3.2 Previous Environmental Investigations

Relevant investigation reports sighted for this investigation (or referenced within signed reports) are identified and summarised in **Table 8**, noting no environmental investigations specifically targeting the site were identified

Table 8: Previous Reports

Report	Report Summary	Relevance to Site
AECOM (2010) Environmental Due Diligence	AECOM completed an environmental due diligence (EDD) on behalf of LandCorp as part of preparatory works in support of the expansion of the townsite as part of the Onslow Townsite Strategy A limited Preliminary Site Investigation (PSI) was completed as part of the EDD and included identification of potentially contaminating activities, industries or land uses relevant to the site and subsequent development of a conceptual site model for the site. The Limited PSI identified a number of potentially contaminating land uses on and in vicinity of the development area and associated recommended actions should the townsite expansion occur.	The EDD investigation area incorporates part of the site as defined in this investigation. Some of the associated potentially contaminating activities, industries and land uses of AECOM (2010) are relevant to the site, including: • Old furnace oil tank, Lot 381 • Old dieseline AST, Lot 383 • Old aviation spirit tank, Lot 385 • Dieseline (Lot 651) and aviation spirit (Lot 658) pumping stations • Fuel pipeline. AECOM (2010) summarises key areas of potential concern, some of which that are relevant to the site, including potential hydrocarbon contamination associated with the bulk storage facilities, the likely presence of fuel/oil in the pipeline on decommissioning and possible product loss from the pipeline, and the possible effects of inundation on contamination migration.
Kelsall (1995) Bulk Fuel Installation, Onslow	Referenced within AECOM (2010), this report described the installation and history of the bulk fuel installation facilities, as described by the engineer who designed the facilities. The report notes that cyclone damage occurred to the fuel installation throughout its history, and that sections of the pipeline were removed by Medalia and Benn Pty Ltd, but further information on the removal is not known.	Parts of the bulk fuel installation facilities were located immediately adjacent the site and are known to have been contaminated (e.g. the furnace oil tank on Lot 381). The locations of former fuel pipelines from the tanks to pump out stations are indicated to be close to the eastern boundary of the site.
Department of Maritime Archaeology (1995) Port Related Structures on the Coast of Western Australia	The Department of Maritime Archaeology (DMA) of the Western Australian Maritime Museum reported on port-related structures in Western Australia. The report notes that the new Onslow jetty at Beadon Point was built in 1923 and was subsequently used for resupplying fuel to naval and other ships during World War (WW) II. The township and port were also the headquarters for nuclear bomb tests in the Montebello Islands in 1952-1956.	Describes the use of the kitty for fuel resupply, and the damage and destruction to the jetty from cyclones in 1953, 1958, and three cyclones in 1961. The report also notes that asbestos from Wittenoom Gorge was exported from a land-backed wharf in Beadon Creek between 1943 and 1966. The nature of the asbestos exported and the exact location of the wharf are not known.

4 AOPC and Data Gaps

4.1 AOPCs

AOPCs are those areas on a site that may have potentially polluting activities, industries and land uses that could result in contamination of surficial and subsurface media. For purposes of this report, AOPCs are generally characterised as areas where:

- Sources from which potential releases of contaminants of potential concern (COPCs) to the environment either currently exist, or have historically existed
- Operational processes, such as storage, handing, and transport of hydrocarbons or other COPC could result in releases to the environment
- Potential polluting activities, such as illegal dumping of asbestos waste, of a scale sufficient to adversely impact surficial and/or subsurface conditions.

360 Environmental have identified six (6) AOPCs at or within the vicinity of the site, and associated COPC) based on the findings of the desktop assessment, including review of the site history and available information. These are summarised in **Table 9** with AOPCs depicted on **Figure 2**.

Note that there is no direct evidence of potential offsite sources impacting the site, as no investigations have been completed at the site and a site inspection was not undertaken as part of the desktop assessment.

Table 9: AOPC and COPC

AOPC	Area / Details	COPC
1	Area adjoining the former furnace oil ASTs and associated fuel infrastructure to the north Based on the previous classification of Lot 381 to the north as Contaminated – remediation required in accordance with the Contaminated Sites Act 2003. The site was classified in January 2007 on the basis of total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAHS) in soil at the site. Contamination was associated with the storage and use of fuels associated with the former refuelling station for submarines during World War II (AECOM, 2010). Based on review of AECOM (2010) it is understood remediation was being undertaken in 2010. However the specific activities and outcomes are not known as no investigation or remediation reports have been sighted to confirm the nature and extent of any remediation activities.	Hydrocarbons, polyaromatic hydrocarbons, heavy metals
2	Area adjoining the former dieseline AST to the east and associated pipeline Based on the previous use of Lot 383 to the immediate east of the site for the storage of dieseline. AECOM (2010) notes that the AST historically sat on a bed of oil-saturated sand and the underground pipe from the AST to the pump out station north of the site was wrapped in bitumen-soaked hessian and buried at a depth of approximately 0.6 mbgl. The AST is understood to have been decommissioned and then re-engineered by Water Corporation for use as a water supply storage tank, receiving water from the Cane River borefield east of Onslow. The use of the former AST for dieseline storage, the bitumen-saturated bed on which it sat, the bitumen-soaked hessian wrap of the pipeline have the potential to be sources of contamination through spillage or product loss from damage to fuel infrastructure.	Hydrocarbons, polyaromatic hydrocarbons, heavy metals

AOPC	Area / Details	COPC
3	Area adjoining or near the former aviation spirit pump station to the south and associated pipeline Based on the previous use of Lot 658 (as reported in AECOM 2010) as a pump out station for the aviation spirit tank to the south of the site at Lot 385, and the pipeline route from the tank to the station and down towards the former jetty location to the north of the site. The use of the former AST for aviation spirit storage, the bitumen-saturated bed on which it sat, and the likely bitumen-soaked hessian wrap of the pipeline are potential sources of contamination.	Hydrocarbons, polyaromatic hydrocarbons, heavy metals
4	Part of the site with a moderate to low risk of ASS being present Based on the identification of part of the site as having a moderate to low risk of ASS being present at less than 3 m depth and high to moderate risk of ASS being present beyond 3 m depth. Site redevelopment works may disturb and/or expose ASS. ASS may impact construction materials and exposed ASS has the potential to produce acidic leachate or groundwater.	Acidic soils and/or leachate
5	Entire site Onslow Town Site (which includes the site) is listed within the Department of Defence (DoD) Unexploded Ordnance (UXO) Mapping Application (accessed online 17 July 2021) as having a Slight Potential for the presence of UXO. The description provided is as follows: "Anti-aircraft artillery live firing practices using high explosive ammunition during WW (World War) II. Aerial bombing also highly likely. For land use planning advice contact the WA Department of Fire and Emergency Services (advice@dfes.wa.gov.au) and quote location number N26 and page number C-275. Where a Defence report is available, it will be listed below and can be found on the Defence UXO Website". Note that no report was listed in the mapping application. AECOM (2010) noted that although at the time of reporting Onslow was not considered to have a slight or substantial risk of UXO potential, Onslow was subject to an air raid on 15 September 1943 during which bombs were dropped. It was not clear how many bombs had been dropped or whether all exploded on impact (AECOM 2010).	UXO
6	Entire site 360 Environmental notes that although there is no evidence of historical development at the site, asbestos containing materials (ACM) or potential ACM (PACM) may be present as a result of illegal fly-tipping of waste materials at the site, the effects of cyclonic activity, or historical exporting of asbestos from a wharf in Beadon Creek. It is noted that several large cyclones have impacted Onslow, including three in 1961 that damaged buildings and destroyed the jetty to the north of the site. Such events have the potential to transport building materials some distance and therefore may have resulted in ACM or PACM being present at the site.	Asbestos [ACM sheeting, asbestos fines (AF), fibrous asbestos (FA)]

4.2 Potential Receptors

Potential receptors to the AOPC are described in **Table 10**.

Table 10: Potential Receptors

Potential Receptor	Relevant AOPC
Onsite human health (including future site workers, future site residents and intrusive maintenance workers)	AOPC 1, AOPC 2, AOPC 3, AOPC 4, AOPC 5, AOPC 6
Offsite human health (current/future workers and residents in the vicinity of the site)	AOPC 1, AOPC 2, AOPC 3, AOPC 4, AOPC 5, AOPC 6

4.3 Potential Migration Pathways

The potential migration pathways between AOPCs and potential receptors both onsite and offsite are described in **Table 11**.

Table 11: Potential Migration Pathways

Migration Pathway	Detail
Exposure to impacted soils via direct contact (i.e. by dermal contact, inhalation and accidental ingestion) from AOPC 1, AOPC 2 and AOPC 3.	Onsite The site is vacant, undeveloped and has natural surface cover. It is considered unlikely that offsite residents or workers would be exposed to onsite soils. Future site workers involved in the development of the site may be exposed to contaminated soils if present. Fauna, if present, are unlikely to contact impacted soils, given the likely depth of impact if present. Flora types are currently not known, therefore the risks associated with contaminant uptake are unknown. Offsite Residents or maintenance workers are more likely to be exposed to offsite soils potentially impacted by AOPC 1, AOPC 2 and AOPC 3, but these sources are not directly associated with the site.
Volatilisation and subsequent migration of hydrocarbon vapour (potentially present in hydrocarbon impacts sands associated with AOPC 1, AOPC 2 and AOPC 3)	Onsite There are no man-made surface coverings or structures at the site, thus if impacted onsite soils were present there is no risk of migration of vapours into aboveground structures. Future site residents, workers and maintenance workers may be exposed to hydrocarbon vapour in the event soil contamination is present at the site and structures are built. Offsite Residents in properties adjacent AOPC 1, AOPC 2 or AOPC 3 are at higher risk of exposure to hydrocarbon vapours, although there is no current evidence of actual contamination associated with these AOPC and AOPC 1 is understood to have been remediated.
Abstraction of COPC in groundwater	Onsite There are no groundwater abstraction bores at the site and it is not known if future development of the site will include groundwater abstraction. The facilities requirements indicate a potable water treatment plant, but it is not indicated if water will be sourced from the site. Offsite One groundwater abstraction licence is associated with the property to the north of the site, although the ultimate use of this groundwater (and whether the allocation is utilised) is not known. As most water used in the Onslow Town site is sourced from abstraction bores east of the town, exposure to potential contaminants is unlikely.
Disturbance of ASS resulting in the development of acidic leachates and acidification of groundwater and/or effects on construction materials	Onsite ASS pose a risk to future site development works if soils are determined to be ASS and development activities disturb those materials. If present, ASS could affect the integrity and longevity of construction materials. Offsite Not relevant to offsite receptors unless disturbed onsite and stockpiles of ASS material develop leachate which runs off the site.

Migration Pathway	Detail
Direct contact with UXO associated with AOPC 5	Onsite The site is currently vacant and undeveloped however it is not known if the site is fenced/access is restricted. Although the likelihood of UXO being present is given as Slight, potential risk of exposure is possible. Risk to future site workers involved in site development are higher, as site works involving machinery and excavations are likely to occur and could contact UXO, if present. Offsite Risks to current and future offsite residents and workers is considered low, given the level of development in the surrounding area.
Inhalation of asbestos fibres from AOPC 6	Onsite The site is vacant and undeveloped with no current site users. If present onsite, ACM, AF or FA could pose a risk to future site users Although there is no current evidence of asbestos being present at the site [a hazardous materials (HAZMAT) survey has not been undertaken at the site] asbestos building products were likely historically used in nearby properties and asbestos products were historically exported from a wharf on Beadon Creek. Damage during cyclonic activities (building products) or demolition and potential losses during transport (asbestos export), exacerbated by potential wind-blown transport during cyclonic activity, may have occurred (although considered unlikely). Offsite Given the age of the Onslow Town site, it is likely that asbestos building products (such as in asbestos fencing or cladding) were historically used. These materials may have been damaged in historical cyclone activity or site redevelopment/demolition works and therefore pose a risk to current offsite residents and workers.

4.4 Source-Pathway-Receptor Linkages

For a particular contaminant to present a risk to receptors, three components must be present:

- **Source** - A potentially hazardous substance that has been released into the environment
- **Pathway** - A mechanism by which receptors can become exposed to the source or derivatives of the source
- **Receptors** - The human or ecological component potentially at risk of experiencing an adverse response following exposure to the source or derivatives of the source.

If one of these three components (referred to as SPR linkages) are missing from an exposure scenario, then there can be no risk. Following the desktop assessment the following SPR linkages were identified as having the potential to be complete at the site if the site is redeveloped:

SPR 1: UXO are potentially present at the site and pose a risk to potential future onsite workers involved in site development works. Although the likelihood of their presence is listed as Slight, the potential human health impacts of exposure for future site workers are high, thus the overall risk associated with UXO (AOPC 5) is considered **LOW to MODERATE**.

SPR 2: Asbestos materials may be present at the site and no HAZMAT survey has been undertaken. Although the likelihood of these being present onsite is low, the potential human

health impacts of exposure for future site workers or residents are high, the overall risk associated with asbestos (AOPC 6) is considered **LOW to MODERATE**.

SPR 3: The potential presence of onsite soil or groundwater contamination associated with offsite bulk fuel infrastructure is not known and no previous onsite investigations have been identified. Although the adjoining site to the north has previously been classified as Contaminated – remediated required, remediation is understood to have occurred, the likelihood of impacts to future site workers or residents is considered low. The overall risk from AOPC 1, AOPC 2 and AOPC 3 is considered **LOW**.

SPR 4: Part of the site is listed as having a moderate to slight risk of ASS being present, although no ASS investigations have been undertaken and specific site development plans (i.e. areas of excavation, the requirement for dewatering) are not known. If present, the risk of ASS to future site workers and the groundwater receptor is considered **LOW**.

4.5 Data Gaps

The identification of data gaps supports determination of information necessary to meet the objectives for completing the desktop contamination assessment. Data gaps relevant to the project are summarised in **Table 12**.

Table 12: Data Gaps

Data Gap	AOPC(s)	Description
1	AOPC 1, 2, 3	There have been no soil or groundwater investigations at the site, however it is understood contamination (and remediation) associated with former fuel infrastructure offsite to the north has previously been identified (AECOM 2010). Reports presenting details of investigation(s) and/or remediation offsite have not been identified and as such the specific scope and/or effectiveness of any remediation works is not well understood. In this regard, the nature and extent of existing and/or residual contamination in soil or groundwater is not known.
2	AOPC 4	It is not known if the soils in the area marked as having a moderate to low risk of ASS being present are potential or actual ASS. The requirement to investigate is dependent on whether development plans for the site involve disturbance of potential ASS material or if dewatering may be required. Management measures, such as development of an ASS management plan (ASSMP) or dewatering management plan (DMP), would be dependent on the findings of any ASS investigation.
3	AOPC 5	Onslow Townsite is listed on the DoD UXO Mapping Application as having a Slight Potential for the presence of UXO. It is not known if a detailed UXO survey has been undertaken at the site, or if records exist of any historical UXO searches or recovery operations in relation to the site. Information on possible UXO presence in AECOM (2010) was anecdotal in nature.
4	AOPC 6	Without a HAZMAT survey of the site or previous site investigations, it is not known if ACM, AF or FA are present at the site. If these are present, they may be a source of potential contamination for: current offsite residents and workers through wind-blown transport of fibres; future site workers involved in the development of the site through ground disturbance activities; or potential future site residents and site workers post development through wind-blown transport of fibres.

5 Conclusions and Recommendations

Based on the findings of this desktop assessment and review of available information, it is concluded that there have been no significant historical contaminating activities at the site, as the site has been vacant and undeveloped. However, six (6) AOPC were identified, namely:

- AOPC 1 – Part of the site located adjacent to the former furnace oil ASTs to the north of the site, and associated fuel pipelines and pumps [the offsite former furnace oil AST area was formerly classified as Contaminated – remediation required (AECOM 2010)].
- AOPC 2 – Part of the site located adjacent to the former historical bulk fuel storage to the east (dieseline) of the site, and associated fuel pipelines and pumps.
- AOPC 3 – Part of the site located adjacent to the former historical bulk fuel storage to the south (aviation spirit) of the site, and associated fuel pipelines and pumps.
- AOPC 4 - Part of the site with a moderate to low risk of acid sulfate soils (ASS) being present within 3 metres of the soils surface.
- AOPC 5 - Potential UXO from activities during WWII (whole of site and Onslow Townsite).
- AOPC 6 - Potential asbestos from illegal fly-tipping or associated with offsite sources (whole of site).

The following data gaps were identified associated with the above AOPCs:

- There have been no soil or groundwater investigations undertaken at the site however it is understood offsite contamination (and possible remediation) associated with former fuel infrastructure located to the north has previously occurred. Reports presenting details of investigation(s) and/or remediation offsite have not been identified and as such the specific scope and/or effectiveness of any remediation works is not well understood. In this regard the nature and extent of existing and/or residual contamination in soil or groundwater is not known. The risk to the site is considered to be **LOW**.
- It is not known if the soils in the area marked as having a moderate to low risk of ASS being present are potential or actual ASS. The requirement to investigate is dependent on whether development plans for the site involve disturbance of potential ASS material or if dewatering may be required. Management measures, such as development of an ASSMP or DMP, would be dependent on the findings of any ASS investigation. The risk to the site is considered to be **LOW**.
- Onslow Townsite (including the site) is listed on the DoD UXO Mapping Application as having a Slight Potential for the presence of UXO. It is not known if a detailed UXO survey has been undertaken at the site, or if records exist of any historical UXO searches or recovery operations in relation to the site. Information on possible UXO presence in AECOM (2010) was anecdotal in nature. The risk to the site is considered to be **LOW to MODERATE**.
- Without a HAZMAT survey of the site or previous site investigations, it is not known if ACM, AF or FA are present at the site. If these are present, they may be a source of potential contamination for onsite and offsite, current and future, receptors (human health). The risk to the site is considered to be **LOW to MODERATE**.

Based on the data gaps, the following recommendations are made:

- A UXO survey of the site should be considered prior to any site works commencing.
- A HAZMAT site survey should be considered to evaluate the potential presence of asbestos at the site.
- Conduct a review of any available contamination investigation and/or remediation reports describing works associated with former bulk fuel infrastructure (i.e. AOPC 1, AOPC 2 and AOPC 3) to determine the requirement for investigation onsite.
- Site development plans should be reviewed to determine if ASS may be disturbed by development activities or if dewatering is to occur, and thereby determine the requirement for an ASSMP/DMP.
- Depending on the findings of the above, consideration should be given to intrusive site investigations to:
    - Investigate the contamination status of soils (and potentially groundwater) onsite at AOPC 1, AOPC 2 and AOPC 3, to confirm there are no hydrocarbon impacts.
    - Assess the potential presence of asbestos (ACM, AF or FA) in soils at the site. If identified to be present, asbestos remediation should be undertaken in accordance with Department of Health guidelines.
- In the absence of any site investigations associated with AOPC 1, AOPC 2 or AOPC 3, an unexpected finds protocol (UFP) is recommended to be developed prior to site development works. The protocol should detail the management requirements should any of the COPCs for the site be encountered during site development works.

6 Limitations

This report is produced strictly in accordance with the scope of services set out in the contract or otherwise agreed in accordance with the contract. 360 Environmental makes no representations or warranties in relation to the nature and quality of soil and water other than the visual observation and analytical data in this report.

In the preparation of this report, 360 Environmental has relied upon documents, information, data and analyses ("client's information") provided by the client and other individuals and entities. In most cases where client's information has been relied upon, such reliance has been indicated in this report. Unless expressly set out in this report, 360 Environmental has not verified that the client's information is accurate, exhaustive or current and the validity and accuracy of any aspect of the report including, or based upon, any part of the client's information is contingent upon the accuracy, exhaustiveness and currency of the client's information. 360 Environmental shall not be liable to the client or any other person in connection with any invalid or inaccurate aspect of this report where that invalidity or inaccuracy arose because the client's information was not accurate, exhaustive and current or arose because of any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to 360 Environmental.

Aspects of this report, including the opinions, conclusions and recommendations it contains, are based on the results of the investigation, sampling and testing set out in the contract and otherwise in accordance with normal practices and standards. The investigation, sampling and testing are designed to produce results that represent a reasonable interpretation of the general conditions of the site that is the subject of this report. However, due to the characteristics of the site, including natural variations in site conditions, the results of the investigation, sampling and testing may not accurately represent the actual state of the whole site at all points.

It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

Subject to the terms of the contract between the Client and 360 Environmental Pty Ltd, copying, reproducing, disclosing or disseminating parts of this report is prohibited (except to the extent required by law) unless the report is produced in its entirety including this page, without the prior written consent of 360 Environmental Pty Ltd.

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Figures



Legend

Approximate Site Boundary

Site Coordinates GDA94 MGA50

Point ID	Easting	Northing
1	303735	7606131
2	304071	7606513
3	304422	7606330
4	304154	7605925

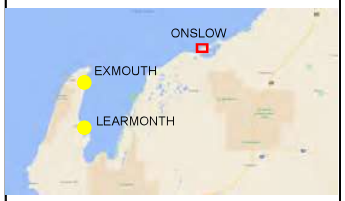
- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2020
- OTHER DATA SOURCED LANDGATE 2020
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
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0 100 200 300
Metres

N

LOCALITY MAP



PROJECT ID	DATE
4754	15/7/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
DO	TS	TS	1

Mineral Resources Limited
Lot 300 Back Beach Rd, Onslow

Desktop Contamination Assessment

Figure 1
Site Location

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Legend

- Approximate Site Boundary

Areas of Potential Concern

- AOPC 1 - parts of site adjacent the former Furnace Oil ASTs and/or associated infrastructure
- AOPC 2 - parts of site adjacent the former Dieseline AST and/or associated infrastructure
- AOPC 3 - parts of site adjacent the former Aviation Spirit AST and/or associated infrastructure
- AOPC 4 - part of site with Moderate to Low risk of ASS within 3m of site surface
- AOPC 5 - UXO risk for whole of site (and Onslow Townsite)
- AOPC 6 - Potential asbestos (whole of site)

NOTE: dashed lines = approximate fuel line locations associated with former bulk fuel infrastructure

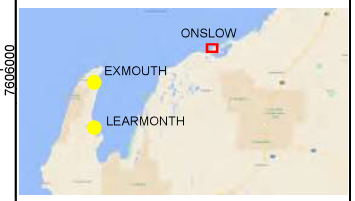
- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2021
- OTHER DATA SOURCED LANDGATE 2021
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2021
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LOCALITY MAP



PROJECT ID	DATE
4754	15/7/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
DO	TS	TS	1

Mineral Resources Limited
Lot 300 Back Beach Rd, Onslow

Desktop Contamination Assessment

Figure 2
Areas of Potential Concern

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Appendices

Appendix A
Basic Summary of Records Results

Government of Western Australia
Department of Water and Environmental Regulation

Your ref: Onslow BSR
Our ref: DMO 7279
Enquiries: Registrar
Phone: 1300 762 982
Fax: (08) 6364 7001
Email: info@dwer.wa.gov.au

Dion Mark Oulton
360 Environmental
57A Shearn Cres
Doubleview WA 6018

Dear Sir/Madam

BASIC SUMMARY OF RECORDS REQUEST

Thank you for your Basic Summary of Records request for the site consisting of the following parcel(s) of land:

- LOT 300 ON PLAN 67927 as shown on certificate of title LR3160/90 known as 300 Back Beach Rd, Onslow WA 6710

which Department of Water and Environmental Regulation (the department) received on 15/07/2021.

A search of the department's records of known and suspected contaminated sites was undertaken however, our records indicate that as of 27/07/2021 this site has not been reported to the department as a known or suspected contaminated site either prior to or after the commencement of the *Contaminated Sites Act 2003*.

For general enquiries, please contact the Registrar on 1300 762 982.

Yours sincerely

Michelle Brierley, A/Manager

CONTAMINATED SITES REGULATION
Delegated Officer under section 91
of the *Contaminated Sites Act 2003*

27/07/2021

Enc. Receipt Number RR023087

Appendix B
Historical Aerial Photographs

Historical Aerial Imagery	
Image	**Image Date**
	September 1970
	September 2001

Historical Aerial Imagery	
Image	**Image Date**
	September 2010
	May 2017

Historical Aerial Imagery	
Image	**Image Date**
	November 2020

360 environmental

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Appendix C
Lot 300 Back Beach Road, Onslow, Flora and Fauna Survey

360 environmental

Lot 300 Back Beach Road, Onslow

Flora and Fauna Report

Prepared for

Rowe Group

July 2021

people planet professional

Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
					Copies	Date
4733AA_Rev0	Internal Draft	B. Duncan P. Walker J. Webb	M. Lohr M. Stone	-	-	
2249AA_Rev1	Client Draft	B. Duncan P. Walker J. Webb	M. Lohr M. Stone	LI	1x electronic	26/07/2021

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Executive Summary

Rowe Group commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a biological survey (Detailed Flora and Vegetation, Basic Vertebrate Fauna) for the proposed development of short stay worker accommodation at Lot 300 Back Beach Road, Onslow (the Survey Area). The Survey Area is located in the Carnarvon bioregion of Western Australia. The Survey Area covers approximately 25 ha.

The purpose of the assessment was to identify key biological values within the Survey Area to support the Environmental Assessment Report (EAR) process and approvals applications for development. This report presents the background, methods, results, and discussion of the survey undertaken.

Flora and Vegetation

Database searches returned nine conservation significant species occurring within 40 km of the Survey Area, of which, two species were determined as having a high likelihood of occurrence and three species as having a medium likelihood of occurrence.

A Detailed Flora and Vegetation Survey was conducted within the proposed development site in the optimal flowering period for the region.

Across the survey area, 30 native taxa were recorded from 15 families. No Threatened flora species pursuant to the Environment Protection and Biodiversity Conservation Act 1999 and/or gazetted as Threatened pursuant to the Biodiversity Conservation Act 2016, or DBCA listed Priority flora species were recorded within the Survey Area.

Four introduced flora species were recorded during the survey; including **Tamarix aphylla*, listed as both a Declared Pest and Weed of National Significance by the Commonwealth Department Agriculture, Water, and the Environment.

One native vegetation type was mapped within the Survey Area, comprising mid to low *Acacia* trees, low shrubs and grass lands. The vegetation type identified by the survey is predominantly uncleared and widespread within the bioregion. Given this, the vegetation mapped within the Survey Area is not considered to be locally or regionally significant.

The level of survey undertaken was consistent with the requirements of a Detailed Flora and Vegetation survey. The expected low diversity and relatively uniform landforms means the findings of the report are sufficient to inform impact assessment for the project area.

Vegetation condition within the Survey Area was Very Good (Trudgen, 1991). Evidence of disturbance included vehicle tracks and weeds.

Vertebrate Fauna

The vertebrate fauna desktop assessment identified 59 conservation significant species occurring within 20 km of the Survey Area. An assessment of the likelihood of occurrence within the Survey Area was undertaken and identified that, of the potential conservation significant fauna, no species had a high likelihood of occurrence, 20 had a medium likelihood of occurrence, and 39 had a low likelihood of occurrence.

Fauna habitat mapping was based on a combination of field observations and fauna habitat assessment data. One fauna habitat was mapped within the Survey Area, with Coastal Dunes representing the most value to conservation significant fauna and overall fauna assemblages.

No conservation significant species were recorded during the fauna survey. Fourteen bird species and one reptile species were confirmed to be using the Lot 300 Back Beach Rd Survey Area.

Abbreviations

Abbreviations used through the report are described below in Table 1.

Table 1: Abbreviations

Abbreviation	Description
BoM	Bureau of Meteorology
DBCA	Department of Biodiversity, Conservation and Attractions
DP	Declared Pest
EN	Endangered
EPA	Environmental Protection Authority
GIS	Geographic Information System
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
MA	Marine
MI	Migratory
NVIS	National Vegetation Information System
OS	Other Specially Protected Fauna
P	Priority
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
Survey Area	The Survey Area is approximately 25 ha and is located on Lot 300 Back Beach Road, Onslow, WA
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora
VU	Vulnerable
VT	Vegetation Type as determined under NVIS guidance statement
WA	Western Australia
WAH	Western Australian Herbarium
WoNS	Weeds of National Significance

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1 Introduction

1.1 The Project

Rowe Group commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a biological survey (Detailed Flora and Vegetation, Basic Vertebrate Fauna) for the proposed development of short stay worker accommodation at Lot 300 Back Beach Road, Onslow (the Survey Area). The Survey Area is located in the Carnarvon bioregion of Western Australia. The Survey Area covers approximately 25 ha (Figure 1).

1.2 Objectives and Scope

The purpose of the survey was to delineate key flora and fauna values within the Survey Area and identify potential environmental sensitivities that may impact the approvals process.

The scope of works was to:

- Undertake a desktop assessment and likelihood of occurrence to determine environmental values and conservation significant flora, fauna, habitat, vegetation, or other environmental features (such as riparian areas, wetlands) relating to the Survey Area
- Carry out a Detailed Flora and Vegetation and Basic Vertebrate Fauna Survey to assess flora, vegetation, and vertebrate fauna values in accordance with EPA Guidance
- Conduct targeted flora survey for potentially occurring Threatened and Priority listed
- Prepare a technical flora, vegetation, and vertebrate fauna survey report
- Provide all spatial/mapping data collected during the survey in IBSA format.

This report presents the background, methods, results, and discussion of the surveys undertaken to support the above objectives.



Legend

- Survey Area Boundary
- Cadastral Lines

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2020
- OTHER DATA SOURCED LANDGATE 2020
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
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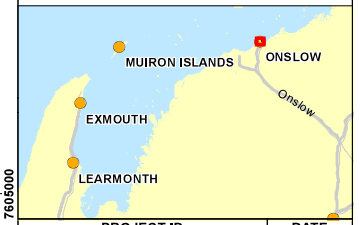
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LOCALITY MAP



PROJECT ID	DATE
4733	22/07/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	SW	0

Rowe Group
Lot 300 Back Beach Road, Onslow

Flora and Fauna Report

Figure 1
Survey Area

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2 Background

2.1 Legislative Context

Western Australian flora and fauna is protected formally and informally by legislative and non-legislative measures:

Legislative measures:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- WA *Biodiversity Conservation Act 2016* (BC Act)
- WA *Environmental Protection Act 1986* (EP Act)
- WA *Biosecurity and Agriculture Management Act 2007* (BAM Act).

Non-legislative measures:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora, and ecological communities
- Weeds of National Significance (WoNS)
- Recognition of locally significant populations by DBCA.

These protection mechanisms are supported by guidance documents published by the Environmental Protection Authority (EPA) and Department of Agriculture, Water and the Environment (DAWE; formerly Department of Environment, and Department of Sustainability, Environment, Water, Population and Communities):

- Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2016a)
- Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2016b)
- Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999 (Department of the Environment, 2013)
- Survey Guidelines for Australia's Threatened Mammals (Department of Sustainability Environment Water Population and Communities, 2011a)
- Survey Guidelines for Australia's Threatened Reptiles (Department of Sustainability Environment Water Population and Communities, 2011b)
- Survey Guidelines for Australia's Threatened Birds Under the Environment Protection and Biodiversity Conservation Act 1999 (Department of the Environment Water Heritage and the Arts, 2010).

2.2 Existing Environment

2.2.1 Climate

The closest long-term Bureau of Meteorology weather station with a complete dataset is Onslow Airport (Station 5017), located approximately 3.0 km south of the Survey Area.

Climate statistics were calculated utilising data from the most current climate normal, which is defined as a 30-year interval (Bureau of Meteorology, 2007), where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate (Bureau of Meteorology, 2007).

The long-term mean minimum temperature for Onslow Airport ranges from 13.9˚C (July) to 25.5˚C (February) (1991 to 2020) and the long-term mean maximum temperature ranges from 26.4˚C (July) to 36.7˚C (January and February) (Figure 1) (Bureau of Meteorology, 2021).

The Onslow Airport weather station recorded 278.0 mm of rainfall in the 12 months prior to the survey (July 2020 to June 2021), which is 27.2 mm above the long-term average of 250.8 mm (Bureau of Meteorology, 2021). In the three months prior to the survey (April to June 2021), 143.8 mm of rainfall was recorded, which is 67.1 mm above the long-term average of 76.7 mm for the same time period (Bureau of Meteorology, 2021).

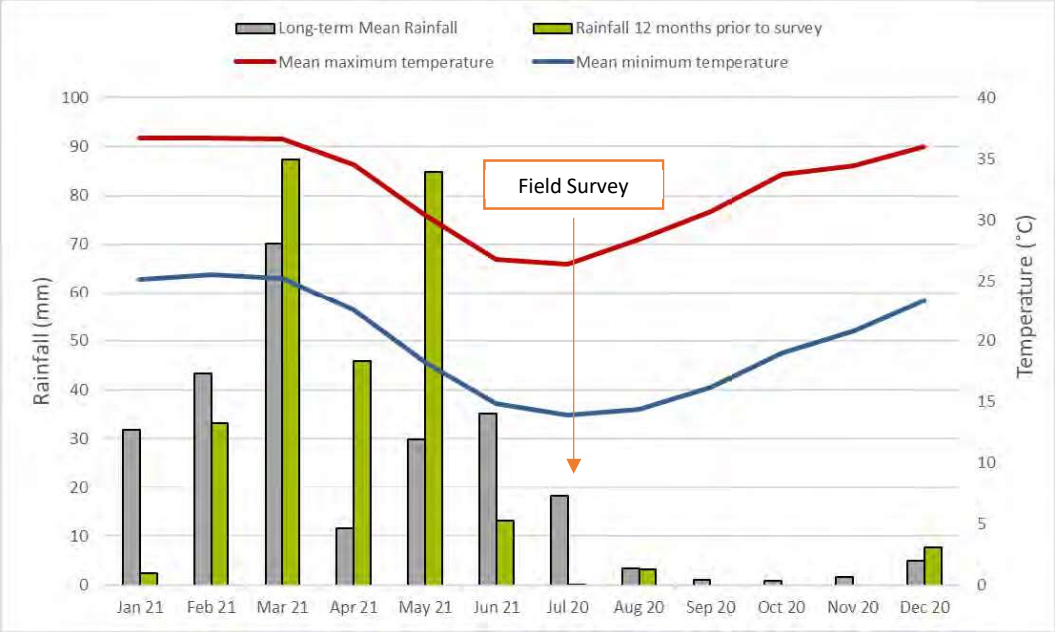


Figure 2: Long term and Monthly Total Rainfall, Maximum and Minimum temperatures for Onslow Airport (5017) (Bureau of Meteorology, 2021).

2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Department of the Environment and Energy, 2016). The Survey Area occurs within the Carnarvon bioregion and the Cape Range (CAR01) subregion.

The Cape Range subregion (CAR01) is characterised by a mosaic of saline alluvial plains with samphire and saltbush low shrublands, low woodland on sandy ridges and plains, snakewood scrub on clay flats, and tree to shrub steppe over hummock grasslands on and between red sand dune fields (Kendrick and Mau, 2002). The subregion is represented by limestone strata with *Acacia stuartii* or *Acacia bivenosa* shrubland outcrop in the north, where extensive tidal flats in sheltered embayments support mangal.

2.2.3 Soil Landscapes and Land Systems

Soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales, ranging from 1:20,000 to 1:250,000 (Department of Agriculture and Food WA, 2012). The Survey Area occurs within the Dune System (201Du), which is described as dune fields supporting soft spinifex and minor hard spinifex grasslands.

2.2.4 Hydrography

The Survey Area does not intersect any major watercourses or water bodies that are mapped by State Government GIS databases (Threatened Species Scientific Committee, 2016). The Survey area is located 160 m from the coastal waterline.

2.2.5 Broad Vegetation Types

Mapping of pre-European vegetation in Western Australia was completed on a broad scale (1:1,000,000) by Beard (1976). These vegetation types were later refined by Shepherd *et al.* (2002) resulting in 819 vegetation types.

The Survey Area is mapped over the Cape Yannare Coastal Plain 117, which is a grass steppe characterised by hummock grassland (*Triodia* spp.). Representation of the system associations at a local, regional, and state level is shown in Table 2.

Table 2: Broad Vegetation Types within the State, Regional and Local Representation (Government of Western Australia, 2019).

System and Vegetation Association	Pre-European Extent (ha)	Current Extent (ha)	Extent Remaining (%)	Current Extent Managed in DBCA Lands (%)*
Representation across Western Australia				
Cape Yannare Coastal Plain 117	919,517.05	886,005.79	96.36	14.79
Representation across the Carnarvon Bioregion				
Cape Yannare Coastal Plain 117	12,424.35	10,907.99	87.80	27.48
Representation across the Cape Range (CAR01) Subregion				
Cape Yannare Coastal Plain 117	12,424.35	10,907.99	87.80	27.48

System and Vegetation Association	Pre-European Extent (ha)	Current Extent (ha)	Extent Remaining (%)	Current Extent Managed in DBCA Lands (%)*
Representation across the Shire of Ashburton				
Cape Yannare Coastal Plain 117	14,506.04	9,073.90	62.55	19.13

*As a portion of the current extent

2.2.6 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands.

The Survey Area does not occur within a mapped ESA. The nearest ESA is associated with an offshore island located approximately 11 km north of the Survey Area (Department of Water and Environmental Regulation, 2018).

2.2.7 Conservation Areas

The Survey Area is not identified within a Conservation Area. The nearest conservation areas are Unallocated Crown Land (LR3046/473), vested under the department of Planning, Lands and Heritage, which is located approximately 22 km south of the Survey Area and the Cane River Conservation Park, which is located 57 km southeast of the Survey Area and is vested under the Conservation Commission of Western Australia.

3 Methods

The survey methods are consistent with the EPA's Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (2016a) for a Detailed Flora and Vegetation Survey and Desktop Assessment and the EPA's Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (2016b) for a Basic Fauna Survey and Desktop Assessment.

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds was compiled prior to the field survey (see Section 2.1). Historical vegetation mapping (Beard, 1976; Shepherd, Beeston and Hopkins, 2002), land systems mapping (Department of Agriculture and Food WA, 2012), and the IBRA classification system (Kendrick and Mau, 2002) were consulted to provide broad contextual knowledge of the vegetation units and habitat likely to be encountered within the Survey Area.

The literature review also considered a selection of biological reports detailing assessments undertaken in the region, that were publicly available:

- A Level 1 Vertebrate Fauna Assessment of the Proposed Tubridgi to Wheatstone Gas Pipeline, Western Australia (Ninox Wildlife Consulting, 2013)
- Detailed flora and vegetation survey for the Pilbara Waste Management Facility (Phoenix Environmental Sciences, 2018)
- Flora and vegetation assessment – Ashburton North Strategic Industrial Area (ANSIA) Phase 2 Area (RPS Group, 2019)
- Flora and Vegetation of the CS2 – Tubridgi – Wheatstone Gas Pipeline Project Area (Mattiske Consulting Pty Ltd, 2013)
- Flora and vegetation survey and terrestrial fauna survey for the Pilbara Regional Waste Management Facility (Phoenix Environmental Sciences, 2017)
- Onslow Townsite Strategy Flora, Vegetation and Fauna Assessment (ENV Australia Pty Ltd, 2011)
- Pilbara Ports Authority - Port of Ashburton - Eastern Port Precinct - Additional Clearing Areas Flora Survey (Vicki Long & Associates, 2020)
- West Pilbara Iron Ore Project Onslow Rail Corridor – Level 1 Fauna Assessment (Biota Environmental Sciences, 2008)
- West Pilbara Iron Ore Project Onslow Rail Corridor Terrestrial Fauna Survey (Biota Environmental Sciences, 2009)
- West Pilbara Project Ashburton East Rail Route Flora and Vegetation Scoping Study (Astron Environmental Services, 2008a)
- West Pilbara Project Onslow Rail Route Flora and Vegetation Survey (Astron Environmental Services, 2008b).

3.1.2 Database Searches

Database searches were undertaken to compile a list of potential flora and fauna and identify potential conservation significant flora, fauna, and ecological communities within or surrounding the Survey Areas (Table 3, Appendix A). In addition, an EPBC Protected Matters Search (PMST) was undertaken to identify the potential for Matters of National Environmental Significance (MNES) to occur within or surrounding the Survey Area (Department of Agriculture Water and the Environment, 2020).

The search area for each parameter was varied to reflect distances recommended by DBCA. The search areas are herein referred to collectively as the Study Area.

Table 3: Database Searches of the Survey Area

Database Name	Date Received	Search Target	Search Area
Threatened and Priority Ecological Communities database search (Department of Biodiversity Conservation and Attractions, 2021b)	12 June 2020	TECs and PECs	50 km buffer around the Survey Area
Threatened and Priority Flora (TPFL) database search (Department of Biodiversity Conservation and Attractions, 2020)	25 May 2020	Threatened and Priority Flora	50 km buffer around the Survey Area
Western Australian Herbarium flora database search (Department of Biodiversity Conservation and Attractions, 2021d)			50 km buffer around the Survey Area
DBCA Threatened and Priority Fauna database search (Department of Biodiversity Conservation and Attractions, 2021c)	27 May 2020	Threatened and Priority Fauna	20 km buffer around the Survey Area
NatureMap (Department of Biodiversity Conservation and Attractions, 2021a)	13 July 2021	Threatened and Priority flora and fauna, and inventory of potential flora and fauna	Flora: 40 km buffer around the Survey Area Fauna: 20 km buffer around the Survey Area
Protected Matters Search Tool (Department of Agriculture Water and the Environment, 2021a)	13 July 2021	Commonwealth listed Threatened flora and fauna and TECs	20 km buffer around the Survey Area

3.1.3 Likelihood of Occurrence

Conservation significant flora and fauna species identified from the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area, both prior to

and post field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 4.

Only species recorded within the Survey Area or considered to have a high or medium likelihood of occurrence are discussed in detail. Species classified as having a low likelihood of occurrence based on the above criteria will not be discussed unless a justification for this classification is required.

For fauna, species listed only as Marine under the EPBC Act were not included as conservation significant as the Marine listing only applies within Commonwealth marine areas.

Table 4: Likelihood of Occurrence Criteria

Rank	Flora and Fauna Criteria
Previously Recorded	The species has been previously recorded in the Survey Area
High (Likely to occur)	• There are existing records of the species in close proximity to the Survey Area (within 10 km), and for fauna has been recorded in the Survey Area in the last 10 years • The species is strongly linked to a specific habitat, which is present in the Survey Area; or • The species has more general habitat preferences, and suitable habitat is present.
Medium (May occur)	• There are existing records of the species from the locality (between 10 km and 20 km), however ○ The species is strongly linked to a specific habitat, of which only a small amount is present in the Survey Area; or ○ The species has more general habitat preferences, but only some suitable habitat is present. • There is suitable habitat in the Survey Area, but the species is recorded infrequently in the locality.
Low (Unlikely to occur)	• The species is linked to a specific habitat, which is absent from the Survey Area; or • Suitable habitat is present, however there are no existing records of the species from the locality (within 20 km) despite reasonable previous search effort in suitable habitat; or • There is some suitable habitat in the Survey Area, however the species is very infrequently recorded in the locality.

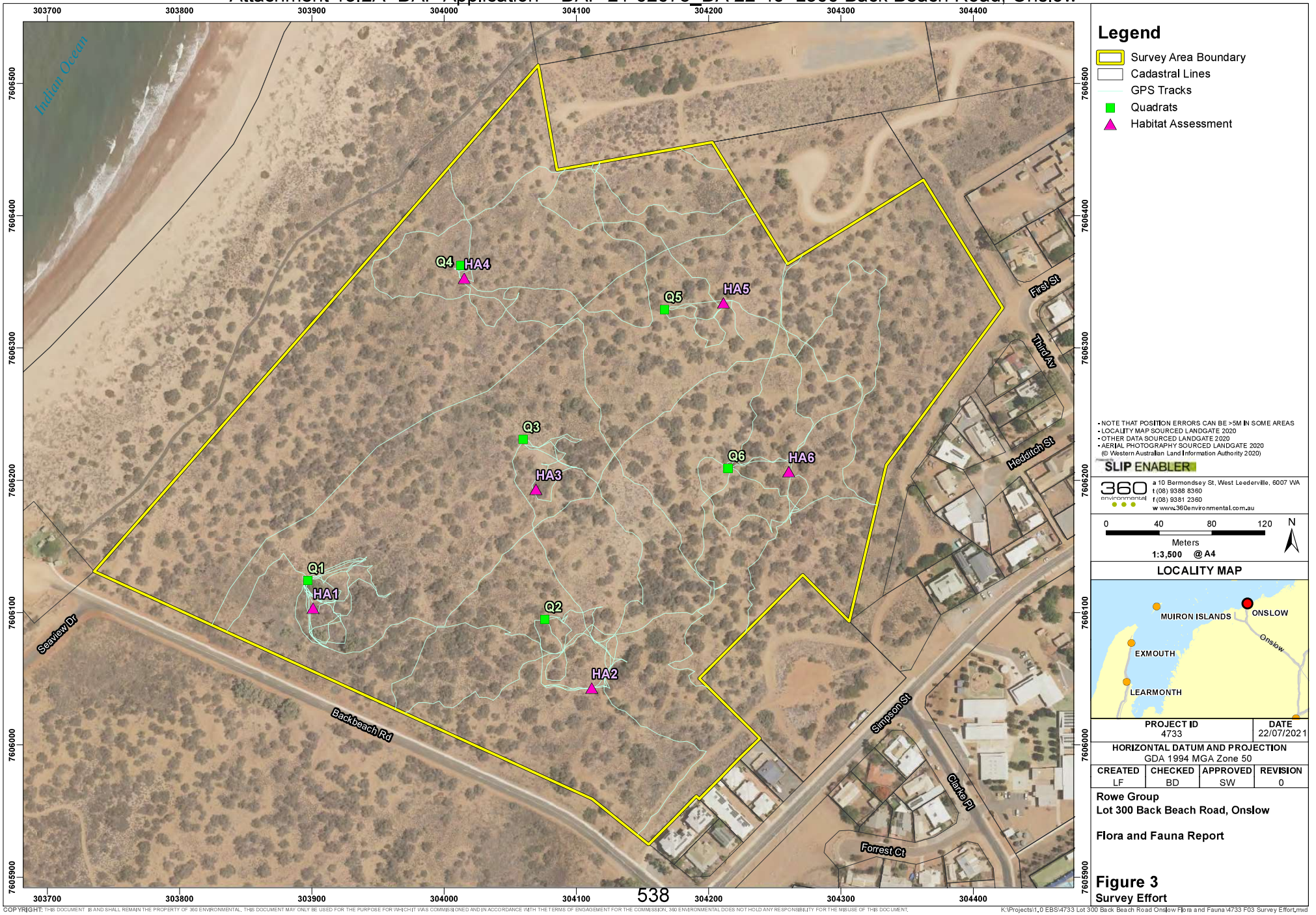
3.2 Field Surveys

The flora and vegetation survey was undertaken by Senior Botanist Jason Webb with assistance from Ecologist Christina Walker between 19th and 21st July 2021. Data was recorded from six quadrats and extensive site traverses Refer to Figure 3 for survey effort and quadrat locations.

All plants collected were taken under flora collecting permits held by Jason Webb and Christina Walker pursuant to Regulation 62 of the *Biodiversity Conservation Regulations 2018* (Table 5).

Table 5: Field Personnel

Personnel	Role	Flora Collection Permit
Jason Webb	Senior Botanist Planning, flora fieldwork, plant identification, data interpretation and report preparation.	FB62000168, TFL 75-1920
Christina Walker	Ecologist Planning, fauna field work, data interpretation and report preparation.	FB62000305



Legend

- Survey Area Boundary
- Cadastral Lines
- GPS Tracks
- Quadrats
- Habitat Assessment

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2020
- OTHER DATA SOURCED LANDGATE 2020
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
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LOCALITY MAP

PROJECT ID	DATE
4733	22/07/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	SW	0

Rowe Group
Lot 300 Back Beach Road, Onslow

Flora and Fauna Report

Figure 3
Survey Effort

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3.3 Flora and Vegetation

3.3.1 Establishment of Flora Sites

Six flora quadrats (50m x 50m) were sampled within the Survey Area.

The northwest corner of each quadrat was recorded using a handheld Garmin GPS. Data collect within each quadrat consisted of:

- Site code
- Date and recorder
- Landform and soil description
- Relevant site descriptors including, slope, aspect, litter cover, bare ground cover and fire history
- Inventory of vascular flora including the approximate average height and percentage foliar cover for each taxon recorded
- Vegetation description in accordance with the National Vegetation Information System (NVIS) Level 6 'sub-association'
- Vegetation condition in accordance with the Eremaean and Northern Botanical Provinces vegetation condition scale (Environmental Protection Authority, 2016a), and evidence of disturbance (e.g. clearing, rubbish, feral animals, weed incursion and evidence of dieback) where present
- Photograph from the northwest corner and vegetation occurring within the site.

Between quadrat locations, opportunistic observations were recorded. These observations include:

- Changes in vegetation structure and composition
- Changes in vegetation condition
- Taxa not previously recorded
- Flora of conservation significance
- Significant weed populations.

3.3.2 Opportunistic Flora

Additional flora taxa observed opportunistically around flora sites or while traversing on foot within the Survey Area were also recorded. Where populations of conservation significant flora taxa, Declared Pests (DPs) or WoNS were encountered, a GPS location and a count of the individuals present was recorded.

3.3.3 Targeted Searching

Prior to the survey, conservation significant flora with the likelihood or potential to occur within the Survey Area was compiled (Appendix C). Field personnel familiarised themselves with photographs, reference samples and descriptions of these taxa before conducting the survey.

The entire Survey Area was not systematically searched. Rather, targeted searching focussed on habitat suitable for Threatened flora and P1 and P2 flora, as per standard practice in the Pilbara.

Personnel also actively searched for conservation significant flora species in and around flora sites, while traversing on foot within the Survey Area and in known locations or preferred habitat encountered in the Survey Area.

Where Threatened or Priority flora were encountered in the field a GPS location was taken and a count of individuals was recorded, followed by a search in the local vicinity to determine if any other individuals were present nearby and delineate population boundaries where relevant. Specimens of any potential conservation significant flora that could not be identified in the field were collected for identification and lodgement at the Western Australian Herbarium (WAH).

3.3.4 Taxonomy and Nomenclature

Where identification of plant taxa was not possible in the field, specimens were collected for identification using resources at the WAH. Identification of flora collections was completed by experienced taxonomists Pierre-Louis De-Kock, Ben Eckermann, Simon Colwill and Megan Stone at the WAH. Any difficult specimens were submitted to WAH specialists for formal identification.

The finalised species list was checked against FloraBase (Western Australian Herbarium, 2021) for taxonomic currency, and to determine the conservation status and known distribution of each taxon. Introduced species were checked against the current BAM Act Declared Plants list and the WoNS list to determine their status (Department of Agriculture Water and the Environment, 2021b; Department of Primary Industries and Regional Development, 2021).

Any conservation significant flora taxa, including potential Threatened and Priority species, range extensions and potential new taxa were submitted to the WAH for verification and lodgement. Where relevant, Threatened and Priority Flora Report Forms (TPRFs) were submitted to DBCA.

3.3.5 Statistical Analyses

Quadrat data as well as field observations were used to define the vegetation association mapping boundaries.

Species data was analysed with Primer v. 7 statistical software. Classification of survey sites was determined utilising the hierarchical agglomerative technique, which produces a dendrogram diagram displaying similarity between survey sites (Clarke and Warwick, 2001). Cluster analysis of a species similarity matrix is a recognised method for describing species assemblages (i.e. vegetation communities; Clarke and Warwick, 2001).

The data matrix was analysed using classification techniques in Primer v7 with estimation of species richness via the methods of Chao (1984). Certain taxa were amalgamated prior to analyses, where species, variants or forms were not identifiable for all specimens. The dissimilarity between sites was determined using the Bray-Curtis measure. The Bray-Curtis measure is a widely used assessment of ecological distance, which reflects compositional change, providing quantitative output for similarity between samples. The resulting dendrogram provided the framework for the vegetation associations and assigning survey sites to the particular groups.

Bray-Curtis dissimilarity analysis was used to refine the vegetation associations identified during the vegetation survey and to assist in identification of uncommon vegetation types.

3.3.5.1 Species Accumulation Curve

A species-area curve based on a species accumulation analysis, was used to evaluate the adequacy of sampling (Colwell, 2005). The asymptotic value was determined using Michaelis-Menten modelling.

3.3.6 Vegetation Unit and Condition Mapping

Broad vegetation and condition mapping was conducted in the field, with boundaries delineated over aerial photography, at a scale of 1:5,000. Broad vegetation units were refined based on taxonomic identification of flora collections, statistical analysis of data collected from the quadrats and mapping notes taken during the field survey. Vegetation condition mapping was refined based on site data and mapping notes. Finalised polygons were digitised and produced as electronic mapping data using GIS software.

3.4 Vertebrate Fauna

3.4.1 Daily Survey Conditions

Survey conditions for the basic fauna survey are presented in Table 6. Daily temperature and rainfall data is from the Onslow Airport Weather Station (Station 5017) (Bureau of Meteorology, 2021). This information is important for potential detection of species diversity during a survey.

Table 6: Detailed Fauna Survey Weather Conditions

Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
19/07/2021	13.2	27.3	0
20/07/2021	15.1	26.6	0.2

3.4.2 Fauna Habitat Assessment

Fauna habitat assessments were undertaken throughout the Survey Area to identify fauna habitat values. Habitat assessment locations are shown in Figure 1. The following information was collected at each site using Fulcrum, a mobile data collection app:

- Site photo
- Landform
- Soil type and colour
- Rock types, surface stone cover and size classes
- Key habitat and microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, water sources
- Habitat quality, fire history and evidence of disturbance
- General description of vegetation structure.

Fauna habitat mapping was based on a combination of field observations, fauna habitat assessment data and vegetation mapping undertaken by 360 Environmental.

3.4.3 Opportunistic Observations and Active Searches

Opportunistic observations of fauna were recorded throughout the Survey Area. Observations of primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings etc.) were recorded. Active searches were undertaken in microhabitats likely to contain fauna. They primarily involved raking leaf litter, peeling bark, and splitting dead wood.

3.4.4 Bird Surveys

Systematic bird surveys were undertaken within the Survey Area for 20 minutes in a 2 ha quadrat (Environmental Protection Authority, 2016b) at each fauna habitat assessment location. Where practicable, this was undertaken during typical peak periods of activity when birds are calling and moving about, which is typically within 3-4 hours of sunrise, particularly during warmer periods.

3.4.5 Identification and Taxonomy

Terrestrial vertebrate fauna taxa were identified in the field and released on site.

Where there was doubt on a species name (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. Taxonomy and nomenclature in this report follows the 2021 WA Museum checklist (Western Australian Museum, 2021) where relevant.

4 Results

4.1 Limitations

Limitations and constraints of the flora, vegetation and fauna survey are detailed below in Table 7. No limitations were identified the assessment, as such the data is sufficient to inform impact assessment for across the Survey Area.

Table 7: Limitations and Constraints Associated with the Survey

Variable	Impact on assessment	Potential Constraints on Survey Outcomes
Survey Scope	Not a constraint	Number of species recorded, number of quadrats sampled, and timing of the survey were adequate for this level of survey. A basic vertebrate fauna survey was undertaken. This involved fauna habitat assessments, active searches for mammal and reptile species, opportunistic records and bird surveys in accordance with EPA (2016b).
Availability of Data	Not a constraint	All data required to complete the scope of works including regional and local contextual information was available.
Site Access	Not a constraint	The entire Survey Area was able to be accessed on foot.
Survey Intensity and Resources	Not a constraint	Sufficient time was allocated to the flora and vegetation survey, given the size and complexity of the Survey Area, and the expected level of survey intensity. The survey effort was considered adequate to assess the flora and vegetation values of the Survey Area and provide information required to support approvals applications. The basic fauna survey consisted of six fauna habitat assessments, six 20 min bird surveys, three hours of active searching and opportunistic records.
Experience	Not a constraint	The Detailed Flora and Vegetation Survey and Basic Fauna Survey were undertaken by Senior Botanist Jason Webb and Ecologist Poppy Walker. Jason has 5 years' experience conducting surveys of similar scope throughout Western Australia. Poppy has worked as an environmental consultant for 1 year and has completed flora, vegetation, and fauna surveys state-wide. Identification of flora collections was completed by experienced taxonomist Udani Sirisena at the WAH.
Timing, weather, season	Not a constraint	The recommended primary survey period for the Eremaean Botanical Province as per the EPA Technical Guidance, i.e. 6-8 weeks post wet season (March to June) (Environmental Protection Authority, 2016a). The field assessment was conducted in July 2021 following above average rainfall in May (6-8 weeks prior to the survey), therefore timing is not considered to be a limitation of the survey. Rainfall was above average for

Variable	Impact on assessment	Potential Constraints on Survey Outcomes
		the year and sufficient to allow for many genera to be in flower.
Life Forms Sampled	Not a constraint	The Survey Area was traversed on foot and representative sites of all remnant vegetation was sampled. All flora species encountered within the Survey Area were recorded. The basic vertebrate fauna survey used a wide range of detection techniques to detect fauna taxa within the Survey Area. All vertebrate fauna species were readily identified in the field.
Mapping Reliability	Not a constraint	Vegetation types were described and mapped based on quadrat data taken during the field survey. High resolution aerial mapping current at the time of the survey was used to differentiate all vegetation greater than 1 ha in size. The greatest effort was expended ground truthing vegetation boundaries within and near the proposed development footprint. Fauna habitat mapping was based largely on vegetation mapping and there were no constraints on mapping reliability.
Disturbances (fire, flood etc.)	Not a constraint	No disturbances to the Survey Area was observed.
Completeness	Not a constraint	The survey was considered complete for a Detailed Flora and Vegetation Survey, all vegetation types were surveyed and delineated within the Survey Area and a minimum of three quadrats was surveyed for each vegetation type.

4.2 Flora and Vegetation

4.2.1 Literature Review

The key findings of the flora and vegetation reports reviewed are summarised in Appendix B.

4.2.2 Database Searches

Database searches identified nine conservation significant flora species occurring within 50 km of the Survey Area (Appendix B), comprising:

- No Threatened species
- Three Priority 1 species
- No Priority 2 species
- Six Priority 3 species
- No Priority 4 species.

No State or Commonwealth listed TECs were identified within the Survey Area by the database searches. The State listed PEC Peedamulla (Cane River) Swamp Community occurs 24 km east of the Survey Area, however its listing category has not been evaluated (Department of Biodiversity Conservation and Attractions, 2021b) (Figure 5).

4.2.3 Pre-Survey Likelihood of Occurrence

The pre-survey likelihood of occurrence assessment identified that of the nine conservation significant flora species identified by the desktop assessment:

- No Threaten or Priority Listed Flora have been recorded within the Survey Area
- Two taxa were considered to have a high likelihood of occurrence based on habitat preference
- Three were considered to have a medium likelihood of occurrence based on habitat preference
- Four were considered to have a low likelihood of occurrence based on habitat preference.

An additional 30 species were identified by the literature review; however, these were not included in the flora likelihood assessment as all were considered highly unlikely to occur within the Survey Area.

The likelihood of occurrence assessment is provided in Appendix C.



Legend

- Survey Area Boundary

DBCA Threatened and Priority Flora

- *Abutilon* sp. Onslow (F. Smith s.n. 10/9/61)
- *Abutilon* sp. *Pritzelianum* (S. van Leeuwen 5095)
- *Carpobrotus* sp. Thevenard Island (M. White 050)
- *Eleocharis papillosa*
- *Eremophila forrestii* subsp. *viridis*
- *Stackhousia clementii*
- *Triumfetta echinata*

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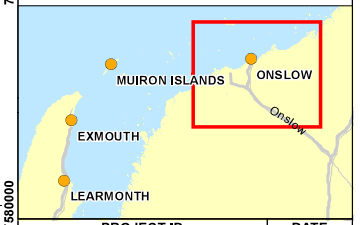
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LOCALITY MAP



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LF	BD	SW	0

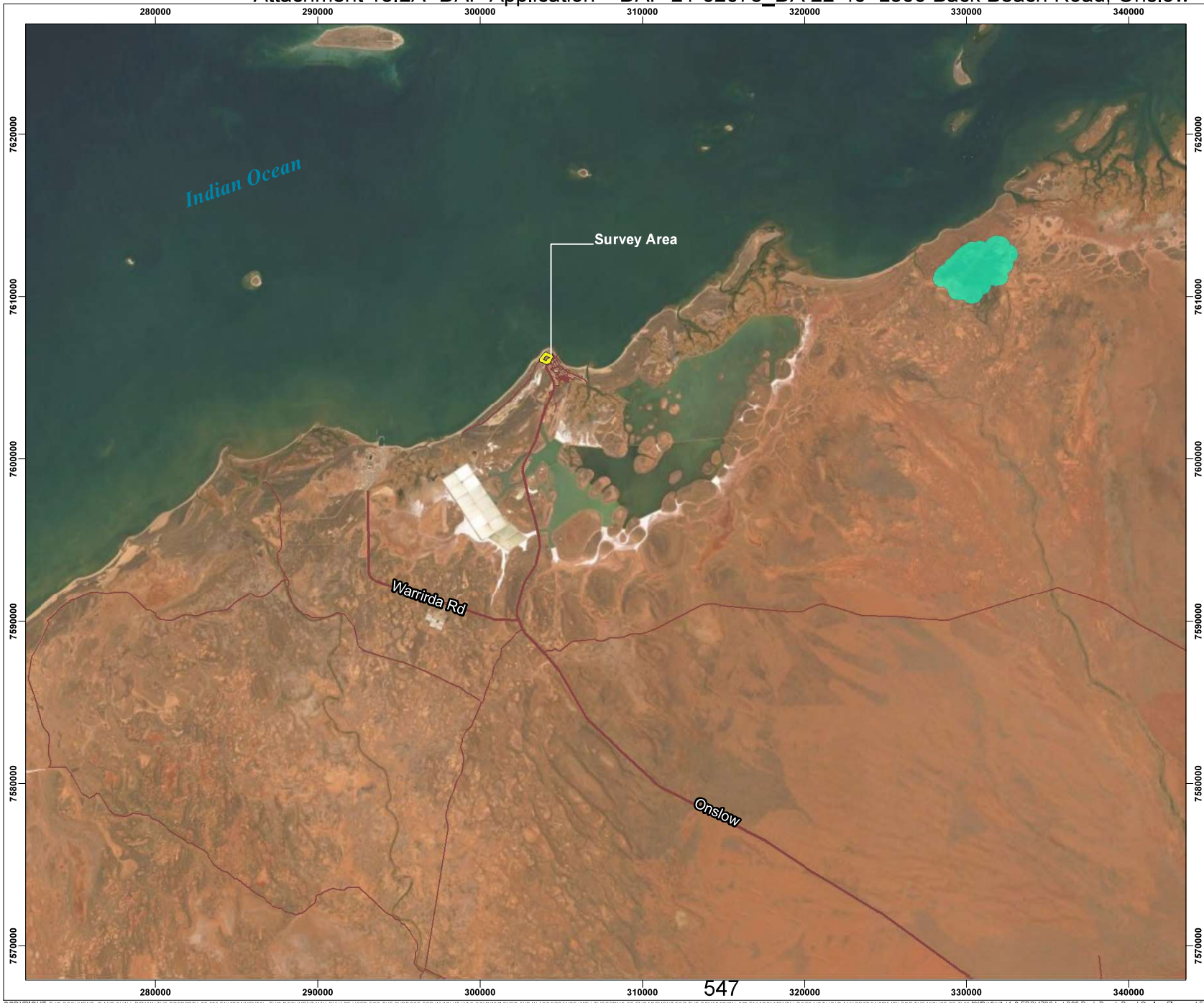
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Flora and Fauna Report

Figure 4

DBCA Threatened and Priority Flora Locations

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Legend

Survey Area Boundary

DBCA Threatened and Priority Ecological Communities

Peedamulla (Cane River) Swamp Community

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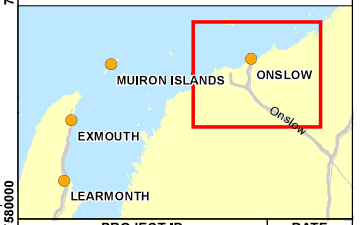
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Figure 5

DBCA Threatened and Priority Ecological Communities

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4.2.4 Flora Composition

The survey recorded a total of 33 taxa from 15 genera across 13 families (refer to Appendix D for full species list). The dominant families were Fabaceae (seven species, 24% of all taxa,), Poaceae (five species, 17 % of all taxa) and Chenopodiaceae (three species, 10% of all taxa).

One species was not be able to be positively identified and has been tentatively listed as ?*Flueggea virosa.* Additionally, two *Tephrosia* collections were not able to be positively identified due to species due to variability with the morphology based on the WAH reference collection. None of these taxa resemble any potentially occurring Threatened and Priority Flora, or flora of Conservation significance.

4.2.5 Flora of Conservation Significance

4.2.5.1 Threatened or Priority Flora

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened pursuant to the BC Act 2016 were recorded during the survey.

No DBCA listed Priority flora species were recorded within the Survey Area.

4.2.5.2 Flora of Other Conservation Significance

Flora may be considered of other conservation significance if it represents a range extension, novel taxon, species that play a keystone role in a community, has relic status, is locally endemic, or represents the extent of a species range.

No taxa recorded within the Survey Area was considered to be of other conservation significance.

4.2.6 Introduced Flora

Four introduced species were recorded within the Survey Area, representing 10% of the total taxa recorded (Appendix D). one of these, **Tamarix aphylla*, are listed as Declared Pests under the BAM Act (Department of Primary Industries and Regional Development, 2018) and WoNS (Department of Agriculture Water and the Environment, 2020b). (Table 8).

Table 8: Introduced Flora Species within the Survey Area

Species	Common Name	Environmental Status	WONS
**Cenchrus ciliaris*	Buffel Grass		Not Listed
**Aerva javanica*	Kapok Bush		Not Listed
**Tamarix aphylla*	Athel Pine	Declared Pest – (DPIRD)	Listed
**Washingtonia filifera*	California Palm		Not Listed

4.2.7 Vegetation Types

Within the Survey Area, one vegetation type was described and mapped across one broad landform (low coastal dune systems with mixed laterite sands) within the Survey Area. The vegetation units are described in Table 9 and mapped in Figure 7. Detailed site sheets for each quadrat are provided in Appendix E.

The vegetation within the Survey Area, VT1, was described as *Acacia coriacea* subsp. *coriacea* and *Acacia tetragonophylla* (with *Crotalaria cunninghamii* subsp. *sturtii*) mid to low sparse shrubland over **Cenchrus ciliaris* and *Eulalia aurea* low tussock grassland with *Triodia epactia* low sparse hummock grassland over *Euphorbia myrtoides* low sparse herbland.

Bray-Curtis dissimilarity analysis indicated one quadrat falls outside the main grouping (Figure 6). Quadrat 6 contains two unique native species; *Nicotiana occidentalis* subsp. *occidentalis* and *Salsola australis.* Additionally, Quadrat 1 contained three species that are not representative of the wider ecology. *Eucalyptus camaldulensis*, **Tamarix aphylla* and **Washingtonia filifera* were not found anywhere else with the survey area. As these taxa are not representative of the wider floristic communities, they may considered to be planted species and were therefore removed from the analysis.

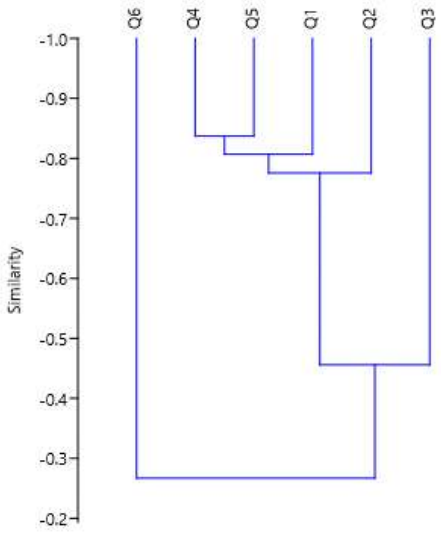


Figure 6: Results of Bray Curtis Cluster analysis (β = -0.1)

4.2.8 Threatened and Priority Ecological Communities

No vegetation considered representative of any Threatened Ecological Community (TEC) or Priority Ecological Community (PEC) was recorded within the Survey Area.

4.2.9 Vegetation Condition

Vegetation condition within the Survey Area was determined to be Very Good (Trudgen, 1991; Table 9), comprising of 100% of the survey area.

Evidence of disturbance included old vehicle tracks, littering and weeds (particularly infestations of **Cenchrus ciliaris*).

Table 9: Vegetation Types Occurring within the Survey Area

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Vegetation Condition	Photograph
Coastal Dunes				
VT1: *Acacia coriacea* subsp. *coriacea* and *Acacia tetragonophylla* (with *Crotalaria cunninghamii* subsp. *sturtii*) mid to low sparse shrubland over **Cenchrus ciliaris* and *Eulalia aurea* low tussock grassland with *Triodia epactia* low sparse hummock grassland over *Euphorbia myrtoides* low sparse herbland. **Sites:** Q1, Q2, Q3, Q4, Q5, Q6	Dunes	25 ha, 100 %	Very Good	



Legend

- Survey Area Boundary
- Cadastral Lines
- Quadrats

Vegetation Types

- Ac

Weed of National Significance

- *Tamarix aphylla*

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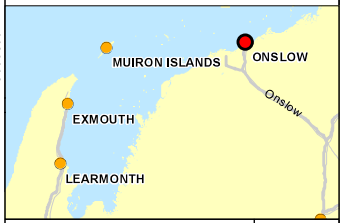
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LOCALITY MAP



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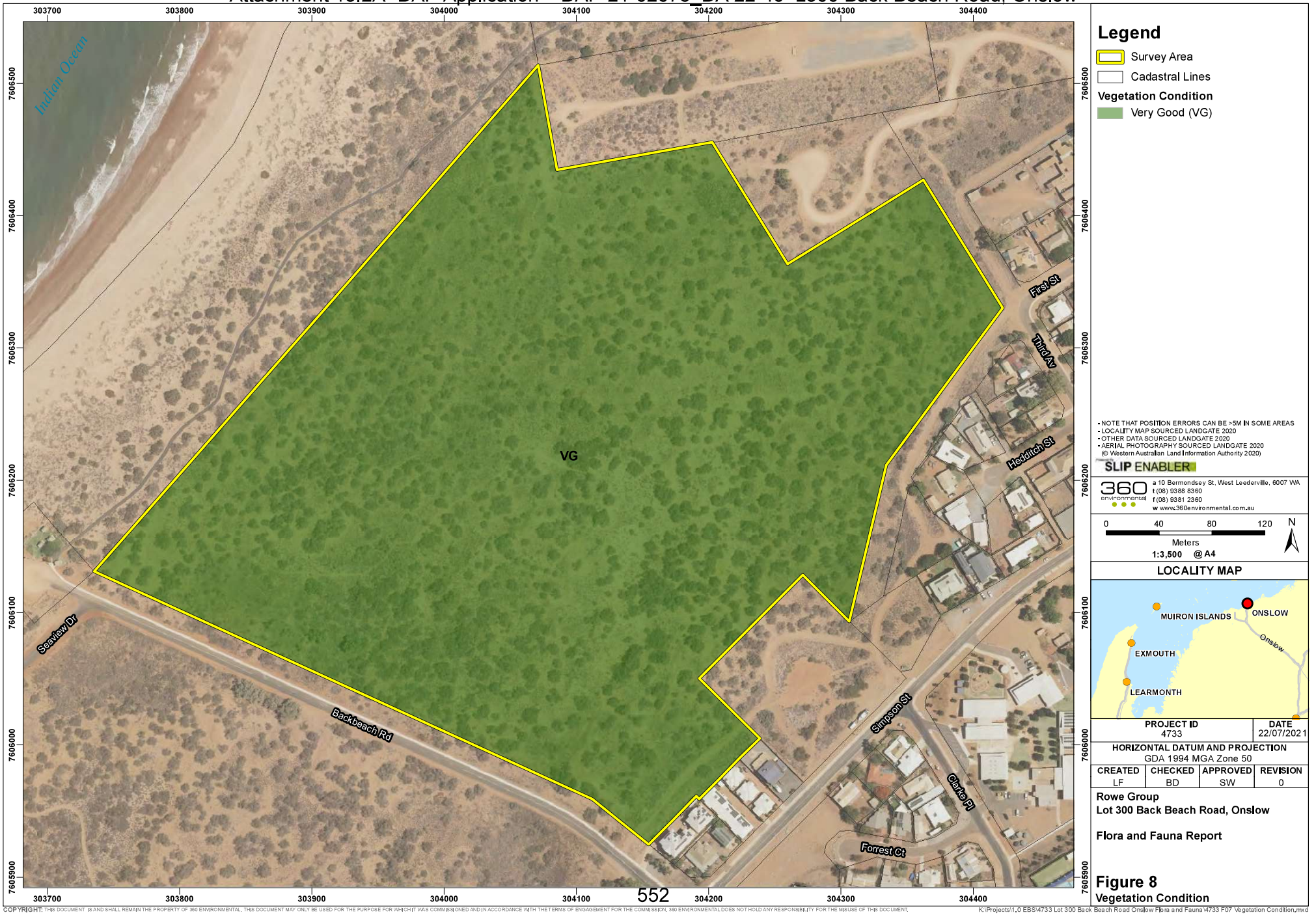
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Figure 7
Vegetation Types

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Legend

- Survey Area
- Cadastral Lines

Vegetation Condition

- Very Good (VG)

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Figure 8
Vegetation Condition

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4.2.10 Vegetation of Conservation Significance

No vegetation representative of any Commonwealth or State listed TECs, DBCA listed PECs was recorded within the Survey Area.

4.2.10.1 Vegetation of Other Conservation Significance

Vegetation may be of significance for a range of reasons, other than a listing as a TEC or a PEC, including (Environmental Protection Authority, 2016a):

- Vegetation extent being below a threshold level
- Scarcity
- Unusual species
- Novel combinations of species
- A role as a refuge
- A role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species
- Being representative of the range of a unit (particularly a good local and/or regional example of a unit in 'prime' habitat, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range); and/or
- A restricted distribution
- Culturally significant to the Traditional Owners of the land.

None of the vegetation within the Survey Area is considered to be of other conservation or cultural significance.

4.2.11 Groundwater Dependent Ecosystems

Groundwater dependant vegetation is wholly or partially dependant on permanent or intermittent access to groundwater to meet their water requirements. Groundwater dependant vegetation in the semi-arid and arid bioregions is typically associated with riparian and floodplain vegetation that includes facultative phreatophytes, which are partially dependant on groundwater and/or obligative phreatophytes, which are wholly dependent on groundwater.

None of the vegetation within the Survey Area is considered to be groundwater dependent.

4.2.12 Survey Adequacy

Six flora quadrats were sampled across the Survey Area, with approximately 4.1 quadrats per hectare. This was adequate to ensure three flora sites were sampled in each vegetation type, and that coverage across the Survey Area was sufficient.

A species-area curve (Figure 9), based on a species accumulation analysis, was used to evaluate the adequacy of sampling (Colwell, 2005). The asymptotic value was determined using Michaelis-Menten modelling. Using this analysis, the incidence-based coverage estimator of species richness (ICE) was calculated to be 37.1 native species (Chao, 1984). Based on this value, and the total of 30 native species recorded from six quadrats during the survey, approximately 81% of the flora species potentially present within the Survey area were recorded within

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quadrats. An additional two native species were recorded opportunistically, further increasing the total native species count.

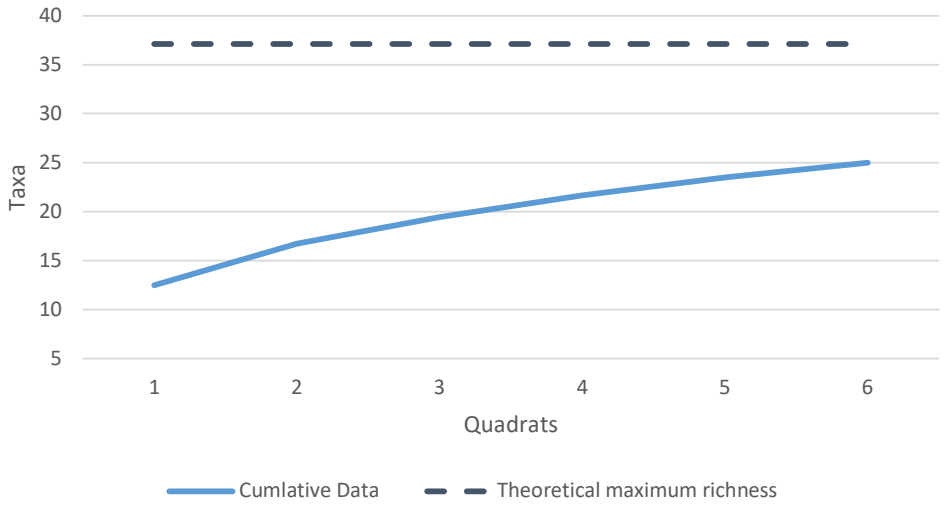


Figure 9: Flora Species Accumulation Curve

4.3 Vertebrate Fauna

4.3.1 Literature Review

The key findings of the literature review are summarised in Appendix B and a list of fauna taxa identified during the literature review is presented in Appendix D.

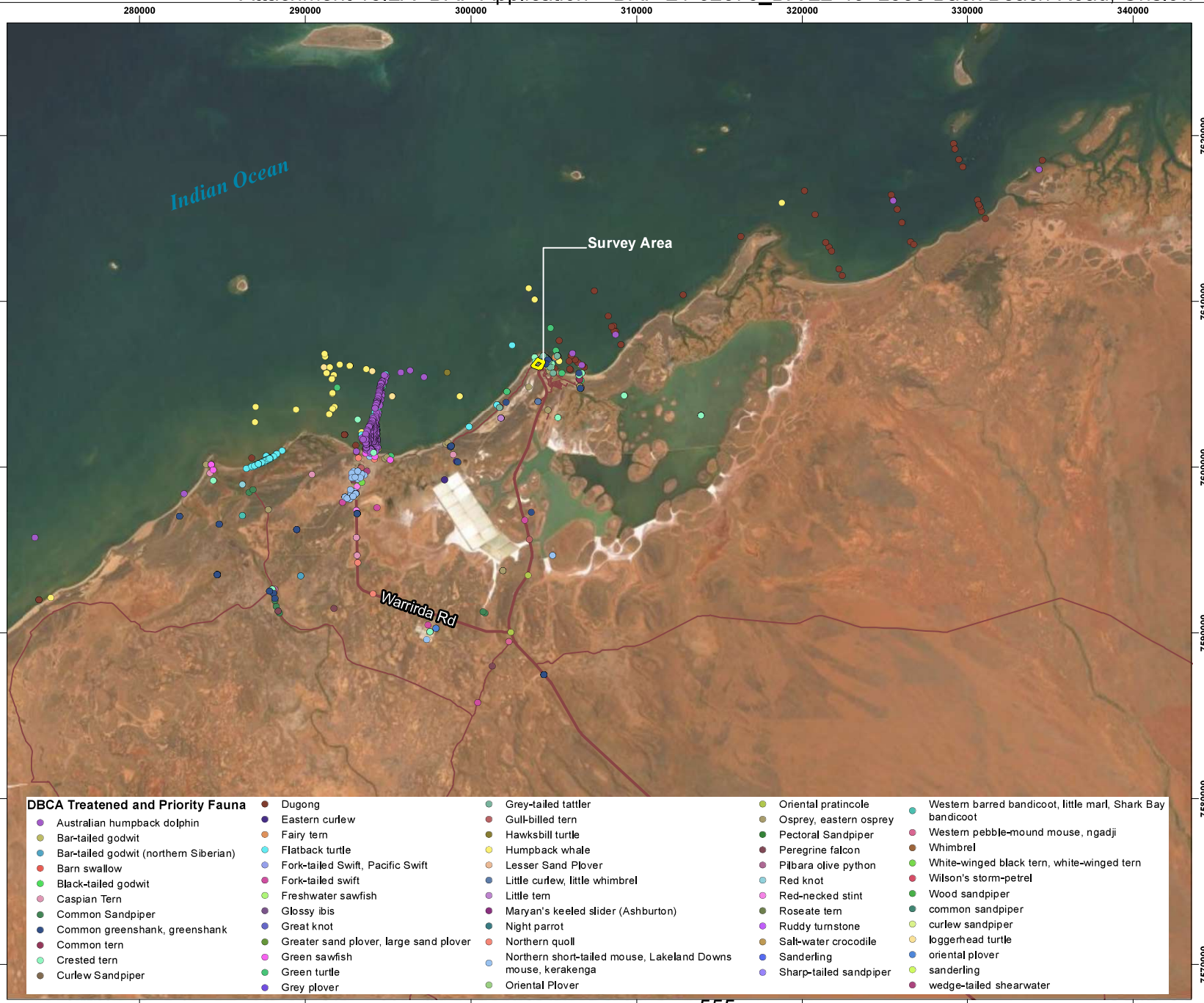
4.3.2 Database Searches

Database searches identified 59 conservation significant terrestrial vertebrate fauna species potentially occurring within the Survey Area, comprising:

- 47 bird species
- Four mammal species
- Eight reptile species (includes five turtle species known to breed in the Pilbara region)
- No amphibian species.

The results of the DBCA Threatened and Priority Fauna database search are mapped in Figure 10. Database searches are displayed in their entirety in Appendix A.

Species listed as Marine only under the EPBC Act, such as the Little Egret (*Egretta garzetta*), White-bellied Sea-Eagle (*Haliaeetus leucogaster*), Silver Gull (*Larus novaehollandiae*), as well as marine dependent species including sea snakes, whales and dolphins have been excluded from the likelihood of occurrence list as there is no marine habitat present within the Survey Area.



DBCA Treatened and Priority Fauna

- Australian humpback dolphin
- Bar-tailed godwit
- Bar-tailed godwit (northern Siberian)
- Barn swallow
- Black-tailed godwit
- Caspian Tern
- Common Sandpiper
- Common greenshank, greenshank
- Common tern
- Crested tern
- Curlew Sandpiper
- Dugong
- Eastern curlew
- Fairy tern
- Flatback turtle
- Fork-tailed Swift, Pacific Swift
- Fork-tailed swift
- Freshwater sawfish
- Glossy ibis
- Great knot
- Greater sand plover, large sand plover
- Green sawfish
- Green turtle
- Grey plover
- Grey-tailed tattler
- Gull-billed tern
- Hawksbill turtle
- Humpback whale
- Lesser Sand Plover
- Little curlew, little whimbrel
- Little tern
- Maryan's keeled slider (Ashburton)
- Night parrot
- Northern quoll
- Northern short-tailed mouse, Lakeland Downs mouse, kerakenga
- Oriental Plover
- Oriental pratincole
- Osprey, eastern osprey
- Pectoral Sandpiper
- Peregrine falcon
- Pilbara olive python
- Red knot
- Red-necked stint
- Roseate tern
- Ruddy turnstone
- Salt-water crocodile
- Sanderling
- Sharp-tailed sandpiper
- Western barred bandicoot, little marl, Shark Bay bandicoot
- Western pebble-mound mouse, ngadji
- Whimbrel
- White-winged black tern, white-winged tern
- Wilson's storm-petrel
- Wood sandpiper
- common sandpiper
- curlew sandpiper
- loggerhead turtle
- oriental plover
- sanderling
- wedge-tailed shearwater

Legend

Survey Area

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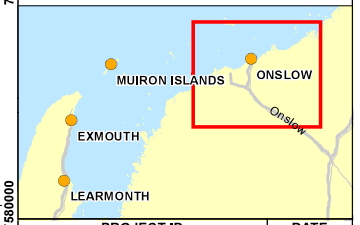
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LOCALITY MAP



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Figure 10

DBCA Threatened and Priority Fauna Locations

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4.3.3 Conservation Significant Fauna Likelihood of Occurrence

The likelihood of occurrence assessment within the Survey Area for conservation significant fauna species identified by the databases searches found that:

- No species had a high likelihood of occurrence
- 20 species had a medium likelihood of occurrence (19 bird species, one reptile species)
- 39 species had a low likelihood of occurrence (28 bird species, four mammal species, seven reptile species).

The results of the likelihood of occurrence assessment are presented in Appendix C.

4.3.4 Fauna Habitat

One broad fauna habitat was identified and mapped within the Survey Area (Figure 7). The coastal dune Fauna Habitat was continuous throughout the Survey Area and is analogous with the Coastal Dune (VT1) vegetation type. The habitat quality was found to be good throughout the Survey Area.

A description, extent within the Survey Area and a representative photo is provided for each fauna habitat in Table 10. Fauna habitat Site sheets for each habitat assessment are shown in Appendix F.

Table 10: Fauna Habitat Type Descriptions with the Survey Area

Fauna Habitat	Total Area, Proportion of the Survey Area	Sites	Representative Photo
Coastal Dunes: *Acacia coriacea* subsp. *coriacea* and *Acacia tetragonophylla* (with *Crotalaria cunninghamii* subsp. *sturtii*) mid to low sparse shrubland over **Cenchrus ciliaris* and *Eulalia aurea* low tussock grassland with *Triodia epactia* low sparse hummock grassland over *Euphorbia myrtoides* low sparse herbland. Suitable good quality habitat for passerine birds (perching birds and songbirds). Suitable, but low-quality habitat for reptile and small mammal species due to the presence of cats and alteration of understory structure by **Cenchrus ciliaris*.	25 ha, 100%	HA1, HA2, HA3, HA4, HA5, HA6	

4.3.5 Fauna Assemblage

The terrestrial vertebrate fauna survey recorded a total of 18 fauna species from 13 families, summarised in Table 11. A full inventory of fauna species recorded during the field survey is provided in Appendix D.

Table 11: Overview of Vertebrate Fauna Species Recorded

Fauna Group	Number of Species	Number of Families
Birds	14	9
Mammals	3	3
Reptiles	1	1
Amphibians	0	0
Total	**18**	**13**

4.3.5.1 Sightings

A total of 14 bird species from nine families were recorded throughout the Survey Area (all birds heard calling were also sighted within the Survey Are). The most recorded species was the Zebra Finch (*Taeniopygia guttata*) followed by the White-plumed Honeyeater (*Ptilotula penicillata*) and the White-breasted Woodswallow (*Artamus leucorynchus*). The most speciose avifauna family was Meliphagidae (three taxa).

One reptile species was tentatively identified, the Dune Dragon (*Ctenophorus femoralis*), with other dragon sightings representing the same genus, but the fast nature of these animals made positive identification difficult.

4.3.5.2 Tracks

Bird tracks were observed throughout the Survey Area, as were cat tracks. Small mammal and reptile tracks were also found, most often occurring between clumps of thicker vegetation.

4.3.6 Conservation Significant Fauna

No fauna species of conservation significance (Threatened or Priority), or evidence of these species such as tracks, scats, nest, diggings, burrows, or direct sightings were recorded within or directly surrounding the Survey Area.

5 Discussion

5.1 Flora and Vegetation

The overall vegetation condition within the survey area was considered to be Very Good (Trudgen, 1991). The species diversity and abundance is consistent with the ecology and diversity of the Cape Range IBRA Subregion, and previous surveys of this level within the local area. **Tamarax aphyllla* was recoded with one quadrat. This species is a weed of conservation significance, being listed as both a Declared Pest and a Weed of National Significance. No PECs or TECs were receded with the Survey Area.

5.1.1 Flora of Conservation Significance

No Threatened or Priority listed Flora were recorded within the Survey Area.

Of the nine potentially occurring flora of Conservation Significance identified by the desktop assessment, three had the potential to occur within the Survey Area:

- *Eleocharis papillosa* (P3) is an annual herb that occurs in brown, Nov. Red clay over granite, open clay flats. Claypans. The survey was undertaken outside the known flowering period for the species it may not have been present at the time of the survey.
- *Abutilon sp. pritzelianum* (P3) is an erect annual shrub no habitat data is available for this taxon (WA Herb). However, based on habit types from the closet record (approximately 11.5 km from the Survey Area) it is unlikely that this species is present within the Survey Area.
- *Stackhousia clementii* (P3) is a dense broom-like perennial, herb, to 0.45 m high. Fl. green/yellow/brown. Habitat preference is Skeletal soils and Sandstone hills. Based on soil type within the Survey Area (fine laterite sands), it is unlikely that this species will be found within the survey area.

Based on soil type and habit recoded during the survey, *Eleocharis papillosa* (P3) and *Abutilon sp. pritzelianum* (P2) and *Stackhousia clementii* (P3) were considered to have a low likelihood of occurrence and are unlikely to occur within the proposed clearing area.

5.1.2 Introduced Flora

Four weed species were recorded in the Survey Area; **Tamarix aphylla* (Declared Pest, WoNS) was recorded in only one quadrat. Based on the location relevant to the prosed clearing sites and population extent (only on mature tree was receded) no addition action would be required.

Two additional weed species **Cenchrus ciliaris, *Washingtonia filifera* were also present, with **Cenchrus ciliaris* covering approximately 70% of the Survey Area.

5.1.3 Vegetation Types

The vegetation type described in the Survey Area is consistent with the Beard (1976) and Shepherd et al. (2002) broad vegetation systems associations. Vegetation mapping within the Survey Area was representative of existing broad scale vegetation and soil and land system mapping for the locality.

The vegetation of the Coastal Dunes (VT1) is broadly representative of Cape Yannare Coastal Plain 117, described as grass-steppe hummock grassland *Triodia* spp. The vegetation type described in this report is not representative any listed PEC or TEC.

5.2 Vertebrate Fauna

5.2.1 Fauna Habitat

One broad fauna habitat was observed within the Survey Area comprising Coastal Dunes. The coastal dune habitat contains limited microhabitat opportunities and is of low value to most conservation significant fauna species and overall fauna assemblages that occur in the broader area.

One conservation significant fauna species, *Lerista planiventralis maryani* (P1), utilises dune habitat in the bioregion and records indicate that it historically occurred within 1 km of the Survey Area. A targeted terrestrial vertebrate survey utilising pitfall traps would be needed to assess its presence or absence in the Survey area with greater certainty.

Shorebirds, including conservation significant species, may use coastal dune areas within the Survey Area, however, these species are highly mobile and would not be reliant on the habitats within the Survey Area.

The level of survey detail undertaken is consistent with the requirements of a Detailed Flora Vegetation Survey. The expected low diversity and relatively uniform landform means that the findings of the report are sufficient to inform impact assessment across the project area.

Clearing of vegetation within the Survey Area is unlikely to significantly impact most fauna species due to the abundance of similar habitat south of the Survey Area. However, if *Lerista planiventralis maryani* (P1) are inhabiting the Survey Area, clearing will have a significant impact on the local population.

6 Conclusion

The key findings of the survey within the Survey Area were:

- No Threatened flora species pursuant to the EPBC Act and/or gazetted as Threatened pursuant to the BC Act, or DBCA listed Priority flora were recorded during the surveys.
- Four introduced species were recorded during the survey, one of these **Tamarix aphylla* listed as a declared pest and a Weed of National significance under the BAM act.
- One vegetation type,VT1, coastal dunes was mapped within the Survey Area.
- No TECs or PECs were recorded within the Survey Area.
- One broad fauna habitat was observed within the Survey Area comprising coastal dunes.
- One conservation significant fauna species, *Lerista planiventralis maryani* (P1), utilises dune habitat in the bioregion, and records indicate that it historically occurred within 1 km of the Survey Area. A targeted terrestrial vertebrate survey would be needed to confirm its presence or absence.
- Shorebirds may use the coastal dune areas within the Survey Area; however, these species are highly mobile and would not be reliant on the habitats within the Survey Area.

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Appendices

Appendix A
Database Searches

DBCA Threatened and Priority Flora Database Search

Taxon	ConsStatus	WARank	Location	District	Vesting	Purpose1	CountDate	InFlower	HabNotes	Landform	SoilType	SoilColor	AssSpecies	Veg_Stru_A	Veg_domA1
Abutilon sp. Onslow (F. Smith s.n. 10/9/61)	1		Davis Bore, ca 30 km SW of Peedamulla Homestead, Peedamulla Locality (L 3114 905).	KARRATHA	PLB	PAS	13-Sep-96	N	Hard hummock grassland.	FL_PLAIN	SAND		Triodia lanigera	Unknown Veg Class	Triodia lanigera
Carpobrotus sp. Thevenard Island (M. White 050)	3		Thevenard Island between Saladin 4 (Oil Well) and jetty area. Ashburton Location 147, Thevenard Island Nature Reserve (Reserve No. 33174).	KARRATHA	CC	CFF	24-Aug-90	Y	Coarse sand. Top of dune.	RI_DUNE	SAND	WHITE			

Western Australian Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Triumfetta echinata	3	Prostrate perennial shrub, spreading to ca 1 m diameter.	Slope of sand dune with red sandy soil.	Soft hummock grassland of Triodia pungens.		Abundance: common.	Ca 3.5 km NW from Peedamulla Homestead and 0.5 km back from sea, Peedamulla Station	05/11/1996
Triumfetta echinata	3		Ridge. Red-brown sand dune.	Low open Woodland, Corymbia hamersleyana and Eucalyptus xerothermica over Open Shrubland of Acacia trachycarpa, Acacia ancistrocarpa, Acacia bivenosa over Very Open Hummock grassland of Triodia lanigera.			ca 2.5 km S of Onslow, Dune Ridge, Cane River Conservation Reserve	14/11/2008
Triumfetta echinata	3		Flat. Red-brown sand-loam.	Open Shrubland of Grevillea stenobotrya, Acacia coriacea subsp. coriacea and Tephrosia rosea var. clementii Low Open Shrubland Pityrodia toxocarpa over Open Hummock Grassland Triodia epactia and Triodia schinzii.			ca 50 km SE of Onslow, Alluvial Plains, Cane River Conservation Reserve	14/11/2008
Triumfetta echinata	3	0.2 m tall annual.	Growing on a sand dune.	With soft spinifex.			20 km E of Onslow	25/10/1980
Triumfetta echinata	3						12 miles S of Onslow	28/05/1962
Triumfetta echinata	3	Shrub 0.5 m high.	Dune. Red sand. Collection site: rangeland. Burnt ca	Shrubland of Grevillea stenobotrya and Scaevola pulchella over open grassland of Triodia schinzii, Triodia epactia and Triumfetta echinata.			Ca 16 km S-SW of Onslow	01/11/2009
Stackhousia clementii	3	40 cm tall.	Coastal plain. 2.5YR 3/4 dark reddish brown sandy clay loam.	Acacia bivenosa open shrubland over Stackhousia clementii scattered herbs over Cenchrus ciliaris very open tussock grassland with Triodia epactia open hummock grassland. Associated Species: Acacia ligulata, Eragrostis pergracilis, Lawrencia viridigrisea,			5.4 km S of Onslow, 35.4 km NNE of Minderoo Homestead and 79.6 km W of Yarraloola Homestead	30/08/2011
Eremophila forrestii subsp. *viridis*	3	Shrub more or less 1 m. Flowers pink-cream.					10 miles S of Onslow	28/08/1960
Eremophila forrestii subsp. *viridis*	3	Medium sized shrub, 0.8 - 1.5 m tall.	Red sands - red/brown sandy loams of flat interdunal swales (not within dunes). Generally occurs on the flats where a hardpan develops in between inland dunes.	Acacia tetragonophylla, A. stellaticeps, Triodia epactia.			Ca 30 km SW of Onslow, Pilbara	19/08/2009
Eremophila forrestii subsp. *viridis*	3	Perennial.	Dune. Red [sand]. Collection site: rangeland.	Tall shrubland.	6-20 plants.	Lifestage: fruiting. Reproductive method: seeds.	Onslow	02/09/2011
Eleocharis papillosa	3	5 cm high.	Broad saline drainage area. Red-brown clay.	Tecticornia indica subsp. leiostachya, T. sp. low open shrubland over Sporobolus mitchellii scattered tussock grasses. Associated species (26 recorded): (complete list available on WA Herbarium database).		Condition: Good; 10+ Cenchrus ciliaris individuals.	Site WH08, 18.8 km S of Onslow townsite	04/04/2009
Eleocharis papillosa	3		Broad drainage area through sandy coastal plain; on a vehicle track. Red-brown clay.	Mosaic of Tecticornia low shrubland with mixed tussock grassland of Sporobolus mitchellii, Eriachne benthamii, Eulalia aurea.		Condition: Excellent to Very Good. No sign of recent fire.	Site: 567_BES622. 17.6 SE of Onslow, 102 km W of Nanutarra Roadhouse and 124 km NW of Barradale Roadhouse	14/03/2011
Carpobrotus sp. Thevenard Island (M. White 050)	3	Prostrate succulent glabrous plant with stems to 1.5 m long, rooting at nodes, dull green. Leaves sessile triangular in cross section to 10 cm long sides 17 mm wide. Flowers cream, solitary 3 - 5 cm diam. on thick pedumcles 4 - 5 cm long. Perianth lobes	Low open area, medium to coarse sand with shell grit.				Thevenard Island. 500 m from south beach 250 m SW windsock	23/06/1988
Carpobrotus sp. Thevenard Island (M. White 050)	3	Prostrate succulent, glabrous plant. Leaves sessile, triangular in cross section to 10 cm in length. Sides 17mm wide. Flowers cream, solitary, 3-5 cm in diameter on thick peduncles 4-5, 2 large, leaflike, others small. Fruit turbinate.	Coarse white sand on top of dune. Disturbed area.				Thevenard Island between Saladin 4 and jetty area	24/08/1990
Abutilon sp. Pritzelianum (S. van Leeuwen 5095)	3	To 150 cm.				Field No. Z 80.	1 km S of Onslow	03/08/1963
Abutilon sp. Onslow (F. Smith s.n. 10/9/61)	1	15 cm high.	Broad flat between distant aeolian. Patchy; cracking clay and loam.	Acacia synchronicia, A. bivenosa shrubland over Triodia epactia open hummock grassland. Associated species: (19 recorded): (complete list available on WA Herbarium database).		Condition: Excellent.	Site: WH11. 27 km SSE of Onslow	04/04/2009
Abutilon sp. Onslow (F. Smith s.n. 10/9/61)	1	Prostrate grey perennial herb with grey foliage and spined pods, growing up to 0.2 m tall.	Plain with sandy surface.	Hard hummock grassland of Triodia lanigera.		Abundance: common.	Davis Bore, ca 30 km SW of Peedamulla Homestead,	13/09/1996
Abutilon sp. Onslow (F. Smith s.n. 10/9/61)	1		Floodplain. Zero slope. No coarse fragments. No bedrock exposed. Red brown sandy loam, average depth 26.4 cm.	High Open Shrubland of Acacia xiphophylla over Open Hummock Grassland of Triodia sp. over Scattered Tussock Grass of Cenchrus ciliaris over Scattered Bunch Grass Very Open Herbs.			Site: OYW12, N side of road, 1.10 m off road, 4.3 km W of Cane River crossing on Peedamulla - Onslow Road, 33 km WSW of Peedan Hill, 31.1 km SE of Onslow, Peedamulla Station, Pilbara IBRA	29/08/2006

Threatened and Priority Ecological Communities Database Search

COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	OCC_CONFID	BDY_ID	ORIG_FID
Peedamulla Swamp Community	Peedamulla (Cane River) Swamp Community	Not Evaluated		1	Peedamulla		500	No	14822	3051

Class	Family	Scientific Name	Common Name	Conservation Code	Year
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	1978
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	1999
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2001
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2002
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2003
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2005
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2006
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2008
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2013
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2014
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2015
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2017
BIRD	Accipitridae	*Pandion cristatus*	Eastern osprey	IA	2019
BIRD	Apodidae	*Apus pacificus*	Fork-tailed Swift	IA	2005
BIRD	Apodidae	*Apus pacificus*	Fork-tailed Swift	IA	2008
BIRD	Apodidae	*Apus pacificus*	Fork-tailed Swift	IA	2012
BIRD	Apodidae	*Apus pacificus*	Fork-tailed Swift	IA	2013
BIRD	Apodidae	*Apus pacificus*	Fork-tailed Swift	IA	2014
BIRD	Apodidae	*Apus pacificus*	Fork-tailed Swift	IA	2014
BIRD	Apodidae	*Apus pacificus*	Fork-tailed Swift	IA	2015
BIRD	Charadriidae	*Charadrius leschenaultii*	Greater sand plover	VU	1900
BIRD	Charadriidae	*Charadrius leschenaultii*	Greater sand plover	VU	2003
BIRD	Charadriidae	*Charadrius leschenaultii*	Greater sand plover	VU	2005
BIRD	Charadriidae	*Charadrius leschenaultii*	Greater sand plover	VU	2006
BIRD	Charadriidae	*Charadrius leschenaultii*	Greater sand plover	VU	2008
BIRD	Charadriidae	*Charadrius leschenaultii*	Greater sand plover	VU	2014
BIRD	Charadriidae	*Charadrius leschenaultii*	Greater sand plover	VU	2015
BIRD	Charadriidae	*Charadrius leschenaultii*	Greater sand plover	VU	2016
BIRD	Charadriidae	*Charadrius leschenaultii*	Greater sand plover	VU	2017
BIRD	Charadriidae	*Charadrius mongolus*	Lesser Sand Plover	EN	1999
BIRD	Charadriidae	*Charadrius mongolus*	Lesser Sand Plover	EN	2008
BIRD	Charadriidae	*Charadrius mongolus*	Lesser Sand Plover	EN	2014
BIRD	Charadriidae	*Charadrius mongolus*	Lesser Sand Plover	EN	2015
BIRD	Charadriidae	*Charadrius mongolus*	Lesser Sand Plover	EN	2017
BIRD	Charadriidae	*Charadrius veredus*	Oriental Plover	IA	2013
BIRD	Charadriidae	*Charadrius veredus*	Oriental Plover	IA	2015
BIRD	Charadriidae	*Pluvialis squatarola*	Grey plover	IA	1999
BIRD	Charadriidae	*Pluvialis squatarola*	Grey plover	IA	2006
BIRD	Charadriidae	*Pluvialis squatarola*	Grey plover	IA	2014
BIRD	Charadriidae	*Pluvialis squatarola*	Grey plover	IA	2015
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	2005
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	2012
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	2017
BIRD	Glareolidae	*Glareola maldivarum*	Oriental pratincole	IA	2008
BIRD	Glareolidae	*Glareola maldivarum*	Oriental pratincole	IA	2013
BIRD	Glareolidae	*Glareola maldivarum*	Oriental pratincole	IA	2017
BIRD	Hirundinidae	*Hirundo rustica*	Barn swallow	IA	2014
BIRD	Hirundinidae	*Hirundo rustica*	Barn swallow	IA	2015
BIRD	Hydrobatidae	*Oceanites oceanicus*	Wilson's storm-petrel	IA	2013
BIRD	Laridae	*Chlidonias leucopterus*	White-winged black tern	IA	2008
BIRD	Laridae	*Chlidonias leucopterus*	White-winged black tern	IA	2016
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	1978
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	1999
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2001
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2002
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2003
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2005
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2006
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2008
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2013
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2014
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2015
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2016
BIRD	Laridae	*Hydroprogne caspia*	Caspian Tern	IA	2017
BIRD	Laridae	*Sterna dougallii*	Roseate tern	IA	2003
BIRD	Laridae	*Sterna dougallii*	Roseate tern	IA	2006
BIRD	Laridae	*Sterna dougallii*	Roseate tern	IA	2008
BIRD	Laridae	*Sterna dougallii*	Roseate tern	IA	2016
BIRD	Laridae	*Sterna hirundo*	Common tern	IA	2008

BIRD	Laridae	*Sterna hirundo*	Common tern	IA	2014
BIRD	Laridae	*Sterna hirundo*	Common tern	IA	2015
BIRD	Laridae	*Sterna hirundo*	Common tern	IA	2017
BIRD	Laridae	*Sternula albifrons*	Little tern	IA	2001
BIRD	Laridae	*Sternula albifrons*	Little tern	IA	2002
BIRD	Laridae	*Sternula albifrons*	Little tern	IA	2006
BIRD	Laridae	*Sternula albifrons*	Little tern	IA	2008
BIRD	Laridae	*Sternula albifrons*	Little tern	IA	2014
BIRD	Laridae	*Sternula albifrons*	Little tern	IA	2015
BIRD	Laridae	*Sternula nereis nereis*	Fairy tern	VU	1947
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	1981
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	1999
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	2001
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	2002
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	2005
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	2006
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	2008
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	2014
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	2015
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	2016
BIRD	Laridae	*Thalasseus bergii*	Crested tern	IA	2017
BIRD	Procellariidae	*Ardenna pacifica*	Wedge-tailed shearwater	IA	2014
BIRD	Procellariidae	*Ardenna pacifica*	Wedge-tailed shearwater	IA	2017
BIRD	Psittacidae	*Pezoporus occidentalis*	Night parrot	CR	1967
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	2001
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	2002
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	2003
BIRD	Scolopacidae	*Actitis hypoleucos*	common sandpiper	IA	2008
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	2013
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	2014
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	2015
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	2016
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	2017
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	2018
BIRD	Scolopacidae	*Arenaria interpres*	Ruddy turnstone	IA	1999
BIRD	Scolopacidae	*Arenaria interpres*	Ruddy turnstone	IA	2006
BIRD	Scolopacidae	*Arenaria interpres*	Ruddy turnstone	IA	2008
BIRD	Scolopacidae	*Arenaria interpres*	Ruddy turnstone	IA	2014
BIRD	Scolopacidae	*Arenaria interpres*	Ruddy turnstone	IA	2015
BIRD	Scolopacidae	*Arenaria interpres*	Ruddy turnstone	IA	2016
BIRD	Scolopacidae	*Calidris acuminata*	Sharp-tailed sandpiper	IA	1901
BIRD	Scolopacidae	*Calidris acuminata*	Sharp-tailed sandpiper	IA	2003
BIRD	Scolopacidae	*Calidris acuminata*	Sharp-tailed sandpiper	IA	2008
BIRD	Scolopacidae	*Calidris acuminata*	Sharp-tailed sandpiper	IA	2011
BIRD	Scolopacidae	*Calidris alba*	Sanderling	IA	2002
BIRD	Scolopacidae	*Calidris alba*	Sanderling	IA	2003
BIRD	Scolopacidae	*Calidris alba*	Sanderling	IA	2006
BIRD	Scolopacidae	*Calidris alba*	Sanderling	IA	2008
BIRD	Scolopacidae	*Calidris alba*	Sanderling	IA	2014
BIRD	Scolopacidae	*Calidris alba*	Sanderling	IA	2015
BIRD	Scolopacidae	*Calidris alba*	Sanderling	IA	2016
BIRD	Scolopacidae	*Calidris alba*	Sanderling	IA	2017
BIRD	Scolopacidae	*Calidris canutus*	Red knot	EN	1980
BIRD	Scolopacidae	*Calidris ferruginea*	Curlew sandpiper	CR	1999
BIRD	Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	IA	2015
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	1999
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	2001
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	2002
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	2003
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	2006
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	2008
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	2013
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	2014
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	2015
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	2016
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	IA	2017
BIRD	Scolopacidae	*Calidris tenuirostris*	Great knot	CR	2008
BIRD	Scolopacidae	*Calidris tenuirostris*	Great knot	CR	2019
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	1977
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	1978

BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2001
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2002
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2003
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2005
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2006
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2008
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2014
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2015
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2016
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2017
BIRD	Scolopacidae	*Limosa lapponica*	Bar-tailed godwit	IA	2019
BIRD	Scolopacidae	*Limosa lapponica menzbieri*	Bar-tailed godwit	CR	1901
BIRD	Scolopacidae	*Limosa lapponica menzbieri*	Bar-tailed godwit	CR	
BIRD	Scolopacidae	*Numenius madagascariensis*	Eastern curlew	CR	1966
BIRD	Scolopacidae	*Numenius madagascariensis*	Eastern curlew	CR	2001
BIRD	Scolopacidae	*Numenius madagascariensis*	Eastern curlew	CR	2002
BIRD	Scolopacidae	*Numenius madagascariensis*	Eastern curlew	CR	2006
BIRD	Scolopacidae	*Numenius madagascariensis*	Eastern curlew	CR	2014
BIRD	Scolopacidae	*Numenius madagascariensis*	Eastern curlew	CR	2015
BIRD	Scolopacidae	*Numenius madagascariensis*	Eastern curlew	CR	2017
BIRD	Scolopacidae	*Numenius madagascariensis*	Eastern curlew	CR	2019
BIRD	Scolopacidae	*Numenius minutus*	Little curlew	IA	2003
BIRD	Scolopacidae	*Numenius minutus*	Little curlew	IA	2016
BIRD	Scolopacidae	*Numenius phaeopus*	Whimbrel	IA	2006
BIRD	Scolopacidae	*Numenius phaeopus*	Whimbrel	IA	2008
BIRD	Scolopacidae	*Numenius phaeopus*	Whimbrel	IA	2014
BIRD	Scolopacidae	*Numenius phaeopus*	Whimbrel	IA	2015
BIRD	Scolopacidae	*Numenius phaeopus*	Whimbrel	IA	2017
BIRD	Scolopacidae	*Tringa brevipes*	Grey-tailed tattler	IA	1999
BIRD	Scolopacidae	*Tringa brevipes*	Grey-tailed tattler	IA	2001
BIRD	Scolopacidae	*Tringa brevipes*	Grey-tailed tattler	IA	2003
BIRD	Scolopacidae	*Tringa brevipes*	Grey-tailed tattler	IA	2006
BIRD	Scolopacidae	*Tringa brevipes*	Grey-tailed tattler	IA	2008
BIRD	Scolopacidae	*Tringa brevipes*	Grey-tailed tattler	IA	2014
BIRD	Scolopacidae	*Tringa brevipes*	Grey-tailed tattler	IA	2015
BIRD	Scolopacidae	*Tringa brevipes*	Grey-tailed tattler	IA	2016
BIRD	Scolopacidae	*Tringa brevipes*	Grey-tailed tattler	IA	2017
BIRD	Scolopacidae	*Tringa glareola*	Wood sandpiper	IA	2008
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	IA	1999
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	IA	2003
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	IA	2006
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	IA	2008
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	IA	2015
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	IA	2016
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	IA	2019
BIRD	Sturnidae	*Gelochelidon nilotica*	Gull-billed tern	IA	1999
BIRD	Sturnidae	*Gelochelidon nilotica*	Gull-billed tern	IA	2003
BIRD	Sturnidae	*Gelochelidon nilotica*	Gull-billed tern	IA	2006
BIRD	Sturnidae	*Gelochelidon nilotica*	Gull-billed tern	IA	2008
BIRD	Sturnidae	*Gelochelidon nilotica*	Gull-billed tern	IA	2016
BIRD	Sturnidae	*Gelochelidon nilotica*	Gull-billed tern	IA	2018
BIRD	Threskiornithidae	*Plegadis falcinellus*	Glossy ibis	IA	2015
FISH	Pristidae	*Pristis zijsron*	Green sawfish	VU	2011
FISH	Pristidae	*Pristis zijsron*	Green sawfish	VU	2013
MAMMAL	Balaenopteridae	*Megaptera novaeangliae*	Humpback whale	CD	2013
MAMMAL	Balaenopteridae	*Megaptera novaeangliae*	Humpback whale	CD	2015
MAMMAL	Dasyuridae	*Dasyurus hallucatus*	Northern quoll	EN	2012
MAMMAL	Dasyuridae	*Dasyurus hallucatus*	Northern quoll	EN	2013
MAMMAL	Dasyuridae	*Dasyurus hallucatus*	Northern quoll	EN	2017
MAMMAL	Delphinidae	*Sousa sahulensis*	Australian humpback dolphin	P4	2013
MAMMAL	Delphinidae	*Sousa sahulensis*	Australian humpback dolphin	P4	2014
MAMMAL	Delphinidae	*Sousa sahulensis*	Australian humpback dolphin	P4	2015
MAMMAL	Dugongidae	*Dugong dugon*	Dugong	OS	2012
MAMMAL	Dugongidae	*Dugong dugon*	Dugong	OS	2013
MAMMAL	Dugongidae	*Dugong dugon*	Dugong	OS	2014
MAMMAL	Dugongidae	*Dugong dugon*	Dugong	OS	2015
MAMMAL	Dugongidae	*Dugong dugon*	Dugong	OS	
MAMMAL	Muridae	*Leggadina lakedownensis*	Northern short-tailed mouse	P4	2003
MAMMAL	Muridae	*Leggadina lakedownensis*	Northern short-tailed mouse	P4	2016
MAMMAL	Muridae	*Pseudomys chapmani*	Western pebble-mound mouse	P4	2005

REPTILE	Cheloniidae	*Caretta caretta*	loggerhead turtle	EN	2013
REPTILE	Cheloniidae	*Caretta caretta*	loggerhead turtle	EN	2014
REPTILE	Cheloniidae	*Caretta caretta*	loggerhead turtle	EN	2015
REPTILE	Cheloniidae	*Chelonia mydas*	Green turtle	VU	2012
REPTILE	Cheloniidae	*Chelonia mydas*	Green turtle	VU	2013
REPTILE	Cheloniidae	*Chelonia mydas*	Green turtle	VU	2014
REPTILE	Cheloniidae	*Chelonia mydas*	Green turtle	VU	2015
REPTILE	Cheloniidae	*Chelonia mydas*	Green turtle	VU	2016
REPTILE	Cheloniidae	*Eretmochelys imbricata*	Hawksbill turtle	VU	2013
REPTILE	Cheloniidae	*Natator depressus*	Flatback turtle	VU	2009
REPTILE	Cheloniidae	*Natator depressus*	Flatback turtle	VU	2010
REPTILE	Cheloniidae	*Natator depressus*	Flatback turtle	VU	2012
REPTILE	Cheloniidae	*Natator depressus*	Flatback turtle	VU	2013
REPTILE	Cheloniidae	*Natator depressus*	Flatback turtle	VU	2014
REPTILE	Cheloniidae	*Natator depressus*	Flatback turtle	VU	2015
REPTILE	Cheloniidae	*Natator depressus*	Flatback turtle	VU	2017
REPTILE	Cheloniidae	*Natator depressus*	Flatback turtle	VU	2018
REPTILE	Cheloniidae	*Natator depressus*	Flatback turtle	VU	
REPTILE	Crocodylidae	*Crocodylus porosus*	Salt-water crocodile	OS	2008
REPTILE	Crocodylidae	*Crocodylus porosus*	Salt-water crocodile	OS	2014
REPTILE	Scincidae	*Lerista planiventralis maryani*	Maryan's keeled slider	P1	1990

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NatureMap Species Report

Created By Guest user on 13/07/2021

Kingdom Plantae
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 06' 29" E,21° 38' 09" S
Buffer 40km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	541	3741
Priority 1	4	8
Priority 3	5	14
TOTAL	**550**	**3763**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Priority 1					
1.	14110	*Abutilon sp. Onslow (F. Smith s.n. 10/9/61)*		P1	
2.	43021	*Abutilon sp. Pritzelianum (S. van Leeuwen 5095)*		P1	
3.	3994	*Isotropis forrestii*		P1	
4.	19420	*Myriocephalus scalpellus*		P1	
Priority 3					
5.	18359	*Carpobrotus sp. Thevenard Island (M. White 050)*		P3	
6.	31017	*Eleocharis papillosa*		P3	
7.	17177	*Eremophila forrestii subsp. viridis*		P3	
8.	4729	*Stackhousia clementii*		P3	
9.	17524	*Triumfetta echinata*		P3	
Non-conservation taxon					
10.		*Abutilon Onslow (F. Smith s.n. 10/9/61)*			
11.	9080	*Abutilon cunninghamii*			
12.	4895	*Abutilon lepidum*			
13.	4899	*Abutilon malvifolium (Bastard Marshmallow)*			
14.	4901	*Abutilon otocarpum (Desert Chinese Lantern)*			
15.		*Abutilon sp.*			
16.	42920	*Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)*			
17.		*Acacia Airlie Island (V. Long VL163)*			
18.	3209	*Acacia ampliceps*			
19.	3214	*Acacia ancistrocarpa (Fitzroy Wattle)*			
20.	3241	*Acacia bivenosa*			
21.	3260	*Acacia citrinoviridis*			
22.	17013	*Acacia colei var. colei*			
23.	3270	*Acacia coriacea (Wirewood)*			
24.	13500	*Acacia coriacea subsp. coriacea*			
25.	14088	*Acacia cyperophylla var. cyperophylla*			
26.	3356	*Acacia gregorii (Gregory's Wattle)*			
27.	3419	*Acacia ligulata (Umbrella Bush, Watarka)*			
28.	3506	*Acacia pyrifolia (Ranji Bush, Kandji)*			
29.	3534	*Acacia sclerosperma (Limestone Wattle)*			
30.	13078	*Acacia sclerosperma subsp. sclerosperma*			
31.	29135	*Acacia sericophylla*			
32.	29102	*Acacia sp. Airlie Island (V. Long VL 163)*			
33.	20819	*Acacia sp. Ripon Hills (B.R. Maslin 8460)*			
34.	3551	*Acacia sphaerostachya*			
35.	19456	*Acacia stellaticeps*			
36.	13070	*Acacia synchronicia*			
37.	3577	*Acacia tetragonophylla (Kurara, Wakalpuka)*			
38.	3579	*Acacia trachycarpa (Minni Ritchi, Balgali)*			
39.	3595	*Acacia victoriae (Bramble Wattle, Ngatunpa)*			

NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum.

Department of Biodiversity, Conservation and Attractions

WESTERN AUSTRALIAN MUSEUM

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
40.	3603	*Acacia wiseana*			
41.	3606	*Acacia xiphophylla*			
42.	26441	*Acanthophora spicifera*			
43.	35868	*Acrocystis nana*			
44.	4583	*Adriana tomentosa*			
45.	17422	*Adriana tomentosa var. tomentosa*			
46.	6486	*Aegialitis annulata (Club Mangrove)*			
47.	6478	*Aegiceras corniculatum (River Mangrove)*			
48.	39780	*Aenictophyton reconditum subsp. reconditum*			
49.	2646	*Aerva javanica (Kapok Bush)*	Y		
50.	3680	*Aeschynomene indica (Budda Pea)*			
51.	4739	*Alectryon oleifolius*			
52.	11487	*Alectryon oleifolius subsp. oleifolius*			
53.	2652	*Alternanthera nodiflora (Common Joyweed)*			
54.	4907	*Alyogyne pinoniana (Sand Hibiscus)*			
55.	17147	*Alysicarpus muelleri*			
56.	2666	*Amaranthus mitchellii (Boggabri Weed)*			
57.	20018	*Amaranthus undulatus*			
58.	5278	*Ammannia multiflora*			
59.	126	*Amphibolis antarctica (Sea Nymph)*			
60.	26462	*Amphiroa fragilissima*			
61.	11874	*Amyema sanguinea var. sanguinea*			
62.	14307	*Amyema sp. Fortescue (M.E. Trudgen 5358)*			
63.	35872	*Anadyomene plicata*			
64.	7822	*Angianthus acrohyalinus (Hook-leaf Angianthus)*			
65.	7827	*Angianthus cunninghamii (Coast Angianthus)*			
66.	7832	*Angianthus milnei (Cone-spike Angianthus)*			
67.	26469	*Anotrichium tenue*			
68.	207	*Aristida contorta (Bunched Kerosene Grass)*			
69.	210	*Aristida holathera*			
70.	12063	*Aristida holathera var. holathera*			
71.	215	*Aristida latifolia (Feathertop Wiregrass)*			
72.	26486	*Asparagopsis taxiformis*			
73.	2451	*Atriplex bunburyana (Silver Saltbush)*			
74.	2453	*Atriplex codonocarpa (Flat-topped Saltbush)*			
75.	2463	*Atriplex isatidea (Coast Saltbush)*			
76.	2476	*Atriplex semilunaris (Annual Saltbush)*			
77.	233	*Avena barbata (Bearded Oat)*	Y		
78.	6828	*Avicennia marina (White Mangrove)*			
79.	26498	*Avrainvillea obscura*			
80.	5183	*Bergia ammannioides*			
81.	5184	*Bergia pedicellaris*			
82.	5185	*Bergia perennis*			
83.	11726	*Bergia perennis subsp. exigua*			
84.	5186	*Bergia trimera*			
85.	48503	*Betaphycus speciosus*			
86.	7866	*Blumea tenella*			
87.	26507	*Boergesenia forbesii*			
88.	2769	*Boerhavia burbidgeana*			
89.	2770	*Boerhavia coccinea (Tar Vine, Wituka)*			
90.	8357	*Boerhavia diffusa*			
91.	2774	*Boerhavia repleta*			
92.	2775	*Boerhavia schomburgkiana*			
93.		*Boerhavia sp.*			
94.	11167	*Bonamia erecta*			
95.	6605	*Bonamia linearis*			
96.	26508	*Boodlea composita*			
97.	26509	*Bornetella oligospora*			
98.	3000	*Brassica tournefortii (Mediterranean Turnip)*	Y		
99.		*Breynia desorii*			
100.	5291	*Bruguiera exaristata (Ribbed Mangrove)*			
101.	7047	*Buchnera linearis (Blackrod)*			
102.	750	*Bulbostylis barbata*			
103.	2860	*Calandrinia polyandra (Parakeelya)*			
104.	2864	*Calandrinia ptychosperma*			
105.	7893	*Calocephalus knappii*			
106.	7903	*Calotis hispidula (Bindy Eye)*			
107.	7906	*Calotis plumulifera*			
108.	3749	*Canavalia rosea (Wild Jack Bean)*			
109.	2981	*Capparis spinosa*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
110.		*Carpobrotus sp. subsp. Thevenard Island (M. White 050)*			
111.	2798	*Carpobrotus virescens (Coastal Pigface, Kolboko, Bain)*			
112.	2948	*Cassytha aurea*			
113.	12073	*Cassytha aurea var. aurea*			
114.	2949	*Cassytha capillaris*			
115.	2950	*Cassytha filiformis (Love Vine, Jirawan)*			
116.	19842	*Casuarina equisetifolia*	Y		
117.	42620	*Caulerpa chemnitzia*			
118.	35158	*Caulerpa corynephora*			
119.	26559	*Caulerpa cupressoides*			
120.	27378	*Caulerpa cupressoides var. lycopodium*			
121.	42783	*Caulerpa delicatula*			
122.	26562	*Caulerpa fergusonii*			
123.	44547	*Caulerpa lamourouxii*			
124.	26567	*Caulerpa lanuginosa*			
125.	26568	*Caulerpa lentillifera*			
126.	26573	*Caulerpa racemosa*			
127.	26576	*Caulerpa serrulata*			
128.	26577	*Caulerpa sertularioides*			
129.	26579	*Caulerpa taxifolia*			
130.	258	*Cenchrus ciliaris (Buffel Grass)*	Y		
131.	41568	*Cenchrus setaceus (Fountain Grass)*	Y		
132.	7919	*Centipeda minima (Spreading Sneezewood, Kanjirralaa, Inteng-inteng, Karengkal, Kata-palkalpa, Munyu-parnti-parnti)*			
133.	19762	*Centipeda minima subsp. macrocephala*			
134.	26587	*Centroceras clavulatum*			
135.	26606	*Ceratodictyon spongiosum*			
136.	26618	*Champia parvula*			
137.	269	*Chloris pectinata (Comb Chloris)*			
138.	270	*Chloris pumilio*			
139.	26628	*Chondria armata*			
140.	273	*Chrysopogon fallax (Golden Beard Grass)*			
141.	35865	*Cladophora catenata*			
142.	36316	*Cladophora herpestica*			
143.	26658	*Cladophora vagabunda*			
144.	29101	*Cleome uncifera subsp. uncifera*			
145.	2988	*Cleome viscosa (Tickweed, Tjinduwadhu)*			
146.	26673	*Codium geppiorum*			
147.	2778	*Codonocarpus cotinifolius (Native Poplar, Kundurangu)*			
148.	26686	*Coelarthrum opuntia*			
149.	2776	*Commicarpus australis (Perennial Tar Vine)*			
150.	19880	*Convolvulus angustissimus*			
151.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		
152.	25847	*Corchorus incanus subsp. incanus*			
153.	18414	*Corchorus sidoides subsp. vermicularis*			
154.	17093	*Corymbia hamersleyana*			
155.	17092	*Corymbia opaca*			
156.	17084	*Corymbia zygophylla*			
157.	1284	*Corynotheca flexuosissima*			
158.	1285	*Corynotheca micrantha (Sand Lily)*			
159.	1286	*Corynotheca pungens*			
160.	20268	*Crassula tetramera*			
161.	19565	*Cressa australis*			
162.	3774	*Crotalaria cunninghamii (Green Birdflower, Bilbun)*			
163.	20175	*Crotalaria cunninghamii subsp. sturtii*			
164.	20179	*Crotalaria medicaginea var. neglecta*			
165.	17117	*Cullen cinereum*			
166.	17436	*Cullen graveolens*			
167.	17116	*Cullen martinii*			
168.	17120	*Cullen pogonocarpum*			
169.	6662	*Cuscuta australis (Australian Dodder)*			
170.	13733	*Cuscuta victoriana*			
171.	129	*Cymodocea serrulata*			
172.	6584	*Cynanchum floribundum (Dumara Bush, Tjipa)*			
173.	48280	*Cynanchum viminale subsp. australe*			
174.	283	*Cynodon dactylon (Couch)*	Y		
175.	46555	*Cynodon prostratus*			
176.	777	*Cyperus bulbosus (Bush Onion, Tjanmata)*			
177.	798	*Cyperus iria*			
178.	808	*Cyperus pygmaeus*			

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179.	809	*Cyperus rigidellus*			
180.	814	*Cyperus squarrosus*			
181.	290	*Dactyloctenium radulans (Button Grass)*			
182.	7958	*Decazesia hecatocephala*			
183.	3853	*Desmodium filiforme*			
184.	29616	*Dichotomaria marginata*			
185.	29615	*Dichotomaria obtusata*			
186.	6754	*Dicrastylis cordifolia*			
187.	26762	*Dictyomenia sonderi*			
188.	26769	*Dictyosphaeria cavernosa*			
189.	26771	*Dictyosphaeria versluysii*			
190.	26782	*Digenea simplex*			
191.	311	*Digitaria ciliaris (Summer Grass)*	Y		
192.	48378	*Diplachne fusca subsp. fusca*			
193.	4745	*Diplopeltis eriocarpa (Hairy Pepperflower)*			
194.	2499	*Dissocarpus paradoxus (Curious Saltbush)*			
195.	2502	*Dysphania kalpari (Rat's Tail, Kalpari)*			
196.	33596	*Dysphania melanocarpa forma leucocarpa*			
197.	2504	*Dysphania plantaginella*			
198.	2505	*Dysphania platycarpa*			
199.	11890	*Dysphania rhadinostachya subsp. rhadinostachya*			
200.	340	*Echinopogon ovatus (Hedgehog Grass)*			
201.	14301	*Ehretia saligna var. saligna*			
202.	2511	*Enchylaena tomentosa (Barrier Saltbush)*			
203.	357	*Enneapogon caerulescens (Limestone Grass)*			
204.	365	*Enneapogon polyphyllus (Leafy Nineawn)*			
205.	368	*Enteropogon ramosus (Windmill Grass, Curly Windmill Grass)*			
206.	369	*Eragrostis australasica (Canegrass)*			
207.	370	*Eragrostis barrelieri*	Y		
208.	375	*Eragrostis cumingii (Cuming's Love Grass)*			
209.	378	*Eragrostis dielsii (Mallee Lovegrass)*			
210.	380	*Eragrostis eriopoda (Woollybutt Grass, Wangurnu)*			
211.	381	*Eragrostis falcata (Sickle Lovegrass)*			
212.	388	*Eragrostis leptocarpa (Drooping Lovegrass)*			
213.	389	*Eragrostis minor (Smaller Stinkgrass)*	Y		
214.	392	*Eragrostis pergracilis*			
215.	393	*Eragrostis setifolia (Neverfail Grass)*			
216.	398	*Eragrostis tenellula (Delicate Lovegrass)*			
217.	7189	*Eremophila clarkei (Turpentine Bush)*			
218.	7208	*Eremophila forrestii (Wilcox Bush)*			
219.	16696	*Eremophila fraseri subsp. fraseri*			
220.	17175	*Eremophila glabra subsp. albicans*			
221.	16363	*Eremophila maculata subsp. brevifolia (Native Fuchsia)*			
222.	400	*Eriachne aristidea*			
223.	403	*Eriachne benthamii (Swamp Wanderrie)*			
224.	408	*Eriachne flaccida (Claypan Grass)*			
225.	409	*Eriachne gardneri*			
226.	414	*Eriachne obtusa (Northern Wandarrie Grass)*			
227.	426	*Eriochloa pseudoacrotricha (Perennial Cupgrass)*			
228.	4334	*Erodium crinitum (Corkscrew)*			
229.	4335	*Erodium cygnorum (Blue Heronsbill)*			
230.	3871	*Erythrina vespertilio (Yulbah)*			
231.	35343	*Eucalyptus camaldulensis subsp. refulgens*			
232.	14548	*Eucalyptus victrix*			
233.	15592	*Eucalyptus xerothermica*			
234.	11011	*Eulalia aurea*			
235.	4617	*Euphorbia australis (Namana)*			
236.	35307	*Euphorbia australis var. australis*			
237.	35303	*Euphorbia australis var. subtomentosa*			
238.	4620	*Euphorbia boophthona (Gascoyne Spurge)*			
239.	4623	*Euphorbia coghlanii (Namana)*			
240.	4626	*Euphorbia drummondii (Caustic Weed, Piwi)*			
241.	4629	*Euphorbia hirta (Asthma Plant)*	Y		
242.	4635	*Euphorbia myrtoides*			
243.	4644	*Euphorbia sharkoensis*			
244.	4647	*Euphorbia tannensis*			
245.	12097	*Euphorbia tannensis subsp. eremophila (Desert Spurge)*			
246.	42879	*Euphorbia trigonosperma*			
247.	11200	*Evolvulus alsinoides var. villosicalyx*			
248.	35558	*Flaveria trinervia (Speedy Weed)*	Y		

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
249.	5188	*Frankenia ambita*			
250.	5209	*Frankenia pauciflora (Seaheath)*			
251.	26835	*Galaxaura rugosa*			
252.	26837	*Ganonema farinosum*			
253.	26845	*Gelidiopsis intricata*			
254.	2835	*Glinus lotoides (Hairy Carpet Weed)*			
255.	7988	*Gnephosis arachnoidea (Cobwebby-headed Gnephosis)*			
256.	7989	*Gnephosis brevifolia (Short-leaved Gnephosis)*			
257.	2680	*Gomphrena cunninghamii*			
258.	11131	*Gomphrena sordida*			
259.	7501	*Goodenia corynocarpa*			
260.	7509	*Goodenia forrestii*			
261.	7521	*Goodenia lamprosperma*			
262.	7526	*Goodenia microptera*			
263.	12571	*Goodenia pascua*			
264.	7556	*Goodenia tenuiloba*			
265.	4910	*Gossypium australe (Native Cotton)*			
266.	4913	*Gossypium hirsutum (Upland Cotton)*	Y		
267.	26873	*Gracilaria salicornia*			
268.	2001	*Grevillea eriostachya (Flame Grevillea, Kaliny-kalinypa)*			
269.	19570	*Grevillea pyramidalis subsp. leucadendron*			
270.	2096	*Grevillea stenobotrya*			
271.	2784	*Gyrostemon ramulosus (Corkybark)*			
272.	2177	*Hakea lorea (Witinti)*			
273.	19137	*Hakea lorea subsp. lorea*			
274.	16897	*Hakea stenophylla subsp. stenophylla*			
275.	26891	*Halimeda cylindracea*			
276.	26892	*Halimeda discoidea*			
277.	26894	*Halimeda macroloba*			
278.	26896	*Halimeda simulans*			
279.	26898	*Halimeda velasquezii*			
280.	47213	*Halimeda versatilis*			
281.	131	*Halodule uninervis*			
282.	164	*Halophila ovalis (Sea Wrack)*			
283.	165	*Halophila spinulosa*			
284.	6174	*Haloragis gossei*			
285.	23464	*Haloragis gossei var. inflata*			
286.	17782	*Hannafordia quadrivalvis subsp. recurva*			
287.	17299	*Heliotropium ammophilum*			
288.	17301	*Heliotropium chrysocarpum*			
289.	6705	*Heliotropium crispatum*			
290.	6706	*Heliotropium cunninghamii*			
291.	6707	*Heliotropium curassavicum (Smooth Heliotrope)*			
292.	6708	*Heliotropium diversifolium*			
293.	6712	*Heliotropium heteranthum*			
294.	17307	*Heliotropium inexplicitum*			
295.	6713	*Heliotropium ovalifolium*			
296.	17309	*Heliotropium pachyphyllum*			
297.	6718	*Heliotropium tenuifolium (Mamukata)*			
298.	17031	*Heliotropium transforme*			
299.	26930	*Heterosiphonia crassipes*			
300.	4922	*Hibiscus brachychlaenus*			
301.	4923	*Hibiscus brachysiphonius*			
302.	4933	*Hibiscus leptocladus*			
303.	4942	*Hibiscus sturtii (Sturt's Hibiscus)*			
304.	3971	*Indigofera boviperda*			
305.	3973	*Indigofera colutea (Sticky Indigo)*			
306.	3974	*Indigofera georgei (Bovine Indigo)*			
307.	3980	*Indigofera linifolia*			
308.	3981	*Indigofera linnaei (Birdsville Indigo)*			
309.	3982	*Indigofera monophylla*			
310.	6624	*Ipomoea costata (Rock Morning Glory, Kanti)*			
311.	6633	*Ipomoea muelleri (Poison Morning Glory, Yumbu)*			
312.	6635	*Ipomoea pes-caprae*			
313.	11312	*Ipomoea pes-caprae subsp. brasiliensis*			
314.	6637	*Ipomoea polymorpha*			
315.	6638	*Ipomoea quamoclit (Cupid's Flower)*	Y		
316.	458	*Iseilema dolichotrichum*			
317.	459	*Iseilema eremaeum*			
318.	465	*Iseilema vaginiflorum (Red Flinders Grass)*			

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319.	8088	*Ixiochlamys cuneifolia*			
320.	26983	*Jania adhaerens*			
321.	42222	*Jania ungulata*			Y
322.		*Launaea sarmenstosa*			
323.	8098	*Launaea sarmentosa*			
324.	26998	*Laurencia brongniartii*			
325.	48408	*Laurencia dendroidea*			
326.	4960	*Lawrencia viridigrisea*			
327.	3032	*Lepidium muelleri-ferdinandii*			
328.	3038	*Lepidium pholidogynum*			
329.	3039	*Lepidium platypetalum (Slender Peppercress)*			
330.	3613	*Leucaena leucocephala (Leucaena)*	Y		
331.	4061	*Lotus cruentus (Redflower Lotus)*			
332.	2547	*Maireana lanosa (Woolly Bluebush)*			
333.	2548	*Maireana lobiflora*			
334.	2556	*Maireana planifolia (Low Bluebush)*			
335.	4962	*Malvastrum americanum (Spiked Malvastrum)*	Y		
336.	75	*Marsilea exarata*			
337.		*Marsilea sp.*			
338.	5051	*Melhania oblongifolia*			
339.	7082	*Mimulus gracilis*			
340.	8107	*Minuria cunninghamii (Bush Minuria)*			
341.	6490	*Muellerolimon salicorniaceum*			
342.	17158	*Myoporum montanum (Native Myrtle)*			
343.	17925	*Myriocephalus oldfieldii*			
344.	8121	*Myriocephalus rudallii*			
345.	2573	*Neobassia astrocarpa*			
346.	6971	*Nicotiana benthamiana (Tjuntiwari)*			
347.	6976	*Nicotiana occidentalis (Native Tobacco)*			
348.	11856	*Nicotiana occidentalis subsp. occidentalis*			
349.	11734	*Nicotiana rosulata subsp. rosulata*			
350.	16347	*Oenothera laciniata*	Y		
351.	7338	*Oldenlandia crouchiana*			
352.		*Olearia Kennedy Range (G. Byrne 66)*			
353.	8127	*Olearia axillaris (Coastal Daisybush)*			
354.	42024	*Olearia sp. Kennedy Range (G. Byrne 66)*			
355.	46834	*Osmundaria melvillii*			
356.	38021	*Palisada concreta*			Y
357.	36400	*Palisada perforata*			
358.	503	*Panicum decompositum (Native Millet, Kaltu-kaltu)*			
359.	505	*Panicum laevinode*			
360.	513	*Paractaenum novae-hollandiae (Reflexed Panic Grass)*			
361.	11232	*Paractaenum novae-hollandiae subsp. novae-hollandiae*			
362.	514	*Paractaenum refractum*			
363.	3673	*Parkinsonia aculeata (Parkinsonia)*	Y		
364.	523	*Paspalidium rarum (Rare Paspalidium)*			
365.	27121	*Penicillus nodulosus*			
366.	18463	*Peplidium sp. C Evol. Fl. Fauna Arid Aust. (N.T. Burbidge & A. Kanis 8158)*			
367.	3674	*Petalostylis cassioides*			
368.	1042	*Phoenix dactylifera (Date Palm)*	Y		
369.	17626	*Phyllanthus erwinii*			
370.	4680	*Phyllanthus maderaspatensis*			
371.	5230	*Pimelea ammocharis*			
372.	17817	*Pluchea dunlopii*			
373.	17816	*Pluchea ferdinandi-muelleri*			
374.	43944	*Pluchea longiseta*			
375.	8168	*Pluchea rubelliflora*			
376.	12075	*Polycarpaea corymbosa var. corymbosa*			
377.	2901	*Polycarpaea holtzei*			
378.	2903	*Polycarpaea longiflora*			
379.	2905	*Polycarpon tetraphyllum (Fourleaf Allseed)*	Y		
380.	41365	*Polygala glaucifolia*			
381.	4572	*Polygala isingii*			
382.	27171	*Polysiphonia blandii*			
383.	27186	*Portieria hornemannii*			
384.	2878	*Portulaca conspicua*			
385.	2882	*Portulaca intraterranea*			
386.	2884	*Portulaca oleracea (Purslane, Wakati)*			
387.	2886	*Portulaca pilosa (Djanggara)*	Y		
388.	3620	*Prosopis pallida (Mesquite, Algaroba)*	Y		

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389.	8189	*Pseudognaphalium luteoalbum (Jersey Cudweed)*			
390.	8192	*Pterocaulon sphacelatum (Apple Bush, Fruit Salad Plant)*			
391.	8193	*Pterocaulon sphaeranthoides*			
392.	2690	*Ptilotus aervoides*			
393.	2694	*Ptilotus appendiculatus*			
394.	2695	*Ptilotus arthrolasius*			
395.	2696	*Ptilotus astrolasius*			
396.	2699	*Ptilotus axillaris (Mat Mulla Mulla)*			
397.	2708	*Ptilotus chamaecladus*			
398.	2721	*Ptilotus exaltatus (Tall Mulla Mulla)*			
399.	2725	*Ptilotus fusiformis*			
400.	2728	*Ptilotus gomphrenoides*			
401.	2738	*Ptilotus latifolius (Tangled Mulla Mulla)*			
402.	2745	*Ptilotus murrayi*			
403.	2746	*Ptilotus nobilis (Tall Mulla Mulla)*			
404.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
405.	2766	*Ptilotus villosiflorus*			
406.	41063	*Quoya loxocarpa*			
407.	41061	*Quoya paniculata*			
408.	2578	*Rhagodia baccata (Berry Saltbush)*			
409.	2582	*Rhagodia eremaea (Thorny Saltbush)*			
410.	2584	*Rhagodia preissii*			
411.	11240	*Rhagodia preissii subsp. obovata*			
412.	5295	*Rhizophora stylosa (Spotted-leaved Red Mangrove)*			
413.	13246	*Rhodanthe humboldtiana*			
414.	13297	*Rhodanthe psammophila*			
415.	13254	*Rhodanthe stricta*			
416.	4191	*Rhynchosia minima (Rhynchosia)*			
417.		*Riccia sp.*			
418.	45154	*Roebuckiella cheilocarpa var. cheilocarpa*			
419.	48884	*Roepera aurantiaca*			
420.	12088	*Rostellularia adscendens var. clementii*			
421.	30434	*Salsola australis*			
422.	6484	*Samolus repens (Creeping Brookweed)*			
423.	14027	*Samolus sp. Millstream (M.I.H. Brooker 2076)*			
424.	2357	*Santalum lanceolatum (Northern Sandalwood, Yarnguli)*			
425.	27230	*Sarconema filiforme*			
426.	12578	*Scaevola acacioides*			
427.	7606	*Scaevola crassifolia (Thick-leaved Fan-flower)*			
428.	7608	*Scaevola cunninghamii*			
429.	7633	*Scaevola parvifolia (Camel Weed)*			
430.	13172	*Scaevola parvifolia subsp. pilbarae*			
431.	12584	*Scaevola pulchella*			
432.	7643	*Scaevola sericophylla*			
433.	7644	*Scaevola spinescens (Currant Bush, Maroon)*			
434.	41660	*Schenkia australis*			
435.	48355	*Schoenoplectiella dissachantha*			
436.	16257	*Schoenoplectus subulatus*			
437.	11650	*Sclerolaena bicornis var. bicornis (Goathead Burr)*			
438.	2604	*Sclerolaena costata*			
439.	2609	*Sclerolaena diacantha (Grey Copperburr)*			
440.	2633	*Sclerolaena uniflora (Two-spined Saltbush)*			
441.	12280	*Senna artemisioides subsp. oligophylla*			
442.	12305	*Senna glutinosa subsp. chatelainiana*			
443.	12312	*Senna notabilis*			
444.	4196	*Sesbania cannabina (Sesbania Pea)*			
445.	4198	*Sesbania formosa (White Dragon Tree)*			
446.	2818	*Sesuvium portulacastrum*			
447.	606	*Setaria dielsii (Diels' Pigeon Grass)*			
448.	613	*Setaria verticillata (Whorled Pigeon Grass)*	Y		
449.	31758	*Sida arsiniata*			
450.	4977	*Sida fibulifera (Silver Sida)*			
451.	18149	*Sida rohlenae subsp. rohlenae*			
452.	6998	*Solanum cleistogamum*			
453.	7002	*Solanum diversiflorum*			
454.	7014	*Solanum horridum*			
455.	7018	*Solanum lasiophyllum (Flannel Bush, Mindjulu)*			
456.	7029	*Solanum phlomoides*			
457.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
458.	619	*Sorghum plumosum (Plume Canegrass)*			

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459.	625	*Spinifex longifolius (Beach Spinifex)*			
460.	629	*Sporobolus australasicus (Fairy Grass)*			
461.	633	*Sporobolus mitchellii (Ratstail Couch)*			
462.		*Sporobolus sp.*			
463.	635	*Sporobolus virginicus (Marine Couch)*			
464.	27310	*Spyridia filamentosa*			
465.	17295	*Stemodia sp. Onslow (A.A. Mitchell 76/148)*			
466.	8235	*Streptoglossa bubakii*			
467.	8237	*Streptoglossa decurrens*			
468.	8238	*Streptoglossa liatroides*			
469.	8239	*Streptoglossa macrocephala*			
470.	8240	*Streptoglossa odora*			
471.	12492	*Striga squamigera*			
472.	3182	*Stylobasium spathulatum (Pebble Bush)*			
473.	12353	*Stylosanthes hamata (Verano Stylo)*	Y		
474.	2638	*Suaeda arbusculoides*			
475.	43203	*Surreya diandra*			
476.	4231	*Swainsona kingii*			
477.	4233	*Swainsona leeana*			
478.	4242	*Swainsona pterostylis*			
479.	13587	*Swainsona tanamiensis*			
480.	7363	*Synaptantha tillaeacea*			
481.	13339	*Synaptantha tillaeacea var. tillaeacea*			
482.	48206	*Synostemon rhytidospermus*			
483.	15741	*Tamarix aphylla (Athel Tree)*	Y		
484.	31616	*Tecticornia auriculata*			
485.	33236	*Tecticornia halocnemoides (Shrubby Samphire)*			
486.	33237	*Tecticornia halocnemoides subsp. halocnemoides*			
487.	33238	*Tecticornia halocnemoides subsp. tenuis*			
488.	33317	*Tecticornia indica*			
489.	33319	*Tecticornia indica subsp. bidens*			
490.	33318	*Tecticornia indica subsp. leiostachya (Samphire)*			
491.	33296	*Tecticornia pergranulata*			
492.	33220	*Tecticornia pterygosperma subsp. denticulata*			
493.	49017	*Tephrosia gardneri*			
494.		*Tephrosia rosea var. ?*			
495.	19531	*Tephrosia rosea var. clementii*			
496.	15947	*Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)*			
497.	42442	*Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)*			
498.	4286	*Tephrosia uniovulata*			
499.	5300	*Terminalia canescens (Joolal)*			
500.	169	*Thalassia hemprichii*			
501.	2644	*Threlkeldia diffusa (Coast Bonefruit)*			
502.	46756	*Thysanotus exfimbriatus*			
503.	35182	*Titanophora pikeana*			
504.	27335	*Tolypiocladia calodictyon*			
505.	27336	*Tolypiocladia glomerulata*			
506.	19053	*Trachymene pilbarensis*			
507.	44305	*Trianthema pilosum*			
508.	44362	*Trianthema triquetrum*			
509.	44360	*Trianthema turgidifolium*			
510.	4377	*Tribulus hirsutus*			
511.	4378	*Tribulus hystrix*			
512.	4380	*Tribulus occidentalis (Perennial Caltrop)*			
513.	4381	*Tribulus platypterus (Cork Hopbush)*			
514.	4383	*Tribulus terrestris (Caltrop)*	Y		
515.	6727	*Trichodesma zeylanicum (Camel Bush, Kumbalin)*			
516.	13559	*Trichodesma zeylanicum var. grandiflorum*			
517.	27340	*Tricleocarpa cylindrica*			
518.	27341	*Tricleocarpa fragilis*			
519.	8252	*Tridax procumbens (Tridax, Tridax Daisy)*	Y		
520.	145	*Triglochin hexagona (Six-point Arrowgrass)*			
521.	679	*Triodia angusta*			
522.		*Triodia basedowii/lanigera*			
523.	13131	*Triodia epactia*			
524.	48467	*Triodia glabra*			
525.	696	*Triodia pungens (Soft Spinifex)*			
526.	17873	*Triodia schinzii*			
527.	706	*Triraphis mollis (Needle Grass)*			
528.	13481	*Triumfetta ramosa*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
529.	27348	*Udotea argentea*			
530.	27349	*Udotea flabellum*			
531.	35260	*Ulva compressa*			
532.	45962	*Ulva kraftiorum*			
533.	27354	*Ulva rigida*			
534.	11321	*Urochloa holosericea subsp. velutina*			
535.	717	*Urochloa piligera*			
536.	30716	*Vachellia farnesiana (Mimosa Bush)*	Y		
537.	46438	*Valonia ventricosa*			
538.	27357	*Valoniopsis pachynema*			
539.	6081	*Verticordia forrestii (Forrest's Featherflower)*			
540.	4323	*Vigna lanceolata (Maloga Vigna, Wega)*			
541.	31391	*Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)*			
542.	7393	*Wahlenbergia tumidifructa*			
543.	17910	*Washingtonia filifera*	Y		
544.	725	*Whiteochloa airoides*			
545.	728	*Whiteochloa cymbiformis*			
546.	27368	*Wrangelia plumosa*			
547.	732	*Yakirra australiensis*			
548.	11894	*Yakirra australiensis var. australiensis*			
549.	4847	*Ziziphus mauritiana (Zornia)*	Y		
550.	4326	*Zornia albiflora*			

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 wholely 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.

NatureMap
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NatureMap Species Report

Created By Guest user on 14/07/2021

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 06' 29" E,21° 38' 09" S
Buffer 20km

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1.		*? ?*			
2.		*Ablennes hians*			
3.		*Abudefduf bengalensis*			
4.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
5.		*Acanthocepola abbreviata*			
6.		*Acanthopagrus latus*			
7.		*Acanthopagrus palmaris*			
8.	25243	*Acanthophis pyrrhus (Desert Death Adder)*			
9.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
10.	25536	*Accipiter fasciatus (Brown Goshawk)*			
11.		*Acentrogobius viridipunctatus*			
12.		*Achnanthidium minutissima (Kütz.) Czarnecki*			
13.	25751	*Acridotheres tristis (Common Myna)*	Y		
14.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
15.		*Adventor elongatus*			
16.		*Adversaeschna brevistyla*			
17.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
18.		*Agraptocorixa parvipunctata*			
19.		*Agraptocorixa sp.*			
20.	25355	*Aipysurus laevis (Olive Seasnake)*			
21.		*Alectis indica*			
22.		*Allodessus bistrigatus*			
23.		*Alona cf. rectangula (but may be > 1 spp.)*			
24.		*Alona rectangula novaezealandiae*			
25.		*Ambassis agassizi*			
26.		*Ambassis gymnocephalus*			
27.		*Amniataba caudavittata*			
28.		*Amniataba percoides*			
29.		*Amniataba percoides?*			Y
30.	30831	*Amphibolurus gilberti (Ta-ta, Gilbert's Dragon)*			
31.	30833	*Amphibolurus longirostris (Long-nosed Dragon)*			
32.		*Aname ellenae*			
33.	24312	*Anas gracilis (Grey Teal)*			
34.	24316	*Anas superciliosa (Pacific Black Duck)*			
35.		*Anax papuensis*			
36.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
37.		*Anisops canaliculatus*			
38.		*Anisops nasutus*			
39.		*Anisops paraexigerus*			
40.		*Anisops sp.*			
41.		*Anisops stali*			
42.		*Anisops thienemanni*			
43.		*Anomoeoneis brachysira (Bréb.) Grun.*			
44.		*Anopheles annulipes s.l.*			
45.	25448	*Antaresia stimsoni (Stimson's Python)*			
46.	25241	*Antaresia stimsoni subsp. stimsoni (Stimson's Python)*			
47.	25670	*Anthus australis (Australian Pipit)*			
48.		*Apistus carinatus*			
49.		*Apogon rueppellii*			
50.	25554	*Apus pacificus (Fork-tailed Swift, Pacific Swift)*		IA	
51.	24285	*Aquila audax (Wedge-tailed Eagle)*			
52.		*Arcella sp. P1*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
53.	25557	*Ardea garzetta (Little Egret)*			
54.	24337	*Ardea garzetta subsp. nigripes (Little Egret)*			
55.	25558	*Ardea ibis (Cattle Egret)*			
56.	25559	*Ardea intermedia (Intermediate Egret)*			
57.	41324	*Ardea modesta (great egret, white egret)*			
58.	24340	*Ardea novaehollandiae (White-faced Heron)*			
59.	24341	*Ardea pacifica (White-necked Heron)*			
60.	25560	*Ardea sacra (Eastern Reef Egret, Eastern Reef Heron)*			
61.	24610	*Ardeotis australis (Australian Bustard)*			
62.		*Areacandona 'undulata' (PSS)*			Y
63.	25736	*Arenaria interpres (Ruddy Turnstone)*		IA	
64.		*Argiocnemis rubescens*			
65.		*Arothron manilensis*			
66.		*Arrenurus (Arrenurus) balladoniensis*			
67.		*Arrhamphus sclerolepis*			
68.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
69.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
70.	25567	*Artamus leucorynchus (White-breasted Woodswallow)*			
71.	24354	*Artamus leucorynchus subsp. leucopygialis (White-breasted Woodswallow)*			
72.	24355	*Artamus minor (Little Woodswallow)*			
73.	24356	*Artamus personatus (Masked Woodswallow)*			
74.	25320	*Aspidites melanocephalus (Black-headed Python)*			
75.		*Assiculus punctatus*			
76.		*Atelomycterus fasciatus*			
77.		*Atherinid sp.*			
78.		*Atherinomorus endrachtensis*			
79.		*Atherinomorus vaigiensis*			
80.		*Aulacoseira ambigua*			
81.		*Aulocoseira granulata (Ehr.) Simonsen*			
82.		*Aulopus purpurissatus*			
83.		*Austrolestes aridus*			
84.		*Austronibea oedegenys?*			Y
85.		*Austropeplea lessoni*			
86.	24318	*Aythya australis (Hardhead)*			
87.		*Baetidae sp.*			
88.		*Bathygobius cocosensis*			
89.		*Bathygobius fuscus*			
90.		*Bdelloidea sp. 2:2*			
91.		*Bdelloidea sp. 3:3*			
92.		*Bennelongia australis OrdX (PSW)*			
93.		*Bennelongia cb*			Y
94.		*Bennelongia minimus*			
95.		*Bennelongia nimala*			
96.		*Bennelongia triangulata (ex sp 414 /460 (CB)*			
97.		*Berosus nutans*			
98.		*Berosus pulchellus*			
99.		*Berosus sp.*			
100.		*Blennodesmus scapularis*			
101.		*Bodianus frenchii*			
102.		*Boeckella triarticulata*			
103.	24251	*Bos taurus (European Cattle)*	Y		
104.		*Brachionus dichotomus*			
105.		*Brachionus falcatus*			
106.		*Brachionus leydigii*			
107.		*Brachionus quadridentatus*			
108.		*Branchinella halsei*			
109.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
110.		*Butis amboinensis*			
111.	47897	*Butorides striata (Striated Heron, Mangrove Heron)*			
112.	25715	*Cacatua roseicapilla (Galah)*			
113.	25716	*Cacatua sanguinea (Little Corella)*			
114.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
115.	24269	*Calamanthus campestris (Rufous Fieldwren)*			
116.		*Calamoecia baylyi (Cue form) (ex nr lucasi CB)*			
117.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
118.	24780	*Calidris alba (Sanderling)*		IA	
119.	24783	*Calidris canutus subsp. rogersi (Red Knot (north-eastern Siberia))*		T	
120.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
121.	24786	*Calidris melanotos (Pectoral Sandpiper)*		IA	
122.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
123.	24790	*Calidris tenuirostris (Great Knot)*		T	
124.		*Canthigaster coronata*			
125.		*Caranx ignobilis*			
126.		*Caranx sexfasciatus*			
127.	25335	*Caretta caretta (Loggerhead Turtle)*		T	
128.		*Ceriodaphnia cornuta*			
129.	24564	*Certhionyx variegatus (Pied Honeyeater)*			
130.	24181	*Chaerephon jobensis (Greater Northern Freetail-bat, Northern Mastiff Bat)*			
131.		*Chaetodontoplus duboulayi*			
132.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
133.		*Chanos chanos*			
134.	25575	*Charadrius leschenaultii (Greater Sand Plover)*		T	
135.	24372	*Charadrius leschenaultii subsp. leschenaultii (Greater Sand Plover (Mongolian))*		T	
136.	25576	*Charadrius mongolus (Lesser Sand Plover)*		T	
137.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
138.	24378	*Charadrius veredus (Oriental Plover)*		IA	
139.	25336	*Chelonia mydas (Green Turtle)*		T	
140.		*Chelonodon patoca*			
141.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
142.	47909	*Cheramoeca leucosterna (White-backed Swallow)*			
143.		*Chimarra sp AV17 (PSW)*			
144.		*Chirocentrus dorab*			
145.	41332	*Chlidonias leucopterus (White-winged Black Tern, white-winged tern)*		IA	
146.		*Choerodon cyanodus*			
147.		*Chroicocephalus novaehollandiae*			
148.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
149.	24434	*Chrysococcyx osculans (Black-eared Cuckoo)*			
150.	24288	*Circus approximans (Swamp Harrier)*			
151.	24289	*Circus assimilis (Spotted Harrier)*			
152.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
153.		*Cloeon sp.*			
154.		*Cloeon sp. P1 (PSW)*			
155.		*Cocconeis placentula var. euglypta ehr.*			
156.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
157.	24399	*Columba livia (Domestic Pigeon)*	Y		
158.		*Colurodontis paxmani*			
159.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
160.		*Coradion chrysozonus*			
161.		*Coris aygula*			
162.	24416	*Corvus bennetti (Little Crow)*			
163.	25593	*Corvus orru (Torresian Crow)*			
164.	24671	*Coturnix pectoralis (Stubble Quail)*			
165.	25701	*Coturnix ypsilophora (Brown Quail)*			
166.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
167.	25595	*Cracticus tibicen (Australian Magpie)*			
168.		*Cracticus tibicen subsp. longirostris*			Y
169.	25596	*Cracticus torquatus (Grey Butcherbird)*			
170.		*Craterocephalus capreoli*			
171.		*Craticula cuspidata (Grun. ex. Van Heurck) Mann*			
172.		*Craticula halophila (Grun. ex. Van Heurck) Mann*			
173.	24859	*Crocodylus porosus (Salt-water Crocodile)*		S	
174.		*Cryptochironomus griseidorsum*			
175.		*Cryptoerithus occultus*			
176.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
177.	24865	*Ctenophorus caudicinctus subsp. caudicinctus (Ring-tailed Dragon)*			
178.	24872	*Ctenophorus femoralis (Dune Dragon)*			
179.	25459	*Ctenophorus isolepis (Crested Dragon, Military Dragon)*			
180.	24875	*Ctenophorus isolepis subsp. gularis (Central Military Dragon)*			
181.	24876	*Ctenophorus isolepis subsp. isolepis (Crested Dragon, Military Dragon)*			
182.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
183.	24885	*Ctenophorus rubens (Red Dragon)*			
184.	24887	*Ctenophorus rufescens (Red Rock Dragon)*			
185.		*Ctenotrypauchen microcephalus*			
186.	25032	*Ctenotus calurus*			
187.	25462	*Ctenotus grandis*			
188.	25043	*Ctenotus grandis subsp. titan*			
189.	25044	*Ctenotus hanloni*			
190.	25046	*Ctenotus iapetus*			
191.	25053	*Ctenotus maryani*			
192.	25463	*Ctenotus pantherinus (Leopard Ctenotus)*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
193.	25064	*Ctenotus pantherinus subsp. ocellifer (Leopard Ctenotus)*			
194.	25066	*Ctenotus quattuordecimlineatus*			
195.	25069	*Ctenotus rufescens*			
196.	25073	*Ctenotus saxatilis (Rock Ctenotus)*			
197.	25074	*Ctenotus schomburgkii*			
198.		*Culicoides sp.*			
199.		*Cybister tripunctatus*			
200.	25375	*Cyclorana maini (Sheep Frog)*			
201.	25376	*Cyclorana platycephala (Water-holding Frog)*			
202.	24322	*Cygnus atratus (Black Swan)*			
203.		*Cylotella menghiniana Kütz.*			
204.		*Cymbacephalus staigeri?*			
205.		*Cypretta 'triangulum'*			
206.		*Cypretta ?lutea*			
207.		*Cypretta baylyi*			
208.		*Cypricercus salinus*			
209.		*Cypricercus sp. 422 (CB)*			
210.		*Cypricercus sp. 442 (CB)*			
211.	25547	*Dacelo leachii (Blue-winged Kookaburra)*			
212.	24304	*Dacelo leachii subsp. leachii (Blue-winged Kookaburra)*			
213.		*Dactylopus dactylopus*			
214.		*Daphnia carinata*			
215.	24091	*Dasykaluta rosamondae (Little Red Kaluta)*			
216.	24093	*Dasyurus hallucatus (Northern Quoll)*		T	
217.	25000	*Delma haroldi*			
218.	25001	*Delma nasuta*			
219.	25004	*Delma tincta*			
220.	25468	*Demansia psammophis (Yellow-faced Whipsnake)*			
221.	25295	*Demansia psammophis subsp. cupreiceps (Yellow-faced Whipsnake)*			
222.		*Dicranophorus epicharis*			
223.		*Dicrotendipes sp P4 (PSW)*			
224.		*Difflugia sp. P1*			
225.		*Dineutus australis*			
226.		*Diplacodes bipunctata*			
227.		*Diplacodes haematodes*			
228.	47932	*Diplodactylus bilybara (Western Fat-tailed Gecko)*			
229.	24926	*Diplodactylus conspicillatus (Fat-tailed Gecko)*			
230.	42400	*Diporiphora adductus (Carnarvon Dragon)*			
231.		*Drepane punctata*			
232.	24470	*Dromaius novaehollandiae (Emu)*			
233.		*Drombus triangularis*			
234.	24084	*Dugong dugon (Dugong)*		S	
235.		*Echeneis naucrates*			
236.		*Egretta novaehollandiae*			
237.		*Elanus axillaris*			
238.	25540	*Elanus caeruleus (Black-shouldered Kite)*			
239.		*Elops hawaiensis*			
240.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
241.	24631	*Emblema pictum (Painted Finch)*			
242.		*Engraulis australis?*			Y
243.		*Enochrus deserticola*			
244.		*Eolophus roseicapillus*			
245.	25362	*Ephalophis greyae*			
246.	24387	*Ephippiorhynchus asiaticus subsp. australis (Black-necked Stork)*			
247.		*Epinephelus amblycephalus*			
248.		*Epinephelus corallicola*			
249.		*Epinephelus lanceolatus*			
250.		*Epinephelus malabaricus*			
251.		*Epinephelus multinotatus*			
252.		*Epinephelus quoyanus*			
253.		*Epinephelus rankini (invalid)*			Y
254.		*Epinephelus rivulatus*			
255.		*Epinephelus sexfasciatus*			
256.		*Epinephelus sp.*			
257.		*Epinephelus tauvina*			
258.		*Epistylis sp*			
259.	24568	*Epthianura aurifrons (Orange Chat)*			
260.	24570	*Epthianura tricolor (Crimson Chat)*			
261.	24258	*Equus caballus (Horse)*	Y		
262.	43381	*Eremiascincus pallidus (Western Narrow-banded Skink, Narrow-banded Sand*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
		Swimmer)			
263.	24837	*Eremiornis carteri (Spinifex-bird)*			
264.		*Eretes australis*			
265.	25473	*Eretmochelys imbricata (Hawksbill Turtle)*		T	
266.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
267.	47938	*Esacus magnirostris (Beach Stone-curlew, Beach Thick-knee)*			
268.		*Escualosa thoracata*			Y
269.	24043	*Eubalaena australis (Southern Right Whale)*		T	
270.		*Euglypha sp.*			
271.		*Eunotia bilunaris (Ehr.) Mills.*			
272.		*Eunotia pectinatus (Dillw.) Rabh.*			
273.	24368	*Eurostopodus argus (Spotted Nightjar)*			
274.		*Eurypegasus draconis*			
275.		*Eurysticta coolawanyah*			
276.	25621	*Falco berigora (Brown Falcon)*			
277.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
278.	24472	*Falco cenchroides subsp. cenchroides (Australian Kestrel, Nankeen Kestrel)*			
279.	25623	*Falco longipennis (Australian Hobby)*			
280.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
281.	24476	*Falco subniger (Black Falcon)*			
282.	24041	*Felis catus (Cat)*	Y		
283.		*Feroxodon multistriatus*			
284.		*Fistularia petimba*			
285.	25327	*Fordonia leucobalia (White-bellied Mangrove Snake)*			
286.		*Fragilaria ulna (Nitz.) Lange Bertalot*			
287.	25727	*Fulica atra (Eurasian Coot)*			
288.	25301	*Furina ornata (Moon Snake)*			
289.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
290.	42314	*Gavicalis virescens (Singing Honeyeater)*			
291.	24952	*Gehyra australis*			
292.	24956	*Gehyra pilbara*			
293.	24958	*Gehyra punctata*			
294.	24957	*Gehyra purpurascens*			
295.	24959	*Gehyra variegata*			
296.	47954	*Gelochelidon nilotica (Gull-billed Tern)*		IA	
297.	24401	*Geopelia cuneata (Diamond Dove)*			
298.	24402	*Geopelia humeralis (Bar-shouldered Dove)*			
299.	25585	*Geopelia striata (Zebra Dove)*			
300.	24403	*Geopelia striata subsp. placida (Peaceful Dove)*			
301.	24404	*Geophaps plumifera (Spinifex Pigeon)*			
302.		*Gerres filamentosus*			
303.		*Gerres oyena*			
304.		*Gerres sp.*			
305.		*Gerres subfasciatus*			
306.	25531	*Gerygone levigaster (Mangrove Gerygone)*			
307.	24276	*Gerygone tenebrosa (Dusky Gerygone)*			
308.	24481	*Glareola maldivarum (Oriental Pratincole)*		IA	
309.		*Gomphonema parvulum (Kütz.) Kütz.*			
310.	24443	*Grallina cyanoleuca (Magpie-lark)*			
311.	24484	*Grus rubicunda (Brolga)*			
312.		*Gymnothorax undulatus*			
313.	25627	*Haematopus fuliginosus (Sooty Oystercatcher)*			
314.	24487	*Haematopus longirostris (Pied Oystercatcher)*			
315.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*			
316.	25541	*Haliastur indus (Brahminy Kite)*			
317.	24294	*Haliastur indus subsp. girrenera (Brahminy Kite)*			
318.	24295	*Haliastur sphenurus (Whistling Kite)*			
319.		*Haliplus sp.*			
320.		*Halophryne diemensis*			
321.		*Halophryne ocellatus*			
322.	24297	*Hamirostra melanosternon (Black-breasted Buzzard)*			
323.		*Hantzschia amphioxys (Ehr.) Grun.*			
324.		*Hemicordulia tau*			
325.		*Hemicypris megalops*			
326.	25232	*Hemidactylus frenatus (Asian House Gecko)*	Y		
327.		*Hemigaleus australiensis*			
328.		*Hemigaleus sp.*			
329.		*Hemiramphus robustus*			
330.		*Herklotsichthys blackburni*			
331.		*Herklotsichthys collettei*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
332.		*Herklotsichthys collettei?*			Y
333.		*Herklotsichthys koningsbergeri*			
334.		*Herklotsichthys quadrimaculatus*			Y
335.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
336.		*Hexarthra mira*			
337.	47965	*Hieraaetus morphnoides (Little Eagle)*			
338.		*Hilsa kelee?*			Y
339.	25734	*Himantopus himantopus (Black-winged Stilt)*			
340.	24775	*Himantopus himantopus subsp. leucocephalus (Black-winged Stilt)*			
341.		*Hippocampus sp.*			
342.		*Hippocampus tuberculatus*			
343.	24491	*Hirundo neoxena (Welcome Swallow)*			
344.	25630	*Hirundo rustica (Barn Swallow)*		IA	
345.		*Holconia westralia*			
346.		*Hydrachna sp. 4/5 (PSW)*			
347.		*Hydroglyphus grammopterus (=trilineatus)*			
348.		*Hydroglyphus leai*			
349.	44656	*Hydrophis major (Olive-headed seasnake, greater seasnake)*			
350.	42410	*Hydrophis ornatus (Ornate Reef Seasnake, Sea Snake)*			
351.	43385	*Hydrophis stokesii (Stoke's Seasnake, Sea Snake)*			
352.	48587	*Hydroprogne caspia (Caspian Tern)*		IA	
353.		*Hydropsychidae sp.*			
354.		*Hyphydrus sp.*			
355.		*Hypopterus macropterus*			
356.		*Ilyocypris 'spiculata' (ms name) (SAP)*			
357.		*Ilyodromus sp. PB*			
358.		*Inimicus sinensis*			
359.		*Ischnura aurora aurora*			
360.		*Isidorella egraria*			
361.		*Isocypris williamsi (ex Ilyodromus sp. 413)*			
362.		*Istiblennius meleagris*			
363.		*Keratella procurva*			
364.		*Keratella tropica*			
365.		*Laccophilus sharpi*			
366.		*Lactoria cornuta*			
367.		*Lactoria diaphana*			
368.	24367	*Lalage tricolor (White-winged Triller)*			
369.		*Lampona ampeinna*			
370.		*Lamponina scutata*			
371.	25637	*Larus novaehollandiae (Silver Gull)*			
372.		*Latonopsis brehmi*			
373.		*Lecane cf. pertica*			Y
374.		*Lecane halsei*			
375.		*Lecane n. sp. psw031 (like signifera but tall)*			Y
376.	24217	*Leggadina lakedownensis (Northern Short-tailed Mouse, Lakeland Downs Mouse, Kerakenga)*		P4	
377.		*Leiognathus decorus*			
378.		*Leiognathus equulus*			
379.	25343	*Lepidochelys olivacea (Olive Ridley Turtle, Pacific Ridley Turtle)*		T	
380.	25124	*Lerista baynesi*			
381.	25125	*Lerista bipes*			
382.	30928	*Lerista clara*			
383.	25133	*Lerista elegans*			
384.	25158	*Lerista onsloviana*			
385.	25164	*Lerista planiventralis subsp. maryani (Maryan's keeled slider (Ashburton), Keeled Slider (NW coast Onslow to Barradale))*		P1	
386.		*Lethocerus distinctifemur*			
387.		*Lethrinus sp.*			
388.	25005	*Lialis burtonis*			
389.	25661	*Lichmera indistincta (Brown Honeyeater)*			
390.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
391.		*Limnesia sp. 4 (PSW)*			
392.		*Limnocytheridae n.gen. sp 419 (CB)*			
393.	30932	*Limosa lapponica (Bar-tailed Godwit)*		IA	
394.	24796	*Limosa lapponica subsp. menzbieri (Bar-tailed Godwit (northern Siberian))*		T	
395.	25380	*Litoria caerulea (Green Tree Frog)*			
396.	25392	*Litoria rubella (Little Red Tree Frog)*			
397.		*Liza melinoptera*			
398.		*Liza sp.*			
399.		*Liza subviridis*			

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Mapping Western Australia's biodiversity

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
400.		*Liza vaigiensis*			
401.		*Lophiocharon trisignatus*			
402.	30933	*Lucasium stenodactylum*			
403.		*Lutjanus argentimaculatus*			
404.		*Lutjanus erythropterus*			
405.		*Lutjanus fulviflamma*			
406.		*Lutjanus malabaricus*			
407.		*Lutjanus russellii*			
408.	25489	*Macropus robustus (Euro, Biggada)*			
409.	24136	*Macropus rufus (Red Kangaroo, Marlu)*			
410.		*Macrothrix indistincta*			
411.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
412.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
413.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
414.	25654	*Malurus splendens (Splendid Fairy-wren)*			
415.	24583	*Manorina flavigula (Yellow-throated Miner)*			
416.		*Mastogloia smithii Thwaites*			
417.		*Megalaspis cordyla*			
418.		*Megalops cyprinoides*			
419.	47995	*Megalurus mathewsi (Rufous Songlark)*			
420.		*Megaporus sp.*			
421.	24051	*Megaptera novaeangliae (Humpback Whale)*		S	
422.	24736	*Melopsittacus undulatus (Budgerigar)*			
423.		*Mene maculata*			
424.	25184	*Menetia greyii*			
425.	24598	*Merops ornatus (Rainbow Bee-eater)*			
426.		*Mesocyclops brooksi*			
427.		*Microcarbo melanoleucos*			
428.		*Microcyclops varicans*			
429.		*Micronecta gracilis*			
430.		*Micronecta sp.*			
431.	25542	*Milvus migrans (Black Kite)*			
432.	24298	*Milvus migrans subsp. affinis (Black Kite)*			
433.	25545	*Mirafra javanica (Horsfield's Bushlark, Singing Bushlark)*			
434.	24302	*Mirafra javanica subsp. horsfieldii (Horsfield's Bushlark, Singing Bushlark)*			
435.		*Moina cf. australiensis (CB)*			
436.		*Moina micrura s.l.*			
437.		*Mugil cephalus*			
438.		*Muraenesox cinereus*			
439.	24223	*Mus musculus (House Mouse)*	Y		
440.	25344	*Natator depressus (Flatback Turtle)*		T	
441.		*Navicula cryptonella Lange-Bertalot*			
442.		*Navicula molestiformis Hust.*			
443.		*Nematalosa come*			
444.		*Nematalosa sp.*			
445.		*Nematalosa vlaminghi*			
446.		*Nematoda sp. P6 (PSW)*			
447.	25422	*Neobatrachus aquilonius (Northern Burrowing Frog)*			
448.	25424	*Neobatrachus fulvus (Tawny Trilling Frog)*			
449.	25685	*Neochmia ruficauda (Star Finch)*			
450.		*Neopomacentrus filamentosus*			
451.		*Neothrix armata*			
452.	25497	*Nephrurus levis*			
453.	24968	*Nephrurus levis subsp. occidentalis*			
454.	24969	*Nephrurus levis subsp. pilbarensis*			
455.		*Netuma thalassina*			Y
456.		*Nilobezzia sp. P2 (PSW)*			
457.	24095	*Ningaui timealeyi (Pilbara Ningaui)*			
458.		*Nitzschia filiformis (W. Sm.) Van Heurck*			
459.		*Nitzschia frustulum (Kütz.) Grun.*			
460.		*Nitzschia palea (Kütz.) W. Sm.*			
461.		*Nitzschia sigma (Kütz.) W. Sm.*			
462.		*Nitzschia umbonata (Ehr.) Lange-Bertalot*			
463.	25430	*Notaden nichollsi (Desert Spadefoot)*			
464.	24224	*Notomys alexis (Spinifex Hopping-mouse)*			
465.	24798	*Numenius madagascariensis (Eastern Curlew)*		T	
466.	24799	*Numenius minutus (Little Curlew, Little Whimbrel)*		IA	
467.	25742	*Numenius phaeopus (Whimbrel)*		IA	
468.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
469.	24742	*Nymphicus hollandicus (Cockatiel)*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
470.	24497	*Oceanites oceanicus (Wilson's Storm-petrel)*		IA	
471.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
472.		*Oecetis sp.*			
473.		*Oecetis sp. Pilbara 5 (PSW)*			
474.		*Omobranchus punctatus*			
475.	41347	*Onychoprion anaethetus (Bridled Tern)*		IA	
476.		*Ophichthus cephalozona*			
477.	24060	*Orcaella heinsohni (Australian Snubfin Dolphin)*		P4	
478.	24618	*Oreoica gutturalis (Crested Bellbird)*			
479.		*Orthetrum caledonicum*			
480.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
481.		*Ostracoda (unident.)*			
482.		*Ozestheria packardi*			
483.	24620	*Pachycephala lanioides (White-breasted Whistler)*			
484.	24621	*Pachycephala melanura subsp. melanura (Mangrove Golden Whistler)*			
485.	48591	*Pandion cristatus (Osprey, Eastern Osprey)*		IA	
486.		*Pantala flavescens*			
487.		*Parachaeturichthys polynema*			
488.		*Paracymus spenceri*			
489.		*Paramecium sp.*			
490.		*Paraplagusia bilineata*			
491.		*Paraplotosus albilabris*			
492.		*Parastromateus niger*			
493.	24627	*Pardalotus rubricatus (Red-browed Pardalote)*			
494.	24642	*Passer montanus (Eurasian Tree Sparrow)*	Y		
495.		*Pelates octolineatus*			
496.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
497.		*Pellona ditchela*			
498.		*Pentapodus vitta*			
499.		*Periophthalmus argentilineatus*			
500.		*Peristrominous dolosus*			
501.		*Pescecyclops sp. 442=462=465=CB2 (salinarum in Morton)*			
502.	48060	*Petrochelidon ariel (Fairy Martin)*			
503.	48061	*Petrochelidon nigricans (Tree Martin)*			
504.	24659	*Petroica goodenovii (Red-capped Robin)*			
505.	24743	*Pezoporus occidentalis (Night Parrot)*		T	
506.	25697	*Phalacrocorax carbo (Great Cormorant)*			
507.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
508.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
509.	25699	*Phalacrocorax varius (Pied Cormorant)*			
510.	24409	*Phaps chalcoptera (Common Bronzewing)*			
511.	24411	*Phaps histrionica (Flock Bronzewing, Flock Pigeon)*			
512.		*Pinnularia borealis*			
513.		*Pinnularia divergens W. Sm.*			
514.		*Pinnularia subrostrata (A. Cl.) Cl.-Euler*			
515.		*Pisodonophis cancrivorus*			
516.	24101	*Planigale ingrami (Long-tailed Planigale)*			
517.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
518.	24842	*Platalea regia (Royal Spoonbill)*			
519.		*Platax teira*			
520.		*Platycephalus indicus*			
521.		*Platycephalus sp.*			
522.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
523.		*Plectorhinchus flavomaculatus*			
524.		*Plectorhinchus gibbosus*			
525.		*Plectorhinchus polytaenia*			
526.	24843	*Plegadis falcinellus (Glossy Ibis)*		IA	
527.		*Plotosus lineatus*			
528.	24383	*Pluvialis squatarola (Grey Plover)*		IA	
529.	25703	*Podargus strigoides (Tawny Frogmouth)*			
530.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
531.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
532.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
533.		*Polyarthra dolichoptera*			
534.		*Polydactylus multiradiatus*			
535.		*Polydactylus plebius*			
536.		*Polypedilum leei*			
537.		*Pomadasys argenteus*			
538.		*Pomadasys kaakan*			
539.		*Pomatomus saltatrix*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
540.	25706	*Pomatostomus temporalis (Grey-crowned Babbler)*			
541.	24684	*Pomatostomus temporalis subsp. rubeculus (Grey-crowned Babbler)*			
542.	24769	*Porzana fluminea (Australian Spotted Crake)*			
543.	25732	*Porzana pusilla (Baillon's Crake)*			
544.	34037	*Pristis zijsron (Green Sawfish)*		T	
545.		*Procladius paludicola*			
546.		*Psammoperca waigiensis*			
547.		*Psettodes erumei*			
548.	24105	*Pseudantechinus roryi (Rory's Pseudantechinus)*			
549.	25261	*Pseudechis australis (Mulga Snake)*			
550.	24233	*Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)*		P4	
551.	24235	*Pseudomys desertor (Desert Mouse)*			
552.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
553.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
554.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
555.	25264	*Pseudonaja nuchalis (Gwardar, Northern Brown Snake)*			
556.		*Pseudorhombus argus*			
557.		*Pseudorhombus arsius*			
558.	24390	*Psophodes occidentalis (Western Wedgebill, Chiming Wedgebill)*			
559.		*Pterois antennata*			
560.		*Pterois volitans*			
561.	24173	*Pteropus scapulatus (Little Red Flying-fox)*			
562.	24716	*Puffinus pacificus (Wedge-tailed Shearwater)*		IA	
563.	25009	*Pygopus nigriceps*			
564.		*Rachycentron canadum*			
565.	24245	*Rattus rattus (Black Rat)*	Y		
566.	24246	*Rattus tunneyi (Pale Field-rat)*			
567.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
568.		*Rheotanytarsus juliae*			
569.	48096	*Rhipidura albiscapa (Grey Fantail)*			
570.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
571.	24457	*Rhipidura phasiana (Mangrove Grey Fantail)*			
572.	24982	*Rhynchoedura ornata (Western Beaked Gecko)*			
573.		*Sardinella albella*			Y
574.		*Sardinella gibbosa*			
575.		*Sargocentron praslin*			
576.		*Sargocentron rubrum*			
577.		*Saurida nebulosa*			
578.		*Scomberoides commersonnianus*			
579.		*Scomberoides lysan*			
580.		*Scomberoides lysan?*			Y
581.		*Scomberoides tol*			
582.		*Scomberomorus commerson*			
583.		*Scomberomorus queenslandicus*			
584.		*Scomberomorus semifasciatus*			
585.		*Selaroides leptolepis*			
586.		*Selenotoca multifasciata*			
587.		*Siganus fuscescens*			
588.		*Sillago analis*			
589.		*Sillago burrus*			
590.		*Sillago ingenuua?*			Y
591.		*Sillago lutea*			
592.		*Sillago sihama*			
593.	25305	*Simoselaps anomalus (Desert Banded Snake)*			
594.	30948	*Smicrornis brevirostris (Weebill)*			
595.	24116	*Sminthopsis macroura (Stripe-faced Dunnart)*			
596.	24120	*Sminthopsis youngsoni (Lesser Hairy-footed Dunnart)*			
597.	48107	*Sousa sahulensis (Australian humpback dolphin)*		P4	
598.		*Sphyraena barracuda*			
599.		*Stauroneis anceps Ehr.*			
600.		*Staurosira construens Ehr.*			
601.	24521	*Sterna bengalensis (Lesser Crested Tern)*			
602.	24522	*Sterna bergii (Crested Tern)*			
603.	25640	*Sterna dougallii (Roseate Tern)*		IA	
604.	25642	*Sterna hirundo (Common Tern)*		IA	
605.	25643	*Sterna hybrida (Whiskered Tern)*			
606.		*Sternopriscus sp.*			
607.	48593	*Sternula albifrons (Little Tern)*		IA	
608.	48594	*Sternula nereis (Fairy Tern)*			
609.	24482	*Stiltia isabella (Australian Pratincole)*			

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	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
610.		*Stolephorus carpentariae*			
611.		*Stolephorus commersonii*			
612.		*Strongylura strongylura*			
613.	24932	*Strophurus jeanae*			
614.	24942	*Strophurus spinigerus subsp. spinigerus*			
615.	24946	*Strophurus strophurus*			
616.		*Supunna picta*			
617.	25269	*Suta fasciata (Rosen's Snake)*			
618.	25307	*Suta punctata (Spotted Snake)*			
619.		*Synanceia horrida*			
620.		*Tabanidae sp.*			
621.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
622.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
623.	30870	*Taeniopygia guttata (Zebra Finch)*			
624.		*Tasmanocoenis arcuata*			
625.		*Tasmanocoenis sp. E (PSW)*			
626.		*Tathicarpus butleri*			
627.		*Terapon jarbua*			
628.		*Terapon puta*			
629.		*Terapon thaeraps*			Y
630.		*Terapon theraps*			
631.		*Testudinella cf trilobata (=sp P3 PSW)*			
632.		*Testudinella patina*			
633.		*Thalasseus bengalensis*			
634.	48597	*Thalasseus bergii (Crested Tern)*		IA	
635.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
636.		*Thryssa mystax?*			
637.		*Thryssa scratchleyi?*			
638.		*Thryssa setirostris*			
639.	25202	*Tiliqua multifasciata (Central Blue-tongue)*			
640.	25548	*Todiramphus chloris (Collared Kingfisher)*			
641.	24306	*Todiramphus chloris subsp. pilbara (Pilbara Collared Kingfisher)*			
642.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
643.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
644.		*Trachinotus baillonii*			
645.		*Triacanthus biaculeatus*			
646.		*Trichocerca cf. tigris*			Y
647.		*Trichocerca similis*			
648.		*Trichocerca tigris*			
649.	24803	*Tringa brevipes (Grey-tailed Tattler)*		P4	
650.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
651.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
652.		*Triops australiensis australiensis*			
653.		*Triplectides australis*			
654.		*Turbellaria sp.*			
655.	24848	*Turnix pyrrhothorax (Red-chested Button-quail)*			
656.	24851	*Turnix velox (Little Button-quail)*			
657.	30954	*Tursiops aduncus (Indo-Pacific Bottlenose Dolphin)*			
658.	25762	*Tyto alba (Barn Owl)*			
659.	24386	*Vanellus tricolor (Banded Lapwing)*			
660.	25209	*Varanus acanthurus (Spiny-tailed Monitor)*			
661.	25210	*Varanus brevicauda (Short-tailed Pygmy Monitor)*			
662.	25211	*Varanus caudolineatus*			
663.	25212	*Varanus eremius (Pygmy Desert Monitor)*			
664.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
665.	25524	*Varanus panoptes (Yellow-spotted Monitor)*			
666.	25223	*Varanus panoptes subsp. rubidus*			
667.	25526	*Varanus tristis (Racehorse Monitor)*			
668.	24040	*Vulpes vulpes (Red Fox)*	Y		
669.		*Wydundra kennedy*			
670.		*Xanthagrion erythroneurum*			
671.		*Xyrichtys sp.*			
672.		*Yongeichthys nebulosus*			
673.		*Zabidius novemaculeatus*			
674.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			
675.	24857	*Zosterops luteus (Yellow White-eye)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement

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Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area

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 wholely 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.

Australian Government
Department of Agriculture, Water and the Environment

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.

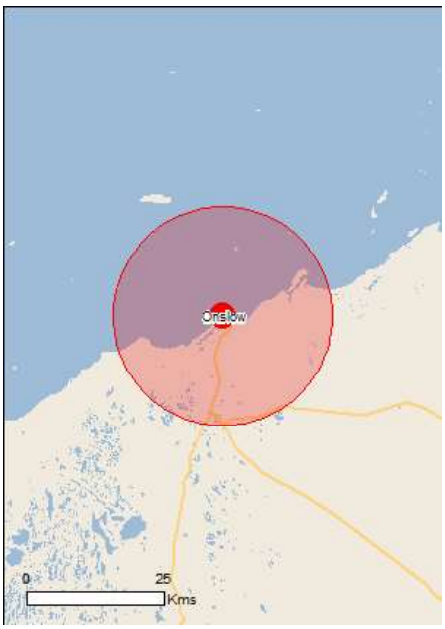
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 14/07/21 15:43:19

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

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:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	26
Listed Migratory Species:	42

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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	80
Whales and Other Cetaceans:	13
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:	None
Regional Forest Agreements:	None
Invasive Species:	12
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat known to 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 [77037]	Endangered	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area
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
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat known to occur within area
Rhinonicteris 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
Aipysurus foliosquama		
Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat 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
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Breeding 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 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
Calonectris leucomelas		
Streaked Shearwater [1077]		Species or species habitat may occur within area
Fregata ariel		
Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur