



Woodside Energy Ltd
Geotechnical Investigation
Fauna Survey

December 2019

Executive summary

Introduction

Woodside Energy Ltd (Woodside) engaged GHD to undertake a Level 1 single season vertebrate fauna survey of the Maitland Strategic Industrial Area (MSIA), adjacent Industrial Buffer Area (Buffer Area) and along a land corridor leading to the Burrup Peninsula. The survey area is located approximately 15 km south-west of Karratha, Western Australia (WA).

Survey effort

Field survey consisted of seven days over two periods the 10th to 13th of June and 22nd to 24th July 2019. The survey aimed to verify the findings of a desktop assessment and preliminary likelihood of occurrence assessment. The survey area was ground truthed with remote cameras and bat detectors installed to assist in species inventory within the survey area. In total 30 camera nights over nine locations and three bat detector nights over three locations were undertaken.

Key results

- Nine broad fauna habitat types (excluding disturbed areas) were recorded during the field survey. These habitat types closely align with the different vegetation types and landforms within the survey area. The fauna habitat present include Mudflat with tidal inundation, Mangroves and supportive scattered Samphire, Rocky Hills with exposed boulder piles, Minor Drainage lines, Hummock Grassland on Rocky Plain, Hummock Grassland on Sandy Plain, Hummock Grassland on Low Rocky Hills, Tussock Grasslands on Cracking Clays, Low Chenopod Shrublands and Waterbodies. Some disturbed areas are also present
- The survey area is largely intact, contiguous with disturbed areas consisting of linear infrastructure, industry, land modifications, cattle grazing and mineral resource extraction the main disturbances observed
- The Level 1 survey identified 101 species from within the survey area, consisting of 68 birds, 17 reptiles and 16 mammals. Of these species, four were introduced and comprise Dog, Cat, Cattle and Black Rat.
- Six species of Conservation significance were recorded;
 - North-western Free-tail Bat (*Mormopterus (Ozimops) cobourgianus*), listed a Priority 1 under DBCA.
 - Western Pebble-mound Mouse (*Pseudomys chapmani*), listed a Priority 4 under DBCA.
 - Whimbrel (*Numenius phaeopus*), Migratory under the EPBC Act and International Agreement under the BC Act.
 - Gull-billed Tern (*Gelochelidon nilotica*), Migratory under the EPBC Act and International Agreement under the BC Act.
 - Caspian Tern (*Hydroprogne caspia*), Migratory under the EPBC Act and International Agreement under the BC Act.
 - Crested Tern (*Thalasseus bergii*), Migratory under the EPBC Act and International Agreement under the BC Act.

These species were recorded in and around the habitat; Mudflats with tidal inundation, mangroves and supportive scattered Chenopods habitats. However the Western Pebble-mound mouse was recorded via an old mound observed.

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- Appendix B - (Species Recorded)
- Appendix C - (Likelihood of Occurrence)
- Appendix D - (Database Searches)

1. Introduction

1.1 Background

Woodside Energy Ltd (Woodside) engaged GHD to undertake a Level 1 single season vertebrate fauna survey for the development envelope relating to a proposed Hybrid Renewable Power Plant concept Woodside is currently examining. The survey will be used to support impact assessments as part of an environmental referral for this project or ancillary activities.

1.2 Purpose of this report

GHD Pty Ltd (GHD) was commissioned by Woodside to undertake a Level 1 fauna assessment of the Investigation Area, defined in this document as the “survey area” (Refer to attached Fauna Survey Area shapefile). The purpose of the assessment is to delineate key fauna values within the survey area and the potential impact to areas of sensitivity. The fauna assessment will support the NVCP application for the Investigation.

1.3 Scope of Works

For the purposes of undertaking this desktop assessment, the survey area refers to the geotechnical investigation area. Where a 20 km buffer has been applied for database searches, the search area is known as the study area.

The scope of works for this project is to complete a:

- Desktop assessment of the study area was completed prior to the field survey work to identify significant fauna values which may be in, or nearby the survey area. This included a likelihood of occurrence assessment
- Review of existing and relevant environmental reports
- Field survey to verify / ground truth the desktop assessment findings
- Fauna habitat assessment across the investigation area
- Determination of the presence and distribution of fauna species within the survey area using motion cameras
- Determination of the presence of conservation significant bat species using bat detectors
- Series of environmental constraints maps using Geographic Information Systems (GIS) mapping software
- Concise report (this document) on the findings of the fauna survey was provided.

1.4 Limitations

This report has been prepared by GHD for Woodside and may only be used and relied on by Woodside for the purpose agreed between GHD and Woodside as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Woodside 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 Woodside 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.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of access tracks, infrastructure and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

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 within the survey area (refer to attached shapefile for Survey Area location). Should the survey area change or be refined, further assessment may be required.

2. Methods

2.1 Desktop

The desktop assessment reviewed existing information for the survey area to determine likelihood of occurrence of conservation significant species and inform the design of the field surveys and timing of the survey.

This assessment is restricted to vertebrate terrestrial fauna within the survey area. The Burrup area (located on the Southern Expansion Lease directly adjacent to the NWS Project Karratha Gas Plant) is devoid of native vegetation and fauna habitats and was not assessed. The desktop assessment includes:

- A review of the Department of the Environment and Energy Protected Matters Search Tool (PMST) database to identify Matters of National Environmental Significance (MNES), fauna species listed under the EPBC Act potentially occurring within the study area
- A review of the DBCA NatureMap database for fauna species previously recorded within a 20 km buffer of the survey area. The following data sets within NatureMap included: Atlas of Australian birds, Birddata – Birdlife Australia, Fauna Survey returns database (new), Pilbara Biological Survey fauna, Pilbara Threatened Fauna, WA Threatened Fauna database, and WA Museum fauna databases.
- A review of DBCA Threatened Fauna databases to identify conservation significant fauna species present within the survey area and surrounds that are contained in DBCA records (20 km buffer). The above database search detail are presented in Table 1.
- A review of a previous and relevant fauna assessment in the area (Fauna records are generally expressed in the NatureMap searches, unless Level 1). Aecom 2013. Environmental Due Diligence, Maitland Industrial Estate. Unpublished report consolidates previous works on the area and this has been reviewed as part of this survey.
- Aerial photography, geology/soils and hydrology information: these datasets were reviewed to provide background information on the variability of the environment and likely habitat types.
- DBCA-managed conservation estates and reserves present within or near the survey area.

Details of the database searches conducted are summarised in Table 1 and the search results are presented in Appendix A. Biological constraints identified in the desktop searches are displayed in the attached Fauna Survey shapefiles. Conservation codes and legislation is presented in Appendix B.

Table 1 Database searches undertaken for this study

Databases	Search Focus	Search area
Department of the Environment and Energy Protected Matters Search Tool (Department of the Environment and Energy 2019)	MNES - Fauna	20 km buffer around line transect, coordinates - 20.799064 116.682674,- 20.596088 116.78361,- 20.596088 116.782924,- 20.596088 116.782924
Threatened and Priority Fauna Database (Department of Biodiversity, Conservation and Attractions 2019)	Listed threatened and priority flora	20 km radius around survey area shapefiles provided
NatureMap (Department of Biodiversity, Conservation and Attractions 2019)	Fauna diversity and fauna of conservation significance	20 km buffer around coordinates -20.596088 116.78361

2.2 Field survey

A Level 1 fauna survey was undertaken over two periods the 10th to 13th of June and 22nd to 24th July 2019. Where access permitted, the area was ground truthed by senior zoologist Glen Gaikhorst, with the Burrup section completed over the first period and remainder of the survey area over the second. The agreed exclusion areas were maintained, otherwise all areas within the survey area were traversed and visually assessed.

The fauna survey was undertaken with reference to Technical Guide – Terrestrial Fauna Surveys (EPA 2016b). The purpose of the reconnaissance survey was to verify the accuracy of the desktop study, and characterise the fauna and faunal assemblages present in the survey area.

The majority of the survey area was traversed on foot and by vehicle over the course of seven days. The purpose of the survey was to:

- identify and describe the dominant fauna habitat types present and their condition, and
- assess habitat connectivity, identify and record fauna species within the survey area.

An assessment of the likelihood of conservation significant fauna and their habitats occurring within the survey area was also undertaken.

Habitat assessment

A fauna habitat assessment was undertaken to document the type, condition 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 mid storey)
- Presence/absence of refuge including: density of ground covers, fallen timber (coarse 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 fauna of conservation significance
- Evaluation of the likelihood of occurrence of conservation significant fauna within the habitat (based on presence of suitable habitat).

Opportunistic fauna searches

Opportunistic fauna searches were conducted across the survey area. The majority of opportunistic searches focussed on the following:

- Searching the survey area for tracks, scats, bones, diggings and feeding areas for both native and feral fauna (Triggs 2004). For each scat found, the location, date, brief habitat description and GPS coordinate was recorded
- Searching through microhabitats including turning over rocks and ground debris (e.g. leaf litter) and examining tree hollows and hollow logs for reptile and other small vertebrate fauna
- Visual and aural surveys. This accounted for many bird species potentially utilising the survey area
- A visual assessment of the water bodies to identify any fish species observed
- Recording GPS locations of any conservation significant fauna species.

Camera trapping

Motion sensor cameras (Reconyx-Hyperfire) were deployed for a total of 30 camera nights (each camera between 2 and 4 nights) at nine locations within the survey area, primarily to identify additional cryptic or nocturnal species that may utilise the survey area. Cameras were positioned in areas where conservation significant species may frequent (e.g. rocky outcrops with cavities and cracking clays). For each camera location the time and date deployed and recovered, a GPS coordinate and brief habitat description was recorded. Camera locations are displayed in the attached Fauna Survey - Sample Sites shapefiles.

Data from the cameras were downloaded to a computer and analysed for the presence of animals following the field survey. Glen Gaikhorst, senior zoologist, undertook the identification of fauna images captured by the cameras. Table 2 provides the camera and bat detector locations and habitat associated.

Table 2 Remote Camera information

Item	Longs	Lats	Environment	Habitat	Total Nights
Remote camera	116.778063	-20.610273	Rocky Hills	Boulder Pile beneath Fig tree	4
Remote camera	116.774419	-20.615333	Rocky Hills	Boulder Piles	4
Remote camera	116.743543	-20.654963	Rocky Hills	Boulder Piles	4
Remote camera	116.740900	-20.659612	Rocky Hills	Boulder Piles	4

Item	Longs	Lats	Environment	Habitat	Total Nights
Remote camera	116.730168	-20.674946	Rocky Hills	Boulder Piles	4
Remote camera	116.728945	-20.676541	Rocky Hills	Boulder Piles	4
Remote camera	116.674933	-20.817698	Cracking Clays	On ground amongst tussock grasses	2
Remote camera	116.689948	-20.808314	Minor Drainage line	Amongst shrubs along minor drainage line	2
Remote camera	116.699785	-20.830550	Rocky Plain	Amongst Triodia	2

Bat survey

A Songmeter SM4BAT+ recorder (Wildlife Acoustics Inc., USA) was deployed at three locations for a total of three nights to record ultrasonic echolocation calls emitted by microchiropteran bats.

Table 3 Bat Detector Information

Item	Longs	Lats	Environment	Habitat	Total Nights
Bat detector	116.769890	-20.630216	Mudflats	Mangroves	1
Bat detector	116.733319	-20.669921	Rocky Hills	Boulder Piles	1
Bat detector	116.730229	-20.681949	Sandy Plain	Shrublands	1

Call analysis

Craig Grabham, senior zoologist, completed the analysis of all data collected during the survey using the ultrasonic bat detectors. Data from SM units were downloaded and viewed using Kaleidoscope Pro (version 4.3.1, Wildlife Acoustics Inc 2016) as full-spectrum files. WAV files were also converted to Anabat sequence files (zero-crossing format) suitable for analysis in Analoow version 4.1s (Corben 2015).

WAV files were viewed and bat calls identified by visually comparing the Kaleidoscope Viewer spectrogram and call characteristics (e.g. characteristic frequency and call shape) with reference calls and/or species call descriptions from available reference material (e.g. McKenzie and Bullen 2009; Armstrong and Coles 2007). The spectrogram displayed each call sequence (see below for call definition) with information on the number and timing of calls.

Calls were also identified using zero-crossing analysis and Analoow by visually comparing the time-frequency graph and call characteristics (e.g. characteristic frequency (Fc) and call shape) with reference calls and/or species call descriptions from available reference material.

The call identification was also assisted by consulting distribution information for possible species (Atlas of Living Australia and DPAW NatureMap records) and previous GHD surveys within the region of the survey area. No reference calls were collected during the survey.

A call (pass) was defined as a sequence of three or more consecutive pulses of similar frequency and shape. Calls with less than three defined consecutive pulses of similar frequency and shape were not unambiguously identified to a species (see below) but were used as part of the activity count for the survey area.

Due to variability in the quality of calls, the lack of published information regarding non-search phase calls and the difficulty in distinguishing some species the identification of each call was assigned a confidence rating (see Mills *et al.* 1996 and Duffy *et al.* 2000) as summarised in Table 4. Due to the absence of reference calls from the study area and the poor quality of some the recordings and known overlap in call characteristics between some species, a conservative approach was taken when analysing calls.

Table 4 Confidence ratings applied to calls

Identification	Description
D - Definite	Species identification not in doubt. Call sequence contains three or more consecutive pulses of similar frequency and shape. Call characteristics match those in referenced material or species reference calls.
PR - Probable	Call most likely to represent a particular species, but there exists a low probability of confusion with species of similar call type or call lacks sufficient detail (e.g. number of pulses).
SG – Species Group	Call made by one of two or more species. Call characteristics overlap making it too difficult to distinguish between species.

Fauna Species Identification

Fauna species were identified in the field using available field and electronic guides (e.g. Morcombe 2014). Nomenclature follows that used by the WA Museum (as shown on *NatureMap*), as it is regarded to contain the most up-to-date species information for WA, with the exception of birds, where Christidis and Boles (2008) or bats which follows Armstrong (2011), then van Dyck *et al.* (2008) was used.

2.3 Limitations

2.3.1 Desktop limitations

Desktop investigations use a variety of online resources such as the WA Museum and DBCA *NatureMap* database (DBCA 2007–), and the EPBC Act PMST. The responsibility for the accuracy of such data remains with the issuing authority, not with GHD.

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 area. The records from the DBCA searches of threatened flora and fauna provide more accurate information for the general area. However, some records of collections, sightings or trappings cannot be dated and often misrepresent the current range of threatened species.

2.3.2 Field survey limitations

The EPA (2016a) Technical Guidance states survey reports for environmental impact assessment in Western Australia 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 5. Based on this assessment, the present survey effort is not subject to any constraints which affect the thoroughness of the assessment and the conclusions that have been formed.

Table 5 Field Survey Limitations

Aspect	Constraint	Comment
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Minor	The majority of the survey area was accessed by vehicle and on foot. Information gained from the survey was extrapolated across those sections of the survey area not accessed on foot during the field survey to assist with determining the vegetation and habitat types for the entire survey area.
Mapping reliability	Nil	Data were recorded in the field using a hand-held GPS tool. Certain atmospheric factors and other sources of error can affect the accuracy of such GPS receivers. On average, the GPS units used during this field survey (Garmin GPS, Samsung Tablet units) have an accuracy to approximately ± 5 m. Therefore the data points consisting of coordinates recorded from the GPS may contain inaccuracies.
Timing/weather/ season/cycle	Moderate	The survey was conducted in June and July 2019 which was relatively late in the season for assessing migratory birds. Typically migratory bird surveys are undertaken in the summer period (Dutsun <i>et al</i> 2009) between October to March. Due to the habitats present in the survey area migratory species may not have been identified from the survey.
Disturbances (e.g. fire, flood, accidental human intervention)	Minor	A number of disturbances were observed that impacted the survey. These included current and historic vegetation clearing pipelines and tracks, as well as some historic grazing. No evidence of recent fire was observed.
Intensity (in retrospect, was the intensity adequate)	Nil	The terrestrial fauna was sampled in accordance with the EPA (2016b) Level 1 assessment. The survey area was sufficiently covered by GHD zoologist during the survey.
Access restrictions	Minor	Some areas had restricted access during the survey, however these could be visually assessed from a distance to determine habitats present. The majority of the survey area was accessed by vehicle and/or on foot.
Experience Levels	Nil	The survey zoologist is suitably qualified and experienced in his field. Glen Gaikhorst is a Senior Zoologist with over 20 years' experience in undertaking ecological surveys in Western Australia.

3. Results

3.1 Desktop

3.1.1 Fauna diversity

A search of NatureMap identified 331 terrestrial vertebrate fauna taxa previously recorded within 20 km of the survey area. This total included 194 birds, 37 mammals, 7 amphibian and 93 reptiles (Appendix A).

Of the 331 species identified 13 are considered introduced to the region, these include four Birds (Domestic Pigeon, Spotted Turtle Dove, European Sparrow and House Sparrow), eight mammals (Cat, Fox, Goat, Sheep, Dog, Rabbit, House mouse and Black Rat) and one reptile (Asian House Gecko).

A number of Short Range Endemic (SRE) invertebrates were also recorded; however, the habitat present in the proposed investigation area (excluding the section on the Burrup Peninsula) are not conducive as SRE environments. While some areas on the Burrup Peninsula may have some habitat present, based on the limited disturbance to undertake the geotechnical investigation, any impacts would be small and highly-localised.

Due to the close proximity to the marine environment a number of marine species were identified, these were excluded from the search. Marine species (such as Gulls and Terns) that are known to opportunistically use terrestrial areas/habitats remained in the assessment. There are some species duplications within the database search due to the inclusion of subspecies and due to recent taxonomic name changes. These species were also excluded from the numbers.

3.1.2 DBCA Database

The DBCA database identified 2281 individual fauna records of conservation significant species (consisting of both terrestrial and marine). Of these records, only one new terrestrial vertebrate species was identified, that was not recorded in other searches. This species North-western Free-tailed Bat (*Mormopterus (Ozimops) cobourgianus*) has been added to the Likelihood of Occurrence table presented in Appendix C.

3.1.3 Conservation significant fauna

Searches of the EPBC Act PMST identified the presence/potential presence of 47 conservation significant fauna, including 41 birds, four mammals and two reptiles (Appendix A). The EPBC Act PMST indicated the potential presence of nine additional introduced fauna taxa within 20 km of the survey area. Species identified by the PMST as marine or pelagic were excluded from this assessment as marine habitats are not present within the survey area; however, species identified by the PMST as migratory, migratory terrestrial or migratory wetland were considered as part of this assessment due to habitats present (saltworks).

3.1.4 Previous Report for the Maitland Industrial Estate

AECOM (2013) completed a desktop assessment for the Maitland Industrial Estate referencing three previous fauna reports undertaken over the area dating back to 1994. The key finding of the summary includes:

- Three main fauna habitats (from the most recent survey) have previously been recorded in the Maitland Industrial Estate including Paddock grassland consisting of *Cenchrus ciliaris*, *Eragrostis xerophila* and *Eriachne aristidea* tussock grassland with *Alternanthera nudiflora*, *Hybanthus auranticatus* and *Heliotropium conocarpum* mixed herbs, Creekline community

of *Grevillea wickhamii* and *Acacia coriacea* tall open shrubland over *Triodia wiseana*, *Triodia pungens* hummock grassland with patches of *Chrysopogon fallax* and Hummock grassland of *Triodia wiseana* and *Triodia pungens* with **Cenchrus ciliaris* and *Eragrostis xerophila* tussock grassland.

- Previous surveys had identified 24 birds, 3 mammals and 10 reptiles and frogs (Aecom 2013).
- Peregrine and Grey Falcon were recorded as potential 'fly over' the site while Northern Quoll, Pilbara Olive Python, Short-tailed Mouse, Bar-tailed Godwit, Common Greenshank, Curlew Sandpiper and Pin-tailed Snipe are possible to occur. The Lined Soil Crevice Skink and Bridled Tern are known to breed in the area. Note: A number of other species were listed as possible however these species no longer have a conservation listing.
- An assessment of likelihood determined that no EPBC Act listed species were likely to be present, with the exception of 31 migratory, marine species that are known or likely to occur.

The reports referenced by AECOM (2013) were desktop only and 10+ years old and therefore not an appropriate representation of species that may / may not be present in the survey area.

3.1.5 Conservation Managed Lands

The majority of the proposed survey area does not have any DBCA managed conservation estates or reserves within the vicinity. Some of the survey area on the Burrup Peninsula is positioned next to a small portion of the Murujuga National Park. No further conservation estates or reserves are identified along the proposed survey area.

3.2 Field Survey

3.2.1 Fauna Habitats

Nine main fauna habitat types were recorded during the field survey, which are described in detail in Table 6 and provided in the attached fauna habitat shapefiles, and include:

- Mudflat with tidal inundation, Mangroves and supportive scattered Samphire.
- Rocky Hills with exposed boulder piles
- Minor Drainage lines
- Hummock Grassland on Rocky Plain
- Hummock Grassland on Sandy Plain
- Hummock Grassland on Low Rocky Hills
- Tussock Grasslands on Cracking Clays
- Low Chenopod Shrublands
- Waterbodies

Disturbed areas also formed portions of the survey area and although not always considered as fauna habitat areas these areas may be utilised by fauna.

The topography of the survey area varied from rocky hills, low rocky hills, stony and sandy plains to minor drainage lines, cracking clays and intertidal mudflats. Minor drainage systems occur within the survey area which drain from the surrounding hills to the coast or across plain. Flow varies in direction through the survey area however always drains to the coast. Waterbodies were present within the minor drainages as a series of two pools at the time of the survey. Soils varied greatly over the survey area and included red-brown stony or sandy loams,

cracking clays on the plain, with areas of rocky hills and exposed boulder piles on hills. The habitat types for the survey area are described in Table 6.

Habitat connectivity

The fauna habitats of the survey area are part of a contiguous largely intact area of remnant vegetation within leased land primarily used for industrial, cattle grazing and resource extraction. The fauna habitats of the survey area are part of a much larger area of similar habitats within the local area and greater study area. The ephemeral drainage lines within the survey area drain towards the coast and on the plain provide corridors linking the coast to the surrounding Karratha hills. Overall, the habitats within the survey area are largely contiguous through the local area and mostly well connected with habitats through the study area.

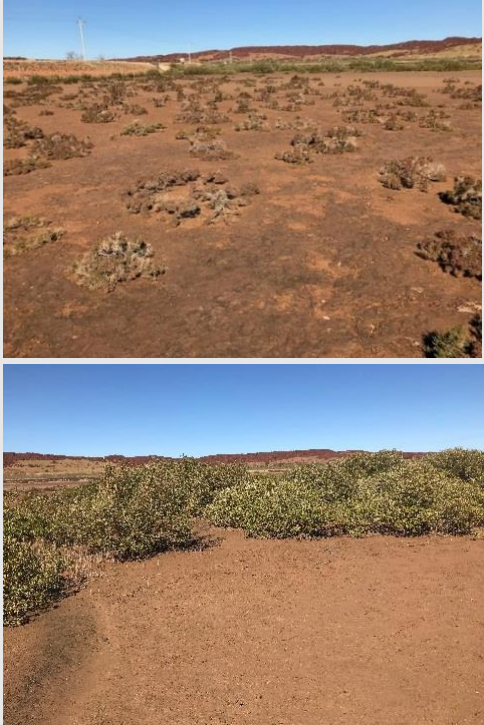
Disturbance

Some of the habitats within the survey area have been impacted by past disturbances including land clearing for infrastructure, linear corridors, land management (rock fall barriers etc), pastoral practices and mineral resource extraction which has been conducted within the survey area. A portion of the survey area lies on Karratha Station and so has suffered degradation from cattle grazing. Some signs of cattle (scats) were observed throughout the survey area.

Habitat value

The survey area provides a moderate to high level of habitat value within the environment. This is due to the diversity of fauna the area maintains and the conservation significance of many native fauna species that are present or likely to be present in the survey area.

Table 6 Fauna habitats recorded in the survey area

Habitat	Image
<p>Mudflat with tidal inundation, Mangroves and supportive scattered Samphire.</p> <p>A small portion of tidal mudflats occur in western part of the survey area on the Burrup Peninsular. Vegetation is minimal except where the mudflats fringe mangroves and samphire. Vegetation was generally sparse and scattered however in areas clustered to form low samphire shrublands. Areas were inundated with water during high tides and retracts to several small pools and a minor drainage line during the low period.</p> <p>Crabs and burrow were recorded on mudflat and generally restricted to those areas regularly influenced by tidal surge. Few areas of debris build up was present however dead branched and some logs were present around the mangrove stand. Scattered large rocks and shell were recorded. The samphire habitat was considered suitable for the Arlie Island Skink however no specimens were recorded during the survey despite four assessments undertaken (walking transects) looking for active skinks. It is likely that the area of available habitat is too small for the skink to persist. No fire evidence was recorded in this area.</p> <p>This habitat type recorded species associated with marine environment included Terns and the Whimbrel (<i>Numenius phaeopus</i>). Additionally mangrove specialist birds were recorded including the Yellow White-eye (<i>Zosterops luteus</i>) and Dusky Gerygone (<i>Gerygone tenebrosa</i>).</p> <p>Habitat value for fauna species of conservation significance</p> <p>Four conservation significant species were recorded in this habitat type and include Whimbrel (<i>Numenius phaeopus</i>), Gull-billed Tern (<i>Gelochelidon nilotica</i>), Caspian Tern (<i>Hydroprogne caspia</i>), and Crested Tern (<i>Thalasseus bergii</i>). The terns appeared to be following the water courses looking for food while the Whimbrel was recorded on the mudflat foraging. All birds when disturbed fly west into Hearson’s Cove. The habitat within the survey area is likely linking habitats from King Bay to Hearsons’ Cove. Other migratory species may also utilise the habitat opportunistically and include the Common Sandpiper (<i>Actitis hypoleucos</i>), Bridled Tern (<i>Onychoprion anaethetus</i>), Common Greenshank (<i>Tringa nebularia</i>) and Wood Sandpiper (<i>Tringa glareola</i>).</p> <p>A bat detector at this location recorded the North-western Free-tail Bat (<i>Mormopterus (Ozimops) cobourgianus</i>), the record was a probably assessment of this species due to the overlap in call frequencies among species in the region. However due to the habitats present it is highly probable that the calls were of the North-western Free-tailed Bat, particularly that the species is known from the area also. The Peregrine Falcon (<i>Falco peregrinus</i>) may also utilise the area for foraging only.</p> <p>High value</p> <p>Foraging habitat for migratory birds, North-western Free-tailed Bat and Peregrine Falcon</p>	

Rocky Hills with exposed boulder piles

Rocky hills occur in the Burrup portion of the survey area. This habitat type is mostly dominated by a *Triodia* hummock grassland however does support tussock grasses and scattered *Acacia* shrubs. However the boulder rock piles are typically devoid of ground cover. The crests of hills contain extensive rock outcropping or boulder piles and support scattered *Ficus platypoda* and *Brachychiton sp.*. The *Ficus*, *Brachychiton* and *Acacia* provided litter and scattered woody debris, however the boulder piles provide extensive cover via crevices, small caves and cavities. No evidence of recent fire was recorded in the survey area. Evidence of old fire scars were present and determined based on the age of the vegetation.

The rocky habitats are known to support a range of saxicoline (rock inhabiting) fauna species including Rothchild's Rock Wallaby (*Petrogale rothchildi*) and Woolley's Pseudantechinus (*Pseudantechinus woolleyae*).

Habitat value for fauna species of conservation significance

A large area of habitat that joins to or is part of a contiguous remnant environment extending beyond the survey area on the Burrup Peninsular. This habitat provides resources for the Northern Quoll (*Dasyurus hallucatus*) and Pilbara Olive Python (*Lialis olivaceus barroni*) and potential hunting and foraging opportunities for the Peregrine Falcon. No large cliffs were present in the survey area for Peregrine Falcon to utilise for breeding however looked to be present outside of the survey area particularly along the coastal cliffs and larger boulder piles surrounding the survey area. Northern Quoll and Pilbara Olive Python would utilise the boulder piles for denning/shelter and feeding and would be considered core habitat (DotE 2016 and Tutt et al 2002) for these species. The Western Pebble-mound Mouse would have utilised this habitat but the species appears to be now extinct on the Burrup Peninsular.

High value

Core habitat for Northern Quoll and Pilbara Olive Python, foraging habitat for the Peregrine Falcon

Minor Drainage lines

This habitat type is limited to the linear drainage systems which flow randomly amongst the rocky hills or on the plains. They primarily consist of a thin, linear corridor of denser vegetation which drain into the intertidal mudflats and coastline. This habitat type is mostly dominated by *Eucalypt* Woodland (on the Burrup Peninsular) and *Acacia* species on the plain. Understorey includes *Triodia* hummock grassland and Buffel Grass (*Cenchrus spp.*) and mixed small shrub species. Litter, woody debris and logs were present along drainage line edges or were water flow created build up. No recent fire scaring was present in the survey area but historical evidence was obvious via the age of vegetation present. This habitat, particularly on the plain provides a habitat corridor from the coastal tidal zone to the rocky hills in the east in a predominantly open plain over the cracking clays.

The taller, mature *Eucalypt* trees provide roosting and breeding opportunities for a range of fauna via tall canopy or hollows large trees provide. The Black-shouldered Kite was recorded breeding within a *Eucalypt* and a number of fauna species favouring riparian vegetation were also recorded including White-plumed



Honeyeater (*Lichenostomus penicillatus*), Bush Stone Curlew (*Burhinus grallarius*), Budgerigar (*Melopsittacus undulatus*), Red Kangaroo (*Macropus rufus*) and Long-snouted Water Dragon (*Gowidon longirostris*).

Habitat value for fauna species of conservation significance

Patchy and typically linear in the landscape but part of a larger area of contiguous remnant vegetation extending beyond the survey area. This habitat was present within the entire survey area and provides potential hunting and foraging opportunities for the Peregrine Falcon. Northern Quoll and Pilbara Olive Python have also been recorded in drainage lines particularly in association to rocky hills on the Burrup Peninsular. Minor drainage lines on the plain would not be suitable. On the plain the Northern Short-tailed Mouse (*Leggadina lakedowniensis*) and Lined Crevice Skink (*Notoscincus butleri*) would utilise this habitat on the plain.

High value

Linear corridor of habitat utilised by Northern Quoll, Pilbara Olive Python and Peregrine Falcon (in rocky environments) and Northern Short-tailed Mouse and Lined Crevice Skink on the plain. A fauna corridor for all other species on the plain.



Exposed granite along a minor drainage line

Hummock Grassland on Rocky Plain

This habitat type occurs across the survey area on the Burrup Peninsular and plain often associated with slight undulation where there is association to low hills or rocky substrates. This habitat type is mostly dominated by a *Triodia* hummock grassland with heavy loam stony soils. The vegetation is a mosaic of shrubs however is dominated by *Acacia*, *Hakea* and *Grevillia* over hummock grasses. Litter, woody debris and branches were present in areas where shrubs were present. No logs or hollows were observed due to the vegetation structure present. No recent fire scaring was present in the survey area but historical evidence was obvious via the age of vegetation present.

The grasslands provide good foraging and breeding opportunities for small native ground mammals, ground dwelling birds and reptiles. Several ground dwelling birds, small skinks and dragons were observed active during the survey (Little Button-quail (*Turnix velox*), Brown Songlark (*Cincloramphus cruralis*), Spinifexbird



(*Eremiornis carteri*) and several raptor species were observed foraging over the grasslands (Black-shouldered Kite (*Elanus axillaris*), Spotted Harrier (*Circus assimilis*), Australian Kestrel (*Falco cenchroides*)).

Habitat value for fauna species of conservation significance

Part of a larger area of contiguous remnant vegetation extending beyond the survey area. This habitat provides potential hunting and foraging opportunities for the Peregrine Falcon. Where sand incursion and in association with drainage lines is present within this habitat the Northern Short-tailed Mouse and Lined Crevice Skink maybe present.

Moderate to High value

Habitat that typically supports high diversity of small vertebrate fauna and provides foraging habitat to Peregrine Falcon. The Northern Short-tailed Mouse and Lined Crevice Skink may also utilise this habitat.



Hummock Grassland on Sandy Plain

Sandy Plain is present between the causeway and start of the Burrup rocky hills and through the investigation area. This area comprises mixed shrublands over *Triodia* sp. and Buffel on sand plain. The vegetation comprises shrubs of *Acacia*, *Hakea* and *Grevillia* over *Triodia* hummock grasses. Litter, woody debris and branches were present in areas where shrubs were present. No logs or hollows were observed due to the vegetation structure present. No recent fire scaring was present in the survey area. This habitat currently supports a range of small fauna species including Ridge-tailed Monitor (*Varanus accanthurus*), Onslow Broad-striped Slider (*Lerista onsloviana*) and the Central Military Dragon (*Ctenophorus isolepis*). *Triodia* species on sandy soils are known to have high fauna diversity particularly in small mammals and skinks.

Habitat value for fauna species of conservation significance

In this region a patchy habitat situated between rocky hills and cracking clays. This habitat provides potential hunting and foraging opportunities for the Peregrine Falcon. Where sandy and associated to drainage lines the Northern Short-tailed Mouse and Lined Crevice Skink maybe present.

Moderate to High value

Habitat that typically supports high diversity of small vertebrate fauna and provides foraging habitat to Peregrine Falcon. The Northern Short-tailed Mouse and Lined Crevice Skink may also utilise this habitat.



Hummock Grassland on Low Rocky Hills

Low rocky hills occur in limited extent on the Burrup portion of the survey area, often adjacent to rocky hills with exposed boulder piles.

This habitat type is mostly dominated by a *Triodia* hummock grassland however does support tussock grasses and scattered *Acacia* shrubs. The crests of the low hills contain rocky substrates but lacks the extensive boulder piles in the surrounding taller hills. Limited litter and woody debris is present and no logs, branches or hollows are available. Typically this habitat is very open with a heavy rocky substrate, providing limited hiding ability for fauna. Few fauna species were recorded in this habitat however the sun loving Ringtail Dragon (*Ctenophorus caudicinctus caudicinctus*) and Rock Ctenotus (*Ctenotus saxatilis*) were observed.

Habitat value for fauna species of conservation significance

This habitat would support foraging and the dispersal of the Northern Quoll and Pilbara Olive Python particularly in area close to or in between boulder piles and minor drainage lines. This environment may provide foraging habitat for the Peregrine Falcon. The Western Pebble-mound Mouse would have utilised this habitat but the species appears to be now extinct on the Burrup Peninsular.

Moderate to High value

Supportive habitat for species foraging and dispersal particularly the Northern Quoll and Pilbara Olive Python.



Tussock Grasslands on Cracking Clays

This habitat type occurs over much of the southern parts of the survey area, and intergrades with smaller areas or scattered *Triodia* hummock grasslands on stony soils. Overstorey is minimal and includes scattered shrub species. The grasslands provide good foraging and breeding opportunities for grassland and cracking clay specialists such as small native ground mammals, ground dwelling birds and reptiles. Several ground dwelling birds were observed active during the survey (Rufous Songlark (*Cincloramphus mathewsi*), Brown Songlark (*Cincloramphus cruralis*), Horsfield's Bushlark (*Mirafrja javanica*)) and several raptor species were observed foraging over the grasslands (Black-shouldered Kite, Spotted Harrier, Australian Kestrel). Old nests were recorded for songlarks and bushlarks suggesting the species breed in the area. Animal tracks, digs and occasional small burrows were recorded in this habitat type, most of which were kangaroos and other small mammals.

Logs, branches and debris were very sparse in this habitat type-which is an artefact of the lack of over storey. Leaf-litter and other forms of non-vascular (ground cover of dead plant material) was localised beneath small clumps of trees but was uncommon.



Habitat value for fauna species of conservation significance

No conservation significant species were recorded in this habitat at the time of the survey. Typically this habitat is utilised in the wet period (December to April) when migratory species are present and grasses flourishing. The migratory species previously recorded in this habitat are the Oriental Plover (*Charadrius veredus*), Oriental Pratincole (*Glareola maldivarum*), Bridled Tern (*Onychoprion anaethetus*) (which has been recorded breeding just to the west) and any other migratory species that may temporarily and opportunistically utilise open plains. The Northern Short-tailed Mouse and Lined Crevice Skink would utilise this habitat.

Moderate value

Seasonal opportunistic use of habitat by migratory species. The Northern Short-tailed Mouse and Lined Crevice Skink may also utilise this habitat.



Low Chenopod Shrublands

Low lying samphire shrublands occur in a very small portion of the survey area where a modified small drainage line with minor drainage lines adjacent to the plains. This environment is mostly dominated by low chenopods but also includes scattered tussock grasses. Logs, branches and debris were very sparse in this habitat type-which is an artefact of the lack of over storey. Leaf-litter and other forms of non-vascular (ground cover of dead plant material) was localised beneath small clumps of trees but was uncommon.

Habitat value for fauna species of conservation significance

Habitat value is generally low value however some migratory species may utilise the area seasonally. The Chenopod habitat was searched for signs of Arlie Island Skink (*Ctenotus angusticeps*). None were recorded and due to minimal extent of habitat and dissimilarities with the known habitat near Karratha (large areas and lack of mangroves and crab holes) it is unknown but considered unlikely that the species occurs in the survey area. Potentially habitat exists for migratory species such as Wood Sandpiper, Common Greenshank and Common Sandpiper, Oriental Pratincole and Oriental Plover.

Moderate value

Opportunistic use of habitat by migratory species. The Northern Short-tailed Mouse and Lined Crevice Skink may also utilise this habitat.



Water Bodies

This habitat type occurs in small areas within the minor drainage lines and a modified drainage line. Two water bodies are present along the investigation area on the plain. The habitat consists of water bodies surrounded by either Acacia, sedges, samphire or the introduced tree Tamarix. The waterbodies are seasonally or tidal filled and both appeared brackish. No fish were present and from the lack of visible prints around the water by birds or kangaroos would suggest to salty as a water source. Logs, branches and debris were very sparse in this habitat type-which is an artefact of the lack of over storey. Leaf-litter and other forms of non-vascular (ground cover of dead plant material) was localised beneath small clumps of trees.

Habitat value for fauna species of conservation significance

Habitat value would be high value to migratory birds however use would be seasonal and opportunistic. Both water bodies are very small, modified and temporary.

Moderate value

Opportunistic use of habitat by migratory species.

Disturbed areas

This environment occurs across small cleared areas or comprise of corridors within the survey area. These include minor roads and supportive infrastructure. Most of the disturbed area have very little value to fauna. Vegetation in these areas varied depending on the location of the disturbance.



3.2.2 Species Diversity

During the survey 101 species were identified from within the survey area, consisting of 68 birds, 17 reptiles and 16 mammals. Of these species, four were introduced and comprise Dog, Cat, Cattle and Black Rat. The remaining species were all native and are known from the region. The full list of species identified can be seen in Appendix B.

Four of these species were recorded on camera and include the Cat, Woolley's Pseudantechinus (Plate 1), Black Rat and Rothchild's Rock Wallaby (Plate 2).



Plate 1 Woolley's Pseudantechinus (zoomed in)



Plate 2 Rothchild's Rock Wallaby

Conservation Significant Fauna

Six species of Conservation significance were recorded;

- North-western Free-tail Bat (*Mormopterus (Ozimops) cobourgianus*), listed a Priority 1 under DBCA.
- Western Pebble-mound Mouse (*Pseudomys chapmani*), listed a Priority 4 under DBCA.
- Whimbrel (*Numenius phaeopus*), Migratory under the EPBC Act and International Agreement under the BC Act.
- Gull-billed Tern (*Gelochelidon nilotica*), Migratory under the EPBC Act and International Agreement under the BC Act.
- Caspian Tern (*Hydroprogne caspia*), Migratory under the EPBC Act and International Agreement under the BC Act.
- Crested Tern (*Thalasseus bergii*), Migratory under the EPBC Act and International Agreement under the BC Act.

These species were recorded in and around the habitat; Mudflats with tidal inundation, mangroves and supportive scattered Chenopods habitats. However the Western Pebble-mound mouse was recorded via an old mound observed. These species are discussed in greater detail below.

North-western Free-tail Bat (Mormopterus (Ozimops) cobourgianus)

The North-western Free-tail Bat is listed as P1 under DBCA priority listed fauna. The North-western Free-tail Bat is known from 12 locations in Western Australia (DBCA 2007–) and four in the Northern Territory. The species appears to be restricted in distribution to a few localised habitats. The species can appear to be locally common because it aggregates, however over a landscape is localised and restricted. In Western Australia, this species inhabits mangrove stands, and has been recorded roosting in hollows and or crevices in mangroves (van Dyck et al. 2013).

The North-western Free-tail Bat was recorded in the survey area from calls classified as probable. Given the lack of mangrove within the survey area, it is likely this species opportunistically forages in the survey area and roosts in the mangroves to the west (in King Bay) or to the east in the northern portion of Hearson's Cove. There is only a small amount of habitat within the survey area for these species to utilise and any impacts are likely to be negligible.

Western Pebble-mound Mouse (Pseudomys chapmani)

The Western Pebble-mound Mouse is listed Priority 4 under DPaW Priority fauna listing.

The Western Pebble-mound Mouse is restricted to the Pilbara region where it is recognised as an endemic species. Habitat for the species can be found on stony hillsides with hummock grasslands. 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).

Evidence of the species was recorded in one location within the survey area (as shown in the attached shapefiles). This mound was considered an inactive mound and was recorded on the rocky hills. From recent surveys few active mounds have been recorded on the Burrup Peninsular and the species considered locally extinct (Start 1996). The species is known to be sensitive to external impacts and populations are known to decline in areas where disturbance has occurred.

Whimbrel (Numenius phaeopus)

The whimbrel is listed as migratory under the EPBC Act and International Agreement under the BC Act.

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 (Higgins & Davies 1996).

One individual Whimbrel was recorded foraging in the intertidal drainage line alongside the survey area. This individual once disturbed flew towards Hearsons Cove on the eastern side of the Burrup Peninsular. There is only a small amount of habitat within the survey area for this species to utilise and any impacts are likely to be negligible. There is habitat (tidal mudflats) available in King Bay and within Hearsons Cove of much larger real estate for wading species to utilise in the region.

Tern Species

The terns recorded are listed as migratory under the EPBC Act and International Agreement under the BC Act.

Three Migratory tern species were observed flying through and around the survey area, these being the Gull-billed Tern (*Gelochelidon nilotica*), Caspian Tern (*Hydroprogne caspia*) and Crested Tern (*Thalasseus bergii*). These species were observed flying to and from King Bay into the tidal portion of the survey area. Additionally one species was recorded flying towards Hearson's Cove to the east. This area is likely a regular in fly over location for these species moving between King Bay and Hearson's Cove. There is only a small amount of habitat within the survey area for these species to utilise and any impacts are likely to be negligible. All species are considered relatively common and to opportunistically use the area.

3.2.3 Likelihood of Occurrence

A preliminary likelihood of occurrence assessment was undertaken pre field survey. This assessment identified a number of species that are likely to exist in the habitats within the survey area. The field survey further refined this data based on species recorded and habitats present.

Searches of the EPBC Act PMST, DBCA Threatened and Priority Fauna database and NatureMap database (Appendix A) identified the presence/potential presence of 60 conservation significant fauna species. These species populate the Likelihood of Occurrence assessment which can be found in Appendix C. Species identified by the PMST as marine or sole marine were excluded from this assessment as no sole marine habitats were present within the survey area however species identified by the PMST as migratory terrestrial/wetland were considered as part of this assessment.

This assessment found (post survey) that 11 species were identified as likely to occur within the survey area, based on species records and habitat identified and review of previous works undertaken in the region. These species can be seen in Table 7.

Table 7 Summary of fauna species of conservation significance determined likely to occur within the survey area

Species and status (EPBC, WC Act)	Justification for Likelihood of Occurrence
<p>Northern Quoll (<i>Dasyurus hallucatus</i>) En, En</p>	<p>Likely – species is known from the Burrup Peninsular and habitat is present</p> <p>The species was not recorded during the field survey however the species is known from the Burrup Peninsular in low numbers. The preferred habitat for the species is rocky hills with exposed boulder piles, rocky hills and minor drainage lines in close proximity to boulder piles.</p> <p>The most recent records is 2015 for this species on the Burrup peninsular and a plant near to the salt works, however the indigenous rangers present during the survey indicated more recent remote camera records from the Burrup.</p>
<p>Pilbara Olive Python (<i>Liasis olivaceus barroni</i>) Vu, Vu</p>	<p>Likely – resident/regular visitor, opportunistic use in/to the survey area</p> <p>The survey area provides suitable habitat for the species. The rocky hills with exposed boulder piles and associated minor drainage lines habitats (on the Burrup Peninsular) would be regarded as important habitat for the species. The remainder of the habitat in the survey area is supportive only and the plain habitat off the Burrup is not habitat for Pilbara Olive Python. There are numerous recent records adjacent to the survey area, from the Burrup Peninsular with at least 5 records since 2016.</p>
<p>Peregrine Falcon (<i>Falco peregrinus</i>) OS</p>	<p>Likely – regular visitor or resident to survey area</p> <p>The survey area provides suitable hunting habitat. The survey area is probably part of the species broader home range, limited breeding habitat occurs within the survey area. Important breeding habitat (e.g. steep cliffs) may be found in nearby ranges and coastal cliffs outside of the survey area but within the study area.</p> <p>There are five records within the study area.</p>
<p>Northern Short-tailed Mouse (<i>Leggadina lakedownensis</i>) P4</p>	<p>Likely –resident to survey area, restricted to the cracking clays and minor drainage lines</p> <p>The survey area provides suitable habitat for the species particularly in minor drainage line associated to cracking clays on plain habitats. The species has been recorded within the study area and the species likely present.</p> <p>There is three historical records within 2 km of the survey area.</p>
<p>Lined Soil-crevice Skink (<i>Notoscincus butleri</i>) P4</p>	<p>Likely – resident in/to the survey area</p> <p>The survey area provides suitable habitat for the species particularly in minor drainage line associated to cracking clays or stony soils on plain habitats. The species has been recorded within the study area and the species likely present.</p> <p>There is five historical records within the study area.</p>
<p>Bridled Tern (<i>Onychoprion anaethetus</i>) Mi, IA</p>	<p>Likely – regular visitor or resident to survey area</p> <p>Most records for this species are on or around the off shore islands, however the species has been recorded breeding on the mainland adjacent to the Maitland Industrial Estate survey area (AECOM 2003) (exact location unknown). A small amount of habitat is present for this species particularly within the intertidal mudflats and minor drainage lines. However use would be irregular and opportunistic.</p>
<p>Wood Sandpiper (<i>Tringa glareola</i>) Mi, IA</p>	<p>Likely –seasonal visitor, opportunistic use in/to the survey area</p> <p>This species has been recorded in the survey area and within the vicinity of the survey area previously and habitat is present for the species. This</p>

Species and status (EPBC, WC Act)	Justification for Likelihood of Occurrence
	<p>species is known to utilise habitats in the Pilbara, including mudflats, plain and minor drainage lines.</p> <p>The species is known from the area with one record from the plain along the infrastructure area and three other records within 2 km of the survey area.</p>
<p>Common Greenshank (<i>Tringa nebularia</i>) Mi, IA</p>	<p>Likely –seasonal visitor, opportunistic use in/to the survey area</p> <p>This species has been recorded in the survey area and within the vicinity of the survey area previously and habitat is present for the species. This species is known to utilise habitats in the Pilbara, including mudflats, plain and minor drainage lines.</p> <p>The species is known from the area with one record from the plain along the infrastructure area and 10 other records within 2 km of the survey area.</p>
<p>Oriental Pratincole (<i>Glareola maldivarum</i>) Mi, IA</p>	<p>Likely –seasonal visitor, opportunistic use in/to the survey area</p> <p>This species has been recorded in the survey area and within the vicinity of the survey area previously and habitat is present for the species. This species is known to utilise habitats in the Pilbara, including mudflats, plain and minor drainage lines.</p> <p>The species is known from the area with one record from the plain along the infrastructure area and another record within 2 km of the survey area.</p>
<p>Oriental Plover (<i>Charadrius veredus</i>) Mi, IA</p>	<p>Likely –seasonal visitor, opportunistic use in/to the survey area</p> <p>This species has been recorded in the vicinity of the survey area previously and habitat is present for the species. This species is known to utilise habitats in the Pilbara, including mudflat and plain.</p> <p>The species is known from the area with three records from within 2 km of the survey area.</p>
<p>Common Sandpiper (<i>Actitis hypoleucos</i>) Mi, IA</p>	<p>Likely –seasonal visitor, opportunistic use in/to the survey area</p> <p>This species has been recorded in the survey area and within the vicinity of the survey area previously and habitat is present for the species. This species is known to utilise habitats in the Pilbara, including mudflats, plain and minor drainage lines.</p> <p>The species is known from the area with two records from the plain along the infrastructure area and seven other records within 2 km of the survey area.</p>

Table note:

Status (see Appendix A for full explanation)

EPBC Act – Species listed as one or more of the following: MiT = migratory terrestrial species, Vu = Vulnerable, En = Endangered

BC Act - Species listed as CR = critically endangered, En = endangered, Vu = Vulnerable, IA = international migratory agreement migratory birds, OS = other specially protected fauna

DBCA – Species listed as Priority (P) 1, 2, 3 or 4

4. Conclusion

Four migratory species listed under the EPBC Act and BC Act were recorded including Whimbrel (*Numenius phaeopus*), Gull-billed Tern (*Gelochelidon nilotica*), Caspian Tern (*Hydroprogne caspia*), and Crested Tern (*Thalasseus bergii*). Two priority listed species (under DBCA) the Western Pebble-mound Mouse (*Pseudomys chapmani*) and North-western Free-tail Bat (*Mormopterus (Ozimops) cobourgianus*) were also recorded.

The four migratory bird species and North-western Free-tailed Bat were all recorded within the same area and included the habitat Mudflat with tidal inundation, Mangroves and supportive scattered Samphire. This habitat comprises a very small portion of the survey area however the tidal area appears to be linking habitat from King Bay to Hearson's Cove (east west connection) and may comprise an important flyway between these areas.

The Western Pebble-mound Mouse was identified via an old mound still present in the landscape. This species is thought to be in decline from coastal areas and is now considered extinct from the Burrup Peninsular (Start 1996). The proposed project would not impact on this species.

Eleven additional species are likely to occur in the survey area and include Northern Quoll (*Dasyurus hallucatus*), Pilbara Olive Python (*Liasis olivaceus barroni*), Peregrine Falcon (*Falco peregrinus*), Northern Short-tailed Mouse (*Leggadina lakedownensis*), Lined Soil-crevice Skink (*Notoscincus butleri*), Bridled Tern (*Onychoprion anaethetus*), Wood Sandpiper (*Tringa glareola*), Common Greenshank (*Tringa nebularia*), Oriental Pratincole (*Glareola maldivarum*), Oriental Plover (*Charadrius veredus*) and Common Sandpiper (*Actitis hypoleucos*).

The Northern Quoll and Pilbara Olive Python would be restricted to the Burrup Peninsular on the rocky hills with exposed boulder piles and minor drainage lines in association to rocky hills. Both species are not considered common on the Burrup and by excluding these habitats (particularly the boulder piles) will reduce any impacts to these species during the survey.

The Peregrine Falcon is known from the region and foraging habitat is present for the species however, the habitat available is not critical to the survival of the species (not breeding habitat) and generally restricted to foraging areas of the survey area. Foraging can occur anywhere in the survey area but is sporadic and opportunistic, the works will having little impact on the species.

The Northern Short-tailed Mouse, Lined Soil-crevice Skink have been recorded in the area previously and within 2 km of the survey area. Both species prefer habitats associated to minor drainage lines on plains of either cracking clays or stony soils. Both species are patchily distributed with the Northern Short-tailed Mouse typically a responsive boom/bust species during good and bad times. Where the Lined Soil-crevice Skink is reliant on more stable suitable habitats. Within the investigation area, the minor drainage lines would be considered critical habitat. Additionally in this region due to the open exposed nature of the cracking clays plain these drainage lines provide the only available vegetative corridors from the coast to the surrounding hills in the east. Numerous large bird species were recorded along these drainages line such as the Australian Bustard, White-breasted Sea-eagle and Whistling Kite. Large mammal like the Red Kangaroo were also utilising the corridors. Numerous smaller birds, reptiles and mammals were also recorded in these area.

The Bridled Tern, Wood Sandpiper, Common Greenshank, Oriental Plover and Common Sandpiper have previously been recorded within 2 km of the survey area and habitats are present in the survey area. All of these species may utilise the habitats present in the Mudflat with tidal inundation, Mangroves and supportive scattered Samphire, low chenopod shrublands

and minor drainage line environments but impacts likely minimal to the species. This is due to the opportunistic use of the survey area by the species. As for the migratory birds recorded previously the King Bay to Hearson's Cove areas could be used as a flyway for these species.

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Appendices

Appendix A - (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 *Environmental 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:

- a) Native vegetation should not be cleared if it comprises a high level of biodiversity.
- b) 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.
- c) Native vegetation should not be cleared if it includes, or is necessary, for the continued existence of rare flora.
- d) Native vegetation should not be cleared if it comprises the whole or part of native vegetation in an area that has been extensively cleared.
- e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.
- f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- g) 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.
- h) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

- i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.
- j) 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 in decision-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 currently is free of that pest.

Fauna

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 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 Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna.

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)	<p>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”.</p> <p>Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.</p>
Endangered (EN)	<p>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”.</p> <p>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</p>
Vulnerable (VU)	<p>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”.</p> <p>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.</p>
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 naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).
Specially protected species	
Migratory (MI)	<p>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).</p> <p>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</p>

Conservation category	Definition
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	<p>Poorly-known taxa</p> <p>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.</p>
Priority 2	<p>Poorly-known taxa</p> <p>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.</p>
Priority 3	<p>Poorly-known taxa</p> <p>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.</p>
Priority 4	<p>Rare, Near Threatened and other taxa in need of monitoring</p> <p>A. 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.</p> <p>B. 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.</p> <p>C. Taxa that have been removed from the list of threatened taxa during the past five years for reasons other than taxonomy.</p>

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).

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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 B - (Species Recorded)

Species recorded from the survey area

Family	Genus	Species	Common Name	Status	Observed	Observed
Birds					10-13 June	22-24 July
Acanthizidae	<i>Smicrornis</i>	<i>brevirostris</i>	Weebill		8	
Acanthizidae	<i>Gerygone</i>	<i>tenebrosa</i>	Dusky Gerygone		2	
Accipitridae	<i>Aquila</i>	<i>audax</i>	Wedge-tailed Eagle		2	1
Accipitridae	<i>Circus</i>	<i>assimilis</i>	Spotted Harrier		1	1
Accipitridae	<i>Elanus</i>	<i>axillaris</i>	Black-shouldered Kite		2	1
Accipitridae	<i>Haliaeetus</i>	<i>leucogaster</i>	White-bellied Sea Eagle		4	1
Accipitridae	<i>Haliastur</i>	<i>indus</i>	Brahminy Kite		1	1
Accipitridae	<i>Haliastur</i>	<i>sphenurus</i>	Whistling Kite		3	2
Accipitridae	<i>Milvus</i>	<i>migrans</i>	Black Kite		23	5
Aegothelidae	<i>Aegotheles</i>	<i>cristatus</i>	Australian Owlet-nightjar		1	
Alaudidae	<i>Mirafra</i>	<i>javanica</i>	Horsefield's Bushlark			2
Ardeidae	<i>Egretta</i>	<i>novaehollandiae</i>	White-faced Heron		1	
Artamidae	<i>Artamus</i>	<i>cinereus</i>	Black-faced Woodswallow		8	2
Artamidae	<i>Artamus</i>	<i>leucorhynchus</i>	White-breasted Woodswallow		2	
Artamidae	<i>Artamus</i>	<i>minor</i>	Little Woodswallow		2	
Artamidae	<i>Cracticus</i>	<i>nigrogularis</i>	Pied Butcherbird		2	3
Burhinidae	<i>Burhinus</i>	<i>grallarius</i>	Bush Stone-curlew		3	3
Cacatuidae	<i>Cacatua</i>	<i>sanguinea</i>	Little Corella		24	12
Cacatuidae	<i>Eolophus</i>	<i>roseicapilla</i>	Galah		60	26
Cacatuidae	<i>Nymphicus</i>	<i>hollandicus</i>	Cockatiel		8	6
Campephagidae	<i>Coracina</i>	<i>novaehollandiae</i>	Black-faced Cuckoo-Shrike		3	1
Campephagidae	<i>Lalage</i>	<i>sueurii</i>	White-winged Triller		4	
Charadriidae	<i>Charadrius</i>	<i>ruficapillus</i>	Red-capped Plover		2	
Columbidae	<i>Phaps</i>	<i>chalcoptera</i>	Common Bronzewing			1
Columbidae	<i>Geophaps</i>	<i>plumifera</i>	Spinifex Pigeon		12	7
Columbidae	<i>Geopelia</i>	<i>cuneata</i>	Diamond Dove		4	
Columbidae	<i>Geopelia</i>	<i>striata</i>	Peaceful Dove		2	

Family	Genus	Species	Common Name	Status	Observed	Observed
Columbidae	<i>Ocyphaps</i>	<i>lophotes</i>	Crested Pigeon		4	6
Corvidae	<i>Corvus</i>	<i>orru</i>	Torresian Crow		4	6
Cuculidae	<i>Chalcites</i>	<i>basilis</i>	Horsefield's Bronze-cuckoo			1
Cuculidae	<i>Cacomantis</i>	<i>pallidus</i>	Pallid Cuckoo		1	
Estrildidae	<i>Emblema</i>	<i>pictum</i>	Painted Finch		4	
Estrildidae	<i>Taeniopygia</i>	<i>guttata</i>	Zebra Finch		52	18
Falconidae	<i>Falco</i>	<i>cenchroides</i>	Nankeen Kestrel		2	5
Falconidae	<i>Falco</i>	<i>berigora</i>	Brown Falcon		2	3
Falconidae	<i>Falco</i>	<i>longipennis</i>	Hobby Falcon		1	
Haematopodidae	<i>Haematopus</i>	<i>longirostris</i>	Australian Pied Oystercatcher		2	
Halcyonidae	<i>Todiramphus</i>	<i>pyrrhopygius</i>	Red-backed Kingfisher		6	1
Hirundinidae	<i>Hirundo</i>	<i>neoxena</i>	Welcome Swallow		5	
Hirundinidae	<i>Petrochelidon</i>	<i>nigricans</i>	Tree Martin		3	6
Laridae	<i>Chroicocephalus</i>	<i>novaehollandiae</i>	Silver Gull		4	
Laridae	<i>Gelochelidon</i>	<i>nilotica</i>	Gull-billed Tern	Mi, IA	1	
Laridae	<i>Hydroprogne</i>	<i>caspia</i>	Caspian Tern	Mi, IA	1	
Laridae	<i>Thalasseus</i>	<i>bergii</i>	Crested Tern	Mi, IA	4	
Maluridae	<i>Malurus</i>	<i>lamberti</i>	Variiegated Fairy-wren			4
Maluridae	<i>Malurus</i>	<i>leucopterus</i>	White-winged Fairy-wren			6
Megaluridae	<i>Cincloramphus</i>	<i>cruralis</i>	Brown Songlark		5	1
Megaluridae	<i>Cincloramphus</i>	<i>mathewsi</i>	Rufous Songlark		13	5
Megaluridae	<i>Eremiornis</i>	<i>carteri</i>	Spinifexbird			2
Meliphagidae	<i>Epthianura</i>	<i>tricolor</i>	Crimson Chat		8	6
Meliphagidae	<i>Lichenostomus</i>	<i>penicillatus</i>	White-plumed Honeyeater		14	2
Meliphagidae	<i>Lichenostomus</i>	<i>virescens</i>	Singing Honeyeater		5	4
Meliphagidae	<i>Lichmera</i>	<i>indistincta</i>	Brown Honeyeater		1	
Meliphagidae	<i>Manorina</i>	<i>flavigula</i>	Yellow-throated Miner		16	4
Meropidae	<i>Merops</i>	<i>ornatus</i>	Rainbow Bee-eater		4	4
Monarchidae	<i>Grallina</i>	<i>cyanoleuca</i>	Magpie-lark		4	1
Motacillidae	<i>Anthus</i>	<i>novaeseelandiae</i>	Australasian Pipit		3	2

Family	Genus	Species	Common Name	Status	Observed	Observed
Otididae	<i>Ardeotis</i>	<i>australis</i>	Australian Bustard			prints
Pachycephalidae	<i>Colluricincla</i>	<i>harmonica</i>	Grey Shrike-thrush		1	
Psittacidae	<i>Barnardius</i>	<i>zonarius</i>	Port Lincoln Parrot		2	
Psittacidae	<i>Melopsittacus</i>	<i>undulatus</i>	Budgerigar		18	24
Ptilonorhynchidae	<i>Ptilonorhynchus</i>	<i>guttatus</i>	Western Bowerbird		1	
Recurvirostridae	<i>Himantopus</i>	<i>himantopus</i>	Black-winged Stilt		5	
Rhipiduridae	<i>Rhipidura</i>	<i>leucophrys</i>	Willie Wagtail		4	6
Scolopacidae	<i>Numenius</i>	<i>phaeopus</i>	Whimbrel	Mi, IA	1	
Threskiornithidae	<i>Threskiornis</i>	<i>spinicollis</i>	Straw-necked Ibis		6	
Tunicidae	<i>Turnix</i>	<i>velox</i>	Little Button-quail		2	
Zosteropidae	<i>Zosterops</i>	<i>luteus</i>	Yellow White-eye		6	
Reptiles						
Agamidae	<i>Gowidon</i>	<i>longirostris</i>	Long-snouted Water Dragon		1	
Agamidae	<i>Ctenophorus</i>	<i>caudicinctus caudicinctus</i>	Ringtail Dragon		4	
Agamidae	<i>Ctenophorus</i>	<i>isolepis isolepis</i>	Central Military Dragon		6	
Gekkonidae	<i>Gehyra</i>	<i>peninsularis</i>	Burrup Peninsular Dtella		1	
Gekkonidae	<i>Gehyra</i>	<i>punctata</i>	Spotted Dtella		3	
Gekkonidae	<i>Gehyra</i>	<i>variegata or crypta</i>	Dtella		1	3
Gekkonidae	<i>Gehyra</i>	<i>variegata</i>	Tree Dtella			1
Gekkonidae	<i>Heteronotia</i>	<i>binoei</i>	Bynoe's Gecko		2	5
Scincidae	<i>Cryptoblepharus</i>	<i>ustulatus</i>	Russet Snake-eyed Skink		1	
Scincidae	<i>Ctenotus</i>	<i>pantherinus ocellifer</i>	Panther's Skink		3	1
Scincidae	<i>Ctenotus</i>	<i>saxatilis</i>	Rock Ctenotus		7	1
Scincidae	<i>Lerista</i>	<i>clara</i>	Sharp-blazed Three-toed Skink		3	
Scincidae	<i>Lerista</i>	<i>onsloviana</i>	Onslow Broad-striped Slider		4	
Scincidae	<i>Menetia</i>	<i>surda surda</i>	Surd's Dwarf Skink		1	
Scincidae	<i>Morethia</i>	<i>ruficauda exquisita</i>	Fire-tailed Skink		1	
Varanidae	<i>Varanus</i>	<i>acanthurus</i>	Ridge-tailed Monitor		1	
Varanidae	<i>Varanus</i>	<i>panoptes rubidus</i>	Yellow spotted Monitor		1	1
Mammals						

Family	Genus	Species	Common Name	Status	Observed	Observed
Bovidae	<i>Bos</i>	<i>taurus</i>	Cow	intro		scats
Canidae	<i>Canus</i>	<i>lupis domesticus</i>	Dog	intro	1	scats
Dasyuridae	<i>Pseudantechinus</i>	<i>woolleyae</i>	Woolley's Pseudantechinus		camera	
Emballonuridae	<i>Taphozous</i>	<i>georgianus</i>	Common Sheath-tail-bat		D	
Felidae	<i>Felis</i>	<i>catus</i>	Cat	intro	camera, 1	prints
Macropodidae	<i>Macropus</i>	<i>robustus</i>	Euro		14	2
Macropodidae	<i>Macropus</i>	<i>rufus</i>	Red Kangaroo			12
Macropodidae	<i>Petrogale</i>	<i>rothchildi</i>	Rothchild's Rock Wallaby		camera	
Molossidae	<i>Austronomus</i>	<i>australis</i>	White-striped freetail Bat		D	X
Molossidae	<i>Chaerephon</i>	<i>jobensis</i>	Northern Freetail Bat		PR	
Molossidae	<i>Mormopetrus</i>	<i>Ozimops cobourgianus</i>	North-western Free-tail Bat	P1	PR	
Molossidae	<i>Mormopetrus</i>	<i>Ozimops lumsdenae</i>	Northern Free-tail Bat		PR	
Muridae	<i>Pseudomys</i>	<i>chapmani</i>	Pilbara Pebble-mound Mouse	P4	mound	
Muridae	<i>Rattus</i>	<i>rattus</i>	Black Rat	intro	camera	
Tachyglossidae	<i>Tachyglossus</i>	<i>aculeatus</i>	Echidna		X	digs
Vespertilionidae	<i>Vespadelus</i>	<i>finlaysoni</i>	Inland Cave Bat		D	

Key

3, numbers recorded

intro, introduced species

camera, identified via remote camera

X, Present, identified from echolocation

Pr, Probable, probably present identified from echolocation either as this species or to species group

Mi, Migratory under EPBC Act

IA, International Agreement under BC Act

P1, 4, Priority species under DBCA

Appendix C - (Likelihood of Occurrence)

Parameters of fauna likelihood of occurrence assessment

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 5 km of the survey area however: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: Survey area = a 20 km buffer around the survey area

Source information - desktop searches

PMST – DoEE Protected Matters Search Tool (PMST) to identify fauna listed under the EPBC Act potentially occurring within the survey area

DBCA – DBCA (2007 -) records of threatened fauna, database search within the survey area (accessed March 2019)

NM – DBCA NatureMap (accessed March 2019)

Table 8 Fauna likelihood of occurrence assessment

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Birds								
Common Sandpiper <i>(Actitis hypoleucos)</i>	IA	Mi	X	X	X	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 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). 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).	This species has been recorded within 20 km of the survey area, habitat is present for the species adjacent to the survey area.	Likely – habitat present and previously recorded in the area, however use is opportunistic.
Ruddy Turnstone <i>(Arenaria interpres)</i>	IA	Mi	X		X	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. Surveys demonstrate that the species can live away from coastal areas in habitats such river beds, and on inland lakes and adjacent farmland (Higgins & Davies 1996).	This species has been recorded within 20 km of the survey area, habitat is present for the species adjacent to the survey area.	Unlikely – however use is opportunistic, limited and irregular.

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Curlew Sandpiper <i>(Calidris ferruginea)</i>	Cr	Cr	X	X	X	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. 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. (Higgins & Davies 1996).	This species has been recorded within 20 km of the survey area, habitat is present for the species adjacent to the survey area.	Unlikely – however use is opportunistic, limited and irregular.
Red Knot <i>(Caladris canutus)</i>	IA	EN	X	X	X	In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps (Higgins & Davies 1996).	This species has been recorded within 20 km of the survey area, habitat is present for the species adjacent to the survey area.	Unlikely – however use is opportunistic, limited and irregular.

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Greater Knot <i>(Calidris tenuirostris)</i>	Cr	CR	X	X	X	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).	This species has been recorded within 20 km of the survey area, habitat is present for the species adjacent to the survey area.	Unlikely – however use is opportunistic, limited and irregular.
Greater Sand Plover <i>(Charadrius leschenaultii)</i>	Vu	VU	X	X	X	In the non-breeding grounds in Australasia, the species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. They are occasionally recorded on near-coastal saltworks and saltlakes, including marginal saltmarsh, and on brackish swamps (Stewart et al. 2007).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Unlikely – opportunistic visitor/no suitable habitat for the species in the survey area

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Lesser Sand Plover <i>(Charadrius mongolus)</i>	En	EN	X	X	X	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 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).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Unlikely – opportunistic visitor/no suitable habitat for the species in the survey area
Bar-tailed Godwit <i>(Limosa lapponica baueri)</i> Western Alaskan Population	Vu	VU	X	X	X	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).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Unlikely – opportunistic visitor/no suitable habitat for the species in the survey area
Bar-tailed Godwit <i>(Limosa lapponica menzbieri)</i> Northern Siberian Population	Cr	CR		X	X	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).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Unlikely – opportunistic visitor/no suitable habitat for the species in the survey area

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Black-tailed Godwit <i>(Limosa limosa)</i>	IA	MI	X	X	X	In Australia the Black-tailed Godwit has a primarily coastal habitat environment. The species is commonly found in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit; occasionally recorded on rocky coasts or coral islets. The use of habitat often depends on the stage of the tide. It is also found in shallow and sparsely vegetated, near-coastal, wetlands; such as saltmarsh, saltflats, river pools, swamps, lagoons and floodplains. There are a few inland records, around shallow, freshwater and saline lakes, swamps, dams and bore-overflows. They also use lagoons in sewage farms and saltworks (Higgins & Davies 1996).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Unlikely – opportunistic visitor/no suitable habitat for the species in the survey area
Eastern Curlew <i>(Numenius madagascariensis)</i>	Vu	CR	X	X	X	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 islets. The Eastern Curlew forages on soft, sheltered, intertidal sand- or mudflats, often near mangroves, on saltflats, saltmarshes, rock pools, 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 reef-flats, in the shallow water of lagoons, near-coastal wetlands and trees (Morcombe 2004).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Unlikely – opportunistic visitor/no suitable habitat for the species in the survey area

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Little Curlew <i>(Numenius minutus)</i>	IA	Mi	X		X	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).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Unlikely – opportunistic visitor/no suitable habitat for the species in the survey area
Whimbrel <i>(Numenius phaeopus)</i>	IA	Mi	X	X	X	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, un-vegetated 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 (Higgins & Davies 1996). There are a small number of inland records from saline lakes and canegrass swamps (Jarman 1978). It has also been recorded in coastal dunes and on a football field (Smith & Chafer 1987).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Present – however use is opportunistic, limited and irregular with limited habitat present.

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Osprey <i>(Pandion haliaetus)</i>	IA	Mi	X	X	X	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 (Marchant & Higgins 1993). 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. Often nests in elevated artificial structures.	This species has been recorded within 20 km of the survey area, habitat is present for the species adjacent to the survey area.	Unlikely – however use is opportunistic, limited and irregular.
Red-necked Phalarope <i>(Phalaropus lobatus)</i>	IA	Mi		X		During the non-breeding period the Red-necked Phalarope occurs mainly at sea. It is commonly sighted in Australia from mid-October to early-April, where it is recorded at both inland and coastal lakes/swamps, including highly saline waters and artificial wetlands notably saltworks. In WA the species has been seen on Rottnest Island, Pelican Point, the Swan River, Port Hedland Saltworks, the Eyre Bird Observatory and Hinds Lake Nature Reserve (DotE 2016).	The species has not been recorded within 20 km of the survey area. Although some habitat is present the species is irregularly observed and utilises available habitats opportunistically.	Unlikely –rare and opportunistic visitor/some habitat for the species in the survey area

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Sanderling (<i>Calidris alba</i>)	IA	Mi	X		X	In Australia, the Sanderling 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. There are rare inland records from sandy shores of ephemeral brackish lakes and brackish river-pools. They occur on most of the coast from Eyre to Derby, and also around Wyndham. They are more often recorded on the south and southwest coasts, north to around southern Shark Bay, with more sparsely scattered records further north in Gascoyne and Pilbara Regions and the Kimberley Division (DotE 2016).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Unlikely – opportunistic visitor/no suitable habitat for the species in the survey area
Red-necked Stint (<i>Calidris ruficollis</i>)	IA	Mi	X		X	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 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).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Unlikely – opportunistic visitor/no suitable habitat for the species in the survey area

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Long-toed Stint <i>(Calidris subminuta)</i>	IA	Mi	X		X	In Australia, the Long-toed Stint occurs in a variety of terrestrial wetlands. They prefer shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species is also fond of areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire. It has also been observed at open, less vegetated shores of larger lakes and ponds and is common on muddy fringes of drying ephemeral lakes and swamps. The Long-toed Stint also frequents permanent wetlands such as reservoirs and artificial lakes. They are uncommon, but not unknown, at tidal estuaries, saline lakes, saltponds and bore swamps (Higgins & Davies 1996). The Long-toed Stint forages on wet mud or in shallow water, often among short grass, weeds and other vegetation on islets or around the edges of wetlands. They occasionally feed on open water, well away from the shore; this is more common in drying ephemeral wetlands. They roost or loaf in sparse vegetation at the edges of wetlands and on damp mud near shallow water. It also roosts in small depressions in the mud (Higgins & Davies 1996).	This species has been recorded within 20 km of the survey area, however no habitat is present for the species.	Unlikely – opportunistic visitor/no suitable habitat for the species in the survey area
Pin-tailed Snipe <i>(Gallinago stenura)</i>	IA	Mi	X		X	During non-breeding periods the Pin-tailed Snipe occurs most often in or at the edges of shallow freshwater swamps, ponds and lakes with emergent, sparse to dense cover of grass/sedge or other vegetation. The species is also found in drier, more open wetlands such as claypans in more arid parts of species' range. It is also commonly seen at sewage ponds; not normally in saline or inter-tidal wetlands. In WA the species was reported in the Pilbara, Port Headland, Myaree Pool, Maitland River and near Karratha. In Pilbara the distribution is believed to be bound by Pardoo (Banningarra Spring) and the lower Maitland River and Shay Gap (DotE 2016).	Some habitat is present around the saltworks area however this area lacks dense cover in which this species prefers.	Unlikely – Some habitat present, not typical for this species.

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Night Parrot <i>(Pezoporus occidentalis)</i>	Cr	En		X		The Night Parrot inhabits arid and semi-arid inland areas that are characterised by having dense, low vegetation. Based on accepted records, the habitat of the Night Parrot consists of <i>Triodia</i> grasslands in stony or sandy environments and of samphire and chenopod shrublands, including genera such as <i>Atriplex</i> , <i>Bassia</i> and <i>Maireana</i> , on floodplains and claypans, and on the margins of saltlakes, creeks or other sources of water (Parker, 1980). It has also been observed to enter dense <i>Muehlenbecki</i> growth when flushed from a more typical habitat (Boles et al. 1994).	Some habitat present with the investigation area, however the species has not been recorded in the region. Also this area is outside of the modelled distribution for the species.	Unlikely – Not known from the region.
Australian Painted Snipe <i>(Rostratula australis)</i>	En	En		X		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).	Some habitat is present around the saltworks area however this area lacks dense cover in which this species prefers.	Unlikely – Some habitat present, not typical for this species.
Gull-billed Tern <i>(Gelocheidon nilotica)</i>	IA	Mi	X		X	The Gull-billed Tern is nomadic or migratory species in Australia. Gull-billed Terns are found in freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands, where resources are favourable (Morcombe 2004). They are only rarely found over the ocean. The Gull-billed Tern. Although essentially an inland species, outside breeding season it shows a distinct preference for saltmarshes and lagoons near the coast. Movements are not fully understood but it is common and widespread in Australia (Morcombe 2004).	Some habitat is present around the saltworks area however the species prefers coastal fringe or open waters, opportunistic use may occur.	Present – however use is opportunistic, limited and irregular with limited habitat present.

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
White-winged Black Tern <i>(Chlidonias leucopterus)</i>	IA		X		X	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. 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 occasionally recorded along the southern coast (DotE 2016).	Some habitat is present around the saltworks area however the species prefers coastal fringe or open waters, opportunistic use may occur.	Unlikely – Some habitat present, not typical for this species.
Bridled Tern <i>(Onychoprion anaethetus)</i>	IA	Ma	X	X	X	Bridled Terns occupy tropical and subtropical seas, breeding on islands, including vegetated coral cays, rocky continental islands and rock stacks. They are only rarely found in inshore continental waters and along mainland coastlines, though the species is reported to breed on the mainland of far southern WA. In WA, breeding is widespread from islands off Cape Leeuwin north to Shark Bay and in Pilbara region and Kimberley Division. At sea, distribution extends from Cape Leeuwin north to Dirk Hartog Island, with isolated mainland coastal records at Point Maud and Ningaloo, and from Barrow Island to the Dampier Archipelago, and at sea off the Kimberley coast from waters west of the Dampier Peninsula to Ashmore Reef and Joseph Bonaparte Gulf (DotE 2016).	This species has been recorded within 1 km of the survey area in the saltworks and breeding recorded within the Maitland Industrial Estate, however limited habitat is present for the species in the survey area.	Likely –however use is opportunistic, limited and irregular.

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Roseate Tern <i>(Sterna dougallii)</i>	IA	Ma	X	X	X	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).	This species has been recorded within 1 km of the survey area in the saltworks, however limited habitat is present for the species in the survey area.	Unlikely – however use is opportunistic, limited and irregular.
Common Tern <i>(Sterna hirundo)</i>	IA	Mi	X		X	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. 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. In WA, the species is rarely recorded south of approximately 30° S, with only scattered records north of there to the Kimberley Division (DotE 2016).	This species has been recorded within 1 km of the survey area in the saltworks, however limited habitat is present for the species in the survey area.	Unlikely – however use is opportunistic, limited and irregular.

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Little Tern <i>(Sternula albifrons)</i>	IA	Mi	X		X	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).	This species has been recorded within 2 km of the survey area in the saltworks, however limited habitat is present for the species in the survey area.	Unlikely – however use is opportunistic, limited and irregular.
Caspian Tern <i>(Sterna caspia)</i>	IA	Mi	X	X	X	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, 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). 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).	This species has been recorded within 1 km of the survey area in the saltworks, however limited habitat is present for the species in the survey area.	Present – however use is opportunistic, limited and irregular with limited habitat present.

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	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Crested Tern <i>(Thalasseus bergii)</i>	IA	Ma	X	X	X	A common tern to coastal regions of Australia. A large species with a large straw yellow bill, white body and black legs. The black cap and slight crest is also evident. The species preferred habitat is primarily coastal and off shore waters including beaches, bays, inlets, tidal rivers, swamps, lakes and large rivers (Higgins & Davis 1996).	This species has been recorded within 1 km of the survey area in the saltworks, however limited habitat is present for the species in the survey area.	Present – however use is opportunistic, limited and irregular with limited habitat present.
Australian Fairy Tern <i>(Sternula nereis subsp. nereis)</i>	VU	VU	X	X	X	The habitat of the fairy tern is essentially marine, including sheltered coasts, bays, inlets, estuaries, coastal lagoons, ocean beaches but rarely out to sea or out of sight of land. They also inhabit wetlands near the coast including salt ponds and lakes. This species favours sites with sand spits and small sand islets in river mouth channels (Morcombe 2004).	This species has been recorded within 1 km of the survey area in the saltworks, however limited habitat is present for the species in the survey area.	Unlikely – however use is opportunistic, limited and irregular.
Grey-tailed Tattler <i>(Tringa brevipes)</i>	P4, IA	Ma, Mi,	X	X	X	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. 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).	This species has been recorded within 1 km of the survey area, habitat is present for the species adjacent to the survey area.	Unlikely – however use is opportunistic, limited and irregular.

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Marsh Sandpiper <i>(Tringa stagnatilis)</i>	IA	Mi	X	X	X	The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, salt pans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In north Australia they prefer intertidal mudflats (Higgins & Davies 1996), although surveys in Kakadu recorded more birds around shallow freshwater lakes than in areas influenced by tide (Bamford 1988). Three of the five sites with highest recorded numbers are saltwater habitats (Hunter Estuary, NSW; Port Hedland Saltworks, Western Australia; Tullakool Evaporation Ponds, NSW) (Watkins 1993). In Western Australia they prefer freshwater to marine environments. In south-east Australia they prefer inland saline lakes and coastal saltworks. They are found infrequently around mangroves (Higgins & Davies 1996).	This species has been recorded within 1 km of the survey area, habitat is present for the species adjacent to the survey area.	Unlikely – however use is opportunistic, limited and irregular.
Common Redshank <i>(Tringa totanus)</i>	IA	Mi		X		The Common Redshank is found at sheltered coastal wetlands such as bays, river estuaries, lagoons, inlets and saltmarsh (with bare open flats and banks of mud or sand). They are also found around saltlakes, freshwater lagoons, artificial wetlands and saltworks and sewage farms (Higgins & Davies 1996). The Common Redshank has been observed feeding in shallow water, on wet bare mud or sand, or on algal deposits, round the edges of wetlands, near rocks or samphire (Higgins & Davies 1996). They have been recorded roosting on small elevated areas such as estuarine sandbars and muddy islets surrounded by water (Higgins & Davies 1996).	Some habitat present however no records of the species are present in the region	Unlikely – Limited habitat present, opportunistically use of the area

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Broad-billed Sandpiper <i>(Limicola falcinellus)</i>	IA	Mi	X		X	<p>The Broad-billed Sandpiper occurs in sheltered parts of the coast, favouring estuarine mudflats but also occasionally occur on saltmarshes, shallow freshwater lagoons, saltworks and sewage farms, and in areas with large soft intertidal mudflats, which may have shell or sandbanks nearby. Occasionally they occur on reefs or rocky platforms. They have also been recorded in creeks, swamps and lakes near the coast, particularly those with bare mudflats or sand exposed by receding water. They often favour mud among, or fringed by, mangroves, particularly on the seaward side and sometimes occur in estuaries edged by saltmarsh. They are rarely recorded inland. Foraging occurs on exposed flats of soft mud or wet sand at edges of coastal and near-coastal wetlands, often around channels on mudflats or in accumulated mud in swales between shell banks. In northern Australia, they forage in soft mud near mangroves, but may remain on same muddy section, even though fresher substrate may be exposed by the receding tide. They also forage in shallow water on muddy edges of ponds. They roost on the banks of sheltered sandy, shelly or shingly beaches (Higgins & Davies 1996). They nest on the ground, frequently in the top of a tussock (Cramp 1985).</p>	<p>This species has been recorded within 2 km of the survey area, habitat is present for the species in and adjacent to the survey area.</p>	<p>Unlikely – however use is opportunistic, limited and irregular.</p>

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Peregrine Falcon <i>(Falco peregrinus)</i>	OS		X		X	The Peregrine Falcon is uncommon but wide-ranging across Australia. Habitat is extremely diverse, from rainforest to arid scrub, from coastal heath to alpine. The Peregrine Falcon nests primarily on ledges of cliffs, shallow tree hollows, and ledges of building in cities (Morcombe 2004).	The survey area provides suitable hunting habitat. The survey area is probably part of the species broader home range, no breeding habitat occurs within the survey area. Numerous records are present (particularly Burrup Peninsula).	Likely – regular visitor or resident to survey area, foraging habitat only
Sharp-tailed Sandpiper <i>(Calidris acuminata)</i>	IA	Mi	X	X	X	In WA, scattered records occur along the Nullarbor Plain and the southern areas of the Great Victoria Desert. They are widespread from Cape Arid to Carnarvon, around coastal and subcoastal plains of Pilbara Region to south-west and east Kimberley Division. Inland records indicate the species is widespread and scattered from Newman, east to Lake Cohen, south to Boulder and west to Meekatharra (Higgins & Davies 1996). The Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation including lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, salt pans and hypersaline salt lakes inland. They use flooded paddocks, sedgeland and other ephemeral wetlands, but leave when they dry. They tend to occupy coastal mudflats mainly after ephemeral. Sometimes they occur on rocky shores and rarely on exposed reefs (Higgins & Davies 1996). They have also been recorded roosting in mangroves (Minton & Whitelaw 2000).	This species has been recorded within and adjacent to the survey area, habitat is present for the species adjacent to the survey area.	Unlikely – however use is opportunistic, limited and irregular.

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	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Grey Plover <i>(Pluvialis squatarola)</i>	IA	Mi	X	X	X	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).	This species has been recorded within 1 km of the survey area, habitat is present for the species in and adjacent to the survey area.	Unlikely – however use is opportunistic, limited and irregular.
Pacific Golden Plover <i>(Pluvialis fulva)</i>	IA	Mi	X	X	X	In Australia the Pacific Golden Plover usually inhabits coastal habitats, on beaches, mudflats and sandflats (sometimes in vegetation such as mangroves, low saltmarsh such as <i>Sarcocornia</i> , or beds of seagrass) in sheltered areas including harbours, estuaries and lagoons, and also in saltworks. It is sometimes recorded on islands, sand and coral cays and exposed reefs and rocks. They are less often recorded in terrestrial habitats, but can be seen in habitats with short grass in paddocks, crops or airstrips, or ploughed or recently burnt areas. In WA, the species is seldom recorded along the southern or south-western coasts (DotE 2016).	This species has been recorded within 2 km of the survey area, habitat is present for the species in and adjacent to the survey area.	Unlikely – however use is opportunistic, limited and irregular.
Oriental Plover <i>(Charadrius veredus)</i>	IA	Mi	X	X	X	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 paddocks, playing fields, lawns and cattle camps or open areas that have been recently burnt (Storr, 1980).	This species has been recorded within 2 km of the survey area, habitat is present for the species in and adjacent to the survey area.	Likely –however use is opportunistic, limited and irregular.

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Fork-tailed Swift <i>(Apus pacificus)</i>	IA	Mi	X	X	X	In 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 Port Hedland, 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).	No habitat present and the species is predominantly aerial utilising terrestrial environments rarely.	Unlikely – No habitat present, not known from the survey area. Use would be very opportunistic and rare.
Oriental Pratincole <i>(Glareola maldivarum)</i>	IA	Mi	X	X	X	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).	This species has been recorded within 20 km of the survey area, habitat is present for the species in and adjacent to the survey area.	Likely –however use is opportunistic, limited and irregular.
Common Greenshank <i>(Tringa nebularia)</i>	IA	Mi	X	X	X	The Common Greenshank does not breed in Australia; however, the species occurs in all types of wetland and has the widest distribution of any shorebird in Australia (DSEWPaC 2013).	This species has been recorded within 20 km of the survey area and some habitat is present for the species. This species is known to utilise habitats in the Pilbara. Numerous records occur at Karratha and region.	Likely – opportunistic visitor/use in/to the survey area

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	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Pectoral Sandpiper <i>(Calidris melanotos)</i>	IA	MI		X		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).	Some habitat present however the habitat present is associated with salt works operations. No records of the species are present in the region	Unlikely – Limited habitat present, opportunistically use of the area
Terek Sandpiper <i>(Xenus cinereus)</i>	IA	Mi	X	X	X	The Terek Sandpiper mostly forages in the open, on soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons. The species has also been recorded on islets, mudbanks, sandbanks and spits, and near mangroves and occasionally in samphire (<i>Halosarcia</i> spp.). Birds are seldom near the edge of water, however, birds may wade into the water (Marchant & Higgins 1993). Less often seen on sandy or shingle beaches, or on rock or coral reefs or platforms, Terek Sandpipers are occasionally sighted around drying sewage ponds and saltpans if surrounded by mudflats. The species is also found around brackish coastal swamps, lagoons and dune-lakes; and also on gravel or rocky edges of estuarine pools and freshwater river-pools (Marchant & Higgins 1993). Very occasionally, birds use swampy, grassy or cultivated paddocks near the coast (Marchant & Higgins 1993). Preferring to roost in or among mangroves, birds may perch in branches or roots up to 2 m from the ground, or beneath them in the shade on hot days. Occasionally, they roost in dead trees or among tangled driftwood. Elsewhere, they may roost with other waders on flat shores, on muddy spits, islets or banks, and sometimes on sandy and pebbly beaches (Marchant & Higgins 1993).	Some habitat present however the habitat present is associated with salt works operations. No records of the species are present in the salt works. Several records are present in surrounding coastal habitats.	Unlikely – Limited habitat present, opportunistically use of the area

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Wood Sandpiper (<i>Tringa glareola</i>)	IA	Mi	X		X	The Wood Sandpiper is a seasonal visitor to Australia and has its largest numbers recorded in north-west Australia (Roebuck Bay near to Broome). Off the Tringa group (like the Common Greenshank) the Wood Sandpiper utilises a broad range of habitat types throughout Western Australia. Typical habitat includes well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. This species does not breed in Australia (DSEWPaC 2013).	This species has been recorded within 20 km of the survey area and habitat is present for the species. This species is known to persist in the Pilbara. Numerous records occur at Karratha and Cape Lambert.	Likely – opportunistic visitor/use in/to the survey area
Barn Swallow (<i>Hirundo rustica</i>)	IA	Mi	X	X	X	In Australia, the Barn Swallow is recorded in open country in coastal lowlands, often near 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 (Schodde et al 1999).	No habitat present and the species has not been recorded in the survey area. Four records are present and associated to the estuary side of the saltworks	Unlikely – No habitat present, not known from the survey area.
Glossy Ibis (<i>Plegadis falcinellus</i>)	IA	Mi	X		X	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 habitat is inland and northern floodplains (Marchant & Higgins 1993).	No habitat present and the species has not been recorded in the immediate area.	Unlikely – No habitat present, not known from the area.
Grey Wagtail (<i>Motacilla cinerea</i>)	IA	Mi		X		A migratory species that regularly visits northern Australia particularly the area from Broome to Darwin (Morcombe 2004). The species prefers coastal habitat near to water where it prefers	Some habitat present and the species has not	Unlikely – Limited habitat present, not known from the

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	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
						to forage. However the species has been recorded further inland feeding on plains (Morcombe 2004).	been recorded in the immediate area.	area. Can opportunistically use and area
Yellow Wagtail <i>(Motacilla cinerea)</i>	IA	Mi		X		A migratory species that regularly visits northern Australia particularly the area from Broome to Darwin (Morcombe 2004). The species prefers coastal habitat near to water where it prefers to forage. However the species has been recorded further inland feeding on plains (Morcombe 2004).	Some habitat present and the species has not been recorded in the immediate area.	Unlikely – Limited habitat present, not known from the area. Can opportunistically use and area
Reptiles								
Airlie Island Skink <i>(Ctenotus angusticeps)</i>	P3	VU	X	X	X	This species was formerly known from only two widely separated localities in Western Australia: Airlie Island, off the north-west coast and Roebuck Bay, just south of Broome. On Airlie Island it inhabits Acacia shrublands, coastal spinifex and tussock grasses. On the mainland, the Airlie Island Ctenotus generally inhabits samphire shrubland in the intertidal zone along mangrove (Grey Mangrove (<i>Avicennia marina</i>) with occasional Red Mangrove (<i>Rhizophora stylosa</i>) margins, however, subtle differences in vegetation/topography exist among sites where the species has been recorded. The Roebuck Bay lizards have been observed on coastal mudflats vegetated with samphire (Wilson and Swan 2017). Recent surveys determined the species' distribution between Karratha and Broome therefore showing the distribution of this species is more widespread than previously thought.	The survey area provides no habitat for the species as it is associated with samphire and mudflats typically fringing mangroves and where crab holes are present. The species has been recorded 3 km west of the survey area in the samphire areas fringing the coastal mudflats.	Unlikely– small amount of habitat present within survey area, but no specimens recorded

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Lined Soil-crevice Skink <i>(Notoscincus butleri)</i>	P4		X		X	<i>Notoscincus butleri</i> is a pale coppery-brown skink with bold black vertebral and dorsal stripes, broad black upper lateral stripes, white mid-lateral stripes and a narrow dark ventrolateral stripe. This species range is restricted to arid, rocky areas of near-coastal Pilbara region. Habitat is found in spinifex dominated areas near creek and river margins (Wilson and Swan 2017).	The survey area provides extensive suitable habitat for the species (hummock and tussock grasslands near drainage lines). There are historical records near to the survey area and numerous records occur within 20 km (particularly Karratha).	Likely – resident within the survey area
Pilbara Olive Python <i>(Liasis olivaceus subsp. barroni)</i>	VU	VU	X	X	X	The Olive Python (Pilbara subspecies) is a dull olive-brown to pale fawn or rich-brown python with a white underside and pale finely dotted lips. This species reaches an average size of 2.5 m but can grow up to 4 m long. The Olive Python's range is restricted to the Pilbara region, north Western Australia, and the Dampier Archipelago. Habitat consists of rocky escarpments, gorges and waterholes within the Pilbara region. The preferred microhabitats for this species are under rock piles, on top of rocks, and under spinifex as well as in man-made features such as overburden heaps, railway embankments and sewerage treatment ponds. The species' breeding season occurs from June to August, with males moving long distances in search of breeding females (Wilson and Swan 2017).	The survey area provides some habitat for the species. The minor drainage lines would be regarded as limited habitat for the species. The remainder of the habitat in the survey area is supportive only. There are records close to the survey area on the Burrup Peninsula.	Likely – However irregular visitor, opportunistic use along minor drainage lines and rock piles
Mammals								

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	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Northern Quoll <i>(Dasyurus hallucatus)</i>	En	En	X	X	X	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 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).	The species is known from the region, particularly from rocky areas or along drainage lines with wooded areas. Very limited habitat appears to be present for this species.	Likely – habitat present opportunistic use along minor drainage lines and rock piles
Northern Short-tailed Mouse <i>(Leggadina lakedownensis)</i>	P4		X		X	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 sedgeland, 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).	The survey area provides extensive suitable habitat for the species (hummock and tussock grasslands on clay plains). There are historical records near to the survey area and numerous records occur within 20 km (particularly Karratha).	Likely – resident within the survey area on the plain and in minor drainage lines

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Western Pebble-mound Mouse <i>(Pseudomys chapmani)</i>	P4		X		X	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).	The survey area provides minimal habitat for the species as it is associated with rocky ranges and associated rocky habitats. Numerous records occur within 20 km (particularly Burrup Peninsula, hills behind Karratha and Cape Lambert areas). The populations on Burrup and around Karratha are presumed locally extinct.	Present –An old mound was recorded within survey area, restricted to the rocky ranges. The species maybe locally extinct on the Burrup Peninsular
Water Rat <i>(Hydromys chrysogaster)</i>	P4		X		X	The Water Rat lives in the vicinity of permanent bodies of fresh or brackish water, from sub-alpine streams to lakes and farm dams, and on sheltered coastal beaches, mangroves and offshore islands. It can travel considerable distance overland and is an occasional vagrant to temporary waters. Water Rat's dens are made at the end of tunnels in banks and occasionally in logs (Van Dyck and Strahan 2008).	The survey area provides minimal habitat for the species as it is associated with permanent water bodies in a range of environments. Records occur within 20 km (particularly Burrup Peninsula)	Unlikely – unlikely resident within survey area, restricted to coastal water bodies in this area

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	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Ghost Bat <i>(Macroderma gigas)</i>	VU	VU	X	X	X	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 (Van Dyck and Strahan 2008).	The species is known from the region, however are restricted to caves, adits and old mine shafts. There are none of these recorded in the survey area. Foraging may occur across the survey area opportunistically.	Unlikely – unlikely a resident within survey area, may opportunistically utilise to survey area for foraging.
North-western Free-tail Bat <i>(Mormopterus (Ozimops) cobourgianus)</i>	P1				X	The Little North-western Freetail Bat occurs along the Western Australian coast from Lake McLeod to Point Torment, occurring sparsely across its range. The Western Australian populations have only been recorded from mangrove stands, particularly those that include mature mangroves (Van Dyck and Strahan 2008). It roosts in crevices and sprouts of the dead upper branches of the mangrove <i>Avicennia marina</i> . The genus for this species is in the process of being renamed in a taxonomic review of molossid by Terry Reardon, which has shown the genus <i>Mormopterus</i> does not occur in Australia (Churchill 2008).	The species is known from the region, however are restricted to mangroves. There are none of these recorded in the survey area. Foraging may occur across the survey area opportunistically.	Present – recorded on bat detector, unlikely a resident within survey area, may utilise to survey area for foraging.

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
Greater Bilby <i>(Macrotis lagotis)</i>	VU	VU		X		The Greater Bilby distribution in Western Australia is restricted to the north, including the Pilbara, Sandy and Gibson Deserts. The Greater Bilby usually spends the daytime in burrows, often built against termite mounds, spinifex hummock or shrubs (Van Dyck and Strahan 2008). Extant population of the Greater Bilby occur in a variety of habitats, usually on landforms with level to low slope topography and light to medium soils. It occupies three major vegetation types; open tussock grassland on uplands and hills, mulga woodland/shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas. Laterite and rock feature substrates are an important part of Greater Bilby habitat. After dark they leave their burrows to feed and populations are known to move long distances when current habitat ranges become unsuitable. Bilbies are largely solitary, widely dispersed and found in low numbers. The current occurrence of the Greater Bilby is strongly associated with higher rainfall and temperatures, which promote areas of higher plant and food production. (Pavey 2006; Southgate et al. 2007).	The survey area does provide habitat for the species however it is not known from the region and it has not been recorded within 150 km of the survey area.	Unlikely – unlikely to occur

Common name (species name)	Status (BC Act/DBCA, EPBC Act)		Search			Description and habitat requirements	Habitat within survey area	Likelihood of Occurrence
	BC Act	EPBC Act	NM	EPBC PMST	DBCA			
<p>Pilbara Leaf-nosed Bat</p> <p><i>(Rhinonicteris aurantia)</i></p> <p>In the NatureMap search this species was reported as the Kimberley population although should have been the Pilbara population.</p>	VU	VU	X	X	X	<p>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 <i>Eucalyptus camaldulensis</i> 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 <i>Melaleuca leucadendron</i>.</p>	<p>No suitable roosting habitat occurs within the survey area. However, the species may forage over the survey area. There are records within 20 km of the survey area.</p>	<p>Unlikely – unlikely a resident within survey area, may opportunistically utilise to survey area for foraging.</p>

Appendix D - (Database Searches)

NatureMap Species Report

Created By Guest user on 14/03/2019

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Species Group All Animals
Method 'By Line'
Vertices 20° 36' 04" S, 116° 46' 50" E 20° 48' 29" S, 116° 40' 10" E 20° 48' 29" S, 116° 40' 10" E
Group By Family

Family	Species	Records
Acanthizidae	4	36
Accipitridae	15	653
Aegothelidae	1	10
Aeshnidae	2	4
Agamidae	11	162
Alaudidae	2	51
Ambassidae	1	2
Anatidae	10	266
Anhingidae	1	43
Antennariidae	2	2
Apistidae	1	2
Apodidae	1	2
Apogonidae	15	29
Araneidae	1	3
Arcellidae	1	1
Ardeidae	8	161
Ariidae	3	3
Artamidae	6	219
Atherinidae	3	3
Baetidae	2	7
Balaenopteridae	1	2
Batrachoididae	3	5
Bdelloidea	2	3
Belonidae	1	1
Belostomatidae	1	1
Blenniidae	9	21
Boidae	8	61
Bolboceratidae	1	1
Bothidae	3	4
Bovidae	2	10
Brachionidae	4	4
Burhinidae	2	30
Buthidae	1	3
Bythitidae	3	3
Cacatuidae	1	42
Caenidae	2	5
Callionymidae	4	7
Camaenidae	7	71
Campephagidae	2	222
Canidae	2	108
Caprimulgidae	1	3
Carabidae	9	19
Carangidae	7	8
Carcharhinidae	1	1
Carpodactylidae	1	2
Casuariidae	1	1
Centriscidae	1	1
Centrogeniidae	1	1
Centropagidae	1	1
Centropodidae	1	30
Centropomidae	1	1
Ceratopogonidae	3	7
Chaetodontidae	3	4
Chanidae	1	1
Charadriidae	11	340
Cheloniidae	4	64
Chirocentridae	1	2
Chironomidae	14	30
Chydoridae	6	8
Ciconiidae	1	12
Clupeidae	4	7
Coenagrionidae	2	6
Colubridae	1	3
Columbidae	10	597
Congridae	1	1
Corinnidae	1	7
Corixidae	5	8
Corvidae	3	95
Cracticidae	3	194
Cuculidae	3	20
Culicidae	6	13
Cyclopidae	4	7
Cynoglossidae	3	10
Cypridae	13	18
Cyzicidae	1	1

Daphniidae	3	3
Dasyuridae	7	488
Delphinidae	3	4
Diatom Family	12	12
Dicaeidae	1	4
Dicruridae	5	541
Diffugiidae	1	1
Diplodactylidae	13	274
Dugongidae	1	2
Dytiscidae	12	27
Ecnomidae	2	4
Elapidae	17	91
Eleotridae	1	1
Elopidae	1	1
Emballonuridae	1	9
Enchytraeidae	1	1
Ephydriidae	2	2
Epistylididae	1	1
Estrilidae	5	336
Euchlanidae	2	3
Euglyphidae	1	1
Exocoetidae	2	2
Falconidae	7	208
Felidae	1	38
Flosculariidae	1	1
Fregatidae	1	18
Gallieniellidae	1	1
Gekkonidae	5	373
Gerreidae	2	4
Ginglymostomatidae	1	1
Glareolidae	2	13
Gobiesocidae	3	3
Gobiidae	34	73
Gobioididae	1	1
Gomphidae	1	1
Gruidae	1	3
Gyrinidae	1	1
Haematopodidae	3	272
Haemulidae	2	2
Halacaridae	20	53
Halcyonidae	6	187
Hebridae	1	1
Hemicorduliidae	1	1
Hemiramphidae	1	1
Hexarthridae	2	2
Hipposideridae	1	1
Hirundinidae	4	195
Holocentridae	3	4
Hydrachnidae	1	1
Hydraenidae	2	4
Hydrobatidae	1	7
Hydrobiidae	1	1
Hydrometridae	1	1
Hydrophilidae	9	17
Hydropsychidae	1	1
Hydroptilidae	2	2
Hylidae	4	82
Hypsimitopodidae	1	1
Ilyocyprididae	1	2
Ixodidae	1	1
Labridae	9	20
Lamponidae	3	17
Laridae	15	414
Latidae	1	1
Lecanidae	9	14
Leiognathidae	2	2
Lepadellidae	1	2
Leporidae	1	1
Leptoceridae	1	3
Libellulidae	6	13
Limnadiidae	4	4
Limnocytheridae	1	1
Limnodynastidae	2	5
Lutjanidae	5	12
Lycosidae	3	13
Lymnaeidae	1	1
Macropodidae	5	209
Macrotrichidae	1	1
Maluridae	2	75
Megadermatidae	1	4
Melanotaeniidae	1	2
Meliphagidae	8	324
Meropidae	1	150
Mesoveliidae	2	2
Moinidae	1	1
Molossidae	3	5
Monacanthidae	2	10
Monodactylidae	1	1
Motacillidae	2	27
Mugilidae	7	10
Mullidae	1	1
Muraenidae	4	7
Muridae	10	290
Muscidae	1	1
Myobatrachidae	1	1
Naididae	1	1
Nematoda	1	4
Nemesiidae	2	4
Nemipteridae	6	6
Nepidae	1	1
Notommatidae	4	4
Notonectidae	5	8
Ogcocephalidae	1	1
Oligochaeta	1	1
Olpidae	1	1

Ophichthidae	6	8
Ophichlinidae	1	5
Opisthopora	1	1
Opistognathidae	1	3
Ostracoda	1	3
Otididae	1	4
Oxyopidae	1	1
Pachycephalidae	4	60
Paradoxosomatidae	2	4
Paralichthyidae	4	4
Pardalotidae	3	16
Passeridae	2	5
Pegasidae	1	1
Pelecanidae	1	93
Pempheridae	1	1
Petroicidae	2	23
Phalacrocoracidae	5	127
Phasianidae	3	36
Pholcidae	1	3
Phreodrilidae	2	4
Pinguipedidae	1	1
Pittidae	1	1
Planorbidae	3	6
Platycephalidae	9	19
Pleidae	1	2
Plotosidae	7	15
Podargidae	2	12
Podicipedidae	2	50
Polynemidae	2	3
Pomacanthidae	1	1
Pomacentridae	9	20
Pomatostomidae	2	29
Pontarachnidae	2	4
Priacanthidae	1	1
Pristinidae	1	1
Procellariidae	2	33
Prodidomidae	6	20
Psettodidae	1	1
Pseudochromidae	4	6
Psittacidae	8	355
Pteropodidae	2	3
Ptilonorhynchidae	2	9
Pygopodidae	5	55
Pyralidae	1	1
Rallidae	7	62
Recurvirostridae	3	129
Salticidae	4	6
Scarabaeidae	2	5
Scatophagidae	3	3
Sciaenidae	1	1
Scincidae	42	867
Scirtidae	1	1
Scolopacidae	21	807
Scolopendridae	4	24
Scombidae	1	1
Scorpaenidae	2	3
Scutigerae	1	19
Serranidae	9	21
Sididae	2	3
Sillaginidae	2	4
Simuliidae	1	1
Soleidae	3	6
Sparassidae	4	4
Sparidae	1	2
Sphyrnaeidae	2	2
Stratiomyidae	1	3
Strigidae	2	5
Sturnidae	1	9
Sulidae	1	4
Sylviidae	2	61
Synanceiidae	2	2
Synchaetidae	1	2
Syngnathidae	5	5
Tabanidae	1	3
Tachyglossidae	1	6
Terapontidae	4	11
Testudinellidae	1	3
Tetraodontidae	1	1
Tetrarogidae	3	5
Tettigoniidae	1	1
Theridiidae	1	2
Thiaridae	1	2
Threskiornithidae	3	42
Triacanthidae	1	1
Trichocercidae	1	1
Trichonotidae	1	1
Trichotriidae	1	1
Triglidae	1	1
Trigoniulidae	1	3
Triopsidae	2	2
Tripterygiidae	7	13
Trombidiformes	1	4
Turbellaria	1	1
Turnicidae	1	18
Tytonidae	1	4
Unionicolidae	1	1
Urodacidae	1	2
Varanidae	10	65
Velliferidae	1	1
Velliidae	2	2
Vespertilionidae	5	26
Zodariidae	1	1
Zosteropidae	1	108
TOTAL	951	12291

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Acanthizidae				
1.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
2.	<i>Gerygone</i> sp.			
3.	24276 <i>Gerygone tenebrosa</i> (Dusky Gerygone)			
4.	30948 <i>Smicromnis brevirostris</i> (Weebill)			
Accipitridae				
5.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
6.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
7.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
8.	24288 <i>Circus approximans</i> (Swamp Harrier)			
9.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
10.	<i>Elanus axillaris</i>			
11.	24290 <i>Elanus caeruleus</i> subsp. <i>axillaris</i> (Australian Black-shouldered Kite)			
12.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
13.	25541 <i>Haliastur indus</i> (Brahminy Kite)			
14.	24294 <i>Haliastur indus</i> subsp. <i>girrenera</i> (Brahminy Kite)			
15.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
16.	24297 <i>Hamirostra melanosternon</i> (Black-breasted Buzzard)			
17.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
18.	25542 <i>Milvus migrans</i> (Black Kite)			
19.	48591 <i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
Aegothelidae				
20.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
Aeshnidae				
21.	<i>Aeshnidae</i> sp.			
22.	<i>Anax papuensis</i>			
Agamidae				
23.	30831 <i>Amphibolurus gilberti</i> (Ta-ta, Gilbert's Dragon)			
24.	30833 <i>Amphibolurus longirostris</i> (Long-nosed Dragon)			
25.	25458 <i>Ctenophorus caudicinctus</i> (Ring-tailed Dragon)			
26.	24865 <i>Ctenophorus caudicinctus</i> subsp. <i>caudicinctus</i> (Ring-tailed Dragon)			
27.	25459 <i>Ctenophorus isolepis</i> (Crested Dragon, Military Dragon)			
28.	24876 <i>Ctenophorus isolepis</i> subsp. <i>isolepis</i> (Crested Dragon, Military Dragon)			
29.	24882 <i>Ctenophorus nuchalis</i> (Central Netted Dragon)			
30.	24886 <i>Ctenophorus reticulatus</i> (Western Netted Dragon)			
31.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
32.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
33.	30814 <i>Tympanocryptis cephalus</i> (Pebble Dragon)			
Alaudidae				
34.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
35.	24302 <i>Mirafra javanica</i> subsp. <i>horsfieldii</i> (Horsfield's Bushlark, Singing Bushlark)			
Ambassidae				
36.	<i>Ambassis vachellii</i>			
Anatidae				
37.	24312 <i>Anas gracilis</i> (Grey Teal)			
38.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
39.	24318 <i>Aythya australis</i> (Hardhead)			
40.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
41.	24322 <i>Cygnus atratus</i> (Black Swan)			
42.	24324 <i>Dendrocygna arcuata</i> (Wandering Whistling Duck, Chestnut Whistling Duck)			
43.	24325 <i>Dendrocygna eytoni</i> (Plumed Whistling Duck)			
44.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
45.	24327 <i>Nettapus pulchellus</i> (Green Pygmy-goose)			
46.	24329 <i>Stictonetta naevosa</i> (Freckled Duck)			
Anhingidae				
47.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
Antennariidae				
48.	<i>Lophiocharon hutchinsi</i>			
49.	<i>Lophiocharon trisignatus</i>			
Apistidae				
50.	<i>Apistus carinatus</i>			
Apodidae				

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
51.	25554 <i>Apus pacificus</i> (Fork-tailed Swift, Pacific Swift)		IA	
Apogonidae				
52.	<i>Apogon breviceaudatus</i>			
53.	<i>Apogon cavitiensis</i>			
54.	<i>Apogon cookii</i>			
55.	<i>Apogon dianthus</i>			
56.	<i>Apogon doederleini</i>			
57.	<i>Apogon fasciatus</i>			
58.	<i>Apogon nigripinnis</i>			
59.	<i>Apogon pallidofasciatus</i>			
60.	<i>Apogon rueppellii</i>			
61.	<i>Apogon talboti</i>			
62.	<i>Apogon trimaculatus</i>			
63.	<i>Foa brachygramma</i>			
64.	<i>Fowleria aurita</i>			
65.	<i>Pterapogon mirifica</i>			
66.	<i>Siphamia majimae</i>			
Araneidae				
67.	<i>Nephila edulis</i>			
Arcellidae				
68.	<i>Arcella</i> sp.			
Ardeidae				
69.	25559 <i>Ardea intermedia</i> (Intermediate Egret)			
70.	41324 <i>Ardea modesta</i> (great egret, white egret)			
71.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
72.	47897 <i>Butorides striata</i> (Striated Heron, Mangrove Heron)			
73.	<i>Egretta garzetta</i>			
74.	<i>Egretta novaehollandiae</i>			
75.	25562 <i>Ixobrychus flavicollis</i> (Black Bittern)			
76.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
Ariidae				
77.	<i>Arius leptaspis</i>			Y
78.	<i>Netuma bilineata</i>			
79.	<i>Netuma proxima</i>			
Artamidae				
80.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
81.	25567 <i>Artamus leucorhynchus</i> (White-breasted Woodswallow)			
82.	24354 <i>Artamus leucorhynchus</i> subsp. <i>leucopygialis</i> (White-breasted Woodswallow)			
83.	24355 <i>Artamus minor</i> (Little Woodswallow)			
84.	24356 <i>Artamus personatus</i> (Masked Woodswallow)			
85.	24357 <i>Artamus superciliosus</i> (White-browed Woodswallow)			
Atherinidae				
86.	<i>Atherinid</i> sp.			
87.	<i>Atherinomorus endrachtensis</i>			
88.	<i>Craterocephalus pauciradiatus</i>			
Baetidae				
89.	<i>Baetidae</i> sp.			
90.	<i>Cloeon</i> sp.			
Balaenopteridae				
91.	24051 <i>Megaptera novaeangliae</i> (Humpback Whale)		S	
Batrachoididae				
92.	<i>Batrachomoeus dahl</i>			
93.	<i>Batrachomoeus trispinosus</i>			
94.	<i>Halophryne diemensis</i>			
Bdelloidea				
95.	<i>Bdelloidea</i> sp. 2:2			
96.	<i>Bdelloidea</i> sp. 3:3			
Belonidae				
97.	<i>Tylosurus crocodilus</i>			
Belostomatidae				
98.	<i>Belostomatidae</i> sp.			
Blenniidae				
99.	<i>Cirripectes filamentosus</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
100.	<i>Ecsenius yaeyamaensis</i>			
101.	<i>Istiblennius meleagris</i>			
102.	<i>Laiphognathus multimaculatus</i>			
103.	<i>Omobranchus punctatus</i>			
104.	<i>Omobranchus rotundiceps</i>			
105.	<i>Omobranchus</i> sp.			
106.	<i>Petroscirtes mitratus</i>			
107.	<i>Salarias sexfilum</i>			
Boidae				
108.	25317 <i>Antaresia childreni</i> (Children's Python)			
109.	25318 <i>Antaresia perthensis</i> (Pygmy Python)			
110.	25448 <i>Antaresia stimsoni</i> (Stimson's Python)			
111.	25241 <i>Antaresia stimsoni</i> subsp. <i>stimsoni</i> (Stimson's Python)			
112.	25320 <i>Aspidites melanocephalus</i> (Black-headed Python)			
113.	25236 <i>Aspidites ramsayi</i> (Woma)			
114.	25238 <i>Liasis olivaceus</i> subsp. <i>barroni</i> (Pilbara Olive Python)		T	
115.	25239 <i>Liasis olivaceus</i> subsp. <i>olivaceus</i> (Olive Python)			
Bolboceratidae				
116.	<i>Bolboleaus truncatus</i>			
Bothidae				
117.	<i>Arnoglossus waitei</i>			Y
118.	<i>Asterorhombus intermedius</i>			
119.	<i>Engyproson</i> sp.			
Bovidae				
120.	24253 <i>Capra hircus</i> (Goat)	Y		
121.	34016 <i>Ovis aries</i> (Sheep)			
Brachionidae				
122.	<i>Anuraeopsis navicula</i>			
123.	<i>Brachionus</i> n sp P2 (PSW)			
124.	<i>Brachionus quadridentatus</i>			
125.	<i>Keratella procurva</i>			
Burhinidae				
126.	24359 <i>Burhinus grallarius</i> (Bush Stone-curlew)			
127.	47938 <i>Esacus magnirostris</i> (Beach Stone-curlew, Beach Thick-knee)			
Buthidae				
128.	<i>Lychas</i> sp. 2			
Bythitidae				
129.	<i>Didymothallus mizolepis</i>			
130.	<i>Dinematichthys</i> sp.			
131.	<i>Eusurculus pistillum</i>			
Cacatuidae				
132.	<i>Eolophus roseicapillus</i>			
Caenidae				
133.	<i>Caenidae</i> sp.			
134.	<i>Tasmanocoenis arcuata</i>			
Callionymidae				
135.	<i>Callionymus japonicus</i>			Y
136.	<i>Callionymus russelli</i>			
137.	<i>Callionymus</i> sp.			
138.	<i>Repomucenus calcaratus</i>			
Camaenidae				
139.	<i>Quistrachia legendrei</i>			
140.	<i>Rhagada angulata</i>			
141.	<i>Rhagada convicta</i>			
142.	<i>Rhagada dampierana</i>			
143.	<i>Rhagada intermedia</i>			
144.	<i>Rhagada minima</i>			
145.	<i>Rhagada perprima</i>			
Campephagidae				
146.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
147.	24367 <i>Lalage tricolor</i> (White-winged Triller)			
Canidae				
148.	48920 <i>Canis familiaris</i> (Dog, Dingo)	Y		

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
149.	24040 <i>Vulpes vulpes</i> (Red Fox)	Y		
Caprimulgidae				
150.	24368 <i>Eurostopodus argus</i> (Spotted Nightjar)			
Carabidae				
151.	<i>Carenum pulchrum</i>			
152.	<i>Carenum subplanatum</i>			
153.	<i>Carenum venustum</i>			
154.	<i>Catadromus lacordairei</i>			
155.	<i>Chlaenius australis</i>			
156.	<i>Geoscaptus laevis</i>			
157.	<i>Loxandrus micantior</i>			
158.	<i>Megacephala greyana</i>			
159.	<i>Pheropsophus verticalis</i>			
Carangidae				
160.	<i>Alepes apercna</i>			
161.	<i>Alepes mate</i>			Y
162.	<i>Atule mate</i>			
163.	<i>Carangoides</i> sp.			
164.	<i>Caranx bucculentus</i>			
165.	<i>Caranx sexfasciatus</i>			
166.	<i>Selaroides leptolepis</i>			
Carcharhinidae				
167.	<i>Carcharhinus brachyurus</i>			
Carphodactylidae				
168.	24969 <i>Nephrurus levis</i> subsp. <i>pilbarensis</i>			
Casuariidae				
169.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
Centriscidae				
170.	<i>Centriscus scutatus</i>			
Centrogeniidae				
171.	<i>Centrogenys vaiigiensis</i>			
Centropagidae				
172.	<i>Boeckella triarticulata</i>			
Centropodidae				
173.	25600 <i>Centropus phasianinus</i> (Pheasant Coucal)			
Centropomidae				
174.	<i>Hypopterus macropterus</i>			
Ceratopogonidae				
175.	<i>Alluaudomyia</i> sp.			
176.	<i>Ceratopogonidae</i> sp.			
177.	<i>Dasyheleinae</i> sp. P2 (PSW)			
Chaetodontidae				
178.	<i>Chaetodon aureofasciatus</i>			
179.	<i>Chelmon marginalis</i>			
180.	<i>Chelmon muelleri</i>			
Chanidae				
181.	<i>Chanos chanos</i>			
Charadriidae				
182.	25575 <i>Charadrius leschenaultii</i> (Greater Sand Plover)		T	
183.	25576 <i>Charadrius mongolus</i> (Lesser Sand Plover)		T	
184.	24375 <i>Charadrius mongolus</i> subsp. <i>mongolus</i> (Lesser Sand Plover)		T	
185.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
186.	24378 <i>Charadrius veredus</i> (Oriental Plover)		IA	
187.	47937 <i>Eiseyornis melanops</i> (Black-fronted Dotterel)			
188.	24379 <i>Erythrogonys cinctus</i> (Red-kneed Dotterel)			
189.	24382 <i>Pluvialis fulva</i> (Pacific Golden Plover)		IA	
190.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
191.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
192.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
Cheloniidae				
193.	25336 <i>Chelonia mydas</i> (Green Turtle)		T	
194.	25473 <i>Eretmochelys imbricata</i> (Hawksbill Turtle)		T	

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
195.	25342 <i>Eretmochelys imbricata</i> subsp. <i>bissa</i> (Hawksbill Turtle)		T	
196.	25344 <i>Natator depressus</i> (Flatback Turtle)		T	
Chirocentridae				
197.	<i>Chirocentrus dorab</i>			
Chironomidae				
198.	<i>Chironominae</i> sp.			
199.	<i>Chironomus</i> aff. <i>alternans</i> (V24) (CB)			
200.	<i>Cryptochironomus griseidorsum</i>			
201.	<i>Dicrotendipes</i> P5 (=balciunasi?) (PSW)			
202.	<i>Larsia albiceps</i>			
203.	<i>Orthoclaadiinae</i> sp.			
204.	<i>Paratanytarsus</i> sp. P2 (PSW)			
205.	<i>Polypedium nubifer</i>			
206.	<i>Procladius paludicola</i>			
207.	<i>Rheotanytarsus trivittatus</i>			
208.	<i>Tanypodinae</i> sp.			
209.	<i>Tanytarsus fuscithorax/semibarbitarsus</i>			
210.	<i>Tanytarsus</i> sp. D (SAP)			
211.	<i>Tanytarsus</i> sp. P8 (PSW)			
Chydoridae				
212.	<i>Alona anodonta</i>			
213.	<i>Alona</i> cf. <i>verrucosa</i>			
214.	<i>Alona rigidicaudis</i>			
215.	<i>Ephemeroporus barroisi</i> s.l.			
216.	<i>Leberis</i> cf. <i>diaphanus</i>			
217.	<i>Ovatalona</i> cf. <i>cambouei</i>			
Ciconiidae				
218.	25578 <i>Ephippiorhynchus asiaticus</i> (Black-necked Stork)			
Clupeidae				
219.	<i>Clupeid</i> sp.			
220.	<i>Herklotsichthys koningsbergeri</i>			
221.	<i>Nematalosa erebi</i>			
222.	<i>Spratelloides delicatulus</i>			
Coenagrionidae				
223.	<i>Coenagrionidae</i> sp.			
224.	<i>Ischnura aurora aurora</i>			
Colubridae				
225.	25327 <i>Fordonia leucobalia</i> (White-bellied Mangrove Snake)			
Columbidae				
226.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
227.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
228.	24402 <i>Geopelia humeralis</i> (Bar-shouldered Dove)			
229.	25585 <i>Geopelia striata</i> (Zebra Dove)			
230.	24403 <i>Geopelia striata</i> subsp. <i>placida</i> (Peaceful Dove)			
231.	24404 <i>Geophaps plumifera</i> (Spinifex Pigeon)			
232.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
233.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
234.	24411 <i>Phaps histrionica</i> (Flock Bronzewing, Flock Pigeon)			
235.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
Congridae				
236.	<i>Conger cinereus</i>			
Corinnidae				
237.	<i>Supunna picta</i>			
Corixidae				
238.	<i>Agraptocorixa parvipunctata</i>			
239.	<i>Corixidae</i> sp.			
240.	<i>Micronecta gracilis</i>			
241.	<i>Micronecta</i> n. sp. P3 (PSW)			
242.	<i>Micronecta</i> sp.			
Corvidae				
243.	24416 <i>Corvus bennetti</i> (Little Crow)			
244.	25593 <i>Corvus orru</i> (Torresian Crow)			
245.	24419 <i>Corvus splendens</i> (House Crow)			

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Cracticidae				
246.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
247.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
248.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
Cuculidae				
249.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
250.	24431 <i>Chrysococcyx basalus</i> (Horsfield's Bronze Cuckoo)			
251.	24434 <i>Chrysococcyx osculans</i> (Black-eared Cuckoo)			
Culicidae				
252.	<i>Anopheles annulipes</i> s.l.			
253.	<i>Culex (Culex) annulirostris</i>			
254.	<i>Culex crinicauda</i>			
255.	<i>Culex</i> nr. <i>crinicauda</i> (PSW)			
256.	<i>Culex palpalis</i>			
257.	<i>Culicidae</i> sp.			
Cyclopidae				
258.	<i>Mesocyclops brooksi</i>			
259.	<i>Metacyclops</i> sp. P2 (PSW)			
260.	<i>Microcyclops varicans</i>			
261.	<i>Thermocyclops decipiens</i>			
Cynoglossidae				
262.	<i>Cynoglossus maculipinnis</i>			
263.	<i>Cynoglossus</i> sp.			
264.	<i>Paraplagusia guttata</i>			Y
Cyprididae				
265.	<i>Bennelongia minimus</i>			
266.	<i>Cypretta ?lutea</i>			
267.	<i>Cypretta seurati</i>			
268.	<i>Cypretta</i> sp PSW074			
269.	<i>Cypricercus salinus</i>			
270.	<i>Cypricercus</i> sp. 422 (CB)			
271.	<i>Hemicypris megalops</i>			
272.	<i>Heterocypris</i> sp.			
273.	<i>Heterocypris tatei</i>			
274.	<i>Ilyodromus</i> sp BOS25			
275.	<i>Ilyodromus</i> sp. PB			
276.	<i>Isocypris williamsi</i> (ex <i>Ilyodromus</i> sp. 413)			
277.	<i>Zonocyprretta kalimna</i>			
Cyzicidae				
278.	<i>Ozestheria packardi</i>			
Daphniidae				
279.	<i>Ceriodaphnia cornuta</i>			
280.	<i>Ceriodaphnia</i> n. sp. a (Berner sp.#3) (SAP)			
281.	<i>Ceriodaphnia</i> n. sp. c (Berner sp.#1) (SAP)			
Dasyuridae				
282.	24091 <i>Dasykaluta rosamondae</i> (Little Red Kaluta)			
283.	24093 <i>Dasyurus hallucatus</i> (Northern Quoll)		T	
284.	24095 <i>Ningaiu timealeyi</i> (Pilbara Ningaiu)			
285.	<i>Planigale</i> sp. nov.			
286.	24105 <i>Pseudantechinus roryi</i> (Rory's Pseudantechinus)			
287.	24106 <i>Pseudantechinus woolleyae</i> (Woolley's Pseudantechinus)			
288.	24116 <i>Sminthopsis macroura</i> (Stripe-faced Dunnart)			
Delphinidae				
289.	24057 <i>Lagenodelphis hosei</i> (Fraser's Dolphin)			
290.	48114 <i>Stenella longirostris</i> (Spinner Dolphin)		P4	
291.	30954 <i>Tursiops aduncus</i> (Indo-Pacific Bottlenose Dolphin)			
Diatom Family				
292.	<i>Achnanthydium minutissima</i> (Kütz.) Czarnecki			
293.	<i>Caloneis silicula</i> (Ehr.) Cl.			
294.	<i>Cymbella delicatula</i> Kütz.			
295.	<i>Hantzschia amphioxys</i> (Ehr.) Grun.			
296.	<i>Luticola mutica</i> (Kütz.) Mann			
297.	<i>Nitzschia microcephala</i> Grun.			
298.	<i>Nitzschia perminuta</i> (Grun.) M. Peragallo			
299.	<i>Nitzschia sigma</i> (Kütz.) W. Sm.			

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300.	<i>Pinnularia divergens</i> W. Sm.			
301.	<i>Pinnularia subrostrata</i> (A. Cl.) Cl.-Euler			
302.	<i>Stauroneis anceps</i> Ehr.			
303.	<i>Stauroneis phoenicenteron</i> (Nitz.) Ehr.			
Dicaeidae				
304.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
Dicruridae				
305.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
306.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
307.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
308.	24454 <i>Rhipidura leucophrys</i> subsp. <i>leucophrys</i> (Willie Wagtail)			
309.	24457 <i>Rhipidura phasiana</i> (Mangrove Grey Fantail)			
Diffugiidae				
310.	<i>Diffugia</i> sp. P1			
Diplodactylidae				
311.	25456 <i>Crenadactylus ocellatus</i> (Clawless Gecko)			
312.	24919 <i>Crenadactylus ocellatus</i> subsp. <i>horni</i> (Clawless Gecko)			
313.	24926 <i>Diplodactylus conspicillatus</i> (Fat-tailed Gecko)			
314.	41404 <i>Diplodactylus galaxias</i> (Northern Pilbara Beak-faced Gecko)			
315.	24937 <i>Diplodactylus mitchelli</i>			
316.	24944 <i>Diplodactylus savagei</i> (Southern Pilbara Beak-faced Gecko)			
317.	30933 <i>Lucasium stenodactylum</i>			
318.	24976 <i>Oedura marmorata</i> (Marbled Velvet Gecko)			
319.	24982 <i>Rhynchoedura ornata</i> (Western Beaked Gecko)			
320.	24924 <i>Strophurus ciliaris</i> subsp. <i>aberrans</i>			
321.	24927 <i>Strophurus elderi</i>			
322.	24932 <i>Strophurus jeanae</i>			
323.	24949 <i>Strophurus wellingtonae</i>			
Dugongidae				
324.	24084 <i>Dugong dugon</i> (Dugong)		S	
Dytiscidae				
325.	<i>Allodessus bistrigatus</i>			
326.	<i>Cybister tripunctatus</i>			
327.	<i>Dytiscidae</i> sp.			
328.	<i>Eretes australis</i>			
329.	<i>Hydroglyphus grammopterus</i> (=trilineatus)			
330.	<i>Hydroglyphus leai</i>			
331.	<i>Hydroglyphus orthogrammus</i>			
332.	<i>Hyphydrus elegans</i>			
333.	<i>Hyphydrus lyratus</i>			
334.	<i>Hyphydrus</i> sp.			
335.	<i>Laccophilus sharpi</i>			
336.	<i>Limbodessus compactus</i>			
Ecnomidae				
337.	<i>Ecnomidae</i> sp.			
338.	<i>Ecnomus pilbarensis</i>			
Elapidae				
339.	<i>Acanthophis wellsei</i>			
340.	25332 <i>Acanthophis wellsi</i> (Pilbara Death Adder)			
341.	25355 <i>Aipysurus laevis</i> (Olive Seasnake)			
342.	25331 <i>Brachyurophis approximans</i> (North-western Shovel-nosed Snake)			
343.	25468 <i>Demansia psammophis</i> (Yellow-faced Whipsnake)			
344.	25295 <i>Demansia psammophis</i> subsp. <i>cupreiceps</i> (Yellow-faced Whipsnake)			
345.	25296 <i>Demansia psammophis</i> subsp. <i>reticulata</i> (Yellow-faced Whipsnake)			
346.	25297 <i>Demansia rufescens</i> (Rufous Whipsnake)			
347.	25362 <i>Ephalophis greyae</i>			
348.	25301 <i>Furina ornata</i> (Moon Snake)			
349.	25363 <i>Hydrelaps darwiniensis</i>			
350.	25261 <i>Pseudechis australis</i> (Mulga Snake)			
351.	42416 <i>Pseudonaja mengdeni</i> (Western Brown Snake)			
352.	25263 <i>Pseudonaja modesta</i> (Ringed Brown Snake)			
353.	25264 <i>Pseudonaja nuchalis</i> (Gwardar, Northern Brown Snake)			
354.	25269 <i>Suta fasciata</i> (Rosen's Snake)			
355.	25307 <i>Suta punctata</i> (Spotted Snake)			
Eleotridae				
356.	<i>Bostrychus sinensis</i>			

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Elopidae				
357.	<i>Elops hawaiiensis</i>			Y
Emballonuridae				
358.	24175 <i>Taphozous georgianus</i> (Common Sheath-tailed Bat)			
Enchytraeidae				
359.	<i>Enchytraeidae</i> sp.			
Ephydriidae				
360.	<i>Ephydriidae</i> sp.			
361.	<i>Ephydriidae</i> sp. 12 (PSW)			
Epistylididae				
362.	<i>Epistylis</i> sp.			
Estrilidae				
363.	24631 <i>Emblema pictum</i> (Painted Finch)			
364.	24633 <i>Heteromunia pectoralis</i> (Pictorella Mannikin)			
365.	25685 <i>Neochmia ruficauda</i> (Star Finch)			
366.	<i>Taeniopygia castanotis</i>			
367.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
Euchlanidae				
368.	<i>Euchlanis dilatata</i>			
369.	<i>Euchlanis lyra</i>			
Euglyphidae				
370.	<i>Euglypha</i> sp.			
Exocoetidae				
371.	<i>Cheilopogon arcticeps</i>			
372.	<i>Paraexocoetus brachypterus</i>			Y
Falconidae				
373.	25621 <i>Falco berigora</i> (Brown Falcon)			
374.	24471 <i>Falco berigora</i> subsp. <i>berigora</i> (Brown Falcon)			
375.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
376.	25623 <i>Falco longipennis</i> (Australian Hobby)			
377.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
378.	24475 <i>Falco peregrinus</i> subsp. <i>macropus</i> (Australian Peregrine Falcon)		S	
379.	24476 <i>Falco subniger</i> (Black Falcon)			
Felidae				
380.	24041 <i>Felis catus</i> (Cat)	Y		
Flosculariidae				
381.	<i>Lacinularia flosculosa</i>			
Fregatidae				
382.	24478 <i>Fregata ariel</i> (Lesser Frigatebird)		IA	
Gallieniellidae				
383.	<i>Meedo houstoni</i>			
Gekkonidae				
384.	24956 <i>Gehyra pilbara</i>			
385.	24958 <i>Gehyra punctata</i>			
386.	24959 <i>Gehyra variegata</i>			
387.	25232 <i>Hemidactylus frenatus</i> (Asian House Gecko)	Y		
388.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			
Gerreidae				
389.	<i>Gerres filamentosus</i>			
390.	<i>Gerres subfasciatus</i>			
Ginglymostomatidae				
391.	<i>Nebrius ferrugineus</i>			Y
Glareolidae				
392.	24481 <i>Glareola maldivarum</i> (Oriental Pratincole)		IA	
393.	24482 <i>Stiltia isabella</i> (Australian Pratincole)			
Gobiesocidae				
394.	<i>Diademichthys lineatus</i>			
395.	<i>Discotrema lineata</i>			Y
396.	<i>Lepadichthys sandaracatus</i>			

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Gobiidae				
397.	<i>Acentrogobius gracilis</i>			
398.	<i>Acentrogobius</i> sp.			
399.	<i>Amblyeleotris gymnocephala</i>			
400.	<i>Amblygobius bynoensis</i>			
401.	<i>Asterropteryx semipunctatus</i>			
402.	<i>Bathygobius cocosensis</i>			
403.	<i>Bathygobius fuscus</i>			
404.	<i>Bathygobius laddi</i>			
405.	<i>Bathygobius</i> sp.			
406.	<i>Bryaninops loki</i>			
407.	<i>Callogobius</i> sp. 2			Y
408.	<i>Drombus</i> sp.			
409.	<i>Eviota queenslandica</i>			
410.	<i>Eviota</i> sp.			
411.	<i>Eviota zebrina</i>			
412.	<i>Favonigobius melanobranchus</i>			
413.	<i>Favonigobius</i> sp.			
414.	<i>Glossogobius giuris</i>			
415.	<i>Glossogobius</i> sp.			
416.	<i>Gnatholepis argus</i>			
417.	<i>Gobiodon histrio</i>			
418.	<i>Gobiodon quinquestrigatus</i>			
419.	<i>Gobiodon rivulatus</i>			
420.	<i>Gobiodon</i> sp.			
421.	<i>Istigobius nigrocellatus</i>			
422.	<i>Istigobius ornatus</i>			
423.	<i>Oxyurichthys</i> sp.			
424.	<i>Pandaka lidwilli</i>			
425.	<i>Parachaeturichthys</i> sp.			Y
426.	<i>Periophthalmus argentilineatus</i>			
427.	<i>Pleurosicya</i> sp.			
428.	<i>Priolepis nuchifasciata</i>			
429.	<i>Valenciennesa muralis</i>			
430.	<i>Yongeichthys nebulosus</i>			
Gobioididae				
431.	<i>Ctenotrypauchen microcephalus</i>			
Gomphidae				
432.	<i>Gomphidae</i> sp.			
Gruidae				
433.	24484 <i>Grus rubicunda</i> (Brolga)			
Gyrinidae				
434.	<i>Dineutus australis</i>			
Haematopodidae				
435.	25627 <i>Haematopus fuliginosus</i> (Sooty Oystercatcher)			
436.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
437.	<i>Haematopus ostralegus</i>			Y
Haemulidae				
438.	<i>Pomadasys kaakan</i>			
439.	<i>Pomadasys maculatus</i>			
Halacaridae				
440.	<i>Actacarus pacificus</i>			
441.	<i>Agauopsis arborea</i>			Y
442.	<i>Agauopsis dasyderma</i>			Y
443.	<i>Agauopsis moorea</i>			Y
444.	<i>Agauopsis obtusa</i>			Y
445.	<i>Anomalohalacarus dampierensis</i>			Y
446.	<i>Copidognathus lutarius</i>			Y
447.	<i>Copidognathus meridianus</i>			
448.	<i>Copidognathus piger</i>			Y
449.	<i>Halacaridae</i> sp.			
450.	<i>Isobactrus australiensis</i>			Y
451.	<i>Isobactrus obesus</i>			Y
452.	<i>Rhombognathus dispar</i>			Y
453.	<i>Rhombognathus ocularis</i>			Y
454.	<i>Rhombognathus scutulatus</i>			
455.	<i>Scaptognathides hawaiiensis</i>			

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				Y
456.	<i>Scaptognathides ornatus</i>			Y
457.	<i>Simognathus platyaspis</i>			Y
458.	<i>Simognathus salebrosus</i>			Y
459.	<i>Simognathus tener</i>			Y
Halcyonidae				
460.	25547 <i>Dacelo leachii</i> (Blue-winged Kookaburra)			
461.	25548 <i>Todiramphus chloris</i> (Collared Kingfisher)			
462.	24306 <i>Todiramphus chloris</i> subsp. <i>pilbara</i> (Pilbara Collared Kingfisher)			
463.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			
464.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
465.	24309 <i>Todiramphus sanctus</i> subsp. <i>sanctus</i> (Sacred Kingfisher)			
Hebridae				
466.	<i>Hebridae</i> sp.			
Hemicorduliidae				
467.	<i>Hemicordulia</i> sp.			
Hemiramphidae				
468.	<i>Hemiramphus</i> sp.			
Hexarthridae				
469.	<i>Hexarthra cf brandorffi</i> (PSW)			
470.	<i>Hexarthra</i> sp P3 5-2/5-2 (PSW)			Y
Hipposideridae				
471.	43368 <i>Rhinonictes aurantia</i> (Orange Leaf-nosed bat)		P4	
Hirundinidae				
472.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
473.	25630 <i>Hirundo rustica</i> (Barn Swallow)		IA	
474.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
475.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
Holocentridae				
476.	<i>Myripristis berndti</i>			
477.	<i>Myripristis hexagona</i>			
478.	<i>Sargocentron rubrum</i>			
Hydrachnidae				
479.	<i>Hydrachna</i> sp. 4/5 (PSW)			
Hydraenidae				
480.	<i>Hydraena</i> sp.			
481.	<i>Hydraenidae</i> sp.			
Hydrobatidae				
482.	24497 <i>Oceanites oceanicus</i> (Wilson's Storm-petrel)		IA	
Hydrobiidae				
483.	<i>Hydrobiidae</i> sp P1 (not assimineid) (PSW)			
Hydrometridae				
484.	<i>Hydrometridae</i> sp.			
Hydrophilidae				
485.	<i>Berosus pulchellus</i>			
486.	<i>Enochrus deserticola</i>			
487.	<i>Enochrus</i> sp.			
488.	<i>Hydrochus obscuraeus</i>			
489.	<i>Hydrophilidae</i> sp.			
490.	<i>Paracymus pygmaeus</i>			
491.	<i>Paracymus spenceri</i>			
492.	<i>Regimbartia attenuata</i>			
493.	<i>Sternolophus australis</i>			
Hydropsychidae				
494.	<i>Cheumatopsyche wellsae</i>			
Hydroptilidae				
495.	<i>Hellyethira</i> sp.			
496.	<i>Hydroptilidae</i> sp.			
Hylidae				
497.	25371 <i>Cyclorana australis</i> (Giant Frog)			
498.	25373 <i>Cyclorana cultripes</i> (Knife-footed Frog)			
499.	25375 <i>Cyclorana maini</i> (Sheep Frog)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
500.	25392 <i>Litoria rubella</i> (Little Red Tree Frog)			
Hypsimelepodidae				
501.	<i>Pilbarophreatoicus platyarthricus</i>			
Ilyocypridae				
502.	<i>Ilyocypris australiensis</i>			
Ixodidae				
503.	<i>Amblyomma triguttatum</i>			
Labridae				
504.	<i>Choerodon cyanodus</i>			
505.	<i>Choerodon vitta</i>			
506.	<i>Coris</i> sp.			
507.	<i>Halichoeres melanochir</i>			
508.	<i>Halichoeres nigrescens</i>			
509.	<i>Halichoeres</i> sp.			
510.	<i>Labroides dimidiatus</i>			
511.	<i>Scarus ghobban</i>			
512.	<i>Stethojulis interrupta</i>			
Lamponidae				
513.	<i>Lampona ampeinna</i>			
514.	<i>Lampona cylindrata</i>			
515.	<i>Lamponina scutata</i>			
Laridae				
516.	24505 <i>Anous stolidus</i> subsp. <i>pileatus</i> (Common Noddy)		IA	
517.	41332 <i>Chlidonias leucopterus</i> (White-winged Black Tern, white-winged tern)		IA	
518.	<i>Chroicocephalus novaehollandiae</i>			
519.	48587 <i>Hydroprogne caspia</i> (Caspian Tern)		IA	
520.	25637 <i>Larus novaehollandiae</i> (Silver Gull)			
521.	25638 <i>Larus pacificus</i> (Pacific Gull)			
522.	41347 <i>Onychoprion anaethetus</i> (Bridled Tern)		IA	
523.	24521 <i>Sterna bengalensis</i> (Lesser Crested Tern)			
524.	25640 <i>Sterna dougallii</i> (Roseate Tern)		IA	
525.	25642 <i>Sterna hirundo</i> (Common Tern)		IA	
526.	25643 <i>Sterna hybrida</i> (Whiskered Tern)			
527.	48593 <i>Sternula albifrons</i> (Little Tern)		IA	
528.	48594 <i>Sternula nereis</i> (Fairy Tern)			
529.	<i>Thalasseus bengalensis</i>			
530.	48597 <i>Thalasseus bergii</i> (Crested Tern)		IA	
Latidae				
531.	<i>Psammoperca waigiensis</i>			
Lecanidae				
532.	<i>Lecane bifastigata</i>			Y
533.	<i>Lecane bulla</i>			
534.	<i>Lecane</i> cf. <i>ludwigii</i> (PSW)			
535.	<i>Lecane</i> cf. <i>rhenana</i> (SAP)			
536.	<i>Lecane luna</i>			
537.	<i>Lecane papuana</i>			
538.	<i>Lecane punctata</i>			
539.	<i>Lecane thalera</i>			
540.	<i>Lecane unguolata</i>			
Leiognathidae				
541.	<i>Leiognathus</i> sp.			
542.	<i>Secutor insidiator</i>			
Lepadellidae				
543.	<i>Lepadella patella</i>			
Leporidae				
544.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
Leptoceridae				
545.	<i>Leptoceridae</i> sp.			
Libellulidae				
546.	<i>Diplacodes bipunctata</i>			
547.	<i>Diplacodes haematodes</i>			
548.	<i>Libellulidae</i> sp.			
549.	<i>Orthetrum caledonicum</i>			
550.	<i>Pantala flavescens</i>			

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551.	<i>Tramea stenoloba</i>			
Limnadiidae				
552.	<i>Eulimnadia dahl</i>			Y
553.	<i>Eulimnadia</i> sp. P1 (PSW)			Y
554.	<i>Limnadopsis "pilbarensis" (ex P2)(PSW)</i>			Y
555.	<i>Limnadopsis birchii</i>			
Limnocytheridae				
556.	<i>Limnocythere dorsosicula</i>			
Limnodynastidae				
557.	25422 <i>Neobatrachus aquilonius (Northern Burrowing Frog)</i>			
558.	25430 <i>Notaden nichollsi (Desert Spadefoot)</i>			
Lutjanidae				
559.	<i>Lutjanus argentimaculatus</i>			
560.	<i>Lutjanus carponotatus</i>			
561.	<i>Lutjanus fulviflamma</i>			
562.	<i>Lutjanus malabaricus</i>			
563.	<i>Lutjanus russellii</i>			
Lycosidae				
564.	<i>Hogna crispipes</i>			
565.	<i>Knoelle clara</i>			
566.	<i>Venatrix arenaris</i>			
Lymnaeidae				
567.	<i>Lymnaeidae</i> sp.			
Macropodidae				
568.	25489 <i>Macropus robustus (Euro, Biggada)</i>			
569.	24135 <i>Macropus robustus subsp. erubescens (Euro, Biggada)</i>			
570.	24136 <i>Macropus rufus (Red Kangaroo, Marlu)</i>			
571.	48034 <i>Osphranter robustus (Euro, Biggada)</i>			
572.	24144 <i>Petrogale rothschildi (Rothschild's Rock-wallaby)</i>			
Macrotrichidae				
573.	<i>Macrotrich</i> sp.			
Maluridae				
574.	25651 <i>Malurus lamberti (Variegated Fairy-wren)</i>			
575.	25652 <i>Malurus leucopterus (White-winged Fairy-wren)</i>			
Megadermatidae				
576.	24180 <i>Macroderma gigas (Ghost Bat)</i>		T	
Melanotaeniidae				
577.	<i>Melanotaenia australis</i>			
Meliphagidae				
578.	24568 <i>Epthianura aurifrons (Orange Chat)</i>			
579.	24570 <i>Epthianura tricolor (Crimson Chat)</i>			
580.	42314 <i>Gavicalis virescens (Singing Honeyeater)</i>			
581.	25661 <i>Lichmera indistincta (Brown Honeyeater)</i>			
582.	24582 <i>Lichmera indistincta subsp. indistincta (Brown Honeyeater)</i>			
583.	24583 <i>Manorina flavigula (Yellow-throated Miner)</i>			
584.	24589 <i>Melithreptus gularis subsp. laetior (Black-chinned Honeyeater)</i>			
585.	42344 <i>Purnella albifrons (White-fronted Honeyeater)</i>			
Meropidae				
586.	24598 <i>Merops ornatus (Rainbow Bee-eater)</i>			
Mesoveliidae				
587.	<i>Mesovelia hungerfordi</i>			
588.	<i>Mesoveliidae</i> sp.			
Moinidae				
589.	<i>Moina micrura</i> s.l.			
Molossidae				
590.	24181 <i>Chaerephon jobensis (Greater Northern Freetail-bat, Northern Mastiff Bat)</i>			
591.	<i>Mormopterus (Ozimops) cobourgianus</i>			
592.	24183 <i>Mormopterus loriae (Little Northern Freetail-bat)</i>			
Monacanthidae				
593.	<i>Monacanthus chinensis</i>			
594.	<i>Paramonacanthus choirocephalus</i>			

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Monodactylidae				
595.	<i>Monodactylus argenteus</i>			
Motacillidae				
596.	25670 <i>Anthus australis</i> (Australian Pipit)			
597.	24599 <i>Anthus australis</i> subsp. <i>australis</i> (Australian Pipit)			
Mugilidae				
598.	<i>Liza alata</i>			
599.	<i>Liza subviridis</i>			
600.	<i>Liza vaigiensis</i>			
601.	<i>Mugil cephalus</i>			
602.	<i>Mugilid</i> sp.			
603.	<i>Valamugil buchanani</i>			
604.	<i>Valamugil seheli</i>			
Mullidae				
605.	<i>Upeneus sulphureus</i>			
Muraenidae				
606.	<i>Gymnothorax pseudothyroideus</i>			
607.	<i>Gymnothorax pseudothyroideus</i>			
608.	<i>Gymnothorax thyrsoideus</i>			
609.	<i>Gymnothorax undulatus</i>			
Muridae				
610.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4	
611.	24217 <i>Leggadina lakedownensis</i> (Northern Short-tailed Mouse, Lakeland Downs Mouse, Kerakenga)		P4	
612.	24223 <i>Mus musculus</i> (House Mouse)	Y		
613.	24224 <i>Notomys alexis</i> (Spinifex Hopping-mouse)			
614.	24233 <i>Pseudomys chapmani</i> (Western Pebble-mound Mouse, Ngadji)		P4	
615.	24234 <i>Pseudomys delicatulus</i> (Delicate Mouse)			
616.	24237 <i>Pseudomys hermannsburgensis</i> (Sandy Inland Mouse)			
617.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
618.	24246 <i>Rattus tunneyi</i> (Pale Field-rat)			
619.	24248 <i>Zyromys argurus</i> (Common Rock-rat)			
Muscidae				
620.	<i>Muscidae</i> sp. P1			
Myobatrachidae				
621.	41428 <i>Uperoleia saxatilis</i> (Pilbara Toadlet)			
Naididae				
622.	<i>Naididae</i> (ex <i>Tubificidae</i>)			
Nematoda				
623.	<i>Nematoda</i> sp. P2/P4 (PSW)			
Nemesiidae				
624.	<i>Aname mainae</i>			
625.	<i>Aname mellosa</i>			
Nemipteridae				
626.	<i>Nemipterus celebicus</i>			
627.	<i>Pentapodus porosus</i>			
628.	<i>Pentapodus</i> sp.			
629.	<i>Pentapodus vitta</i>			
630.	<i>Scolopsis bilineatus</i>			
631.	<i>Scolopsis taenioptera</i>			
Nepidae				
632.	<i>Nepidae</i> sp.			
Notommatidae				
633.	<i>Cephalodella biungulata</i>			
634.	<i>Cephalodella cf forficula</i>			
635.	<i>Cephalodella gibba</i>			
636.	<i>Monommata</i> sp.			
Notonectidae				
637.	<i>Anisops canaliculatus</i>			
638.	<i>Anisops hackeri</i>			
639.	<i>Anisops nasutus</i>			
640.	<i>Anisops</i> sp.			
641.	<i>Notonectidae</i> sp.			

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Ogcocephalidae				
642.	<i>Haliutaea brevicaudata?</i>			
Oligochaeta				
643.	<i>Oligochaeta sp.</i>			
Olpidae				
644.	<i>Indolpium sp.</i>			
Ophichthidae				
645.	<i>Muraenichthys sp.</i>			
646.	<i>Ophichthus celebicus?</i>			
647.	<i>Pisodonophis cancrivorus</i>			
648.	<i>Scolecenchelys macroptera</i>			
649.	<i>Yirrkala lumbricoides</i>			
650.	<i>Yirrkala sp.</i>			
Ophiclinidae				
651.	? ?			
Opisthopora				
652.	<i>Opisthopora sp.</i>			
Opistognathidae				
653.	<i>Opistognathus darwiniensis</i>			
Ostracoda				
654.	<i>Ostracoda (unident.)</i>			
Otididae				
655.	24610 <i>Ardeotis australis (Australian Bustard)</i>			
Oxyopidae				
656.	<i>Oxyopes variabilis</i>			
Pachycephalidae				
657.	24620 <i>Pachycephala lanioides (White-breasted Whistler)</i>			
658.	25678 <i>Pachycephala melanura (Mangrove Golden Whistler)</i>			
659.	24621 <i>Pachycephala melanura subsp. melanura (Mangrove Golden Whistler)</i>			
660.	25680 <i>Pachycephala rufiventris (Rufous Whistler)</i>			
Paradoxosomatidae				
661.	<i>Boreoheesperus undulatus</i>			
662.	<i>Orthomorpha coarctata</i>			
Paralichthyidae				
663.	<i>Pseudorhombus argus</i>			
664.	<i>Pseudorhombus arsius</i>			
665.	<i>Pseudorhombus elevatus</i>			
666.	<i>Pseudorhombus sp.</i>			
Pardalotidae				
667.	24627 <i>Pardalotus rubricatus (Red-browed Pardalote)</i>			
668.	48053 <i>Pardalotus rubricatus subsp. rubricatus (Red-browed Pardalote)</i>			Y
669.	25682 <i>Pardalotus striatus (Striated Pardalote)</i>			
Passeridae				
670.	25687 <i>Passer domesticus (House Sparrow)</i>	Y		
671.	24642 <i>Passer montanus (Eurasian Tree Sparrow)</i>	Y		
Pegasidae				
672.	<i>Pegasus volitans</i>			
Pelecanidae				
673.	24648 <i>Pelecanus conspicillatus (Australian Pelican)</i>			
Pempheridae				
674.	<i>Pempheris ypsilychnus</i>			
Petroicidae				
675.	24653 <i>Eopsaltria pulverulenta (Mangrove Robin)</i>			
676.	<i>Peneoanthe pulverulenta</i>			
Phalacrocoracidae				
677.	<i>Microcarbo melanoleucos</i>			
678.	25697 <i>Phalacrocorax carbo (Great Cormorant)</i>			
679.	25698 <i>Phalacrocorax melanoleucos (Little Pied Cormorant)</i>			
680.	24667 <i>Phalacrocorax sulcirostris (Little Black Cormorant)</i>			
681.	25699 <i>Phalacrocorax varius (Pied Cormorant)</i>			

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Phasianidae				
682.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
683.	24673 <i>Coturnix ypsilophora</i> subsp. <i>australis</i> (Brown Quail)			
684.	24672 <i>Coturnix ypsilophora</i> subsp. <i>cervina</i> (Brown Quail)			
Pholcidae				
685.	<i>Trichocyclus nigropunctatus</i>			
Phreodrilidae				
686.	<i>Phreodrilid with dissimilar ventral chaetae</i>			
687.	<i>Phreodrilid with similar ventral chaetae</i>			
Pinguipedidae				
688.	<i>Parapercis diplospilus</i>			
Pittidae				
689.	24677 <i>Pitta moluccensis</i> (Blue-winged Pitta)			
Planorbidae				
690.	<i>Glyptophysa</i> sp.			
691.	<i>Isidorella egraria</i>			
692.	<i>Planorbidae</i> sp.			
Platycephalidae				
693.	<i>Cymbacephalus bosschei</i>			
694.	<i>Cymbacephalus nematophthalmus</i>			
695.	<i>Inegocia japonica</i>			
696.	<i>Onigocia pedimacula</i>			
697.	<i>Onigocia pedimacula?</i>			
698.	<i>Platycephalus endrachtensis</i>			
699.	<i>Platycephalus</i> sp.			
700.	<i>Sorsogona tuberculata</i>			
701.	<i>Suggrundus macracanthus</i>			
Pleidae				
702.	<i>Pleidae</i> sp.			
Plotosidae				
703.	<i>Euristhmus microceps</i>			
704.	<i>Euristhmus sandrae</i>			Y
705.	<i>Neosilurus hyrtlil</i>			
706.	<i>Paraplotosus albilabris</i>			
707.	<i>Paraplotosus butleri</i>			
708.	<i>Paraplotosus muelleri</i>			
709.	<i>Plotosus lineatus</i>			
Podargidae				
710.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
711.	24679 <i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			
Podicipedidae				
712.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
713.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
Polynemidae				
714.	<i>Eleutheronema tetradactylum</i>			
715.	<i>Polydactylus multiradiatus</i>			
Pomacanthidae				
716.	<i>Pomacanthus sexstriatus</i>			
Pomacentridae				
717.	<i>Abudefduf bengalensis</i>			
718.	<i>Chromis fumea</i>			
719.	<i>Dischistodus darwiniensis</i>			
720.	<i>Neoglyphidodon nigroris</i>			
721.	<i>Neopomacentrus azysron</i>			
722.	<i>Neopomacentrus cyanomos</i>			
723.	<i>Neopomacentrus filamentosus</i>			
724.	<i>Pomacentrus milleri</i>			
725.	<i>Pristotis obtusirostris</i>			
Pomatostomidae				
726.	25706 <i>Pomatostomus temporalis</i> (Grey-crowned Babbler)			
727.	24684 <i>Pomatostomus temporalis</i> subsp. <i>rubeculus</i> (Grey-crowned Babbler)			
Pontarachnidae				

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728.	<i>Litarachna bartschae</i>			Y
729.	<i>Pontarachne australis</i>			Y
Priacanthidae				
730.	<i>Priacanthus hamrur</i>			
Pristinidae				
731.	<i>Pristina longiseta</i>			
Procellariidae				
732.	48573 <i>Ardenna pacifica</i> (Wedge-tailed Shearwater)		IA	
733.	24716 <i>Puffinus pacificus</i> (Wedge-tailed Shearwater)		IA	
Prodidomidae				
734.	<i>Cryptoerithus halli</i>			
735.	<i>Cryptoerithus occultus</i>			
736.	<i>Prodidomus woodleigh</i>			
737.	<i>Wesmaldra nixaut</i>			
738.	<i>Wydundra kennedy</i>			
739.	<i>Wydundra nixaut</i>			Y
Psettodidae				
740.	<i>Psettodes erumei</i>			
Pseudochromidae				
741.	<i>Blennodesmus scapularis</i>			
742.	<i>Congrogadus spinifer</i>			
743.	<i>Congrogadus subducens</i>			
744.	<i>Pseudochromis wilsoni</i>			
Psittacidae				
745.	<i>Barnardius zonarius</i>			
746.	25715 <i>Cacatua roseicapilla</i> (Galah)			
747.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
748.	24727 <i>Cacatua sanguinea</i> subsp. <i>westralensis</i> (Little Corella)			
749.	24736 <i>Melopsittacus undulatus</i> (Budgerigar)			
750.	<i>Neopsephotus bourkii</i>			
751.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
752.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
Pteropodidae				
753.	24172 <i>Pteropus alecto</i> (Black Flying-fox)			
754.	24173 <i>Pteropus scapulatus</i> (Little Red Flying-fox)			
Ptilonorhynchidae				
755.	<i>Chlamydera guttatus</i>			Y
756.	<i>Ptilonorhynchus guttatus</i>			
Pygopodidae				
757.	24996 <i>Delma borea</i>			
758.	25001 <i>Delma nasuta</i>			
759.	25002 <i>Delma pax</i>			
760.	25004 <i>Delma tincta</i>			
761.	25005 <i>Lialis burtonis</i>			
Pyralidae				
762.	<i>Pyralidae</i> sp.			
Rallidae				
763.	25727 <i>Fulica atra</i> (Eurasian Coot)			
764.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
765.	24765 <i>Gallirallus philippensis</i> subsp. <i>mellori</i> (Buff-banded Rail)			
766.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
767.	25732 <i>Porzana pusilla</i> (Baillon's Crake)			
768.	24771 <i>Porzana tabuensis</i> (Spotless Crake)			
769.	48141 <i>Tribonyx ventralis</i> (Black-tailed Native-hen)			
Recurvirostridae				
770.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
771.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
772.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
Salticidae				
773.	<i>Graynulla waldockae</i>			
774.	<i>Omoedus orbiculatus</i>			
775.	<i>Simaetha tenuior</i>			
776.	<i>Zenodorus orbiculatus</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Scarabaeidae				
777.	<i>Heteronyx mimus</i>			
778.	<i>Heteronyx tepperi</i>			
Scatophagidae				
779.	<i>Scatophagus argus</i>			
780.	<i>Selenotoca multifasciata</i>			
781.	<i>Selenotoca sp.</i>			Y
Sciaenidae				
782.	<i>Protonibea diacanthus</i>			
Scincidae				
783.	25015 <i>Carlia munda</i> (Shaded-litter Rainbow Skink)			
784.	25017 <i>Carlia triacantha</i> (Desert Rainbow Skink)			
785.	30893 <i>Cryptoblepharus buchananii</i>			
786.	25020 <i>Cryptoblepharus plagiocephalus</i>			
787.	30892 <i>Cryptoblepharus ustulatus</i>			
788.	25024 <i>Ctenotus angusticeps</i> (Airlie Island Ctenotus, Northwestern coastal Ctenotus)		P3	
789.	25027 <i>Ctenotus australis</i>			
790.	25036 <i>Ctenotus duricola</i>			
791.	25039 <i>Ctenotus fallens</i>			
792.	25462 <i>Ctenotus grandis</i>			
793.	25043 <i>Ctenotus grandis</i> subsp. <i>titan</i>			
794.	25045 <i>Ctenotus helenae</i>			
795.	25052 <i>Ctenotus leonhardii</i>			
796.	25463 <i>Ctenotus pantherinus</i> (Leopard Ctenotus)			
797.	25060 <i>Ctenotus pantherinus</i> subsp. <i>acripes</i> (Leopard Ctenotus)			
798.	25064 <i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i> (Leopard Ctenotus)			
799.	25070 <i>Ctenotus robustus</i>			
800.	25072 <i>Ctenotus rubicundus</i>			
801.	25073 <i>Ctenotus saxatilis</i> (Rock Ctenotus)			
802.	25074 <i>Ctenotus schomburgkii</i>			
803.	25077 <i>Ctenotus serventyi</i>			
804.	25466 <i>Cyclodomorphus melanops</i> (Slender Blue-tongue)			
805.	25090 <i>Cyclodomorphus melanops</i> subsp. <i>melanops</i> (Slender Blue-tongue)			
806.	41406 <i>Egernia cygnitos</i> (Western Pilbara Spiny-tailed Skink)			
807.	25092 <i>Egernia depressa</i> (Southern Pygmy Spiny-tailed Skink)			
808.	25101 <i>Egernia pilbarensis</i> (Pilbara Skink)			
809.	42404 <i>Eremiascincus isolepis</i>			
810.	41409 <i>Eremiascincus musivus</i> (Mosaic Desert Skink)			
811.	25125 <i>Lerista bipes</i>			
812.	30928 <i>Lerista clara</i>			
813.	30929 <i>Lerista jacksoni</i>			
814.	25155 <i>Lerista muelleri</i>			
815.	30925 <i>Lerista verhmens</i>			
816.	41417 <i>Liopholis striata</i> (Night Skink)			
817.	25184 <i>Menetia greyii</i>			
818.	25491 <i>Menetia surda</i>			
819.	25187 <i>Menetia surda</i> subsp. <i>surda</i>			
820.	25495 <i>Morethia ruficauda</i>			
821.	25193 <i>Morethia ruficauda</i> subsp. <i>exquisita</i>			
822.	25196 <i>Notoscincus butleri</i> (lined soil-crevice skink (Dampier))		P4	
823.	25197 <i>Notoscincus ornatus</i> subsp. <i>ornatus</i>			
824.	25202 <i>Tiliqua multifasciata</i> (Central Blue-tongue)			
Scirtidae				
825.	<i>Scirtidae sp.</i>			
Scolopacidae				
826.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
827.	25736 <i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
828.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
829.	24780 <i>Calidris alba</i> (Sanderling)		IA	
830.	25738 <i>Calidris canutus</i> (Red Knot, knot)		IA	
831.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
832.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
833.	24789 <i>Calidris subminuta</i> (Long-toed Stint)		IA	
834.	24790 <i>Calidris tenuirostris</i> (Great Knot)		T	
835.	24793 <i>Gallinago stenura</i> (Pin-tailed Snipe)		IA	
836.	25739 <i>Limicola falcinellus</i> (Broad-billed Sandpiper)		IA	
837.	30932 <i>Limosa lapponica</i> (Bar-tailed Godwit)		IA	

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
838.	25741 <i>Limosa limosa</i> (Black-tailed Godwit)		IA	
839.	24798 <i>Numenius madagascariensis</i> (Eastern Curlew)		T	
840.	24799 <i>Numenius minutus</i> (Little Curlew, Little Whimbrel)		IA	
841.	25742 <i>Numenius phaeopus</i> (Whimbrel)		IA	
842.	24803 <i>Tringa brevipes</i> (Grey-tailed Tattler)		P4	
843.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
844.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
845.	24809 <i>Tringa stagnatilis</i> (Marsh Sandpiper, little greenshank)		IA	
846.	41351 <i>Xenus cinereus</i> (Terek Sandpiper)		IA	
Scolopendridae				
847.	<i>Arthrorhabdus paucispinus</i>			
848.	<i>Ethmostigmus curtipes</i>			
849.	<i>Scolopendra laeta</i>			
850.	<i>Scolopendra morsitans</i>			
Scombridae				
851.	<i>Rastrelliger kanagurta</i>			
Scorpaenidae				
852.	<i>Parascorpaena picta</i>			
853.	<i>Pterois volitans</i>			
Scutigeridae				
854.	<i>Pilbarascutigera incola</i>			
Serranidae				
855.	<i>Cephalopholis boenak</i>			
856.	<i>Chromileptes altivelis</i>			
857.	<i>Epinephelus bilobatus</i>			
858.	<i>Epinephelus coioides</i>			
859.	<i>Epinephelus corallicola</i>			
860.	<i>Epinephelus fasciatus</i>			
861.	<i>Epinephelus malabaricus</i>			
862.	<i>Epinephelus quoyanus</i>			
863.	<i>Epinephelus sexfasciatus</i>			
Sididae				
864.	<i>Diaphanosoma excisum</i>			
865.	<i>Latonopsis australis</i>			
Sillaginidae				
866.	<i>Sillago burrus</i>			
867.	<i>Sillago lutea</i>			
Simuliidae				
868.	<i>Simulium ornatipes</i>			
Soleidae				
869.	<i>Dexillus muelleri</i>			
870.	<i>Soleichthys heterorhinos</i>			
871.	<i>Zebrias quagga</i>			
Sparassidae				
872.	<i>Isopedella gibsandi</i>			
873.	<i>Isopedella tindalei</i>			
874.	<i>Pediana horni</i>			
875.	<i>Pediana tenuis</i>			
Sparidae				
876.	<i>Acanthopagrus latus</i>			
Sphyraenidae				
877.	<i>Sphyraena barracuda</i>			
878.	<i>Sphyraena</i> sp.			
Stratiomyidae				
879.	<i>Stratiomyidae</i> sp.			
Strigidae				
880.	48016 <i>Ninox boobook</i> (Boobook Owl)			
881.	25747 <i>Ninox connivens</i> (Barking Owl)			
Sturnidae				
882.	47954 <i>Gelochelidon nilotica</i> (Gull-billed Tern)		IA	
Sulidae				
883.	25754 <i>Sula leucogaster</i> (Brown Booby)		IA	

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Sylviidae				
884.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
885.	24837 <i>Eremiornis carteri</i> (Spinifex-bird)			
Synanceiidae				
886.	<i>Minous versicolor</i>			
887.	<i>Synanceia horrida</i>			
Synchaetidae				
888.	<i>Polyarthra dolichoptera</i>			
Syngnathidae				
889.	<i>Festucalex</i> sp.			
890.	<i>Haliichthys taeniophorus</i>			
891.	<i>Hippichthys penicillus</i>			
892.	<i>Hippocampus</i> sp.			
893.	<i>Micrognathus micronotopterus</i>			
Tabanidae				
894.	<i>Tabanidae</i> sp.			
Tachyglossidae				
895.	24207 <i>Tachyglossus aculeatus</i> (Short-beaked Echidna)			
Terapontidae				
896.	<i>Amniataba caudavittata</i>			
897.	<i>Amniataba percoides</i>			
898.	<i>Leiopotherapon unicolor</i>			
899.	<i>Terapon jarbua</i>			
Testudinellidae				
900.	<i>Testudinella patina</i>			
Tetraodontidae				
901.	<i>Chelonodon patoca</i>			
Tetrarogidae				
902.	<i>Cottapistus cottoides</i>			
903.	<i>Liocranium praepositum</i>			
904.	<i>Paracentropogon vespa</i>			
Tettigoniidae				
905.	<i>Antipodectes bituberculatus</i>			Y
Theridiidae				
906.	<i>Latrodectus geometricus</i>			
Thiaridae				
907.	<i>Thiaridae</i> sp.			
Threskiornithidae				
908.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
909.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
910.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
Triacanthidae				
911.	<i>Triacanthus</i> sp.			
Trichocercidae				
912.	<i>Trichocerca similis</i>			
Trichonotidae				
913.	<i>Trichonotus setiger</i>			
Trichotriidae				
914.	<i>Macrochaetus</i> sp.			
Triglidae				
915.	<i>Lepidotrigla</i> sp.			
Trigoniulidae				
916.	<i>Austrostrophus stictopygus</i>			
Triopsidae				
917.	<i>Triops australiensis australiensis</i>			
918.	<i>Triops nr australiensis</i> (PSW) (?nsp BVT)			Y
Tripterygiidae				
919.	<i>Enneapterygius gracilis</i>			
920.	<i>Enneapterygius larsonae</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
921.	<i>Enneapterygius philippinus</i>			
922.	<i>Enneapterygius sp.</i>			
923.	<i>Enneapterygius tutuilae</i>			
924.	<i>Helcogramma striata</i>			
925.	<i>Norfolkia brachylepis</i>			
Trombidiformes				
926.	<i>Acariformes sp.</i>			
Turbellaria				
927.	<i>Turbellaria sp.</i>			
Turnicidae				
928.	24851 <i>Turnix velox (Little Button-quail)</i>			
Tytonidae				
929.	<i>Tyto delicatula</i>			
Unionicolidae				
930.	<i>Encentridophorus sarasini</i>			
Urodacidae				
931.	<i>Urodacus armatus</i>			
Varanidae				
932.	25209 <i>Varanus acanthurus (Spiny-tailed Monitor)</i>			
933.	25210 <i>Varanus brevicauda (Short-tailed Pygmy Monitor)</i>			
934.	25212 <i>Varanus eremius (Pygmy Desert Monitor)</i>			
935.	25216 <i>Varanus giganteus (Perentie)</i>			
936.	25218 <i>Varanus gouldii (Bungarra or Sand Monitor)</i>			
937.	25524 <i>Varanus panoptes (Yellow-spotted Monitor)</i>			
938.	25223 <i>Varanus panoptes subsp. rubidus</i>			
939.	25224 <i>Varanus pilbarensis (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)</i>			
940.	25526 <i>Varanus tristis (Racehorse Monitor)</i>			
941.	25227 <i>Varanus tristis subsp. tristis (Racehorse Monitor)</i>			
Veliferidae				
942.	<i>Metavelifer multiradiatus</i>			
Veliidae				
943.	<i>Microvelia (Austromicrovelia) peramoena</i>			
944.	<i>Veliidae sp.</i>			
Vespertilionidae				
945.	24192 <i>Nyctophilus arnhemensis (Arnhem Land Long-eared Bat)</i>			
946.	42365 <i>Nyctophilus daedalus (Northwestern Long-eared Bat, Pallid Long-eared Bat)</i>			
947.	24194 <i>Nyctophilus geoffroyi (Lesser Long-eared Bat)</i>			
948.	<i>Nyctophilus geoffroyi subsp. pallascens</i>			
949.	24205 <i>Vespadelus finlaysoni (Finlayson's Cave Bat)</i>			
Zodariidae				
950.	<i>Minasteron minusculum</i>			
Zosteropidae				
951.	24857 <i>Zosterops luteus (Yellow White-eye)</i>			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



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.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 14/03/19 17:12:27

[Summary](#)

[Details](#)

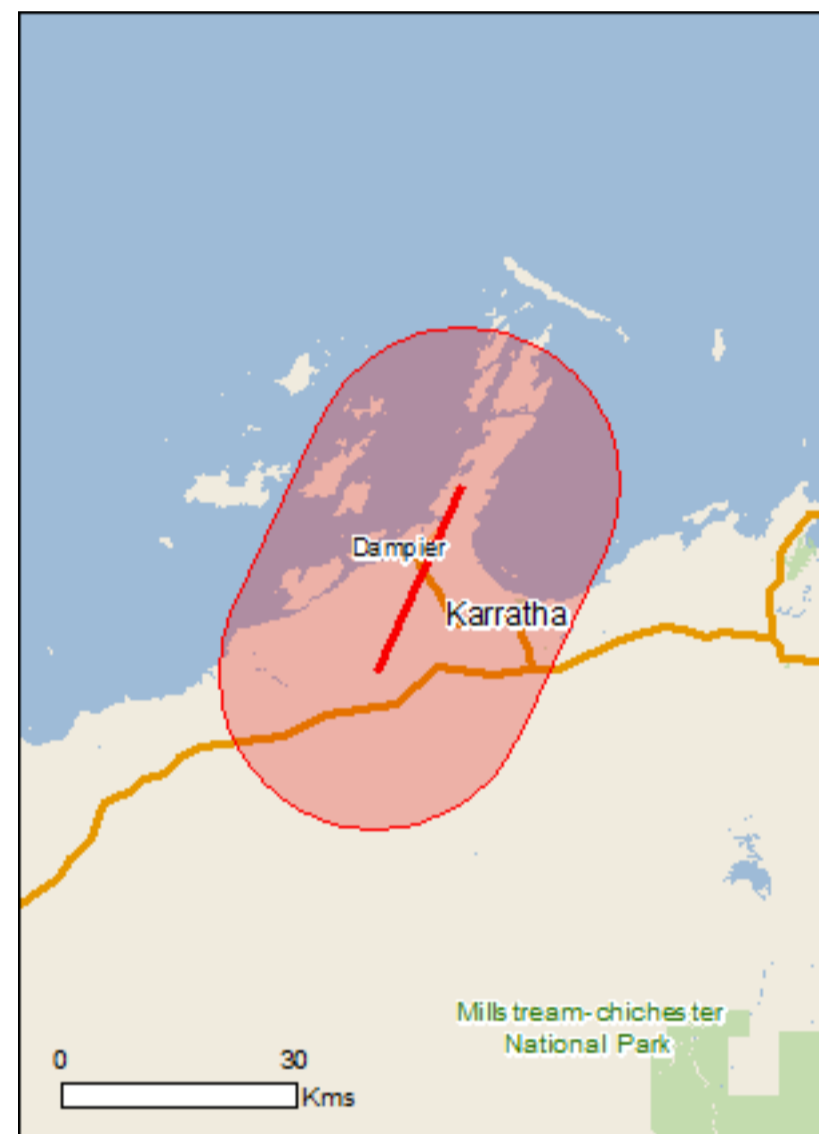
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

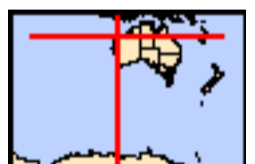
[Acknowledgements](#)



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[Coordinates](#)

Buffer: 20.0Km



Summary

Matters of National Environmental 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:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	31
Listed Migratory Species:	60

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 <http://www.environment.gov.au/heritage>

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

Commonwealth Land:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	101
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	6
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties		[Resource Information]
Name	State	Status
Indigenous		
Dampier Archipelago (including Burrup Peninsula)	WA	Listed place

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area

Name	Status	Type of Presence
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Rhinonictis aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Ctenotus angusticeps Northwestern Coastal Ctenotus, Airlie Island Ctenotus [25937]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Liasis olivaceus barroni Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Sharks		
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species

Name	Status	Type of Presence
habitat may occur within area		
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Migratory Marine Species		
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area

Name	Threatened	Type of Presence
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat known to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat known to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to 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		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Thalasseus bergii Crested Tern [83000]		Breeding known to occur

Name	Threatened	Type of Presence within area
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Tringa totanus Common Redshank, Redshank [835]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

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

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

Name
Commonwealth Land - Defence - KARRATHA TRAINING DEPOT

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

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Larus novaehollandiae Silver Gull [810]		Breeding known to occur

Name	Threatened	Type of Presence within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		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
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Puffinus pacificus Wedge-tailed Shearwater [1027]		Breeding known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Sterna anaethetus Bridled Tern [814]		Breeding known to occur within area
Sterna bergii Crested Tern [816]		Breeding known to occur within area
Sterna caspia Caspian Tern [59467]		Breeding known to occur within area

Name	Threatened	Type of Presence
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Stiltia isabella Australian Pratincole [818]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Tringa totanus Common Redshank, Redshank [835]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area
Fish		
Bulbonaricus brauni Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
Campichthys tricarinatus Three-keel Pipefish [66192]		Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Reptiles		
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Aipysurus duboisii Dubois' Seasnake [1116]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
Aipysurus eydouxii Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Aipysurus tenuis Brown-lined Seasnake [1121]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
Ephalophis greyi North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Hydrelaps darwiniensis Black-ringed Seasnake [1100]		Species or species habitat may occur within area
Hydrophis czeblukovi Fine-spined Seasnake [59233]		Species or species habitat may occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Hydrophis mcdowellii null [25926]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat known to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves		[Resource Information]
Name	State	
Murujuga	WA	
Unnamed WA36907	WA	
Unnamed WA36909	WA	
Unnamed WA36910	WA	
Unnamed WA36915	WA	
Unnamed WA38287	WA	

Invasive Species

[[Resource Information](#)]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species

Name	Status	Type of Presence
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		habitat likely to occur within area Species or species habitat known to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, 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 distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for 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 reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-20.799064 116.682674,-20.596088 116.78361,-20.596088 116.782924,-20.596088 116.782924

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](#)
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- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
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- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

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

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

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Rev 0	GGaikhorst	Robert Browne Cooper	On file	Fionnuala Hannon	<i>Fionnuala Hannon</i>	2/8/2019
Rev 0	GGaikhorst	Joel Collins	On file	Fionnuala Hannon	<i>Fionnuala Hannon</i>	3/12/2019

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