055)

3.5 Conservation Reserves and Protected Areas

Fifteen significant lands occur within 40 km of the survey area, including six Department of Biodiversity, Conservation and Attractions (DBCA) managed lands, one DBCA land of interest and eight ESAs (Figure 3.4).

The six DBCA managed lands, include two gazetted nature reserves, Thevenard Island and Lockyer Island, two unofficial nature reserves, Bessieres Island and Airlie Island, as well as two unnamed island reserves. None of these are in close proximity (within 20 km); the closest reserve is the Thevenard Island Nature Reserve which is approximately 23 km northwest of the survey area.

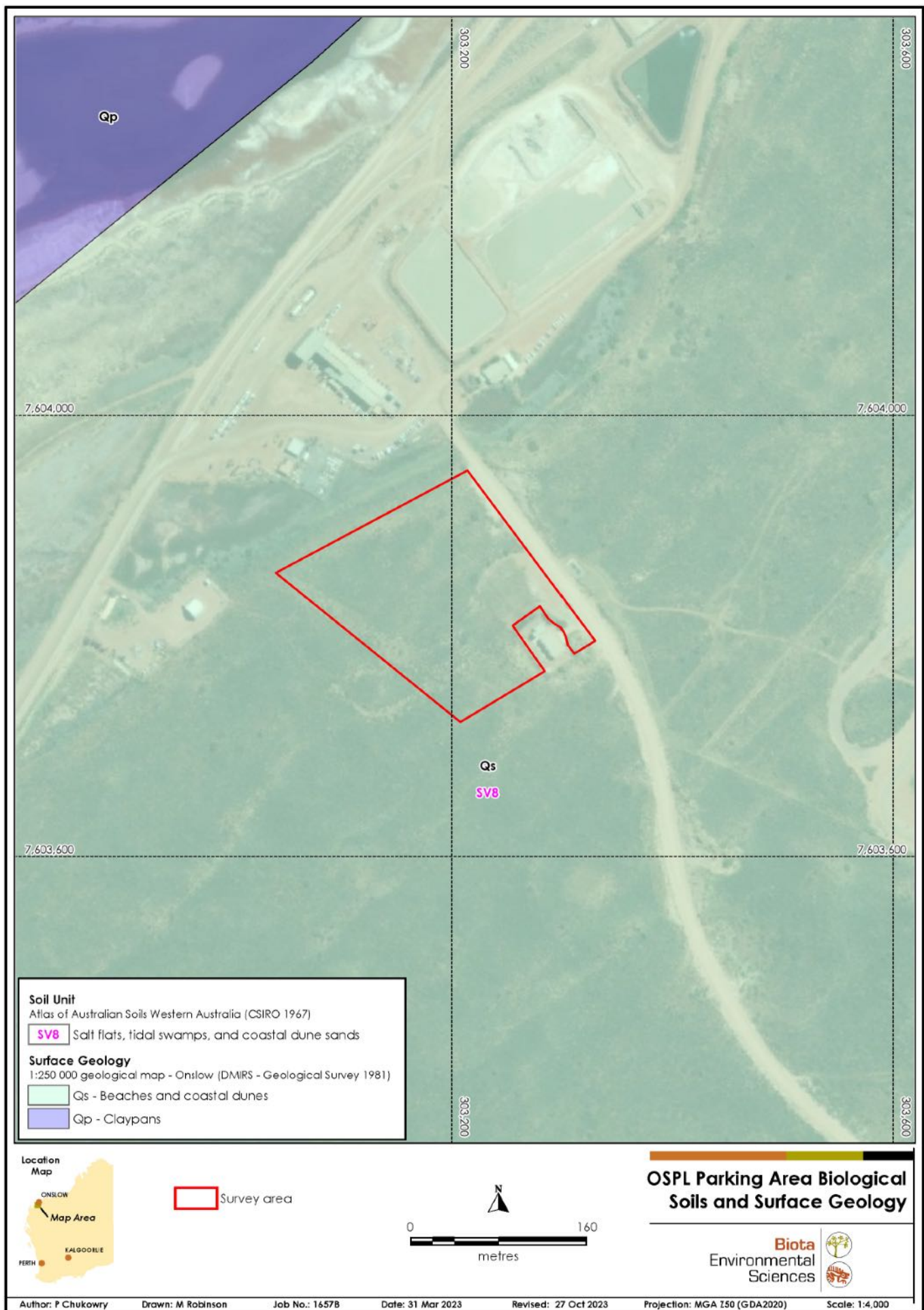


Figure 3.2: Geological and soil units occurring within the survey area and surrounds.



Figure 3.3: Beard's vegetation units occurring within the survey area and surrounds.

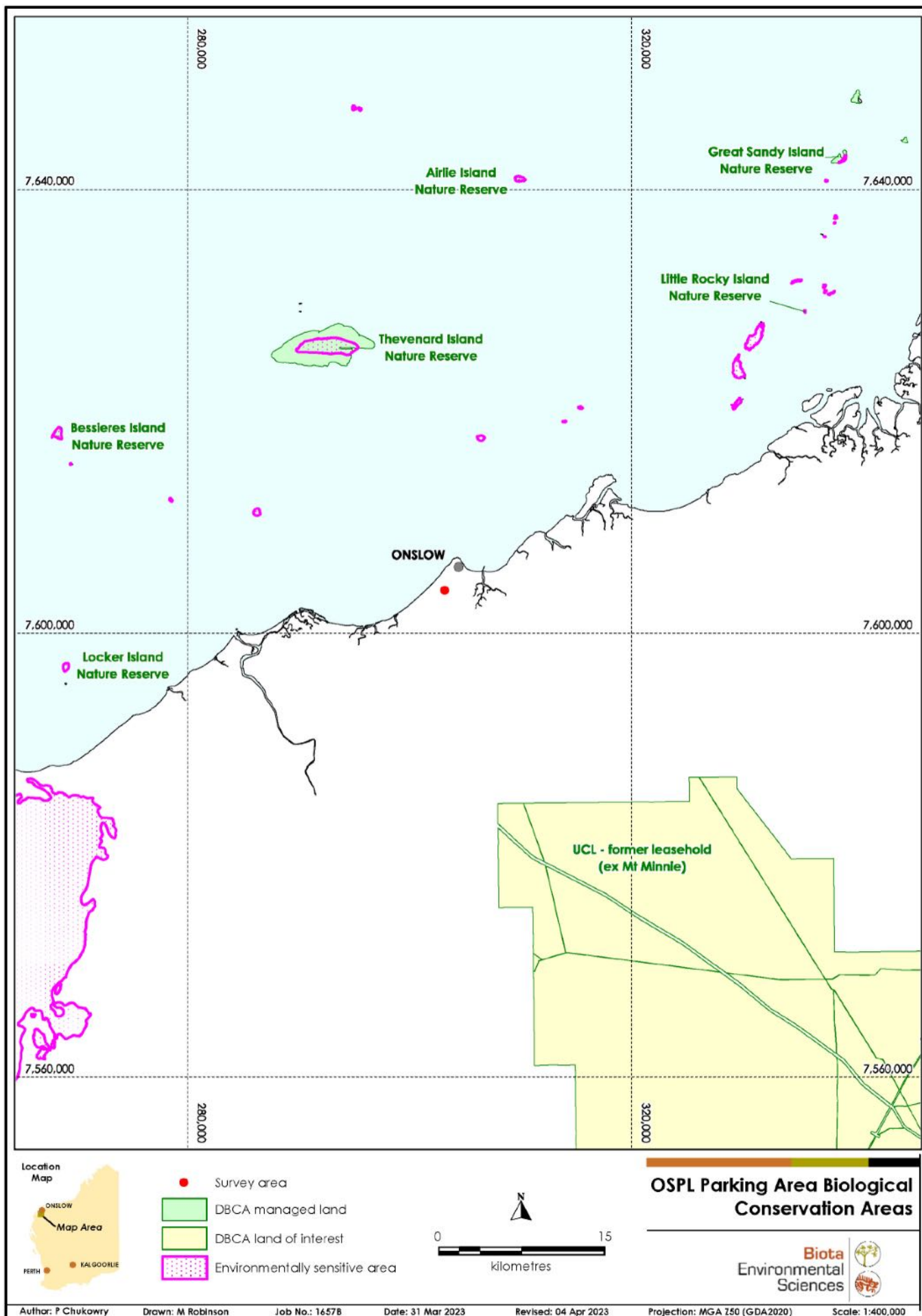


Figure 3.4: Conservation reserves in the vicinity of the survey area.

4.0 Methodology

4.1 Desktop Study

A desktop study was undertaken to identify features of significance known from the survey area, in close proximity to the survey area (within 20 km) or in the broader locality (within 40 km). The desktop study was also undertaken to assess the level of biological survey work that had been completed previously in the survey area. The study incorporated regional information, previous biological surveys 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. Appendix 1 contains more information regarding the framework for conservation significance ranking of communities and species in WA.

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.

4.1.1 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 DBCA databases of 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 databases were queried on 15/03/2023.
2. 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 fauna records from a 40 km buffer around the survey area boundary and was conducted on 16/03/2023.
3. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool. The database search requested the return of records within a 40 km buffer around the survey area boundary (Appendix 2). The database was searched on 16/03/2023 and again on 22/03/2023.
4. eBird (<https://ebird.org/>) - A citizen science database for bird records run by the Cornell Lab of Ornithology. This database was searched for supplementary records of conservation significant bird species within 40 km of the survey area. The database was searched on 16/03/2023.

4.2 Assessment of Likelihood of Occurrence 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, to determine which significant species had the potential to occur in the survey area. 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.

The likelihood that flora and fauna species of conservation significance would occur in the survey area was then assessed as part of the desktop study using a set of rankings and criteria (Table 4.1). These rankings were subsequently revised as necessary following the field survey (see Appendices 3 and 4).

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).

Table 4.1: 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, or was recorded in this study.
Likely to occur "High" likelihood	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	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	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	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.

4.3 Field Survey

4.3.1 Survey Team

The field survey was undertaken from 18-19 August 2022 by Rachel Warner and Michael Greenham. Table 4.2 summarises their experience, qualifications and role on the survey.

Table 4.2: Summary of personnel and qualifications.

Name	Position at Biota	Qualification	Years of Experience	Survey Role	Licence Number
Rachel Warner	Principal Environmental Scientist	BSc (Hons)	17	Botanist	FB62000036
Michael Greenham	Senior Biologist	BSc	23	Zoologist	NA

4.3.2 Survey Timing and Conditions

Preceding weather conditions (particularly rainfall) influence the number and suite of flora species that are recorded. Rainfall data were compiled from Onslow Salt's monitoring station data and the Bureau of Meteorology (Bureau) weather recording station at Onslow Airport (station number 5017), as shown in Figure 4.1.

Rainfall over the 12 months preceding the survey (431.8 mm) was nearly four times the long-term median (113.5 mm). Three months preceding the survey, rainfall (333.2 mm) was over five times the long-term median (63.2 mm). This was primarily due to very high rainfall in May 2022, which saw 310.4 mm of rain compared with the 23.8 mm median (Bureau of Meteorology 2022).

Conditions at the time of the survey were therefore considered optimal for the collection of annual and cryptic flora.

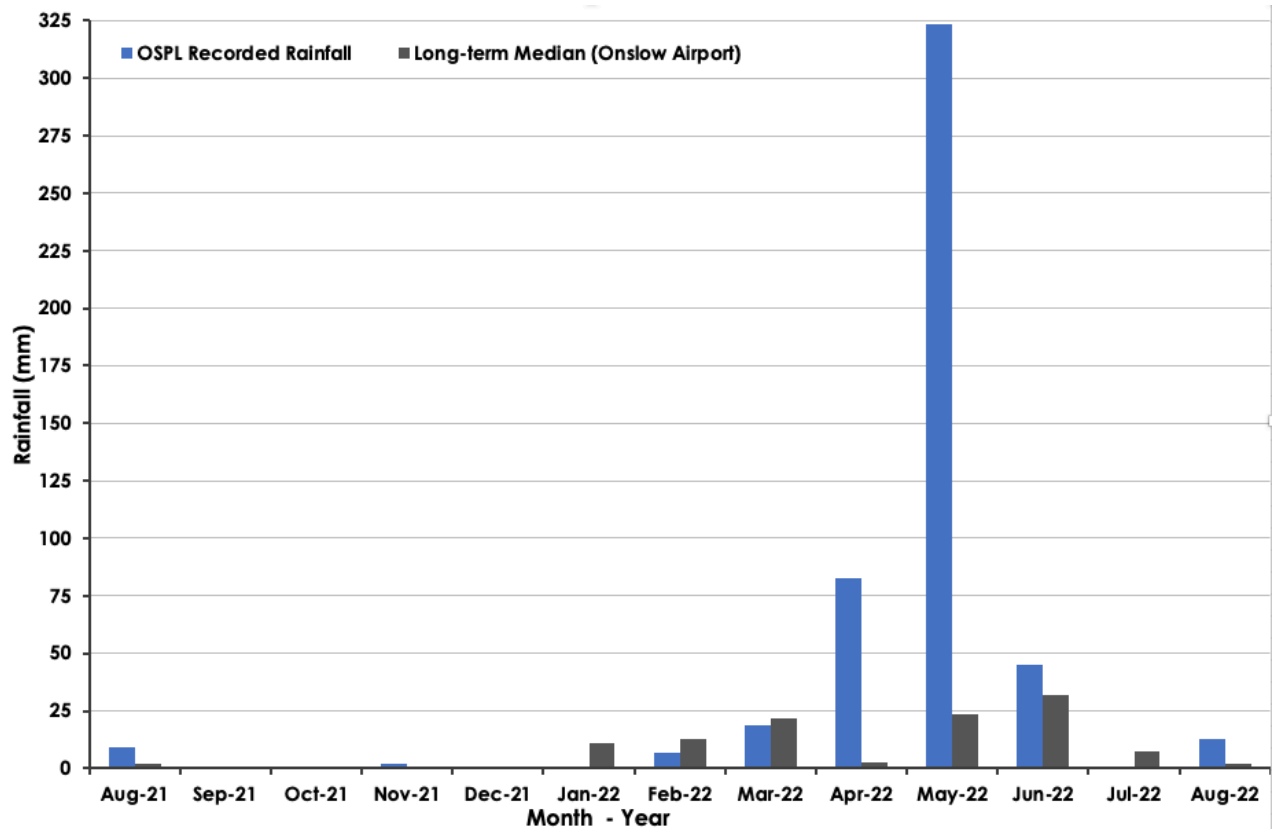


Figure 4.1: Total monthly rainfall for the Onslow Salt recording station for August 2021 to August 2022, compared to the long-term monthly median rainfall for the Bureau Onslow Airport station (1916-2022).

4.3.3 Floristic Data Collection

Two relevés (unbounded floristic sampling site) approximately 25 m x 100 m in size were established within the survey area and thoroughly surveyed (Figure 4.2). Given the small size of the survey area and lack of variation in vegetation, the two relevés effectively sampled the entire area. The following parameters were recorded at each relevé:

1. Location: A central MGA coordinate was recorded in WGS84 datum using a hand-held Global Positioning System (GPS) unit;
2. Habitat: A description of the landform and habitat;
3. Flora Species: All flora species present within the relevé and the estimated percentage foliar cover for each;
4. Vegetation Description: A broad description based on the height and estimated cover of dominant species after Aplin's (1979) modification of the vegetation classification system of Specht (1970) (see Appendix 4);
5. Fire History: An estimate of time since last fire;
6. Soil: A broad description of the soil surface and stony surface mantle;
7. Disturbance: Vegetation condition was ranked according to the scale from EPA (2016a), which was based on that developed by Trudgen (1988), considering evidence of grazing, physical disturbance, weed invasion etc. (see Appendix 4); and
8. Photograph: A representative digital photograph of the vegetation was taken.



Figure 4.2: Location of relevés within the survey area.

4.3.4 Vegetation Description, Condition Assessment and Mapping

Vegetation for this study was described at the sub-association level (level VI as per the National Vegetation Information System; NVIS)², which is the most detailed level under the NVIS. This level of detail would be considered fine-scale (intra-locality) delineation of vegetation units as per EPA (2016a).

The vegetation condition assessment was based on the ranking scale developed by Trudgen (1988) (see Appendix 4). The rankings include degree of invasion by introduced flora (weeds), impact from humans, feral animals and livestock activities, and the structural integrity of the vegetation.

The vegetation maps were created and consolidated using Geographical Information System (GIS) software (QGIS and MapInfo Professional), and locations of significant flora were added. All maps in this report were produced by Melissa Robinson (Principal GIS Cartographer at Biota) using MapInfo Professional.

4.3.5 Searches for Conservation Significant Flora and Weeds

Targeted searches for significant species were conducted on foot through the entire survey area.

Locations of significant species, weed species and/or unknown taxa were recorded using a handheld GPS unit (WGS84 datum). Where these were encountered, the number of individuals, extent of the population, the habitat and associated species were also recorded.

4.3.6 Fauna Habitat Assessment and Sampling

Non-systematic methods were employed to search for fauna, or secondary evidence thereof, during foot traverses of the survey area. The aim was to locate, describe and search habitats that may support significant fauna, habitat-specific species and other species of interest with the potential to occur, based on the results of the desktop study. A range of non-systematic techniques were used, including:

- foot traverses to record evidence of terrestrial vertebrate significant species;
- identification and recording of secondary signs including tracks, scats and diggings; and
- recording of opportunistic sightings and calls.

4.4 Flora Specimen Identification, Nomenclature and Data Entry

Common species that were well known to the survey botanist were confirmed in the field. A voucher specimen was collected if the specimen was either difficult to determine without closer examination, belonged to a recognised species complex, was poorly collected or otherwise unusual, or was in very good condition (for submission to the WA Herbarium in line with their acquisitions policies).

Voucher specimens were identified using flora keys, consulting appropriate publications and checking reference collections. Biota botanists identified all specimens, which were then confirmed by Specialist Taxonomist, Pierre-Louis de Kock, of dK Botanical.

Nomenclature and conservation rankings used in this report are consistent with the current listing of WA flora recognised by the WA Herbarium on Florabase at the time of preparation of this report. A vascular flora species list is provided in Appendix 6.

² <http://www.environment.gov.au/erin/nvis/publications/avam/section-2-1.htm>

4.5 Limitations

As per the EPA's *Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a) and *Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA 2020), potential constraints or limitations for this study are addressed in Table 4.3.

Table 4.3: Potential constraints and limitations of the biological assessment.

Potential Constraint	Statement of Limitations
1. Sources of information	<ul style="list-style-type: none"> The broader Onslow locality has been well surveyed, with several publicly available reports and data providing contextual information. Additionally, several public and private databases of rare species and communities were searched for information relevant to this study. Regional and local level information is not considered to be a limitation for this study.
2. Survey scope	<ul style="list-style-type: none"> The objective of the survey was to provide the information required to support a NVCP application. Given the small size of the survey area and the scale of the proposed clearing, a desktop study, targeted flora survey and basic fauna survey as per EPA (2016a, 2020) are considered appropriate for this purpose. No systematic trapping for fauna was performed. This is consistent with a basic fauna survey (EPA 2020).
3. Proportion of flora / fauna collected and identified	<ul style="list-style-type: none"> All vascular flora encountered in the survey area were recorded. A total of 33 native vascular flora species from 16 families were recorded during the current survey. The basic fauna survey focused on recording significant species from secondary evidence and did not attempt to record all species (this would require systematic trapping as part of a detailed survey).
4. Completeness of survey	<ul style="list-style-type: none"> The survey area was surveyed to a satisfactory level to support a NVCP application. As for any study, additional survey effort would lead to additional species being recorded.
5. Mapping reliability	<ul style="list-style-type: none"> Vegetation units and fauna habitats were described and mapped based on data collected during systematic and targeted foot traverses throughout the survey area. The mapping is considered to provide a reliable indication of the vegetation units and fauna habitats in the survey area.
6. Timing, weather, season, cycle	<ul style="list-style-type: none"> The survey was conducted at the start of the dry season, however preceding rainfall was very high and conditions were good for the collection of most flora species (above average rainfall was recorded) including annual and cryptic perennial species.
7. Disturbances	<ul style="list-style-type: none"> There were no disruptions during the survey, and it was undertaken as planned. The main disturbance factor in the survey area was the presence of weeds and this did not present any limitations.
8. Intensity of survey	<ul style="list-style-type: none"> A targeted/basic survey was considered adequate to address the requirements for a NVCP application. The survey intensity was adequate for recording the annual, ephemeral and cryptic perennial flora present at the time, and the list of vascular flora documented from the survey area is comprehensive for an area of this size (3.16 ha).
9. Resources and experience levels	<ul style="list-style-type: none"> Due to the small size of the survey area, minimal time was required to complete a thorough survey. The botanist and zoologist undertaking the survey were suitably qualified and very experienced in the area. There were therefore no limitations due to resourcing or experience.
10. Access issues	<ul style="list-style-type: none"> The entirety of the survey area could be accessed and surveyed at an appropriate level. There were therefore no limitations due to access issues.

It should also be noted that in relation to vertebrate fauna, due to the proximity of the survey area to marine environs, multiple species reliant on marine environments were identified from the locality in the desktop study. However, as the survey area does not encompass marine environs, obligate marine species (e.g. cetaceans, marine turtles, pelagic seabirds) have been excluded from this study.

5.0 Desktop Study Results

5.1 Previous Surveys in the Locality

5.1.1 Previous Flora Surveys

Several major surveys completed within 40 km of the present survey area were reviewed, with a focus on identifying records of TECs, PECs, and significant flora species known from the locality. The findings from the most relevant surveys are summarised in Table 5.1.

For all of the surveys, it was recognised that these comprised “snap-shot” assessments of the flora at a particular time, and that further species would be recorded with additional survey work; the species lists should therefore be taken as indicative rather than exhaustive. Any other key limitations mentioned in the reports that are relevant to their current use are listed in Table 5.1.

5.1.2 Previous Fauna Surveys

Fauna surveys targeting both vertebrate fauna and SRE invertebrate fauna relevant to this study, conducted within the locality (40 km) of the survey area since 2004 are summarised in Table 5.2.

Table 5.1: Summary of the major flora and vegetation surveys completed within 40 km of the survey area.

Project/Survey (Reference)	Survey Type: Date	Area (ha)	No. of Native Taxa	Features of Conservation Significance / TECs and PECs / Threatened and Priority Species	Stated Limitations Relevant to the Current Use of this Survey
Onslow Solar Saltfield Annual Environmental Report (Biota 2022)	Annual Environmental Report: August 2022	23,283	Not applicable	<ul style="list-style-type: none"> • No TECs. • No PECs. • No Threatened flora. • Two Priority 3 flora species: <i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095) and <i>Dysphania congestiflora</i>. 	<ul style="list-style-type: none"> • None stated.
Onslow Solar Saltfield Annual Environmental Report (Biota 2021a)	Annual Environmental Report: August 2021	23,283	Not applicable	<ul style="list-style-type: none"> • No TECs. • No PECs. • No Threatened flora. • One Priority 3 flora species: <i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095). 	<ul style="list-style-type: none"> • None stated.
Onslow Solar Saltfield Annual Environmental Report (Biota 2018)	Annual Environmental Report: August 2018	23,283	Not applicable	<ul style="list-style-type: none"> • No TECs. • No PECs. • No Threatened flora. • One Priority 3 flora species: <i>Stackhousia clementii</i>. 	<ul style="list-style-type: none"> • None stated.
Wheatstone Rare Flora Survey (Biota 2011)	Rare flora searches: March 2011	Greater Onslow locality.	Not applicable	<ul style="list-style-type: none"> • No TECs. • No PECs. • No Threatened flora. • One Priority 1 (currently P3) flora species: <i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61). • Three Priority 3 flora species: <i>Eleocharis papillosa</i>, <i>Eremophila forrestii</i> subsp. <i>viridis</i>, <i>Triumfetta echinata</i>. 	<ul style="list-style-type: none"> • The timing of the survey was not suitable to collect flowering or fruiting material of the perennial target species.
A Vegetation and Flora Survey of the Wheatstone Study Area near Onslow (Biota 2010a)	Flora and vegetation survey: March & April 2009	9,794	<ul style="list-style-type: none"> • 418 taxa • 162 genera • 58 families 	<ul style="list-style-type: none"> • No TECs. • No PECs. • Vegetation considered to be of high conservation significance: Inland linear sand dunes (units ID1, ID2), and Mangal vegetation (unit T2). • No Threatened flora. • One Priority 1 (currently P3) flora species: <i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61). • Four Priority 3 flora species: <i>Atriplex flabelliformis</i>, <i>Eleocharis papillosa</i>, <i>Eremophila forrestii</i> subsp. <i>viridis</i>, <i>Triumfetta echinata</i>. 	<ul style="list-style-type: none"> • Although the timing of the 2009 surveys was appropriate to detect most annual flora species, groups such as the daisies (family Asteraceae), which germinate mainly after winter rainfall are under-represented on the vascular flora list. • The record of <i>Atriplex flabelliformis</i> was based on an unvouchered record from Astron (2008), and was considered questionable.

Project/Survey (Reference)	Survey Type: Date	Area (ha)	No. of Native Taxa	Features of Conservation Significance / TECs and PECs / Threatened and Priority Species	Stated Limitations Relevant to the Current Use of this Survey
Wheatstone Project Flora and Fauna Assessment Addendum (Biota 2010b)	Desktop assessment: May 2010	Five areas, totalling 2,772	<ul style="list-style-type: none"> • 422 taxa • 161 genera • 58 families 	<ul style="list-style-type: none"> • No TECs. • No PECs. • No Threatened flora. • Four Priority 3 flora species: <i>Atriplex flabelliformis</i>, <i>Eleocharis papillosa</i>, <i>Eremophila forrestii</i> subsp. <i>viridis</i>, <i>Triumfetta echinata</i>. 	<ul style="list-style-type: none"> • The record of <i>Atriplex flabelliformis</i> was based on an unvouchered record from Astron (2008), and was considered questionable.
Onslow Strategic Industrial Area Flora Survey (Biota 2006)	Flora and vegetation survey: October 2005	~500	<ul style="list-style-type: none"> • 158 taxa • 95 genera • 41 families 	<ul style="list-style-type: none"> • No TECs. • No PECs. • No Threatened flora. • No Priority flora. 	<ul style="list-style-type: none"> • Some sections of the project area were not accessible by vehicle, and could only be reached on foot. • As only a portion of the project area could be systematically sampled, not all of the variation in the vegetation, nor all of the flora species, would have been identified.
BHP Billiton Pilbara LNG Project: Flora and Vegetation Study (Biota 2005)	Flora and vegetation survey: June 2005	490	<ul style="list-style-type: none"> • 158 taxa • 95 genera • 41 families 	<ul style="list-style-type: none"> • No TECs. • No PECs. • No Threatened flora. • No Priority flora. 	<ul style="list-style-type: none"> • Some sections of the project area were not accessible by vehicle, and could only be reached on foot. • As only a portion of the project area could be systematically sampled, not all of the variation in the vegetation, nor all of the flora species, would have been identified.
A Vegetation and Flora Survey of Additional Infrastructure Areas of the Proposed BHP Billiton Pilbara LNG Project (Biota 2007)	Flora and vegetation survey: August 2006	1,305	<ul style="list-style-type: none"> • 242 taxa • 140 genera • 47 families 	<ul style="list-style-type: none"> • No TECs. • No PECs. • Vegetation considered being regionally and locally significant: samphire shrublands of saline flats (units SF.1, SF.2, SF.3, and SF.4), and ephemeral bare claypans (unit BCp). • No Threatened flora. • No Priority flora. 	<ul style="list-style-type: none"> • Some sections of the project area were not accessible by vehicle, and could only be reached on foot. An area south of a main tributary of Beadon Creek could not be accessed on foot or by vehicle, as there are no crossings of the creek in this area.
Ashburton Salt Project Flora and Vegetation Survey (Biota 2020a)	Flora and vegetation survey: 2019	60,104	<ul style="list-style-type: none"> • 288 taxa • 126 genera • 45 families 	<ul style="list-style-type: none"> • No TECs. • No PECs. • One Priority 1 species: <i>Minuria tridens</i>. • Three Priority 3 species: <i>Abutilon</i> sp. <i>Pritzelianum</i> (S. van Leeuwen 5095), <i>Eremophila forrestii</i> subsp. <i>viridis</i>, <i>Stackhousia clementii</i>, <i>Triumfetta echinata</i>. 	<ul style="list-style-type: none"> • None stated.

Project/Survey (Reference)	Survey Type: Date	Area (ha)	No. of Native Taxa	Features of Conservation Significance / TECs and PECs / Threatened and Priority Species	Stated Limitations Relevant to the Current Use of this Survey
Onslow Desalination Plant and Pipeline Fauna and Flora Survey (Biota 2020b)	Flora and vegetation survey	35	<ul style="list-style-type: none"> • 73 taxa • 53 genera • 25 families 	<ul style="list-style-type: none"> • No TECs. • No PECs. • Vegetation considered being locally significant: samphire shrublands (unit T1). 	<ul style="list-style-type: none"> • None stated.
Macedon Gas Pipeline Rehabilitation Survey (Biota 2017, 2019, 2021b)	Flora monitoring: 2017, 2019, 2021	690	<ul style="list-style-type: none"> • 253 taxa • 108 genera • 38 families 	<ul style="list-style-type: none"> • One Priority 1 (currently P3) flora species: <i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61). 	<ul style="list-style-type: none"> • Fire disturbance at some transects.

Table 5.2: Summary of previous fauna surveys conducted within 40 km of the survey area.

Project/Survey (Reference)	Survey Type: Date	Size of Area (ha)	Taxonomic Groups Documented	Survey Methods	Significant Findings	Stated Limitations Relevant to the Current Use of this Survey
Ashburton Salt Project Level 2 Seasonal Fauna Survey (Biota 2020c)	Level 2 two-phase survey: 2018-2019	60,104	<ul style="list-style-type: none"> • Terrestrial birds • Mammals • Bats • Reptiles • Amphibians • SRE invertebrates 	<ul style="list-style-type: none"> • Pitfall trapping. • Elliott trapping. • Funnel trapping. • Systematic and opportunistic bird searches. • Remote camera trapping. • Echolocation call recording. • Habitat-specific searches. • Recording secondary sign. • Opportunistic sightings. • SRE fauna searches. 	<ul style="list-style-type: none"> • 12 significant avifauna species. • One significant bat species. 	<ul style="list-style-type: none"> • Not all areas were ground-truthed or systematically sampled.
Ashburton Salt Project Migratory Shorebird Survey	Targeted shorebird survey	60,104	<ul style="list-style-type: none"> • Migratory shorebirds 	<ul style="list-style-type: none"> • Targeted migratory shorebird counts. 	<ul style="list-style-type: none"> • 19 Migratory-listed shorebird species 	<ul style="list-style-type: none"> • Some habitats not inundated at time of surveys.
Wheatstone Project Terrestrial Fauna Survey (Biota 2010c)	Level 2 single-phase survey: 2009	9,824	<ul style="list-style-type: none"> • Terrestrial birds • Mammals • Bats • Reptiles • Amphibians • SRE Invertebrates 	<ul style="list-style-type: none"> • Pitfall trapping. • Funnel trapping. • Elliott trapping. • Recording secondary sign. • Opportunistic records. 	<ul style="list-style-type: none"> • Two significant mammal species. • Four significant avifauna species. 	<ul style="list-style-type: none"> • Not all areas were ground-truthed or equally sampled for fauna. • Single-phase survey only.
West Pilbara Iron Ore Project Onslow Rail Corridor Terrestrial Fauna Survey (Biota 2009)	Level 2 single-phase survey: 2008	100,651	<ul style="list-style-type: none"> • Terrestrial birds • Mammals • Bats • Reptiles • Amphibians • SRE Invertebrates 	<ul style="list-style-type: none"> • Pitfall trapping. • Elliott trapping. • Systematic bird sampling. • Echolocation call recording. • Burrow searching . • Spotlighting. • Recording secondary sign. • Opportunistic sightings. 	<ul style="list-style-type: none"> • Northern Quoll (<i>Dasyurus hallucatus</i>; EN). • Australian Bustard (<i>Ardeotis australis</i>; P4). 	<ul style="list-style-type: none"> • Single-phase survey only.

Project/Survey (Reference)	Survey Type: Date	Size of Area (ha)	Taxonomic Groups Documented	Survey Methods	Significant Findings	Stated Limitations Relevant to the Current Use of this Survey
Chevron Domgas Project Onslow Fauna Assessment (Validus 2008)	Level 2 single-phase survey	100	<ul style="list-style-type: none"> • Terrestrial birds • Mammals • Bats • Reptiles • Amphibians 	<ul style="list-style-type: none"> • Pitfall trapping. • Funnel trapping. • Elliott trapping. • Echolocation call recording. • Opportunistic sightings. • Spotlighting. • Targeted searches . 	<ul style="list-style-type: none"> • 2 state-listed significant bird species. • 17 federally listed significant bird species. 	<ul style="list-style-type: none"> • Single-phase survey only.

5.2 Vegetation and Flora

5.2.1 Threatened and Priority Ecological Communities

TECs are described by DBCA as biological assemblages occurring in a particular habitat, which are under threat of modification or destruction from various processes (as per DEC 2010; see Appendix 1). TECs are protected under the *WA Biodiversity Conservation Act 2016*. No TECs are known to occur within 40 km of the survey area.

PECs are defined as possible TECs that do not meet survey criteria or that are not adequately defined. These communities are added to the PEC List under priorities 1, 2 and 3 (DBCA 2013). Two occurrences of a PEC were identified within the 40 km study area from a search of the DBCA database. This PEC is described below:

*“Coastal dune native tussock grassland dominated by Whiteochloa airoides – Priority 3 Tussock grassland of Whiteochloa airoides occurs on the landward side of foredunes, hind dunes or remnant dunes with white or pinkish white medium sands with marine fragments. There may be occasional Spinifex longifolius tussock or Triodia epactia hummock grasses and scattered low shrubs of Olearia sp. Kennedy Range (G. Byrne 66), Scaevola spinescens, S. cunninghamii, Trianthema turgidifolium and Corchorus species (C. walcottii, C. laniflorus). Occurs on Barrow Island, Tent Island and possibly some unaffected littoral areas in west Pilbara. Threats include weed invasion (*Cenchrus ciliaris, *Aerva javanica), altered fire regimes, grazing, basic raw material extraction” (DBCA 2022).*

The closest occurrence of this PEC is on Thevenard Island, located approximately 25 km northwest of the survey area. There is another occurrence on Airlie Island (38 km north-northeast). Both occurrences of this PEC are restricted in their distribution and would not occur within the survey area.

5.2.2 Threatened and Priority Flora

Based on the desktop study, no Threatened species have been recorded from the locality, and none would be expected to occur in the survey area.

Eight Priority 3 species have been recorded within 40 km of the survey area (see Figure 5.1), comprising:

- one species that was ranked as ‘likely to occur’, *Abutilon* sp. Pritzelianum (S. van Leeuwen 5095);
- four species ranked as ‘may occur’ (*Abutilon* sp. Onslow (F. Smith s.n. 10/9/61), *Eremophila forrestii* subsp. *viridis*, *Stackhousia clementii* and *Triumfetta echinatum*);
- two considered ‘unlikely to occur’, *Carpobrotus* sp. Thevenard Island (M. White 050) and *Corynotheca flexuosissima*; and
- one ranked as ‘would not occur’, *Eleocharis papillosa*.

The detailed likelihood assessment is provided in Appendix 3.

5.2.3 Significant Weed Species

Although databases were not searched for weed species as part of the desktop study, given the location of the survey area near a settlement, it is possible that weeds listed as Declared Pests or Weeds of National Significance (WONS) may be present.

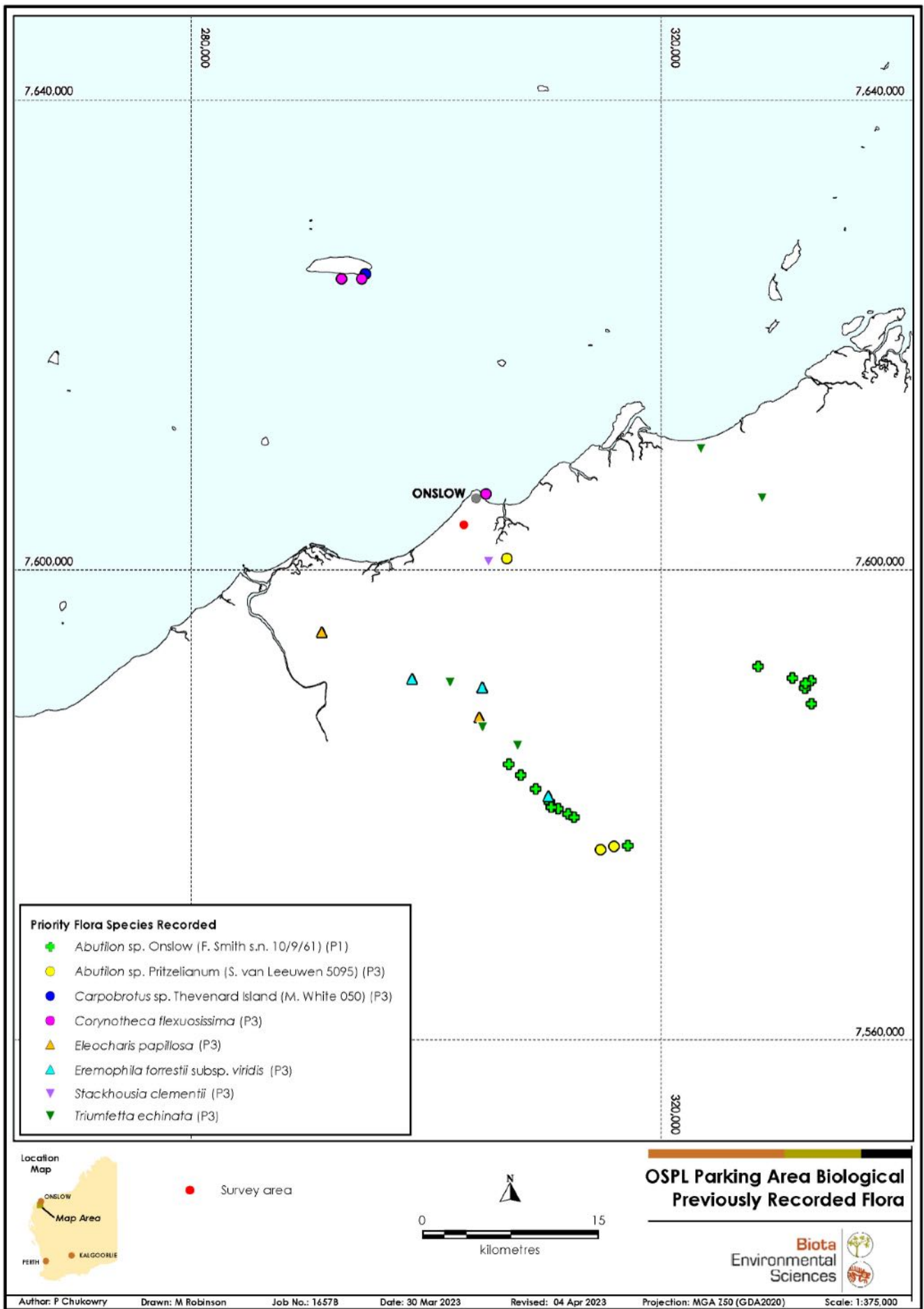


Figure 5.1: Previous records of Priority flora within 40 km of the survey area.

5.3 Fauna

5.3.1 Significant Vertebrate Fauna

Native fauna species that are rare, threatened with extinction, or have high conservation value, are specially protected by law under the *WA Biodiversity Conservation Act 2016* (BC Act) and/or the Commonwealth EPBC Act. Migratory and Marine species are also protected under the EPBC Act as Matters of National Environmental Significance (MNES). In addition, the DBCA maintains a list of fauna that are deemed a priority for conservation, which have not been assigned statutory protection under the BC Act, but are still considered to be of conservation priority in need of monitoring (DBCA 2020). Appendix 1 details categories of significance recognised under the above frameworks.

A total of seven mammals, 48 bird, and four reptile species listed as significant under either State or Federal legislation or policy were identified as occurring in the locality in the desktop study, and thus, potentially occurring within the survey area (Figure 5.2, Figure 5.3; Appendix 7). This does not include species listed solely as Marine under the EPBC Act listing, as the survey area does not encompass any marine environs. Similarly, due to the presence of marine environs within the desktop study area, a number of obligate marine species listed as threatened or Migratory were identified in the desktop study but have not been included in the likelihood assessments.

A preliminary assessment of likelihood of occurrence was undertaken to identify significant species potentially occurring within the survey area. A total of 14 significant species were preliminarily assessed as having a moderate or high likelihood of occurrence within the survey area (Appendix 7). Following the on-ground field assessment of habitats within the survey area, the likelihood of occurrence for these species was reviewed to determine a final likelihood of occurrence (see Section 7.0; Appendix 7).

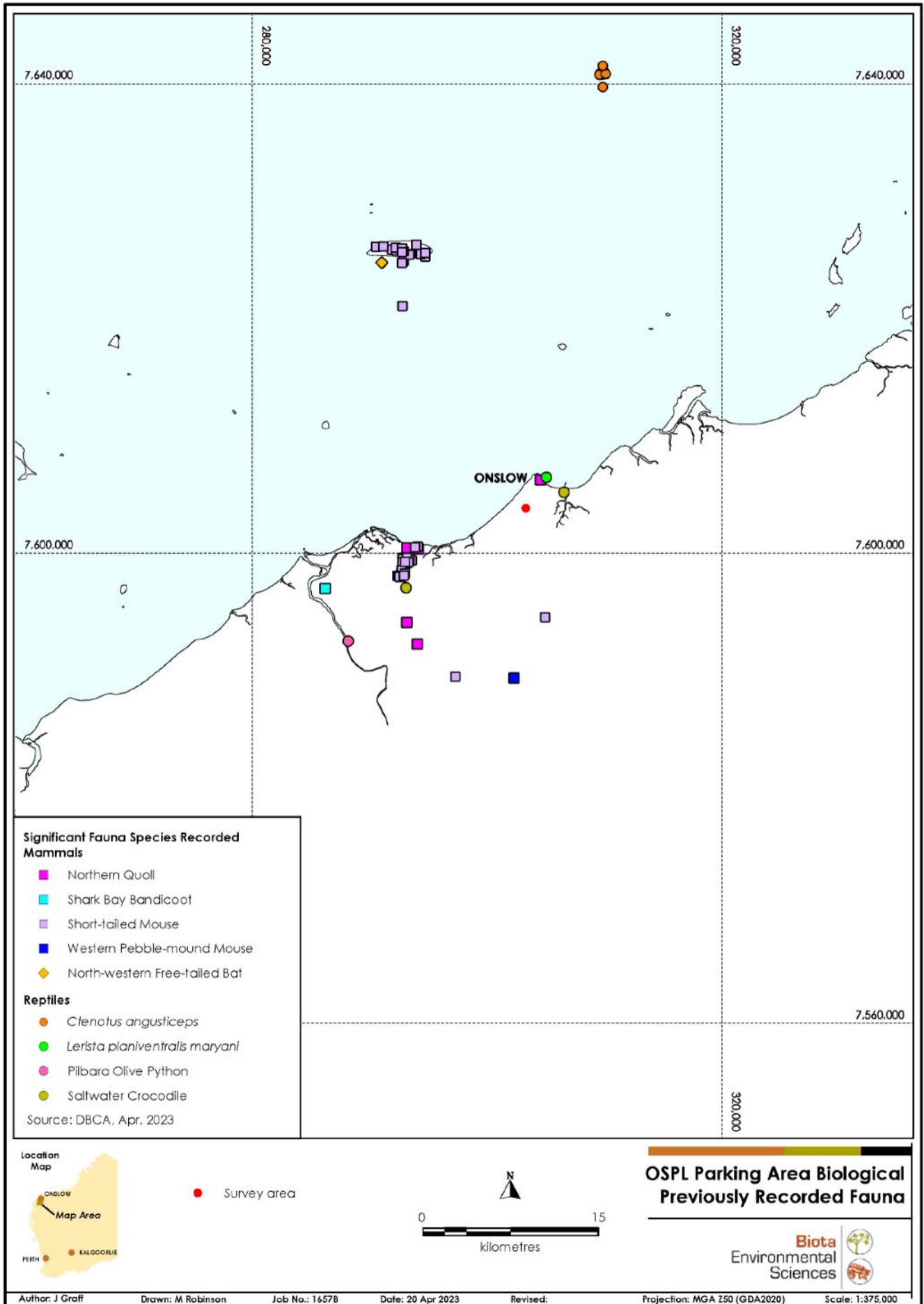


Figure 5.2: Previous records of significant mammals and reptiles within 40 km of the survey area.

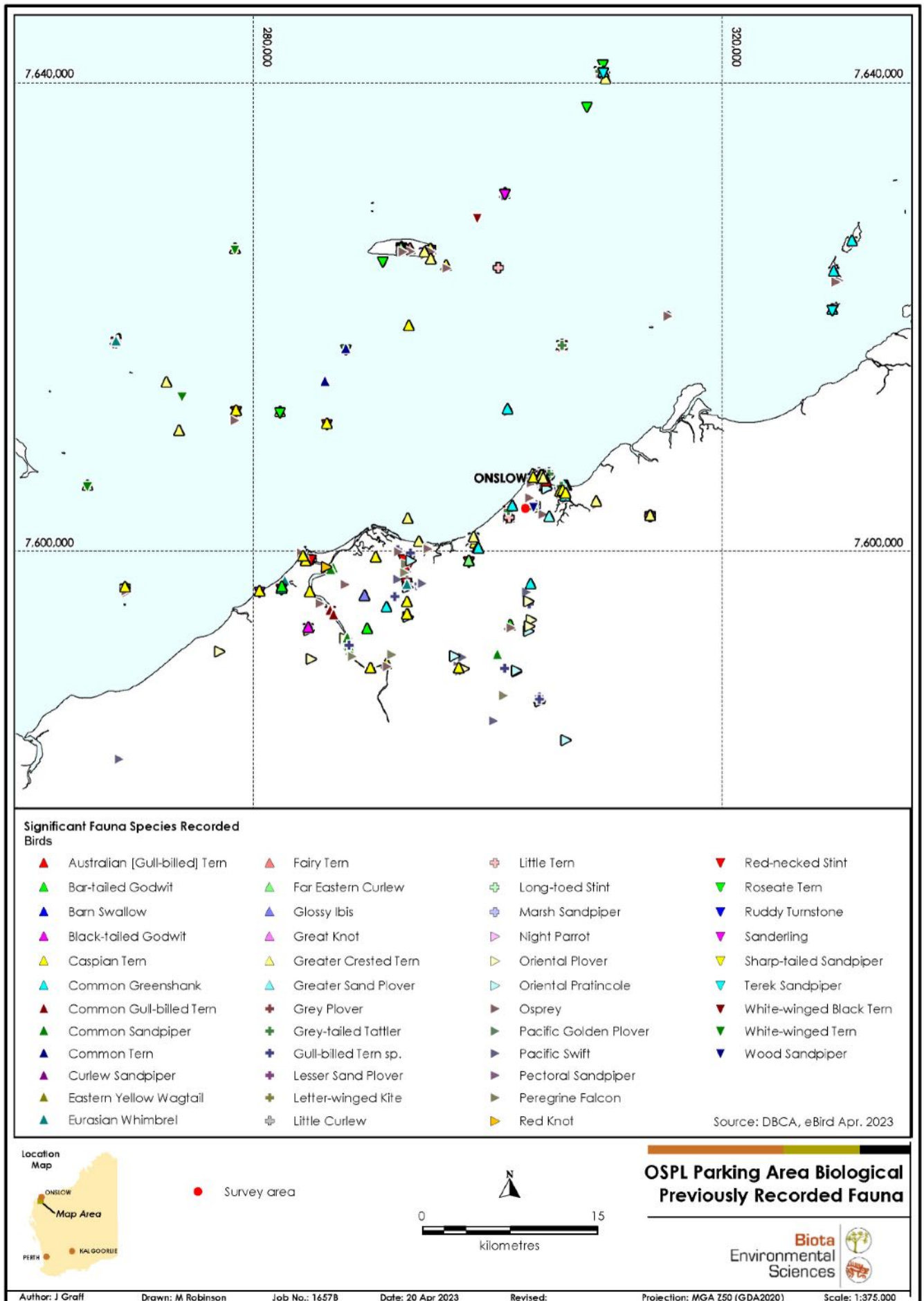


Figure 5.3: Previous records of significant birds within 40 km of the survey area.

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6.0 Vegetation and Flora Results

6.1 Vegetation

One vegetation unit was mapped over one dominant landform in the survey area (Figure 6.1). Vegetation unit D1, described as *Acacia coriacea* subsp. *coriacea*, *Trichodesma zeylanicum* var. *grandiflorum*, tall open shrubland over *Crotalaria cunninghamii* subsp. *cunninghamii*, (*Tephrosia rosea* var. *clementii*) shrubland over **Cenchrus ciliaris* tussock grassland and *Triodia epactia* very open hummock grassland occurred over low to medium coastal sand dunes and swales. Interdunal sandy plains were also considered to support D1 vegetation, however the shrub layer showed minor variability in shrub species (e.g. lack of *Acacia coriacea* subsp. *coriacea*) and in rehabilitated areas where historical disturbance was evident, **Cenchrus ciliaris* was observed in higher densities. The vegetation described in the survey area does not represent a listed TEC or PEC.

There was no sign of recent fire in the survey area and the general condition of the vegetation was Very Good, with the presence of weeds, sometimes in high densities (e.g. **Cenchrus ciliaris* and **Aerva javanica*) and evidence of historical ground disturbance being the main disturbance factors (Figure 6.2).

6.2 Flora

A total of 33 native vascular flora species from 26 genera and 16 families were recorded from the survey area (see Appendix 6). Fabaceae was the dominant family within the survey area, followed by Malvaceae. *Acacia* and *Indigofera* were the two most dominant genera among the native species (three species each). These families and genera are typically well represented in species lists from this region.

A total of five individuals of the Priority 3 species *Abutilon* sp. Pritzelianum (S. van Leeuwen 5095) were recorded within the survey area at both relevé locations (Figure 6.1). *Abutilon* sp. Pritzelianum (S. van Leeuwen 5095) is a perennial shrub growing to 1.5 m tall with yellow-orange flowers in August (WA Herbarium 2022). This species occurs on sand plains with orange-brown sandy loam substrate and is distributed over a range of more than 700 km, extending from the southern Carnarvon bioregion through to Port Hedland in the Pilbara (WA Herbarium 2022).

Three weed species from three genera and three families were recorded within the survey area (**Aerva javanica*, **Cenchrus ciliaris* and **Tribulus terrestris*). None of these species are listed as significant (WONS or declared pests) under State or Federal legislation (DAFWA 2018a, DoEE 2018).

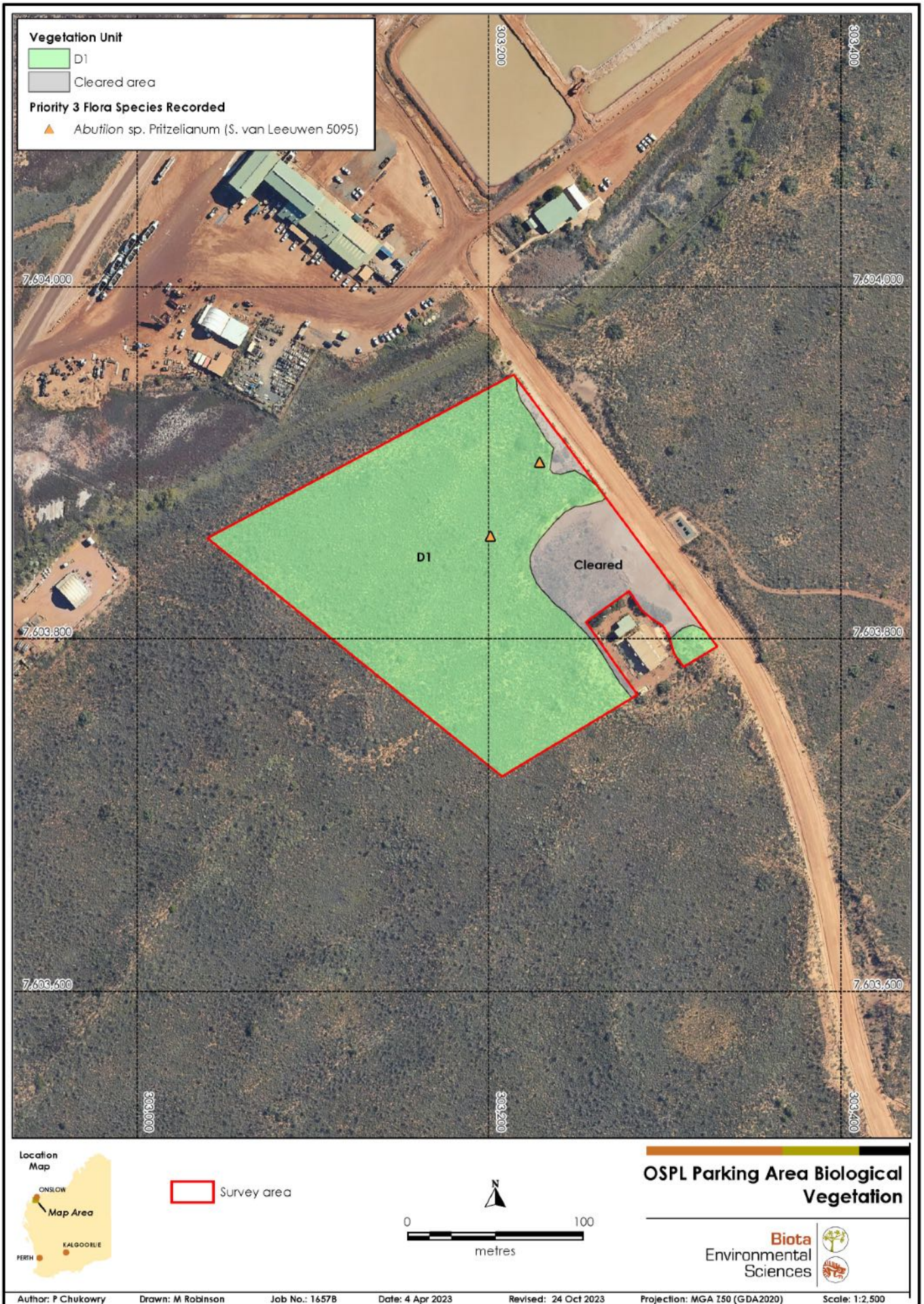


Figure 6.1: Vegetation mapping and Priority flora locations in the survey area.

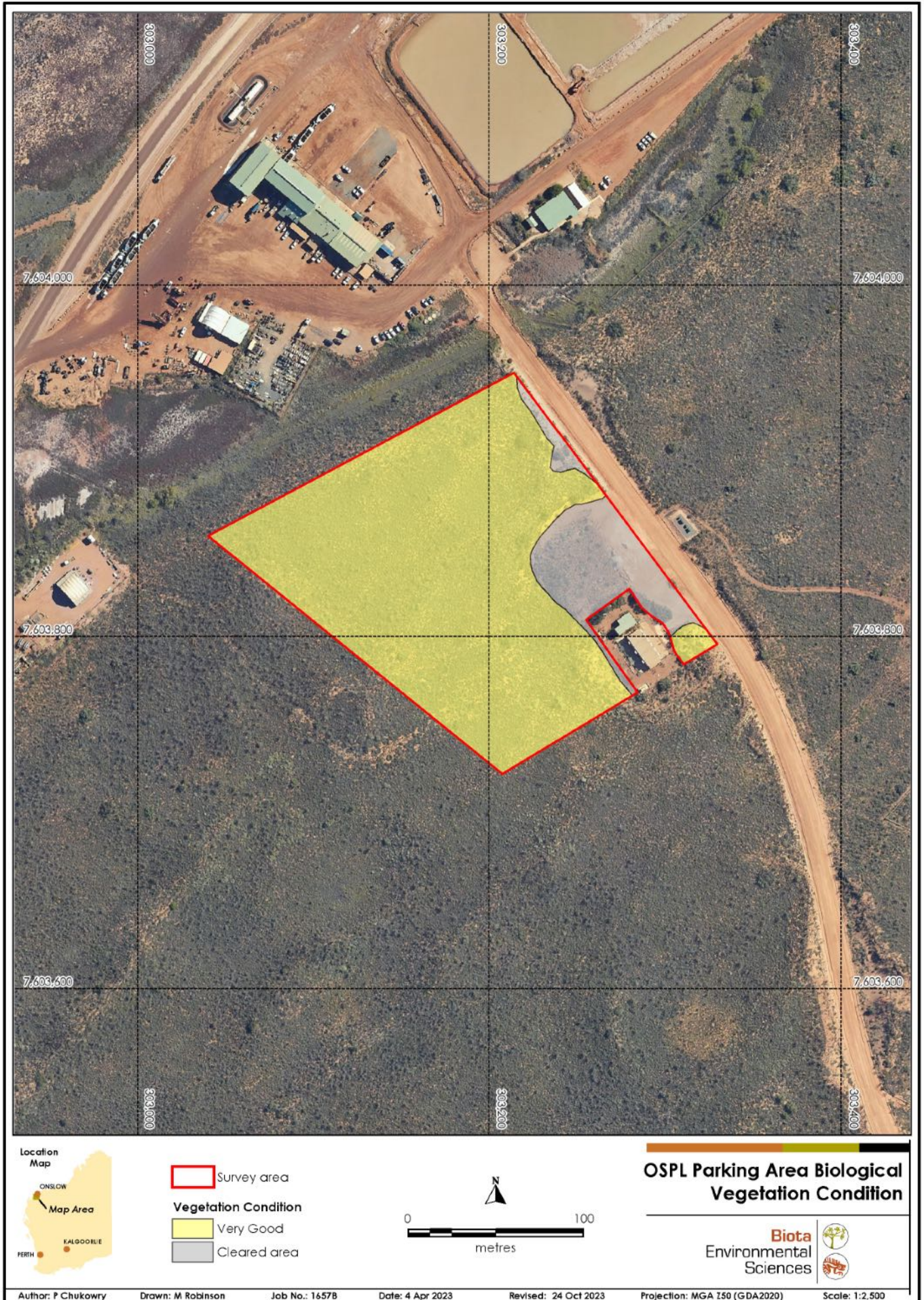


Figure 6.2: Vegetation condition mapping.

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7.0 Terrestrial Fauna Results

One fauna habitat was defined in the survey area, mixed shrubland on consolidated coastal sand dunes, as described in Section 6.1. It is unlikely that this habitat represents critical habitat for any significant fauna species.

Eight bird species were observed opportunistically in the survey area during the field survey (Table 7.1). Secondary evidence of a skink (*Lerista* sp.), monitor lizard (*Varanus* sp./spp.), and shells of the snail species *Rhagada convicta* were also recorded, along with secondary evidence (scats) from one introduced species, dog/dingo (*Canis familiaris*). The secondary evidence of *Lerista* sp./spp. may be attributable to the Priority 1 listed skink *Lerista planiventralis maryani* which potentially occurs within the survey area, but multiple other *Lerista* species are also likely to occur, so it is not possible to determine which species are involved.

Table 7.1: Bird species recorded in the survey area.

Species	Common Name	Conservation Status	
		State	Commonwealth
<i>Phaps chalcoptera</i>	Common Bronzewing	-	-
<i>Turnix velox</i>	Little Buttonquail	-	-
<i>Merops ornatus</i>	Rainbow Bee-eater	-	_*
<i>Falco berigora</i>	Brown Falcon	-	-
<i>Lichmera indistincta</i>	Brown Honeyeater	-	-
<i>Gavicalis virescens</i>	Singing Honeyeater	-	-
<i>Cincloramphus cruralis</i>	Brown Songlark	-	-
<i>Taeniopygia castanotis</i>	Australian Zebra Finch	-	-

* Listed as Marine but Marine listings not considered in this report as survey area does not encompass marine environs

Following on-ground assessment of the habitat within the survey area during the field survey, a final likelihood assessment ranking was made for the 60 terrestrial vertebrate fauna species identified as potentially occurring in the survey area, as identified in the desktop study (Section 5.3.1). Based on this assessment, 13 significant vertebrate fauna species were assessed as having a moderate (May occur) or high (Likely to occur) likelihood of occurrence within the survey area (Table 7.2; Sections 7.1.1 to 7.1.12). The remaining 47 significant species were ranked as "unlikely to occur" or "would not occur" (see Appendix 7).

Table 7.2: Significant vertebrate fauna with moderate to high likelihood of occurrence in survey area.

Species	Common Name	Conservation Status		Final Likelihood of Occurrence
		State	C'wealth	
Mammals				
<i>Leggadina lakedownensis</i>	Short-tailed Mouse	P4	-	Likely to occur
<i>Ozimops cobourgianus</i>	North-western Coastal Free-tailed Bat	P1	-	May occur
Birds				
<i>Apus pacificus</i>	Pacific [Fork-tailed] Swift	MI	MI	Likely to occur
<i>Charadrius veredus</i>	Oriental Plover	MI	MI	May occur
<i>Numenius minutus</i>	Little Curlew	MI	MI	May occur
<i>Glareola maldivarum</i>	Oriental Pratincole	MI	MI	Likely to occur
<i>Gelochelidon [nilotica] inc:</i> <i>Gelochelidon [nilotica] macrotarsa</i> <i>Gelochelidon nilotica</i>	Gull-billed Tern spp. incl: Australian [Gull-billed] Tern Common Gull-billed Tern	MI	MI	Likely to occur, May occur
<i>Pandion haliaetus</i>	Osprey	MI	MI	Likely to occur
<i>Falco hypoleucos</i>	Grey Falcon	VU	VU	May occur
<i>Falco peregrinus</i>	Peregrine Falcon	OS	-	May occur
<i>Hirundo rustica</i>	Barn Swallow	MI	MI	Likely to occur
Reptiles				
<i>Lerista planiventralis maryani</i>	-	P1	-	May occur

7.1.1 Short-tailed Mouse *Leggadina lakedownensis*

The Short-tailed Mouse is listed as Priority 4 by the DBCA. Prior to 1997, only two specimens of this species had been collected, however the number of records of this species has increased substantially since this time (Cooper et al. 2003). In Western Australia, it occurs primarily in the Pilbara and Kimberley regions (Menkhorst and Knight 2011). Regional records suggest that the primary mainland habitat comprises areas of cracking clay and adjacent habitats. However, other sources provide a more diverse picture of habitat utilisation that includes areas of open tussock and hummock grassland, *Acacia* shrubland and savannah woodland, sandy soils, cracking clays (Aplin et al. 2016), hilltops (Dr Peter Kendrick, pers. comm.) and sandy coastal areas (Biota, pers. obs.). Population sizes appear to vary dramatically by season.

The species was not recorded from the survey area during the current survey but there are numerous records of the species from similar habitat c. 10 km to the south-east of the survey area (DBCA 2023; Figure 5.2), as well as offshore on Thevenard Island, so it is considered likely to occur in the survey area.

7.1.2 North-western Coastal Free-tailed Bat *Ozimops cobourgianus*

The North-western Coastal Free-tailed Bat is listed as a Priority 4 species by the DBCA. The species is endemic to Australia, occurring in coastal areas from Broome to Exmouth (Churchill 2008). The species is a mangrove specialist, but does occur in adjacent habitats when foraging (Churchill 2008).

The species was not recorded from the survey area during the current survey but has been recorded from Thevenard Island (DBCA 2023), and further west along the coast (Biota 2020c). Potentially suitable roosting habitat occurs to the west of the survey area within 3 km, so the species may occur as a foraging visitor to the survey area.

7.1.3 Pacific Swift *Apus pacificus*

The Pacific Swift (formerly known as Fork-tailed Swift) is listed as Migratory under the BC Act and the EPBC Act. It occurs as a non-breeding migrant across much of Australia from September to April, particularly in the northern half of the continent. In general, the species is most common closer to the coast, but does occur in inland areas. In Australia, the species is thought to be almost entirely aerial in habit, foraging for flying insects and even sleeping on the wing. It is highly mobile, often occurring in association with unsettled weather and low pressure systems (Johnstone and Storr 1998).

The species was not recorded during the current survey, which is not surprising given the survey timing. However, it is a regular visitor to the Pilbara region (particularly coastal areas) and there are multiple records (>10) from the locality, the closest of which are within 3 km to the north-east of the survey area (Cornell Lab of Ornithology 2023, DBCA 2023; Figure 5.2). Hence, the species is likely to occur in airspace over the survey area sporadically from September to April, particularly (but not exclusively) in association with the passage of low pressure systems.

7.1.4 Oriental Plover *Charadrius veredus*

The Oriental Plover is listed as Migratory under the BC Act and EPBC Act. The species breeds in Mongolia, northern China and southern Siberia, and is a non-breeding summer migrant to Australia, occurring primarily from September to April (Johnstone and Storr 1998). However, unlike most shorebird species, they are not tied to wetland and coastal habitats while in Australia. Their preferred foraging habitats are sparsely vegetated open areas, including short-grassed or bare plains, bare wetland margins, and recently burnt areas (Johnstone and Storr 1998). This also includes similar man-made habitats, such as sports fields and airfields. The species will also use tidal mudflats, beaches, sewage ponds and freshwater wetland areas, primarily while on migration, or for roosting during the heat of the day (Johnstone and Storr 1998, Menkhorst et al.

2017). They are mobile in response to conditions, and disperse across inland northern Australia during the wet season (Minton et al. 2013).

The species was not recorded from the survey area during the current survey, which is not unexpected given the timing of the survey. There are multiple records from the locality, with the closest within 8 km of the survey area to the south (Cornell Lab of Ornithology 2023, DBCA 2023; Figure 5.2); however, the habitat within the survey area is only of marginal suitability for the species, so it may occur as an occasional visitor to the survey area.

7.1.5 Little Curlew *Numenius minutus*

The Little Curlew is listed as Migratory under the BC Act and EPBC Act. It is a common non-breeding summer migrant to northern Australia, primarily between mid-September and April, with very few overwintering (Menkhorst et al. 2017). It favours short grassland habitats, including natural short grasslands or recently burnt grasslands, airfields and sports grounds, and less commonly other open habitats such as drying river beds and tidal flats (Johnstone and Storr 1998). The species is generally more common in coastal areas but disperses further inland following widespread rainfall during the wet season.

The species was not recorded from the survey area during the current survey, which is not unexpected given the timing of the survey. There are several records from the locality, including one in close proximity to the survey area (within 1 km to the east) (Cornell Lab of Ornithology 2023, DBCA 2023; Figure 5.2). However, the habitat within the survey area is only of marginal suitability for the species, so it may occur as an occasional visitor.

7.1.6 Oriental Pratincole *Glareola maldivarum*

The Oriental Pratincole is listed as Migratory under the BC Act and the EPBC Act. The species is a non-breeding migrant to Australia and is typically present from October to May, with the largest numbers present from December to March (Johnstone and Storr 1998, Sitters et al. 2004). The Oriental Pratincole often uses broadly similar foraging habitats to the Oriental Plover, including short-grassed or bare plains, bare wetland margins. However, Oriental Pratincoles take most of their insect prey aerially (Johnstone and Storr 1998), and so will forage over a wider range of open habitat types, and occasionally over more wooded areas. Oriental Pratincole will also use tidal mudflats, beaches, sewage ponds and freshwater wetland areas, primarily for roosting during the heat of the day. They are mobile in response to conditions, and disperse across inland northern Australia during the wet season, occasionally gathering in exceptionally high numbers (Sitters et al. 2004).

The species was not recorded from the survey area during the current survey, which is not unexpected given the timing of the survey. However, there are multiple records from the locality, the closest of which is located c. 2.5 km to the northeast of the survey area (Cornell Lab of Ornithology 2023, DBCA 2023; Figure 5.2), so the species is likely to occur as an occasional foraging visitor between December and March.

7.1.7 Gull-billed Tern spp. *Gelochelidon [nilotica]*

The Gull-billed Tern is listed as Migratory under both the BC Act and the EPBC Act. However, there are two populations of Gull-billed Tern in Australia, a resident population, *G. [nilotica] macrotarsa* and a migratory population *G. nilotica affinis*. Most authorities now recognise the resident Australian population as a distinct species, the Australian [Gull-billed] Tern, based on differences in plumage, structure, ecology and genetics (Rogers et al. 2005). The Australian [Gull-billed] Tern is still listed as Migratory under the EPBC Act due to a lag in updating the taxonomy of the species. Australian [Gull-billed] Terns are nomadic and occur widely across Australia, including both coastal and inland areas, but generally remain within Australia. They breed colonially on inland wetlands, and forage over sheltered coastal and inland wetlands, and over open grassland and bare ground (Johnstone and Storr 1998). Numerous records of Gull-billed Terns from the broader

locality were identified in the desktop study, including records within 1 km of the survey area to the east, though few differentiate between the two taxa.

The survey area represents potentially suitable foraging habitat for the species, so it is likely to occur as a foraging visitor. [Common] Gull-billed Terns (*Gelochelidon nilotica affinis*) are non-breeding migrants to Australia and use primarily coastal habitats and are less likely to forage over dry terrestrial habitats. They may occur in the survey area as an occasional foraging visitor.

7.1.8 Osprey *Pandion haliaetus*

The Osprey is listed as Migratory under both the BC Act and the EPBC Act. It occurs almost worldwide, with populations in the Oceania region, including Australia, Papua New Guinea, Indonesia, the Solomons and New Caledonia sometimes treated as a separate species the Eastern Osprey *P. cristatus* (Cornell Lab of Ornithology 2022). In Western Australia, the Eastern Osprey occurs on offshore islands, sheltered mainland coasts, estuaries, along larger rivers and occasionally around inland water bodies (Johnstone and Storr 1998).

The species was not recorded from the survey area during the current survey, but is commonly recorded in close proximity, including over 20 records from Onslow township (Cornell Lab of Ornithology 2023, DBCA 2023; Figure 5.2). The closest record is within 1.5 km east of the survey area, so the species is likely to overfly the survey area regularly. However, the habitat within the survey area is not suitable for breeding or foraging, so the species is unlikely to directly utilise the survey area.

7.1.9 Grey Falcon *Falco hypoleucos*

The Grey Falcon is listed as Vulnerable under both the BC Act and the EPBC Act. The species is sparsely distributed across much of arid inland Australia, including the Kimberley, occurring mainly on lightly wooded plains and along major watercourses (Johnstone et al. 2013). Breeding usually takes place in taller trees such as river red gums, or on isolated man-made structures such as communications towers.

The species was not recorded from the survey area during the current survey nor was it returned in the DBCA search as occurring in the desktop study area. It is however, known from the vicinity of the survey area. The survey area does not represent suitable breeding habitat for the species, but it may occur here as an occasional foraging visitor.

7.1.10 Peregrine Falcon *Falco peregrinus*

The Peregrine Falcon is listed as Other Specially Protected Fauna under the BC Act. It occurs almost Australia-wide, but is largely absent from most deserts and the Nullarbor Plain (Johnstone and Storr 1998). The species inhabits a wide range of habitats including forests, woodlands, wetlands and open country (Pizzey and Knight 2007). Individuals maintain large home ranges of up to 30 km², and nest in recesses of cliff faces, tree hollows and along rivers (Johnstone and Storr 1998).

The species was not recorded from the survey area during the current survey. However, there are several records from the broader locality, the closest of which lies c. 11 km to the southwest of survey area (Cornell Lab of Ornithology 2023, DBCA 2023; Figure 5.2). The survey area does not represent suitable breeding habitat for the species, but it may occur as an occasional foraging visitor.

7.1.11 Barn Swallow *Hirundo rustica*

The Barn Swallow is listed as Migratory under both the BC and EPBC Acts. The species is a non-breeding migrant to Australia, where they occur in coastal areas of northern Australia between

the Pilbara in Western Australia and northern Queensland. In Australia, they occur primarily over open habitats, particularly in areas such as wetlands where insect densities are high.

The species was not recorded from the survey area during the current survey, which is expected given the survey timing. However, there are multiple records from around Onslow township, the closest of which is c. 2.5 km to the northeast of the survey area (Cornell Lab of Ornithology 2023, DBCA 2023; Figure 5.2). Hence, the species is considered likely to occur as a foraging visitor to the survey area, primarily between December and March when most records occur in the region.

7.1.12 *Lerista planiventralis maryani*

The skink *Lerista planiventralis maryani* is listed as Priority 1 by the DBCA. It occurs in coastal consolidated dunes and low shrubland with sandy substrate in a small area of the northwest coast between Onslow and Barradale (Cogger 2014, Wilson and Swan 2021).

The species was not recorded from the survey area during the current survey, but secondary evidence of one or more unidentified *Lerista* species was recorded. There are few records of this subspecies generally, but at least one from the Onslow region, though the location provided is imprecise (DBCA 2023). The habitat of the survey area is suitable for this species, so it may occur, though the lack of records (locally and overall) mean it is difficult to confidently assess its likelihood of occurrence.

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8.0 Conclusions

8.1 Significant Vegetation

One vegetation type (D1: *Acacia coriacea* subsp. *coriacea*, *Trichodesma zeylanicum* var. *grandiflorum*, tall open shrubland over *Crotalaria cunninghamii* subsp. *cunninghamii*, (*Tephrosia rosea* var. *clementii*) shrubland over **Cenchrus ciliaris* tussock grassland and *Triodia epactia* very open hummock grassland) was described and mapped over the survey area. This is within the range expected for a 3.16 ha area in this locality, taking into account the one main landform present and the scale of vegetation mapping. It is not representative of any TEC or PEC, nor is it considered to represent vegetation of particular local significance. Vegetation condition was rated as Very Good.

8.2 Significant Flora

A total of 33 native vascular flora species from 26 genera and 16 families were recorded during the survey. This is within the range expected for a survey area of this size in this locality.

No Threatened flora species were recorded and none are considered likely to occur. One Priority 3 species, *Abutilon* sp. *Pritzelianum* (S. van Leeuwen 5095), was recorded; a total of five individuals occurred at both relevé locations. No other Priority flora species are considered likely to occur.

8.3 Introduced Flora

A total of three weed species were recorded from the study area, **Aerva javanica*, **Cenchrus ciliaris* and **Tribulus terrestris*. None of these are listed WONS (DotEE 2018) or declared pests under the WA Biosecurity and Agriculture Management Act 2007 (DAFWA 2018b).

8.4 Significant Fauna

No confirmed evidence of significant fauna were recorded in the survey area during the survey. Secondary evidence of *Lerista* sp./spp. may be attributable to the Priority 1 listed skink *Lerista planiventralis maryani* which potentially occurs within the survey area, but multiple other *Lerista* species are also likely to occur, so it is not possible to determine which species are involved. On the basis of the desktop study, 13 significant fauna species were assessed as having a high or moderate likelihood of occurrence in the survey area. However, the small extent of the survey area suggests it is unlikely that major impacts on any significant species would arise as a result of the proposed clearing.

8.5 Assessment Against the Ten Clearing Principles

A general assessment of the proposal to clear land within the survey area against each of the 10 clearing principles, as outlined in Schedule 5 of the EP Act, is provided in Table 8.1.

Table 8.1: Assessment of vegetation within the survey area against the ten clearing principles.

Clearing Principle	Justification of Variance	Assessment
A	Native vegetation should not be cleared if it comprises a high level of biological diversity.	
	<p>Flora</p> <p>The survey area is not located within a known biodiversity hotspot for WA (Department of the Agriculture, Water and the Environment 2020).</p> <p>Vascular flora species diversity recorded within the survey area was considered to be moderate to low; a total of 33 native flora species from 16 families were recorded within the 3.16 ha survey area. One Priority 3 flora species, <i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095) was recorded during the survey. This species occurs relatively commonly on dunes in the locality. No other conservation significant flora species were deemed likely to occur following the field survey.</p> <p>One Priority flora species was recorded in the survey area, <i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095). This species has been recorded on the dunes in the Onslow locality in recent surveys (see Table 5.1) and as part of this survey. Clearing of undisturbed dunes supporting this species should be avoided where possible. No other Priority flora species are considered to have the potential to occur, given the habitats present.</p> <p>Assuming the sand dunes supporting <i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095) are not cleared, the proposal is unlikely to be at variance with this principle. However, clearing of <i>A. sp. Pritzelianum</i> (S. van Leeuwen 5095) in areas not regenerating from historical disturbance may result in this proposal being at variance with this principle.</p> <p>Fauna</p> <p>The scope of the assessment did not include a comprehensive census of vertebrate fauna in the survey area. However, on the basis of the desktop study, 60 significant fauna species were identified as potentially occurring in the survey area. Following an assessment of the habitat available in the survey area, 13 of these species are considered to have a moderate to high likelihood of occurrence in the survey area, though most are only likely to be occasional visitors.</p> <p>The clearing footprint for the project is small (3.16 ha); neither the vascular flora species diversity nor the fauna species diversity would be affected by clearing at this small scale.</p>	May be at Variance
B	Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.	
	One fauna habitat was recorded in the survey area, mixed shrubland on consolidated coastal sand dunes, which occurs widely in the broader locality. The proposal's clearing footprint is small (3.16 ha) and the vegetation is unlikely to be considered significant habitat for any significant fauna species.	Unlikely to be at Variance
C	Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	
	The results of the desktop study show that no records of any Threatened flora species occurring within 40 km of the survey area, and none were recorded.	Unlikely to be at Variance
D	Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.	
	None of the vegetation within the survey area is considered to be analogous to any TECs defined at State or Commonwealth level. The proposed clearing is not at variance with this principle.	Not at Variance

E	Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	
	<p>The survey area contains one broad -scale regional vegetation unit described as Cape Yannare Coastal Plain: Hummock grasslands, grass steppe; soft spinifex (1975a, 1975b). The current extent of this vegetation unit in the Cape Range and Roebourne subregions is 57,809.6 ha (91.2 %) of the pre-European extent (see Section 3.4).</p> <p>The proposed clearing is not within a significantly cleared landscape and does not represent an ecological linkage. Clearing of up to 3.16 ha would represent a very minor increment on historical clearing.</p>	Unlikely to be at Variance
F	Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	
	There are no watercourses or wetlands within or near the survey area. The nearest watercourse is the Ashburton River some 20 km to the southwest of the survey area. The proposal is unlikely to be at variance with this principle.	Unlikely to be at Variance
G	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	
	Given its very small scale (3.16 ha), it is considered unlikely that the proposal would contribute significantly to land degradation in the locality of the survey area.	Unlikely to be at Variance
H	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	
	No conservation reserves occur within the survey area. The closest conservation estate to the survey area is the Thevenard Island Reserve, some 23 km to the northwest of the survey area. Given the small amount of clearing required, it is unlikely to affect any conservation estate.	Unlikely to be at Variance
I	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	
	The proposed clearing does not intersect any waterbodies. Provided that the construction avoids any excavations below the water table level, there is no reason to expect that the clearing would affect the quality of surface or underground water.	Unlikely to be at Variance
J	Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.	
	No permanent surface water sources or wetlands occur in the survey area. The sandy soil would provide rapid infiltration of rainfall events. Clearing of vegetation is unlikely to affect the intensity or incidence of flooding.	Not at Variance

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9.0 References

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Appendix 1

Framework for Conservation Significance Ranking of Species



A. Categories for Threatened and Priority Ecological Communities

A1. Categories and Criteria for Threatened Ecological Communities under the BC Act

Division 2

Subdivision 1 — Threatened ecological communities

27. Listing of threatened ecological communities

- (1) The Minister may, by order, list an ecological community as a threatened ecological community in one of the following categories —
 - (a) critically endangered ecological community;
 - (b) endangered ecological community;
 - (c) vulnerable ecological community.
- (2) An ecological community is not eligible for listing as a threatened ecological community if it is a collapsed ecological community.
- (3) When deciding whether or not to list an ecological community as a threatened ecological community or to amend or repeal such a listing, the Minister must have regard only to matters relating to the survival of the ecological community.
- (4) An order made under subsection (1) may describe or identify an ecological community by reference to a map or plan held in the Department.
- (5) Section 258 applies to an order made under subsection (1).

28. Criteria for categorisation as critically endangered ecological community

An ecological community is eligible for listing in the category of critically endangered ecological community at a particular time if, at that time —

- (a) it is facing an extremely high risk of becoming eligible for listing as a collapsed ecological community in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines; and
- (b) listing in that category is otherwise in accordance with the ministerial guidelines.

29. Criteria for categorisation as endangered ecological community

An ecological community is eligible for listing in the category of endangered ecological community at a particular time if, at that time —

- (a) it is not a critically endangered ecological community; and
- (b) it is facing a very high risk of becoming eligible for listing as a collapsed ecological community in the near future, as determined in accordance with criteria set out in the ministerial guidelines; and
- (c) listing in that category is otherwise in accordance with the ministerial guidelines.

30. Criteria for categorisation as vulnerable ecological community

An ecological community is eligible for listing in the category of vulnerable ecological community at a particular time if, at that time —

- (a) it is not a critically endangered ecological community or an endangered ecological community; and
- (b) it is facing a high risk of becoming eligible for listing as a collapsed ecological community in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines; and
- (c) listing in that category is otherwise in accordance with the ministerial guidelines.

Subdivision 2 — Collapsed ecological communities

31. Listing of collapsed ecological communities

- (1) The Minister may, by order, list an ecological community as a collapsed ecological community.
- (2) Section 258 applies to an order made under subsection (1).

32. Criteria for listing as collapsed ecological community

An ecological community is eligible for listing as a collapsed ecological community at a particular time if, at that time —

- (a) there is no reasonable doubt that the last occurrence of the ecological community has collapsed; or
- (b) the ecological community has been so extensively modified throughout its range that no occurrence of it is likely to recover —
 - (i) its species composition or structure; or
 - (ii) its species composition and structure.

33. Rediscovered ecological communities

If a collapsed ecological community is discovered in a state that no longer makes it eligible for listing as a collapsed ecological community, it is to be regarded as a threatened ecological community for the purposes of this Act until —

- (a) it is listed as a threatened ecological community; or
- (b) the Minister declares, by instrument published in the Gazette, that it is not to be so listed.

A2. Categories and Criteria for Priority Ecological Communities (DEC 2010)

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the DBCA 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

B1. Western Australian BC Act, 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 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 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.

B2. 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 (MI)** 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 (MA) 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 Act Protected Matters Database Search Results





Australian Government

Department of Climate Change, Energy,
the Environment and Water

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: 22-Mar-2023

[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:	34
Listed Migratory Species:	58

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 environment anywhere.

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 <https://www.dcceew.gov.au/parks-heritage/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:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	91
Whales and Other Cetaceans:	27
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	3

Extra Information

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

State and Territory Reserves:	7
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	31
Key Ecological Features (Marine):	3
Biologically Important Areas:	15
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 may 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

[Charadrius leschenaultii](#)

Greater Sand Plover, Large Sand Plover [877]

Vulnerable

Species or species habitat known to occur within area

In feature area

[Erythrotriorchis radiatus](#)

Red Goshawk [942]

Vulnerable

Species or species habitat may occur within area

In feature area

[Falco hypoleucos](#)

Grey Falcon [929]

Vulnerable

Species or species habitat likely 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may 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
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
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
FISH			
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
MAMMAL			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area	In buffer area only
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat may occur within area	In buffer area only

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 buffer area only
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
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In feature area

SHARK

Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
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Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to 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 buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only

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 buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat may occur within area	In buffer area only
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Hydroprogne caspia Caspian Tern [808]		Breeding known to 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 buffer area only
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area	In buffer area only
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Marine Species			
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area	In buffer area only
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat likely to occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
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 buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area	In buffer area only
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Megaptera novaeangliae Humpback Whale [38]		Breeding known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In feature area
Orcaella heinsohni Australian Snubfin Dolphin [81322]		Species or species habitat known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area	In buffer area only
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to 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 buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sousa sahalensis as Sousa chinensis Australian Humpback Dolphin [87942]		Species or species habitat known to occur within area	In buffer area only
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area	In buffer area only
Migratory Terrestrial Species			
Hirundo rustica Barn Swallow [662]		Species or species habitat may 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 may 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
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may 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 melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area	In feature area
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat may occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to 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
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In feature area

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 - [50385]	WA	In buffer area only
Commonwealth Land - [51887]	WA	In buffer area only
Commonwealth Land - [51104]	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 buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat may occur within area	In buffer area only
Ardena pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding 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 canutus Red Knot, Knot [855]	Endangered	Species or species habitat may 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 likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area	In buffer area only
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to 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 veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may 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
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area overfly marine area	In feature area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area	In buffer area only
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat may 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
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
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 may 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
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Breeding known to occur within area	In buffer area only
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area	In buffer area only
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalasseus bengalensis as Sterna bengalensis Lesser Crested Tern [66546]		Breeding known to occur within area	In feature area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In feature area
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 buffer area only
Campichthys tricarinatus Three-keel Pipefish [66192]		Species or species habitat may occur within area	In buffer area only
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area	In buffer area only
Choeroichthys latispinosus Muiron Island Pipefish [66196]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area	In buffer area only
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area	In buffer area only
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area	In buffer area only
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 buffer area only
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area	In buffer area only
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area	In buffer area only
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In buffer area only
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area	In buffer area only
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area	In buffer area only
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In buffer area only
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In buffer area only
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area	In buffer area only
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In buffer area only
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In buffer area only
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In buffer area only
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area	In buffer area only
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 buffer area only
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area	In buffer area only
Mammal			
Dugong dugon Dugong [28]		Species or species habitat known to occur within area	In buffer area only
Reptile			
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area	In buffer area only
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 buffer area only
Aipysurus eydouxii Spine-tailed Seasnake [1117]		Species or species habitat may occur within area	In buffer area only
Aipysurus foliosquama Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area	In buffer area only
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 buffer area only
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 buffer area only
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area	In buffer area only
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area	In buffer area only
Ephalophis greyi North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area	In feature area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area	In buffer area only
Leioselasma czeblukovi as Hydrophis czeblukovi Fine-spined Seasnake, Geometrical Seasnake [87374]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 buffer area only

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 buffer area only
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area	In buffer area only
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area	In buffer area only
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area	In buffer area only
Kogia sima as Kogia simus Dwarf Sperm Whale [85043]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Breeding known to occur within area	In buffer area only
Orcaella heinsohni as Orcaella brevirostris Australian Snubfin Dolphin [81322]		Species or species habitat known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area	In buffer area only
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area	In buffer area only
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area	In buffer area only
Sousa sahalensis as Sousa chinensis Australian Humpback Dolphin [87942]		Species or species habitat known to occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area	In buffer area only
Stenella longirostris Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area	In buffer area only
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area	In buffer area only

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 buffer area only
Dec - Jan			
Chelonia mydas Green Turtle [1765]	Nesting	Known to occur	In buffer area only
Nov - May			
Eretmochelys imbricata Hawksbill Turtle [1766]	Nesting	Known to occur	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Airlie Island	Nature Reserve	WA	In buffer area only
Bessieres Island	Nature Reserve	WA	In buffer area only
Cane River (Mount Minnie and Nanutarra)	NRS Addition - Gazettal in Progress	WA	In buffer area only
Locker Island	Nature Reserve	WA	In buffer area only
Thevenard Island	Nature Reserve	WA	In buffer area only
Unnamed WA40322	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA44665	5(1)(h) Reserve	WA	In buffer area only

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Exmouth Gulf East	WA	In buffer area only

EPBC Act Referrals					[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status	
Ashburton Infrastructure Project	2021/9064		Completed	In buffer area only	

Controlled action				
Construct and operate LNG & domestic gas plant including onshore and offshore facilities - Wheatston	2008/4469	Controlled Action	Post-Approval	In feature area
Construction and operation of a Solar Salt Project, SW Onslow, WA	2016/7793	Controlled Action	Assessment Approach	In buffer area only
Greater Gorgon Development - Optical Fibre Cable, Mainland to Barrow Island	2005/2141	Controlled Action	Completed	In feature area
Proposed West Pilbara Iron Ore Project	2009/4706	Controlled Action	Post-Approval	In buffer area only
Yannarie Solar Salt Project	2004/1679	Controlled Action	Completed	In buffer area only

Not controlled action				
Airlie Island soil and groundwater investigations, Exmouth Gulf, offshore Pilbara coast	2014/7250	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Baniyas-1 Exploration Well, EP-424, near Onslow	2007/3282	Not Controlled Action	Completed	In buffer area only
Construct 110km buried natural gas pipeline from Onslow, connecting to Dampier/Bunbury natural gas p	2013/7039	Not Controlled Action	Completed	In buffer area only
Exploration Well (Taunton-2)	2002/731	Not Controlled Action	Completed	In buffer area only
HCA05X Macedon Experimental Survey	2004/1926	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
Infill Production Well (Griffin-9)	2001/417	Not Controlled Action	Completed	In buffer area only
Klammer 2D Seismic Survey	2002/868	Not Controlled Action	Completed	In buffer area only
Onslow Power Infrastructure Upgrade Project, Onslow, WA	2014/7314	Not Controlled Action	Completed	In buffer area only
Onslow Rare Earths Plant	2021/9046	Not Controlled Action	Completed	In buffer area only
Onslow Water Supply Infrastructure Upgrade Project, Onslow, WA	2014/7329	Not Controlled Action	Completed	In buffer area only
Subsea Gas Pipeline From Stybarrow Field to Griffin Venture Gas Export Pipeline	2005/2033	Not Controlled Action	Completed	In buffer area only
Thevenard Island Retirement Project	2015/7423	Not Controlled Action	Completed	In buffer area only
To construct and operate an offshore submarine fibre optic cable, WA	2014/7373	Not Controlled Action	Completed	In buffer area only
Wanda Offshore Research Project, 80 km north-east of Exmouth, WA	2018/8293	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
'Kate' 3D marine seismic survey, exploration permits WA-320-P and WA-345-P, 60km	2005/2037	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
2D and 3D seismic surveys	2005/2151	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Babylon 3D Marine Seismic Survey, Commonwealth Waters, nr Exmouth WA	2013/7081	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Huzzas MC3D Marine Seismic Survey (HZ-13) Carnarvon Basin, offshore WA	2013/7003	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Huzzas phase 2 marine seismic survey, Exmouth Plateau, Northern Carnarvon Basin, WA	2013/7093	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Macedon Gas Field Development	2008/4605	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Munmorah 2D seismic survey within permits WA-308/9-P	2003/970	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Ocean Bottom Cable Seismic Survey	2005/2017	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Onslow Seawater Desalination Plant Marine Geophysical Investigation	2020/8794	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Referral decision

3D Marine Seismic Survey in the offshore northwest Carnarvon Basin	2011/6175	Referral Decision	Completed	In buffer area only
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Key Ecological Features

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region	Buffer Status
Ancient coastline at 125 m depth contour	North-west	In buffer area only
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	North-west	In buffer area only
Continental Slope Demersal Fish Communities	North-west	In buffer area only

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
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Scientific Name	Behaviour	Presence	Buffer Status
Marine Turtles			
Chelonia mydas Green Turtle [1765]	Aggregation	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
Eretmochelys imbricata Hawksbill Turtle [1766]	Internesting buffer	Known to occur	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Nesting	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 buffer area only
Natator depressus Flatback Turtle [59257]	Nesting	Known to occur	In buffer area only
Seabirds			
Ardena pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur	In feature area
Sterna dougallii Roseate Tern [817]	Breeding	Known to occur	In buffer area only
Sternula nereis Fairy Tern [82949]	Breeding	Known to occur	In buffer area only
Thalasseus bengalensis Lesser Crested Tern [66546]	Breeding	Known to occur	In feature area
Sharks			
Rhincodon typus Whale Shark [66680]	Foraging	Known to occur	In buffer area only
Whales			

Scientific Name	Behaviour	Presence	Buffer Status
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur	In buffer area only
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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Appendix 3

Significant Flora Species Recorded within 40 km and their Likelihood of Occurrence



Taxon	Habit and Habitat (WA Herbarium 2023)	Source		Likelihood of Occurrence in Survey Area	
		DBCA TPFL	WA Herbarium	Initial Ranking Based on Desktop Study	Final Ranking Including Results of Field Survey
Priority 3					
<i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61)	Prostrate perennial shrub or herb to 1 m, typically growing on sand plains	✓	✓	May occur; suitable habitat and several records in locality (NR 21 km SSE).	Unlikely to occur.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	Shrub to 1.5 m growing on sand plains and dunes.	-	✓	Likely to occur; suitable habitat and records in study area (NR 4.6 km SE).	Recorded at OPA-REL01 and OPA-REL02.
<i>Carpobrotus</i> sp. Thevenard Island (M. White 050)	Prostrate, succulent perennial herb to 1.5 m tall, growing on dunes and in disturbed areas.	✓	✓	Unlikely to occur; no mainland records in the study area; nearest records on Thevenard Island (NR 24 km NNW).	Would not occur.
<i>Corynotheca flexuosissima</i>	Rhizomatous perennial herb or shrub to 60 cm tall, growing on coastal dunes in sand or limestone.	-	✓	Unlikely to occur; no mainland records but one island record in close proximity (NR 3.3 km NE).	Unlikely to occur.
<i>Eleocharis papillosa</i>	Annual herb to 10 cm tall, growing on clay plains.	-	✓	Would not occur; no suitable habitat (NR 15 km SW).	Would not occur.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	Much-branched shrub to 1 m tall, growing on plains, dunes, interdunal swales.	-	✓	May occur; suitable habitat and two records in close proximity (NR 14 km SW).	Unlikely to occur.
<i>Stackhousia clementii</i>	Dense perennial herb to 45 cm tall, growing in coastal plains and sandstone hills.	-	✓	May occur; suitable habitat and one record in close proximity (NR 3.6 km SE).	Unlikely to occur.
<i>Triumfetta echinata</i>	Prostrate shrub to 30 cm tall, growing on sand dunes.	-	✓	May occur; suitable habitat and three records in close proximity (NR 13 km S).	Unlikely to occur.

Appendix 4

Vegetation Structural Classes and Condition Scale



Vegetation structural classes based on modifications of the vegetation classification system of Specht (1970) by Muir (1977) and Aplin (1979).

Stratum	Canopy Cover (%)				
	70-100%	30-70%	10-30%	2-10%	<2%
Trees over 30 m	Tall closed forest	Tall open forest	Tall woodland	Tall open woodland	Scattered tall trees
Trees 10-30 m	Closed forest	Open forest	Woodland	Open woodland	Scattered trees
Trees under 10 m	Low closed forest	Low open forest	Low woodland	Low open woodland	Scattered low trees
Shrubs over 2 m	Tall closed scrub	Tall open scrub	Tall shrubland	Tall open shrubland	Scattered tall shrubs
Shrubs 1-2 m	Closed heath	Open heath	Shrubland	Open shrubland	Scattered shrubs
Shrubs under 1 m	Low closed heath	Low open heath	Low shrubland	Low open shrubland	Scattered low shrubs
Hummock grasses	Closed hummock grassland	Hummock grassland	Open hummock grassland	Very open hummock grassland	Scattered hummock grasses
Grasses, Sedges, Herbs	Closed tussock grassland / bunch grassland / sedgeland / herbland	Tussock grassland / bunch grassland / sedgeland / herbland	Open tussock grassland / bunch grassland / sedgeland / herbland	Very open tussock grassland / bunch grassland / sedgeland / herbland	Scattered tussock grasses / bunch grasses / sedges / herbs

Vegetation condition scale taken from EPA (2016a), based on scales developed by Keighery (1994) and Trudgen (1988).

Vegetation Condition	South West and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor		Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix 5

Raw Site Data



Site	OPA-REL01					
Described by	RW	Date	19/08/22	Type	Relevé	100m x 25 m
MGA Zone	50	303228 mE	7603899 mN			
Habitat	Plain and base of low dune.					
Soil	Sand.					
Rock Type	None.					
Vegetation	<i>Crotalaria cunninghamii</i> subsp. <i>cunninghamii</i> , <i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i> , <i>Tephrosia rosea</i> var. <i>clementii</i> open shrubland over <i>*Aerva javanica</i> scattered low shrubs over <i>*Cenchrus ciliaris</i> tussock grassland and <i>Triodia epactia</i> very open hummock grassland.					
Veg Condition	Good. Moderate cover of <i>*Cenchrus ciliaris</i> , low cover of <i>*Aerva javanica</i> and signs of past disturbance.					
Fire Age	No sign of recent fire.					
Notes	In good condition considering historic clearing and proximity to site.					

Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Abutilon lepidum</i>	0.1	120	REL01-05	
<i>Abutilon</i> sp. <i>Pritzelianum</i> (S. van Leeuwen 5095)	0.1	200	REL01-01	N=3
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	160		
<i>Acacia stellaticeps</i>	0.1	60		
<i>Adriana tomentosa</i> var. <i>tomentosa</i>	0.1	80		
<i>*Aerva javanica</i>	1	90		
<i>Cassutha capillaris</i>	0.1	30		
<i>*Cenchrus ciliaris</i>	35	60		
<i>Crotalaria cunninghamii</i> subsp. <i>cunninghamii</i>	1	170		
<i>Cullen martinii</i>	0.1	25	OPARW20=	
<i>Euphorbia myrtoides</i>	0.1	25	REL01-04	
<i>Euphorbia trigonosperma</i>	0.1	10	REL01-06	
<i>Haloragis gossei</i>	0.1	10	REL01-09	
<i>Hibiscus brachychlaenus</i>	0.1	60	REL01-02	
<i>Indigofera boviparda</i> subsp. <i>boviparda</i>	0.1	30		
<i>Indigofera colutea</i>	0.1	5		
<i>Indigofera linifolia</i>	0.1	10	REL01-08	
<i>Ptilotus polystachyus</i>	0.1	45		
<i>Rhynchosia minima</i>	0.1	20		
<i>Salsola australis</i>	0.1	30		
<i>Sida fibulifera</i>	0.1	30		
<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	20	REL01-03	
<i>Solanum cleistogamum</i>	0.1	10		
<i>Tephrosia rosea</i> var. <i>clementii</i>	1	120	REL01-07	
<i>Trachymene oleracea</i> subsp. <i>oleracea</i>	0.1	10		
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	1	170		
<i>Triodia epactia</i>	6	30		



Site	OPA-REL02					
Described by	RW	Date	19/08/22	Type	Relevé	25 x 100 m
MGA Zone	50	303200 mE	7603857 mN			
Habitat	Low dune crest and slope.					
Soil	Sand.					
Rock Type	None present					
Vegetation	(Acacia coriacea subsp. coriacea), Trichodesma zeylanicum var. grandiflorum tall open shrubland over Crotalaria cunninghamii subsp. cunninghamii, (Tephrosia rosea var. clementii) shrubland over Quoya loxocarpa, (Corynotheca pungens) low shrubland over Triodia epactia open hummock grassland and *Cenchrus ciliaris scattered tussock grasses.					
Veg Condition	Very Good. Low cover of *Cenchrus ciliaris.					
Fire Age	No sign of recent fire.					

Species	Cover (%)	Height (cm)	Specimen	Notes
Abutilon sp. Pritzelianum (S. van Leeuwen 5095)	0.1	90		N=2
Acacia coriacea subsp. coriacea	2	250		
Bulbostylis barbata	0.1	4		
Calandrinia polyandra	0.1	10		
Cassutha capillaris	0.1	25		
*Cenchrus ciliaris	1.5	40		
Corynotheca pungens	1	50		
Crotalaria cunninghamii subsp. cunninghamii	12	130		
Euphorbia myrtilloides	0.1	15		
Euphorbia trigonosperma	0.1	15	REL02-03	
Indigofera colutea	0.1	5		
Nicotiana occidentalis	0.1	60	REL02-01	
Quoya loxocarpa	9	40		
Rhodanthe psammophila	0.1	15	REL02-04	
Salsola australis	0.1	35		
Sida rohlenae subsp. rohlenae	0.1	40	REL02-02	
Tephrosia rosea var. clementii	2	130	REL01-07=	
*Tribulus terrestris	0.1	5		
Trichodesma zeylanicum var. grandiflorum	7	210		
Triodia epactia	29	45		



Appendix 6

Vascular Flora Species List



FAMILY	SPECIES	STATUS
Amaranthaceae	* <i>Aerva javanica</i> <i>Ptilotus polystachyus</i>	Weed
Araliaceae	<i>Trachymene oleracea</i> subsp. <i>oleracea</i>	
Asteraceae	<i>Rhodanthe psammophila</i>	
Boraginaceae	<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	
Chenopodiaceae	<i>Salsola australis</i>	
Euphorbiaceae	<i>Adriana tomentosa</i> var. <i>tomentosa</i> <i>Euphorbia myrtoides</i> <i>Euphorbia trigonosperma</i>	
Fabaceae	<i>Acacia coriacea</i> subsp. <i>coriacea</i> <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> <i>Acacia stellaticeps</i> <i>Crotalaria cunninghamii</i> subsp. <i>cunninghamii</i> <i>Cullen martinii</i> <i>Indigofera boviparda</i> subsp. <i>boviparda</i> <i>Indigofera colutea</i> <i>Indigofera linifolia</i> <i>Rhynchosia minima</i> <i>Tephrosia rosea</i> var. <i>clementii</i>	
Haloragaceae	<i>Haloragis gossei</i>	
Hemerocallidaceae	<i>Corynotheca pungens</i>	
Lamiaceae	<i>Quoya loxocarpa</i>	
Lauraceae	<i>Cassytha capillaris</i>	
Malvaceae	<i>Abutilon lepidum</i> <i>Abutilon</i> sp. <i>Pritzelianum</i> (S. van Leeuwen 5095) <i>Hibiscus brachychlaenus</i> <i>Sida fibulifera</i> <i>Sida rohlenae</i> subsp. <i>rohlenae</i>	Priority 3
Montiaceae	<i>Calandrinia polyandra</i>	
Poaceae	* <i>Cenchrus ciliaris</i> <i>Triodia epactia</i> <i>Whiteochloa airoides</i>	Weed
Solanaceae	<i>Nicotiana occidentalis</i> <i>Solanum cleistogamum</i>	
Zygophyllaceae	* <i>Tribulus terrestris</i>	Weed

Appendix 3

Significant Fauna Species Recorded within 40 km and their Likelihood of Occurrence



FAUNA GROUP	Common Name	Conservation Status		Record Source					Habitat Preference	Likelihood of Occurrence (Initial)	Suitable Habitat in Study Area	Likelihood of Occurrence (Final)
		State	Federal	ALA	eBird	EPBC	DBCA	Past surveys (combined)				
Mammals												
<i>Dasyurus hallucatus</i>	Northern Quoll	EN	EN			•	•	•	In the Pilbara, primarily rocky areas, often near water, and major drainage lines.	Unlikely to occur	-	Unlikely to occur
<i>Perameles bougainville</i>	Shark Bay Bandicoot, Little Marl	VU	EN				•		Formerly a variety of semi-arid shrublands. Remnant populations occur in dense shrubby vegetation behind sand dunes on offshore islands.	Would not occur	✓	Would not occur
<i>Leggadina lakedownensis</i>	Short-tailed Mouse	P4					•		Primarily cracking clay plains and associated environs in most of Pilbara, but occurs in sandy shrublands in coastal areas and offshore islands	Likely to occur	✓	Likely to occur
<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse	P4					•	•	Stony hillsides with hummock grasslands in the central and eastern parts of the Pilbara.	Unlikely to occur	-	Would not occur
<i>Rhinonictis aurantia Pilbara form</i>	Pilbara Leaf-nosed Bat	VU	VU			•	•		Reliant on roost sites in caves or mine adits with stable, very hot (28 – 32°C) and very humid (96 – 100 %) microclimates. Forages over wide range of habitats.	Unlikely to occur	Foraging only	Unlikely to occur
<i>Macroderma gigas</i>	Ghost Bat	VU	VU			•	•		Occurs in a broad range of habitats, with distribution primarily influenced by the availability of suitable caves and mines for roost sites	Unlikely to occur	Foraging only	Unlikely to occur
<i>Ozimops cobourgianus</i>	Northern Coastal Free-tailed Bat	P1					•	•	Associated with mangrove habitat, roost in hollows of those trees. Forage in eucalypt or melaleuca woodlands, and other coastal habitats.	May occur	Foraging only	May occur
Birds												
<i>Apus pacificus</i>	Pacific Swift	MI	MI	•	•		•	•	Entirely aerial when in Australia.	Likely to occur	✓	Likely to occur
<i>Pluvialis fulva</i>	Pacific Golden Plover	MI	MI	•	•	•	•	•	Muddy, rocky and sandy wetlands, saltmarshes, estuaries and lagoons.	Unlikely to occur	-	Unlikely to occur
<i>Pluvialis squatarola</i>	Grey Plover	MI	MI	•	•	•	•	•	Coastal and estuarine mudflats and sandflats, less commonly sandy beaches and rocky coasts. Also occur very occasionally around freshwater wetlands.	Unlikely to occur	-	Would not occur
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN	EN; MI	•	•		•	•	Coastal and estuarine areas. Can also be found in intertidal sandflats and mudflats, mangroves, brackish swamps or riverbeds.	Unlikely to occur	-	Would not occur
<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU	VU; MI	•	•	•	•	•	Coastal and estuarine areas. Mainly found on beaches with large intertidal mudflats or sandbanks, as well as estuarine lagoons, saltflakes or swamps.	Unlikely to occur	-	Would not occur
<i>Charadrius veredus</i>	Oriental Plover	MI	MI	•	•		•	•	Open, semi-arid or arid grasslands interspersed with hard, bare ground (inc. claypans, paddocks, lawns, recently burnt areas), lightly wooded grasslands, wetland margins. Uses beaches, mudflats and wetlands for roosting, and after arriving from migration	Likely to occur	✓	May occur

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<i>Rostratula australis</i>	Australian Painted-snipe	EN	EN	•		•			•	Shallow, terrestrial freshwater wetlands (temporary and permanent lakes, swamps, claypans), inundated grassland or saltmarsh and dams. Often includes tussocks of grass, sedges, rushes or reeds, or samphire. Breeding: shallow wetlands with areas of bare wet mud and both upper and canopy cover.	Unlikely to occur	-	Would not occur
<i>Numenius phaeopus</i>	Eurasian Whimbrel	MI	MI	•	•	•	•	•		Coastal and estuarine intertidal mudflats, rocky coasts, tidal creeks, mangroves.	Unlikely to occur	-	Would not occur
<i>Numenius minutus</i>	Little Curlew	MI	MI	•	•		•			Open, semi-arid or arid grasslands (inc. claypans, paddocks, lawns, recently burnt areas), lightly wooded grasslands, wetland margins. Uses beaches, mudflats and wetlands for roosting, and after arriving from migration	May occur	✓	May occur
<i>Numenius madagascariensis</i>	Far Eastern Curlew	CR	CR; MI	•	•		•	•		Coastal and estuarine intertidal mudflats, tidal creeks, mangrove fringes	Unlikely to occur	-	Would not occur
<i>Limosa lapponica</i>	Bar-tailed Godwit	CR/VU	MI	•	•	•	•	•		Coastal and estuarine mudflats and sandflats, less commonly sandy beaches and rocky coasts. Also occur very occasionally around freshwater wetlands.	Unlikely to occur	-	Would not occur
<i>Limosa limosa</i>	Black-tailed Godwit	MI	MI	•	•		•	•		Primarily coastal, found in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats. Also found in sparsely vegetated, shallow, near-coastal wetlands.	Unlikely to occur	-	Would not occur
<i>Arenaria interpres</i>	Ruddy Turnstone	MI	MI	•	•		•	•		Rocky coasts, sandy beaches (esp. with extensive tide wrack), intertidal mudflats, near-coastal salt lakes.	Unlikely to occur	-	Would not occur
<i>Calidris tenuirostris</i>	Great Knot	CR	CR; MI	•	•		•	•		Coastal and estuarine mudflats, less commonly sandy beaches and rocky coasts. Also occur very occasionally around freshwater wetlands.	Unlikely to occur	-	Would not occur
<i>Calidris canutus</i>	Red Knot	EN	EN; MI	•			•	•		Coastal and estuarine mudflats, less commonly sandy beaches and rocky coasts. Also occur very occasionally around freshwater wetlands.	Unlikely to occur	-	Would not occur
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MI	MI	•	•		•	•		Muddy edges or shallows of fresh or brackish wetlands, including swamps, lakes, dams, salt pans, hypersaline salt lakes, saltworks, sewage dams, and flooded paddocks, also intertidal mudflats.	Unlikely to occur	-	Would not occur
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR	CR; MI	•	•		•	•		Intertidal mudflats in sheltered coastal areas (estuaries, bays, inlets and lagoons), non-tidal swamps, lakes and lagoons near the coast, inland around ephemeral and permanent lakes, dams, waterholes and bore drains with bare edges of mud or sand.	Unlikely to occur	-	Unlikely to occur
<i>Calidris subminuta</i>	Long-toed Stint	MI	MI	•	•			•		Shallow, often vegetated, freshwater or brackish wetlands including lakes and swamps.	Unlikely to occur	-	Unlikely to occur

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<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI	•	•		•	•	Coastal and estuarine mudflats, sandy beaches, shallow margins of freshwater wetlands.	Unlikely to occur	-	Unlikely to occur
<i>Calidris alba</i>	Sanderling	MI	MI	•	•		•	•	Open sandy beaches, less commonly on intertidal mudflats and sandflats, and near coastal lakes	Unlikely to occur	-	Unlikely to occur
<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI	•	•		•	•	Muddy edges or shallows of fresh or brackish wetlands, including swamps, lakes, dams, salt pans, hypersaline salt lakes, salt works, sewage dams, and flooded paddocks	Unlikely to occur	-	Unlikely to occur
<i>Limnodromus semipalmatus</i>	Asian Dowitcher	MI	MI	•			•		Intertidal mudflats, salt works, less commonly near coastal freshwater wetlands	Unlikely to occur	-	Unlikely to occur
<i>Xenus cinereus</i>	Terek Sandpiper	MI	MI	•	•		•	•	Intertidal mudflats, sheltered estuaries, mudbanks and mangroves.	Unlikely to occur	-	Unlikely to occur
<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI	•	•		•	•	Wide range of coastal and inland wetlands mostly found around muddy margins (narrow, steep) or rocky shores (rarely mudflats). Often associated with mangroves.	Unlikely to occur	-	Unlikely to occur
<i>Tringa brevipes</i>	Grey-tailed Tattler	MI; P4	MI	•	•		•	•	Sheltered coasts with reefs or rock platforms, or intertidal mudflats.	Unlikely to occur	-	Unlikely to occur
<i>Tringa stagnatilis</i>	Marsh Sandpiper	MI	MI	•	•			•	Muddy edges or shallows of fresh or brackish wetlands, including swamps, lakes, dams, salt pans, hypersaline salt lakes, salt works, sewage dams, and flooded paddocks. Less commonly on intertidal mudflats	Unlikely to occur	-	Unlikely to occur
<i>Tringa glareola</i>	Wood Sandpiper	MI	MI	•	•		•	•	Well-vegetated, shallow, freshwater wetlands such as swamps, dominated by taller fringing vegetation, especially Melaleuca and Red River Gums. Inundated grasslands and wooded floodplains where floodwaters are temporary or receding, drying wetlands.	Unlikely to occur	-	Unlikely to occur
<i>Tringa nebularia</i>	Common Greenshank	MI	MI	•	•		•	•	Muddy edges or shallows of fresh or brackish wetlands, including swamps, lakes, dams, salt pans, hypersaline salt lakes, salt works, sewage dams, and flooded paddocks, also intertidal mudflats.	Unlikely to occur	-	Unlikely to occur
<i>Glareola maldivarum</i>	Oriental Pratincole	MI	MI	•	•		•	•	Forages primarily aerially over a range of more open, flat habitats, particularly open plains, shrublands, floodplains, short grassland. Often near terrestrial wetlands or along the coast.	May occur	✓	May occur
<i>Gelochelidon [nilotica]</i>	Gull-billed Tern spp.	MI	MI	•	•	•	•	•	Freshwater swamps, beaches and estuarine mudflats.	Likely to occur	Foraging only	Likely to occur
<i>Hydroprogne caspia</i>	Caspian Tern	MI	MI	•	•	•	•	•	Sheltered coasts, estuaries, offshore islands, and larger wetlands and drainage systems inland.	Unlikely to occur	-	Unlikely to occur
<i>Thalasseus bergii</i>	Greater Crested Tern	MI	MI	•	•		•	•	Coasts, estuaries, coastal waters and offshore islands.	Unlikely to occur	-	Unlikely to occur
<i>Sternula albifrons</i>	Little Tern	MI	MI	•	•		•	•	Sheltered coasts and estuaries.	Unlikely to occur	-	Unlikely to occur

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<i>Sternula nereis</i>	Fairy Tern	VU	VU	•	•		•	•	Sheltered sandy beaches, nesting above the high tide line. Also found in estuaries, wetlands and mainland coast lines.	Unlikely to occur	-	Unlikely to occur
<i>Sterna dougallii</i>	Roseate Tern	MI	MI	•	•	•	•	•	Rocky and sandy beaches, primarily on islands, and foraging offshore.	Would not occur	-	Would not occur
<i>Sterna hirundo</i>	Common Tern	MI	MI		•	•	•	•	Near-coastal waters including ocean beaches and estuarine shores. Occasionally recorded in coastal and near-coastal wetlands.	Unlikely to occur	-	Unlikely to occur
<i>Chlidonias leucopterus</i>	White-winged Tern	MI	MI	•	•	•	•	•	Coastal, subcoastal, or terrestrial wetlands, and flooded grassland plains	Likely to occur	-	Unlikely to occur
<i>Fregata ariel</i>	Lesser Frigatebird	MI	MI	•					Coastal waters and open oceans, breeding on offshore islands.	May occur	-	Would not occur
<i>Sula leucogaster</i>	Brown Booby	MI	MI			•	•		Open waters and islands, sometimes seen in inshore waters and coastlines.	Would not occur	-	Would not occur
<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI	•	•		•		Freshwater wetlands and flooded grasslands, occasionally found in coastal areas such as estuaries and saltmarshes.	Unlikely to occur	-	Unlikely to occur
<i>Pandion cristatus</i>	Eastern Osprey	MI	MI		•	•	•	•	Coastal and larger terrestrial wetlands, offshore islands, occasionally found inland along larger rivers.	Likely to occur	-	Likely to occur (overflying)
<i>Elanus scriptus</i>	Letter-winged Kite	P4		•		•	•		Open country and grasslands in arid and semi-arid areas. Found near tree-lined streams or water courses.	Unlikely to occur	✓	Unlikely to occur
<i>Falco hypoleucos</i>	Grey Falcon	VU	VU	•					Lightly wooded plains and along major watercourses	May occur	Foraging	May occur
<i>Falco peregrinus</i>	Peregrine Falcon	OS		•		•	•	•	Forest, woodlands, wetlands and open country	May occur	✓	May occur
<i>Pezoporus occidentalis</i>	Night Parrot	CR	EN	•			•		(Highly cryptic) Remote arid and semi-arid areas. Roosting and nesting in clumps of dense vegetation (primarily old and large spinifex clumps) that is naturally fragmented and therefore protected from fire. Foraging in high productivity grasslands, chenopod shrublands.	Unlikely to occur	-	Unlikely to occur
<i>Hirundo rustica</i>	Barn Swallow	MI	MI	•	•		•		Open country in coastal lowlands, often near water, towns and cities.	Likely to occur	✓	Likely to occur
<i>Motacilla tschutschensis</i>	Eastern Yellow Wagtail	MI	MI	•	•				Wet meadows, marshland, grassy and muddy lakeshores, fields, often near livestock, shrubland, grassland, and wetlands.	Unlikely to occur	-	Unlikely to occur
<i>Motacilla cinerea</i>	Grey Wagtail	MI	MI	•					Flowing water, rocky or surrogate rocky habitat, mountain streams, weirs, inland wetlands, grassland, forested areas, and lowland water courses.	Unlikely to occur	-	Unlikely to occur
Reptiles												
<i>Crocodylus porosus</i>	Saltwater Crocodile	MI	MI				•		Coastal and near-coastal rivers, mangrove creeks, beaches, swamps and wetlands, extending further inland along larger drainage systems.	Would not occur	-	Would not occur

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Species	Common Name	State	Federal	ALA	eBird	EPBC	DBCA	Past surveys (combined)				
<i>Ctenotus angusticeps</i>		P3					•		Coastal samphire on high mudflats, usually with crabholes and occurring in association with mangrove communities	May occur	-	Unlikely to occur
<i>Lerista planiventralis maryani</i>		P1					•		Consolidated coastal dunes and low shrubland on sandy substrates	May occur		May occur
<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	VU				•	•	Rocky areas within the Pilbara, showing a preference for rocky gorges containing water in streams and rock pools	Unlikely to occur	-	Unlikely to occur