ecological associates pty ltd

Native Vegetation Clearance

Billy Lights Point: Eyre Peninsula Desalination Plant Project Data Report

Clearance under the *Native Vegetation Regulations 2017*

October 2024

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1. Application information

Application Details

Applicant:	SA Water		
Key contact:	Senior Environmental Impact Assessment Officer 250 Victoria Square Adelaide SA 5000 0407 106 531		
Landowner:	SA Water/others		
Site Address:	via St Andrews Drive, Port Lincoln		
Local Government Area:	City of Port Lincoln Lower Eyre Council	Hundred:	Lincoln
	Title ID:	Parcel ID:	
Pump Station (Wastewater Treatment Plant)	CR 5753/706	A3 D31966	
Desalination Plant / Pump Station Connection	CT 6252/673	A601 D126465	
Desalination Plant / Pump Station Connection	CT 6193/313	A82 D113518	
Desalination Plant	CT 6275/756	A10 D129500	
Transfer Main (former train line)	CT 6275/757	A11 D129500	
Transfer Main (former train line)	CT 6275/758	A12 D129500	
Transfer Main (adjacent Greyhound Road)	CT 6248/729	Q70 D124175	
Transfer Main (adjacent Greyhound Road)	CT 5401/703	S499 H510600	
SAPN Connection (Windsor Avenue Road Reserve)			
Transfer Main (Greyhound Road Reserve)			
Transfer Main (and Bluefin Road Reserve)	CL 6221/531	SE1231 H510600	
Transfer Main (adjacent Bluefin Road)	CT 5149/26	S1237 H510600	
Transfer Main (Northside Hill Tanks)	CR 5757/942	S538 H510600	

Summary of proposed clearance

Purpose of clearance	Clearance is required for the construction of a reverse osmosis desalination plant at Billy Lights Point, Port Lincoln, and associated infrastructure.
Native Vegetation Regulation	Regulation 12(34) - Infrastructure 5(1)(d) Clearance incidental to the construction or expansion of a building or infrastructure (and associated services) where the Minister has declared that the clearance is in the public interest.
Description of the vegetation under application	Mallee woodland dominated by *Eucalyptus diversifolia, angulosa, E. conglobata, E. oleosa, E. rugosa* and *E. albopurpurea* with an understorey of coastal shrubs: Site 1, Site 2, Site 3, Site 4, Site 6, Site 6a, Site 9a, Site 9b, Site 9c, WW1, WW4, WW5, RC1, RC2, RC3, RC4, RC6, RC15

	Mallee Woodland dominated by *Eucalyptus diversifolia* and/or *E. albopurpurea* with an understorey of terrestrial shrubs: TR1, TR2, TR3, TR4 Coastal shrubland dominated by *Melaleuca halmaturorum* and/or *Myoporum insulare* and *Leucopogon parviflorus:* Site RC7, RC10, RC11, RC13, RC14 Exotic and non-local native woodlands and shrublands with some native species: Site 7, Site 8, RC8, RC11, RC12
Total proposed clearance - area (ha) and number of trees	10.7337 ha total comprising: - 7.4313 ha permanent clearance - 3.3025 ha clearance with rehabilitation
Level of clearance	**Level 4**
Overlays (Planning and Design Code)	Overlays: Marine Section of Seawater Intake and Brine Disposal Pipelines • Building Near Airfields • Coastal Areas • Hazards (Acid Sulfate Soils) • Historic Shipwrecks - State • Hazards (Bushfire - Medium Risk) • Hazards (Bushfire - Outback) • Heritage Adjacency • Hazards (Flooding- Evidence Required) • **Native Vegetation** • **State Significant Vegetation** Desalination Plant and Pump Station • Coastal Areas • Hazards (Bushfire - Medium Risk) • Hazards (Flooding - Evidence Required) • **Native Vegetation** Transfer Pipeline (East of Greyhound Road) • Affordable Housing • Coastal Areas • Hazards (Bushfire - Medium Risk) • Hazards (Flooding - Evidence Required) • **Native Vegetation** Transfer Pipeline (West of Greyhound Road) • Limited Land Division • Coastal Areas • Hazards (Bushfire - General) • Hazards (Bushfire - High Risk) • Hazards (Flooding - Evidence Required) • **Native Vegetation** • **State Significant Native Vegetation** • Significant Landscape Protection • Water Resources

Map of proposed clearance area 	
Mitigation hierarchy	Clearance has been avoided by making use of cleared areas as much as possible to locate infrastructure. Clearance of the EPBC vulnerable Subtropical and Temperate Coastal Saltmarsh has been avoided by the positioning of the transfer main along Greyhound Road. Clearance to coastal vegetation adjacent to the Wastewater Treatment Plant has been avoided by tunneling the marine intake and brine disposal pipelines. The Billy Lights Point site was selected as the lowest-impact and most practical option for the desalination plant. Alternative sites at Sleaford Bay, Point Boston and Uley were rejected on the basis of higher ecological impacts, cultural heritage impacts and power demands for water transfer. Clearance has been minimised locating works in degraded vegetation as much as possible when clearance cannot be avoided. The SAPN maintenance corridor has been co-located with the Drinking Water Transfer Main to reduce clearance. The 15 m width of the Drinking Water Transfer Main construction corridor will be reduced to 12 m for approximately 560m when passing through sensitive areas including: - the SA Rare Port Lincoln Mallee plant community. - areas that support well-preserved vegetation; and

	- areas that support threatened plant species. Work will be undertaken to minimise disturbance to nesting white-bellied sea-eagle nearby. Clearance will be offset by the establishment of a new SEB area on SA Water land at Uley South.
SEB Offset proposal	**Uley Basin On-ground SEB Proposal**

2. Purpose of clearance

2.1 Description

Clearance of native vegetation is required to construct a desalination plant and associated infrastructure at Billy Lights Point at Port Lincoln, South Australia (Figure 1).

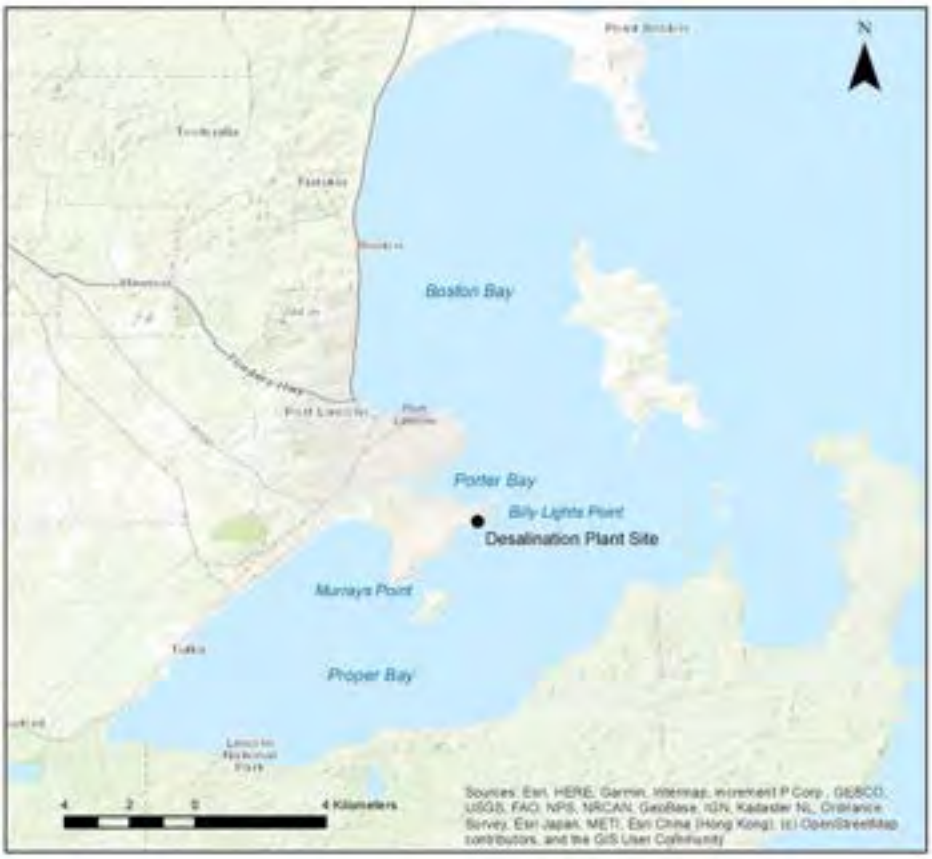

Figure 1. Site Location.

2.2 Background

SA Water plans to construct a desalination plant at Billy Lights Point to augment the water supply to Eyre Peninsula.

SA Water currently supplies Eyre Peninsula water customers through a combination of groundwater extraction and River Murray water piped to the region. The Uley South Groundwater Basin, located 30 km west of Port Lincoln, is the last remaining major productive groundwater source on Eyre Peninsula and supplies approximately 75% of the region's drinking water. For many years water in the Uley South Basin has gradually depleted towards historic low levels, placing the region's main source of water under severe pressure. Sustained over-extraction and reduced groundwater recharge also puts the basin at risk of salinisation and permanent degradation from seawater intrusion. SA Water currently holds a water allocation licence to extract groundwater from the Uley South Groundwater Basin. The licence is administered by the SA Department for Environment and Water (DEW). The allocated volume is expected to be reduced by DEW due to the basin's degraded condition, which will impact SA Water water supply volumes. To improve the basin's long-term health and meet water volume demand, a desalination plant is proposed as a climate-independent water source.

A new small 5.3 gigalitre per annum desalination plant, the Eyre Peninsula Desalination Plant (the project) is planned at Port Lincoln. Once complete, the project is expected to provide drinking water and water supplies for approximately 35,000 customers including the towns of Port Lincoln, Cummins, Wudinna, Streaky Bay, Cowell, Tumby Bay and Ceduna, and to industries including, but not limited to, the regionally and state important agriculture and seafood industries.

The drivers for the project are:

- Long term, climate-independent water security for Eyre Peninsula
- Sustainable and proactive environmental water resource management and protection of the Uley South Groundwater Basin. Water quality improvement for Eyre Peninsula through improved groundwater catchment health, and human supply via predictable desalinated water quality.
- Sustained and enabled economic growth within Eyre Peninsula through provision of predictable stable water volumes, and the potential for increased desalination plant capacity in the future.

2.3 General location map

The desalination plant will be constructed at the former BHP sand depot at Billy Lights Point (Figure 2). A new pipeline will be constructed to transfer drinking water from the plant to existing storage tanks at Northside Hill 4 km south-west of Port Lincoln. Marine transfer pipelines will be constructed from the desalination plant into Proper Bay to provide seawater to the desalination plant and dispose of brine. A pump station will be constructed on the marine intake pipeline within the Port Lincoln Wastewater Treatment Plant. A new electricity connection will be required to supply the plant and will connect to the grid in Port Lincoln.

Figure 2. General location map

2.4 Details of the proposal

Reverse Osmosis Desalination Plant and Access Road

The Reverse Osmosis (RO) Desalination Plant will be located within a brownfield site formerly used for mineral resource export (Figure 3). Site preparation will include clearance of native vegetation and levelling of the site. The SA Water land parcel is approximately 9.5 ha of which approximately 5 ha will be occupied by the plant building and infrastructure.

The RO Desalination Plant will include:

- RO desalination plant building and associated infrastructure
- Entrance way to join St Andrews Drive to the north
- Treated water pump station
- Site office, shed, chemical storage and dosing areas
- Treated water tank
- Temporary (back up) and two permanent diesel generators (duty), in case of power outage
- Concrete water tank for drinking water
- Electrical switchrooms and high voltage transformers
- Brine tank and brine pit
- Stormwater basin and process lagoon.

Figure 3. RO Desalination Plant

Drinking Water Transfer Pipeline (DWTP)

Drinking water will be transferred from the Desalination Plant to the existing SA Water water supply network via a 7 km long, 600 mm diameter underground Drinking Water Transfer Pipeline (DWTP). The DWTP will connect to the existing SA Water North Side Hill water storage tanks site on Blue Fin Road (Figure 2).

The pipeline will extend west from the Desalination Plant and will be located immediately north of the disused rail line. The pipeline will continue north-west within the Greyhound Road road reserve and adjacent properties on the

northern side. The pipeline will turn south-west to pass through cleared vegetation on the east side of Proper Bay Road until it joins Blue Fin Road. The pipeline will be located in the road bed of Blue Fin Road as far as west as Kathai Drive. From Kathai Drive the pipeline will be located in private property on the north-east side of Blue Fin Road and will then enter the North Side Hill tanks from the western side.

North Side Hill is a high point for gravity feed in the network to distribute water to customers via the existing SA Water network infrastructure.

Overhead SA Power Networks Electricity Transmission Lines

The Desalination Plant will be connected by South Australia Power Networks (SAPN) to the South Australian energy grid via a 11 kilovolt (kV) overhead transmission line (Figure 4).

The transmission line will connect to the grid at Windsor Avenue and will extend south to join the drinking water transfer pipeline corridor on Greyhound Road. The transmission line will be located immediately adjacent to the transfer pipeline main in the section along the former BHP train line.

The overhead SAPN transmission line would be approximately 3.5 km in length and supported by 32 monopoles up to 13 m high.

Figure 4. SAPN Connection at Windsor Avenue

Marine Intake and Outfall Pump Station (MIPS) site and pipeline connection RO Desalination Plant

The Marine Intake and Outfall Pump Station (MIPS) will be located at the Port Lincoln Wastewater Treatment Plant, 500 m north-east of the RO Desalination Plant (Figure 6). The MIPs will be constructed in unutilized land containing former wastewater treatment lagoons.

The route for the marine intake and brine outfall pipelines will follow the southern verge of St Andrews Drive. The marine intake has a nominal diameter of 900 mm and the brine outfall pipeline has a nominal diameter of 1000 mm.

A rising sewer main will be constructed from the RO Desalination Plant to the wastewater treatment plant.

Figure 5. Marine transfer pipelines and pump station

Marine Intake and Outfall Pipelines (excluded from this application)

The marine intake and outfall pipelines will extend from the MIPS eastwards to the marine environment and terminate approximately 1 km off the coast in Proper Bay. The pipelines will be drilled underground and pass beneath coastal vegetation adjacent to the Wastewater Treatment Plant.

Marine native vegetation impacted by the marine infrastructure is not included in this Native Vegetation Data Report and will be lodged as a separate application as agreed with Department of Environment and Water.

2.5 Approvals required *or* obtained

SA Water is established as a corporation under the *South Australian Water Corporation Act 1994* (SA) and is a statutory corporation to which the provisions of the *Public Corporations Act 1993* (SA) apply. SA Water operations, including the development and operation of the proposed project, are primarily managed under the *Work Health and Safety Act 2012* (SA), *Safe Drinking Water Act 2011* (SA), *South Australian Public Health Act 2011* (SA) and the *Work Health and Safety Act 2012* (SA).

The project requires regulatory approval under the following legislation.

Planning, Development and Infrastructure Act 2016 (SA) (PDI Act)

On 17 June 2024, the project was submitted for Development Assessment under the Section 131 (Crown Development) pathway of the PDI Act. The project will be assessed against the relevant policies under the Planning and Design Code, established under this Act.

Section 131 provides a dedicated process for development proposed by a State agency. Under Schedule 13 (ii) of the *Planning, Development and Infrastructure (General) Regulations 2017* (SA) (PDI Regulations, SA), state agency development is exempt from local government planning approval where the works involve the construction, reconstruction, alteration, repair or maintenance of any drain, pipe or underground cable. Elements of the project that fall under this exemption include terrestrial pipelines and an 11 kV overhead transmission line. However, for

completeness, these elements were assessed and included in the Section 131 development application for the project.

Local Government Act 1999 (SA) (LG Act)

It is envisaged that upgrades to some local roads would be required to facilitate safe vehicle access to the project site during construction. To support this, SA Water is required to obtain a license from City of Port Lincoln Council to make an alteration to a public road pursuant to Sections 221(2)(b) and 221(6)(b) of the LG Act.

Native Vegetation Act 1999(SA) (NV Act)

The project site is located within an area of South Australia subject to the provisions of the NV Act. Under this Act, any clearance to native vegetation must be approved by the Native Vegetation Council (or delegate). The project will require the clearance of native vegetation and related permission under this Act.

Regulation 12(34) - Infrastructure 5(1)(d) applies to this project. This Regulation allows for clearance incidental to the construction or expansion of a building or infrastructure (and associated services) where the Minister has declared that the clearance is in the public interest.

Environment Protection Act 1993 (SA)

The operation of the project infrastructure will require an EPA License. Authorisation is required to undertake prescribed activities of environmental significance e.g. dredging, discharge to marine environment.

Aboriginal Heritage Act 1988 (SA) (AH Act)

The AH Act is the central legislation for the management of Aboriginal heritage in South Australia. All Aboriginal sites, objects and remains within South Australia are protected under the Act. It is an offence under Section 23 of the AH Act to damage, disturb or interfere with Aboriginal sites, objects or remains, unless written authorisation is sought from the Minister for Aboriginal Affairs and Reconciliation. SA Water has lodged a Section 21 and Section 23 Authorisation request under the AH Act seeking authorisation from the Minister to damage, disturb or interfere with any Aboriginal site or object, where this cannot be avoided by project design or construction method.

Other environmental approvals, authorisations and permits will be required in the construction and operational phases of the project. The relevant construction contractor would be required to obtain all other work permits and approvals from relevant authorities required for construction, prior to commencing works.

Environment Protection and Biodiversity Conservation Act 1999 (Cwth) (EPBC Act)

The site is located within an area that supports Matters of National Environmental Significance (MNES) under the EPBC Act.

The project was referred by SA Water to the Commonwealth Minister for the Environment on 22 July 2024 who determined on 24 September 2024 that the project is not considered a controlled action.

Coast Protection Act 1972 (SA)

Coast Protection Board Policy[1] states that any development must establish a spatial buffer of 2 km from the breeding territories of White-bellied Sea-eagle, and 1 km from the breeding territories of Osprey. A lesser buffer distance may be supported where there is specific, independent advice provided by a suitably qualified person to demonstrate a lesser distance is acceptable with regards to the proposed development.

SA Water have agreed on an Interim Raptor Management Plan with DEW to minimise impacts during site investigation works (see Section 4.2.3).

2.6 Native Vegetation Regulation

Vegetation clearance in this project is permitted under Regulation 12(34) - Infrastructure 5(1)(d) Clearance incidental to the construction or expansion of a building or infrastructure (and associated services) where the Minister has declared that the clearance is in the public interest.

2.7 Development Application information

[1] Coast Protection Board (2016). Coast Protection Board Policy Document. Coast Protection Board, Adelaide.

The project's development application number is 24017594.

3. Method

3.1 Database Searches for Flora and Fauna

Existing records of threatened flora and fauna were reviewed for a 5 km search radius centered on the site using:

- NatureMaps and Atlas of Living Australia (20th May 2024).
- EPBC Protected Matters Search Tool (20th May 2024)
- South Australian Department for Environment and Water Biological Database of South Australia search (21st May 2024: Record set number DEWNRBDBSA240521-1.)

Figure 6. Protected Matters search area following route from Northside tanks near Kathai Conservation Park to the Billy Lights Point Wastewater Treatment Plant, with 5 km buffer.

Records with a locational reliability greater than 1 km or occurring prior to 1995 in the BDBSA, NatureMaps and Atlas of Living Australia, were excluded. For EPBC Protected Matters, species were only included if they are known to occur or their habitat is known to occur in the search area.

National conservation ratings are in accordance with the most recent *EPBC Act* Listing Status available in the Species Profile and Threats Database.

State Conservation Ratings are in accordance with the *National Parks and Wildlife Act 1972*.

Regional conservation ratings were sourced from Gillam, S. and Urban, R. (2009) Regional Species Conservation Assessment Project, Phase 1 Report: Regional Species Status Assessments, West Region. Department for Environment and Heritage, South Australia.

3.2 Flora assessment

A vegetation survey of the entire route was conducted in July 2021 to identify plant communities, compile plant species lists and evaluate risks to fauna [1]. Additional surveys were undertaken to assess coastal vegetation near the wastewater treatment plant on 7th July 2023, and near the RO Desalination Plant and east of Blue Fin Rd on 11th September 2024 (Ecological Associates). Targeted surveys for spring-flowering threatened flora, particularly orchids, were conducted along the entire route from 3rd-6th October 2023 (Ecological Associates). At the same time mapping was refined for plant communities at the desalination plant and along the disused rail corridor.

Bushland Assessments were completed for each plant association as prescribed by the Native Vegetation Council (NVC) Bushland Assessment Manual (July 2020). This included recording plant species present, vegetation structure, and habitat values offered by the plant community. Plant associations were mapped and classified according to composition and condition.

3.3 Fauna assessment

Two fauna surveys were undertaken along the proposed route.

<u>July 2021 (T&M Ecologists):</u>

Three areas were surveyed for birds:

- mallee woodlands in the proposed site for the desalination plant (Sites 1-4);
- mallee woodlands adjacent to the disused rail corridor (Sites RC1-RC6); and
- open water and adjacent saltmarsh at the western end of the proposed pipeline route (Site RC9).

The bird survey was undertaken in three areas, representing habitats that had not previously been extensively surveyed as part of this project [1]. At least one hour was spent during the early morning and late afternoon recording bird species present in the area, as per standard Biological Survey of South Australia methods [2]. Identification was either visual or by call. In addition, opportune observations were made whilst vegetation data was being gathered.

<u>December 2023 (David Armstrong)</u>

A more extensive survey of woodland birds and shore birds was conducted along the proposed pipeline route from 4th -7th December 2023. This included five locations along the old rail corridor from Billy Lights Point west to the coast on Greyhound Road, and three points along Blue Fin Road on the north-eastern side of Kathai Conservation Park (Figure 7). Shore birds were monitored within the bay south of the racetrack at four locations. Opportunistic fauna sightings were recorded during visits to the sewage works ponds, coast adjacent to Billy Lights Point and the North Side Hill tanks site. A night-time traverse of the woodland west of Billy Lights Point was undertaken on 6th December, to listen for nocturnal birds, specifically Bush Stone-curlew, owl, frogmouth or nightjar species.

Opportunistic observations of fauna during general field surveys were also recorded.

Lists of all fauna species observed during these surveys are provided in Appendices 1 and 2.

Results from these fauna surveys were supplemented with desktop searches. For State or Nationally threatened species, the suitability of the site for rare and threatened fauna was assessed based on the known distribution and occurrence of species, their habitat requirements and the quality of habitat available at the site.

Figure 7. Location of fauna survey sites conducted in December 2023 at 8 woodland (WB) sites and 4 shoreline (SB) sites along the proposed works alignment.

3.4 Marine assessment

Assessments on the potential impacts of the project on the marine environment, particularly near the intake and outfall pipes are ongoing and will be addressed in a separate data report.

4. Assessment Outcomes

4.1 Vegetation Assessment

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

The proposed desalination plant site is planned for construction at the south-eastern outskirts of the Port Lincoln township. The site is on a headland between Porter Bay to the north and Proper Bay to the south. The headland terminates at Billy Lights Point in the north-east and Murray Point in the south-west. The landscape in the vicinity of the plant site lies at 5 to 15 m AHD.

The site is located in the Lincoln IBRA Association which comprises the Jussieu Peninsula on the south-eastern tip of Eyre Peninsula and nearby islands in Spencer Gulf. Landforms in the area are strongly influenced by the shallow and very hard Lincoln Complex Granitoids whose surface influences the topography of hills, islands and embayments in the region. The surface geology mainly comprises the poorly consolidated coastal dune calcarenites of the Bridgewater Formation. The underlying granitoids frequently outcrop through the more recent material in hills, coastal cliffs and coastal rock platforms [3].

The surface geology of Murray's Point Peninsula is a low relief limestone sheet lying at mostly less than 10 m elevation with shallow sandy soils. Murrays Point is connected by a low-lying marshy area between Porter Bay and the Murrays Point Wetlands. Part of this area has been developed for the Port Lincoln Marina and a former waste disposal site (dump) in Section 507.

The topography rises to the west of Port Lincoln to 150 m AHD at the site of the Northside Tanks where soils are deeper and sandier.

The desalination plant site is on former BHP land. The site was used as a depot for lime sand hauled by rail from a mine at Coffin Bay to a wharf at Proper Bay. The site was decommissioned in 2000 but retains disused buildings including a large sand shed and maintenance shed.

The SA Water Wastewater Treatment Plant is located 500 m north-east of the desalination plant site.

The project site is located in a contiguous tract of remnant native vegetation which extends across the Murrays Point headland, covering more than 380 ha. This vegetation comprises mallee woodland, mangrove shrublands and samphire flats. The headland is isolated from remnant vegetation further west by a 1-2 km wide strip of cleared land and urban development which extends from the Port Lincoln Marina to Murrays Point Wetland.

The landscape to the west and south-west of Port Lincoln features extensive areas of native vegetation. Remnant vegetation extends from North Side Hill and Kathai Conservation Park to SA Water reserves, Lincoln Conservation Park and Lincoln National Park.

Mallee is the dominant vegetation across the study area. On the Murrays Point headland, where sandy soils overlie limestone, plant communities are dominated by *Eucalyptus diversifolia, E. oleosa* and *E. albopurpurea*. The shallow limestone sheet between the desalination plant and Greyhound Road is dominated by *E. oleosa* and *E. conglobulata*. Recent jumbled sand dunes on the south side of the headland, facing Proper Bay, are mostly cleared of native vegetation but include coastal shrublands dominated by *Myoporum insulare* and chenopods with coastal saltmarsh vegetation in Murrays Point Wetland. Native vegetation is largely absent from the limestone plain at the foot of the hills to the west of Port Lincoln. Native vegetation on the slopes and crest of the North Side Hill, including Kathai Conservation Park, is dominated by *E. diversifolia*.

Kathai Conservation Park lies 4.9 km west of the proposed desalination plant site, and Port Lincoln National Park lies ~4.6 km south on the other side of Proper Bay. The nearest Heritage Agreements are situated 15 km north-east and 15 km south-east of the site.

Average annual rainfall from 1976 to 2005 at Port Lincoln is 467 mm (NatureMaps).

Clearance Overview

Lists of native plant species recorded within the areas of impact across are provided in Appendix 4.

RO Desalination Plant

The vegetation in the proposed desalination plant site includes:

- highly disturbed areas where existing tracks and infrastructure occur;
- areas where previous clearance has occurred but natural regeneration is occurring (e.g. Sites 6 and 7);
- areas where some planting has been undertaken with non-indigenous species but there is natural regeneration occurring underneath (e.g. Site 8);
- coastal shrublands (e.g. RC7, RC10 and RC11); and
- areas of mallee, generally in good condition, albeit with some disturbance around the edges (Sites 1-4).

Areas with shallow limestone tended to support *Eucalyptus diversifolia* and *E. angulosa* over a dense understory of low and medium shrubs and sedges (Sites 2 and 4). In lower-lying areas *Melaleuca uncinata* becomes a dominant understory species (Site 3). Where soils are deeper and heavier, the overstorey includes *E. conglobata*, *E. rugosa* and *E. leptophylla* as co-dominants, over a more open low shrub understory, with *Melaleuca lanceolata* also prominent. Vegetation condition ranges from poor in previously disturbed areas through to good in the remnant mallee patches.

Wastewater Treatment Plant

Infrastructure and paved areas occupy most of the Wastewater Treatment Plant site and remnant vegetation is mostly limited to the edges of the site. Along the northern, western and southern perimeter (Site WW1), the overstorey is principally *E. diversifolia* and *E. rugosa* with scattered patches of *E. albopurpurea* and scattered emergent planted eucalypt species. The principal dominants in the understorey are *M. lanceolata* and *Myoporum insulare*. There are small, lower lying sections where water accumulates during winter, and moisture-loving species such as *Melaleuca brevifolia* and *Atriplex paludosa* occur. Vine lifeforms, such as *Tetragonia implexicoma*, *Cassytha melantha*, *Clematis microphylla* and *Comesperma volubile* are prominent features of this vegetation.

Along the eastern edge where soils are shallower adjoining the coast (Sites WW4 and WW5), the overstorey becomes *E. angulosa*, *E. conglobata* and *E. diversifolia*, with *M. lanceolata* and *Myoporum insulare* prominent medium-large shrubs. The most abundant small shrubs are *Rhagodia candolleana* and *Acrotriche patula*.

While most of the site has been disturbed to some extent, vegetation has generally recovered well and is in moderate to good condition.

Drinking Water Transfer Pipeline and SAPN Connection

The drinking water transfer pipeline and power line extend west from the desalination plant through a large area of mallee. The route follows a cleared track, approximately 3 m wide, which runs adjacent to the disused rail corridor on the northern side. The vegetation includes areas in good to excellent condition. Vegetation includes areas dominated by *E. conglobata* and *E. diversifolia* with low shrubs prominent in the understorey (Sites RC2, RC3 and RC4), and areas dominated by *E. gracilis*, *E. oleosa* and *E. rugosa* with a dense mid-shrub understorey of *Melaleuca* spp. over a thick layer of leaf litter layer (Site RC6). Towards the western end, *E. albopurpurea* makes up the dominant overstory although these sections have been disturbed by rubbish dumping and track clearances (Site RC1).

Greyhound Road– Eastern End

West of the mallee vegetation, the drinking water transfer pipeline and power line route follows Greyhound Road. The unsealed road approximately is 3 metres width, with Murrays Point Wetland to the south and degraded coastal shrubland vegetation in the road verges and adjacent land to the north (Site RC8).

SAPN Power Line Connection to Windsor Avenue

The SAPN power line route extends north from Greyhound Road to join Windsor Avenue. The route initially passes through a coastal shrubland degraded by invasive grassy and herbaceous weeds (Site RC10). The route follows the Windsor Avenue road reserve where clearance is required of degraded coastal vegetation (RC8 and RC11), degraded mallee (RC15) and degraded *Melaleuca halmaturorum* shrubland (RC13).

The coastal saltmarsh community in Murrays Point Wetland is not impacted by the project.

Greyhound Road - Western End

The drinking water transfer pipeline continues west along Greyhound Road. The impact area is centered on the road but vegetation on the verges will be cleared including coastal shrublands (RC7, RC8, RC10, RC14) and planted trees over degraded coastal shrubs (RC12).

Blue Fin Road and North Side Hill Tanks

The drinking water transfer pipeline impacts on native vegetation on Blue Fin Road. The pipeline will be located in the unsealed road but some overhanging vegetation on the verges will be removed.

At the eastern end roadside vegetation has been degraded by clearance and ongoing mowing and comprises *Acacia paradoxa* and *A. cupularis* shrubland (TR4).

As the route passes Kathai Conservation Park the road verge supports *Eucalyptus diversifolia / E. albopurpurea* mallee vegetation with moderate levels of disturbance (TR3). Only vegetation overhanging the road will be removed with no disturbance to the understorey.

At the crest of the hill the route enters private land on the north side of Blue Fin Road to avoid areas of high cultural heritage significance and shallow rock in the bed of Blue Fin Road. The vegetation is a *Eucalyptus diversifolia / E. albopurpurea* mallee with a highly diverse shrub understorey (TR2). The vegetation has been slashed to provide a fire break. The route passes through a small area of unimpacted mallee (TR1) to enter the North Side Hill tank site.

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

Vegetation Association	**Site 1: *Eucalyptus conglobata, E. diversifolia, E. rugosa +/- E. angulosa, E. leptophylla* mallee over a shrubby understory**

Photo Site 1.1 facing west at 581093, 6154216 (WGS 84 Zone 53).

Photo Site 1.2 facing SSE at 581063, 6154231 (WGS 84 Zone 53).

General description	This vegetation association occurs throughout the central and western sections of the desalination plant site, where soils are deeper and heavier. The overstorey comprises *Eucalyptus conglobata* (Port Lincoln Mallee), *E. diversifolia* (Coastal White Mallee) and *E. rugosa* (White Mallee) as co-dominants, over an open low shrub understory including *Acrotriche patula* (Prickly Groundberry), *Lasiopetalum discolor* (Coast Velvet-bush), *Templetonia retusa* (Cockies Tongue) and *Melaleuca lanceolata* (Dryland Tea-tree). At least eight species of winter- and spring-emergent orchids were recorded, including *Pterostylis* spp. (Greenhoods), *Microtis sp.* (Onion-orchid), *Diuris sp.* (Donkey Orchid), *Caladenia* spp. (Spider-orchids) and *Thelymitra* spp. (Sun-orchids) Weed species are a minor component of the community and include *Asparagus asparagoides* (Bridal Creeper), *Pinus halepensis* (Aleppo Pine), *Casuarina glauca* (Swamp Oak), *Senecio pterophorus* (African Daisy) and *Asphodelus fistulosus* (Onion Weed). **The vegetation community is in good condition.**				
Threatened species or community	State-listed vegetation community: • State Rare *Eucalyptus conglobata* Low Woodland on fertile loams over limestone. State-threatened flora observed: • State Rare Alcock's Wattle (*Acacia alcockii*) • Port Lincoln Mallee (*Eucalyptus conglobata*) Nationally- and State-threatened fauna that might utilise this vegetation community: • Nationally Vulnerable: Diamond Firetail • State Endangered: White-bellied Sea Eagle • State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail • State Rare: Purple-gaped Honeyeater, Elegant Parrot, White-winged Chough, Rock Parrot, Western Gerygone, Shy Heathwren, Peregrine Falcon, Bush Stone-curlew & Painted Buttonquail. The State Endangered Eastern Osprey has been recorded nearby, but vegetation at the site is not preferred nesting habitat.				
Landscape context score	1.12	Vegetation Condition Score	57.35	Conservation significance score	1.28
Unit biodiversity Score	82.22	Area (ha)	Permanent: 1.5347 Rehabilitate: 0.0733	Total biodiversity Score	Permanent: 126.18 Rehabilitate: 6.03

Vegetation Association	**Site 2: *Eucalyptus angulosa, E. diversifolia, E. conglobata* open mallee over heath**

Photo Site 2.1 facing south-east at 581053, 6154259 (WGS 84 Zone 53).

Photo Site 2.2 facing south at 581105, 6154327 (WGS 84 Zone 53).

<table>
<tr><td>General description</td><td colspan="5">This vegetation association occurs within the proposed desalination plant site, in areas where limestone is closer to the surface.

Eucalyptus angulosa (Coast Ridge-fruited Mallee), *E. diversifolia* and *E. conglobata* are co-dominant canopy species. Sedges such as *Gahnia deusta* (Limestone Saw-sedge) and *Lomandra collina* (Sand Mat-rush), and small to medium shrubs such as *Acrotriche cordata* (Blunt-leaf Groundberry) and *Templetonia retusa* are characteristic understory species.

At least eight species of winter- and spring-emergent orchids were detected including *Pterostylis flavovirens* (Tall Greenhood), *P. sanguinea* (Blood Greenhood), *Acianthus pusillus* (Mosquito Orchid), *Cyrtostylis robusta* (Robust Gnat-orchid), *Microtis frutetorum* (Onion-orchid), *Thelymitra megcalyptra* (Scented Sun-orchid), *T. luteocilium* (Yellow-tuft Sun-orchid) and *Caladenia campestris* (Spider-orchid).

Weed species are a minor component of the community and include Bridal Creeper, Aleppo Pine and *Polygala myrtifolia* (Myrtle-leaf Milkwort).

The vegetation community is in good condition.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5"><u>State-listed vegetation community:</u>
• State Rare *Eucalyptus conglobata* Low Woodland on fertile loams over limestone.
<u>State-threatened flora observed:</u>
• State Rare Alcock's Wattle (*Acacia alcockii*)
• State Rare Port Lincoln Mallee (*Eucalyptus conglobata*)
<u>Nationally- and State-threatened fauna that might utilise this vegetation community:</u>
• Nationally Vulnerable: Diamond Firetail
• State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail
• State Endangered: White-bellied Sea Eagle
• State Rare: Purple-gaped Honeyeater, Elegant Parrot, Rock Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Peregrine Falcon, Bush Stone-curlew and Painted Buttonquail.

The State Endangered Eastern Osprey has been recorded nearby, but vegetation at the site is not preferred nesting habitat.</td></tr>
<tr><td>Landscape context score</td><td>1.12</td><td>Vegetation Condition Score</td><td>54.38</td><td>Conservation significance score</td><td>1.28</td></tr>
<tr><td>Unit biodiversity Score</td><td>77.95</td><td>Area (ha)</td><td>Permanent: 0.9972
Rehabilitate: 0</td><td>Total biodiversity Score</td><td>Permanent: 77.73
Rehabilitate: 0</td></tr>
</table>

Vegetation Association	**Site 3: *Eucalyptus angulosa, E. diversifolia* ± *E. conglobata* mallee over *Melaleuca uncinata***

Photo Site 3.1 facing south at 581091, 6154439 (WGS 84 Zone 53).

Photo Site 3.2 , facing SW at 581103, 6154409 (WGS 84 Zone 53).

<table>
<tr><td>General description</td><td colspan="5">This vegetation association occurs in lower lying areas in the north-western section of the proposed desalination plant site.

Melaleuca uncinata (Broombush) and *M. lanceolata* (Dryland Teatree) become dominant understory species beneath a canopy of *Eucalyptus angulosa, E. diversifolia* and *E. conglobata*. Other common understory species include *Gonocarpus mezianus* (Broad-leaf Raspwort), *Lepidosperma viscidum* (Sticky Sword-sedge), *Templetonia retusa* and *Pomaderris flabellaris* (Fan Pomaderris). The groundlayer supports a variety of orchid species, including Greenhoods, Mosquitos orchids, Gnat-orchids, Onion orchids, Donkey orchids and Sun-orchids.

Freesia sp. was the most encountered weed species, with Bridal Creeper, Aleppo Pine, *Acacia cyclops* (Western Coastal Wattle) and *Moraea setifolia* (Thread Iris) being minor components of the association.

The plant community has a very high diversity of native species, good structural diversity, deep leaf litter and provides good habitat value.

The vegetation community is in very good condition.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5">State-listed vegetation community:
• State Rare *Eucalyptus conglobata* Low Woodland on fertile loams over limestone.
State-threatened flora observed:
• State Rare Alcock's Wattle (*Acacia alcockii*)
• State Rare Port Lincoln Mallee (*Eucalyptus conglobata*)
Nationally- and State-threatened fauna that might utilise this vegetation community:
• Nationally Vulnerable: Diamond Firetail
• State Endangered: White-bellied Sea Eagle
• State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail
• State Rare: Purple-gaped Honeyeater, Elegant Parrot, Rock Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Peregrine Falcon, Bush Stone-curlew and Painted Buttonquail.
The State Endangered Eastern Osprey has been recorded nearby, but vegetation at the site is not preferred nesting habitat.</td></tr>
<tr><td>Landscape context score</td><td>1.12</td><td>Vegetation Condition Score</td><td>60.30</td><td>Conservation significance score</td><td>1.28</td></tr>
<tr><td>Unit biodiversity Score</td><td>86.45</td><td>Area (ha)</td><td>Permanent: 0.3510
Rehabilitate: 0</td><td>Total biodiversity Score</td><td>Permanent: 30.34
Rehabilitate: 0</td></tr>
</table>

Vegetation Association	**Site 4: *Eucalyptus angulosa, E. diversifolia* mallee (burnt) over *Lasiopetalum spp.***

Photo Site 4.1 facing south at 581105, 6154511 (WGS 84 Zone 53).

Photo Site 4.2 facing south at 581118, 6154577 (WGS 84 Zone 53).

General description	Vegetation association 4 occurs along the proposed access route to the north of the desalination plant. *Eucalyptus angulosa* and *E. diversifolia* provide the main canopy cover, with *E. conglobata* and *Eucalyptus oleosa ssp. ampliata* (Red Mallee) also present. Velvet-bushes (*Lasiopetalum* spp.), *Eutaxia microphylla* (Common Eutaxia), *Templetonia retusa* and *Acacia spinescens* (Spiny Wattle) are common in the understory. Several species of spring-flowering orchids were observed in the groundlayer. Weed cover is low but includes scattered plants of Bridal Creeper, Myrtle-leaf Milkwort and Western Coastal Wattle. The community has a high diversity of native plant species and is regenerating well after a fire approximately 11 years ago. It is of high habitat value with good structural diversity and fallen timber and debris. **The vegetation community is in very good condition.**				
Threatened species or community	State-listed vegetation community: Not considered a threatened ecosystem State-threatened flora observed: • State Rare Port Lincoln Mallee (*Eucalyptus conglobata*) • State Rare Alcock's Wattle (*Acacia alcockii*) Nationally- and State-threatened fauna that might utilise this vegetation community: • Nationally Vulnerable: Diamond Firetail • State Endangered: White-bellied Sea Eagle • State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail • State Rare: Purple-gaped Honeyeater, Elegant Parrot, Rock Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Peregrine Falcon, Bush Stone-curlew and Painted Buttonquail. The State Endangered Eastern Osprey has been recorded nearby, but vegetation at the site is not preferred nesting habitat.				
Landscape context score	1.12	Vegetation Condition Score	62.44	Conservation significance score	1.18
Unit biodiversity Score	82.52	Area (ha)	Permanent: 0.4118 Rehabilitate: 0.0489	Total biodiversity Score	Permanent: 33.98 Rehabilitate: 4.04

Vegetation Association	**Site 6: *Eucalyptus diversifolia* recovering open mallee**

Photo 6.1 facing south at 581133, 6154152 (WGS 84 Zone 53).

Photo Site 6.2 facing south at 580979, 6154257 (WGS 84 Zone 53).

General description	Vegetation association 6 comprises areas where areas where previous clearance has occurred but natural regeneration of the mallee community is occurring. The canopy layer is sparse and dominated by *Eucalyptus diversifolia* and *E. rugosa* and the understory supports regenerating shrub species such as *Alyxia buxifolia* (Sea Box), *Templetonia retusa* and several species of wattles. Two species of spring-flowering orchids were observed (*Caladenia* sp. and *Microtis* sp.). The community has a moderate diversity of native species, represented by shrubs, sedges, vines and grasses. Exotic species include Bridal Creeper, Aleppo Pine, Swamp Oak, Onion Weed and Western Coastal Wattle, each being a minor component of the community. **The vegetation community is in moderate condition.**				
Threatened species or community	State-listed vegetation community: Not considered a threatened ecosystem State-threatened flora observed: • State Rare Alcock's Wattle (*Acacia alcockii*) Nationally- and State-threatened fauna that might utilise this vegetation community: • Nationally Vulnerable: Diamond Firetail • State Vulnerable: Yellow-tailed Black Cockatoo • State Rare: Purple-gaped Honeyeater, Elegant Parrot, Western Gerygone, Shy Heathwren, Peregrine Falcon and Rock Parrot. The Rock Parrot was observed within this vegetation association. The State Endangered Eastern Osprey and White-bellied Sea Eagle occur nearby, but vegetation at the site is not their preferred nesting habitat. The State Rare Bush Stone-curlew, White-winged Chough and Painted Buttonquail have been recorded within 5 km of the site but are unlikely to use degraded habitats with little leaf litter.				
Landscape context score	1.12	Vegetation Condition Score	36.49	Conservation significance score	1.12
Unit biodiversity Score	45.77	Area (ha)	Permanent: 0.5236 Rehabilitate: 0.0684	Total biodiversity Score	Permanent: 23.97 Rehabilitate: 3.13

Vegetation Association	**Site 6a: *Eucalyptus diversifolia* recovering open to very open mallee**				
 *Photo Site 6a facing south at 580988, 6154224 (WGS 84 Zone 53).*					
General description	This plant community is a more degraded version of vegetation association 6, occurring in the vicinity of the existing infrastructure at the site and along the southern road verge of St Andrews Drive. Both the canopy and shrub layers are sparser due to previous clearance and disturbance, but several species are naturally regenerating. **The vegetation community is in poor to moderate condition.**				
Threatened species or community	State-listed vegetation community: Not considered a threatened ecosystem State-threatened flora observed: • State Rare Alcock's Wattle (*Acacia alcockii*) Nationally- and State-threatened fauna that might utilise this vegetation community: • Nationally Vulnerable: Diamond Firetail • State Vulnerable: Yellow-tailed Black Cockatoo • State Rare: Purple-gaped Honeyeater, Elegant Parrot, Western Gerygone, Rock Parrot, Peregrine Falcon The State Endangered Eastern Osprey and White-bellied Sea Eagle occur nearby, but vegetation at the site is not their preferred nesting habitat. The State Rare Bush Stone-curlew, White-winged Chough and Painted Buttonquail have been recorded within 5 km of the site but are unlikely to rely on this plant community.				
Landscape context score	1.12	Vegetation Condition Score	31.76	Conservation significance score	1.12
Unit biodiversity Score	39.84	Area (ha)	Permanent: 0.1582 Rehabilitate: 0.3654	Total biodiversity Score	Permanent: 6.3 Rehabilitate: 14.56

Vegetation Association	**Site 7: **Acacia cyclops, *Pinus halepensis* shrubland/woodland**

Photo Site 7.1, facing south at 581000, 6154136 (WGS 84 Zone 53).

Photo Site 7.2 facing south at 581059, 6154120 (WGS 84 Zone 53).

General description	This plant community occurs in highly disturbed areas adjacent to the disused BHP shed and associated tracks and infrastructure. It has been cleared in the past and is now dominated by exotic trees and shrubs (Western Coastal Wattle, Aleppo Pine, *Rhamnus alaternus* (Blowfly Bush) and *Lycium ferocissimum* (African Boxthorn)). Although sparse, the understory supports a medium diversity of regenerating native species including *Eucalyptus diversifolia* (Coastal White Mallee), several *Acacia* species*, Pomaderris obcordata* (Wedge-leaf Pomaderris), *Templetonia retusa* (Cockies Tongue), *Carpobrotus rossii* (Native Pigface), and a variety of small shrubs, forbs and grasses. **The vegetation community is in poor to moderate condition.**				
Threatened species or community	State-listed vegetation community: Not considered a threatened ecosystem State-threatened flora observed: • State Rare Port Lincoln Mallee (*Eucalyptus conglobata*) Nationally- and State-threatened fauna that might utilise this vegetation community: • Nationally Vulnerable: Diamond Firetail • State Vulnerable: Yellow-tailed Black Cockatoo • State Rare: Purple-gaped Honeyeater, Elegant Parrot, Western Gerygone, Rock Parrot, Peregrine Falcon. Given the poor condition of the vegetation and limited structural diversity it is unlikely to provide important habitat for most of these species. The State Endangered Eastern Osprey) and White-bellied Sea Eagle occur nearby, but vegetation at the site is not their preferred nesting habitat. The State Rare Bush Stone-curlew, White-winged Chough and Painted Buttonquail have been recorded within 5 km of the site but are unlikely to rely on this plant community.				
Landscape context score	1.12	Vegetation Condition Score	34.25	Conservation significance score	1.12
Unit biodiversity Score	42.97	Area (ha)	Permanent: 0.0317 Rehabilitate: 0.1275	Total biodiversity Score	Permanent: 1.36 Rehabilitate: 5.48

Vegetation Association	**Site 8: Planted *Eucalyptus spp., *Pinus halepensis woodland***

Photo Site 8, facing south-east at 581036, 6154416 (WGS 84 Zone 53).

General description	Plant association 8 occurs adjacent to an old shed and a section of the southern road verge along St Andrews Drive. It compromises areas where some planting has been undertaken with non-indigenous *Eucalyptus* species but there is natural regeneration occurring underneath. The community supports a medium diversity of native species including regenerating *Eucalyptus diversifolia* (Coastal White Mallee) and *E. conglobata* (Port Lincoln Mallee), as well as several species of *Acacia*. The understory comprises a variety of shrubs (e.g. *Lasiopetalum* spp. (Velvet-bushes), *Acrotriche* spp. (Ground-berries)), vines, daisies and native grasses. Exotic species are a significant component and include *Aleppo Pine,* Bridal Creeper, Myrtle-leaf Milkwort, *Scabiosa atropurpurea* (Pincushion) and *Piptatherum miliaceum* (Rice Millet). **The vegetation community is in poor to moderate condition.**
Threatened species or community	State-listed vegetation community: Not considered a threatened ecosystem State-threatened flora observed: • State Rare Port Lincoln Mallee (*Eucalyptus conglobata*) Nationally- and State-threatened fauna that might utilise this vegetation community: • Nationally Vulnerable: Diamond Firetail • State Vulnerable: Yellow-tailed Black Cockatoo • State Rare: Purple-gaped Honeyeater, Elegant Parrot, Western Gerygone, Rock Parrot and Peregrine Falcon Given the poor condition of the vegetation and limited structural diversity it is unlikely to provide important habitat for most of these species. The Eastern Osprey, White-bellied Sea Eagle, Bush Stone-curlew, Painted Buttonquail and White-winged Chough occur nearby, but vegetation at the site is not their preferred habitat.

Landscape context score	1.12	Vegetation Condition Score	30.50	Conservation significance score	1.12
Unit biodiversity Score	38.26	Area (ha)	Permanent: 0.012	Total biodiversity Score	Permanent: 0.46

Vegetation Association	**Site 9a: Cleared/slashed *Eucalyptus rugosa* open mallee over *Pimelea serpyfolia, Acacia* spp.*, Lasiopetalum discolor***

Photo 457, facing east along fenceline at waypoint 1053, Latitude -34.74772/ Longitude 135.888694

General description	Plant association 9a occurs on an SA Water easement on the southern side of St. Andrews Drive linking the desalination plant with the marine pump station. An ~8 m strip of vegetation inside the boundary fence has been cleared and/or slashed, and comprises a regenerating *Eucalyptus rugosa* mallee over a sclerophyllous shrublayer dominated by *Acacia nematophylla* (Coast Wallowa), *Pimelea serpyllifolia* (Thyme Riceflower), *Lasiopetalum discolor* and *Templetonia retusa*. The community lacks a tall canopy and shrub layer, and the understory is often sparse, however the diversity of native plant species is relatively high with many regenerating. Other lifeforms present include vines (*Cassytha melantha*), mat plants (*Carpobrotus rossii, Tetragonia implexicoma*), sedge-like plants (*Dianella brevicaulis*), and grasses (*Austrostipa elegantissima*). The introduced Western Coastal Wattle and Soursob occur throughout the community. Other high-risk weeds such as Bridal Creeper, African Boxthorn and Aleppo Pine are mostly present near the western and eastern boundary fences. **Plant association 9a is in moderate condition.**
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: • State Rare Alcock's Wattle (*Acacia alcockii*) Two plants of Alcock's Wattle are present within the western end of the works footprint. A larger stand (~20 plants) growing near the eastern boundary is outside the area of impact. Nationally- and State-threatened fauna that might utilise this vegetation community: • Nationally Vulnerable: Diamond Firetail • State Vulnerable: Yellow-tailed Black Cockatoo • State Rare: Purple-gaped Honeyeater, Elegant Parrot, Western Gerygone, Rock Parrot and Peregrine Falcon

Landscape context score	1.12	Vegetation Condition Score	44.39	Conservation significance score	1.12
Unit biodiversity Score	55.68	Area (ha)	Permanent: 0.0999	Total biodiversity Score	Permanent: 5.56

Vegetation Association	**Site 9b: *Eucalyptus rugosa* closed mallee over *Melaleuca* spp., *Acacia* spp.**				
 *Photo 467, facing east at waypoint 1055, Latitude -34.747875/ Longitude 135.887828*					
General description	Plant association 9b extends south of association 9a where dense overstory and shrub layers have been retained. *Eucalyptus rugosa* is the dominant canopy species over tall shrubs of *Melaleuca lanceolata* and *M. acuminata*. The community supports a similar suite of understory flora, but includes additional species and lifeforms such as *Pomaderris obcordata, Comesperma calymega* (Blue-spike Milkwort), *Pittosporum angustifolium* (Native Apricot), *Amyema melaleucae* (Tea-tree Mistletoe) and *Cyrtostylis* spp. (Gnat Orchid). Habitat features such as fallen logs and deep leaf litter provide additional structural diversity. The introduced Western Coastal Wattle, Soursob, Bridal Creeper and Rice Millet occur throughout the community, with scattered individuals of Aleppo Pine also present. **Plant association 9b is in moderate to good condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: • State Rare Alcock's Wattle (*Acacia alcockii*) Alcock's wattle is present but no plants were noted within the proposed footprint. Nationally- and State-threatened fauna that might utilise this vegetation community: • Nationally Vulnerable: Diamond Firetail • State Endangered: White-bellied Sea Eagle • State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail • State Rare: Purple-gaped Honeyeater, Elegant Parrot, Rock Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Peregrine Falcon, Bush Stone-curlew and Painted Buttonquail. The White-wing chough was observed at the site in September 2024.				
Landscape context score	1.12	Vegetation Condition Score	55.69	Conservation significance score	1.14
Unit biodiversity Score	71.11	Area (ha)	Permanent: 0.0122 Rehabilitate: 0.0907	Total biodiversity Score	Permanent: 0.87 Rehabilitate: 6.45

Vegetation Association	**Site 9c: *Eucalyptus rugosa / *Acacia cyclops* over *Acacia nematophylla, Olearia axillaris***				
 *Photo 469, facing west at waypoint 1057, Latitude -34.747673/ Longitude 135.887378*					
General description	Plant association 9c is a highly degraded mallee community growing within the roadside reserve on the southern side of St Andrews Drive. *Eucalyptus rugosa* is present as highly scattered individuals, with the predominant canopy structure provided by the introduced Western Coastal Wattle. The ground layer is highly disturbed and sparse and dominated by *Acacia nematophylla* and *Olearia axillaris*. Other native species include *Myoporum insulare* (Common Boobialla), *Correa pulchella* (Salmon Correa), *Rhagodia candolleana*, *Alyxia buxifolia, Pimeala serpyllifolia* and *Cassytha melantha*, many of which are regenerating. High-risk weeds present in the community include Bridal Creeper, *Juncus acutus* (Spiny Rush), Onion Weed, Soursob, African Daisy and Rice Millet. **Plant association 9c is in poor condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: None Nationally- and State-threatened fauna that might utilise this vegetation community: None. This highly degraded roadside community is unlikely to provide significant habitat for threatened fauna.				
Landscape context score	1.12	Vegetation Condition Score	26.09	Conservation significance score	1.00
Unit biodiversity Score	29.22	Area (ha)	Permanent: 0.1017 Rehabilitate: 0.011	Total biodiversity Score	Permanent: 2.97 Rehabilitate: 0.32

Vegetation Association	**Site WW1: *Eucalyptus rugosa, E. diversifolia* ± *E. albopurpurea mallee* with emergent planted species**

Photo Site WW1.1, facing south at 581384, 6154601 (WGS 84 Zone 53).

Photo Site WW1.2 facing north-east at 581539, 6154733 (WGS 84 Zone 53).

General description	This plant community occurs along the northern, western and southern edges of the Wastewater Treatment Plant. The overstorey is principally *Eucalyptus diversifolia* (Coastal White Mallee) and *E. rugosa* (White Mallee), with scattered patches of *E. albopurpurea* (Purple-flowered Mallee Box) and scattered emergent planted Eucalypt species. The principal dominants in the understory are *Melaleuca lanceolata* (Dryland Tea-tree) and *Myoporum insulare* (Common Boobialla). There are small, lower lying sections where water accumulates during winter, and moisture-loving species such as *Melaleuca brevifolia* (Short-leaf Honey-myrtle) and *Atriplex paludosa ssp. cordata* (Marsh Saltbush) occur. Vine lifeforms, such as *Tetragonia implexicoma* (Bower Spinach), *Cassytha melantha* (Coarse Dodder-laurel), *Clematis microphylla* (Old Man's Beard) and *Comesperma volubile* (Love Creeper) are prominent features of this vegetation. The most abundant weed species are African Boxthorn and *Oxalis pes-caprae* (Soursob), with *Juncus acutus* (Spiny Rush) and *Watsonia* sp. present as minor components. **The vegetation community is in moderate to good condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: • State Rare Alcock's Wattle (*Acacia alcockii*) Nationally- and State-threatened fauna that might utilise this vegetation community: • State Endangered: White-bellied Sea Eagle • State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail • State Rare: Purple-gaped Honeyeater, Elegant Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Rock Parrot, Peregrine Falcon and Painted Buttonquail. The State Endangered Eastern Osprey has been recorded nearby, but vegetation at the site is not preferred habitat. The Nationally Vulnerable Diamond Firetail and State Rare Bush Stone-curlew have been recorded within 5 km of the site but prefer more open habitats and are unlikely to use this plant community.				
Landscape context score	1.12	Vegetation Condition Score	46.71	Conservation significance score	1.12
Unit biodiversity Score	58.59	Area (ha)	Permanent: 0.7269 Rehabilitate: 0.2036	Total biodiversity Score	Permanent: 42.59 Rehabilitate: 11.93

Vegetation Association	**Site WW4: *Eucalyptus conglobata* + *E. diversifolia mallee* over dense understory of *Myoporum insulare, Olearia axillaris and Tetragonia implexicoma***				
	 *Photo Site WW4.1 7146 facing west at Latitude -34.78552 / Longitude 135.891395*				
General description	Vegetation association WW4 occurs along the coast east of the Wastewater Treatment Plant sedimentation ponds. The overstorey becomes dominated by *Eucalyptus diversifolia* and *E. conglobata* with scattered *E. oleosa, E. angulosa* and emergent *E. leptophylla*. *Myoporum insulare, Olearia axillaris, Templetonia retusa* and *Leocopogon parviflorus* shrubs along with *Tetragonia implexicoma and Threlkeldia diffusa* (Coast Bonefruit) are prominent features of the dense understory and groundlayer. The mallee thins out along the coastal frontage where sedges such as *Gahnia deusta, Lepidospermum viscidum* and *Ficinia nodosa,* and tussocks of *Austrostipa stipoides* grow amongst the shrublayer. Bridal Creeper occurs throughout the understory, but other weed species are a minor component and include very sparse individuals of African Boxthorn and African Daisy. Soursob grows mostly along the edges of the walkway. The plant association has a medium to high diversity of native species including many regenerating species, very high structural diversity, and moderate weed cover. **The vegetation community is in good condition.**				
Threatened species or community	<u>State-listed vegetation community:</u> • State Rare *Eucalyptus conglobata* Low Woodland on fertile loams over limestone. <u>State-threatened flora observed:</u> • State Rare Port Lincoln Mallee (*Eucalyptus conglobata*) <u>Nationally- and State-threatened fauna that might utilise this vegetation community:</u> • Nationally Vulnerable: Diamond Firetail • State Endangered: White-bellied Sea Eagle, Eastern Osprey • State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail • State Rare: Purple-gaped Honeyeater, Elegant Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Rock Parrot, Peregrine Falcon and Painted Buttonquail. The Bush Stone-curlew prefers more open habitats and is unlikely to use this community.				
Landscape context score	1.12	Vegetation Condition Score	57.28	Conservation significance score	1.24
Unit biodiversity Score	79.55	Area (ha)	Permanent: 0.0305	Total biodiversity Score	Permanent: 2.43

<table>
<tr><td>Vegetation Association</td><td colspan="5">Site WW5: Eucalyptus diversifolia, E. conglobata mallee over Pomaderris paniculosa, Alyxia buxifolia, Exocarpos aphyllus and Melaleuca lanceolata</td></tr>
<tr><td colspan="6"> 
Photo 7257, facing west at Latitude -34.76006 / Longitude 135.892051</td></tr>
<tr><td>General description</td><td colspan="5">Vegetation association WW5 occurs between the coast and the decommissioned ponds of the Wastewater Treatment Plant. The overstorey is similar to that of WW4, being dominated by Eucalyptus diversifolia and E. conglobata, but the groundlayer becomes more open, and the predominant shrubs are Pomaderris paniculosa, Alyxia buxifolia, Exocarpos aphyllus and Melaleuca lanceolata. Moss covers the ground beneath the mallee, and two species of winter-flowering orchids (Cyrtostylis robusta and Pterostylis erythroconcha) were observed.
The most abundant weed is Bridal Creeper which occurs scattered throughout the mallee understory. Other exotic species such as African Daisy and Box Thorn are present as minor components and Soursob grows mostly along the edges of the walking track.
The plant association has a medium to high diversity of native species including many regenerating species, very high structural diversity, and moderate weed cover.
The vegetation community is in good condition.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5"><u>State-listed vegetation community:</u>
• State Rare Eucalyptus conglobata Low Woodland on fertile loams over limestone.
<u>State-threatened flora observed:</u>
• State Rare Port Lincoln Mallee (Eucalyptus conglobata)
<u>Nationally- and State-threatened fauna that might utilise this vegetation community:</u>
• Nationally Vulnerable: Diamond Firetail
• State Endangered: White-bellied Sea Eagle, Eastern Osprey
• State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail
• State Rare: Purple-gaped Honeyeater, Elegant Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Rock Parrot, Peregrine Falcon and Painted Buttonquail.
The Bush Stone-curlew prefers more open habitats and is unlikely to use this community.</td></tr>
<tr><td>Landscape context score</td><td>1.12</td><td>Vegetation Condition Score</td><td>57.49</td><td>Conservation significance score</td><td>1.24</td></tr>
<tr><td>Unit biodiversity Score</td><td>79.84</td><td>Area (ha)</td><td>Permanent: 0.0006</td><td>Total biodiversity Score</td><td>Permanent: 0.05</td></tr>
</table>

Vegetation Association	**Site RC1: *Eucalyptus albopurpurea* mallee disturbed by rubbish dumping and weeds**

Photo RC1, facing NE at 579139, 6153850 (WGS 84 Zone 53).

General description	Vegetation association RC1 occurs at the western end of a large expanse of mallee between the proposed desalination plant and Greyhound Rd. The canopy is dominated by *Eucalyptus albopurpurea* over *Rhagodia crassifolia, Melaleuca lanceolata* and a dense cover of *Tetragonia implexicoma*. There are some dense patches of *Austrostipa elegantissima* in more open areas, but the remaining groundlayer is highly disturbed and invaded by exotic annual grasses. Bridal Creeper and African Daisy are also present. The plant association has a moderate diversity of native plant species and good structural diversity but the groundlayer is disturbed by rubbish dumping and weed invasion. **The vegetation community is in moderate condition.**
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: None Nationally- and State-threatened fauna that are likely to utilise this community: • State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail • State Rare: Purple-gaped Honeyeater, Elegant Parrot, Rock Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Peregrine Falcon and Painted Buttonquail. The Nationally Vulnerable Diamond Firetail and State Rare Bush Stone-curlew have been recorded within 5 km of the site but prefer more open habitats and are unlikely to use this plant community. The State Endangered Eastern Osprey and White-bellied Sea Eagle have been recorded nearby but are unlikely to rely on vegetation away from the coast.

Landscape context score	1.12	Vegetation Condition Score	46.48	Conservation significance score	1.08
Unit biodiversity Score	56.22	Area (ha)	Permanent: 0.0228 Rehabilitate: 0.0770	Total biodiversity Score	Permanent: 1.28 Rehabilitate: 4.33

Vegetation Association	**Site RC2: *Eucalyptus conglobata, E. diversifolia* ± *E. oleosa, E. rugosa, E. gracilis* mallee over a shrubby understorey**

Photo RC2, facing NE at 579228, 6153858 (WGS 84 Zone 53).

Acacia alcockii stand growing on the southern side of the existing track

<table>
<tr><td>General description</td><td colspan="5">Vegetation association RC2 occurs on the northern side of the rail corridor, within a large expanse of mallee between the proposed desalination plant and Greyhound Rd. The community is characterised by a canopy dominated by Eucalyptus conglobata ssp. conglobata and E. diversifolia ssp. diversifolia over dense patches of Melaleuca lanceolata and more open areas supporting low shrubs such as Lasiopetalum discolor, Acacia triquetra (Mallee Wreath Wattle), Templetonia retusa, Dodonaea species and patches of Gahnia deusta. Five species of orchid were recorded in the association (Caladenia capillata, C. campestris, Thelymitra megcalyptra, Microtis sp. and Pterostylis flavovirens).
Apart from very sparsely scattered plants of Bridal Creeper, Sour-sob and Hair's Tail Grass, weed cover is very low.
The plant association has a high diversity of native plant species, many of which are regenerating, with good structural diversity and deep leaf litter.
The vegetation community is in excellent condition.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5"><u>State-listed vegetation community:</u>
• State Rare Eucalyptus conglobata Low Woodland on fertile loams over limestone
<u>State-threatened flora observed:</u>
• State Rare Port Lincoln Mallee (Eucalyptus conglobata)
• State Rare Alcock's Wattle (Acacia alcockii)
Two stands of Alcock's Wattle were recorded in the community:
– ~20 individuals mostly on the south side of the track between waypoints 400 & 401
– ~ 60 plants along the southern edge of the track at waypoint 402.
<u>Nationally- and State-threatened fauna that are likely to utilise this community:</u>
• Nationally Vulnerable: Diamond Firetail
• State Vulnerable: Yellow-tailed Black Cockatoo, Little Eagle, Brown Quail
• State Rare: Purple-gaped Honeyeater, Elegant Parrot, Rock Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Bush Stone-curlew, Peregrine Falcon and Painted Buttonquail.
The White-wing chough was observed at the site in October 2023.
The State Endangered Eastern Osprey and White-bellied Sea Eagle have been recorded nearby, but are unlikely to rely on vegetation away from the coast.</td></tr>
<tr><td>Landscape context score</td><td>1.12</td><td>Vegetation Condition Score</td><td>62.89</td><td>Conservation significance score</td><td>1.28</td></tr>
<tr><td>Unit biodiversity Score</td><td>90.16</td><td>Area (ha)</td><td>Permanent: 0.2954
Rehabilitate: 0.4333</td><td>Total biodiversity Score</td><td>Permanent: 26.63
Rehabilitate: 39.07</td></tr>
</table>

Vegetation Association	**Site RC3: *Eucalyptus rugosa, E. gracilis, E. oleosa* ± *E. conglobata, E. diversifolia* mallee over a shrubby understorey**

Photo RC3.1, facing NE at 579435, 6153868 (WGS 84 Zone 53).

Photo RC3.2 Stand of Acacia alcockii along the northern side of the track

General description	Vegetation association RC3 occurs on the northern side of the rail corridor, within a large expanse of mallee between the proposed desalination plant and Greyhound Rd. *Eucalyptus gracilis*, *E. oleosa ssp. ampliata* and *E. rugosa* are the dominant canopy species, generally with a dense understorey of *Melaleuca lanceolata* shrubs, many supporting mistletoe (*Amyema melaleucae). Eucalyptus conglobata* is a minor overstory component in areas that intergrade between communities RC2 and RC3. *Acacia nematophylla*, *Eutaxia microphylla*, *Acacia triquetra* and *Dianella* species are common in the understory. Four orchid species were observed within the proposed clearance area: *Caladenia capillata, C. campestris, Microtis sp.* and *Pterostylis flavovirens*. Apart from very sparsely scattered plants of Bridal Creeper and Soursob, weed cover is generally very low. The plant association has a high diversity of native plant species, many of which are regenerating, with good structural diversity and deep leaf litter. **The vegetation community is in excellent condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: • State Rare Port Lincoln Mallee (*Eucalyptus conglobata*) • State Rare Alcock's Wattle (*Acacia alcockii*) *Acacia alcockii* (Alcock's Watte) occurs in several large stands which include reproductive adult plants and numerous juveniles regenerating through root suckering. The species is abundant in disturbed areas within 5 m of the vehicle track (both sides), becoming sparser further away from the track. – One stand of ~80 plants between waypoints 392 and 394, – Another stand with over 1000 plants between waypoints 398 and 399. Nationally- and State-threatened fauna that are likely to utilise this community: • Nationally Vulnerable: Diamond Firetail • State Vulnerable: Yellow-tailed Black Cockatoo, Little Eagle, Brown Quail • State Rare: Purple-gaped Honeyeater, Elegant Parrot, Rock Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Bush Stone-curlew, Peregrine Falcon and Painted Buttonquail. The White-wing chough was observed at the site in October 2023. The State Endangered Eastern Osprey and White-bellied Sea Eagle have been recorded nearby, but are unlikely to rely on vegetation away from the coast.				
Landscape context score	1.12	Vegetation Condition Score	60.94	Conservation significance score	1.18
Unit biodiversity Score	80.54	Area (ha)	Permanent: 0.2119 Rehabilitate: 0.4750	Total biodiversity Score	Permanent: 17.07 Rehabilitate: 38.26

<table>
<tr><td>Vegetation Association</td><td colspan="5">Site RC4: Eucalyptus diversifolia with a heathy understorey on limestone</td></tr>
<tr><td colspan="6"> 
Photo RC4, facing SW at 580801, 6154218 (WGS 84 Zone 53).</td></tr>
<tr><td>General description</td><td colspan="5">Vegetation association RC4 occurs within a small patch on the northern side of the track, where Eucalyptus diversifolia dominates over a dense cover of low and medium shrubs and sedges. Eucalyptus conglobata is present as a minor overstory component. Acrotriche spp., Melaleuca lanceolata, Gahnia deusta, Pomaderris obcordata and Templetonia retusa are common understory species.
The plant association has a moderate-high diversity of native plant species, with several regenerating species. Weed cover is low and includes sparse plants of Bridal Creeper, Aleppo Pine and Western Coastal Wattle.
The vegetation community is in good condition.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5">State-listed vegetation community: No
State-threatened flora observed:
State Rare Port Lincoln Mallee (Eucalyptus conglobata)
Nationally- and State-threatened fauna that are likely to utilise this community:
Nationally Vulnerable: Diamond Firetail
State Vulnerable: Yellow-tailed Black Cockatoo, Little Eagle, Brown Quail
State Rare: Purple-gaped Honeyeater, Elegant Parrot, Rock Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Bush Stone-curlew, Peregrine Falcon and Painted Buttonquail.
The State Endangered Eastern Osprey and White-bellied Sea Eagle have been recorded nearby but are unlikely to rely on vegetation away from the coast.</td></tr>
<tr><td>Landscape context score</td><td>1.12</td><td>Vegetation Condition Score</td><td>63.38</td><td>Conservation significance score</td><td>1.14</td></tr>
<tr><td>Unit biodiversity Score</td><td>72.17</td><td>Area (ha)</td><td>Permanent: 0.0081
Rehabilitate: 0.0170</td><td>Total biodiversity Score</td><td>Permanent: 0.58
Rehabilitate: 1.23</td></tr>
</table>

Vegetation Association	**Site RC6: *Eucalyptus diversifolia, E. conglobata, E. gracilis, E. rugosa, *Pinus halepensis* regenerating mallee**				
	 *Photo RC6, facing East at 579506, 6153858 (WGS 84 Zone 53).*				
General description	Vegetation association RC6 occurs between the track and the rail corridor, where mallee vegetation is recovering well after past disturbances, but still contains open bare areas and has a greater incursion of weeds. *Eucalyptus diversifolia, E. conglobata, E. gracilis and E. rugosa* are the main native canopy species, with several species of *Acacia, Dodonaea* and *Melaleuca* regenerating in the understory. Dominant weed species include Aleppo Pine and Pincushion, with Bridal Creeper, Western Coastal Wattle and *Phalaris* sp. (Canary Grass) present as minor components. The plant association has a moderate-high diversity of native plant species, and very good regeneration, but lower structural diversity compared to adjacent mature mallee communities. **The vegetation community is in moderate condition.**				
Threatened species or community	<u>State-listed vegetation community:</u> • State Rare *Eucalyptus conglobata* Low Woodland on fertile loams over limestone <u>State-threatened flora observed:</u> • State Rare Alcock's Wattle (*Acacia alcockii*) • State Rare Port Lincoln Mallee (*Eucalyptus conglobata*) <u>Nationally- and State-threatened fauna that are likely to utilise this community:</u> • Nationally Vulnerable: Diamond Firetail • State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail • State Rare: Purple-gaped Honeyeater, Elegant Parrot, Rock Parrot, White-winged Chough, Western Gerygone, Shy Heathwren, Bush Stone-curlew & Peregrine Falcon. The State Endangered Eastern Osprey and White-bellied Sea Eagle occur nearby but are unlikely to rely on vegetation away from the coast. The State Rare Painted Buttonquail prefers dense canopy and ground cover and is unlikely to be supported by this plant community.				
Landscape context score	1.12	Vegetation Condition Score	63.38	Conservation significance score	1.28
Unit biodiversity Score	49.16	Area (ha)	Permanent: 0.0396 Rehabilitate: 0.1128	Total biodiversity Score	Permanent: 2.79 Rehabilitate: 7.95

Vegetation Association	**Site RC7: *Olearia axillaris, Leucopogon parviflorus* coastal shrubland**				
	 *Photo RC7, facing NW at 579041, 6153877 (WGS 84 Zone 53).*				
General description	Vegetation association RC7 occurs west of the mallee communities, along either side of Greyhound Rd. It is a coastal shrubland community with an overstorey principally composed of *Acacia nematophylla*, *Leucopogon parviflorus* and *Olearia axillaris. Rhagodia spp.* and *Pomaderris paniculosa* are prevalent in the understorey. Sour-sob is the most dominant weed with Bridal Creeper, Western Coastal Wattle and *Euphorbia terracina* (False Caper) present as minor components. The plant association has a high diversity of native plant species. **The vegetation community is in moderate to good condition.**				
Threatened species or community	<u>State-listed vegetation community:</u> No <u>State-threatened flora observed:</u> None <u>Nationally- and State-threatened fauna that may use this community:</u> • State Endangered Eastern Osprey, White-bellied Sea Eagle • State Vulnerable: Yellow-tailed Black Cockatoo, Brown Quail • State Rare: Elegant Parrot, Rock Parrot, Painted Buttonquail, Cape Barren Goose and Peregrine Falcon. The Rock Parrot was recorded in nearby coastal habitat during bird surveys conducted in December 2023. Coastal shrubland is not preferred habitat for the Nationally Vulnerable Diamond Firetail or the State Rare Purple-gaped Honeyeater, Western Gerygone, Shy Heathwren, White-winged Chough and Bush Stone-curlew.				
Landscape context score	1.12	Vegetation Condition Score	58.70	Conservation significance score	1.1
Unit biodiversity Score	72.31	Area (ha)	Permanent: 0.3916 Rehabilitate: 0.1648	Total biodiversity Score	Permanent: 28.32 Rehabilitate: 11.92

Vegetation Association	**Site RC8: **Lycium ferocissimum* open shrubland**				
 *Photo RC8 facing NW at 578971, 6153970 (WGS 84 Zone 53).*					
General description	Plant association RC8 occurs north of Greyhound Rd in highly disturbed areas where introduced Boxthorn (*Lycium ferocissimum*) is prominent and the understorey is dominated by introduced grasses and forbs (Pincushion and False Caper). Regenerating native shrub species such as *Acacia cupularis*, *A. nematophylla, Adriana quadripartita* (Coast Bitter-bush) and *Olearia axillaris* occur as scattered individuals. The plant association has a low diversity of native plant species, with a very high burden of high-threat weeds. **The vegetation community is poor condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: None Nationally- and State-threatened fauna that are likely to utilise this community: None. This highly degraded community is unlikely to provide significant habitat for threatened fauna.				
Landscape context score	1.12	Vegetation Condition Score	5.90	Conservation significance score	1.00
Unit biodiversity Score	6.61	Area (ha)	Permanent: 0.6360 Rehabilitate: 0.0464	Total biodiversity Score	Permanent: 4.2 Rehabilitate: 0.31

Vegetation Association	**Site RC10: *Olearia axillaris, Acacia nematophylla* disturbed coastal shrubland**

Photo RC10 facing NW at 578654, 6154278 (WGS 84 Zone 53).

General description	This degraded coastal shrubland occurs north of Greyhound Road where there has been past clearance. The overstory is quite sparse and comprised mostly of *Olearia axillaris, Acacia nematophylla* with regenerating *Leucopogon parviflorus, Adriana quadripartita* and various chenopod shrubs. Native plant species diversity is moderate to high. The ground layer is heavily invaded by grassy and herbaceous weeds such as Coastal Galenia, Bridal Creeper and Soursob. **The vegetation community is in moderate condition.**
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: None Nationally- and State-threatened fauna that may use this community: • State Rare: Elegant Parrot, Rock Parrot and Peregrine Falcon. This disturbed coastal shrubland is not preferred habitat for the Nationally Vulnerable Diamond Firetail, State Endangered Eastern Osprey and White-bellied Sea Eagle, State Vulnerable Yellow-tailed Black Cockatoo and Brown Quial, or the State Rare Purple-gaped Honeyeater, White-winged Chough, Western Gerygone, Shy Heathwren, Painted Buttonquail and Bush Stone-curlew.

Landscape context score	1.12	Vegetation Condition Score	42.83	Conservation significance score	1.04
Unit biodiversity Score	49.89	Area (ha)	Permanent: 0.1790 Rehabilitate: 0.0914	Total biodiversity Score	Permanent: 8.93 Rehabilitate: 4.56

Vegetation Association	**Site RC11: **Acacia saligna, A. paradoxa* shrubland with emergent **Pinus halepensis***

Photo RC11, facing NW at 578593, 6154568 (WGS 84 Zone 53).

General description	Plant community RC11 is present along the powerline alignment on the spur heading north from the transfer pipe. It occurs on a very disturbed low dune considered likely to have once been a coastal mallee community. It is now dominated by *Acacia paradoxa* (Kangaroo Thorn), with the introduced *Acacia saligna* (Golden Wreath Wattle) and *Pinus halepensis* also significant in the overstorey. The understorey supports native shrub and sedge lifeforms including several *Acacia* species, *Adriana quadripartita*, *Rhagodia crassifolia* and *Dianella brevicaulis,* but also with a heavy load of grassy and herbaceous weeds. The plant association has a moderate diversity of native plant species, with a high burden of high-threat weeds (e.g. Bridal Creeper, Myrtle-leaf Milkwort, Blowfly Bush, Sour-sob, African Boxthorn and *Asparagus declinatus* (Bridal Veil). **The vegetation community is in poor condition.**
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: None Nationally- and State-threatened fauna that are likely to utilise this community: None. This highly degraded community is unlikely to provide significant habitat for threatened fauna.

Landscape context score	1.12	Vegetation Condition Score	16.08	Conservation significance score	1.0
Unit biodiversity Score	18.01	Area (ha)	Permanent: 0.0496 Rehabilitate: 0.0293	Total biodiversity Score	Permanent: 0.89 Rehabilitate: 0.53

Vegetation Association	**Site RC12: Planted **Eucalyptus spp., *Casuarina sp.* over disturbed coastal shrubland**				
 *Photo RC12 facing N at 577990, 6154382 (WGS 84 Zone 53).*					
General description	This plant association occurs to the south-east of the racecourse and near the intersection of Greyhound and Proper Bay roads. It is a degraded version of the coastal shrubland (RC7), where the disturbed remnant community persists beneath overstorey plantings of non-indigenous *Eucalyptus* and *Casuarina* species, and exotic Aleppo Pine and Western Coast Wattle. *Enchylaena tomentosa* and *Rhagodia candolleana* are the most common native shrubs, and there are several regenerating species including *Leucopogon parviflorus, Melaleuca halmaturorum, Acacia nematophylla and A. paradoxa,* Sour-sob is dominant in the groundlayer, and Bridal Creeper is also present. **The vegetation community is in moderate condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: None Nationally- and State-threatened fauna that may use this community: • State Vulnerable Yellow-tailed Black Cockatoo • State Rare: Elegant Parrot, Rock Parrot, White-winged Chough, and Peregrine Falcon. This disturbed coastal shrubland is not preferred habitat for the Nationally Vulnerable Diamond Firetail, State Endangered Eastern Osprey and White-bellied Sea Eagle, State Vulnerable Brown Quail or the State Rare Purple-gaped Honeyeater, Western Gerygone, Shy Heathwren, Painted Buttonquail and Bush Stone-curlew.				
Landscape context score	1.12	Vegetation Condition Score	40.13	Conservation significance score	1.06
Unit biodiversity Score	47.64	Area (ha)	Permanent: 0.0089 Rehabilitate: 0.0788	Total biodiversity Score	Permanent: 0.42 Rehabilitate: 3.75

<table>
<tr><td>Vegetation Association</td><td colspan="5">Site RC13: Melaleuca halmaturorum woodland</td></tr>
<tr><td colspan="6"> 
Photo RC13, facing W at 577948, 6154311 (WGS 84 Zone 53).</td></tr>
<tr><td>General description</td><td colspan="5">This saline wetland system occurs south of the racecourse on the northern side of Greyhound Road, and along the powerline spur heading north from the transfer pipe.
It consists of an overstorey of Melaleuca halmaturorum (Swamp Paper-bark) over Distichlis distichophylla (Emu-grass) and the small/medium chenopod shrubs Rhagodia candolleana and Threlkeldia diffusa (Coast Bonefruit), with several highly threatening weeds, including *Juncus acutus (Spiny Rush), Bridal Creeper, Olive and African Boxthorn.
Native species diversity and the community has a medium-high level of structural diversity, with good canopy cover.
The vegetation community is in moderate condition.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5"><u>State-listed vegetation community:</u> No
<u>State-threatened flora observed:</u> None
<u>Nationally- and State-threatened fauna that may use this community:</u>
• State Rare: Elegant Parrot, Rock Parrot, and Peregrine Falcon.
The wetland community is not preferred habitat for the Nationally Vulnerable Diamond Firetail, the State Vulnerable Yellow-tailed Black Cockatoo and Brown Quail, or the State Rare Purple-gaped Honeyeater, White-winged Chough, Western Gerygone, Shy Heathwren, Painted Buttonquail and Bush Stone-curlew.
Given the site's proximity to busy roads, it is highly unlikely to support the State Endangered Eastern Osprey and White-bellied Sea Eagle.</td></tr>
<tr><td>Landscape context score</td><td>1.12</td><td>Vegetation Condition Score</td><td>45.18</td><td>Conservation significance score</td><td>1.04</td></tr>
<tr><td>Unit biodiversity Score</td><td>52.62</td><td>Area (ha)</td><td>Permanent: 0.0496
Rehabilitate: 0.0421</td><td>Total biodiversity Score</td><td>Permanent: 2.61
Rehabilitate: 2.22</td></tr>
</table>

Vegetation Association	**Site RC14: *Nitraria billardieri* shrubland**				
 *Photo RC14, facing W at 577790, 6154287 (WGS 84 Zone 53).*					
General description	Plant community RC14 occurs as a narrow strip on the southern side of Greyhound Rd, south of the racecourse. The coastal shrubland has a moderate diversity of native species with an overstorey dominated by *Nitraria billardieri* (Nitre Bush) over *Suaeda australis* (Austral Seablite). Three SA Declared weeds Spiny Rush, Bridal Creeper and African Boxthorn occur in the association. **The vegetation community is in moderate condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: None Nationally- and State-threatened fauna that may use this community: • State Rare: Elegant Parrot, Rock Parrot, Painted Buttonquail and Peregrine Falcon. Coastal shrubland is not preferred habitat for the Nationally Vulnerable Diamond Firetail, the State Vulnerable Yellow-tailed Black Cockatoo or Brown Quail, or the State Rare Purple-gaped Honeyeater, Western Gerygone, Shy Heathwren, White-winged Chough and Bush Stone-curlew. Given the site's proximity to busy roads, it is highly unlikely to support the State Endangered Eastern Osprey and White-bellied Sea Eagle.				
Landscape context score	1.12	Vegetation Condition Score	36.64	Conservation significance score	1.04
Unit biodiversity Score	42.67	Area (ha)	Permanent: 0.0411 Rehabilitate: 0.0733	Total biodiversity Score	Permanent: 1.75 Rehabilitate: 3.13

Vegetation Association	**Site RC15: *Eucalyptus albopurpurea, E. diversifolia* disturbed mallee**				
 *Photo RC15, facing North at 578481, 6155053 (WGS 84 Zone 53).*					
General description	This highly disturbed *Eucalyptus albopurpurea* and *Eucalyptus diversifolia* mallee community occurs at the northernmost end of the powerline alignment on the spur heading north from the transfer pipe. Whilst the overstorey trees are generally in good condition, the understorey is highly degraded and generally dominated by introduced grass, herb and climber weeds. Native species diversity is low and includes some understorey shrubs and groundcovers such as *Rhagodia crassifolia, Pimelea serpyllifolia, Exocarpos aphyllus* and *Tetragonia implexicoma*. The community contains several high threat weeds (Bridal Creeper, Aleppo Pine, African Box Thorn, Sour Sob and Swamp Oak). **The vegetation community is in poor condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: None Nationally- and State-threatened fauna that may use this community: • State Vulnerable Yellow-tailed Black Cockatoo • State Rare: Elegant Parrot, Rock Parrot, White-winged Chough, Western Gerygone The White-winged Chough was observed using the site. The degraded understory is unlikely to provide suitable habitat for the Nationally Vulnerable Diamond Firetail, the State Vulnerable Brown Quail, or the State Rare Purple-gaped Honeyeater, Peregrine Falcon, Shy Heathwren, Painted Buttonquail and Bush Stone-curlew.				
Landscape context score	1.12	Vegetation Condition Score	17.00	Conservation significance score	1.06
Unit biodiversity Score	20.18	Area (ha)	Permanent: 0.0312 Rehabilitate: 0.0298	Total biodiversity Score	Permanent: 0.63 Rehabilitate: 0.6

Vegetation Association	**Site TR1: *Eucalyptus diversifolia, E. albopurpurea* mallee with emergent *Allocasuarina verticillata***

Photo TR1, facing SE at 575172, 6154560 (WGS 84 Zone 53).

Threatened flora recorded in TR1: Tate's Grass Tree (left), Spoon-leaved Spyridium (centre) and Snowdrop Spurge (right)

General description	Vegetation Association TR1 is present around the existing North Side Hill tank site at the western end of Blue Fin Rd. *Eucalyptus diversifolia* and *Eucalyptus albopurpurea* are co-dominant canopy species with some emergent *Allocasuarina verticillata.* The vegeetation has a highly diverse heathy shrub layer comprising *Pomaderris obcoradta, Xanthorrhoea semiplana, Acrotriche cordata, Acacia myrtoifolia, A. paradoxa, Hibbertia devitata, Lepidospermum viscidum* and *Lasiopetalum* species. Two species of orchids (*Diuris* sp. and *Microtis* sp.) were detected in spring surveys. Weed incursions are minor and include scattered plants of Bridal Creeper, Freesias, Sour-sob, African Daisy and Aleppo Pine. The plant community has very high structural and native plant species diversity, with many regenerating species, and offers good fauna habitat. **The vegetation community is in excellent condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: • State Rare Tate's Grass-tree (*Xanthorrhoea semiplana ssp. tateana*) • State Rare Spoon-leaved Spyridium (*Spyridium daphnoides*) • State Rare Snowdrop Spurge (*Lysiandra calycina*) • State Rare Yellow Sour-bush (*Choretrum chrysanthum*) *Xanthorrhoea semiplana spp. tateana* (SA Rare) occurs interspersed with *X. semiplana ssp. semiplana*. *Xanthorrhoea semiplana* are a dominant component of the understory, however it is not possible to estimate numbers of Tate's Grass-tree plants as the subspecies is only distinguishable when flowering or in mature individuals that have a distinct trunk. Flowering individuals of Tate's Grass-tree were identified along the roadside of Bluefin Road, and at waypoint 408 north-west of the tanks. Note, many *Xanthorrhoea* are showing signs of yellowing, possibly indicating the presence of *Phytophthora cinnamomi* at the site. Numerous individuals of *Spyridium daphnoides* are present along the north-eastern roadside of Blue Fin Rd, and a few to the north-west of the tanks outside the fence (waypoints 406, 408, 409 to 427). Two plants of *Lysiandra calycina* were recorded on the northern side of Blue Fin Rd at waypoints 407 and 420. Two plants of *Choretrum chrysanthum* were noted within the road reserve on the northeastern side of Blue Fin Rd at waypoints 1062.1 and 1062.2. Nationally- and State-threatened fauna that may use this community: • Nationally Endangered: Mallee Whipbird, EP Southern Emu-wren • Nationally Vulnerable: Diamond Firetail • State Vulnerable: Yellow-tailed Black Cockatoo and Little Eagle • State Rare: Purple-gaped Honeyeater, Western Gerygone, Shy Heathwren, White-winged Chough, Painted Buttonquail and Peregrine Falcon. The Diamond Firetail was recorded during fauna surveys in December 2023 and White-winged choughs were observed at the site in October 2023. Although not recorded within 5km of the site, it is considered likely that the Mallee Whipbird may occur at the site, as the mallee provides suitable habitat and is part of an extensive and continuous tract of mallee to the south and west.				
Landscape context score	1.09	Vegetation Condition Score	69.35	Conservation significance score	1.18
Unit biodiversity Score	89.20	Area (ha)	Permanent: 0.0316 Rehabilitate: 0.0327	Total biodiversity Score	Permanent: 2.82 Rehabilitate: 2.92

Vegetation Association	**Site TR2: *Eucalyptus diversifolia, E. albopurpurea* slashed low open mallee**

Photo TR2.1 facing East at waypoint 1060 (575286, 6154505 (WGS 84 Zone 53)).

Photo TR2.2 facing South-east at waypoint 1061 (575285, 6154503 (WGS 84 Zone 53), showing vegetation structure of adjacent non-slashed mallee community

General description	Plant Association TR2 occurs within a 25 m wide strip on private property to the north-east of Blue Fin Rd. It represents a similar suite of species to that of TR1, except that it is regularly slashed for fire risk mitigation. The community supports a very high diversity of native species, and high levels of regeneration. As no previous clearance approval has been granted for this area, the Native Vegetation Branch has advised that the structural diversity and habitat scores for this plant association should be representative of the community in a non-disturbed state. As such, assessments of Native Plant Life Forms, Tree Canopy Cover, Mature Tree Score, Fallen Debris, and Potential Habitat for Threatened Fauna, are based on the adjacent non-slashed roadside community. Weed incursions are very low throughout most of plant association TR2 and include very sparse plants of Bridal Creeper, Onion weed and *Centaurea melitensis* (Malta Thistle). The community becomes weedier at the southeastern end of the alignment (adjacent to roadside association TR3), where Bridal Creeper, Onion weed and Myrtle-leaf Milkwort are prominent. **The vegetation community is in very good condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: • State Rare Spoon-leaved Spyridium (*Spyridium daphnoides*) • State Rare Snowdrop Spurge (*Lysiandra calycina*) Two plants of *Spyridium daphnoides* were detected during surveys in October 2023 (waypoints 413), however there are likely to be more along the proposed pipeline route. Four plants of *Lysiandra calycina* were recorded at the north-western end of the plant community – 3 plants at waypoint 1063 and 1 plant at waypoint 1064. Given their prevalence in Vegetation Association TR1, it is likely that *Xanthorrhoea semiplana spp. tateana* (SA Rare) also occurs in Association TR2, however this was not possible to confirm because the plants had been recently slashed. Nationally- and State-threatened fauna that may use this community: • Nationally Endangered: Mallee Whipbird, EP Southern Emu-wren • Nationally Vulnerable: Diamond Firetail • State Vulnerable: Yellow-tailed Black Cockatoo and Little Eagle • State Rare: Purple-gaped Honeyeater, Western Gerygone, Shy Heathwren, White-winged Chough, Painted Buttonquail and Peregrine Falcon.				
Landscape context score	1.09	Vegetation Condition Score	71.23	Conservation significance score	1.18
Unit biodiversity Score	91.61	Area (ha)	Permanent: 0.2901 Rehabilitate: 0.2139	Total biodiversity Score	Permanent: 26.58 Rehabilitate: 19.60

Vegetation Association	**Site TR3: *Eucalyptus diversifolia* ± *E. albopurpurea* mallee over dense *Acacia paradoxa***				
	 *Photo TR3, facing E at 575404, 6154372 (WGS 84 Zone 53).*				
General description	Association TR3 occurs along the roadsides of Blue Fin Rd, east of the intersection with Kathai Drive. The mallee overstorey becomes more open, but is still principally *Eucalyptus diversifolia* and *E. albopurpurea*. There is a dense mid-shrub layer of *Acacia paradoxa* with a lower diversity and cover of native heath species, likely as a result of previous disturbance, including clearance and fire. Vegetation in close proximity to the road verge is often highly disturbed by grading activities and invaded by weeds such as Rice Millet, Soursob and Pincushion. Bridal Creeper, Boxthorn and Myrtle-leaf Milkwort are present in the understory. **The vegetation community is in moderate condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: • State Rare Snowdrop Spurge (*Lysiandra calycina*) *Lysiandra calycina* was recorded in this plant association during surveys in July 2021. A subsequent survey in October 2023 found no plants within the proposed impact area along the northern side of Blue Fin Rd. Nationally- and State-threatened fauna that may use this community: • Nationally Endangered: EP Southern Emu-wren • Nationally Vulnerable: Diamond Firetail • State Vulnerable: Yellow-tailed Black Cockatoo and Little Eagle • State Rare: Purple-gaped Honeyeater, Western Gerygone, Shy Heathwren, White-winged Chough, Painted Buttonquail and Peregrine Falcon. The Shy Heathwren was observed at the site during 2023 fauna surveys.				
Landscape context score	1.09	Vegetation Condition Score	39.09	Conservation significance score	1.14
Unit biodiversity Score	48.58	Area (ha)	Permanent: 0.0669 Rehabilitate: 0.3089	Total biodiversity Score	Permanent: 3.25 Rehabilitate: 15.01

Vegetation Association	**Site TR4: *Acacia paradoxa, A. cupularis* very open disturbed shrubland**				
 *Photo TR4, facing E at 575952, 6154031 (WGS 84 Zone 53).*					
General description	Association TR4 represents sections of recovering roadside vegetation along the eastern end of Blue Fin Rd. Native shrub species are regenerating, with a moderate diversity, but generally very low cover. These areas would formerly have been mallee, and so are considered to be highly disturbed. Weeds are dominated by Pincushion, but also include Bridal Creeper, African Daisy, False Caper and Onion Weed. **The vegetation community is in poor condition.**				
Threatened species or community	State-listed vegetation community: No State-threatened flora observed: • State Rare Snowdrop Spurge (*Lysiandra calycina*) *Lysiandra calycina* was recorded in this plant association during surveys in July 2021. A subsequent survey in October 2023 found no plants within the proposed impact area along the northern side of Blue Fin Rd. Nationally- and State-threatened fauna that may use this community: This highly disturbed community is unlikely to provide significant habitat for threatened fauna.				
Landscape context score	1.09	Vegetation Condition Score	17.22	Conservation significance score	1.04
Unit biodiversity Score	19.52	Area (ha)	Permanent: 0.0859 Rehabilitate: 0.0871	Total biodiversity Score	Permanent: 1.68 Rehabilitate: 1.70

Site map showing areas of proposed impact

Figure 8. Key to vegetation clearance maps

Figure 9. Map 1

Figure 10. Map 2

Figure 11. Map 3

Figure 12. Map 4

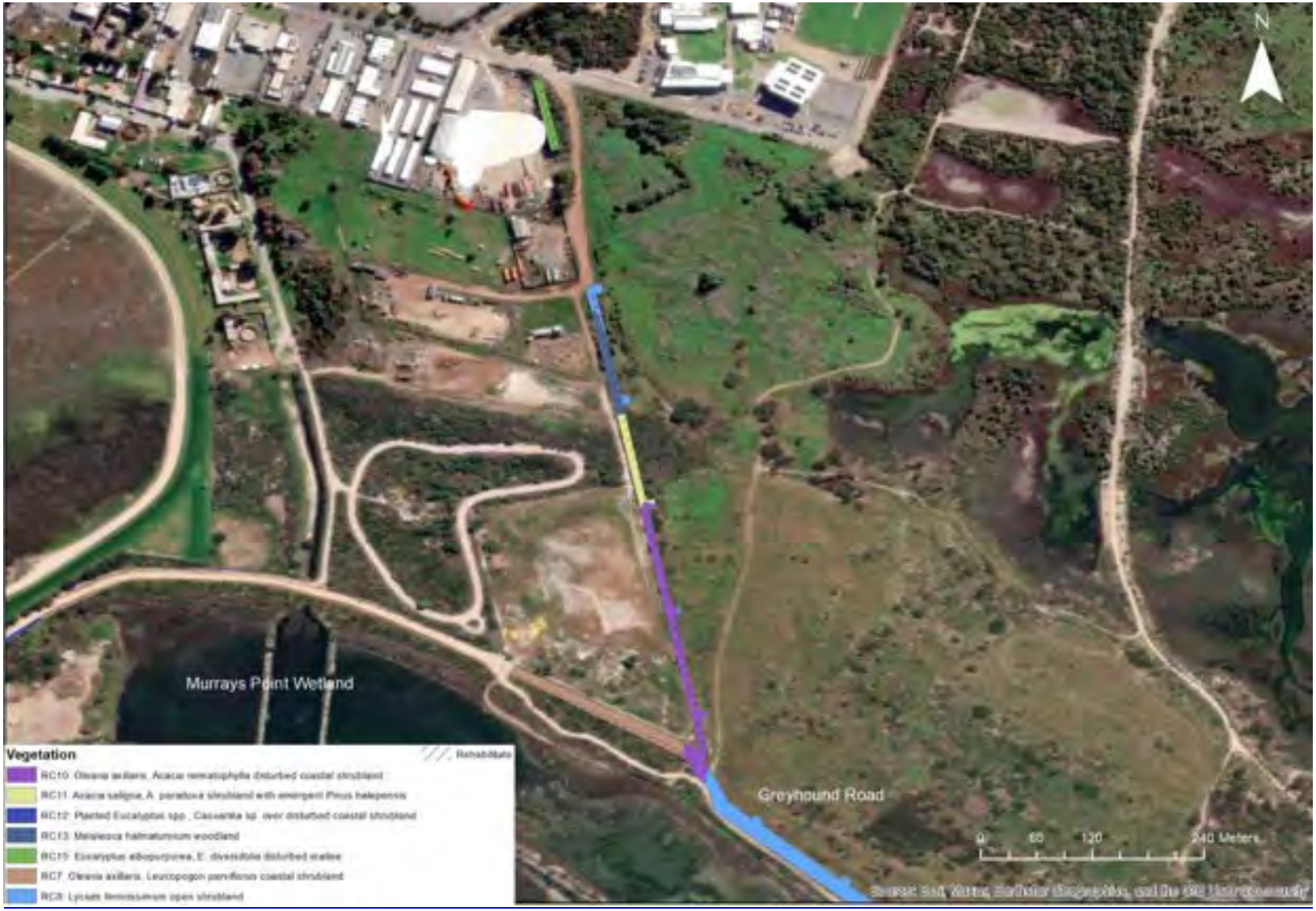

Figure 13. Map 5

Figure 14. Map 6

Figure 15. Map 7

Figure 16. Map 8

Photo log

Photo	Photo Direction	Easting (53H)	Northing	Description
Site 1.1	West	581093	6154216	Vegetation Association 1
Site 1.2	South south-east	581063	6154231	Vegetation Association 1
Site 2.1	South-east	581053	6154259	Vegetation Association 2
Site 2.2	South	581105	6154327	Vegetation Association 2
Site 3.1	South	581091	6154439	Vegetation Association 3
Site 3.2	South-west	581103	6154409	Vegetation Association 3
Site 4.1	South	581105	6154511	Vegetation Association 4
Site 4.2	South	581118	6154577	Vegetation Association 4
Site 6.1	South	581133	6154152	Vegetation Association 6
Site 6.2	South	580979	6154257	Vegetation Association 6
Site 6a	South	580988	6154224	Vegetation Association 6a
Site 7.1	South	581000	6154136	Vegetation Association 7
Site 7.2	South	581059	6154120	Vegetation Association 7
Site 7.3	West	580876	6154275	Vegetation Association 7
Site 8	South-east	581036	6154416	Vegetation Association 8
Site WW1.1	South	581384	6154601	Vegetation Association WW1
Site WW1.2	North-east	581539	6154733	Vegetation Association WW1
Site WW4.1	West	-34.78552 lat	135.891359 long	Vegetation Association WW4
Site WW5.1	West	-34.76006 lat	135 892051 long	Vegetation Association WW5
RC1	North-east	579139	6153850	Vegetation Association RC1
RC2	North-east	579228	6153858	Vegetation Association RC2
RC3.1	North-east	579435	6153868	Vegetation Association RC3
RC3.2	North-east	-34.75375 lat	135.87417 long	Stand of *Acacia alcockii* in RC3
RC4	South-west	580801	6154218	Vegetation Association RC4
RC6	East	579506	6153858	Vegetation Association RC6
RC7	North-west	579041	615877	Vegetation Association RC7
RC8	North-west	578971	615970	Vegetation Association RC8
RC10	North-west	578654	6154278	Vegetation Association RC10
RC11	North-west	578593	6143568	Vegetation Association RC11
RC12	North	577990	61545382	Vegetation Association RC12
RC13	West	577948	6154311	Vegetation Association RC13
RC14	West	577790	6154287	Vegetation Association RC14
RC15	North	578481	6155053	Vegetation Association RC 15
TR1	South-east	575172	6154560	Vegetation Association TR1
TR2.1	East	575286	6154505	Vegetation Association TR2
TR2.2	South-east	575285	6154503	Unslashed example association TR2
TR3	East	575404	6154372	Vegetation Association TR3
TR4	East	575952	6154031	Vegetation Association TR4

4.2 Threatened Species assessment

4.2.1 Vegetation communities of conservation significance

Nationally-threatened Communities

No nationally (EPBC) listed vegetation communities occur within the areas of impact.

The Nationally Vulnerable "Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Community" occurs along the coastline at Greyhound Rd (within 5 km of the site) but does not occur in areas impacted by the project.

State-threatened Communities

One community is listed as Rare under South Australia's Provisional List of Threatened Ecosystems:

- *Eucalyptus conglobata* Low Woodland on fertile loams over limestone

This community is endemic to the Eyre Peninsula, and listed as Rare in South Australia because it is now confined to southern Eyre Peninsula and adjacent Taylor and Boston Islands. It occurs in vegetation associations: 1, 2, 3, RC2, RC6, WW4 and WW5.

4.2.2 Flora of conservation significance

Nationally-threatened flora

No flora species of national conservation significance were detected during field survey work.

Four flora species of national conservation significance were recorded in the BDBSA database or identified as "Known to Occur" by the Protected Matters Search Tool, within a 5 km radius of the impact site.

- Goldsack's Leek-orchid (*Prasophyllum goldsackii*)- Endangered
- Metallic Sun-orchid (*Thelymitra epipactoides*) - Endangered
- Large-club Spider-orchid (*Caladenia macroclavia*) – Endangered
- Trailing Hop-bush (*Dodonaea procumbens*) - Vulnerable

Habitat at the assessment site may be suitable for two of these taxa: the Metallic Sun-orchid and Goldsack's Leek-orchid, which have both been recorded in similar habitat nearby (Appendix 3). These species flower in spring (mid-August to October) and were not detected during the targeted field survey in October 2023.

A fifth species (Inland Green-comb Spider-orchid *Caladenia tensa*) recorded in the BDBSA is unlikely to be the nationally-listed taxon, which is restricted to south-eastern parts of South Australia.

State-listed flora

Six State Rare species were recorded during field surveys.

- Alcock's Wattle (*Acacia alcockii*) – Sites 1, 2, 3, 4, 6, 6a, 9a, 9b, WW1, RC2, RC3 and RC6
- Port Lincoln Mallee (*Eucalyptus conglobata ssp. conglobata*) - Sites 1, 2, 3, 4, 7, RC2, RC3, RC4, RC6, WW4 and WW5
- Snowdrop Spurge (*Lysiandra calycina*) – Sites TR1, TR2, TR3 and TR4
- Spoon-leaved Spyridium (*Spyridium daphnoides*) – Sites TR1 and TR2
- Tate's Grass-tree (*Xanthorrhoea semiplana ssp. tateana*) – Site TR1
- Yellow Sour-bush (*Choretrum chrysanthum*) – Site TR1

A further nine State Rare species have been recorded within a 5 km radius since 1995 (Appendix 3). Habitat at the assessment site may be suitable for six of these taxa:

- Dogwood Haeckeria (*Haeckeria cassiniiformis*)
- Eyre Peninsula Fringe-lily (*Thysanotus wangariensis)*
- Green Mintbush (*Prostanthera chlorantha*)
- Port Lincoln Guinea-flower (*Hibbertia cinerea*)
- Twisted Sun-orchid (*Thelymitra flexuosa*)
- Western Daddy-long-legs (*Caladenia bicalliata ssp. bicalliata*)

The two orchid species flower in spring (mid-August to November) and were not detected during the targeted field survey in October 2023.

4.2.3 Fauna of conservation significance

Nationally-threatened fauna

Five EPBC-listed species were recorded during the fauna surveys (Table 1, Appendices 1 and 2):

- Diamond Firetail – EPBC Vulnerable
- Common Greenshank - EPBC Endangered
- Fairy Tern – EPBC Vulnerable
- Sharp-tailed Sandpiper – EPBC Vulnerable
- Australian Sea Lion - EPBC Endangered

The Australia Sea Lion, Common Greenshank, Sharp-tailed Sandpiper and Fairy Tern are marine or shoreline species and will not be impacted by the vegetation clearance under this application (Table 2).

The desktop assessment identified a further three Nationally-listed terrestrial bird species that are known to occur, or may find suitable habitat, within 5 km of the impact area:

- Mallee Whipbird (eastern subspecies) – EPBC Endangered
- Eyre Peninsula Southern Emu-wren – EPBC Endangered
- Malleefowl - EPBC Vulnerable

Detailed descriptions of the habitat requirements for the Diamond Firetail, Mallee Whipbird and Eyre Peninsula Southern Emu-wren are provided in Section 6.3.5 (SEB Offset).

Diamond Firetail – EPBC Vulnerable

A small group of Diamond Firetails was observed near the Tank Site during the fauna survey. Prior to this, the species was recorded in 2018 in Port Lincoln. It is likely to occur in open mallee vegetation within the assessment site, particularly where native grasses are present in the ground layer.

Mallee Whipbird (eastern subspecies) – EPBC Endangered

The EPBC Protected Matters search states the Mallee Whipbird, or its habitat, is known to occur within 5 km of the project, however the nearest record is in Port Lincoln National Park. The area of mallee vegetation at Murrays Point is unlikely to support whipbirds as it has a more open understorey than the shrubby habitat the species requires and because the vegetation is fragmented by off-road vehicle tracks. The vegetation at Kathai CP is more suitable, however the absence of any local records for a species with a distinctive call in an area easily accessible from Port Lincoln suggests the bird is not present.

Eyre Peninsula Southern Emu-wren – EPBC Endangered

The nearest records for the Southern Emu-wren are near Tulka, ~5 km south of Kathai CP, and given that there is good connectivity to the North Side Tank site, it is feasible that the species would find suitable habitat in the area. There are no post-1995 records within 5 km of the proposed desalination plant at Billy Lights Point and there is no suitable contiguous vegetation that would allow the species to disperse to the area from the south.

Malleefowl - EPBC Vulnerable

The Malleefowl, *Leipoa ocellata,* occurs in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or acacias and associated habitats such as *Melaleuca uncinate* and *Callitris verrucosa*. They require a sandy substrate and abundance of leaf litter for the construction of their mound incubator-nests, and their abundance is usually greater in higher rainfall areas and on more fertile soils where vegetation tends to be denser and more diverse. The birds preferred old growth (i.e. long unburnt) mallee where there is plenty of leaf litter for nest building and thicker understorey cover to provide protection from predators [4]. The EPBC Protected Matters search states that the Malleefowl, or its habitat, is known to occur within 5 km of the assessment site, however there are no recent (post-1995) records within this area. There are numerous records for the species in Port Lincoln National Park. There was no evidence of recent or historic mounds at the assessment site.

Twelve Nationally-threatened species of marine or aquatic birds, mammals and reptiles have also been recorded within 5 km of the site but will not be impacted by the works assessed in this application (Table 2).

Nationally-listed Marine and Migratory (Terrestrial) Species

Two raptor species, the White-bellied Sea-eagle (*Haliaeetus leucogaster*) and Eastern Osprey (*Pandion haliaetus cristatus*), are Commonwealth listed marine and/or migratory seabird species and receive national protection as MNES under the *EPBC Act*. Both species are listed as Endangered under the South Australian *NP&W Act*.

The White-bellied Sea-eagle is distributed along the coastline of Australia and extends inland along some of the larger waterways. They breed in solitary and monogamous pairs that mate for life. In southern Australia, the breeding season extends from June to January (sometimes February). Their large nests, made of sticks lined with leaves, grass or seaweed, may be built in tall trees (especially *Eucalyptus* species), bushes, mangroves, cliffs, rocky outcrops, caves, crevices, on the ground or on artificial structures. Pairs usually return to the same breeding territory each year, and often the same nest, although territories may contain one or two additional, less developed nests. Breeding pairs tend to be widely dispersed and are generally separated by distances of several kilometres or more. A breeding pair of White-bellied Sea-eagles has been nesting within 500 m of the proposed project site for the last 4 years.

The Osprey is mostly found in coastal areas but occasionally travels inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging and frequent a variety of wetland habitats including inshore waters, coastal cliffs, beaches, estuaries, mangrove swamps, rivers and large lakes. The Osprey breeds from April to February, constructing a large stick nest usually on exposed cliffs, in low coastal trees or man-made structures. The species is nesting in the vicinity of the Lincoln Cove Marina, around 1 km away from the project site.

The White-bellied Sea-eagle and Eastern Osprey are sensitive to human disturbance, particularly during the breeding season, and may abandon nests and young if exposed to human activity.

The works do not affect breeding sites and affect a small proportion of the home ranges of the birds, in an area that is already substantially modified for industry, housing, fishing and navigation.

An Interim Raptor Management Plan has been developed by SA Water in consultation with the Department of Environment and Water and provides measures to reduce risks including timing of construction work outside of sensitive breeding periods. As with all projects involving installation of new overhead powerlines, there is a potential electrocution risk to raptor species through collision whilst hunting. Potential mitigation measures to reduce these risks on raptors are being investigated in collaboration with SAPN.

State-threatened fauna

Twenty-nine bird and three reptile species recorded during surveys or database searches are listed as threatened under the NP&W Act. Sixteen of these are present or may find suitable habitat within the vegetation associations under application (Table 1).

Table 1: Threatened fauna species recorded during fauna and vegetation surveys in 2023.

Common Name	EPBC Act	NPW Act	Location
Australian Sea Lion	EN	V	East side of Billy Lights Point
Banded Stilt		V	Wetlands between Greyhound Rd and bay
Brown Quail		V	Roadside near Billy Lights Point
Common Greenshank	EN		Tidal flats south of the racetrack
Common Sandpiper		R	Billy Lights Point
Diamond Firetail	VU	V	Northside Hill tanks site
Eastern Osprey		E	Wetlands between Greyhound Rd and bay
Fairy Tern	VU	E	Wetlands between Greyhound Rd and bay.
Little Egret		R	Wetlands between Greyhound Rd and bay and shore bird site 3.
Pied Oystercatcher		R	Greyhound Rd shore bird survey sites
Purple-gaped Honeyeater		R	Woodland bird sites (RC2 and 3)
Rock Parrot		R	Greyhound Rd Shore bird site 3, woodland bird site 1, wetlands between Greyhound Rd and bay.
Sharp-tailed Sandpiper	VU		Tidal flats south of the racetrack
Shy Heathwren		R	Bluefin Rd (Woodland bird site 7, TR3)
Sooty Oystercatcher		R	3 of 4 shore bird survey sites
White-bellied Sea Eagle		E	Jetty on south side of Billy Lights Point.
White-winged Chough		R	Rail corridor (RC2 and RC3) and Tank site (TR1).

Table 2. Species observed on site, or recorded within 5km of the application area since 1995, or the vegetation is considered to provide suitable habitat.

SPECIES	EPBC Act	NPWS Act	Source	Date of last record[1]	Species known habitat preferences	Likelihood for use for habitat - comments
BIRDS						
Actitis hypoleucos (Common Sandpiper)		R	1,3, 4	2023 (DP,RC)	This species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. Migratory species, breeding in Northern Hemisphere, and flying to the Southern Hemisphere in the southern spring and summer [5].	Known. Unlikely to use mallee associations (Sites 1–8, RC1-6, TR1-4). Observed near Billy Lights Point during 2023 fauna surveys. Highly likely to use coastal shoreline near proposed outfall area. Numerous records around Port Lincoln and Billy Light Peninsula.
Bubulcus ibis coromandus (Eastern Cattle Egret)		R	1,3	2019 (DP,RC,TR)	The Cattle Egret is found in grasslands, grassy woodlands, wetlands and river systems. It also uses pastures and croplands, especially where drainage is poor [6].	Unlikely to use mallee associations (Sites 1–8, RC 1-6, TR 1-4, WW 1-4). Highly likely to use coastal shrubland (Greyhound Rd). Previously recorded in samphire areas along Greyhound Rd and mangroves near Port Lincon Marina.
Burhinus grallarius (Bush Stone-curlew)		R	1,2	2006 (DP,RC)	The Bush Stone-curlew is a large ground-dwelling bird found in a variety of habitats including open forest, eucalyptus woodland, rainforest edges, grassy plains, arid scrubland, and along inland watercourses. Key habitat components include fallen dead timber, leaf litter and an open ground layer.	Possible in Sites 1-4 and RC2 - 6 which provide some suitable open habitat. Only one record nearby at Kirton Point, within previous 20 years. Unlikely to use coastal shrubland or degraded mallee areas (Sites 6-9a, RC1,7-14). Not recorded within 5km of the proposed Tank Site (TR1-4).
Calidris acuminata (Sharp-tailed Sandpiper)	VU		3, 5	2023 (DP,RC,TR)	A small-medium migratory shorebird breeding in northern Siberia and moving to non-breeding areas south of the Equator. The species is widespread in both inland and coastal locations, occurring in freshwater and saline habitats. They feed along the water's edge of mudflats, wetlands and sewage ponds [7].	Known. Unlikely to use mallee associations (Sites 1–8, RC 1-6, TR 1-4, WWTP 1-4). Highly likely at wastewater treatment plant ponds. Observed during 2023 field surveys. Numerous records across the coastal and wetland areas of the assessment area.
Calidris alba alba (Sanderling)		R	2	2019 (DP,RC)	Small wading bird which breeds in the High Arctic areas and migrates south over winter where it inhabits open sandy beaches, tidal sand flats, mud flats and the shores of lakes and rivers. Occasionally uses rocky shores.	Unlikely to use mallee associations (Sites 1–8, RC1-6, TR1-4). Likely to use coastal shoreline at proposed outfall area. Previously recorded in Murrays Point Reserve and Port Lincoln marina.
Calidris canutus (Red Knot)	VU	E	1,2,3	2020 (DP,RC)	Small to medium shorebird which breeds in the northern hemisphere and migrates south to spend the boreal winter in Australasia. It inhabits intertidal mudflats, sandflats and sandy beaches of sheltered coasts and sometimes on sandy ocean beaches or shallow pools on exposed rock platforms. Occasionally seen on saline wetlands near the coast and on sewage ponds and saltworks [8].	Unlikely to use mallee associations (Sites 1–8, RC1-6, TR1-4). Highly likely to use wastewater treatment area and coastal shoreline at proposed outfall area. Previously recorded at Billy Lights long beach and at the Pt Lincoln Marina drain.

SPECIES	EPBC Act	NPWS Act	Source	Date of last record[1]	Species known habitat preferences	Likelihood for use for habitat - comments
Calidris ferruginea (Curlew Sandpiper)	CR	E	2,5	2023 (DP,RC)	A migratory shorebird which breeds across Arctic Siberia. Non-breeding birds are found in many Australian coastal sites and may also be seen inland in suitable wetland habitats. Feeding habitat includes exposed sandy or soft mud substrates on intertidal flats and beaches. Roosting habitat consists primarily of large intertidal sandflats, spits, and banks [9].	Unlikely to use mallee associations (Sites 1–8, RC1-6, TR1-4). Highly likely to use saltmarsh wetlands along Greyhound Rd.
Calidris melanotos (Pectoral Sandpiper)		R	2,3	2021 (DP,RC)	Small wader which breeds in the northern hemisphere and migrates to south-eastern Australia, arriving mainly in coastal areas and then dispersing inland. Found in coastal lagoons, estuaries, swamps, lakes, creeks, floodplains, and artificial wetlands. It forages for invertebrates on grasslands and mudflats.	Unlikely to use mallee associations (Sites 1–8, RC1-6, TR1-4). Highly likely to use wastewater treatment lagoons and coastal shoreline at proposed outfall area. Recorded at Billy Lights Point.
Cereopsis novaehollandiae novaehollandiae (Cape Barren Goose)		R	1,2,3	2015 (DP) 2019 (RC, TR)	Large ground-dwelling bird found near coastal shorelines and lakes, as well as nearby grasslands and shrublands, including pastureland. They favour grassy areas but can also be seen on beaches and in low heathy scrubs.	Unlikely to use mallee associations (Sites 1-4,6-8, RC1-6, TR1-4). Possible use of coastal shrubland (RC7) and shoreline at proposed outfall area, however this is not preferred habitat. Recorded nearby at Billy Lights Point and shoreline along Greyhound Rd.
Cladorhynchus leucocephalus (Banded Stilt)		V	1,2,3,4	2023 (DP,RC) 2020 (TR)	A nomadic wading bird, found mainly in shallow saline and hypersaline waters of the inland and coast including ephemeral salt lakes, salt works, lagoons, salt- or claypans and intertidal flats. Sometimes found in brackish or fresh water, including farm dams and sewage ponds [10].	Known. Unlikely to use mallee associations. Highly likely to use wastewater treatment lagoons and coastal shoreline at proposed outfall area. Observed during 2023 fauna surveys in wetlands along Greyhound Rd. Previously recorded at Billy Lights Point, wastewater treatment plant, Pt Lincoln Marina and in samphire areas along Greyhound Rd.
Coturnix ypsilophora (Brown / Swamp Quail)		V	4	2023 (DP)	Found in dense vegetation fringing freshwater wetlands, wetter grasslands and shrublands, sedgelands, amongst bracken and occasionally along roadsides. Under favourable conditions the population may irrupt outside of its normal range into semi-arid and arid areas for short periods. Considered to be a vagrant species to Eyre Peninsula [11].	Highly Likely / Known. Observed on roadside near Billy Lights Point during 2023 fauna surveys. In wetter year, suitable habitat may be available at Sites with a dense shrubby or sedge understory (Sites 1 - 4, WW1 - 5, RC1 - 7)
Corcorax melanorhamphos (White-winged Chough)		R	1,2,3,4	2023 (DP, RC, TR)	White-winged Choughs are found in open forests and woodlands. They tend to prefer the wetter areas, with lots of leaf-litter, for feeding, and available mud for nest building [12].	Known. Observed during field surveys in RC2, RC3, RC9, RC15 and TR1. Highly likely in all other good quality mallee habitats with dense leaf litter. Unlikely to use coastal shrubland (RC8, 10) and degraded mallee areas (Sites 6-8, RC6) which lack leaf litter.

SPECIES	EPBC Act	NPWS Act	Source	Date of last record[1]	Species known habitat preferences	Likelihood for use for habitat - comments
Diomedea exulans (Wandering Albatross)	VU	V	2,5	2017 (DP, RC)	Large seabird which nests on remote islands and forages in open waters of the southern oceans. Juveniles and non-breeding adults circumnavigate Antarctica, often passing close to the Australian mainland [13].	Unlikely. Oceanic species. One record of 2 birds seen off Port Lincoln beachfront.
Egretta garzetta nigripes (Little Egret)		R	1,4	2023 (DP, RC)	The Little Egret frequents tidal mudflats, saltwater and freshwater wetlands, and mangroves [14].	Known. Unlikely to use mallee associations. Observed in wetlands and along shoreline near Greyhound Rd during 2023 fauna surveys. Highly likely to use wastewater treatment lagoons and coastal shoreline at proposed outfall area.
Falco peregrinus macropus (Peregrine Falcon)		R	1	2011 (DP) 2017 (RC, TR)	Found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites and prefers coastal and inland cliffs or open woodlands near water [15].	Highly Likely. Recorded in last 10 years, and suitable prey species present (e.g. may feed on pigeons associated with old sheds at the proposed desalination site).
Gerygone fusca (Western Gerygone)		R	1	2017 (DP, RC) 2018 (TR)	Small bushland bird which occurs in a wide range of wooded habitats varying from open sclerophyll eucalypt forests to sparse mallee and mulga shrublands.	Highly Likely. Recorded in Port Lincoln in the last 6 years, and suitable habitat is present in mallee associations.
Haematopus fuliginosus fuliginosus (Sooty Oystercatcher)		R	1,2,3	2023 (DP,RC,TR)	The Sooty Oystercatcher is strictly coastal, usually within 50 m of the ocean. It prefers rocky shores but will be seen on coral reefs or sandy beaches near mudflats [16].	Unlikely to use mallee associations. Highly likely along coast (near outfall). Observed during 2023 fauna surveys on tidal flats along Greyhound Rd. Numerous records in assessment area.
Haematopus longirostris (Pied Oystercatcher)		R	1,4	2023 (DP,RC,TR)	The Pied Oystercatcher prefers mudflats, sandbanks and sandy ocean beaches and is less common along rocky or shingle coastlines. May occasionally be found in estuarine mudflats and short pasture [17].	Unlikely to use mallee or shrubland associations. Highly likely along shorelines. Numerous records in assessment area and observed during 2023 fauna surveys on tidal flats along Greyhound Rd.
Haliaeetus leucogaster (White-bellied Sea Eagle)		E	1,4	2023 (DP,RC) 2021 (TR)	White-bellied Sea-Eagles build a large stick nest, which is used for many seasons in succession. The nest can be located in trees up to 30m tall (including low coastal mallees and mangroves), cliff-face ledges or rocky outcrops but may also be placed on the ground where there are no suitable trees. They range around the coast of Eyre Peninsula, fishing over the water [18].	Known. Recorded in Lincoln Cove Marina and samphire areas along Greyhound Rd and known to nest nearby. Observed opportunistically during 2021 and 2023 field surveys. May use moderate to good quality vegetation with emergent trees near the coast (Sites 1-6, 8, RC7, WW1-5). Unlikely to use mallee associations further inland (RC1-6, TR1-4). Unlikely in degraded habitats (Site 7, RC8).
Hieraaetus morphnoides (Little Eagle)		V	2,3	2004 (TR)	A widespread species found in open eucalypt forest or woodland, tree-lined watercourses, mallee and sheoak or acacia woodlands. Nests in mature living trees. Also hunts over open habitats such as grasslands, crops, dunefields, bluebush and saltbush plains, and sedge-covered floodplains. Usually avoid large areas of dense forest.	Possible at Tank Site and Blue Fin Road (TR1-4). Not recorded within 5km of desalination plant, wastewater treatment plant or rail corridor, but suitable habitat is present in good quality mallee associations.

SPECIES	EPBC Act	NPWS Act	Source	Date of last record[1]	Species known habitat preferences	Likelihood for use for habitat - comments
Hylacola cauta cauta (Shy Heathwren)		R	4	2023 (TR)	Inhabits mallee woodland with a relatively dense shrub and heath understory. Feeds mostly on ground-dwelling insects, although may occasionally eat seeds. The species uses all age classes of vegetation but prefers dense understory often associated with either long unburnt or recently burnt (1-5 years) habitat. Occur in coastal and semi-arid regions.	Known. Observed during 2023 fauna surveys in mallee habitat along Bluefin Rd (TR3). There are no other post-1995 records for the species within 5 km of the proposed route but suitable habitat exists in mallee associations (Site 1-6, WW1-5, RC1-6, TR1 & 3).
Leipoa ocellata (Malleefowl)	VU	V	5	N/A	Found principally in the semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats [4].	Unlikely. No mounds or birds recorded in the area. Only recorded in Port Lincoln National Park (>5km from project area).
Lichenostomus cratitius occidentalis (Purple-gaped Honeyeater (mainland SA))		R	1,2,3, 4	2023 (DP,RC) 2019 (TR)	Mallee eucalypt associations, preferring mallee heathland, but also often in mallee woodland [19], usually with dense shrubby understorey. Feed mainly on nectar and insects, especially from flowering mallee eucalypts and banksias.	Known. Observed at 3 survey points along the rail corridor in 2023 (in RC2 and RC3) and there are numerous recent records in the area. Highly likely in mallee (Sites 1-6, WW1-5, RC1-6, TR1-3).
Macronectes giganteus (Southern Giant-Petrel)	EN	V	1,5	1999 (DP)	Breeds in Antarctica and sub-Antarctic islands. The Australian population has decreased in number by 50% in the last three generations, probably as a result of long-line fishing and possibly introduced predators [13].	Unlikely. Few records on lower EP, all around the Coffin Bay area. One record offshore 5 km east of outfall pipeline.
Macronectes halli (Northern Giant Petrel)	VU			2005 (DP)	Large predatory seabird which breeds on remote islands. They forage at sea and also scavenge on land, feeding mainly on carrion (dead penguins and seals), as well as fish, krill, squid, and other cephalopod [13].	Unlikely. Oceanic species. One record from Port Lincoln.
Neophema elegans elegans (Elegant Parrot)		R	1,2	1999 (DP,RC)	This species can be found in a wide variety of habitats, including grasslands, shrublands, mallee, woodlands and thickets, bluebush plains, heathlands, saltmarsh and farmland. They feed on the seeds of grasses and low growing shrubs [20].	Possible. Most likely in open areas but may also shelter in adjoining mallee areas. Recorded over 20 years ago in Port Lincoln at Kirton Point, and there are historical records in saltmarsh areas along Greyhound Rd. Not recorded near the tank site (TR1-4).
Neophema petrophila zietzi (Rock Parrot)		R	1,2,3,4	2023 (DP,RC) 2019 (TR)	The Rock Parrot is restricted to coastlines and offshore rocky islands, frequenting windswept coastal dunes, mangroves, saline swamps and rocky islets. It is seldom seen more than a few hundred metres from the sea [21]. The species feeds on the ground, among rocks, or on tidal flats and beaches often among low plants, such as samphire, pigface, groundsel, Nitre bush, saltbush and Sea Rocket.	Known. Observed in 2023 fauna surveys in mallee at the desal plant site and in coastal shrubland along Greyhound Rd. Numerous records occur in assessment area near the proposed desal plant, at Billy Lights Point, near the marina and in samphire areas along Greyhound Rd. Highly likely at Sites 1-7, 9, WW1-5, RC7,10-15). Observations at Site 6, suggest the species may also use the mallee associations close to the coast (RC1-6). Unlikely at TR1-4.

SPECIES	EPBC Act	NPWS Act	Source	Date of last record[1]	Species known habitat preferences	Likelihood for use for habitat - comments
Pandion haliaetus cristatus (Eastern Osprey)		E	1,4	2023 (DP,RC) 2016 (TR)	Mostly found in coastal areas but occasionally travel inland along rivers. They range around the coast of Eyre Peninsula and require extensive areas of open fresh, brackish or saline water for foraging. Eastern Ospreys build a large stick bowl usually in the top of a dead or partly dead tree, from isolated trees in open country to open forest, with prominent emergent perches nearby (e.g. dead trees). They can also nest on stacks along rocky shores, and increasingly on man-made structures such as power poles, bridges, and purpose-built nest platforms on poles [22].	Known. Observed over the wetlands along Greyhound Rd during 2023 fauna surveys. Numerous records in the area, including in last 3 years. Known to nest at the entrance to the Lincoln Cove Marina. Mallee associations (Sites 1–4, RC1-3, TR1-4) are unlikely to provide important habitat. Coastal mallee and shrubland with emergent trees may provide suitable roosting sites (Site 5, RC7, WW3-5).
Podiceps cristatus australis (Great Crested Grebe)		R	1	2014 (DP,RC,TR)	Inhabits wetlands, rivers, lakes, estuaries and sheltered bays, but favours large, deep, open bodies of fresh water [23].	Unlikely. Unlikely to use habitat impacted by the project works. One record in samphire areas along Greyhound Rd.
Psophodes leucogaster leucogaster (Mallee Whipbird)	EN	E	2, 5	2014 (DP)	Found in dense mallee scrub on sandy flats, dunes, or limestone, where it forages on the ground and in low shrubs for arthropods. Generally prefers habitat with a dense understory 1.5–2 m tall, below an open mallee eucalypt overstory 2–5 m tall [24].	Possible. May occur in good quality mallee associations near the tank site (TR1 and TR3) where an extensive area of mallee is continuous with large patches of mallee to the south and west. Most recent records (2023) are near Tulka almost 7km south of the North Side Hill tanks site. Also recorded in Lincoln NP (2014). The larger area west of Billy Lights Point is highly unlikely to support whipbirds, as it has a more open understorey than the species preferred dense shrubby habitat and is heavily fragmented by vehicle tracks.
Spatula rhynchotis (Australasian Shoveler)		R	1,2	2018 (DP,RC) 2002 (TR)	Occurs in all types of wetlands but prefers large deep freshwater lakes and swamps which are heavily vegetated. It can also be found on open waters and occasionally along the coast.	Unlikely. Habitat near outfall and wastewater treatment plant is not suitable. Recorded near Pt Lincoln and in saltmarsh area along Greyhound Rd.
Stagonopleura guttata (Diamond Firetail)	VU	V	2,4,5	2018 (DP,RC) 2023 (TR)	Occurs in *Eucalyptus, Acacia* or *Allocasuarina* woodlands, open forests, mallee and other lightly timbered habitats, including farmland and grassland with scattered trees. They prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover, although are occasionally found in denser shrub layers. They feed on the ground on seeds and insects [25].	Highly Likely/ Known. Observed near the Kathai Tank site during the 2023 fauna surveys. Recently recorded (2018) in Pt Lincoln. Likely in most sites with open patches of mallee and grasses (e.g. Sites 1–4, 9, RC2-6, WW4-5, TR1 - 3). Unlikely at highly degraded sites, those with very dense groundcover of shrubs and vines, or coastal shrublands (WW1, RC1, RC 7-15, TR4).
Sternula albifrons sinensis (Little Tern)		E	1,2,3	2010 (DP,RC,TR)	Inhabits sheltered coastal shores and lagoons. Nest in colonies on sandy beaches. Can also be found around sewage works.	Unlikely in mallee or coastal shrubland associations. Possible around shoreline near Greyhound Rd and the proposed intake/outfall site. Recorded on Port Lincoln foreshore.

SPECIES	EPBC Act	NPWS Act	Source	Date of last record[1]	Species known habitat preferences	Likelihood for use for habitat - comments
Sternula nereis nereis (Fairy Tern)	VU	E	1,2,4,5	2023 (DP,RC,TR)	Shorebird, inhabiting a variety of habitats including offshore, estuarine or lacustrine islands, wetlands, beaches and spits. They nest above the high water mark on sites where the substrate is sandy and the vegetation low and sparse [26].	Known. Unlikely to use mallee or coastal shrubland. Observed in the wetlands near Greyhound Rd during the 2021 and 2023 field surveys.
Stipiturus malachurus parimeda (Southern Emu-wren (Eyre Peninsula)	EN	E	5	2023 (TR, RC)	Found only on the southern tip of Eyre Peninsula, in shrubland, mallee and sedgeland, all of which are characterised by one or two low, dense layers of vegetation. The species is more likely to choose habitats based on vegetation structure than floristics. Mallee habitats can be open or closed and are typically dominated by *Eucalyptus diversifolia* and *E. incrassata.* Dense vegetation is important for shelter and because it has higher insect abundance. The species is generally thought to be poor at dispersing - they are not strong flyers and prefer dense cover [27].	Possible. Suitable habitat is available in good quality shrubland and mallee associations with a dense understory (TR1,3). One recent record near Tulka and numerous records around Sleaford Bay and in Lincoln NP. Unlikely elsewhere. There are no post-1995 records within 5km of the proposed desalination plant site and there is no suitable contiguous vegetation that would allow the species to disperse to the area from the south.
Thalassarche steadi (White-capped Albatross)	VU		5	NA	This large seabird breeds only in New Zealand and disperses into southern Australia to forage [13].	Unlikely. Oceanic species. No nearby records.
Thinornis cucullatus cucullatus (Hooded Plover)	VU	V	1,3,5	2018	Inhabits ocean beaches, particularly wide beaches backed by dunes with large amounts of seaweed, creek mouths and inlet entrances. It may also occur on near-coastal saline and freshwater lakes and lagoons, tidal bays and estuaries, on rock platforms, or on rocky or sandy reefs close to shore [28].	Unlikely to use mallee or coastal shrubland. Possible along shoreline near proposed outfall. Recorded in Lincoln NP, but there are no records near Billy Lights Point or the coastline or wetlands along Greyhound Rd or Proper Bay.
Tringa brevipes (Grey-tailed Tattler)		R	2,3	2020 (DP,RC)	A migratory shorebird which spends the boreal winter foraging on muddy and sandy coasts in Asia and Australia. Usually seen in small flocks and prefer sheltered coasts with intertidal mudflats or reefs and rock platforms.	Unlikely to use mallee or coastal shrubland. Highly likely along shoreline near proposed outfall. There are two records for the species on the beach at Billy Lights Point.
Tringa glareola (Wood Sandpiper)		R	1,2,3	2019 (DP,RC) 2008 (TR)	A small wading bird seen in small flocks or singly on inland shallow freshwater wetlands, often with other waders. They prefer ponds and pools with emergent reeds and grass, surrounded by tall plants or dead trees and fallen timber [23]. Breeding in Northern Hemisphere, they migrate to the Southern Hemisphere in the southern spring and summer.	Unlikely to use mallee or coastal shrubland. Highly likely along shoreline near proposed outfall. Recorded in sewage works, at Billy Lights Point and near the breakwater on Greyhound Rd.
Tringa nebularia (Common Greenshank)	EN		2,3,5	2023 (DP,RC,TR)	Breeds across northern Europe and Asia; migrating to Africa, southern Asia and Australia during the boreal winter. The species occurs in all types of wetlands, being recorded in most coastal regions, foraging at the edges of mudflats or shallows. They roost both on the coast and inland, in estuaries and mudflats, mangrove swamps and lagoons, and in billabongs, swamps, sewage farms and flooded crops [29].	Known. Unlikely to use mallee associations (Sites 1–8, RC 1-6, TR 1-4, WWTP 1-4). Highly likely at wastewater treatment plant ponds. Observed during 2023 field surveys. Numerous records across the coastal and wetland areas of the assessment area.

SPECIES	EPBC Act	NPWS Act	Source	Date of last record[1]	Species known habitat preferences	Likelihood for use for habitat - comments
Turnix varius varius (Painted Buttonquail)		R	1,2,3	2017 (DP) 2018 (RC,TR)	Small ground-dwelling bird found in woodland and forest, shrublands & heathlands and coastal vegetation, usually with a closed canopy and some shrubby understory and deep ground leaf litter [30].	Highly likely in mallee areas with good canopy and understory cover (Sites 1-4, 8, RC1-7, TR1,3). Less likely in degraded open sites that lack dense canopy and ground cover. Several records in the area in the last 6 years, including at Murray Point.
Xenus cinereus (Terek Sandpiper)		R	2	2020	Migratory species, breeding in Northern Hemisphere, and flying to the Southern Hemisphere in the southern spring and summer. Usually found on the coast in mangrove swamps, tidal mudflats and the seashore.	Unlikely to use mallee or coastal shrubland. Highly likely along shoreline near proposed outfall. Recently recorded near boat ramp at Billy Lights Point.
Zanda funerea whiteae (Yellow-tailed Black Cockatoo)		V	1	2017 (DP,RC) 2008 (TR)	Isolated endangered population occurs on the peninsula. It nests in large eucalypt hollows. Feed on seeds of exotic Aleppo Pines throughout the peninsula, and native hakea species (*H. rugosa, H. cycloptera*). Also insect larvae in flowering spikes of *Xanthorrhoea semiplana*, wood borers of Eucalypts and *Acacia* galls.	Highly Likely. Most sites contain food resources for the species, including exotic Aleppo Pines and Acacias. Numerous records in the area, including in last 6 years.
MAMMALS						
Bettongia penicillata ogilbyi (Woylie)	EN	R	2,5	2001	This species has been re-introduced into national parks in the Eyre Peninsula region (including Lincoln National Park), but as yet has not been observed outside of Parks [31].	Unlikely. Not recorded outside reintroduction areas.
Eubalaena australis (Southern Right Whale)	EN	V	2,5	2014	Marine species. A large baleen whale with a circumpolar distribution in the Southern Hemisphere. Breeding aggregations occur over a wide environmental range across the entire southern Australian coast, although preferred habitat generally includes shallow sloping sandy bottom bays that provide protection from prevailing wind and weather. Reproductive areas where females calve and nurse their young appear to be exclusively coastal [32].	Does not occur in terrestrial habitats. Possible along coastline near marine intake/outfall. However, local sightings are of transient animals and the area is not a known aggregation site for the species.
Neophoca cinerea (Australian Sea Lion)	EN	V	1,2,4,5	2023	Marine species which breeds on remote coastlines or on islands, and forages at sea. They use a variety of coastal habitats as haul-out sites, from exposed islands, reefs and rocky terrain to sandy beaches and vegetated fore dunes [33].	Does not occur in terrestrial habitats. Observed during field surveys to the east side of Billy Lights Point and there have been several sightings at Billy Light Point and Port Lincoln foreshore. May use the shoreline near the proposed outfall.

SPECIES	EPBC Act	NPWS Act	Source	Date of last record[1]	Species known habitat preferences	Likelihood for use for habitat - comments
REPTILES						
Caretta caretta (Loggerhead Turtle)	EN	E	5	-	Loggerhead turtles forage in all coastal states and the Northern Territory, but are uncommon in South Australia, Victoria and Tasmania. They feed predominantly on benthic invertebrates in habitats ranging from near shore to shore to depths of 55 m [34].	Unlikely. No records within 5 km of site.
Dermochelys coriacea (Leatherback Turtle)	EN	V	1,5	1989	Marine species. Leatherback turtles are known to forage and migrate throughout Australia. They are an oceanic species, remaining planktivorous throughout their life, feeding on jellyfish and large planktonic ascidians (e.g. sea squirts) in the water column [34].	Unlikely. No records since 1995 within 5 km of site.
Varanus rosenbergi (Heath Goanna)		V	3	2021	Found in sandy heathland, open woodland or sclerophyll forest. Shelters in hollow logs, rock crevices and in burrows. Uses termite mounds as nesting sites and has a varied diet including birds, eggs, reptiles, small mammals and carrion.	Possible. Although the species has not been recorded in vicinity of project footprint (all records are from Lincoln NP), suitable habitat is present along most of the proposed route.
FISH						
Carcharodon carcharias (Great White Shark)	VU		3,5	2003	The species primarily inhabits continental and insular shelf waters but is also known to use the open ocean. It often occurs close inshore near the surf-line and may move into shallow bays. Commonly found in inshore waters in the vicinity of islands, and often near seal colonies [35].	Does not occur in terrestrial habitats. Possible along coastline near marine intake/outfall.

Source; 1- BDBSA, 2 - AoLA, 3 – NatureMaps, 4 – Observed/recorded in the field, 5 - Protected matters search tool, 6 – others
EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable; NP&W Act; E= Endangered, V = Vulnerable, R= Rare
[1]Date of Last Record – within 5km of: DP (Desal Plant); RC (Rail Corridor); TR (Tank Site)

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 provides limited 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 the previous 20 years, but the area provide no habitat or feeding resources for the species, including perching, roosting or nesting opportunities, corridor for movement or shelter. 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.

The Port Lincoln Desalination Plant is a stand-alone project.

The project does not promote activities that result in further vegetation clearance. Any future expansion of the desalination plant infrastructure to accommodate the potential requirement to 8GL/yr can be accommodated within the existing Plant and MIPS sites. The pipeline infrastructure (terrestrial and marine) has been sized sufficiently to accommodate a proposed plant expansion to 8GL/yr if required.

Clearance for a perimeter fence for the plant was previously approved (approval number NVC2023-3229-931). The approved fence line clearance has therefore been excluded from this assessment.

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

Vegetation clearance has been avoided by locating as much of the works as possible within existing cleared areas. Construction of the drinking water transfer main makes use of existing cleared vegetation areas:

- along the track north of the former BHP tramline
- in the bed of Greyhound Road
- adjacent to Proper Bay Road within the road verge
- in the bed of Bluefin Road from Proper Bay Road to Kathai Drive.

The section of the Drinking Water Transfer Pipeline and SAPN route along Greyhound Road has been aligned to avoid the Murrays Point wetland environment and any impacts to the EPBC Vulnerable Subtropical and Temperate Coastal Saltmarsh. The route will be located in the road and verge on the north side of the road. Pipeline scour locations will not discharge to the wetland or to the coastal environment.

The drinking water transfer pipeline avoids clearance at the connection to the North Side Tanks by following the road to the west side of the tanks and entering through the existing cleared gateway.

Consideration was given to locating the transfer main in the existing cleared corridor of the disused railway line to further reduce vegetation clearance. This option was not practical because the rail corridor is too narrow for construction, particularly where it passes through cuttings. There is also a high risk of soil contamination in the rail ballast including herbicides, heavy metals and other persistent toxic chemicals.

The works at the desalination plant site make use of existing cleared vegetation at the site including tracks, roads and disused building pads. The more intact vegetation at the site will not be disturbed with no clearance proposed.

The works at the wastewater treatment plant make use of existing cleared areas including tracks and disused settlement ponds. Clearance to coastal vegetation adjacent to the Wastewater Treatment Plant has been avoided by tunnelling under coastal section to allow the marine intake and brine disposal pipelines access to the marine environment.

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).

Billy Lights Point was selected as the lowest-impact, most practical option from a range of alternative sites on southern Eyre Peninsula. Investigations were conducted at Sleaford Bay, Point Boston and Shoal Point at Uley, including vegetation survey, habitat assessments, engineering assessments and cultural heritage assessments. Billy Lights Point was selected as having the lowest risk to matters of national environmental significance, a relatively small extent of vegetation clearance and the lower energy requirements for transferring water from a site close to Port Lincoln.

The Billy Lights location is a brownfield former industrial site with areas of cleared and degraded vegetation where the desalination plant can be constructed. The marine environment where the sea water intake and brine outfall are located is a relatively developed area and supports ship repair and fisheries facilities and the Port Lincoln Wastewater Treatment Plant.

Vegetation clearance has been minimised in the design of the works by adopting the following measures:

- locating the desalination plant in the area of most degraded vegetation at the site
- co-locating/abutting the SAPN access easement with the Drinking Water Transfer Main easement to reduce clearance extent
- reducing the width of the transfer main corridor from 15 m to 12 m within key sections of the pipeline route when passing through sensitive vegetation including a 500 m section that passes through sensitive Association RC2 that supports the state rare *Eucalyptus conglobulata* plant community and the state rare *Acacia alcockii*.

Contractors will apply hygiene protocols specified by SA Water to minimise the spread of weeds and plant pathogens during the works as specified in a Construction Environmental Management Plan.

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.

Clearance areas that do not need to be maintained for operations and maintenance will be restored. Restoration will involve:

- collecting seed from native vegetation before the works take place
- using/moving suitable trunks that require clearing as habitat structures in the proposed SEB offset site
- removing and setting aside topsoil during construction
- respreading topsoil after construction
- revegetation through direct seeding and tubestock planting over the three years following construction.
- In those areas where operational access must be maintained, slashing and rolling will be employed rather than clearance through vegetation spraying.

The ongoing inspection program for SA Water works will include assessment for weed invasion in vegetation disturbed by the desalination plant works. Weeds will be controlled as required under an Operations Environmental Management Plan.

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.

The residual impacts of the project will be offset by establishing a new SEB offset area on SA Water land at Uley South, west of Port Lincoln (see Section 6).

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. The Native Vegetation Council will consider all the principles of clearance of the Act as relevant, when considering an application referred under the *Planning, Development and Infrastructure Act 2016*.

<table>
<tr><th>Principle of clearance</th><th>Considerations</th></tr>
<tr><td>Principle 1a - it comprises a high level of diversity of plant species</td><td>
<u>Relevant information</u>
<table>
<tr><th>Patch</th><th>Plant Diversity Score</th><th>No. Native Plant Species</th><th>No. Introduced Plant Species</th></tr>
<tr><td>RC1</td><td>16</td><td>24</td><td>6</td></tr>
<tr><td>RC2</td><td>26</td><td>53</td><td>3</td></tr>
<tr><td>RC3</td><td>12</td><td>40</td><td>5</td></tr>
<tr><td>RC4</td><td>24</td><td>40</td><td>2</td></tr>
<tr><td>RC6</td><td>26</td><td>46</td><td>4</td></tr>
<tr><td>RC7</td><td>30</td><td>44</td><td>4</td></tr>
<tr><td>RC8</td><td>6</td><td>9</td><td>5</td></tr>
<tr><td>RC10</td><td>22</td><td>18</td><td>5</td></tr>
<tr><td>RC11</td><td>14</td><td>19</td><td>8</td></tr>
<tr><td>RC12</td><td>22</td><td>19</td><td>5</td></tr>
<tr><td>RC13</td><td>20</td><td>12</td><td>5</td></tr>
<tr><td>RC14</td><td>18</td><td>6</td><td>3</td></tr>
<tr><td>RC15</td><td>8</td><td>10</td><td>5</td></tr>
<tr><td>Site 1</td><td>24</td><td>45</td><td>1</td></tr>
<tr><td>Site 2</td><td>24</td><td>47</td><td>3</td></tr>
<tr><td>Site 3</td><td>28</td><td>62</td><td>4</td></tr>
<tr><td>Site 4</td><td>26</td><td>54</td><td>4</td></tr>
<tr><td>Site 6</td><td>18</td><td>28</td><td>4</td></tr>
<tr><td>Site 6a</td><td>18</td><td>28</td><td>4</td></tr>
<tr><td>Site 7</td><td>20</td><td>32</td><td>4</td></tr>
<tr><td>Site 8</td><td>18</td><td>25</td><td>5</td></tr>
<tr><td>Site 9a</td><td>24</td><td>36</td><td>18</td></tr>
<tr><td>Site 9b</td><td>26</td><td>45</td><td>11</td></tr>
<tr><td>Site 9c</td><td>15</td><td>18</td><td>16</td></tr>
<tr><td>TR1</td><td>30</td><td>67</td><td>5</td></tr>
<tr><td>TR2</td><td>30</td><td>61</td><td>3</td></tr>
<tr><td>TR3</td><td>16</td><td>22</td><td>6</td></tr>
<tr><td>TR4</td><td>14</td><td>21</td><td>5</td></tr>
<tr><td>WW1</td><td>24</td><td>35</td><td>5</td></tr>
<tr><td>WW4</td><td>24</td><td>38</td><td>11</td></tr>
<tr><td>WW5</td><td>22</td><td>33</td><td>10</td></tr>
</table>
<u>Assessment against the principles</u>
<u>Seriously at Variance</u>
</td></tr>
</table>

RC2, RC4, RC6, RC7, RC10, RC12, Site 1, Site 2, Site 3, Site 4, Site 9a, Site 9b, TR1, TR2, WW1, WW4, WW5

At Variance

RC1, RC3, RC11, RC13, RC14, Site 6, Site 6a, Site 9c, TR3, TR4

Moderating factors that may be considered by the NVC

The total clearance for the project of is 10.7337 ha which is less than 10% of the 2896 ha of remnant vegetation within 5km of the site.

Principle 1b - significance as a habitat for wildlife

Relevant information

The vegetation is known to or potentially provides habitat for three EPBC listed fauna species and 16 NPWS listed fauna species.

Vegetation that is intact and part of extensive remnants are more likely to support a high diversity of animal species.

This includes vegetation at the top of Blue Fin Road:

TR1, TR2, TR3

and vegetation along the rail corridor:

RC2, RC3, RC4, RC7

None of the vegetation is likely to provide a corridor for fauna or a habitat refuge in heavily cleared areas.

Species	Common Name	EPBC	NPWS
Burhinus grallarius	Bush Stone-curlew		R
Cereopsis novaehollandiae novaehollandiae	Cape Barren Goose		R
Corcorax melanorhamphos	White-winged Chough		R
Coturnix ypsilophora	Brown / Swamp Quail		V
Falco peregrinus macropus	Peregrine Falcon		R
Gerygone fusca	Western Gerygone		R
Haliaeetus leucogaster	White-bellied Sea Eagle		E
Hieraaetus morphnoides	Little Eagle		V
Hylacola cauta cauta	Shy Heathwren		R
Lichenostomus cratitius occidentalis	Purple-gaped Honeyeater mainland SA		R
Neophema elegans elegans	Elegant Parrot		R
Neophema petrophila zietzi	Rock Parrot		R
Pandion haliaetus cristatus	Eastern Osprey		E
Psophodes leucogaster leucogaster	Mallee Whipbird	EN	E
Stagonopleura guttata	Diamond Firetail	VU	V
Stipiturus malachurus parimeda	Southern Emu-wren Eyre Peninsula	EN	E
Turnix varius varius	Painted Buttonquail		R
Varanus rosenbergi	Heath Goanna		V
Zanda funerea whiteae	Yellow-tailed Black Cockatoo		V

Patch	Threatened Fauna Score	Unit Biodiversity Score
RC1	0.08	56.22
RC2	0.1	90.16
RC3	0.1	80.54
RC4	0.1	72.17
RC6	0.1	70.48
RC7	0.1	72.31
RC8	0	6.61
RC10	0.04	49.89

RC11	0	18.01	
RC12	0.06	47.64	
RC13	0.04	52.62	
RC14	0.04	42.67	
RC15	0.06	20.18	
Site 1	0.1	82.22	
Site 2	0.1	77.95	
Site 3	0.1	86.45	
Site 4	0.1	82.52	
Site 6	0.08	45.77	
Site 6a	0.08	39.84	
Site 7	0.08	42.97	
Site 8	0.08	38.26	
Site 9a	0.08	55.68	
Site 9b	0.1	71.11	
Site 9c	0	29.22	
TR1	0.1	89.2	
TR2	0.1	91.61	
TR3	0.1	48.58	
TR4	0	19.52	
WW1	0.08	58.59	
WW4	0.1	79.55	
WW5	0.1	79.84	

Assessment against the principles

Seriously at Variance

RC1, RC2, RC3, RC4, RC6, RC7, RC12, RC15, Site 1, Site 2, Site 3, Site 4, Site 6, Site 6a, Site 7, Site 8, Site 9a, Site 9b, TR1, TR2, TR3, WW1, WW4, WW5

At Variance –

RC10, RC13, RC14

Moderating factors that may be considered by the NVC

Principle 1c - plants of a rare, vulnerable or endangered species

Relevant information

Six state rare species occur in vegetation impacted by the project.

Targeted surveys in spring failed to find other nationally- or state-listed species that have previously been reported within 5 km of the site, or are known to occur in the region. See Section 4.2.2.

Species	Common Name	EPBC	SA	Site
Acacia alcockii	Alcock's Wattle		R	1, 2, 3, 4, 6, 6a, 9a, 9b, WW1, RC2, RC3, RC6
Eucalyptus conglobata	Port Lincoln Mallee		R	1, 2, 3, 4, 7, RC2, RC3, RC4, RC6, WW4, WW5
Xanthorrhoea semiplana ssp. tateana	Tate's Grass-tree		R	TR1
Spyridium daphnoides	Spoon-leaved Spyridium		R	TR1, TR2
Lysiandra calycina	Snowdrop Spurge		R	TR1, TR2, TR3, TR4

Choretrum chrysanthum	Yellow Sour-bush		R	TR1

Acacia alcockii, Eucalyptus conglobulata, Xanthorrhoea semiplana ssp. tateana and *Spyridium daphnoides* are well represented in adjacent plant communities and the proposed works are unlikely to have a detrimental impact on local populations of these species.
Lysiandra calycina occurs as highly scattered individuals, with less than 10 plants observed across four plant associations. The proposed works are likely to impact one plant in TR1 and four plants in TR2. No plants will be impacted in TR3 and TR4.
The two *Choretrum chrysanthum* shrubs recorded in TR1 are outside the works footprint.

Site	Threatened Flora Score
RC1	0
RC2	0.08
RC3	0.08
RC4	0.04
RC6	0.08
RC7	0
RC8	0
RC10	0
RC11	0
RC12	0
RC13	0
RC14	0
RC15	0
Site 1	0.08
Site 2	0.08
Site 3	0.08
Site 4	0.08
Site 6	0.04
Site 6a	0.04
Site 7	0.04
Site 8	0.04
Site 9a	0.04
Site 9b	0.04
Site 9c	0
TR1	0.08
TR2	0.08
TR3	0.04
TR4	0.04
WW1	0.04
WW4	0.04
WW5	0.04

Assessment against the principles:
Seriously at Variance
None

At Variance
RC2, RC3, RC4, RC6, Site 1, Site 2, Site 3, Site 4, Site 6, Site 6a, Site 7, Site 8, Site 9a, Site 9b, TR1, TR2, TR3, TR4, WW1, WW4, WW5.

Moderating factors that may be considered by the NVC

<table>
<tr><td></td><td>The works are unlikely to have a long-term impact on local populations of Acacia alcockii, Eucalyptus conglobulata, Xanthorrhoea semiplana ssp. tateana, Spyridium daphnoides and Choretrum chrysanthum.</td></tr>
<tr><td rowspan="3">Principle 1d - the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered:</td><td>Relevant information
The rare plant community Eucalyptus conglobulata low woodland on fertile loams over limestone (DEW Provisional List of Threatened Ecosystems) is present in associations RC2, RC6, Site 1, Site 2, Site 3, WW4 and WW5.

<table>
<tr><th>Association</th><th>Threatened Community Score</th><th>Clearance Area (Ha)</th></tr>
<tr><td>RC2</td><td>1.1</td><td>0.7284</td></tr>
<tr><td>RC6</td><td>1.1</td><td>0.1524</td></tr>
<tr><td>Site 1</td><td>1.1</td><td>1.608</td></tr>
<tr><td>Site 2</td><td>1.1</td><td>0.9972</td></tr>
<tr><td>Site 3</td><td>1.1</td><td>0.351</td></tr>
<tr><td>WW4</td><td>1.1</td><td>0.0305</td></tr>
<tr><td>WW5</td><td>1.1</td><td>0.0006</td></tr>
</table></td></tr>
<tr><td>Assessment against the principles
Seriously at Variance
RC2, RC6, Site 1, Site 2, Site 3, WW4 and WW5.</td></tr>
<tr><td>Moderating factors that may be considered by the NVC</td></tr>
<tr><td rowspan="2">Principle 1e - it is significant as a remnant of vegetation in an area which has been extensively cleared.</td><td>Relevant information

The project impacts on vegetation in the Lincoln IBRA Association which has a remnancy of 84% and the Eyre Hills IBRA Subregion which has a remnancy of 29%.

Plant associations that are in poor condition have been impacted by the removal of a stratum and have a high proportion of introduced species, including invasive species. These associations are likely to degrade without rehabilitation actions.

These associations are:
6a, 7, 8, 9c, RC15 and TR4.

The remaining associations are in moderate to excellent condition and are substantially intact with few introduced species. These associations are likely to improve or retain their condition if left undisturbed.

These associations are:
1, 2, 3, 4, 9a, 9b, WW1, WW4, WW5, RC1, RC2, RC3, RC4, RC6, RC7, RC10, RC12, RC13, RC14, TR1, TR2 and TR3

Total Biodiversity Score - 694.22</td></tr>
<tr><td>Assessment against the principles
Seriously at Variance
Yes
At Variance
No</td></tr>
</table>

	Moderating factors that may be considered by the NVC Plant associations in poor condition are likely to continue to degrade over the next 20 to 50 years and persistence of the vegetation is uncertain.
Principle 1f - it is growing in, or in association with, a wetland environment.	Relevant information Site RC13 is a wetland plant community. The community occurs in the Windsor Avenue road reserve and is impacted by clearance for the SAPN power line. The community supports species associated with saline waterlogged soils including *Melaleuca halmaturorum* and *Distichlis distichophylla.* Exotic species include *Juncus acutus, Olea europaea* and *Lycium fecrocissimum.* The vegetation is in moderate condition.
	Assessment against the principles Seriously at Variance Plant Association RC13 At Variance – None
	Moderating factors that may be considered by the NVC
Principle 1g - it contributes significantly to the amenity of the area in which it is growing or is situated.	Relevant information Vegetation cleared in the project area is frequented by the public at one location, on the southern verge of St Andrews Drive between the Desalination Plant entrance and the Wastewater Treatment Plant. This section of road provides access to the Parnkalla Walking Trail, the Billy Lights Point boat ramp and a recreational vehicle parking area. Mallee vegetation directly facing St Andrews Drive will be cleared over approximately 250 m between the desalination plant entrance and the entrance to Australian Fishing Enterprises at 150 St Andrews Drive. Clearance for a further 280 m to the east will be in the wastewater treatment plant. The clearance will be partly set back from the road and will be somewhat screened by retained vegetation. Clearance will reduce the visual amenity of this section of road.
	N/A
	Moderating factors that may be considered by the NVC

Principles of Clearance (h-m) will be considered by comments provided by the local NRM Board or relevant Minister. The Data Report should contain information on these principles where relevant and where sufficient information or expertise is available.

4.6 Risk Assessment

Determine the level of risk associated with the application

Total clearance	No. of trees	0
	Area (ha)	10.7337
	Total biodiversity Score	694.2204
Seriously at variance with principle 1(b), 1(c) or 1 (d)		**1(b) and 1(d)**

Risk assessment outcome	4

4.7 NVC Guidelines

Provide any other information that demonstrates that the clearance complies with any relevant NVC guidelines related to the activity.

5. Clearance summary

Clearance Area(s) Summary table

Clearance summary Table - Agricultural region

Bushland assessment

Block	Site	Native species diversity score	Threatened Ecological community Score	Threatened plant score	Threatened fauna score	DBH	Area (ha)	Total Biodiversity score	Loss factor	Landuse	Reductions	SEB Points required	SEB payment	Admin Fee
1	RC1	16	1	0	0.08	56.22	0.0226	1.28	1			1.35	$938.09	$51.60
1	RC1	16	1	0	0.08	56.22	0.077	4.33	1		0.50	2.27	$1,584.05	$87.12
1	RC2	26	1.1	0.08	0.1	90.16	0.2954	26.63	1			27.96	$19,491.48	$1,072.03
1	RC2	26	1.1	0.08	0.1	90.16	0.4333	39.07	1		0.50	20.51	$14,295.29	$786.24
1	RC3	12	1	0.08	0.1	80.54	0.2119	17.07	1			17.92	$12,490.02	$686.95
1	RC3	12	1	0.08	0.1	80.54	0.475	38.26	1		0.50	20.08	$13,998.96	$769.94
1	RC4	24	1	0.04	0.1	72.17	0.0081	0.58	1			0.61	$427.82	$23.53
1	RC4	24	1	0.04	0.1	72.17	0.017	1.23	1		0.50	0.64	$448.95	$24.69
1	RC5	26	1.1	0.08	0.1	70.48	0.0396	2.79	1			2.93	$2,042.59	$112.34
1	RC5	26	1.1	0.08	0.1	70.48	0.1128	7.95	1		0.50	4.17	$2,909.15	$160.00
1	RC7	30	1	0	0.1	72.31	0.3916	28.32	1			29.73	$20,723.43	$1,139.79
1	RC7	30	1	0	0.1	72.31	0.1648	11.92	1		0.50	6.26	$4,360.60	$239.83
1	RC8	6	1	0	0	6.61	0.636	4.20	1			4.41	$3,076.66	$169.22
1	RC8	6	1	0	0	6.61	0.0464	0.31	1		0.50	0.16	$112.23	$6.17
1	RC10	22	1	0	0.04	45.89	0.179	8.93	1			9.38	$6,535.62	$359.46
1	RC10	22	1	0	0.04	45.89	0.0914	4.56	1		0.50	2.39	$1,668.59	$91.77
1	RC11	14	1	0	0	18.01	0.0496	0.89	1			0.94	$653.76	$35.96
1	RC11	14	1	0	0	18.01	0.0293	0.53	1		0.50	0.28	$193.10	$10.62
1	RC12	22	1	0	0.06	47.64	0.0089	0.42	1			0.45	$310.30	$17.07
1	RC12	22	1	0	0.06	47.64	0.0788	3.75	1		0.50	1.97	$1,373.69	$75.55
1	RC13	20	1	0	0.04	52.62	0.0496	2.61	1			2.74	$1,910.09	$105.05
1	RC13	20	1	0	0.04	52.62	0.0421	2.22	1		0.50	1.16	$810.63	$44.58
1	RC14	18	1	0	0.04	42.67	0.0411	1.75	1			1.84	$1,283.47	$70.59
1	RC14	18	1	0	0.04	42.67	0.0733	3.13	1		0.50	1.64	$1,144.50	$62.95
1	RC15	8	1	0	0.06	20.18	0.0311	0.63	1			0.66	$460.78	$25.34
1	RC15	8	1	0	0.06	20.18	0.0298	0.60	1		0.50	0.32	$220.05	$12.10
1	Site1	24	1.1	0.08	0.1	82.22	1.5347	126.18	1			132.49	$92,346.72	$5,079.07
1	Site1	24	1.1	0.08	0.1	82.22	0.0731	6.03	1		0.50	3.16	$2,205.32	$121.29
1	Site2	24	1.1	0.08	0.1	77.95	0.9971	77.73	1			81.62	$56,887.77	$3,128.83
1	Site3	28	1.1	0.08	0.1	86.45	0.351	30.34	1			31.86	$22,207.34	$1,221.39
1	Site4	26	1	0.08	0.1	82.52	0.4118	33.98	1			35.68	$24,869.44	$1,367.82
1	Site9	26	1	0.08	0.1	82.52	0.0489	4.04	1		0.50	2.12	$1,476.59	$81.21
1	Site6	18	1	0.04	0.08	45.77	0.5236	23.97	1			25.16	$17,538.83	$964.64
1	Site6	18	1	0.04	0.08	45.77	0.0684	3.13	1		0.50	1.64	$1,145.59	$63.01
1	Site6a	18	1	0.04	0.08	39.84	0.1582	6.30	1			6.62	$4,612.61	$253.69
1	Site6a	18	1	0.04	0.08	39.84	0.3654	14.56	1		0.50	7.64	$5,326.95	$292.98
1	Site7	20	1	0.04	0.08	42.97	0.0317	1.36	1			1.43	$996.89	$54.83
1	Site7	20	1	0.04	0.08	42.97	0.1275	5.48	1		0.50	2.88	$2,004.78	$110.26
1	Site8	18	1	0.04	0.08	38.26	0.012	0.46	1			0.48	$336.01	$18.48
1	Site9a	24	1	0.04	0.08	55.68	0.0999	5.56	1			5.84	$4,070.85	$223.90
1	Site9b	20	1	0.04	0.1	71.11	0.0122	0.87	1			0.91	$634.91	$34.92
1	Site9c	20	1	0.04	0.1	71.11	0.0907	6.45	1		0.50	3.39	$2,360.09	$129.80
1	Site9c	16	1	0	0	29.22	0.1017	2.97	1			3.12	$2,174.81	$119.61
1	Site9c	16	1	0	0	29.22	0.011	0.32	1		0.50	0.17	$117.62	$6.47
1	TR1	30	1	0.08	0.1	89.2	0.0316	2.82	1			2.96	$2,062.87	$113.46
1	TR1	30	1	0.08	0.1	89.2	0.0327	2.92	1		0.50	1.53	$1,067.34	$58.70
1	TR2	30	1	0.08	0.1	91.81	0.2901	26.58	1			27.90	$19,449.62	$1,069.73
1	TR2	30	1	0.08	0.1	91.81	0.2139	19.60	1		0.50	10.29	$7,170.41	$394.37
1	TR3	16	1	0.04	0.1	48.56	0.0669	3.25	1			3.41	$2,378.51	$130.82
1	TR3	16	1	0.04	0.1	48.56	0.3069	15.01	1		0.50	7.88	$5,491.18	$302.02
1	TR4	14	1	0.04	0	19.52	0.0809	1.68	1			1.76	$1,227.14	$67.49
1	TR4	14	1	0.04	0	19.52	0.0871	1.70	1		0.50	0.89	$622.14	$34.22
1	WW1	24	1	0.04	0.08	58.09	0.7269	42.59	1			44.72	$31,168.70	$1,714.28
1	WW1	24	1	0.04	0.08	58.59	0.2036	11.93	1		0.50	6.26	$4,365.08	$240.08
1	WW4	24	1.1	0.04	0.1	79.65	0.0305	2.43	1			2.55	$1,775.86	$97.66
1	WW6	22	1.1	0.04	0.1	79.64	0.0006	0.05	1			0.05	$35.06	$1.93
Insert additional rows into the table as required.						Total	10.7337	694.220461				619.21	$431,590.54	$23,737.48

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
Application	694.22	619.21	$431,590.54	$23,737.48	$455,328.02

Economies of Scale Factor	0.5
Rainfall (mm)	459

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.

ON-GROUND SEB

Application Details

Applicant:	SA Water		
Key contact:			
Landowner:	SA Water		
Site Address:	Charlotte Waterhole Track, Uley South Basin Reserve		
Local Government Area:	DC of Lower Eyre Peninsula	Hundred:	Uley 511200
Title ID:	CT/6028/666	Parcel ID	H511200 S35

6.1 Background

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

The site is located in the Talia subregion of the Mungerowie IBRA Association.

The Uley South Basin Reserve is one of four Basin Reserves on the lower Eyre Peninsula which form protection zones for a series of underground aquifer basins. The Uley South Basin is located about 27 km west of Port Lincoln, and can be accessed via an unsealed council road off the Flinders Highway or via a tramline corridor or main pipeline road through the Lincoln Underground Basin Reserve. The reserve is approximately 18,595 ha in area. The proposed SEB offset area is located to the south of the Charlotte Waterhole Track in the south-western part of Uley South Basin Reserve (Figure 17). The Basin comprises a large low-lying depression, encompassing Paradise, Charlotte and Caroona Waterholes, and is encircled by undulating rises and hills.

The proposed offset area lies to the south-west of Charlotte Waterhole (Figure 18). Topography within the SEB area rises gently from less than 10m above sea level (a.s.l.) in the saline depressions up to 70 m a.s.l. to the south-west. Soils on these north-east facing slopes consist of shallow highly calcareous sandy loams with limestone rubble over calcrete. There is significant cover of exposed limestone sheets and rocks, with shallow sandy loam in the intervening spaces. Beyond the proposed offset area, the slopes continue to rise to an elevation of 140 m a.s.l. before culminating in a steep south-west facing coastal cliff.

The lowest lying areas (Charlotte Waterhole and Caroona Waterhole) support *Gahnia trifida* sedgelands (State Endangered) and *Melaleuca halmaturorum* shrubland. Vegetation on the lower slopes of the SEB offset area ranges from very open derived herblands/grasslands to open *Leucopogon parviflorus* shrublands. There are some small patches of *Eucalyptus diversifolia* mallee. The area has been historically cleared and there is very little regeneration due to overgrazing, initially by livestock and more recently by kangaroos and the persistence of low numbers of rabbits [36]. Remnant stumps and fallen *A. verticillata* trees are evident throughout and the vegetation is considered to be derived from the Nationally-listed Drooping Sheoak Grassy Woodland community [37]. The shrubby understory on the mid-slopes becomes much denser and more diverse, under a canopy of sparsely scattered *A. verticillata* and some dense patches of introduced *Acacia cyclops*. The steeper north-east facing slopes above the offset area support high quality *E. diversifolia* coastal mallee grading into low coastal shrublands and heathlands on the hind dunes and clifftop.

The area receives an annual average rainfall of 510 mm (1976 to 2005, NatureMaps).

The proposed SEB offset area has very good connectivity with high quality and protected vegetation. Coffin Bay National Park (NP) and two Heritage Agreements (HA870 and HA994) lie on the boundary of the Uley South Basin Reserve, approximately 6.5-7.5 km to the north of the site. Heritage Agreement 1291 is just over 1.1 km south of the site, which together with the adjoining property (HA1493), covers over 3500 ha (Figure 18). The north-eastern section of the Uley South Reserve includes Mungerowie Scrub, a large, uncleared remnant patch of principally mallee scrub which provides faunal linkages from the north to the coastal eco-tones in the south-west [37].

Rehabilitation and expansion of the Drooping Sheoak woodland community within the proposed offset area would connect good quality coastal mallee vegetation to the south-west with the *Gahnia trifida* sedgelands in the north-east, creating a corridor for the movement of threatened fauna such as the Eyre Peninsula Southern Emu-wren.

Threatened Ecological Communities

Drooping Sheoak Grassy Woodland on calcrete of the Eyre Yorke Block Bioregion – EPBC Critically Endangered

The *Drooping Sheoak Grassy Woodland on calcrete of the Eyre Yorke Block Bioregion* is listed as a Critically Endangered ecological community under the EPBC Act. The community has declined by approximately 97%, compared with its original pre-European distribution and now occurs mainly within the Talia and Southern Yorke subregions, in the Eyre Yorke Block Bioregion. An indicative distribution of the community is provided in Appendix 8. In 2020, approximately 20% of the remaining ecological community occurred in protected reserves or heritage agreements [38].

The ecological community varies from a low to mid-height open woodland to open forest structure and is dominated by *Allocasuarina verticillata* (Drooping Sheoak). The understorey is typically dominated by grasses and sedges with sparsely scattered shrubs but can vary from predominantly grasses to predominantly sedges to densely shrubby [39]. Variation in the structure and composition of the woodland occurs in response to local soil properties, rainfall, fire regimes, disturbance and management history [38].

The Conservation Advice for the ecological community [38] lists the following key diagnostic characteristics:

- Distribution limited to the Eyre Yorke Block Bioregion
- Occurs on calcrete substrates (at various depths) or limestone outcrops overlain by calcareous loam and/or sandy loam soils.
- Vegetation structure is typically a sparse woodland to open forest with at least 10% solid crown cover and of low height (4–10m).
- Canopy is dominated by *Allocasuarina verticillata* with other tree species such as *Callitris gracilis* (Southern Cypress-pine), *Eucalyptus diversifolia* (Coastal White Mallee), *E. porosa* (Mallee Box) or *Melaleuca lanceolata* (Dryland Tea-tree) potentially present but not dominant across a patch.
- The understorey typically varies from absent to sparse and scattered. A denser understorey may occur, for instance representing a transient state after disturbance and transitioning to a more typical open understorey over time.
    - The ground layer ranges from a sparse to thick layer of perennial native grasses, other graminoids, sedges, ferns, geophytes, other forbs and shrubs and is typically dominated by one or more of the graminoid genera: *Austrostipa* (Spear-grasses), *Chorizandra* (Bristle rushes), *Gahnia* (Saw-sedges), *Lepidosperma* (Sword Sedges), *Lomandra* (Mat Rushes), *Rytidosperma* (Wallaby Grasses) and *Themeda* (Kangaroo Grass).
    - There can be a range of low shrubs present such as: *Acacia spinescens* (Spiny Wattle), *A. triquetra* (Gold Dust Wattle), *Correa pulchella* (Salmon Correa), *Dodonaea hexandra* (Horned Hop-bush), *Olearia ramulosa* (Twiggy Daisy-bush), *Prostanthera calycina* (West Coast Mintbush) and *Scaevola albida* (White Fan-flower). Chenopods such as *Enchylaena tomentosa* (Ruby Saltbush), *Rhagodia candolleana* (Sea-berry Saltbush) and *Rhagodia crassifolia* (Fleshy Saltbush) can also occur in some patches.
    - On the Eyre Peninsula, taller shrubs can include: *Acacia anceps* (West Coast Wattle), *A. brachybotrya* (Grey mulga), *A. cupularis* (Coastal Umbrella Bush), *Dodonaea baueri* (Crinkled Hop Bush), *D. viscosa* subsp. *spatulata* (Sticky Hop-bush), *Eremophila alternifolia* (Narrow-leaf Emubush), *Leucopogon parviflorus* (Coastal beard-heath) and *Olearia axillaris* (Coast Daisy-bush). The conservation advice provides a more comprehensive list of flora species that characterise the ecological community.
- The ecological community is not present if the substrate is dominated by buckshot soils or comprises a dense understorey of coastal shrubs (e.g. *Leucopogon parviflorus*, *Olearia axillaris*) with coastal understorey species (e.g. *Lepidosperma gladiatum*) where the substrate is dominated by sand.

To be protected as a Matter of National Environmental Significance, areas of the ecological community must meet both the key diagnostic characteristics listed above and at least the following minimum condition thresholds:

- At least 2 mature Drooping Sheoak trees AND/OR 10 seedlings and/or saplings present per 30 x 30 m sample plot, and
- ≥ 50% of perennial vegetation cover in the understorey is native, and
- ≥ 9 native plant species per sample plot in the ground layer.

A key threatening process highlighted in the Conservation Advice is the removal of native grasses and herbs over many decades of heavy grazing, resulting in the loss of shallow topsoils and leaving large areas of exposed limestone. The Conservation Advice also states that derived native grasslands, or areas lacking canopy cover and/or tree regrowth are not considered part of this ecological community, unless they represent a small gap in, or are on the edge of a larger patch of the woodland. Restored (including reconstructed) sites or areas of regrowth are part of the listed ecological community as long as the patch meets the key diagnostic characteristics [38].

The site visit identified patches of *A. verticillata* woodland to the north of the proposed SEB offset area, which meet the criteria listed above and may be considered as Benchmark or Reference communities to guide and inform restoration programs. These woodlands are characterised by a canopy dominated by *A. verticillata* with occasional *E. diversifolia* and *M. lanceolata* over a sparse to moderately dense shrub layer comprising species typically found in the nationally-listed ecological community (e.g. *Lasiopetalum discolor, Leucopogon parviflorus, Pimelea serpyllifolia, Acacia cupularis, Acrotriche patula,, Olearia axillaris, Pomaderris paniculosa, Exocarpos aphyllus, Dianella brevicaulis, Bursaria spinosa, Pittosporum angustifolium* and *Beyeria lechenaultii*. Native grasses such as *Austrostipa spp.* and *Rytidosperma spp*. are present but are not a dominant component of the groundlayer.

Gahnia trifida Sedgeland in drainage lines and depressions (Endangered in South Australia)

The *Gahnia trifida* sedgelands found in Charlotte Waterhole and Caroona Waterhole are listed as Endangered in South Australia's Provisional List of Threatened Ecosystems [40]. The sedgelands occur in the lowest parts of the Uley South Basin, tolerating periods of inundation to shallow depths and often relying on the presence of shallow groundwater. This threatened ecological community abuts the proposed SEB offset area to the north-east and east.

The sedgelands are highly dependent on maintenance of good hydrology. Changing rainfall patterns have lowered the groundwater table over the last three decades leaving significant areas of the community more susceptible to the detrimental impacts of weed invasion, overgrazing and the encroachment of terrestrial native species [37]. These changes have reduced the cover of native sedges and changed the structure of the sedgelands [41].

Information relating to the relevant land

Uley South basin is a critical water resource, contributing approximately 70 percent of public water supply for our customers on Eyre Peninsula. Uley South will continue to play an important role in supplying water to customers even after the Eyre Peninsula desalination plant is commissioned.

The proposed offset site has been chosen based on its strategic location within the Uley South borefield and several important water security, environmental and operational considerations were critical in the selection of the proposed site.

To avoid impacts to groundwater recharge, key considerations were developed with water security specialists and hydrogeologists and included:

- rising topography towards the coast where groundwater drops rapidly with proximity to the coastline. Depth to groundwater is expected to be >10 m in the proposed offset area.
- the understanding that Sheoaks are relatively shallow rooted and unlikely to intercept significant volumes of surface water/groundwater
- the area identified for the SEB offset is downgradient of all of SA Water's current production bores and away from key point source recharge locations in the central basin.
- the area is unlikely to be targeted for future production bores.

It was also recommended that any offset sites would be a minimum of 500m from existing bore infrastructure as this would allow sufficient area for future bore drilling activities should bores need to be replaced in the future. Consideration was also given to ensure any offset site would not impact on existing access tracks to production and observation bores.

General location map

The proposed offset area is located within the Uley South Basin on the west coast of Lower Eyre Peninsula, 28 km west-south-west of Port Lincoln and 18 km south of Coffin Bay (Figure 17).

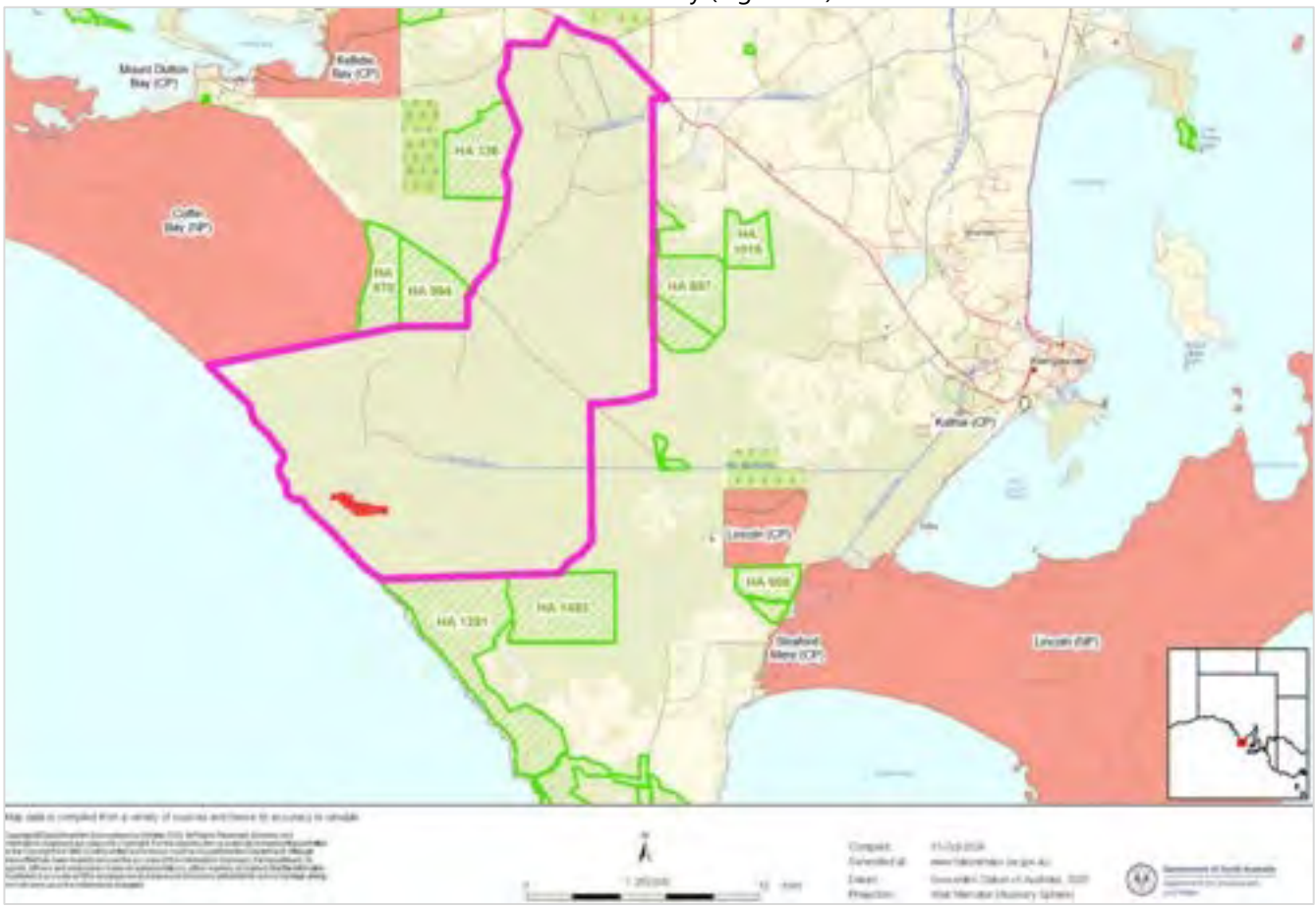

Figure 17. Site Location (in red), showing boundary of Uley South Basin (pink outline) and proximity to Heritage Agreement properties (green hatching) and protected reserves

Figure 18. Topographical setting of proposed SEB offset area (in pink)

6.2 Method

Database Searches for Flora and Fauna

A preliminary desk-top review of databases was conducted to identify threatened species and ecological communities prior to the field survey. Records were reviewed for a 5 km search radius centred on the site using NatureMaps, Atlas of Living Australia and the EPBC protected matters search tool (16th November 2023 and 6th March 2024). Records prior to 1995 were excluded. For EPBC Protected Matters, species were only included if they are known to occur, or their habitat is known to occur in the search area. In addition to the database searches detailed above, previous reports prepared for SA Water were examined for records of threatened flora and fauna in proximity to the area of interest.

National Conservation Ratings are in accordance with the most recent *EPBC Act* Listing Status available in the Species Profile and Threats Database. State Conservation Ratings are in accordance with the *National Parks and Wildlife Act 1972*.

Regional conservation ratings were sourced from Gillam, S. and Urban, R. (2009) Regional Species Conservation Assessment Project, Phase 1 Report: Regional Species Status Assessments, West Region. Department for Environment and Heritage, South Australia.

Flora assessment

SEB Offset opportunities were assessed by Ecological Associates and Darren Longbottom of SA Water from the 20th to 22nd November 2023. Sites were investigated in the Uley Wanilla, Uley South and Lincon Basin Reserves.

The investigation focused on state and nationally threatened communities to meet the 'like for like, or better' offset requirement. The Nationally Critically Endangered "Drooping Sheoak Grassy Woodland on calcrete of the Eyre Yorke Block Bioregion" was of most interest because this community was once widespread across the Uley Basin. The community was preferentially cleared from 1850-1960 and has been heavily grazed by livestock and rabbits and, more recently, kangaroos.

The site visit identified a potential SEB offsite area within an extensive tract of derived grassland/herbland and shrubland, located between high quality coastal mallee along the south-western coastline and the *Gahnia trifida*

sedgelands to the north-east. Benchmark communities that provide a high-quality reference condition for rehabilitation works were also identified.

The offset area was assessed following the vegetation survey methods set out by the Native Vegetation Council (NVC). Plant associations were mapped and classified according to composition and condition. Bushland Assessments were completed for each plant association as prescribed by the Guide for Calculating a Significant Environmental Benefit [42] and the NVC Bushland Assessment Manual [40]. This included recording the plant species present, the vegetation structure, and habitat values offered by the plant community.

Subsequent site visits on 1 May 2024 with staff from Wild Eyre (Greening Australia), EP Landscapes SA, SA Water and Ecological Associates, and on 12th September 2024 (SA Water and Ecological Associates) were conducted to gain expert on ground advice for the restoration potential of the site and recommended techniques.

Fauna assessment

The suitability of vegetation associations for rare and threatened fauna was assessed based on the known distribution and occurrence of species and their habitat requirements. In addition to the database searches detailed above, reports and management plans prepared for SA Water and various government and non-government organisations were interrogated for records of threatened fauna in proximity to the area of interest. SA Water staff also provided anecdotal observations of threatened fauna observed near the site.

6.3 Assessment Outcomes

6.3.1 Description of the vegetation

The site visit identified several potential offset sites within the Uley South, Uley Wanilla and Lincoln Basins.

Of these, the area in the south-west of Uley South Basin, is considered to provide the greatest offset potential given that:

- rehabilitation would seek to re-establish a Nationally Critically Endangered ecological community, as well as improve the condition of adjacent remnant patches;
- the rehabilitated communities would connect high quality coastal vegetation to the west, with a State Endangered sedgeland community to the east;
- the rehabilitated communities would provide habitat for threatened fauna such as the EPBC-listed EP Southern Emu-wren, Western Whipbird and Diamond Firetail (detailed below);
- the availability of large areas suitable for the restoration in one location, offers practical and cost advantages for the implementation of weed control, revegetation works and herbivore management; and,
- expert advice is available from successful Drooping Sheoak Grassy Woodland restoration projects in Coffin Bay NP (EP Landscapes SA Sheoak Grassy Woodland Restoration Program [43, 44] and on the West Coast of Eyre Peninsula (Wild Eyre Program) [39].

The proposed offset area comprises three vegetation associations in varying conditions:

US2: Derived herbland/grassland, in poor-moderate condition.

US3: Derived *Leucopogon parviflorus* very open shrubland on rises and lower slopes, in poor-moderate condition.

US4: *Allocasuarina verticillata* very open woodland over *Lasiopetalum discolor, Acrotriche patula* and *Hibbertia devitata* low shrubland, in good condition.

Vegetation association US2 is on an elevated plain of sandy-loam that holds water over winter, and is suitable for the establishment of a Drooping Sheoak Grassy Woodland over a predominantly grassy understory.

Vegetation association US3 contains fallen and/or dead *A. verticillata* trees and a suite of understory species that are characteristic of the Drooping Sheoak Grassy Woodland threatened ecological community but is too degraded to meet the criteria of the EPBC-listed community. This association is suitable for the establishment of a Drooping Sheoak Grassy Woodland over a predominantly shrubby understory, including a 1 ha area of dense understory to create linkage habitat for threatened fauna species.

Vegetation association US4 supports a highly diverse understory indicative of the Drooping Sheoak Grassy Woodland ecological community, but has a very sparse *A. verticillata* canopy with parts that are heavily invaded by **Acacia cyclops* and does not meet the minimum threshold criteria of the EPBC-listed ecological community.

Several potential benchmark sites were identified to the north and north-west of the proposed offset area. These sites demonstrate a canopy density and community composition consistent with the key diagnostic characteristics for the EPBC-listed Drooping Sheoak Grassy Woodland ecological community (Figure 19, Figure 20). These reference sites will help guide and set targets for rehabilitation in SEB offset areas.

Figure 19. Potential benchmark community for Drooping Sheoak Grassy Woodland. Photo 9288 facing south at waypoint 433.

6.3.2 Description of the vegetation

Vegetation Association	US2: Very open derived *Vittadenia* spp. and *Asteridea athrixioides* herbland/ *Rytidosperma* spp. grassland

Photo 9304 facing east at waypoint 437 (Latitude -34.787035, Longitude 135.532098)

Photo 9308 facing south-west at waypoint 438 (Latitude -34.781966, Longitude 135.523802)

General description	Plant community US2 covers an area of approximately 12 ha on a raised plain in the central part of the offset area (waypoint 437). The soil substrate comprises unusually deep sandy loam with little exposed limestone and holds water during the wetter months. Piles of scattered rocks near the edges indicate that the land was cleared of rocks and taller vegetation. A previous landholder has confirmed that the area was historically used for cropping. The vegetation association is a native herbland/grassland dominated by native grasses (*Austrostipa exilis* (Heath Spear-grass), *Austrostipa scabra ssp. falcata* (Rough Spear-grass), *Rytidosperma caespitosum* (Common Wallaby-grass) and daisies (*Asteridea athrixioides* (Wirewort)*, Vittadinia megacephala* (Giant New Holland Daisy) and *V. australasica* (Sticky New Holland Daisy)). It supports a medium diversity of native species including *Pimelea serpyllifolia* (Thyme Riceflower), *Wahlenbergia gracilenta* (Annual Bluebell) and *Acaena echinata* (Sheep's Burr), with patches of *Selliera radicans* (Tongue Plant), *Schoenus nitens* (Shiny Bog-rush) and mosses in areas that retain moisture. Many of the groundlayer species are characteristic of a Drooping Sheoak Grassy woodland community (highlighted in bold). Shrubs such as *Leucopogon parviflorus* (Coast Beard-heath), *Olearia axillaris* (Coast Daisy-bush) and *Exocarpos syrticola* (Coast Cherry) are very sparse and often heavily grazed. Exotic grasses and herbs such as *Vulpia* spp. (Fescue), *Rostraria cristata (*Annual Cat's-tail), *Lysimachia arvensis* (Pimpernel), *Trifolium campestre* (Hop Clover), *Bellardia trixago* (Mediterranean Linseed), *Asphodelus fistulosus* (Onion Weed) and *Carthamus lanatus* (Saffron Thistle) are prominent. A small stand of *Eucalyptus gomphocephala* (Tuart Gums) planted as shade trees north of waypoint 437 has been excluded from the association. The SA Declared weeds *Echium plantagineum* (Salvation Jane) and *Marrubium vulgare* (Horehound) are present as minor components of the association. Grazing pressure is high with large numbers of kangaroos seen nearby, and there are areas of significant soil disturbance caused by rabbits. The introduced White Italian Snail (*Theba pisana*) is abundant and known to inhibit the recruitment of native plants by feeding on germinating seedlings. The plant association is in poor condition with a low to medium diversity of native species, no canopy cover, very high grazing pressure and moderate levels of weed invasion.				
Threatened species or community	<u>Threatened Ecological Communities</u> None <u>Threatened Flora</u> No threatened flora were recorded in the vegetation association. <u>Threatened Fauna</u> The plant community may provide resources for three threatened fauna species: - Diamond Firetail (EPBC Vulnerable) - Heath Goanna (SA Vulnerable) - Peregrine Falcon (SA Rare)				
Landscape context score	1.03	Vegetation Condition Score	16.96	Conservation significance score	1.08
Gain Score	4.91	Area (ha)	11.3	SEB Points of Gain	55.5

Vegetation Association	US3: Derived *Leucopogon parviflorus* open shrubland on rises and lower slopes

Photo 9323 facing west at waypoint 442 (Latitude -34.786964, Longitude 135.540067)

Photo 9309 facing north at waypoint 438 (Latitude -34.781966, Longitude 135.523802)

General description	Plant community US3 is a regenerating shrubland growing on calcrete areas with extensive areas of exposed limestone. The association is characterised by a very open to mid-open shrublayer dominated by *Leucopogon parviflorus, Acacia longifolia* var. *sophorae* and *Exocarpos syrticola* over a herbland of native daisies, native grasses and mosses, with exotic annual grasses and herbs. Sheoak stumps and fallen trunks are widespread, indicating that the community was once an *Allocasuarina verticillata* woodland. Exposed limestone outcrops are prominent. Shrub cover varies from quite sparse in the north-western parts to moderately dense in the south-east. The vegetation association has a medium diversity of native species which includes several regenerating shrub species (*Pittosporum angustifolium* (Native Apricot), *Olearia axillaris, Melaleuca lanceolata* (Dryland Tea-tree)*, Pimelea serpyllifolia, Rhagodia candolleana* (Sea-berry Saltbush), *Acrotriche patula* (Prickly Ground-berry), *Lasiopetalum discolor* (Coast Velvet-bush) and *Dodonaea viscosa subsp. spatulata* (Sticky Hop-bush). The community also supports a variety of other native lifeforms such as vines (*Clematis microphylla*), lilies (*Bulbine semibarbata* (Small Leek-lily)), sedges (*Gahnia deusta* (Limestone Saw-sedge), *Gahnia lanigera* (Black Grass Saw-sedge), forbs (*Asteridea athrixioides, Vittadinia australasica, Dichondra repens* (Kidney Weed)), grasses (*Austrostipa exilis, Rytidosperma caespitosum*) and mosses. Prominent introduced species include *Lagurus ovatus* (Hair's Tail Grass), Fescue, Onion Weed, Mediterranean Linseed, Hop Clover and *Melilotus indicus* (King Island Melilot). High risk weeds present in parts of the community include **Acacia cyclops* (Western Coastal Wattle), Horehound, Salvation Jane, *Senecio pterophorus* (African Daisy) and *Asparagus asparagoides* (Bridal Creeper). Grazing pressure is high with large numbers of kangaroos observed in the area and there is significant soil disturbance by rabbits. The introduced White Snail is abundant throughout the community. The plant association is in moderate condition with a medium diversity of native species, little tree canopy, very high grazing pressure and moderate levels of weed invasion.				
Threatened species or community	<u>Threatened Ecological Communities</u> This derived shrubland lacks a dominant Drooping Sheoak canopy and does not meet the criteria for the nationally-listed *Drooping Sheoak Grassy Woodland on calcrete of the Eyre Yorke Block Bioregion.* However, several flora species characteristic of the ecological community were recorded (indicated in bold above). <u>Threatened Flora</u> No threatened flora were recorded in the vegetation association. <u>Threatened Fauna</u> The plant community may provide resources for three threatened fauna species: - Diamond Firetail (EPBC Vulnerable) - Heath Goanna (SA Vulnerable) - Peregrine Falcon (SA Rare)				
Landscape context score	1.03	Vegetation Condition Score	37.47	Conservation significance score	1.08
Gain Score	6.20	Area (ha)	66.8	SEB Points of Gain	414.3

Vegetation Association	US4: *Allocasuarina verticillata* very open woodland over *Lasiopetalum discolor, Acrotriche patula* and *Hibbertia devitata* low shrubland

Photo 9333 facing north at waypoint 445 (Latitude -34.789431, Longitude 135.530189)

Photo 9313 facing northwest at waypoint 439 (Latitude -34.784794, Longitude 135.522079)

General description	Plant community US4 occurs on calcareous soils of the east-facing mid-slopes above the derived shrubland and herbland communities. Varying age classes of *Allocasuarina verticillata* occur mostly as sparsely scattered trees, although there are some small stands where the species becomes more dense, particularly in the north-western parts. Large fallen trunks and logs indicate that the canopy layer was once dominated by *Allocasuarina verticillata.* The introduced *Acacia cyclops* (listed as *Acacia longifolia ssp. longifolia* in the BAM scoresheet) now forms the dominant canopy layer in some areas. The low shrub layer comprises *Lasiopetalum discolor*, *Olearia axillaris, Hibbertia devitata* (Smooth Guinea-flower), *Leucopogon parviflorus* and *Acrotriche patula* with dense patches of *Gahnia lanigera*. Calcrete rocks are present on the soil surface and interspersed with the vegetation. Native species diversity is high and comprises a suite of other species that are characteristic of the EPBC-listed *Drooping Sheoak Grassy Woodland on calcrete of the Eyre Yorke Block Bioregion* community (e.g. *Pittosporum angustifolium*, *E. diversifolia, Pimelea serpyllifolia, Acacia cupularis* (Cup Wattle), *A. triquetra* (Mallee Wreath Wattle), *A. spinescens* (Spiny Wattle), *Pomaderris paniculosa* (Coast Pomaderris), *Clematis microphylla, Dianella brevicaulis, Asteridea athrixioides, Austrostipa* spp. and *Rytidosperma* spp.). Several species of orchids were noted during a spring site visit (September 2024). The SA Declared Bridal Creeper is present as very sparsely scattered small plants. Non-native grasses and herbs are a minor component of the ground layer. Grazing pressure is generally less than on the lower slopes but remains high in more open areas. The vegetation association is generally in good condition with a high diversity of native species, low to moderate cover of canopy and fallen timber and low levels of weed invasion outside of **A. cyclops* patches.
Threatened species or community	<u>Threatened Ecological Communities</u> While there are some denser stands of *Allocasuarina verticillata*, much of the community does not currently meet the minimum threshold criteria for the nationally-listed *Drooping Sheoak Grassy Woodland on calcrete of the Eyre Yorke Block Bioregion* (at least 2 mature Drooping Sheoak trees and/or 10 seedlings and/or saplings present per 30 x 30 m sample plot). However, the highly diverse understory supports numerous flora species characteristic of the threatened ecological community (indicated in bold above), and the community (in particular the canopy layer) could be restored through the management of pest plants and grazing pressure. <u>Threatened Flora</u> One threatened flora species was recorded: - *Thysanotus nudicaulis* (a Fringe-lily), (SA Endangered) <u>Threatened Fauna</u> The plant community may provide resources for seven threatened fauna species: - EP Southern Emuwren (EPBC Endangered) - White-bellied Whipbird (EPBC Endangered) - Diamond Firetail (EPBC Vulnerable) - Heath Goanna (SA Vulnerable) - Yellow-tailed Black Cockatoo (SA Vulnerable) - Peregrine Falcon (SA Rare) - Rock Parrot (SA Rare) 

Landscape context score	1.03	Vegetation Condition Score	56.64	Conservation significance score	1.22
Gain Score	5.72	Area (ha)	26.7	SEB Points of Gain	152.8

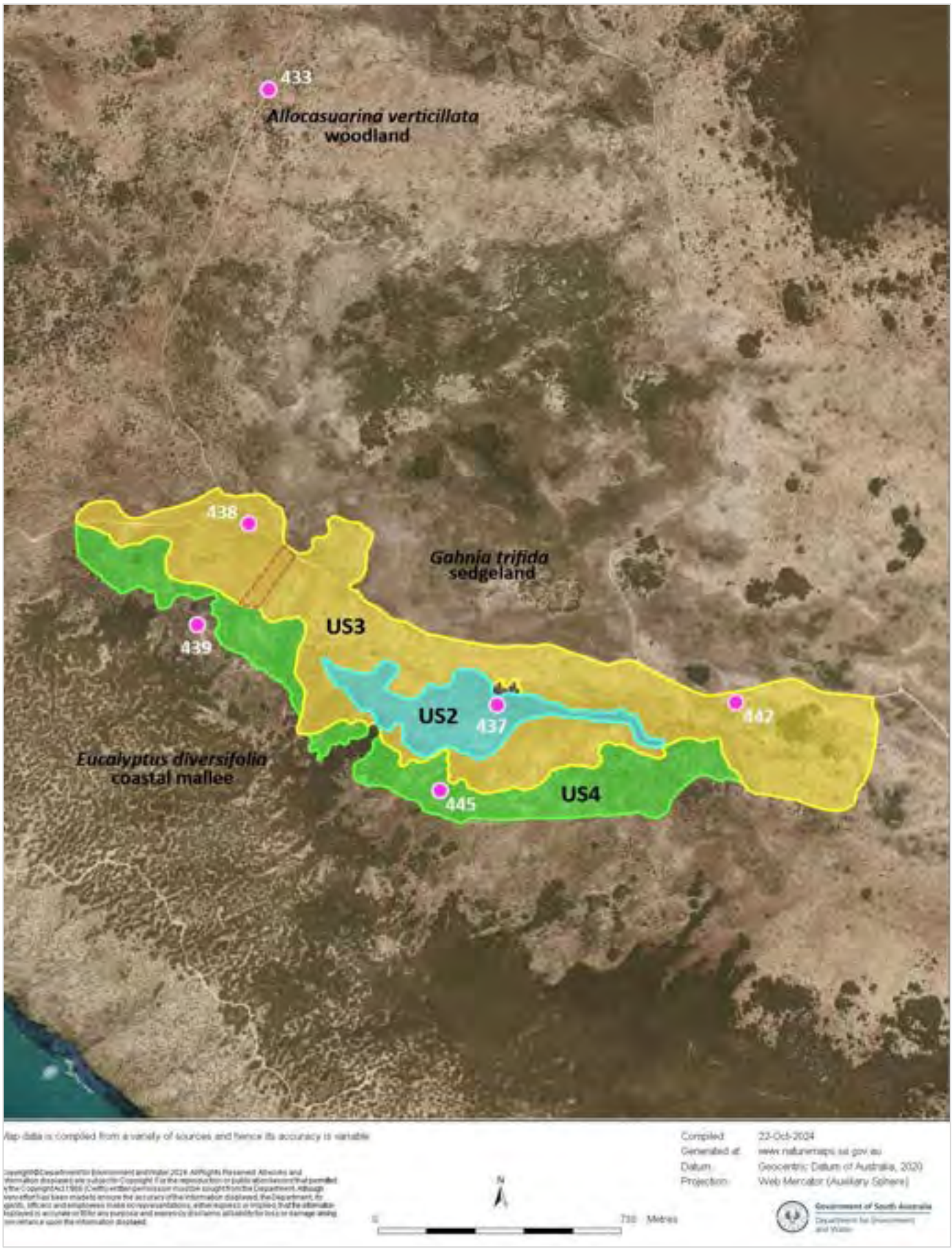

Figure 20. Site map showing vegetation associations within proposed SEB offset area, waypoints (pink circles) and proposed faunal linkage habitat (brown dashed line).

6.3.3 Photo log

Photo log

Photo	Direction	Description	Waypoint
9304	East	Vegetation Association US2	437
9308	South-west	Vegetation Association US3	438
9309	North	Vegetation Association US3	438
9323	West	Vegetation Association US3	442
9313	North-west	Vegetation Association US4	439
9333	North	Vegetation Association US4	445
9288	South	Benchmark Drooping Sheoak woodland community	433
9289	East	Benchmark Drooping Sheoak woodland community	433
9290	North-west	Benchmark Drooping Sheoak woodland community	433

6.3.4 Fauna and Flora assessment

Threatened Fauna

Three Nationally-listed fauna species have been recorded within 5 km of the site:

- Eyre Peninsula Southern Emu-wren (EPBC Endangered)
- Mallee Whipbird (EPBC Endangered)
- The Diamond Firetail (EPBC Vulnerable)

Eyre Peninsula Southern Emu-wren (EPBC Endangered)

The Eyre Peninsula Southern Emu-wren, *Stipiturus malachurus parimeda,* was listed as Endangered under the EPBC Act in July 2023. The subspecies is found only on the southern tip of Eyre Peninsula, and most recent surveys (2023) indicate that their previous (2002) extent of occupancy has been reduced from eleven to nine isolated subpopulations [41]. The estimated number of mature individuals was 750 (based on 2002 surveys), with an observed and inferred continuing decline [27, 41].

The EP Southern Emu-wren (EPSEW) utilises shrubland, mallee, samphire and sedgeland habitats with one or two layers of dense understorey. Vegetation structure appears to be a more important habitat component than floristic composition, as dense layers of vegetation provide shelter and a higher abundance of insects [27].

Shrubland habitats include wet and dry heathlands, usually dominated by one or two major plant species such as *Melaleuca brevifolia, M. decussata* and *M. lanceolata*. Coastal shrubland species such as *Leucopogon parviflorus, Alyxia buxifolia, Lasiopetalum discolor, Acrotriche patula* and *Beyeria lechenaultii* may also be prominent. Mallee habitats are typically dominated by *E. diversifolia and E. incrassata*, over a dense layer of low heathy shrubs and sedges. Sedgeland habitats occupied by the EPSEW are located around seasonal swamps in coastal regions and are characterised by a dense (>90%) cover of *Gahnia* species, often with dense understorey of sedges and rushes [41, 45].

Southern Emu-wrens are not strong flyers, and when coupled with their need for dense cover, they are considered to be poor dispersers. Habitat loss, degradation and fragmentation are regarded as the main threats to the EPSEW [27]. Even vegetation communities with a continuous canopy layer but degraded (thinned) understory become a barrier for movement. This makes them particularly vulnerable to genetic isolation and catastrophic events such as fire [41].

The subspecies' Conservation Advice lists the following habitats as critical to their survival:

- All known sites where the subspecies occurs;
- Specific habitat types that may be potential habitat for the subspecies; and
- Surrounding matrix of these areas for providing corridors for dispersal between suitable habitat patches.

The proposed SEB offset area lies within one of five subpopulations identified as critical for the long-term survival and recovery of the subspecies. Being one of the largest, this subpopulation (Shoal Point – D'Anville Bay – Whalers Way – Fishery Bay) is likely a major source for regional dispersal in the Sleaford and Uley Basin district [27]. Targeted surveys conducted in 2002 and 2006 found EPSEW in the *Gahnia trifida* sedgeland of Paradise - Charlotte Waterholes and in low *E. diversifolia* coastal mallee west of the proposed offset area [45, 46]. A recent survey (August 2023) recorded emu-wrens in the low coastal mallee site, but did not detect the species in the sedgelands [41]. The species has also been recorded in coastal habitats south of the SA Water Reserve boundary, approximately 1.5 km south of the proposed offset area (Figure 21).

Within the Uley South Basin, both the low *E. diversifolia* coastal mallee south-west of the proposed offset area, and the *Gahnia trifida* sedgelands, provide critical habitat for the EPSEW. It is possible that some areas of Vegetation Association US4 with dense understory could also provide suitable habitat for the Southern Emu-wren. Although the remainder of the proposed offset area is unlikely to support the species in its current state, management actions are expected to improve adjacent critical habitats (through weed management and the reduction of grazing pressure) and would create linkage habitat by incorporating restoration areas with dense understory.

Mallee Whipbird (EPBC Endangered)

The Mallee Whipbird, *Psophodes leucagaster leucogaster,* (also known as the White-bellied Whipbird or Western Whipbird) was uplisted from Vulnerable to Endangered under the EPBC Act in December 2023. The subspecies occurs in four subpopulations: one on each of Yorke and Eyre Peninsulas, one from the Murray mallee in South Australia and one from the Mallee region in Victoria (although the Murray mallee subpopulation may now be locally extinct). On the Eyre Peninsula it is found from Lincoln NP to Coffin Bay NP, including private land throughout Whalers Way. The species' Conservation Advice estimates approximately 1575 mature individuals, with around 80% occurring in the Eyre Peninsula subpopulation [47].

The Mallee Whipbird inhabits mallee scrub on sandy flats, dunes or limestone, with an overstorey of mallee eucalypts including *Eucalyptus incrassata, E. socialis, E. leptophylla* and *E. diversifolia*, and a dense species-rich understory comprising shrubs such as *Melaleuca lanceolata, M. uncinata, Baeckia behrii, Callitris verrucosa, Allocasuarina* spp*., Hakea muelleriana, Leptospermum coriaceum,* and *Triodia* spp. It is also found in *Acacia* thickets. As for the EP Southern Emu-wren, vegetation structure appears to be a more important determinant of habitat selection than floristic composition [47]. The subspecies prefers a dense shrubby understorey 1.5–2 m tall below an open 2–5 m tall mallee eucalypt layer. Although in mallee regions, this is often influenced by post-fire age, the coastline habitat on lower Eyre Peninsula has no recorded fire history suggesting that suitable habitat structure is maintained in the absence of fire in this region [47].

A shy and elusive bird, the Mallee Whipbird dwells mainly on the ground and in low shrubs, feeding on arthropods such as spiders and insects, as well as small skinks. Their nest, comprising of a bowl of twigs, bark and grass, is built approximately 50 cm off the ground in dense shrubs. It is a sedentary bird, with pairs occupying the same home range over many years. Mallee Whipbirds have a restricted dispersal ability, and generally do not travel further than 30 metres over cleared vegetation [47].

There are numerous records of Mallee Whipbird in *E. diversifolia* mallee woodland and in *Leucopogon parviflorus* coastal shrubland approximately 1.5 km south of the proposed offset area, and it is very likely that the species also occupies coastal habitats to the north of the SA Water boundary (Figure 21). In July 2022, the species and its distinctive call were recorded in coastal shrubland south of Shoal Point, less than a kilometer to the west of the proposed offset area [48]. It is possible that some areas of Vegetation Association US4 with dense understory could also provide suitable habitat for the Mallee Whipbird. The remainder of the proposed offset area is unlikely to support the species in its current state, however management actions are expected to improve adjacent critical habitat and may expand available habitat by incorporating restoration areas with dense understory.

The Diamond Firetail (EPBC Vulnerable)

The Diamond Firetail, *Stagonopleura guttata*, was listed as Vulnerable under the *EPBC Act* in March 2023. The species occurs on mainland Australia from south-east Queensland to Eyre Peninsula and up to 300 km inland. In South Australia there are three isolated subpopulations (Eyre Peninsula, Mt Lofty to Southern Flinders Ranges, and the south-east), with few recent records from a fourth on Yorke Peninsula. The species' Conservation Advice estimates a total population size of 136,000 mature individuals, however the reliability of this estimate is low [25].

The species' Conservation Advice identifies habitat critical to their survival as "Eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats, with low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding". They are found in open forests and other lightly timbered habitats, including farmland and grassland with scattered trees. The Diamond Firetail is listed as a species that is likely to occur in the Drooping Sheoak Grassy Woodland threatened ecological community [38].

Diamond firetails usually occur in flocks of between 5 to 40, and feed mostly on the ground, on seeds of grasses and herbs, as well as on green leaves and insects. It has been noted that in areas where perennial grasses have been replaced by exotic annuals, the species relies heavily on the seeds of *Allocasuarina verticillata* to provide food during the cooler months [25]. Diamond Firetails often build their nests into the base of large stick-nests made by birds of prey (e.g. Wedge-tailed Eagle Brown Falcon, Nankeen kestrel and White-bellied Sea-eagle) but may also choose dense or prickly shrubs like hakeas and box thorn.

On lower Eyre Peninsula most records of Diamond Firetails are from Lincoln NP, Coffin Bay NP and Sleaford Mere Conservation Park (CP) with no recent observations along the south-western coast between Whalers Way and Coffin Bay (Atlas of Living Australia). However, SA Water staff reported seeing a group of approximately 8 birds in May 2023, foraging on the SA Water Boundary Track approximately 1 km south of the proposed offset area (D. Longbottom, pers. comm.) (Figure 21). Given that suitable (open grassland) habitat is already available across much of the proposed offset area, it is feasible that the species may already use the available habitat to some extent. Management actions that improve these habitats (weed reduction, lowered grazing pressure, restoration of grass, shrub and low-density canopy layers) would all help to increase the availability of food and nesting resources (particularly perennial native grasses and *A. verticillata*) for the Diamond Firetail.

Fauna Species listed under the SA National Parks and Wildlife Act 1972

Six species of conservation concern at the State level have been recorded within 5 km of the proposed offset site, since 1995:

- Eastern Osprey (SA Endangered, listed as Migratory and Marine under the EPBC Act)
- White-bellied Sea Eagle (SA Endangered, listed as Marine under the EPBC Act)
- Yellow-tailed Black Cockatoo (SA Vulnerable)
- Heath Monitor (SA Vulnerable)
- Peregrine Falcon (SA Rare)
- Rock Parrot (SA Rare)

Details of the habitat preferences and likelihood of use for vegetation associations within the SEB offset area are provided in Table 3. Locations of sightings for all but the Heath Monitor) are shown in Figure 21.

The Yellow-tailed Black Cockatoo and Heath Monitor are listed as species that that are likely to occur in the Drooping Sheoak Grassy Woodland threatened ecological community [38]. Improvement and restoration of habitat within the offset area is likely to benefit the Yellow-tailed Black Cockatoo (by increasing food resources, particularly *A. verticillata*), Peregrine Falcon and Heath Monitor.

The Conservation Advice for the Drooping Sheoak Grassy Woodland lists a number of other threatened species that use the ecological community [38]. Several of these have been recorded on lower EP, and may also benefit from restoration of the grassy woodland habitat:

- Blue-winged Parrot (EPBC VU; SA Vulnerable)
- Brown Quail (SA Vulnerable)
- Little Eagle (SA Vulnerable)
- Purple-Gaped Honeyeater (SA Rare)
- Western Three-lined Skink (SA Rare)
- White-Winged Chough (SA Rare)

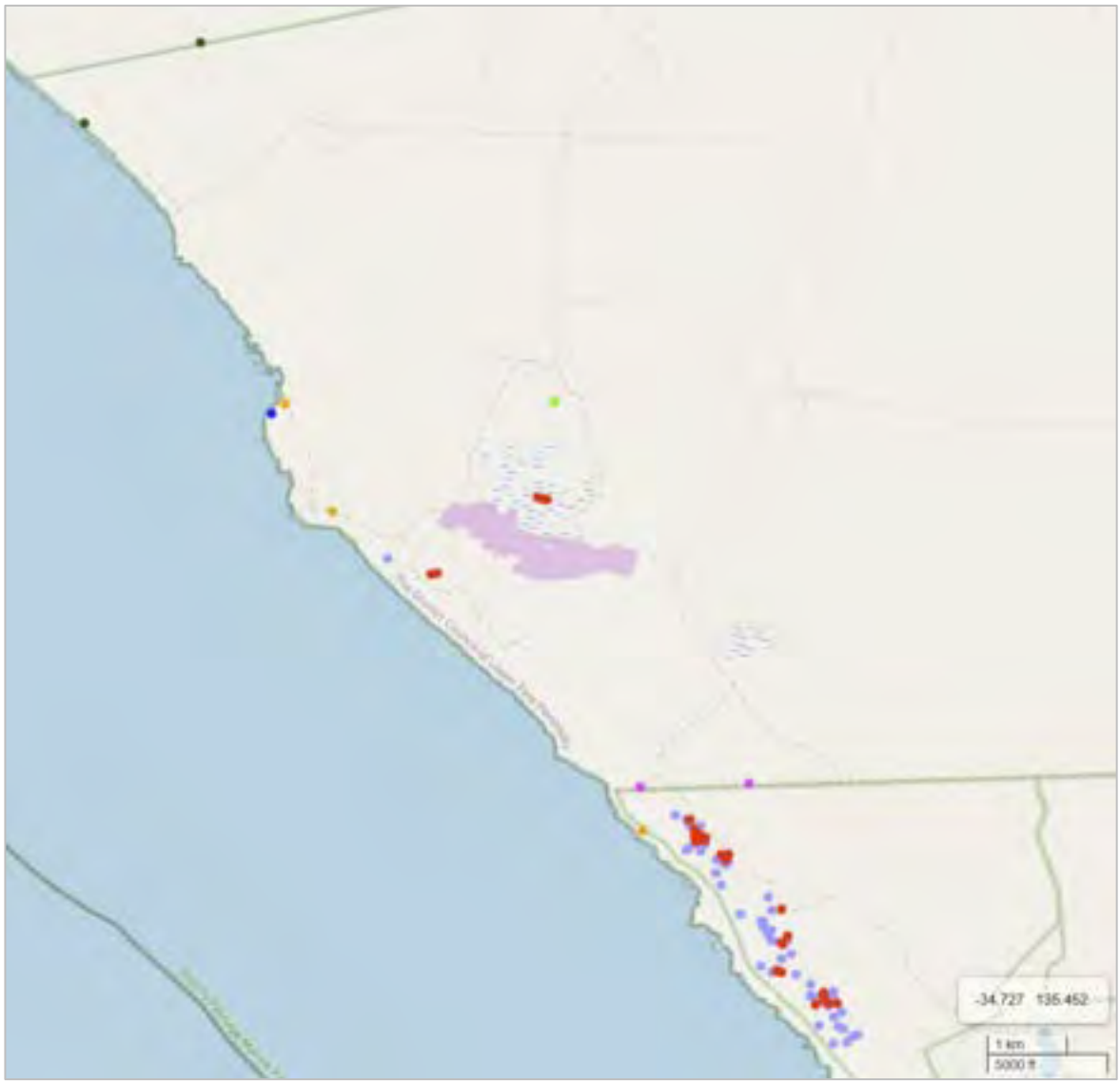

Figure 21. Map of threatened fauna species recorded since 1995 within 5 km of the proposed SEB offset area (shaded in pink). EP Southern Emuwren (red dots), Mallee Whipbird (purple), Diamond Firetail (bright pink), Rock Parrot (orange), Peregrine Falcon (dark blue), Yellow-tailed Black Cockatoo (light green) and Heath Monitor (dark green). Note that the higher density of records in private land south of the SA Water Reserve most likely reflects a greater survey effort rather than differences in habitat use.

Threatened Flora

Four State-listed flora species have been recorded within 5 km of the project site since 1995:

- Fringe-lily *Thysanotus nudicaulis* (SA Endangered)
  - Recorded during the site visit in Vegetation Association US4 and in adjacent *E. diversifolia* mallee. Had not been recorded on Lower EP since 1972.
- Port Lincoln Mallee *Eucalyptus conglobata ssp. conglobata* (SA Rare)
  - recorded in 2018 in a stand with *E. diversifolia* ~ 2 km NW of the proposed SEB area [37]
- Snowdrop Spurge *Lysiandra (Phyllanthus) calycina* (SA Rare)
  - Recorded in 2021 on private land ~2.5 km south-east of the proposed offset site, in *E. diversifolia / A. verticillata* mallee over *L. parviflorus* shrubland [49]
- Western Daddy-long-legs *Caladenia bicalliata ssp. bicalliata* (SA Rare)
  - found in 2022 in low heathland and in *E. diversifolia* mallee with emergent *A. verticillata*, on private land ~3 km south of the project area [50]

A further two species known to occur in Drooping Sheoak Grassy Woodland, have been recorded on Lower EP:

- Alcock's Wattle *Acacia alcockii* (SA Rare)
    - Restricted to the southern tip of EP, most records are near Pt Lincoln and in Lincoln NP, but there are two observations in coastal vegetation ~7 km south of the proposed offset area. It is often found in shallow soil over limestone and grows in a variety of plant communities, including Sheoak woodland.
- West Coast Mintbush *Prostanthera calycina* (EPBC Vulnerable, SA Vulnerable)
    - Known only from Eyre Peninsula, mostly along the west coast. There is one historic record near Port Lincoln, and one record just south of the Lincoln Basin Reserve. The species is usually found on limestone outcrops in mallee vegetation.

Three of these threatened flora species, *Acacia alcockii*, *Eucalyptus conglobata ssp. conglobata* and *Lysiandra calycina,* are likely to be impacted by the works detailed in the clearance report for the Billy Light's Desalination Plant project. Seeds of *Acacia alcockii* will be collected from the impact area prior to clearance, for propagation and translocation to the Uley South Offset site.

Table 3. 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)	EPBC Act	NP&W Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
Stipiturus malachurus parimeda (Eyre Peninsula Southern Emuwren)	EN	E	3,5,6	2023	Found only on the southern tip of Eyre Peninsula, in shrubland, mallee, samphire and sedgeland habitats with a low, dense understorey. They forage on small invertebrates and construct their domed nests in dense vegetation. The species' Conservation Advice [27] lists Shoal Point – D'Anville Bay – Whalers Way as one of five subpopulations critical for the long-term survival and recovery of the subspecies.	Likely. Recorded recently (2023) in low coastal mallee vegetation to the west of the proposed offset area [41]. Also observed using the adjacent *Gahnia trifida* sedgelands in 2006 [46]. Most likely to use Vegetation Association US4, particularly where the understorey is dense. Unlikely to use US2 or US3.
Psophodes leucagaster leucogaster (Mallee Whipbird, White-bellied Whipbird, Western Whipbird)	EN	E	3,5,6	2022	Found in dense mallee scrub on sandy flats, dunes, or limestone, in coastal and inland areas of southern South Australia. The species forages on the ground and in low shrubs for arthropods. As it occupies dense habitat, it is more often heard than seen.	Likely. Recorded recently (July 2022) in coastal shrubland to the west of the proposed offset area. Most likely to use Vegetation Association US4, particularly where the understorey is dense. Unlikely to use US2 or US3.
Zanda funerea whiteae (Yellow-tailed Black Cockatoo)		V	1	2004	Occurs in forests, woodlands, urban areas, particularly eucalypts and pines. Nests in tree hollows. Feed on seeds of native and introduced trees, particularly she-oaks, eucalypts, acacias, banksias, hakeas and pines. They also extract insect larvae from flowering spikes of *Xanthorrhoea* and wood borers in eucalypts and acacias.	Possible. Only one record nearby but suitable foraging habitat is available at the site. Most likely to use Vegetation Association US4. Unlikely to use Associations US2 or US3.

Species (common name)	EPBC Act	NP&W Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
Neophema petrophila (Rock Parrot)		R	1,6	2010	A small grass parrot inhabiting coastal dune areas and rocky islands. Nests in burrows or rocky crevices mostly on offshore islands. Feeds on seeds of grasses, forbs and shrubs. It is seldom seen more than a few hundred metres from the sea.	Unlikely. Recorded along the coastal cliffs near Shoal Point, but the species is unlikely to use mallee and shrubland vegetation further inland.
Falco peregrinus macropus (Peregrine Falcon)		R	1	2009	Found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites, and prefers coastal and inland cliffs or open woodlands and grasslands often near water.	Likely. There is only one record for the species nearby, however suitable nesting habitat is available along the coastal cliffs, and open areas provide foraging opportunities. Likely in all vegetation associations.
Stagonopleura guttata (Diamond Firetail)	VU	V	2,6	2023	Sedentary small finch which inhabits Eucalyptus, Acacia or Allocasuarina woodlands, open forests and other lightly timbered habitats. Prefers areas with relatively low tree density, few large logs, and little litter cover but high grass cover. Feeds on the ground on seeds and insects.	Highly Likely. Recorded near the assessment site by SA Water staff (D. Longbottom pers. comm.). Approximately 8 birds were seen foraging on a fire track in shrubland. Suitable foraging habitat is available in all vegetation associations.
Varanus rosenbergi (Heath Monitor)		V	6	2022	Found in sandy heathland, open woodland or sclerophyll forest. Shelters in hollow logs, rock crevices and in burrows. Uses termite mounds as nesting sites and has a varied diet including birds, eggs, reptiles, small mammals and carrion.	Highly Likely. Recorded by SA Water staff north of the *Gahnia trifida* sedgeland, and south of the offset area along the Eastern Boundary Track. (D. Longbottom pers. comm.). Likely to use all vegetation associations.
Haliaeetus leucogaster (White-bellied Sea Eagle)	Mi/Ma	E	6	2009	White-bellied Sea-Eagles build a large stick nest, which can be located in low coastal trees, cliff-face ledges or rocky. They range around the coast of Eyre Peninsula fishing over the water.	Unlikely. The coastal escarpment is used as a flight path for the species between Coffin Bay and the Lincoln NP [36]. However, the vegetation associations are unlikely to provide important habitat for the species.

Species (common name)	EPBC Act	NP&W Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
Pandion haliaetus cristatus (Eastern Osprey)	Mi/Ma	E	6	2009	This species is mostly found in coastal areas and offshore islands and requires extensive areas of open fresh, brackish or saline water for foraging. As of 2023 there were estimated to be only 50 breeding pairs left in SA, mostly on islands and isolated stretches of coast.	Unlikely. The coastal escarpment is used as a flight path for the species between Coffin Bay and the Lincoln NP [36]. Although a juvenile has been observed perching on a dead *Melaleuca lanceolata* near Charlottes Water Hole, the vegetation associations are unlikely to provide important habitat for the species.
Source; 1- BDBSA, 2 - AoLA, 3 – NatureMaps 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; Mi/Ma= Migratory/Marine						

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 provide limited 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 the previous 20 years, but the area provide no habitat or feeding resources for the species, including perching, roosting or nesting opportunities, corridor for movement or shelter. 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.

6.4 Environmental Benefits

Key environmental outcomes expected and associated benefits, include:

- Reconstruction of 78 ha of Drooping Sheoak Grassy Woodland, to meet the key diagnostic characteristics of the Nationally Critically Endangered ecological community.
- Restoring or improving habitat for three Nationally-listed bird species (EP Southern Emu-wren, Mallee Whipbird and Diamond Firetail) and several State-listed fauna species
- Restoration (of canopy layer) and weed control of 26 ha of *Allocasuarina verticillata* very open woodland to bring the community to a condition that meets the minimum condition threshold for the Nationally-listed ecological community.
- Protecting and improving the habitat of the State Endangered *Thysanotus nudicaulis*
- Indirectly (through management of pest plants and animals) improving the vegetation condition of adjacent Coastal Mallee and State Endangered *Gahnia trifida* sedgelands, which provide critical habitat for Nationally-threatened fauna, and support several species of State-listed flora and fauna.
- Establishing a population of State Rare *Acacia alcockii*.

6.5 Addressing the Requirements For Establishing On-ground SEB Areas

The Native Vegetation Significant Environmental Benefit Policy [51] specifies a number of requirements for establishing an on-ground SEB area. These are summarised below, along with an assessment of the proposed SEB offset site against these criteria.

Requirement 1: Suitability of an SEB Area

The SEB Area must achieve the principle of like-for-like, or better.

- *Like-for-like requires that the vegetation to be protected and managed within the SEB Area must be of the same vegetation type (structure and dominant species) as that to be cleared (like-for-like). If the vegetation to be impacted is threatened or provides habitat for threatened species, the SEB Area should be like-for-like and should provide significant, long-term benefit for the recovery of the threatened species or community.*
- *Like-for-like or better is permitted if the vegetation within the SEB Area is of a higher conservation value than the vegetation/species to be cleared. However, this is only permitted where the SEB area provides habitat for a similar assemblage of native fauna species and particularly with the agricultural zone of the State, it must be within close proximity to the vegetation being impacted.*

The clearance area impacts on 3.87 ha of the State-threatened ecological community (*Eucalyptus conglobata* Low Woodland on fertile loams over limestone (Rare in South Australia)), present across seven plant associations. In addition, six State Rare flora species have been recorded in the impacted vegetation associations (*Acacia alcockii* at six sites; *Eucalyptus conglobata* at six sites, *Lysiandra calycina* at two sites, *Xanthorrhoea semiplana ssp. tateana* at one site, *Choretrum chrysanthum* at one site and *Spyridium daphnoides* at two sites).

Although not in "close proximity", the proposed SEB area meets the Like-for-like or better requirement as the management goals aim to restore a Nationally Critically Endangered ecological community, which is of a higher conservation value than the vegetation to be cleared. The State threatened *Acacia alcockii* will be included in the revegetation plans at the offset area. The management actions are also likely to improve adjacent coastal mallee habitat (through reduced grazing pressure and weed management), which is of similar habitat to coastal mallee plant associations in the clearance areas. Furthermore, the SEB area would provide habitat for a similar assemblage of threatened fauna species.

Requirement 2: Location of an SEB Area

The SEB Area should be located as close as practical to the site of impact, within the following order of preference:

- *same Interim Biogeographic Regionalisation for Australia (IBRA) Association, or*
- *same IBRA Subregion, or*
- *only where it has been demonstrated that it is not possible to achieve the SEB within the same IBRA Association or IBRA Subregion, then the same IBRA Region*

The SEB area and site of impact are 27-33 km apart. Both are in the Eyre Yorke Block IBRA Region, however they are in different IBRA subregions and different IBRA Associations (Table 4).

Table 4. Comparison of location of SEB area relative to site of impact.

	Impact Site (Billy Lights)	SEB Area (Uley South)
IBRA Association	Lincoln	Mungerowie
IBRA subregion	Eyre Hills	Talia
IBRA region	Eyre Yorke Block	Eyre Yorke Block
% native veg. remaining in IBRA Association	84	87
% native veg. remaining in IBRA subregion	29	56
% native veg. protected in IBRA Association	77	25

SA Water has actively investigated other SEB offset opportunities closer to the impact site. However, given that much of the Lincoln IBRA Association is already protected, with the remainder under development or used for agricultural purposes, there are few options, and none at the scale or with the potential environmental benefits offered by the proposed SEB area at Uley South.

Requirement 3: SEB Area required

The SEB Area must directly improve the condition, protection and/or extent of native vegetation over an area of land.

The management goals for the proposed SEB area include:

- Improving the condition of 26 ha of *Allocasuarina verticillata* open woodland.
- Restoring 78 ha of derive herbland/grassland and open shrubland to Drooping Sheoak Grassy Woodland.
- Improving the condition of adjacent coastal mallee which is known to provide critical habitat for nationally threatened fauna species.

Requirement 4: Additionality

In order to comply with the additionality principle, areas of land or vegetation that are already protected and managed for conservation purposes will generally not be considered suitable as SEB Areas.

The land is not already dedicated for conservation and will provide substantial additional biodiversity benefits beyond those that would likely have occurred with 'duty of care' land management practices.

The land complies with all of the additionality principles listed in the Significant Environmental Benefit Policy [51].

Requirement 5: SEB protection

The SEB Area must be conserved in perpetuity for the growth of native vegetation and must not be used in a way that is inconsistent with that dedication.

The SEB Areas will be protected under the Native Vegetation Act.

Requirement 6: SEB management

- *An SEB Area must be managed in accordance with an NVC approved management plan.*
- *Environmental threats and degrading processes must be managed within the SEB Area.*

SA Water will manage the SEB area in accordance with the approved management plan, including but not limited to managing and preventing the spread of pest plants and animals, reducing grazing pressure, erecting fences and preventing development or any other future disturbance within the area.

Requirement 7: Establishing an SEB Area

The SEB Area must be established over a clearly defined area of land.

The SEB Area must be, as a single connected block, of a minimum size and dimension (at least 1 ha for a community listed under the EPBC Act, or at least 3 ha for any other SEB Area).

The SEB Area should not be located in an area likely to be subject to future disturbance (e.g. subject to an easement, located under powerlines, within a built asset protection zone for bushfire management, required or highly likely to be used for future infrastructure, development or mining related activities, subject to direct or indirect impacts of a development).

If an SEB Area is to involve revegetation, it must be designed to achieve a functional ecosystem with a reasonable level of species and structural diversity and must be appropriate for the site of establishment.

The proposed SEB area far exceeds the minimum size and dimensions specified and has been sited 500 m away from existing bores and pipeline infrastructure. The area is downgradient of all of SA Water's current production bores and is unlikely to be targeted for future production bores (pers. comm. SA Water Security Team).

The revegetation addresses specific conservation objectives (i.e. restoring a Nationally-threatened ecological community, and creating habitat for threatened species), and supplements and extends existing remnant vegetation.

SA Water has an excellent track record for successfully implementing, managing, monitoring and maintaining SEB offset areas across South Australia (e.g. Mt Bold Reservoir, Todd Reservoir) often achieving benefits that exceed the goals specified in Management Plans.

Requirement 8: Revegetation or reconstruction

Where clearance of native vegetation;

- *requires greater than 250 SEB Points, and*
- *receives UBS of greater than 30, and*
- *is of remnant vegetation (not regrowth vegetation less than 10 years old), and*
- *is to occur in an IBRA Association or IBRA Subregion with equal to or less than 30% native vegetation cover, then the SEB should incorporate an area of revegetation or habitat reconstruction (the rehabilitation of an area of native vegetation containing highly reduced native flora species and structural diversity) of an equivalent area to that being cleared.*

The proposed clearance comprises 10.7 ha of mostly remnant vegetation, receiving a UBS of 694.22, and requiring 619 SEB points. Remnancy in the Lincoln IBRA Association and Eyre Hills subregion is 77% and 29%, respectively (Table 4).

The proposed SEB management plan includes 78 ha of revegetation or habitat reconstruction (the rehabilitation of an area of native vegetation containing highly reduced native flora species and structural diversity), over 7-fold greater than the area to be cleared.

6.5 Summary Table

Block	Site	Vegetation Association	UBS	Gain Score	Area (ha)	SEB Points of Gain
US	**2**	Very open derived herbland/ grassland	18.8	4.91	11.3	55.5
US	**3**	Derived *Leucopogon parviflorus* open shrubland	37.23	4.91	66.8	414.3
US	**4**	*Allocasuarina verticillata* very open woodland	71.17	5.72	26.7	152.8
				Total	**104.8**	**622.6**

6.6 SEB Management Plan

SA Water has agreed through consultation with with the Native Vegetation Branch to submission of the fully developed Management Plan for the proposed SEB area during the assessment process when greater details can be provided.

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7. Appendices

Appendix 1. Fauna Species List (Bird Survey – July 2021)

Appendix 2. Fauna Species List (Fauna survey December 2023)

Appendix 3. Flora of State and National Significance recorded since 1995 within 5 km of the assessment sites.

Appendix 4. Flora Species List

Appendix 5. Bushland Vegetation Assessment Scoresheets associated with the proposed clearance and SEB Area (submitted in Excel format)

Appendix 6. Copies of associated approvals

Appendix 7. Flora Species List (SEB Area)

Appendix 8. Indicative distribution of the Drooping Sheoak Grassy Woodland ecological community

Appendix 9. SEB Management Plan (to be submitted during assessment phase)

Appendix 1: Bird Surveys Winter 2021 (T & M Ecologists)

Table A1. Bird species recorded in Fauna Surveys and opportunistically during Field surveys

Species name	Common Name	AUS[2]	SA[3]	EP[4]	Mallee woodlands (Sites 1-4)	Mallee associated with rail corridor (RC2-6)	Saltmarsh (RC9)	Opportune
Pachycephala pectoralis	Australian Golden Whistler			NT		1		
Gymnorhina tibicen	Australian Magpie				1			
Pelecanus conspicillatus	Australian Pelican				FO			1
Corvus coronoides	Australian Raven				1	1		
Barnardius zonarius	Australian Ringneck				1	1		1
Tadorna tadornoides	Australian Shelduck			NT			1	
Cygnus atratus	Black Swan			NT			1	
Elanus axillaris	Black-shouldered Kite			NT				1
Falco berigora	Brown Falcon							FO
Melithreptus brevirostris	Brown-headed Honeyeater				1	1		
Phaps elegans	Brush Bronzewing			RA	1	1		
Hydroprogne caspia	Caspian Tern			RA			FO	
Sternula nereis nereis	Fairy Tern	VU	E	VU			FO	
Cacomantis flabelliformis flabelliformis	Fan-tailed Cuckoo			NT				1
**Columba livia*	Feral Pigeon				1			
Eolophus roseicapilla	Galah				1	1		
Strepera versicolor	Grey Currawong				1	1		
Rhipidura albiscapa	Grey Fantail			NT	1			1
Colluricincla harmonica	Grey Shrikethrush				1	1		
Chalcites basalis	Horsfield's Bronze Cuckoo				1	1		
**Passer domesticus domesticus*	House Sparrow				1			
Grallina cyanoleuca	Magpielark				1			
Falco cenchroides	Nankeen Kestrel				1			1

2 Australian conservation rating under the *Environment Protection and Biodiversity Conservation Act 1999*

3 South Australian conservation rating under the *National Parks and Wildlife Act 1972*

4 Gillam, S. and Urban, R. (2009) Regional Species Conservation Assessment Project, Phase 1 Report: Regional Species Status Assessments, West Region. Department for Environment and Heritage, South Australia.

Species name	Common Name	AUS[2]	SA[3]	EP[4]	Mallee woodlands (Sites 1-4)	Mallee associated with rail corridor (RC2-6)	Saltmarsh (RC9)	Opportune
Phylidonyris novaehollandiae novaehollandiae	New Holland Honeyeater (mainland SA)				1	1		1
Larus pacificus	Pacific Gull			RA			1	1
Anthochaera carunculata woodwardi	Red Wattlebird (MLR, AP, YP, EP, far west, Yellabinna)				1	1		1
Pachycephala rufiventris rufiventris	Rufous Whistler					1		
Chroicocephalus novaehollandiae novaehollandiae	Silver Gull						1	1
Zosterops lateralis	Silvereye				1	1		1
Gavicalis virescens	Singing Honeyeater				1			
Drymodes brunneopygia	Southern Scrub Robin				1	1		
Acanthagenys rufogularis	Spiny-cheeked Honeyeater				1	1		
Pardalotus punctatus	Spotted Pardalote				1	1		
Pardalotus striatus substriatus	Striated Pardalote				1	1		
Malurus cyaneus leggei	Superb Fairywren (Mainland SA)				1	1		
Circus approximans	Swamp Harrier			RA				FO
Gliciphila melanops	Tawny-crowned Honeyeater				1	1		
Smicrornis brevirostris	Weebill				1	1		
Hirundo neoxena neoxena	Welcome Swallow				FO			
Eopsaltria griseogularis rosinae	Western Yellow Robin				1			
Haliaeetus leucogaster	White-bellied Sea Eagle		E	EN				FO
Pomatostomus superciliosus	White-browed Babbler				1	1		
Sericornis frontalis	White-browed Scrubwren				1	1		
Egretta novaehollandiae	White-faced Heron						1	1
Epthianura albifrons	White-fronted Chat							1
Ardea pacifica	White-necked Heron			NT				1
Rhipidura leucophrys leucophrys	Willie Wagtail				1			
Acanthiza chrysorrhoa	Yellow-rumped Thornbill					1		

Conservation ratings: E = Endangered, VU = Vulnerable, RA = Rare, NT = Near Threatened, LC = Least Concern

1 = noted in vegetation/habitats during field survey, FO = observed as a species flying over the site

Appendix 2: December 2023 Fauna Survey of Port Lincoln Desal Proposed Pipeline Route (David Armstrong)

METHOD

To provide a repeatable systematic approach to monitoring woodland birds along the proposed pipeline route, eight points at approximately 500 metre intervals were selected, five on the old rail line corridor from Billy Lights Point west to the coast on the bay on Greyhound Road, and three along Blue Fin Road on the north eastern side of Kathai Conservation Park.

Each point was visited once on each of four consecutive days (4th -7th December 2023) and all bird species observed or calls were heard over 20-30 minutes, within approximately 100 metres of each point were recorded. Similarly, to monitor the shore birds within the bay south of the racetrack, four locations based on accessibility and observation potential were selected along the shoreline and bird species and numbers present were recorded once on each of the same four days.

Figure A1: locations of systematic survey sites for woodland (WB) and shore birds (SB).

In addition to the systematic site based approach, visits to the sewage works ponds, coast adjacent to Billy Lights Point and the hilltop water tanks site were made and birds and a few other animals present were recorded, as well as "opportunistic" sightings of significant or less commonly encountered species when travelling between fixed survey sites. A night time traverse of the woodland west of Billy Lights Point was undertaken on 6th December, stopping periodically to listen for nocturnal birds, specifically Bush Stone-curlew, owl, frogmouth or nightjar species, but none were heard.

RESULTS

The total number of bird species recorded at sample sites were, 274 records of 33 woodland bird (Appendix 1) and 121 records of 20 shore bird species (Appendix 2). An additional 20 bird, two mammal and one reptile species were recorded opportunistically or at single visits to several specific sites (Appendix 3).

Threat Rated Species

Sixteen conservation rated species were recorded during the survey (Table 1). Many of these were single observations away from designated survey sites. There are existing records in the general area or district for all these species, although they are few in most cases. Of particular interest were four Diamond Firetails which were observed accessing water through a ground level steel grid above a sump a few metres outside the gate to the hilltop water tanks site. There are several past records of Fairy Terns in and around the survey area, including at the bay south of Greyhound Road. However the critical locations for this species are breeding colony sites, which are generally protected at least from terrestrial predators on islands off-shore, in coastal bays or inland saline lakes.

Table A2: Threat rated species recorded during December 2023 survey

Common Name	NPW ACT STATUS	EPBC ACT STATUS	Location
Australian Sea Lion	V	EN	East side of Billy Lights Point
Banded Stilt	V		Pools between Greyhound Rd and bay
Brown Quail	V		Roadside near Billy Lights Point
Common Greenshank		EN	Tidal flats south of the racetrack
Common Sandpiper	R		Billy Lights Point
Diamond Firetail	V	VU	Hilltop tanks site
Eastern Osprey	E		Pools between Greyhound Rd and bay
Fairy Tern	E	VU	Pools between Greyhound Rd and bay
Little Egret	R		Pools between Greyhound Rd and bay & 4 days at shore bird site 3
Pied Oystercatcher	R		3 of 4 shore bird survey sites
Purple-gaped Honeyeater	R		Woodland bird sites 2 (twice), 3 (once) and 4 (twice)
Rock Parrot	R		One bird at shore bird site 3, one at woodland bird site 1, twice (2+1) at Pools between Greyhound Rd and bay
Sharp-tailed Sandpiper		VU	Tidal flats south of the racetrack
Shy Heathwren	R		Once at woodland bird site 7
Sooty Oystercatcher	R		3 of 4 shore bird survey sites
White-bellied Sea Eagle	E		Jetty on south side of Billy Lights Point

Waders

Four species of migratory waders were recorded. These were a single Common Sandpiper and a group of seven Red-necked Stints at Billy Lights Point, and a handful of Common Greenshanks and varying numbers of Sharp-tailed Sandpipers on the tidal flats south of the racetrack. Sharp-tailed Sandpipers were present on three of four days, with daily counts varying from 24 to 121. Common Greenshanks were present on all four days with daily counts of six on three days and three on one day. The Common Greenshank and Sharp-tailed Sandpiper were listed as threatened under the EPBC Act in January 2024.

In addition to the two wader species and Australian Sea Lion only recorded at Billy Lights Point, other bird species were only recorded at one of two other locations within the survey area. These included the effluent pond, where small numbers of Pacific Black Duck, Hardhead, Eurasian Coot and Australasian Grebe were seen, as well as over 200 Grey Teal, scarce in the saline bay a few kilometres away where Chestnut Teal dominated. Presumably, all these

species prefer the relatively fresh effluent pond water to the nearby sea water or saline bay. The hilltop water tank site also provided a few species not seen at regular survey sites. These included the Diamond Firetails already mentioned as likely attracted by access to fresh water, Australian Ringneck, Peaceful Dove and Brown-headed Honeyeater, which like the koalas may prefer the taller trees in and around the tank compound.

Hooded Plover: SA Vulnerable, EPBC Vulnerable.

In light of the high threat rating for this species, the series of small beaches on the eastern side of Billy Lights Point were inspected. None of these areas are large enough to support resident Hooded Plovers and all but one of four are regularly inundated at high tide. Whilst mobile none-breeding birds could possibly visit the area, it is not considered core habitat for the species. The high level of visitation by people and dogs to the area would also prevent any birds from becoming established.

White-bellied Whipbird: SA Endangered, EPBC Vulnerable.

No whipbirds were recorded during the survey. Of the two significant areas of native vegetation along the proposed pipeline route, the larger area west of Billy Lights Point is highly unlikely to support whipbirds, as it is has a more open understorey than the species prime dense shrubby habitat and is heavily fragmented by off road vehicle tracks. Kathai Conservation Park is more suitable habitat for this species, however given the proximity of several houses and the town of Port Lincoln to the proposed pipeline corridor it is likely that the distinct song of this species, known to carry up to 800 metres in favourable weather, would have been locally known, particularly as numerous locations for the species are known in the larger, more intact areas of suitable habitat across the southern Eyre Peninsula (BDBSA records). To confirm the absence of the White-bellied Whipbird from this area would require a species specific survey, using song meters or call playback methods during the peak singing period for the species, from July to September, after which there is a gradual decline in intensity from September to December [52]. The time required to undertake such intense work on one species was not available during the recent survey.

Mammals

A single Australian sea Lion was observed swimming close inshore off the eastern side of Billy Lights Point. This is reported to be a common occurrence and is only mentioned due to the conservation rating of the species, of vulnerable under both state and federal legislation. This species is known to have personal feeding areas, so these are possibly sightings of one, or at least a very small number of individuals. Critical habitat areas are offshore island breeding colony sites and regular haul out locations.

Three koalas, an adult male, adult female and dependant juvenile were observed at the hilltop tank site, and another heard a few hundred metres downslope towards the coast between Blue Fin Road and the highway. These are mentioned as they are an introduced or deliberately released population which continues to expand, even in to sub-optimal habitat. Those at the hilltop tank site are likely there due to the larger Eucalypts in the immediate area, which is largely surrounded by more unsuitable shrubby habitat.

Table A3: Woodland birds recorded at fixed survey sites.

Numbers in columns under each site are the number of days out of four on which the species was recorded at the site.

Common Name	AUS	SA	EP	Woodland Birds Site 1	Woodland Birds Site 2	Woodland Birds Site 3	Woodland Birds Site 4	Woodland Birds Site 5	Woodland Birds Site 6	Woodland Birds Site 7	Woodland Birds Site 8	Number of sessions recorded at (max 32)	Number of sites recorded at (max 8)
Australian Golden Whistler			NT	3	3	3	1	4		2	1	**17**	**7**
Australian Raven				2	1							**3**	**3**
Brush Bronzewing			RA	2	1	2	1	4	4	2	4	**20**	**8**
*Common Blackbird				4	2	1	1	3	3	2	4	**20**	**8**
Common Bronzewing				1								**1**	**2**
*Feral Pigeon				4								**4**	**1**
Galah				1								**1**	**1**
Grey Butcherbird							1					**1**	**2**
Grey Currawong				1	2	4	2	1	1			**11**	**7**
Grey Fantail			NT					2	2		3	**7**	**4**
Grey Shrikethrush					1			2				**3**	**3**
*House Sparrow											3	**3**	**2**
Inland Thornbill										1		**1**	**2**
Nankeen Kestrel				1								**1**	**1**
New Holland Honeyeater				4	4	3	2	2	4	4	3	**26**	**8**
Purple-backed Fairywren				1	2			1	2		1	**7**	**5**
Purple-crowned Lorikeet			NT								1	**1**	**1**
Purple-gaped Honeyeater		R	LC		2	1	2					**5**	**3**
Rainbow Lorikeet									1		1	**2**	**2**
Red Wattlebird				2	1	1	1	1	3	1	2	**12**	**8**
Rock Parrot		R	NT	1								**1**	**1**
Shy Heathwren		R	LC							1		**1**	**1**
Silvereye				4	2	1	1	4	4	4	3	**23**	**8**
Southern Scrub Robin				3	3	4	3		3	3	1	**20**	**7**
Spotted Pardalote				1	2	3	2	5			1	**14**	**6**
Striated Pardalote				3		1	1		1			**6**	**4**
Superb Fairywren				1				1	1	2	1	**6**	**5**
Swamp Harrier			RA								1	**1**	**1**
Weebill				4	3	4	2	4	1	1		**19**	**7**
Welcome Swallow				3								**3**	**1**
Western Yellow Robin				1	2	3	3	1	2	1	1	**14**	**8**
White-browed Babbler				3		3	1				1	**8**	**4**
White-browed Scrubwren				2	1	1	1		4	2	1	**12**	**7**
Total Species at Site (Max 33)				**23**	**16**	**15**	**16**	**14**	**15**	**13**	**18**	**274**	

Table A4: Shore birds recorded at fixed survey sites.

Numbers in columns under each site are the number of days out of four on which the species was recorded at the site.

Common Name	AUS	SA	EP	Shore Birds Site 1	Shore Birds Site 2	Shore Birds Site 3	Shore Birds Site 4	Number of sessions recorded at (max 16)	Number of sites recorded at (max 4)
Australian Pelican				1	3			**4**	**2**
Banded Stilt		V	RA			3		**3**	**1**
Black Swan			NT	2	4	2	2	**10**	**4**
Caspian Tern			RA		1			**1**	**1**
Chestnut Teal			NT	4	4	3	1	**12**	**4**
Common Greenshank	EN		RA		3	4	1	**8**	**3**
Great Pied Cormorant			NT	3				**3**	**1**
Greater Crested Tern							1	**1**	**1**
Grey Teal				1	1			**2**	**2**
Little Black Cormorant			NT	1		1	1	**3**	**3**
Little Egret		R	NT			4		**4**	**1**
Little Pied Cormorant			NT	4	3		3	**10**	**3**
Masked Lapwing					4	3	2	**9**	**3**
Pacific Gull			RA	3			2	**5**	**2**
Pied Oystercatcher		R	RA		4	4	2	**10**	**3**
Rock Parrot		R	NT			1		**1**	**1**
Sharp-tailed Sandpiper	VU		NT	1	3	2		**6**	**3**
Silver Gull				4	4			**8**	**2**
Sooty Oystercatcher		R	RA		4	2	2	**8**	**3**
White-faced Heron				1	4	4	4	**13**	**4**
Total Species at Site (max 20)				**11**	**13**	**12**	**11**	**121**	

Table A5: Species recorded opportunistically (not at set survey sites) during December 2023 survey.

CLASS	SPECIES	AUS	SA	EP	LOCATION	RECORDS
Birds	Australasian Grebe			RA	Effluent pond	1
	Australian (Spotted) Crake			RA	Pools between Greyhound Rd and bay	1
	Australian Ringneck				Hilltop tank site	1
	Black-tailed Native Hen				Pools between Greyhound Rd and bay	1
	Brown Goshawk			NT	Murray Point	1
	Brown Quail		V		Roadside near Billy Lights Point	1
	Brown-headed Honeyeater				Hilltop tank site	1
	Buff-banded Rail			RA	Pools between Greyhound Rd and bay	1
	Common Sandpiper		R	VU	Billy Lights Point	1
	Diamond Firetail	VU	V	RA	Hilltop tank site	1
	Eastern Osprey		E	EN	Pools between Greyhound Rd and bay	1
	Eurasian Coot			RA	Effluent pond	1
	Fairy Tern	VU	E	VU	Pools between Greyhound Rd and bay	1
	Hardhead			NT	Effluent pond	1
	Horsfield's Bronze Cuckoo				Pools between Greyhound Rd and bay	1
	Little Grassbird			RA	Pools between Greyhound Rd and bay	1
	Pacific Black Duck				Effluent pond	1
	Peaceful Dove			VU	Hilltop tank site	1
	Red-necked Stint			NT	Billy Lights Point	1
	White-bellied Sea Eagle		E	EN	Jetty on south side of Billy Lights Point	1
Mammals	Australian Sea Lion	EN	V	VU	Off east side of Billy Lights point	1
	Koala				Hilltop tank site and adjacent Blue Fin Rd	2
Reptiles	Sleepy Lizard				Hilltop tank site and around pools along greyhound Rd	3

Appendix 3: Flora of State and National Significance recorded since 1995 within 5 km of the assessment sites.

SPECIES	COMMON NAME	EPBC	NPWS	Source	Date of last record	Species known habitat preferences	Likelihood for use for habitat - comments
Acacia alcockii	Alcock's Wattle		R	1,3,4	2021	Endemic to South Australia and is often found in sand over limestone, more rarely on skeletal soils or sandy soils over granite. It is restricted to the southern tip of Eyre Peninsula. Bushy shrub or small tree to 3 m [53].	Known. Recorded within mallee associations during survey.
Acacia dodonaeifolia	Hop-bush Wattle		R	1,3	2008	Endemic to South Australia and found mainly on southern Eyre Peninsula and southern Mt Lofty Ranges, with minor occurrences on southern Yorke Peninsula, Kangaroo Island and the South-East. Viscid shrubs or small trees to 6 m high. Grows in woodland and open forest vegetation in hard acidic, yellow duplex, red shallow porous loamy, sandy alkaline yellow duplex soils [53].	Unlikely. Soils at assessment sites are not the preferred habitat.
Boronia pilosa ssp. torquata	Hairy Boronia		R	1,3	2013	Confined to edges of freshwater wetland and damp sands. Found only in the lower South-east in South Australia, with an old record from the tip of Eyre Peninsula.	Unlikely. No suitable habitat occurs in the project area.
Caladenia bicalliata ssp. bicalliata	Western Daddy-long-legs		R	1,2,3	2022	Found scattered in the southern part of South Australia growing on calcareous sands or in leaf litter on limestone, chiefly along the coast. Flowers Aug-Sep.	Possible. Two observed nearby in similar mallee. On EP recorded in *Eucalyptus diversifolia* and *Allocasuarina verticillata* mallee and woodland.
Caladenia macroclavia	Large-club Spider-orchid	EN	E	1,5	1960	Grows in *Eucalyptus gracilis, E. socialis, or E. incrassata* mallee over *Melaleuca uncinata, Alyxia buxifolia, Acrotriche patula, Lepidosperma congestum, Gahnia deusta* and *Lomandra effusa*. It prefers sandy loam soils over limestone, usually in lower lying areas [54]. Flowers Aug-Oct.	Unlikely. Habitat does not match mallee communities in assessment area. Last recorded in Lincoln NP in 1985.

SPECIES	COMMON NAME	EPBC	NPWS	Source	Date of last record	Species known habitat preferences	Likelihood for use for habitat - comments
Caladenia tensa	Inland Green-comb Spider-orchid	EN		1	2009	Inland Green-comb Spider-orchid occurs in *Callitris spp.* (cypress pine), *Eucalyptus leucoxylon* (yellow gum) woodland and *Melaleuca uncinata* (broombush) mallee on aeolian sandy loams in the Murray-Darling Depression bioregion [55]. Flowers Aug-Oct.	Unlikely. The listed species is confined to the upper south-east and eastern mallee region in South Australia. The taxon was formerly treated as *C. dilatata* and the one record from nearby is more likely to be one of several recently described species within the *C. dilatata* complex awaiting conservation ratings [56].
Choretrum chrysanthum	Yellow Sour-bush		R	3	2021	A semi-parasitic shrub found in the southern part of South Australia from the west coast to the lower South-east.	Known. Recorded in association TR1.
Dodonaea procumbens	Trailing Hop-bush	VU		5	NA	Widely but patchily distributed across south-eastern Australia, including lower EP. SA populations have been recorded in low-lying areas of open *Eucalyptus camaldulensis, E. fasciculosa* and *E. leucoxylon* woodlands and in native grasslands with *Lepidosperma viscida, Themeda triandra, Austrodanthonia spp., Austrostipa spp.* and shrubs including *Acacia acinacea, Dodonaea viscosa* and *Bursaria spinosa* [57].	Unlikely. No habitat as described in the project area. Last recorded in 1986, 10 km west of Port Lincon.
Eucalyptus conglobata ssp. conglobata	Port Lincoln Mallee		R	1,4	2021	Found on the southern tip of Eyre Peninsula in South Australia, on loam over limestone in mallee shrubland [58].	Known. Widely recorded in assessment area.
Haeckeria cassiniiformis	Dogwood Haeckeria		R	3	2008	Endemic to South Australia and found mainly on the Eyre Peninsula. More common after disturbance (e.g. fire, road work [53].	Possible. Recorded in last 20 years along a track south of Kathai CP in *E. diversifolia* mallee. Similar habitat occurs in the area.

SPECIES	COMMON NAME	EPBC	NPWS	Source	Date of last record	Species known habitat preferences	Likelihood for use for habitat - comments
Hibbertia cinerea	Port Lincoln Guinea-flower		R	1,3	2005	Grows usually on sandy soil often with limestone outcrops in low mallee vegetation on the southern tip of Eyre Peninsula [59].	Possible, based on habitat description. One record from Murray Point.
Lysiandra calycina (syn. *Phyllanthus calycinus)*	Snowdrop Spurge		R	1,3,4	2015	Small shrub found on Eyre Peninsula, tip of Yorke Peninsula, Kangaroo Island and southern Fleurieu Peninsula, growing on sandy soil [53].	Known. Recorded in TR1, TR2 and TR4.
Prasophyllum goldsackii	Goldsack's Leek-orchid	EN	E	1	2008	Occurs in areas of limestone, reddish-brown soils and sands containing lime. On EP it is found in two locations (Bascombe Well CP and near Port Lincoln). Associated vegetation includes *Eucalyptus cladocalyx* woodland, as well as *Leptospermum* spp. and *Allocasuarina* spp. shrubland [60]. Flowers Sep-Oct.	Possible although habitats are not a perfect match for the species. One record from coastal *E. rugulosa/ E. diversifolia* mallee nearby.
Prostanthera chlorantha	Green Mintbush		R	1,2,3	2008	This species forms small populations of a few scattered plants, on sandy and loamy soils. It is commonly associated with *Banksia, Daviesia* and *Leptospermum* shrubland [61].	Possible, although habitats are not a perfect match for the species. Several records from coastal *E. rugulosa/ E. diversifolia* mallee nearby.
Sphaerolobium minus	Leafless Globe-pea		R	3	1995	Erect mostly leafless shrub, widely distributed along the coast and adjacent ranges in southeastern Australia.	Unlikely. One record over 20 years ago, in limestone heath vegetation near Tulka.
Spyridium daphnoides	Spoon-leaf Spyridium		R	4	2023	Endemic to South Australia on southern Eyre Peninsula, Kangaroo Island, the Mount Lofty region and the south-east of the State [62].	Known. Recorded in TR1 and TR2.
Thelymitra epipactoides	Metallic Sun-orchid	EN	E	1,5	2008	Found primarily in sandy soils in mesic coastal heathlands, grasslands and woodlands, but may also be found in drier inland heathlands, open forests and woodlands [63]. Flowers Aug – Oct.	Possible. Suitable habitat is present. One record from coastal *E. rugulosa/ E. diversifolia* mallee nearby.

SPECIES	COMMON NAME	EPBC	NPWS	Source	Date of last record	Species known habitat preferences	Likelihood for use for habitat - comments
Thelymitra flexuosa	Twisted Sun-orchid		R	1,2,3	2008	Found on the lower Eyre Peninsula, Kangaroo Island, southern Mount Lofty Ranges and the South-east in South Australia, growing in heathland, woodland and mallee scrub in higher rainfall districts [53]. Flowers Sep-Nov.	Possible. Suitable habitat is present. One record from coastal *E. rugulosa/ E. diversifolia* mallee nearby.
Thysanotus wangariensis	Eyre Peninsula Fringe-lily		R	1,2,3	2008	Restricted to mallee woodlands on southern and western Eyre Peninsula. Observed near Sleaford in a previous phase of this project.	Possible. Several records from coastal *E. rugulosa/ E. diversifolia* mallee nearby.
Xanthorrhoea semiplana ssp. tateana	Tate's Grass-tree		R	1,3,4	2008	Found mainly in the southern Mount Lofty Ranges in South Australia, with scattered occurrences on the Eyre Peninsula and in the South-east, growing in sandy soil in woodland and heathland [53].	Known. Recorded in TR1 and likely in TR2. Several records from coastal *E. rugulosa/ E. diversifolia* mallee nearby.

Source; 1- BDBSA, 2 - AoLA, 3 – NatureMaps, 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

Appendix 4.1: Flora species recorded at each site (Desalination Plant, Wastewater Treatment Plant)

Species name	Common name	Conservation Rating		Vegetation Association												
		AUS	SA	S1	S2	S3	S4	S6	S7	S8	S9a	S9b	S9c	WW 1	WW 4	WW5
Acacia alcockii	Alcock's Wattle		RA	1	1	1		1			R	R		R		
Acacia sp. Winged	Angled Wattle			R			R	1						1		
Acacia cupularis	Cup Wattle			1			U	R	R	R	R	R	1			
Acacia leiophylla	Coast Golden Wattle				1		1		R	R						
Acacia ligulata	Umbrella Bush			1										1		
Acacia myrtifolia	Myrtle Wattle				1											
Acacia nematophylla	Coast Wallowa			R	1	1	1	R	R	U,R	U,R	U,R	U,R	1		
Acacia paradoxa	Kangaroo Thorn				R	R	R		R	R				1		
Acacia rupicola	Rock Wattle					R										
Acacia spinescens	Spiny Wattle			1	1	1	1	1	R		R	1				
Acacia triquetra	Mallee Wreath Wattle							1	R		1	1				
Acaena echinata	Sheep's Burr								1							
Acianthus pusillus	Mosquito Orchid				1	1										
Acrotriche cordata	Blunt-leaf Ground-berry			1	U	1	1	1		1						
Acrotriche patula	Prickly Ground-berry			U	1	1	1	1	1	1	1	1				
Allocasuarina verticillata	Drooping Sheoak													R		
Alyxia buxifolia	Sea Box			R		R	1	U	1		R	R	1	1		
Amyema melaleucae	Tea-tree Mistletoe			1			1					1		1		
Apium annuum	Annual Celery											1				
Astroloma humifusum / Styphelia humifusa	Cranberry Heath					1										
Atriplex paludosa ssp. cordata	Marsh Saltbush													1		
Austrostipa acrociliata	Graceful Spear-grass				1	1	1	1								
Austrostipa elegantissima	Feather Spear-grass				1	1	1		1	1	U	U	1	1		
Austrostipa sp.	Spear-grass			1	1				1				1			
Beyeria lechenaultii	Pale Turpentine Bush							1	1							
Billardiera sericophora	Silky Apple-berry						1		1	1						
Caladenia campestris				*	*											
Caladenia capillata	Wispy Spider-orchid			*		*	*									
Caladenia septuosa	Eyre-peninsula Spider-orchid					*	*									
Carpobrotus rossii	Native Pigface			1	1	R	1		1	1	1	1	1	1		
Cassytha glabella f. dispar	Slender Dodder-laurel			1		1										
Cassytha melantha	Coarse Dodder-laurel			1		1	1	1		1	1	1	1	1		

Species name	Common name	Conservation Rating		Vegetation Association												
		AUS	SA	S1	S2	S3	S4	S6	S7	S8	S9a	S9b	S9c	WW 1	WW 4	WW5
Cassytha peninsularis	Peninsula Dodder-laurel					1			*	1						
Cassytha pubescens	Downy Dodder-laurel			1		1	1									
Cheiranthera alternifolia	Hand-flower				1	1	1									
Choretrum glomeratum	White Sour-bush						1									
Clematis microphylla	Old Man's Beard					1			*	1	1	1		1		
Comesperma volubile	Love Creeper			1		1	1	1				1		1		
Correa backhouseana var. coriacea	Thick-leaf Correa				1	1		1								
Correa pulchella	Salmon Correa										R	R	R			
Cyrtostylis robusta	Robust Gnat-orchid				1	1										1
Cyrtostylis sp.	Gnat-orchid											1				
Dianella brevicaulis	Short-stem Flax-lily										R	R	R			
Dianella revoluta var. revoluta	Black-anther Flax-lily				1	1	1							1		
Diuris sp.	Donkey Orchid			*			*									
Dodonaea viscosa ssp. spatulata	Sticky Hop-bush								1					1		
Drosera macrantha ssp. planchonii	Climbing Sundew				1	1										
Eucalyptus albopurpurea	Purple-flowered Mallee Box													O		
Eucalyptus angulosa	Coast Ridge-fruited Mallee			1	O	O	O,R		E			1		1		
Eucalyptus conglobata ssp. conglobata	Port Lincoln Mallee		RA	O	O	O	1		*	1						
Eucalyptus diversifolia ssp. diversifolia	Coastal White Mallee			O	O	O	O,R	O,R	E,R	R	1	1		O		
Eucalyptus gracilis	Yorrell										1	1		1		
Eucalyptus leptophylla	Narrow-leaf Red Mallee			1	1	U										
Eucalyptus oleosa ssp. ampliata	Red Mallee			1			1									
Eucalyptus rugosa	Coastal White Mallee			O		1		O			O,R	O,R	O	O		
Eutaxia microphylla	Common Eutaxia			1	1	1	1		1		1	1				
Exocarpos aphyllus	Leafless Cherry			1							1	1		1		
Gahnia deusta	Limestone Saw-sedge			1	U	1	1									
Gahnia lanigera	Black Grass Saw-sedge						1									
Geijera linearifolia	Sheep Bush										1	1		1		
Glischrocaryon behrii	Golden Pennants						1									
Gonocarpus mezianus	Broad-leaf Raspwort					U										
Goodenia willisiana	Silver Goodenia				1	1	1									

Species name	Common name	Conservation Rating		Vegetation Association												
		AUS	SA	S1	S2	S3	S4	S6	S7	S8	S9a	S9b	S9c	WW 1	WW 4	WW5
Hakea cycloptera	Elm-seed Hakea					1	*									
Hardenbergia violacea	Native Lilac			1	1						R	R				
Hibbertia devitata	Smooth Guinea-flower				1	1	1		*	R	1	1				
Hibbertia virgata	Twiggy Guinea-flower										1	1				
Lasiopetalum baueri	Slender Velvet-bush			1	1		U,R		1	1						
Lasiopetalum behrii	Pink Velvet-bush					1	R			1	1	1				
Lasiopetalum discolor	Coast Velvet-bush			U	1	1	U,R		1	1	R	R	1	1		
Lepidosperma viscidum	Sticky Sword-sedge				1	U		1								
Leucopogon parviflorus	Coast Beard-heath			R					1	1				1		
Lomandra collina	Sand Mat-rush				U	1		1		1						
Lomandra effusa	Scented Mat-rush			1				1								
Lysiandra (Phyllanthus) calycina	Snowdrop Spurge		RA													
Melaleuca acuminata ssp. acuminata	Mallee Honey-myrtle						R					1				
Melaleuca brevifolia	Short-leaf Honey-myrtle													1		
Melaleuca lanceolata	Dryland Tea-tree			U		*					R	R		U		
Melaleuca uncinata	Broombush				1	U				1						
Microtis sp.	Onion-orchid			1		1	1									
Microtis frutetorum					*	*										
Muehlenbeckia adpressa	Climbing Lignum										1	1				
Myoporum insulare	Common Boobialla				R			1			R	R	R	U,R		
Neurachne alopecuroidea	Fox-tail Mulga-grass					1										
Nitraria billardierei	Nitre-bush								1							
Olearia axillaris	Coast Daisy-bush									1	R	R	U,R			
Olearia minor	Heath Daisy-bush						1					1				
Olearia ramulosa	Twiggy Daisy-bush			1	1				1					1		
Opercularia scabrida	Stalked Stinkweed					1	1									
Opercularia turpis	Twiggy Stinkweed				1		1									
Oxalis perennans	Native Sorrel								1							
Pimelea serpyllifolia ssp. serpyllifolia	Thyme Riceflower										U,R	U,R	R			
Pittosporum angustifolium	Native Apricot											R		1		
Pomaderris flabellaris	Fan Pomaderris					U		1								
Pomaderris obcordata	Wedge-leaf Pomaderris			1	R	1	1	1	R			U				

Species name	Common name	Conservation Rating		Vegetation Association												
		AUS	SA	S1	S2	S3	S4	S6	S7	S8	S9a	S9b	S9c	WW 1	WW 4	WW5
Pomaderris paniculosa ssp. paniculosa	Mallee Pomaderris					1					1	1		1		
Pterostylis erythroconcha	Red Shell-orchid															1
Pterostylis longifolia complex					1	1										
Pterostylis flavovirens	Tall Greenhood			*	*	*										
Pterostylis sanguinea	Blood Greenhood			1	1											
Pultenaea acerosa	Bristly Bush-pea			1	1	1	1		*							
Rhagodia candolleana ssp. candolleana	Sea-berry Saltbush												1	1		
Rhagodia crassifolia	Fleshy Saltbush					1	1	1			1	1		1		
Rytidosperma sp.	Wallaby-grass			1	1	1	1		1	1	1	1				
Senecio sp.	Groundsel										1	1				
Schoenus breviculmis	Matted Bog-rush					1										
Spyridium phylicoides	Narrow-leaf Spyridium			1			1									
Templetonia retusa	Cockies Tongue			U,R	U,R	R	R	U,R	R		U,R	U,R	1	1		
Tetragonia implexicoma	Bower Spinach						1		1		1	1	1	1		
Thelymitra sp.	Sun-orchid				1	1										
Thelymitra megcalyptra	Scented Sun-orchid			*	*	*	*									
Thelymitra luteocilium	Yellow-tuft Sun Orchid			*	*	*										
Threlkeldia diffusa	Coast Bonefruit										1	1	R	1		
Thryptomene micrantha	Ribbed Thryptomene						R			1						
Thysanotus patersonii	Twining Fringe-lily				1	1	1	1								
Vittadinia australasica var. australasica	Sticky New Holland Daisy									1						

1= observed during field survey, * = noted in other sections of this vegetation type but not in the assessment area, R=noted to be regenerating in that site, O = overstorey dominant species, U = understory dominant species, E = emergent overstorey species. Key to Conservation Codes: RA=Rare

Appendix 4.2: Flora species recorded at each site (Rail Corridor)

		Conservation Rating		Vegetation Association												
Species name	**Common name**	**AUS**	**SA**	**RC1**	**RC2**	**RC3**	**RC4**	**RC6**	**RC7**	**RC8**	**RC10**	**RC11**	**RC12**	**RC13**	**RC14**	**RC15**
Acacia alcockii	Alcock's Wattle		RA		R	R		R								
Acacia sp. Winged						1	1	R								
Acacia calamifolia/euthycarpa	Wallowa							R								
Acacia cupularis	Cup Wattle			1			1		1	1	1	1	1			
Acacia leiophylla	Coast Golden Wattle				1	1	1					1				
Acacia myrtifolia	Myrtle Wattle						R									
Acacia nematophylla	Coast Wallowa			R	1	R	1	R	O	R	O	R	R			
Acacia paradoxa	Kangaroo Thorn											O,R	R			U
Acacia rupicola	Rock Wattle				R	1	1	R								
Acacia spinescens	Spiny Wattle						1	1								
Acacia triquetra	Mallee Wreath Wattle			R	R,U	R,U	1	R	1		1	R				
Acrotriche cordata	Blunt-leaf Ground-berry				*	1	U	U								
Acrotriche patula	Prickly Ground-berry				1	1	U	R,U								
Adriana quadripartita	Coast Bitter-bush								R	R	R	R	1			
Alyxia buxifolia	Sea Box					R										
Amyema melaleucae	Tea-tree Mistletoe			1	1	1	1	1								
Atriplex paludosa ssp. cordata	Marsh Saltbush										1					
Austrostipa elegantissima	Feather Spear-grass			1				1				1				1
Austrostipa sp.	Spear-grass				1				1	1						
Austrostipa stipoides	Coast Spear-grass															
Beyeria lechenaultii	Pale Turpentine Bush				1		1	1								
Billardiera sericophora	Silky Apple-berry							1								
Billardiera uniflora	One-flower Apple-berry								1							
Caladenia campestris					*	*										
Caladenia capillata	Wispy Spider-orchid				*	*										
Callistemon rugulosus	Scarlet Bottlebrush							1								
Carpobrotus rossii	Native Pigface			1	1	1		1	1				1			
Cassytha glabella f. dispar	Slender Dodder-laurel			1	1			1								
Cassytha melantha	Coarse Dodder-laurel			1	1	1	1	1	1							
Cassytha peninsularis	Peninsula Dodder-laurel						1		1			1				
Clematis microphylla	Old Man's Beard			1		1		1	1			1				
Comesperma volubile	Love Creeper				1											
Correa pulchella	Salmon Correa				1		1									

		Conservation Rating		Vegetation Association												
Species name	**Common name**	**AUS**	**SA**	**RC1**	**RC2**	**RC3**	**RC4**	**RC6**	**RC7**	**RC8**	**RC10**	**RC11**	**RC12**	**RC13**	**RC14**	**RC15**
Daucus glochidiatus	Native Carrot				1	1										
Dianella brevicaulis	Short-stem Flax-lily			1	1	1		1	R	1	R	1	1	1	1	1
Dianella revoluta var. revoluta	Black-anther Flax-lily			1	*		1									
Distichlis distichophylla	Emu-grass											1	1	U		
Dodonaea humilis	Dwarf Hop-bush				1			R								
Dodonaea viscosa ssp. spatulata	Sticky Hop-bush				R			R								
Enchylaena tomentosa var. tomentosa	Ruby Saltbush			1					1		1		U	1		
Eucalyptus albopurpurea	Purple-flowered Mallee Box			O												O
Eucalyptus angulosa	Coast Ridge-fruited Mallee						1									
Eucalyptus conglobata ssp. conglobata	Port Lincoln Mallee		RA		O	1	1	R								
Eucalyptus diversifolia ssp. diversifolia	Coastal White Mallee				O		O		E							O
Eucalyptus gracilis	Yorrell				1	O		1								
Eucalyptus leptophylla	Narrow-leaf Red Mallee					1		1								
Eucalyptus oleosa ssp. ampliata	Red Mallee				1	O										
Eucalyptus rugosa	Coastal White Mallee				1	O	1	R								
Eutaxia microphylla	Common Eutaxia				1	1	1	1								
Exocarpos aphyllus	Leafless Cherry			1	1		1	1	1			1				1
Exocarpos sparteus	Slender Cherry				1		1	1								
Ficinia nodosa	Knobby club-rush							1	1				1			
Gahnia deusta	Limestone Saw-sedge				1		U	1								
Geranium retrorsum	Grassland Geranium								1							
Goodenia varia	Sticky Goodenia				*											
Hardenbergia violacea	Native Lilac			1	1	1		1								
Hibbertia devitata	Smooth Guinea-flower				1		1	1	1							
Hibbertia virgata	Twiggy Guinea-flower							1								
Hydrocotyle callicarpa	Tiny Pennywort				1											
Lasiopetalum discolor	Coast Velvet-bush			1	U	1	1	R								
Lasiopetalum schulzenii	Drooping Velvet-bush								1							

		Conservation Rating		Vegetation Association												
Species name	**Common name**	**AUS**	**SA**	**RC1**	**RC2**	**RC3**	**RC4**	**RC6**	**RC7**	**RC8**	**RC10**	**RC11**	**RC12**	**RC13**	**RC14**	**RC15**
Lepidosperma congestum	(blank)						1									
Leucopogon parviflorus	Coast Beard-heath					R		1	O		R	R	R			
Melaleuca acuminata ssp. acuminata	Mallee Honey-myrtle				1											
Melaleuca brevifolia	Short-leaf Honey-myrtle				R	R		R								
Melaleuca decussata	Totem-poles						R									
Melaleuca halmaturorum	Swamp Paper-bark							R					R	O,R		
Melaleuca lanceolata	Dryland Tea-tree			U,R	U,R	U	U	R								
Microtis sp.	Onion-orchid				1	*										
Muehlenbeckia adpressa	Climbing Lignum								1							
Muehlenbeckia gunnii	Coastal Climbing Lignum								1		1		1	1	1	
Myoporum brevipes	Warty Boobialla					R										
Myoporum insulare	Common Boobialla								1				1	1		
Nitraria billardierei	Nitre-bush													1	O	
Olearia axillaris	Coast Daisy-bush			1				1	O,R	R	O,R	1				
Olearia minor	Heath Daisy-bush				1	1	1									
Pimelea serpyllifolia ssp. serpyllifolia	Thyme Riceflower			1	1	1		1	1	1	1	1	1	1		1
Pittosporum angustifolium	Native Apricot				1						1		1	1		1
Poa poiformis var. poiformis	Coast Tussock-grass								1							
Pomaderris obcordata	Wedge-leaf Pomaderris				1	1	U	1								
Pomaderris paniculosa ssp. paniculosa	Mallee Pomaderris								U							
Pomaderris paniculosa ssp. paralia	Coast Pomaderris			1												
Pterostylis longifolia complex	(blank)				1	1	1									
Pterostylis flavovirens	Tall Greenhood				*	*										
Pultenaea acerosa	Bristly Bush-pea						1	1								
Rhagodia candolleana ssp. candolleana	Sea-berry Saltbush								U		1	1	U	U		
Rhagodia crassifolia	Fleshy Saltbush			U	1	R		1	U		1	U				U
Rytidosperma sp.	Wallaby-grass				1		1	1								
Salicornia sp.																
Senecio pinnatifolius group	Variable Groundsel								1		1					

		Conservation Rating		Vegetation Association												
Species name	**Common name**	**AUS**	**SA**	**RC1**	**RC2**	**RC3**	**RC4**	**RC6**	**RC7**	**RC8**	**RC10**	**RC11**	**RC12**	**RC13**	**RC14**	**RC15**
Stackhousia aspericocca ssp.	Bushy Candles						1									
Suaeda australis	Austral Seablite									1	1			1	U	
Templetonia retusa	Cockies Tongue				R	1	U,R	R								
Tetragonia implexicoma	Bower Spinach			1	1				1		1	1	1		1	1
Thelymitra megcalyptra	Scented Sun-orchid				*											
Threlkeldia diffusa	Coast Bonefruit			1		1			1	1	1	1	1	U	1	
Thysanotus patersonii	Twining Fringe-lily				1											
Westringia eremicola	Slender Westringia						1									

1= observed during field survey, * = noted in other sections of this vegetation type but not in the assessment area, R=noted to be regenerating in that site, O = overstorey dominant species, U = understory dominant species, E = emergent overstorey species. Key to Conservation Codes: RA=Rare

Appendix 4.3: Flora species recorded at Tank Site

Species name	Common name	Conservation Rating		Vegetation Association			
		AUS	SA	TR1	TR2	TR3	TR4
Acacia cupularis	Cup Wattle				1	R	R
Acacia gillii	Gill's Wattle			1	R	R	
Acacia myrtifolia	Myrtle Wattle			R	R		
Acacia paradoxa	Kangaroo Thorn			R	R	U,R	R
Acacia spinescens	Spiny Wattle			1	R		
Acaena echinata	Sheep's Burr				1		1
Acianthus pusillus	Mosquito Orchid				1		
Acrotriche cordata	Blunt-leaf Ground-berry			1	1	1	
Acrotriche patula	Prickly Ground-berry			1	1	1	1
Allocasuarina muelleriana ssp. muelleriana	Common Oak-bush			U,R	R		
Allocasuarina verticillata	Drooping Sheoak			E,R	R		
Astroloma humifusum / Styphelia humifusa	Cranberry Heath				1		
Austrostipa sp.	Spear-grass			1	1	1	1
Billardiera sericophora	Silky Apple-berry			1			
Billardiera versicolor	Yellow-flower Apple-berry					*	
Bursaria spinosa ssp. spinosa	Sweet Bursaria					R	
Cassytha glabella f. dispar	Slender Dodder-laurel			1	1		
Cassytha peninsularis	Peninsula Dodder-laurel			1	1		1
Cheiranthera alternifolia	Hand-flower			1	*		
Choretrum chrysanthum	Yellow Sour-bush		RA	*			
Choretrum glomeratum	White Sour-bush			1	1		
Chrysocephalum apiculatum	Common Everlasting			1	1		
Clematis microphylla	Old Man's Beard			1	1		1
Correa backhouseana var. coriacea	Thick-leaf Correa			1	1		
Dampiera rosmarinifolia	Rosemary Dampiera			1	1		
Daviesia asperula ssp. obliqua	Eyre Peninsula Bitter-pea			1	R		
Dianella revoluta var. revoluta	Black-anther Flax-lily			1	1		R
Diuris orientis	Wallflower Donkey-orchid				*		
Diuris sp.	Donkey-orchid			*			
Dodonaea hexandra	Horned Hop-bush			1	1		
Dodonaea viscosa ssp. spatulata	Sticky Hop-bush			1			
Drosera macrantha ssp. planchonii	Climbing Sundew			1	1		
Eucalyptus albopurpurea	Purple-flowered Mallee Box			O,R	O,R	1	

Species name	Common name	Conservation Rating		Vegetation Association			
		AUS	SA	TR1	TR2	TR3	TR4
Eucalyptus angulosa	Coast Ridge-fruited Mallee			1			
Eucalyptus diversifolia ssp. diversifolia	Coastal White Mallee			O,R	O	O	
Eucalyptus gracilis	Yorrell			1			
Eutaxia microphylla	Common Eutaxia			1	R		
Exocarpos sparteus	Slender Cherry			1	1		1
Gahnia deusta	Limestone Saw-sedge			1	1	1	1
Gahnia lanigera	Black Grass Saw-sedge			1	1		1
Geranium retrorsum	Grassland Geranium					1	1
Gonocarpus mezianus	Broad-leaf Raspwort			1	1		
Goodenia geniculata	Bent Goodenia			1			
Goodenia willisiana	Silver Goodenia			1	1		R
Goodia medicaginea	Western Golden-tip					1	
Grevillea ilicifolia ssp. ilicifolia	Holly-leaf Grevillea			1	1		
Grevillea pauciflora ssp. pauciflora	Few-flower Grevillea			1	1		
Hakea cycloptera	Elm-seed Hakea			1	1		
Hakea rugosa	Dwarf Hakea				1		
Hakea vittata	Limestone Needlebush			1			
Halgania cyanea	Rough Blue-flower				*		
Haloragis acutangula	Smooth Raspwort						1
Hardenbergia violacea	Native Lilac				1	1	R
Hibbertia devitata	Smooth Guinea-flower			1	U,R	*	
Hysterobaeckea behrii	Silver Broombush			*			
Kennedia prostrata	Scarlet Runner			1	1		1
Lasiopetalum baueri	Slender Velvet-bush			1	1		
Lasiopetalum behrii	Pink Velvet-bush			1	R		
Lasiopetalum discolor	Coast Velvet-bush			1	U	U,R	R
Lepidosperma viscidum	Sticky Sword-sedge			1	1		
Leucopogon parviflorus	Coast Beard-heath			R		R	
Lomandra collina	Sand Mat-rush			1	1		
Lomandra effusa	Scented Mat-rush			1			
Lomandra micrantha ssp. micrantha	Small-flower Mat-rush			1	1		
Lysiandra (Phyllanthus) calycina	Snowdrop Spurge		RA	*	*	1	1
Melaleuca decussata	Totem-poles			1	R		
Microtis sp.	Onion-orchid			*			
Muehlenbeckia adpressa	Climbing Lignum					1	

Species name	Common name	Conservation Rating		Vegetation Association			
		AUS	SA	TR1	TR2	TR3	TR4
Olearia ciliata var. ciliata	Fringed Daisy-bush			1			
Olearia minor	Heath Daisy-bush						
Olearia ramulosa	Twiggy Daisy-bush			R			
Opercularia turpis	Twiggy Stinkweed			1			
Pelargonium australe	Austral Stork's-bill					1	
Pimelea glauca	Smooth Riceflower				R		
Pimelea stricta	Erect Riceflower				R		
Pomaderris obcordata	Wedge-leaf Pomaderris			1	1		
Pomaderris paniculosa ssp. paniculosa	Mallee Pomaderris					1	
Pultenaea acerosa	Bristly Bush-pea			1	1		
Rhagodia crassifolia	Fleshy Saltbush			1			
Rytidosperma sp.	Wallaby-grass			1	U	1	1
Scaevola linearis	Rough Fanflower				*		
Spyridium daphnoides	Spoon-leaved Spyridium		RA	*			
Spyridium nitidum	Shining Spyridium			1	1		
Stackhousia aspericocca ssp.	Bushy Candles			1	*		
Templetonia retusa	Cockies Tongue			R	R		
Vittadinia australasica var. australasica	Sticky New Holland Daisy						1
Xanthorrhoea semiplana ssp. semiplana	Yacca			U	R		
Xanthorrhoea semiplana ssp. tateana	Tate's Grass-tree		RA	*			

1= observed during field survey, * = noted in other sections of this vegetation type but not in the assessment area, R=noted to be regenerating in that site, O = overstorey dominant species, U = understory dominant species, E = emergent overstorey species. Key to Conservation Codes: RA=Rare

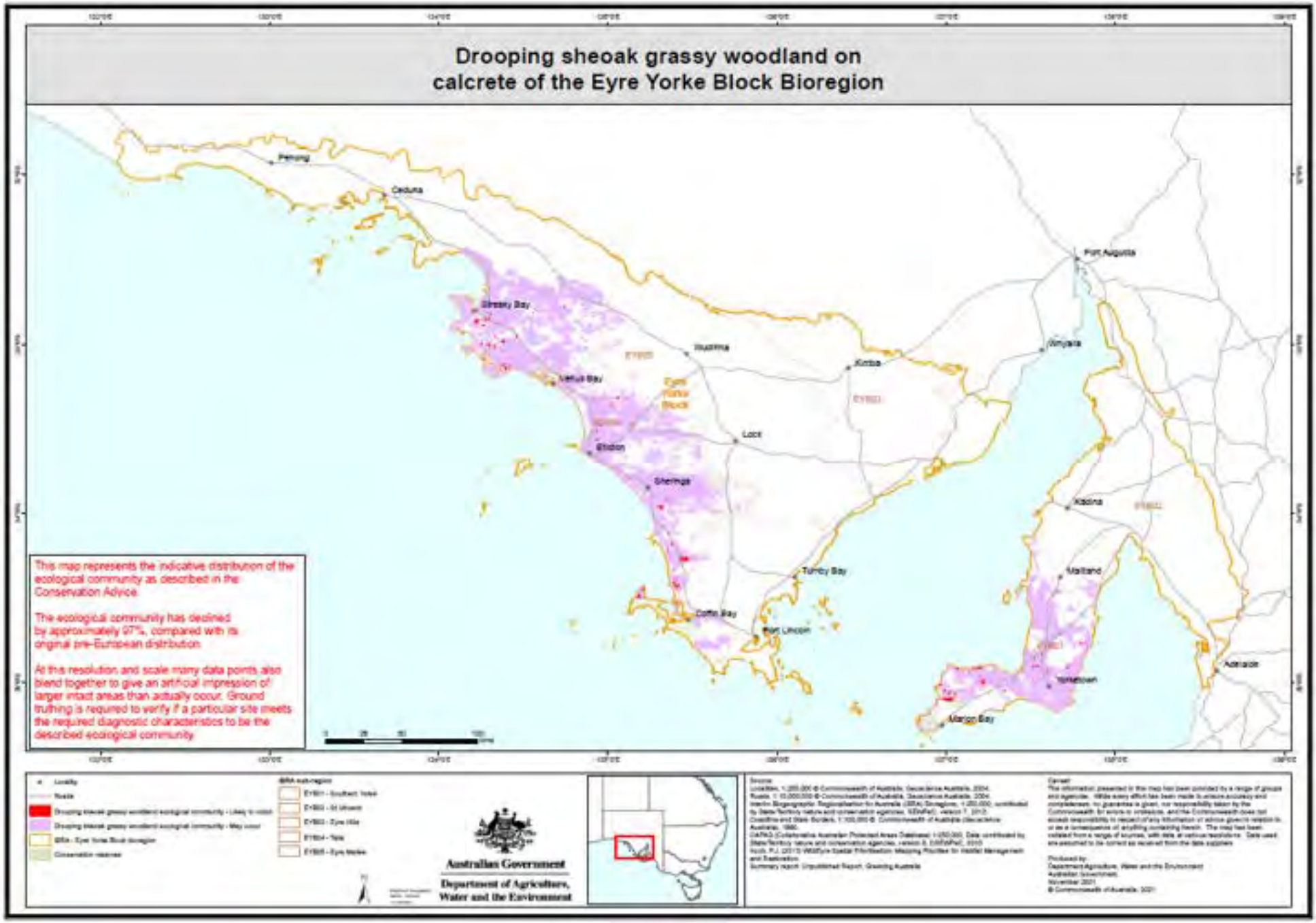
Appendix 7: Flora species recorded at Uley South offset sites

Species	Common Name	Conservation Status				Association		
		EPBC	SA	West (EP)	Talia Subregion	US2	US3	US4
Acacia cupularis	Cup Wattle			NT	LC			1
*Acacia cyclops**	Western Coastal Wattle						1	
Acacia leiophylla	Coast Golden Wattle							1
Acacia longifolia ssp. sophorae	Coastal Wattle			NT	LC		+	1
Acacia spinescens	Spiny Wattle			NT	LC			1
Acacia triquetra	Mallee Wreath Wattle			LC	LC			1
Acaena echinata	Sheep's Burr			LC	LC	1	+	
Acrotriche cordata	Blunt-leaf Ground-berry			LC	LC			1
Acrotriche patula	Prickly Ground-berry			LC	LC		+	1
Adriana quadripartita	Coast Bitter-bush			NT	LC			1
*Aira sp.**	Hair-grass					1	1	
Allocasuarina verticillata	Drooping Sheoak			LC	LC		+	1
Alyxia buxifolia	Sea Box			LC	LC			1
*Arctotheca calendula**	Cape Weedd						1	
*Asphodelus fistulosus**	Onion Weed					1	1	
Asteridea athrixioides	Wirewort			NT	LC	1	1	1
Austrostipa exilis	Heath Spear-grass			LC	LC	1	1	1
Austrostipa scabra ssp. falcata	Slender Spear-grass			NT	LC	1		
*Avena barbata**	Bearded Oat						1	
*Bellardia trixago**	Bellardia					1	1	
Brachyscome sp.	Native Daisy							+
*Bromus diandrus**	Great Brome						1	
Bulbine semibarbata	Small Leek-lily			LC	LC	1	+	+
Caladenia capillata	Wispy Spider-orchid			LC	LC			+
Caladenia latifolia	Pink Caladenia			NT	LC			+
*Carthamus lanatus**	Saffron Thistle					1		
Calytrix tetragona	Common Fringe-myrtle			NT	LC		+	
*Centaurium sp.**	Centaury					1		
Chrysocephalum baxteri	White Everlasting			NT	RA			1
Clematis microphylla	Old Man's Beard			NT	LC	1	1	1
Craspedia variabilis	Billy-buttons			LC	LC			+
Dianella brevicaulis	Short-stem Flax-lily			NT	LC			1
Dianella sp.	Flax-lily						1	
Dichondra repens	Kidney Weed			LC	LC		1	
*Dittrichia graveolens**	Stinkweed						1	
Dodonaea viscosa ssp. spatulata	Sticky Hop-bush			LC	LC		+	
*Echium plantagineum**	Salvation Jane					1	1	
Eucalyptus diversifolia ssp. diversifolia	Coastal White Mallee			LC	LC		+	1
Exocarpos syrticola	Coast Cherry			LC	LC	1	1	1
Gahnia deusta	Limestone Saw-sedge			LC	LC		+	1

Species	Common Name	Conservation Status				Association		
		EPBC	SA	West (EP)	Talia Subregion	US2	US3	US4
Gahnia lanigera	Black Grass Saw-sedge			LC	LC		1	1
Geranium molle var. molle	Soft Geranium						1	
Goodia medicaginea	Western Golden-tip			RA	LC			1
Hibbertia devitata	Smooth Guinea-flower			LC	LC			1
*Lagurus ovatus**	Hare's Tail Grass						1	
Lasiopetalum discolor	Coast Velvet-bush			LC	LC		1	1
Lepidosperma sp.	Sword-sedge/Rapier-sedge							1
Leucopogon parviflorus	Coast Beard-heath			LC	LC	1	1	1
*Lysimachia arvensis**	Pimpernel					1	1	
*Marrubium vulgare**	Horehound					1		
Melaleuca lanceolata	Dryland Tea-tree			NT	LC		+	
*Melilotus indicus**	King Island Melilot						1	
Olearia axillaris	Coast Daisy-bush			NT	LC	1	1	1
Pimelea serpyllifolia ssp. serpyllifolia	Thyme Riceflower			LC	LC	1	1	1
Pittosporum angustifolium	Native Apricot			LC	LC		1	1
Pomaderris paniculosa ssp.								1
Prasophyllum sp.	Leek Orchid							+
Ptilotus spathulatus	Pussy-tails			LC	LC		+	
*Reichardia tingitana**	False Sowthistle					1		
Rhagodia candolleana ssp. candolleana	Sea-berry Saltbush			NT	LC		1	
*Rostraria cristata**	Annual Cat's-tail					1	1	
Rytidosperma caespitosum	Common Wallaby-grass			LC	LC	1	1	1
Rytidosperma pilosum	Velvet Wallaby-grass						1	
Samolus repens	Creeping Brookweed			LC	LC		+	
Schoenus nitens	Shiny Bog-rush			NT	NT	1		
Selliera radicans	Shiny Swamp-mat			RA	RA	1		
*Senecio pterophorus**	African Daisy					1	1	
*Sherardia arvensis**	Field Madder					1		
Tetragonia implexicoma	Bower Spinach			LC	LC		1	
Thelymitra megcalyptra	Scented Sun-orchid			LC	LC			+
Thysanotus nudicaulis			EN	EN	-			1
*Trifolium campestre**	Hop Clover					1	1	
Vittadinia australasica var. australasica	Sticky New Holland Daisy			NT	LC	1	1	
Vittadinia megacephala	Giant New Holland Daisy			NT	LC	1		
Vittadinia sp.	New Holland Daisy							1
*Vulpia sp.**	Fescue					1	1	1
Wahlenbergia gracilenta	Annual Bluebell			NT	LC	1		

1 = observed during field survey; * = introduce species; + = noted in other sections of this vegetation type but not in the assessment area.

Key to Conservation Codes: EN = Endangered; RA=Rare; NT = Near Threatened; LC = Least Concern


Drooping sheoak grassy woodland on
calcrete of the Eyre Yorke Block Bioregion
Penong
Ceduna
Streaky Bay
Iluka
Venus Bay
Eyre Yorke Block
Elliston
Sheringa
Lock
Kimba
Port Augusta
Whyalla
Kadina
Maitland
Tumby Bay
Coffin Bay
Port Lincoln
Yorketown
Marion Bay
Adelaide
This map represents the indicative distribution of the ecological community as described in the Conservation Advice.
The ecological community has declined by approximately 97%, compared with its original pre-European distribution.
At this resolution and scale many data points also blend together to give an artificial impression of larger intact areas than actually occur. Ground truthing is required to verify if a particular site meets the required diagnostic characteristics to be the described ecological community.
Australian Government
Department of Agriculture, Water and the Environment