



**ECOSPHERE**  
Ecological Solutions

# Olympic Dam SCM21 Temporary Accommodation Camp

# Native Vegetation Clearance Proposal

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# Glossary

AECOM	AECOM Pty Limited
BDBSA	Biological Database of South Australia
BHP	BHP Billiton Olympic Dam Corporation Pty Limited
DEW	Department for Environment and Water
Ecosphere	Ecosphere Ecological Solutions Pty Limited
EMM	EMM Consulting Pty Limited
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
IBRA	Interim Biogeographical Regionalisation of Australia
MNES	Matters of National Environmental Significance
NPW Act	National Parks and Wildlife Act 1972
NRM Act	Natural Resources Management Act 2004
NV Act	Native Vegetation Act 1991
NV Regs	Native Vegetation Regulations 2017
NVC	Native Vegetation Council
ODV	Olympic Dam Village
PMST	Protected Matters Search Tool
RAM	Rangelands Assessment Manual
Ramsar	Convention on Wetlands of International Importance
SAALNRM	South Australian Arid Lands Natural Resources Management (Board)
SCM	Smelter campaign maintenance
SEB	Significant environmental benefit
UBS	Unit Biodiversity Score
WWTP	Wastewater treatment plant

# Executive summary

The Olympic Dam South Accommodation Camp ecological assessment was comprised of desktop study and field survey components. This was aimed at determining how matters of Commonwealth and State environmental significance may be impacted by the proposed development as well as calculating the SEB requirements of any native vegetation clearance. To allow flexibility as the design was progressed, a larger Study area was selected for the ecological assessment, comprised of three main components. Following several layout refinements and planning amendments, BHP have resolved to undertake an alternative temporary accommodation camp development. This is proposed to be located immediately to the south of the Charlton Road industrial estate. The site, including road access and service corridors, is just over 40 ha in area.

The desktop study used data accessed via the Protected Matters Search Tool (PMST) to identify nationally threatened species potentially occurring in the Study area, as well as other matters of national environmental significance protected under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The Biological Database of South Australia (BDBSA) was also used to identify existing records of any threatened species listed under the South Australian National Parks and Wildlife Act 1972 (NPW Act) and the EPBC Act within the Study area.

The key results of the desktop study when integrated with the survey results included:

- The PMST identified one nationally threatened flora species, *Frankenia plicata* and 10 nationally threatened fauna species as potentially having suitable habitat or having been translocated within 50 km of the Study area. Two fauna species were considered as possibly occurring within the Study area, Plains Rat (*Pseudomys australis*) and Thick-billed Grasswren (*Amytornis modestus indulkanna*).
- The BDBSA identified 258 fauna species with historical records from within 50 km of the Study area. This included two amphibian species, 143 avian species (including 2 exotic species), 39 mammal species (including six exotic species) and 73 reptile species. Of these, 23 birds, nine mammal and one reptile species were threatened at national or state level. The Flock Bronzewing (*Phaps histrionica*) was considered as possibly occurring within the Study area.
- The BDBSA also identified 546 flora species as having records from within 50 km of the Study area. Of these, nine species were threatened at state level. One species, *Atriplex kochiana* (Koch's Saltbush), was considered as possibly occurring within the Study area.

The field survey included a vegetation survey performed by accredited ecologists in accordance with the South Australian Rangelands Assessment Method (RAM) and an opportunistic fauna assessment concurrently with the vegetation survey. The key results of the field survey included:

- seven vegetation associations covering 378.23 ha were identified and mapped within the overall Study area of which four occurred within the final refined Project area;
- no threatened ecological communities or protected flora species listed under the EPBC Act or the NPW Act were observed;
- a total of 37 bird species were recorded within and adjacent to the Study area, 26 of which were commonly occurring and widespread. One of the species was listed as rare within South Australia; Musk Duck (*Biziura lobata*) which was located on one of the wastewater treatment ponds within the Study area. No exotic bird species were recorded during the survey;
- Unit Biodiversity Scores calculated as part of the rangeland assessment sheets ranged from 34.81 (poor - moderate) up to 62.37 (moderate - good);
- exotic flora species were very sparsely present at the time of the survey. *Brassica tournefortii* (Wild Turnip) was emergent, following some rainfall in the months prior to the survey; however, the overall dry conditions meant that very few annual exotic species were present; and
- evidence of feral animals was observed including Rabbits (*Oryctolagus cuniculus*) and Cats (*Felis catus*).

The direct impact of construction of the proposed OD South accommodation camp, including service corridors, will be the clearance of a maximum of 42.6 hectares of native vegetation.

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# 1 Applicant Details

Applicant:	BHP Billiton Olympic Dam Corporation Pty Ltd		
Key contact:	Michelle Waters		
Landowner: <i>(if the applicant is not the landowner, you must attach written permission)</i>	BHP Billiton Olympic Dam Corporation Pty Ltd		
Site Address:	N/A		
Local Government Area:	Municipal Council of Roxby Downs	Hundred:	N/A
Certificate of Title:	CR/6017/774	Section/Allotment:	D77526 A21 14
<b>Summary of Application</b>			
Proposed clearance area:	42.6 hectares located immediately to the south of the Charlton Road industrial estate, Olympic Dam, between Olympic Way to the east and Kanyaka Road to the west.		
Applicable regulation and purpose of the clearance	Regulation 12(34) – Infrastructure temporary construction accommodation including road access and service corridors to accommodate approximately 800 construction workers and associated support facilities with the longer term intention to retain for other future temporary accommodation camps, hard-stand areas or for industrial land use.		
Level of risk	4		
Proposed SEB offset:	Existing SEB offset area credit at Emerald Springs. This SEB area is approximately 38,022 hectares in size, is located 120 km north of the Olympic Dam mine and lies within the Stuart Creek Pastoral Lease.		

## 2 Introduction

BHP Billiton Olympic Dam Corporation Pty Limited (BHP) requires accommodation capacity additional to the existing accommodation villages at Olympic Dam Village (ODV) and Roxby Downs Village (RDV), for a planned smelter campaign maintenance (SCM) shut down, scheduled for April 2021 (SCM21). Two preferred accommodation village site options were initially identified for further investigation, both greenfield sites, located within the Roxby Downs (Municipal) Council boundary (see Figure 1). To allow flexibility as the project progressed, a larger Study area was selected for the ecological assessment, comprised of three main components (see Figure 1), as follows:

1. OD South, including potential wastewater treatment plant (WWTP) upgrades and the OD South accommodation village;
2. RD West, including WWTP upgrades and the RD West accommodation village; and
3. Utilities infrastructure corridor, including proposed water / power supply infrastructure from Borefield Road to Roxby West.

Following several layout refinements and planning amendments, BHP have resolved to undertake an alternative temporary accommodation development. This is proposed to be located immediately to the south of the Charlton Road industrial estate, between Olympic Way to the east and Kanyaka Road to the west. The site, including road access and service corridors, is just over 40 ha in area. While the proposed temporary construction accommodation will be utilised for approximately eight months (to accommodate approximately 800 construction workers and associated support facilities), the longer term intention of BHP is to retain this area for other future temporary accommodation camps or hard-stand areas.

Ecosphere Ecological Solutions (Ecosphere) was initially contracted by EMM Consulting (EMM) to conduct the ecological baseline assessment for the overall Study area for the proposed village expansion project. AECOM have subsequently engaged Ecosphere to prepare the native vegetation clearance proposal for the Olympic Dam South Temporary Accommodation Village (the Project area) to finalise the project (Figure 2).

## 2.1 Objectives

The objective of the ecological baseline assessment was to identify ecological values and constraints which would inform refinement of the accommodation villages component footprints. To address this objective, the following tasks were undertaken:

- conduct database searches to identify matters of Commonwealth and State environmental significance;
- review existing mapping data (e.g. vegetation communities, vegetation condition and aerial photographs);
- identify areas where significant ecological constraints may occur and provide preliminary spatial data to describe these areas;
- ground truth and confirm the outcomes and findings of the desktop study by conducting a field assessment;
- collect vegetation data dependent on vegetation type and as required to fulfil legislative requirements under relevant Commonwealth and State Acts;
- identify any flora species of Commonwealth or State conservation significance known to, or likely to, occur in the area;
- identify any declared plants under the South Australian *Natural Resources Management Act 2004* (NRM Act) that may be significant in relation to the establishment of the proposed accommodation village;
- conduct an opportunistic fauna assessment to determine if any native fauna species, or fauna habitat, of Commonwealth or State conservation significance may be impacted upon by the proposed accommodation village, electricity transmission line, potable water pipeline and WWTP upgrade areas; and
- assess likelihood of occurrence for threatened species based on desktop information and field survey results including previous surveys commissioned by BHP for the Olympic Dam project

The final project layout will allow the following objectives to be met:

- provide the refined extent of vegetation community structure and extent on maps including area occupied in hectares and SEB points requirement for individual associations within the project area; and
- calculate the significant environmental benefit (SEB) offset requirements as part of the proposal to remove native vegetation within the Study area

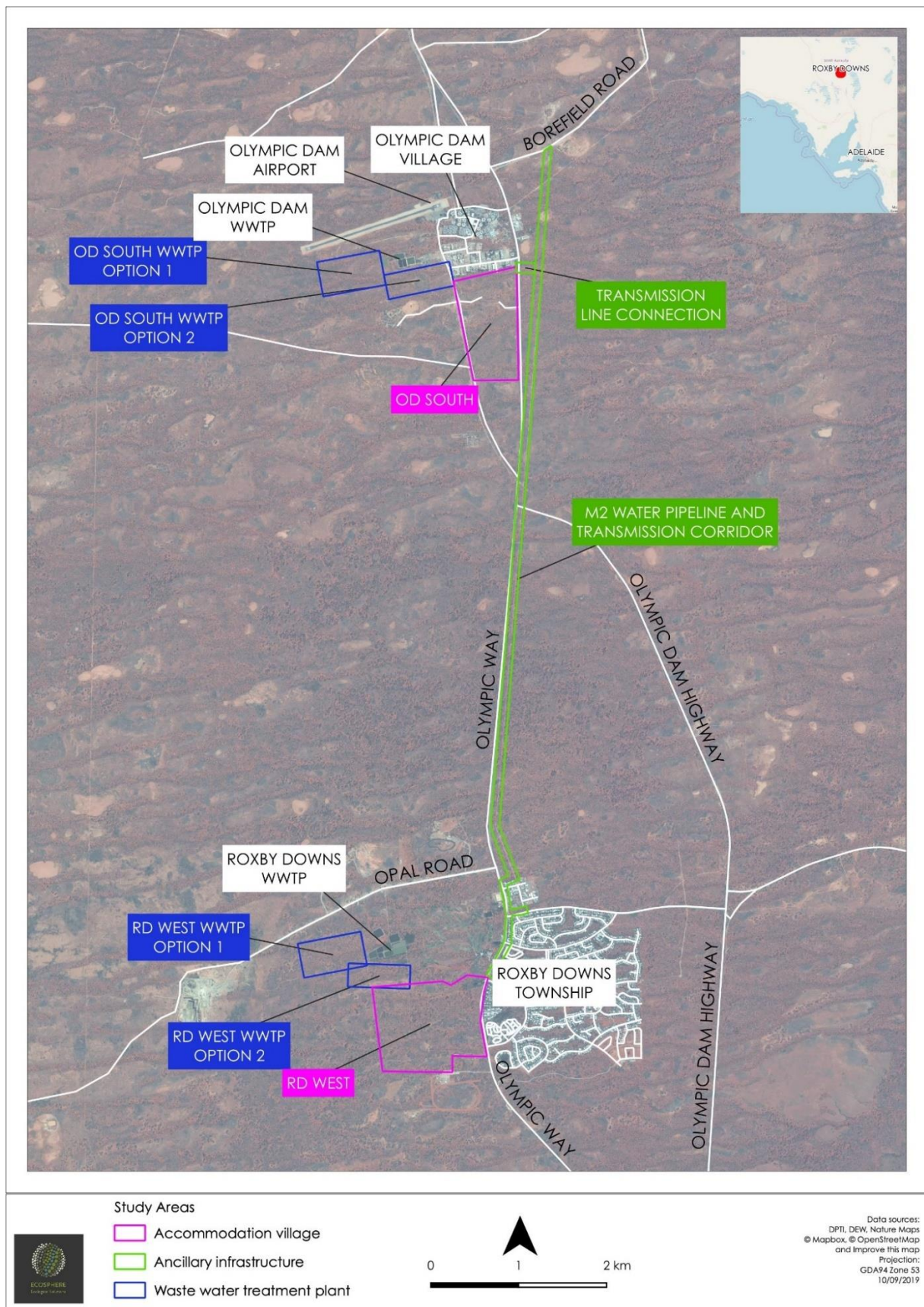


Figure 1. Location of the broad Study area for the proposed accommodation village expansion and associated infrastructure components undertaken by Ecosphere for EMM consulting.

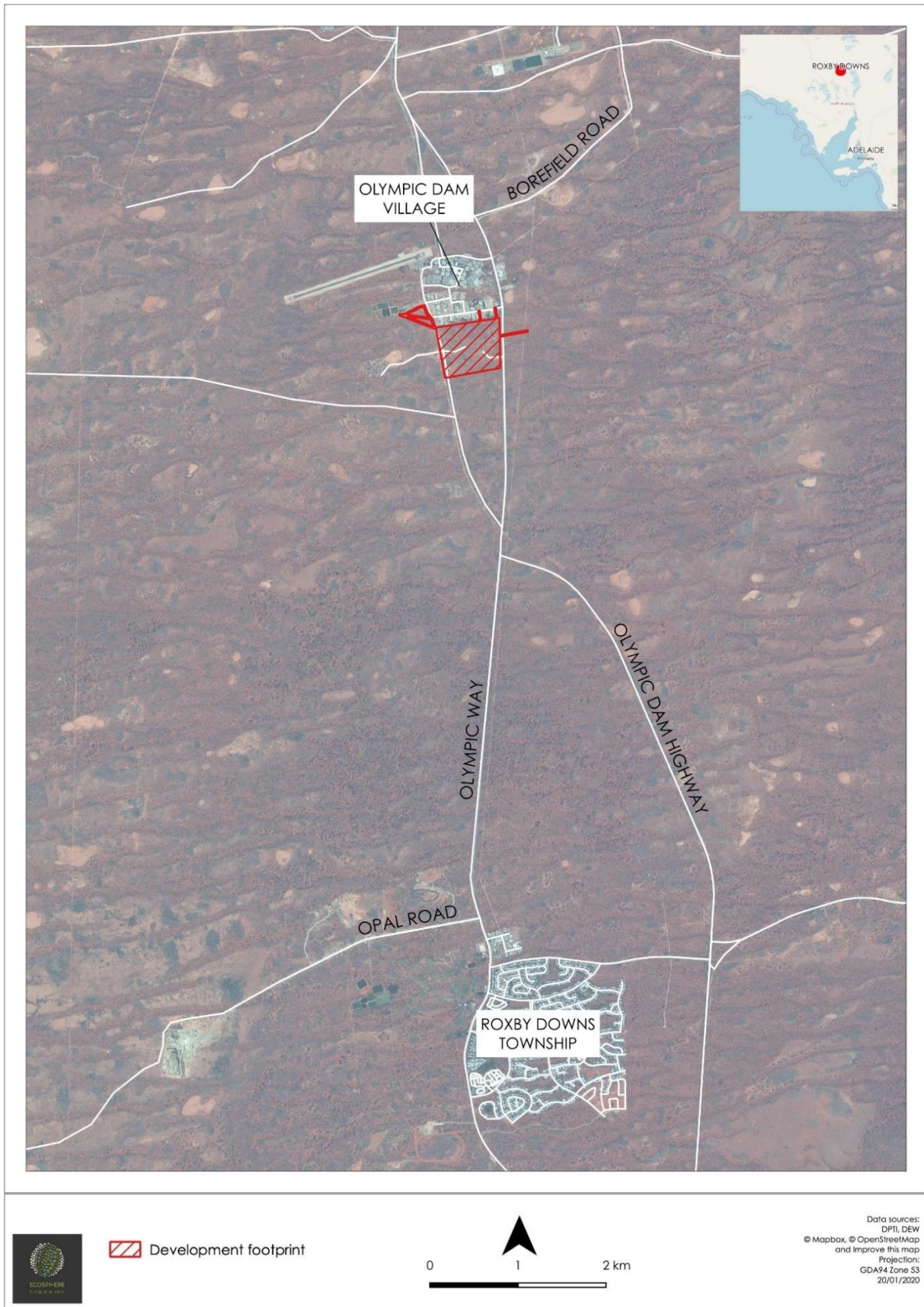


Figure 2. Finalised proposed Project area for temporary accommodation village and service corridors.

## 3 Legislative summary.

### 3.1 *Environment Protection and Biodiversity Conservation Act 1999*

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and the *Environment Protection and Biodiversity Conservation Regulations 2000* (EPBC Regs), "...provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the EPBC Act as matters of national environmental significance". The nine matters of national environmental significance (MNES) to which the EPBC Act applies are:

1. world heritage properties;
2. national heritage places;
3. wetlands of international importance (listed under the Ramsar Convention);
4. nationally threatened species and ecological communities;
5. migratory species;
6. Commonwealth marine areas;
7. the Great Barrier Reef Marine Park;
8. nuclear actions (including uranium mining); and
9. a water resource, in relation to coal seam gas development and large coal mining development.

Regarding the construction of the proposed temporary accommodation camp and service corridors, and in the context of the ecological baseline assessment, only the following would apply:

- nationally threatened species and ecological communities; and
- migratory species.

Any action that has, will have, or is likely to have a significant impact on MNES requires referral under the EPBC Act. Substantial penalties apply for undertaking an action that has, will have or is likely to have significant impact on a matter of national environmental significance without approval.

### 3.2 Native Vegetation Act 1991

Native vegetation within the proposed accommodation village Study area is protected under the South Australian *Native Vegetation Act 1991* (NV Act) and *Native Vegetation Regulations 2017* (NV Regs). Any proposed clearance of native vegetation in South Australia (unless exempt under the NV Regs) is to be assessed against the NV Act Principles of Clearance and requires approval from the NVC.

### 3.3 National Parks and Wildlife Act 1972

Native plants and animals in South Australia are protected under the South Australian *National Parks and Wildlife Act 1972* (NPW Act). It is an offence to take a native plant or protected animal without approval. Threatened plant and animal species are listed in Schedules 7 (endangered species), 8 (vulnerable species) and 9 (rare species) of the Act. Persons must not:

- Take a native plant on a reserve, wilderness protection area, wilderness protection zone, land reserved for public purposes, a forest reserve or any other Crown land.
- Take a native plant of a prescribed species on private land.
- Take a native plant on private land without the consent of the owner (such plants may also be covered by the NV Act).
- Take a protected animal or the eggs of a protected animal without approval.
- Keep protected animals unless authorised to do so.
- Use poison to kill a protected animal without approval.

### 3.4 Natural Resources Management Act 2004

Under the South Australian NRM Act, landholders have a legal responsibility to manage declared pest plants and animals and prevent land and water degradation. Key components under the NRM Act include the establishment of regional Natural Resource Management (NRM) Boards and development of regional NRM Plans; the ability to control water use through prescription, allocations and restrictions; and the requirement to control pest plants and animals, and activities that might result in land degradation.

## 4 Background

### 4.1 IBRA

The Interim Biogeographical Regionalisation of Australia (IBRA) identifies geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The bioregions are further refined into subregions and environmental associations (DotEE 2012). The proposed temporary accommodation village is located within the Gawler Bioregion and the Roxby Subregion.

Native vegetation remnancy figures for IBRA subregions are useful for setting regional landscape targets. Approximately 98% (1,375,681 ha) of the Roxby Subregion is mapped as remnant vegetation of which none is formally conserved and protected within National Parks and Wildlife reserves or private Heritage Agreements under the NV Act. A full summary of the landscapes and remnancy data is provided below in Table 1.

Table 1. IBRA bioregion, subregion, and environmental association environmental landscape summary.

<b>Gawler Bioregion</b>
Semi-arid to arid, flat topped to broadly rounded hills of the Gawler Range Volcanics and Proterozoic sediments, low plateau on sandstone and quartzite with an undulating surface of aeolian sand or gibbers and rocky quartzite hills with colluvial foot slopes, erosional and depositional plains and salt encrusted lake beds, with Black Oak (Belah) and Myall low open woodlands, open mallee scrub, Bluebush/Saltbush open chenopod shrublands and tall mulga shrublands on shallow loams, calcareous earths and hard red duplex soils.
<b>Roxby Subregion</b>
An ancient alluvial plain between the Arcoona Tablelands and Stuart Range complex, substantially covered with more recent sands. In the west are well-spaced low dunes of <i>Acacia aneura</i> woodland over <i>Acacia</i> spp., <i>Dodonaea</i> spp. and grasses, and sand sheets of <i>Acacia aneura</i> woodland over <i>Maireana sedifolia</i> and grasses. <i>Acacia</i> shrublands also typify the dunes. Calcareous plains have <i>Acacia papyrocarpa</i> woodlands with <i>Maireana sedifolia</i> and <i>Atriplex vesicaria</i> . <i>Casuarina pauper</i> over <i>Hakea leucomyxa</i> , perennial chenopods and <i>Ptilotus obovatus</i> occupy rises above the plain. The linear dune field in the east has dunes of <i>Acacia aneura</i> , <i>Acacia ramulosa</i> and <i>Callitris</i> spp. over <i>Dodonaea</i> spp., <i>Eragrostis eriopoda</i> and <i>Aristida contorta</i> . Between the dunes are <i>Acacia papyrocarpa</i> and <i>Maireana sedifolia</i> on calcareous soils, saline swales of <i>Atriplex</i> spp., <i>Gunniopsis quadrifida</i> and <i>Frankenia</i> spp. or claypans of <i>Eragrostis</i> spp., <i>Duma florulenta</i> or <i>Melaleuca glomerata</i> fringes. Broad saline flats in the west of the region, possibly marking older paleochannels, support variable <i>Atriplex</i> spp. / <i>Maireana</i> spp. low shrublands and possess salt lake/lunette chain complexes of mixed character.



Remnant vegetation	Approximately 98% (1,375,681 ha) of the subregion is mapped as remnant native vegetation, of which none is formally conserved.
Landform	Undulating terrain with mesas and buttes, some saline seasonally swampy areas with gypseous lunettes. Dune formations in east.
Geology	Variable stone & gravel mantle. Some low silcrete capped hills. Evaporite deposits (gypsum, halite). Sand, silt, clay deposits in lowlands.
Soil	Brown calcareous earths.
Vegetation	Arid and semi-arid <i>Acacia</i> Low Open Woodlands and Shrublands with tussock grass
Conservation significance	41 species of threatened fauna, 11 species of threatened flora.

## 4.2 Climate

The rainfall records at Woomera Aerodrome provide the most comprehensive and accurate long term local rainfall data (Figure 3). Roxby Downs (Olympic Dam Aerodrome) has only complete data since 1998 making Woomera the most reliable long term comparative location. The Roxby downs regional area had received just over half the long-term mean rainfall of 182 mm in the past 12 months; 103 mm.

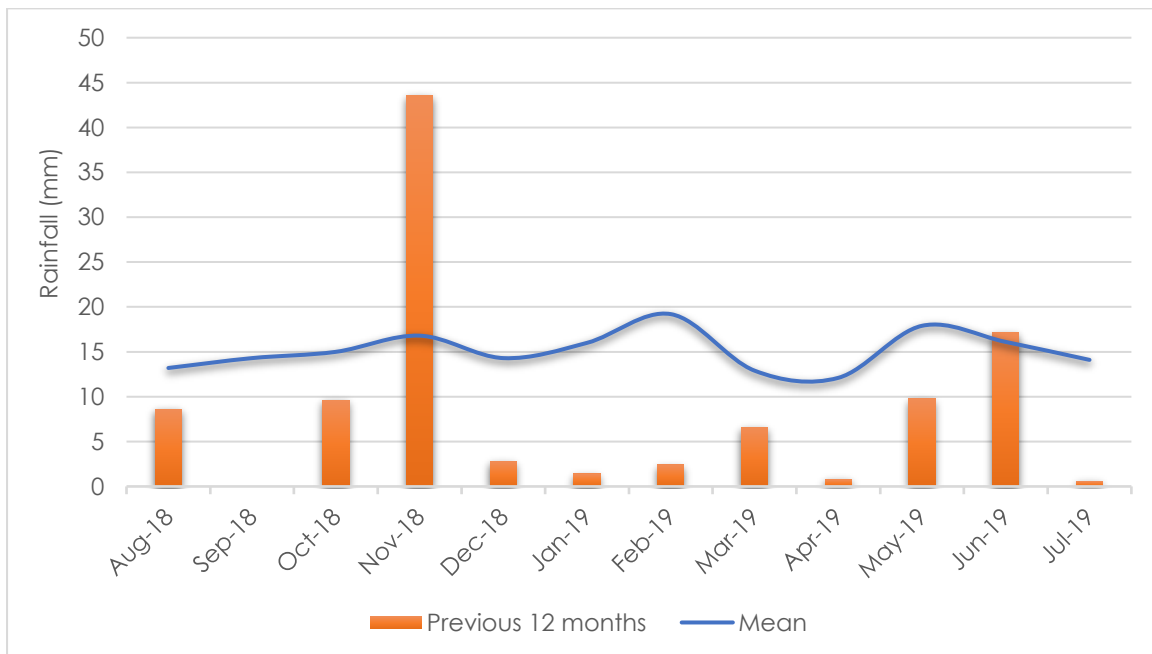


Figure 3. Previous 12-month rainfall from survey period at Woomera Aerodrome (Station 16001, opened 1949).

## 5 Methods

The ecological baseline assessment comprised a desktop study and field survey. The desktop study involved searching Commonwealth and State databases to identify threatened species, protected under the EPBC Act and the NPW Act, with the potential to occur within the overall Study area. The ecological field survey included a vegetation survey performed in accordance with the Rangelands Assessment Manual (RAM) (Native Vegetation Council 2017) devised by the Native Vegetation Council (NVC), part of the Department for Environment and Water (DEW). Opportunistic fauna observations were also conducted as part of the vegetation survey, within and surrounding the overall Study area.

### 5.1 Desktop study

A desktop study was conducted to assess the potential for any threatened species (both Commonwealth and State listed) to occur within the Study area. This was achieved by undertaking database searches using a 50 km buffer from the overall Study area layout.

#### 5.1.1 Protected Matters Search Tool (PMST) – EPBC Act

A PMST report was generated on August 7, 2019 to identify MNES under the EPBC Act, relevant to the Study area (DotEE, 2019). The PMST is maintained by the Department of the Environment and Energy (DotEE) and was used to identify flora and fauna species or ecological communities of national environmental significance that may occur or likely to have suitable habitat within the Study area.

#### 5.1.2 Biological Database of South Australia (BDBSA) – NPW Act

Threatened species listed under the NPW Act were assessed using the BDBSA, obtained through the general query tool on Naturemaps. The dataset was obtained on August 7, 2019 and was used to identify threatened species that have been recorded within the Study area (DEW 2019). Known records of threatened species listed under the EPBC Act were also identified within this search.

#### 5.1.3 2009 Olympic Dam Expansion Draft Environmental Impact Statement (DEIS)

A review of previously conducted flora and fauna assessments within the Study area was undertaken to identify any potential ecological constraints that have been previously identified. The review specifically focused on the detailed information contained in 'Appendix N Terrestrial Ecology' of the 'Olympic Dam Expansion Draft Environmental Impact Statement' (EIS) (BHP, 2009).

#### 5.1.4 Assessment of the likelihood of occurrence

The likelihood of each threatened flora and fauna species occurring within the Study area was assessed. A likelihood of occurrence rating (Highly Likely / Known, Likely, Possible and Unlikely) was assigned to each threatened species identified in the desktop PMST and BDBSA search (Table 2).

Table 2. Criteria for the likelihood of occurrence of species within the Study area.

Likelihood	Criteria
Highly Likely/Known	Recorded in the last 10 years, the species does not have highly specific niche requirements, the habitat is largely intact and falls within the known range of the species distribution or; The species was recorded as part of field surveys.
Likely	Recorded within the previous 20 years, the area falls within the known distribution of the species and the area provides species habitat which is largely intact.
Possible	Recorded within the previous 20 years, the area falls inside the known distribution of the species, but the area does not provide species habitat which is largely intact. Recorded within 20 -40 years, survey effort is considered adequate, habitat is present and intact, and species of similar habitat needs have been recorded in the area.
Unlikely	Recorded within 20 -40 years; however, suitable habitat does not occur, and species of similar habitat requirements have not been recorded in the area. No records within the previous 40 years despite suitable habitat being known to occur in the area. No records despite adequate survey effort.

#### 5.1.5 Desktop study limitations

The content of the desktop study was derived from existing datasets and references from a range of sources. Flora and fauna records were sourced from the Protected Matters Database via the PMST and the BDBSA via Naturemaps. The BDBSA only includes verified flora and fauna records submitted to DEW or partner organisations. It is recognised that drawing conclusions can be unreliable within areas that have been under represented in terms of biological studies. It is possible, therefore, that significant species occur within the Study area that are not reflected by database records. Although much of the BDBSA data has been subjected to a variety of validation processes, the lists may contain errors and should be used with caution. DEW give no warranty that the data is accurate or fit for any particular purpose of the user or any person to whom the user discloses the information.

## 5.2 Field survey

Field survey was undertaken on August 14 - 16, 2019 by Ecosphere vegetation ecologist and NVC-accredited consultant Andrew Sinel with assistance provided by specialist ornithologist Rob Kelman.

### 5.2.1 Vegetation survey

The vegetation survey was performed in accordance with the RAM devised by the NVC (NVC 2017) within the Study area and immediately adjacent areas. Sites selected were based on vegetation communities that were representative of the Study area generally. The Study area was traversed on foot and by vehicle. The RAM is suitable for assessing vegetation systems within the SAALNRM region.

- landscape context;
- vegetation condition (including a measure of land condition); and
- conservation value.

Each area to be assessed (i.e. each application area) within the RAM framework is assigned specific naming protocols. Individual areas are termed 'Blocks', which are further divided into stratified sites. Each site relates to a vegetation association found within the Block.

The three component scores are combined to provide a 'Unit Biodiversity Score' (per hectare; UBS) and then multiplied by the size (hectares) of the site to provide a 'Total Biodiversity Score' for each site, and then the overall Block.

The conservation significance scores were calculated from direct and historical observations of flora and fauna species listed under the EPBC Act and the NPW Act. Historical observations were obtained from the PMST and BDBSA using a defined 50 km point buffer. For the PMST, only species or species habitat known to occur within the 50 km buffer were included (as per the RAM Section 5.3.2 and Section 5.3.3) (NVC 2017).

The number of sites assessed is generally determined by dividing Blocks into predetermined areas, usually based on one or all of:

- rainfall gradient;
- grazing gradient; and
- pastoral paddocks.

The assessment design and sampling protocol used for this assessment was modified due to the lack of pastoral activity. The number of 'sites' was determined in this instance to reflect the vegetation communities within the range of landforms present within the Study area as opposed to a grazing gradient. Several sites were located within the broader study area and were subsequently not located within the refined project footprint. The vegetation associations present within the project footprint however are representative of the associations assessed in the broader study area.

### 5.2.2 Fauna assessment

Fauna surveys were based on the rambling loop method in keeping with the RAM. Avian observations made during the August 2019 survey were undertaken by a specialist ornithologist which was undertaken in collaboration with vegetation assessment and mapping within the proposed accommodation villages.

All fauna species, signs of fauna (e.g. scats, burrows, skeletons) and potential habitat for fauna were recorded. Birds are an excellent indicator of general environmental health including habitat condition and ecosystem function, and most can be easily observed without the need for trapping. Therefore, bird species were targeted during the fauna assessment. The value of habitat for threatened fauna listed under the EPBC Act and NPW Act was also determined when searching the Study area. Desktop assessment studies suggested a lack of preferred habitat availability for threatened species so field surveys were geared towards covering the largest possible area. If suitable habitat conditions existed for threatened flora and fauna species, then targeted searches would occur. Subsequently, vegetation communities were relatively homogenous in landform with no specific critical habitats observed requiring targeted surveys for highlighted threatened species.

### 5.2.3 Field survey limitations

The seasonal conditions in the lead up to the field survey were not optimal for detection of annual and ephemeral flora species due to extremely low rainfall (Figure 3). Identification of some flora species was limited to genus level due to a lack of distinguishing identification features such as flowers or fruits. It should be noted; however, that the perennial species inventory was largely complete, and data collected is considered more than adequate to complete the rangelands vegetation assessment which focusses solely on perennial species to determine outcomes.

The compiled list of fauna observations does not represent all species expected to occur within the Study area. Being an opportunistic only survey and over the equivalent of two full days, the likelihood of detection of many species is largely reduced with many species

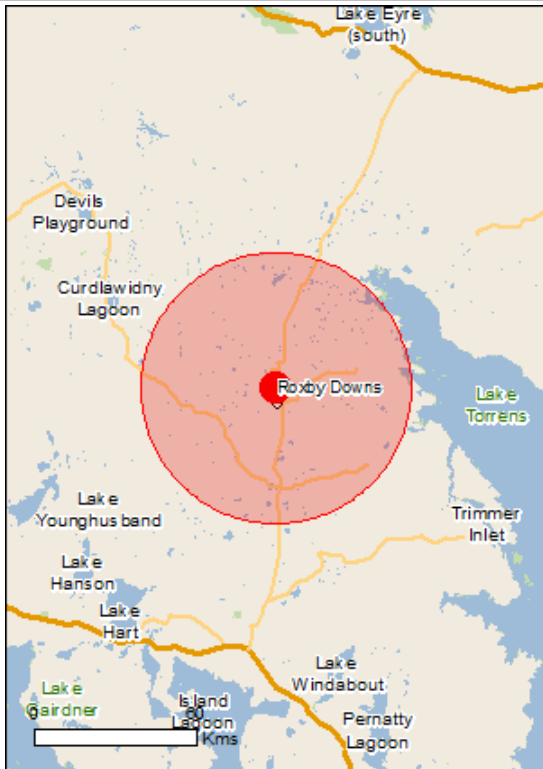
active for small periods of the day or nocturnal, limiting the ability to assess their occurrence. Despite this, habitat assessment through vegetation association mapping combined with historical records allows for reasonable determination of the likelihood of presence of threatened species.

## 6 Assessment outcomes

### 6.1 Desktop study

A total of 11 threatened species and 10 migratory species were identified by the EPBC Act PMST report as potentially occurring, having suitable habitat potentially occurring or being translocated within 50 km of the Study area (Table 3) (DotEE 2019). The relevant matters of national environmental significance protected under the EPBC Act, and threatened species listed under the NPW Act are discussed in detail below.

Table 3. EPBC Act PMST report results summary.

Search area (50 km buffer)	Matters of national environmental significance under the EPBC Act	Identified within the search area
	World heritage properties	None
	National heritage properties	None
	Wetlands of international importance	None
	Great Barrier Reef marine park	None
	Commonwealth marine area	None
	Threatened ecological communities	None
	Threatened species	11
	Migratory species	10
	Commonwealth land	1
	Commonwealth heritage places	None
	Listed marine species	15
	Whales and other cetaceans	None
	Critical habitats	None
	Commonwealth reserves terrestrial	None
	Commonwealth reserves marine	None
	State and Territory reserves	1
	Regional forest agreements	None
	Invasive species	18
	Nationally important wetlands	1
	Key ecological features (marine)	None

### 6.1.1 Nationally threatened flora

One flora species listed as threatened under the EPBC Act was identified in the PMST report as potentially occurring or having suitable habitat within the Study area (Table 6). *Frankenia plicata* is a low, mat-forming perennial shrub on lower slopes of hills and in small run-off channels. This species is known from well drained soils and a wide variety of landforms such as stream channels and on heavy loams on low slopes. This species has not been previously recorded in the Study area. See Table 4 for detailed synopsis.



Table 4. Threatened flora species potentially occurring within the Study area identified in the PMST (DotEE 2019)

Scientific name	Common name	Conservation status		Likelihood of occurrence within Project Area	Comment
		Aus	SA		
<b>Flora</b>					
<i>Frankenia plicata</i>	Frankenia	EN	V	Unlikely	The species is a low, mat-forming perennial shrub on lower slopes of hills and in small run-off channels. Locally, this species is most likely at the fringes of Salt Lake margins at Lake Mary south of the Study area in well drained soils of high salinity. This species is known from well drained soils and a wide variety of landforms, however, has been recorded in the wider regional area from within stream channels and on heavy loams on low slopes. Nearest records are located 50 km south east at Andamooka Station on Arcoona Plateau flood out landforms. Next nearest record at Woomera near airstrip on heavy clay flood out area. The Study area is dominated by low dunes and sandy undulations with shrublands and woodlands which do not typically support <i>Frankenia plicata</i> based on nearby historical records. <i>Frankenia</i> are notoriously difficult to identify in the field however the leaf structure of this species leaves them as being reasonably distinct in having the underside leaf margins completely concealed. Highly unlikely within the sandy low dune shrubland / woodland habitats present within Study area.

**Conservation status:** **Aus:** Australia (*Environment Protection and Biodiversity Conservation Act 1999*). **SA:** South Australia (*National Parks and Wildlife Act 1972*).

**Conservation codes:** **EN/E:** Endangered. **V:** Vulnerable

### 6.1.2 Nationally threatened fauna

A total of 11 fauna species listed as threatened under the EPBC Act were identified by the PMST as having suitable habitat potentially occurring within or have been translocated into the 50km buffer area (Table 5). Two species were considered as possibly occurring within the proposed temporary accommodation village Study area; *Amytornis modestus indulkanna* (Thick-billed Grasswren) and *Pseudomys australis* (Plains Rat).

### 6.1.3 Commonwealth listed migratory species

Ten fauna species listed as migratory under the EPBC Act were identified in the PMST as potentially occurring or having suitable habitat potentially occurring within the 50 km buffer from the Study area (Table 5). None of these were considered as possibly utilising the habitat within the Project area.

Table 5. Threatened and migratory fauna species potentially occurring within the Study area identified in the PMST (DoEE 2019)

Scientific name	Common name	Conservation status		Likelihood of occurrence within Project Area	Comment
		Aus	SA		
<b>Aves</b>					
<i>Actitis hypoleucos</i>	Common Sandpiper	Mi. (W)	R	Unlikely	Coastal shorebird, presence would be as stopover only as migratory species. Found in coastal or inland wetlands, both saline and fresh. It is found mainly on muddy edges or rocky shores. During the breeding season in the northern hemisphere, it prefers freshwater lakes and shallow rivers. No habitat within Study area available.
<i>Amytornis modestus indulkanna</i>	Thick-billed Grasswren	VU		Possible	The species has known records from within 30 km (ALA 2019b), being observed in previous baseline surveys. Typically, most records are located further north west of the Study area and the species favours chenopod shrublands, especially those supporting larger <i>Maireana</i> spp. and <i>Atriplex</i> spp. along drainage lines and flood plains (Black, Carpenter & Pedler 2011). This species does not occur in areas where overstorey is present. No preferred habitat within Study area available making it highly unlikely that the species will be present within the Study area. See section 6.3.5 for more detailed synopsis.
<i>Apus pacificus</i>	Fork-tailed swift	Mi. (M)		Unlikely	Asian origin - species is aerial during its stay in Australia.
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Mi. (W)		Unlikely	Prefers the grassy edges of shallow inland freshwater wetlands. It is also found around sewage farms, flooded fields, mudflats, mangroves, rocky shores and beaches. Its breeding habitat in Siberia is the peat-hummock and lichen tundra of the high Arctic. No habitat within Study area available.
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE, Mi. (W)		Unlikely	Curlew Sandpipers in Australia are present within coastal and subcoastal habitats. The habitats within which they are present range from fresh to hypersaline and include intertidal mudflats, saltworks, sewage farms, wetlands, lakes, swamps and lagoons (Pizzey and Knight 2007). No habitat within Study area available.

Scientific name	Common name	Conservation status		Likelihood of occurrence within Project Area	Comment
		Aus	SA		
<i>Calidris melanotos</i>	Pectoral Sandpiper	Mi. (W)		Unlikely	Stopover, Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. No habitat within Study area available.
<i>Charadrius veredus</i>	Oriental Plover	Mi. (W)		Unlikely	In non-breeding grounds, they prefer coastal habitats such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches or nearby reefs, or in near-coastal grasslands. Flyover only, coastal shorebird may use plains away from water. No habitat within Study area available.
<i>Motacilla cinerea</i>	Grey Wagtail	Mi. (T)		Unlikely	Vagrant A migratory species found within Europe, Asia and North America, has been recorded in Australia infrequently. Most of these records are from northern Australia.
<i>Motacilla flava</i>	Yellow Wagtail	Mi. (T)		Unlikely	Vagrant Breeds in Europe and Alaska before migrating south into Asia and Africa. Regular summer visitor to northern Australia, however, has been recorded in all states. Prefers grasslands and swamps as well as Saltmarshes or prepared lands (sports fields, airfields etc.).
<i>Pedionomus torquatus</i>	Plains Wanderer	CE		Unlikely	Single record from Roxby Downs. There are also recent records from near Quorn and along the Strzelecki and Birdsville Tracks however these inland sightings are likely to be nomadic or migratory individuals or groups.
<i>Pandion haliaetus</i>	Osprey	Mi (W)	E	Unlikely	This species has an extremely large range, however In Australia, Ospreys are generally found in the northern coastal areas. A southern population inhabits from Kangaroo Island in South Australia, westward to the Great Australian Bight. Fish make up some 99% of the Osprey's diet making unlikely observation in Study area.

Scientific name	Common name	Conservation status		Likelihood of occurrence within Project Area	Comment
		Aus	SA		
<i>Pezoporus occidentalis</i>	Night Parrot	EN	E	Unlikely	Long thought extinct, this species historically occupied much of semi-arid and arid Australia. Habit appears to be mainly open grasslands consisting principally of <i>Triodia</i> in stony or sandy environments. Present distribution of the species is unknown, with the confirmed locations being in South-western Queensland, the Pilbara, Western Australia, and southern Northern Territory. The species is believed to be highly nomadic, moving into areas with preferred habitat when resources are good. There is a lack of intact habitat within the Study area.
<i>Tringa nebularia</i>	Common Greenshank	Mi. (W)		Unlikely	Coastal shorebird, stopover possible on migratory flyway. No habitat within Study area available.
<b>Mammalia</b>					
<i>Pseudomys australis</i>	Plains Rat	VU	V	Possible	Primarily found in gibber (stone-covered) plains and mid slopes with boulders, small stones and Gilgai's. Primary habitat is drainage channels and depressions with deep friable cracking clays. These habitats are best able to collect water from even minor falls of rain. Secondary habitats are associated with Gilgai's and minor drainage areas with low perennial chenopod shrublands and heavier cracking clays. In years of very good rainfall, this species occurs on adjoining sandy plains. During poor conditions, core refuge areas may occur on low-lying Gilgai's and watercourses of gibber plains. Known from the region, widespread refuge habitat available for species and widespread on Arcoona Plateau. This species shows incredible resilience being able to persist for long periods underground lying in wait for the next boom period to breed. The irruptive life history strategy of this species means they can be present in high numbers for short periods before becoming largely inconspicuous again for long periods until suitable seasonal conditions re-occur. No refuge habitat within Study area available. See section 6.3.5 for more detailed synopsis.

Scientific name	Common name	Conservation status		Likelihood of occurrence within Project Area	Comment
		Aus	SA		
<i>Bettongia lesueur lesueur</i>	Burrowing Bettong	VU	E	Unlikely	Translocated into Arid Recovery. Breeding success and lack of predators has meant that this species has proliferated within the reserve. One-way gates were used to allow over abundant species to leave the enclosure. Satellite tagging suggested that once out of the enclosure animals did not persist.
<i>Leporillus conditor</i>	Greater Stick-nest Rat	VU	V	Unlikely	Translocated into Arid Recovery.
<i>Macrotis lagotis</i>	Greater Bilby (Bilby)	VU	V	Unlikely	Translocated into Arid Recovery. Breeding success and lack of predators has meant that this species has proliferated within the reserve. One-way gates were used to allow over abundant species to leave the enclosure. Satellite tagging suggested that once out of the enclosure animals did not persist.
<i>Myrmecobius fasciatus</i>	Numbat	EN	E	Unlikely	Translocated into Arid Recovery.
<i>Perameles bougainville bougainville</i>	Western Barred Bandicoot	EN		Unlikely	Translocated into Arid Recovery.

#### 6.1.4 State threatened flora

Nine flora species listed as threatened under the NPW Act were identified in the Naturemaps search as being previously recorded within the Study area (Table 6). None of the NPW Act listed species were considered likely to occur within the unsuitable dune habitats within the Study area, with most of the threatened species largely preferring habitat that is subject to periodical wetting, such as stream channels and gilgais.

The distribution of all Commonwealth and State listed threatened flora species identified in the BDBSA search are shown in Figure 4. The complete list of flora species identified in the 50 km Study area search is provided in Appendix 3.

Table 6. Threatened flora species records identified by the BDBSA search (50km buffer).

Scientific name	Common name	Conservation status		Likelihood of occurrence within Study area	BDBSA last record (year)	Comment
		EPBC Act	NPW Act			
<i>Atriplex kochiana</i>	Koch's Saltbush		V	Possible	2013	Most records concentrated around Andamooka and 17km north of Olympic Dam. <i>A. kochiana</i> is a short-lived saltbush that can regenerate from seed following summer rains. Regenerating populations on track verges and erosion gutters at Andamooka suggest the species is relatively robust to disturbance (Read & Kilpatrick 2009). All surrounding records from stony hills and gypseous rises. No available habitat within Study area.
<i>Malacocera gracilis</i>	Slender Soft-horns		V	Unlikely	1989	Grows on saline clay soils or gypseous mounds.
<i>Brachyscome eriogona</i>	-		R	Unlikely	2004	Occurs around Gilgai's and low areas which get wet after good rainfall. Unlikely to be recorded during the baseline study due to the conditions at the time of the survey.
<i>Cyperus dactyloides</i>	-		V	Unlikely	2004	Grows in seasonally wet situations, such as stream banks and roadside drains. No habitat within Study area available.
<i>Frankenia cupularis</i>	-		R	Unlikely	2012	Grows on sand flats and salt pans in semi-arid districts. Lack of suitable habitat within Study area.
<i>Bothriochloa macra</i>	Red-leg Grass		R	Unlikely	1978	Often occurs in semi disturbed sites such as roadsides. No recent records.
<i>Wurmbea stellata</i>	Star Nancy		R	Unlikely	1968	Endemic to South Australia, in arid or semi-arid areas westward from the Flinders Ranges to the Great Victoria Desert and south to the Gawler Ranges, growing in red clay soils on plains or rocky hills, often in exposed sites free of other vegetation (Bates 1995).
<i>Orobanche cernua</i> var. <i>australiana</i>	Australian Broomrape		R	Unlikely	2004	Parasitic species listed as rare but relatively common in the region and often encountered when conditions are suitable, primarily in sandy creeks lined with host species such as <i>Acacia ligulata</i> and <i>Senecio magnificus</i> . No suitable habitat within Study area available.



Scientific name	Common name	Conservation status		Likelihood of occurrence within Study area	BDBSA last record (year)	Comment
		EPBC Act	NPW Act			
<i>Santalum spicatum</i>	Sandalwood		V	Unlikely	2016	Sandalwood grows in loam soils and amongst rocks in woodland and scrubland areas and is primarily found in the southern half of Western Australian and South Australia. This species often occurs sporadically as individuals in a variety of habitats throughout the semi-arid rangelands of SA. One record from 16 km north west of Olympic Dam village. Next nearest record 58km away. Individuals are sparsely scattered and relatively conspicuous. Likely to have observed any individuals within Study area if present.

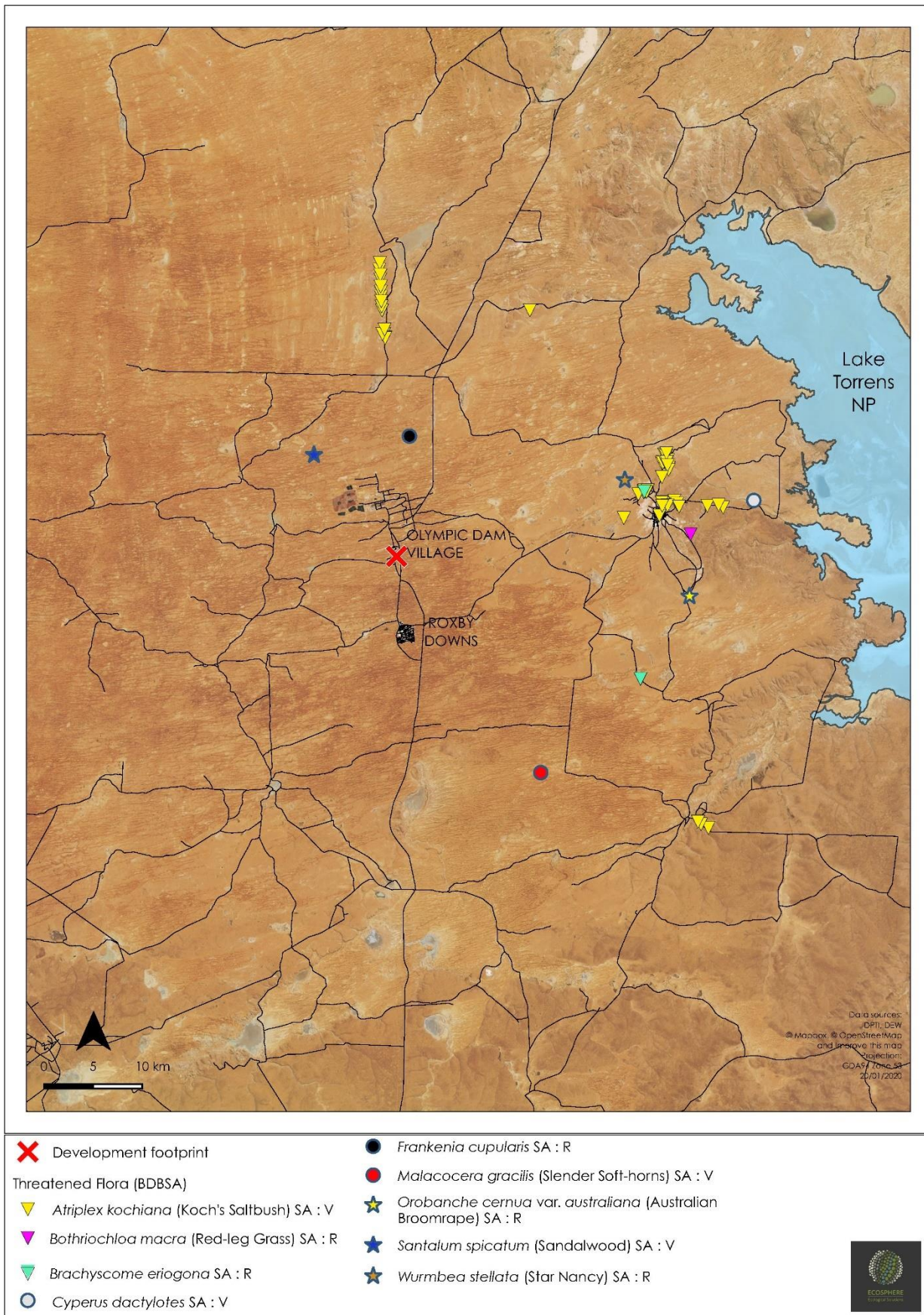


Figure 4. Locations of threatened flora species within Study area based on historical BDBSA records.

### 6.1.5 State threatened fauna

A total of 29 fauna species listed as threatened under the NPW Act were identified in the Naturemaps search as being previously recorded within 50km of the Study area (Table 7). Based on historical records and the habitat type present, one species, *Phaps histrionica* (Flock Bronzewing), was considered as possibly occurring within the Project area.

The distribution of all Commonwealth and State listed fauna species identified in the Naturemaps search are shown in Figure 5.

Table 7. Threatened fauna species records identified by the BDBSA search (50km buffer).

Scientific name	Common name	Conservation status		Likelihood	BDBSA last record (year)	Comment
		EPBC Act	NPW Act			
<b>Aves</b>						
<i>Anas rhynchos</i>	Australasian Shoveler		R	Unlikely	1994	The Australasian Shoveler ( <i>Anas rhynchos rhynchos</i> ) is a species of waterfowl that regularly occurs inland. Within the Study area, the species is likely to occur at pastoral dams and may temporarily inhabit inland waterbodies during flood.
<i>Anhinga novaehollandiae</i>	Australasian Darter		R	Unlikely	1993	The Australasian Darter ( <i>Anhinga novaehollandiae</i> ) is a moderate to large sized diving water bird. The species is considered unlikely to occur due to the absence of river channels within the Study area, which it inhabits.
<i>Arenaria interpres</i>	Ruddy Turnstone	Mi.	R	Unlikely	1993	The Ruddy Turnstone ( <i>Arenaria interpres</i> ) is a species of shorebird that is most frequently encountered within coastal environments. This species rarely occurs inland, and as such, is considered unlikely to occur. As an EPBC listed migratory species, any observations are likely to be short term stopovers.
<i>Biziura lobata</i>	Musk Duck		R	Observed (in adjacent areas) Unlikely within Study area	2007	The Musk Duck ( <i>Biziura lobata</i> ) is a species of waterfowl that inhabits inland waterbodies. This species is less likely to occur at pastoral dams unless they are expansive, as they prefer large waterbodies. Observed within Roxby Downs wastewater treatment plant.
<i>Bubulcus ibis coromandus</i>	Eastern Cattle Egret		R	Unlikely	1986	Since Cattle Egrets were first recorded in Australia in 1948, their range has expanded to include eastern and northern Australia, and also along major inland river systems. Their breeding colonies are often shared with other species of waterbirds, especially herons, ibis and other egrets. Cattle Egrets are usually seen stalking about in pasture, accompanying cattle to snap up insects as they are disturbed. Likely to be observed only in wetland habitats within arid -zone. No habitat within study area available.

Scientific name	Common name	Conservation status		Likelihood	BDBSA last record (year)	Comment
		EPBC Act	NPW Act			
<i>Cladorhynchus leucocephalus</i>	Banded Stilt		V	Unlikely	1994	The Banded Stilt ( <i>Cladorhynchus leucocephalus</i> ) is a species of shorebird that regularly ventures inland to breed upon Salt Lakes. Flooded inland waterbodies are also expected to provide foraging habitat for this species. No suitable habitat within Study area.
<i>Egretta garzetta</i>	Little Egret		R	Unlikely	1993	The Little Egret ( <i>Egretta garzetta</i> ) is a wading water bird species that typically occurs within coastal and subcoastal areas. The species may inhabit inland wetlands; however, these predominantly occur within the Murray Darling Basin. As such, the species is considered unlikely to occur within the Study area.
<i>Emblema pictum</i>	Painted Finch		R	Unlikely	1992	Painted Finches are Australian natives that occur naturally in the drier, arid areas of northwestern Australia through the Northern Territory and into Queensland and south to northern and central Southern Australia. They range south into Southern Australia, where they are mostly found around Lakes Eyre, Torrens and Frome and the Flinders Ranges. Their preferred habitats are semi-desert areas, grasslands, rock areas, and subtropical (lowland) dry grasslands. They are often found near permanent or semi-permanent bodies of water. Lack of recent historical records suggests unlikely occurrence.
<i>Falco peregrinus</i>	Peregrine Falcon		R	Unlikely	1988	The Peregrine Falcon ( <i>Falco Peregrinus</i> ) is a species of raptor that is distributed over the entire Australian continent. The species can inhabit a wide range of habitats from plains to woodlands, and therefore may occur over the Study area. Peregrine Falcons typically nest on cliffs; however, human created structures or the disused nests of other raptors may also support breeding opportunities for this species.

Scientific name	Common name	Conservation status		Likelihood	BDBSA last record (year)	Comment
		EPBC Act	NPW Act			
<i>Grus rubicunda</i>	Brolga		V	Unlikely	1994	Brolgas can be found across tropical northern Australia, throughout Queensland and in parts of western Victoria, central NSW and south-east South Australia. They feed and breed in open wetlands, coastal mudflats and irrigated croplands, occasionally visiting estuaries and mangrove creeks. No suitable habitat within Study area.
<i>Limosa limosa</i>	Black-tailed Godwit	Mi.	R	Unlikely	1994	The Black-tailed Godwit ( <i>Limosa limosa</i> ) is a species of migratory shorebird that predominantly occurs within coastal habitats. The species irregularly uses inland waterbodies of which, most are restricted to the Murray Darling Basin. As an EPBC listed migratory species, any observations are likely to be short term stopovers on migratory flight paths
<i>Neophema splendida</i>	Scarlet-chested Parrot		R	Unlikely	1993	The Scarlet-chested Parrot ( <i>Neophema splendida</i> ) is a highly nomadic and irruptive parrot that inhabits arid Australia. The species would be most likely to occur within areas of vegetated dunes and Mulga. However a lack of recent records suggests unlikely presence.
<i>Oriolus sagittatus sagittatus</i>	Olive-backed Oriole		R	Unlikely	2012	The Olive-backed Oriole lives in forests, woodlands and rainforests, as well as well-treed urban areas, particularly parks and golf courses. Most likely in township areas of Roxby Downs. Single record only, Unlikely.
<i>Oxyura australis</i>	Blue-billed Duck		R	Unlikely	1993	The Blue-billed Duck ( <i>Oxyura australis</i> ) is a species of waterfowl that inhabits inland waterbodies. This species is less likely to occur at pastoral dams unless they are expansive, as they prefer large waterbodies. No waterbodies within study area makes species unlikely to occur.

Scientific name	Common name	Conservation status		Likelihood	BDBSA last record (year)	Comment
		EPBC Act	NPW Act			
<i>Phaps histrionica</i>	Flock Bronzewing		R	Possible	2013	The Flock Bronzewing ( <i>Phaps histrionica</i> ) is a highly nomadic species of pigeon that forms flocks numbering thousands of individuals. In the southern parts of its range, including central northern South Australia, the Flock Bronzewing is uncommonly recorded during times of significant ephemeral vegetation response, triggered by sustained above-average rainfall (Pedler & Lynch 2013). In late 2013, while core habitats in Queensland were in extended drought and much of arid South Australia received below-average rainfall, an area of ~10 000 km <sup>2</sup> between Roxby Downs and Lake Eyre South supported tens of thousands of Flock Bronzewings. The Flock Bronzewing is well known for its irruptive nature and remarkable ability to locate and exploit localised productive habitat within vast dynamic and stochastic landscapes (Pedler & Lynch 2013). Therefore, while this species may occur infrequently during periods where conditions are not ideal within their core habitat, they may occur temporarily; however, the study area do not form critical habitat for this species.
<i>Plegadis falcinellus</i>	Glossy Ibis	Mi.	R	Unlikely	1993	The Glossy Ibis is a nomadic and irruptive species of water bird. The species regularly occurs at ephemeral waterbodies. Lack of available habitat within study area.
<i>Podiceps cristatus</i>	Great Crested Grebe		R	Unlikely	1994	The Great Crested Grebe ( <i>Podiceps cristatus</i> ) is a species of waterfowl that inhabits inland waterbodies. This species is less likely to occur at pastoral dams unless they are expansive, as they prefer large waterbodies. Lack of available habitat within study area.

Scientific name	Common name	Conservation status		Likelihood	BDBSA last record (year)	Comment
		EPBC Act	NPW Act			
<i>Stictonetta naevosa</i>	Freckled Duck		V	Unlikely	1994	The Freckled Duck ( <i>Stictonetta naevosa</i> ) is a species of waterfowl that regularly occurs inland. Within the Project Area, the species is likely to occur at pastoral dams and may temporarily inhabit inland waterbodies during flood. Lack of available habitat within study area.
<i>Tringa glareola</i>	Wood Sandpiper	Mi.	R	Unlikely	1994	The Wood Sandpiper ( <i>Tringa glareola</i> ) is a species of migratory shorebird. Although more common in coastal and sub-coastal environments, the species does occur inland. Pastoral dams and inland waterbodies may provide temporal habitat for this species during migratory flight path stops or resting sites being an EPBC listed migratory species.
<b>Mammalia</b>						
<i>Bettongia lesueur lesueur</i>	Burrowing Bettong	VU	E	Unlikely	2018	Translocated into Arid Recovery. Breeding success and lack of predators has meant that this species has proliferated within the reserve. One-way gates were used to allow over abundant species to leave the enclosure. Satellite tagging suggested that once out of the enclosure animals did not persist.
<i>Leporillus conditor</i>	Greater Stick-nest Rat	VU	V	Unlikely	2017	Translocated into Arid Recovery.
<i>Macrotis lagotis</i>	Greater Bilby (Bilby)	VU	V	Unlikely	2018	Translocated into Arid Recovery. Breeding success and lack of predators has meant that this species has proliferated within the reserve. One-way gates were used to allow over abundant species to leave the enclosure. Satellite tagging suggested that once out of the enclosure animals did not persist.
<i>Myrmecobius fasciatus</i>	Numbat	EN	E	Unlikely	2006	Translocated into Arid Recovery.
<i>Perameles bougainville bougainville</i>	Western Barred Bandicoot	EN		Unlikely	2018	Translocated into Arid Recovery.
<i>Pseudomys australis</i>	Plains Rat	VU	V	Possible	2018	See Table 6.



Scientific name	Common name	Conservation status		Likelihood	BDBSA last record (year)	Comment
		EPBC Act	NPW Act			
<i>Dasyurus geoffroi</i>	Western Quoll	VU	E	Unlikely	2018	Translocated into Arid Recovery. Males will disperse out of the enclosure by climbing fence so it is possible that animals will be present within the Mining Lease for short periods. Very unlikely that animals will persist further away from reserve.
<b>Reptilia</b>						
<i>Aspidites Ramsayi</i>	Woma		R	Unlikely	1990	The Woma is a large python with an average length of 1.5 m. Widespread throughout arid and semi-arid Australia from coastal Western Australia to western Queensland. The Woma is a ground dweller that seeks shelter in hollow logs, animal burrows or thick herbage during the day. It can also use its head like a shovel to dig and enlarge its burrow. Reintroductions to Arid Recovery were unsuccessful.

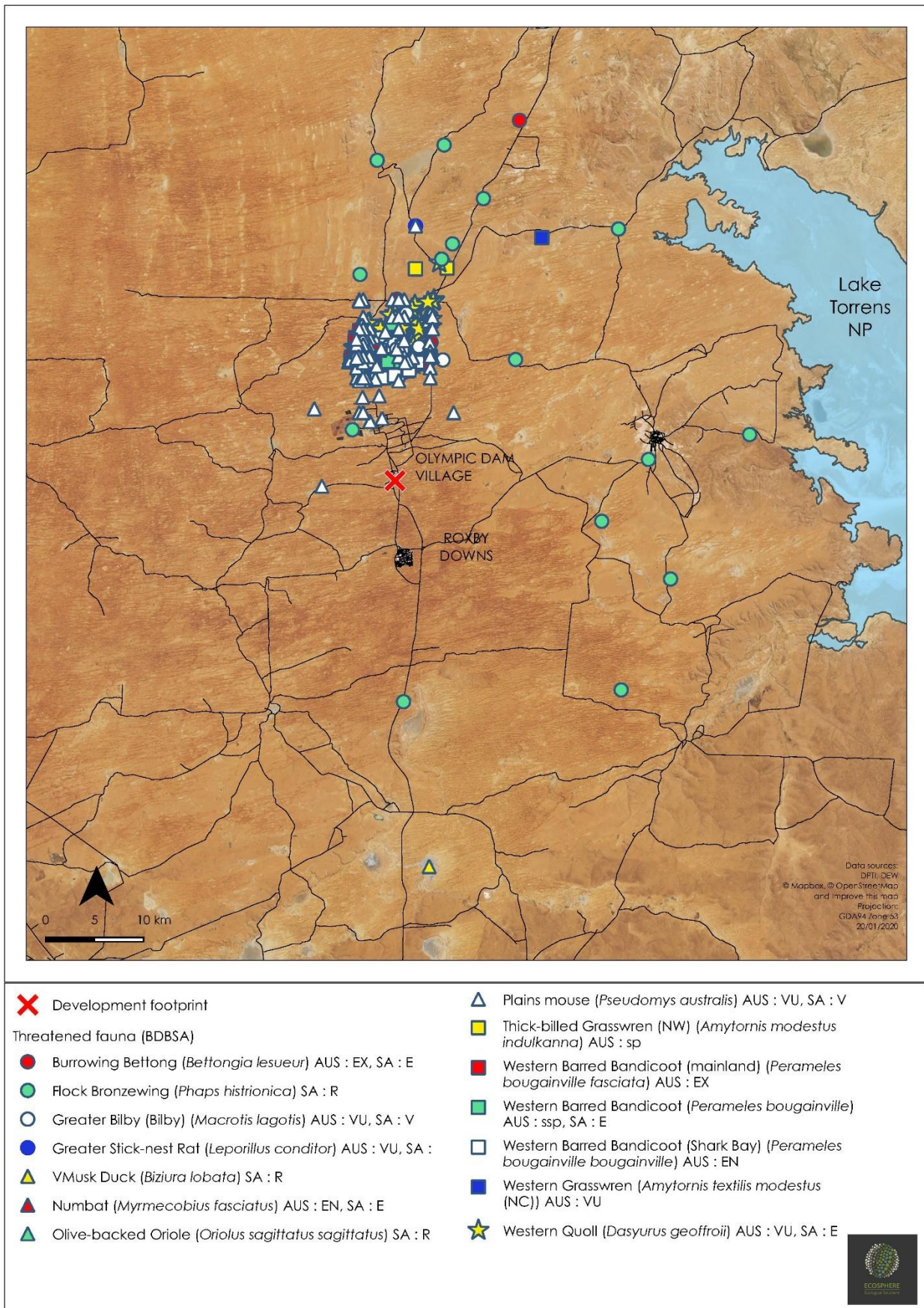


Figure 5. Locations of threatened fauna species historical observations within Study area (50km buffer).

## 6.2 Olympic Dam Expansion EIS review

The Olympic Dam Expansion Draft Environmental Impact Statement (2009) section N1.4 Special Mining Lease (SML) and Roxby Downs municipality, describes the ecological features most aligned with the Project area.

### 6.2.1 Vegetation associations

BHP (2009) identified 12 broad vegetation associations in the SML and municipality. These were consistent with those observed during this study.

### 6.2.2 Flora

In total, 257 indigenous vascular plant species were recorded within the SML and the municipality since 1982 with no species of conservation significance observed within the Study area at the time of the EIS submission. Monitoring surveys have since recorded *Santalum spicatum* (Sandalwood) within this area.

### 6.2.3 Fauna

Twenty-two native and five introduced mammal species were recorded within the SML and municipality area (not including Arid Recovery). Fifty-five reptile, four amphibian, four bat and 171 bird species have also been recorded.

### 6.2.4 EPBC Act listed species

Targeted searches for Thick-billed Grasswren (*Amytornis modestus*), Plains Rat (*Pseudomys australis*) and Koch's Saltbush (*Atriplex kochiana*) were undertaken within the proposed Hiltaba village and Airstrip areas for the EIS by Ecological Horizons. No records for any of these species was observed during these surveys however annual monitoring surveys have recorded Thick-billed Grasswren and Plains Rat in both the SML and municipal leases in a range of habitats. It is possible that both species occupy the Project area at some point in time when seasonal conditions allow. These species will retreat to areas of persistent refugia outside of these periods. The EIS stated that the Horn Ridge area which is very similar in structure to sections of the Project area, being low dune ridges with *Callitris* and Mulga, is unlikely to provide core or significant habitat for either Thick-billed Grasswren or Plains Rat.

## 6.3 Field survey

### 6.3.1 Flora species richness

A total of 39 flora species were observed within the overall Study area (Appendix 2), which was considered low and attributed largely to the presence of only perennial species. These were represented by a range of lifeforms including grasses, herbs, shrubs and trees with moderate structural diversity recorded within most habitats. No Commonwealth or State listed threatened flora species were observed. Most threatened flora species highlighted within the BDBSA searches for the Study were associated with drainage, run-off and specific habitat niches. The species composition of the proposed temporary accommodation village was considered common, widespread and consistent with communities commonly recorded throughout the Roxby Environmental Association. The previously disturbed and rehabilitated sections of the temporary accommodation Project area were also indicative of areas less likely to contain threatened species than surrounding areas of specific niche habitats such as calcareous outcrops or ephemeral drainage channels and flood outs.

### 6.3.2 Threatened flora

No species of conservation significance were observed during the overall Study area vegetation survey. One species considered as possibly occurring within the Study area, *Atriplex kochiana* (Koch's Saltbush), was not observed or deemed likely to be present following the field survey. While it is an annual species and not likely to be present given prevailing seasonal conditions, nearby records show a preference for this species to inhabit stony gibber rises (ALA 2019a). No records are known in the immediate area and a lack of suitable habitat exists within the Project area. It is highly unlikely that this species is present within the Project area even given the habitat type where they have been recorded previously remains relatively specific and not present within the study area.

### 6.3.3 Exotic flora species

Exotic flora species were very sparsely present at the time of the survey. *Brassica tournefortii* (Wild Turnip) was emergent, following recent rainfall; however, the overall dry conditions meant that very few annual exotic species were present. No species listed as declared under the NRM Act were present. There was no evidence of species that may be inconspicuous during low rainfall conditions such as *Cenchrus ciliaris* (Buffel Grass) and *Xanthium spinosum* (Bathurst Burr). It is likely that the relatively high intensity monitoring that is undertaken as part of ongoing compliance with regulatory requirements for OD highlights any early outbreaks of significant exotic species, particularly target weed species for the NRM district.

### 6.3.4 Vegetation associations

Four vegetation associations were observed within the Project area (Table 8). Three of these were intact communities and one was a disturbed area where features such as old dams, borrow pits, old camp areas, remnant gravel paths and non-indigenous trees were present. The vegetation association mapping is shown below in Figure 6.

Table 8. Summary of vegetation associations observed within the Project area.

Association	Description
1	<i>Callitris glaucophylla</i> (Northern Cypress Pine), <i>Acacia aneura</i> var. (Mulga) Very Open Woodland over <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> (Narrow leaved Hopbush), <i>Acacia ligulata</i> (Sandhill Wattle)
2	<i>Acacia burkittii</i> (Pin Bush Wattle), <i>Alectryon oleifolius</i> (Bullock Bush) <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> (Narrow leaved Hopbush), <i>Acacia ligulata</i> (Sandhill Wattle) Mixed Shrubland
3	<i>Atriplex vesicaria</i> (Bladder Saltbush) Low Open Shrubland
4	Anthropogenic disturbances with high proportion of non-indigenous <i>Eucalyptus</i> plantings

The Project area landscape structure was characterized by low sand dunes overlying a clay base. The dunes were not forming highly distinct ridgelines which resulted in gentle transitions between vegetation community structures, and changes were consistent with the elevation or depth of sand overlying the base material. Vegetation association 3 was present on saline swale areas devoid of sand with only the saline clay base material present. *Acacia burkittii* (Pin Bush Wattle) and *Dodonaea viscosa* subsp. *angustissima* (Narrow-leaved Hopbush) Mixed Shrublands were transitional between the low dunes and the deeper sand rises where tree species such as *Acacia aneura* var. (Mulga) and *Callitris glaucophylla* (Northern Cypress Pine) became more dominant. A summary of each association present within the Project area is shown below.

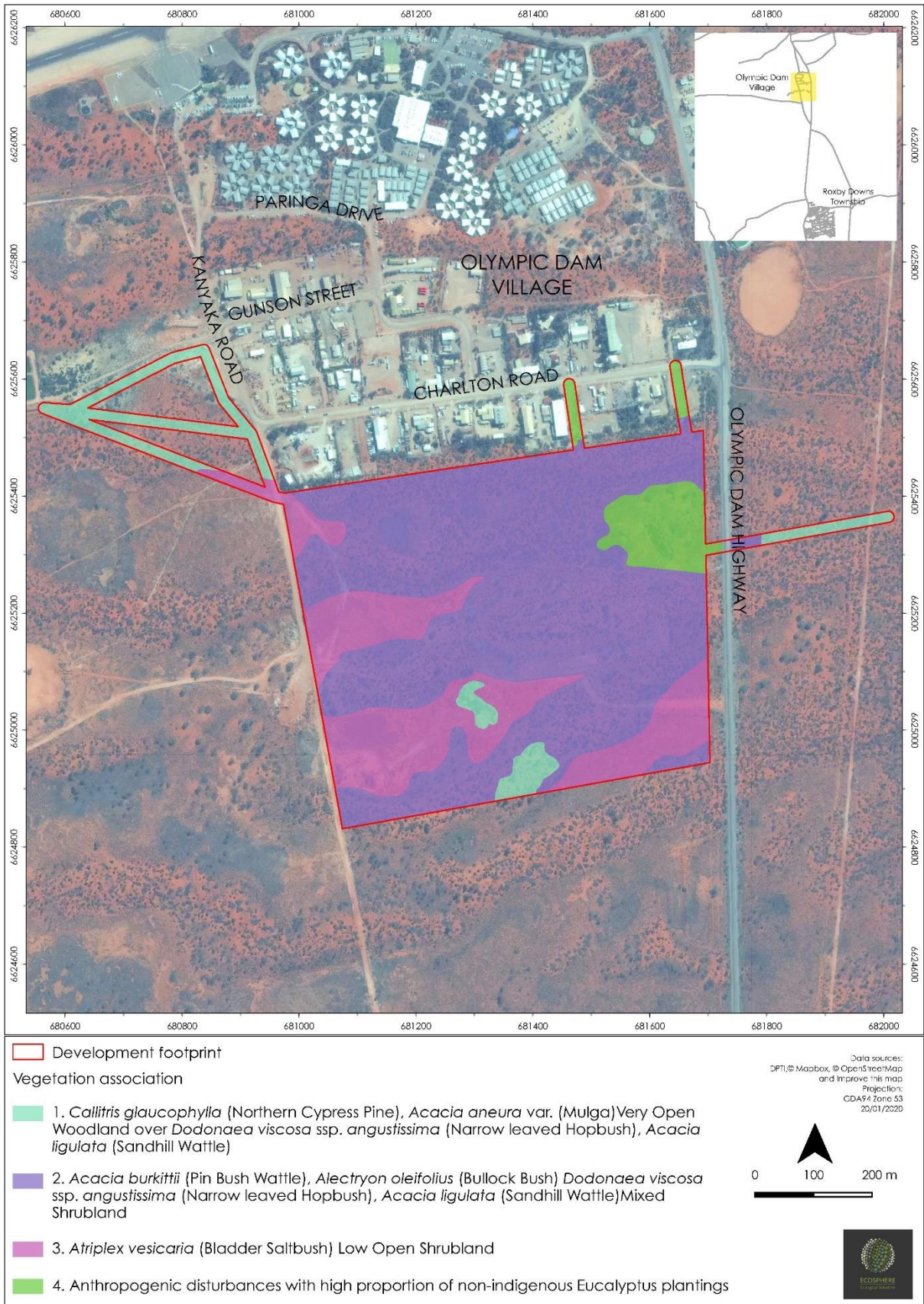


Figure 6. Vegetation associations within Olympic Dam South Project area.

**Vegetation association 1: *Callitris glaucophylla* (Northern Cypress Pine), *Acacia aneura* var. (Mulga) Very Open Woodland over *Dodonaea viscosa* subsp. *angustissima* (Narrow-leaved Hopbush), *Acacia ligulata* (Sandhill Wattle)**

Vegetation association 1 covered a large part of the overall Study area and was highly transitional between the *Callitris glaucophylla* (Northern Cypress Pine) dominant ridges and the low dune areas dominated by *Acacia ligulata* (Sandhill Wattle) and *Dodonaea viscosa* subsp. *angustissima* (Narrow-leaf Hopbush). The community had a high incidence of perennial grass tussocks and potentially the highest habitat value due to the large variation in species present and its structural diversity, with tall trees, shrubs, understorey shrubs and grasses all present. There was a low incidence of exotic flora species at the time of the survey. Figure 7 shows a representative photo of the community within the Study area, while Table 9 shows the species commonly recorded within this community during the assessment.



Figure 7. Vegetation association 1 representative photo showing mixed woodland structure.

Table 9. *Callitris glaucophylla* (Northern Cypress Pine), *Acacia aneura* var. (Mulga) Very Open Woodland over *Dodonaea viscosa* subsp. *angustissima* (Narrow-leaved Hopbush), *Acacia ligulata* (Sandhill Wattle) community summary.

<b>Overstorey species</b>	<i>Callitris glaucophylla</i> (Northern Cypress Pine) <i>Acacia aneura</i> (Mulga) <i>Myoporum platycarpum</i> (False Sandalwood) <i>Alectryon oleifolius</i> (Bullock Bush)
<b>Midstorey species</b>	<i>Acacia ligulata</i> (Sandhill Wattle) <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> (Narrow-leaved Hopbush) <i>Acacia oswaldii</i> (Umbrella Wattle) <i>Senna petiolaris</i> (Senna) <i>Lycium australe</i> (Native Boxthorn)
<b>Understorey species</b>	<i>Roepera</i> sp. <i>Enchylaena tomentosa</i> (Ruby Saltbush) <i>Sida cunninghamii</i> (Sandhill Sida) <i>Eragrostis eriopoda</i> (Woollybutt) <i>Maireana pentatropis</i> (Tall Bluebush)
<b>Threatened species</b>	None observed
<b>Exotic species</b>	<i>Brassica tournefortii</i> (Wild Turnip)
<b>Landscape context</b>	1.08
<b>Vegetation condition</b>	45.61 (Medium)
<b>Conservation significance</b>	1.10
<b>UBS</b>	54.19



**Vegetation association 2: *Acacia burkittii* (Pin Bush Wattle), *Alectryon oleifolius* (Bullock Bush), *Dodonaea viscosa* subsp. *angustissima* (Narrow-leaved Hopbush), *Acacia ligulata* (Sandhill Wattle) Mixed Shrubland.**

Vegetation association 2 was a transitional community between the *Callitris glaucophylla* (Northern Cypress Pine) / *Acacia aneura* (Mulga) Woodlands and the *Acacia papyrocarpa* (Western Myall) Low Open Woodlands that occurred further south and west of the project site. When dunes were present as undulating low structures without distinct parallel lines, this community dominated. The cover values in this community were moderate with significant emergence of *Senna* sp. within most fragments. Habitat values for this community were moderate with low dense shrubs providing refuge habitat for small mammals and reptiles. There was a high incidence of disturbance from rabbits within these areas and ringbarking of small *Senna* sp. and *Acacia ligulata* (Sandhill Wattle) shrubs was observed. Table 10 shows the species commonly recorded within this community during the assessment while Figure 8 shows a representative photo of the community.



Figure 8. Low undulating sand dune with *Acacia burkittii* / *Alectryon oleifolius* Shrubland.

Table 10. *Acacia burkittii* (Pin Bush Wattle), *Alectryon oleifolius* (Bullock Bush) *Dodonaea viscosa* subsp. *angustissima* (Narrow-leaved Hopbush), *Acacia ligulata* (Sandhill Wattle) Mixed Shrubland community summary.

<b>Overstorey species</b>	<i>Acacia burkittii</i> (Pin Bush Wattle) <i>Acacia aneura</i> (Mulga) <i>Alectryon oleifolius</i> (Bullock Bush)
<b>Midstorey species</b>	<i>Acacia ligulata</i> (Sandhill Wattle) <i>Eremophila scoparia</i> (Lilac Emubush) <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> (Narrow-leaved Hopbush) <i>Acacia oswaldii</i> (Umbrella Wattle) <i>Senna petiolaris</i> (Senna) <i>Lycium australe</i> (Native Boxthorn)
<b>Understorey species</b>	<i>Enchylaena tomentosa</i> (Ruby Saltbush) <i>Sida cunninghamii</i> (Sandhill Sida) <i>Maireana pentatropis</i> (Tall Bluebush) <i>Tetragonia eremaea</i> (Native Spinach) <i>Erodium malacoides</i> (Storks Bill) <i>Maireana georgei</i> (Satiny Bluebush)
<b>Threatened species</b>	None observed
<b>Exotic species</b>	<i>Brassica tournefortii</i> (Wild Turnip)
<b>Landscape context</b>	1.08
<b>Vegetation condition</b>	45.73 (Medium)
<b>Conservation significance</b>	1.10
<b>UBS</b>	54.33

### Vegetation association 3: *Atriplex vesicaria* (Bladder Saltbush) Low Open Shrubland

Vegetation association 3 was observed to be in a climax community state. Many of the shrubs had almost completely defoliated as a result of dry conditions. The species richness within these areas was low with the dominant overstorey providing most of the community cover. This is indicative of low disturbance and highly functional landforms meaning that despite the lean prevailing conditions, this community has the capacity to rebound extremely well. The association represents as a stable community with moderately intact soil crusts, low to moderate disturbances from animal tracks and few large patches of bare soils. Weed cover was not observed within this community. Figure 9 shows a representative photo of the community within the Study area and Table 11 shows the species commonly recorded within this community during the assessment.



Figure 9. *Atriplex vesicaria* (Bladder Saltbush) shrubland fringing dune with Association 2 OD South.

Table 11. *Atriplex vesicaria* (Bladder Saltbush) Low Open Shrubland community summary.

<b>Overstorey species</b>	<i>Atriplex vesicaria</i> (Bladder Saltbush)
<b>Midstorey species</b>	<i>Sclerolaena patenticuspis</i> (Spear fruit Bindyi) <i>Maireana integra</i> <i>Sclerolaena divaricata</i> (Yellow Poverty bush)
<b>Understorey species</b>	<i>Dissocarpus paradoxus</i> (Cannonball) <i>Austrostipa</i> sp. (Spear Grass)
<b>Threatened species</b>	None observed
<b>Exotic species</b>	None observed
<b>Landscape context</b>	1.08
<b>Vegetation condition</b>	52.50 (Medium / High)
<b>Conservation significance</b>	1.10
<b>UBS</b>	62.37

**Vegetation association 4: Anthropogenic disturbances with high proportion of non-indigenous *Eucalyptus* plantings**

Two areas within OD south Project area had been previously disturbed, with historic anthropogenic features such as terracing and plantings of non-indigenous *Eucalyptus* species, mostly of WA goldfields region origin, evident. One section within the Project area was still relatively different from the surrounding vegetation however the primary camp area had rehabilitated to be largely consistent with surrounding vegetation. Table 12 shows the species commonly recorded within this community during the assessment while Figure 10 shows a representative photo of the community within the Study area.



Figure 10. Non-Indigenous *Eucalyptus* species within understorey of *Senna* spp. RD West.

Table 12. Anthropogenic disturbances with high proportion of non-indigenous *Eucalyptus* plantings community summary.

<b>Overstorey species</b>	<b><i>Eucalyptus</i> spp.</b>
<b>Midstorey species</b>	<i>Acacia ligulata</i> (Sandhill Wattle) <i>Senna petiolaris</i> (Senna) <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> (Narrow leaved Hopbush)
<b>Understorey species</b>	<i>Enchylaena tomentosa</i> (Ruby Saltbush) <i>Tetragonia eremaea</i> (Native Spinach) <i>Erodium malacoides</i> (Storks Bill) <i>Maireana georgei</i> (Satiny Bluebush)
<b>Threatened species</b>	None observed
<b>Exotic species</b>	<i>Brassica tournefortii</i> (Wild Turnip)
<b>Landscape context</b>	1.08
<b>Vegetation condition</b>	38.25 (Medium / Low)
<b>Conservation significance</b>	1.10
<b>UBS</b>	45.44

### 6.3.5 Fauna assessment

One native and three exotic mammal species were recorded within the Study area (Table 13). The Red Kangaroo (*Macropus rufus*) was common throughout the Study area. The European Rabbit (*Oryctolagus cuniculus*), which is an introduced pest species common in all states, was widespread and common. The Red Fox (*Vulpes vulpes*) was observed from numerous tracks across the Project area. Cat (*Felis catus*) tracks were also observed frequently.

Two reptile species were recorded during the survey (Table 13). The Shingleback Lizard (*Tiliqua rugosa*) is common to the documented habitat types and were recorded across the Study area. The Sand Goanna (*Varanus gouldii*) was observed via tracks and this species is also common in South Australia.

A total of 37 bird species were recorded within and adjacent to the Project area, 26 of which were commonly occurring and widespread (Table 13). One of the species was listed as Rare within South Australia; Musk Duck (*Biziura lobata*) which was located on one of the wastewater treatment ponds north of the RD West project area. No exotic bird species were recorded during the survey.

The desktop assessment highlighted three species as being possibly occurring within the Study area. A summary of the ecology of *Amytornis modestus indulkanna* and *Pseudomys australis* are provided below.

### ***Amytornis modestus indulkanna* (Thick-billed Grasswren)**

Thick-billed Grasswrens (*Amytornis modestus indulkanna*) have records from within 30 km of the Study area (ALA 2019b).

In South Australia, the genus has been described and separated taxonomically into three main subspecies. The genus itself is widespread from the Lake Frome basin, west to the eastern Lake Torrens basin, northwest to near Leigh Creek and Marree, and along the southern and western fringes of the Lake Eyre Basin (including the Davenport Ranges and near William Creek), and west to the Coober Pedy region (Badman, 1989; Brandle, 1998; Higgins *et al.* 2001; in TSSC 2016). The subspecies 'indulkanna' occupies the northern most and largest range of the three subspecies and is therefore far more commonly encountered provided the preferred habitat exists.

*Amytornis modestus indulkanna* occurs in chenopod shrublands in the arid and semi-arid zones, especially shrublands dominated by *Maireana* spp. (Bluebush) and *Atriplex* spp. (Saltbush), sometimes with widely scattered trees. The species favours chenopod shrublands, especially those supporting larger *Maireana* spp. and *Atriplex* spp. along drainage lines and flood plains (Black, Carpenter & Pedler 2011). Other studies have also indicated that the species persists in low chenopod shrublands, particularly where water courses are present (NPWS, 2002) and/or in areas dominated by both *Atriplex* spp. and *Maireana* spp. (Garnett and Crowley, 2000).

A habitat assessment was undertaken as part of this study and only very small fragments of chenopod shrubland existed within the OD south Project area (Association 3). This was largely *Atriplex vesicaria* (Bladder Saltbush) with areas of overstorey shrubs present which is not known to be preferred habitat when present as small, isolated patches with no other preferred vegetation patches found within proximity. It was therefore considered extremely unlikely that Thick-billed Grasswren inhabit the OD south Project area.

### ***Pseudomys australis* (Plains Rat)**

Terrestrial mammals within arid habitats are highly variable in abundance, mainly due to the climatic conditions that are being experienced during the season or year at the time. These species react rapidly to rainfall events and can go from total obscurity to large populations in short time periods. Arid species react to optimum conditions when resources are expected to be prevalent. Aided by early sexual maturity, short gestation periods and large litter size, species from the Muridae families produce population explosions known as irruptions. The nationally threatened Plains Rat (*Pseudomys australis*) are well known for this trait, and as such when conditions are optimal for this species it can be expected that they will be

present, and potentially in large numbers. Predavec (1994), recorded changes in abundance of two species of rodents up to a 40-fold increase from the lowest to highest abundance with a four month lag period from high rainfall events.

Plains Rat is primarily found across gibber (stone-covered) plains, mid slopes characterised by boulders and small stones, and gilgais. Primary habitat comprises drainage channels and depressions with deep friable cracking clays. These habitats are best able to collect water from even minor falls of rain. Secondary habitats are associated with gilgais and minor drainage areas with low perennial chenopod shrublands and heavier cracking clays (Brandle, Moseby & Adams 1999). In years of high rainfall, this species occurs on adjoining sandy plains. During poor conditions, core refuge areas may occur on gilgais and watercourses of gibber plains. The Plains Rat is known from the region, and widespread refuge habitat is available on the nearby Arcoona Plateau. This species shows incredible resilience, being able to persist for long periods underground lying in wait for the next boom period to breed. This species is unlikely to occur within the Project area, other than as dispersing individuals during periods of breeding.

Based on the habitat analysis undertaken, no part of the OD south Project area is suitable 'refuge' habitat for the Plains Rat (clay gilgais).



Table 13. Fauna species recorded across the overall Study area.

Scientific Name	Common Name	Habitat Comment	EPBC Act	NPW Act	Exotic
<b>Birds</b>					
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	Widespread			
<i>Acanthiza apicalis</i>	Inland Thornbill	Woodlands			
<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill	Woodlands			
<i>Anas gracilis</i>	Grey Teal	WWTP			
<i>Anas superciliosa</i>	Pacific Black Duck	WWTP			
<i>Anthus australis</i>	Australian Pipit	Low Shrublands			
<i>Aphelocephala leucopsis</i>	Southern Whiteface	Low Shrublands			
<i>Aquila audax</i>	Wedge-tailed Eagle	Flyover			
<i>Artamus cinereus</i>	Black-faced Woodswallow	Widespread			
<i>Artamus personatus</i>	Masked Woodswallow	Widespread			
<i>Aythya australis</i>	Hardhead	WWTP			
<i>Biziura lobata</i>	Musk Duck	WWTP		R	
<i>Cacatua sanguinea</i>	Little Corella	Widespread			
<i>Cheramoeca leucosterna</i>	White-backed Swallow	Shrublands			
<i>Corvus coronoides</i>	Australian Raven	Widespread			
<i>Cracticus torquatus</i>	Grey Butcherbird	Woodlands			
<i>Cygnus atratus</i>	Black Swan	WWTP			
<i>Euseyornis melanops</i>	Black-fronted Dotterel	WWTP			
<i>Falco cenchroides</i>	Nankeen Kestrel	Woodlands			
<i>Fulica atra</i>	Eurasian Coot	WWTP			
<i>Grallina cyanoleuca</i>	Magpie-lark	Woodlands			
<i>Gymnorhina tibicen</i>	Australian Magpie	Widespread			
<i>Haliastur sphenurus</i>	Whistling Kite	Widespread			
<i>Hirundo neoxena</i>	Welcome Swallow	Widespread			
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck	WWTP			
<i>Malurus lamberti</i>	Variegated Fairywren	Widespread			

Scientific Name	Common Name	Habitat Comment	EPBC Act	NPW Act	Exotic
<i>Malurus leucopterus</i>	White-winged Fairywren	Low Shrublands			
<i>Manorina flavigula wayensis</i>	Yellow-throated Miner	Widespread			
<i>Milvus migrans</i>	Black Kite	Widespread			
<i>Ocyphaps lophotes</i>	Crested Pigeon	Widespread			
<i>Pachycephala rufiventris</i>	Rufous Whistler	Callitris Woodland			
<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe	WWTP			
<i>Pomatostomus superciliosus</i>	White-browed Babbler	Shrublands			
<i>Psephotus haematonotus</i>	Mulga Parrot	Widespread			
<i>Rhipidura leucophrys</i>	Willie Wagtail	Widespread			
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	WWTP			
<i>Taeniopygia guttata</i>	Zebra Finch	Low Shrubland			
<b>Mammals</b>					
<i>Felis catus</i>	Cat	Widespread			*
<i>Macropus rufus</i>	Red Kangaroo	Widespread			
<i>Oryctolagus cuniculus</i>	European Rabbit	Widespread			*
<i>Vulpes vulpes</i>	Red Fox	Widespread			*
<b>Reptiles</b>					
<i>Tiliqua rugosa</i>	Shingleback Lizard	Widespread			
<i>Varanus gouldii</i>	Sand Goanna	Widespread			

## 7 Requirement of the NV Regulations

A SEB is required to be implemented to obtain approval to clear native vegetation under Regulation 12(34) – Infrastructure of the NV Regulations. The NVC must be satisfied that, as a result of the loss of native vegetation, a SEB will result in a positive outcome for the environment that is over and above the negative impact of native vegetation clearance.

### 7.1 Direct impacts

The direct impact of construction of the proposed accommodation village will be the clearance of a maximum of 42.6 hectares of native vegetation. It is important to note that this is the maximum predicted clearance based on clearance of the entire OD south temporary accommodation village service corridors as shown in Figure 2.

The removal of the vegetation will leave a hardstand area that can be used for accommodation camp as required or for storage and industrial landuse. The loss of the vegetation accounts for a reduction in the habitat remaining in the immediate area however this is minor given the intact nature of surrounding vegetation. The extent of the clearance and location adjacent to already cleared areas does not pose significant risks in the fragmentation of habitats or directly interfere with biodiversity corridors such as drainage channels or other linear passages that have played roles in allowing wildlife to move through the landscape easier than the surrounding areas.

### 7.2 Indirect impacts

Indirect impacts may occur as a result of native vegetation clearing, including the following:

- a low risk of changes to faunal community structure as increases in exotic predators such as foxes and cats can be driven by increased access to food resources and water. The proximity to the Olympic Dam industrial area and associated infrastructure would suggest that an increase in the cleared area would have a very minimal impact on the density and abundance of feral predators. This risk is nominal.
- a low risk of increase in abundance of exotic flora species through unintentional dispersal via machinery and construction equipment, and increased vehicle traffic. It is unlikely that any new weed incursions would occur as part of this project with most of the 800 people coming to and from site as a fly in fly out basis.

## 7.3 Risk Assessment

Certain clearance activities with a potential high or unknown level of risk of doing irreversible damage to biodiversity are required to undergo the risk assessment (Regulation 16). There are four levels of risk, depending on the significance of the vegetation proposed to be cleared. Level 1 poses a very low risk to biodiversity, and Level 4 poses a high risk to biodiversity.

To assess the level of risk of a proposal, the Native Vegetation Council (NVC), through the Department of Environment, Water and Natural Resources (DEWNR), considers the:

1. size of the clearance (area of clearance or number of trees to be cleared)
2. presence of threatened species or communities (representing three of the 'Principles of Clearance' from the Act).

Criteria for assessing and approving applications are shown in Table 14 below.

The Olympic Dam South Project covers 42.6 hectares which immediately elevates it to a level 3 assessment. The total biodiversity score (TBS) is less than 2500 (Table 16) however escalating matters deem that the threatened fauna score of 0.1 means that the clearance is seriously at variance with Principles of Clearance of Native Vegetation (b)it has significance for wildlife. This therefore results in a level 4 assessment.

Table 14. Risk assessment pathway.

		Agricultural (AMLR, EP, N&Y, SAMDB, KI and SE Region)		Pastoral (SAAL and AW NRM regions)		Escalating matters Clearance assessment will be raised to the next level if;	Approval
		Patches - clearance	Trees - clearance	Patches - clearance	Trees - clearance		
<b>Level 1</b>		<b>0.05 ha</b> or less	<b>5 trees</b> or less	<b>3 ha</b> or less	<b>5 trees</b> or less	Clearance involves <b>any</b> trees with a trunk circumference measured at 1m above the ground of (for multi-stemmed trees, measure the largest trunk/stem): <ul style="list-style-type: none"> <li>- 50cm or more for Agricultural zone, or</li> <li>- 30cm or more for the Pastoral zone;</li> </ul> or There is an associated application within the last 5 years; or There is a high likelihood (as determined by NVC delegate) that the site contains or is habitat for a species listed under the <i>National Parks &amp; Wildlife Act 1972</i> or a threatened community under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> .	<b>Delegation:</b> NVB, DPC Mining, SOPs
Assessment	Desktop assessment (Applicant to provide information) – a map of area of impact, site photographs, explanation of the purpose of clearance, why there is no alternative, and whether there has been any other clearance application in the last 5 years						
SEB	\$500 payment into the Native Vegetation Fund						
<b>Level 2</b>		<b>&gt;0.05 ha to 0.5 ha</b>	<b>6 - 20 trees</b>	<b>&gt; 3 ha to 10 ha</b>	<b>6 - 20 trees</b>	The clearance is seriously at variance with <i>Native Vegetation Act 1991</i> Principle of Clearance b, c or d (schedule 1).	<b>Delegation:</b> NVB, DPC Mining, SOPs
Assessment	Field assessment (Accredited Consultant) – Bushland, Rangeland or Scattered Tree Assessment Manual 2017						
SEB	Determined as per NVC SEB Policy and Guide 2017						
<b>Level 3</b>		Total Biodiversity Score of less than or equal to <b>250</b>		Total Biodiversity Score of less than or equal to <b>2500</b> .		The clearance is seriously at variance with <i>Native Vegetation Act 1991</i> Principle of Clearance b, c or d (schedule 1).	<b>Delegation:</b> NVB, DPC Mining
Assessment	Field assessment (Accredited Consultant) - Bushland, Rangeland or Scattered Tree Assessment Manual 2017 and a documented Fauna Survey.						
SEB	Determined as per NVC SEB Policy and Guide 2017						
<b>Level 4</b>		Total Biodiversity Score of greater than <b>250</b>		Total Biodiversity Score of greater than <b>2500</b>			<b>Delegation:</b> NVAP, DPC Mining
Assessment	Field assessment (Accredited Consultant) - Bushland, Rangeland or Scattered Tree Assessment Manual 2017 and a documented Fauna Survey. <i>Applications are made available to the public and referred to the relevant agency or body for comment</i>						
SEB	Determined as per NVC SEB Policy and Guide 2017						

## 8 Mitigation hierarchy

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must have regard to the mitigation hierarchy. The NVC will assess the measures taken to avoid and minimize impacts on biodiversity and rare or threatened species or ecological communities within the property or immediate vicinity of the development.

### 8.1 Avoidance

BHP have endeavoured to avoid the clearance of vegetation in undertaking the shutdown work. Several scenarios have been investigated with options including existing accommodation at Roxby Downs, the existing Olympic Dam Village and new village options at Olympic Dam South and Roxby Downs West. The current extent of works requires another 800 accommodation beds as a minimum. Therefore, BHP have settled on a disturbance scenario at Olympic Dam South immediately adjacent to the existing Olympic Dam Industrial area. This avoids significant clearance in the following ways:

- temporary accommodation facility;
  - foregoes the requirement for permanent footings;
  - plumbing and power infrastructure can be over ground or aerial rather than buried for removal at a later date.
- utilises an area previously disturbed and (partially) rehabilitated; and
- requires little in the way of new access tracks with existing site access and nearby infrastructure such as waste water treatment plants.

### 8.2 Minimization

Reducing the project size from 1500 people to 800 essentially halves the requirement in village area from 96 hectares proposed at Roxby Downs West down to 42.6. There are two existing access areas, Kanyaka Road on the western side and Olympic Way on the eastern side. Both roads have existing entry / exit points. The Olympic Dam South Project area utilises an area of past disturbance where rehabilitation has occurred. Some of these areas have returned to the original and surrounding indigenous vegetation structure however the absence of trees of old age cohorts are still absent making this option potentially more attractive than areas where trees are present that may be well over a century old. Any vegetation within the project footprint that may remain within the footprint will be retained where possible.

## 8.3 Rehabilitation or restoration

The proposed project footprint is in an area that has not been subjected to pastoral activities for a substantial period. Therefore, many species which typically respond very poorly to livestock impacts, such as *Callitris glaucophylla* (Northern Cypress Pine) and *Alectryon oleifolius* (Bullock Bush), were exhibiting characteristics not often observed in pastoral regions, with mostly intact canopies and regeneration observed. This results in trees of healthy characteristics and often means they are better able to produce reproductive material such as seed in comparison to modified structures impacted by extensive ungulate browsing.

## 8.4 Offset

Offsetting is the preferred method of achieving the SEB for the construction of the project. See Section 9.3 for details of the proposed offset.

## 9 Significant environmental benefit

### 9.1 Overview

In South Australia, native vegetation is protected by the NV Act and the associated NV Regulations. The NVC, an independent body appointed by the Governor of South Australia, administers the NV Act, and is responsible for making decisions about a wide range of matters concerning native vegetation in South Australia, including whether to approve native vegetation clearance.

### 9.2 Determination of the SEB obligation

The SEB obligation is quantified by multiplying the geographical hectare area by the unit biodiversity score to give a total biodiversity score. The total maximum area of clearance is 42.6 ha (Table 17).

The individual hectares represented by each vegetation association is multiplied by the UBS, resulting in subsequent points of loss and overall hectare requirement. Table 18 below shows the outcome of the rangeland's assessment sheets requiring a SEB offset amount of 2,459.58 points in total.



Table 15. Clearance summary of individual associations within OD south Project area.

Assoc #	Vegetation Association description	Total ha
1	<i>Callitris glaucophylla</i> (Northern Cypress Pine), <i>Acacia aneura</i> var. (Mulga) Very Open Woodland over <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> (Narrow leaved Hopbush), <i>Acacia ligulata</i> (Sandhill Wattle)	3.42
2	<i>Acacia burkittii</i> (Pin Bush Wattle), <i>Alectryon oleifolius</i> (Bullock Bush) <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> (Narrow leaved Hopbush), <i>Acacia ligulata</i> (Sandhill Wattle) Mixed Shrubland	27.20
3	<i>Atriplex vesicaria</i> (Bladder Saltbush) Low Open Shrubland	9.30
4	Anthropogenic disturbances with high proportion of non-indigenous <i>Eucalyptus</i> plantings	2.67
<b>Total</b>		<b>42.59</b>

Table 16. Biodiversity score and SEB points requirement for individual associations within OD south Project area.

Association	Hectares cleared	Total biodiversity score	Points of loss
1	3.42	183.6	192.78
2	27.20	1463.99	1537.19
3	9.30	574.67	603.4
4	2.67	120.2	126.21
<b>Total</b>	<b>42.59</b>	<b>2342.46</b>	<b>2459.58</b>

## 9.3 Achieving SEB

BHP wish to utilise an existing SEB offset area credit at Emerald Springs. This SEB area is approximately 38,022 hectares in size, is located 120 km north of Olympic Dam and lies within the Stuart Creek Pastoral Lease / Station along the Oodnadatta Track. Emerald Springs is located to the west of Lake Eyre South (Kati Thanda-Lake Eyre National Park). It is also adjacent to the western side of the already established SEB area, Gosse Springs (which is adjacent to the Finnis Springs Indigenous Lands on its eastern boundary) and the eastern boundary of the Wabma Kadarbu Conservation Park. The total SEB points credit of Emerald Springs is 267,143 SEB points.

- Establish a new SEB Area on land owned by the proponent.
- Use part of Emerald Springs SEB Credit of 267,147 points that the proponent has established. Credit Ref. No. \_\_\_\_\_
- Apply to have SEB Credit assigned from another person or body. The [application form](#) needs to be submitted with this Data Report.
- Apply to have an SEB to be delivered by a Third Party. The [application form](#) needs to be submitted with this Data Report.
- Pay into the Native Vegetation Fund

## 10 References

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# 11 Appendices

Appendix 1. Rangelands Assessment Scoresheets associated with the proposed clearance and SEB area.

Rangeland Assessment Scoresheet		(Version - 4 January 2018)	
<b>Block (name)</b>	Roxby	<b>ASSESSOR(S)</b>	Andrew Sinel
<b>NRM Region</b>	South Australian Arid Lands	<b>DATE OF ASSESSMENT</b>	14/08/2019
<b>IBRA Sub Region</b>	Roxby		
<b>Property</b>	N/A		
<b>Map of the Block (Including the Sites)</b>			
		Map	
<b>Landscape Context Scores</b>			
<b>Number of Landform Features within Block</b>	1		
1 = 0.01pts, 2 = 0.03pts, > 2 = 0.06pts	0.01		
<b>Size of the Block</b>	42.6		
<10ha = 0; 10 - <100ha = 0.01pts; 100 - <500ha = 0.02pts; 500 - <1000ha = 0.03pts; 1000 - <2000ha = 0.04pts; 2000 - 5000 = 0.05pts; >5000pts = 0.06pts	0.01		
<b>% native veg. protected in IBRA Sub region</b>	0		
0-2% = 0.05 pts; >2-5% = 0.04 pts; >5-10% = 0.03 pts; >10-25% = 0.02 pt; >25% = 0.01 pt	0.05		
		<b>Wetland or Riparian Habitat present</b>	
		Does the block contain a wetland feature (Yes/No)	
		Permanent or semi permanent = 0.08 pt	No
		Contains water for at least 6 months of the year	
		Occasionally contains water = 0.05 pts	No
		Contains water approximately once every 5 years	
		Very occasionally contains water = 0.02 pts	No
		Contains water approximately once every 20 years	
		<b>Score</b>	0
<i>Note: Blocks will score a minimum Landscape Context Score of 1</i>		<b>LANDSCAPE CONTEXT SCORE (max 1.25)</b>	1.07




Vegetation Condition Scores																			
SITE (name):		RDV01	SIZE OF SITE (Ha) 3.42																
VEGETATION ASSOCIATION DESCRIPTION		Callitris glaucophylla (white Native Pine), Acacia aneura var.																	
LANDSCAPE TYPE		Dunefield																	
SURFACE CHARACTER		Domina	Hummock	Minor															
<b>Biotic Disturbance Indicators</b>																			
with trees and large shrubs only (select one tickbox for each row)		Sites	Domina	Minor	None -	Score													
			>50%	<50%	0														
Presence of palatable shrubs or perennial grasses under the canopy of tree/shrub >3m			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1													
Presence of mostly intact litter mats under canopy of tree/shrub >3m tall (>50% of tree canopy area has intertwined litter or shrub cover)			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1													
<b>Total Score (Max 10 - weighted by 2)</b>					<b>5</b>														
<b>Physical Disturbance Indicators</b>																			
		Domina	Minor	None -	Score														
			>50%	<50%	0														
Prevalence of large patches of bare soil (> 5m x 5m) that shows no signs of productive capacity (ie ephemeral plant litter, stems etc.)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0													
Evidence of animal tracks, vehicle tracks or other physical disturbance to the natural land surface			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0													
Destabilised creek channel banks (if present), characterised by no vegetation or stabilizing roots, deflation and bank erosion. Inspect banks on both sides of channels.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1													
<b>Total Score (Max 18 - weighted by 3)</b>					<b>3</b>														
<b>Vegetation Stratum</b> (tick the <u>Present</u> box for all stratum that are present or tick for <u>Absent</u> box of any stratum that should be present but have been removed)																			
		Present	Absent		<i>Note: don't tick either box if stratum was likely never present - e.g. Trees stratum in a low shrubland</i>														
Trees/shrubs >3m		<input checked="" type="checkbox"/>	<input type="checkbox"/>																
Shrubs 1-3m		<input checked="" type="checkbox"/>	<input type="checkbox"/>																
Low shrubs <1m & hummock grasses		<input checked="" type="checkbox"/>	<input type="checkbox"/>																
Perennial tussock grasses with basal areas >30mm		<input checked="" type="checkbox"/>	<input type="checkbox"/>																
<b>Total Score (Max 16 - weighted by 4)</b>					<b>16</b>														
<b>Introduced Plant Species</b>																			
		Select	Score																
Declared species present?		No	2																
Introduced species dominate (>50% of vegetation cover)		<input type="checkbox"/>	2																
Moderate invasion of introduced species (5 to 50% of the vegetation cover)		<input type="checkbox"/>																	
Very sparse to nil introduced species present (<5% of vegetation cover)		<input checked="" type="checkbox"/>																	
<b>Total Score (Max 10 - weighted by 1)</b>					<b>10</b>														
<b>Vegetation Utilisation Score</b>																			
<b>Total Score (Max 26)</b>					<b>11.61</b>														
<b>Vegetation Condition Score Calculation</b>																			
<b>VEGETATION CONDITION SCORE</b>					<b>45.61</b>														
<table border="1"> <thead> <tr> <th>Component</th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>Vegetation Utilisation Score</td> <td>11.61</td> </tr> <tr> <td>Introduced Plant Species Score</td> <td>10</td> </tr> <tr> <td>Vegetation Stratum Score</td> <td>16</td> </tr> <tr> <td>Physical Disturbance Indicator</td> <td>3</td> </tr> <tr> <td>Biotic Disturbance Indicator</td> <td>5</td> </tr> <tr> <td><b>Vegetation Condition Score</b></td> <td><b>45.61</b></td> </tr> </tbody> </table>						Component	Score	Vegetation Utilisation Score	11.61	Introduced Plant Species Score	10	Vegetation Stratum Score	16	Physical Disturbance Indicator	3	Biotic Disturbance Indicator	5	<b>Vegetation Condition Score</b>	<b>45.61</b>
Component	Score																		
Vegetation Utilisation Score	11.61																		
Introduced Plant Species Score	10																		
Vegetation Stratum Score	16																		
Physical Disturbance Indicator	3																		
Biotic Disturbance Indicator	5																		
<b>Vegetation Condition Score</b>	<b>45.61</b>																		


Conservation Significance Score	
<b>Is the vegetation association considered a Threatened Ecological community or Ecosystem?</b>	<b>Yes/No</b>
State (Provisional List of Threatened Ecosystems of SA) <b>Rare</b> community (0.1 pt)	<input type="checkbox"/>
State (Provisional List of Threatened Ecosystems of SA) <b>Vulnerable</b> community (0.2 pts)	<input type="checkbox"/>
State (Provisional List of Threatened Ecosystems of SA) <b>Endangered</b> community (0.3 pts)	<input type="checkbox"/>
Nationally (EPBC Act) <b>Vulnerable</b> community (0.35 pts)	<input type="checkbox"/>
Contains a Nationally (EPBC Act) <b>Endangered</b> or <b>Critically Endangered</b> community (0.4 pts)	<input type="checkbox"/>
<i>Note: all sites will score a minimum Conservation Significance Score of 1</i>	<b>Score</b> 1
<b>Number of Threatened Plant Species recorded for within the Site</b>	<b>Number</b>
<i>*If a species has both a State (NPS&amp;W Act) and National (EPBC Act) rating, it's only recorded for its National rating.</i>	
State <b>Rare</b> species recorded (1 pt each)	0
State <b>Vulnerable</b> species recorded (2.5 pt each)	0
State <b>Endangered</b> recorded (5 pts each)	0
Nationally <b>Vulnerable</b> species recorded (10 pts each)	0
Nationally <b>Endangered</b> or <b>Critically endangered</b> species recorded (20 pts each)	0
0 = 0 pts; < 2 = 0.04 pts; 2 - < 5 = 0.08 pts; 5 - < 10 = 0.12 pts; 10 - < 20 = 0.16 pts; 20 or > = 0.2 pts	<b>0</b>
<b>Score</b>	0
<b>Potential habitat for Threatened Animal Species (number observed or recorded) for the Site</b>	<b>Number</b>
<i>*If a species has both a State (NPS&amp;W Act) and National (EPBC Act) rating, it's only recorded for its National rating.</i>	
State <b>Rare</b> species observed or locally recorded (1 pt each)	3
State <b>Vulnerable</b> species observed or locally recorded (2.5 pt each)	0
State <b>Endangered</b> species observed or locally recorded (5 pt each)	0
Nationally <b>Vulnerable</b> species observed or locally recorded (10 pts each)	2
Nationally <b>Endangered</b> or <b>Critically endangered</b> species observed or locally recorded (20 pts each)	0
0 = 0 pts; < 2 = 0.02 pts; 2 - < 5 = 0.04 pts; 5 - < 10 = 0.06 pts; 10 - < 20 = 0.08pts; 20 or > = 0.1 pts	<b>23</b>
<b>Score</b>	0.1
<b>CONSERVATION SIGNIFICANCE SCORE</b>	<b>1.1</b>
<b>Total Scores for the Site</b>	Vegetation Condition x Landscape Context x Conservation Significance =
<b>LANDSCAPE CONTEXT SCORE</b> 1.07	<b>UNIT BIODIVERSITY SCORE</b> 53.68
<b>VEGETATION CONDITION SCORE</b> 45.61	<b>Total Biodiversity Score</b>
<b>CONSERVATION SIGNIFICANCE SCORE</b> 1.10	<b>(Biodiversity Score x hectares)</b> 183.60
<b>Photo Point and Vegetation Survey Location</b>	<b>Direction of the Photo</b>
	Sw
	<b>GPS Reference</b>
	Datum GDA94
	Zone (52, 53 or 54) 53
	Easting (6 digits) 680260
Northing (7 digits) 6616619	
<b>Description</b>	Dominant dune community within project area Mixed Woodland on low undulating dunefield.
<input type="button" value="Clearance"/> <input type="button" value="SEB Area"/> <input type="button" value="Other"/>	
<b>Assessment for Clearance</b>	Approximate Hectares required 24.10
Loss Factor 1.0	Economies of Scale factor 0.11
Loadings for clearance of protected areas	Mean Annual rainfall for the site (mm) 172
Reductions for rehabilitation of impact site	Payment into the fund (GST Exclusive) <b>\$9,485.53</b>
<b>SEB Points of loss</b> 192.78	Administration fee (GST Inclusive) <b>\$521.70</b>




Vegetation Condition Scores					
<b>SITE (name):</b>	ODS02	<b>SIZE OF SITE (Ha)</b>	27.2		
<b>VEGETATION ASSOCIATION DESCRIPTION</b>	Acacia burkittii (Pin Bush Wattle), Alectryon oleifolius (Bullock				
<b>LANDSCAPE TYPE</b>	Plain - level				
<b>SURFACE CHARACTER</b>	<b>Dominant</b>	Hummock	<b>Minor</b>		
<b>Biotic Disturbance Indicators</b> with trees and large shrubs only (select one tickbox for each row)	<b>Sites</b>	<b>Dominant &gt;50%</b>	<b>Minor &lt;50%</b>	<b>None = 0</b>	<b>Score</b>
Presence of palatable shrubs or perennial grasses under the canopy of tree/shrub >3m		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Presence of mostly intact litter mats under canopy of tree/shrub >3m tall (>50% of tree canopy area has intertwined litter or shrub cover)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
<b>Total Score (Max 10 - weighted by 2)</b>					<b>5</b>
<b>Physical Disturbance Indicators</b>		<b>Dominant &gt;50%</b>	<b>Minor &lt;50%</b>	<b>None = 0</b>	<b>Score</b>
Prevalence of large patches of bare soil (> 5m x 5m) that shows no signs of productive capacity (ie ephemeral plant litter, stems etc.)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0
Evidence of animal tracks, vehicle tracks or other physical disturbance to the natural land surface		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Destabilised creek channel banks (if present), characterised by no vegetation or stabilizing roots, deflation and bank erosion. Inspect banks on both sides of channels.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
<b>Total Score (Max 18 - weighted by 3)</b>					<b>6</b>
<b>Vegetation Stratum</b> (tick the <b>Present</b> box for all stratum that are present or tick for <b>Absent</b> box of any stratum that should be present but have been removed)		<b>Present</b>	<b>Absent</b>	<i>Note: don't tick either box if stratum was likely never present - e.g. Trees stratum in a low shrubland</i>	
Trees/shrubs >3m		<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Shrubs 1- 3m		<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Low shrubs <1m & hummock grasses		<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Perennial tussock grasses with basal areas >30mm		<input checked="" type="checkbox"/>	<input type="checkbox"/>		
<b>Total Score (Max 16 - weighted by 4)</b>					<b>16</b>
<b>Introduced Plant Species</b>		<b>Select</b>	<b>Score</b>		
Declared species present?		No	2		
Introduced species dominate (>50% of vegetation cover)		<input type="checkbox"/>	2		
Moderate invasion of introduced species (5 to 50% of the vegetation cover)		<input type="checkbox"/>			
Very sparse to nil introduced species present (<5% of vegetation cover)		<input checked="" type="checkbox"/>			
<b>Total Score (Max 10 - weighted by 1)</b>					<b>10</b>
<b>Vegetation Utilisation Score</b>	<b>Total Score (Max 26)</b>				8.73
<b>Vegetation Condition Score Calculation</b>					
<b>VEGETATION CONDITION SCORE</b>					
<b>45.73</b>					
	Low	Medium	High		
Vegetation Utilisation Score					
Introduced Plant Species Score					
Vegetation Stratum Score					
Physical Disturbance Indicator					
Biotic Disturbance Indicator					
Vegetation Condition Score					

Conservation Significance Score		
<b>Is the vegetation association considered a Threatened Ecological community or Ecosystem?</b>	<b>Yes/No</b>	
State (Provisional List of Threatened Ecosystems of SA) <b>Rare</b> community (0.1 pt)	<input type="checkbox"/>	
State (Provisional List of Threatened Ecosystems of SA) <b>Vulnerable</b> community (0.2 pts)	<input type="checkbox"/>	
State (Provisional List of Threatened Ecosystems of SA) <b>Endangered</b> community (0.3 pts)	<input type="checkbox"/>	
Nationally (EPBC Act) <b>Vulnerable</b> community (0.35 pts)	<input type="checkbox"/>	
Contains a Nationally (EPBC Act) <b>Endangered</b> or <b>Critically Endangered</b> community (0.4 pts)	<input type="checkbox"/>	
<i>Note: all sites will score a minimum Conservation Significance Score of 1</i>	<b>Score</b> 1	
<b>Number of Threatened Plant Species recorded for within the Site</b>	<b>Number</b>	
<i>*If a species has both a State (NF&amp;W Act) and National (EPBC Act) rating, it's only recorded for its National rating.</i>		
State <b>Rare</b> species recorded (1pt each)	0	
State <b>Vulnerable</b> species recorded (2.5 pt each)	0	
State <b>Endangered</b> recorded (5 pts each)	0	
Nationally <b>Vulnerable</b> species recorded (10 pts each)	0	
Nationally <b>Endangered</b> or <b>Critically endangered</b> species recorded (20 pts each)	0	
0 = 0 pts; <2 = 0.04 pts; 2 - <5 = 0.08 pts; 5 - <10 = 0.12 pts; 10 - <20 = 0.16 pts; 20 or > = 0.2 pts	<b>0</b>	
<b>Score</b>	0	
<b>Potential habitat for Threatened Animal Species (number observed or recorded) for the Site</b>	<b>Number</b>	
<i>*If a species has both a State (NF&amp;W Act) and National (EPBC Act) rating, it's only recorded for its National rating.</i>		
State <b>Rare</b> species observed or locally recorded (1 pt each)	3	
State <b>Vulnerable</b> species observed or locally recorded (2.5 pt each)	0	
State <b>Endangered</b> species observed or locally recorded (5 pt each)	0	
Nationally <b>Vulnerable</b> species observed or locally recorded (10 pts each)	2	
Nationally <b>Endangered</b> or <b>Critically endangered</b> species observed or locally recorded (20 pts each)	0	
0 = 0 pts; <2 = 0.02 pts; 2 - <5 = 0.04 pts; 5 - <10 = 0.06 pts; 10 - <20 = 0.08pts; 20 or > = 0.1 pts	<b>23</b>	
<b>Score</b>	0.1	
<b>CONSERVATION SIGNIFICANCE SCORE</b>	<b>1.1</b>	
<b>Total Scores for the Site</b>	Vegetation Condition x Landscape Context x Conservation Significance =	
<b>LANDSCAPE CONTEXT SCORE</b> 1.07	<b>UNIT BIODIVERSITY SCORE</b> 53.82	
<b>VEGETATION CONDITION SCORE</b> 45.73	<b>Total Biodiversity Score</b>	
<b>CONSERVATION SIGNIFICANCE SCORE</b> 1.10	<b>(Biodiversity Score x hectares)</b> 1463.99	
<b>Photo Point and Vegetation Survey Location</b>	<b>Direction of the Photo</b>	
	West	
	<b>GPS Reference</b>	
	Datum GDA94	
	Zone (52, 53 or 54) 53	
	Easting (6 digits) 681511	
Northing (7 digits) 6624347		
	<b>Description</b>	
	transitional community on low slowly undulating dunefield, often co dominant without defined boundaries between site 1 and site 2.	
<input type="button" value="Clearance"/>	<input type="button" value="SEB Area"/>	<input type="button" value="Other"/>
<b>Assessment for Clearance</b>	Approximate Hectares required	192.15
Loss Factor 1.0	Economies of Scale factor	0.11
Loadings for clearance of protected areas	Mean Annual rainfall for the site (mm)	172
Reductions for rehabilitation of impact site	Payment into the fund (GST Exclusive)	<b>\$75,635.70</b>
<b>SEB Points of loss</b> 1537.19	Administration fee (GST Inclusive)	<b>\$4,159.96</b>

Vegetation Condition Scores																			
<b>SITE (name):</b>		ODS03		<b>SIZE OF SITE (Ha)</b> 9.3															
<b>VEGETATION ASSOCIATION DESCRIPTION</b>		Atrilex vesicaria Open Shrubland																	
<b>LANDSCAPE TYPE</b>		Dunefield																	
<b>SURFACE CHARACTER</b>		<b>Domina</b> Pavement		<b>Minor</b> Stony															
<b>Biotic Disturbance Indicators</b>																			
Sites with trees and large shrubs only (select one tickbox for each row)		<b>Domina nt &gt;50%</b>	<b>Minor &lt;50%</b>	<b>None - 0</b>	<b>Score</b>														
Presence of palatable shrubs or perennial grasses under the canopy of tree/shrub >3m		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1														
Presence of mostly intact litter mats under canopy of tree/shrub >3m tall (>50% of tree canopy area has intertwined litter or shrub cover)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1														
<b>Total Score (Max 10 - weighted by 2)</b>					<b>5</b>														
<b>Physical Disturbance Indicators</b>																			
		<b>Domina nt &gt;50%</b>	<b>Minor &lt;50%</b>	<b>None - 0</b>	<b>Score</b>														
Prevalence of large patches of bare soil (> 5m x 5m) that shows no signs of productive capacity (ie ephemeral plant litter, stems etc.)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1														
Evidence of animal tracks, vehicle tracks or other physical disturbance to the natural land surface		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1														
Destabilised creek channel banks (if present), characterised by no vegetation or stabilizing roots, deflation and bank erosion. Inspect banks on both sides of channels.		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2														
<b>Total Score (Max 18 - weighted by 3)</b>					<b>12</b>														
<b>Vegetation Stratum</b> (tick the <u>Present</u> box for all stratum that are present or tick for <u>Absent</u> box of any stratum that should be present but have been removed)																			
		<b>Present</b>	<b>Absent</b>	<i>Note: don't tick either box if stratum was likely never present - e.g. Trees stratum in a low shrubland</i>															
Trees/shrubs >3m		<input type="checkbox"/>	<input type="checkbox"/>																
Shrubs 1- 3m		<input type="checkbox"/>	<input checked="" type="checkbox"/>																
Low shrubs <1m & hummock grasses		<input checked="" type="checkbox"/>	<input type="checkbox"/>																
Perennial tussock grasses with basal areas >30mm		<input checked="" type="checkbox"/>	<input type="checkbox"/>																
<b>Total Score (Max 16 - weighted by 4)</b>					<b>6</b>														
<b>Introduced Plant Species</b>																			
		<b>Select</b>		<b>Score</b>															
Declared species present?		No		2															
Introduced species dominate (>50% of vegetation cover)		<input type="checkbox"/>		2															
Moderate invasion of introduced species (5 to 50% of the vegetation cover)		<input type="checkbox"/>																	
Very sparse to nil introduced species present (<5% of vegetation cover)		<input checked="" type="checkbox"/>																	
<b>Total Score (Max 10 - weighted by 1)</b>					<b>10</b>														
<b>Vegetation Utilisation Score</b>																			
<b>Total Score (Max 26)</b>					<b>19.50</b>														
<b>Vegetation Condition Score Calculation</b>																			
<b>VEGETATION CONDITION SCORE</b>					<b>52.50</b>														
<table border="1"> <thead> <tr> <th>Indicator</th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>Vegetation Utilisation Score</td> <td>19.50</td> </tr> <tr> <td>Introduced Plant Species Score</td> <td>10</td> </tr> <tr> <td>Vegetation Stratum Score</td> <td>6</td> </tr> <tr> <td>Physical Disturbance Indicator</td> <td>12</td> </tr> <tr> <td>Biotic Disturbance Indicator</td> <td>5</td> </tr> <tr> <td><b>Vegetation Condition Score</b></td> <td><b>52.50</b></td> </tr> </tbody> </table>						Indicator	Score	Vegetation Utilisation Score	19.50	Introduced Plant Species Score	10	Vegetation Stratum Score	6	Physical Disturbance Indicator	12	Biotic Disturbance Indicator	5	<b>Vegetation Condition Score</b>	<b>52.50</b>
Indicator	Score																		
Vegetation Utilisation Score	19.50																		
Introduced Plant Species Score	10																		
Vegetation Stratum Score	6																		
Physical Disturbance Indicator	12																		
Biotic Disturbance Indicator	5																		
<b>Vegetation Condition Score</b>	<b>52.50</b>																		

Conservation Significance Score		
<b>Is the vegetation association considered a Threatened Ecological community or Ecosystem?</b>	<b>Yes/No</b>	
State (Provisional List of Threatened Ecosystems of SA) <b>Rare</b> community (0.1 pt)	<input type="checkbox"/>	
State (Provisional List of Threatened Ecosystems of SA) <b>Vulnerable</b> community (0.2 pts)	<input type="checkbox"/>	
State (Provisional List of Threatened Ecosystems of SA) <b>Endangered</b> community (0.3 pts)	<input type="checkbox"/>	
Nationally (EPBC Act) <b>Vulnerable</b> community (0.35 pts)	<input type="checkbox"/>	
Contains a Nationally (EPBC Act) <b>Endangered</b> or <b>Critically Endangered</b> community (0.4 pts)	<input type="checkbox"/>	
<i>Note: all sites will score a minimum Conservation Significance Score of 1</i>	<b>Score</b> 1	
<b>Number of Threatened Plant Species recorded for within the Site</b>	<b>Number</b>	
<i>*If a species has both a State (INP&amp;W Act) and National (EPBC Act) rating, it's only recorded for its National rating.</i>		
State <b>Rare</b> species recorded (1 pt each)	0	
State <b>Vulnerable</b> species recorded (2.5 pt each)	0	
State <b>Endangered</b> recorded (5 pts each)	0	
Nationally <b>Vulnerable</b> species recorded (10 pts each)	0	
Nationally <b>Endangered</b> or <b>Critically endangered</b> species recorded (20 pts each)	0	
0 = 0 pts; < 2 = 0.04 pts; 2 - < 5 = 0.08 pts; 5 - < 10 = 0.12 pts; 10 - < 20 = 0.16 pts; 20 or > = 0.2 pts	<b>0</b>	
<b>Score</b>	0	
<b>Potential habitat for Threatened Animal Species (number observed or recorded) for the Site</b>	<b>Number</b>	
<i>*If a species has both a State (INP&amp;W Act) and National (EPBC Act) rating, it's only recorded for its National rating.</i>		
State <b>Rare</b> species observed or locally recorded (1 pt each)	3	
State <b>Vulnerable</b> species observed or locally recorded (2.5 pt each)	0	
State <b>Endangered</b> species observed or locally recorded (5 pt each)	0	
Nationally <b>Vulnerable</b> species observed or locally recorded (10 pts each)	2	
Nationally <b>Endangered</b> or <b>Critically endangered</b> species observed or locally recorded (20 pts each)	0	
0 = 0 pts; < 2 = 0.02 pts; 2 - < 5 = 0.04 pts; 5 - < 10 = 0.06 pts; 10 - < 20 = 0.08pts; 20 or > = 0.1 pts	<b>23</b>	
<b>Score</b>	0.1	
<b>CONSERVATION SIGNIFICANCE SCORE</b>	<b>1.1</b>	
<b>Total Scores for the Site</b>	Vegetation Condition x Landscape Context x Conservation Significance =	
<b>LANDSCAPE CONTEXT SCORE</b> 1.07	<b>UNIT BIODIVERSITY SCORE</b> 61.79	
<b>VEGETATION CONDITION SCORE</b> 52.50	<b>Total Biodiversity Score</b>	
<b>CONSERVATION SIGNIFICANCE SCORE</b> 1.10	<b>(Biodiversity Score x hectares)</b> 574.67	
<b>Photo Point and Vegetation Survey Location</b>	<b>Direction of the Photo</b>	
	NE	
	<b>GPS Reference</b>	
	Datum GDA94	
	Zone (52, 53 or 54) 53	
	Easting (6 digits) 681374	
Northing (7 digits) 6624806		
	<b>Description</b>	
	Very intact community despite dry conditions in lead up to survey period. High defoliation rate however not indicative of diseased or dying material.	
<input type="checkbox"/> Clearance	<input type="checkbox"/> SEB Area	<input type="checkbox"/> Other
<b>Assessment for Clearance</b>	Approximate Hectares required	75.43
Loss Factor 1.0	Economies of Scale factor	0.11
Loadings for clearance of protected areas	Mean Annual rainfall for the site (mm)	172
Reductions for rehabilitation of impact site	Payment into the fund (GST Exclusive)	<b>\$29,689.77</b>
<b>SEB Points of loss</b> 603.40	Administration fee (GST Inclusive)	<b>\$1,632.94</b>

Vegetation Condition Scores					
<b>SITE (name):</b>	RDV07	<b>SIZE OF SITE (Ha)</b>	2.67		
<b>VEGETATION ASSOCIATION DESCRIPTION</b>	Anthropogenic disturbances with high proportion of non-ind				
<b>LANDSCAPE TYPE</b>	Dunefield				
<b>SURFACE CHARACTER</b>	<b>Domina</b>	Hummock	<b>Minor</b>	Hummock	
<b>Biotic Disturbance Indicators</b>	<b>Sites</b>	<b>Domina</b>	<b>Minor</b>	<b>None -</b>	<b>Score</b>
with trees and large shrubs only (select one tickbox for each row)					
Presence of palatable shrubs or perennial grasses under the canopy of tree/shrub >3m		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Presence of mostly intact litter mats under canopy of tree/shrub >3m tall (>50% of tree canopy area has intertwined litter or shrub cover)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
<b>Total Score (Max 10 - weighted by 2)</b>					<b>5</b>
<b>Physical Disturbance Indicators</b>		<b>Domina</b>	<b>Minor</b>	<b>None -</b>	<b>Score</b>
Prevalence of large patches of bare soil (> 5m x 5m) that shows no signs of productive capacity (ie ephemeral plant litter, stems etc.)					
		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0
Evidence of animal tracks, vehicle tracks or other physical disturbance to the natural land surface					
		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0
Destabilised creek channel banks (if present), characterised by no vegetation or stabilizing roots, deflation and bank erosion. Inspect banks on both sides of channels.					
		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
<b>Total Score (Max 18 - weighted by 3)</b>					<b>3</b>
<b>Vegetation Stratum</b> (tick the <u>Present</u> box for all stratum that are present or tick for <u>Absent</u> box of any stratum that should be present but have been removed)		<b>Present</b>	<b>Absent</b>	<i>Note: don't tick either box if stratum was likely never present - e.g. Trees stratum in a low shrubland</i>	
Trees/shrubs >3m		<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Shrubs 1- 3m		<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Low shrubs <1m & hummock grasses		<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Perennial tussock grasses with basal areas > 30mm		<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Total Score (Max 16 - weighted by 4)</b>					<b>10</b>
<b>Introduced Plant Species</b>		<b>Select</b>	<b>Score</b>		
Declared species present?		No	2		
Introduced species dominate (>50% of vegetation cover)		<input type="checkbox"/>	2		
Moderate invasion of introduced species (5 to 50% of the vegetation cover)		<input type="checkbox"/>			
Very sparse to nil introduced species present (<5% of vegetation cover)		<input checked="" type="checkbox"/>			
<b>Total Score (Max 10 - weighted by)</b>					<b>10</b>
<b>Vegetation Utilisation Score</b>	<b>Total Score (Max 26)</b>				10.25
<b>Vegetation Condition Score Calculation</b>					
<b>VEGETATION CONDITION SCORE</b>					<b>38.25</b>
	Low	Medium	High		
Vegetation Utilisation Score					
Introduced Plant Species Score					
Vegetation Stratum Score					
Physical Disturbance Indicator					
Biotic Disturbance Indicator					
Vegetation Condition Score					

Conservation Significance Score	
<b>Is the vegetation association considered a Threatened Ecological community or Ecosystem?</b>	<b>Yes/No</b>
State (Provisional List of Threatened Ecosystems of SA) <b>Rare</b> community (0.1 pt)	<input type="checkbox"/>
State (Provisional List of Threatened Ecosystems of SA) <b>Vulnerable</b> community (0.2 pts)	<input type="checkbox"/>
State (Provisional List of Threatened Ecosystems of SA) <b>Endangered</b> community (0.3 pts)	<input type="checkbox"/>
Nationally (EPBC Act) <b>Vulnerable</b> community (0.35 pts)	<input type="checkbox"/>
Contains a Nationally (EPBC Act) <b>Endangered</b> or <b>Critically Endangered</b> community (0.4 pts)	<input type="checkbox"/>
<i>Note: all sites will score a minimum Conservation Significance Score of 1</i>	<b>Score</b> 1
<b>Number of Threatened Plant Species recorded for within the Site</b>	<b>Number</b>
<i>If a species has both a State (NFS&amp;W Act) and National (EPBC Act) rating, it's only recorded for its National rating.</i>	
State <b>Rare</b> species recorded (1pt each)	0
State <b>Vulnerable</b> species recorded (2.5 pt each)	0
State <b>Endangered</b> recorded (5 pts each)	0
Nationally <b>Vulnerable</b> species recorded (10 pts each)	0
Nationally <b>Endangered</b> or <b>Critically endangered</b> species recorded (20 pts each)	0
0 = 0 pts; <2 = 0.04 pts; 2 - <5 = 0.08 pts; 5 - <10 = 0.12 pts; 10 - <20 = 0.16 pts; 20 or > = 0.2 pts	<b>0</b>
<b>Score</b>	0
<b>Potential habitat for Threatened Animal Species (number observed or recorded) for the Site</b>	<b>Number</b>
<i>If a species has both a State (NFS&amp;W Act) and National (EPBC Act) rating, it's only recorded for its National rating.</i>	
State <b>Rare</b> species observed or locally recorded (1pt each)	3
State <b>Vulnerable</b> species observed or locally recorded (2.5 pt each)	0
State <b>Endangered</b> species observed or locally recorded (5 pt each)	0
Nationally <b>Vulnerable</b> species observed or locally recorded (10 pts each)	2
Nationally <b>Endangered</b> or <b>Critically endangered</b> species observed or locally recorded (20 pts each)	0
0 = 0 pts; <2 = 0.02 pts; 2 - <5 = 0.04 pts; 5 - <10 = 0.06 pts; 10 - <20 = 0.08pts; 20 or > = 0.1 pts	<b>23</b>
<b>Score</b>	0.1
<b>CONSERVATION SIGNIFICANCE SCORE</b>	<b>1.1</b>
<b>Total Scores for the Site</b>	Vegetation Condition x Landscape Context x Conservation Significance =
<b>LANDSCAPE CONTEXT SCORE</b> 1.07	<b>UNIT BIODIVERSITY SCORE</b> 45.02
<b>VEGETATION CONDITION SCORE</b> 38.25	<b>Total Biodiversity Score</b>
<b>CONSERVATION SIGNIFICANCE SCORE</b> 1.10	<b>(Biodiversity Score x hectares)</b> 120.20
<b>Photo Point and Vegetation Survey Location</b>	<b>Direction of the Photo</b>
	SW
	<b>GPS Reference</b>
	Datum GDA94
	Zone (52, 53 or 54) 53
	Easting (6 digits) 681067
Northing (7 digits) 6617346	
	<b>Description</b>
	Previously disturbed areas subject to some rehabilitation efforts historically however still anthropogenic intervention obvious. Numerous non indigenous Eucalyptus trees throughout.
<input type="button" value="Clearance"/> <input type="button" value="SEB Area"/> <input type="button" value="Other"/>	
<b>Assessment for Clearance</b>	Approximate Hectares required 15.78
Loss Factor 1.0	Economies of Scale factor 0.11
Loadings for clearance of protected areas	Mean Annual rainfall for the site (mm) 172
Reductions for rehabilitation of impact site	Payment into the fund (GST Exclusive) <b>\$6,210.22</b>
<b>SEB Points of loss</b> 126.21	Administration fee (GST Inclusive) <b>\$341.56</b>

## Appendix 2. Flora species observations list from the overall Study area.

Family	Species	Common	EPBC Act	NPW Act	Exotic
CHENOPODIACEAE	<i>Enchylaena tomentosa</i> var.	Ruby Saltbush			
GRAMINEAE	<i>Eragrostis eriopoda</i>	Woollybutt			
SAPINDACEAE	<i>Dodonaea viscosa</i> subsp. <i>angustissima</i>	Narrow-leaf Hop-bush			
CUPRESSACEAE	<i>Callitris glaucophylla</i>	White Cypress-pine			
LEGUMINOSAE	<i>Acacia ligulata</i>	Umbrella Bush			
MALVACEAE	<i>Sida ammophila</i>	Sand Sida			
PORTULACACEAE	<i>Calandrinia</i> sp.	Purslane/Parakeelya			
GERANIACEAE	<i>Erodium malacoides</i>	Oval Heron's-bill			*
CHENOPODIACEAE	<i>Dissocarpus paradoxus</i>	Ball Bindyi			
CRUCIFERAE	<i>Brassica tournefortii</i>	Wild Turnip			*
ZYGOPHYLLACEAE	<i>Zygophyllum aurantiacum/eremaeum</i>	Shrubby Twinleaf			
CHENOPODIACEAE	<i>Maireana pentatropis</i>	Erect Mallee Bluebush			
SAPINDACEAE	<i>Alectryon oleifolius</i> subsp. <i>canescens</i>	Bullock Bush			
LEGUMINOSAE	<i>Acacia burkittii</i>	Pin-bush Wattle			
SOLANACEAE	<i>Lycium australe</i>	Australian Boxthorn			
AIZOACEAE	<i>Tetragonia eremaea</i>	Desert Spinach			
UMBELLIFERAE	<i>Trachymene glaucifolia</i>	Blue Parsnip			
LEGUMINOSAE	<i>Acacia papyrocarpa</i>	Western Myall			
PROTEACEAE	<i>Hakea leucoptera</i> subsp. <i>leucoptera</i>	Silver Needlewood			
CRUCIFERAE	<i>Harmsiodoxa brevipes</i> var.	Short Cress			
SANTALACEAE	<i>Santalum acuminatum</i>	Quandong			
LEGUMINOSAE	<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
CHENOPODIACEAE	<i>Sclerolaena tricuspis</i>	Three-spine Bindyi			
CHENOPODIACEAE	<i>Sclerolaena patentispis</i>	Spear-fruit Bindyi			
CHENOPODIACEAE	<i>Sclerolaena divaricata</i>	Tangled Bindyi			
MYOPORACEAE	<i>Eremophila glabra</i> subsp.	Tar Bush			
MYOPORACEAE	<i>Eremophila scoparia</i>	Broom Emubush			
MALVACEAE	<i>Sida trichopoda</i>	High Sida			
GRAMINEAE	<i>Aristida contorta</i>	Curly Wire-grass			
CHENOPODIACEAE	<i>Atriplex vesicaria</i>	Bladder Saltbush			
GRAMINEAE	<i>Austrostipa</i> sp.	Spear-grass			
CHENOPODIACEAE	<i>Maireana integra</i>	Entire-wing Bluebush			
SANTALACEAE	<i>Santalum lanceolatum</i>	Plumbush			
MYOPORACEAE	<i>Myoporum platycarpum</i> subsp.	False Sandalwood			
CHENOPODIACEAE	<i>Rhagodia spinescens</i>	Spiny Saltbush			
THYMELAEACEAE	<i>Pimelea microcephala</i> subsp.	Shrubby Riceflower			
GRAMINEAE	<i>Digitaria</i> sp.	Summer-grass			
GRAMINEAE	<i>Enneapogon</i> sp.	Bottle-washers/Nineawn			
LEGUMINOSAE	<i>Acacia aneura</i> var.	Mulga			

Appendix 3. BDBSA flora species records for Study area.

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Abutilon halophilum</i>	Plains Lantern-bush				22/04/2007
<i>Abutilon leucopetalum</i>	Desert Lantern-bush				18/11/2013
<i>Abutilon otocarpum</i>	Desert Lantern-bush				1/11/2012
<i>Abutilon oxycarpum</i> var.	Straggly Lantern-bush				1/11/2012
<i>Acacia aneura</i> complex	Mulga				1/08/2012
<i>Acacia aneura</i> var. (NC)	Mulga				18/11/2013
<i>Acacia aneura</i> var. <i>aneura</i>	Mulga				3/11/1989
<i>Acacia aneura</i> var. <i>aneura</i> (NC)	Mulga				1/11/2012
<i>Acacia aptaneura</i>	Slender Mulga				3/11/1989
<i>Acacia brachystachya</i>	Turpentine Mulga				9/11/1989
<i>Acacia burkittii</i>	Pin-bush Wattle				30/07/1992
<i>Acacia kempeana</i>	Witchetty Bush				7/04/1989
<i>Acacia ligulata</i>	Umbrella Bush				18/11/2013
<i>Acacia oswaldii</i>	Umbrella Wattle				1/11/2012
<i>Acacia papyrocarpa</i>	Western Myall				10/09/2006
<i>Acacia ramulosa</i> var.	Horse Mulga			*	1/08/2012
<i>Acacia ramulosa</i> var. <i>linophylla</i>	Horse Mulga				4/04/1989
<i>Acacia ramulosa</i> var. <i>ramulosa</i>	Horse Mulga				1/11/2012
<i>Acacia tetragonophylla</i>	Dead Finish				1/11/2012
<i>Acacia victoriae</i> subsp. <i>victoriae</i>	Elegant Wattle				16/12/1989
<i>Actinobole uliginosum</i>	Flannel Cudweed				10/09/2006
<i>Alectryon oleifolius</i> subsp. <i>canescens</i>	Bullock Bush				1/11/2012
<i>Alopecurus geniculatus</i>	Marsh Fox-tail			*	10/08/2001
<i>Alternanthera denticulata</i>	Lesser Joyweed				24/07/1992
<i>Alternanthera pungens</i>	Khaki Weed			*	30/01/2012
<i>Alyssum linifolium</i>	Flax-leaf Alyssum			*	10/08/2001
<i>Amaranthus cuspidifolius</i>	Boggabri Weed				14/04/1997
<i>Amaranthus grandiflorus</i>	Large-flower Amaranth				14/04/1997
<i>Amyema maidenii</i> subsp. <i>maidenii</i>	Pale-leaf Mistletoe				25/07/1991



Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Amyema miraculosa</i> subsp. <i>boormanii</i>	Fleshy Mistletoe				22/10/2004
<i>Amyema preissii</i>	Wire-leaf Mistletoe				3/06/2006
<i>Amyema quandang</i> var. <i>quandang</i>	Grey Mistletoe				1/11/2012
<i>Anemocarpa podolepidium</i>	Rock Everlasting				24/04/1989
<i>Angianthus brachypappus</i>	Spreading Angianthus				8/09/1968
<i>Arabidella glaucescens</i>					25/07/1989
<i>Arabidella nasturtium</i>	Yellow Cress				1/08/2012
<i>Arabidella trisecta</i>	Shrubby Cress				30/06/1989
<i>Aristida anthoxanthoides</i>	Yellow Three-awn				20/01/1989
<i>Aristida contorta</i>	Curly Wire-grass				18/11/2013
<i>Aristida holathera</i> var. <i>holathera</i>	Tall Kerosene Grass				18/11/2013
<i>Aristida latifolia</i>	Feather-top Wire-grass				9/08/1978
<i>Aristida nitidula</i>	Brush Three-awn				20/01/1989
<i>Astrebula pectinata</i>	Barley Mitchell-grass				18/11/2013
<i>Atriplex angulata</i>	Fan Saltbush				18/11/2013
<i>Atriplex fissivalvis</i>	Gibber Saltbush				1/11/2012
<i>Atriplex holocarpa</i>	Pop Saltbush				18/11/2013
<i>Atriplex incrassata</i>	Oodnadatta Saltbush				10/09/2013
<i>Atriplex kochiana</i>	Koch's Saltbush		V		9/09/2013
<i>Atriplex limbata</i>	Spreading Saltbush				24/04/1989
<i>Atriplex lindleyi</i> subsp. <i>conduplicata</i>	Baldoo				10/08/2001
<i>Atriplex lindleyi</i> subsp. <i>inflata</i>	Corky Saltbush				4/11/1929
<i>Atriplex lindleyi</i> subsp. <i>lindleyi</i>	Baldoo				26/07/1991
<i>Atriplex lindleyi</i> subsp. <i>quadripartita</i>	Baldoo				8/10/1978
<i>Atriplex lobativalvis</i>					25/09/1989
<i>Atriplex nummularia</i> subsp. <i>omissa</i> (NC)	Old-man Saltbush				1/11/2012
<i>Atriplex obconica</i>					9/10/1978
<i>Atriplex pseudocampanulata</i>	Spreading Saltbush				7/09/1968
<i>Atriplex spongiosa</i>	Pop Saltbush				1/11/2012
<i>Atriplex suberecta</i>	Lagoon Saltbush				16/07/1992
<i>Atriplex velutinella</i>	Sandhill Saltbush				18/11/2013

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Atriplex vesicaria</i>	Bladder Saltbush				18/11/2013
<i>Austrobryonia micrantha</i>	Desert Cucumber				12/04/1997
<i>Austrostipa nitida</i>	Balcarra Spear-grass				20/09/1989
<i>Austrostipa nodosa</i>	Tall Spear-grass				6/05/1989
<i>Austrostipa</i> sp.	Spear-grass				18/11/2013
<i>Avena barbata</i>	Bearded Oat			*	22/10/1978
<i>Avena fatua</i>	Wild Oat			*	3/08/1989
<i>Bergia trimera</i>	Three-part Water-fire				14/04/1997
<i>Blennodia pterosperma</i>	Wild Stock				3/09/2001
<i>Boerhavia burbidgeana</i>	Tar-vine				24/04/1989
<i>Boerhavia coccinea</i>	Tar-vine				2/05/1989
<i>Boerhavia dominii</i>	Tar-vine				1/08/2012
<i>Boerhavia schomburgkiana</i>	Schomburgk's Tar-vine				22/01/1990
<i>Bothriochloa ewartiana</i>	Desert Blue-grass				14/04/1997
<i>Bothriochloa macra</i>	Red-leg Grass		R		28/09/1978
<i>Brachyscome campylocarpa</i>	Large White Daisy				5/10/1989
<i>Brachyscome ciliaris</i> var.	Variable Daisy				18/11/2013
<i>Brachyscome ciliaris</i> var. <i>lanuginosa</i>	Woolly Variable Daisy				22/10/2004
<i>Brachyscome dichromosomatica</i> var. <i>dichromosomatica</i>	Large Hard-head Daisy				3/09/2001
<i>Brachyscome eriogona</i>			R		23/10/2004
<i>Brachyscome gilesii</i>	Giles Daisy				10/09/1968
<i>Brachyscome lineariloba</i>	Hard-head Daisy				25/07/1989
<i>Brassica tournefortii</i>	Wild Turnip			*	1/08/2012
<i>Bromus arenarius</i>	Sand Brome				20/01/1989
<i>Bromus diandrus</i>	Great Brome			*	9/10/1978
<i>Bryophyllum delagoense</i>				*	20/01/1989
<i>Bulbine alata</i>	Winged Bulbine-lily				24/09/1975
<i>Bulbostylis barbata</i>					14/04/1997
<i>Calandrinia disperma</i>	Two-seed Purslane				26/09/1960
<i>Calandrinia eremaea</i>	Dryland Purslane				10/09/2006
<i>Calandrinia pumila</i>	Tiny Purslane				18/05/1989

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Calandrinia remota</i>	Round-leaf Parakeelya				22/10/2004
<i>Callitris glaucophylla</i>	White Cypress-pine				1/11/2012
<i>Calocephalus platycephalus</i>	Western Beauty-heads				13/10/1989
<i>Calotis cymbacantha</i>	Showy Burr-daisy				1/08/2012
<i>Calotis hispidula</i>	Hairy Burr-daisy				1/11/2012
<i>Calotis multicaulis</i>	Woolly-headed Burr-daisy				5/10/1989
<i>Calotis plumulifera</i>	Woolly-headed Burr-daisy				28/05/1989
<i>Calotis porphyroglossa</i>	Channel Burr-daisy				16/10/1937
<i>Carrichtera annua</i>	Ward's Weed			*	26/08/1989
<i>Carthamus tinctorius</i>	Safflower			*	19/06/1989
<i>Cenchrus ciliaris</i>	Buffel Grass			*	17/03/2015
<i>Centaurea melitensis</i>	Malta Thistle			*	13/10/1989
<i>Centipeda crateriformis</i> subsp. <i>crateriformis</i>	Common Sneezeweed				21/06/1990
<i>Centipeda thespidioides</i>	Desert Sneezeweed				1/11/2012
<i>Centrolepis eremica</i>	Dryland Centrolepis				21/09/1989
<i>Cheilanthes lasiophylla</i>	Woolly Cloak-fern				22/04/1989
<i>Chenopodium album</i>	Fat Hen			*	30/05/1990
<i>Chenopodium auricomum</i>	Golden Goosefoot				14/10/1989
<i>Chenopodium desertorum</i> subsp. <i>desertorum</i>	Frosted Goosefoot				10/05/1989
<i>Chenopodium nitrariaceum</i>	Nitre Goosefoot				15/05/1981
<i>Chloris gayana</i>	Rhodes Grass			*	20/01/1989
<i>Chloris pectinata</i>	Comb Windmill Grass				24/04/1989
<i>Chloris truncata</i>	Windmill Grass				14/04/1997
<i>Chloris virgata</i>	Feather-top Rhodes Grass			*	15/07/1992
<i>Chrysocephalum apiculatum</i>	Common Everlasting				18/11/2013
<i>Chrysocephalum pterochaetum</i>	Shrub Everlasting				14/04/1997
<i>Chthonocephalus pseudevax</i>	Ground-heads				28/05/1989
<i>Citrullus colocynthis</i>	Colocynth			*	1/11/2012
<i>Convolvulus clementii</i>					28/08/1977
<i>Convolvulus crispifolius</i>	Silver Bindweed				20/01/1989
<i>Convolvulus erubescens</i> complex					1/11/2012

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Convolvulus eyreanus</i>	Silver Bindweed				22/10/2004
<i>Convolvulus remotus</i>	Grassy Bindweed				16/12/1989
<i>Conyza bonariensis</i>	Flax-leaf Fleabane			*	22/01/1990
<i>Crassula colorata</i> var. <i>acuminata</i>	Dense Crassula				3/08/1989
<i>Crassula colorata</i> var. <i>colorata</i>	Dense Crassula				10/08/2001
<i>Crassula extrorsa</i>					22/10/2004
<i>Crassula tetramera</i>	Australian Stonecrop				21/09/1989
<i>Cressa australis</i>	Rosinweed				24/07/1992
<i>Crinum flaccidum</i>	Murray Lily				1/11/2012
<i>Crotalaria eremaea</i> subsp.	Loose-flowered Rattle-pod				18/11/2013
<i>Crotalaria eremaea</i> subsp. <i>eremaea</i>	Downy Loose-flowered Rattle-pod				2/09/2001
<i>Crotalaria eremaea</i> subsp. <i>strehlowii</i>	Smooth Loose-flowered Rattle-pod				6/05/1989
<i>Cucumis myriocarpus</i> subsp. <i>myriocarpus</i>	Paddy Melon			*	1/11/2012
<i>Cullen australasicum</i>	Tall Scurf-pea				14/10/1989
<i>Cullen cinereum</i>	Annual Scurf-pea				23/10/2004
<i>Cullen graveolens</i>	Native Lucerne				20/01/1989
<i>Cullen pallidum</i>	White Scurf-pea				13/10/1989
<i>Cullen patens</i>	Spreading Scurf-pea				5/10/1989
<i>Cylindropuntia fulgida</i> var. <i>mamillata</i>				*	27/02/2005
<i>Cynanchum viminale</i> subsp. <i>australe</i>	Caustic Bush				1/11/2012
<i>Cyperus alterniflorus</i>	Umbrella Flat-sedge				13/10/1989
<i>Cyperus bulbosus</i>	Bulbous Flat-sedge				24/04/1989
<i>Cyperus dactylotes</i>			V		22/10/2004
<i>Cyperus difformis</i>	Variable Flat-sedge				6/05/1989
<i>Cyperus eragrostis</i>	Drain Flat-sedge			*	20/01/1989
<i>Cyperus gilesii</i>	Giles' Flat-sedge				28/10/1976
<i>Cyperus gymnocaulos</i>	Spiny Flat-sedge				2/09/2001
<i>Cyperus hamulosus</i>	Curry Flat-sedge			*	14/04/1997
<i>Cyperus involucratus</i>				*	10/05/1991
<i>Cyperus iria</i>					21/01/1989
<i>Cyperus laevigatus</i>	Bore-drain Sedge				11/04/1997

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Cyperus rigidellus</i>	Dwarf Flat-sedge				14/04/1997
<i>Cyperus squarrosus</i>	Bearded Flat-sedge				14/04/1997
<i>Cyperus vaginatus</i>	Stiff Flat-sedge				20/01/1989
<i>Cyperus victoriensis</i>	Yelka				14/04/1997
<i>Dactyloctenium radulans</i>	Button-grass				3/06/2006
<i>Daucus glochidiatus</i>	Native Carrot				6/05/1989
<i>Dichanthium sericeum</i> subsp.	Silky Blue-grass				3/06/2006
<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	Annual Silky Blue-grass				16/03/1992
<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	Silky Blue-grass				13/10/1989
<i>Digitaria brownii</i>	Cotton Panic-grass				22/10/2004
<i>Digitaria ciliaris</i>	Summer Grass			*	14/01/1990
<i>Dimorphocoma minutula</i>					10/08/2001
<i>Disphyma crassifolium</i> subsp. <i>clavellatum</i>	Round-leaf Pigface				16/07/1992
<i>Dissocarpus biflorus</i> var.	Two-horn Saltbush				1/08/2012
<i>Dissocarpus biflorus</i> var. <i>biflorus</i>	Two-horn Saltbush				30/06/1989
<i>Dissocarpus fontinalis</i>					15/10/1989
<i>Dissocarpus paradoxus</i>	Ball Bindyi				18/11/2013
<i>Dodonaea lobulata</i>	Lobed-leaf Hop-bush				22/04/2007
<i>Dodonaea microzyga</i> var. <i>microzyga</i>	Brilliant Hop-bush				29/03/1989
<i>Dodonaea viscosa</i> subsp.	Sticky Hop-bush				1/08/2012
<i>Dodonaea viscosa</i> subsp. <i>angustissima</i>	Narrow-leaf Hop-bush				18/11/2013
<i>Duboisia hopwoodii</i>	Pituri				10/12/1981
<i>Dysphania cristata</i>	Crested Crumbweed				1/08/1989
<i>Dysphania plantaginella</i>	Plantain Crumbweed				1/05/1938
<i>Dysphania platycarpa</i>	Flat-fruit Crumbweed				14/04/1997
<i>Dysphania truncata</i>					14/04/1997
<i>Echinochloa inundata</i>	Channel Millet				2/01/1991
<i>Echium plantagineum</i>	Salvation Jane			*	11/10/1992
<i>Einadia nutans</i> subsp.	Climbing Saltbush				18/11/2013
<i>Einadia nutans</i> subsp. <i>eremaea</i>	Dryland Climbing Saltbush				23/04/1989
<i>Einadia nutans</i> subsp. <i>nutans</i>	Climbing Saltbush				1/08/1978

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Einadia nutans subsp. oxycarpa</i>	Pointed-fruit Climbing Saltbush				9/09/1968
<i>Eleocharis pallens</i>	Pale Spike-rush				13/10/1989
<i>Eleocharis pusilla</i>	Small Spike-rush				23/04/1989
<i>Enchylaena tomentosa</i> var.	Ruby Saltbush				18/11/2013
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush				5/04/1989
<i>Enneapogon avenaceus</i>	Common Bottle-washers				18/11/2013
<i>Enneapogon caeruleus</i>	Blue Bottle-washers				22/04/2007
<i>Enneapogon cylindricus</i>	Jointed Bottle-washers				18/11/2013
<i>Enneapogon intermedius</i>	Tall Bottle-washers				1/11/2012
<i>Enneapogon nigricans</i>	Black-head Grass				21/01/1989
<i>Enneapogon polyphyllus</i>	Leafy Bottle-washers				18/11/2013
<i>Enneapogon</i> sp.	Bottle-washers/Nineawn				1/11/2012
<i>Enteropogon acicularis</i>	Umbrella Grass				18/11/2013
<i>Enteropogon ramosus</i>	Umbrella Grass				13/10/1989
<i>Eragrostis australasica</i>	Cane-grass				1/11/2012
<i>Eragrostis basedowii</i>	Neat Love-grass				30/05/1989
<i>Eragrostis cilianensis</i>	Stink Grass			*	20/01/1989
<i>Eragrostis dielsii</i>	Mulka				1/11/2012
<i>Eragrostis eriopoda</i>	Woollybutt				3/06/2006
<i>Eragrostis falcata</i>	Sickle Love-grass				5/04/1989
<i>Eragrostis laniflora</i>	Hairy-flower Woollybutt				10/04/1989
<i>Eragrostis leptocarpa</i>	Drooping Love-grass				21/01/1989
<i>Eragrostis parviflora</i>	Weeping Love-grass				24/04/1989
<i>Eragrostis setifolia</i>	Bristly Love-grass				18/11/2013
<i>Eragrostis</i> sp.	Love-grass				1/11/2012
<i>Eragrostis trichophora</i>	Hairyflower Lovegrass			*	18/03/2015
<i>Eragrostis xerophila</i>	Knotty-butt Neverfail				21/01/1989
<i>Eremophila alternifolia</i>	Narrow-leaf Emubush				14/12/1981
<i>Eremophila deserti</i>	Turkey-bush				1/11/2012
<i>Eremophila duttonii</i>	Harlequin Emubush				22/10/2004
<i>Eremophila freelingii</i>	Rock Emubush				24/04/1989

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Eremophila glabra</i> subsp.	Tar Bush				1/11/2012
<i>Eremophila glabra</i> subsp. <i>glabra</i>	Tar Bush				17/05/1989
<i>Eremophila latrobei</i> subsp. <i>glabra</i>	Crimson Emubush				7/04/1989
<i>Eremophila longifolia</i>	Weeping Emubush				3/08/1992
<i>Eremophila macdonnellii</i>	Macdonnell's Emubush				30/08/1977
<i>Eremophila maculata</i> subsp. <i>maculata</i>	Spotted Emubush				22/04/2007
<i>Eremophila oppositifolia</i> subsp. <i>oppositifolia</i>	Opposite-leaved Emubush				22/04/2007
<i>Eremophila paisleyi</i> subsp. <i>paisleyi</i>					20/07/2001
<i>Eremophila rotundifolia</i>	Round-leaf Emubush				20/09/1989
<i>Eremophila scoparia</i>	Broom Emubush				7/04/1989
<i>Eremophila serrulata</i>	Green Emubush				22/04/2007
<i>Eriachne aristidea</i>	Three-awn Wanderie				14/04/1997
<i>Eriachne helmsii</i>	Woollybutt Wanderie				7/04/1989
<i>Eriachne mucronata</i>	Mountain Wanderie				24/04/1989
<i>Eriachne ovata</i>	Swamp Wanderie				24/04/1989
<i>Eriochiton sclerolaenoides</i>	Woolly-fruit Bluebush				18/11/2013
<i>Eriochlamys eremaea</i>	Woolly Mantle				20/09/1989
<i>Eriochloa australiensis</i>	Australian Cupgrass				24/07/1997
<i>Eriochloa pseudoacrotricha</i>	Perennial Cupgrass				24/04/1989
<i>Erodium aureum</i>				*	10/08/2001
<i>Erodium carolinianum</i>	Clammy Heron's-bill				10/09/2006
<i>Erodium cicutarium</i>	Cut-leaf Heron's-bill			*	20/09/1989
<i>Erodium crinitum</i>	Blue Heron's-bill				24/08/1989
<i>Erodium cygnorum</i>	Blue Heron's-bill				1/11/2012
<i>Erodium</i> sp.	Heron's-bill/Crowfoot				3/06/2006
<i>Eucalyptus coolabah</i>	Coolibah				5/02/1990
<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>					12/05/2006
<i>Eulalia aurea</i>	Silky Brown-top				13/10/1989
<i>Euphorbia drummondii</i> (NC)					18/11/2013
<i>Euphorbia drummondii</i> group					1/08/2012
<i>Euphorbia ferdinandi</i> var. <i>saxosiplaniticola</i>					3/09/2001

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Euphorbia inappendiculata</i> var. <i>queenslandica</i>					3/11/1929
<i>Euphorbia multifaria</i>					2/05/1989
<i>Euphorbia parvicaruncula</i>	Rough-seeded Spurge				3/09/2001
<i>Euphorbia porcata</i>					25/04/1981
<i>Euphorbia stevenii</i>	Bottle-tree Spurge				23/04/1989
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	Desert Spurge				18/11/2013
<i>Euphorbia thelephora</i> var. <i>australis</i>					14/10/1989
<i>Euphorbia wheeleri</i>	Wheeler's Spurge				1/11/2012
<i>Exocarpos aphyllus</i>	Leafless Cherry				10/09/2006
<i>Festuca arundinacea</i>	Tall Meadow Fescue			*	13/04/1998
<i>Fimbristylis dichotoma</i>	Common Fringe-rush				3/06/2006
<i>Fimbristylis ferruginea</i>					17/05/1989
<i>Frankenia cupularis</i>			R		1/08/2012
<i>Frankenia foliosa</i>	Leafy Sea-heath				17/08/1983
<i>Frankenia serpyllifolia</i>	Thyme Sea-heath				18/11/2013
<i>Glinus lotoides</i>	Hairy Carpet-weed				21/12/1990
<i>Glycine canescens</i>	Silky Glycine				18/11/2013
<i>Glycine rubiginosa</i>	Twining Glycine				1/08/2012
<i>Gnephosis arachnoidea</i>	Spidery Button-flower				18/11/2013
<i>Gnephosis tenuissima</i>	Dwarf Golden-tip				10/09/2006
<i>Goodenia cycloptera</i>	Serrated Goodenia				1/08/2012
<i>Goodenia fascicularis</i>	Silky Goodenia				23/04/1989
<i>Goodenia lunata</i>	Stiff Goodenia				22/04/2007
<i>Goodenia pinnatifida</i>	Cut-leaf Goodenia				23/10/2004
<i>Goodenia pusilliflora</i>	Small-flower Goodenia				24/05/1989
<i>Goodenia vernicosa</i>	Wavy Goodenia				20/01/1989
<i>Grevillea nematophylla</i> subsp. <i>nematophylla</i>	Water Bush				3/12/1989
<i>Gunniopsis kochii</i>	Koch's Pigface				22/06/1989
<i>Gunniopsis quadrifida</i>	Sturt's Pigface				1/11/2012
<i>Gyrostemon ramulosus</i>	Bushy Wheel-fruit				4/09/2007
<i>Hakea leucoptera</i> subsp. <i>leucoptera</i>	Silver Needlewood				1/11/2012



Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Haloragis glauca</i> f. <i>glauca</i>	Bluish Raspwort				20/09/1989
<i>Haloragis uncatipila</i>	Shrubby Raspwort				24/04/1989
<i>Helianthus annuus</i>	Sunflower			*	16/07/1992
<i>Heliotropium curassavicum</i>	Smooth Heliotrope			*	15/10/1989
<i>Heliotropium europaeum</i>	Common Heliotrope			*	1/11/2012
<i>Heliotropium supinum</i>	Creeping Heliotrope			*	20/01/1989
<i>Hemichroa diandra</i>	Mallee Hemichroa				23/10/2004
<i>Hibiscus brachysiphonius</i>	Low Hibiscus				23/04/1989
<i>Hibiscus krichauffianus</i>	Velvet-leaf Hibiscus				18/11/2013
<i>Holcus lanatus</i>	Yorkshire Fog			*	1/10/1989
<i>Indigofera psammophila</i>	Sand Indigo				22/10/2004
<i>Iseilema membranaceum</i>	Small Flinders-grass				21/01/1989
<i>Isoetopsis graminifolia</i>	Grass Cushion				1/08/1989
<i>Isolepis australiensis</i>	Southern Club-rush				21/09/1989
<i>Ixiochlamys cuneifolia</i>	Silverton Daisy				23/10/2004
<i>Ixiochlamys filicifolia</i>					1/08/2012
<i>Ixiochlamys nana</i>	Small Fuzzweed				30/06/1989
<i>Juncus aridicola</i>	Inland Rush				2/04/1991
<i>Juncus bufonius</i>	Toad Rush				23/10/2004
<i>Kippistia suaedifolia</i>	Fleshy Kippistia				8/10/1978
<i>Lachnagrostis filiformis</i>	Common Blown-grass				21/09/1989
<i>Lactuca serriola</i> f. <i>serriola</i>	Prickly Lettuce			*	15/07/1992
<i>Lawrencella davenportii</i>	Davenport Daisy				19/06/1989
<i>Lawrencia glomerata</i>	Clustered Lawrencia				23/10/2004
<i>Leiocarpa leptolepis</i>	Pale Plover-daisy				10/08/2001
<i>Leiocarpa websteri</i>	Narrow Plover-daisy				6/05/1989
<i>Lemooria burkittii</i>	Wires-and-wool				3/08/1989
<i>Lepidium muelleri-ferdinandi</i>	Mueller's Peppergrass				14/04/1997
<i>Lepidium oxytrichum</i>	Green Peppergrass				6/05/1989
<i>Lepidium phlebopetalum</i>	Veined Peppergrass				1/08/2012
<i>Lepidium sagittulatum</i>	Fine-leaf Peppergrass				30/06/1989

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Leucochrysum molle</i>	Hoary Sunray				24/08/1989
<i>Limonium sinuatum</i>	Notch-leaf Sea-lavender			*	20/12/1989
<i>Lolium rigidum</i>	Wimmera Ryegrass			*	15/11/1990
<i>Lotus cruentus</i>	Red-flower Lotus				3/09/2001
<i>Lycium australe</i>	Australian Boxthorn				30/08/2014
<i>Lycium ferocissimum</i>	African Boxthorn			*	25/01/1989
<i>Lysiana exocarpi</i> subsp. <i>exocarpi</i>	Harlequin Mistletoe				23/04/1989
<i>Lysiana murrayi</i>	Mulga Mistletoe				1/11/2012
<i>Lythrum hyssopifolia</i>	Lesser Loosestrife				15/05/1981
<i>Lythrum wilsonii</i>	Wilson's Loosestrife				14/10/1989
<i>Maireana aphylla</i>	Cotton-bush				18/11/2013
<i>Maireana appressa</i>	Pale-fruit Bluebush				18/11/2013
<i>Maireana astrotricha</i>	Low Bluebush				18/11/2013
<i>Maireana ciliata</i>	Hairy Fissure-plant				1/08/2012
<i>Maireana eriantha</i>	Woolly Bluebush				18/11/2013
<i>Maireana erioclada</i>	Rosy Bluebush				10/09/2006
<i>Maireana georgei</i>	Satiny Bluebush				18/11/2013
<i>Maireana integra</i>	Entire-wing Bluebush				18/11/2013
<i>Maireana microcarpa</i>	Swamp Bluebush				3/03/1981
<i>Maireana pentatropis</i>	Erect Mallee Bluebush				1/11/2012
<i>Maireana pyramidata</i>	Black Bluebush				18/11/2013
<i>Maireana</i> sp.	Bluebush/Fissure-plant				18/04/2012
<i>Maireana spongioearpa</i>	Spongy-fruit Bluebush				18/11/2013
<i>Maireana trichoptera</i>	Hairy-fruit Bluebush				22/04/1989
<i>Maireana triptera</i>	Three-wing Bluebush				20/09/1989
<i>Maireana turbinata</i>	Top-fruit Bluebush				13/07/1990
<i>Maireana villosa</i>	Silky Bluebush				27/11/1970
<i>Malacocera albolanata</i>	Woolly Soft-horns				20/01/1989
<i>Malacocera gracilis</i>	Slender Soft-horns		V		20/01/1989
<i>Malacocera tricornis</i>	Goat-head Soft-horns				18/11/2013
<i>Malva parviflora</i>	Small-flower Marshmallow			*	1/08/1989

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Marsilea costulifera</i>	Narrow-leaf Nardoo				13/10/1989
<i>Marsilea drummondii</i>	Common Nardoo				1/11/2012
<i>Marsilea exarata</i>	Swayback Nardoo				10/08/2001
<i>Marsilea hirsuta</i>	Short-fruit Nardoo				23/10/2004
<i>Medicago sativa</i>	Lucerne			*	16/07/1992
<i>Melaleuca glomerata</i>	Inland Paper-bark				21/06/1990
<i>Melaleuca lanceolata</i>	Dryland Tea-tree				3/11/1929
<i>Melaleuca xerophila</i>	Boree				21/02/1990
<i>Menkea australis</i>	Fairy Spectacles				1/08/2012
<i>Menkea crassa</i>	Fat Spectacles				8/09/1968
<i>Mentha australis</i>	River Mint				24/04/1989
<i>Minuria cunninghamii</i>	Bush Minuria				18/11/2013
<i>Minuria denticulata</i>	Woolly Minuria				6/05/1989
<i>Minuria integerrima</i>	Smooth Minuria				25/04/2007
<i>Minuria leptophylla</i>	Minnie Daisy				23/10/2004
<i>Monachather paradoxus</i>	Bandicoot Grass				24/07/1989
<i>Myoporum montanum</i>	Native Myrtle				15/07/1992
<i>Myriophyllum verrucosum</i>	Red Milfoil				23/10/2004
<i>Neobassia proceriflora</i>	Desert Glasswort				24/07/1989
<i>Neurachne munroi</i>	Window Mulga-grass				5/12/1995
<i>Nicotiana glauca</i>	Tree Tobacco			*	22/10/1978
<i>Nicotiana simulans</i>	Native Tobacco				10/08/2001
<i>Nicotiana velutina</i>	Velvet Tobacco				1/08/2012
<i>Omphalolappula concava</i>	Burr Stickseed				6/05/1989
<i>Opuntia elata</i>	Riverina Pear			*	7/04/2005
<i>Opuntia elatior</i>				*	8/05/2006
<i>Opuntia ficus-indica</i>	Indian Fig			*	3/05/2005
<i>Opuntia polyacantha</i> var. <i>hystricina</i>	Grizzly Bear Cactus			*	6/11/2005
<i>Orobanche cernua</i> var. <i>australiana</i>	Australian Broomrape		R		23/10/2004
<i>Osteocarpum acropterum</i> var. <i>acropterum</i>	Tuberculate Bonefruit				10/09/2006
<i>Osteocarpum dipterocarpum</i>	Two-wing Bonefruit				1/11/2012

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Panicum decompositum</i> var. <i>decompositum</i>	Native Millet				1/11/2012
<i>Panicum effusum</i> var. <i>effusum</i>	Hairy Panic				20/01/1989
<i>Panicum laevinode</i>					20/01/1989
<i>Panicum millaceum</i>	Broom Millet			*	15/07/1992
<i>Paractaenum novae-hollandiae</i> subsp. <i>reversum</i>	Barbed-wire Grass				26/06/1992
<i>Paractaenum refractum</i>	Bristle-brush Grass				18/11/2013
<i>Phlegmatospermum cochlearinum</i>	Downy Cress				3/09/2001
<i>Phyllanthus fuernrohrii</i>	Sand Spurge				1/11/2012
<i>Picris drummondii</i>	Coast Picris				13/10/1989
<i>Pimelea microcephala</i> subsp. <i>microcephala</i>	Shrubby Riceflower				17/05/1989
<i>Pimelea simplex</i> subsp.	Desert Riceflower				1/11/2012
<i>Pimelea simplex</i> subsp. <i>continua</i>	Desert Riceflower				7/08/1989
<i>Pimelea simplex</i> subsp. <i>simplex</i>	Desert Riceflower				20/01/1989
<i>Pimelea trichostachya</i>	Spiked Riceflower				16/07/1992
<i>Pittosporum angustifolium</i>	Native Apricot				5/04/1989
<i>Plagiobothrys pluriseipaleus</i>	White Rochelia				3/08/1989
<i>Plantago drummondii</i>	Dark Plantain				1/08/2012
<i>Podolepis capillaris</i>	Wiry Podolepis				3/06/2006
<i>Podolepis davisiana</i>	Button Podolepis				25/07/1989
<i>Polycalymma stuartii</i>	Poached-egg Daisy				18/11/2013
<i>Polygonum aviculare</i>	Wireweed			*	15/07/1992
<i>Polygonum plebeium</i>	Small Knotweed				24/07/1992
<i>Polypogon monspeliensis</i>	Annual Beard-grass			*	31/12/1991
<i>Polypogon viridis</i>	Water Bent			*	24/07/1997
<i>Portulaca oleracea</i>	Common Purslane				24/04/1989
<i>Prostanthera striatiflora</i>	Striated Mintbush				22/04/2007
<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed			*	24/07/1992
<i>Pterocaulon sphacelatum</i>	Apple-bush				1/11/2012
<i>Ptilotus helipteroides</i>	Hairy Mulla Mulla				1/08/2012
<i>Ptilotus obovatus</i>	Silver Mulla Mulla				10/09/2006
<i>Ptilotus parvifolius</i>	Small-leaf Mulla Mulla				10/09/2013

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Ptilotus polystachyus</i>	Long-tails				9/11/1989
<i>Ptilotus sessilifolius</i>	Crimson-tails				1/08/2012
<i>Pycnosorus eremaeus</i>	Golden Billy-buttons				1/11/2012
<i>Pycnosorus pleiocephalus</i>	Soft Billy-buttons				10/09/2006
<i>Ranunculus pentandrus</i> var. <i>platycarpus</i>	Smooth Buttercup				13/10/1989
<i>Ranunculus pumilio</i> var. <i>pumilio</i>	Ferny Buttercup				13/10/1989
<i>Rhagodia parabolica</i>	Mealy Saltbush				2/07/1962
<i>Rhagodia spinescens</i>	Spiny Saltbush				18/11/2013
<i>Rhodanthe floribunda</i>	White Everlasting				1/11/2012
<i>Rhodanthe microglossa</i>	Clustered Everlasting				3/09/2001
<i>Rhodanthe moschata</i>	Musk Daisy				22/10/2004
<i>Rhodanthe pygmaea</i>	Pigmy Daisy				4/05/1989
<i>Rhodanthe stricta</i>	Slender Everlasting				3/09/2001
<i>Rhodanthe uniflora</i>	Woolly Daisy				1/11/2012
<i>Riccia macrospora</i>					8/04/1973
<i>Riccia nigrella</i>					14/12/1981
<i>Roepera ammophila</i>	Sand Twinleaf				1/11/2012
<i>Roepera eremaea</i>					1/11/2012
<i>Roepera prismatotheca</i>	Square-fruit Twinleaf				1/11/2012
<i>Roepera similis</i>	White Twinleaf				10/09/2006
<i>Roepera</i> sp.	Twinleaf				1/11/2012
<i>Rostraria pumila</i>	Tiny Bristle-grass			*	1/08/1989
<i>Rumex crystallinus</i>	Glistening Dock				20/09/1989
<i>Salsola australis</i>	Buckbush				18/11/2013
<i>Santalum acuminatum</i>	Quandong				22/12/1984
<i>Santalum lanceolatum</i>	Plumbush				1/11/2012
<i>Santalum spicatum</i>	Sandalwood		V		3/05/1993
<i>Sarcozona praecox</i>	Sarcozona				1/08/2012
<i>Scaevola collaris</i>					13/10/1989
<i>Scaevola spinescens</i>	Spiny Fanflower				23/10/2004
<i>Schenkia australis</i>	Spike Centaury				23/04/1993

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Schismus arabicus</i>	Arabian Grass			*	19/07/1990
<i>Schismus barbatus</i>	Arabian Grass			*	19/07/1990
<i>Schizostoma laceratum</i>					13/08/2001
<i>Schoenia ramosissima</i>	Dainty Everlasting				21/09/1978
<i>Sclerolaena bicornis</i> var. <i>bicornis</i>	Goat-head Bindyi				3/06/2006
<i>Sclerolaena brachyptera</i>	Short-wing Bindyi				18/11/2013
<i>Sclerolaena constricta</i>					25/07/1989
<i>Sclerolaena cuneata</i>	Tangled Bindyi				3/09/2001
<i>Sclerolaena decurrens</i>	Green Bindyi				3/06/2006
<i>Sclerolaena diacantha</i>	Grey Bindyi				1/11/2012
<i>Sclerolaena divaricata</i>	Tangled Bindyi				18/11/2013
<i>Sclerolaena eriacantha</i>	Silky Bindyi				1/11/2012
<i>Sclerolaena holtiana</i>	Holt's Bindyi				22/04/2007
<i>Sclerolaena intricata</i>	Tangled Bindyi				18/11/2013
<i>Sclerolaena lanicuspis</i>	Spinach Bindyi				18/11/2013
<i>Sclerolaena obliquicuspis</i>	Oblique-spined Bindyi				22/04/2007
<i>Sclerolaena parallelicuspis</i>	Western Bindyi				1/11/2012
<i>Sclerolaena patentispis</i>	Spear-fruit Bindyi				4/05/1989
<i>Sclerolaena tatei</i>	Tate's Bindyi				22/06/1989
<i>Sclerolaena uniflora</i>	Small-spine Bindyi				1/11/2012
<i>Sclerolaena ventricosa</i>	Salt Bindyi				18/11/2013
<i>Senecio glossanthus</i>	Annual Groundsel				1/08/1989
<i>Senecio gregorii</i>	Fleshy Groundsel				6/05/1989
<i>Senecio lacustrinus</i>					1/06/1942
<i>Senecio lanibracteus</i>	Inland Shrubby Groundsel				27/05/1989
<i>Senna artemisioides</i> subsp.	Desert Senna				1/11/2012
<i>Senna artemisioides</i> subsp. <i>filifolia</i>	Fine-leaf Desert Senna				12/12/1981
<i>Senna artemisioides</i> subsp. <i>helmsii</i>	Blunt-leaf Senna				14/10/1989
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>					1/11/2012
<i>Senna artemisioides</i> subsp. <i>quadrifolia</i>	Four-leaf Desert Senna				5/10/1989
<i>Senna artemisioides</i> subsp. <i>X artemisioides</i>	Silver Senna				22/04/2007

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Senna cardiosperma</i> subsp. <i>gawlerensis</i>	Gawler Ranges Senna				1/11/2012
<i>Senna cardiosperma</i> subsp. <i>microphylla</i>	Curved-leaf Senna				23/08/1978
<i>Senna phyllodinea</i>					27/01/1990
<i>Setaria basiclada</i>					6/04/1992
<i>Setaria clementii</i>	Clement's Paspalidium				20/01/1989
<i>Setaria constricta</i>	Knotty-butt Paspalidium				7/04/1989
<i>Setaria dielsii</i>	Diel's Pigeon-grass				24/04/1989
<i>Setaria reflexa</i>					15/07/1992
<i>Sida ammophila</i>	Sand Sida				18/11/2013
<i>Sida cunninghamii</i>	Ridge Sida				1/11/2012
<i>Sida fibulifera</i>	Pin Sida				25/04/2007
<i>Sida intricata</i>	Twiggy Sida				1/11/2012
<i>Sida petrophila</i>	Rock Sida				2/04/1989
<i>Sida trichopoda</i>	High Sida				23/10/2004
<i>Sisymbrium erysimoides</i>	Smooth Mustard			*	25/04/2007
<i>Sisymbrium irio</i>	London Mustard			*	21/06/1990
<i>Sisymbrium orientale</i>	Indian Hedge Mustard			*	9/10/1978
<i>Solanum cleistogamum</i>	Shy Nightshade				16/06/2004
<i>Solanum ellipticum</i> (NC)	Velvet Potato-bush				25/04/2007
<i>Solanum esuriale</i>	Quena				25/04/2007
<i>Solanum nigrum</i>	Black Nightshade			*	24/07/1992
<i>Solanum petrophilum</i>	Rock Nightshade				12/01/2009
<i>Sonchus oleraceus</i>	Common Sow-thistle			*	1/08/2012
<i>Sorghum halepense</i>	Johnson Grass			*	16/07/1992
<i>Spergularia diandra</i>	Lesser Sand-spurrey			*	20/09/1989
<i>Sphaeromorphaea littoralis</i>	Spreading Nut-heads				10/03/1990
<i>Sporobolus actinocladus</i>	Ray Grass				18/11/2013
<i>Sporobolus caroli</i>	Yakka Grass				20/01/1989
<i>Stackhousia clementii</i>	Limestone Candles				23/10/2004
<i>Stemodia florulenta</i>	Bluerod				1/11/2012
<i>Stenopetalum lineare</i>	Narrow Thread-petal				6/05/1989

Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Stenopetalum lineare</i> (NC)	Narrow Thread-petal				3/06/2006
<i>Stenopetalum velutinum</i>	Velvet Thread-petal				30/06/1989
<i>Streptoglossa liatroides</i>	Wertaloona Daisy				20/01/1989
<i>Swainsona adenophylla</i>	Violet Swainson-pea				2/09/2001
<i>Swainsona campylantha</i>					23/10/2004
<i>Swainsona formosa</i>	Sturt Pea				22/04/2007
<i>Swainsona oliveri</i>					2/05/1989
<i>Swainsona phacoides</i>	Dwarf Swainson-pea				22/10/2004
<i>Swainsona stipularis</i>	Orange Swainson-pea				7/08/1989
<i>Synaptantha tillaeacea</i> var. <i>hispidula</i>					22/10/2004
<i>Synostemon rhytidospermus</i>	Rough-seed Spurge				17/05/1989
<i>Tecticornia disarticulata</i>					22/06/1989
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	Brown-head Samphire				21/10/1989
<i>Tecticornia medullosa</i>					1/08/2012
<i>Tecticornia tenuis</i>	Slender Samphire				1/11/2012
<i>Templetonia egena</i>	Broombush Templetonia				5/09/1981
<i>Tetragonia eremaea</i>	Desert Spinach				4/05/1989
<i>Tetragonia</i> sp.	False Spinach				10/09/2006
<i>Teucrium racemosum</i>	Grey Germander				24/07/1992
<i>Themeda triandra</i>	Kangaroo Grass				23/04/1989
<i>Thysanotus baueri</i>	Mallee Fringe-lily				23/10/1989
<i>Trachymene glaucifolia</i>	Blue Parsnip				18/11/2013
<i>Tragus australianus</i>	Small Burr-grass				15/04/1989
<i>Trianthema triquetrum</i>	Red Spinach				3/06/2006
<i>Tribulus eichlerianus</i>	Eichler's Caltrop				10/08/1928
<i>Tribulus terrestris</i>	Caltrop			*	22/04/2007
<i>Trichanthodium skirrophorum</i>	Woolly Yellow-heads				27/10/1989
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	Camel Bush				18/11/2013
<i>Trigonella suavissima</i>	Sweet Fenugreek				24/07/1992
<i>Triodia irritans</i>	Spinifex				20/01/1989
<i>Tripogonella loliiformis</i>	Five-minute Grass				1/11/2012



Species	Common	EPBC Act	NWP Act	Exotic	Most recent sighting
<i>Triraphis mollis</i>	Purple Plume Grass				1/11/2012
<i>Triticum aestivum</i>	Wheat			*	16/07/1992
<i>Tulostoma australianum</i>					13/08/2001
<i>Tulostoma operculatum</i>					13/08/2001
<i>Tulostoma pulchellum</i>					13/08/2001
<i>Typha domingensis</i>	Narrow-leaf Bulrush				12/12/1990
<i>Urochloa praetervis</i>	Large Arm-grass				24/09/1989
<i>Verbena officinalis</i>	Common Verbena			*	24/07/1992
<i>Verbena supina</i> var. <i>supina</i>	Trailing Verbena			*	13/10/1989
<i>Vittadinia cervicalis</i> var. <i>circularis</i>	Waisted New Holland Daisy				2/05/1989
<i>Vittadinia eremaea</i>	Desert New Holland Daisy				1/11/2012
<i>Vittadinia</i> sp.	New Holland Daisy				18/11/2013
<i>Wahlenbergia aridicola</i>	Dryland Bluebell				21/01/1989
<i>Wahlenbergia communis</i>	Tufted Bluebell				23/04/1989
<i>Wahlenbergia gracilent</i>	Annual Bluebell				22/10/2004
<i>Wahlenbergia tumidiflora</i>	Swollen-fruit Bluebell				1/08/1989
<i>Waitzia acuminata</i> var. <i>acuminata</i>	Orange Immortelle				19/07/1989
<i>Wurmbea citrina</i>	Green-flower Nancy				21/09/1983
<i>Wurmbea stellata</i>	Star Nancy		R		8/09/1968
<i>Xerochrysum bracteatum</i>	Golden Everlasting				1/11/2012
<i>Zygochloa paradoxa</i>	Sandhill Cane-grass				1/11/2012

Appendix 4. BDBSA fauna species records for Study area.

Class	Species	Common	EPBC Act	NPW Act	Most Recent Sighting
AMPHIBIA	<i>Neobatrachus</i> sp.				1/10/2006
	<i>Neobatrachus sudellae</i>	Sudell's Frog			21/04/2017
AVES	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater			8/09/2016
	<i>Acanthiza apicalis</i>	Inland Thornbill			8/09/2016
	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill			7/09/2016
	<i>Acanthiza nana</i>	Yellow Thornbill			14/04/2015
	<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill			8/09/2016
	<i>Accipiter cirrocephalus cirrocephalus</i>	Collared Sparrowhawk			22/12/2002
	<i>Actitis hypoleucos</i>	Common Sandpiper		R	2/02/1991
	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar			23/04/2007
	<i>Amytornis modestus indulkanna</i>	Thick-billed Grasswren (NW)	sp		22/07/2014
	<i>Amytornis textilis modestus (NC)</i>	Western Grasswren	VU		1/02/2008
	<i>Anas castanea</i>	Chestnut Teal			17/07/1994
	<i>Anas gracilis</i>	Grey Teal			1/10/2017
	<i>Anas rhynchosotis rhynchosotis</i>	Australasian Shoveler		R	14/03/1994
	<i>Anas superciliosa</i>	Pacific Black Duck			17/04/2011
	<i>Anhinga novaehollandiae</i>	Australasian Darter		R	5/12/1993
	<i>Anthus australis</i>	Australian Pipit			7/09/2016
	<i>Aphelocephala leucopsis</i>	Southern Whiteface			1/10/2017
	<i>Aquila audax</i>	Wedge-tailed Eagle			1/10/2017
	<i>Ardea alba modesta</i>	Great Egret			29/05/1993
	<i>Ardea pacifica</i>	White-necked Heron			3/09/1994
	<i>Arenaria interpres</i>	Ruddy Turnstone		R	9/10/1993
	<i>Artamus cinereus</i>	Black-faced Woodswallow			1/10/2017
	<i>Artamus leucorhynchus</i>	White-breasted Woodswallow			6/07/1991
	<i>Artamus personatus</i>	Masked Woodswallow			3/09/2016
	<i>Artamus superciliosus</i>	White-browed Woodswallow			3/09/2016
	<i>Aythya australis</i>	Hardhead			22/10/2011
	<i>Biziura lobata</i>	Musk Duck		R	2/09/2007

Class	Species	Common	EPBC Act	NPW Act	Most Recent Sighting
	<i>Bubulcus ibis coromandus</i>	Eastern Cattle Egret		R	13/05/1986
	<i>Cacatua sanguinea sanguinea</i>	Little Corella			8/09/2016
	<i>Cacomantis pallidus</i>	Pallid Cuckoo			7/09/2016
	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper			3/09/1994
	<i>Calidris ferruginea</i>	Curlew Sandpiper	CR		3/09/1994
	<i>Calidris ruficollis</i>	Red-necked Stint			3/09/1994
	<i>Certhionyx variegatus</i>	Pied Honeyeater			3/09/2016
	<i>Chalcites basalis</i>	Horsfield's Bronze Cuckoo			30/08/2016
	<i>Charadrius ruficapillus</i>	Red-capped Plover			3/09/1994
	<i>Chenonetta jubata</i>	Maned Duck			12/02/2010
	<i>Cheramoeca leucosterna</i>	White-backed Swallow			2/09/2016
	<i>Chlidonias hybrida</i>	Whiskered Tern			14/03/1994
	<i>Chroicocephalus novaehollandiae</i>	Silver Gull			2/09/2007
	<i>Cinclosoma cinnamomeum</i>	Cinnamon Quailthrush			7/09/2016
	<i>Circus assimilis</i>	Spotted Harrier			3/09/2016
	<i>Cladorhynchus leucocephalus</i>	Banded Stilt		V	1/05/1994
	<i>Colluricincla harmonica</i>	Grey Shrikethrush			17/04/2012
	<i>Coracina maxima</i>	Ground Cuckooshrike			3/09/2016
	<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike			6/09/2016
	<i>Corvus bennetti</i>	Little Crow			1/09/2016
	<i>Corvus coronoides</i>	Australian Raven			1/10/2017
	<i>Coturnix pectoralis</i>	Stubble Quail			26/11/1991
	<i>Cracticus torquatus</i>	Grey Butcherbird			3/09/2016
	<i>Cuculus optatus</i>	Oriental Cuckoo			12/11/1993
	<i>Cygnus atratus</i>	Black Swan			19/03/2012
	<i>Dicaeum hirundinaceum</i>	Mistletoebird			1/09/2016
	<i>Dromaius novaehollandiae</i>	Emu			27/06/2018
	<i>Egretta garzetta</i>	Little Egret		R	9/10/1993
	<i>Egretta novaehollandiae</i>	White-faced Heron			1/09/2016
	<i>Euseyonis melanops</i>	Black-fronted Dotterel			2/09/2007
	<i>Emblema pictum</i>	Painted Finch		R	13/09/1992

Class	Species	Common	EPBC Act	NPW Act	Most Recent Sighting
	<i>Eolophus roseicapilla</i>	Galah			8/09/2016
	<i>Epthianura albifrons</i>	White-fronted Chat			3/09/2016
	<i>Epthianura aurifrons</i>	Orange Chat			14/02/1993
	<i>Epthianura tricolor</i>	Crimson Chat			3/09/2016
	<i>Erythrogonys cinctus</i>	Red-kneed Dotterel			3/09/2016
	<i>Falco berigora</i>	Brown Falcon			7/09/2016
	<i>Falco cenchroides</i>	Nankeen Kestrel			8/09/2016
	<i>Falco longipennis</i>	Australian Hobby			1/10/2017
	<i>Falco peregrinus</i>	Peregrine Falcon		R	8/01/1988
	<i>Fulica atra</i>	Eurasian Coot			1/10/2017
	<i>Gavicalis virescens</i>	Singing Honeyeater			7/09/2016
	<i>Gelochelidon nilotica</i>	Gull-billed Tern			23/04/2007
	<i>Geopelia cuneata</i>	Diamond Dove			27/01/1994
	<i>Geopelia placida</i>	Peaceful Dove			9/10/1993
	<i>Grallina cyanoleuca</i>	Magpielark			8/09/2016
	<i>Grus rubicunda</i>	Brolga		V	2/07/1994
	<i>Gymnorhina tibicen</i>	Australian Magpie			7/09/2016
	<i>Haliastur sphenurus</i>	Whistling Kite			2/09/2007
	<i>Hieraetus morphnoides</i>	Little Eagle			9/12/1992
	<i>Himantopus leucocephalus</i>	White-headed Stilt			2/09/2007
	<i>Hirundo neoxena</i>	Welcome Swallow			7/09/2016
	<i>Hirundo rustica</i>	Barn Swallow			1/11/2014
	<i>Hydroprogne caspia</i>	Caspian Tern			29/05/1993
	<i>Lalage tricolor</i>	White-winged Triller			7/09/2016
	<i>Limosa limosa</i>	Black-tailed Godwit		R	14/03/1994
	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck			3/09/1994
	<i>Malurus lamberti</i>	Variegated Fairywren			1/10/2017
	<i>Malurus leucopterus</i>	White-winged Fairywren			1/10/2017
	<i>Manorina flavigula</i>	Yellow-throated Miner	ssp	ssp	7/09/2016
	<i>Megalurus cruralis</i>	Brown Songlark			31/08/2016
	<i>Megalurus mathewsi</i>	Rufous Songlark			2/09/2016

Class	Species	Common	EPBC Act	NPW Act	Most Recent Sighting
	<i>Melanodryas cucullata westralensis</i>	Hooded Robin (EP, GR, NW)			7/09/2016
	<i>Melopsittacus undulatus</i>	Budgerigar			3/09/2016
	<i>Merops ornatus</i>	Rainbow Bee-eater			5/12/1993
	<i>Microcarbo melanoleucos melanoleucos</i>	Little Pied Cormorant			27/01/1994
	<i>Milvus migrans</i>	Black Kite			1/10/2017
	<i>Mirafra javanica</i>	Horsfield's Bush Lark			2/09/2016
	<i>Neophema splendida</i>	Scarlet-chested Parrot		R	29/08/1993
	<i>Neopsephotus bourkii</i>	Bourke's Parrot			2/09/2016
	<i>Northiella haematogaster (NC)</i>	Bluebonnet		ssp	7/09/2016
	<i>Nymphicus hollandicus</i>	Cockatiel			1/09/2016
	<i>Ocyphaps lophotes</i>	Crested Pigeon			1/10/2017
	<i>Oreoica gutturalis</i>	Crested Bellbird			8/09/2016
	<i>Oriolus sagittatus sagittatus</i>	Olive-backed Oriole		R	18/04/2012
	<i>Oxyura australis</i>	Blue-billed Duck		R	26/06/1993
	<i>Pachycephala rufiventris rufiventris</i>	Rufous Whistler			8/09/2016
	<i>Pelecanus conspicillatus</i>	Australian Pelican			3/09/1994
	<i>Peltohyas australis</i>	Inland Dotterel			1/10/2017
	<i>Petrochelidon ariel</i>	Fairy Martin			2/09/2016
	<i>Petrochelidon nigricans</i>	Tree Martin			2/09/2016
	<i>Petroica goodenovii</i>	Red-capped Robin			8/09/2016
	<i>Phalacrocorax carbo</i>	Great Cormorant			1/09/2016
	<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant			1/05/1994
	<i>Phalacrocorax varius</i>	Great Pied Cormorant			5/12/1993
	<i>Phaps chalcoptera</i>	Common Bronzewing			23/04/2007
	<i>Phaps histrionica</i>	Flock Bronzewing		R	12/12/2013
	<i>Platalea flavipes</i>	Yellow-billed Spoonbill			3/09/1994
	<i>Plegadis falcinellus</i>	Glossy Ibis		R	1/08/1993
	<i>Pluvialis squatarola</i>	Grey Plover			26/11/1991
	<i>Podargus strigoides</i>	Tawny Frogmouth			3/09/2016
	<i>Podiceps cristatus</i>	Great Crested Grebe		R	14/03/1994
	<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe			17/07/1994

Class	Species	Common	EPBC Act	NPW Act	Most Recent Sighting
	<i>Pomatostomus superciliosus</i>	White-browed Babbler			1/10/2017
	<i>Psephotellus varius</i>	Mulga Parrot			7/09/2016
	<i>Psophodes cristatus</i>	Chirruping Wedgebill			1/10/2017
	<i>Ptilotula penicillata</i>	White-plumed Honeyeater			1/09/2016
	<i>Purnella albifrons</i>	White-fronted Honeyeater			16/04/2012
	<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet			3/09/1994
	<i>Rhipidura albiscapa</i>	Grey Fantail			4/07/1992
	<i>Rhipidura leucophrys</i>	Willie Wagtail			8/09/2016
	<i>Spilopelia chinensis</i>	Spotted Dove			1/10/1993
	<i>Stictonetta naevosa</i>	Freckled Duck		V	3/09/1994
	<i>Sturnus vulgaris</i>	Common Starling			9/10/1993
	<i>Tachybaptus novaehollandiae</i>	Australasian Grebe			1/10/2017
	<i>Tadorna tadornoides</i>	Australian Shelduck			1/05/1994
	<i>Taeniopygia guttata</i>	Zebra Finch			1/10/2017
	<i>Threskiornis moluccus</i>	Australian White Ibis			1/05/1994
	<i>Threskiornis spinicollis</i>	Straw-necked Ibis			1/09/2016
	<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher			7/09/2016
	<i>Tribonyx ventralis</i>	Black-tailed Nativehen			1/10/2017
	<i>Tringa glareola</i>	Wood Sandpiper		R	27/01/1994
	<i>Tringa nebularia</i>	Common Greenshank			3/09/1994
	<i>Tringa stagnatilis</i>	Marsh Sandpiper			1/05/1994
	<i>Vanellus miles</i>	Masked Lapwing			2/09/2007
	<i>Vanellus tricolor</i>	Banded Lapwing			7/09/2016
MAMMALIA	<i>Antechinomys laniger</i>	Kultarr			18/12/2010
	<i>Austronomus australis</i>	White-striped Free-tailed Bat			7/09/2016
	<i>Bettongia lesueur</i>	Burrowing Bettong	EX	E	19/06/2018
	<i>Canis lupus</i>	Feral Dog, Dingo			14/07/2016
	<i>Canis lupus dingo</i>	Dingo			29/08/2016
	<i>Canis lupus familiaris</i>	Feral Dog			1/09/2016
	<i>Dasyurus geoffroii</i>	Western Quoll	VU	E	18/12/2018
	<i>Equus caballus</i>	Horse (Brumby)			1/01/2004

Class	Species	Common	EPBC Act	NPW Act	Most Recent Sighting
	<i>Felis catus</i>	Domestic Cat (Feral Cat)			7/09/2016
	<i>Leggadina forresti</i>	Central Short-tailed Mouse (Forrest's Mouse)			4/09/2016
	<i>Leporillus conditor</i>	Greater Stick-nest Rat	VU	V	1/10/2017
	<i>Leporillus sp.</i>	stick-nest rats			16/09/2012
	<i>Macropus (Osphranter) robustus</i>	Euro			4/09/2016
	<i>Macropus (Osphranter) rufus</i>	Red Kangaroo			27/06/2018
	<i>Macropus fuliginosus</i>	Western Grey Kangaroo			4/07/2016
	<i>Macropus sp.</i>				15/07/2011
	<i>Macrotis lagotis</i>	Greater Bilby (Bilby)	VU	V	14/05/2018
	<i>Mormopterus sp.</i>				7/09/2016
	<i>Mus musculus</i>	House Mouse			13/04/2018
	<i>Myrmecobius fasciatus</i>	Numbat	EN	E	14/06/2006
	<i>Notomys alexis</i>	Spinifex Hopping-mouse			13/04/2018
	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat			7/09/2016
	<i>Oryctolagus cuniculus</i>	Rabbit (European Rabbit)			2/09/2016
	<i>Perameles bougainville</i>	Western Barred Bandicoot	ssp	E	19/06/2018
	<i>Perameles bougainville bougainville</i>	Western Barred Bandicoot (Shark Bay)	EN		16/05/2017
	<i>Perameles bougainville fasciata</i>	Western Barred Bandicoot (mainland)	EX		10/07/2012
	<i>Planigale gilesi</i>	Giles' Planigale (Paucident Planigale)			6/03/2017
	<i>Pseudomys australis</i>	Plains mouse	VU	V	13/04/2018
	<i>Pseudomys bolami</i>	Bolam's Mouse			19/04/2017
	<i>Pseudomys desertor</i>	Desert Mouse			9/12/2013
	<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse			4/09/2016
	<i>Pseudomys sp.</i>				13/12/2006
	<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat			7/09/2016
	<i>Scotorepens sp.</i>				23/04/2007
	<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart			9/03/2017
	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart			9/03/2017
	<i>Sminthopsis sp.</i>				22/12/2011
	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	ssp		18/07/2017
	<i>Vespadelus baverstocki</i>	Inland Forest Bat			2/09/2016

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	<i>Vulpes vulpes</i>	Fox (Red Fox)			1/01/1995
REPTILIA	<i>Anilius bituberculatus</i>	Rough-nosed Blind Snake			17/12/2014
	<i>Anilius endoterus</i>	Centralian Blind Snake			13/04/2018
	<i>Anilius sp.</i>				1/01/2010
	<i>Antaresia stimsoni</i>	Stimson's Python			25/10/1994
	<i>Aspidites ramsayi</i>	Woma		R	10/10/1990
	<i>Brachyuophis fasciolatus</i>	Narrow-banded Snake			3/11/2008
	<i>Cryptoblepharus australis</i>	Desert Wall Skink			11/09/1990
	<i>Ctenophorus fordi</i>	Mallee Dragon			12/04/2018
	<i>Ctenophorus gibba</i>	Gibber Dragon			10/09/1997
	<i>Ctenophorus maculosus</i>	Lake Eyre Dragon			9/10/2009
	<i>Ctenophorus nuchalis</i>	Central Netted Dragon			9/03/2017
	<i>Ctenophorus pictus</i>	Painted Dragon			12/04/2018
	<i>Ctenotus brooksi</i>	Sandhill Ctenotus			13/04/2018
	<i>Ctenotus leae</i>	Centralian Coppertail			18/04/2017
	<i>Ctenotus leonhardii</i>	Common Desert Ctenotus			8/03/2017
	<i>Ctenotus olympicus</i>	Saltbush Ctenotus			15/05/1995
	<i>Ctenotus regius</i>	Eastern Desert Ctenotus			12/04/2018
	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus			18/04/2017
	<i>Ctenotus sp.</i>				13/12/2000
	<i>Ctenotus strauchii</i>	Short-legged Ctenotus			11/04/2018
	<i>Ctenotus taeniatus</i>	Eyrean Ctenotus			4/09/2016
	<i>Demansia reticulata</i>	Desert Whipsnake			30/08/2016
	<i>Demansia sp.</i>				12/06/1995
	<i>Diplodactylus conspicillatus (NC)</i>	Fat-tailed Gecko			13/12/2013
	<i>Diplodactylus conspicillatus (revised)</i>	Variable Fat-tailed Gecko			9/03/2017
	<i>Diplodactylus tessellatus</i>	Tessellated Gecko			9/03/2017
	<i>Diporiphora winneckeii (NC)</i>	Canegrass Dragon			11/11/1990
	<i>Egernia stokesii</i>	Gidgee Skink			30/08/2016
	<i>Eremiascincus phantasmus</i>	Ghost Skink			12/04/2018
	<i>Eremiascincus richardsonii</i>	Broad-banded Sandswimmer			9/03/2017



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	<i>Gehyra lazelli</i>	Southern Rock Dtella			19/04/2017
	<i>Gehyra purpurascens</i>	Robust Tree Dtella			19/04/2017
	<i>Gehyra sp.</i>				31/08/2016
	<i>Gehyra variegata (NC)</i>	Tree Dtella			11/02/2014
	<i>Gehyra variegata (revised)</i>	Western Tree Dtella			10/12/2014
	<i>Gehyra variegata complex</i>				29/08/2016
	<i>Gehyra versicolor</i>	Eastern Tree Dtella			6/09/2016
	GEKKONIDAE sp.	geckos			1/10/2017
	<i>Heteronotia binoei</i>	Bynoe's Gecko			8/03/2017
	<i>Lerista desertorum</i>	Great Desert Slider			14/01/2007
	<i>Lerista labialis</i>	Eastern Two-toed Slider			13/04/2018
	<i>Lerista sp.</i>				23/10/1989
	<i>Lerista timida</i>	Dwarf Three-toed Slider			6/09/2016
	<i>Lialis burtonis</i>	Burton's Snake-lizard			9/11/1997
	<i>Lucasium damaeum</i>	Beaded Gecko			13/04/2018
	<i>Lucasium stenodactylum (revised)</i>	Sandplain Gecko			21/04/2017
	<i>Menetia greyii</i>	Dwarf Skink			9/03/2017
	<i>Morethia adelaidensis</i>	Adelaide Snake-eye			8/03/2017
	<i>Morethia boulengeri</i>	Common Snake-eye			10/04/2018
	<i>Nephurus levis</i>	Common Knob-tailed Gecko			12/04/2018
	<i>Pogona vitticeps</i>	Central Bearded Dragon			18/04/2017
	<i>Pseudechis australis</i>	Mulga Snake			7/03/2017
	<i>Pseudonaja mengdeni</i>	Gwardar			19/04/2017
	<i>Pseudonaja modesta</i>	Five-ringed Snake			19/04/2017
	<i>Pseudonaja nuchalis (NC)</i>	Western Brown Snake			20/11/1995
	<i>Pygopus nigriceps</i>	Western Hooded Scaly-foot			22/02/2012
	<i>Rhynchoedura eyrensis</i>	Eyrean Beaked Gecko			9/03/2017
	<i>Rhynchoedura ornata (NC)</i>	Beaked Gecko			15/02/2013
	<i>Rhynchoedura ornata (revised)</i>	Western Beaked Gecko			12/04/2018
	<i>Rhynchoedura sp.</i>				12/01/2012
	SAURIA sp.	lizards			1/10/2017

<b>Class</b>	<b>Species</b>	<b>Common</b>	<b>EPBC Act</b>	<b>NPW Act</b>	<b>Most Recent Sighting</b>
	<i>Simoselaps bertholdi</i>	Desert Banded Snake			12/04/2018
	<i>Simoselaps sp.</i>				15/03/1988
	<i>Strophurus ciliaris</i>	Northern Spiny-tailed Gecko			19/04/2017
	<i>Suta suta</i>	Curl Snake			29/08/2016
	<i>Tiliqua occipitalis</i>	Western Bluetongue			8/03/2016
	<i>Tiliqua rugosa</i>	Shingleback Lizard			6/09/2016
	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon			19/04/2017
	<i>Tympanocryptis lineata</i>	Lined Earless Dragon			6/03/2017
	<i>Tympanocryptis tetraporophora</i>	Eyrean Earless Dragon			5/03/2017
	<i>Underwoodisaurus milii</i>	Common Barking Gecko			9/03/2017
	<i>Varanus gilleni</i>	Pygmy Mulga Goanna			14/06/1994
	<i>Varanus gouldii</i>	Sand Goanna			1/10/2017

