CONFIDENTIAL

Fauna Survey for Onslow Project

Horizon Power

August 03, 2023

→ The Power of Commitment

CONFIDENTIAL

Project name	Biological survey for Onslow						
Document title	Biological survey for Onslow						
Project number	12614084						
File name	12614084 - Biological survey for Onslow.docx						
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S3	Rev A	J. Eastwood	R. Browne-Cooper	On file	J Collins	On file	14/07/2023
S4	Rev 0	J. Eastwood	J. Collins	On file	J Collins	On file	02/08/2023
[Status code]							
[Status code]							
[Status code]							

GHD Pty Ltd | ABN 39 008 488 373

999 Hay Street, level 10

Perth, Western Australia 6000, Australia

T +61 8 6222 8222 | **F** +61 8 6222 8555 | **E** permail@ghd.com | **ghd.com**

Executive Summary

Horizon Power is proposing expansion options for the existing solar site project near the town of Onslow, Western Australia (WA). The survey area is proposed to have gas and renewables to serve an increase in customer loads, as well as decarbonisation objectives.

GHD have been commissioned to undertake a basic and targeted fauna survey of the proposed site (the survey area). The location of the survey area is near the coastal town of Onslow, in the Pilbara bioregion. The survey area is situated on the south side of Onslow Road approximately 15 km from the town centre. The survey area is approximately 11.2 hectares.

The post-wet single season basic and targeted fauna survey was undertaken from 31st May – 2nd June 2023 by GHD zoologist Jack Eastwood.

Fauna

One broad fauna habitat type (not including cleared) was identified within the survey area based on the predominant landforms, soil, and vegetation structure in the survey area. In total, 18 fauna species were identified, which include 8 birds, 4 reptiles and 6 mammals. Three of the species are introduced (House mouse, Cat, and Rabbit).

No *Environment Protection and Biodiversity Conservation Act 1999* or *Biodiversity Conservation Act 2016* listed Threatened fauna or Priority listed fauna by the DBCA were recorded during the survey. Additionally, one Marine overfly listed species, Rainbow Bee-eater (*Merops ornatus*) under the *Environment Protection and Biodiversity Conservation Act 1999*, was recorded on site at the time of the survey.

No evidence of Northern Quoll (*Dasyurus hallucatus*) (Endangered) activity (footprints, foraging evidence, or scats) was recorded within the Onslow survey area.

The likelihood of occurrence of significant fauna species:

– Six fauna species are considered likely to occur due to potentially suitable foraging and/or breeding habitat in the survey area and close proximity of previous records. These include: Grey Falcon (*Falco hypoleucos*) (VU), Peregrine Falcon (*Falco peregrinus*) (OS), Oriental pratincole (*Glareola maldivarum*) (MI), Oriental plover (*Charadrius veredus*) (MI), Lakeland downs mouse (*Leggadina lakedownensis*) (P4) and Maryan's keeled slider (*Lerista planiventralis maryani*) (P1).
– 35 species are considered unlikely to occur and 8 species are considered highly unlikely to occur.

The survey area is part of a larger continuous area of coastal and sub coastal plains, consisting of grass savanna dominated by *Triodia pungens* hummock grass, and *Acacia translucens* forming the dwarf shrub steppe. This habitat type occurs throughout the surrounding area, and, due to limited natural barriers, displays a high degree of habitat connectivity with surrounding vegetation displaying similar or better condition vegetation.

The proposed development for expanding the existing solar site project is considered not to have a significant impact on the fauna values at a local and regional scale due to the high representation and continuation of vegetation in the region outside of the survey area.

Contents

Table index

Appendices

1. Introduction

Horizon Power is proposing expansion options for the existing solar site project near the town of Onslow, Western Australia (WA). The site is proposed to have gas and renewables to serve an increase in customer loads, as well as decarbonisation objectives. These areas need to be cleared of native vegetation to accommodate the expansion of the infrastructure footprint. The land is to be secured via Lease from the Crown after extensive negotiation with Traditional Owners and Community councils. The subject land cannot be developed without obtaining native vegetation clearing permits (NVCP) that will be supported by biological surveys and assessments. GHD have been commissioned to undertake a Basic and Targeted fauna survey of the proposed site (the survey area).

1.1 Purpose of this report

The purpose of the assessment is to define sensitive environmental values, in particular their spatial location and conservation significance, so the impacts of the proposed works can be managed to inform subsequent approvals and works to be undertaken. The outcomes of the assessment will be used to inform the project design and provide information to support a native vegetation clearing permit application under Part V of the *Environmental Protection Act 1986* (EP Act).

1.2 Location

1.2.1 Survey area

The study area is situated in the west Pilbara, a short distance from the coastal town of Onslow. The survey area is located on the south side of Onslow Road approximately 15 km from the town centre, covering approximately 11.2 ha. The location of the survey area is shown on Figure 1 (Appendix A).

1.2.2 Study area

A study area was defined for the desktop-based searches of the assessment and consists of a 20 km buffer of the survey area.

1.3 Scope of works

The scope of works included the following:

– A desktop assessment of relevant literature, databases and spatial datasets to determine the environmental values that may be present within or in close proximity to the survey area
– A Basic and Targeted fauna survey
– A concise technical report (this document) outlining the method and compiling the results of the assessment

1.4 Relevant legislation, conservation codes and background information

In Western Australia (WA) significant communities, and flora and fauna are protected under both Federal and State Government legislation, including the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), *Environmental Protection Act 1986* (EP Act), *Biodiversity Conservation Act 2016* (BC Act) and the *Biosecurity and Agriculture Management Act 2007* (BAM Act).

In addition, regulatory bodies also provide a range of guidance and information on expected standards and protocols for environmental surveys. An overview of key legislation and guidelines, conservation codes and background information relevant to this Project are provided in Appendix B.

1.5 Report limitations and assumptions

This report has been prepared by GHD for Horizon Power and may only be used and relied on by Horizon Power for the purpose agreed between GHD and Horizon Power as set out in section 1.4 of this report.

GHD otherwise disclaims responsibility to any person other than Horizon Power arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Horizon Power and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Site conditions may change after the date of this report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

This report has assessed the fauna values within the survey area, as shown in the Locality figures in Appendix A for each location. Should the survey area change or be refined, further assessment may be required.

2. Methodology

2.1 Desktop assessment

A desktop assessment of the survey area to identify environmental values and constraints was undertaken by viewing geographic information system (GIS) spatial files largely sourced from Government of Western Australia (GoWA) (2022a) and reviewing publicly available, government managed databases. The information sources utilised in this assessment are presented in Table 1.

Table 1 Desktop information sources

Aspect	Information source
Climate	Bureau of Meteorology (BoM) Climate Data Online (2023)
Geology, landforms and soil	1:500 000 State linear structures layer (DMIRS-015) Soil Landscape Mapping – Systems (DPIRD-064) (GoWA 2022a)
Environmentally Sensitive Areas (ESAs)	Clearing Regulations - Environmentally Sensitive Areas (DWER-046) (GoWA 2022a)
Conservation reserves and areas	Department of Biodiversity, Conservation and Attractions (DBCA) – Legislated Lands and Waters (DBCA-011) DBCA – Lands of Interest (DBCA-012) (GoWA 2022a)
Hydrology	Public Drinking Water Source Areas (DWER-033) RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037) RIWI Act, Groundwater Areas (DWER-034) RIWI Act, Rivers (DWER-036) Waterways Conservation Act Management Areas (DWER-072) Ramsar Sites (DBCA-010) Directory of Important Wetlands in Australia - Western Australia (DBCA-045) (GoWA 2022a)
Vegetation	Pre-European Vegetation (DPIRD-006) Native Vegetation Extent (DPIRD-005) (GoWA 2022b) Statewide Vegetation Statistics (GoWA 2022b)
Threatened and Priority Ecological Communities (TECs and PECs)	DBCA Threatened Ecological Community (TEC) and Priority Ecological Community (PEC) spatial dataset Priority Ecological Communities for Western Australia Version 28 (DBCA 2023a)
Conservation significant fauna	DBCA NatureMap database (DBCA 2007–) DBCA Threatened and Priority Fauna database
Matters of National Environmental Significance	EPBC Act Protected Matters Search Tool (PMST) (Department of Climate Change, Energy, Environment and Water (DCCEEW 2023)

2.1.1 Fauna

The fauna desktop assessment included a review of:

– DCCEEW PMST database to identify fauna species listed under the EPBC Act potentially occurring within the desktop study area (DCCEEW 2023) (Appendix C)
– The DBCA Threatened and Priority Fauna database for the study area (DBCA 2023b)
– The DBCA NatureMap (DBCA 2007–) database for fauna species previously recorded within the study area (Appendix C). This database comprises the following composite datasets:

- Atlas of Australian birds
- Bird data – Birdlife Australia
- Fauna Survey Returns Database
- WA Museum (WAM) databases (mammals, birds, reptiles)

– Aerial photography, geology/soils, land systems and hydrology information to provide background information on the variability of the environment and likely habitat types present
– A fauna likelihood of occurrence assessment. For the purpose of this study, exclusively marine animals (fish, whales, turtles etc.) were excluded from the likelihood of occurrence assessment as they are not expected to interact with the survey area (Appendix E).

2.2 Field survey

2.2.1 Survey timing and personnel

The post-wet single season basic and targeted fauna survey was undertaken from 31st May – 2nd June 2023 by GHD Zoologist Jack Eastwood.

2.2.2 Guiding documents

The survey methodology and data collection that GHD employed was consistent with:

– EPA Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment (EPA 2020)
– DAWE (2011a) Survey Guidelines for Australia's Threatened Mammals
– DAWE (2011b) Survey Guidelines for Australia's Threatened Reptiles
– EPBC (2016) Act referral guideline for the endangered Northern Quoll

2.2.3 Data collection and storage

Field data collection for the fauna survey was undertaken using GPS enabled Samsung tablets using electronic forms in Collector and tailored to IBSA spatial data requirements. Data was synced to the cloud at the conclusion of each field day. Field photographs were stored and where applicable have been provided as part of the Project deliverables.

2.2.4 Basic and targeted fauna survey

The Basic fauna and Targeted survey were conducted simultaneously. The survey area was traversed by foot to identify and describe dominant fauna habitat types present, and their condition, assess habitat for significant fauna, and undertake Targeted Northern Quoll assessment, and identify and record fauna occurring in the area.

Habitat assessment

A fauna habitat assessment was undertaken to document the type, value, and extent of habitats within the survey area. The following information was recorded:

– Habitat structure (e.g., vegetation type, presence/absence of structural layers such as ground cover and midstory)
– Presence/absence of refuge including density of ground covers, fallen timber (course woody debris), hollow-bearing trees and stags and rocks/boulder piles, and the type and extent of each refuge
– Presence/absence of waterways including type, extent and habitat quality within waterway
– Location of the habitat within the survey area in comparison to the habitat within the surrounding landscape
– Habitat connectivity and identification of wildlife corridors within and immediately adjacent to the survey area

- Current land use and disturbance history
- Evaluation of key habitat features and types identified during the desktop assessment relevant to significant fauna
- Evaluation of the likelihood of occurrence of significant fauna within the habitat (based on presence of suitable habitat)
- A presentative photograph of each habitat-type.

Opportunistic fauna searches

Opportunistic fauna searches were conducted across the survey area. This included:

- Searching the survey area for tracks, scats, bones, diggings and feeding areas for native and feral species
- Searching through microhabitats including examining termite mounds, tree hollows and hollow logs and turning over leaf litter
- Visual and aural surveys, which accounted for all the bird species recorded utilising the habitats of the survey area at that time
- Recording GPS locations of significant fauna species.

Targeted searches

Targeted intensive searches using diurnal indirect detection methodologies to provide evidence of species presence such as scats, diggings in the ground, nests, dreys, remains, tracks and burrows as outlined by DAWE (2011a & 2011b) were employed for this survey. Desktop searches using a 20km buffer of the survey area show the potential presence of four conservation significant species, including; Northern Quoll (*Dasyurus hallucatus*) EN, Lakeland Downs mouse (*Leggadina lakedownensis*) P4, Lined soil-crevice skink (*Notoscincus butleri*) P4 and Maryan's keeled slider (*Lerista planiventralis maryani*) P1.

Given the relatively small size of the survey area, the approach for the survey was to undertake a series of transects, which would cover most of the area to detect any evidence of conservation significant fauna. Species presence was assessed in line with basic and targeted assessments by utilising search transects giving systematic coverage to maximise detection of Northern Quoll evidence (scats, tracks, foraging signs, footprints). During Northern Quoll assessment, all evidence of non-target fauna (if present) activity is recorded. This is undertaken because Northern Quoll assessments are evidence based and by recording all species infers that if Northern Quoll are present their evidence should be observed, this aids in the potential of excluding false negatives. By recording all evidence observed when Northern Quoll are present addresses the potential of false positives. Evidence such as scats and prints in the Onslow region are positive records for the species.

Approximately linear transects were walked across the entirety of the site where vegetation density permitted entry. During these transects, habitat assessments were also undertaken, analysing the potential useability of habitat by significant fauna inside the survey area.

Fauna species identification

Identification of fauna species were made in the field using available field guides and electronic guides (e.g., Morcombe 2004). Nomenclature used in this report follows WAM as reported on NatureMap (DBCA 2021). This nomenclature is considered the most up to date species information for WA groups: reptiles, amphibians, invertebrates, and mammals (including bats). All bird nomenclature follows Christidis and Boles (2008). Other reference materials used are presented in Table 2.

Table 2 Fauna references

Fauna group	Field Guide
Mammals	Menkhorst and Knight (2010), Van Dyck and Strahan (2008), Churchill (2008)
Birds	Christidis and Boles (2008), Morcombe (2004), Pizzey and Knight (2012)
Reptiles	Wilson and Swan (2020)
Amphibians	Tyler and Doughty (2009)

2.3 Limitations

2.3.1 Desktop limitations

The EPBC Act PMST is based on bioclimatic modelling for the potential presence of species. As such, this does not represent actual records of the species within the survey area. The records from the DBCA searches of Threatened and Priority fauna provide more accurate information for the general area and local occurrence. However, some collections, sighting or trapping records cannot be dated and often misrepresent the current range of Threatened and Priority species.

2.3.2 Field survey limitations

The EPA (2020) Technical Guidance states that fauna survey reports for environmental impact assessment in WA should contain a section describing the limitations of the survey methods used. The limitations and constraints associated with this field survey are discussed in Table 3. Based on this assessment, the survey effort has not been subject to any constraints, which affect the thoroughness of the assessment or conclusions formed.

Table 3 Field survey limitations

Aspect	Constraint	Comment
Sources of information and availability of contextual information.	Nil	Adequate information is available across the survey areas which includes: – Broad scale (1:1,000,000) pre-European vegetation mapping of the area by Beard (1974; 1977) and digitised by Shepherd et al. (2002) – *NatureMap* (DBCA, 2007-).
Scope (what life forms were sampled etc.)	Nil	Terrestrial vertebrate fauna were sampled during the survey. Non-invertebrate and aquatic fauna were not surveyed.
Proportion of fauna collected and identified (based on sampling, timing and intensity)	Nil	The single season Basic/Targeted fauna surveys were undertaken on 31st May – 2nd June 2023. The basic fauna surveys were undertaken to identify habitat types and terrestrial vertebrate fauna utilising the survey area. The fauna assessment sampled those species that can be easily seen, heard or have distinctive signs, such as tracks, scats, diggings, etc. Many cryptic species would not have been identified during a basic survey and seasonal variation within species often requires targeted surveys at a particular time of the year. Of the fauna species recorded during the survey, all were identified to species level.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed	Nil	The entire survey area was traversed on foot and was adequately surveyed. Additional opportunistic sampling was undertaken through all the survey area to develop a fauna species inventory.
Mapping reliability	Nil	The fauna habitat types were mapped using high-resolution ESRI aerial imagery obtained from Landgate, topographical features, previous broad scale mapping (Beard 1977; 1974) and field data. Data was recorded in the field using hand-held GPS tools (e.g. Samsung tablet and Garmin GPS). Certain atmospheric factors and other sources of error can affect the accuracy of GPS receivers. The Garmin ® GPS units and Android ® tablets used for this survey are accurate to within ±5 m on average. Therefore, the data points consisting of coordinates recorded from the GPS may contain inaccuracies. However, the aerial imagery displayed on the interactive tablet surface allowed for greater accuracy as field staff

Aspect	Constraint	Comment
		could use key visual indicators (such as tree canopy's, cleared areas, fence line etc.) to more accurately locate points.
Timing/weather/ season/cycle	Nil	The field survey was undertaken in 31st May – 2nd June 2023 which is considered to be during the optimal season to undertake fauna surveys in the regions.
Disturbances (e.g. fire, flood, accidental human intervention)	Nil	No disturbance had an impact on the results of the survey.
Intensity (in retrospect, was the intensity adequate)	Nil	The terrestrial fauna sampled in accordance with EPA (2020). The survey area was sufficiently covered by the field zoologist during the survey.
Resources	Nil	Adequate resources were employed during the field survey. Three person-days were conducted at the survey area.
Access restrictions	Nil	The survey area was accessible by vehicle and traversed on foot.
Experience levels	Nil	All survey staff are suitably qualified and experienced. Jack Eastwood has a broad range of experience across Western Australia, having conducted many jobs throughout the Pilbara region. He has undertaken both detailed and targeted fauna assessments.

3. Desktop assessment

3.1 Location

The Onslow survey area is located on the south side of Onslow Road approximately 15 km from the town centre. The survey area is approximately 11.2 ha (Figure 1, Appendix A).

3.2 Physical environment

Ecological and land use constraints for the Onslow survey area are presented on Figure 2, Appendix A.

3.2.1 Climate

The south-west Pilbara is characterised by very hot summers, mild winters, and low and variable rainfall. Much of the rainfall occurs in the first half of the year, during the summer as a result of unpredictable tropical downpours and cyclonic low-pressure systems. The subregion of the area can be defined as coastal and sub coastal plains, with hot savanna grasslands. The closest BoM weather station with sufficient historical data is Onslow airport (3.9km from town site) (site number 005017).

Climate data from this station indicates the mean maximum temperature ranges from 36.5 °C in January to 25.6 °C in July. The mean minimum temperature ranges from 13.1 °C in July to 25.1 °C in February. The mean annual rainfall is 306.4 mm, with approximately 16.9 rain days a year (BoM 2023).

3.2.2 Land systems and soil

The Pilbara region has been surveyed by the Department of Agriculture and Food (DAFWA) and others for the purposes of land classification, mapping, and resource evaluation. One hundred and two land systems have been described for the region, which are distinguished on the basis of topography, geology, soils and vegetation (Vreeswyk *et al.* 1999). The survey area intersects two mapped land systems. Details of these land systems are presented below in Table 4.

Table 4 Land system within the survey area

Land system	Description	Geology	Geomorphology
Dune	Dune fields supporting soft spinifex and minor hard spinifex grasslands Sandy fields with spinifex grasslands	Quaternary aeolian sands	Sandplain and dune fields with little organised drainage; sandplain up to 16 km in extent, with shallow valleys, plains with thin sand cover, and scattered pans; limited surface drainage in zones of sheet-flow up to 3.2 km wide and extending up to 8 km downslope from adjacent uplands.
Onslow	Undulating sandplains, dunes and level clay plains supporting soft spinifex grasslands and minor tussock grasslands	Quaternary sand, silt and clay	Depositional surfaces - sandy plains; - gently undulating sand plain with intervening non-saline clay plains subject to sheet flow, narrow drainage zones receiving more concentrated flow, minor depressions subject to inundation; coastal fringes of low sand plain, interspersed with slightly lower saline samphire flats, also minor claypans, coastal dunes and beach; relief up to 20 m.

3.3 Land use

Approximately 4.5 hectares of the survey area is currently used as power supply infrastructure.

3.3.1 Conservation reserves and estates

No DBCA managed conservation areas occur within the survey area. The closest DBCA managed area is the Thevenard, located approximately 38 km northwest.

3.3.2 Environmentally sensitive areas

No ESAs occur within or in the immediate vicinity of the survey area. The closest ESA is located approximately 30 km southwest of the survey area, which is associated with the Exmouth Golf East area.

3.4 Hydrology

The GoWA (2022a) data layers identified the water resource aspects present in the survey area. These are detailed below in Table 5.

Table 5 Hydrology aspects within the study area

Aspect	Details	Results
Groundwater Areas	Groundwater areas proclaimed under the RIWI Act	Pilbara ground water area
Surface Water Areas	Surface water areas proclaimed under the RIWI Act	Ashburton River and Cane River
Irrigation District	Irrigation Districts proclaimed under the RIWI Act	None present
Rivers	Rivers proclaimed under the Rights in RIWI Act	Ashburton River and Beadon Creek
Public Drinking Water Source Areas (PDWSA)	PDWSA is a collective term used for the description of Water Reserves, Catchment Areas and Underground Pollution Control Areas declared (gazetted) under the provisions of the *Country Area Water Supply Act 1947*	None present
Waterways Management Areas	Areas proclaimed under *the Waterway Conservation Act 1976*	None present

3.4.1 Wetlands

There are no wetlands of significance located within or in close vicinity to the survey area. The closest significant wetlands are the Exmouth Gulf East, which are located approximately 30 km southwest of the survey area.

3.5 Vegetation

3.5.1 Regional biogeography

Bioregions are large, geographically distinct areas of land with common characteristics such as geology, landform patterns, climate, ecological features and plant and animal communities. The bioregions are described in the interim

Biogeographic Regionalisation for Australia (IBRA). The latest version of Interim Biogeographic Regionalisation of Australia (IBRA7) classifies Australia's landscapes into 89 large geographically distinct bioregions. The 89 bioregions are further refined to form 419 subregions which are more localised and homogenous geomorphological units in each bioregion (DAWE 2021).

This study is situated in the Carnarvon bioregion (CAR), and Cape Range (CAR01) sub-region as described by Interim Biogeographic Regionalisation of Australia (IBRA). The Pilbara bioregion is characterised by vast coastal plains and inland mountain ranges with cliffs and deep gorges. Vegetation is predominantly low mulga woodlands or snappy gum over hummock grasses.

The Cape Range (CAR01) subregion consists of Quaternary alluvial and older colluvial coastal and sub coastal plains, with a grass savanna dominated by *Triodia pungens* hummock grass, and *Acacia translucens* forming the dwarf shrub steppe. Resistant linear ranges of basalts occur across the coastal plains. These uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support Eucalyptus woodlands, Samphire, Sporobolus grasslands and mangal occur on the marine alluvial flats and river deltas. The islands are Quaternary sand accumulations, basalt and/or limestone.

3.5.2 Broad vegetation mapping and extent

Broad scale (1:1,000,000) pre-European vegetation mapping of the area was completed by Beard (1975) at an association level. The mapping indicates that one vegetation association is present within the survey area; Vegetation association 670.

The pre-European mapping has been adapted and digitised by Shepherd et al. (2002). The extent of vegetation associations have been determined by the state-wide vegetation remaining extent calculations maintained by DBCA (GoWA 2019). As shown in Table 6, the current extent remaining of vegetation association 670 is greater than 99% of their calculated pre-European extents at all scales (e.g. State, IBRA bioregion, IBRA subregion and Local Government Area (LGA)).

Table 6 Extent of pre-European vegetation association mapped within the survey area (DBCA 2019)

Vegetation association	Scale	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	%current extent in all DBCA managed land (proportion of current extent)
670	State: Western Australia	147,897.10	147,794.60	99.93	11.66
	IBRA bioregion: Carnarvon	147808.61	147792.05	99.98	11.66
	IBRA sub-region: Cape Range	147808.61	147792.05	99.99	11.66
	LGA: Shire of Ashburton	130,267.09	130,164.59	99.92	1.99

3.5.3 Significant ecological communities

The EPBC Act PMST did not identify any EPBC Act listed TECs within 20 km of the survey area. Similarly, the DBCA TEC and PEC database search did not identify conservation significant communities occurring within 20 km of the survey area.

3.6 Fauna

3.6.1 Fauna diversity

The *NatureMap* database identified 390 terrestrial vertebrate and avian marine/migratory fauna species previously recorded within 40 km of the survey area. This total comprised 253 birds, 93 reptiles, 37 mammals and 7 amphibians. Raw data produced by Naturemap contains numerous erroneous data entries, consisting of outdated taxonomy and dubious records. These discrepancies may lead to inaccuracies of summarised data. The *NatureMap* database search is provided in Appendix C.

3.6.2 Significant fauna

The EPBC Act PMST, *NatureMap* and DBCA Threatened Fauna databases identified the presence/potential presence of 49 conservation significance fauna within the study area. This total comprised 43 birds, 1 reptile and 5 mammals.

The locations of significant fauna registered on the DBCA databases are mapped in Figure 2, Appendix A. database searches identified the presence/potential presence of 49 conservation significance fauna within the study area (excluding aquatic marine and offshore island species).

4. Field survey results

4.1 Fauna

4.1.1 Fauna habitats

One broad fauna habitat type (not including cleared areas) was identified within the survey area based on the predominant landforms, soil, and vegetation structure in the area. Fauna habitat identified in the desktop assessment, closely aligns with the habitat assessment sampling points (OS01, OS02, OS03). The habitat type identified during the survey consisted of an undulating orange sand dune system, dominated by *Acacia* shrubs over *Triodia* hummock grass, sparsely occupied by the occasional *Eucalyptus camaldulensis* on lower elevations.

Sparse emergent *Eucalyptus camaldulensis* on the southern boundary of the survey area provide some limited resources for nesting and shelter, however, there are very few moderate to large fallen logs suitable as shelter due to the low tree density. Most refugia habitat is in the form of dense shrub foliage and localised ground leaf litter associated with these shrubs and trees. The structure of the dominant dune system of the survey area provides shelter and breeding sites for a broad range of taxa. The approximate 15-25 percent of bare ground over most of the survey area, typifies the open structure associated with the tussock grass sand plains which occur throughout the region. Sandy open ground and dunes provides habitat for a high diversity of arid adapted terrestrial fauna including a range of small vertebrates, especially fossorial reptiles, and burrowing mammals. The tall shrubs provide suitable foraging and nesting habitat for a range of shrubland birds particularly insectivorous and nectar-feeding birds, terrestrial reptiles, and mammals species.

The survey area is part of a larger continuous area of *Triodia* hummock grass sand plains with occasional drainage system habitats and salt marshes/lakes throughout the surrounding area. This provides a high degree of habitat connectivity with surrounding vegetation with variable condition of vegetation.

Table 7 Fauna habitat types within the survey area

Habitat Type	Habitat Description	Extent (ha) and proportion of survey area (%)	Sampling point ID	Representative photograph
Orange sand dune system	Orange dune system punctuated by mixed shrubs (mostly *Acacia* sp.) over spinifex grass (*Triodia* sp.). Margins of patches within the survey area are suffering from 'edge effect', supporting several weed species including Buffel Grass (*Cenchrus ciliaris*). This habitat is widespread in the region, and most represented in the survey area. Overall, habitat patches on the northern boundary of the survey area (OS01, OS02) are in good condition. In contrast, the adjacent habitat patch on the southern boundary of the survey area (OS03), is in notably poorer condition, being heavily impacted by *Cenchrus ciliaris.* The native grass understorey over sand dunes provides suitable foraging and nesting for various bird species such as doves, pigeons and quail, and insectivorous and granivore bird species. The habitat would be utilised by are range of native mammals and reptiles such as	9.3 ha (63%)	OS01, OS02, OS03	

Habitat Type	Habitat Description	Extent (ha) and proportion of survey area (%)	Sampling point ID	Representative photograph
	Spinifex hopping mice, several Dunnart species and a broad diversity of reptile species. Several birds of prey would utilise this habitat as it provides an open plain for foraging. As the Eucalypt trees are not tall it would not provide breeding habitat for birds of prey. **Conservation significant fauna** The Grey Falcon (*Falco hypoleucos*) (VU) has the potential to utilise this habitat as it contains suitable foraging opportunity. The survey area is within the known distribution of the Grey Falcon. The Peregrine Falcon (*Falco peregrinus*) (OS) is likely to utilise this habitat for foraging. This species is known to occur locally. **Habitat value** Moderate to high			
Cleared areas	Unmapped areas that include infrastructure footprint and tracks.	5.3 ha (36%)	-	Photo not available

4.1.2 Fauna diversity

A fauna species list has been compiled for the survey area and is presented in Appendix D. In total across the site 18 fauna species were identified, which included 8 birds, 4 reptiles and 6 mammals. Three of the species are introduced (House mouse, Cat, and Rabbit).

4.1.3 Significant fauna

No BC Act or EPBC Act listed Threatened fauna or Priority listed fauna by the DBCA were recorded during the survey. One Marine overfly listed species under the EPBC Act, the Rainbow Bee-eater (*Merops ornatus*), was recorded within the survey area. This species is widespread across Australia and WA and occupies a wide variety of habitats. It is likely this species is present across the survey area and throughout adjacent areas.

Targeted survey

No evidence of Northern Quoll (*Dasyurus hallucatus*) (EN) activity (footprints, foraging, or scats) was recorded within the Onslow survey area. In addition, approximately linear transects carried out on foot, yielded no evidence of other target significant species, such as Lakeland Downs mouse (*Leggadina lakedownensis*) P4 or Lined soil-crevice skink (*Notoscincus butleri*) P4.

Likelihood of occurrence

A likelihood of occurrence assessment was conducted for significant fauna species identified in the desktop assessment. This assessment was based on species biology, habitat requirements, the quality and availability of suitable habitat (based on vegetation types present within the survey area) and previous records of species in the study area. No assumptions were made on the transient potential of these species. The complete likelihood of assessment is provided in Appendix C.

The likelihood of occurrence of significant fauna species:

– Six fauna species are considered likely to occur due to potentially suitable foraging and/or breeding habitat in the survey area and close proximity of previous records. The Grey Falcon (*Falco hypoleucos*) (VU), Peregrine Falcon (*Falco peregrinus*) (OS), Oriental pratincole (*Glareola maldivarum*) (MI), Oriental plover (*Charadrius veredus*) (MI), Lakeland downs mouse (*Leggadina lakedownensis*) (P4) and Maryan's keeled slider (*Lerista planiventralis maryani*) (P1).
– 35 species are considered unlikely to occur and 8 species are considered highly unlikely to occur.

5. Conclusion

The proposed development for expanding the existing solar site project is considered not to have a significant impact on the fauna values at a local and regional scale due to the high representation and continuation of vegetation in the region outside of the survey area.

No EPBC Act or BC Act listed Threatened fauna or Priority listed fauna by the DBCA were recorded during the survey. One Marine overfly listed species under the EPBC Act, the Rainbow Bee-eater (*Merops ornatus*), was recorded. No evidence of Northern Quoll (*Dasyurus hallucatus*) (EN) activity (footprints, foraging, or scats) was recorded within the Onslow survey area.

The survey area is part of a larger continuous area of coastal and sub coastal plains, consisting of grass savanna dominated by *Triodia pungens* hummock grass, and *Acacia translucens* forming the dwarf shrub steppe. This habitat type occurs throughout the surrounding area, and, due to limited natural barriers, displays a high degree of habitat connectivity with surrounding vegetation displaying similar or better condition vegetation.

6. References

Beard, J. 1975. Vegetation Survey of Western Australia: Pilbara, map and explanatory memoir 1:1,000,000 series. University of Western Australia Press, Nedlands.

Birdlife Australia. 2019. Website https://birdlife.org.au/projects/bittern-project, assessed January 2023.

Bureau of Meteorology (BoM) 2023, Climate Data Online, retrieved June 2023, from http://www.bom.gov.au/climate/data/**.**

Christidis & Boles (2008). Systematics and Taxonomy of Australian Birds. CSIRO Publishing.

Churchill, S 2008, *Australian Bats*, second edition, Milton, Australia, Allen & Unwin

Commonwealth of Australia. (2016). *EPBC Act referral guideline for the endangered northern quoll*. Retrieved from https://www.dcceew.gov.au/sites/default/files/documents/referral-guideline-northern-quoll.pdf.

Commonwealth of Australia. 2012. Interim Biogeographic Regionalisation for Australia, Version 7.

Department of Biodiversity, Conservation and Attractions. (DBCA 2007-). NatureMap: Mapping Western Australia's Biodiversity. http://naturemap.dpaw.wa.gov.au/default.aspx/.

Department of Biodiversity, Conservation and Attractions (DBCA) 2017. Guidelines for surveys to detect the presence of bilbies, and assess the importance of habitat in Western Australia

Department of Biodiversity, Conservation and Attractions. 2017. Ramsar Sites (DBCA-010).

Department of Biodiversity, Conservation and Attractions. 2018b. Directory of Important Wetlands in Australia - Western Australia (DBCA-045).

Department of Biodiversity Conservation and Attractions. 2019. DBCA Statewide Vegetation Statistics.

Department of Biodiversity Conservation and Attractions. 2021. DBCA - Legislated Lands and Waters (DBCA-011).

Department of Biodiversity, Conservation and Attractions. 2021. Priority Ecological Communities for Western Australia Version 32. Species and Communities Program.

Department of Biodiversity, Conservation and Attractions. 2022. DBCA - Legislated Lands and Waters (DBCA-011).

Department of Biodiversity, Conservation and Attractions. 2023a. Threatened Ecological Community (TEC) and Priority Ecological Community (PEC) database search.

Department of Biodiversity, Conservation and Attractions. 2023b. Threatened and Priority Fauna (DBCA-037).

Department of Climate Change, Energy, the Environment and Water. 2023. Environmental Protection and Biodiversity Conservation Act 1999 Protected Matters Search Tool. http://www.environment.gov.au/epbc/pmst/index.html.

Department of Environment and Energy. 2022. Australian Faunal Directory.

DAWE 2011a. Survey Guidelines for Australia's threatened Mammals. Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999.

DAWE 2011b. Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act.

Department of Primary Industries and Regional Development. 2022. Soil Landscape Mapping - Systems (DPIRD-064).

Department of Water and Environmental Regulation. 2020. Clearing Regulations - Environmentally Sensitive Areas (DWER-046).

Department of Water and Environmental Regulation. 2023. Department of Water and Environmental Regulation - Datasets. https://catalogue.data.wa.gov.au/org/department-of-water-and-environmental-regulation.

Environmental Protection Authority. 2020. Technical guidance - terrestrial vertebrate fauna surveys for environmental impact assessment.

Government of Western Australia (GoWA) 2022a, data.wa.gov.au, accessed December 2022, from https://data.wa.gov.au/.

Government of Western Australia (GoWA) 2022b, 2019 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full report), Current as of March 2019, Perth, Australia, Department of Biodiversity, Conservation and Attractions, retrieved December 2022, from https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics.

Government of Western Australia 2019, *Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full report), Current as of March 2019, Perth*, Australia, Department of Biodiversity, Conservation and Attractions, retrieved May 2023, from https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics.

Menkhorst, P., and Knight, F. 2010. A field Guide to the Mammals or Australia. Oxford University Press.

Morcombe, M, 2004, Field Guide to Australian Birds. Steve Parish Publishing Archer Field Queensland Australia.

NVIS Technical Working Group. 2017. Australian Vegetation Attribute Manual: National Vegetation Information System, Version 7.0. Department of the Environment and Energy, Canberra.

Pizzey, G and Knight, F 2012, *The Field Guide to the Birds of Australia*, Sydney, Australia, Harper Collins Publishers.

Shepherd, D., G. Beeston, and A. Hopkins. 2002. Native Vegetation in Western Australia – Extent, Type and Status, Resource Management Technical Report 249. Department of Agriculture, Western Australia.

Tyler & Doughty. 2009. Field Guide to Frogs of Western Australia. WA Museum.

Van Dyck, S. and Strahan R, 2008, The mammals of Australia. New Holland Publishers. Sydney.

Western Australia Museum. 2021. Checklist of the Terrestrial Vertebrate Fauna of Western Australia.

Wilson, S., and Swan, J. 2017. A Complete Guide to the Reptiles of Australia. Hew Holland Publishers

Appendices

Appendix A

Figures

Paper Size ISO A3
at Scale: 1:100,000

0 0.5 1 1.5 2
Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

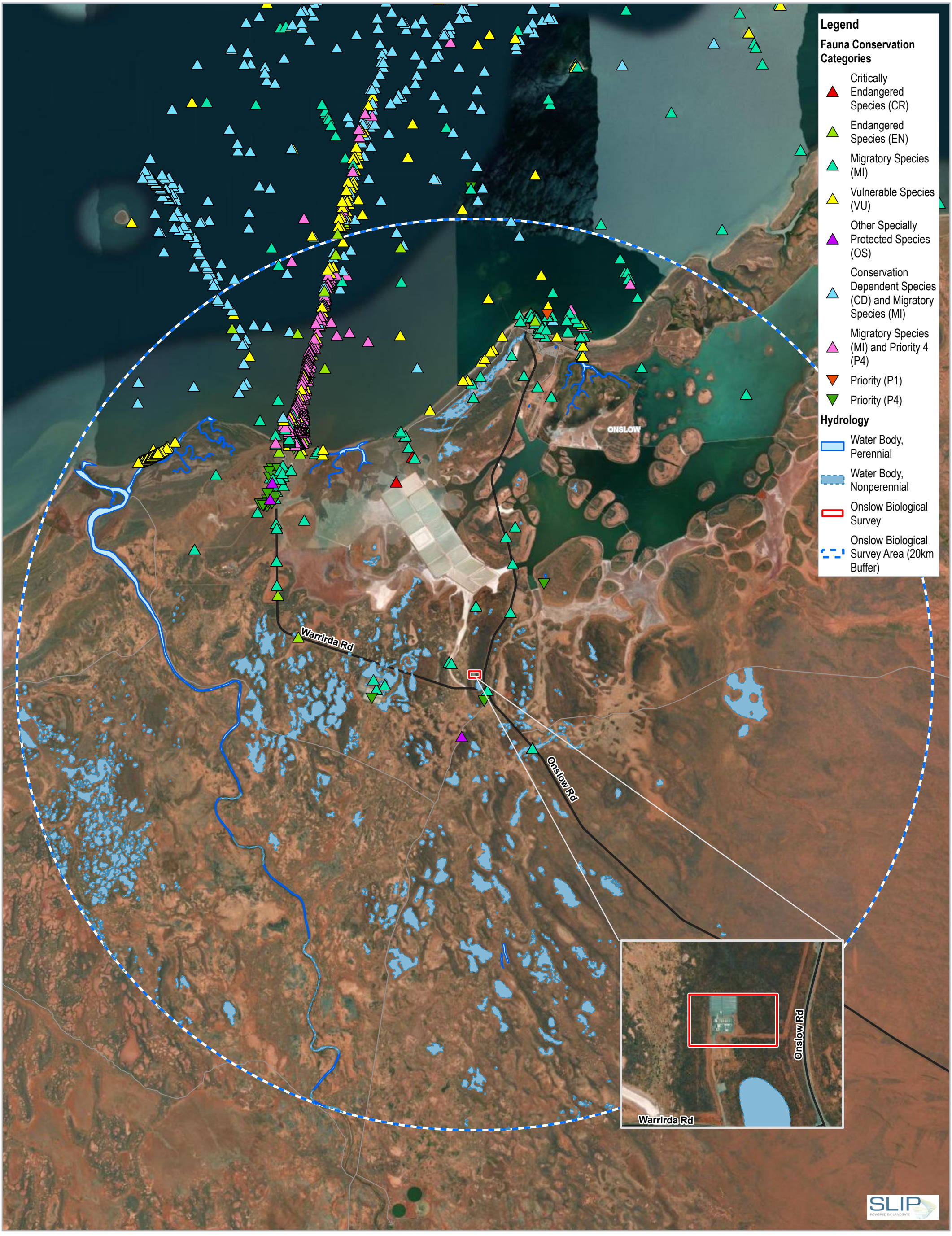
Horizon Power
Biological survey for Onslow

Locality

Project No. **12614084**
Revision No. **0**
Date **1/08/2023**

FIGURE 1

G:\61\12614084\GIS\Maps\Working\12614084_FieldMap\12614084_FieldMap.aprx\12614084_001_Locality_Rev0
Print date: 01 Aug 2023 - 13:16



Paper Size ISO A3
at Scale: 1:150,000

0 0.5 1 1.5 2
Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

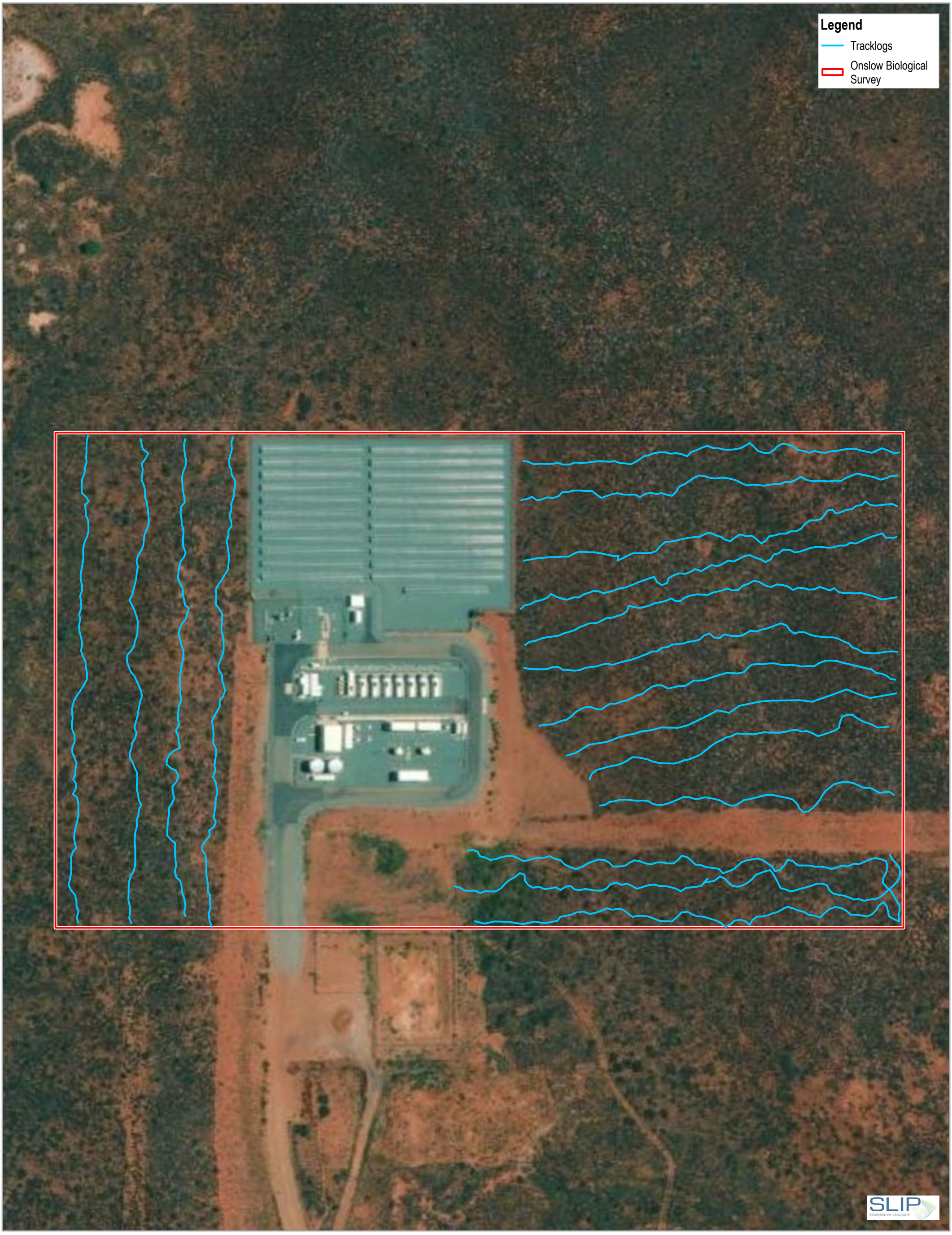
Horizon Power
Biological survey for Onslow

Environmental Constraints

Project No. **12614084**
Revision No. **0**
Date **1/08/2023**

FIGURE 2

G:\61\12614084\GIS\Maps\Working\12614084_FieldMap\12614084_FieldMap.aprx\12614084_002_EnvironmentalConstraints_Rev0
Print date: 01 Aug 2023 - 14:01



Paper Size ISO A3
at Scale: 1:2,000

0 25 50
Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Horizon Power
Biological survey for Onslow

Survey Effort

Project No. **12614084**
Revision No. **0**
Date **2/08/2023**

FIGURE 3

G:\61\12614084\GIS\Maps\Working\12614084_FieldMap\12614084_FieldMap.aprx\12614084_003_SurveyEffort_Rev0
Print date: 02 Aug 2023 - 09:03

Paper Size ISO A3
at Scale: 1:2,000

0 25 50
Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Horizon Power
Biological survey for Onslow

Fauna Habitat

Project No. **12614084**
Revision No. **0**
Date **1/08/2023**

FIGURE 4

G:\61\12614084\GIS\Maps\Working\12614084_FieldMap\12614084_FieldMap.aprx\12614084_004_FaunaHabitat_Rev0
Print date: 01 Aug 2023 - 14:00

Appendix B

Relevant legislation, conservation codes and background information

Relevant legislation

Federal *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Federal Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as Matters of National Environmental Significance (MNES).

The biological aspects listed as MNES include:

– Nationally threatened flora and fauna species and ecological communities
– Migratory species

A person must not undertake an action that has, will have, or is likely to have a significant impact (direct or indirect) on MNES, without approval from the Federal Minister for the Environment.

The EPBC Act is administered by the Department of the Environment and Energy (DEE).

State *Environment Protection Act 1986*

The *Environmental Protection Act 1986* (EP Act) is the primary legislative Act dealing with the protection of the environment in Western Australia. The Act allows the Environmental Protection Authority (EPA), to prevent, control and abate pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing. Part IV of the EP Act is administered by the EPA and makes provisions for the EPA to undertake environmental impact assessment of significant proposals, strategic proposals and land use planning schemes.

The Department of Water and Environment Regulation (DWER) is responsible for administering the clearing provisions of the EP Act (Part V). Clearing of native vegetation in Western Australia requires a permit from the DWER, unless exemptions apply. Applications for clearing permits are assessed by the Department and decisions are made to grant or refuse the application in accordance with the Act. When making a decision the assessment considers clearing against the ten clearing principles as specified in Schedule 5 of the EP Act:

1. Native vegetation should not be cleared if it comprises a high level of biodiversity.
2. Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a significance habitat for fauna indigenous to Western Australia.
3. Native vegetation should not be cleared if it includes, or is necessary, for the continued existence of rare flora.
4. Native vegetation should not be cleared if it comprises the whole or part of native vegetation in an area that has been extensively cleared.
5. Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.
6. Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
7. 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.
8. Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
9. 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.

10. Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

Exemptions for clearing include clearing that is a requirement of a written law or authorised under certain statutory processes (listed in Schedule 6 of the EP Act) and exemptions for prescribed low impact day-to-day activities (prescribed in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004); these exemptions do not apply in environmentally sensitive areas (ESAs).

State Biodiversity and Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) provides for the conservation and protection of biodiversity and biodiversity components, as well as the promotion of the ecologically sustainable use of biodiversity components in Western Australia. The BC Act replaces both the repealed *Wildlife Conservation Act 1950* (WC Act) and the *Sandalwood Act 1929* (Sandalwood Act), as well as their associated regulations. To attain the objectives of the BC Act, principles of ecological sustainable development have been established:

- Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
- If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations
- The conservation of biodiversity and ecological integrity should be a fundamental consideration indecision-making
- Improved valuation, pricing and incentive mechanisms should be promoted.

The BC Act is administered by the Department of Biodiversity Conservation and Attractions (DBCA).

State Biosecurity and Agriculture Management Act 2007

The *Biosecurity and Agriculture Management Act 2007* (BAM Act) and associated regulations are administered by the Department of Primary Industries and Regional Development (DPIRD) and replace the repealed *Agriculture and Related Resources Protection Act 1976.* The main purposes of the BAM Act and its regulations are to:

Prevent new animal and plant pests (vermin and weeds) and diseases from entering WA

Manage the impact and spread of those pests already present in the state

Safely manage the use of agricultural and veterinary chemicals

Increased control over the sale of agricultural products that contain violative chemical residues.

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act. A Declared Pest is a prohibited organism or an organism for which a declaration under Section 22(2) of the Act is in force. Declared Pests may be assigned a control category including: C1 (exclusion), C2 (eradication) and C3 (management). The category may apply to the whole of the State, LGAs, districts, individual properties or even paddocks, and all landholders are obliged to comply with the specific category of control. Categories of control are defined below.

DPIRD Categories for Declared Pests under the BAM Act

Control class code	Description
C1 (Exclusion)	Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.
C2 (Eradication)	Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.
C3 (Management)	Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which is currently is free of that pest.

Fauna Conservation codes

Conservation significant fauna

The Federal conservation level of fauna species and their significance status is assessed under the EPBC Act. The significance levels for fauna used in the EPBC Act align with the International Union for Conservation of Nature (IUCN) Red List criteria, which are internationally recognised as providing best practice for assigning the conservation status of species. The EPBC Act also protects land and migratory species that are listed under International Agreements. The list of migratory species established under section 209 of the EPBC Act comprises:

– Migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II)
– Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China–Australia Migratory Bird Agreement (CAMBA)
– Native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)

The State conservation level of fauna species and their significance status also follows the IUCN Red List criteria. Under the BC Act fauna can be listed as Threatened, Extinct and as Specially Protected species.

Threatened species are those are species which have been adequately searched for and are deemed to be, in the wild, either rare, under identifiable threat of extinction, or otherwise in need of special protection, and have been gazetted as such. The assessment of the conservation status of Threatened species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria. Specially protected species meet 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 or Extinct species under the BC Act cannot also be listed as Specially Protected species.

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna List 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 flora or fauna.

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.

For the purposes of this assessment, all species listed under the EPBC Act, BC Act and DBCA Priority species are considered conservation significant.

Conservation categories and definitions for EPBC Act and BC Act listed fauna species

Conservation category	Definition
Threatened species	
Critically Endangered (CR)	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 criteria set out in section 20 and the ministerial guidelines.
Endangered (EN)	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.
Vulnerable (VU)	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.
Extinct species	
Extinct (EX)	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).
Extinct in the Wild (EW)	Species that "is known only to survive in cultivation, in captivity or as a naturalized population well outside its past range, and it has not been recorded in its known habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its lifecycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).
Specially protected species	
Migratory (MI)	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.
Species of special conservation interest (conservation dependent fauna) (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Other specially protected fauna (OS)	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).

Conservation codes for DBCA listed Priority fauna

Priority category	Definition
Priority 1	Poorly-known taxa

Priority category	Definition
	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.
Priority 2	Poorly-known taxa 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.
Priority 3	Poorly-known taxa 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.
Priority 4	Rare, Near Threatened and other taxa in need of monitoring – Rare: Taxa 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 taxa are usually represented on conservation lands. – Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. – Taxa that have been removed from the list of threatened taxa during the past five years for reasons other than taxonomy.

Other significant fauna

Fauna species may be significant for a range of reasons other than those protected by international agreement or treaty, Specially Protected or Priority Fauna. Significant fauna may include short-range endemic species, species that have declining populations or declining distributions, species at the extremes of their range, or isolated outlying populations, or species which may be undescribed (EPA 2010).

References

ANZECC 2000, Core Environmental Indicators for Reporting on the State of Environment, ANZECC State of the Environment Reporting Task Force.

Commonwealth of Australia 2001, National Targets and Objectives for Biodiversity Conservation 2001–2005, Canberra, AGPS.

EPA 2010, Technical Guide – Terrestrial Fauna Surveys, EPA, Perth, WA

Appendix C

Desktop searches

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: 04-Jul-2023

Summary

CONFIDENTIAL

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:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	12
Listed Migratory Species:	15

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:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	19
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	5
Key Ecological Features (Marine):	None
Biologically Important Areas:	1
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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
BIRD		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
SHARK		
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Marine Species		
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		

Scientific Name	Threatened Category	Presence Text
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Construct and operate LNG & domestic gas plant including onshore and offshore facilities - Wheatston	2008/4469	Controlled Action	Post-Approval
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
Onslow Power Infrastructure Upgrade Project, Onslow, WA	2014/7314	Not Controlled Action	Completed
Onslow Rare Earths Plant	2021/9046	Not Controlled Action	Completed
Onslow Water Supply Infrastructure Upgrade Project, Onslow, WA	2014/7329	Not Controlled Action	Completed

Biologically Important Areas		
Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Breeding	Known to occur

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.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

Naturemap database fauna search within 40 km of the survey area

Taxon	Status
BIRDS	
Acanthagenys rufogularis	
Accipiter cirrocephalus	
Accipiter fasciatus	
Acridotheres tristis	
Actitis hypoleucos	MI
Aegotheles cristatus	
Anas gracilis	
Anas superciliosa	
Anhinga melanogaster subsp. novaehollandiae	
Anhinga novaehollandiae	
Anous stolidus	MI
Anthus australis	
Anthus novaeseelandiae	
Apus pacificus	MI
Aquila audax	
Aquila morphnoides	
Ardea alba	
Ardea garzetta subsp. nigripes	
Ardea ibis	
Ardea intermedia	
Ardea modesta	
Ardea novaehollandiae	
Ardea pacifica	MI
Ardea sacra	
Ardenna pacifica	
Ardeotis australis	
Arenaria interpres	MI
Artamus cinereus	
Artamus cyanopterus	
Artamus leucorynchus subsp. leucopygialis	
Artamus minor	
Artamus personatus	
Aythya australis	
Barnardius zonarius	
Burhinus grallarius	
Butorides striata	

Taxon	Status
Butorides striatus subsp. stagnatilis	
Cacatua roseicapilla	
Cacatua sanguinea	
Cacomantis pallidus	
Calamanthus campestris	
Calidris acuminata	MI
Calidris alba (Crocethia alba)	MI
Calidris canutus subsp. rogersi	EN
Calidris ferruginea	CR
Calidris melanotos	MI
Calidris ruficollis	MI
Calidris tenuirostris	CR
Centropus phasianinus	
Certhionyx niger	
Certhionyx variegatus	
Charadrius leschenaultii subsp. leschenaultii	VU
Charadrius melanops	
Charadrius mongolus subsp. mongolus	EN
Charadrius ruficapillus	
Charadrius veredus	MI
Chenonetta jubata	
Cheramoeca leucosterna	
Cheramoeca leucosternus	
Chlidonias leucopterus	MI
Chroicocephalus novaehollandiae	
Chrysococcyx basalis	
Chrysococcyx osculans	
Cincloramphus cruralis	
Cincloramphus mathewsi	
Circus approximans	
Circus assimilis	
Cladorhynchus leucocephalus	
Colluricincla harmonica	
Columba livia	
Coracina novaehollandiae	
Corvus bennetti	
Corvus orru	
Coturnix pectoralis	

Taxon	Status
Coturnix ypsilophora subsp. australis	
Coturnix ypsilophora subsp. cervina	
Cracticus nigrogularis	
Cracticus tibicen subsp. longirostris	
Cracticus torquatus	
Cuculus pallidus	
Cygnus atratus	
Dacelo leachii subsp. leachii	
Dendrocygna eytoni	
Dromaius novaehollandiae	
Egretta garzetta	
Egretta novaehollandiae	
Egretta sacra	
Elanus axillaris	
Elanus caeruleus subsp. axillaris	
Elseyornis melanops	
Emblema pictum	
Eolophus roseicapillus	
Eopsaltria pulverulenta	
Ephippiorhynchus asiaticus subsp. australis	
Epthianura aurifrons	
Epthianura tricolor	
Eremiornis carteri	
Erythrogonys cinctus	
Esacus magnirostris	
Esacus neglectus	
Eurostopodus argus	
Falco berigora	
Falco cenchroides subsp. cenchroides	
Falco longipennis	
Falco peregrinus	OS
Falco subniger	
Fulica atra	
Gallirallus philippensis subsp. mellori	
Gavicalis virescens	
Gelochelidon nilotica	MI
Geopelia cuneata	
Geopelia humeralis	

Taxon	Status
Geopelia placida	
Geopelia striata clelandi	
Geopelia striata subsp. placida	
Geophaps plumifera	
Gerygone levigaster	
Gerygone tenebrosa	
Glareola maldivarum	MI
Grallina cyanoleuca	
Grus rubicunda	
Haematopus fuliginosus subsp. ophthalmicus	
Haematopus longirostris	
Haliaeetus leucogaster	
Haliastur indus subsp. girrenera	
Haliastur sphenurus	
Hamirostra melanosternon	
Hieraaetus morphnoides	
Himantopus himantopus subsp. leucocephalus	
Hirundo ariel	
Hirundo neoxena	
Hirundo nigricans	
Hirundo rustica	MI
Hydroprogne caspia	MI
Lalage tricolor	
Larus novaehollandiae	
Lichenostomus keartlandi	
Lichenostomus penicillatus	
Lichenostomus virescens	
Lichmera indistincta subsp. indistincta	
Limosa lapponica subsp. menzbieri	CR
Lophoictinia isura	
Malacorhynchus membranaceus	
Malurus lamberti	
Malurus leucopterus	
Malurus splendens	
Manorina flavigula	
Megalurus mathewsi	
Melopsittacus undulatus	
Merops ornatus	Marine overfly

Taxon	Status
Microcarbo melanoleucos	
Milvus migrans	
Milvus migrans subsp. affinis	
Mirafra javanica subsp. horsfieldii	
Mirafra javanica subsp. woodwardi	
Neochmia ruficauda subsp. subclarescens	
Ninox boobook	
Ninox connivens	
Ninox novaeseelandiae	
Numenius madagascariensis	CR
Numenius minutus	MI
Numenius phaeopus	MI
Nycticorax caledonicus	
Nymphicus hollandicus	
Oceanites oceanicus	MI
Ocyphaps lophotes	
Onychoprion anaethetus	MI
Oreoica gutturalis	
Pachycephala lanioides	
Pachycephala melanura subsp. melanura	
Pachycephala rufiventris	
Pandion haliaetus subsp. cristatus	MI
Pardalotus rubricatus	
Passer montanus	
Pelecanus conspicillatus	
Petrochelidon ariel	
Petrochelidon nigricans	
Petroica goodenovii	
Pezoporus occidentalis	CR
Phalacrocorax carbo	
Phalacrocorax melanoleucos	
Phalacrocorax sulcirostris	
Phalacrocorax varius	
Phaps chalcoptera	
Phaps histrionica	
Platalea flavipes	
Platalea regia	
Platycercus zonarius	

Taxon	Status
Platycercus zonarius subsp. zonarius	
Plegadis falcinellus	MI
Pluvialis fulva	MI
Pluvialis squatarola	MI
Podargus strigoides	
Poliocephalus poliocephalus	
Pomatostomus temporalis subsp. rubeculus	
Porzana fluminea	
Porzana pusilla	
Psophodes occidentalis	
Ptilotula penicillatus	
Puffinus pacificus	
Pyrrholaemus brunneus	
Recurvirostra novaehollandiae	
Rhipidura (fuliginosa) albicauda	
Rhipidura albiscapa	
Rhipidura leucophrys	
Rhipidura phasiana	
Smicrornis brevirostris	
Sterna albifrons	MI
Sterna bengalensis	
Sterna bergii	
Sterna caspia	
Sterna dougallii subsp. gracilis	MI
Sterna hirundo	MI
Sterna hybrida	
Sterna leucoptera	
Sterna nereis subsp. nereis	
Sterna nilotica	
Sternula nereis subsp. nereis	VU
Stiltia isabella	
Sugomel niger	
Sula leucogaster	MI
Tachybaptus novaehollandiae	
Taeniopygia guttata	
Thalasseus bengalensis	
Thalasseus bergii	MI
Threskiornis molucca	

Taxon	Status
Threskiornis spinicollis	
Todiramphus chloris subsp. pilbara	
Todiramphus pyrrhopygia	
Todiramphus pyrrhopygius	
Todiramphus sanctus	
Tribonyx ventralis	
Tringa brevipes	MI & P4
Tringa glareola	MI
Tringa hypoleucos	
Tringa nebularia	MI
Turnix maculosa	
Turnix pyrrhothorax	
Turnix velox	
Tyto alba	
Tyto delicatula	
Vanellus miles	
Vanellus tricolor	
Xenus cinereus	MI
Zosterops lateralis	
Zosterops luteus subsp. balstoni	
MAMMALS	
Bos taurus	INTRODUCED
Canis lupus	
Canis lupus subsp. familiaris	INTRODUCED
Capra hircus	INTRODUCED
Chaerephon jobensis	
Chalinolobus gouldii	
Dasykaluta rosamondae	
Dasyurus hallucatus	EN
Equus caballus	INTRODUCED
Felis catus	INTRODUCED
Leggadina lakedownensis	P4
Macropus robustus	
Macropus rufus	
Mormopterus beccarii	
Mormopterus loriae	
Mus musculus	INTRODUCED
Ningaui timealeyi	

Taxon	Status
Notomys alexis	
Nyctophilus geoffroyi	
Oryctolagus cuniculus	
Perameles bougainville	
Planigale ingrami	
Pseudantechinus roryi	
Pseudomys chapmani	P4
Pseudomys desertor	
Pseudomys hermannsburgensis	
Pteropus alecto	
Pteropus scapulatus	
Rattus rattus	INTRODUCED
Rattus tunneyi	
Sminthopsis macroura	
Sminthopsis youngsoni	
Stennella longirostris subsp. longirostris	
Tachyglossus aculeatus	
Tadarida australis	
Vespadelus finlaysoni	
Vulpes vulpes	INTRODUCED
REPTILES	
Acanthophis pyrrhus	
Anilios ammodytes	
Anilios grypus	
Anilios hamatus	
Anilios pilbarensis	
Antaresia childreni	
Aspidites melanocephalus	
Caretta caretta	
Chelonia mydas	
Crocodylus porosus	
Cryptoblepharus sp.	
Ctenophorus caudicinctus	
Ctenophorus caudicinctus subsp. caudicinctus	
Ctenophorus femoralis	
Ctenophorus isolepis	
Ctenophorus isolepis subsp. gularis	
Ctenophorus isolepis subsp. isolepis	

Taxon	Status
Ctenophorus nuchalis	
Ctenophorus rubens	
Ctenophorus rufescens	
Ctenotus angusticeps	P3
Ctenotus calurus	
Ctenotus duricola	
Ctenotus grandis subsp. titan	
Ctenotus hanloni	
Ctenotus helenae	
Ctenotus iapetus	
Ctenotus maryani	
Ctenotus pantherinus	
Ctenotus quattuordecimlineatus	
Ctenotus rufescens	
Ctenotus saxatilis	
Ctenotus schomburgkii	
Delma haroldi	
Delma nasuta	
Delma tincta	
Demansia psammophis	
Dermochelys coriacea	
Diplodactylus bilybara	
Diplodactylus pulcher	
Diplodactylus stenodactylus	
Diporiphora adductus	
Diporiphora winneckei	
Eremiascincus fasciolatus	
Eremiascincus isolepis	
Eremiascincus pallidus	
Fordonia leucobalia	
Furina ornata	
Gehyra australis	
Gehyra pilbara	
Gehyra punctata	
Gehyra purpurascens	
Gehyra variegata	
Gowidon longirostris	
Hemidactylus frenatus	INTRODUCED

Taxon	Status
Heteronotia binoei	
Lerista baynesi	
Lerista bipes	
Lerista clara	
Lerista elegans	
Lerista muelleri	
Lerista onsloviana	
Lerista planiventralis subsp. maryani	P1
Lerista uniduo	
Lialis burtonis	
Liasis olivaceus subsp. barroni	VU
Lophognathus gilberti	
Lucasium squarrosum	
Lucasium woodwardi	
Menetia greyii	
Morethia ruficauda exquisita	
Nephrurus levis subsp. occidentalis	
Pogona minor subsp. minor	
Pseudechis australis	
Pseudonaja mengdeni	
Pseudonaja modesta	
Pseudonaja nuchalis	
Pygopus nigriceps	
Rhynchoedura ornata	
Simoselaps anomalus	
Strophurus jeanae	
Strophurus strophurus	
Suta fasciata	
Suta punctata	
Tiliqua multifasciata	
Varanus acanthurus	
Varanus brevicauda	
Varanus bushi	
Varanus caudolineatus	
Varanus eremius	
Varanus gouldii	
Varanus panoptes subsp. rubidus	
Varanus tristis	

Taxon	Status
AMPHIBIANS	
Cyclorana maini	
Cyclorana platycephala	
Litoria caerulea	INTRODUCED
Litoria rubella	
Neobatrachus aquilonius	
Neobatrachus fulvus	
Notaden nichollsi	

Appendix D

Fauna survey results

Fauna recorded during the survey

Family	Taxa	Common Name	Status
Birds			
Accipitridae	*Accipiter fasciatus*	Brown goshawk	
Accipitridae	*Haliastur sphenurus*	Whistling kite	
Columbidae	*Ocyphaps lophotes*	Crested pigeon	
Estrildidae	*Taeniopygia castanotis*	Zebra finch	
Meliphagidae	*Gavicalis virescens*	Singing honeyeater	
Meropidae	*Merops ornatus*	Rainbow bee-eater	
Monarchidae	*Grallina cyanoleuca*	Magpie-lark	
Rhipiduridae	*Rhipidura leucophrys*	Willy wagtail	
Reptiles			
Agamidae	*Ctenophorus rubens*	Rufus sand dragon	
Carphodactylidae	*Nephrurus levis occidentalis*	Western smooth knob-tailed gecko	
Scincidae	*Lerista bipes*	North-western sandslider	
Varanidae	*Varanus gouldii flavirufus*	Sand monitor	
Mammals			
Dasyuridae	*Sminthopsis* sp.	Dunnart	
Felidae	*Felis catus*	Cat	*Introduced
Leporidae	*Oryctolagus cuniculus*	European rabbit	*Introduced
Muridae	*Notomys alexis*	Spinifex hopping mouse	
Muridae	*Pseudomys* sp.	Native mouse	
Muridae	*Mus musculus*	House mouse	*Introduced

Fauna likelihood of occurrence assessment guidelines

Assessment outcome	Description
Present	Species recorded during the field survey or from recent, reliable records from within or close proximity to the survey area.
Likely	Species are likely to occur in the survey area where there is suitable habitat within the survey area and there are recent records of occurrence of the species in close proximity to the survey area. OR Species known distribution overlaps with the survey area and there is suitable habitat within the survey area.
Unlikely	Species assessed as unlikely include those species previously recorded within 10 km of the survey area however: There is limited (i.e. the type, quality and quantity of the habitat is generally poor or restricted) habitat in the survey area. The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area. OR Those species that have a known distribution overlapping with the survey area however:

Assessment outcome	Description
	There is limited habitat in the survey area (i.e. the type, quality and quantity of the habitat is generally poor or restricted). The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area.
Highly unlikely	Species that are considered highly unlikely to occur in the survey area include: Those species that have no suitable habitat within the survey area. Those species that have become locally extinct, or are not known to have ever been present in the region of the survey area.

Definitions

Term	Description
study area	a 40 km buffer around the survey area
survey area	the area subject to the current survey
locality	the area within an approximate 20 km radius of the survey area

Likelihood of occurrence assessment for significant fauna identified in the desktop assessment

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
Birds						
Calidris ferruginea	**Curlew Sandpiper**	CR	CR, MI	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, as well as around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms (Higgins & Davies 1996). They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters (Higgins & Davies 1996). Curlew Sandpipers forage on mudflats and nearby shallow water. In non-tidal wetlands, they usually wade, mostly in water 15–30 mm, but up to 60 mm, deep. At high tide, they forage among low sparse emergent vegetation, such as saltmarsh, and sometimes forage in flooded paddocks or inundated salt flats. Curlew Sandpipers generally roost on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands, occasionally roosting in dunes during very high tides and sometimes in saltmarsh (Higgins & Davies 1996).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	PMST, NM, DBCA
Pezoporus occidentalis	**Night Parrot**	CR	EN	The Night Parrot inhabits arid and semi-arid areas that are characterised by having dense, low vegetation. Based on accepted records, the habitat of the Night Parrot consists of *Triodia* grasslands in stony or sandy environments and	**Highly Unlikely** Large old-growth *Triodia* is absent from the survey area, and there are no known	PMST, NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				of samphire and chenopod shrublands, including genera such as Atriplex, Bassia and Maireana, on floodplains and claypans, and on the margins of salt lakes, creeks or other sources of water (Parker, 1980). It has also been observed to enter dense Muehlenbecki growth when flushed from a more typical habitat (Boles et al. 1994).	records from the Onslow region.	
Falco hypoleucos	**Grey Falcon**	VU	VU	The Grey Falcon inhabits lightly timbered country, especially stony plains and lightly timbered acacia scrub. This species is considered scarce to rare and is usually found singularly or sometimes in pairs (Morcombe, 2004).	**Likely** The species is likely to utilise habitat within the survey area on an infrequent or sporadic basis.	PMST
Falco peregrinus	**Peregrine Falcon**	OS		The Peregrine Falcon is seen occasionally anywhere in the south-west of Western Australia. It is found everywhere from woodlands to open grasslands and coastal cliffs - though less frequently in desert regions (Morcombe, 2004).	**Likely** The species is likely to utilise habitat within the survey area on an infrequent or sporadic basis.	NM, DBCA
Rostratula australis	**Australian Painted Snipe**	EN	EN	The Australian Painted Snipe is rarely seen as it is extremely secretive, keeping to dense vegetation of swamps, emerging only in subdued light of dawn and dusk. The preferred habitat of this species includes surrounds and shallows of wetlands that are well vegetated with dense low cover (Morcombe 2004).	**Highly Unlikely** There are records in the area and no suitable habitat is present within the survey area.	PMST
Sternula nereis nereis	**Fairy Tern**	VU	VU	The Fairy Tern is mostly found in the southern part of Australia including much of the southwest coastline. It nests on narrow sandy spits and islands such as Dirk Hartog Island, Peron Peninsula and Garden Island (Neville 2013).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	PMST, NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
Thalassarche carteri	**Indian Yellow-nosed Albatross**	VU, MI	VU, MI	The Indian Yellow-nosed Albatross is a marine bird located over subtropical and warmer subantarctic waters. The species forages predominantly in the southern Indian Ocean, particularly abundant off Western Australia (Marchant & Higgins 1990).	**Highly Unlikely** There are records in the area and no suitable habitat is present within the survey area.	PMST
Charadrius leschenaultii	**Greater Sand Plover**	VU	VU, MI	The Greater Sand Plover is found on inter-tidal mudflats and sandbanks of sheltered bays and estuaries, sandy cays of coral reefs and reef platforms. It less commonly occurs on salt marsh and rarely on freshwater wetlands (Neville 2013).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area	PMST, NM, DBCA
Macronectes giganteus	**Southern Giant Petrel**	MI	EN, MI	A marine species which occurs over open seas and inshore waters. Common around the South coast of Australia (Neville 2013).	**Unlikely** There are records in the area (nearest recent records in the Shark Bay area) and no suitable habitat is present within the survey area.	PMST
Erythrotriorchis radiatus	**Red Goshawk**	VU	EN	The Red Goshawk occurs in coastal and sub-coastal areas in wooded and forested lands of tropical and warm-temperate Australia (Marchant & Higgins 1993). Riverine forests are also used frequently (Debus 1991, 1993). Such habitats typically support high bird numbers and biodiversity, especially medium to large species which the goshawk requires for prey. The Red Goshawk nests in large trees, frequently the tallest and most massive in a tall stand, and nest trees are invariably within one km of permanent water (Aumann & Baker-Gabb 1991)	**Unlikely** There are records in the area and no suitable habitat is present within the survey area.	PMST
Calidris canutus	**Red Knot**	EN	EN, MI	The Red Knot migrates to Australian coastlines by August or September. They use sheltered coasts on mudflats and sandbars of estuaries, harbours and lagoons (Neville 2013).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	PMST
Hirundo rustica	**Barn swallow**	MI	MI	In Australia, the Barn Swallow is recorded in open country in coastal lowlands, often near	**Unlikely**	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				water, towns and cities. Birds are often sighted perched on overhead wires , and also in or over freshwater wetlands, paperbark Melaleuca woodland, mesophyll shrub thickets and tussock grassland.	The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	
Limosa lapponica	**Bar-tailed Godwit**	MI	MI	The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips, although it is commonly recorded in paddocks at some locations overseas (Marchant & Higgins 1993).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA
Sterna caspia	**Caspian tern**	MI	MI	The Caspian Tern is mostly found in sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred. They also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes (including ephemeral lakes), waterholes, reservoirs, rivers and creeks. They also use artificial wetlands, including reservoirs, sewage ponds and saltworks. In offshore areas the species prefers sheltered situations, particularly near islands, and is rarely seen beyond reefs (Higgins & Davis 1996). Large numbers may shelter along the coast, behind coastal sand-dunes or coastal lakes during rough weather, and have been recorded inland after storms (Higgins & Davies 1996).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				Foraging habitat: The Caspian Tern usually forages in open wetlands, including lakes and rivers. They often prefer sheltered shallow water near the margins, but can also be found in open coastal waters. In coastal inlets they may prefer to forage in tidal channels, or over submerged mudbanks (Higgins & Davis 1996).		
Tringa nebularia	**Common Greenshank**	MI	MI	The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees. It was once recorded with Black-winged Stilts (Himantopus himantopus) in pasture, but are generally not found in dry grassland (Higgins & Davies 1996).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA
Actitis hypoleucos	**Common Sandpiper**	MI	MI	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and	**Unlikely** The species is known to frequent the Onslow area;	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				rarely on mudflats. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The muddy margins utilised by the species are often narrow, and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags (Geering et al. 2007; Higgins & Davies 1996). Foraging environments: Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands (Higgins & Davies 1996). Roost sites: Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves. The species is known to perch on posts, jetties, moored boats and other artificial structures, and to sometimes rest on mud or 'loaf' on rocks (Higgins & Davies 1996).	however, no suitable habitat is present within the survey area.	
Numenius madagascariensis	**Eastern Curlew**	CR	CR, MI	The Eastern Curlew is a large non-breeding migratory shorebird, found commonly along the north coast of Western Australia, but rarely south of Shark Bay. The species is found along the coastline from Barrow Island and Dampier Archipelago, through the Kimberley in WA to the NT. It is found in estuaries, bays, harbours, inlets and coastal lagoons, saltworks and sewerage farms, areas (e.g. intertidal mudflats or sandflats fringed by mangroves) often with beds of seagrass and occasionally on ocean beaches, coral reefs, rock platforms and rocky	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				islets. The Eastern Curlew forages on soft, sheltered, intertidal sand- or mudflats, often near mangroves, on saltflats, saltmarshes, rockpools, coastal reefs and ocean beaches near the tideline. The species roosts in large flocks, separate from other waders on sandy spits and islets, dry beach sand near the high-water mark, among coastal vegetation (including low saltmarsh and mangroves) and occasionally on reef-flats, in the shallow water of lagoons, near-coastal wetlands, in trees and posts (Morcombe 2004).		
Pluvialis squatarola	**Grey Plover**	MI	MI	In non-breeding grounds in Australia, Grey Plovers occur almost entirely in coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons. They also occur around terrestrial wetlands such as near-coastal lakes and swamps, or salt-lakes. The species is also very occasionally recorded further inland, where they occur around wetlands or salt-lakes (Marchant & Higgins 1993).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA
Tringa brevipes	**Grey-tailed Tattler**	MI, P4	MI	The Grey-tailed Tattler is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayments, estuaries and coastal lagoons, especially fringed with mangroves. In Moreton Bay, Queensland, it is most abundant in areas with dense beds of seagrass. In	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				Tasmania it is also abundant in areas with seagrass beds. It is less often on open flat sandy beaches or sandbanks, especially around accumulated seaweed or isolated clumps of dead coral. It is occasionally found around near-coastal wetlands, such as lagoons and lakes and ponds in sewage farms and saltworks. Inland records for the species are rare with sightings on river banks and the edges of rock pools (Higgins & Davies 1996).		
Gelochelidon nilotica	**Gull-billed Tern**	MI	MI	Breeds in a variety of locations with bare or sparsely vegetated islands, banks, flats, or spits of dry mud and sand including barrier beaches (shoals), dunes, saltmarshes, saltpans, freshwater lagoons, estuaries, deltas, inland lakes, rivers, marshes and swamps (del Hoyo et al. 1996, Higgins and Davies 1996, Snow and Perrins 1998). During this season, it may also feed on emerging insects over lakes, agricultural fields, grasslands and even over semi-desert regions (del Hoyo et al. 1996). Non-breeding On passage the species typically forages over saltpans, coastal lagoons, mudflats, marshes and wet fields, overwintering on estuaries, saltpans, lagoons and saltmarshes, or in more inland sites such as large rivers, lakes, rice-fields, sewage ponds, reservoirs, saltpans and irrigation canals (del Hoyo et al. 1996, Higgins and Davies 1996, Snow and Perrins 1998).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA
Charadrius mongolus	**Lesser Sand Plover**	EN	MI	In non-breeding grounds in Australia, this species usually occurs in coastal littoral and estuarine environments. It inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				rock platforms and rocky outcrops. In north-western Australia, the species appears to use the Port Hedland saltworks in preference to nearby beaches. The species is seldom recorded away from the coast, at margins of lakes, soaks and swamps associated with artesian bores (Marchant & Higgins 1993).		
Numenius minutus	**Little Curlew**	MI	MI	When resting during the heat of day, the Little Curlew congregates around pools, river beds and water-filled tidal channels, and shallow water at edges of billabongs. The species prefers pools with bare dry mud (including mudbanks in shallow water) and they do not use pools if they are totally dry, flooded or heavily vegetated (Higgins & Davies 1996). Birds may also rest in grassy, open woodlands and on bare blacksoil plains, or on dry or recently burnt grasslands on floodplains, which may be without vegetation for hundreds of metres, and occasionally on mudflats when nearby grasslands are unburnt, or around swamps. Resting has also been recorded under partly submerged vegetation. After freshwater pools dry up, roosting may occur in the shallows of reservoirs and the sea (Higgins & Davies 1996).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA
Charadrius veredus	**Oriental Plover**	MI	MI	Immediately after arriving in non-breeding grounds in northern Australia, Oriental Plovers spend a few weeks in coastal habitats such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches or nearby reefs, or in near-coastal grasslands, before dispersing further inland. Thereafter they usually inhabit flat, open, semi-arid or arid grasslands, where the grass is short and sparse, and interspersed with hard, bare ground, such as claypans, dry	**Likely** The habitat within the survey area is likely to support this species at least on an intermittent basis.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				paddocks, playing fields, lawns and cattle camps or open areas that have been recently burnt (Storr, 1980).		
Glareola maldivarum	**Oriental Pratincole**	MI	MI	In non-breeding grounds in Australia, the Oriental Pratincole usually inhabits open plains, floodplains or short grassland (including farmland or airstrips), often with extensive bare areas. They often occur near terrestrial wetlands, such as billabongs, lakes or creeks, and artificial wetlands such as reservoirs, saltworks and sewage farms, especially around the margins. The species also occurs along the coast, inhabiting beaches, mudflats and islands, or around coastal lagoons (Lloyd and Lloyd, 1991).	**Likely** The habitat within the survey area is likely to support this species at least on an intermittent basis.	NM, DBCA
Calidris melanotos	**Pectoral Sandpiper**	MI	MI	In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The species has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands (Higgins & Davies 1996).	**Highly Unlikely** The species is rarely seen in the northwest and no suitable habitat is present within the survey area.	NM, DBCA
Calidris ruficollis	**Red-necked Stint**	MI	MI	In Australasia, the Red-necked Stint is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. They sometimes use flooded paddocks or damp grasslands. They have occasionally been recorded on dry gibber plains, with little or no perennial vegetation (Higgins & Davies 1996).		
Arenaria interpres	**Ruddy Turnstone**	IA	MI	In Australasia, the Ruddy Turnstone is mainly found on coastal regions with exposed rock coast lines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. It can, however, be found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral. It has occasionally been sighted in estuaries, harbours, bays and coastal lagoons, among low saltmarsh or on exposed beds of seagrass, around sewage ponds and on mudflats. In north Australia it is known to occur in a wide variety of habitats, and may prefer wide mudflats. In southern Australia the Ruddy Turnstone prefers rockier coastlines and is less numerous on large embayments with extensive mudflats. On Flinders Island, Tasmania, it has been sighted around rocky reefs during spring and summer, and moves to bays and estuaries for autumn and winter. In south-west Australia, it may occur on pebble-strewn shores of saltlakes near the coast. On Rottnest Island, the Ruddy Turnstone prefers shores with scattered fragments of limestone. In New Zealand it has occasionally been recorded in	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				paddocks or grassy areas. Surveys demonstrate that the Ruddy Turnstone can live away from coastal areas in habitats such river beds, and on inland lakes and adjacent farmland (Higgins & Davies 1996).		
Calidris alba	**Sanderling**	MI	MI	In Australia, the species is almost always found on the coast, mostly on open sandy beaches exposed to open sea-swell, and also on exposed sandbars and spits, and shingle banks, where they forage in the wave-wash zone and amongst rotting seaweed. Sanderlings also occur on beaches that may contain wave-washed rocky outcrops. Less often the species occurs on more sheltered sandy shorelines of estuaries, inlets and harbours. Rarely, they are recorded in near-coastal wetlands, such as lagoons, hypersaline lakes, saltponds and samphire flats. There are rare inland records from sandy shores of ephemeral brackish lakes and brackish river-pools (Higgins & Davies 1996). They roost on/behind: bare sand high on the beach, clumps of washed-up kelp, coastal dunes, rocky reefs and ledges (Higgins & Davies 1996). Breeding habitat is usually open ground, sometimes on raised hummocks or ridges, in the Arctic tundra of Greenland, Canada and Siberia (Cramp 1985; Pringle 1987).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA
Calidris acuminata	**Sharp-tailed Sandpiper**	MI	MI	In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beachcast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs (Higgins & Davies 1996).		
Apus pacificus	**Fork-tailed Swift**	MI	MI	In south-west WA there are sparsely scattered records along the south coast, ranging from the Eyre Bird Observatory and west to Denmark. They are widespread in coastal and sub-coastal areas between Augusta and Carnarvon, including some on nearshore and offshore islands. This species is almost exclusively aerial, flying less than 1 m to at least 300 m above ground. This species is considered rare in the south-west region (DSEWPaC 2013).	**Unlikely** The species is known to frequent areas following storm activity; however, no given the species aerial ecology, it is unlikely to occur within the survey area.	NM, DBCA
Plegadis falcinellus	**Glossy Ibis**	MI	MI	The Glossy Ibis' preferred habitat for foraging and breeding are fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons. Within Australia, the largest contiguous areas of prime	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				habitat is inland and northern floodplains (Marchant & Higgins 1990).		
Calidris tenuirostris	**Great Knot**	CR	MI	In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps (Higgins & Davies 1996). Typically, the Great Knot roosts in large groups in open areas, often at the waters edge or in shallow water close to feeding grounds (Higgins & Davies 1996; Rogers 2001). It is known that in hot conditions, waders prefer to roost where a damp substrate lowers the local temperature (Rogers 1999b). A group of approximately 8610 birds have been recorded roosting at an inland claypan near Roebuck Bay in north-west Western Australia (Collins et al. 2001).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA
Tringa glareola	**Wood Sandpiper**	MI	MI	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and River Red Gums Eucalyptus camaldulensis and often with fallen timber. They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. They are also found at some small wetlands only when they are drying. They	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				are rarely found using brackish wetlands, or dry stunted saltmarsh. Typically they do not use coastal flats, but are occasionally recorded in stony wetlands. This species uses artificial wetlands, including open sewage ponds, reservoirs, large farm dams, and bore drains (Higgins & Davies 1996). In Western Australia, within wetlands, birds often occur within a few metres of one another and are concentrated at a few sites in a wetland (Higgins & Davies 1996).		
Sterna hirundo	**Common Tern**	MI	MI	Common Terns are marine, pelagic and coastal. In Australia, they are recorded in all marine zones, but are commonly observed in near-coastal waters, both on ocean beaches, platforms and headlands and in sheltered waters, such as bays, harbours and estuaries with muddy, sandy or rocky shores. However, off Wollongong, NSW, Common Terns were recorded in all marine zones but generally recorded in offshore and pelagic waters, 11–55 km from shore. Occasionally they are recorded in coastal and near-coastal wetlands, either saline or freshwater, including lagoons, rivers, lakes, swamps and saltworks. Sometimes they occur in mangroves or saltmarsh and, in bad weather, in coastal sand-dunes or coastal embayments (Brandis et al. 1992; Chatto 2006; Higgins & Davies 1996; Hitchcock 1965; Morris 1989; Morris et al. 1981, 1990; Wood 1991). Common Terns forage in marine environments, often close to the shore, including sheltered embayments and in the surf-zone, but also well out to sea. They also forage in near-coastal terrestrial wetlands, including estuaries, rivers and swamps (Cramp 1985; Gochfeld & Burger 1996; Higgins & Davies 1996; Hitchcock 1965;	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				Milledge 1977; Nisbet 2002; Serventy et al. 1971). There has been one record of foraging behind a trawler in the Gulf of Carpentaria (Blaber & Milton 1994). Common Terns roost on unvegetated, intertidal sandy ocean beaches, sandy islands, shores of estuaries or lagoons, and sandbars, as well as on rocky shores, rock platforms or rocks protruding above the surface of the water. In poor weather, they have been recorded sheltering in coastal sand-dunes or coastal embayments. They are often recorded perched on wooden structures protruding from the water, including piers, wharves, groynes and posts and on moored boats. They often roost in large flocks, for example, up to 38 000 birds observed roosting on Noosa sandbanks (Chan & Dening 2007; Chan et al. 2008; Chatto 2006; Cramp 1985; Higgins & Davies 1996; Hitchcock 1965; Morris 1989; Morris et al. 1990). Common Terns nest on the ground in the open, usually on bare substrates, occasionally near vegetation or in it, or on a floating mat of vegetation. They usually nest on islands, either marine or in lakes, only sometimes on mainland beaches or promontories or salt or freshwater marshes. Common Terns often nest in sites washed over by winter storms or floods.		
Elanus scriptus	**Letter-Winged Kite**	P4		The Letter-Winged Kite inhabits open or sparsely wooded country and rests in Eucalyptus coolabah during the day. They nest in the cooler months when the rats often reach their peak, with nesting peaking in July. The nest is an open platform of sticks from herbage and shrubs. The Letter-Winged Kite occurs in the eastern arid zone of Australia but occasionally irrupts to all parts of the continent.	**Unlikely** The species is known in the Onslow area, and likely to occur at least on an intermittent basis.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				Population cycles appear to be linked to those of the principal prey, the plague rat Rattus villossimus, which has population explosions following high rainfall (IUCN Redlist 2016).		
Sterna albifrons	**Little Tern**	MI	MI	In Australia, Little Terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-spits, and also on exposed ocean beaches. One of its breeding populations is found across northern Australia, from about Broome to the Gulf of Carpentaria and eastern Cape York Peninsula. Non-breeding birds extend farther around the Australian coast than known breeding colonies. In WA the species regularly occurs south to approximately 20° S, with occasional records south of there (e.g. Shark Bay) (DotE 2016).	**Unlikely** Although the species is occasionally recorded coastally in the Onslow area, no suitable habitat is present.	NM, DBCA
Pandion haliaetus	**Osprey**	MI	MI	Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging. They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. They exhibit a preference for coastal cliffs and elevated islands in some parts of their range but may also occur on low sandy, muddy or rocky shores and over coral cays. The distribution of the species around the northern coast (south-western WA to south-eastern	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				NSW) appears continuous except for a possible gap at Eighty Mile Beach (DotE 2016).		
Sterna dougallii gracilis	**Roseate Tern**	MI	MI	The Roseate Tern occurs in coastal and marine areas in subtropical and tropical seas. The species inhabits rocky and sandy beaches, coral reefs, sand cays and offshore islands. Birds rarely occur in inshore waters or near the mainland, usually venturing into these areas only accidentally, when nesting islands are nearby. In WA, the subspecies is regularly recorded north from Mandurah to around Eighty Mile Beach. Around the Kimberley coastline, the subspecies occurs at scattered sites, north to the Bonaparte Archipelago and possibly further. The subspecies used to be a sporadic visitor to the southwest, but occurs regularly at present. In addition, breeding colonies have been established on Lancelin Island and Second Rock (DotE 2016).	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA
Numenius phaeopus	**Whimbrel**	MI	MI	The Whimbrel is often found on the intertidal mudflats of sheltered coasts. It is also found in harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, unvegetated mudflats. It is occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms. It has been infrequently recorded using saline or brackish lakes near coastal areas. It also used saltflats with saltmarsh, or saline grasslands with standing water left after high spring-tides, and in similar habitats in sewage farms and saltfields. There are a small number of inland records from saline lakes and canegrass swamps. The Whimbrel is common and widespread from Carnarvon to the north-east Kimberley Division. It is occasionally seen on	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present within the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				the south coast of WA and has occasionally been recorded in the south-west and further north to Shark Bay (DEE 2017).		
Ardenna pacifica	**Wedge-Tailed Shearwater**	MI	MI	In WA, the Wedge-tailed Shearwater breeds mainly on vegetated islands, atolls and cays on the west coast and off-shore islands. The species usually excavates burrows on flat or flattish areas with dense grassy and tussocky vegetation but much depends on the nature of soil and terrain, as at some sites burrows are below the cover of trees and shrubs. In deep soft soil, burrows can be > 2 m long. At sites with sandy vegetated screes or stable dunes or on flats of shell grit, burrows are approximately to 1.5 m long, parallel with the surface or steeply dipping (DotE 2016).	**Highly Unlikely** The survey area is situated too far from the coast and no suitable habitat is present.	NM, DBCA
Chlidonias leucopterus	**White-Winged Black Tern**	MI	MI	In Australia, the White-Winged Tern mostly inhabits fresh, brackish or saline, and coastal or subcoastal wetlands. They frequent tidal wetlands, such as harbours, bays, estuaries and lagoons, and their associated tidal sandflats and mudflats. Terrestrial wetlands, including swamps, lakes, billabongs, rivers, floodplains, reservoirs, saltworks, sewage ponds and outfalls are also inhabited. Wetlands may be open, or with floating emergent or marginal vegetation. They rarely occur on inland wetlands. Most breeding is on vegetated, freshwater inland wetlands. The species is widespread on the southern west coast, north to Mongers Lake, and also on coasts of the Pilbara region and Kimberley Division, with occasional records farther inland, mainly along major river systems, such as the Ord. The species only rarely occurs in the Gascoyne Region of the central-western coast, and is	**Unlikely** The species is known to frequent the Onslow area; however, no suitable habitat is present in the survey area.	NM, DBCA

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				occasionally recorded along the southern coast (DotE 2016).		
Oceanites oceanicus	**Wilson's Storm-Petrel**	MI	MI	In Australia, most reports of the Wilson's Storm-Petrel are from the edge of the continental shelf and during autumn. The species is known to breed on Heard Island, where it is described as abundant (Woehler & Johnstone 1991). The species is common off the coast of Queensland during May to September, but are scarce off south-east Queensland during the north and southwards migrations (Storr 1984b). During this time, the species is recorded more regularly off New South Wales (NSW), Victoria, Tasmania and South Australia; with maximum abundances in March to June and October to November (Reid et al. 2002). Off Western Australia and the Northern Territory, Wilson's Storm-Petrels are mainly observed along the coast during migration (Marchant & Higgins 1990).	**Highly Unlikely** The survey area is situated too far from the coast and no suitable habitat is present.	NM, DBCA
Thalasseus bergii	**Greater Crested Tern**	MI	MI	Greater Crested Terns form small to large flocks, often with other species, along coastal areas throughout Australia and Tasmania. They are seldom seen on inland waterways, preferring islands, beaches, lakes and inlets. They are widespread from the south coast of Africa north to Asia and east to Polynesia (Pringle, 1987).	**Highly Unlikely** The survey area is situated too far from the coast and no suitable habitat is present.	NM, DBCA
Mammals						
Dasyurus hallucatus	**Northern Quoll**	EN	EN	The Northern Quoll once occurred across the majority of northern Australia, but its range has significantly contracted. It occurs in the Pilbara region but in disjunct populations. The Northern Quoll inhabits a range of vegetation associations but is especially abundant on dissected rocky escarpment and eucalypt woodland within 200 km of the coast. It is known to den in rock crevices and rock piles and favours rocky areas. They are	**Unlikely** Although there are records in the general Onslow region, there is no suitable habitat within the survey area.	PMST

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				predominantly nocturnal but are occasionally active during the day, particularly during the mating season and are known to have a large home range (Van Dyck and Strahan 2008).		
Rhinonicteris aurantia (Pilbara form)	**Pilbara Leaf-nosed Bat**	VU	VU	The Pilbara Leaf-nosed Bat roosts in deep caves or mines in the wet season and forages nearby. This species occurs in the Pilbara region where its populations are scattered and localised. There are a few known populations of this species in the western Pilbara, roosting in caves formed in gorges that dissect massive siliceous sedimentary geology. It is most often observed in flight over waterholes in gorges (Van Dyck and Strahan 2008). Optimal roosts are thought to occur in caves that form between ascending rock layers, where humidity is maintained from seeping groundwater (Van Dyck and Strahan 2008). Roosts are commonly located over pools of water, or areas deep within the mine or cave structure which provides elevated temperature and humidity. Foraging habitat includes: *Triodia* hummock grasslands covering low rolling hills and shallow gullies, with *Eucalyptus camaldulensis* along the creeks; over small watercourses throughout granite boulder terrain; over pools and low shrubs in ironstone gorges; and in and around gravelly watercourses with *Melaleuca leucodendron*.	**Unlikely** The habitat within the survey area is not suitable for this species.	PMST
Macroderma gigas	**Ghost Bat**	VU	VU	The Ghost Bat occurs in a wide range of habitats, and requires an undisturbed cave, deep fissure, or disused mine shaft in which to roost. It is patchily distributed across Australia and is sensitive to disturbance. The species has a wide-ranging distribution for foraging and utilises sensitive hearing and visuals to locate prey. Prey ranges from small birds (doves,	**Unlikely** Although foraging may occur in the general Onslow region, there is no suitable habitat within the survey area for roosting etc.	PMST

Species Name	Common name	Status		Description and habitat requirements	Likelihood	Source
		BC Act	EPBC Act			
				budgies, willie wagtails) to insects (large moths) reptiles (geckos) and small mammals (mice and dasyurids). Prey items are normally sourced and then consumed in a protected location in a tree, overhang, or cave (Van Dyck and Strahan 2008).		
Pseudomys chapmani	**Western pebble-mound mouse**	P4		The Western Pebble-mound Mouse is restricted to the Pilbara region where it is recognised as an endemic species. Habitat for the Western Pebble-mound Mouse can be found on stony hillsides with hummocky grasslands and little or no soil. It constructs large mounds of pebbles on stony slopes which cover an area of 0.5-9.0 square metres. 'Active' mounds are characterized by volcano-like cones capped by 'craters' that mark occluded entrances to subterranean burrow systems in which the mice live, often gregariously (Van Dyck and Strahan 2008).	**Highly Unlikely** The stony habitat associated with this species is completely absent from the survey area and immediate adjacent areas.	NM, DBCA
Leggadina lakedownensis	**Lakeland Downs mouse**	P4		The Lakeland Downs Mouse occupies a diverse range of habitats from the monsoon tropical coast to semiarid climates, including spinifex and tussock grasslands, samphire and sedgelands, Acacia shrublands, tropical Eucalyptus and Melaleuca woodlands and stony ranges. Most habitats, however, are seasonally inundated on red or white sandy-clay soils. They are nocturnal, largely solitary, and individuals spend the day in simple, single-chambered burrows (Van Dyck and Strahan 2008).	**Likely** The habitat within the survey area is suitable for this species.	NM, DBCA
Reptiles						
Lerista planiventralis maryani	**Maryan's keeled slider**	P1		Maryan's keeled slider occupies orange dune systems and sandplains around the Onslow area, south to Barradale. The legitimacy of the subspecies has long been considered dubious, with a pending taxonomic revision likely to see this population absorbed into the adjacent population on the mid-west coast (Wilson & Swan, 2013).	**Likely** The habitat within the survey area is highly suitable for this species.	NM, DBCA