# Native Vegetation Clearance

## Dublin Tourist Park Construction

## Ruskin Road, Dublin

## Data Report

Clearance under the *Native Vegetation Regulations 2017*

8th August 2022

Prepared by EnviRO Environmental, NVC accredited consultant Rohan Calley

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# 1. Application information

**Application Details**

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| Applicant: | Matthew Slater | | |
| Key contact: | | | |
| Landowner: | Matthew Slater | | |
| Site Address: | 401 Ruskin Road<br>Dublin<br>SA 5501 | | |
| Local Government Area: | Adelaide Plains Council<br>*(DC Adelaide Plains)* | Hundred: | Dublin 140400 |
| Title ID: | CT6191/771 | Parcel ID | D115556 A11 |

**Summary of proposed clearance**

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| Purpose of clearance | Vegetation clearance is required for the construction a 28 site Tourist Park with caretaker residence, septic system, utilities building, vehicle parking and ancillary water tanks. |
| Block size (m2) | 4.0 Ha |
| Native Vegetation Regulation | Schedule 1; Regulation 12, Clause 33, House or Buildings |
| Description of the vegetation under application | Two vegetation associations were assessed on the block<br>• Low chenopod shrubland (Site A)<br>• Tecticornia shrubland (Site B)<br>Assessed Site A is approximately 1 Ha of low chenopod shrubland in average, degraded condition. The site is dominated by *Atriplex paludosa ssp cordata* (Marsh Saltbush), *Enchylaena tomentosa* (Ruby Saltbush) and *Maireana erioclada* (Rosy Bluebush), with *Senecio pinnatifolius* (Variable Groundsel) common and noticeable in flower. Native species diversity is high with 20 species identified with coverage at approximately 30%. Regeneration is present across the site consisting of multiple species and individuals. Introduced species number 24 in heavy abundance, representing 35 % of total biomass. Dominant weed species are *Asphodelus fistulosus* (Onion Weed), *Carrichtera annua* (Wards Weed), *Mesembryanthemum crystallinum* (Common Iceplant), *Brassica tournefortii* (Wild Turnip), and multiple specimens at varying ages of African Boxthorn (Lycium ferocissimum), a *Weed of National Significance*. One declared weed under the Landscape Act of SA 2019 was present, *Echium plantagium*, (Salvation Jane), as was a planted Olive bush (*Olea europaea*), however being planted it is not classed as a weed for assessment purposes.<br>Site B is an area of 1 ha assessed as heavily disturbed *Tecticornia halocnemoides* (Grey Samphire) shrubland, present as a depression between areas of the cheonopod shubland. As such some species overlap occurs on the transition zone. This 1 Ha site has approximately 3600m2 used as a recreational vehicle/bike track which has removed vegetation. Species present as scattered specimens in the site but mainly towards the transition margins are *Disphyma crassifolium* (Round-leaf Pigface) *Atriplex paludosa ssp cordata* (Marsh Saltbush), *Enchylaena tomentosa* (Ruby Saltbush) and *Maireana erioclada* (Rosy Bluebush). Dominant weed species mirror Site A albeit in lower abundance. *Asphodelus fistulosus* (Onion Weed), *Carrichtera annua* (Wards Weed), *Mesembryanthemum crystallinum* (Common Iceplant), *Brassica tournefortii* (Wild Turnip), and multiple specimens at varying ages of African Boxthorn (Lycium ferocissimum) are all present but mainly in the transition margins.<br>The association presents in average condition with 8 native species observed with a coverage of 20%. Introduced species number 11 and represent |

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| | approximately 20% of the biomass. One Weed of National Significance species is present, African Boxthorn (*Lycium ferocissimum)*.<br><br>Both sites have evidence of historic disturbance, grazing, vehicle tracks and rubbish dumping. |
| Total proposed clearance - area (Ha) | Proposed new vegetation clearance is 2.64 ha |
| Level of clearance | Level 4 |
| Overlay (Planning and Design Code) | **Zones**<br>Conservation - Con<br><br>**Overlays**<br>Coastal Areas<br>The Coastal Areas Overlay seeks to ensure the conservation of the natural coastal environment, provide for natural coastal processes and recognise and respond to coastal hazards.<br>Environment and Food Production Area<br>The Environment and Food Production Area Overlay is an area of rural, landscape, environmental or food production significance within Greater Adelaide that is protected from urban encroachment<br>Hazards (Acid Sulfate Soils)<br>The Hazards (Acid Sulfate Soils) Overlay aims to protect the environment and development from the release of acid water resulting from the disturbance of acid sulfate soils.<br>Hazards (Bushfire - Medium Risk)<br>The Hazards (Bushfire - Medium Risk) Overlay seeks to ensure development responds to the medium level of bushfire risk by siting and designing buildings to mitigate threat and impact of bushfires on life and property and facilitating access for emergency service vehicles.<br>Hazards (Flooding - Evidence Required)<br>The Hazards (Flooding - Evidence Required) Overlay adopts a precautionary approach to mitigate potential impacts of potential flood risk through appropriate siting and design of development.<br>Native Vegetation<br>The Native Vegetation Overlay seeks to protect, retain and restore areas of native vegetation.<br>State Significant Native Vegetation<br>The State Significant Native Vegetation Overlay seeks to protect, retain and restore significant areas of native vegetation. |

Aerial of proposed clearance area at 401 Ruskin Road Dublin, situated in the transition zone between 2 distinct vegetation associations. *Tecticornia low shrubland* and Site B. (outlined in red) and low chenopod shrubland, Site A, in blue.


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| 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 minimise, 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<br><br>**Avoidance**.<br><br>The proposed development has been planned to sit over the most disturbed areas on the block. The block itself has been used for grazing historically, but has also seen heavy dumping of rubbish and recreational vehicles used to create motorbike and buggy trails. The development is set back from the Adelaide International Bird Sanctuary (AIBS) boundary and will avoid a small area of T*ecticornia sp*, into the south east corner which adjoins the sanctuary, along with a patch of healthier less disturbed native vegetation, providing a buffer to the AIBS.<br><br>Eco tent site is located in an area that exhibits and elevation landform and the heaviest weed infestation (Onion Weed, *Asphelodus fistulosus*).<br><br>**Minimise**.<br><br>Minimisation of vegetation clearance will occur by the client locating the dwelling and ancillary structures on already disturbed areas and utilising tracks already established. Planning a tent area on natural existing ground does not require the permanent clearance of an area and allows some vegetation to remain in place. Repurposing the existing shedding on the area and incorporating it in the design, and using existing fence line tracks as walking trails minimises total disturbance. |

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| | **Rehab or Restore.**<br><br>Heavy dumping of rubbish has occurred in the area, in low lying *Tecticornia* shrubland and areas surrounding the established shedding. This will be removed and the area fenced off, left to regenerate. The well-established weeds present, African Boxthorn (Lycium ferocissimum) will be removed, and the infestation of *Asphodelus fistulosus* (Onion Weed), *Carrichtera annua* (Wards Weed) *Mesembryanthemum crystallinum* (Common Iceplant) will need to be contained.<br><br>Large Rabbit warren present will be destroyed.<br><br>By law, the Weed of National Significance African Boxthorn (*Lycium ferocissimum)* is to be removed.<br><br>**Offset**<br><br>Offset will be achieved by payment into the fund. |
| SEB Offset proposal | Payment of **$79,024.66** (excl) plus **$4,346.36** (inc) admin fee into fund |

# 2. Purpose of clearance

## 2.1 Description

The purpose of the proposed clearance is to construct a 28 site Tourist Park with caretaker residence, biocycle septic system, utilities building, vehicle parking, 3 ancillary water tanks and a future camping area.

## 2.2 Background

The applicant Matthew Slater purchased the block at 401 Ruskin Road in 2007, and has subsequently sold part to be included in the Adelaide International Bird Sanctuary National Park – Winaityinaityi Pangkara, established in 2016. The sale included all of the low lying samphire flat on the property that was deemed to be part of the wetland ecosystem.
The block sits half way between the town of Dublin on Port Wakefield Road and the beachside township of Thompson Beach. Each township is 4 km form the development site. The Thompson beach township was founded in the early 1980s on a narrow strip of coastal shrubland between the tidal flat high water mark and the natural low lying samphire salt flat inland. The township is split into north and south settlements, and during the initial development levee banks were installed across low lying areas to the north, south and inland to prevent saltwater incursion of any source into the saltmarsh area or coastal dune system, hence heavily modifying the natural ecosystem of the area. Maps of these levee banks (Western et al, 2014) are provided in Appendix 4. This directly relates to the presence of an EPBC listed threatened vegetation community present in the area and is discussed more in section 4.3, "Threatened species assessment".
The township formalised in 1992, its boundaries mapped out in 1997. There are 400 residential blocks in the Thompson Beach Township, with approximately 160 private dwellings and a population of 200 residents. Dublin, to the east of the development site has is a township of 400 people on Port Highway road, serving as a major fuel stop along the highway and also a service centre close to the Dublin Cattle Markets and the Dublin Waste Facility.

Figure 1 provides an aerial view of the block.

Figure 1. Aerial of development block following rainfall, Adelaide International Bird Sanctuary National Park – Winaityinaityi Pangkara in the background.

## 2.3 General location map

The development site is located on Ruskin Road which adjoins Thompson Beach and Dublin Townships. The site is situated in the middle of both towns, 4km from each. Thompson Beach is located approximately 72 kilometres north of the centre of Adelaide. The township is situated 8km by road west of Dublin on the Samphire Coast in South Australia's Gulf of St. Vincent. It is situated in the Northern and Yorke Landscape Region in the DC of Adelaide Plains in the hundred of Dublin. The IBRA association is Parham, the subregion being St.Vincent.

The Thompson Beach area is a popular crabbing, fishing, bushwalking and bird watching destination. The town takes its name from members of the Thompson family who farmed in the general area from the late 1800's. The proposed development site is located in the historical farmed area. The Thompson Beach of today had its beginnings in the 1980's when a subdivision was created by Cape Investments Pty. Ltd. The Township was formalised in 1992 and boundaries were mapped out in 1997.

Today the township is completely surrounded by the Adelaide International Bird Sanctuary National Park – Winaityinaityi Pangkara, established in 2016.

Figure 2 and 3 show the proposed development site at 401 Ruskin Road. Winaityinaityi Pangkara approximately 90m (Pink shaded area). Visible on the maps is the extent of Winaityinaityi Pangkara, which extends 60km along the coast and covers 2457 Ha. Dublin is the nearest township can be seen 4km to the north east, along with the Dublin Waste Facility, 4.5 km to the south east. Other nearby coastal townships are Port Parham 7.5km to the north, and Middle Beach 20km due south. Heritage Agreement, HA1440 is 3.4km to the west, HA687 is 4km to the east and HA1164 is 9km to the South East.


Figure 2. 1:9000 map of proposed clearance at 401 Ruskin Road. Hundred of Dublin, Parham IBRA Association and St.Vincent Subregion. Adelaide International Bird Sanctuary National Park – Winaityinaityi Pangkara in pink highlight.

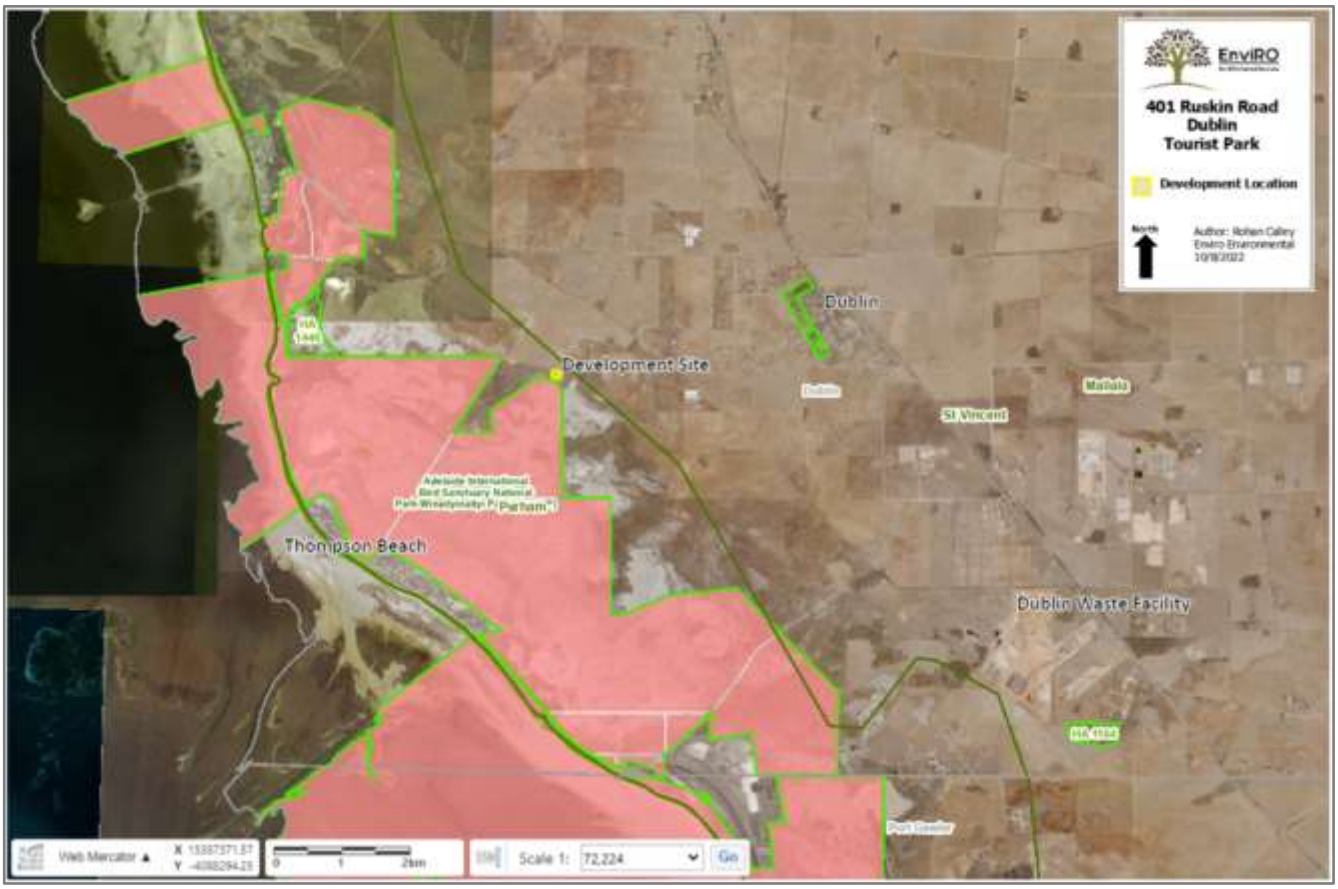


Figure 3. 1:72,000 map of greater Thompson Beach and Dublin region. Adelaide International Bird Sanctuary - Winaityinaityi Pangkara (pink), surrounding the township. LGA, IBRA association & landscape region shown.

## 2.4 Details of the proposal

The proposal is for the construction of a low impact 28 site Tourist Park with caretaker residence (Fig 4), recreation area, ecotent site area, septic system, utilities building, vehicle parking and ancillary water tanks at 401 Ruskin Road Dublin. This represents Stage 1 of an expanded tourist park development plan that would only progress based on the success of the first stage. The site requires the removal of vegetation and some minor earthworks to level the sites beyond the residences, with the land having a minor fall a minor fall <2m over the length of the block.
All roads and caravan camp sites will be covered with compacted road base/gravel and have power and water available. Grey waste water is to be contained as per entry requirement and disposed of at onsite treatment facility. Ecotent area will be left as natural landform for tents to be erected by visitors. Recreation area will be used for visitors to walk dogs, bike riding, and outdoor acitivity. All fences will be updated as currently the fence protecting the AIBS is in a state of disrepair due vandalism and not fit for purpose. The existing shed will be upgraded to provide storage and undercover area for bird observation. Areas present on the block that have been used for dumping of tyres, concrete and general rubbish from previous farm use will be cleaned up and native vegetation in these areas fenced off for natural regrowth.

From the planning report, the proposal includes:

- Only one vehicle access point is provided to the site;
- The access, internal driveways and visitor car park are to be constructed of compacted gravel, utilising existing tracks.
- The roads and visitor parking spaces are of an appropriate width to accommodate the anticipated vehicles, including emergency vehicles;
- Each site is provided sufficient area to accommodate a vehicle and caravan;
- The visitor carpark is provided as excess parking, and of a size capable of accommodating a trailer or boat
- Internal speed limits will be introduced (10-20 km/hour) to ensure the safe movement of vehicles throughout the site is achieved, minimise dust generation.
- the proposed land use is designed to be of a low impact and scale to preserve the intent of the Conservation Zone;
- the site is capable of being connected to the required infrastructure, mains water, power and stormwater services;
- the proposed development will provide short term stay for tourists to utilise the localities environmental amenities;

Figure 4. Schematic of the proposed caretaker residence which includes toilets, office and camp kitchen facilities, all under the main roof.

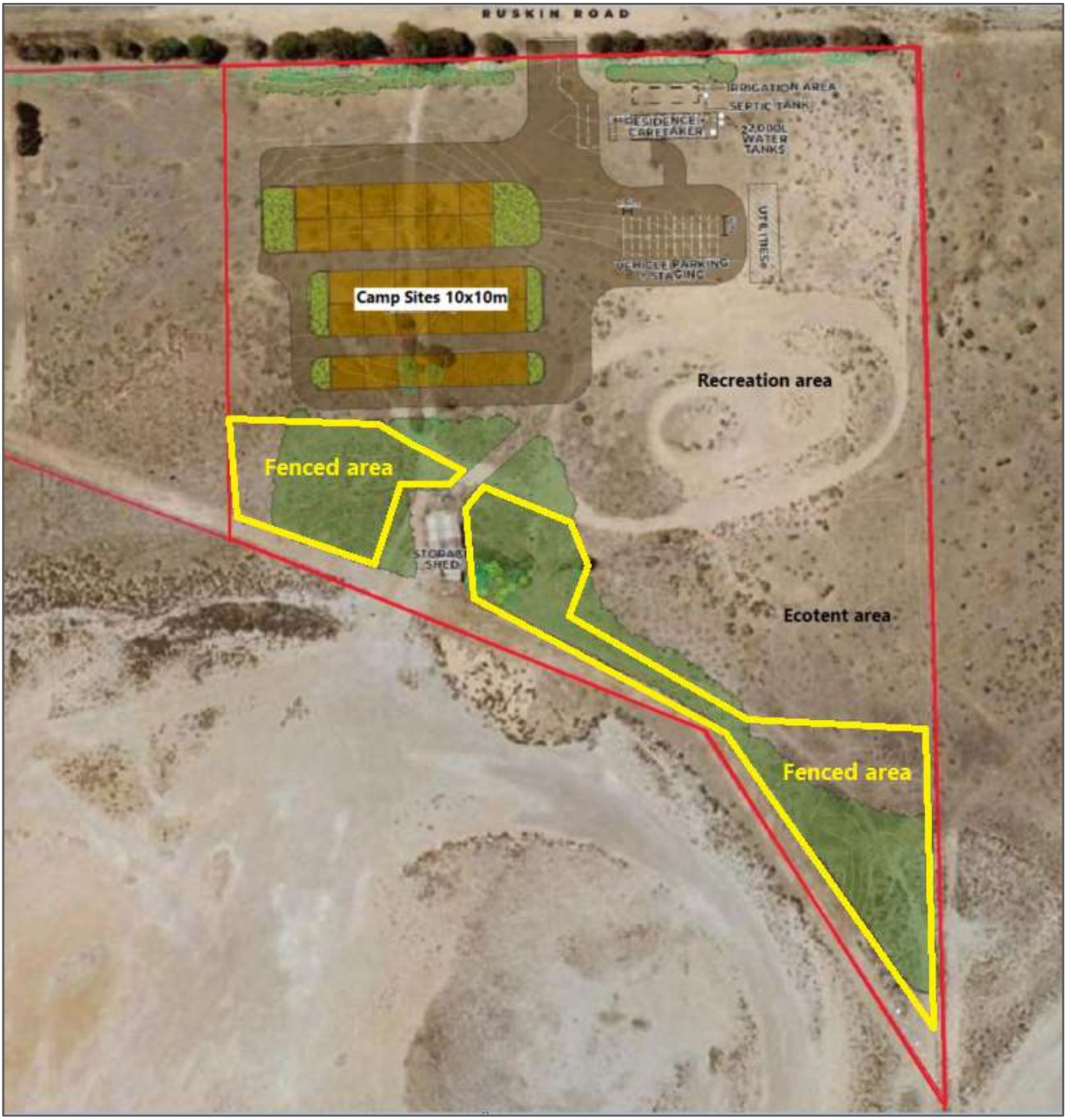

Figure 5. Proposed stage 1 development plan overlaid on block.

Figure 6. Aerial of site (top) and overlay of proposed development below.

## 2.5 Approvals <u>required</u> *or* <u>obtained</u>

Approvals required *or* obtained under other legislation (including past clearance approvals)

- **<u>Native Vegetation Act 1991</u>**

  Native Veg Council Approval for the removal of vegetation ***required*.**
  Application falls under Schedule 1; Regulation 12, Clause 33, House or Buildings

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

- **<u>Planning, Development and Infrastructure Act 2016</u>,**

  Development approval ***required*.**
  Development application has been submitted on 6/09/2021, Application ID: 21025827.

- **<u>The DC of Adelaide Plains</u>**

  Development approval ***required*.**

- **<u>Landscapes SA Act 2019</u>**

  From July 1, 2020, the Landscape South Australia Act 2019 replaced the Natural Resources Management Act 2004, as the key framework for managing the state's land, water, pest plants and animals, and biodiversity across the state.

  The department works in partnership with the eight new regional Landscape South Australia boards, responsible for administering the new Act. A new entity Green Adelaide will also bring an integrated approach to managing Adelaide's urban environment.

  A key priority of landscape boards is to support local communities and landowners to be directly responsible for sustainably managing their region's landscapes with an emphasis on land and water management, pest animal and plant control, and biodiversity

  Under the Landscapes Act 2019 landholders have a legal responsibility to manage declared pest plants and animals and prevent land and water degradation. Key components under the Act include the ability to control water use through prescription, allocations and restrictions; requirement to control pest plants and animals and activities that might result in land degradation.

  The proposed site contains a Weed of National Significance, African Boxthorn (*Lycium ferocissimum).* These plants must be removed in line with legislation. A planted Olive bush (*Olea europaea*) was present, however being planted it is not classed as a weed for assessment purposes.

- **<u>National Parks and Wildlife Act 1972</u>**

  Development must comply with act.

National Parks and Wildlife Act 1972 Native plants and animals in South Australia are protected under the National Parks and Wildlife Act 1972 (NPW Act). It is an offence to take a native plant or protected animal without approval. Threatened plant and animal species are listed in Schedules 7 9 (endangered species), 8 (vulnerable species) and 9 (rare species) of the Act.

Persons must not:
• Take a native plant on a reserve, wilderness protection area, wilderness protection zone, land reserved for public purposes, a forest reserve or any other Crown land.
• Take a native plant of a prescribed species on private land.
• Take a native plant on private land without the consent of the owner (such plants may also be covered by the NV Act).
• Take a protected animal or the eggs of a protected animal without approval;
• Keep protected animals unless authorised to do so; and
• Use poison to kill a protected animal without approval.

Conservation rated flora and fauna species listed on Schedules 7, 8, or 9 of the NPW Act may occur within the proposed clearance site. Persons must comply with the conditions imposed upon permits and approvals.

- **Environment Protection and Biodiversity Conservation Act 1999.**

Proposal not to impact under the act.

The EPBC Act and the Environment Protection and Biodiversity Conservation Regulations 2000 provide a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places. These are defined in the Act as 'matters of national environmental significance'. There are nine matters of national environmental significance protected under the Act
1. World Heritage properties
2. National Heritage places
3. Wetlands of international importance (listed under the RAMSAR Convention)
4. Listed threatened species and ecological communities
5. Migratory species protected under international agreements
6. Commonwealth marine areas
7. The Great Barrier Reef Marine Park
8. Nuclear actions (including uranium mines).
9. A water resource, in relation to coal seam gas development and large coal mining development

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

- **Coast Protection Act 1972**

Referral ***required***

The Coast Protection Board is a referral body under Schedule 8 of the *Development Regulations 2008* for development applications on "coastal Land". Almost all responses are provided under delegated authority, in accordance with Board policy by officers of the Department of Environment and Water. The Department provided technical and administrative assistance to the Board.

The Coast Protection Board was formed in 1972 with the proclamation of the Coast Protection Act 1972 (the Act). The functions of the Coast Protection Board (as stated in the Act) are to:

- protect the coast from erosion, damage, deterioration, pollution and misuse
- restore any part of the coast that has been subjected to erosion, damage, deterioration, pollution or misuse
- develop any part of the coast aesthetically, or to improve it for those who use and enjoy it
- manage, maintain and develop those coast facilities that the Board is responsible for
- report to the Minister where required
- carry out, or be involved in, research into the protection, restoration or development of the coast.

Under the Act the Board has the power to:

- carry out works
- remove sand
- acquire coastal land, with the approval of the Minister
- deal with its land, with the approval of the Minister
- Enter land (any member of the Board or an authorised person).

- **Water Resources Act 1997**

  The *Water Resources Act 1997* provides for the management of the State's water resources. It is understood that all details relevant to the *Water Resources Act 1997* will be included a development application for the project.

## 2.6 Native Vegetation Regulation

The proposed vegetation clearance will be assessed under *Native Vegetation Regulations,* Schedule 1; Regulation 12, Clause 33, House or Buildings

## 2.7 Development Application information (if applicable)

The block planned for development is designated Conservation (Con). Development application has been submitted on 6/09/2021, Application ID: 21025827.

# 3. Method

## 3.1 Flora assessment

A desktop assessment was carried out prior to the field survey. A PMST report was generated on July 13, 2021, to identify matters of national environmental significance under the EPBC Act relevant to the clearance site. The report was used to identify flora and fauna species or ecological communities of national environmental significance that may occur or have suitable habitat within the proposed clearance site.
One threatened ecological community was listed as potentially occurring in the area, Subtropical and Temperate Saltmarsh. Aerial imagery indicated this vegetation association not to be present by definition. (See section 4.3).
One species of threatened flora was identified as possibly occurring in the development site, *Tecticornia flabelliformis,* Bead Samphire

A BDBSA database search for species listed under South Australia's NPW Act in the proposed clearance was undertaken. The dataset was obtained on July 13, 20221 and used to identify threatened species that have been recorded within the 5 km buffer of the proposed clearance site as per assessment guidelines. This provided 2 threatened species potentially being present in the proposed development site, the aforementioned *T.flabelliformis*, and *Maireana rohrlachii*, Rohrlachs Bluebush.
A literature review of the Thompson Beach and Dublin area was carried out to assess previously undertaken flora and fauna surveys relative to the site. ALA search was used to help identify species distribution.
A bushland assessment method (BAM) field survey was carried out on July 15, 2022. The site contained 2 distinct vegetation associations are present. The field survey method consisted of traversing across both associations in their entirety to identify all flora present. This presented a way to determine if any species listed under the EPBC or NPW Act were present and in identifying Declared Weeds (SA) and Weeds of National Significance (Dept. Agriculture, Water & Environment). Specimens were photographed and aerial imagery was taken to assist in the determination of percentage cover and species distribution. Any tree heights are measures using DJI Mavic Drone with an accuracy of 0.1m. Figure 8 depicts the vegetation associations and sites.

Figure 7. Survey sites and vegetation associations present.

## 3.2 Fauna assessment

A desktop assessment was carried out prior to the field survey involving a BDBSA database search and a PMST report, generated on July 13, 2022. These were used to identify threatened species that have been recorded within the 5 km buffer zone of the proposed clearance site, as per assessment guidelines for species listed under South Australia's NPW Act. Simple species lists from Nature maps were created and assessed prior to the survey to determine potential species.
A literature review of the Thompson Beach and Dublin area was carried out to assess previously undertaken flora and fauna surveys relative to the site. ALA search was used to help identify species distribution.
Eleven threatened bird species were listed as potentially occurring or suitable habitat occurring in the area. This consisted of 2 endangered species, 4 rare species and 4 vulnerable species. The 2 endangered species listed are the Far Eastern Curlew (*Numenius madagascariensis*) and the Eastern Osprey (*Pandion haliaetus cristatus).* The rare species

listed are the Elegant Parrot (*Neophema elegans elegans*), Little Egret (*Egretta garzetta nigripes*), Painted Buttonquail (*Turnix varius varius)* and the Rock Parrot (*Neophema petrophila*). The threatened species listed are the Slender-billed Thornbill (*Acanthiza iredalei rosinae*), Brown Quail (*Coturnix ypsilophora australis),* the Little Eagle (*Hieraaetus morphnoides*) and the Blue-Winged Parrot (*Neophema chrysostoma*).
Of the 11 species listed, the desktop survey identifies the only species likely to use the vegetation associations present is the Slender-billed Thornbill.
The field survey consists of direct observation and active searching for the presence of fauna or suitable habitat, animal scats, tracks, diggings and nesting sites. This involves noting and inspecting any burrows, logs, rocks, leaf litter, left over building materials and dumped rubbish.
2 dedicated bird surveys were carried out for 45 minutes each, involving quiet observation while traversing the block. Opportunistic sightings were also noted during the vegetation assessments. Bird calls are used occasionally when appropriate to help identify species in the vicinity.

# 4. Assessment Outcomes

## 4.1 Flora Assessment

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

Two vegetation associations were assessed on the block;

- Low chenopod shrubland (Site A)
- Tecticornia shrubland (Site B)

The field assessment was carried out on 15th July, 2022. Weather on the day of assessment was cold and windy, following overnight rain. The temperature being 13 degrees and wind 25 km/h from the SW.

Block 1, Site A

Assessed Site A is approximately 1 Ha of low chenopod shrubland in average, degraded condition. The shrubland is present in the distinct transition zone between two vegetation associations present on the block, as such some species overlap occurs with the adjoining tecticornia shrubland on the margins. The site is dominated by *Atriplex paludosa ssp cordata* (Marsh Saltbush), *Enchylaena tomentosa* (Ruby Saltbush) and *Maireana erioclada* (Rosy Bluebush), with *Senecio pinnatifolius* (Variable Groundsel) common and noticeable in flower. Native species diversity is high with 20 species identified with coverage at approximately 30%. Regeneration is present across the site consisting of multiple species and individuals. Other native species present as second tier species, common but in less abundance are Nitraria billardierei (Nitre Bush) Disphyma crassifolium ssp clavellatum, (Round-leaf Pigface), Salsola australis (Buckbush) Maireana brevifolia ( Short-leaf Bluebush) and Spergularia marina (slat Sand-spurrey). Numerous eucalypts have been planted along boundary fence lines, identified as *Eucalyptus utilis* (Coastal Moort) a native of Western Australia. Some juvenile plants were observed having self-seeded in the site.

Introduced species number 24 in heavy abundance, representing 35 % of total biomass. Dominant weed species are *Asphodelus fistulosus* (Onion Weed), *Carrichtera annua* (Wards Weed), *Mesembryanthemum crystallinum* (Common Iceplant), *Brassica tournefortii* (Wild Turnip), and multiple specimens at varying ages of African Boxthorn (Lycium ferocissimum), a *Weed of National Significance.* One declared weed under the Landscape Act of SA 2019 was present, *Echium plantagium*, (Salvation Jane), as was a planted Olive bush (*Olea europaea*), however being planted it is not classed as a weed for assessment purposes.

Plants present were in good health, however the association is degraded with the site having evidence of frequent vehicle traffic, both motorbikes and cars, human habitation and rubbish dumping. This disturbance ad historic use of

the land for grazing purposes has seen a heavy weed species presence establish. As such the diversity of native species is relatively high, however the abundance of species outside the dominant species present has been reduced in comparison to a healthy intact system would be expected to contain.

The site shows evidence of clearance closer to the roadside fence line where the surface looks to have been levelled and evident in less vegetation cover. There is evidence of species being planted in old tyres, while old degraded irrigation tube is spread across the site set up as a watering system, while a fenced off area is also present. While the area may naturally present as treeless, larger shrubs would be expected to be present as observed in nearby areas, such as *Myoporum insulare* (Common Boobialla). One juvenile was observed lending weight to the observations and conclusion the association in Site A is not a strand of intact vegetation.

Aspect is slight slope facing south, soil type present in the association is that of an elevated saline silty/clay loam. Across the site minimal leaf litter was present characterised by this vegetation association. Soil testing had been undertaken by NATA Accredited Enviro Lab, the results returned a negative to being potentially acid forming soils.

An abandoned shed(s) that appeared to be stables at one stage, now severely rundown containing bedding and household furniture, deceased animals including birds and kangaroos, evidence of vermin (rats) and rabbits. Weed presence was strong around these sheds, along with significant assorted rubbish.

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Block 1, Site B

Site B is an area of 1 ha assessed as heavily disturbed *Tecticornia halocnemoides* (Grey Samphire) shrubland, present as a transitional depression beteween areas of the cheonopod shubland and the claypan saltmarsh present in neighbouring property. As such some species overlap occurs on the transition zone. This 1 Ha site has approximately 3600m2 used as a recreational vehicle/bike track which has removed vegetation. Species present as scattered sepcimens in the site but mainly towards the transition margins are *Disphyma crassifolium* (Round-leaf Pigface) *Atriplex paludosa ssp cordata* (Marsh Saltbush), *Enchylaena tomentosa* (Ruby Saltbush) and *Maireana erioclada* (Rosy Bluebush). Dominant weed species mirror Site A however in lower abundance. *Asphodelus fistulosus* (Onion Weed), *Carrichtera annua* (Wards Weed), *Mesembryanthemum crystallinum* (Common Iceplant), *Brassica tournefortii* (Wild Turnip), and multiple specimens at varying ages of African Boxthorn (Lycium ferocissimum) are all present but mainly in the transition margins.

The association presents in average condition with 8 native species observed with a coverage of 20%. Introduced species number 11 and represent approximately 20% of the biomass. One Weed of National Significance species is present, African Boxthorn (*Lycium ferocissimum).*

As with Site A, Site B has have evidence of historic disturbance, grazing, vehicle tracks and rubbish dumping.

Figure 8. Aerial of block taken at 60 m elevation, facing south. Yellow outline is the block for proposed clearance.

Figure 9. Aerial of block taken at 60m elevation, facing SW. Adelaide International Bird Sanctuary in the background, Thompson Beach in distant horizon.

Figure 10. Aerial of block taken at 60m elevation, facing NE. The township of Dublin in the back right of the picture.

Figure 11. Aerial of block at 60 m elevation facing north.

Figure 12. Aerial of abandoned sheds, scattered rubbish including tyres, cement, sheet iron and assorted waste.

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

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| **Vegetation Association** | Site A, Low chenopod shrubland<br><br>*Representative photos were taken from each corner of the block.* |

Photo 1. Taken from SW corner of Site A, facing NE (Z54, E 252416, N 6183567)

Photo 2 Taken from SE corner of Site A, facing NW. (Z54 E 252480, N 6183571).

Photo 3. Taken from NW corner of Site A, facing SE (Z54 E 252423, N 6183683).

Photo 4. Taken from NE corner of Site A, facing SW (Z54 E 252477, N 6183686).

Photo 5. Dominant species, *Maireana erioclada,* Rosy Bluebush

Photo 6. Dominant species, *Enchylaena tomentosa,* Ruby Saltbush

Photo 7. *Atriplex paludosa* ssp cordata, Marsh Saltbush

Photo 8 *Senecio pinnatifolius*, Variable Groundsel

Photo 9. Weed, *Cynara cardunculus ssp flavescens,* Artichoke Thistle

Photo 10. Large area dominated by Onion Weed, *Asphelodus fistulosis.*

Photo 11. Large African Boxthorn, (*Lycium ferocissimum*), a *Weed of National Significance.*

| | | | | | |
|---|---|---|---|---|---|
| General Description | Approximately 1 Ha of low chenopod shrubland in average, degraded condition. The site is dominated by *Atriplex paludosa ssp cordata* (Marsh Saltbush), *Enchylaena tomentosa* (Ruby Saltbush) and *Maireana erioclada* (Rosy Bluebush), with *Senecio pinnatifolius* (Variable Groundsel) common and noticeable in flower. Native species diversity is high with 20 species identified with coverage at approximately 30%. Regeneration is present across the site consisting of multiple species and individuals. Introduced species number 24 in heavy abundance, representing 35 % of total biomass. Dominant weed species are *Asphodelus fistulosus* (Onion Weed), *Carrichtera annua* (Wards Weed), *Mesembryanthemum crystallinum* (Common Iceplant), *Brassica tournefortii* (Wild Turnip), and multiple specimens at varying ages of African Boxthorn (Lycium ferocissimum), a *Weed of National Significance*. One declared weed under the Landscape Act of SA 2019 was present, *Echium plantagium*, (Salvation Jane), as was a planted Olive bush (*Olea europaea*), however being planted it is not classed as a weed for assessment purposes. | | | | |
| Threatened species or community | No threatened flora or fauna under the NP&W Act or EPBC Act listed species or community were present on the block to be cleared. | | | | |
| Landscape context score | **1.17** | Vegetation Condition Score | **46.44** | Conservation significance score | **1.10** |
| Unit biodiversity Score | **59.77** | Area (ha) | **2.0** | Total biodiversity Score | **119.54** |

Table 1. Flora species identified in survey site A

| SPECIES | COMMON NAME | NATIVE | NATIONAL RATING | STATE RATING |
|---|---|---|---|---|
| Atriplex paludosa ssp. cordata | Marsh Saltbush | Y | | |
| Enchylaena tomentosa var. tomentosa | Ruby Saltbush | Y | | |
| Maireana brevifolia | Short-leaf Bluebush | Y | | |
| Austrostipa sp. | Spear-grass | Y | | |
| Disphyma crassifolium ssp. clavellatum | Round-leaf Pigface | Y | | |
| Sclerolaena diacantha | Grey Bindyi | Y | | |
| Vittadinia sp. | New Holland Daisy | Y | | |
| Maireana erioclada | Rosy Bluebush | Y | | |
| Myoporum insulare | Common Boobialla | Y | | |
| Nitraria billardierei | Nitre-bush | Y | | |
| Rytidosperma sp. | Wallaby-grass | Y | | |
| Sclerolaena uniflora | Small-spine Bindyi | Y | | |
| Salsola australis | Buckbush | Y | | |
| Scaevola spinescens | Spiny Fanflower | Y | | |
| Spergularia marina | Salt Sand-spurrey | Y | | |
| Tecticornia halocnemoides ssp. halocnemoides | Grey Samphire | Y | | |
| Tetragonia implexicoma | Bower Spinach | Y | | |
| Threlkeldia diffusa | Coast Bonefruit | Y | | |
| Senecio pinnatifolius | Variable Groundsel | Y | | |
| Echium plantagineum | Salvation Jane | N | | |
| Carrichtera annua | Ward's Weed | N | | |
| Sisymbrium orientale | Indian Hedge Mustard | N | | |
| Rolulea rosea var australis | Common Onion-grass | N | | |
| Asphodelus fistulosus | Onion Weed | N | | |
| Olea europuraea ssp europaea | Olive | N | | |
| Aizoon pubescens | Coastal Galenia | N | | |
| Mesembryanthemum crystallinum | Common Iceplant | N | | |
| Arctotheca calendula | Cape Weed | N | | |
| Cynara cardunculus ssp. flavescens | Artichoke Thistle | N | | |
| Dittrichia graveolens | Stinkweed | N | | |
| Reichardia tingitana | False Sowthistle | N | | |
| Brassica tournefortii | Wild Turnip | N | | |
| Cucumis myriocarpus ssp. myriocarpus | Paddy Melon | N | | |
| Scabiosa atropurpurea | Pincushion | N | | |
| Erodium cicutarium | Cut-leaf Heron's-bill | N | | |
| Avena sp. | Oat | N | | |
| Medicago polymorpha | Burr-medic | N | | |
| Limonium companyonis | Sea-lavender | N | | |
| Oxalis pes-caprae | Soursob | N | | |
| Lycium ferocissimum | African Boxthorn | N | | |
| Poa annua | Winter Grass | N | | |
| Sonchus asper | Rough Sow-thistle | N | | |

| | |
|---|---|
| **Vegetation Association** | Site B, Tecticornia shrubland.<br><br>Block photos as above |


Site B.

Photo 1. Site B NW corner facing SE. GPS Z54, E252514 N6183641

Photo 2. Site B NE corner facing SW. GPS Z54, E252626 N6183693. *Tecticornia halocnemoides* (Grey Samphire)

Photo 3. Site B SE corner facing NW. GPS Z54, E252606 N6183549. *Atriplex paludosa* (Marsh Saltbush). *Tecticornia halocnemoides* (Grey Samphire), Onion weed (*Asphodelus fistulosus*).

Photo 4. Site B SW corner facing NE. GPS Z54, E252520 N6183558 *Tecticornia halocnemoides* (Grey Samphire) and *Atriplex paludosa ssp cordata* (March Saltbush) of the margins of Site B.

Photo 5. *Tecticornia halocnemoides* (Grey Samphire)

Photo 6. *Vehicle tracks in historically cleared area, site B.*

| | | | | | |
|---|---|---|---|---|---|
| General Description | Site B is an area of 1 ha assessed as of heavily disturbed *Tecticornia halocnemoides* (Grey Samphire) shrubland, present as a depression beteween areas of the cheonopod shubland. As such some species overlap occurs on the transition zone. This 1 Ha site has approximately 3600m2 used as a recreational vehicle/bike track which has removed vegetation. Species present as scattered sepcimens in the site but mainly towards the transition margins are *Disphyma crassifolium* (Round-leaf Pigface) *Atriplex paludosa ssp cordata* (Marsh Saltbush), *Enchylaena tomentosa* (Ruby Saltbush) and *Maireana erioclada* (Rosy Bluebush). Dominant weed species mirror Site A, however in lower abundance and located toward the margins of the transition zone. *Asphodelus fistulosus* (Onion Weed), *Carrichtera annua* (Wards Weed), *Mesembryanthemum crystallinum* (Common Iceplant), *Brassica tournefortii* (Wild Turnip), and multiple specimens at varying ages of African Boxthorn (Lycium ferocissimum). | | | | |
| Threatened species or community | No threatened flora or fauna under the NP&W Act or EPBC Act listed species or community were present on the block to be cleared. | | | | |
| Landscape context score | **1.17** | Vegetation Condition Score | **48.96** | Conservation significance score | **1.10** |
| Unit biodiversity Score | **63.01** | Area (ha) | **0.64** | Total biodiversity Score | **40.32** |

Table 2. Flora species identified in survey site B

| SPECIES | COMMON NAME | NATIVE | NATIONAL RATING | STATE RATING |
|---|---|---|---|---|
| Atriplex paludosa ssp. cordata | Marsh Saltbush | Y | | |
| Enchylaena tomentosa var. tomentosa | Ruby Saltbush | Y | | |
| Maireana brevifolia | Short-leaf Bluebush | Y | | |
| Disphyma crassifolium ssp. clavellatum | Round-leaf Pigface | Y | | |
| Maireana erioclada | Rosy Bluebush | Y | | |
| Spergularia marina | Salt Sand-spurrey | Y | | |
| Tecticornia halocnemoides ssp. halocnemoides | Grey Samphire | Y | | |
| Senecio pinnatifolius | Variable Groundsel | Y | | |
| Carrichtera annua | Ward's Weed | N | | |
| Rolulea rosea var australis | Common Onion-grass | N | | |
| Asphodelus fistulosus | Onion Weed | N | | |
| Aizoon pubescens | Coastal Galenia | N | | |
| Mesembryanthemum crystallinum | Common Iceplant | N | | |
| Dittrichia graveolens | Stinkweed | N | | |
| Brassica tournefortii | Wild Turnip | N | | |
| Medicago polymorpha | Burr-medic | N | | |
| Limonium companyonis | Sea-lavender | N | | |
| Oxalis pes-caprae | Soursob | N | | |
| Lycium ferocissimum | African Boxthorn | N | | |
| Poa annua | Winter Grass | N | | |

## 4.2 Fauna Assessment

The site field survey was carried out at 8:00 am on the 15th July and again on 17th July, consisting of direct observation and active searching for the presence of fauna or suitable habitat, animal scats, tracks, diggings and nesting sites. This involved noting and inspecting any burrows, logs, rocks, leaf litter, left over building materials and dumped rubbish.
A dedicated bird survey was carried out for 45 minutes each day, involving quiet observation while traversing the block. Bird calls are used occasionally when appropriate to help identify species in the vicinity.
Thirteen (13) species of bird were recorded in combined bird and fauna surveys. This included 10 native and 3 introduced species. Three mammals were noted, scats and deceased Western Grey Kangaroo (*Macropus fuliginosus*), fresh Red Fox (*Vulpes vulpes*) scats and tracks found at a large rabbit warren, and 3 Rabbits (*Oryctolagus cuniculus)* observed along with multiple burrows and a large active warren. Very small inactive burrows were observed in multiple locations, possible insect or reptile.

A search through rubbish lying on the ground, lifting of iron sheeting, inside tyres and around abandoned infrastructure did not return any specimens. This is likely to be heavily influenced by seasonal conditions, being mid-winter. If a search was conducted in warmer weather it is expected a reptilian presence would be observed.

Given the low abundance of all species no dominant could be determined.

No threatened species identified under the EPBC Act or NPW Act were present in the proposed development area.

Table 3. Fauna Survey observations

| Species | Common Name | No.Observed | Other Notes |
|---|---|---|---|
| **Birds** | | | |
| *Gavicalis virescens* | Singing Honeyeater | 2 | Observed |
| *Falco cenchroides* | Nankeek Kestrel | 1 | flew past |
| *Vanellus miles* | Masked Lapwing | 4 | vocals, observed |
| *Grallina cyanoleuca* | Magpie Lark | 2 | *observed* |
| *Hirundo neoxena* | Welcome Swallow | 4 | onserved |
| *Gymnohina tibicen* | Australian Magpie | 4 | observed, lew past |
| *Corvus coronoides* | Australian Raven | 2 | flew past |
| *Zosterops lateralis* | Silvereye | 10 | observed |
| *Epthianura tricolour* | White-fronted chat | 12 | observed |
| *Acanthagenys rufogularis* | Spiny-cheeked Honeyeater | 2 | observed, vocals |
| *Columba livia* | Feral Pigeon | 25 | *Introduced, observed* |
| *Passer domesticus* | House Sparrow | 12 | *Introduced, observed* |
| *Sturnus vulgaris* | Common Starling | 12 | *Introduced* |
| **Mammals** | | | |
| *Vulpes vulpes* | Red Fox | | *fresh scats* |
| *Oryctolagus cuniculus* | Rabbit | 3 | *Observed*<br>*Large aactive warren present.* |
| *Macropus sp.* | Kangaroo | | *scats observed*<br>*Dead specimen* |

Figure 13. *Acanthagenys rufogularis,* Spiny-cheeked Honeyeater in dead tree habitat.

Figure 14. Silvereye, *Zosterops lateralis.* A small group was present on site, using the introduced African Boxthorn as shelter.

Figure 15. Aerial view of rabbit warren on the southern boundary. A large warren complex, approximately 20x20m.

## 4.3 Threatened species assessment

The EPBC Protected matters report (PMST, Table 1) identified 1 threatened ecological community, 38 listed threatened species and 60 listed migratory species as potentially occurring or having suitable habitat potentially occurring with a 5 km buffer zone radius of the clearance site. This buffer zone captures a large area of marine ecosystem which is included in the PMST report. As the clearance is based on a terrestrial ecosystem, any fauna or flora that is marine based will not be reported.

All 28 threatened terrestrial fauna species listed are birds with 1 known to possibly occur in the clearance site vegetation association, this being the Slender-billed Thornbill (*Acanthiza iredalei rosinae*). None were observed on site.

Twenty one (21) fauna species listed as threatened under the NPW Act were identified in the Naturemaps Supertable search as being previously recorded within 5 km of the proposed clearance site. This includes 20 bird species and 1 mammal (Echidna). None were observed on site. Five (5) species of threatened flora were identified in PMST report for the proposed site, and 2 flora species listed as threatened under the NPW Act were identified in the Naturemaps Supertable search as being previously recorded within 5 km of the proposed clearance site. None were observed on site.

From the PMST report, EPBC list the ecological threatened community "Subtropical and Temperate Coastal Saltmarsh" as vulnerable. By definition, this ecological community is present on Block 1 Assessment Site B, approximately 640 $m^2$.

Taken from the EPBC Conservation Advice for Subtropical and Temperate Coastal Saltmarsh, page 4/92:

> "*The physical environment for the ecological community is coastal areas under regular or intermittent tidal influence. In southern latitudes saltmarsh is often the main vegetation-type in the intertidal zone and commonly occurs in association with estuaries (Adam, 2002; Fairweather, 2011; Sainty et al., 2012). It is typically restricted to the upper intertidal environment, occurring in areas within the astronomical tidal limit, often between the elevation of the mean high tide and the mean spring tide (Saintilan et al., 2009). However, exceptions may occur that retain a regular or intermittent tidal connection and these are still considered to be the ecological community. For example, coastal saltmarsh may occur in intermittently open 1 For example: T. disarticulata, T. doleiformis, T. halocnemoides subsp. tenuis, T. indica subsp. leiostachya, T. pergranulata subsp. elongata, T. pterygosperma subsp. denticulata and T. pruinosa (G. Keighery pers. comm.). 2 For example: Samolus repens var paucifolius and Samolus junceus (G. Keighery pers. comm.). Subtropical and Temperate Coastal Saltmarsh Conservation Advice Page 5 of 92 lagoonal estuaries that are only intertidal when the lagoon is opened (which may only be for limited periods, with periods of several years of closure). Such estuaries, known as ICOLLs (intermittently closed and open lakes and lagoons), are common in NSW3 and also occur in south-western Western Australia. Also, in South Australia there are extensive supratidal4 The Coastal Saltmarsh ecological community may also include areas that have groundwater connectivity to tidal water bodies. For example, groundwater hydrology may play a role in the occurrence of species such as the nationally vulnerable Tecticornia flabelliformis (bead samphire) which has a preference for water logging (Coleman and Cook, 2008). Also, some sabka-related saltmarshes may be reliant on groundwater tidal flows. Saltmarsh communities which occur above the reach of astronomical tides, but are inundated by weather assisted tides (i.e. storm surges, e.g. Gulf St Vincent). Thus it occurs at places with at least some tidal connection, including rarely-inundated supratidal areas and intermittently opened or closed lagoons, but not areas receiving only aerosol spray (i.e. such as cliff tops)".*

However, in the EPBC Advice under "exclusions" it is stated the following are excluded from the Coastal Saltmarsh ecological community:

- saltmarsh occurring in seepage zones on sea cliffs and elevated rock platforms above the tidal limit and on elevated headlands subject only to aerosolic salt
- saltmarsh occurring on inland saline soils with no tidal
- isolated patches of saltmarsh < 0.1 ha • patches or areas of saltmarsh that contain > 50% weeds (i.e. patches must be dominated by native saltmarsh plant species to be the ecological community) and
- patches of saltmarsh (possibly senescent) within the coastal margin that are disconnected (either naturally or artificially) from a tidal regime but were once connected. However, should the patch be reconnected to the

tidal regime (e.g. via removal of an artificial barrier, or constructing a pipeline under a roadway), then the patch can become part of the ecological community (i.e. if it meets other key diagnostics and condition thresholds).

Thompson Beach levee banks were installed across low lying areas to the north, south and inland of the Thompson Beach development to prevent saltwater incursion of any source into the inland saltmarsh area or coastal dune system. This prevents tidal flow to the area, making the closest inlet 6km to the south west. Under dot point (2) above, the saltmarsh assessed on the block at 401 Ruskin Road is excluded from EPBC listing as a coastal saltmarsh ecological community as it lies outside of tidal influence.
Maps of these levee banks (Western et al, 2014) are provided in Appendix 4.

Table 4 lists the PMST summary for the 5km buffer zone around the proposed clearance.
Table 5 discusses the identified threatened species and the likelihood of use for proposed cleared habitat.

Table 4. PMST report summary of identified threatened species and communities.

| **Matters of National Environmental Significance under the *EPBC Act 1999*** | **Identified within Search Area** | **Search Area 5 km Buffer Zone** |
|---|---|---|
| World Heritage Properties | **None** |  |
| National Heritage Properties | **None** | |
| Wetlands of International importance | **None** | |
| Great Barrier Reef Marine Park | **None** | |
| Commonwealth Marine Area | **None** | |
| Listed Threatened Ecological Communities | **1** | |
| Listed Threatened Species | **38** | |
| Listed Migratory Species | **60** | |
| Commonwealth Land | **None** | |
| Commonwealth Heritage Places | **None** | |
| Listed Marine Species | **95** | |
| Whales and other Cetaceans | **8** | |
| Critical habitats | **None** | |
| Commonwealth Reserves Terrestrial | **None** | |
| Australian Marine Parks | **None** | |
| State and Territory Reserves | **2** | |
| Regional Forest Agreements | **None** | |
| Invasive Species | **19** | |
| Nationally Important Wetlands | **1** | |
| Key Ecological Features (Marine) | **None** | |

**Species observed on site, or recorded within 5km (50km in the arid zone) of the application area since 1995, or the vegetation is considered to provide suitable habitat**

Table 5. Discusses the identified threatened species known to occur in the area and the likelihood of use for proposed cleared habitat.

| Species | Common Name | NP&W Act | EPBC Act | Data Source | Date of last record | Species known habitat preferences | Likelihood of use for habitat – Comments |
|---|---|---|---|---|---|---|---|
| *Acanthiza iredalei rosinae* | Slender-billed Thornbill (Gulf St Vincent) | V | V | 3, 5 | 2020 | Prefers open low shrubs, beach habitat. | Likely, though developed habitat not suitable |
| *Botaurus poiciloptilus* | Australasian Bittern | | E | 5 | 2030 | Swamp/wetland habitat. | Unlikely, developed habitat not suitable |
| *Calidris canutus* | Red Knot, Knot | SSP | E | 3, 5 | 2016 | Swamp/wetland habitat. | Unlikely, developed habitat not suitable |
| *Calidris ferruginea* | Curlew Sandpiper | E | CR | 3, 5 | 2017 | Swamp/wetland habitat. | Unlikely, developed habitat not suitable |
| *Calidris tenuirostris* | Great Knot | E | CR | 3, 5 | 2016 | Swamp/wetland, dune habitat. | Possible. Vagrant visitor. Roosting habitat. |
| *Charadrius mongolus* | Lesser Sand Plover, Mongolian Plover | E | E | 3, 5 | 2006 | Swamp/wetland, dune habitat. | Possible. Vagrant visitor. Roosting habitat. |
| *Falco hypoleucos* | Grey Falcon | | V | 1, 5 | 2019 | Arid, semi-arid timbered plains, along watercourses | Unlikely, habitat not suitable. |
| *Grantiella picta* | Painted Honeyeater | | V | 1, 5 | 2015 | Woodlands, mature trees | Unlikely, habitat not suitable. |
| *Limosa lapponica baueri* | Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit | R | V | 3, 5 | 2016 | Intertidal sandflats, mudflats, lagoons | Unlikely, developed habitat not suitable |
| *Neophema chrysogaster* | Orange-bellied Parrot | | CR | 1,5 | 2017 | coastal grasslands, salt marshes and low scrublands | Unlikely. Rare visitor north of Murray Mouth. |

| Species | Common Name | NP&W Act | EPBC Act | Data Source | Date of last record | Species known habitat preferences | Likelihood of use for habitat – Comments |
|---|---|---|---|---|---|---|---|
| *Numenius madagascariensis* | Eastern Curlew, Far Eastern Curlew | E | CR | 3,5 | 2017 | sheltered coasts, estuaries, inlets and coastal lagoons, with large intertidal mudflats or sandflat | Unlikely, developed habitat not suitable |
| *Pedionomus torquatus* | Plains-wanderer | | | 5 | 2012 | Sparse grassland | Unlikely, habitat not suitable. |
| *Pezoporus occidentalis* | Night Parrot | | Extinct in area | 5 | | Remote, arid spinifex grassland | Unlikely, habitat not suitable. |
| *Sternula nereis nereis* | Australian Fairy Tern | E | V | 3,5 | 2016 | offshore, estuarine or lacustrine (lake) islands, wetlands, beaches and spits | Unlikely, developed habitat not suitable |
| *Thinornis cucullatus cucullatus* | Eastern Hooded Plover, Eastern Hooded Plover | V | V | 3,5 | 2013 | ocean beaches, particularly wide beaches backed by dunes with large amounts of seaweed, creek mouths and inlet entrances | Possible. Area provides limited habitat or feeding resources |
| *Arenaria interpres interpres* | Ruddy Turnstone | R | | 1,3 | 2017 | Saltwater lakes, coastal bays, inlets and intertidal shorelines. | Unlikely, developed habitat not suitable |
| *Calidris melanotos* | Pectoral Sandpiper | R | | 1,3 | 2017 | coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes | Unlikely, developed habitat not suitable |
| *Charadrius leschenaultii leschenaultii* | Greater Sand Plover | R | | 1,3 | 2006 | sheltered sandy, shelly or muddy beaches with large intertidal mudflats | Unlikely, developed habitat not suitable |

| ***Species*** | **Common Name** | **NP&W Act** | **EPBC Act** | **Data Source** | **Date of last record** | **Species known habitat preferences** | **Likelihood of use for habitat – Comments** |
|---|---|---|---|---|---|---|---|
| *Cladorhynchus leucocephalus* | Banded Stilt | V | | 1,3 | 2016 | large, shallow saline or hyp ersaline lakes, either inland or near the coast, including ephemeral salt lakes, salt works, lagoons, salt- or clay pans and intertidal flats | Unlikely, developed habitat not suitable |
| *Coturnix ypsilophora australis* | Brown Quail | V | | 1,3 | 2020 | Unlikely, developed habitat not suitable | Possible. Area provides limited habitat or feeding resources |
| *Egretta garzetta nigripes* | Little Egret | R | | 1,3 | 2020 | Tidal mudflats, saltwater and freshwater wetlands, and mangroves. | Possible. Area provides limited habitat or feeding resources |
| *Haematopus fuliginosus fuliginosus* | Sooty Oystercatch er | R | | 1,3 | 2014 | rocky coastlines, occasionally estuaries | Unlikely, developed habitat not suitable |
| *Haematopus longirostris* | Pied Oystercatch er | R | | 1,3 | 2017 | mudflats, sandbanks and sandy ocean beaches | Unlikely, developed habitat not suitable |
| *Hieraaetus morphnoides* | Little Eagle | V | | 1,3 | 2014 | woodland and open forest | Unlikely, developed habitat not suitable |
| *Neophema chrysostoma* | Blue-winged Parrot | V | | 1,3 | 2014 | coastal, sub-coastal and inland areas, semi-arid zones, favour grasslands and grassy woodlands | Possible. Area provides limited habitat or feeding resources |

| ***Species*** | **Common Name** | **NP&W Act** | **EPBC Act** | **Data Source** | **Date of last record** | **Species known habitat preferences** | **Likelihood of use for habitat – Comments** |
|---|---|---|---|---|---|---|---|
| *Neophema elegans elegans* | Elegant Parrot | R | | 1,3 | 2020 | grasslands, shrublands, mallee, woodlands and thickets, bluebush plains, heathlands, saltmarsh and farmland | Possible. Area provides limited habitat or feeding resources |
| *Neophema petrophila zietzi* | Rock Parrot | R | | 1,3 | 2005 | coastlines and offshore rocky islands, frequenting windswept coastal dunes, mangroves, saline swamps and rocky islets | Possible. Area provides limited habitat or feeding resources |
| *Northiella haematogaster (NC)* | Bluebonnet (Eastern and Naretha) | ssp | | 1,3 | 2006 | arid and semi-arid areas, on plains with low shrub layers such as saltbush or bluebush, scattered trees or open woodland | Possible. Area provides limited habitat or feeding resources |
| *Pandion haliaetus cristatus* | Eastern Osprey | E | | 1,3 | 2014 | coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands | Unlikely, developed habitat not suitable |
| *Turnix varius varius* | Painted Buttonquail | R | | 1,3 | 2006 | Temperate and eastern tropical forests and woodlands | Unlikely, developed habitat not suitable |
| *Xenus cinereus* | Terek Sandpiper | R | | 1,3 | 2005 | intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons | Unlikely, developed habitat not suitable |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Tachyglossus aculeatus* | Short-beaked Echidna | ssp | | 1,3 | 2011 | Forests and woodlands, heath, grasslands and arid environments. | Possible. Area provides limited habitat or feeding resources |
| 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<br>EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable | | | | | | | |

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

| **Likelihood** | **Criteria** |
|---|---|
| Highly Likely/Known | Recorded in the last 10 years, the species does not have highly specific niche requirements, the habitat is present and falls within the known range of the species distribution or;<br>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.<br>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 provides no habitat or feeding resources for the species, including perching, roosting or nesting opportunities, corridor for movement or shelter.<br>Recorded within 20 -40 years; however, suitable habitat does not occur, and species of similar habitat requirements have not been recorded in the area.<br>No records despite adequate survey effort. |

## 4.4 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 block boarders an inland section of Adelaide International Bird Sanctuary NP, separated by a fence line. The area has traditionally been used for sheep grazing and cropping prior, as such mush of the natural vegetation has been removed or heavily impacted.

Impacts associated therefore will be limited to the additional generation of dust and storm water run-off. These have the potential to drift and smother vegetation on adjacent blocks, or create erosion pathways, ultimately decreasing the health of plants in the community and fauna habitat.

Storm water runoff that is not captured by the ancillary rainwater tanks will divert to ground, given a potential for erosion infiltration for groundwater.

Other impacts will be the opportunity in a broader sense for the establishment of pest and weed species. Effluent disposal area has the potential to influence near surface groundwater quantity, quality and nutrient availability.

**Installation of new services**

Underground services are available from road connection, and will require trenching to infrastructure and sites. This disturbance will be contained within the cleared area. Potential for water erosion entry points is possible with all ground disturbance. Timely and compacted backfill is required.

Few deep rooted plants are present for trenching to impact on roots.

**Construction machinery access.**

The site already has established access for material delivery and machinery without requiring any further clearance.

**Dust generation**

Dust generation with the possibility to smother vegetation outside the cleared area will possible with the construction of the development.

**Storm water Runoff.**

Storm water will be collected in the three 22,500 litre storage with excess diverted to the ground. Potential erosion I due to high velocity run-off, though likely infrequent due to tank holding capacity, low rainfall and use of collected water in facilities. Measures to reduce velocity should be in place to prevent erosional impacts.

Run-off from camp sites given they will be compacted gravel will be higher that natural landform but less than a developed hard surface. Erosion potential exists and can be mitigated to an extent by established and stable vegetation.

**Altered groundwater flow and erosion**

An altered groundwater flow will result as less water will infiltrate into the ground in areas with a surface covering. This presents more of a change of location rather than a change of volume given water will be diverted to utilities and waste water treatment, resulting in dispersion in a close but different location.

**Potential Acid Sulfate Soil**

Low lying areas of frequently inundated soil have the potential to form acid sulphate soils, which when disturbed or drained and exposed to oxygen can result in the formation of sulfuric acid. Soil tests carried out on the development site in Auggust 2022 by LAB and FIELD Construction Material Testing and NATA accredited Envirolab Serviced have determined the soil present is *not* an acid sulfate soil nor conducive to the formation.

**Introduction of pest flora and fauna**

With clearance of any type, colonising plants, animals and insects will take advantage of a created environmental niche**.** The assessed vegetation was high in introduced species, which will be very difficult to prevent re-establishing. It is essential that all specimens of African Boxthorn (*Lycium ferocissimum*) be removed in proposed cleared area.

**Future Development**

Dependent on financial success, the Tourist Park may extend to the west increasing in size and potential impact. This would require further vegetation clearance in an area that has been traditionally grazed and has seen substantial removal of native vegetation.


Figure 16. Potential future expansion, dependent of financial success of stage 1.

## 4.5 Address the Mitigation Hierarchy

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

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

The proposed development has been planned to sit over the most disturbed areas on the block. The block itself has been used for grazing historically, but has also seen heavy dumping of rubbish and recreational vehicles used to create motorbike and buggy trails. The development is set back from the Adelaide International Bird Sanctuary (AIBS) boundary and will avoid a small area of T*ecticornia sp*, into the south east corner which adjoins the sanctuary, along with a patch of healthier less disturbed native vegetation, providing a buffer to the AIBS.

Ecotent site is located in an area that exhibits and elevation landform and the heaviest weed infestation (Onion Weed, *Asphelodus fistulosus*).

Existing tracks will be utilised in the plan as access routes for construction and internal roads. Existing infrastructure sites will be utilised for future buildings such as storage sheds and bird sanctuary viewing locations. Walkways will follow existing established fence line clearances.

***b) Minimisation – 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).***

Minimisation of vegetation clearance is planned by utilising the already disturbed areas.

New clearance has been minimised by the applicant locating the dwelling and ancillary structures towards the front (road end) of the block, which exhibits previous land use. The initial proposed 5 stages of the development requiring clearance approval has been reduced to only proposing to develop stage one of the potential 5 stages. This minimises potentially unnecessary clearance, as with all business ventures there is the risk the development proves to be not financially viable and does not proceed. In this event the smallest amount of native vegetation disturbance possible for the development has been impacted.

Storm water capture and reuse is planned to prevent erosion, soil testing carried out to investigate the potential acid sulfate soils.

Trees, though planted Western Australian eucalypts, Coastal Moort (*Eucalyptus utilis),* will be left in place untouched as given their age are providing habitat and resources for fauna on the site.

Utilising compacted gravels instead of constructed hard surfaces for roads and paths presents a cheaper and more environmentally friendly construction, allowing water and air infiltration into the soil.

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

The ecosystem present is in a degraded state. To aid in restoring the health and improve the site outside of the development, 7000 m2 of vegetation will be fenced off with a wire fence as a buffer between the development site and the downhill fence line of the AIBS. It is noted that in this area there is significant rubbish dumping which will be removed and the area allowed to re-establish.

This fenced off area has a significant weed population which will require removal. Future revegetation and management of this location will require an approved vegetation management plan.

A large rabbit warren will be removed by way of approved baiting and physical means.

Colonising weed species located across site will be removed and require ongoing control. Fence line adjoining the AIBS will be reestablished to prevent access.

By law, the Weed of National Significance African Boxthorn (Lycium ferocissimum) is to be removed

***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 NVC will only consider an offset once avoidance, minimization and restoration have been documented and fulfilled. The SEB Policy explains the biodiversity offsetting principles that must be met.*

It is proposed that SEB offset will be by means of payment into the fund.

## 4.6 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*.

| **Principle of clearance** | **Considerations** |
|---|---|
| ***Principle 1a - it comprises a high level of diversity of plant species*** | Relevant information<br><br>**Bushland Plant Diversity Score – 24**<br><br>The number of plant species recorded (native) for Block Site A and B is 24 each. Two different associations with an overlap of species. |
| | **Assessment against the principles**<br><br>**Seriously at Variance**<br>• **Site A & B**<br><br>At Variance –<br>• none |
| | **Moderating factors that may be considered by the NVC**<br>• Clearance area is relatively small in a location that exhibits heavy disturbance.<br>• Equivalent ecosystem at site is present in larger areas on surrounding blocks.<br>• Continued use of area by way of antisocial behavior will not see an improvement in current ecosystem status. |
| ***Principle 1b - significance as a habitat for wildlife*** | Relevant information<br><br>**Threatened Fauna Score – 0.1** (each for both sites)<br>**Unit biodiversity Score –** Site A **59.77**<br>Site B **63.01**<br><br>*Acanthiza iredalei rosinae* (Slender-billed Thornbill) is recorded in the area and the habitat for Sites A and B is suitable for foraging.<br>List of the threatened species that were recorded or may use the vegetation. |

| | |
|---|---|
| Acanthiza iredalei rosinae | Slender-billed Thornbill (Gulf St Vincent) |
| Arenaria interpres interpres | Ruddy Turnstone |
| Calidris canutus | Red Knot |
| Calidris ferruginea | Curlew Sandpiper |
| Calidris melanotos | Pectoral Sandpiper |
| Calidris tenuirostris | Great Knot |
| Charadrius leschenaultii | Greater Sand Plover |
| Charadrius mongolus | Lesser Sand Plover |
| Cladorhynchus leucocephalus | Banded Stilt |
| Coturnix ypsilophora australis | Brown Quail |
| Egretta garzetta nigripes | Little Egret |
| Haematopus fuliginosus | Sooty Oystercatcher |
| Haematopus longirostris | Pied Oystercatcher |
| Hieraaetus morphnoides | Little Eagle |
| Limosa lapponica baueri | Bar-tailed Godwit |
| Neophema chrysostoma | Blue-winged Parrot |
| Neophema elegans | Elegant Parrot |
| Neophema petrophila zietzi | Rock Parrot |
| Northiella haematogaster (NC) | Bluebonnet (Eastern and Naretha) |
| Numenius madagascariensis | Far Eastern Curlew |
| Pandion haliaetus cristatus | Eastern Osprey |
| Sternula nereis | Fairy Tern |
| Thinornis cucullatus | Hooded Plover |
| Turnix varius | Painted Buttonquail |
| Xenus cinereus | Terek Sandpiper |
| Tachyglossus aculeatus | Short-beaked Echidna |

The vegetation association has the potential to support a high diversity of animal species with 138 listed on Nature Maps. Daytime fauna survey of the proposed clearance area recorded 16 species, 10 native birds, 3 introduced birds, 1 native mammal and 2 introduced mammals.

The habitat is not an isolated fragment as equivalent shrubland exists within the immediate area.

**Assessment against the principles**

**Seriously at Variance**

- **Site A - Low chenopod shrubland**
- **Site B - Tecticornia low shrubland**

At Variance

- None

Moderating factors that may be considered by the NVC

Vegetation association assessed is disturbed with the immediate area being developed.

Suitable vegetation association (Site A and B) has a large percentage remaining in the immediate area if not so in the greater region.

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| | |
|---|---|
| ***Principle 1c - plants of a rare, vulnerable or endangered species*** | Relevant information<br><br>**Threatened Flora Score(s) – 0**<br><br>No threatened plant species listed within 5km radius of the proposed clearance site were observed. |
| | Assessment against the principles<br><br>Seriously at Variance<br>• none<br>At Variance<br>• none |
| | Moderating factors that may be considered by the NVC |
| ***Principle 1d - the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered*:** | Relevant information<br><br>**EPBC Act, Critically Endangered Ecological Community**<br><br>• Subtropical and Temperate Coastal Saltmarsh (not present)<br><br>**Threatened Community Score – 1.0** |
| | Assessment against the principles<br><br>Seriously at Variance<br>• None |
| | Moderating factors that may be considered by the NVC<br>• None. |
| ***Principle 1e - it is significant as a remnant of vegetation in an area which has been extensively cleared.*** | Relevant information<br>Remnancy vegetation for IBRA Association and IBRA Subregion<br><br>IBRA Association<br>• **Parham – 44% Remnancy**<br>IBRA Subregion<br>• **St Vincent – 8% Remnancy** |

| | |
|---|---|
| | **Total Biodiversity Score - 159.86**<br>• Site A - 119.54<br>• Site B – 40.33 |
| | Assessment against the principles<br><br>Seriously at Variance<br>• None<br>At Variance<br>• **Block 1, Site A and B** |
| | Moderating factors that may be considered by the NVC<br>• Block is located in an area that has seen historic ecological disturbance to alter water flows and hence ecosystem health. |
| ***Principle 1f - it is growing in, or in association with, a wetland environment.*** | Relevant information<br>No wetland association. |
| | Assessment against the principles<br><br>Seriously at Variance<br>• none<br>At Variance –<br>• 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<br>Clearance location is land parcel in an established agricultural region. The major visual feature in the areas is the samphire species that are represented by a small area on the block leading to the Adelaide International Bird Sanctuary.<br>The major visual are planted exotic eucalypts that will remain. Unpleasant aesthetically are old sheds and rubbish which will be removed. |
| | Moderating factors that may be considered by the NVC |

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

# 5. Clearance summary

**Clearance Area(s) Summary table**

Table 6. Clearance 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 | UBS | Area (ha) | Total Biodiversity score | Loss factor | Loadings | Reductions | SEB Points required | SEB payment | Admin Fee |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | a | 24 | 1 | 0 | 0.1 | 59.77 | 2 | 119.54 | 1 | | | 125.52 | $59,090.64 | $3,249.99 |
| 1 | b | 24 | 1 | 0 | 0.1 | 63.01 | 0.64 | 40.33 | 1 | | | 42.34 | $19,934.02 | $1,096.37 |
| | | | | | | | | 0.00 | | | | 0.00 | $0.00 | $0.00 |
| | | | | | | | | 0.00 | | | | 0.00 | $0.00 | $0.00 |
| | | | | | | | | 0.00 | | | | 0.00 | $0.00 | $0.00 |
| | | | | | | | | 0.00 | | | | 0.00 | $0.00 | $0.00 |
| | | | | | | | | 0.00 | | | | 0.00 | $0.00 | $0.00 |
| | | | | | | | | 0.00 | | | | 0.00 | $0.00 | $0.00 |
| | | | | | | | | 0.00 | | | | 0.00 | $0.00 | $0.00 |
| *Insert additional rows into the table as required.* | | | | | | **Total** | **2.64** | **159.8664** | | | | **167.86** | **$79,024.66** | **$4,346.36** |

| | |
|---|---|
| IBRA Association percent vegetation remnancy (%) | 44 |
| IBRA Subregion percent vegetation remnancy (%) | 8 |
| Is the vegetation associated with a Wetland | No |
| Economies of Scale Factor | 0.5 |
| Rainfall (mm) | 352 |

| | Total Biodiversity score | Total SEB points required | SEB Payment | Admin Fee | Total Payment |
|---|---|---|---|---|---|
| Application | 159.87 | 167.86 | $79,024.66 | $4,346.36 | $83,371.02 |

**Risk level** Level 2, 3 or 4: **4**

| Principle | Seriously at variance | Vegetation Assocation | Trees |
|---|---|---|---|
| a - Plant species diversity | Yes | 1a, 1b | |
| b - Wildlife habitat | Yes | 1a, 1b | |
| c - Rare plant species | | | |
| d - Rare plant communities | | | |
| e - Remnancy | Yes | All | |
| f - Wetland | | | |

| At variance | Vegetation Assocation | Trees |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

# 6. Significant Environmental Benefit

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

**ACHIEVING AN SEB**

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

☐ Establish a new SEB Area on land owned by the proponent.

☐ Use SEB Credit that the proponent has established. Provide the SEB Credit Ref. No. _____

☐ Apply to have SEB Credit assigned from another person or body. The application form needs to be submitted with this Data Report.

☐ Apply to have an SEB to be delivered by a Third Party. The application form needs to be submitted with this Data Report.

☑ Pay into the Native Vegetation Fund.

**PAYMENT SEB**

If a proponent proposes to achieve the SEB by paying into the Native Vegetation Fund, summary information must be provided on the amount required to be paid and the manner of payment:

- **Payment will be made via single payment**

# 7. References

Weston, M & Kellet, J 2014, *Coastal Settlements Adaptation Study Thompson Beach Framework Report,* University of South Australia School of Natural and Built Environments Institute for Urban Renewal, Adelaide, South Australia. (Pages 1-12).

EPBC Act, 2013, *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (s266B) Conservation Advice for SUBTROPICAL AND TEMPERATE COASTAL SALTMARSH* (Pages 4-6, 16)

Planning Report for Eco Tourist Park, 401 Ruskin Road Dublin, Masterplan SA Pty LTD, 2022.

LAB and FIELD Construction material Testing, Soil Investigation & Borelog Report for 401 Ruskin Road, Dublin, 2022

# 8. Appendices

Appendix 1. **Fauna species recorded with 5km**

| ***SPECIES*** | **COMMON NAME** | **NATIVE** | **NATIONAL RATING** | **STATE RATING** | **DATE OF LAST RECORD** |
|---|---|---|---|---|---|
| *Acanthagenys rufogularis* | Spiny-cheeked Honeyeater | Y | | | 27-Oct-2020 |
| *Acanthiza iredalei* | Slender-billed Thornbill | Y | ssp | ssp | 22-Aug-2014 |
| *Acanthiza iredalei rosinae* | Slender-billed Thornbill (Gulf St Vincent) | Y | VU | V | 11-Oct-2020 |
| *Acanthiza lineata* | Striated Thornbill | Y | | | 24-Sep-2020 |
| *Actitis hypoleucos* | Common Sandpiper | Y | | R | 18-Jun-1988 |
| *Alauda arvensis arvensis* | Eurasian Skylark | N | | | 26-Nov-2020 |
| *Anas gracilis gracilis* | Grey Teal | Y | | | 25-Aug-2020 |
| *Anthochaera carunculata* | Red Wattlebird | Y | | | 24-Sep-2020 |
| *Anthochaera carunculata woodwardi* | Red Wattlebird (MLR, AP, YP, EP, far west, Yellabinna) | Y | | | 19-Jan-2017 |
| *Anthus australis* | Australian Pipit | Y | | | 27-Oct-2020 |
| *Ardea alba modesta* | Great Egret | Y | | | 11-Oct-2020 |
| *Arenaria interpres interpres* | Ruddy Turnstone | Y | | R | 19-Jan-2017 |
| *Artamus superciliosus* | White-browed Woodswallow | Y | | | 13-Nov-1999 |
| *AVES sp.* | birds | Y | | | 24-Sep-2020 |
| *Calidris acuminata* | Sharp-tailed Sandpiper | Y | | | 11-Oct-2020 |
| *Calidris canutus* | Red Knot | Y | EN | ssp | 28-Feb-2016 |
| *Calidris canutus rogersi* | Red Knot | Y | sp | E | 29-Nov-2012 |
| *Calidris ferruginea* | Curlew Sandpiper | Y | CR | E | 19-Jan-2017 |

| | | | | | |
|---|---|---|---|---|---|
| *Calidris melanotos* | Pectoral Sandpiper | Y | | R | 19-Jan-2017 |
| *Calidris ruficollis* | Red-necked Stint | Y | | | 11-Oct-2020 |
| *Calidris tenuirostris* | Great Knot | Y | CR | E | 28-Feb-2016 |
| *Caligavis chrysops* | Yellow-faced Honeyeater | Y | | | 24-Sep-2020 |
| *Chalcites basalis* | Horsfield's Bronze Cuckoo | Y | | | 27-Oct-2020 |
| *Charadrius bicinctus bicinctus* | Double-banded Plover | Y | | | 10-Jun-1985 |
| *Charadrius leschenaultii leschenaultii* | Greater Sand Plover | Y | sp | R | 29-Oct-2006 |
| *Charadrius mongolus mongolus* | Lesser Sand Plover | Y | sp | E | 29-Oct-2006 |
| *Charadrius ruficapillus* | Red-capped Plover | Y | | | 27-Oct-2020 |
| *Charadrius veredus* | Oriental Plover | Y | | | 14-Dec-2003 |
| *Cheramoeca leucosterna* | White-backed Swallow | Y | | | 13-Nov-1993 |
| *Chlidonias hybrida javanicus* | Whiskered Tern | Y | | | 11-Oct-2020 |
| *Chroicocephalus novaehollandiae novaehollandiae* | Silver Gull | Y | | | 27-Oct-2020 |
| *Cincloramphus cruralis* | Brown Songlark | Y | | | 11-Oct-2020 |
| *Circus approximans* | Swamp Harrier | Y | | | 19-Jan-2017 |
| *Circus assimilis* | Spotted Harrier | Y | | | 19-Nov-2014 |
| *Cladorhynchus leucocephalus* | Banded Stilt | Y | | V | 28-Feb-2016 |
| *Colluricincla harmonica* | Grey Shrikethrush | Y | | | 11-Oct-2020 |
| *Columba livia* | Feral Pigeon | N | | | 02-Jun-2017 |
| *Coracina novaehollandiae* | Black-faced Cuckooshrike | Y | | | 10-Jun-1985 |
| *Corvus mellori* | Little Raven | Y | | | 27-Oct-2020 |
| *Coturnix pectoralis* | Stubble Quail | Y | | | 30-Nov-2016 |

| | | | | | |
|---|---|---|---|---|---|
| *Coturnix ypsilophora australis* | Brown Quail | Y | | V | 24-Aug-2020 |
| *Cracticus torquatus leucopterus* | Grey Butcherbird | Y | | | 27-Oct-2020 |
| *Cygnus atratus* | Black Swan | Y | | | 19-Jan-2017 |
| *Dacelo novaeguineae* | Laughing Kookaburra | Y | | | 24-Sep-2020 |
| *Egretta garzetta nigripes* | Little Egret | Y | | R | 11-Oct-2020 |
| *Egretta novaehollandiae* | White-faced Heron | Y | | | 19-Jan-2017 |
| *Elanus axillaris* | Black-shouldered Kite | Y | | | 28-Feb-2016 |
| *Eolophus roseicapilla* | Galah | Y | | | 25-Aug-2020 |
| *Eolophus roseicapilla albiceps* | Galah (most of SA) | Y | | | 19-Jan-2017 |
| *Epthianura albifrons* | White-fronted Chat | Y | | | 26-Nov-2020 |
| *Epthianura aurifrons* | Orange Chat | Y | | | 26-Oct-1985 |
| *Falco berigora* | Brown Falcon | Y | | | 13-Nov-1999 |
| *Falco cenchroides* | Nankeen Kestrel | Y | | | 11-Oct-2020 |
| *Gavicalis virescens* | Singing Honeyeater | Y | | | 27-Oct-2020 |
| *Gavicalis virescens sonorus* | Singing Honeyeater (EP, YP, FR, MN, AP, MM, coastal SE) | Y | | | 19-Jan-2017 |
| *Grallina cyanoleuca* | Magpielark | Y | | | 11-Oct-2020 |
| *Gymnorhina tibicen* | Australian Magpie | Y | | | 27-Oct-2020 |
| *Haematopus fuliginosus fuliginosus* | Sooty Oystercatcher | Y | | R | 22-Aug-2014 |
| *Haematopus longirostris* | Pied Oystercatcher | Y | | R | 19-Jan-2017 |
| *Haliastur sphenurus* | Whistling Kite | Y | | | 28-Feb-2016 |

| | | | | | |
|---|---|---|---|---|---|
| *Hieraaetus morphnoides* | Little Eagle | Y | | V | 28-Dec-2014 |
| *Himantopus leucocephalus* | Pied Stilt | Y | | | 28-Apr-1990 |
| *Hirundo neoxena neoxena* | Welcome Swallow | Y | | | 11-Oct-2020 |
| *Hydroprogne caspia* | Caspian Tern | Y | | | 11-Oct-2020 |
| *Larus pacificus* | Pacific Gull | Y | | | 11-Oct-2020 |
| *Limosa lapponica* | Bar-tailed Godwit | Y | ssp | ssp | 29-Nov-2012 |
| *Limosa lapponica baueri* | Bar-tailed Godwit | Y | VU | R | 28-Feb-2016 |
| *Limosa limosa melanuroides* | Black-tailed Godwit | Y | | R | 29-Oct-1988 |
| *Malurus leucopterus leuconotus* | White-winged Fairywren | Y | | | 26-Nov-2020 |
| *Manorina flavigula* | Yellow-throated Miner | Y | ssp | ssp | 24-Nov-1984 |
| *Melanodryas cucullata cucullata* | Hooded Robin (YP, MN, AP, MLR, MM, SE) | Y | | R | 30-Dec-1985 |
| *Melopsittacus undulatus* | Budgerigar | Y | | | 26-Oct-1985 |
| *Microcarbo melanoleucos melanoleucos* | Little Pied Cormorant | Y | | | 11-Oct-2020 |
| *Milvus migrans migrans* | Black Kite | Y | | | 25-Aug-2020 |
| *Mirafra javanica* | Horsfield's Bush Lark | Y | | | 15-Aug-2014 |
| *Neophema chrysostoma* | Blue-winged Parrot | Y | | V | 22-Aug-2014 |
| *Neophema elegans elegans* | Elegant Parrot | Y | | R | 27-Oct-2020 |
| *Neophema petrophila zietzi* | Rock Parrot | Y | | R | 21-Jan-2005 |
| *Neophema sp.* | Neophema parrots | Y | | | 25-Aug-2020 |
| *Northiella haematogaster (NC)* | Bluebonnet (Eastern and Naretha) | Y | | ssp | 29-May-2006 |

| | | | | | |
|---|---|---|---|---|---|
| *Northiella haematogaster haematogaster* | Eastern Bluebonnet (eastern and central SA) | Y | | | 26-Aug-2020 |
| *Numenius madagascariensis* | Far Eastern Curlew | Y | CR | E | 19-Jan-2017 |
| *Numenius phaeopus variegatus* | Whimbrel | Y | | R | 08-Dec-1990 |
| *Ocyphaps lophotes* | Crested Pigeon | Y | | | 27-Oct-2020 |
| *Pandion haliaetus cristatus* | Eastern Osprey | Y | | E | 28-Oct-2014 |
| *Passer domesticus domesticus* | House Sparrow | N | | | 19-Jan-2017 |
| *Pelecanus conspicillatus* | Australian Pelican | Y | | | 11-Oct-2020 |
| *Petrochelidon ariel* | Fairy Martin | Y | | | 13-Nov-1993 |
| *Petrochelidon nigricans* | Tree Martin | Y | | | 22-Nov-2014 |
| *Petrochelidon nigricans neglecta* | Tree Martin (all of SA) | Y | | | 19-Jan-2017 |
| *Phalacrocorax carbo* | Great Cormorant | Y | | | 19-Jan-2017 |
| *Phalacrocorax fuscescens* | Black-faced Cormorant | Y | | | 13-Nov-1993 |
| *Phalacrocorax sulcirostris* | Little Black Cormorant | Y | | | 19-Jan-2017 |
| *Phalacrocorax varius* | Great Pied Cormorant | Y | | | 19-Jan-2017 |
| *Phaps chalcoptera* | Common Bronzewing | Y | | | 13-Nov-1993 |
| *Phaps elegans* | Brush Bronzewing | Y | | | 19-Jan-2017 |
| *Platalea regia* | Royal Spoonbill | Y | | | 25-Aug-2020 |
| *Pluvialis fulva* | Pacific Golden Plover | Y | | R | 22-Feb-1981 |
| *Pluvialis squatarola squatarola* | Grey Plover | Y | | | 19-Jan-2017 |
| *Pomatostomus superciliosus* | White-browed Babbler | Y | | | 27-Oct-2020 |
| *Pomatostomus superciliosus superciliosus* | White-browed Babbler (southern SA) | Y | | | 28-Feb-2016 |

| | | | | | |
|---|---|---|---|---|---|
| *Porzana fluminea* | Australian Crake (Australian Spotted Crake) | Y | | | 22-Aug-2014 |
| *Rhipidura albiscapa* | Grey Fantail | Y | | | 10-Jun-1985 |
| *Rhipidura leucophrys leucophrys* | Willie Wagtail | Y | | | 11-Oct-2020 |
| *Sericornis frontalis* | White-browed Scrubwren | Y | | | 11-Oct-2020 |
| *Sericornis frontalis (NC)* | White-browed Scrubwren | Y | | | 22-Aug-2014 |
| *Spilopelia chinensis* | Spotted Dove | N | | | 24-Aug-2020 |
| *Sternula nereis nereis* | Fairy Tern | Y | VU | E | 28-Feb-2016 |
| *Sturnus vulgaris vulgaris* | Common Starling | N | | | 11-Oct-2020 |
| *Tadorna tadornoides* | Australian Shelduck | Y | | | 27-Oct-2020 |
| *Thalasseus bergii cristatus* | Greater Crested Tern | Y | | | 11-Oct-2020 |
| *Thinornis cucullatus cucullatus* | Hooded Plover | Y | VU | V | 29-Jan-2013 |
| *Threskiornis molucca molucca* | Australian White Ibis | Y | | | 28-Feb-2016 |
| *Todiramphus sanctus* | Sacred Kingfisher | Y | | | 22-Aug-2014 |
| *Tribonyx ventralis* | Black-tailed Nativehen | Y | | | 22-Aug-2014 |
| *Tringa nebularia* | Common Greenshank | Y | | | 11-Oct-2020 |
| *Tringa stagnatilis* | Marsh Sandpiper | Y | | | 13-Jan-1990 |
| *Turdus merula merula* | Common Blackbird | N | | | 11-Oct-2020 |
| *Turnix varius varius* | Painted Buttonquail | Y | | R | 16-Sep-2006 |
| *Vanellus miles* | Masked Lapwing | Y | | | 02-Jun-2017 |
| *Vanellus miles novaehollandiae* | Spur-winged Plover | Y | | | 19-Jan-2017 |
| *Vanellus tricolor* | Banded Lapwing | Y | | | 22-Dec-1985 |
| *Xenus cinereus* | Terek Sandpiper | Y | | R | 02-Jan-2005 |
| *Zosterops lateralis* | Silvereye | Y | | | 22-Aug-2014 |

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|---|---|---|---|---|---|
| *Felis catus* | Domestic Cat (Feral Cat) | N | | | 19-Nov-2014 |
| *Lepus europaeus* | European Brown Hare | N | | | 20-Nov-2014 |
| *Macropus (Osphranter) robustus* | Euro | Y | | | 30-Nov-2016 |
| *Mus musculus* | House Mouse | N | | | 22-Nov-2014 |
| *Oryctolagus cuniculus* | Rabbit (European Rabbit) | N | | | 21-Nov-2014 |
| *Tachyglossus aculeatus* | Short-beaked Echidna | Y | ssp | ssp | 01-Sep-2011 |
| *Vulpes vulpes* | Fox (Red Fox) | N | | | 22-Nov-2014 |
| *Aprasia inaurita* | Red-tailed Worm-lizard | Y | | | 21-Nov-2014 |
| *Christinus marmoratus* | Marbled Gecko | Y | | | 10-May-1987 |
| *Ctenophorus pictus* | Painted Dragon | Y | | | 01-Feb-1982 |
| *Ctenotus spaldingi* | Eastern Striped Skink | Y | | | 01-Feb-1982 |
| *Hemiergis peronii* | Four-toed Earless Skink | Y | | | 04-May-2015 |
| *Lerista dorsalis* | Southern Four-toed Slider | Y | | | 19-Nov-2014 |
| *Lerista edwardsae* | Myall Slider | Y | | | 14-Feb-2013 |
| *Lerista terdigitata* | Southern Three-toed Slider | Y | | | 04-May-2015 |
| *Liopholis multiscutata* | Bull Skink | Y | | | 10-May-1987 |
| *Menetia greyii* | Dwarf Skink | Y | | | 04-May-2015 |
| *Morethia adelaidensis* | Adelaide Snake-eye | Y | | | 04-May-2015 |
| *Morethia obscura* | Mallee Snake-eye | Y | | | 20-Nov-2014 |
| *Pogona barbata* | Eastern Bearded Dragon | Y | | | 28-Oct-2014 |
| *Pseudonaja textilis* | Eastern Brown Snake | Y | | | 06-Dec-2016 |
| *Strophurus intermedius* | Southern Spiny-tailed Gecko | Y | | | 07-May-2015 |
| *Suta spectablilis* | Mallee Black-headed Snake | Y | | | 10-May-1987 |

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|---|---|---|---|---|---|
| *Tiliqua occipitalis* | Western Bluetongue | Y | | | 20-Nov-2014 |
| *Tiliqua rugosa* | Sleepy Lizard | Y | | | 02-Jun-2017 |
| *Tympanocryptis lineata* | Lined Earless Dragon | Y | | | 10-May-1987 |
| *Underwoodisaurus milii* | Common Barking Gecko | Y | | | 10-May-1987 |
| *Varanus gouldii* | Sand Goanna | Y | | | 29-Nov-2020 |

Appendix 2. **Flora species recorded within 5km**

| ***SPECIES*** | **COMMON NAME** | **NATIVE** | **NATIONAL RATING** | **STATE RATING** | **DATE OF LAST RECORD** |
|---|---|---|---|---|---|
| *Cheilanthes austrotenuifolia* | Annual Rock-fern | Y | | | 17-Sep-2020 |
| *Carpobrotus rossii* | Native Pigface | Y | | | 06-Dec-2016 |
| *Carpobrotus rossii (NC)* | Native Pigface | Y | | | 23-Oct-1997 |
| *Carpobrotus sp.* | Pigface | Y | | | 30-Oct-2003 |
| *Carpobrotus sp. Short calyx (S.T.Blake 20451)* | Native Pigface | Y | | | 25-Oct-1984 |
| *Disphyma crassifolium ssp. clavellatum* | Round-leaf Pigface | Y | | | 07-Jun-2017 |
| *Gunniopsis septifraga* | Green Pigface | Y | | | 06-Dec-2016 |
| *Mesembryanthemum crystallinum* | Common Iceplant | N | | | 10-Apr-2017 |
| *Mesembryanthemum nodiflorum* | Slender Iceplant | N | | | 06-Dec-2016 |
| *Mesembryanthemum sp.* | Iceplant | N | | | 07-Jun-2017 |
| *Tetragonia implexicoma* | Bower Spinach | Y | | | 06-Dec-2016 |
| *Alyxia buxifolia* | Sea Box | Y | | | 06-Dec-2016 |
| *Avicennia marina ssp. marina* | Grey Mangrove | Y | | | 02-Sep-2015 |
| *Arenaria leptoclados* | Lesser Thyme-leaved Sandwort | N | | | 24-Oct-1997 |
| *Cerastium balearicum* | Chickweed | N | | | 24-Oct-1997 |
| *Minuartia mediterranea* | Slender Sandwort | N | | | 06-Dec-2016 |
| *Silene nocturna* | Mediterranean Catchfly | N | | | 24-Oct-1997 |
| *Spergularia diandra* | Lesser Sand-spurrey | N | | | 06-Dec-2016 |
| *Spergularia diandra (NC)* | Lesser Sand-spurrey | N | | | 12-Nov-1996 |
| *Spergularia marina* | Salt Sand-spurrey | Y | | | 12-Nov-1996 |
| *Spergularia marina (NC)* | Salt Sand-spurrey | N | | | 12-Nov-1996 |
| *Spergularia sp.* | Sand-spurrey | N | | | 07-Jun-2017 |
| *Spergularia tasmanica* | Coast Sand-spurrey | Y | | | 25-Oct-1984 |
| *Allocasuarina verticillata* | Drooping Sheoak | Y | | | 17-Sep-2020 |

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|---|---|---|---|---|---|
| *Centrolepis aristata* | Pointed Centrolepis | Y | | | 17-Sep-2020 |
| *Atriplex cinerea* | Coast Saltbush | Y | | | 16-Aug-2005 |
| *Atriplex paludosa ssp.* | Marsh Saltbush | Y | | | 28-Sep-2015 |
| *Atriplex paludosa ssp. cordata* | Marsh Saltbush | Y | | | 07-Jun-2017 |
| *Atriplex paludosa ssp. paludosa* | Marsh Saltbush | Y | | | 07-Jun-2017 |
| *Atriplex prostrata* | Creeping Saltbush | N | | | 24-Oct-1997 |
| *Chenopodium album* | Fat Hen | N | | | 28-Sep-2015 |
| *Enchylaena tomentosa var.* | Ruby Saltbush | Y | | | 28-Sep-2015 |
| *Enchylaena tomentosa var. tomentosa* | Ruby Saltbush | Y | | | 07-Jun-2017 |
| *Halosarcia sp. (NC)* | Samphire | Y | | | 30-Oct-2003 |
| *Maireana appressa* | Pale-fruit Bluebush | Y | | | 06-Jun-1984 |
| *Maireana brevifolia* | Short-leaf Bluebush | Y | | | 07-Jun-2017 |
| *Maireana oppositifolia* | Salt Bluebush | Y | | | 10-Apr-2017 |
| *Rhagodia candolleana ssp. candolleana* | Sea-berry Saltbush | Y | | | 06-Dec-2016 |
| *Rhagodia crassifolia* | Fleshy Saltbush | Y | | | 28-Sep-2015 |
| *Salicornia quinqueflora ssp. quinqueflora* | Beaded Samphire | Y | | | 28-Sep-2015 |
| *Salsola australis* | Buckbush | Y | | | 07-Jun-2017 |
| *Sclerolaena diacantha* | Grey Bindyi | Y | | | 12-Nov-1996 |
| *Sclerolaena obliquicuspis* | Oblique-spined Bindyi | Y | | | 07-Jun-2017 |
| *Sclerolaena uniflora* | Small-spine Bindyi | Y | | | 07-Jun-2017 |
| *Suaeda australis* | Austral Seablite | Y | | | 10-Apr-2017 |
| *Tecticornia arbuscula* | Shrubby Samphire | Y | | | 12-Nov-1996 |
| *Tecticornia flabelliformis* | Bead Samphire | Y | VU | V | 17-Feb-2011 |
| *Tecticornia halocnemoides ssp.* | Grey Samphire | Y | | | 28-Sep-2015 |
| *Tecticornia halocnemoides ssp. halocnemoides* | Grey Samphire | Y | | | 07-Jun-2017 |
| *Tecticornia indica ssp.* | Brown-head Samphire | Y | | | 28-Sep-2015 |
| *Tecticornia indica ssp. leiostachya* | Brown-head Samphire | Y | | | 12-Nov-1996 |
| *Tecticornia moniliformis* | | Y | | | 12-Nov-1996 |

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|---|---|---|---|---|---|
| *Tecticornia pergranulata ssp.* | Black-seed Samphire | Y | | | 07-Jun-2017 |
| *Tecticornia pergranulata ssp. pergranulata* | Black-seed Samphire | Y | | | 12-Nov-1996 |
| *Tecticornia pruinosa* | Bluish Samphire | Y | | | 06-Dec-2016 |
| *Tecticornia sp.* | Samphire | Y | | | 07-Jun-2017 |
| *Threlkeldia diffusa* | Coast Bonefruit | Y | | | 07-Jun-2017 |
| *Rhizoclonium tortuosum* | | Y | | | 25-Mar-1982 |
| *Angianthus tomentosus* | Hairy Angianthus | Y | | | 23-Oct-1997 |
| *Arctotheca calendula* | Cape Weed | N | | | 17-Sep-2020 |
| *Brachyscome ciliaris var. ciliaris* | Variable Daisy | Y | | | 06-Dec-2016 |
| *Brachyscome lineariloba* | Hard-head Daisy | Y | | | 12-Nov-1996 |
| *Centaurea melitensis* | Malta Thistle | N | | | 06-Dec-2016 |
| *Chrysanthemoides monilifera ssp. monilifera* | Boneseed | N | | | 17-Sep-2020 |
| *Cotula australis* | Common Cotula | Y | | | 11-Apr-2017 |
| *Craspedia haplorrhiza* | Billy-buttons | Y | | | 25-Aug-1907 |
| *Dittrichia graveolens* | Stinkweed | N | | | 10-Apr-2017 |
| *Hypochaeris sp.* | Cat's Ear | N | | | 23-Oct-1997 |
| *Olearia axillaris* | Coast Daisy-bush | Y | | | 06-Dec-2016 |
| *Olearia muelleri* | Mueller's Daisy-bush | Y | | | 12-Nov-1996 |
| *Olearia ramulosa* | Twiggy Daisy-bush | Y | | | 24-Oct-1997 |
| *Oncosiphon suffruticosum* | Calomba Daisy | N | | | 07-Jun-2017 |
| *Podotheca angustifolia* | Sticky Long-heads | Y | | | 23-Oct-1997 |
| *Pogonolepis muelleriana* | Stiff Cup-flower | Y | | | 12-Nov-1996 |
| *Reichardia tingitana* | False Sowthistle | N | | | 07-Jun-2017 |
| *Senecio glossanthus (NC)* | Annual Groundsel | Y | | | 23-Oct-1997 |
| *Senecio pinnatifolius (NC)* | Variable Groundsel | Y | | | 24-Oct-1997 |
| *Senecio pinnatifolius group* | Variable Groundsel | Y | | | 06-Dec-2016 |
| *Senecio sp.* | Groundsel | Y | | | 06-Dec-2016 |

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|---|---|---|---|---|---|
| *Senecio spanomerus* | | Y | | | 07-Jun-2017 |
| *Sonchus oleraceus* | Common Sow-thistle | N | | | 07-Jun-2017 |
| *Sonchus oleraceus (NC)* | Common Sow-thistle | N | | | 30-Oct-2003 |
| *Vittadinia australasica var. australasica* | Sticky New Holland Daisy | Y | | | 06-Dec-2016 |
| *Crassula colligata ssp. lamprosperma* | | Y | | | 12-Nov-1996 |
| *Crassula sieberiana* | Sieber's Crassula | Y | | E | 17-Sep-2020 |
| *Crassula sieberiana ssp. tetramera (NC)* | Australian Stonecrop | Y | | | 24-Oct-1997 |
| *Crassula sp.* | Crassula/Stonecrop | Y | | | 06-Dec-2016 |
| *Alyssum linifolium* | Flax-leaf Alyssum | N | | | 12-Nov-1996 |
| *Brassica tournefortii* | Wild Turnip | N | | | 07-Jun-2017 |
| *Cakile maritima ssp. maritima* | Two-horned Sea Rocket | N | | | 28-Sep-2015 |
| *Carrichtera annua* | Ward's Weed | N | | | 23-Oct-1997 |
| *Hornungia procumbens* | Oval Purse | N | | | 09-Aug-1995 |
| *Sisymbrium orientale* | Indian Hedge Mustard | N | | | 24-Oct-1997 |
| *Cucumis myriocarpus ssp. myriocarpus* | Paddy Melon | N | | | 07-Jun-2017 |
| *Callitris gracilis* | Southern Cypress Pine | Y | | | 24-Oct-1997 |
| *Ficinia nodosa* | Knobby Club-rush | Y | | | 06-Dec-2016 |
| *Lepidosperma carphoides* | Black Rapier-sedge | Y | | | 09-Jun-1924 |
| *Hibbertia sericea* | Silky Guinea-flower | Y | | | 17-Sep-2020 |
| *Drosera glanduligera* | Scarlet Sundew | Y | | | 17-Sep-2020 |
| *Beyeria lechenaultii* | Pale Turpentine Bush | Y | | | 03-May-2011 |
| *Euphorbia helioscopia* | Sun Spurge | N | | | 30-Oct-2003 |
| *Euphorbia paralias* | Sea Spurge | N | | | 28-Sep-2015 |
| *Euphorbia terracina* | False Caper | N | | | 28-Sep-2015 |
| *Frankenia pauciflora var.* | Southern Sea-heath | Y | | | 06-Dec-2016 |
| *Frankenia pauciflora var. fruticulosa* | Southern Sea-heath | Y | | | 28-Sep-2015 |
| *Frankenia pauciflora var. gunnii* | Southern Sea-heath | Y | | | 12-Nov-1996 |
| *Frankenia pulverulenta* | Mediterranean Sea-heath | N | | | 12-Nov-1996 |
| *Frankenia sp.* | Sea-heath | Y | | | 07-Jun-2017 |

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|---|---|---|---|---|---|
| *Centaurium tenuiflorum* | Branched Centaury | N | | | 17-Sep-2020 |
| *Scaevola albida* | Pale Fanflower | Y | | | 17-Sep-2020 |
| *Aira sp.* | Hair-grass | N | | | 07-Jun-2017 |
| *Anthoxanthum odoratum* | Sweet Vernal Grass | N | | | 28-Sep-2015 |
| *Austrostipa drummondii* | Cottony Spear-grass | Y | | | 06-Dec-2016 |
| *Austrostipa elegantissima* | Feather Spear-grass | Y | | | 06-Dec-2016 |
| *Austrostipa exilis* | Heath Spear-grass | Y | | | 06-Dec-2016 |
| *Austrostipa pilata* | Prickly Spear-grass | Y | | | 06-Dec-2016 |
| *Austrostipa scabra ssp. falcata* | Slender Spear-grass | Y | | | 24-Oct-1997 |
| *Austrostipa sp.* | Spear-grass | Y | | | 07-Jun-2017 |
| *Avellinia festucoides* | Avellinia | N | | | 06-Dec-2016 |
| *Avena barbata* | Bearded Oat | N | | | 07-Jun-2017 |
| *Bromus diandrus* | Great Brome | N | | | 23-Oct-1997 |
| *Bromus madritensis* | Compact Brome | N | | | 10-Apr-2017 |
| *Bromus rubens* | Red Brome | N | | | 06-Dec-2016 |
| *Bromus sp.* | Brome | Y | | | 06-Dec-2016 |
| *Gramineae sp.* | Grass Family | Y | | | 09-Aug-1995 |
| *Hordeum glaucum* | Blue Barley-grass | N | | | 30-Oct-2003 |
| *Hordeum marinum* | Sea Barley-grass | N | | | 28-Sep-2015 |
| *Lagurus ovatus* | Hare's Tail Grass | N | | | 06-Dec-2016 |
| *Lolium perenne* | Perennial Ryegrass | N | | | 25-Oct-1984 |
| *Lolium perenne X Lolium rigidum* | Hybrid Ryegrass | N | | | 28-Sep-2015 |
| *Lolium rigidum* | Wimmera Ryegrass | N | | | 30-Oct-2003 |
| *Lolium sp.* | Ryegrass | N | | | 23-Oct-1997 |
| *Parapholis incurva* | Curly Ryegrass | N | | | 06-Dec-2016 |
| *Phalaris minor* | Lesser Canary-grass | N | | | 05-Nov-1904 |
| *Rostraria cristata* | Annual Cat's-tail | N | | | 06-Dec-2016 |
| *Rytidosperma caespitosum (NC)* | Common Wallaby-grass | Y | | | 10-Apr-2017 |
| *Rytidosperma setaceum* | Small-flower Wallaby-grass | Y | | | 07-Jun-2017 |
| *Rytidosperma sp.* | Wallaby-grass | Y | | | 07-Jun-2017 |
| *Schismus barbatus* | Arabian Grass | N | | | 23-Oct-1997 |

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|---|---|---|---|---|---|
| *Sphenopus divaricatus* | Wedge-foot Grass | N | | | 12-Nov-1996 |
| *Spinifex sericeus (NC)* | Rolling Spinifex | Y | | | 23-Oct-1997 |
| *Thinopyrum junceiforme* | Sea Wheat-grass | N | | | 28-Sep-2015 |
| *Vulpia myuros f.* | Fescue | N | | | 06-Dec-2016 |
| *Vulpia myuros f. megalura* | Fox-tail Fescue | N | | | 24-Oct-1997 |
| *Vulpia myuros f. myuros* | Rat's-tail Fescue | N | | | 24-Oct-1997 |
| *Vulpia sp.* | Fescue | N | | | 06-Dec-2016 |
| *Moraea setifolia* | Thread Iris | N | | | 07-Jun-2017 |
| *Romulea rosea var. australis* | Common Onion-grass | N | | | 17-Sep-2020 |
| *Marrubium vulgare* | Horehound | N | | | 30-Nov-2016 |
| *Acacia cupularis* | Cup Wattle | Y | | | 11-Apr-2017 |
| *Acacia hakeoides* | Hakea Wattle | Y | | | 04-Dec-1980 |
| *Acacia ligulata* | Umbrella Bush | Y | | | 30-Nov-2016 |
| *Acacia paradoxa* | Kangaroo Thorn | Y | | | 17-Sep-2020 |
| *Medicago minima* | Little Medic | N | | | 12-Nov-1996 |
| *Medicago polymorpha* | Burr-medic | N | | | 07-Jun-2017 |
| *Melilotus indicus* | King Island Melilot | N | | | 06-Dec-2016 |
| *Trifolium dubium* | Suckling Clover | N | | | 06-Dec-2016 |
| *Trifolium tomentosum* | Woolly Clover | N | | | 12-Nov-1996 |
| *Aloe maculata* | Broad-leaf Aloe | N | | | 06-Dec-2016 |
| *Asphodelus fistulosus* | Onion Weed | N | | | 10-Apr-2017 |
| *Dianella brevicaulis* | Short-stem Flax-lily | Y | | | 06-Dec-2016 |
| *Dianella revoluta var.* | | Y | | | 09-Aug-1995 |
| *Xanthorrhoea quadrangulata* | Rock Grass-tree | Y | | | 17-Sep-2020 |
| *Limonium companyonis* | Sea-lavender | N | | | 06-Dec-2016 |
| *Limonium sinuatum* | Notch-leaf Sea-lavender | N | | | 22-Oct-2015 |
| *Limonium sp.* | Sea-lavender | N | | | 10-Apr-2017 |
| *Linum marginale* | Native Flax | Y | | | 17-Sep-2020 |
| *Amyema melaleucae* | Tea-tree Mistletoe | Y | | | 06-Dec-2016 |
| *Lichen sp.* | | Y | | | 12-Nov-1996 |
| *Moss sp.* | | Y | | | 12-Nov-1996 |
| *Lawrencia squamata* | Thorny Lawrencia | Y | | | 06-Dec-2016 |
| *Eremophila deserti* | Turkey-bush | Y | | | 24-Oct-1997 |

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|---|---|---|---|---|---|
| *Myoporum insulare* | Common Boobialla | Y | | | 06-Dec-2016 |
| *Calytrix tetragona* | Common Fringe-myrtle | Y | | | 17-Sep-2020 |
| *Eucalyptus sp.* | | Y | | | 17-Sep-2020 |
| *Melaleuca lanceolata* | Dryland Tea-tree | Y | | | 06-Dec-2016 |
| *Melaleuca lanceolata ssp. lanceolata (NC)* | Dryland Tea-tree | Y | | | 30-Oct-2003 |
| *Glossodia major* | Purple Cockatoo | Y | | | 17-Sep-2020 |
| *Papaver somniferum ssp. setigerum (NC)* | Small-flower Opium Poppy | N | | | 23-Oct-1997 |
| *Pittosporum angustifolium* | Native Apricot | Y | | | 06-Dec-2016 |
| *Comesperma sp.* | Milkwort | Y | | | 28-Sep-2015 |
| *Comesperma volubile* | Love Creeper | Y | | | 24-Oct-1997 |
| *Muehlenbeckia gunnii* | Coastal Climbing Lignum | Y | | | 23-Oct-1997 |
| *Lysimachia arvensis* | Pimpernel | N | | | 11-Apr-2017 |
| *Hakea carinata* | Erect Hakea | Y | | | 17-Sep-2020 |
| *Isopogon ceratophyllus* | Horny Cone-bush | Y | | | 17-Sep-2020 |
| *Clematis microphylla* | Old Man's Beard | Y | | | 16-Aug-2005 |
| *Pomaderris paniculosa ssp. paniculosa* | Mallee Pomaderris | Y | | | 23-Oct-1997 |
| *Galium murale* | Small Bedstraw | N | | | 24-Oct-1997 |
| *Geijera linearifolia* | Sheep Bush | Y | | | 06-Dec-2016 |
| *Exocarpos aphyllus* | Leafless Cherry | Y | | | 06-Dec-2016 |
| *Dodonaea viscosa ssp.* | Sticky Hop-bush | Y | | | 17-Sep-2020 |
| *Dodonaea viscosa ssp. angustissima* | Narrow-leaf Hop-bush | Y | | | 28-Sep-2015 |
| *Dodonaea viscosa ssp. spatulata* | Sticky Hop-bush | Y | | | 24-Oct-1997 |
| *Parentucellia sp.* | Bartsia | N | | | 17-Sep-2020 |
| *Lycium ferocissimum* | African Boxthorn | N | | | 07-Jun-2017 |
| *Solanum nigrum* | Black Nightshade | N | | | 07-Jun-2017 |
| *Pimelea serpyllifolia ssp. serpyllifolia* | Thyme Riceflower | Y | | | 16-Aug-2005 |
| *Bupleurum semicompositum* | Hare's Ear | N | | | 24-Oct-1997 |
| *Daucus glochidiatus* | Native Carrot | Y | | | 09-Aug-1995 |
| *Hydrocotyle medicaginoides* | Medic Pennywort | Y | | | 06-Dec-2016 |
| *Nitraria billardierei* | Nitre-bush | Y | | | 07-Jun-2017 |

Appendix 3. **Images**

Abandoned shed, rubbish, cement, top and bottom.

Coastal Moort, *Eucalyptus utilis*

Dumped tyres

Abandoned shedding, inside and out.

Existing track

Damaged AIBS fence

Rabbit burrow

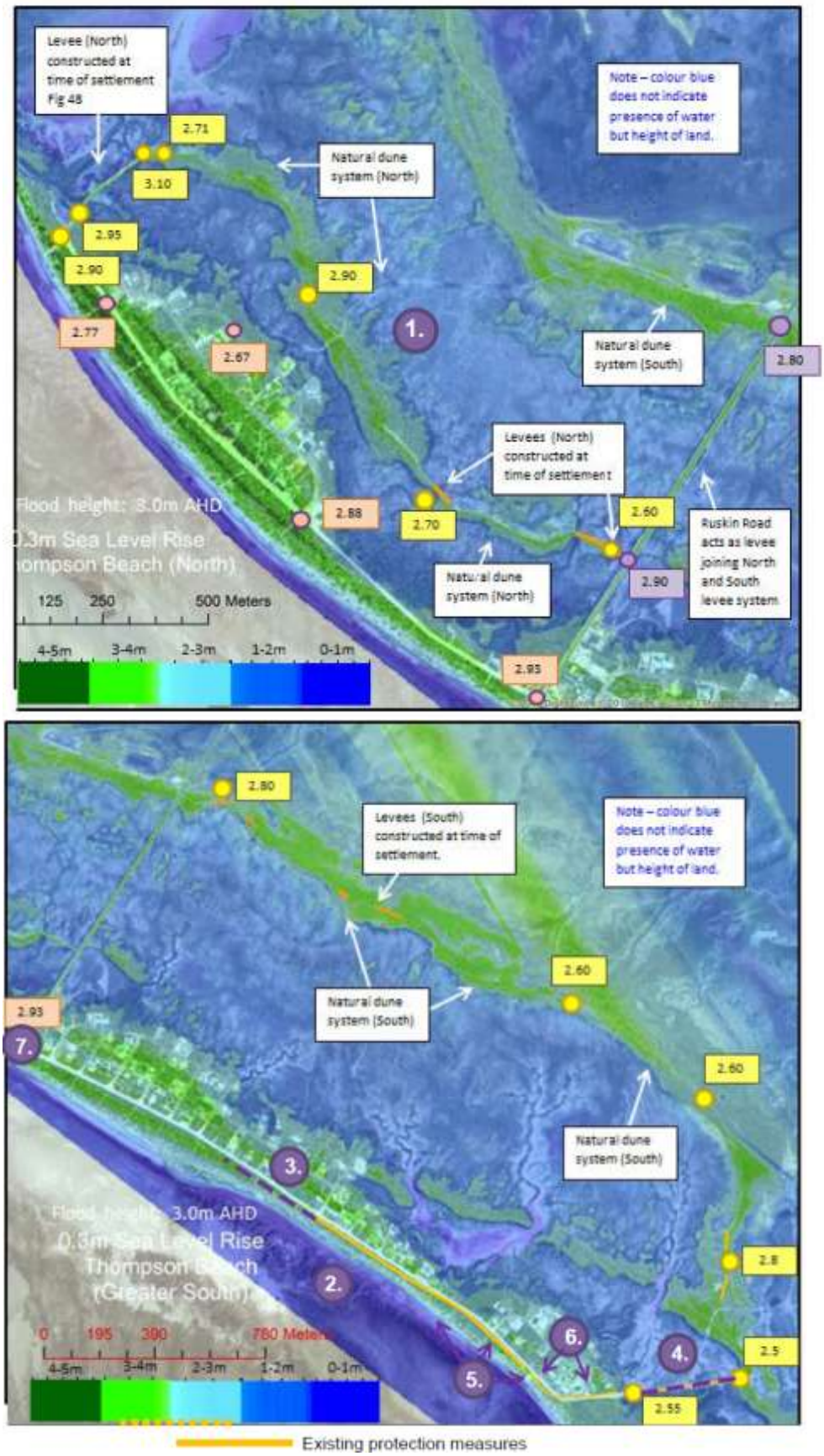
Rubbish dumped in samphire shrubland leading to AIBS.

Silvereye group in dead African Boxthorn.

Juvenile Coastal Moort, *Eucalyptus utilis*.

Fox scat.

Appendix 4. **Thompson Beach Levee Bank Locations**




Thompson Beach North (top) and South (bottom) levee bank locations. Taken from Weston, M & Kellet, J 2014, *Coastal Settlements Adaptation Study Thompson Beach Framework Report,* University of South Australia School of Natural and Built Environments Institute for Urban Renewal, Adelaide, South Australia.


Levee banks, tidal flow and development location