Woolstores Place Ecological Surveys 2023

Rowe Group

Report

JBS&G 65310 | 161,820

22 August 2024

We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.

Caring for Country The Journey of JBS&G
Artist: Patrick Caruso, Eastern Arrernte

Executive Summary

JBS&G Australia Pty Ltd (JBS&G) were commissioned to undertake a Reconnaissance flora and vegetation survey and Basic fauna survey of nine lots on Woolstores Place, Mt Elphinstone for the development of a Local Structure Plan.

The surveys were undertaken from 25-28 October 2023 by an experienced botanist from JBS&G and an experienced zoologist from Kingfisher Consulting Pty Ltd.

No significant constraints were identified with regards to flora and vegetation, with the majority of the Survey Area having been previously cleared, such that 97% of the Survey Area was in Completely Degraded condition in accordance with Keighery's (1994) scale. A small, and avoidable, section of the Survey Area (0.22 ha) contained part of an EPBC Act listed threatened ecological community, *Subtropical and Temperate Coastal Saltmarsh*. The remaining remnant native vegetation in the Survey Area was likely to be groundwater dependant with the entirety of the site being low-lying/wetland and a small lake being present. Only 27 native flora species were identified in the Survey Area.

The fauna survey identified four listed fauna species, including the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed Western Ringtail Possum (Critically Endangered, 1.4 ha of habitat) and *Biodiversity Conservation Act 2016* (BC Act) Quenda (Priority 4, 8.24 ha of habitat), which were both resident, and Migratory birds (listed under International Agreements) in large numbers utilising the adjacent mudflats, including the EPBC Act listed Fairy Tern (Vulnerable/Migratory). The presence of some listed fauna species (e.g. fish and invertebrates) was not able to be assessed without a targeted survey.

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1. Introduction

Mainbeam Pty Ltd (Mainbeam) are developing a Local Structure Plan (LSP) over nine lots on Woolstores Place, Mount Elphinstone, located within the City of Albany. The LSP area (the 'Survey Area') includes Mainbeam landholdings, as well as other State, Commonwealth, and privately owned land, and is depicted in Figure 1.1. The proposed development's focus will primarily be on the future use and development of the Mainbeam landholdings, exploring a mixture of tourist and quality medium to high density residential, with non-residential commercial land uses considered in close proximity to the rail corridor and future road interchange.

1.1 Survey/Study Area (Delete as applicable)

The Survey Area is located approximately 3.5 km west of the Albany Central Business District in City of Albany and covers a land area of 16.77 ha within the area bound by Frenchman Bay Road, the Princess Royal Harbour waterfront, and the Princess Royal Drive (Figure 1.1).

1.2 Scope of Work

The proposed scope of works for ecological surveys of the LSP includes:

- Reconnaissance-level flora and vegetation survey;
- Targeted flora survey to record the presence of any conservation – listed fauna taxa identified from the desktop study as having 'Likely' potential to occur;
- Basic fauna survey, including a targeted survey for conservation- listed fauna taxa, including threatened bird species known from, or considered 'Likely' to occur at the site; and
- Threatened and Priority Ecological Community survey to evaluate species composition and vegetation condition against criteria contained within the approved Subtropical and Temperate Coastal Saltmarsh TEC/PEC conservation advice (TSSC, 2013).

Legend

- Survey Area
- Cadastral boundary
- Highway
- Major road
- Minor road
- Track

JBS&G

Job No: 65310

Client: ROWE Group

Version: A	Date: 11/07/2024
Drawn By: droberts	Checked By: RP

Scale 1:8,000 at A4

0 100 200
metres

Coord. Sys. GDA2020 MGA Zone 50

Woolstores Place, Albany, WA

SURVEY AREA AND REGIONAL LOCATION

FIGURE 1.1

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2. Existing Environment

2.1 Biogeography

The Survey Area occurs in the South-west Botanical Province, in the Southern Jarrah Forest subregion, of the Jarrah Forest region under the Interim Biogeographic Regionalisation for Australia (IBRA) (DEE, 2012).

The Southern Jarrah Forest includes forests south of Collie which slope gently towards the south coast. The region is characterised by Jarrah-Marri (*Eucalyptus marginata-Corymbia calophylla*) forest in the west where rainfall is higher, grading to drier Marri and Wandoo (*Eucalyptus wandoo*) forest in the east (Hearn, et al., 2002).

Within this region, granite outcrops, riparian areas, peaty wetlands act as refugia for species with restricted distributions and/or relict taxa representative of historically wetter and milder climates (Hearn, et al., 2002).

2.2 Climate

The Southern Jarrah Forest sub-region has a warm Mediterranean climate with mild, dry summers and cool, wet winters (Beard, 1990).

The Albany weather station (Station 9500) is positioned approximately 1.5 km from the Survey Area and recorded rainfall data between 1877 and 2024 and temperature data between 1880 and 2024.

The average annual rainfall at Albany was 924.7 mm, with the highest monthly rainfall occurring from May to September. The highest recorded rainfall of 1395.2 mm was received in 1955. 2023 received 863.1 mm of rainfall, approximately 93% of the long-term average (BOM, 2024).

The average monthly maximum temperature at Albany ranges from 15.8 °C in July to 22.9 °C in February. Average monthly minimum temperatures range from 8.2 °C in July to 15.6 °C in February (BOM, 2024).

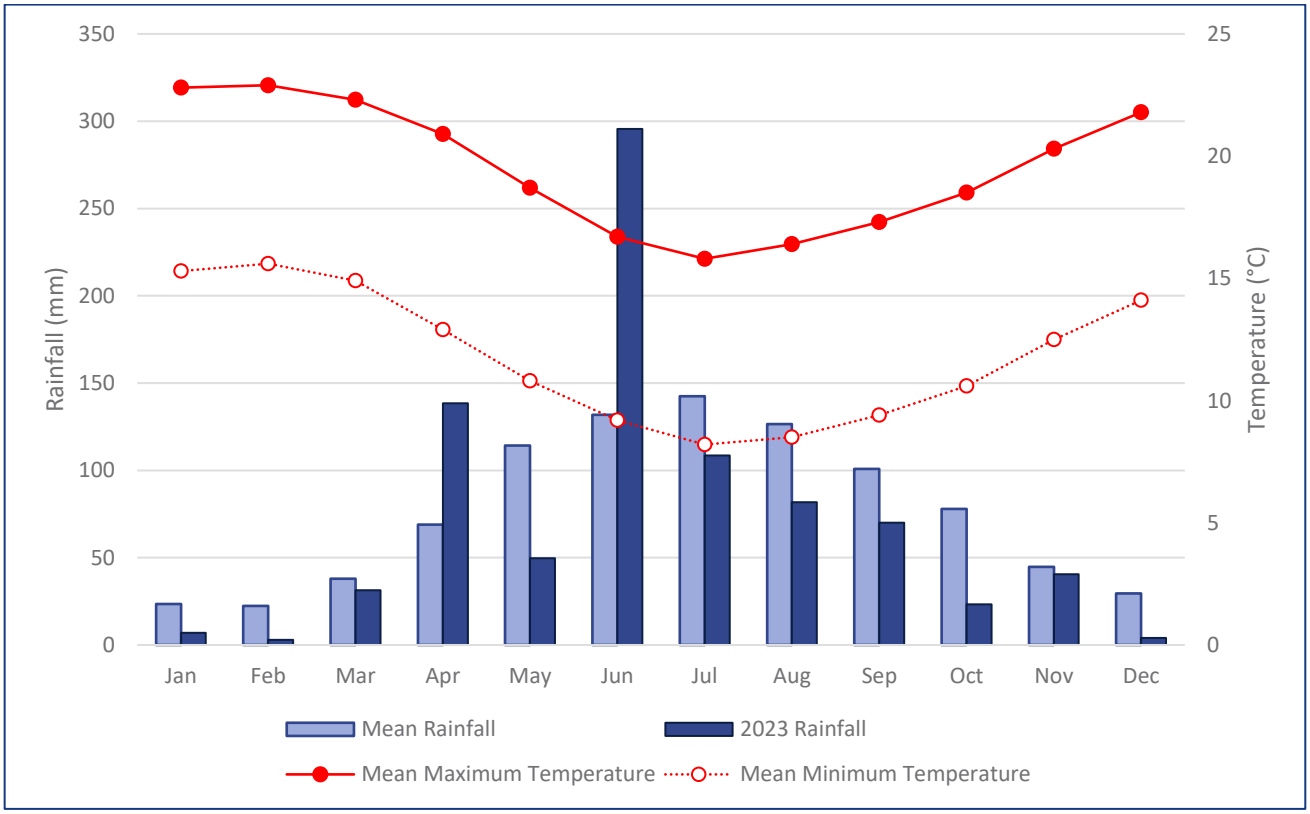

Figure 2.1 Climate data for the Albany weather station (station 9500)

2.3 Soils and Landforms

2.3.1 Soil-landscape Systems

Two soil-landscape systems are mapped in the Survey Area, the Gardner granite phase and the Owingup subsystem (DPIRD, 2018). Department of Primary Industry and Regional Development (DPIRD) spatial data does not cover the full extent of the Survey Area, so area of this mapping does not tally up to 16.77 ha.

Table 2.1 Soil-landscape systems mapped within the Survey Area

Land System Code System Name	Description	Area (ha)	Proportion of the Survey Area
242MmGAg Gardner granite phase	Granite outcrop.	0.14	0.92 %
242TbOW Owingup subsystem	Plains with swamps, lunettes and dunes. Yellow solonetzic soils, organic loams and diatomaceous earth; Wattle-Paperbark thickets, Teatree heath and reeds. Podzols on dunes; Banksia-Sheoak woodland.	15.55	99.08 %

2.3.2 Topography

The Survey Area is low-lying and occurs at less than 10 m above sea level. The southernmost portion of the Survey Area is an artificial landform (Plate 1, Figure 2.2), with historic aerial photography indicating that this area was originally saltmarsh, with land reclaimed for the Albany Woolstores between 1954 and 1977 (Landgate, 2024). The northern portion of the Survey Area was cleared but not filled historically.

Plate 1 An artificial rock-wall at the southern side of the Survey Area

Legend

- Survey Area

Soils-landscape Systems (DPIRD-027)

- Gardner granite phase
- Gardner sandy phase
- Mattaband yellow duplex phase
- Owingup subsystem
- Topographic contours - 2m

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SOILS-LANDSCAPE SYSTEMS AND TOPOGRAPHY

FIGURE 2.2

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2.4 Inland Waters

2.4.1 Surface Water

The Survey Area lies adjacent to, and extends into, the Princess Royal Harbour. The Survey Area is only slightly above sea level and norther parts of the site contain swamp. No fine scale contour mapping is available for the Survey Area.

The Survey Area does not occur near any important wetlands (DCCEEW, 2022; DBCA, 2017a; DBCA, 2017b).

2.4.2 Groundwater

The Survey Area occurs in the Princess Royal Harbour catchment of the Albany Coast basin. The Survey Area falls within the Karri groundwater sub-area (DWER, 2017). Little information is available about the coastal portions of this sub-area.

2.5 Regional Vegetation

On 10 November 2023, Australia's environment ministers agreed on 6 priority areas for national targets under Australia's Strategy for Nature. These included protecting and conserving 30 % of Australia's land and 30 % of Australia's oceans by 2030 (DCCEEW, 2024).

One pre-European vegetation association coincides with the Survey Area, Albany – 3 (Table 2.2 and Figure 2.4). More than 30 % of the pre-European extent of Albany – 3 remains at a local and regional scale.

Table 2.2 Pre-European vegetation associations/sub-associations and their extent

Vegetation Sub-Association	Scale	Pre-European Extent (ha)	Current Extent (ha)	% Remaining
Albany - 3 Medium forest; jarrah-marri	Western Australia	2,661,404.62	1,803,437.48	67.76
	Jarrah Forest IBRA Region	2,390,591.54	1,604,101.56	67.10
	Southern Jarrah Forest IBRA Sub-region	1,482,491.85	880,655.65	59.40
	City of Albany	50,509.32	16,024.66	31.73

Legend

- Survey Area
- Cadastral boundary
- Topographic contours - 2m

Hydrography, linear (DWER-031)

- Drain - minor
- Lake - perennial
- Lake - artificial
- Earth Dam
- Highway
- Major road
- Minor road
- Track

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SOILS-LANDSCAPE SYSTEMS AND TOPOGRAPHY

FIGURE 2.3

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Legend

Survey Area

Pre-European Vegetation (DPIRD-006)

ALBANY_128

ALBANY_3

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PRE - EUROPEAN VEGETATION

FIGURE 2.4

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2.6 Previous Surveys

The *Albany Regional Vegetation Survey* (Sandiford & Barrett, 2010) spanned 124,415 ha extending 30 km east and west of Albany and 20 km to the north. The survey defined 67 vegetation units, including several communities now listed at a State or Commonwealth level. More than 800 species were recorded during the survey, including 49 taxa then listed at a State or Commonwealth level (Sandiford & Barrett, 2010). The regional vegetation map produced by the *Albany Regional Vegetation Survey* did not show the Survey Area as being vegetated, but identified *Juncus kraussii* Sedgeland, Peppermint Low Forest and Coastal *Melaleuca cuticularis* Low Forest as occurring to either side of the Survey Area (Sandiford & Barrett, 2010).

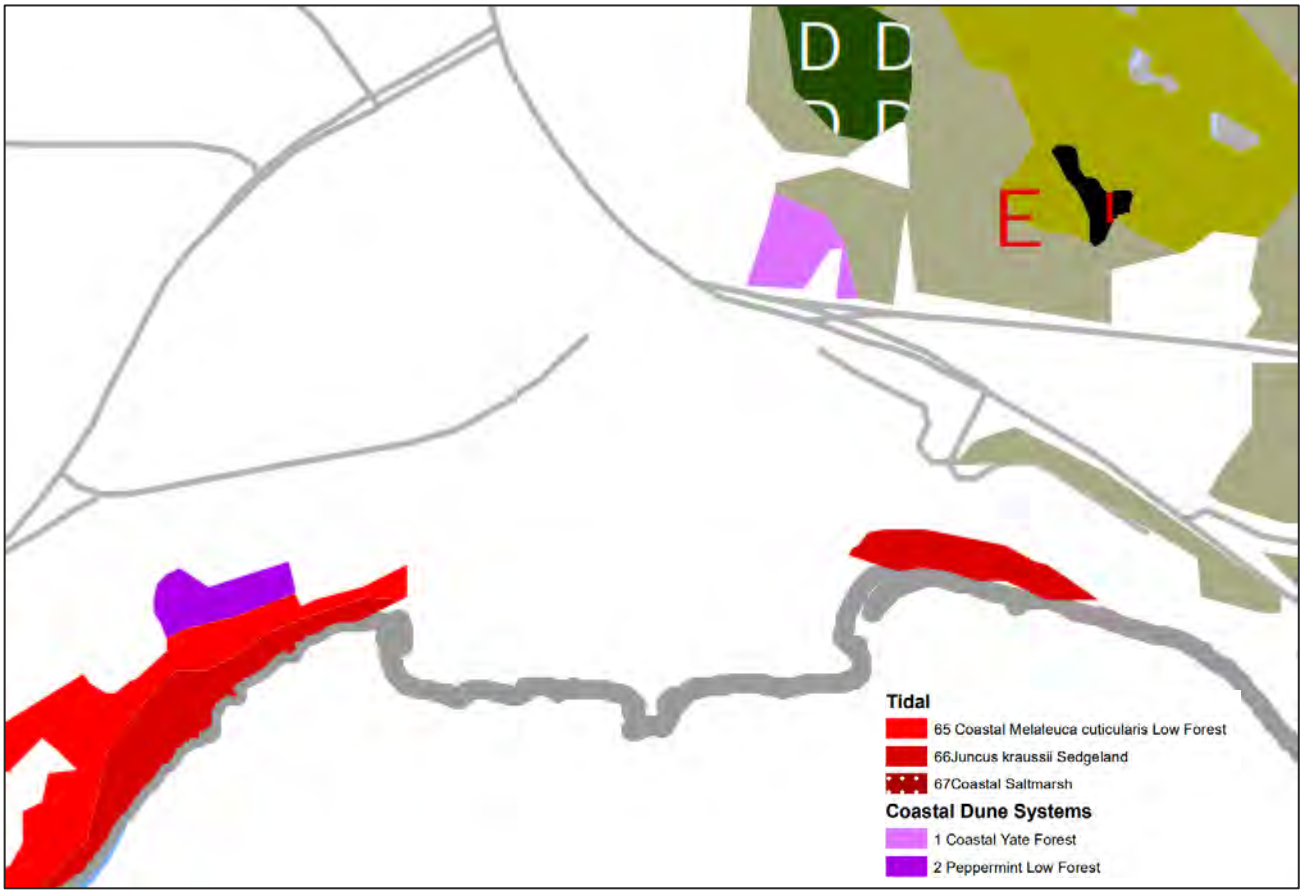

Plate 2 Albany Regional Vegetation Survey vegetation map

A biological survey was undertaken north of the Survey Area as part of studies undertaken for the Albany Ring Road: *Biological Survey: Albany Ring Road* (Southern Ecology, 2020). This survey incorporated the northern portion of the Survey Area. Southern Ecology (2020) identified most of this area as Completely Degraded *"isolated plants (pasture and herbaceous weeds with isolated plants)"* with small areas of Yate (*Eucalyptus cornuta*) woodland and *Melaleuca preissiana* low woodland (Plate 3). Of the area identified as Yate woodland, only a single tree lies within the Survey Area.

Southern Ecology (2020) considered *Melaleuca preissiana* low woodland to be regionally significant as a wetland habitat. They also noted the presence of the Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Community (TEC) (Vulnerable) approximately 100 m from Southern Ecology's survey on the margin of Princess Royal Harbor.

Plate 3 Vegetation mapping by Southern Ecology (2020)

No listed flora were identified in the Survey Area by Southern Ecology, who recorded four Priority flora taxa in their broader survey:

- *Thysanotus isantherus* (P4) approximately 200 m east of the Survey Area;
- *Boronia crassipes* (P3);
- *Andersonia* sp. Jamesii (J. Liddelow 84) (P4); and
- *Synaphea incurva* (P3).

Southern Ecology also recorded five significant fauna species:

- Carnaby's Black Cockatoo (*Zanda latirostris*) (T-EN)
- Baudin's Black Cockatoo (*Zanda baudinii*) (T-EN)
- Forest Red-tailed Black Cockatoo (*Calyptorhychus banksii naso*) (T-VU)
- Western Ringtail Possum (*Pseudocheirus occidentalis*) (T-CR)
- Southern Brown Bandicoot (*Isoodon obesulus fusciventer*) (P4)

2.7 Significant Ecological Communities

2.7.1 Database Searches

A search of Department of Biodiversity, Conservation and Attractions (DBCA) flora communities and fauna databases and DCCEEW's Protected Matters Search Tool for listed ecological communities occurring within 15 km of the Survey Area . Four significant ecological communities were listed by DBCA as occurring within 15 km of the Survey Area

Table 2.3 Significant ecological communities listed in databases as occurring near the Survey Area

ID	Community	State	Cth
Coastal *Melaleuca incana/Taxandria juniperina*	Coastal *Melaleuca incana / Taxandria juniperina* Shrubland/Closed Forest	Priority 1	Not listed
Banksia littoralis/Melaleuca incana	*Banksia littoralis* woodland / *Melaleuca incana* Shrubland	Priority 1	Not listed
Astartea scoparia Swamp Thicket	*Astartea scoparia* Swamp Thicket	Priority 1	Not listed
126 *Banksia coccinea* thicket	Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia • *Banksia coccinea* Shrubland/*Eucalyptus staeri*/Sheoak Open Woodland (Community 14a - Sandiford & Barrett 2010) (all/or portion in EPBC listed Kwongkan community)	Priority 1	Endangered
118	*Subtropical and Temperate Coastal Saltmarsh*	Priority 3	Vulnerable
174	*Empodisma peatlands of southwestern Australia*	Not listed[1]	Vulnerable

2.7.2 Groundwater Dependent Ecosystems

Geoscience Australia describes Groundwater Dependent Ecosystems as those that rely on groundwater for some, or all, of their water requirements (Geoscience Australia, 2023). This can broadly apply to many ecosystems in Australia, so six types of GDEs have been identified in Australia:

- Terrestrial vegetation that relies on the availability of shallow groundwater;
- Wetlands such as paperbark swamp forests and mound springs;
- River baseflow systems where groundwater discharge provides a significant baseflow component to the river;
- Aquifer and cave ecosystems where life exists independent of sunlight;
- Terrestrial fauna, both native and introduced species, that rely on groundwater as a source of drinking water; and
- Estuarine and near-shore marine systems, such as coastal mangroves, salt marshes and sea-grass beds, which rely on the submarine discharge of groundwater.

These have been categorised into three categories (BOM, 2017):

- Aquatic ecosystems which rely on the surface expression of groundwater, such as rivers, wetlands and springs (this can also include marine and estuarine ecosystems);

[1] DBCA advise that a number of South-west communities have peat associations that may be listed as other ecological communities at a State level.

- Terrestrial ecosystems which rely on the subsurface presence of groundwater, including groundwater dependent terrestrial vegetation; and
- Subterranean ecosystems including cave and aquifer ecosystems.

Aquatic and subterranean environments are not included in flora and vegetation surveys for Environmental Impact Assessment so are not covered by this report.

Regionally, the following vegetation has been identified as Groundwater Dependent:

- Base-flow ecosystems in south-western Western Australia (Hatton & Evans, 1998);
- The jarrah forest and Banksia woodlands of south-western Western Australia (limited dependence) (Hatton & Evans, 1998);
- Coastal mangrove and salt marsh ecosystems (limited dependence) (Hatton & Evans, 1998);
- The near-shore stromatolite systems of coastal Western Australia (Hatton & Evans, 1998);
- Karstic groundwater ecosystems of Exmouth Cape, Yanchep Caves, the Nullarbor and elsewhere (Hatton & Evans, 1998); and
- Karst ecosystems including those on the Nullarbor (Hatton & Evans, 1998);

2.8 Significant Flora

Flora, or populations of flora, may be considered significant for a range of reasons, including:

- Conservation dependent taxa (including those identified as a threatened or priority taxa);
- Being locally endemic, geographically restricted or associated with a restricted habitat type, including phreatophytic species;
- Novel, hybrid or taxonomically unusual taxa;
- Geographically isolated populations and range extensions;
- Bush tucker, bush medicine species and culturally important species; and
- Keystone species or those which provide critical habitat for fauna species.

2.8.1 Conservation Listed Flora

2.8.1.1 Database Searches

A search of DBCA databases and the Protected Matters Search Tool identified 77 conservation listed flora occurring within 15 km of the Survey Area (Figure 2.5). Of these, a likelihood assessment (Appendix C) identified 29 taxa as likely to occur within the Survey Area based on nearby records (within 5 km) and a desktop assessment of potential habitats present. A further 25 taxa were considered to possibly occur in the Survey Area based on their preferred habitats but were not known to occur in the immediate vicinity of the Survey Area (Table 2.4). Two recently State-listed threatened species (upgraded 6 October 2023) were not yet listed under the EPBC Act, *Conospermum quadripetalum* and *Isopogon buxifolius* subsp. *buxifolius*.

Table 2.4 Summary of likelihood assessment

State Listing (State of Western Australia, 2023)	Likely	Possible	Unlikely	Total
Critically Endangered (CR)	4	0	2	**6**
Endangered (EN)	0	4	3	**7**
Vulnerable (VU)	2	0	3	**5**
Priority 1 (P1)	3	1	2	**6**

State Listing (State of Western Australia, 2023)	Likely	Possible	Unlikely	Total
Priority 2 (P2)	7	5	2	**14**
Priority 3 (P3)	5	11	5	**21**
Priority 4 (P4)	8	6	6	**20**
Total	**29**	**27**	**23**	**79**

Taxa considered likely to occur, and their WA conservation status, were:

Threatened Flora:

- *Banksia brownii* (CR)
- *Caladenia harringtoniae* (VU)
- *Calectasia cyanea* (CR)
- *Conospermum quadripetalum* (CR)
- *Conostylis misera* (VU)
- *Isopogon uncinatus* (CR)

Priority Flora:

- *Acacia ataxiphylla* subsp. *ataxiphylla* (P3)
- *Adenanthos x cunninghamii* (P4)
- *Agrostocrinum scabrum* subsp. *littorale* (P2)
- *Boronia crassipes* (P3)
- *Chorizema carinatum* (P3)
- *Conospermum spectabile* (P2)
- *Drosera paleacea* (P1)
- *Gahnia sclerioides* (P4)
- *Gonocarpus pusillus* (P4)
- *Lepidium pseudotasmanicum* (P4)
- *Leucopogon alternifolius* (P3)
- *Leucopogon bracteolaris* (P2)
- *Lysinema lasianthum* (P4)
- *Microtis pulchella* (P4)
- *Microtis quadrata* (P4)
- *Prasophyllum paulinae* (P1)
- *Stylidium articulatum* (P2)
- *Stylidium falcatum* (P2)
- *Styphelia cymbiformis* (P2)
- *Synaphea preissii* (P3)
- *Thelymitra porphyrosticta* (P2)
- *Thomasia multiflora* (P1)
- *Thomasia solanacea* (P4)

2.8.1.2 Nearby Surveys

No additional flora were identified by Southern Ecology (2020) that were not captured by database searches. Of the four significant flora taxa identified by Southern Ecology, *Synaphea incurva* (P3) occurred within 5 km of the Survey Area, however its preference for slopes means it's unlikely to occur within the Survey Area.

2.8.2 Other Significant Flora

2.8.2.1 Phrase Name Species

'Phrase name' flora taxa are those which have not yet been formally named and described. Approximately 59 phrase name flora taxa occur within Shire of Albany (WAHerb, 1998-). This number fluctuates as species are formally named and described, and as new species are identified.

2.8.2.2 Geographically Restricted Flora

Taxa which rely on granite outcropping are usually geographically restricted. The Great Southern region is known for its granite outcropping, and approximately 111 native flora taxa were associated with granite outcropping in the Shire of Albany (WAHerb, 1998-). This did not include phrase name species which have not yet had habitat information input to Florabase.

A small section of the Survey Area is mapped as granite outcrop (DPIRD, 2018).

2.8.2.3 Groundwater Dependent Flora

Phreatophytic species are reliant on access to groundwater reserves for persistence and are thus considered to be groundwater dependent. Groundwater dependent species may be 'obligate' phreatophytes, dependent on free access to groundwater, or 'facultative' phreatophytes, which require access to groundwater resources when the soil surface moisture is depleted but are able to utilise surface water during periods of rainfall (Nevill, et al., 2010).

Regionally, taxa known to occur only in wetlands or riparian vegetation should be treated as obligate phreatophytes, while many taxa and communities may be facultative phreatophytes.

2.8.2.4 Flora Associated with Significant Vegetation

Locally the following flora can be considered significant as indicators of Threatened and Priority Ecological Communities:

- *Melaleuca incana*
- *Taxandria juniperina*
- *Banksia littoralis*
- *Astartea scoparia*
- *Banksia coccinea*
- *Eucalyptus staeri*
- *Allocasuarina* spp.
- Proteaceae spp.
- Saltmarsh species (Chenopod species, *Suaeda australis, Threlkeldia diffusa, Juncus* spp. etc.)
- *Empodisma gracillimum*

2.9 Significant Fauna

One hundred and one listed fauna species were identified by database searches as potentially occurring in the Survey Area (excluding purely marine species such as marine fish, sharks, turtles and whales). This included 40 listed as threatened under the EPBC Act, ten only listed as threatened under the BC Act, and 45 listed as Migratory or under an International Agreement (Table 2.5, Figure 2.6). A full assessment of the potential for these taxa to occur in the Survey Area is provided in Appendix B.

Table 2.5 Number of listed species potentially occurring in the Survey Area

Class	Western Australia Only					Commonwealth						
	P1	P2	P3	P4	T	CR	EN	EN/MI	MI	VU	VU/MI	Total
Bird			1	3	3	2	8	4	35	11	5	**72**
Invertebrate			1		3		1			1		**6**
Mammal				5	3	2	3	1		3		**17**
Reptile		1										**1**
Fish					1		2					**2**
Total	**0**	**1**	**2**	**8**	**10**	**4**	**15**	**5**	**35**	**15**	**5**	**101**

570000 571000 572000 573000 574000 575000 576000 577000 578000 579000 580000 581000 582000 583000 584000 585000 586000 587000

6130000 6129000 6128000 6127000 6126000 6125000 6124000 6123000 6122000 6121000 6120000 6119000 6118000 6117000

Legend

Survey Area

Threatened and Priority Ecological Communities

- *Astartea scoparia* Swamp Thicket (Priority 1)
- *Banksia coccinea* Shrubland *Eucalyptus staeri* Sheoak Open Woodland (Priority 1)
- *Banksia littoralis* woodland / Melaleuca incana Shrubland, (Priority 1)
- Coastal *Melaleuca incana* / *Taxandria juniperina* Shrubland/Closed Forest (Priority 1)
- Subtropical and Temperate Coastal Saltmarsh (Priority 3)

Significant Flora Conservation code

- Threatened
- Priority 1
- Priority 2
- Priority 3
- Priority 4

JBS&G

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Kilometers

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DATABASE SEARCH

FIGURE 2.5

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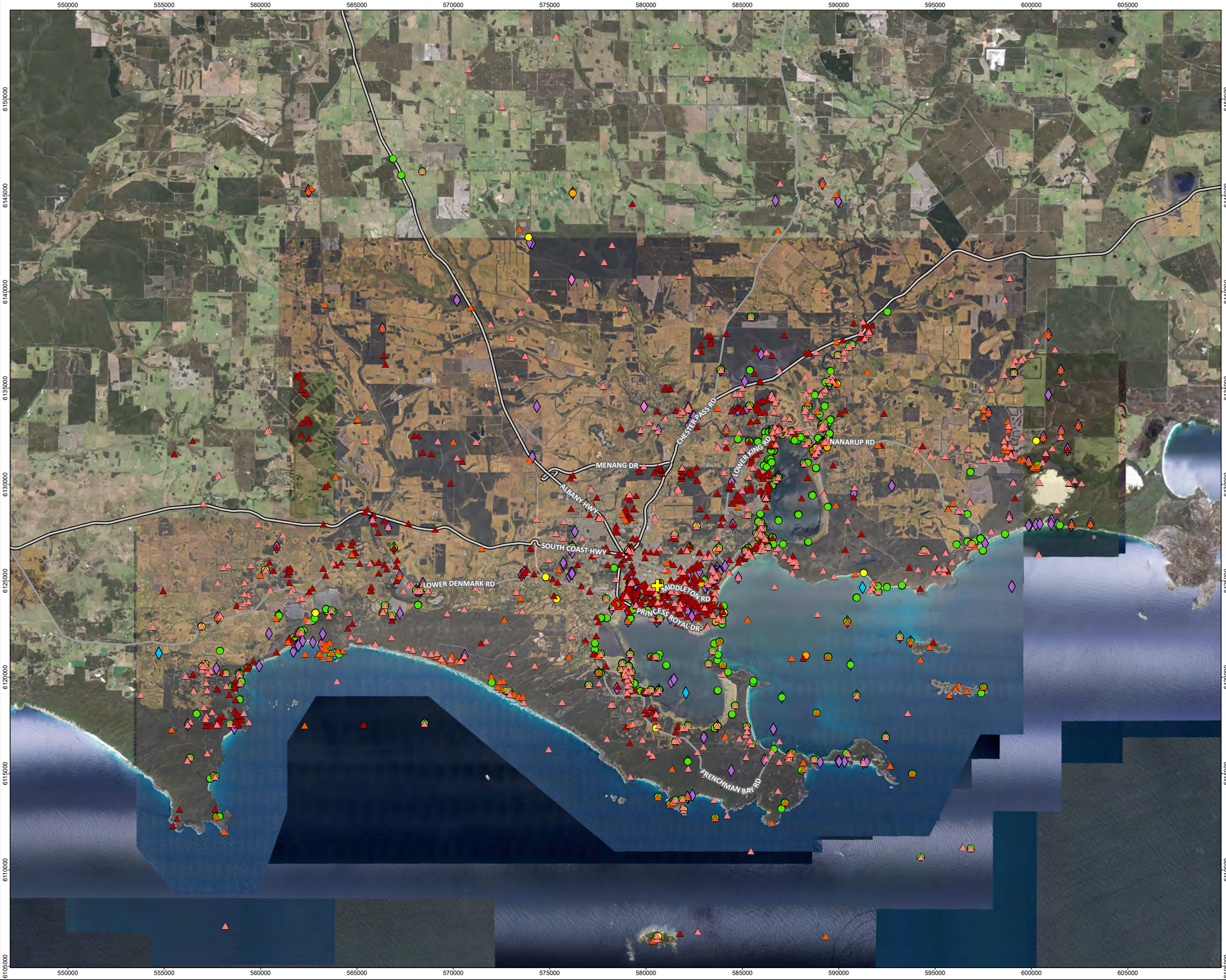

Legend

- Survey Area

Conservation status

- Critically endangered
- Endangered
- Vulnerable
- Extinct
- Conservation dependant
- Other specifically protected
- Migratory
- P2
- P3
- P4
- Highway
- Major road

JBS&G

Job No: 65310	
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Scale 1:180,000 at A3

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Kilometers

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Woolstores Place, Albany, WA

FAUNA DATABASE SEARCH

FIGURE 2.6

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3. Methods

3.1 Personnel

The field assessment of the Survey was led by an experienced botanist from JBS&G and an independent consultant Zoologist (Table 3.1), with more than 5 years' experience in the bioregion as required by EPA guidance.

Table 3.1 Key Personnel

Name	Experience	Role	Permits
Rachael Pratt (JBS&G)	21 years	Botanist	FB62000141-2 (13 Sep 2022-12 Sep 2025) TFL 2223-0029 (26 Jul 2022-31 Jul 2025)
Jeff Turpin (Kingfisher Environmental Consulting)	22 years	Zoologist	n/a
Frank Obbens	31 years	Taxonomist	n/a

3.2 Desktop Assessment

Requests were made to DCCEEW and DBCA for data from key databases to generate a list of significant vascular flora, fauna and ecological communities previously recorded within, and in the vicinity of, the Survey Area. A subset of these results was generated based on a buffer distance of 20 km from the Survey Areas (Table 3.2). This information was supplemented with additional data on broad fauna and flora assemblage within a 150 m buffer of the Survey Area.

Table 3.2. Database searches

Data Custodian	Database	Search Buffer
DCCEEW	Protected Matters Search Tool (flora records on MNES protected under the EPBC Act.)	20 km
DBCA	Threatened and Priority Ecological Communities	20 km
DBCA	Threatened (Declared Rare) and Priority Flora (TPFL)	20 km
DBCA	WA Herbarium	20 km
DBCA	Threatened and Priority Fauna	20 km
DBCA	Black Cockatoo Roosting Sites (Great Cocky Count)	20 km
DBCA	White-tailed Black Cockatoo Breeding Site Locations	20 km
BirdLife	BirdData	150 km
DBCA	Naturemap (Records from the Western Australian Museum (WAM) and Department of Biodiversity, Conservation and Attractions (DBCA) databases, including historical data and Threatened and Priority species in WA)	150 km
DCCEEW	Protected Matters Search Tool (fauna records on MNES protected under the EPBC Act.)	150 km
CSIRO	Atlas of Living Australia (fauna records from Australian museums and conservation/research bodies.)	150 km

Species identified by database searches and nearby survey work were assessed for their likelihood of occurring in the Survey Area based on proximity to the Survey Area and the presence of suitable habitat (Table 3.3 and Table 3.4).

Table 3.3 Flora likelihood assessment categories

Likelihood	Definition
Present	The taxon has been recorded within the Survey Area.
Likely	The Survey Area contains suitable habitat for the taxon and it is likely the taxon may occur based on presence of a recent historical record close to (within 5 km) the Survey Area.
Possible	The Survey Area contains suitable habitat for the taxon but there is no other information to suggest that the taxon may occur within or close to the Survey Area, or habitat information is lacking for the taxon.
Unlikely	The Survey Area does not contain suitable habitat for the taxon, regional records suggest the taxon does not occur near the Survey Area , or the Survey Area contains suitable habitat for the taxon within which thorough targeted searches were completed and conclusion has been made that the taxon is unlikely to be present.
Absent	Habitats present within the Survey Area preclude the possibility of this taxon occurring. E.g. aquatic taxa at a Survey Area where no seasonally inundated areas occur.

Table 3.4 Fauna likelihood assessment categories, adapted from Bamford Consulting Ecologists (2024)

Likelihood	Definition
Resident	Taxa with a population permanently present in the Survey Area.
Regular migrant or visitor	Taxa that occur within the Survey Area regularly in at least moderate numbers, such as part of an annual cycle.
Irregular visitor	Taxa that occur within the Survey Area irregularly such as nomadic and irruptive species. The length of time between visitations could be decades but when the species is present, it uses the Survey Area in at least moderate numbers and for some time.
Vagrant	Taxa that occur within the Survey Area unpredictably, in small numbers and/or for very brief periods. Therefore, the Survey Area is unlikely to be of importance for the species.
Absent	No habitat occurs within the Survey Area or the Survey Area is outside the known range of the taxon.
Locally extinct	Taxa that would have been present but has not been recently recorded in the local area and therefore is almost certainly no longer present in the Survey Area.
(Other)	Specific comment with respect to likelihood.

3.3 Field Survey

3.3.1 Survey Rationale

JBS&G plan and implement flora and vegetation surveys to comply with legislation, regulations and standards detailed in the guidelines required for environmental impact assessment (EIA). A reconnaissance survey was chosen for this site with consideration to its clearing and survey history. The site had been previously cleared, included an artificial landform, and was part of the *Biological Survey: Albany Ring Road* (Southern Ecology, 2020). With this in mind, a Reconnaissance survey in combination with targeted flora surveys, an assessment of potential TECs and a basic fauna survey were considered appropriate.

3.3.2 Reconnaissance Flora Survey

The reconnaissance flora and vegetation survey was undertaken from 25-27 October 2023. The Survey Area was traversed predominantly on foot, with an attempt made to visit all vegetation units within the Survey Area based on observations of aerial photography.

For each vegetation unit, a description was prepared of structural form and dominant species and likely vegetation boundaries were marked on a map or recorded by GPS. A minimum of one relevé was recorded for each vegetation unit, unless they were too small to map at the scale of the survey.

Within each relevé, the following were recorded:

- Site code;
- Location, with GPS coordinate and datum;
- Photograph of vegetation;
- Landform and soil description;
- Vegetation structural description and dominant species;
- Assessment of vegetation condition;
- A species list, including weeds; and

3.3.3 Targeted Flora Survey

A targeted flora survey was undertaken within remnant native vegetation in the Survey Area. The area was not systematically traversed at 10 m intervals due to dense swamp vegetation which required a more ad-hoc approach where impenetrable vegetation had to be avoided. Instead additional time was spent in these areas, looking into and under dense vegetation from the edges, while traversing gaps at a suitable intensity but in a non-linear manner.

Note: current DBCA terms and conditions for the collection of threatened flora prevent the disclosure of specific locality information of threatened flora populations to other persons without the written permission of the CEO.

3.3.4 Basic Fauna Survey

A basic fauna survey was undertaken in accordance with EPA's (2020) *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*.

This included an assessment of vegetation and soil associations and microhabitats present, and broad habitat mapping. Opportunistic fauna observations were be made during the habitat assessment.

Three camera traps were set 25-28 October (Table 3.5, Figure 3.1) and bird surveys conducted throughout and on adjacent mudflats, over two consecutive mornings and afternoons. Targeted searching for signs of significant fauna was conducted throughout, and once Western Ringtail Possums signs were observed, a wider transect was searched to identify the species presence.

Table 3.5 Camera trap locations

Camera Name	Datum	Latitude	Longitude	Habitat
C1	GDA2020	-35.0243271	117.8619259	Densely vegetated drainage
C2	GDA2020	-35.0251351	117.8608117	Peppermint thicket
C3	GDA2020	-35.0265703	117.8599226	Peppermint thicket

3.4 Specimen Identification

Flora samples collected during the survey had information recorded that allows for identification and allocation to the correct sample site or collection location. Specimens were pressed in the field so that as many identifiable characteristics were preserved and to ensure that they dried correctly. Taxonomic work was completed with reference to appropriate keys and other works by personnel with adequate skills and training. Samples that could be identified, were conservation significant, potential novel species or range extensions

were be submitted to the Western Australian Herbarium for identification. Nomenclature followed Florabase (WAHerb, 1998-).

3.5 Data analysis

3.5.1 Vegetation units

Vegetation units were delineated using a combination of sample site data, site observations and cluster analysis. Aerial photography interpretation and field notes taken during the survey were then used to develop vegetation mapping polygon boundaries over the Survey Area. These polygon boundaries were then digitised using GIS software.

Vegetation descriptions have been adapted from the (NVIS) Australian Vegetation Attribute Manual Version 7.0 (NVIS Technical Working Group 2017), a system of describing structural vegetation units (based on dominant taxa). This model follows nationally agreed guidelines to describe and represent vegetation types, so that comparable and consistent data is produced nation-wide.

3.6 Constraints and Limitations

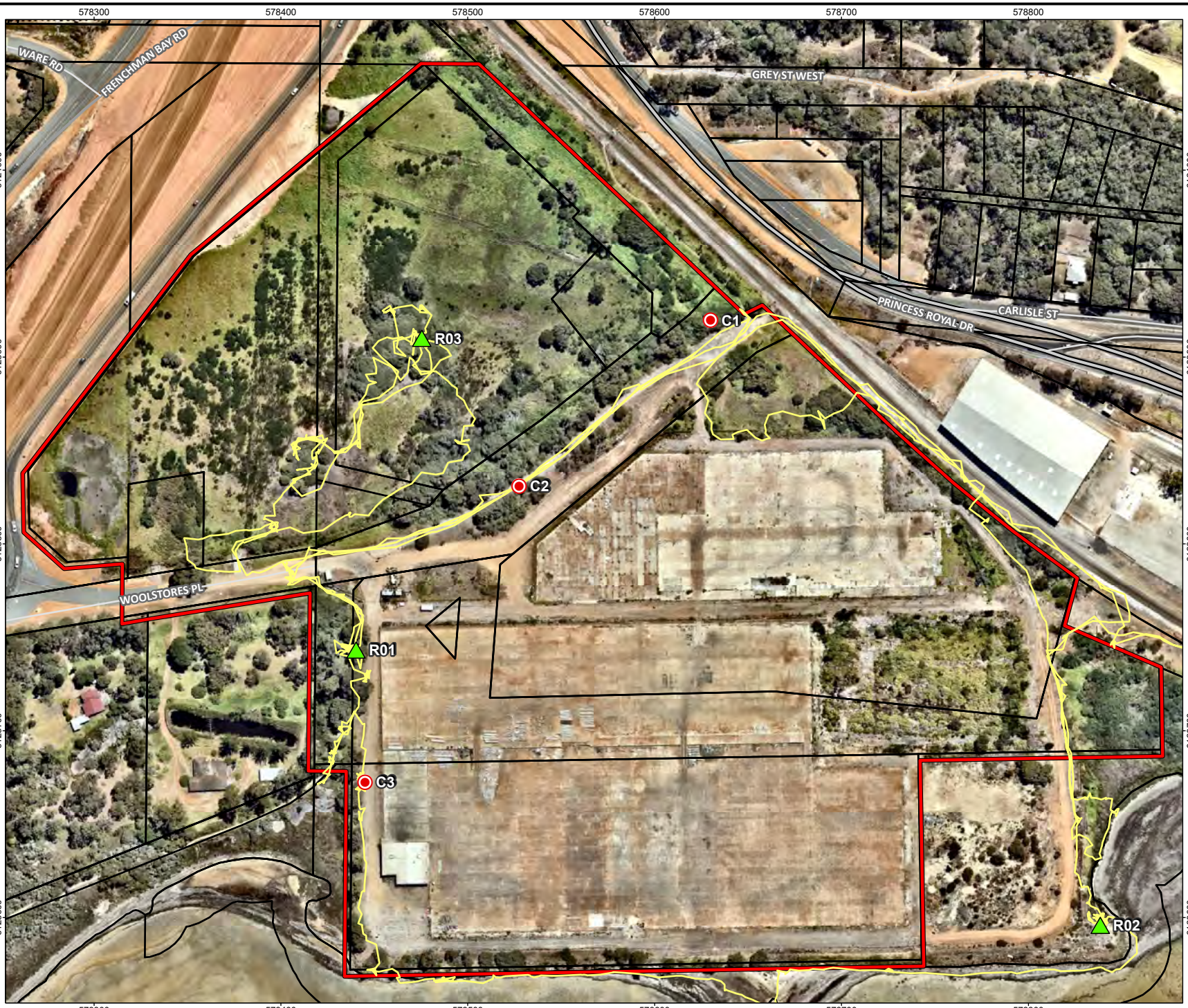
The survey was evaluated against a range of standard limitations (Table 3.6) identified by EPA (2016) which are required to be addressed for every survey. Based on this evaluation, the assessment was subject to limitations or constraints that have affected the thoroughness of the assessment and the conclusions reached.

Table 3.6 Flora and Vegetation Survey Potential Limitations and Constraints

Potential Limitation	Impact on Assessment	Comment
Availability of contextual information at a regional and local scale	Not a constraint	Adequate regional and local contextual information was available.
Proportion of flora Recorded and/or collected, any identification issues	Not a constraint	Some taxa were incompletely identified, however this was not considered to be a constraint for a Reconnaissance level survey and those taxa were able to be excluded as listed flora taxa.
Was the appropriate area fully surveyed (extent and effort)	Not a constraint	The Survey Area was fully surveyed sufficient for a Reconnaissance level survey.
Survey timing, rainfall, season of survey	Not a constraint	The survey was conducted in spring 2023, which received 93% of the long-term average rainfall.
Disturbance that may have affected the results of the survey such as fire, flood or clearing	Not a constraint	There were no recent disturbances which affected the results of the Survey.
Access problems (i.e., ability to access Survey Area).	Minor constraint	The Survey Area was boggy and much of it was full of tall grass, within which footing was unsure. This prevented traversing through some of the historically cleared areas of the Survey Area. One vegetation unit on the foreshore was in deep mud and could not be accessed.
Competency/experience of the team carrying out the survey, including experience in the bioregion surveyed	Not a constraint	Lead Botanist Rachael Pratt has >5 years' experience in the Jarrah Forrest IBRA bioregion.

Table 3.7 Fauna Survey Potential Limitations and Constraints

Potential Limitation	Impact on Assessment	Comment
Availability of data and information	Not a constraint	Adequate regional and local contextual information was available.
Competency/experience of the survey team, including experience in the bioregion surveyed	Not a constraint	Lead Zoologist Jeff Turpin is experienced in systematic fauna surveys and fauna identification and has extensive experience of the fauna of the Jarrah Forrest IBRA region.
Scope of the survey, e.g. where faunal groups were excluded from the survey	Not a constraint	No vertebrate fauna groups were excluded, however this was a Basic fauna survey only.
Timing, weather and season	Not a constraint	The survey was undertaken during spring, following adequate rainfall, during the primary season for reptiles, bush birds and mammals. Although out of season, sufficient water was present at the site that frogs were active. The survey did not occur at peak times for migratory birds, however the Survey Area did not contain significant wetlands and was adjacent to mudflats which would see more use by migratory birds.
Disturbance that may have affected results, e.g. fire, flood	Not a constraint	There were no recent disturbances which affected the results of the Survey.
The proportion of fauna identified, recorded or collected	Not a constraint	The proportion of fauna identified and recorded was adequate for a Basic fauna survey.
Adequacy of the survey intensity and proportion of survey achieved, e.g. the extent to which the area was surveyed	Not a constraint	All habitats within the Survey Area were accessible.
Access problems	Minor constraint	The Survey Area was boggy and much of it was full of tall grass, within which footing was unsure. This prevented traversing through some of the historically cleared areas of the Survey Area.
Problems with data and analysis, including sampling biases	Not a constraint	No sampling biases or other problems with data and analyses were encountered.



Legend

- Survey Area
- Cadastral boundary
- Releve
- Camera trap
- Traverse
- Highway
- Major road
- Minor road
- Track

JBS&G

Job No: 65310

Client: ROWE Group

Version: A | Date: 16/08/2024

Drawn By: ianandagoda | Checked By: RP

Scale 1:2,800 at A4

0 50 100
metres

Coord. Sys. GDA2020 MGA Zone 50

Woolstores Place, Albany, WA

SURVEY EFFORT

FIGURE 3.1

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Image Reference: www.nearmap.com© - Imagery Date: February 10. 2024

4. Results

4.1 Flora

4.1.1 Flora Assemblage

Eighty vascular flora taxa from 69 genera and 37 families were recorded during the survey, including 53 introduced taxa. No species accumulation curve has been prepared for this assessment because of the highly degraded nature of the site and its unusual diversity of introduced flora taxa.

4.1.2 Introduced Flora

Fifty-three introduced flora taxa were recorded during the survey, including two weeds listed as Declared Pests under the BAM Act:

- *Acacia longifolia* subsp. *longifolia*
- *Asparagus asparagoides*
- *Avena barbata*
- *Briza maxima*
- *Briza minor*
- *Callistemon sp.*
- *Cenchrus clandestinus*
- *Centella asiatica*
- *Cirsium vulgare*
- *Coprosma repens*
- *Cortaderia selloana*
- *Cotula coronopifolia*
- *Crassula glomerata*
- *Cupressaceae* sp.
- *Cynodon dactylon*
- *Dipogon lignosus*
- *Erigeron bonariensis*
- *Eucalyptus globulus*
- *Eucalyptus petiolaris*
- *Euphorbia paralias*
- *Fumaria muralis* subsp. *muralis*
- *Gaudium laevigatum*
- *Geranium molle*
- *Hypochaeris glabra*
- *Juncus oxycarpus*
- *Lagunaria patersonia*
- *Lagurus ovatus*
- *Lemna minor*
- *Lolium* sp.
- *Lophostemon confertus*
- *Lotus subbiflorus*
- *Lysimachia arvensis*
- *Metrosideros* sp.
- *Oxalis pes-caprae*
- *Pelargonium capitatum*
- *Physalis peruviana*
- *Phytolacca octandra*
- *Plantago sp.*
- *Polypogon monspeliensis*
- *Psoralea pinnata*
- *Rubus ulmifolius*
- *Rumex acetosella*
- *Salix babylonica*
- *Solanum laciniatum*
- *Solanum nigrum*
- *Sonchus asper*
- *Stachys arvensis*
- *Stenotaphrum secundatum*
- *Tamarix aphylla* Declared Pest - s22(2)
- *Tropaeolum majus*

- *Watsonia meriana*
- *Yucca aloifolia*
- *Zantedeschia aethiopica* Declared Pest - s22(2)

4.1.3 Significant Flora

4.1.3.1 Listed Flora

No flora listed as Threatened or Priority at a State or Commonwealth level were identified during the Survey.

4.1.3.2 Other Significant Flora

Tecticornia ?indica subsp. *bidens, Juncus ?krausii* and *Threlkeldia diffusa* were identified during the Survey. These species are associated with the TEC *Subtropical and Temperate Coastal Saltmarsh* listed as Vulnerable under the EPBC Act.

4.1.4 Unidentified Flora

Several flora taxa were unable to be completely identified. This was usually due to an absence of reproductive material at the time of the survey. Some weeds were not collected, e.g. *Plantago* sp. because identifying the taxon to species level would not materially benefit the outcomes of the survey. One taxon, Cupressaceae sp. was an introduced conifer which was too tall to collect a specimen from.

4.2 Vegetation

4.2.1 Vegetation Units

Six vegetation units were identified in the Survey Area. The majority of these were dominated by weed taxa and poorly defined. Only three were considered to be of adequate condition to justify relevé assessment and of these, the *Juncus pallidus* closed sedgeland was inaccessible due to thick mud.

Table 4.1 Vegetation Units

Vegetation Unit	Area (ha)	Proportion of Survey Area	Photo
Juncus pallidus closed sedgeland over sparse mixed weeds and *Threlkeldia diffusa*	0.22	1.30%	

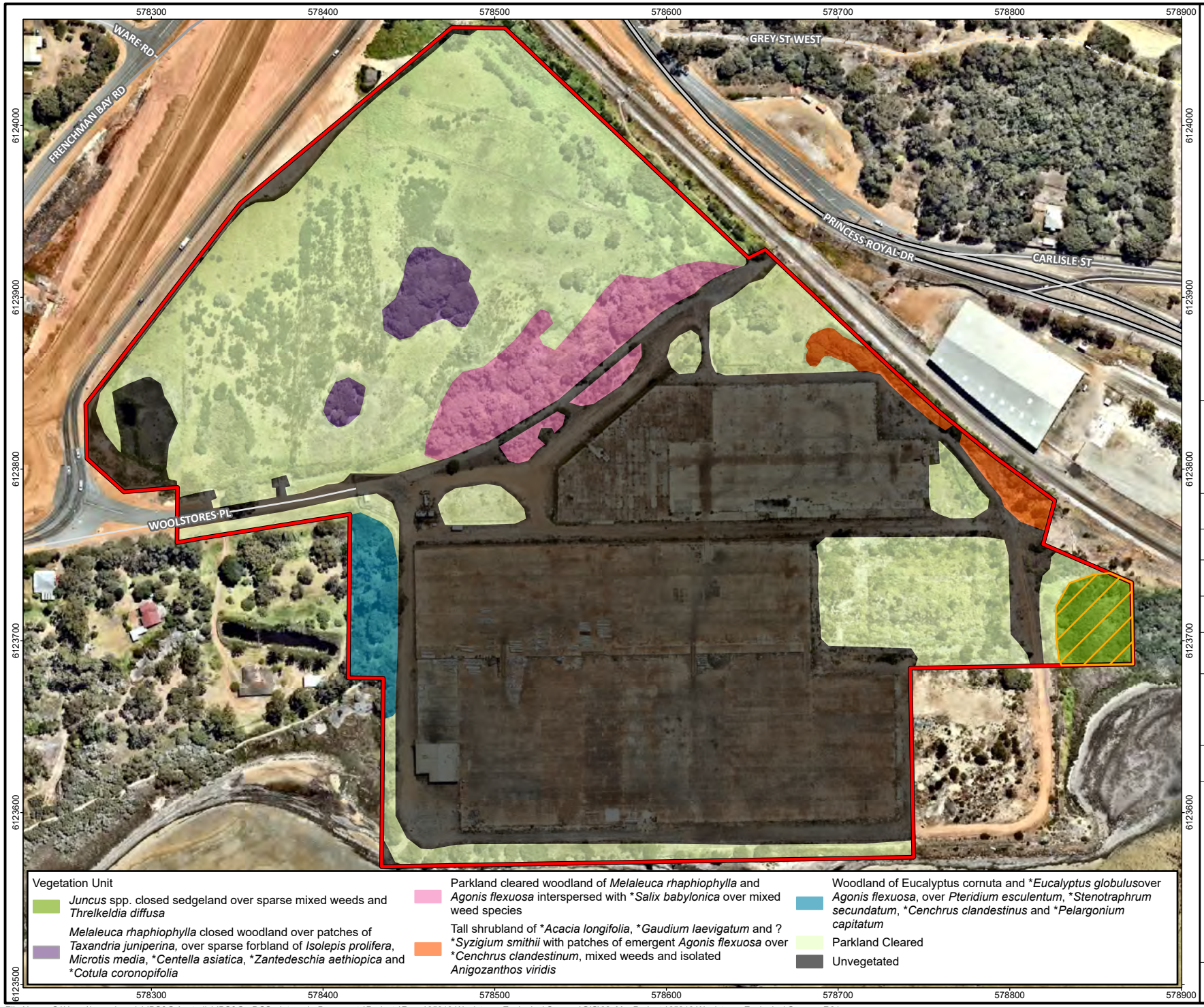
Vegetation Unit	Area (ha)	Proportion of Survey Area	Photo
Melaleuca rhaphiophylla closed woodland over patches of *Taxandria juniperina*, over sparse forbland of *Isolepis prolifera, Microtis media, *Centella asiatica, *Zantedeschia aethiopica* and **Cotula coronopifolia* (Relevé 3)	0.26	1.53%	
Parkland cleared woodland of *Melaleuca rhaphiophylla* and *Agonis flexuosa* interspersed with **Salix babylonica* over *Pteridium esculentum* and mixed weed species	0.73	4.33%	
Tall shrubland of **Acacia longifolia, *Gaudium laevigatum* and ?**Syzygium smithii* with patches of emergent *Agonis flexuosa* over **Cenchrus clandestinus,* mixed weeds and isolated *Anigozanthos viridis*	0.22	1.32%	

Vegetation Unit	Area (ha)	Proportion of Survey Area	Photo
Woodland of *Eucalyptus cornuta* and **Eucalyptus globulus* over *Agonis flexuosa*, over *Pteridium esculentum, *Stenotaphrum secundatum, *Cenchrus clandestinus* and *Pelargonium capitatum* (Relevé 1)	0.28	1.66 ha	
Parkland cleared	6.76 ha	44.33%	
Unvegetated	8.30	49.53%	
Total	**16.77**		

One additional vegetation unit was described adjacent to the Survey Area:

- Low, closed samphire shrubland of *Tecticornia ?indica* subsp. *bidens*, with sparse **Juncus ?kraussii* subsp. *australiensis* and *Threlkeldia diffusa*. (Relevé 2)

Plate 4 Fringing Temperate and Subtropical Saltmarsh outside the Survey Area



Legend

- Survey Area
- Subtropical and Temperate Coastal Saltmarsh TEC
- Highway
- Major road
- Minor road
- Track

JBS&G

Job No: 65310

Client: ROWE Group

Version: A | Date: 16/08/2024

Drawn By: ianandagoda | Checked By: RP

Scale 1:3,000 at A4

0 50 100
metres

Coord. Sys. GDA2020 MGA Zone 50

Woolstores Place, Albany, WA

VEGETATION MAPPING

FIGURE 4.1

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4.2.2 Vegetation Condition

The majority of the Survey Area was in Completely Degraded condition due to historic clearing (Table 4.2). These areas were covered by weeds, concrete and hardstand.

Table 4.2 Vegetation condition in the Survey Area

Condition	Area (ha)	Proportion of Survey Area
Completely Degraded	16.29	97.02%
Good	0.03	0.16%
Very Good	0.47	2.82%
Grand Total	**16.79**	

4.2.3 Significant Vegetation

4.2.3.1 Conservation Dependent Vegetation

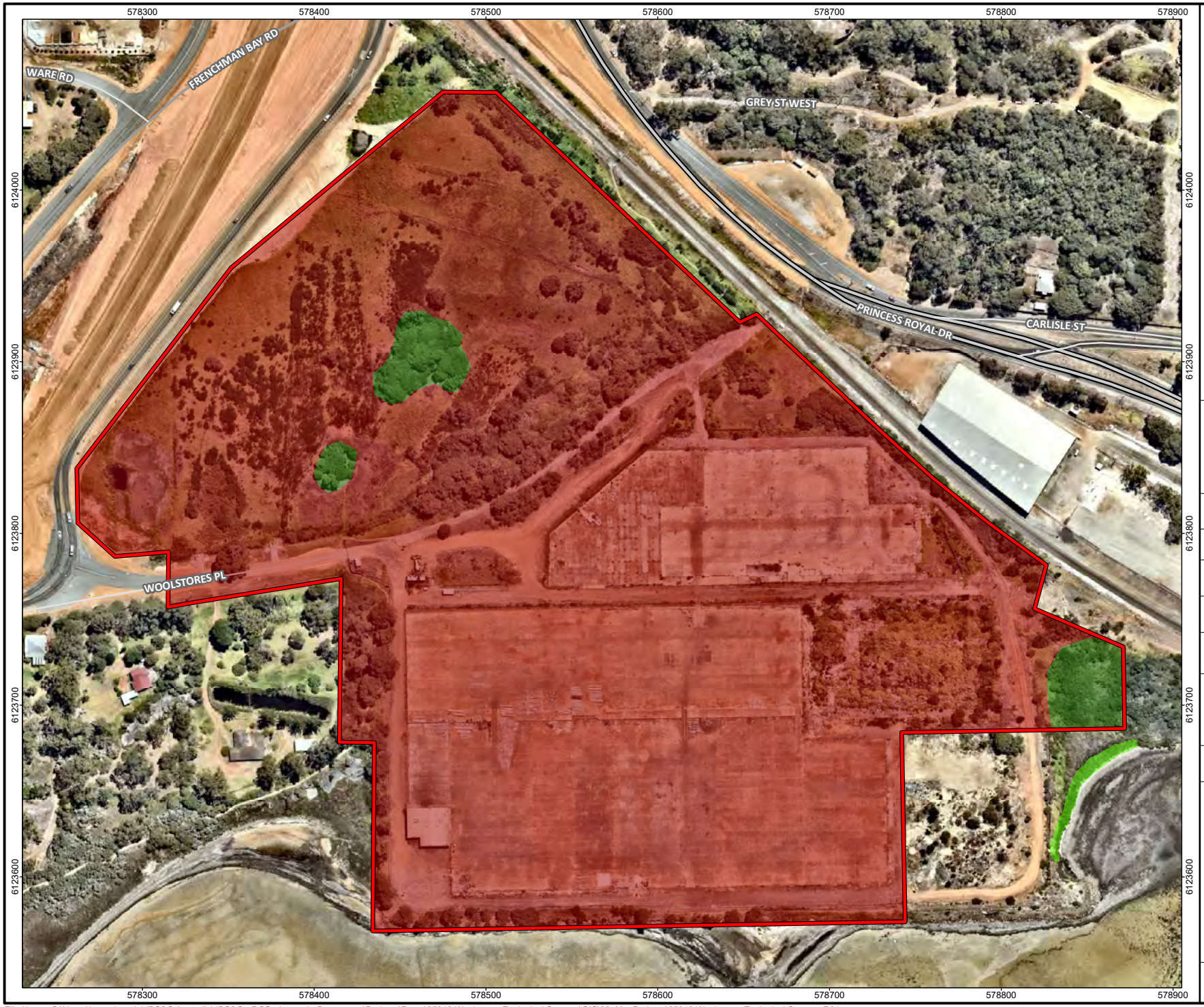
Vegetation in the Juncus closed sedgeland was consistent with the key diagnostic criteria for the TEC *Subtropical and Temperate Coastal Saltmarsh* (Table 4.3). This patch is contiguous with saltmarsh vegetation outside the Survey Area, amounting to approximately 1 ha (greater than the minimum patch size of 0.4 ha). The patch contained <50% weeds, meeting the minimum condition thresholds.

Table 4.3 Key Diagnostic Criteria for the Subtropical and Temperate Coastal Saltmarsh Ecological Community

Diagnostic Criteria	Site features	Met/Not Net
Occurs south of 23° 37' S latitude - from the central Mackay coast on the east coast of Australia, southerly around to Shark Bay on the west coast of Australia (26° latitude) and including the Tasmanian coast and islands within the above range.	The site occurs at 35° south.	Met
Occurs on the coastal margin, along estuaries and coastal embayments and on low wave energy coasts.	The site occurs on the shore of the Princess Royal Harbour, a coastal embayment in King George Sound.	Met
Occurs on places with at least some tidal connection, including rarely-inundated supratidal areas, intermittently opened or closed lagoons, and groundwater tidal influences, but not areas receiving only aerosol spray.	The site had visual indicators of tide activity (low and high tide lines).	Met
Occurs on sandy or muddy substrate and may include coastal clay pans (and the like).	The site had deep muds.	Met
Consists of dense to patchy areas of characteristic coastal saltmarsh plant species (i.e. salt tolerant herbs, succulent shrubs or grasses, which may also include bare sediment as part of the mosaic) and.	The site was dominated by *Juncus* spp. and *Threlkeldia diffusa* and *Tecticornia ?indica* was present adjacent.	Met
Proportional cover by tree canopy such as mangroves, Melaleucas or Casuarinas is not greater than 50%, nor is proportional ground cover by seagrass greater than 50%.	No tree cover was present.	Met

4.2.3.2 Groundwater Dependent Vegetation

Much of the Survey Area would have had historic dependence on groundwater due to the high water table in the Survey Area and its location in the riparian zone for Princess Royal Harbor, however, few native vegetation remnants remain on the site. Saltmarsh in the Survey Area and *Melaleuca* woodland should both be treated as having groundwater dependence.



Legend

- Survey Area

Vegetation condition

- Very Good
- Good
- Completely Degraded

- Highway
- Major road
- Minor road
- Track

JBS&G

Job No: 65310

Client: ROWE Group

Version: A	Date: 16/08/2024
Drawn By: ianandagoda	Checked By: RP

Scale 1:3,000 at A4

0 50 100
metres

Coord. Sys. GDA2020 MGA Zone 50

Woolstores Place, Albany, WA

VEGETATION CONDITION

FIGURE 4.2

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4.3 Fauna

4.3.1 Fauna Assemblage

Seventy three fauna taxa were recorded during the Survey including 57 from within the Survey Area and additional bird sightings adjacent (Appendix F). The following taxa were observed during the survey (Table 4.4, Plate 5, Figure 4.3).

Table 4.4 Fauna taxa observed during the survey

Taxon	Status	Observation
Amphibians		
Slender Tree Frog (*Litoria adelaidensis)*		Heard
Motorbike Frog (*Litoria moorei*)		Heard
Rattling Froglet (*Crinia glauerti*)		Heard
Reptiles		
King's Skink (*Egernia kingii*)		Camera trap
Mammals		
Quenda, Southern Brown Bandicoot (*Isoodon obesulus*)	P4	Camera trap, diggings, seen
Western Ringtail Possum (*Pseudocheirus occidentalis*)	CE	Dreys, scat
Western Grey Kangaroo (*Macropus fuliginosus*)		Seen
Dog (*Canis lupus*)	Introduced	Seen
Cat (*Felis catus*)	Introduced	Camera trap
Rabbit (*Oryctolagus cuniculus*)	Introduced	Camera trap
Black Rat (*Rattus rattus*)	Introduced	Camera trap
Birds		
Acanthiza chrysorrhoa (Yellow-rumped Thornbill)		Seen
Actitis hypoleucos (Common Sandpiper)	MI	Seen adjacent
Anas castanea (Chestnut Teal)		Seen
Anas superciliosa (Pacific Black Duck)		Seen
Anhinga melanogaster (Darter)		Seen adjacent
Anthochaera carunculata (Red Wattlebird)		Seen
Ardea alba (Eastern Great Egret)	MI	Seen adjacent
Barnardius zonarius (Australian Ringneck)		Seen
Cacomantis flabelliformis (Fan-Tailed Cuckoo)		Seen
Calidris ruficollis (Red-necked Stint)	MI	Seen
Calyptorhynchus banksii (Red-tailed Black-Cockatoo)	VU	Heard adjacent
Chalcites lucidus (Shining Bronze Cuckoo)		Seen
Charadrius ruficapillus (Red-capped Plover)		Seen
Chenonetta jubata (Australian Wood Duck)		Seen
Circus approximans (Swamp Harrier)		Seen
Colluricincla harmonica (Grey Shrike-thrush)		Seen
Columba livia (Feral Pigeon)		Seen
Coracina novaehollandiae (Black-faced Cuckoo-shrike)		Seen

Taxon	Status	Observation
Corvus coronoides (Australian Raven)		Seen
Cracticus tibicen (Australian Magpie)		Seen
Cracticus torquatus (Grey Butcherbird)		Seen
Egretta novaehollandiae (White-faced Heron)		Seen
Eolophus roseicapillus (Galah)		Seen
Gavicalis virescens (Singing Honeyeater)		Seen
Glossopsitta porphyrocephala (Purple-crowned Lorikeet)		Seen
Grallina cyanoleuca (Magpie-lark)		Seen
Haematopus longirostris (Pied Oystercatcher)		Seen
Haliastur sphenurus (Whistling Kite)		Seen
Hirundo neoxena (Welcome Swallow)		Seen
Hydroprogne caspia (Caspian Tern)	MI	Seen adjacent
Larus novaehollandiae (Silver Gull)		Seen
Larus pacificus (Pacific Gull)	MI	Seen adjacent
Lichmera indistincta (Brown Honeyeater)		Seen
Malurus elegans (Red-winged Fairywren)		Seen
Malurus splendens (Splendid Fairy-wren)		Seen
Pachycephala pectoralis (Golden Whistler)		Seen
Pandion haliaetus (Eastern Osprey)	MI	Seen
Pardalotus punctatus (Spotted Pardalote)		Seen
Pelecanus conspicillatus (Australian Pelican)		Seen adjacent
Petrochelidon ariel (Fairy Martin)		Seen
Phalacrocorax carbo (Great Cormorant)		Seen adjacent
Phalacrocorax melanoleucos (Little Pied Cormorant)		Seen adjacent
Phalacrocorax sulcirostris (Little Black Cormorant)		Seen adjacent
Phalacrocorax varius (Pied Cormorant)		Seen adjacent
Phaps chalcoptera (Common Bronzewing)		Seen
Phylidonyris novaehollandiae (New Holland Honeyeater)		Seen
Platalea flavipes (Yellow-billed Spoonbill)		Seen adjacent
Platycercus icterotis (Western Rosella)		Seen
Pluvialis squatarola (Grey Plover)	MI	Seen adjacent
Poodytes gramineus (Little Grassbird)		Seen adjacent
Porphyrio porphyrio (Purple Swamphen)		Seen
Purpureicephalus spurius (Red-capped Parrot)		Seen
Rhipidura albiscapa (Grey Fantail)		Seen
Rhipidura leucophrys (Willie Wagtail)		Seen
Sericornis maculatus (Spotted Scrubwren)		Seen
Smicrornis brevirostris (Weebill)		Seen
Stagonopleura oculata (Red-eared Firetail)		Seen
Sternula nereis (Fairy Tern)	VU/MI	Seen adjacent

Taxon	Status	Observation
Stipiturus malachurus (Southern Emu-wren)		Seen
Thalasseus bergii (Crested Tern)	MI	Seen adjacent
Threskiornis moluuca (Australian White Ibis)		Seen
Zosterops lateralis (Silvereye)	MI	Seen

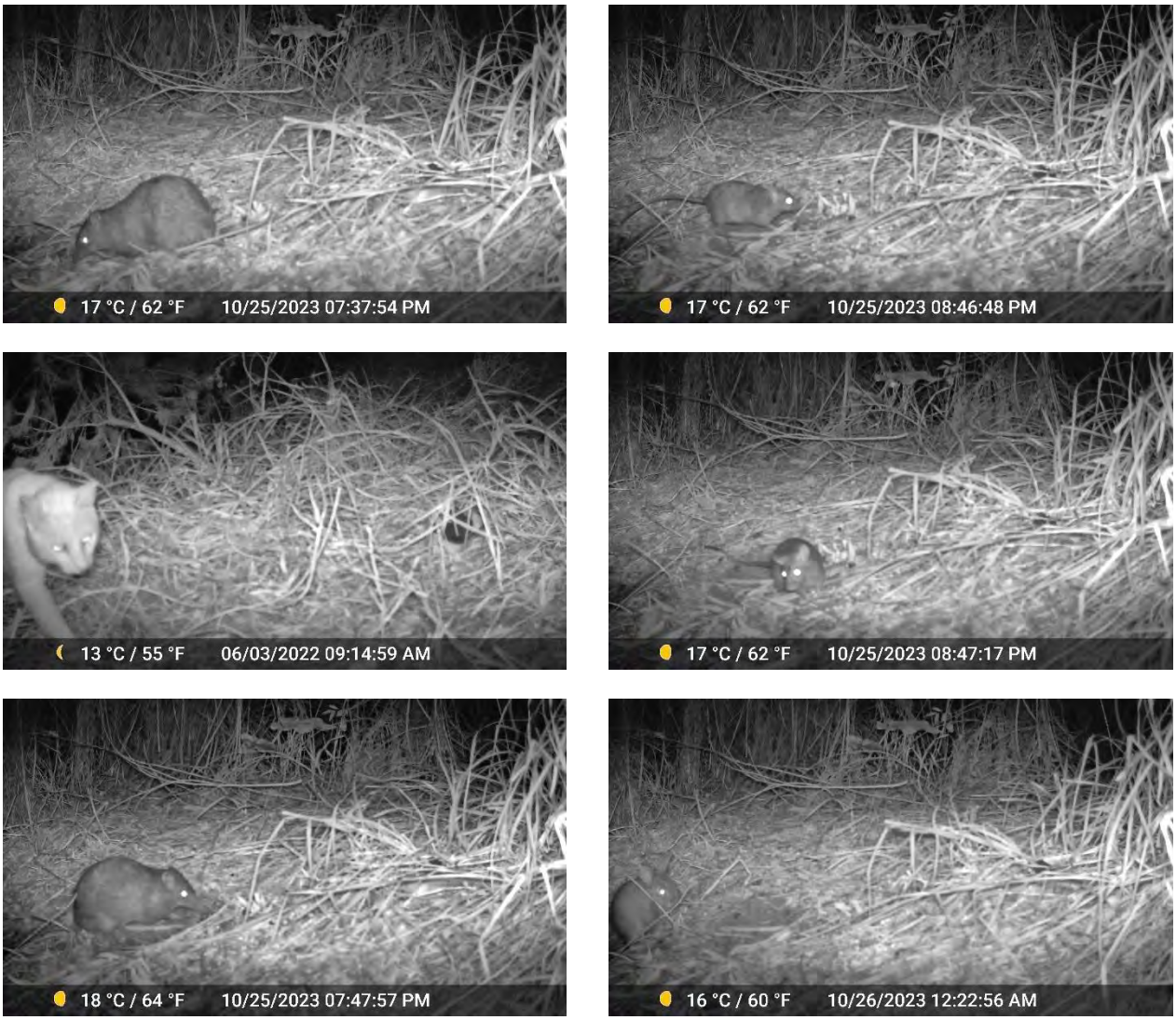

Plate 5 Camera trap images (note, one camera had the incorrect date and time set)

Legend

- Survey Area
- Significant fauna
  - T
  - P4
- Highway
- Major road
- Minor road
- Track

JBS&G

Job No: 65310

Client: ROWE Group

Version: A | Date: 16/08/2024

Drawn By: ianandagoda | Checked By: RP

Scale 1:3,000 at A4

0 50 100
metres

Coord. Sys. GDA2020 MGA Zone 50

Woolstores Place, Albany, WA

SIGNIFICANT FAUNA

FIGURE 4.3

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Image Reference: www.nearmap.com© - Imagery Date: February 10. 2024

4.3.2 Fauna Habitat

Six fauna habitats were identified within the Survey Area (Table 4.5, Table 4.6, Figure 4.4). Most of these were highly modified but still retained some value to fauna as evidenced by fauna observed during the survey. Approximately 48.65% of the Survey Area was occupied by tracks, hardstand or concrete and provided little to no value for fauna.

Table 4.5 Fauna habitats in the Survey Area

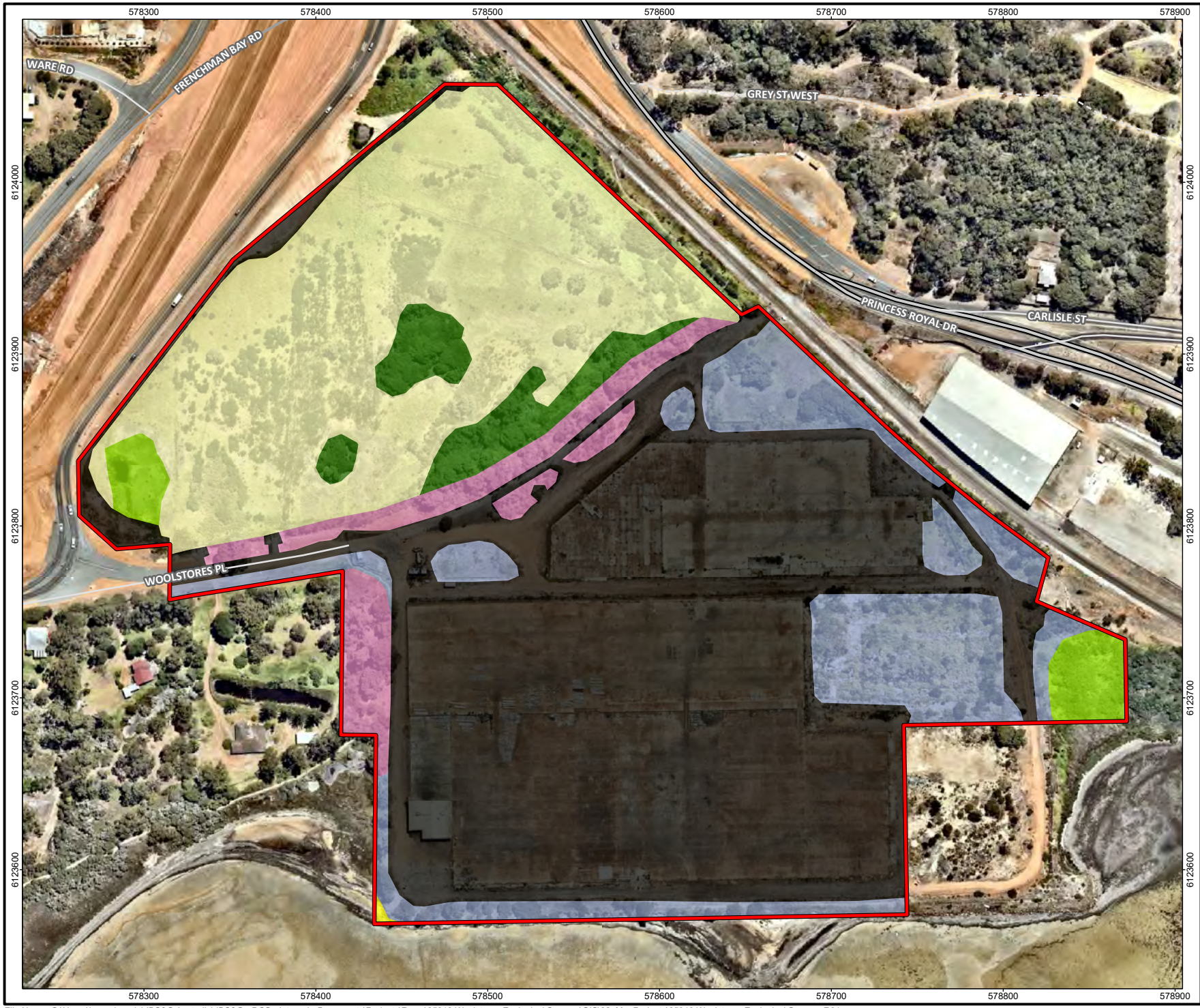
Habitat type	Area (ha)	Proportion of Survey Area
Damplands 1	0.62	3.68%
Damplands 2	4.62	27.55%
Disturbed	2.22	13.27%
Drainage Line	0.78	4.67%
Freshwater and Brackish Wetlands	0.36	2.13%
Mudflats and Shoreline	0.01	0.05%
Unvegetated	8.16	48.65%
Total	**16.77**	

Table 4.6 Fauna habitat descriptions

Landform Vegetation	Inside survey area	Comments	Photo
Damplands 1 Melaleuca preissiana and Peppermint Woodland	Yes	Habitat for Western Ringtail Possum and Quenda	
Damplands 2 Mixed native and introduced species	Yes	Quenda occur	

Landform Vegetation	Inside survey area	Comments	Photo
Disturbed Pasture, introduced weeds and native species	Yes	Quenda occur	
Drainage line Yate and Peppermint thickets over sedges and mixed shrubs	Yes	Habitat for Western Ringtail Possum and Quenda	
Freshwater and Brackish Wetlands Reeds / Sedges and fringing riparian	Yes	Waterbirds and frogs, Chestnut Teal breeding	

Landform Vegetation	Inside survey area	Comments	Photo
Mudflats and shoreline None	Minimal	Wader habitat	



Legend

- Survey Area

Fauna habitat

- Damplands 1
- Damplands 2
- Disturbed
- Drainage Line
- Freshwater and Brackish Wetlands
- Mudflats and Shoreline
- Unvegetated
- Highway
- Major road
- Minor road
- Track

JBS&G

Job No: 65310

Client: ROWE Group

Version: A	Date: 16/08/2024
Drawn By: ianandagoda	Checked By: RP

Scale 1:3,000 at A4

0 50 100
metres

Coord. Sys. GDA2020 MGA Zone 50

Woolstores Place, Albany, WA

FAUNA HABITAT

FIGURE 4.4

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Image Reference: www.nearmap.com© - Imagery Date: February 10. 2024

5. Discussion

5.1 Flora

Native species diversity in the Survey Area was extremely poor (16 taxa) due to historic clearing and the presence of invasive weed species at high densities.

No flora species listed at a State or Commonwealth level were present in the Survey Area. Although the high densities of weeds would have made listed taxa difficult to detect, it is unlikely that any are present since the site has been historically cleared and likely grazed.

"Significant" flora in the Survey Area were restricted to saltmarsh taxa and *Melaleuca* species which are groundwater dependent.

5.2 Vegetation

The Survey Area contained 0.48 ha of intact native vegetation, with the remaining vegetation units being degraded to the extent that they no longer represent a community of indigenous species native to the area. Instead these areas were parkland cleared, with no more than three native flora taxa present.

Vegetation at the eastern end of the Survey Area was consistent with the TEC *Subtropical and Temperate Coastal Saltmarsh*, listed as Vulnerable under the EPBC Act and Priority 3 by DBCA. Dense cover of Juncus has resulted in low native species richness in the patch, but also low levels of weed invasion.

Saltmarsh in the Survey Area is at risk from anthropogenic changes in sea level, with steep embankments preventing saltmarsh from retreating landward as sea levels rise. Other risks to the patch include weed invasion, acid sulfate soils, stormwater drainage, reinforcement of embankments for development and pedestrian traffic.

5.3 Fauna

Two fauna taxa listed at a State or Commonwealth level were identified within the Survey Area, Western Ringtail Possum and Quenda. One additional listed taxon, the Forest Red-tailed Black Cockatoo was heard outside the Survey Area and ten bird species listed as Migratory and/or under an International Agreement were recorded in or adjacent to the Survey Area. One of these, the Fairy Tern is also listed as Vulnerable under the EPBC Act.

Western Ringtail Possum (*Pseudocheirus occidentalis*)

The Western Ringtail Possum is a small, arboreal mammal whose distribution is restricted to the South-west of Western Australia. It inhabits coastal and near coastal Peppermint-Tuart, Jarrah-Marri, Sheoak and eucalypt woodland and mallee woodland (preferably closed-canopy) (DPaW, 2017).

Numerous Peppermint trees occurred within the Survey Area and dreys were found in two locations, with additional dreys found south-west along the coastline. Numerous scat were found below shrubs growing along the top of the embankment on the southern side of the reclaimed land, as well as in other areas of the Survey Area.

Quenda/Southern Brown Bandicoot (*Isoodon obesulus*)

The Quenda/Southern Brown Bandicoot is a small, ground-dwelling mammal which ranges from New South Wales to Western Australia, predominantly in coastal and near-coastal areas. It inhabits forest, woodland, shrub and heath communities, typically with dense, healthy vegetation in the lower stratum (van Dyck, et al., 2013). Most habitats within the Survey Area provide suitable habitat for Quenda.

Most Quenda observations were made in and around thickly-grassed, elevated areas of the site.

Forest Red-tailed Black Cockatoo (*Calyptorhychus banksii naso*)

The Forest Red-tailed Black Cockatoo is a large bird endemic to the South-west of Western Australia. It relies upon Marri, Jarrah, Wandoo, Tuart and Karri woodlands and forests, where they feed primarily on Marri and Jarrah (Johnstone & Kirkby, 2011).

EPBC Act referral guidelines for black cockatoos (DAWE, 2022) describe referral triggers including the loss of greater than 1 ha of high-quality foraging habitat or the loss of one or more suitable nesting trees. To qualify as high-quality foraging habitat for the Forest Red-tailed Black Cockatoo, a site must contain Jarrah or Marri woodland/forest, be on the edge of Karri forest or contain Wandoo or Blackbutt (DAWE, 2022). None of this habitat was present within the Survey Area.

Fairy Tern

The Fairy Tern is a is a small tern occurring along Australia's south coast. It inhabits coastal waters, bays, inlets, saline or brackish lakes, saltfields, sewage ponds near coast (Pizzey & Knight, 2012). It was not seen inside the Survey Area but was seen foraging in the Princess Royal Harbour. Within the Survey Area, saline or brackish lakes may provide habitat for Fairy Terns.

Migratory Birds

Although numerous birds listed as Migratory under the EPBC Act and/or subject to International Agreements were identified within or adjacent to the Survey Area, most of the Survey Area does not provide suitable habitat for these species, all of which were observed in the Princess Royal Harbor or immediately adjacent. Within the Survey Area, saline or brackish lakes may provide occasional habitat for these species and they may utilise the rocky embankment on the southern shoreline.

5.4 Fauna Habitat

The most significant fauna habitat identified by the Survey was Western Ringtail Possum habitat (Drainage Line and Damplands 1). This occupied 8.35 % (1.4 ha) of the Survey Area. Western Ringtail Possums are listed as Critically Endangered under the EPBC Act and the BC Act. Twelve dreys were present in the Survey Area and numerous scat, suggesting that the Survey Area is well used.

Quenda, King Skink and three frog species were also resident and are unlikely to be easy to relocate during clearing as they hide under vegetation.

The mudflats adjacent to the Survey Area appear important for waders with close to 100 Red-necked Stints, a migratory species subject to International Agreements (EPBC Act, Bonn, CAMBA, JAMBA, ROKAMBA), recorded adjacent to the Survey Area. Greater Sand Plover, Red Knot, Ruddy Turnstone, Pacific Golden Plover, Bar-tailed Godwit and Great Knot were all recorded nearby within 5 km (Little Grove-Rushy Point) during September and October 2023 (Cornell University, 2023).

5.5 Survey Adequacy

Given the land-use history and predominantly cleared nature of the Survey Area, a Reconnaissance flora and vegetation survey in combination with Targeted flora survey and Basic fauna survey is considered adequate for this site. Although additional effort might find additional flora taxa, the vast majority of these would be introduced taxa.

The Survey Area did not contain significant microhabitats typical of Short Range Endemic fauna. Main's Assassin Spider was the only listed invertebrate species which might occur in the Survey Area as this inhabits sedges and low shrubs in dense coastal or near-coastal groves of Peppermint, consistent with the Damplands 1 and Drainage Line fauna habitats. Other dense vegetation in the Survey Area may also provide habitat. Main's

Assassin Spider was collected approximately 3.5 km from the Survey Area in 1983. There were no other nearby records of this taxon.

The very small lake in the Survey Area has potential to host threatened freshwater fish species, which have been recorded within 5 km of the Survey Area.

6. Conclusion

The key results and outcomes of the flora and vegetation survey were:

- Twenty-seven native flora species were recorded within the Survey Area;
- Fifty-three introduced flora species were recorded within the Survey Area, two of which were Declared Pests;
- No listed (conservation significant) flora taxa were identified by the survey;
- Most of the undeveloped portion of the Survey Area was a wetland (6.38 ha or 38.04% of the Survey Area);
- One EPBC Act listed threatened ecological community was identified by the survey, *Subtropical and Temperate Coastal Saltmarsh,* occupying 0.22 ha (1.3 % of the Survey Area). Access to this community was limited due to deep mud;
- One predominantly native vegetation type and three degraded vegetation units containing few native species were mapped across the Survey Area, ranging in condition from Very Good to Completely Degraded, with 16.29 ha (97.02 % of the Survey Area) being in Completely Degraded condition; and
- Vegetation units within the Survey Area are likely to be groundwater dependent.

The key results and outcomes of the fauna survey were:

- Sixty-nine native or migratory fauna were recorded within and adjacent to the Survey Area, including three frogs, one lizard, three mammals and 62 birds;
- Four introduced fauna taxa were recorded within the Survey Area;
- Thirteen listed fauna taxa were observed during the survey including ten migratory, one Critically Endangered, two Vulnerable and one Priority 4 fauna taxa.
- The Survey Area contained approximately 1.40 ha (8.35 % of the Survey Area) of Western Ringtail Possum (Critically Endangered) habitat and was utilised by Western Ringtail Possum, with both dreys and scat found;
- The Survey Area contained approximately 8.24 ha (49.14 % of the Survey Area) of Quenda habitat and was utilised by Quenda, with camera trap sightings;
- The adjacent mudflats which were outside the Survey Area are likely to be a regionally significant habitat for waterbirds, including Fairy Terns (listed as Vulnerable and Migratory under the EPBC Act);
- Potential habitat for listed fish species was present (Freshwater and Brackish wetlands), but targeted survey for these was outside the scope of this survey;
- Potential habitat for the Mains Assassin Spider was present (Damplands 1, Damplands 2, Drainage Line and riparian zones of Freshwater and Brackish Wetlands), but targeted survey for these was outside the scope of this survey; and
- No habitat for threatened black cockatoo species was identified, although the Forest Red-tailed Black Cockatoo (listed as Vulnerable under the EPBC Act) was heard nearby.

7. Limitations

Scope of services

This report ("the report") has been prepared by JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, JBS&G has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, JBS&G has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. JBS&G has also not attempted to determine whether any material matter has been omitted from the data. JBS&G will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to JBS&G. The making of any assumption does not imply that JBS&G has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. JBS&G disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made, including to any third parties, and no liability will be accepted for use or interpretation of this report by any third party.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G or reproduced other than in full, including all attachments as originally provided to the client by JBS&G.

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Appendix A Conservation Significant Flora and Ecological Community Definitions

Biodiversity Conservation Act 2016 (Western Australia)

Threatened, Extinct and Specially Protected Fauna and Flora

Under the Western Australian Biodiversity Conservation Act 2016, Threatened, Extinct and Specially Protected fauna or flora are species which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

A.1 Western Australian Threatened, Extinct and Specially Protected fauna and flora categories

Code	Conservation Category
Threatened Species (T)	
Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).	
Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.	
Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.	
The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.	
CR	**Critically Endangered Species** Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.
EN	**Endangered Species** Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.
VU	**Vulnerable Species** Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.
Extinct species (EX)	
Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.	
EX	**Extinct Species** Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.
EW	**Extinct in the Wild Species** Species that "is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Code	Conservation Category
	Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.
Specially Protected Species	
Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.	
MI	**Migratory Species** Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species. Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018.*
CD	**Species of special conservation interest (conservation dependent fauna)** Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018.*
OS	**Other specially protected species** Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
Priority species (P)	
Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations	
P1	**Priority 1: Poorly-known species** Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
P2	**Priority 2: Poorly-known species** Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3	**Priority 3: Poorly-known species**

Code	Conservation Category
	Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4	**Priority 4: Rare, Near Threatened and other species in need of monitoring** Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Threatened and Priority Ecological Communities

Division 2 of the *Biodiversity Conservation Act 2016* (BC Act) provides for the statutory listing of threatened ecological communities (TECs) by the Minister.

A.2 Western Australian listed Threatened Ecological Community categories

Code	Conservation Category
PD	**Presumed Totally Destroyed (PD)** An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (a or b) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or All occurrences recorded within the last 50 years have since been destroyed.
CR	**Critically Endangered Communities** An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (a, b or c): a. The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii): i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years); ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated. b. Current distribution is limited, and one or more of the following apply (i, ii or iii): i. geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years); ii. there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes; iii. there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes. c. The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).
EN	**Endangered Communities** An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Code	Conservation Category
	An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (a, b, or c): a. The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii): i. the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years); ii. modification throughout its range is continuing such that in the short-term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated. b. Current distribution is limited, and one or more of the following apply (i, ii or iii): i. geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years); ii. there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes; iii. there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes. c. The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).
VU	**Vulnerable Communities** An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium (within approximately 50 years) to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (a, b or c): a. The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated. b. The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations. c. The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long-term future because of existing or impending threatening processes.

Priority Ecological Communities

Priority is not a listing category under the BC Act. The Priority Ecological Communities list is maintained by Department of Biodiversity, Conservation and Attractions and is published on the department's website.

All fauna and flora that may be present in an ecological community are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when these species occur in an ecological community that is not listed as threatened, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land).

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

A.3 Western Australian listed Priority Ecological Community categories

Code	Conservation Category
P1	**Priority One: Poorly-known ecological communities**

Code	Conservation Category
	Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤ 5 occurrences or a total area of ≤ 100 ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
P2	**Priority Two: Poorly-known ecological communities** Communities that are known from few occurrences with a restricted distribution (generally ≤ 10 occurrences or a total area of ≤ 200 ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
P3	**Priority Three: Poorly known ecological communities** Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them. This category includes three sub-categories: a. Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation. b. Communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years). c. Communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.
P4	**Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list.** These communities require regular monitoring. a. Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands. b. Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category. c. Ecological communities that have been removed from the list of threatened communities during the past five years.
P5	**Priority Five: Conservation Dependent ecological communities** Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

Threatened Species

Threatened fauna and flora may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in any one of the following categories.

A.4 Commonwealth listed Threatened Species categories

Code	Conservation Category
EX	**Extinct Species** A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
EW	**Extinct in the Wild Species** A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time: a. it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or

Code	Conservation Category
	b. it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, d
CR	**Critically Endangered Species** A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
EN	**Endangered Species** A native species is eligible to be included in the endangered category at a particular time if, at that time: a. it is not critically endangered; and b. it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
VU	**Vulnerable Species** A native species is eligible to be included in the vulnerable category at a particular time if, at that time: a. it is not critically endangered or endangered; and b. it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent Species** A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: a. the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or b. the following subparagraphs are satisfied: i. the species is a species of fish; ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised; iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory; iv. cessation of the plan of management would adversely affect the conservation status of the species.

Threatened Ecological Communities

Threatened Ecological Communities may be listed under Section 181 of the EPBC Act in any one of the following categories.

A.5 Commonwealth listed Threatened Ecological Community categories

Code	Conservation Category
CR	**Critically Endangered Communities** An ecological community is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
EN	**Endangered Communities** An ecological community is eligible to be included in the endangered category at a particular time if, at that time: a. it is not critically endangered; and b. it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
VU	**Vulnerable Communities** An ecological community is eligible to be included in the vulnerable category at a particular time if, at that time: a. it is not critically endangered nor endangered; and b. it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

Appendix B Conservation Significant Flora and Fauna Likelihood Assessment

Table B.6 Conservation significant flora identified by database searches and their likelihood of presence in the Survey Area

Taxon FAMILY	State	Cth	Description	Likelihood of Occurrence	Reassessment Post-field
Acacia ataxiphylla subsp. *ataxiphylla* FABACEAE	P3	Not listed	Prostrate, sprawling shrub, 0.15-0.5 m high, to 1 m wide. Fl. yellow, Nov to Dec or Jan. Gravelly clay loam, white/grey sand. Flats, roadsides.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences
Acacia prismifolia FABACEAE	CR	EX	Shrub, 0.15-0.5 m high. Rocky slopes.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Adenanthos x cunninghamii PROTEACEAE	P4	Not listed	Erect open shrub, 1-3 m high. Fl. red/pink-red, Mar or Sep to Oct. Grey sand. Coastal dunes & sandplains.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences
Agrostocrinum scabrum subsp. *littorale* HEMEROCALLIDACEAE	P2	Not listed	Rhizomatous, perennial, herb, to 0.15 m high. Fl. blue, Oct to Nov. Shallow granite loams. Coastal slopes.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences
Andersonia auriculata ERICACEAE	P3	Not listed	Erect or spreading shrub, 0.1-0.3(-0.5) m high. Fl. white & blue, Apr to Oct. Grey or peaty sand, often over laterite. Swampy areas, granite outcrops.	Possible based on habitat preferences	Unlikely based on habitat preferences
Andersonia setifolia ERICACEAE	P3	Not listed	Decumbent to erect, cushion-forming shrub, 0.05-0.15 m high. Fl. red/white, Jun to Oct. Sandy & gravelly soils. Hillslopes & breakaways.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Andersonia sp. Jamesii (J. Liddelow 84) ERICACEAE	P4	Not listed	No description available	Possible based on regional distribution	Unlikely based on habitat preferences
Anzybas abditus ORCHIDACEAE	P3	Not listed	Tuberous herb to 0.02 m high. Fl. Oct to early-Nov. Peaty soils in seasonally wet flats and drainage lines.	Possible based on habitat preferences	Possible based on habitat preferences Could have been missed among dense vegetation

Taxon FAMILY	State	Cth	Description	Likelihood of Occurrence	Reassessment Post-field
Asplenium decurrens ASPLENIACEAE	P4	Not listed	Rhizomatous fern growing to 0.6 m high. Sheltered sites close to the sea.	Possible based on habitat preferences	Possible based on habitat preferences Could have been missed among dense vegetation
Austrostipa mundula POACEAE	P3	Not listed	Perennial grass to 0.6 m high.	Possible based on regional distribution	Possible based on regional distribution Could have been missed among dense vegetation
Banksia brownii PROTEACEAE	CR	CR	Bushy, non-lignotuberous shrub or tree (small), 1-6 m high. Fl. cream & brown/orange-red, Mar to Jul. Sand over laterite, gravel, loam over granite. In gullies.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences.
Banksia goodii PROTEACEAE	VU	VU	Lignotuberous, prostrate shrub, ca 0.2 m high. Fl. orange-brown-red, May or Nov. White or grey sand over laterite.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Banksia seneciifolia PROTEACEAE	P4	Not listed	Columnar,non-lignotuberous shrub, 0.6-1 m high. Fl. cream-yellow-brown, Jun or Aug. Sandy loam, sand. Rocky hillslopes.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Banksia serra PROTEACEAE	P4	Not listed	Columnar,non-lignotuberous shrub, 0.6-1 m high. Fl. cream-yellow-brown, Jun or Aug. Sandy loam, sand. Rocky hillslopes.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Banksia verticillata PROTEACEAE	CR	VU	Non-lignotuberous shrub or tree (rarely), 1.3-6 m high. Fl. yellow-orange, Jan to Apr. Sandy loam. On or beside granite outcrops.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Boronia crassipes RUTACEAE	P3	Not listed	Erect, spindly shrub, 0.5-2 m high. Fl. red-pink, Aug to Sep. Sand, peaty sand. Winter-wet swamps, creeklines.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Smaller plants could have been missed among dense vegetation
Bossiaea sp. Mt Frankland (L. Graham 2174) FABACEAE	P2	Not listed	No description available.	Possible based on regional distribution	Possible based on regional distribution Smaller plants could have been missed among dense vegetation

Taxon FAMILY	State	Cth	Description	Likelihood of Occurrence	Reassessment Post-field
Caladenia evanescens ORCHIDACEAE	P1	Not listed	Tuberous, perennial, herb, 0.15-0.2 m high. Fl. green-cream-yellow, Nov. Sand. Consolidated sand dunes.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Caladenia granitora ORCHIDACEAE	EN	EN	Tuberous, perennial, herb, 0.2-0.35 m high. Fl. cream & white & red, Oct to Nov. Shallow soil crevices on granite. Coastal areas.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Caladenia harringtoniae ORCHIDACEAE	VU	VU	Tuberous, perennial, herb, 0.2-0.4 m high. Fl. pink, Oct to Nov. Sandy loam. Winter-wet flats, margins of lakes, creeklines, granite outcrops.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Could have been missed among dense vegetation
Calandrinia sp. Torndirrup (S.D. Hopper et al. SDH 8712) MONTIACEAE	P2	Not listed	No description available.	Possible based on regional distribution	Possible based on regional distribution Could have been missed among dense vegetation
Calectasia cyanea DASYPOGONACEAE	CR	CR	Rhizomatous, clump forming, woody perennial, herb, 0.1-0.6 m high, to 0.3 m wide. Fl. blue/purple, Jun to Oct. White, grey or yellow sand, gravel.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences
Caustis sp. Boyanup (G.S. McCutcheon 1706) CYPERACEAE	P3	Not listed	Rhizomatous, clumped perennial, grass-like or herb (sedge), 0.7-1 m high. White or grey sand.	Possible based on habitat preferences	Unlikely based on habitat preferences
Chordifex abortivus RESTIONACEAE	VU	EN	Rhizomatous, erect perennial, herb, to 0.5 m high. Fl. brown, Sep to Oct. Sand. Low rises & undulating areas.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Chorizema carinatum FABACEAE	P3	Not listed	Erect or spreading shrub, 0.1-0.6 m high. Fl. yellow, Oct to Dec. Sand, sandy clay.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences
Conospermum quadripetalum PROTEACEAE	CR	Not listed	Diffuse, straggly shrub, 0.3-1 m high. Fl. blue/white, Sep to Nov. Sandy clay, grey sand. Flats behind coastal hills.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Smaller plants could have been missed among dense vegetation

Taxon FAMILY	State	Cth	Description	Likelihood of Occurrence	Reassessment Post-field
Conospermum spectabile PROTEACEAE	P2	Not listed	Erect, compact shrub, 0.5-0.8 m high. Fl. white & blue, Oct to Nov. Sandy soils.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences
Conostylis misera HAEMODORACEAE	VU	EN	Rhizomatous, tufted perennial, grass-like or herb, 0.05-0.18 m high. Fl. yellow, Oct to Nov. White or grey sand, sandy loam. Winter-wet flats.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Could have been missed among dense vegetation
Corysanthes limpida ORCHIDACEAE	P4	Not listed	Tuberous herb to 0.02 m high. Fl. July to early-Sep. Peaty soils in seasonally damp flats.	Possible based on habitat preferences	Possible based on habitat preferences Could have been missed among dense vegetation
Diuris drummondii ORCHIDACEAE	EN	VU	Tuberous, perennial, herb, 0.5-1.05 m high. Fl. yellow, Nov to Dec or Jan. Low-lying depressions, swamps.	Possible based on habitat preferences	Possible based on habitat preferences Could have been missed among dense vegetation
Drakaea micrantha ORCHIDACEAE	EN	VU	Tuberous, perennial, herb, 0.15-0.3 m high. Fl. red & yellow, Sep to Oct. White-grey sand.	Possible based on habitat preferences	Unlikely based on habitat preferences
Drosera fimbriata DROSERACEAE	P4	Not listed	Erect tuberous, perennial, herb, 0.05-0.15 m high. Fl. white, Sep to Oct. White sand, granite.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Drosera paleacea DROSERACEAE	P1	Not listed	Fibrous-rooted, rosetted perennial, herb, to 0.03 m high, to 0.015 m wide. Fl. white-cream, Sep to Dec or Jan. White sand, sandy clay.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Could have been missed among dense vegetation
Eucalyptus newbeyi MYRTACEAE	P3	Not listed	Tree, 5-8 m high, bark smooth. Fl. yellow-green, Sep to Dec or Jan to Feb. Sandy clay, loam. Steep spongolite valley sides & cliffs forming river banks.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Eucalyptus x missilis MYRTACEAE	P4	Not listed	(Mallee), to 3 m high, bark smooth. Fl. yellow/cream-white, Jan to Apr. Sand over limestone or granite. Coastal sites.	Possible based on habitat preferences	Unlikely based on habitat preferences
Gahnia sclerioides CYPERACEAE	P4	Not listed	Lax, slender rhizomatous, perennial, grass-like or herb (sedge), 0.3-0.9 m high. Loam, sandy soils. Moist shaded situations.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Could have been missed among dense vegetation

Taxon FAMILY	State	Cth	Description	Likelihood of Occurrence	Reassessment Post-field
Gonocarpus pusillus HALORAGACEAE	P4	Not listed	Prostrate annual, herb, 0.05-1.2 m high. Fl. green/yellow-red, Nov to Dec. Grey sandy clay. Winter-wet swamps.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Smaller plants could have been missed among dense vegetation
Gonocarpus simplex HALORAGACEAE	P4	Not listed	Tufted perennial, herb, 0.2-0.6 m high. Fl. green/red-brown, Nov to Dec. Peaty sand. Swamps, seasonally inundated areas.	Possible based on habitat preferences	Possible based on habitat preferences Could have been missed among dense vegetation
Goodenia sp. South Coast (A.R. Annels ARA 1846) GOODENIACEAE	P3	Not listed	Slender, erect herb, 0.3-0.45 m high. Fl. blue, Nov to Dec. Gravelly loams, sandy clays. Edge granite outcrop, roadside.	Possible based on habitat preferences	Possible based on habitat preferences Could have been missed among dense vegetation
Gyrostemon thesioides GYROSTEMONACEAE	P2	Not listed	Straggling, decumbent shrub, to 0.7 m high. Fl. red-orange-yellow/yellow-green, Nov. Sand over limestone. Consolidated coastal dunes.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Hakea lasiocarpha PROTEACEAE	P3	Not listed	Erect shrub, to 6 m high. Fl. white, May to Jul. Sandy loam soils, organic litter over sand, clay or gravel. Hill tops, valleys.	Possible based on habitat preferences	Unlikely to have been missed by survey due to its size.
Hydrocotyle serendipita ARALIACEAE	P2	Not listed	Annual herb to 0.1 m high and 0.5 m wide. Fl. White to pale pink, Oct to Dec. Fire ephemeral, grey-black or orange-brown sand. Gullies and base of outcropping granite.	Possible based on habitat preferences	Possible based on habitat preferences Could have been missed among dense vegetation
Isopogon buxifolius var. *buxifolius* PROTEACEAE	EN	Not listed	Upright shrub, 0.3-1.7 m high. Fl. pink/blue-purple/cream-white-green, May to Dec. Sandy soils, gravelly loam or clay. Sandplains, wet or swampy areas.	Possible based on habitat preferences	Possible based on habitat preferences Could have been missed among dense vegetation
Isopogon uncinatus PROTEACEAE	CR	EN	Tufted spreading or prostrate, non-lignotuberous shrub, 0.05-0.4 m high. Fl. yellow/cream, Oct to Nov. Loam or sand on granite, peaty sand. Swampy depressions, hillslopes.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Could have been missed among dense vegetation
Juncus meianthus JUNCACEAE	P3	Not listed	Tufted perennial, herb, 0.05-0.2 m high, to 0.4 m wide. Fl. brown, Nov to Dec or Jan. Black sand, sandy clay. Creeks, seepage areas.	Possible based on habitat preferences	Possible based on habitat preferences

Taxon FAMILY	State	Cth	Description	Likelihood of Occurrence	Reassessment Post-field
					Could have been missed among dense vegetation
Kennedia glabrata FABACEAE	VU	VU	Prostrate shrub, 0.05-0.5 m high, to 5 m wide. Fl. red, Aug to Nov. Soil pockets, sandy soils. Granite outcrops.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Kunzea pauciflora MYRTACEAE	P4	Not listed	Erect, compact shrub, (0.35-)0.5-1.2(-1.5) m high. Fl. pink, Aug to Nov. Gravelly sandy or loamy soils over limestone, sandstone or spongolite. Hillsides, coastal slopes.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Lachnagrostis billardierei subsp. *billardierei* POACEAE	P3	Not listed	Annual, herb. Fl. purple/green, Dec. Sand over granite. Hilltops.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Lasiopetalum sp. Denmark (B.G. Hammersley 2012) MALVACEAE	P3	Not listed	No description available	Possible based on regional distribution	Possible based on regional distribution Could have been missed among dense vegetation
Lepidium pseudotasmanicum BRASSICACEAE	P4	Not listed	Erect annual or biennial, herb, 0.2-0.4(-1) m high. Fl. white-green, Feb or Dec. Loam, sand.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Could have been missed among dense vegetation
Leucopogon alternifolius ERICACEAE	P3	Not listed	Erect or semi-erect, scrambling shrub, 0.1-1(-2) m high. Fl. white/white-pink, Aug to Dec. Grey/white sand. Swampy areas, seasonally wet areas.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Smaller plants could have been missed among dense vegetation
Leucopogon altissimus ERICACEAE	P3	Not listed	Erect shrub to 1.5 m high. Fl. Cream, Aug to Oct. Sand, loam, seasonally wet areas, outcropping granite.	Possible based on habitat preferences	Possible based on habitat preferences Smaller plants could have been missed among dense vegetation
Leucopogon bracteolaris ERICACEAE	P2	Not listed	Shrub, 0.25-1 m high. Fl. white, Feb or May or Jul or Oct. Stony sand, gravelly loam.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Smaller plants could have been missed among dense vegetation

Taxon FAMILY	State	Cth	Description	Likelihood of Occurrence	Reassessment Post-field
Lysinema lasianthum ERICACEAE	P4	Not listed	Spindly shrub, 0.25-0.7 m high. Fl. white-cream, Jul to Nov. Swamps, seasonally wet areas.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Could have been missed among dense vegetation
Microtis globula ORCHIDACEAE	EN	VU	Tuberous, perennial, herb, 0.18-0.35 m high. Fl. yellow-green, Dec or Jan. Peaty soils. Winter-wet swamps.	Possible based on habitat preferences	Possible based on habitat preferences Could have been missed among dense vegetation
Microtis pulchella ORCHIDACEAE	P4	Not listed	Tuberous, perennial, herb, 0.12-0.25 m high. Fl. white, Nov to Dec or Jan. Peaty sand. Winter-wet swamps.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Could have been missed among dense vegetation
Microtis quadrata ORCHIDACEAE	P4	Not listed	Tuberous perennial herb to 0.8 m high. Fl. Dec-Jan. Clayey soils. Swamps.	Likely based on nearby records	Possible based on habitat preferences Could have been missed among dense vegetation
Poa billardierei POACEAE	P3	Not listed	Tussock grass to 1.3 m high. Fl. Sep to Nov. White sands. Coastal Dunes.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Prasophyllum paulinae ORCHIDACEAE	P1	Not listed	Tuberous herb to 0.25 m high. Fl. Yellowish-green and purple, Sep to Nov. Seasonally wet flats.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Could have been missed among dense vegetation
Pterostylis heberlei ORCHIDACEAE	P2	Not listed	Tuberous herb to 0.4 m high. Fl. Brown, green and white, Aug to early-Oct. Sandy soils.	Possible based on habitat preferences	Unlikely based on habitat preferences
Schoenus sp. Grassy (E. Gude & J. Harvey 250) CYPERACEAE	P2	Not listed	Rhizomatous, perennial, grass-like or herb (sedge), to 0.7 m high. Fl. yellow. Black silt. Swamps.	Possible based on habitat preferences	Possible based on habitat preferences Could have been missed among dense vegetation
Schoenus sp. Grey Rhizome (K.L. Wilson 2922) CYPERACEAE	P1	Not listed	Grass-like or herb (sedge), 0.06-0.08 m high. Sandy clay, sand.	Possible based on habitat preferences	Unlikely based on habitat preferences
Sphenotoma drummondii ERICACEAE	EN	EN	Tufted shrub, 0.15-0.5 m high. Fl. white, Sep to Dec. Stony or shallow soils over granite or quartzite. Steep rocky slopes, crevices of rocks.	Unlikely based on habitat preferences	Unlikely based on habitat preferences

Taxon FAMILY	State	Cth	Description	Likelihood of Occurrence	Reassessment Post-field
Spyridium spadiceum RHAMNACEAE	P4	Not listed	Erect slender or weak semi-prostrate shrub, 0.15-3 m high. Fl. white, Aug to Dec or Jan to Feb or Apr. Sand or gravelly loam. Granitic hills.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Stenanthemum sublineare RHAMNACEAE	P2	Not listed	Erect shrub, to 0.1 m high. Fl. green, Oct to Dec. Littered white sand. Coastal plain.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Stylidium articulatum STYLIDIACEAE	P2	Not listed	Rosetted perennial, herb, 0.15-0.25 m high. Fl. pink, Nov to Dec. Sandy loam, granite. Hills, coastal heath.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences
Stylidium falcatum STYLIDIACEAE	P2	Not listed	Perennial, herb, 0.15-0.35(-0.6) m high. Fl. white, Oct to Nov. Sand, gravelly clay loam. Plains, lateritic ridges.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences
Styphelia cymbiformis ERICACEAE	P2	Not listed	Sprawling perennial shrub to 0.7 m high. Fl. white to pink, Nov to Dec. Varied habitats.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Smaller plants could have been missed among dense vegetation
Synaphea incurva PROTEACEAE	P3	Not listed	Clumped, spreading shrub. Fl. yellow, Sep to Nov. Gravelly loam, sandy soils. Slopes.	Possible based on habitat preferences	Unlikely based on habitat preferences
Synaphea preissii PROTEACEAE	P3	Not listed	Erect, low shrub, 0.15-0.4 m high. Fl. yellow, Jul to Nov. Sand, gravelly loam.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences
Thelymitra porphyrosticta ORCHIDACEAE	P2	Not listed	Tuberous herb to 0.35 m high. Fl. Purple, mauve, orange and yellow, Aug-Sep. Sandy soils.	Likely based on nearby records and presence of preferred habitat	Unlikely based on habitat preferences
Thomasia multiflora MALVACEAE	P1	Not listed	Spreading shrub, 0.3-1 m high, to 2 m wide. Fl. pink-purple, Sep to Oct. Black sand. Seasonally wet areas, granite outcrops.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Smaller plants could have been missed among dense vegetation
Thomasia purpurea x solanacea MALVACEAE	P1	Not listed	Shrub, 0.5-0.8 m high. Fl. pink-purple, Nov to Dec or Jan. Grey sand over limestone. Creek sides.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Thomasia quercifolia	P4	Not listed	Shrub, ca 1 m high.	Possible based on regional distribution	Possible based on regional distribution

Taxon FAMILY	State	Cth	Description	Likelihood of Occurrence	Reassessment Post-field
MALVACEAE					Smaller plants could have been missed among dense vegetation
Thomasia solanacea MALVACEAE	P4	Not listed	Erect shrub, 0.5-3 m high. Fl. blue-purple-pink, Sep to Dec. Alluvium, sand over limestone, rocky loam. Coastal areas.	Likely based on nearby records and presence of preferred habitat	Possible based on habitat preferences Smaller plants could have been missed among dense vegetation
Thysanotus gageoides ASPARAGACEAE	P3	Not listed	Perennial, herb (with tuberous roots), to 0.2 m high. Fl. purple, Oct to Nov. Sand, clay, granite, sandstone, laterite.	Possible based on habitat preferences	Unlikely based on habitat preferences
Thysanotus isantherus ASPARAGACEAE	P4	Not listed	Caespitose perennial, herb (with tuberous roots), to 0.15 m high. Fl. purple, Nov to Dec. Granite.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Verticordia endlicheriana var. *angustifolia* MYRTACEAE	P3	Not listed	Erect shrub, 0.3-0.5 m high. Fl. yellow, Oct to Nov. Sandy clay. Granite outcrops.	Unlikely based on habitat preferences	Unlikely based on habitat preferences
Verticordia fimbrilepis subsp. *australis* MYRTACEAE	EN	VU	Slender shrub, 0.2-0.4 m high. Fl. pink, Oct to Dec. Shallow sand, clay loam. Granite outcrops.	Unlikely based on habitat preferences	Unlikely based on habitat preferences

Table B.2 Conservation significant fauna identified by database searches and their likelihood of presence in the Survey Area

Taxon Common Name COM_NAME	State	Cth	Habitat	Likelihood of Occurrence
BIRDS				
Actitis hypoleucos Common Sandpiper	MI	MI	Occurs in a wide variety of habitats on the shores of waterbodies (Pizzey & Knight, 1997). Shallow, pebbly, muddy or sandy edges of rivers and streams, coastal to far inland; dams, lakes, sewage ponds, margins of tidal rivers, waterways in mangroves or saltmarsh; mudflats; rocky or sandy beaches, causeways, riverside lawns, drains, street gutters.	Regular migrant or visitor; recorded on the rocks fringing the Survey Area
Aphelocephala leucopsis Southern Whiteface	Not listed	VU	Occurs across most of mainland Australia south of the tropics, in a wide range of open woodlands and shrublands where there is an understory of grasses, shrubs	Absent - out of range

Taxon Common Name COM_NAME	State	Cth	Habitat	Likelihood of Occurrence
			or both. Habitats are usually dominated by Acacias or eucalypts on ranges, foothills, lowlands and plains. They nest in hollows and crevices of trees (TSSC, 2023).	
Apus pacificus Fork-tailed Swift, Pacific Swift	MI	MI	Airborne over a variety of habitats from rainforest to arid areas (Pizzey & Knight, 1997). Aerial: open country, from semi-deserts to coasts, islands; sometimes over forests, cities (Pizzey & Knight 2012).	Vagrant
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater	VU	MI	Temperate to tropical waters, breeding on islands off southern WA, also SA and Lord Howe. Often attracted to fishing vessals. Trans-equatorial migrant in Pacific and Indian oceans, largely absent May-Sep.	Vagrant
Ardenna grisea Sooty shearwater	MI	MI	Warm-temperate to cold subantarctic oceans. In Australia, breeds on offshore islands off NSW and Tasmania.	Vagrant
Ardenna tenuirostris Short-tailed shearwater	MI	MI	Inshore and offshore waters (Menkhorst, et al., 2019)	Vagrant
Arenaria interpres Ruddy turnstone	MI	MI	Occurs in a wide variety of habitats on the shores of waterbodies, commercial saltfields, open or ploughed ground (Pizzey & Knight, 1997). Coastal/marine (Pizzey & Knight 2012).	Regular migrant or visitor
Atrichornis clamosus noisy scrub-bird, tjimiluk	EN	EN	Dense, unburnt understorey vegetation of low forest, scrub thicket and occasionally heath that occur in gullies, drainage lines and lowland areas.	Locally extinct
Botaurus poiciloptilus Australasian bittern	EN	EN	Occurs in or over water in tall reedbeds, sedges, rushes or Typha; drains in tussocky paddocks, occasionally saltmarsh or brackish wetlands (Pizzey & Knight, 2012).	Locally extinct
Calidris acuminata Sharp-tailed sandpiper	MI	MI	Tidal mudflats, saltmarshes, mangroves; shallow fresh, brackish or saline inland wetlands; floodwaters, irrigated pastures and crops; sewage ponds, saltfields (Pizzey & Knight, 2012).	Regular migrant or visitor
Calidris alba Sanderling	MI	MI	Broad ocean beaches of firm sand 'where waves ebb and flow', depositing strands and heaps of seaweed; often near river mouths; also inlets, tidal mudflats, coastal lagoons (Pizzey & Knight, 2012).	Regular migrant or visitor

Taxon Common Name **COM_NAME**	State	Cth	Habitat	Likelihood of Occurrence
Calidris canutus Red knot	EN	EN	Tidal mudflats, sandflats, beaches, saltmarshes, flooded pastures and ploughed lands (Pizzey & Knight, 1997).	Regular migrant or visitor
Calidris ferruginea curlew sandpiper	CR	MI	Tidal mudflats, saltmarsh, saltfields; fresh, brackish or saline wetlands and sewage ponds (Pizzey & Knight, 1997).	Regular migrant or visitor
Calidris ruficollis red-necked stint	MI	MI	Tidal mudflats, saltmarshes; sandy or shelly beaches; saline and freshwater wetlands, coastal and inland; saltfields, sewage ponds (Pizzey & Knight, 2012).	Regular migrant or visitor; recorded on adjacent mud flats
Calidris subminuta Long-toed Stint	MI	MI	Tussocky, weedy margins of shallow wetlands, both coastal and inland, sewage ponds, weed on tidelines, tidal mudflats (Pizzey & Knight, 2012).	Regular migrant or visitor
Calidris tenuirostris Great knot	CR	MI	Tidal mudflats, sandy ocean and bay shores, estuaries, shallow saline and freshwater wetlands (Pizzey & Knight, 1997).	Regular migrant or visitor
Calyptorhynchus banksii naso forest red-tailed black cockatoo	VU	VU	Marri, jarrah, wandoo, tuart and karri woodlands and forests, where they feed primarily on marri and jarrah (Johnstone & Kirkby, 2011).	Regular migrant or visitor; recorded adjacent
Cereopsis novaehollandiae grisea Cape Barren Goose, Recherche Cape Barren goose	VU	VU	Offshore islands, grassy patches among low scrub and rocks, beaches and headlands, pasture, shallow wetlands, irrigated crops (Menkhorst et al. 2019).	Absent - out of range
Charadrius leschenaultii Greater sand plover, large sand plover	VU	MI	Wide, sandy or shelly beaches; sandspits, tidal mudflats, reefs, sand cays, mangroves, saltmarsh, dunes, bare paddocks; seldom far inland (Pizzey & Knight, 2012).	Regular migrant or visitor
Charadrius mongolus Lesser Sand Plover	EN	MI	Tidal mudflats and sandflats; gently sloping sandy or shelly beaches, saltmarsh, estuaries, atolls, reefs, mangroves and airfields (Pizzey & Knight, 2012). . Occasionally found inland on freshwater lakes, swamps, bore drains etc.	Regular migrant or visitor
Dasyornis longirostris western bristlebird	EN	EN	Very restricted distribution, mostly between Two Peoples Bay and Wychinicup Inlet in dense, low, coastal heath.	Locally extinct
Diomedea antipodensis Antipodean Albatross	MI/EN	VU/MI	A sea bird, spending most of its time at sea. Does not breed in Australia (Menkorst et al. 2019).	Vagrant

Taxon Common Name **COM_NAME**	State	Cth	Habitat	Likelihood of Occurrence
Diomedea dabbenena Tristan Albatross	CR	EN/MI	A seabird with a poorly understood distribution. Breeds on islands of the Tristan da Cunha archipelago (Pizzey & Knight, 2012).	Vagrant
Diomedea epomophora Southern Royal Albatross	VU	VU/MI	A seabird found in offshore waters. Does not breed in Western Australia (Pizzey & Knight, 2012).	Vagrant
Diomedea exulans Wandering Albatross	MI	VU	A seabird found in offshore waters south of Fremantle. Breeds at high latitudes in the S. Indian and S. Atlantic oceans (Pizzey & Knight, 2012).	Vagrant
Diomedea sanfordi Northern Royal Albatross	EN	EN/MI	A seabird which does not breed in Western Australia. Rarely seen from land (Menkhorst, et al., 2019).	Vagrant
Falco hypoleucos Grey Falcon	VU	VU	Inhabits open plains with treed watercourses in the arid inland (Menkhorst et al. 2019).	Vagrant
Falco peregrinus Peregrine falcon	OS	Not listed	Diverse habitats ranging from rainforest to the coast, alpine areas and arid shrublands (Pizzey & Knight, 1997). Cliffs, gorges, timbered watercourses, environs of rivers, wetlands, plains, open woodlands pylons, spires, buildings (Pizzey & Knight, 2012).	Regular migrant or visitor
Halobaena caerulea Blue Petrel	Not listed	VU	A seabird occurring offshore south of Fremantle. Breeds on sub-Antarctic islands (Pizzey & Knight, 2012).	Vagrant
Hydroprogne caspia Caspian Tern	MI	MI	Sheltered coastal bays with sandy or muddy margins, and near coastal or inland saline or brackish waterbodies (DCCEEW, 2023).	Irregular visitor; recorded on adjacent mudflats
Leipoa ocellata malleefowl	VU	VU	Mallee, Acacia, paperbark, sheoak and other scrubs, eucalypt woodland and coastal heaths, mainly on sandy or gravel soils (Pizzey & Knight, 2012).	Absent - out of range
Limosa lapponica Bar-tailed Godwit	MI	MI	Tidal mudflats, estuaries, sewage ponds, shallow river margins, brackish or saline inland lakes, flooded pastures and airfields (Pizzey & Knight, 1997).	Regular migrant or visitor
Limosa limosa Black-tailed Godwit	MI	MI	Shallow inland wetlands and on coast. Prefers sites with muddy substrates where it feeds by wading. Does not breed in Australia (Menkhorst et al. 2019).	Regular migrant or visitor
Macronectes giganteus Southern Giant Petrel	MI	EN	A seabird, breeding on Antarctic and sub-Antarctic islands (Pizzey & Knight, 1997)	Vagrant

Taxon Common Name **COM_NAME**	State	Cth	Habitat	Likelihood of Occurrence
Macronectes halli Northern Giant Petrel	No listed	VU/MI	A seabird, breeding on sub-Antarctic islands. Common on inland and offshore waters from approximately south of Fremantle (Pizzey & Knight, 1997).	Vagrant
Numenius madagascariensis Eastern Curlew	CR	CR	Estuaries, tidal mudflats, sandspits, saltmarshes, mangroves, fresh or brackish lakes, grasslands near water (Pizzey & Knight, 1997).	Vagrant
Numenius phaeopus Whimbrel	MI	MI	Estuaries, mangroves, tidal flats, coral cays, exposed reefs, flooded paddocks, sewage ponds, bare grasslands, sportsgrounds, lawns (Pizzey & Knight, 2012).	Regular migrant or visitor
Oceanites oceanicus Wilson's Storm-petrel	MI	MI	Wilson's Storm-Petrel spends much of its life at sea (Marchant & Higgins 1990).	Vagrant
Oxyura australis Blue-billed Duck	P4	Not listed	Well vegetated freshwater swamps, large dams, lakes (Pizzey & Knight, 2012).	Regular migrant or visitor
Pachyptila turtur subantarctica Fairy Prion (southern)	Not listed	VU	A seabird found in offshore waters. Breeds on sub-Antarctic islands (Menkhorst, et al., 2019).	Vagrant
Pandion cristatus Osprey, Eastern Osprey	MI	MI	Coasts, inshore waters, tidal reaches of large streams (Menkhorst, et al., 2019).	Regular migrant or visitor; recorded on adjacent mudflats
Pezoporus flaviventris Western Ground Parrot	CR	CR	Dense heathland in Cape Arid National Park and southwest Western Australia.	Locally extinct
Phaethon rubricauda Red-Tailed Tropicbird	P4	EN/MI	Tropical pelagic waters, rarely near land unless breeding (Menkhorst et al. 2019).	Vagrant
Philomachus pugnax Ruff (Reeve)	MI	MI	Nests in marshes of the low Arctic. Occupies a variety of open, moist habitats. Grasslands, agricultural lands, freshwater wetlands (Menkhorst et al., 2019).	Vagrant
Phoebetria fusca Sooty Albatross	MI	MI	A seabird found in offshore waters. Breeds on sub-Antarctic islands (Pizzey & Knight, 2012).	Vagrant
Plegadis falcinellus Glossy Ibis	MI	MI	Well vegetated wetlands, wet pastures, ricefields, floodwaters, floodplains, brackish or saline wetlands, mangroves, mudflats and occasionally dry-grasslands (Pizzey & Knight, 2012).	Regular migrant or visitor

Taxon Common Name **COM_NAME**	State	Cth	Habitat	Likelihood of Occurrence
Pluvialis fulva Pacific Golden Plover	MI	MI	Estuaries, mudflats, saltmarshes, mangroves, rocky reefs and stranded seaweed on ocean shores; margins of shallow open inland swamps; sewage ponds, short-grass paddocks, sportsgrounds, airfields, ploughed land (Pizzey & Knight, 2012).	Regular migrant or visitor
Pluvialis squatarola Grey Plover	MI	MI	Occurring almost entirely in coastal areas, inhabits sheltered bays, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts. They also occur around terrestrial wetlands such as near-coastal lakes and swamps, or salt-lakes (DCCEEW, 2023). Mudflats, saltmarsh; tidal reefs and estuaries; rarely inland (Pizzey & Knight, 2012).	Regular migrant or visitor; recorded on adjacent mudflats
Psophodes nigrogularis Western Whipbird	EN or P4	Not listed	Dense, low scrub, heath and mallee thickets 1-2 m tall with open space at ground level (Menkhorst et al., 2019).	Locally extinct
Psophodes nigrogularis nigrogularis Western Whipbird (Western Heath)	EN	EN	Dense, low scrub, heath and mallee thickets 1-2 m tall with open space at ground level (Menkhorst et al., 2019).	Locally extinct
Pterodroma mollis Soft-plumaged Petrel	Not listed	VU	A seabird found in offshore waters. Breeds on sub-Antarctic islands (Pizzey & Knight, 2012).	Vagrant
Puffinus huttoni Hutton's shearwater	EN	Not listed	Tropical inshore waters and offshore. Breeds in New Zealand mountains.	Vagrant
Stercorarius antarcticus lonnbergi Brown Skua, Subantarctic Skua	P4	Not listed	Strictly marine birds in the Australian region. Apr-Sep off the south of Western Australia, can be seen in larger aggregations near to dead seals, Gannet populations etc. Rarely seen ashore.	Vagrant
Stercorarius maccormicki South polar Skua	MI	MI	Circumpolar seabird nesting on Antarctic shorelines (Menkhorst et al., 2019).	Vagrant
Stercorarius parasiticus Arctic Jaeger, Arctic Skua	MI	MI	Trans-equatorial migrant, prefers inshore waters, enters bays. Less common in offshore waters.	Vagrant
Sternula nereis nereis Australian Fairy Tern	Not listed	VU	Coastal waters, bays, inlets, saline or brackish lakes, saltfields, sewage ponds near coast (Pizzey & Knight, 2012).	Regular migrant or visitor; recorded on adjacent mudflats

Taxon Common Name COM_NAME	State	Cth	Habitat	Likelihood of Occurrence
Thalassarche carteri Indian Yellow-nosed Albatross	EN	VU	A seabird found in offshore waters. Breeds on sub-Antarctic islands (Pizzey & Knight, 2012).	Vagrant
Thalassarche cauta cauta Shy Albatross	VU	EN/MI	A seabird found in offshore waters. Breeds on Albatross Is. Bass Strait (Pizzey & Knight, 2012).	Vagrant
Thalassarche chlororhynchos Atlantic Yellow-nosed Albatross	MI	MI	A seabird with a poorly understood distribution. Breeds on Gough Is. and islands of the Tristan da Cunha archipelago (Pizzey & Knight, 2012).	Vagrant
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross	Not listed	VU/MI	A seabird found in offshore waters. Breeds on Campbell Is. (New Zealand region) (Pizzey & Knight, 2012).	Vagrant
Thalassarche melanophris Black-Browed Albatross	MI	MI	A seabird found in offshore waters. Breeds on sub-Antarctic islands (Menkhorst, et al., 2019).	Vagrant
Thalassarche steadi White-capped Albatross	Not listed	VU/MI	A seabird found in offshore waters. Breeds on Auckland Is. Group and Antipodes Is. (New Zealand region) (Pizzey & Knight, 2012).	Vagrant
Thalasseus bergii Crested Tern	MI	MI	Coastal, offshore waters; beaches, bays, inlets, tidal rivers, salt swamps, lakes and larger rivers (Pizzey & Knight, 2012).	Regular migrant or visitor; recorded on adjacent mudflats
Thinornis rubricollis Hooded Plover, Hooded Dotterel	P4	Not listed	Broad sandy ocean beaches with plentiful seaweed, and adjacent dunes; weedy rock shelves and reefs, occasionally tidal flats; coastal and inland salt lakes (Pizzey & Knight, 2012).	Regular migrant or visitor
Tringa brevipes Grey-tailed Tattler	P4	MI	The Grey-tailed Tattler is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayments, estuaries and coastal lagoons, especially fringed with mangroves. In Moreton Bay, Queensland, it is most abundant in areas with dense beds of seagrass. In Tasmania it is also abundant in areas with seagrass beds. It is less often on open flat sandy beaches or sandbanks, especially around accumulated seaweed or isolated clumps of dead coral. It is occasionally found around near-coastal wetlands, such as lagoons and lakes and	Regular migrant or visitor

Taxon Common Name COM_NAME	State	Cth	Habitat	Likelihood of Occurrence
			ponds in sewage farms and saltworks. Inland records for the species are rare with sightings on river banks and the edges of rock pools (Higgins & Davies 1996).	
Tringa glareola Wood Sandpiper	MI	MI	Muddy wetland margins, tidal mangroves, margins of tidal mudflats, saltmarshes and sewage ponds (Pizzey & Knight, 2012).	Regular migrant or visitor
Tringa nebularia Common Greenshank, Greenshank	MI	MI	Mudflats, estuaries, saltmarshes, margins of lakes; wetlands, fresh and saline claypans, saltfields and sewage ponds (Pizzey & Knight, 2012).	Regular migrant or visitor
Tringa stagnatilis Marsh Sandpiper, Little Greenshank	MI	MI	Wetlands (freshwater, salt or brackish), sewage ponds, saltfields, bore drains, mangroves, tidal mudflats, estuaries (Pizzey & Knight, 2012).	Regular migrant or visitor
Tyto novaehollandiae novaehollandiae Masked Owl (southwest)	P3	Not listed	Inhabits a variety of forests and woodlands, roosting in tree hollows, dense foliage or caves.	Irregular visitor
Xenus cinereus Terek Sandpiper	MI	MI	Tidal mudflats, estuaries; shores and reefs of islands; coastal swamps, commercial saltfields.	Regular migrant or visitor
Zanda baudinii Baudin's Cockatoo	EN	EN	Eucalypt forests, especially marri-jarrah and karri forests, less commonly in woodlands of wandoo, blackbutt, flooded gum, yate, and cleared areas (Johnstone & Kirkby, 2011).	Regular migrant or visitor
Zanda latirostris Carnaby's Cockatoo	EN	EN	Forests, woodlands and shrublands of Eucalyptus and Proteaceae species, where they feed primarily on Banksia, Hakea and marri, pine plantations and urban areas (Johnstone, et al., 2011; Pizzey & Knight, 1997).	Regular migrant or visitor
FISH				
Galaxias truttaceus (Western Australian population) Western Trout Minnow, Western Spotted Galaxias	EN	EN	On the south coast in near-coastal freshwater rivers and their tributaries and associated downstream lakes. The species is tolerant of tannin-stained acidic waters.	Potentially resident

Taxon Common Name COM_NAME	State	Cth	Habitat	Likelihood of Occurrence
Galaxiella munda Mud Minnow, Western Dwarf Galaxias	VU	Not listed	Swift flowing streams within karri forests and is typically found near submerged vegetation, occasionally in the still water of ponds, swamps and roadside drains, and often inhabiting darkly tannin-stained and acidic water.	Potentially resident
Galaxiella nigrostriata Black-Stripe Minnow, Black-Striped Dwarf Galaxias	EN	EN	Acidic ephemeral wetlands of the south-west of Western Australia. Generally prefer sandy soils (has been shown to be more suited for burrowing). Has been documented to survive in both natural wetlands, as well as excavated roadside pools.	Potentially resident
Geotria australis Pouched Lamprey	P3	Not listed	South-west coast, spawning in rivers.	Absent - no habitat
Lepidogalaxias salamandroides Salamanderfish	EN	Not listed	Pools in sandy peat flat areas. These waters are usually darkly tannin stained and often very acidic (pH 3.0-6.5).	Potentially resident
Nannatherina balstoni Balston's Pygmy Perch	VU	VU	Inundated riparian vegetation, in pools that often dry up in coastal flats of the South-west. Has also been found in the Collie River.	Potentially resident
INVERTEBRATES				
Cynotelopus notabilis Western Australian Pill Millipede	EN	Not listed	A short range endemic inhabiting deep litter, esp. karri bark, and under logs or rocks associated with granite tors (Main et al., 2002).	Unlikely - habitat dubious
Helicarion castanea a Helicarionid land snail	EX	Not listed	No information available. Last collected in 1925 near the Preston River.	Locally extinct
Hylaeus globuliferus Woolybush Bee	P3	Not listed	This native bee is distributed across the south-west of western Australia, with 223 records in the Atlas of Living Australia (ALA 2023). *Hylaeus globuliferus* is known to be associated with *Adenanthos cygnorum* and *Banksia attenuata* amongst other native plants (Houston 2018)	Absent - no habitat
Trioza barrettae Banksia brownii Plant-louse	EN	EN	Associated with its host plant *Banksia brownii*, which is associated with a range of habitats including thickets and mallee-heath and mallee heath shrublands and woodlands that are rich in proteaceous and myrtaceous species.	Absent - no habitat

Taxon Common Name COM_NAME	State	Cth	Habitat	Likelihood of Occurrence
Westralunio carteri Carter's Freshwater Mussel	VU	VU	Perennial streams, rivers, lakes and reservoirs, occasionally swamps with a salinity of <1.6 g/L and sediments composed of sand/mud/clay which are soft enough for burrowing, but stable enough for support.	Absent - no habitat
Zephyrarchaea mainae Main's Assassin Spider	VU	Not listed	Known from Walpole-Nornalup National Park (near Walpole) east to Bremer Bay and north to the Porongurup National Park, with a range centred on the Torndirrup Peninsula south of Albany. Specimens have been collected by beating and sifting sedges *(Lepidosperma* sp.), curly grass (*Empodisma gracillimum*) and low shrubs in dense coastal or near-coastal groves of Peppermint, with several outlying populations also known from wet Karri forest (Rix and Harvey, 2012).	Potentially resident
MAMMALS				
Arctocephalus forsteri New Zealand Fur-seal, Long-Nosed Fur-seal	OS	Not listed	Oceanic waters and rocky islands off the coast.	Unlikely visitor
Arctocephalus tropicalis Subantarctic Fur-seal	VU	Not listed	Oceanic waters and rocky islands off the coast.	Unlikely visitor
Bettongia penicillata ogilbyi Woylie, Brush-Tailed Bettong	CR	EN	Open, sclerophyllous forests and woodlands with a dense understorey/ground cover of tussock grasses or woody scrub (DBCA, 2017).	Potentially resident, but low likelihood
Dasyurus geoffroii Chuditch, Western Quoll	VU	VU	Forests, mallee shrublands, heathlands and woodlands (DBCA, 2017), with a preference for riparian locations in the jarrah forest (DEC, 2012).	Irregular visitor
Falsistrellus mackenziei Western False Pipistrelle, Western Falsistrelle	P4	Not listed	Mostly Karri wet sclerophyll forest or high-rainfall zones of Jarrah forest; also Tuart forest and adjacent woodlands. Roosts in tree hollows (van Dyke et al., 2013).	Irregular visitor
Hydromys chrysogaster Water-rat, Rakali	P4	Not listed	Occurs in a variety of aquatic environments (Menkhorst & Knight, 2011).	Irregular visitor
Isoodon fusciventer Quenda, Southwestern Brown Bandicoot	P4	Not listed	Dense, scrubby, often swampy vegetation (DEC, 2012). Forest, woodland, shrub and heath communities, ideally with sandy soils and dense health vegetation in the lower stratum	Resident

Taxon Common Name **COM_NAME**	State	Cth	Habitat	Likelihood of Occurrence
Limosa lapponica menzbieri Dibbler	CR	EN/MI	A wader occurring on tidal flats throughout Western Australia's coast. Does not breed in Western Australia (Menkhorst, et al., 2019).	Locally extinct
Macrotis lagotis Bilby, Dalgyte, Ninu	VU	VU	Mitchell grass and stony downs country of cracking clays. Also desert sandplains and dune fields, sometimes with spinifex hummock grasslands and Acacia shrubland.	Locally extinct
Neophoca cinerea Australian Sea-lion	VU	EN	Colonies found on near-shore islands. Females pup on rocky platforms, dunes and limestone crevices. Forages on continental shelf or shelf break.	Irregular visitor
Notamacropus eugenii derbianus Tammar Wallaby	P4	Not listed	Coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland. Requires dense, low vegetation for daytime shelter and open, grassy areas for feeding.	Locally extinct
Notamacropus irma Western Brush Wallaby	P4	Not listed	Open forest or woodland with a preference for seasonally inundated flats with low grasses and open, scrubby thickets (van Dyck, et al., 2013).	Locally extinct
Parantechinus apicalis Dibbler	EN	EN	Mature mallee-heath on mainland; low heath scrubland on islands	Locally extinct
Phascogale tapoatafa wambenger South-western Brush-tailed Phascogale, Wambenger	CD	Not listed	Dry, sclerophyllous forests and open woodlands that contain hollow-bearing trees, with sparse ground cover (Anon., 2012).	Irregular visitor
Potorous gilbertii Gilbert's Potoroo	CR	CR	On Mt Gardner in *Melaleuca striata* heath with dense sedge understory on slopes; on Bald Island in Taxandria scrub near Eucalyptus stands (van Dyke et al., 2013).	Locally extinct
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir	CR	CR	Coastal and near coastal peppermint -tuart, jarrah-marri, sheoak and eucalypt woodland and mallee woodland (preferably closed-canopy) (DPaW, 2017).	Resident
Setonix brachyurus Quokka	VU	VU	Mainland: tea-tree bordering swamps/watercourses in the Jarrah forest and Karri forests. Rottnest Island: thickets of Acacia, Melaleuca and sedges as well as modified habitats (van Dyck et al. 2013).	Locally extinct

Taxon Common Name COM_NAME	State	Cth	Habitat	Likelihood of Occurrence
REPTILES				
Elapognathus minor Short-nosed Snake	P2	Not listed	Heaths edging swamps. Shelters in low, dense vegetation such as tussocks and sedges (Wilson and Swan, 2023).	Potentially resident

Appendix C Species List

Family	Taxon	Status	Notes
Apiaceae	*Centella asiatica*	Weed	
Araceae	*Lemna minor*	Weed	
Araceae	*Zantedeschia aethiopica*	Declared Pest - s22(2)	
Asparagaceae	*Asparagus asparagoides*	Weed	
Asparagaceae	*Yucca aloifolia*	Weed	
Asteraceae	*Cirsium vulgare*	Weed	
Asteraceae	*Cotula coronopifolia*	Weed	
Asteraceae	*Erigeron bonariensis*	Weed	
Asteraceae	*Hypochaeris glabra*	Weed	
Asteraceae	*Sonchus asper*	Weed	
Campanulaceae	*Lobelia anceps*		
Chenopodiaceae	Chenopodiaceae sp.		Sterile
Chenopodiaceae	*Rhagodia baccata* subsp. *baccata*		
Chenopodiaceae	*Tecticornia ?indica* subsp. *bidens*		
Chenopodiaceae	*Threlkeldia diffusa*		
Crassulaceae	*Crassula glomerata*	Weed	
Cupressaceae	Cupressaceae sp.	Weed	Fruit out of reach
Cyperaceae	*Ficinia nodosa*		
Cyperaceae	*Isolepis cernua* var. *setiformis*		
Cyperaceae	*Isolepis prolifera*		
Cyperaceae	*Lepidosperma gladiatum*		
Cyperaceae	*Machaerina articulata*		
Cyperaceae	*Machaerina juncea*		
Dennstaedtiaceae	*Pteridium esculentum*		
Dilleniaceae	*Hibbertia cuneiformis*		
Euphorbiaceae	*Euphorbia paralias*	Weed	
Fabaceae	*Acacia littorea*		
Fabaceae	*Acacia longifolia* subsp. *longifolia*	Weed	
Fabaceae	*Dipogon lignosus*	Weed	
Fabaceae	*Lotus subbiflorus*	Weed	
Fabaceae	*Psoralea pinnata*	Weed	
Geraniaceae	*Geranium molle*	Weed	
Geraniaceae	*Pelargonium capitatum*	Weed	
Iridaceae	*Watsonia meriana*	Weed	
Juncaceae	*Juncus ?kraussii* subsp. *australiensis*		
Juncaceae	*Juncus oxycarpus*	Weed	
Juncaceae	*Juncus pallidus*		

Family	Taxon	Status	Notes
Lamiaceae	*Stachys arvensis*	Weed	
Malvaceae	*Lagunaria patersonia*	Weed	
Myrtaceae	*Agonis flexuosa*		
Myrtaceae	*Callistemon* sp.	Weed	Sterile, appears planted
Myrtaceae	*Eucalyptus ?conferruminata*		
Myrtaceae	*Eucalyptus cornuta*		
Myrtaceae	*Eucalyptus globulus*	Weed	
Myrtaceae	*Eucalyptus gomphocephala* var. *gomphocephala*		
Myrtaceae	*Eucalyptus petiolaris*	Weed	
Myrtaceae	*Gaudium laevigatum*	Weed	
Myrtaceae	*Lophostemon confertus*	Weed	
Myrtaceae	*Melaleuca rhaphiophylla*		
Myrtaceae	*Metrosideros* sp.	Weed	
Myrtaceae	*Taxandria juniperina*		
Orchidaceae	*Microtis media* subsp. *media*		
Oxalidaceae	*Oxalis pes-caprae*	Weed	
Papaveraceae	*Fumaria muralis* subsp. *muralis*	Weed	
Phytolaccaceae	*Phytolacca octandra*	Weed	
Pittosporaceae	*Billardiera fusiformis*		
Plantaginaceae	*Plantago* sp.	Weed	
Poaceae	*Avena barbata*	Weed	
Poaceae	*Briza maxima*	Weed	
Poaceae	*Briza minor*	Weed	
Poaceae	*Cenchrus clandestinus*	Weed	
Poaceae	*Cortaderia selloana*	Weed	
Poaceae	*Cynodon dactylon*	Weed	
Poaceae	*Lagurus ovatus*	Weed	
Poaceae	*Lolium* sp.	Weed	
Poaceae	*Polypogon monspeliensis*	Weed	
Poaceae	*Stenotaphrum secundatum*	Weed	
Polygonaceae	*Rumex acetosella*	Weed	
Primulaceae	*Lysimachia arvensis*	Weed	
Proteaceae	*Hakea florida*		
Rhamnaceae	*Spyridium globulosum*		
Rosaceae	*Rubus ulmifolius*	Weed	
Rubiaceae	*Coprosma repens*	Weed	
Salicaceae	*Salix babylonica*	Weed	
Solanaceae	*Physalis peruviana*	Weed	

Family	Taxon	Status	Notes
Solanaceae	*Solanum laciniatum*	Weed	
Solanaceae	*Solanum nigrum*	Weed	
Tamaricaceae	*Tamarix aphylla*	Declared Pest - s22(2)	
Tropaeolaceae	*Tropaeolum majus*	Weed	
Typhaceae	*Typha orientalis*		

Appendix D Site-Species Matrix

	Taxon	R01	R02	R03	Opp
*	*Centella asiatica*			+	
*	*Lemna minor*				+
*	*Zantedeschia aethiopica*	+		+	
*	*Asparagus asparagoides*				+
*	*Yucca aloifolia*				+
*	*Cirsium vulgare*				+
*	*Cotula coronopifolia*				+
*	*Erigeron bonariensis*				+
*	*Hypochaeris glabra*				+
*	*Sonchus asper*				+
	Lobelia anceps				+
	Chenopodiaceae sp.		+		
	Rhagodia baccata subsp. *baccata*	+			
	Tecticornia ?indica subsp. *bidens*		+		
	Threlkeldia diffusa		+		
*	*Crassula glomerata*		+		
*	Cupressaceae sp.				+
	Ficinia nodosa				+
	Isolepis cernua var. *setiformis*				+
	Isolepis prolifera			+	+
	Lepidosperma gladiatum				+
	Machaerina articulata				+
	Machaerina juncea				+
	Pteridium esculentum	+			
	Hibbertia cuneiformis				+
*	*Euphorbia paralias*		+		+
	Acacia littorea				+
*	*Acacia longifolia* subsp. *longifolia*				+
*	*Dipogon lignosus*				+
*	*Lotus subbiflorus*				+
*	*Psoralea pinnata*				+
*	*Geranium molle*	+			
*	*Pelargonium capitatum*	+	+		+
*	*Watsonia meriana*				+
	Juncus ?kraussii subsp. *australiensis*		+		
*	*Juncus oxycarpus*				+
	Juncus pallidus				+
*	*Stachys arvensis*		+		

	Taxon	R01	R02	R03	Opp
*	*Lagunaria patersonia*				+
	Agonis flexuosa	+			+
*	*Callistemon* sp.				+
	Eucalyptus ?conferruminata				+
	Eucalyptus cornuta				+
*	*Eucalyptus globulus*	+			
	Eucalyptus gomphocephala var. *gomphocephala*	+			
*	*Eucalyptus petiolaris*			+	
*	*Gaudium laevigatum*		+		+
*	*Lophostemon confertus*				+
	Melaleuca rhaphiophylla			+	+
*	*Metrosideros* sp.				+
	Taxandria juniperina				+
	Microtis media subsp. *media*				+
*	*Oxalis pes-caprae*				+
*	*Fumaria muralis* subsp. *muralis*				+
*	*Phytolacca octandra*				+
	Billardiera fusiformis				+
*	*Plantago* sp.				+
*	*Avena barbata*	+	+		+
*	*Briza maxima*				+
*	*Briza minor*				+
*	*Cenchrus clandestinus*	+			
*	*Cortaderia selloana*				+
*	*Cynodon dactylon*		+		
*	*Lagurus ovatus*		+		+
*	*Lolium* sp.				+
*	*Polypogon monspeliensis*				+
*	*Stenotaphrum secundatum*	+	+		
*	*Rumex acetosella*				+
*	*Lysimachia arvensis*				+
	Hakea florida				+
	Spyridium globulosum				+
*	*Rubus ulmifolius*				+
*	*Coprosma repens*				+
*	*Salix babylonica*				+
*	*Physalis peruviana*				+
*	*Solanum laciniatum*				+
*	*Solanum nigrum*				+
*	*Tamarix aphylla*				+

	Taxon	R01	R02	R03	Opp
*	*Tropaeolum majus*				+
	Typha sp.				+

Appendix E Site Data

Project: 65310 **Date:** 2023-10-25

Site: R01 **Coordinates:** -35.025593, 117.859817 **Datum:** GDA94 **Site Type:** Releve

Site Size: 10 x 10 m **Site Marker:** No marker (temporary site) **Photo Location:** Centre

Landform: dune **Aspect:** n/a **Slope:** 0

Outcropping: no **Rock Type:** Nil

Soil Type: **Soil Notes:** Light grey brown sand

Surface: 1% bare ground, 0% outcropping, 2% litter **Years Since Fire:** yrs

Large Trees Present (>500 mm DBH): yes

Condition: Completely Degraded **Disturbance Notes:** Parkland cleared, weeds

Vegetation Description: *Eucalyptus cornuta* and **Eucalyptus globulus* over *Agonis flexuosa* over *Pteridium esculentum*, **Stenotaphrum secundatum*, **Cenchrus clandestinus* and **Pelargonium capitatum*

	Taxon	Height (cm)	Cover (%)	Cover (Dead %)	Comment
*	*Eucalyptus globulus*	1500	60		
	Eucalyptus gomphocephala var. *gomphocephala*	1500	5		
*	Cupressaceae sp.	900			Opp coll
	Agonis flexuosa	800	20		
	Rhagodia baccata subsp. *baccata*	120			Opp coll
	Pteridium esculentum	100	3		
*	*Cenchrus clandestinus*	100	3		
*	*Stenotaphrum secundatum*	100	80		
*	*Pelargonium capitatum*	80	5		
*	*Avena barbata*	70	0.5		
*	*Zantedeschia aethiopica*	25	0.05		
*	*Geranium molle*	5	0.001		
	Hibbertia cuneiformis				Opp coll
	Machaerina juncea				Opp coll
	Acacia littorea				Opp coll
	Billardiera fusiformis				Opp coll
*	*Psoralea pinnata*				Opp coll

	Hakea florida	Opp coll
	Lepidosperma gladiatum	Opp coll
*	*Briza maxima*	Opp coll
	Ficinia nodosa	Opp coll
*	*Asparagus asparagoides*	Opp coll
	Spyridium globulosum	Opp coll
*	*Briza minor*	Opp coll
*	*Cortaderia selloana*	Opp coll
*	*Metrosideros* sp.	Opp coll
*	*Physalis peruviana*	Opp coll
*	*Leptospermum laevigatum*	Opp coll
*	*Tamarix aphylla*	Opp coll
*	*Euphorbia paralias*	Opp coll
*	*Lagurus ovatus*	Opp coll
*	*Lagunaria patersonia*	Opp coll

Project: 65310 **Date:** 2023-10-25

Site: R02 **Coordinates:** -35.027226, 117.864242 **Datum:** GDA94 **Site Type:** Releve

Site Size: 10 x 10 m **Site Marker:** No marker (temporary site) **Photo Location:** Centre

Landform: depression/ basin **Aspect:** South-east **Slope:** 5

Outcropping: no **Rock Type:** Laterite breakwater

Soil Type: **Soil Notes:** Loamy mud

Surface: 30% bare ground, 0% outcropping, 5% litter **Years Since Fire:** yrs

Large Trees Present (>500 mm DBH): no

Condition: Degraded **Disturbance Notes:** Weeds

Vegetation Description: *Juncus ?krausii* over *Threlkeldia diffusa* and *Tecticornia ?indica*

	Taxon	Height (cm)	Cover (%)	Cover (Dead %)	Comment
*	*Gaudium laevigatum*	200	1		
	Juncus ?kraussii subsp. *australiensis*	100	20		
*	*Avena barbata*	45	0.1		
	Threlkeldia diffusa	30	5		
*	*Euphorbia paralias*	30	0.5		
*	*Lagurus ovatus*	20	0.01		
*	*Pelargonium capitatum*	20	0.1		
	Tecticornia ?indica subsp. *bidens*	20	30		
*	*Stachys arvensis*	15	0.001		
	Chenopodiaceae sp. (sterile)	15	0.25		
*	*Stenotaphrum secundatum*	10	0.5		
*	*Cynodon dactylon*	5	2		
*	*Crassula glomerata*	3	0.01		
*	*Phytolacca octandra*				Opp coll
*	*Solanum laciniatum*				Opp coll
*	*Rubus ulmifolius*				Opp coll
*	*Lophostemon confertus*				Opp coll
	Eucalyptus ?conferruminata				Opp coll - behind fence
*	*Dipogon lignosus*				Opp coll

Project: 65310 **Date:** 2023-10-27

Site: R03 **Coordinates:** -35.024270, 117.860263 **Datum:** GDA94 **Site Type:** Releve

Site Size: 10 x 10 m **Site Marker:** No marker (temporary site) **Photo Location:** Centre

Landform: depression/ basin **Aspect:** n/a **Slope:** 0

Outcropping: no **Rock Type:** Nil

Soil Type: **Soil Notes:** Obscured

Surface: 0% bare ground, 0% outcropping, 100% litter **Years Since Fire:** yrs

Large Trees Present (>500 mm DBH): yes

Condition: Very Good **Disturbance Notes:** Weeds

Vegetation Description: *Melaleuca rhaphiophylla* over *Isolepis prolifera, *Zantedeschia aethiopica* and **Centella asiatica*

Taxon	Height (cm)	Cover (%)	Cover (Dead %)	Comment
Melaleuca rhaphiophylla	800	95		
* *Zantedeschia aethiopica*	100	0.5		
Isolepis prolifera	25	5		
* *Centella asiatica*	20	0.1		
Taxandria juniperina				Opp coll
* *Acacia longifolia* subsp. *longifolia*				Opp coll
Typha sp.				In drain
* *Tropaeolum majus*				Opp coll
* *Fumaria muralis* subsp. *Muralis*				Opp coll
* *Juncus oxycarpus*				Opp coll
* *Eucalyptus petiolaris*				Opp coll

Appendix F Fauna Report

Albany
2023 Fauna Assessment

Prepared by: J. Turpin
Kingfisher Environmental
Mundaring, WA 6073

October 2023

Categories Used in the Assessment of Conservation Status.

IUCN categories as used for the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Biodiversity Conservation Act 2016*.

CATEGORY	DEFINITION
Extinct	Taxa not definitely located in the wild during the past 50 years.
Extinct in the Wild	Taxa known to survive only in captivity.
Critically Endangered	Taxa facing an extremely high risk of extinction in the wild in the immediate future.
Endangered	Taxa facing a very high risk of extinction in the wild in the near future.
Vulnerable	Taxa facing a high risk of extinction in the wild in the medium-term future.
Near Threatened	Taxa that risk becoming Vulnerable in the wild.
Conservation Dependent	Taxa whose survival depends upon ongoing conservation measures. Without these measures, a conservation dependent taxon would be classed as Vulnerable or more severely threatened.
Data Deficient (Insufficiently Known)	Taxa suspected of being Rare, Vulnerable or Endangered, but whose true status cannot be determined without more information.
Least Concern	Taxa that are not Threatened.

Definitions of relevant categories under the EPBC Act 1999.

CATEGORY	DEFINITION
Endangered (EN)	The species is likely to become extinct unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate; or its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction.
Vulnerable (VU)	Within the next 25 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.
Migratory (M)	Species are defined as migratory if they are listed in an international agreement approved by the Commonwealth Environment Minister, including: • the Bonn Convention ((Convention on the Conservation of Migratory Species of Wild Animals) for which Australia is a range state;

	• The Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA); or • The Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA).

Categories used in the Biodiversity Conservation Act 2016.

CATEGORY	DEFINITION
Critically Endangered	Facing an extremely high risk of extinction in the wild in the immediate future.
Endangered	Facing a very high risk of extinction in the wild in the near future.
Vulnerable	Facing a high risk of extinction in the wild in the medium-term future.
Extinct	There is no reasonable doubt that the last individual has died. A species is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the species' life cycle and life form.
Extinct in the wild	It is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A species is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the species' life cycle and life form
Special Conservation Interest	It is of special conservation interest because it - (i) has a naturally low population range; or (ii) has a restricted natural range; or (iii) is subject to or recovering from a significant population decline or reduction in natural range Conservation dependent species – that is species that have previously been listed as threatened, but have recovered to the extent that they no longer meet the criteria for threatened, and the species is dependent on conservation actions continuing, i.e. the species is the focus of a specific conservation programme, the cessation of which would result in it again becoming eligible for listing as a threatened species within a period.
Migratory	A native species is eligible for listing in the category of migratory if: (i) Members of the species periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or (ii) the species is the subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth. International agreements that apply to the listing of a species as a migratory species are: Japan - Australia Migratory Birds Agreement (JAMBA); China - Australia Migratory Birds Agreement (CAMBA); Republic of Korea - Australia Migratory Birds Agreement (ROKAMBA); and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn).
Species otherwise in need of special protection	A species that is otherwise in need of special protection if it does not meet any of the above criteria, but is a species for which a need for special protection exists.

Department of Biodiversity, Conservation and Attractions Priority Fauna Species (species not listed under the BC Act, but for which there is some concern).

CATEGORY	DEFINITION
Priority One (P1)	Poorlyknown species. Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g., agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority Two (P2)	Poorly known species. Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g., national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority Three (P3)	Poorly known species. Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority Four (P4)	Rare, Near Threatened and other species in need of monitoring: (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Fauna recorded during the assessment.

73 species recorded, including 66 from within the project area during the assessment on the 25th and 26th October 2023. Three cameras set 25th and collected 28th October and bird surveys conducted throughout and on adjacent mudflats, over two consecutive mornings and afternoons. Targeted searching for sign of significant fauna was conducted throughout, and also when the Western Ringtail Possum was identified, a wider transect was searched to identify the species presence.

Fauna Recorded (X) from the Survey Area (Tables 1 to 4).

TABLE 1. Frogs recorded during the survey

Common Name	Species Name	Status	Survey Area
PELODRYADIDAE			
Slender Tree Frog	*Litoria adelaidensis*		X
Motorbike Frog	*Litoria moorei*		X
MYOBATRACHIDAE			
Rattling Froglet	*Crinia glauerti*		X
Total Number of Species: 3			**3**

TABLE 2. Reptiles recorded during the survey

Common Name	Species Name	Status	Survey Area
SCINCIDAE			
King's Skink	*Egernia kingii*		X
Total Number of Species: 1			1

TABLE 3. Birds recorded during the survey

Common Name	Species Name	Status	Survey Area
ANATIDAE			
Australian Wood Duck	*Chenonetta jubata*		X
Pacific Black Duck	*Anas superciliosa*		X
Chestnut Teal	*Anas castanea*		X
ANHINGIDAE			
Darter	*Anhinga melanogaster*		
COLUMBIDAE			
Common Bronzewing	*Phaps chalcoptera*		X
Feral Pigeon	*Columba livia*		X
ARDEIDAE			
White-faced Heron	*Egretta novaehollandiae*		X
Eastern Great Egret	*Ardea alba*	M	
PHALACROCORACIDAE			
Little Pied Cormorant	*Phalacrocorax melanoleucos*		
Pied Cormorant	*Phalacrocorax varius*		
Little Black Cormorant	*Phalacrocorax sulcirostris*		
Great Cormorant	*Phalacrocorax carbo*		
PELECANIDAE			
Australian Pelican	*Pelecanus conspicillatus*		
Threskiornithidae			
Australian White Ibis	*Threskiornis moluuca*		X
Yellow-billed Spoonbill	*Platalea flavipes*		
ACCIPITRIDAE			
Eastern Osprey	*Pandion haliaetus*	M	X
Whistling Kite	*Haliastur sphenurus*		X
Swamp Harrier	*Circus approximans*		X
RALLIDAE			
Purple Swamphen	*Porphyrio porphyrio*		X
HAEMATOPODIDAE			
Pied Oystercatcher	*Haematopus longirostris*		X
CHARADRIIDAE			
Red-capped Plover	*Charadrius ruficapillus*		X
Grey Plover	*Pluvialis squatarola*	M	
SCOLOPACIDAE			
Red-necked Stint	*Calidris ruficollis*	M	X
Common Sandpiper	*Actitis hypoleucos*	M	
LARIDAE			
Silver Gull	*Larus novaehollandiae*		X

Common Name	Species Name	Status	Survey Area
Pacific Gull	*Larus pacificus*	Ma	
Caspian Tern	*Hydroprogne caspia*	IA	
Crested Tern	*Thalasseus bergii*	MI	
Fairy Tern	*Sternula nereis*	V	
CACATUIDAE			
Galah	*Eolophusroseicapillus*		X
Red-tailed Black-Cockatoo	*Calyptorhynchus banksii*	V	
PSITTACIDAE			
Purple-crowned Lorikeet	*Glossopsitta porphyrocephala*		X
Australian Ringneck	*Barnardius zonarius*		X
Red-capped Parrot	*Purpureicephalus spurius*		X
Western Rosella	*Platycercus icterotis*		X
CUCULIDAE			
Shining Bronze Cuckoo	*Chalcites lucidus*		X
Fan-Tailed Cuckoo	*Cacomantis flabelliformis*		X
MALURIDAE			
Splendid Fairy-wren	*Malurus splendens*		X
Red-winged Fairywren	*Malurus elegans*		X
Southern Emu-wren	*Stipiturus malachurus*		X
ACANTHIZIDAE			
Weebill	*Smicrornis brevirostris*		X
Spotted Scrubwren	*Sericornis maculatus*		X
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*		X
PARDALOTIDAE			
Spotted Pardalote	*Pardalotus punctatus*		X
MELIPHAGIDAE			
Singing Honeyeater	*Gavicalis virescens*		X
Red Wattlebird	*Anthochaera carunculata*		X
Brown Honeyeater	*Lichmera indistincta*		X
New Holland Honeyeater	*Phylidonyris novaehollandiae*		X
CAMPEPHAGIDAE			
Black-faced Cuckoo-shrike	*Coracinanovaehollandiae*		X
PACHYCEPHALIDAE			
Golden Whistler	*Pachycephala pectoralis*		X
Grey Shrike-thrush	*Colluricincla harmonica*		X
ARTAMIDAE			
Grey Butcherbird	*Cracticustorquatus*		X
Australian Magpie	*Cracticustibicen*		X

Common Name	Species Name	Status	Survey Area
RHIPIDURIDAE			
Grey Fantail	*Rhipidura albiscapa*		X
Willie Wagtail	*Rhipidura leucophrys*		X
CORVIDAE			
Australian Raven	*Corvus coronoides*		X
MONARCHIDAE			
Magpie-lark	*Grallina cyanoleuca*		X
MEGALURIDAE			
Little Grassbird	*Poodytes gramineus*		
HIRUNDINIDAE			
Welcome Swallow	*Hirundo neoxena*		X
Fairy Martin	*Petrochelidon ariel*		X
ESTRILDIDAE			
Red-eared Firetail	*Stagonopleura oculata*		X
ZOSTEROPIDAE			
Silvereye	*Zosterops lateralis*		X
Total Number of Species: 62		10	55

TABLE 4. Mammals recorded during the survey

Common Name	Species Name	Status	Survey Area
PERAMELIDAE			
Quenda, Southern Brown Bandicoot	*Isoodon obesulus*	P4	X
PSEUDOCHEIRIDAE			
Western Ringtail Possum	*Pseudocheirus occidentalis*	CE	X
MACROPODIDAE			
Western Grey Kangaroo	*Macropus fuliginosus*		X
INTRODUCED MAMMALS			
Dog	*Canis lupus*		X
Feral Cat	*Felis catus*		X
Rabbit	*Oryctolagus cuniculus*		X
Black Rat	*Rattus rattus*		X
Total Number of Native Species: 3		**2**	**3**
Total Number of Introduced Species: 4			**4**

Details of Survey Methodology

Location of Motion-activated Cameras installed during the survey

Camera Name	Datum	Latitude	Longitude	Habitat
1	GDA2020	-35.0243271	117.8619259	Densely vegetated drainage
2	GDA2020	-35.0251351	117.8608117	Peppermint thicket
3	GDA2020	-35.0265703	117.8599226	Peppermint thicket

Species recorded on camera

Common Name	Species Name	Status	Cameras
King's Skink	*Egernia kingie*		3
Quenda	*Isoodon obesulus*		1
Black Rat	*Rattus rattus*		2
Feral Cat	*Felis catus*		1
Rabbit	*Oryctolagus cuniculus*		1

Locations of Conservation Significant Fauna

Table 1. Species of Conservation Significance Recorded

Species	Status	latitude	longitude	Comments
Fairy Tern	V	-35.0303653	117.8581854	Four birds seen foraging
Great Egret	MA	-35.0298255	117.8554567	1 bird seen foraging
Caspian Tern	IA	-35.0277998	117.8622792	2 birds seen
Greater Crested Tern (Crested	MI	-35.0310682	117.8546606	2 birds seen
Common Sandpiper	IA	-35.0273543	117.864434	1 bird seen
Common Sandpiper	IA	-35.0274499	117.863672	1 bird seen
Grey Plover	IA	-35.0303653	117.8581854	1 bird seen
Grey Plover	IA	-35.0277575	117.8623883	2 birds seen
Grey Plover	IA	-35.0284805	117.8598714	2 birds seen
Red-necked Stint	IA	-35.0277831	117.8583951	65 birds seen foraging
Red-necked Stint	IA	-35.0271031	117.8589219	43 birds seen foraging
Red-necked Stint	IA	-35.0274163	117.8623124	24 birds seen foraging
Red-necked Stint	IA	-35.027521	117.8607744	24 birds seen foraging
Red-necked Stint	IA	-35.0310682	117.8546606	90 birds seen foraging
Red-necked Stint	IA	-35.0269708	117.8595234	12 birds seen foraging
Eastern Osprey	M	-35.0275286	117.8580417	1 birds seen foraging
Western Ringtail Possum	CE	-35.0265703	117.8599226	5 Dreys seen in one tree
Western Ringtail Possum	CE	-35.0255424	117.8639863	Drey in tree
Western Ringtail Possum	CE	-35.029568	117.8546286	Drey in tree
Western Ringtail Possum	CE	-35.0354676	117.8497851	Drey in tree
Western Ringtail Possum	CE	-35.029992	117.8537088	Drey in tree
Western Ringtail Possum	CE	-35.0293693	117.8551888	Drey x 2 in tree
Western Ringtail Possum	CE	-35.0300893	117.8533328	Drey in tree
Western Ringtail Possum	CE	-35.0319361	117.8515157	Scat
Western Ringtail Possum	CE	-35.0264899	117.8594427	Scat
Western Ringtail Possum	CE	-35.0258597	117.8598088	Scat
Western Ringtail Possum	CE	-35.0263057	117.8640448	Scat
Western Ringtail Possum	CE	-35.0274053	117.861443	Scat
Western Ringtail Possum	CE	-35.027406	117.8619878	Scat
Western Ringtail Possum	CE	-35.0275575	117.8621045	Scat
Western Ringtail Possum	CE	-35.0272934	117.8599411	Scat
Western Ringtail Possum	CE	-35.0273965	117.8600244	Scat
Western Ringtail Possum	CE	-35.0274872	117.8601975	Scat
Western Ringtail Possum	CE	-35.0273926	117.8603149	Scat
Western Ringtail Possum	CE	-35.0274287	117.8604358	Scat
Western Ringtail Possum	CE	-35.0273755	117.8614482	Scat
Western Ringtail Possum	CE	-35.0247213	117.862659	Scat
Western Ringtail Possum	CE	-35.0248351	117.861119	Scat
Western Ringtail Possum	CE	-35.0252257	117.8605794	Scat
Western Ringtail Possum	CE	-35.0251351	117.8608117	Scat
Western Ringtail Possum	CE	-35.0251565	117.860755	Scat
Western Ringtail Possum	CE	-35.0251282	117.8608611	Scat
Western Ringtail Possum	CE	-35.0248763	117.8612651	Scat
Western Ringtail Possum	CE	-35.0248132	117.8612014	Scat
Quenda	P4	-35.0264899	117.8594427	Scat
Quenda	P4	-35.0236365	117.861398	Dig
Quenda	P4	-35.0247977	117.8625677	Dig
Quenda	P4	-35.0252001	117.8606372	Dig
Quenda	P4	-35.0243271	117.8619259	One observed
Red-tailed Black Cockatoo	V	-35.026393	117.865626	Heard adjacent

Note: status refers to conservation status

Broad Fauna habitats recorded during the assessment.

Landform	Vegetation	Inside survey area	Comments
Mudflats and shoreline	None	Intertidal area	Wader habitat
Freshwater and Brackish Wetlands	Reeds / Sedges and fringing riparian	Yes	Waterbirds and frogs, Chestnut Teal breeding
Drainage line	Yate and Peppermint thickets over sedges and mixed shrubs	Yes	Habitat for Western Ringtail Possum and Quenda
Damplands	Melaleuca preissiana and Peppermint Woodland	Yes	Habitat for Western Ringtail Possum and Quenda
Damplands	Mixed native and introduced species	Yes	Quenda occur
Disturbed	Pasture, introduced weeds and native speces	Yes	Quenda occur

Notes:

The mudflats appear important for waders with close to 100 Red-necked Stints recorded adjacent to the survey area. Greater Sand Plover, Red Knot, Ruddy Turnstone, Pacific Golden Plover, Bar-tailed Godwit and Great Knot all recorded nearby within 5 km (Little Grove-Rushy Point) during September and October 2023 – see EBird. This area has mudflat connectivity with the project – see satellite imagery.

Appendix G PMST Search

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 27-Jun-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	75
Listed Migratory Species:	64

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

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

Commonwealth Lands:	16
Commonwealth Heritage Places:	None
Listed Marine Species:	91
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	20
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	27
Key Ecological Features (Marine):	None
Biologically Important Areas:	9
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name	Buffer Status
Commonwealth Marine Areas (EPBC Act)	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Empodisma peatlands of southwestern Australia	Endangered	Community likely to occur within area	In feature area
Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia	Endangered	Community may occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area	In feature area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cereopsis novaehollandiae grisea Cape Barren Goose (south-western), Recherche Cape Barren Goose [25978]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Dasyornis longirostris Western Bristlebird [515]	Endangered	Species or species habitat likely to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Endangered	Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In feature area
Psophodes nigrogularis nigrogularis Western Heath Whipbird [64449]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Xenus cinereus			
Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In feature area
Zanda baudinii listed as Calyptorhynchus baudinii			
Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Breeding known to occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
FISH			
Nannatherina balstoni			
Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thunnus maccoyii			
Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
INSECT			
Trioza barrettae			
Banksia brownii plant louse [87805]	Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
Balaenoptera borealis			
Sei Whale [34]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus			
Fin Whale [37]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dasyurus geoffroii			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In feature area
[Parantechinus apicalis](#) Dibbler [313]	Endangered	Species or species habitat known to occur within area	In feature area
[Pseudocheirus occidentalis](#) Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat known to occur within area	In feature area
OTHER			
[Westralunio carteri](#) Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
PLANT			
[Banksia brownii](#) Brown's Banksia, Feather-leaved Banksia [8277]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Banksia goodii](#) Good's Banksia [16727]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Banksia verticillata](#) Granite Banksia, Albany Banksia, River Banksia [8333]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Caladenia granitora](#) [65292]	Endangered	Species or species habitat may occur within area	In feature area
[Caladenia harringtoniae](#) Harrington's Spider-orchid, Pink Spider-orchid [56786]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Calectasia cyanea](#) Blue Tinsel Lily [7669]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Chordifex abortivus](#) Manypeaks Rush [64868]	Endangered	Species or species habitat known to occur within area	In feature area
[Conostylis misera](#) Grass Conostylis [21320]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Diuris drummondii](#) Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Drakaea micrantha](#) Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Isopogon uncinatus](#) Albany Cone Bush, Hook-leaf Isopogon [20871]	Endangered	Species or species habitat known to occur within area	In feature area
[Kennedia glabrata](#) Northcliffe Kennedia [16452]	Vulnerable	Species or species habitat may occur within area	In feature area
[Microtis globula](#) South-Coast Mignonette Orchid [6780]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Sphenotoma drummondii](#) Mountain Paper-heath [21160]	Endangered	Species or species habitat may occur within area	In feature area
[Verticordia fimbrilepis subsp. australis](#) Southern Shy Featherflower [24630]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
REPTILE			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
SHARK			
Carcharias taurus (west coast population)			
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Galeorhinus galeus			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Breeding known to occur within area	In feature area
Ardenna grisea			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis			
Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea dabbenena			
Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Onychoprion anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
[Balaenoptera borealis](#) Sei Whale [34]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Balaenoptera edeni](#) Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
[Balaenoptera physalus](#) Fin Whale [37]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Caperea marginata](#) Pygmy Right Whale [39]		Species or species habitat may occur within area	In feature area
[Carcharhinus longimanus](#) Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area
[Carcharodon carcharias](#) White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In feature area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Arenaria interpres](#) Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
[Calidris alba](#) Sanderling [875]		Roosting known to occur within area	In feature area
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area	In feature area
[Calidris tenuirostris](#) Great Knot [862]	Vulnerable	Roosting known to occur within area	In feature area
[Charadrius bicinctus](#) Double-banded Plover [895]		Roosting known to occur within area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Charadrius mongolus](#) Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
[Gallinago megala](#) Swinhoe's Snipe [864]		Roosting likely to occur within area	In buffer area only
[Gallinago stenura](#) Pin-tailed Snipe [841]		Roosting likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In feature area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - ALBANY TRAINING DEPOT [50137]	WA	In buffer area only
Defence - ALBANY TRAINING DEPOT [50136]	WA	In buffer area only
Defence - ALBANY TRAINING DEPOT ; AIRTC ALBANY [50116]	WA	In buffer area only
Defence - ALBANY TRAINING DEPOT ; AIRTC ALBANY [50115]	WA	In buffer area only
Unknown		
Commonwealth Land - [51033]	WA	In buffer area only
Commonwealth Land - [51034]	WA	In buffer area only
Commonwealth Land - [51035]	WA	In buffer area only
Commonwealth Land - [51036]	WA	In buffer area only
Commonwealth Land - [51038]	WA	In buffer area only
Commonwealth Land - [51398]	WA	In buffer area only
Commonwealth Land - [51017]	WA	In buffer area only
Commonwealth Land - [52149]	WA	In buffer area only
Commonwealth Land - [51399]	WA	In buffer area only
Commonwealth Land - [51032]	WA	In buffer area only
Commonwealth Land - [50308]	WA	In buffer area only
Commonwealth Land - [51030]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Breeding known to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Cereopsis novaehollandiae grisea Cape Barren Goose (south-western), Recherche Cape Barren Goose [25978]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In feature area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area	In buffer area only
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In feature area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area	In feature area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Pterodroma macroptera Great-winged Petrel [1035]		Breeding known to occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Puffinus assimilis Little Shearwater [59363]		Breeding known to occur within area	In buffer area only
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalasseus bergii as Sterna bergii](#) Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
[Thinornis cucullatus as Thinornis rubricollis](#) Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature area
[Tringa brevipes as Heteroscelus brevipes](#) Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In feature area
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Fish			
[Acentronura australe](#) Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In feature area
[Campichthys galei](#) Gale's Pipefish [66191]		Species or species habitat may occur within area	In feature area
[Heraldia nocturna](#) Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In feature area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In feature area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area	In feature area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In feature area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In feature area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In feature area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In feature area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In feature area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In feature area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In feature area
Mammal			
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Breeding known to occur within area	In feature area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In feature area
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In feature area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Bakers Junction	Nature Reserve	WA	In buffer area only
Bon Accord Road	Nature Reserve	WA	In buffer area only
Down Road	Nature Reserve	WA	In buffer area only
Eclipse Island	Nature Reserve	WA	In buffer area only
Gledhow	Nature Reserve	WA	In buffer area only
Green Island	Nature Reserve	WA	In buffer area only
Gull Rock	National Park	WA	In buffer area only
Lake Powell	Nature Reserve	WA	In buffer area only
Marbelup	Nature Reserve	WA	In buffer area only
Mill Brook	Nature Reserve	WA	In buffer area only
Mistaken Island	Nature Reserve	WA	In buffer area only
Mount Mason	Nature Reserve	WA	In buffer area only
Seal Island (WA32199)	Nature Reserve	WA	In buffer area only
Torndirrup	National Park	WA	In buffer area only
Unnamed WA23088	Conservation Park	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Unnamed WA23923	Nature Reserve	WA	In buffer area only
Unnamed WA32478	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA33308	5(1)(h) Reserve	WA	In buffer area only
Voyagers Park	5(1)(h) Reserve	WA	In buffer area only
West Mount Mason	Nature Reserve	WA	In buffer area only

Nationally Important Wetlands

[Resource Information]

Wetland Name	State	Buffer Status
Oyster Harbour	WA	In buffer area only

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Sydney Street Subdivision	2023/09530		Completed	In buffer area only
Controlled action				
Albany Heritage Park Link Trail, WA	2019/8480	Controlled Action	Assessment Approach	In buffer area only
Albany Heritage Park Trail Network Concept Plan	2017/7943	Controlled Action	Completed	In buffer area only
Albany Port Authority dredging project	2006/2540	Controlled Action	Post-Approval	In buffer area only
Albany Ring Road Stages 2 and 3B, WA	2020/8769	Controlled Action	Post-Approval	In feature area
Bayonet Head Residential Development, Albany, WA	2015/7624	Controlled Action	Further Information Request	In buffer area only
Emu Point Residential Area Project	2010/5479	Controlled Action	Completed	In buffer area only
Southdown Magnetite Mine	2006/2544	Controlled Action	Completed	In feature area
Not controlled action				
Albany Motorsport Park, 20kms Northwest Albany, WA	2021/8944	Not Controlled Action	Completed	In buffer area only
Albany Port Maintenance Dredging, Albany, WA	2014/7246	Not Controlled Action	Completed	In buffer area only
Anzac Centre Develpment, Albany, WA	2012/6571	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Anzac Interpretive Centre Development, Albany, WA	2013/6903	Not Controlled Action	Completed	In buffer area only
Development of Grasmere Wind Farm	2008/4368	Not Controlled Action	Completed	In buffer area only
Engineered Strand Lumber Plant	2007/3421	Not Controlled Action	Completed	In buffer area only
Eradication of the European House Borer, Perth metropolitan area, WA	2009/5027	Not Controlled Action	Completed	In buffer area only
Firebreak Creation, Kalgan, WA	2020/8681	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Mount Barker to Albany Water Supply Pipeline	2013/6720	Not Controlled Action	Completed	In buffer area only
Prescribed burn of Cells 5, 6 & 8 of Crown Land Reserve 35381, Napier, WA	2013/6798	Not Controlled Action	Completed	In buffer area only
Protected Harbour Development	2006/3091	Not Controlled Action	Completed	In buffer area only
Scuttling of the HMAS Perth	2001/171	Not Controlled Action	Completed	In buffer area only
Seismic Survey, Bremer Basin, Mentelle Basin and Zeewyck Sub-basin	2004/1700	Not Controlled Action	Completed	In feature area
South Coast Highway Widening 8.2-14.16 SLK	2017/8009	Not Controlled Action	Completed	In buffer area only
Sth Coast Hwy Road Widening, Albany, WA	2018/8279	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
Albany Port Maintenance Dredging	2010/5527	Referral Decision	Completed	In buffer area only

Biologically Important Areas			[Resource Information]
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna carneipes			
Flesh-footed Shearwater [82404]	Foraging (in high numbers)	Known to occur	In buffer area only
Eudyptula minor			
Little Penguin [1085]	Foraging (provisioning young)	Known to occur	In feature area
Hydroprogne caspia			
Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In feature area
Larus pacificus			
Pacific Gull [811]	Foraging (in high numbers)	Known to occur	In buffer area only
Onychoprion anaethetus			
Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In buffer area only
Puffinus assimilis tunneyi			
Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In buffer area only
Sternula nereis			
Fairy Tern [82949]	Foraging (in high numbers)	Known to occur	In buffer area only
Sharks			
Carcharodon carcharias			
White Shark [64470]	Foraging	Known to occur	In feature area
Whales			
Megaptera novaeangliae			
Humpback Whale [38]	Migration (north)	Known to occur	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
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-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

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

Please feel free to provide feedback via the Contact us page.

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