

# Native Vegetation Clearance Data Report

## Port Wakefield Overpass and Highway Duplication

Clearance under the *Native Vegetation Regulations 2017*

July 2020

Prepared by Jeremy Tiller



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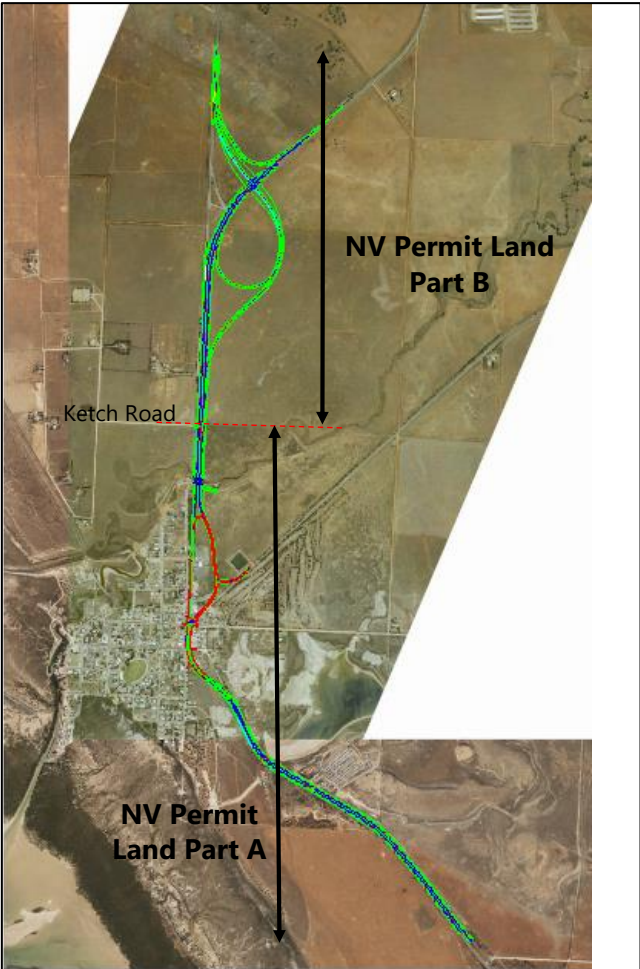
Cover photograph: *Atriplex paludosa ssp. cordata* (Marsh Saltbush) coastal plain shrubland.

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# 1. Application information

## Application Details

Applicant:	<b>CPB Contractors</b> CPB Contractors is the Head Contractor and member of the Port Wakefield to Port Augusta Alliance, which is contracted by the Commissioner of Highways for the construction of the Port Wakefield Overpass and Highway Duplication.
Key contact:	Dylan Gordge Ph: 0419 421 867 Email: <a href="mailto:Dylan.Gordge@pw2pa.com.au">Dylan.Gordge@pw2pa.com.au</a>
Landowner:	<b>The Commissioner of Highways.</b> Note: The Commissioner is in the process of finalising acquisition of the land for the project.
Site Address:	<p>The project footprint impacts the road corridors of Princes Highway, Balaklava Road and Copper Coast Highway in the vicinity of Port Wakefield. Multiple properties adjacent to these roads will also be impacted during the project.</p> <p>For the purpose of this application, the project site is divided into two Parts:</p> <ul style="list-style-type: none"><li>• Part A – South of Ketch Road. Information for this area is based on final survey results.</li><li>• Part B – North of Ketch Road (not yet acquired). Information for this area is based on preliminary survey, supplementary desktop assessment and roadside observations, and will be ground-truthed once the land is acquired.</li></ul> <p>Native vegetation areas within Part B are identified as such within this Data Report.</p>  <p>The map is an aerial photograph with a white overlay indicating the project footprint. A horizontal dashed red line labeled 'Ketch Road' divides the site. Below this line, the area is labeled 'NV Permit Land Part A' with a double-headed arrow pointing south. Above the line, the area is labeled 'NV Permit Land Part B' with a double-headed arrow pointing north. The project footprint is shown as a series of colored lines (green, blue, red) tracing the road corridors and associated areas.</p>

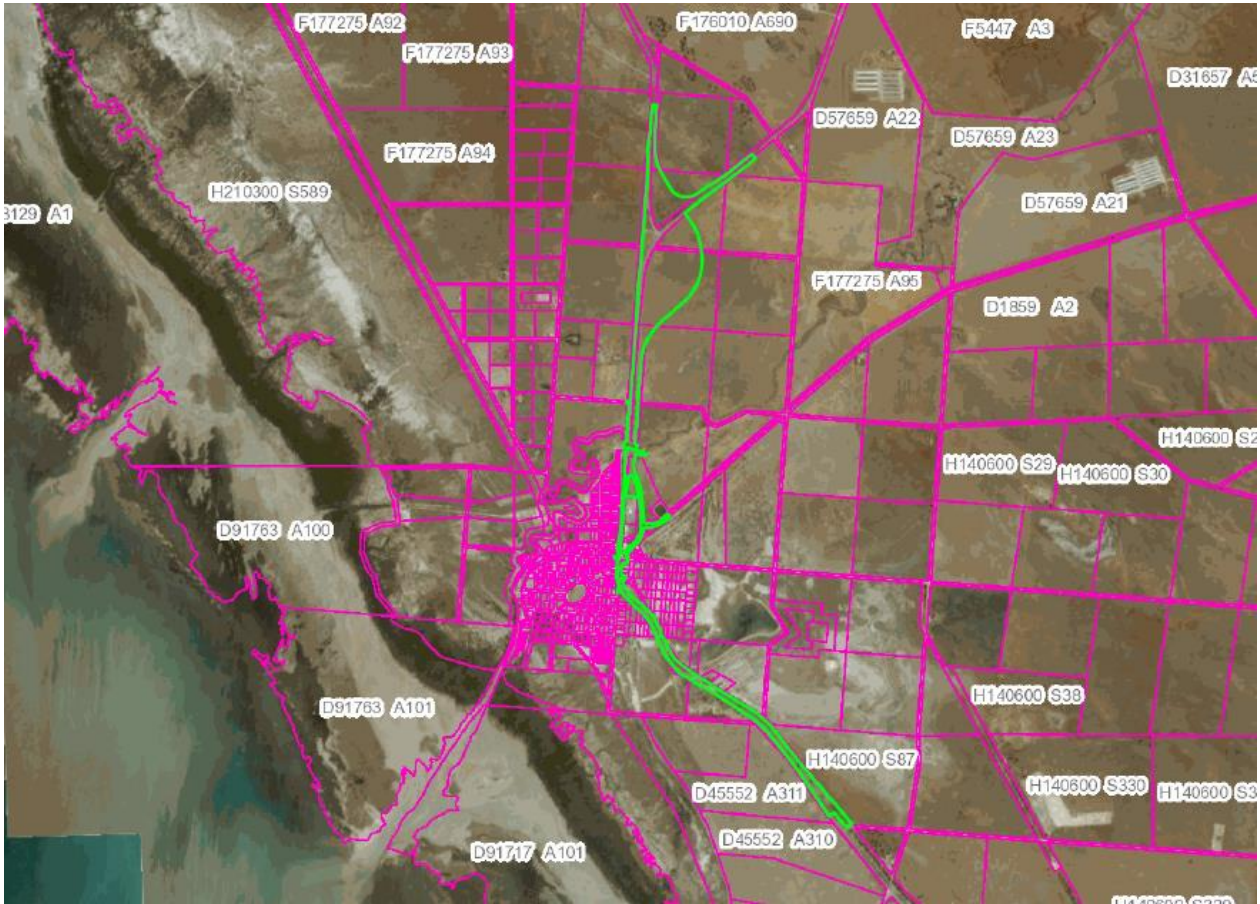
Local Government Area:	Wakefield Regional Council	Hundred:	Inkerman and Goyder
Title ID:  * land not yet acquired (within Part B)	CT/6237/336 CT/6237/550 CT/6238/117 CT/6238/113 CT/6238/118 CT/6236/635* CT/6236/634* CT/6236/633* CT/6236/637* CT/6236/630* CT/6236/633* CT/6236/636*	Parcel ID	D123098 A180 D123342 A315 D123712 A320 D123712 A69 D123713 A325 D123225 A330 D50244 A53 D50244 Q52 F213117 A92 F216746 Q98 D50244 Q51 D123225 A340
Road reserves along Princes Highway, Balaklava Road and Copper Coast Highway.			

### Summary of proposed clearance

Purpose of clearance	Clearance required for the construction of a highway, associated stormwater infrastructure, borrow pit, laydown area and site office compound.
Native Vegetation Regulation	<i>Regulation 12(32) – Works on behalf of Commissioner of Highways</i>
Description of the vegetation under application	<ul style="list-style-type: none"> <li>• 0.169 ha of <i>Eucalyptus phenax ssp. phenax</i> (White Mallee) mallee in moderate condition.</li> <li>• 0.52 ha of <i>Acacia ligulata</i> (Umbrella Bush) tall coastal plain shrubland in moderate condition.</li> <li>• 2.89 ha of <i>Nitraria billardierei</i> (Nitre-bush) +/- <i>Rhagodia candolleana ssp. cordata</i> (Sea-berry Saltbush) +/- <i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) open coastal plain shrubland in moderate condition.</li> <li>• 0.99 ha of <i>Nitraria billardierei</i> (Nitre-bush) +/- <i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) open coastal plain shrubland in poor condition.</li> <li>• 0.29 ha of <i>Tecticornia halocnemoides ssp.</i> (Grey Samphire) +/- <i>Tecticornia indica ssp.</i> (Brown-head samphire) shrubland with infrequent inundation in moderate condition.</li> <li>• 0.36 ha of <i>Myoporum platycarpum ssp.</i> (False Sandalwood) coastal plain shrubland in moderate condition.</li> <li>• 0.35 ha of <i>Myoporum platycarpum ssp.</i> (False Sandalwood) coastal plain shrubland in poor condition.</li> <li>• 0.25 ha of <i>Maireana brevifolia</i> (Short-leaf Bluebush) very open coastal plain shrubland in poor condition</li> <li>• 23.48ha of <i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) coastal plain shrubland in moderate condition.</li> <li>• 6.54 ha of <i>Maireana brevifolia</i> (Short-leaf Bluebush) +/- <i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) open coastal plain shrubland in moderate condition.</li> <li>• 4 medium healthy <i>Eucalyptus porosa</i> (Mallee Box) trees.</li> </ul> <p>Descriptions of the vegetation within Part B of the land are subject to confirmation after acquisition.</p> <p>All areas of land for each vegetation type are subject to confirmation (refer below).</p>
Total proposed clearance - area (ha) and number of trees	A maximum of 35.839 ha and 4 scattered trees are proposed to be cleared. To be amended once project design and construction impact footprint are finalised.

Level of clearance	Level 4
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Map of proposed clearance area



<p>Mitigation hierarchy</p>	<p>The PWOHD project has avoided impacts to native vegetation by aligning the proposed development along pre-existing roads where possible and steepening batters to reduce encroachment into adjoining native vegetation. Impacts to native vegetation were further avoided by repositioning the southern compound to a rehabilitated hardstand area which has been revegetated with local and non-local native species.</p> <p>In undeveloped areas, the PWOHD project has aimed to minimise the additional construction footprint required beyond the requirements for the design, by minimising haul routes and locating stockpiles in previously disturbed areas wherever possible.</p> <p>The PWOHD project will minimise impacts to native vegetation by implement an environmental management protection system during construction, such as establishing vegetation protection zones, educating site staff, suppressing dust, designating site access routes and managing the spread and introduction of weed species.</p>
<p>SEB Offset proposal</p>	<p>Payment of \$709,779.81</p>

# 2. Purpose of clearance

## 2.1 Description

Jeremy Tiller was engaged by the Port Wakefield to Port Augusta Alliance (PW2PA) to conduct a native vegetation clearance assessment for the development of the Port Wakefield Overpass and Highway Duplication (PWOHD) project in Port Wakefield, South Australia, and to assess the proposed clearance envelopes against the Clearance Requirements of the *Native Vegetation Act 1991* and *Native Vegetation Regulations 2017*.

As stated on the Department of Planning, Transport and Infrastructure's (DPTI) project website:

'The Port Wakefield Overpass and Highway Duplication Project is a joint initiative of the Australian and South Australian Governments.

Port Wakefield Road typically carries 8,800 vehicles per day, however, this can increase to around 16,000 during holiday peak periods. As a result of high holiday traffic volumes and conflicting traffic movements at the intersection with the Copper Coast Highway, lengthy queues have been experienced causing substantial delays. The Augusta Highway and Copper Coast Highway intersection north of Port Wakefield is one of the State's busiest regional road intersections being a national and regional link between Adelaide, Port Augusta and the Yorke Peninsula.

The project will improve traffic flow and reduce congestion for all road users, particularly during peak travel times and public holidays, and improve safety and freight productivity along the National Land Transport Network (DPTI 2020<sup>1</sup>).

## 2.2 Background

The project is located within the Kallora and Mallala IBRA Associations of South Australia.

The landform in the Kallora IBRA Association is described as undulating calccrete plains with widespread dunes and occasional salt lakes. The association is dominated by grasslands and open parklands with sown pastures and cereal crops. Approximately 3% of the Kallora IBRA Association is mapped as remnant native vegetation, of which 1% is protected.

The landform in the Mallala IBRA Association is described as undulating plains with occasional dunes. The association is dominated by grasslands of sown pastures and cereal crops. Approximately 3% of the Mallala IBRA Association is mapped as remnant native vegetation, of which 2% is protected.

Current land uses of the properties to be impacted by the project includes roads and highways, livestock grazing, commercial and residential properties, and other agricultural purposes. Adjacent land uses to the project includes commercial, residential, rural residential and vacant residential properties, livestock grazing, mining quarry, and other agricultural purposes (accessed from NatureMaps, 2020).

## 2.3 Details of the proposal

As discussed above, the PWOHD design includes (refer to Appendix 1 for the Port Wakefield Overpass and Highway Duplication design plans and project layout – North and South):

- two lanes in each direction through the Port Wakefield township with provisions for safe U-turn movements;
- a realigned dual carriageway through the Port Wakefield township, allowing for increased parking and landscaping opportunities, as well as safer vehicle and pedestrian movements. This will make it safer to build and reduce disruption to motorists during construction;
- a realigned Balaklava Road intersection with the Princes Highway, allowing for safer turn movements;
- new bridges across the Wakefield River;
- a new two-lane overpass for traffic travelling southbound from the Copper Coast Highway to Port Wakefield, and for traffic travelling south along the Princes Highway to the Copper Coast Highway;

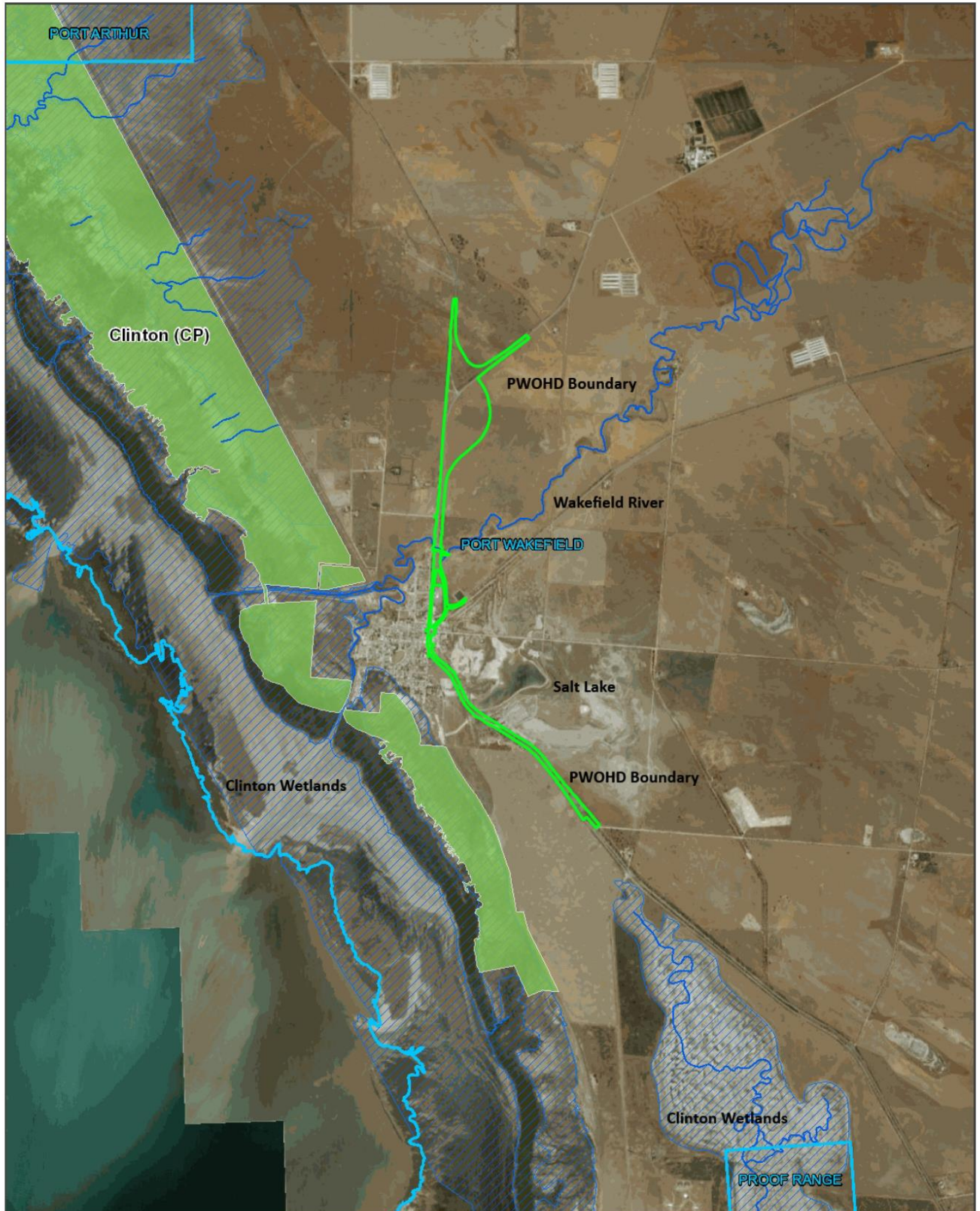
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<sup>1</sup> DPTI 2020, SA Government, accessed 29 June 2020,

[https://www.dpti.sa.gov.au/infrastructure/road\\_projects/port\\_wakefield\\_overpass\\_and\\_township\\_duplication](https://www.dpti.sa.gov.au/infrastructure/road_projects/port_wakefield_overpass_and_township_duplication)

2.4 General location map

Map 1. Location of PWOHD Project



Map data is compiled from a variety of sources and hence its accuracy is variable.

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 Projection: Web Mercator (Auxiliary Sphere)





- the new overpass will remove all hazardous at-grade turn movements at the intersection of the Princes Highway, Copper Coast Highway and Augusta Highway (DPTI 2020); and
- associated stormwater infrastructure.

In addition, the construction phase of the project will require clearance for a temporary laydown area, site office compound and borrow pit. Once the required material has been extracted, the borrow pit will be developed into a stormwater catchment basin and landscaped with appropriate native species. The applicant has also advised that the temporary laydown and site office compound areas will be rehabilitated once construction is completed with similar native flora species currently found at these sites.

At present, the design and construction impact footprint for the PWOHD project is in draft form and yet to be finalised. It is anticipated that the total clearance area of 35.839 ha and 4 scattered trees discussed in this data report may need to be adjusted once the final design has been confirmed. Once confirmed, this data report will be amended to reflect these changes and the Total Biodiversity Scores and SEB offset requirements adjusted accordingly. Therefore, the applicant is requesting the NVC to consider providing 'in principle consent to clear' for 35.839 ha of native vegetation and 4 scattered trees.

## **2.5 Approvals required or obtained**

### ***Native Vegetation Act 1991***

Consent to clear native vegetation under the *Native Vegetation Act 1991* is subject to this application and data report.

One previous clearance application is located within the PWOHD project area (Map 2). Evidence gathered during the site assessment concluded that Clearance Application 2015\_3088 was lodged to clear 1.39 hectares of native vegetation for the purpose of constructing an underground water pipe within the Princes Highway road reserve.

### ***Planning, Development and Infrastructure Act 2016***

No Development Approval is required for the PWOHD project. The project was approved by the Parliamentary Public Works Committee.

### ***Water Resources Act 1997***

No current water licences exist for the project, although the project may explore the option of utilising groundwater for construction purposes.

### ***Landscapes SA***

An application for a water affecting activity permit is currently sitting with the Northern & Yorke Landscape Board; this covers the Wakefield River works and adjacent culvert crossings.

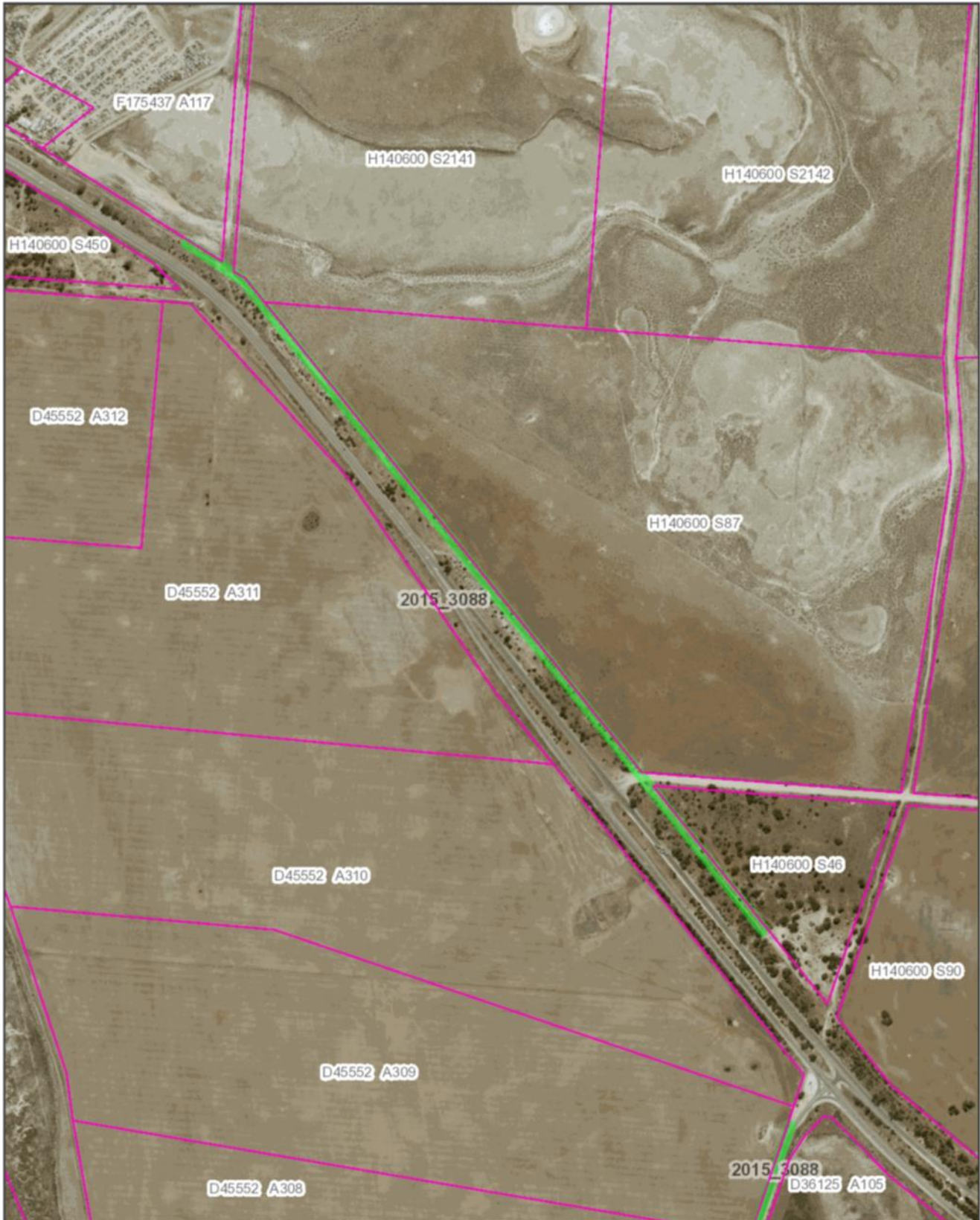
### ***Aboriginal Heritage Act 1988***

DPTI are currently seeking a Section 23 approval under the *Aboriginal Heritage Act 1988* for the project. An outcome is expected in July.

## **2.6 Native Vegetation Regulation**

*Regulation 12(32) – Works on behalf of Commissioner of Highways*

## Map 2. Location of previous vegetation clearance applications



Map data is compiled from a variety of sources and hence its accuracy is variable.

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# 3. Method

Prior to the site survey the following desktop assessments were conducted:

- Review of the Atlas of Living Australia and *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* Protected Matter search tools within 5km of the proposed clearance areas to determine the likelihood of any National and State listed fauna species that may utilise the vegetation under application.
- Review of the Atlas of Living Australia and *EPBC Act 1999* Protected Matter search tools within 5km of the proposed clearance areas to determine the likelihood of any National and State listed flora species and/or habitats of conservation significance that may be present on the subject land.

## 3.1 Flora assessment

The project site was surveyed on 23 and 24 June 2020. The site survey was undertaken in accordance with the Native Vegetation Council (NVC) Bushland Assessment Manual 2019 and DPTI Vegetation Removal Policy (2018). The aim of the site survey was to:

- record the vegetation association and flora species present;
- record the condition of the vegetation present;
- record the attributes of the native trees present;
- record any threatened flora species, if present; and
- to assess the proposed clearance against the Requirements and Regulations of the *Native Vegetation Act 1991* and *Native Vegetation Regulations 2017*.

It is noted that site access was restricted at various locations during the assessment. Due to PW2PA safety policies and procedures, site personnel undertaking the assessment were prohibited from encroaching within 15m of Princes Highway, Balaklava Road and Copper Coast Highway. Field data was collected in adjoining areas of similar vegetation type and from sight into the 15m safety exclusion zone. Due to these access restrictions, this report assumes that the data collected in the adjoining areas contains the same species composition, habitat value and vegetation condition.

Furthermore, site access was restricted to private lands containing Sites I4, J1 and L1 (within Part B of the land). With the aim of establishing the Total Biodiversity Scores and Significant Environmental Benefit (SEB) offset requirements for these sites, the data collected within Site I1 was applied to estimate the potential impacts to native vegetation. Nevertheless, after studying aerial images of Sites I4, J1 and L1 and viewing the vegetation from property boundaries it is likely that the Unit Biodiversity Scores for these sites will be lower than Site I1 due to poorer vegetation conditions, sparser native vegetation cover and greater introduced species cover. Once site access is granted, these areas will be assessed in accordance with the NVC assessment manuals to finalise the Total Biodiversity Scores and SEB offset requirements accordingly. Consequently, the applicant is requesting the NVC to consider providing 'in principle consent to clear' for Sites I4, J1 and L1 as part of this clearance application.

Lastly, a preliminary field assessment was undertaken on 13 June 2019 by a Jacobs Ecologist. Ecological information was collected according to the DPTI Vegetation Removal Policy (2018) and NVC Bushland and Scattered Tree Assessment Manuals 2019. All vegetation under application in this report was reassessed during the site visit on 23 and 24 June 2020, except for Site K1 and scattered Trees 1-4 (both within Part B of the land) due to site access restrictions. For the purpose of this data report and application, the data collected by the Jacobs ecologist was applied to determine the Total Biodiversity Score and SEB Offset requirements. Once site access is granted, Site K1 and scattered Trees 1-4 will be reviewed in accordance with the NVC assessment manuals to finalise and adjust the Total Biodiversity Scores and SEB offset requirements accordingly. Consequently, the applicant is requesting the NVC to consider providing 'in principle consent to clear' for Site K1 and Trees 1-4 as part of this clearance application.

With respect to the individual spatial areas nominated for clearance, the applicant advises that these are conservative estimates and that there will be every effort to minimise any clearance additional to the footprint that is required for the design alone.

### 3.2 Fauna assessment

Methodology involved active physical searching of the survey sites (excluding Site F3 and I3) and surrounding areas, and investigating any potential shelter and habitat for the following five threatened terrestrial fauna species that have been recorded in the area or are known to occur in the area:

- Elegant Parrot (*Neophema elegans*) SA: Rare
- Letter-Winged Kite (*Elanus scriptus*) SA: Rare
- Orange-bellied Parrot (*Neophema chrysogaster*) EPBC: Critically Endangered; SA: Endangered
- Peregrine Falcon (*Falco peregrinus*) SA: Rare
- Plains-wanderer (*Pedionomus torquatus*) EPBC: Critically Endangered; SA: Endangered

Monitoring was conducted between 11:00 and 17:00 on 23 June and 07:30 and 14:00 on 24 June 2020. The time spent surveying each site ranged between 30 minutes to 1.5 hours depending on the size of the area. The survey efforts returned no sightings of the species listed above. Of the habitat observed, only the Elegant Parrot (*Neophema elegans*) may potentially utilise the chenopod shrublands and small areas of mallee communities located within the proposed clearance areas (excluding Site F3 and I3).

In addition to the above methodology, acoustic monitoring was conducted to determine the presence of the Gulf St Vincent Slender-billed Thornbill (*Acanthiza iredalei rosinae*), previously sighted in the local area and listed as Vulnerable in the EPBC Protected Matters Search Tool, in the vicinity of the Samphire shrubland along Wakefield River. The method involved playing a recorded 60 second 'Gulf St Vincent Slender-billed Thornbill' call in the area and checking if there was a response or sightings. This was undertaken in four localities approximately 50-100 m apart and monitored for 5 minutes to see if there was a response. The monitoring was conducted between 07:30 and 14:00 on 24 June 2020. The above methodology was recommended by Graham Carpenter from the Native Vegetation Branch (NVB) via personal communication on 15 June 2020. The survey efforts returned no sightings or acoustic response of the Gulf St Vincent Slender-billed Thornbill. In addition, the Gulf St Vincent Slender-billed Thornbill mainly inhabits intertidal samphire flats dominated by *Tecticornia arbuscula* (Shrubby Samphire), which was not recorded in the proposed clearance areas at Site F2 and I3. As such, the species is unlikely to occur in Site F2 and I3 (personal communication with Graham Carpenter on 15 June 2020).

# 4. Assessment Outcomes

## 4.1 Vegetation Assessment

### **General description of the vegetation, the site and matters of significance**

As discussed above, the project is located within the Kallora and Mallala IBRA Associations of South Australia. The landform in the Kallora IBRA Association is described as undulating calcrete plains with widespread dunes and occasional salt lakes. The landform in the Mallala IBRA Association is described as undulating plains with occasional dunes. The project traverses the Wakefield River approximately 200m north of the Port Wakefield township limits.

The soil type south of Port Wakefield is described as shallow calcareous loam on calcrete. Approximately 700m south of Port Wakefield an intermittent salt lake is located adjacent to the proposed project boundary which contains calcareous saline soils. The soils north of Port Wakefield are mapped as loam over pedaric red clay and calcareous loam (NatureMaps, 2020).

The Kallora and Mallala IBRA Associations have been heavily cleared in the past with approximately 3% of the regions containing remnant vegetation. However, remnant native vegetation within a 5km radius of the project area represents approximately 33-40% cover.

The project is located approximately 700m to the east of Clinton Conservation Park and Clinton Wetlands, which is listed as a listed Wetland of National Importance. No Heritage Agreements are near the proposed development, with the closest being approximately 9km to the north (HA1114).

The native vegetation under application contains nine different vegetation associations ranging from poor to moderate condition. All associations are dominated with chenopod shrubs and have a similar species composition, except for the two samphire shrublands recorded at Sites F2 and I3. In addition, 4 scattered moderately healthy *Eucalyptus porosa* (Mallee Box) are under application.

**Details of the vegetation associates/scattered trees proposed to be impacted**

Site A1, B1 and C1 (Map 3)

Vegetation Association	<i>Eucalyptus phenax ssp. phenax</i> (White Mallee) mallee over open chenopod and sclerophyll shrubs
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**Photo 1:** viewing south from mid-section of Site A1

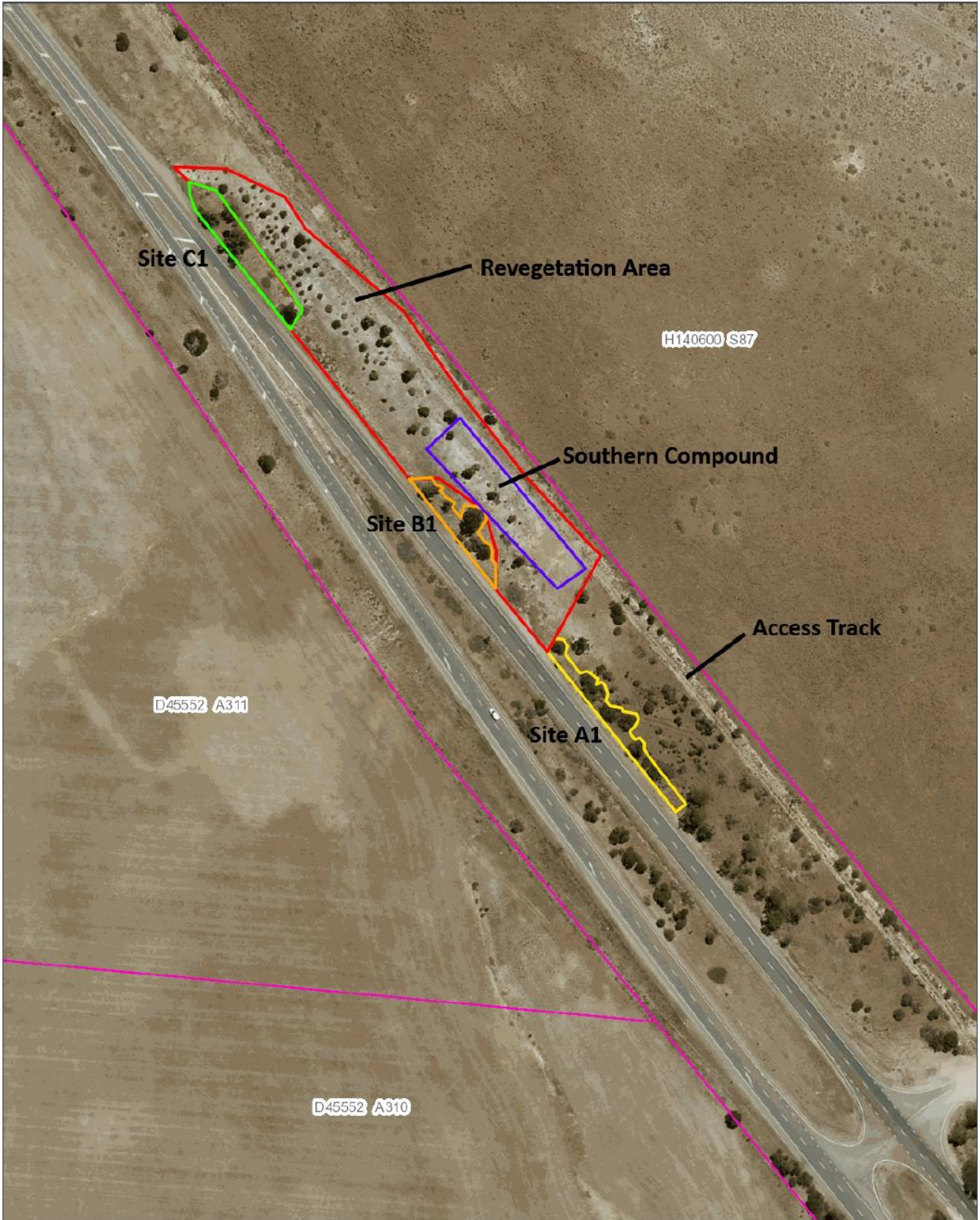


**Photo 2:** viewing south into Site B1



General description	<p>Dominant understorey species include <i>Acacia ligulata</i> (Umbrella Bush), <i>Nitraria billardierei</i> (Nitre-Bush), <i>Enchylaena tomentosa</i> (Ruby Saltbush), <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush) and <i>Rytidosperma caespitosum</i> (Common Wallaby-grass). The full flora species list recorded during the survey in Site A1, B1 and C1 is shown in Appendix 3.</p> <p>The regeneration of native flora species in Site A1, B1 and C1 was moderate with three species recorded as regenerating. Tree canopy cover in the site was approximately 20%. The trees were observed to be in moderate health with approximately 30% die-back of their canopies. No hollow or nest were recorded. The site contained fallen branch sized logs and no leaf litter. The understorey in Site A1, B1 and C1 contains approximately 10% native species cover and is dominated by introduced species.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob) and <i>Carrichtera annua</i> (Ward's Weed). Two declared plant species listed under the <i>Landscape South Australia Act 2019</i> were recorded in Site A1, B1 and C1. They include <i>Asparagus asparagoides</i> f. <i>asparagoides</i> (Bridal Creeper) and <i>Echium plantagineum</i> (Salvation Jane).</p> <p>Site A1, B1 and C1 are located adjacent to a rehabilitated hardstand area (Map 3) which has been revegetated with local and non-local native species via direct seeding and planting methods. Planted native species include, but not limited to, <i>Rytidosperma</i> sp., <i>Enneapogon</i> sp., <i>Chloris truncata</i>, <i>Maireana</i> sp., <i>Dodonaea lobulata</i>, <i>Senna</i> sp., <i>Atriplex</i> sp., <i>Eucalyptus</i> sp., <i>Allocasuarina</i> sp. and <i>Enchylaena tomentosa</i>. Introduced species include <i>Oxalis pes-caprae</i> (Soursob) and <i>Carrichtera annua</i> (Ward's Weed), <i>Asphodelus fistulosus</i> (Onion Weed), <i>Echium plantagineum</i> (Salvation Jane) and <i>Marrubium vulgare</i> (Horehound). The southern site compound will be located within the revegetation area to avoid clearance to native vegetation protected under the <i>Native Vegetation Act 1991</i>.</p> <p>Rabbit (<i>Oryctolagus cuniculus</i>) scats and scratching's were observed in Site A1. (<i>Oryctolagus cuniculus</i>) scats and scratching's were observed in Site A1, B1 and C1.</p>				
Threatened species or community	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site A1, B1 and C1.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site A1, B1 and C1 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.14	Vegetation Condition Score	24.98	Conservation significance score	1.10
Unit biodiversity Score	31.33	Area (ha)	0.169	Total biodiversity Score	5.29

### Map 3. Site A1, B1 and C1



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Site D1 (Map 4)

Vegetation Association	<i>Acacia ligulata</i> (Umbrella Bush) tall coastal plain shrubland over open chenopod shrubs
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**Photo 3:** viewing south from mid-section of Site D1



**Photo 4:** viewing north from southern section of Site D1



General description	<p>Dominant native species include <i>Enchylaena tomentosa</i> (Ruby Saltbush), <i>Nitraria billardierei</i> (Nitre-Bush), <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush), <i>Rhagodia crassifolia</i> (Fleshy Saltbush), <i>Rhagodia candolleana</i> (Sea-berry Saltbush) and <i>Maireana brevifolia</i> (Short-leaf Bluebush). The full flora species list recorded during the survey in Site D1 is shown in Appendix 3.</p> <p>Site D1 was assessed as a naturally treeless vegetation community. The regeneration of native flora species in Site D1 was moderate to high with four species recorded as regenerating. The understorey in Site D1 contains approximately 10% native species cover and is dominated by introduced species.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob) and <i>Carrichtera annua</i> (Ward's Weed). Two declared plant species listed under the <i>Landscape South Australia Act 2019</i> were recorded in Site D1. They include <i>Lycium ferocissimum</i> (African Boxthorn) and <i>Echium plantagineum</i> (Salvation Jane).</p> <p>Rabbit (<i>Oryctolagus cuniculus</i>) scats and scratching's were observed in Site D1.</p>				
Threatened species or community	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site D1.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site D1 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.16	Vegetation Condition Score	34.67	Conservation significance score	1.10
Unit biodiversity Score	44.24	Area (ha)	0.52	Total biodiversity Score	23.00

# Map 4. Site D1 and D2



Map data is compiled from a variety of sources and hence its accuracy is variable.

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0 197 Metres

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Datum: Geocentric Datum of Australia, 1994  
Projection: Web Mercator (Auxiliary Sphere)



Site D2 (Map 4)

Vegetation Association	<i>Nitraria billardierei</i> (Nitre-bush) +/- <i>Rhagodia candolleana</i> ssp. (Sea-berry Saltbush) +/- <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush) <i>cordata</i> open coastal plain shrubland under a planted overstorey
------------------------	--

**Photo 5:** viewing north from southern section of Site D2 with planted vegetation in middle of site



**Photo 6:** viewing south from southern section of Site D2 with planted vegetation in middle of site



**Photo 7:** viewing south from mid-section of Site D2 with planted vegetation overstorey



General description

Dominant native species include *Enchylaena tomentosa* (Ruby Saltbush), *Nitraria billardierei* (Nitre-Bush), *Atriplex paludosa* ssp. *cordata* (Marsh Saltbush), *Rhagodia crassifolia* (Fleshy Saltbush), *Rhagodia candolleana* (Sea-berry Saltbush), *Maireana erioclada* (Rosy Bluebush) and *Maireana brevifolia* (Short-leaf Bluebush). The full flora species list recorded during the survey in Site D2 is shown in Appendix 3.

Site D2 was assessed as a naturally treeless vegetation community. The regeneration of native flora species in Site D2 was moderate to high with four species recorded as regenerating. The understorey in Site D2 contains approximately 10-20% native species cover and is dominated by introduced species.

While Site D2 is considered a naturally treeless vegetation community the area contains planted local and non-local native tree and tall shrub species. Planted native species include, but not limited to, *Eucalyptus* sp., *Allocasuarina* sp., *Acacia* sp., *Senna* sp. and *Melaleuca lanceolata*.

Dominant introduced species include *Oxalis pes-caprae* (Soursob) and *Carrichtera annua* (Ward's Weed). One declared plant species listed under the *Landscape South Australia Act 2019*, *Lycium ferocissimum* (African Boxthorn), was recorded in Site D2.

Rabbit (*Oryctolagus cuniculus*) scats and scratching's were observed in Site D2.

Threatened species or community

No threatened flora under the NP&W Act or EPBC Act listed flora species or community were recorded in Site D2.

Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site D2 (for further information see Section 4.2 below):

- Elegant Parrot (*Neophema elegans*) SA: Rare
- Letter-Winged Kite (*Elanus scriptus*) SA: Rare

	<ul style="list-style-type: none"> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.16	Vegetation Condition Score	30.43	Conservation significance score	1.10
Unit biodiversity Score	38.83	Area (ha)	1.95	Total biodiversity Score	75.71

Site E1 (Map 5)

Vegetation Association	<i>Nitraria billardierei</i> (Nitre-bush) +/- <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush) open coastal plain shrubland under a planted overstorey
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**Photo 8:** viewing north west from southern section of Site E1 with planted overstorey



General description	Dominant native species include <i>Nitraria billardierei</i> (Nitre-Bush), <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush), <i>Rhagodia crassifolia</i> (Fleshy Saltbush), <i>Rhagodia candolleana</i> (Sea-berry Saltbush) and <i>Enchylaena tomentosa</i> (Ruby Saltbush). The full flora species list recorded during the survey in Site E1 is shown in Appendix 3.
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	<p>Site E1 was assessed as a naturally treeless vegetation community. The regeneration of native flora species in Site E1 was low with no species recorded as regenerating. The understorey in Site E1 contains approximately 10-15% native species cover and is dominated by introduced species.</p> <p>While Site E1 is considered a naturally treeless vegetation community the area contains planted overstorey of <i>Eucalyptus salubris</i> (Gimlet) which is a native species endemic to Western Australia.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob) and <i>Carrichtera annua</i> (Ward's Weed). Two declared plant species listed under the <i>Landscape South Australia Act 2019</i> were recorded in Site E1. They include <i>Lycium ferocissimum</i> (African Boxthorn) and <i>Echium plantagineum</i> (Salvation Jane).</p>				
Threatened species or community	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site E1.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site E1 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.14	Vegetation Condition Score	17.36	Conservation significance score	1.10
Unit biodiversity Score	21.77	Area (ha)	0.06	Total biodiversity Score	1.31

Site F1 (Map 5)

Vegetation Association	<i>Nitraria billardierei</i> (Nitre-bush) +/- <i>Rhagodia candolleana</i> ssp. (Sea-berry Saltbush) +/- <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush) coastal plain shrubland
<p><b>Photo 9:</b> viewing north west from southern section of Site F1</p> 	
General description	<p>Dominant native species include <i>Enchylaena tomentosa</i> (Ruby Saltbush), <i>Nitraria billardierei</i> (Nitre-Bush), <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush), <i>Rhagodia crassifolia</i> (Fleshy Saltbush), <i>Rhagodia candolleana</i> (Sea-berry Saltbush) and <i>Maireana brevifolia</i> (Short-leaf Bluebush). The full flora species list recorded during the survey in Site F1 is shown in Appendix 3.</p> <p>The regeneration of native flora species in Site F1 was low consisting of scattered juvenile plants of a limited number of species. The understorey in Site F1 contains approximately 30-50% native species cover.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob), <i>Lycium ferocissimum</i> (African Boxthorn) and <i>Carrichtera annua</i> (Ward's Weed). Two declared plant species listed under the <i>Landscape South Australia Act 2019</i> were recorded in Site F1. They include <i>Lycium ferocissimum</i> (African Boxthorn) and <i>Echium plantagineum</i> (Salvation Jane).</p> <p>Rabbit (<i>Oryctolagus cuniculus</i>) scats and scratching's were observed in Site F1.</p>
Threatened species or community	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site F1.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site F1 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> </ul>

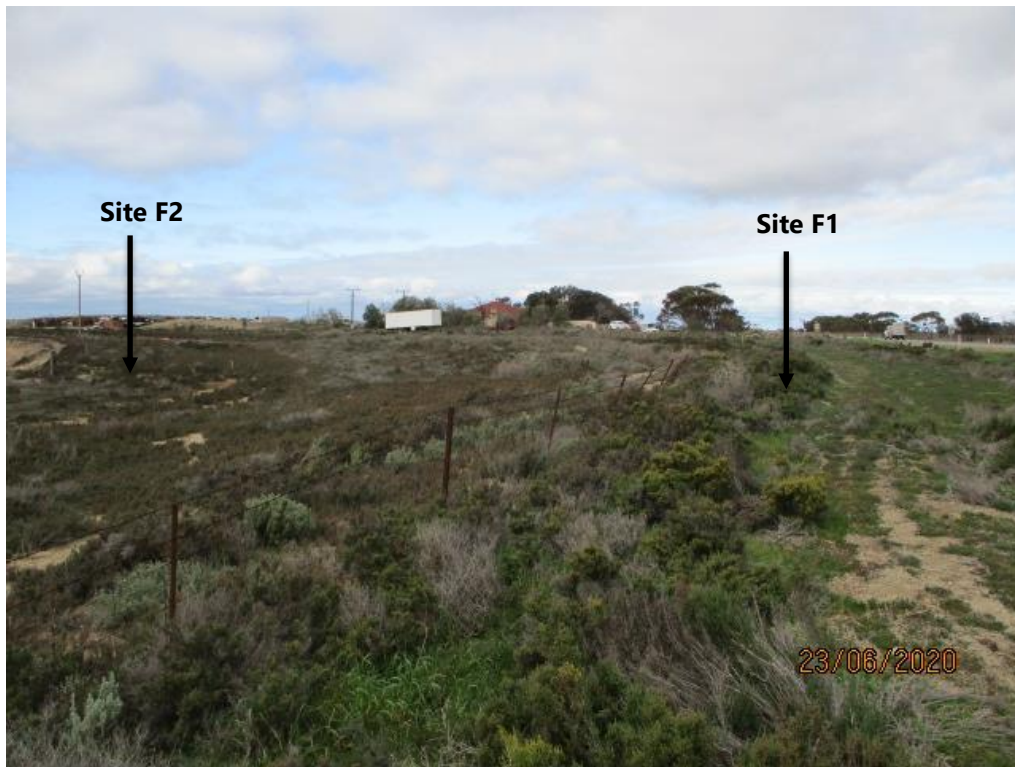


	<ul style="list-style-type: none"> <li>Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.17	Vegetation Condition Score	40.73	Conservation significance score	1.10
Unit biodiversity Score	52.42	Area (ha)	0.48	Total biodiversity Score	25.16

Site F2 (Map 5)

Vegetation Association	<i>Tecticornia halocnemoides</i> ssp. (Grey Samphire) +/- <i>Tecticornia indica</i> ssp. (Brown-head samphire) shrubland with infrequent inundation
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**Photo 10:** viewing south east from northern section. Site F2 is situated left of the photo with of Site F1 in the foreground




General description	<p>Native species observed was limited to <i>Tecticornia halocnemoides</i> ssp. (Grey Samphire) and <i>Tecticornia indica</i> ssp. (Brown-head samphire). The full flora species list recorded during the survey in Site F2 is shown in Appendix 3.</p> <p>The regeneration of native flora species in Site F2 was low with no species recorded as regenerating. The understorey in Site F2 contains approximately 80% native species cover. No introduced species were recoded.</p>
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Threatened species or community	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site F2.</p> <p>Search results registered the following wetland fauna species that have been recorded in the vicinity of Site F2 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>Gulf St Vincent Slender-billed Thornbill (<i>Acanthiza iredalei rosinae</i>) EPBC: Vulnerable; SA: Vulnerable</li> <li>Common Sandpiper (<i>Actitis hypoleucos</i>) SA: Rare</li> </ul>
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Landscape context score	1.17	Vegetation Condition Score	26.60	Conservation significance score	1.08
Unit biodiversity Score	33.61	Area (ha)	0.02	Total biodiversity Score	0.67

Site F3 (Map 5)

Vegetation Association	<i>Myoporum platycarpum</i> ssp. (False Sandalwood) coastal plain shrubland
<b>Photo 11:</b> viewing south east from southern section of Site F3	
	
General description	<p>Dominant species include <i>Enchylaena tomentosa</i> (Ruby Saltbush), <i>Nitraria billardierei</i> (Nitre-Bush), <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush), <i>Rhagodia crassifolia</i> (Fleshy Saltbush), <i>Rhagodia candolleana</i> (Sea-berry Saltbush) and <i>Maireana brevifolia</i> (Short-leaf Bluebush). The full flora species list recorded during the survey in Site F2 is shown in Appendix 3.</p> <p>The regeneration of native flora species in Site F2 was moderate consisting of multiple juvenile plants of a limited number of species. The understorey in Site F2 contains approximately 10-30% native species cover.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob), <i>Lycium ferocissimum</i> (African Boxthorn) and <i>Carrichtera annua</i> (Ward's Weed). Two declared plant species listed under the <i>Landscape South Australia Act 2019</i> were recorded in Site F2. They include <i>Lycium ferocissimum</i> (African Boxthorn) and <i>Echium plantagineum</i> (Salvation Jane).</p> <p>Rabbit (<i>Oryctolagus cuniculus</i>) scats and scratching's were observed in Site F2.</p>
Threatened species or community	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site F3.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site F3 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>

Landscape context score	1.17	Vegetation Condition Score	40.50	Conservation significance score	1.10
Unit biodiversity Score	52.13	Area (ha)	0.36	Total biodiversity Score	18.77

Site F4 (Map 5)

Vegetation Association	Degraded <i>Myoporum platycarpum</i> ssp. (False Sandalwood) coastal plain shrubland
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**Photo 12:** viewing North west from southern section of Site F4 with Aleppo Pine to right of photo

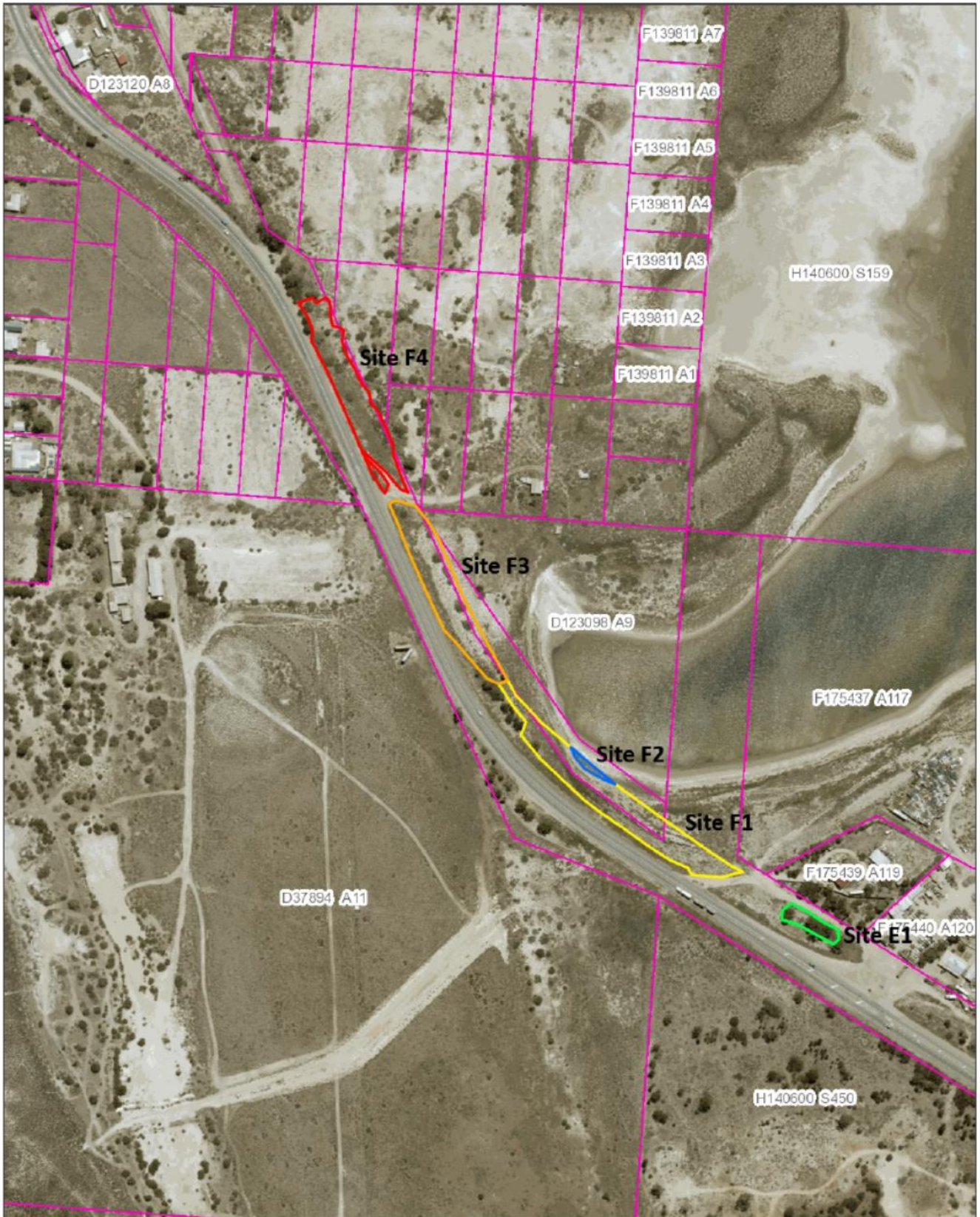


**Photo 13:** Old stockpiles located in Site F4



<p>General description</p>	<p>Dominant species include <i>Enchylaena tomentosa</i> (Ruby Saltbush), <i>Nitraria billardierei</i> (Nitre-Bush) and <i>Maireana brevifolia</i> (Short-leaf Bluebush). The full flora species list recorded during the survey in Site F4 is shown in Appendix 3.</p> <p>The regeneration of native flora species in Site F2 was moderate consisting of multiple juvenile plants of a limited number of species. The understorey in Site F2 contains approximately 10-30% native species cover. The majority of Site F4 consist of old soil stockpiles with both native and introduced species established on the surface.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob) and <i>Carrichtera annua</i> (Ward's Weed). Three declared plant species listed under the <i>Landscape South Australia Act 2019</i> were recorded in Site F3. They include <i>Lycium ferocissimum</i> (African Boxthorn), <i>Asparagus asparagoides</i> f. (Bridal Creeper) and <i>Pinus halepensis</i> (Allepo Pine).</p> <p>Rabbit (<i>Oryctolagus cuniculus</i>) scats and scratching's were observed in Site F4.</p>				
<p>Threatened species or community</p>	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site F4.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site F4 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
<p>Landscape context score</p>	<p>1.17</p>	<p>Vegetation Condition Score</p>	<p>22.57</p>	<p>Conservation significance score</p>	<p>1.10</p>
<p>Unit biodiversity Score</p>	<p>29.05</p>	<p>Area (ha)</p>	<p>0.35</p>	<p>Total biodiversity Score</p>	<p>10.17</p>

## Map 5. Site E1, F1, F2, F3 and F4



Map data is compiled from a variety of sources and hence its accuracy is variable.

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0 197 Metres

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 Datum: Geocentric Datum of Australia, 1994  
 Projection: Web Mercator (Auxiliary Sphere)



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Site G1 (Map 6)

Vegetation Association	<i>Nitraria billardierei</i> (Nitre-bush) +/- <i>Rhagodia candolleana ssp.</i> (Sea-berry Saltbush) +/- <i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) coastal plain shrubland
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**Photo 14:** viewing south east from mid-section of Site G1

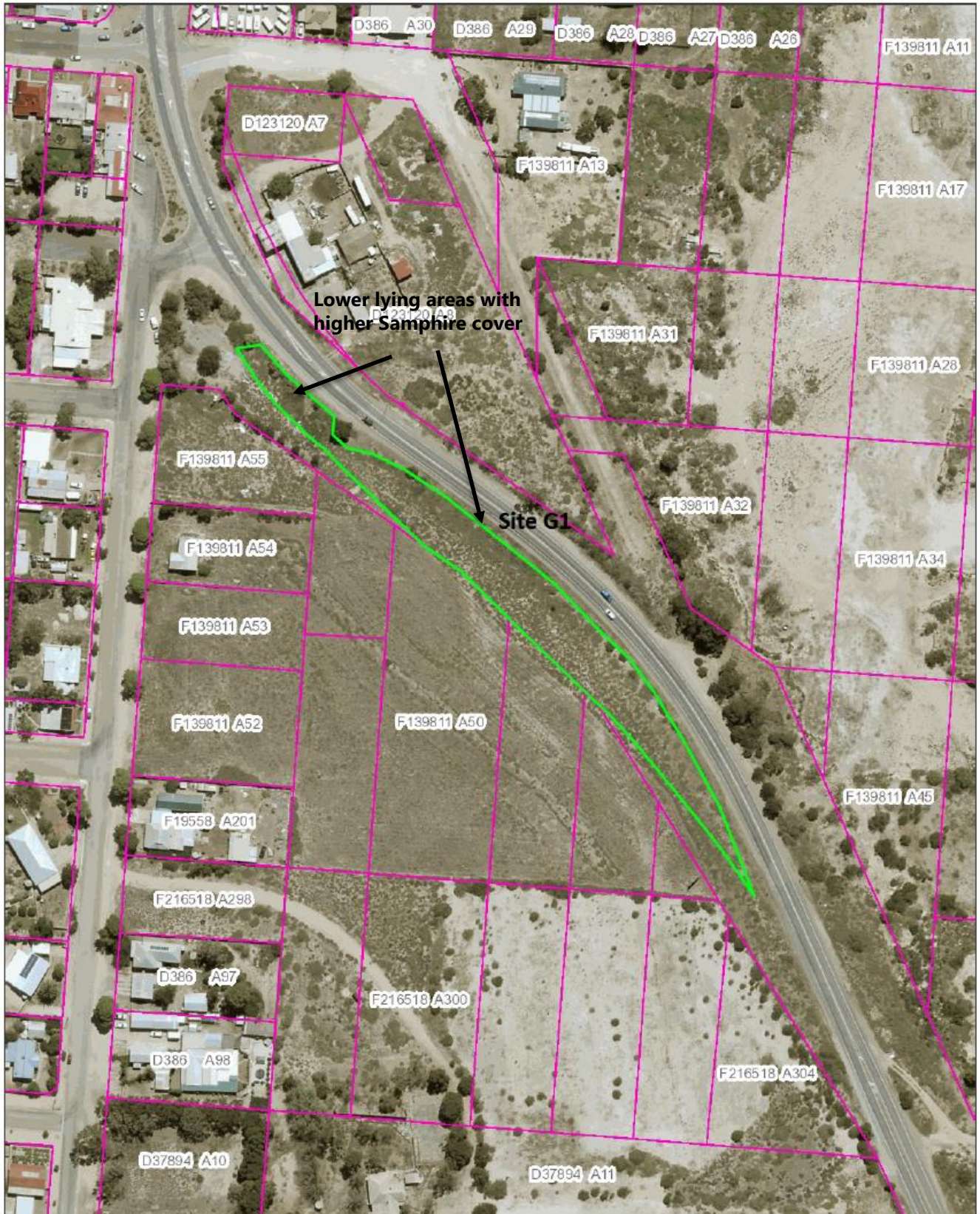


**Photo 15:** viewing north east section of Site G1 into low lying area with denser Samphire cover and planted *Acacia* sp. and *Casuarina glauca* (Swamp Oak) around the perimeter



General description	<p>Dominant native species include <i>Enchylaena tomentosa</i> (Ruby Saltbush), <i>Nitraria billardierei</i> (Nitre-Bush), <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush), <i>Rhagodia candolleana</i> (Sea-berry Saltbush), <i>Tecticornia halocnemoides</i> ssp. (Grey Samphire) and <i>Tecticornia indica</i> ssp. (Brown-head samphire). The full flora species list recorded during the survey in Site F2 is shown in Appendix 3. The road shoulder along Princess Highway contains several scattered <i>Acacia ligulata</i> (Umbrella Bush).</p> <p>Site G1 contains a man-made land depression in the northern section of the site. <i>Tecticornia halocnemoides</i> ssp. (Grey Samphire) and <i>Tecticornia indica</i> ssp. (Brown-head samphire) cover is greater in this area compared to the rest of the site on higher ground. In addition, the northern section of Site G1 contains planted non-local native species, including <i>Acacia</i> sp. and <i>Casuarina glauca</i> (Swamp Oak).</p> <p>The regeneration of native flora species in Site G1 was low consisting of scattered juvenile plants of a limited number of species. The understorey in Site G1 contains approximately 40-60% native species cover.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob), <i>Lycium ferocissimum</i> (African Boxthorn) and <i>Romulea</i> sp. (Onion Grass). Three declared plant species listed under the <i>Landscape South Australia Act 2019</i> were recorded in Site G1. They include <i>Lycium ferocissimum</i> (African Boxthorn), <i>Opuntia stricta</i> (Prickly Pear) and <i>Casuarina glauca</i> (Swamp Oak).</p> <p>Rabbit (<i>Oryctolagus cuniculus</i>) scats and scratching's were observed in Site G1.</p>				
Threatened species or community	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site F1.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site G1 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.14	Vegetation Condition Score	33.57	Conservation significance score	1.10
Unit biodiversity Score	42.57	Area (ha)	0.46	Total biodiversity Score	19.58

# Map 6. Site G1



Map data is compiled from a variety of sources and hence its accuracy is variable.

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 Datum: Geocentric Datum of Australia, 1994  
 Projection: Web Mercator (Auxiliary Sphere)





Site H1 (Map 7)

Vegetation  
Association

*Maireana brevifolia* (Short-leaf Bluebush) very open coastal plain shrubland

**Photo 16:** viewing south from mid-section of Site H1

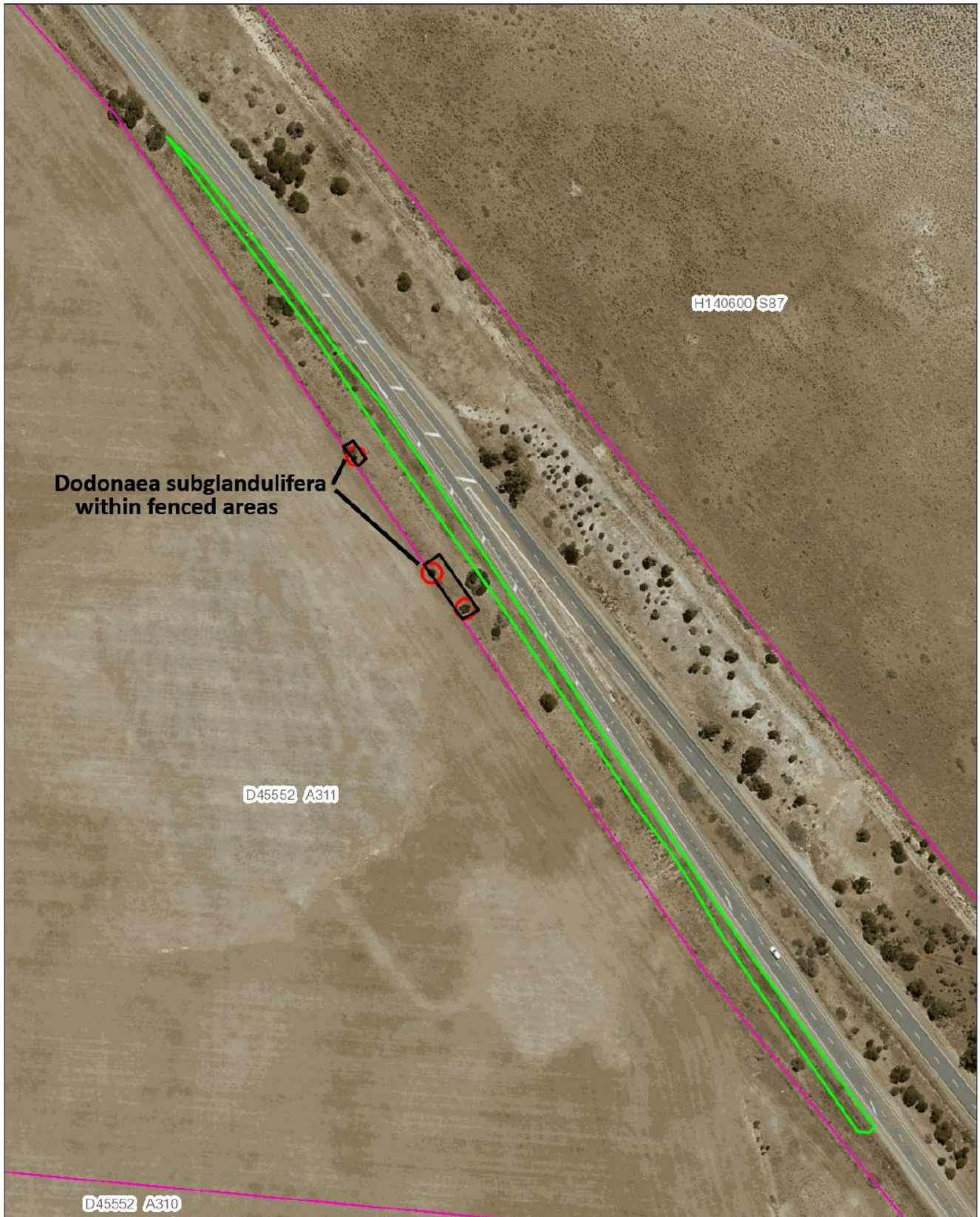


**Photo 17:** Two *Dodonaea subglandulifera* (Peep Hill Hop-bush) within enclosed fenced area. This species will not be impacted during the proposed project development and are not part of this application.



General description	<p>Dominant native species include <i>Enchylaena tomentosa</i> (Ruby Saltbush), <i>Enneapogon nigricans</i> (Black-head grass), <i>Rytidosperma caespitosum</i> (Common Wallaby-grass), <i>Austrostipa sp.</i> (Spear-grass) and <i>Chloris truncata</i> (Windmill Grass). The full flora species list recorded during the survey in Site H1 is shown in Appendix 3.</p> <p>The road shoulder along Princess Highway contains several scattered <i>Acacia ligulata</i> (Umbrella Bush) which will not be impacted. The road reserve adjacent to contains three <i>Dodonaea subglandulifera</i> (Peep Hill Hop-bush) which is an Endangered species listed under the <i>EPBC Act 1999</i> (Map 7). The proposed development will not impact these species and therefore not included as part of this application.</p> <p>The regeneration of native flora species in Site H1 was low consisting of scattered juvenile plants of a limited number of species. The understorey in Site G1 contains approximately 40-60% native species cover.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob) and <i>Avena barbata</i> (Bearded Oat). Three declared plant species listed under the <i>Landscape South Australia Act 2019</i> were recorded in Site H1. They include <i>Lycium ferocissimum</i> (African Boxthorn), <i>Solanum elaeagnifolium</i> (Silverleaf Nightshade) and <i>Marrubium vulgare</i> (Horehound).</p> <p>Rabbit (<i>Oryctolagus cuniculus</i>) scats and scratching's were observed in Site H1.</p>				
Threatened species or community	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site H1.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site H1 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.14	Vegetation Condition Score	16.93	Conservation significance score	1.10
Unit biodiversity Score	21.23	Area (ha)	0.25	Total biodiversity Score	5.31

# Map 7. Site H1 and Dodonaea subglandulifera locations



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Projection: Web Mercator (Auxiliary Sphere)



Site I1 (Map 8)

Vegetation Association	<i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) coastal plain shrubland
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**Photo 18:** viewing south from behind the OTR service station within Site I1a (South of Wakefield River)



**Photo 19:** viewing west, north of the OTR service station within Site I1a (South of Wakefield River)



**Photo 20:** viewing south, south of Wakefield River within Site I1a showing shrubs in poor health with die-back approximately 40-50% with many dead plants.




**Photo 21:** viewing south, north of Wakefield River, within Site I2b showing shrubs in poor health with die-back approximately 40-50% with many dead plants.



General description	<p>Dominant native species include <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush), <i>Nitraria billardierei</i> (Nitro-Bush), <i>Rhagodia crassifolia</i> (Fleshy Saltbush), <i>Rhagodia candolleana</i> (Sea-berry Saltbush), <i>Enchylaena tomentosa</i> (Ruby Saltbush) and <i>Maireana brevifolia</i> (Short-leaf Bluebush). The full flora species list recorded during the survey in Site F1 is shown in Appendix 3.</p> <p>The regeneration of native flora species in Site I1 was moderate with three species recorded as regenerating. The health of shrubs ranges between 20-50% die-back in the southern section of I1a. Plant health deteriorates in the northern section of I1a and the entirety of I2b with many dead plants present and die-back averaging approximately 40-50%. The understorey in Site I1 contains approximately 30% native species cover due to heavy die-back in most areas.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob), <i>Galenia pubescens</i> var. <i>pubescens</i> (Coastal Galenia) and <i>Carrichtera annua</i> (Ward's Weed). Two declared plant species listed under the <i>Landscape South Australia Act 2019</i> were recorded in Site I1. They include <i>Lycium ferocissimum</i> (African Boxthorn) and <i>Oncosiphon suffruticosum</i> (Calomba Daisy).</p> <p>Rabbit (<i>Oryctolagus cuniculus</i>) scats and scratching's were observed in Site I1.</p>				
Threatened species or community	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site I1.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site I1 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.20	Vegetation Condition Score	32.90	Conservation significance score	1.10
Unit biodiversity Score	43.42	Area (ha)	3.86	Total biodiversity Score	167.61

Site I2 (Map 8)

Vegetation Association	<i>Nitraria billardierei</i> (Nitre-bush) +/- <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush) open coastal plain shrubland
<b>Photo 22:</b> viewing south, directly south of Wakefield River within Site I2	
	
General description	<p>Dominant native species include <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush), <i>Nitraria billardierei</i> (Nitre-Bush), <i>Maireana brevifolia</i> (Short-leaf Bluebush) and <i>Disphyma crassifolium</i> ssp. <i>clavellatum</i> (Round-leaf Pigface). The full flora species list recorded during the survey in Site I2 is shown in Appendix 3.</p> <p>The regeneration of native flora species in Site I2 was low with only one species recorded as regenerating. The understorey in Site I2 contains approximately 25% native species cover.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob) and <i>Echium plantagineum</i> (Salvation Jane). Two declared plant species listed under the <i>Landscape South Australia Act 2019</i> were recorded in Site I2. They include <i>Lycium ferocissimum</i> (African Boxthorn) and <i>Echium plantagineum</i> (Salvation Jane).</p> <p>Inland Thornbill's (<i>Acanthiza apicalis</i>) were sighted during the field assessment and Feral Pigeon's (<i>Columba livia</i>) were observed nesting under the Princess Highway bridge which crosses the Wakefield River. Rabbit (<i>Oryctolagus cuniculus</i>) scats and scratching's were also recorded in Site I2.</p>
Threatened species or community	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site I2.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site I2 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>

Landscape context score	1.20	Vegetation Condition Score	15.96	Conservation significance score	1.10
Unit biodiversity Score	21.07	Area (ha)	0.93	Total biodiversity Score	19.60

Site I3 (Map 8)

Vegetation Association	<i>Tecticornia halocnemoides</i> ssp. (Grey Samphire) +/- <i>Tecticornia indica</i> ssp. (Brown-head samphire) shrubland with infrequent inundation
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**Photo 23:** viewing south across Wakefield River



General description	<p>Native species observed was limited to <i>Tecticornia halocnemoides</i> ssp. (Grey Samphire) and <i>Tecticornia indica</i> ssp. (Brown-head samphire). The full flora species list recorded during the survey in Site I3 is shown in Appendix 3.</p> <p>The regeneration of native flora species in Site I3 was moderate three species recorded as regenerating. The understorey in Site I3 contains approximately 70% native species cover. No introduced species were recoded.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob), <i>Brassica</i> sp. (Wild Turnip) and <i>Lycium ferocissimum</i> (African Boxthorn) which were mostly observed on the banks of Wakefield River. One declared plant species listed under the <i>Landscape South Australia Act 2019</i>, <i>Lycium ferocissimum</i> (African Boxthorn), was recorded in Site I3.</p> <p>Inland Thornbill's (<i>Acanthiza apicalis</i>) were sighted during the field assessment and Feral Pigeon's (<i>Columba livia</i>) were observed nesting under the Princess Highway bridge which crosses the Wakefield River.</p>
Threatened species or community	<p>The vegetation in Site I3 may be considered a Temperate Coastal Saltmarsh ecological community which are listed as vulnerable under the <i>EPBC Act 1999</i>. Note: an EPBC referral is not required for Vulnerable Threatened Ecological Community listed under the <i>EPBC Act 1999</i>.</p>



	<p>Search results registered the following wetland fauna species that have been recorded in the vicinity of Site I3 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Gulf St Vincent Slender-billed Thornbill (<i>Acanthiza iredalei rosinae</i>) EPBC: Vulnerable; SA: Vulnerable</li> <li>• Common Sandpiper (<i>Actitis hypoleucos</i>) SA: Rare</li> </ul> <p><b>Note:</b> following a targeted survey for the Gulf St Vincent Slender-billed Thornbill, the species was not observed in Site I3.</p>				
Landscape context score	1.18	Vegetation Condition Score	45.26	Conservation significance score	1.43
Unit biodiversity Score	76.37	Area (ha)	0.27	Total biodiversity Score	20.62

Site I4 (Map 9) – Included in Part B of the land

**Note:** Due to site access restrictions Site I4 was inaccessible to undertake a site assessment. With the aim of establishing the Total Biodiversity Score and Significant Environmental Benefit (SEB) offset requirements for Site I4, the baseline data collected within Site I1 was applied to estimate the proposed impacts. However, after studying aerial images of Sites I4, and viewing the vegetation from property boundaries it is likely that the Unit Biodiversity Scores for these sites will be lower than Site I1 due to poorer vegetation conditions, sparser native vegetation cover and greater introduced species cover. Once site access is granted, Site I4 will be assessed in accordance with the NVC assessment manuals. When completed this data report will be amended accordingly to adjust and finalise Site I4 Total Biodiversity Scores and SEB offset requirements.

Vegetation Association	Assumed <i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) coastal plain shrubland				
<p><b>Photo 24:</b> North section of Site I1b directly south of Site I4. No photo of Site I4 available at present due to sun glare reducing photo quality</p> 					
General description	<p>See description for Site I1.</p> <p>As shown on Map 9, Site I4 will contain a borrow pit and a connecting haul road that will be used to transport extracted material from the site. The position of the haul road is yet to be</p>				

	confirmed, but it is expected that the area of vegetation to be impacted for both the borrow pit and haul road will be approximately 7 ha. Final details will be provided at a later date when the position of the haul road is confirmed.				
Threatened species or community	<p>Not available at present.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site I4 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.20	Vegetation Condition Score	32.90	Conservation significance score	1.10
Unit biodiversity Score	43.42	Area (ha)	17.35	Total biodiversity Score	753.36

Site I5 (Map 8)

Vegetation Association	<i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) open coastal plain shrubland
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**Photo 25:** viewing south from Ketch Road

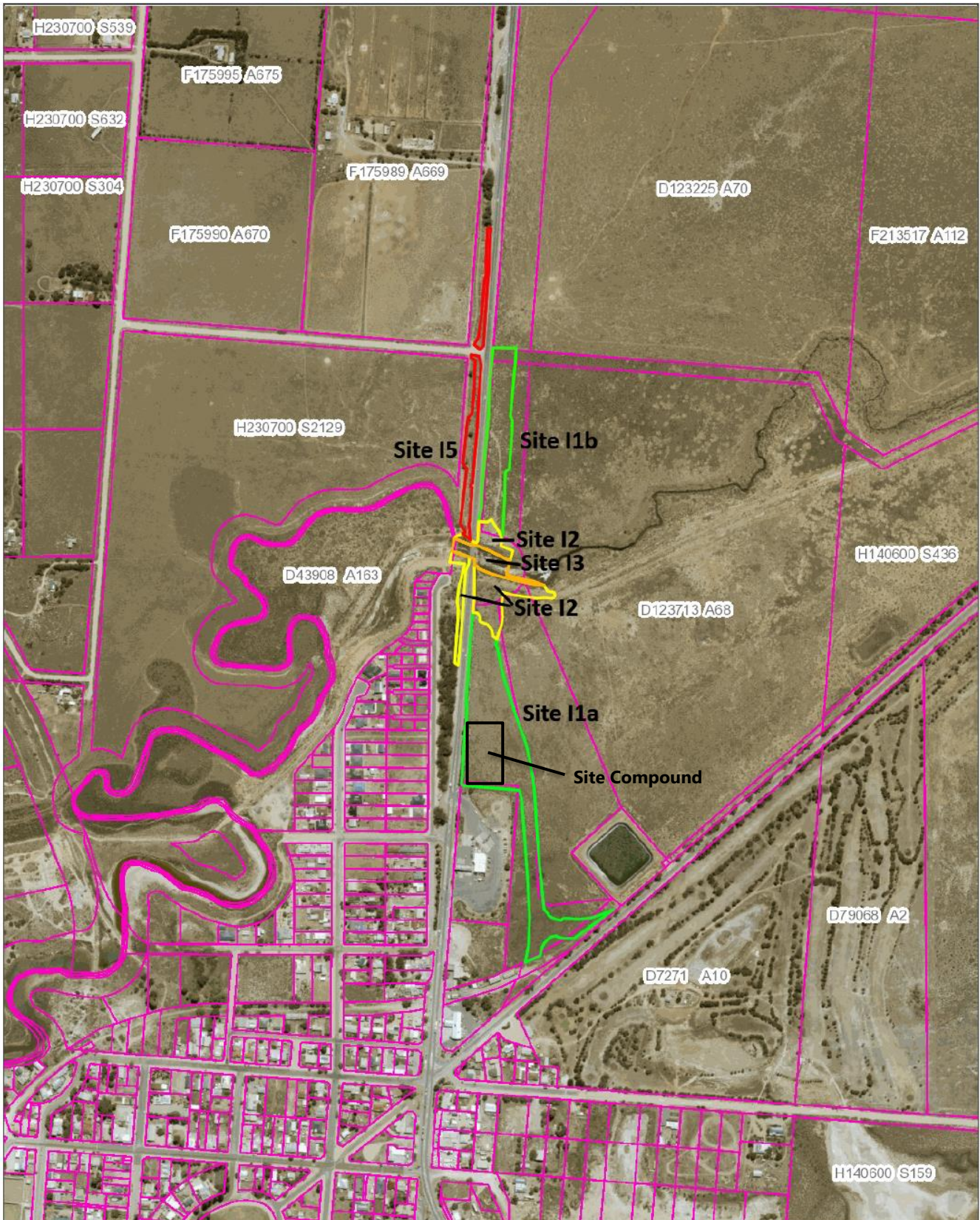


**Photo 26:** viewing north from Ketch Road



<p>General description</p>	<p>Dominant native species include <i>Atriplex paludosa</i> ssp. <i>cordata</i> (Marsh Saltbush), <i>Nitraria billardierei</i> (Nitre-Bush), <i>Enchylaena tomentosa</i> (Ruby Saltbush) and <i>Maireana brevifolia</i> (Short-leaf Bluebush). The full flora species list recorded during the survey in Site I5 is shown in Appendix 3.</p> <p>The regeneration of native flora species in Site I5 was moderate with three species recorded as regenerating. The understorey in Site I5 contains approximately 30% native species cover due to heavy die-back in most areas.</p> <p>Dominant introduced species include <i>Oxalis pes-caprae</i> (Soursob), <i>Avena Barbata</i> (Wild Oat) and <i>Carrichtera annua</i> (Ward's Weed). One declared plant species listed under the <i>Landscape South Australia Act 2019</i>, <i>Lycium ferocissimum</i> (African Boxthorn), was recorded in Site I5.</p>				
<p>Threatened species or community</p>	<p>No threatened flora under the NP&amp;W Act or EPBC Act listed flora species or community were recorded in Site I5.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site I5 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
<p>Landscape context score</p>	<p>1.18</p>	<p>Vegetation Condition Score</p>	<p>37.56</p>	<p>Conservation significance score</p>	<p>1.10</p>
<p>Unit biodiversity Score</p>	<p>48.76</p>	<p>Area (ha)</p>	<p>0.48</p>	<p>Total biodiversity Score</p>	<p>23.40</p>

## Map 8. Site I1a, I1b, I2, I3 and I5



Map data is compiled from a variety of sources and hence its accuracy is variable.

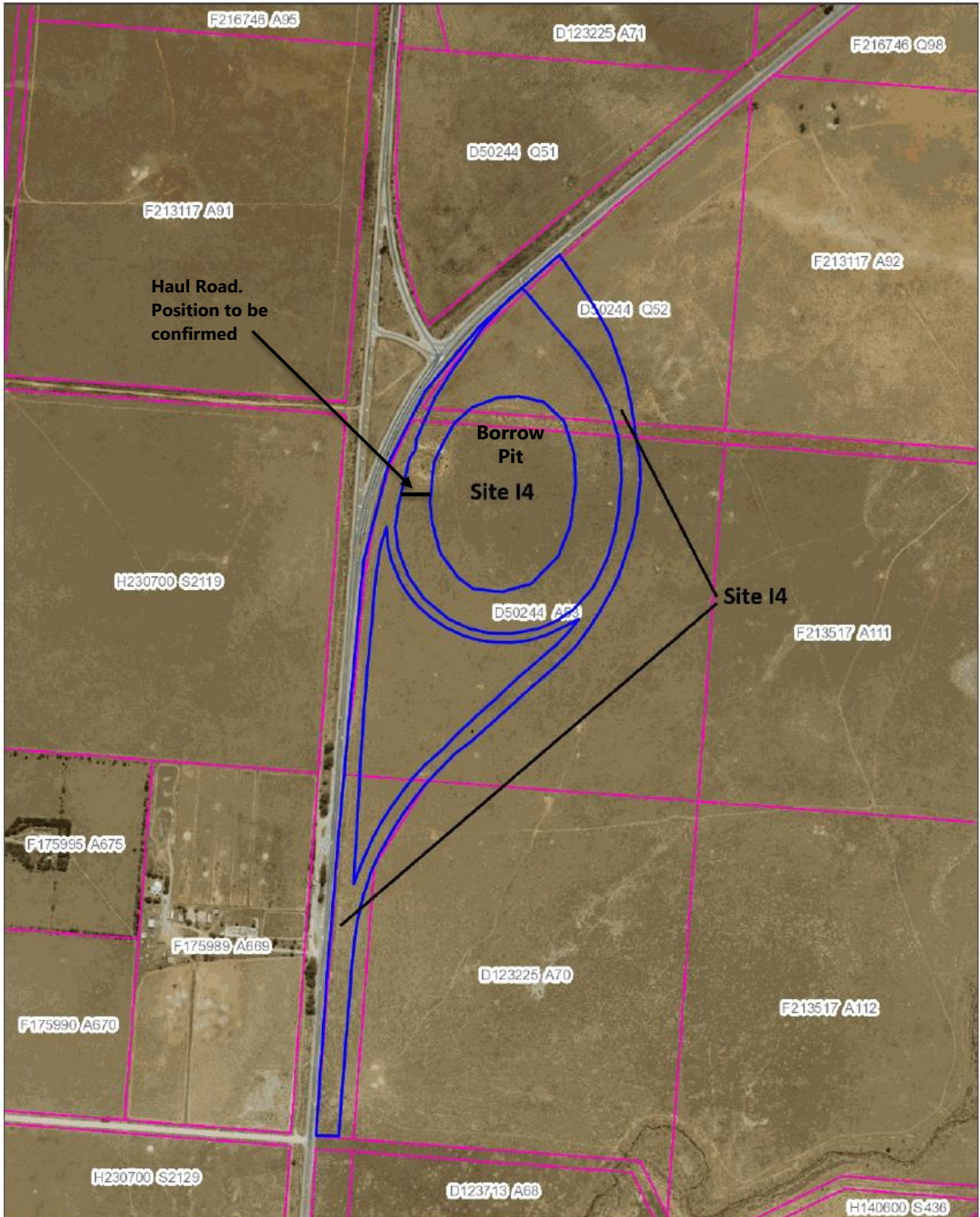
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# Map 9. Site I4



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Site J1 (Map 10) – Included in Part B of the land

**Note:** Due to site access restrictions Site J1 was inaccessible to undertake a site assessment. With the aim of establishing the Total Biodiversity Score and Significant Environmental Benefit (SEB) offset requirements for Site J1, the baseline data collected within Site I1 was applied to estimate the proposed impacts. However, after studying aerial images of Sites J1 and viewing the vegetation from property boundaries it is likely that the Unit Biodiversity Scores for these sites will be lower than Site I1 due to poorer vegetation conditions, sparser native vegetation cover and greater introduced species cover. Once site access is granted, Site J1 will be assessed in accordance with the NVC assessment manuals. When completed this data report will be amended accordingly to adjust and finalise Site J1 Total Biodiversity Scores and SEB offset requirements.

Vegetation Association	Assumed <i>Maireana brevifolia</i> (Short-leaf Bluebush) +/- <i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) open coastal plain shrubland
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**Photo 27:** viewing north west from Copper Coast Highway



General description	See description for Site I1.				
Threatened species or community	<p>Not available at present.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site J1 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.20	Vegetation Condition Score	32.90	Conservation significance score	1.10
Unit biodiversity Score	42.34	Area (ha)	6.54	Total biodiversity Score	276.88

Site K1 (Map 10) – Included in Part B of the land

**Note:** A preliminary field assessment was undertaken at Site K1 on 13 June 2019 by a Jacobs Ecologist. Ecological information was collected according to the DPTI Vegetation Removal Policy (2018) and NVC Bushland Assessment Manual 2019. For the purpose of this report and application, the data collected by the Jacobs ecologist was used to estimate the Total Biodiversity Scores and SEB offset requirements for the proposed impacts in Site K1. Once site access is granted, Site K1 will be in accordance with the NVC Bushland Assessment Manual. When completed this data report will be amended accordingly to adjust and finalise Site K1 Total Biodiversity Scores and SEB offset requirements.

Vegetation Association	<i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) open coastal plain shrubland				
<b>Photo 28:</b> viewing south along Copper Coast Highway					
					
General description	Not available at present.				
Threatened species or community	<p>Not available at present.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site K1 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.16	Vegetation Condition Score	36.77	Conservation significance score	1.10
Unit biodiversity Score	46.91	Area (ha)	1.02	Total biodiversity Score	47.85

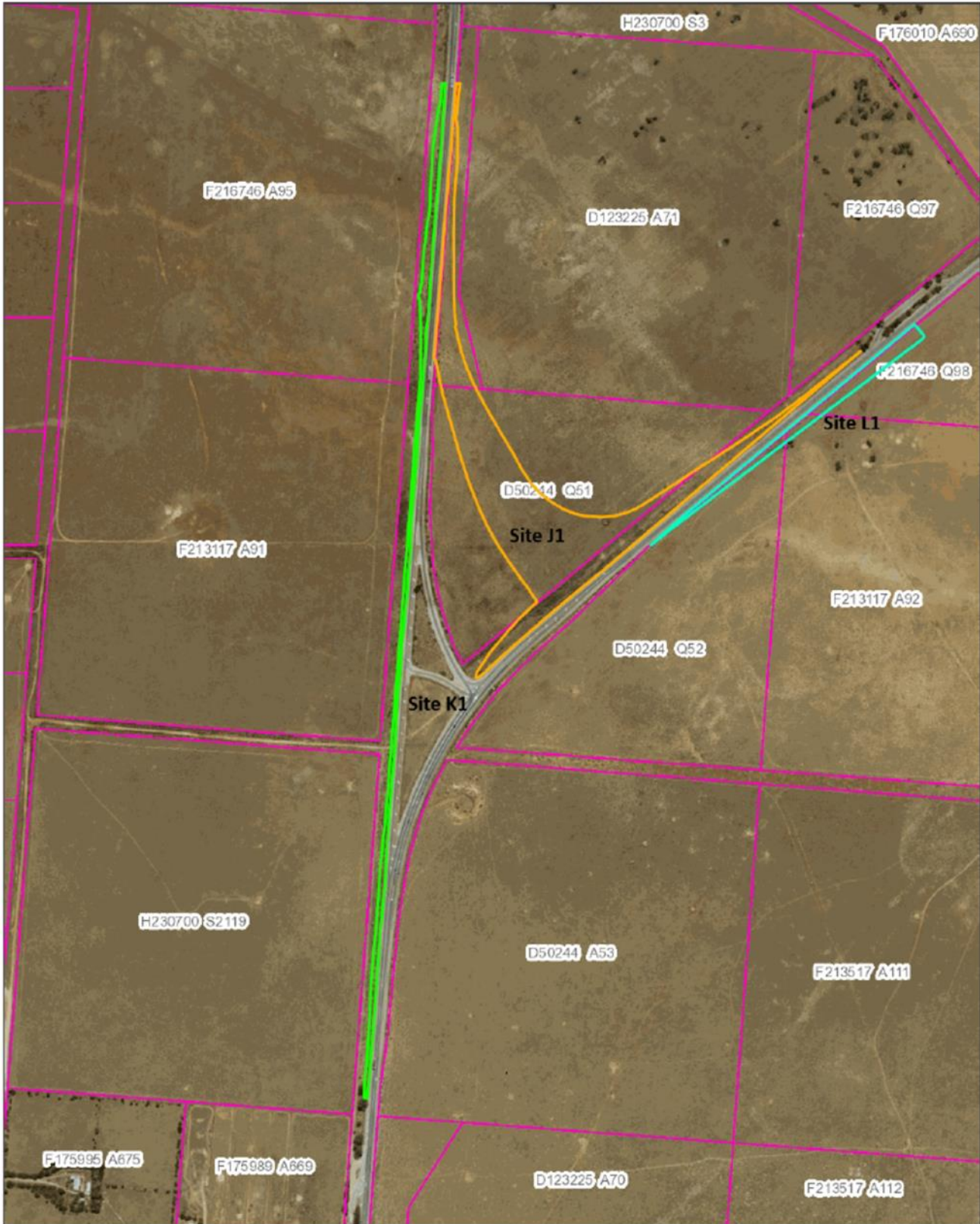
Site L1 (Map 10) – Included in Part B of the land

**Note:** Due to site access restrictions Site L1 was inaccessible to undertake a site assessment. With the aim of establishing the Total Biodiversity Score and Significant Environmental Benefit (SEB) offset requirements for Site L1, the baseline data collected within Site L1 was applied to estimate the proposed impacts. However, after studying aerial images of Sites I1 and viewing the vegetation from property boundaries it is likely that the Unit Biodiversity Scores for these sites will be lower than Site I1 due to poorer vegetation conditions, sparser native vegetation cover and greater introduced species cover. Once site access is granted, Site L1 will be assessed in accordance with the NVC assessment manuals. When completed this data report will be amended accordingly to adjust and finalise Site L1 Total Biodiversity Scores and SEB offset requirements.

Vegetation Association	Assumed <i>Atriplex paludosa ssp. cordata</i> (Marsh Saltbush) coastal plain shrubland				
<b>Photo not available</b>					
General description	See description for Site I1.				
Threatened species or community	<p>Not available at present.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of Site L1 (for further information see Section 4.2 below):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (<i>Neophema elegans</i>) SA: Rare</li> <li>• Letter-Winged Kite (<i>Elanus scriptus</i>) SA: Rare</li> <li>• Orange-bellied Parrot (<i>Neophema chrysogaster</i>) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) SA: Rare</li> <li>• Plains-wanderer (<i>Pedionomus torquatus</i>) EPBC: Critically Endangered; SA: Endangered</li> </ul>				
Landscape context score	1.16	Vegetation Condition Score	32.90	Conservation significance score	1.10
Unit biodiversity Score	41.97	Area (ha)	0.77	Total biodiversity Score	32.32



# Map 10. Site J1, K1 and L1



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 Projection: Web Mercator (Auxiliary Sphere)



Scattered Trees 1-4 (Map 11) – Included in Part B of the land

**Note:** A preliminary field assessment of Trees 1-4 was undertaken on 13 June 2019 by a Jacobs Ecologist. Ecological information was collected according to the DPTI Vegetation Removal Policy (2018) and NVC Scattered Tree Assessment Manual 2019. For the purpose of this report and application, the data collected by the Jacobs ecologist was used to estimate the Total Biodiversity Scores and SEB offset requirements for the proposed impacts to Trees 1-4. Once site access is granted, Trees 1-4 will be reassessed in accordance with the NVC Scattered Tree Assessment Manual. When completed this data report will be amended accordingly to adjust and finalise Trees 1-4 Total Biodiversity Scores and SEB offset requirements.

Tree ID – Tree 1	<p><b>Photo 29:</b> viewing south. Photo taken by Jacobs ecologist. Photo of entire tree will be taken and included in the amended report once site access has been gained.</p> 
<i>Eucalyptus porosa</i> (Mallee Box)	
Number of trees – 1	
Height (m) – 6	
Hollows – Nil	
Diameter (cm) – 20	
Canopy dieback (%) – 20	
Total Biodiversity Score – 0.59	
<p>Tree 1 may provide habitat for the Elegant Parrot (<i>Neophema elegans</i>) which is rated as Rare under the <i>NPW Act</i>. However, due to Tree 1’s proximity to an existing major transport route, it is unlikely to be used as habitat by the Elegant Parrot.</p>	

Tree ID – Tree 2
<i>Eucalyptus porosa</i> (Mallee Box)
Number of trees – 1
Height (m) – 6
Hollows – Nil
Diameter (cm) – 25
Canopy dieback (%) – 20
Total Biodiversity Score – 0.99

**Photo 30:** viewing north east. Photo taken by Jacobs ecologist. Photo of entire tree will be taken and included in the amended report once site access has been gained.



Tree 2 may provide habitat for the Elegant Parrot (*Neophema elegans*) which is rated as Rare under the *NPW Act*. However, due to Tree 2's proximity to an existing major transport route, it is unlikely to be used as habitat by the Elegant Parrot.

Tree ID – Tree 3
<i>Eucalyptus porosa</i> (Mallee Box)
Number of trees – 1
Height (m) – 5
Hollows – Nil
Diameter (cm) – 20
Canopy dieback (%) – 20
Total Biodiversity Score – 0.50

**Photo 31:** viewing south. Photo taken by Jacobs ecologist. Photo of entire tree will be taken and included in the amended report once site access has been gained.



Tree 3 may provide habitat for the Elegant Parrot (*Neophema elegans*) which is rated as Rare under the *NPW Act*. However, due to Tree 3's proximity to an existing major transport route, it is unlikely to be used as habitat by the Elegant Parrot.

Tree ID – Tree 4
<i>Eucalyptus porosa</i> (Mallee Box)
Number of trees – 1
Height (m) – 6
Hollows – Nil
Diameter (cm) – 25
Canopy dieback (%) – 20
Total Biodiversity Score – 0.99

**Photo 32:** viewing south. Photo taken by Jacobs ecologist. Photo of entire tree will be taken and included in the amended report once site access has been gained.



Tree 4 may provide habitat for the Elegant Parrot (*Neophema elegans*) which is rated as Rare under the *NPW Act*. However, due to Tree 4's proximity to an existing major transport route, it is unlikely to be used as habitat by the Elegant Parrot.

# Map 11. Scattered Trees 1-4



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0 66 Metres

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Projection: Web Mercator (Auxiliary Sphere)



## 4.2 Threatened Species assessment

No species of conservation significance at the national or state level were recorded during the site assessment. Only one native bird species was observed in Site I2 and I3, being the Inland Thornbill (*Acanthiza apicalis*). Also sighted in Site I2 and I3 was the introduced feral Pigeon (*Columba livia*). In addition, European Rabbit (*Oryctolagus cuniculus*) scats and scratching were observed across most of the proposed clearance areas.

### Species observed on site, or recorded within 5km of the application area since 1995, or the vegetation is considered to provide suitable habitat

Species (common name)	NP&W Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
<i>Acanthiza iredalei rosinae</i> (Gulf St Vincent Slender-billed Thornbill)	V	VU	2 & 5	2007	Mainly inhabits intertidal samphire flats dominated by <i>Tecticornia arbuscula</i> (Shrubby Samphire).	Possible in Site F2 & I3 – No sighting during targeted survey. Preferred habitat not present. However, the Gulf St Vincent Slender-billed Thornbill mainly inhabits intertidal samphire flats dominated by <i>Tecticornia arbuscula</i> (Shrubby Samphire), which was not recorded in the proposed clearance area along Wakefield River. As such, the species <u>unlikely</u> to occur in these areas (personal communication with Graham Carpenter on 15 June 2020).
<i>Actitis hypoleucos</i> (Common Sandpiper)		R	2	2018	Utilises coastal wetlands and some inland wetlands.	Possible in habitat in Site F2 & I3. Not sighted during site assessment.
<i>Anas rhynchos</i> (Australasian Shoveler)		R	2	2017	Prefers large undisturbed heavily vegetated freshwater swamps. It is also found on open waters and occasionally along the coast.	Possible as recorded within the previous 20 years - Preferred habitat not present.
<i>Biziura lobata</i> (Musk Duck)		R	2	2018	Found in deep freshwater lagoons, with dense reed beds.	Possible as recorded within the previous 20 years - Preferred habitat not present.
<i>Calidris canutus</i> (Red Knot)	EN		5	No records	Coast in sandy estuaries with tidal mudflats.	Unlikely - Preferred habitat not present.
<i>Calidris ferruginea</i> (Curlew Sandpiper)	CR		5	No records	Intertidal mudflats of estuaries, lagoons, mangroves, as well as	Unlikely - Preferred habitat not present.

					beaches, rocky shores and around lakes, dams and floodwaters.	
<i>Calidris tenuirostris</i> (Great Knot)	CE	R	5	No records	Inhabit intertidal mudflats and sandflats in sheltered coasts.	Unlikely - Preferred habitat not present.
<i>Charadrius leschenaultia</i> (Greater Sand Plover)	VU	R	5	No records	Open grasslands in arid and semi-arid zones.	Unlikely - Preferred habitat not present.
<i>Charadrius mongolus</i> (Lesser Sand Plover)	EN	R	5	No records	Open grasslands in arid and semi-arid zones.	Unlikely - Preferred habitat not present.
<i>Cladorhynchus leucocephalus</i> (Banded Stilt)		V	2	2013	Found mainly in saline and hypersaline waters of the inland and coast, typically large, open and shallow.	Possible as recorded within the previous 20 years - Preferred habitat not present.
<i>Egretta garzetta</i> (Little Egret)		R	2	2018	Tidal mudflats, saltwater and freshwater wetlands, and mangroves.	Possible as recorded within the previous 20 years - Preferred habitat not present.
<i>Elanus scriptus</i> (Letter-Winged Kite)		R	2	2013	Open country and grasslands where there are tree-lined streams or water courses.	Possible in all sites, except F2 & I3, as recorded within the previous 20 years - Preferred habitat not present. Not sighted during site assessment.
<i>Falco peregrinus</i> (Peregrine Falcon)		R	2	2017	Prefers coastal and inland cliffs or open woodlands near water.	Possible in all sites, except F2 & I3, as recorded within the previous 20 years - Preferred habitat not present. Not sighted during site assessment.
<i>Limosa lapponica baueri</i> (Bar-tailed Godwit)	VU		5	No records	Inhabit estuarine mudflats, beaches and mangroves	Unlikely - Preferred habitat not present.
<i>Neophema elegans</i> (Elegant Parrot)		R	2	2017	Open habitats including grasslands, shrublands, mallee, woodlands and thickets, bluebush plains, heathlands, saltmarsh and farmland.	Possible, except F2 & I3, as recorded within the previous 20 years. However, given the sites proximity to an existing major transport route, the NVC may consider it unlikely that the Elegant Parrot would utilise these areas as suitable habitat. Not sighted during site assessment.
<i>Neophema chrysogaster</i> (Orange-bellied Parrot)	CR	E	5	No records	Has limited distribution in SA, prefers coastal	Unlikely - Preferred habitat not present.



					habitats, saltmarsh, dunes.	
<i>Numenius madagascariensis</i> (Far Eastern Curlew)	CR	V	5	No records	Found on intertidal mudflats and sandflats.	Unlikely - Preferred habitat not present.
<i>Oxyura australis</i> (Blue-Billed Duck)		R	2	2017	Almost wholly aquatic on large, deep open freshwater dams.	Possible as recorded within the previous 20 years - Preferred habitat not present.
<i>Pedionomus Torquatus</i> (Plains-wanderer)	CR	E	5	No records	Lives on open, sparse swards and grasslands.	Unlikely - Preferred habitat not present.
<i>Pezoporus occidentalis</i> (Night Parrot)	EN	E	5	No records	Inhabit arid or semi-arid grasslands that are dominated by spinifex.	Unlikely - Preferred habitat not present.
<i>Plegadis falcinellus</i> (Glossy Ibis)		R	2	2017	Requires shallow water and mudflats.	Possible as recorded within the previous 20 years - Preferred habitat not present.
<i>Porzana tabuensis</i> (Spotless Crane)		R	2	2017	Well-vegetated edges of wetlands.	Possible as recorded within the previous 20 years - Preferred habitat not present
<i>Rostratula australis</i> (Australian Painted Snipe)	EN	V	5	No records	Inhabits shallow, brackish or freshwater terrestrial wetlands.	Unlikely - Preferred habitat not present.
<i>Sternula nereis</i> (Fairy Tern)	VU	E	5	No records	Found on coastal beaches, inshore and offshore islands, sheltered inlets, sewage farms, harbours, estuaries and lagoons.	Unlikely - Preferred habitat not present.
<i>Stictonetta naevosa</i> (Freckled Duck)		V	2	2018	Prefers permanent freshwater swamps and creeks with heavy growth of cumbungi (bullrushes), lignum or tea-tree.	Possible as recorded within the previous 20 years - Preferred habitat not present
<i>Thincornis cucullatus</i> (Hooded Plover)	VU	V	5	No records	Found on sandy beaches.	Unlikely - Preferred habitat not present.
<i>Tringa brevipes</i> (Grey-Tailed Tattler)		R	2	2014	Usually seen in small flocks on sheltered coasts with reefs and rock platforms or with intertidal mudflats.	Possible as recorded within the previous 20 years - Preferred habitat not present
Source; 1- BDBSA, 2 - AoLA, 3 – NatueMaps 4 – Observed/recorded in the field, 5 - Protected matters search tool, 6 – others NP&W Act; E= Endangered, V = Vulnerable, R= Rare EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable						

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

Likelihood	Criteria
Highly Likely/Known	Recorded in the last 10 years, the species does not have highly specific niche requirements, the habitat is present and falls within the known range of the species distribution or; The species was recorded as part of field surveys.

Likely	Recorded within the previous 20 years, the area falls within the known distribution of the species and the area provides habitat or feeding resources for the species.
Possible	Recorded within the previous 20 years, the area falls inside the known distribution of the species, but the area does not provide habitat or feeding resources for the species.  Recorded within 20 -40 years, survey effort is considered adequate, habitat and feeding resources present, and species of similar habitat needs have been recorded in the area.
Unlikely	Recorded within 20 -40 years; however, suitable habitat does not occur, and species of similar habitat requirements have not been recorded in the area.  No records despite adequate survey effort.

## 4.3 Cumulative impact

*When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must consider the potential cumulative impact, both direct and indirect, that is reasonably likely to result from a proposed clearance activity.*

### **Direct Impacts**

The direct impacts to native vegetation of the proposed development are discussed above in Section 4.1. Clearance is required for the construction of a highway, associated stormwater infrastructure, borrow pit, laydown area and site office compound.

### **Indirect Impacts**

No indirect impacts are foreseen for the proposed development. The PWOHD project will avoid indirect impacts to native vegetation by implement an environmental management protection system during construction, such as establishing vegetation protection zones, educating site staff, suppressing dust, designating site access routes and managing the spread and introduction of weed species.

### **Cumulative Impacts**

There are no additional clearances associated with this development and application.

## 4.4 Address the Mitigation Hierarchy

*When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must have regard to the mitigation hierarchy. The NVC will also consider, with the aim to minimize, impacts on biological diversity, soil, water and other natural resources, threatened species or ecological communities under the EPBC Act or listed species under the NP&W Act.*

### **a) Avoidance – outline measures taken to avoid clearance of native vegetation**

The design of the PWOHD project has been chosen to predominantly run adjacent of the existing highway. This allows the project to utilise the pre-existing roads and limits the encroachment of new infrastructure into neighbouring properties, and thus, impacts to native vegetation. The new south bound lane is to diverge around the eastern side of the township to minimise impact to local businesses and ensure ongoing access to the township for road network users. The overpass to be constructed at the intersection of the Princess highway and Copper Coast Highway has been chosen to alleviate impacts to road users during construction and allow effective movement for all road network users. Impacts to native vegetation were further avoided by steepening batters to reduce encroachment into adjoining areas and minimising the additional footprint required for constructability (PW2PA, personal communication 3 July 2020). In addition, the southern compound was originally located within a patch of remnant revegetation immediately north of the intersection of Shrike Road and the Princess Highway. The compound would have impacted approximately 0.13ha of protected native vegetation. Following the site assessment and recommendations, the applicant moved the southern compound site further north to a rehabilitated hardstand area which has been revegetated with local and non-local native species to further avoid impacts to native vegetation protected under the *Native Vegetation Act 1991*. An existing vehicle track leads to the proposed compound site from Shrike Road adjacent to neighbouring property which will be utilised during construction (see Map. 3).

### **b) Minimization – if clearance cannot be avoided, outline measures taken to minimize the extent, duration and intensity of impacts of the clearance on biodiversity to the fullest possible extent (whether the impact is direct, indirect or cumulative).**

Where clearance cannot be avoided all reasonable measures will be taken to minimise further impacts to native vegetation during construction activities. Such measures include; delineating native vegetation with exclusion zone fencing, use of non-destructive excavation techniques where practical, education and training of site staff regarding native vegetation protection, strict use of designated access points/routes etc, engagement of

suitably qualified consultants (ecologist, arborists, fauna spotter-catchers etc), ongoing weed management to avoid the introduction and spread of weed species and effective dust mitigation by ongoing dust suppression and revegetation of disturbed areas (PW2PA, personal communication 3 July 2020).

**c) Rehabilitation or restoration – outline measures taken to rehabilitate ecosystems that have been degraded, and to restore ecosystems that have been degraded, or destroyed by the impact of clearance that cannot be avoided or further minimized, such as allowing for the re-establishment of the vegetation.**

The areas of roadside native vegetation impacted during construction activities will be rehabilitated via hydroseed treatments. The final details of the hydroseed treatment methodology are still in development via consultation with hydroseeding contractors, but the intent is as follows:

- place 100mm layer of site won topsoil ameliorated with compost and gypsum;
- hydroseed with native hydroseed mix similar to the vegetation species composition found on site. Where appropriate, and aligned with construction program, local sourced seed will be utilised. Final species mixes will be developed in consultation with hydroseeding contractors and local seed suppliers (PW2PA, personal communication 3 July 2020).

In addition, the construction phase of the project will require clearance for a temporary laydown area, site office compound and borrow pit. Once the required material has been extracted, the borrow pit will be developed into a stormwater catchment basin and landscaped with appropriate native species. Furthermore, the temporary laydown and site office compound areas will be rehabilitated once construction is completed with similar native flora species currently found at these sites.

**d) Offset – any adverse impact on native vegetation that cannot be avoided or further minimized should be offset by the achievement of a significant environmental benefit that outweighs that impact.**

As stated below in Section 6, PW2PA has requested preference to provide the Significant Environmental Benefit (SEB) through payment into the NVC Fund.

## 4.5 Principles of Clearance (Schedule 1, Native Vegetation Act 1991)

The Native Vegetation Council will consider Principles 1(b), 1(c) and 1(d) when assigning a level of Risk under Regulation 16 of the Native Vegetation Regulations.

Principle of clearance	Relevant information	Assessment against the principles	Moderating factors that may be considered by the NVC
<b>Principle 1b - significance as a habitat for wildlife</b>	<p>No threatened species were recorded during the site assessment.</p> <p>Search results registered the following terrestrial fauna species that have been recorded in the vicinity of all sites (not including wetland communities at Sites F2 &amp; I3):</p> <ul style="list-style-type: none"> <li>• Elegant Parrot (Neophema elegans) SA: Rare</li> <li>• Letter-Winged Kite (Elanus scriptus) SA: Rare</li> <li>• Orange-bellied Parrot (Neophema chrysogaster) EPBC: Critically Endangered; SA: Endangered</li> <li>• Peregrine Falcon (Falco peregrinus) SA: Rare</li> <li>• Plains-wanderer (Pedionomus torquatus) EPBC: Critically Endangered; SA: Endangered</li> </ul>	<p><u>Seriously at Variance</u> All sites under application.</p> <p><u>At Variance</u> – Trees 1-4.</p>	<p>The vegetation under application may not be regarded as essential habitat for the fauna species included in this report. If the NVC determine that the listed species would not utilise the vegetation under application as essential habitat this principle of clearance may be reduced to 'at variance' or 'not at variance'.</p> <p>In addition, given the sites proximity to an existing major transport route, the NVC may consider it unlikely that the list species would utilise these areas as suitable habitat.</p>

	<p>Search results registered the following wetland fauna species that have been recorded in the vicinity of Sites F2 &amp; I3:</p> <ul style="list-style-type: none"> <li>• Gulf St Vincent Slender-billed Thornbill (<i>Acanthiza iredalei rosinae</i>) EPBC: Vulnerable; SA: Vulnerable</li> <li>• Common Sandpiper (<i>Actitis hypoleucos</i>) SA: Rare</li> </ul> <p>However, Graham Carpenter from the NVB advised that the Gulf St Vincent Slender-billed Thornbill mainly inhabits intertidal samphire flats dominated by <i>Tecticornia arbuscula</i> (Shrubby Samphire), which was not recorded in Site F2 and I3. As such, the species is unlikely to occur in these areas (personal communication on 15 June 2020). In addition, targeted surveying efforts during the site assessment failed to record the presence of the Gulf St Vincent Slender-billed Thornbill.</p> <p><u>Patches:</u> Threatened Fauna Score: All Sites scored 0.1, except for Site F2 and I3 which scored 0.08.</p> <p>Unit biodiversity Score: Site I3 scored 76.37.</p> <p><u>Trees:</u> Trees 1-4 may provide habitat for one Rare bird species, the Elegant Parrot, listed under the <i>NPW Act</i></p>		
<p><b>Principle 1c - plants of a rare, vulnerable or endangered species</b></p>	<p>No threatened species recorded within the proposed clearance areas.</p> <p>Threatened Flora Scores: All sites scored 0.00.</p>	<p>Not at Variance</p>	
<p><b>Principle 1d - the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered:</b></p>	<p>The vegetation in Site I3 <u>may</u> be considered a Temperate Coastal Saltmarsh ecological community which are listed as vulnerable under the EPBC Act 1999.</p> <p>Threatened Community Score: Site I3 scored 1.35.</p>	<p><u>Seriously at Variance</u> - Site I3: <i>Tecticornia halocnemoides</i> ssp. (Grey Samphire) +/- <i>Tecticornia indica</i> ssp. (Brown-head samphire) shrubland (Temperate Coastal Saltmarsh)</p>	<p>Due to the small size of Site I3 (0.27ha) and that similar ecological communities are well represented in the northern section of St. Vincent Gulf coastal area; clearance of Site I3 will not significantly reduce the overall extent of Temperate Coastal Saltmarshes in the region or lead to a long-term adverse effect in their regional cover.</p>

## 4.6 Risk Assessment

<b>Total clearance</b>	No. of trees	4
	Area (ha)	35.839
	Total biodiversity Score	1526.61
<b>Seriously at variance with principle 1(b), 1(c) or 1 (d)</b>	1(b) – all sites & 1 (d) – Site 13	
<b>Risk assessment outcome</b>	Level 4	

# 5. Clearance summary

**Clearance Areas Summary table**

Block	Site	Species diversity score	Threatened Ecological community Score	Threatened plant score	Threatened fauna score	UBS	Area (ha)	Total Biodiversity score	Loss factor	Loadings	Reductions	SEB Points required	SEB payment	Admin Fee
A	A1	9	1	0	0.1	31.33	0.056	1.75	1	0	0	1.84	785.71	43.21
B	B1	9	1	0	0.1	31.33	0.043	1.35	1	0	0	1.41	603.32	33.18
C	C1	9	1	0	0.1	31.33	0.07	2.19	1	0	0	2.30	979.15	53.85
D	D1	18	1	0	0.1	44.24	0.52	23.00	1	0	0	24.15	10,238.75	563.13
D	D2	16	1	0	0.1	38.83	1.95	75.71	1	0	0	79.50	33,595.21	1,847.74
E	E1	12	1	0	0.1	21.77	0.06	1.31	1	0	0	1.37	577.80	31.78
F	F1	21	1	0	0.1	52.16	0.48	25.16	1	0	0	26.42	11,097.28	610.35
F	F2	6	1	0	0.08	33.61	0.02	0.67	1	0	0	0.71	296.43	16.30
F	F3	21	1	0	0.1	52.13	0.36	18.77	1	0	0	19.70	8,275.45	455.15
F	F4	15	1	0	0.1	29.05	0.35	10.17	1	0	0	10.67	4,483.11	246.57
G	G1	15	1	0	0.1	42.57	0.46	19.58	1	0	0	20.56	8,608.43	473.46
H	H1	15	1	0	0.1	21.23	0.25	5.31	1	0	0	5.57	2,376.31	130.70
I	I1	20	1	0	0.1	43.42	3.86	167.61	1	0	0	175.99	73,457.00	4,040.14
I	I2	6	1	0	0.1	21.07	0.93	19.60	1	0	0	20.58	8,588.83	472.39
I	I3	18	1.35	0	0.08	76.37	0.27	20.62	1	0	0	21.65	9,037.29	497.05
I	I4*	20	1	0	0.1	43.42	17.35	753.36	1	0	0	791.03	331,204.49	18,216.25
I	I5	15	1	0	0.1	48.76	0.48	23.40	1	0	0	24.57	10,257.29	564.15
J	J1*	20	1	0	0.1	42.34	6.54	276.88	1	0	0	290.72	121,724.81	6,694.86
K	K1	10	1	0	0.1	46.91	1.02	47.85	1	0	0	50.24	21,036.73	1,157.02
L	L* 1*	20	1	0	0.1	41.97	0.77	32.32	1	0	0	33.94	14,209.02	781.50
<b>Total</b>							<b>35.839</b>	<b>1526.61</b>				<b>1602.92</b>	<b>\$671,432.41</b>	<b>\$36,928.78</b>

\* Included in Part B of the land

**Scattered trees Summary table**

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Biodiversity score	Loss factor	SEB Points required	SEB Payment	Admin Fee
1	1	1	0	0.59	1	0.62	\$258.94	\$12.95
2	1	1	0	0.99	1	1.04	\$436.60	\$21.83
3	1	1	0	0.50	1	0.52	\$218.65	\$10.93
4	1	1	0	0.99	1	1.04	\$436.60	\$21.83
<b>Total</b>	<b>4</b>			<b>3.07</b>		<b>3.22</b>	<b>\$1,351.08</b>	<b>\$67.54</b>

**Totals summary table**

	<b>Total Biodiversity score</b>	<b>Total SEB points required</b>	<b>SEB Payment</b>	<b>Admin Fee</b>	<b>Total Payment</b>
<b>Application</b>	1,529.68	1,606.14	\$672,783.49	\$36,996.32	\$709,779.81

<b>Economies of Scale Factor</b>	0.5
<b>Rainfall (mm)</b>	323-328



# 6. Significant Environmental Benefit

A Significant Environmental Benefit (SEB) is required for approval to clear under Division 5 of the *Native Vegetation Regulations 2017*. The NVC must be satisfied that as a result of the loss of vegetation from the clearance that an SEB will result in a positive impact on the environment that is over and above the negative impact of the clearance.

## **ACHIEVING AN SEB**

Indicate how the SEB will be achieved by ticking the appropriate box and providing the associated information:

- Establish a new SEB Area on land owned by the proponent.
- Use SEB Credit that the proponent has established.
- Apply to have SEB Credit assigned from another person or body.
- Apply to have an SEB to be delivered by a Third Party.
- Pay into the Native Vegetation Fund.

## **PAYMENT SEB**

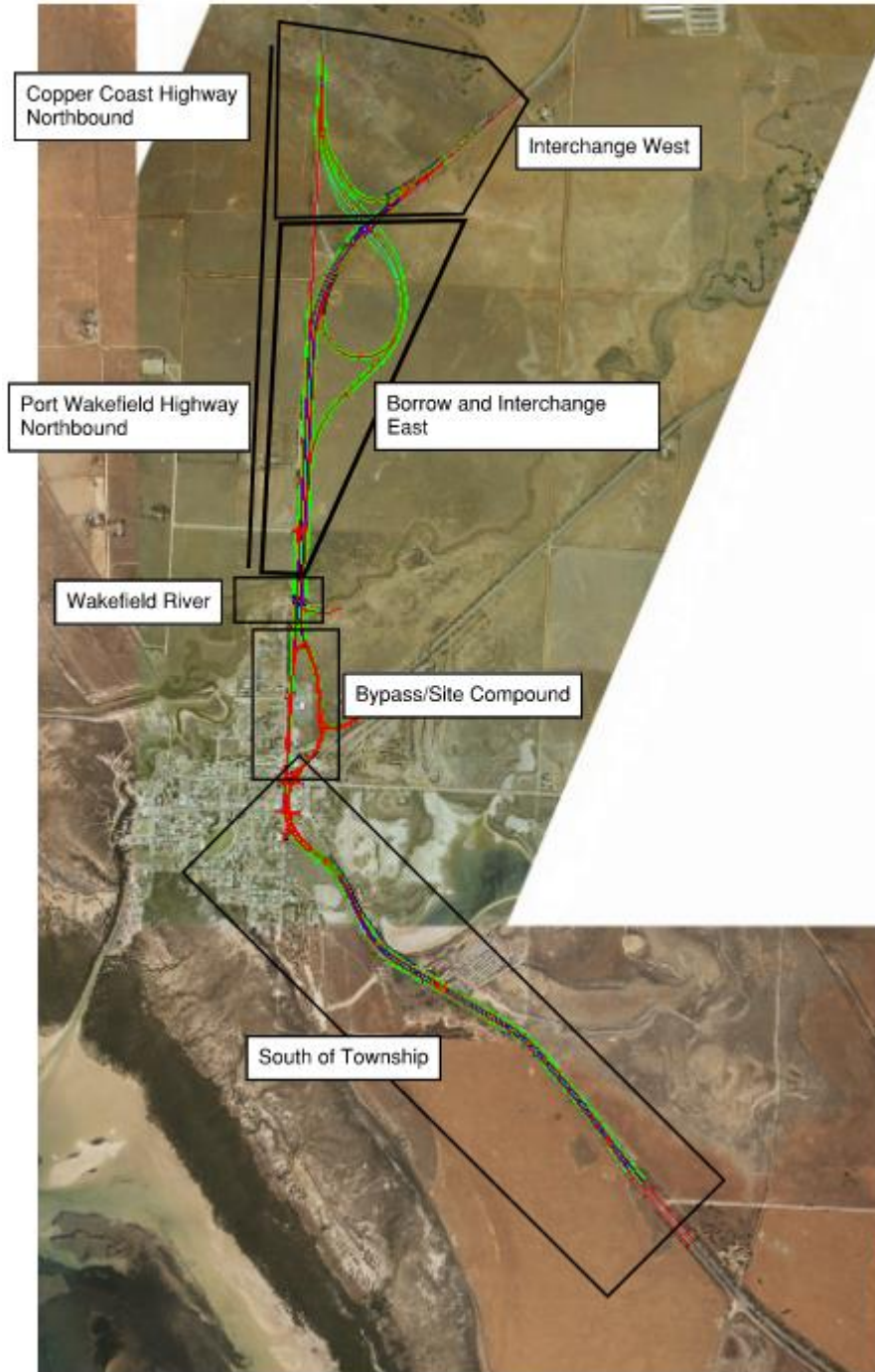
- Total SEB Amount: \$709,779.81

## **Payment Staging Plan**

SEB payments have been proposed to be paid one month prior to clearance within each area of the project. The tables below display the current program dates for clearance of each site with a provision for SEB payment to be made one month in advance. The Project proposes 5 payment checkpoints based on the staging of construction, areas referred to in the table are shown on the map below.

Block	Site	Area (ha)	SEB Points required	SEB payment	Admin Fee	Area	Proposed clearance date	Proposed Payment Date
A	A1	0.056	1.84	785.71	43.21	South of Township	12/10/2020	12/09/2020
B	B1	0.043	1.41	603.32	33.18	South of Township	12/10/2020	12/09/2020
C	C1	0.07	2.3	979.15	53.85	South of Township	12/10/2020	12/09/2020
D	D1	0.52	24.15	10,238.75	563.13	South of Township	12/10/2020	12/09/2020
D	D2	1.95	79.5	33,595.21	1,847.74	South of Township	12/10/2020	12/09/2020
E	E1	0.06	1.37	577.8	31.78	South of Township	12/10/2020	12/09/2020
F	F1	0.48	26.42	11,097.28	610.35	South of Township	12/10/2020	12/09/2020
F	F2	0.02	0.71	296.43	16.3	South of Township	12/10/2020	12/09/2020
F	F3	0.36	19.7	8,275.45	455.15	South of Township	12/10/2020	12/09/2020
F	F4	0.35	10.67	4,483.11	246.57	South of Township	12/10/2020	12/09/2020
G	G1	0.46	20.56	8,608.43	473.46	South of Township	12/10/2020	12/09/2020
H	H1	0.25	5.57	2,376.31	130.7	South of Township	12/10/2020	12/09/2020
I	I1	3.86	175.99	73,457.00	4,040.14	Bypass/Site Compound	1/09/2020	1/08/2020
I	I2	0.93	20.58	8,588.83	472.39	Wakefield River	11/11/2020	11/10/2020
I	I3	0.27	21.65	9,037.29	497.05	Wakefield River	11/11/2020	11/10/2020
I	I4*	17.35	791.03	331,204.49	18,216.25	Pt Wakefield Sthbound/Borrow Pit/Interchange East	11/11/2020	11/10/2020
I	I5	0.48	24.57	10,257.29	564.15	Pt Wakfield Highway Northbound	10/08/2021	10/07/2021
J	J1*	6.54	290.72	121,724.81	6,694.86	Interchange West	11/11/2020	11/10/2020
K	K1	1.02	50.24	21,036.73	1,157.02	Northbound Highway	2/02/2021	2/01/2021
L	L*1*	0.77	33.94	14,209.02	781.5	Pt Wakefield Sthbound/Borrow Pit/Interchange East	11/11/2020	11/10/2020
	<b>Total</b>	<b>35.839</b>	<b>1602.92</b>	<b>\$671,432.41</b>	<b>\$36,928.78</b>			

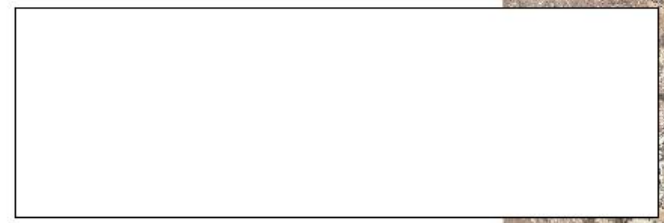
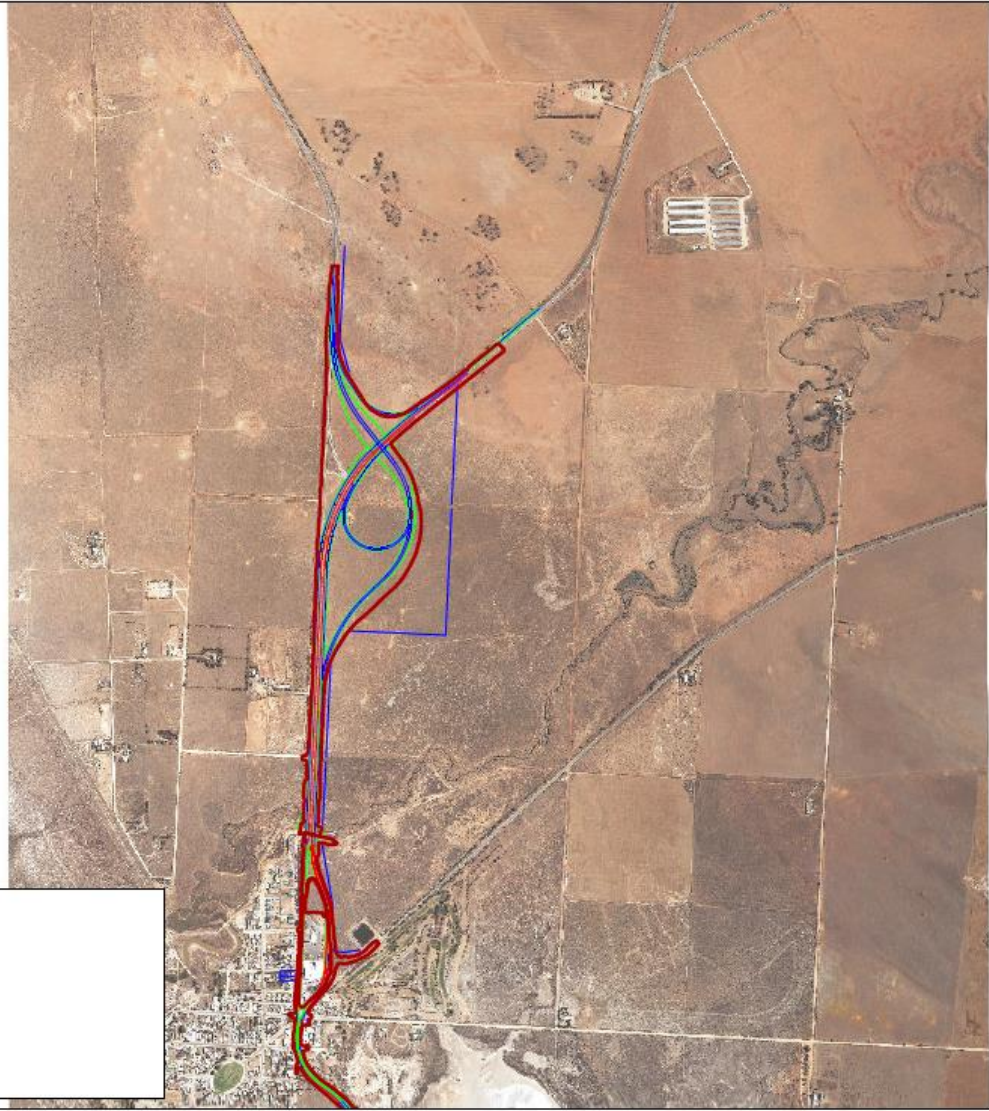
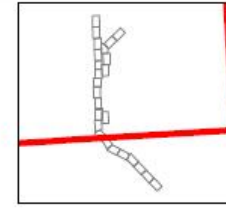
Payment Checkpoints	Area Description
1/08/2020	Bypass/Site Compound
12/09/2020	South of Township
11/10/2020	Wakefield River Pt Wakefield Sthbound/Borrow Pit/Interchange East Interchange West
2/01/2021	Copper Coast Highway Northbound
10/07/2021	Port Wakefield Highway Northbound



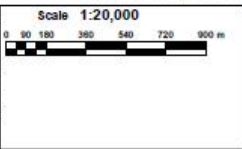
# 7. Appendices

Appendix 1. Port Wakefield Overpass and Highway Duplication design plans and project layout – North and South (also submitted in PDF format)

North



Rev	Description	Date	Approved
A			MD

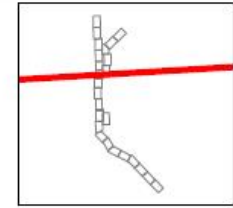


Status			
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Coordinate System	MGA ZONE 54	Designed	GD
Height Datum	AHD	Date Printed	02-07-20
Filename:	SEP_PWP_Map.mxd		

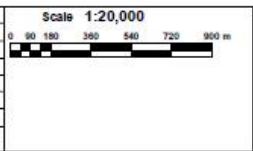


PW to PA - PWP			
MAP SERIES			
1 of 1			
Project Number	Discipline	Document	Document Number
VD1033	ENV	FL	001
Rev	B		

# South



Rev	Description	Date	Approved
A			MD



Status			
Original Size	A3	Drawn	GIS
Coordinate System	MGA ZONE 54	Designed	GD
Height Datum	AHD	Date Printed	02-07-20
Filename:	SEP_PWP_Map.mxd		



PW to PA - PWP				
MAP SERIES				
1 of 1				
Project Number	Discipline	Document	Document Number	Rev
VD1033	ENV	PL	001	B

Appendix 2. Bushland, Rangeland and Scattered Tree Vegetation Assessment Scoresheets associated with the proposed clearance (submitted in Excel format)

Appendix 3. Flora Species List

Scientific Name	Common Name	A1	B1	C1	D1	D2	E1	F1	F2	F3	F4	G1	H1	I1	I2	I3	I4	I5	J1	K1	L1
<i>Acacia hakeoides</i>	Hakea Wattle																				
<i>Acacia ligulata</i>	Umbrella Bush	√	√	√	√R							√									
<i>Atriplex paludosa</i> ssp. <i>cordata</i>	Marsh Saltbush				√	√	√	√		√				√R	√		√R	√	√R	√R	√R
<i>Atriplex stipitata</i>	Bitter Saltbush				√			√		√				√			√	√	√	√R	√
<i>Austrostipa elegantissima</i>	Feather Spear-grass													√			√		√		√
<i>Austrostipa</i> sp.	Spear-grass												√								
<i>Chloris truncata</i>	Windmill Grass												√								
<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	Round-leaf Pigface					√R		√R		√R		√R		√R	√R	√R	√R	√R	√R	√R	√R
<i>Duma florulenta</i>	Lignum															√					
<i>Einadia nutans</i> ssp.	Climbing Saltbush												√	√			√		√		√
<i>Enchylaena tomentosa</i> var.	Ruby Saltbush	√R	√R	√R	√R	√R	√	√		√	√	√		√R			√R	√R	√R		√R
<i>Enneapogon nigricans</i>	Black-head Grass												√								
<i>Erodium crinitum</i>	Blue Heron's-bill																				
<i>Eucalyptus phenax</i> ssp. <i>phenax</i>	White Mallee	√	√	√																	
<i>Exocarpos aphyllus</i>	Leafless Cherry					√	√														
<i>Maireana brevifolia</i>	Short-leaf Bluebush	√	√	√	√	√R		√		√	√		√	√	√		√	√R	√	√R	√
<i>Maireana erioclada</i>	Rosy Bluebush	√R	√R	√R	√R	√R		√		√	√										
<i>Melaleuca lanceolata</i>	Dryland Tea-tree																				
<i>Myoporum platycarpum</i> ssp.	False Sandalwood									√R	√										
<i>Nitraria billardierei</i>	Nitre-bush	√	√	√	√	√	√	√		√	√	√		√	√	√	√	√	√	√R	√

Scientific Name	Common Name	A1	B1	C1	D1	D2	E1	F1	F2	F3	F4	G1	H1	I1	I2	I3	I4	I5	J1	K1	L1
<i>Osteocarpum acropterum</i> var.	Bonefruit																			√	
<i>Pittosporum angustifolium</i>	Native Apricot																				
<i>Rhagodia candolleana</i> ssp.	Sea-berry Saltbush	√	√	√	√	√	√	√		√				√			√		√		√
<i>Rhagodia crassifolia</i>	Fleshy Saltbush				√	√		√		√		√		√			√		√		√
<i>Rhagodia spinescens</i>	Spiny Saltbush													√			√		√		√
<i>Rytidosperma caespitosum</i>	Common Wallaby-grass				√	√							√R								
<i>Senna artemisioides</i> ssp.	Desert Senna																				
<i>Suaeda australis</i>	Austral Seablite					√						√				√					
<i>Tecticornia halocnemoides</i> ssp.	Grey Samphire					√		√	√	√	√	√				√		√			
<i>Tecticornia indica</i> ssp.	Brown-head Samphire					√		√	√	√	√	√				√		√			
<i>Tetragonia implexicoma</i>	Bower Spinach	√	√	√	√R		√							√			√		√		√
<i>Threlkeldia diffusa</i>	Coast Bonefruit					√		√		√			√					√			
<i>Zygophyllaceae</i> sp.	Twinleaf Family																				
<i>Asparagus asparagoides</i> f.*+	Bridal Creeper	√	√	√							√										
<i>Asphodelus fistulosus</i> *	Onion Weed																				
<i>Avena barbata</i> *	Bearded Oat	√	√	√	√	√		√		√	√	√	√	√			√	√	√		√
<i>Brassica</i> sp.*		√	√	√										√		√	√		√		√
<i>Briza</i> sp.*	Quaking Grass													√			√		√		√
<i>Bromus</i> sp.*	Brome												√								
<i>Carrichtera annua</i> *	Ward's Weed	√	√	√	√	√	√	√		√	√		√	√			√	√	√		√
<i>Casuarina glauca</i> *+	Grey Bul oak											√									



Scientific Name	Common Name	A1	B1	C1	D1	D2	E1	F1	F2	F3	F4	G1	H1	I1	I2	I3	I4	I5	J1	K1	L1
<i>Cynodon sp.*</i>	Couch							√		√											
<i>Echium plantagineum**</i>	Salvation Jane	√	√	√	√		√	√		√					√						
<i>Eucalyptus spathulata ssp. spathulata*</i>	Swamp Mallet																	√			
<i>Galenia pubescens var. pubescens*</i>	Coastal Galenia										√			√			√		√		√
<i>Lycium ferocissimum**</i>	African Boxthorn				√	√	√	√		√	√	√	√	√	√	√	√	√	√		√
<i>Malva sp.*</i>	Mallow										√		√	√			√	√	√		√
<i>Marrubium vulgare**</i>	Horehound												√								
<i>Mesembryanthemum sp.*</i>	Iceplant						√														
<i>Oncosiphon suffruticosum**</i>	Calomba Daisy													√			√		√		√
<i>Opuntia stricta**</i>	Erect Prickly Pear											√									
<i>Oxalis pes-caprae*</i>	Soursob	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√		√
<i>Pinus halepensis**</i>	Aleppo Pine																				
<i>Piptatherum miliaceum*</i>	Rice Millet							√		√											
<i>Raphanus sp.*</i>	Radish												√								
<i>Ricinus communis*</i>	Castor Oil Plant															√					
<i>Romulea sp.*</i>	Onion-grass	√	√	√	√	√		√				√	√	√			√	√	√		√
<i>Salvia verbenaca var.*</i>	Wild Sage												√								
<i>Schinus mole*</i>	Pepper-tree									√	√										
<i>Sisymbrium sp.*</i>	Wild Mustard									√	√		√	√			√		√		√
<i>Solanum elaeagnifolium**</i>	Silver-leaf Nightshade												√								
<i>Sonchus oleraceus*</i>	Common Sow-thistle	√	√	√																	
<i>Trifolium sp.*</i>	Clover				√	√															

Scientific Name	Common Name	A1	B1	C1	D1	D2	E1	F1	F2	F3	F4	G1	H1	I1	I2	I3	I4	I5	J1	K1	L1
<i>Vicia sp.*</i>	Vetch													√			√		√		√

\*Introduced species, +Declared plant, R: Regenerating