

South Trigg Lookout Revegetation Plan



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Document Control

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Version	Date	Prepared by	Reviewed by	Approved by
Draft 1	2 June 2025			
Draft 2	9 June 2025			
Final 1	10 June 2025			
Final 2	12 June 2025			
Final 3	14 July 2025			

Foreword

This revegetation plan is being developed by the City of Stirling in consideration of Department of Water and Environmental Regulation guidance document, *A Guide to Preparing Revegetation Plans for Clearing Permits under Part V of the Environmental Protection Act 1986*. The plan is related to clearing application **CPS 10923/1**.

Introduction

The City of Stirling has been restoring the Quindalup Trigg dunes for the past 15 years in partnership with local friends group Stirling Natural Environment Coastcare and the wider community. During this time, all primary dune cells between Trigg Point and the South Trigg Beach have been actively restored except for one 3,650m² dune cell located immediately west of the new Surfing WA building and the intersection of West Coast Drive and West Coast Highway. For decades, this dune cell has been utilised as an unofficial lookout for surfers to assess the beach and surf conditions to decide where and whether to surf. As a result, the dune cell has experienced persistent trampling and erosion, causing habitat loss and sand inundation. Foot traffic from surfers was too excessive for any restoration in this area to be successful, with approximately 40% of the dune cell (1,460m²) being persistently trampled.

To effectively ameliorate the cell with establishing habitat and stabilising the dune, an effective alternative vantage point would need to be provided for surfers to assess the beach and surf conditions. The City has developed a two-stage lookout design with a natural sandy beach lookout within the dunes and a more formalised lookout set further back off the dunes including showers, drink fountain and some limestone walls to prevent grass from entering dune areas followed by active dune restoration of the site. As part of these works, it is anticipated that 58m² of dune vegetation will be impacted and 3,500m² of the dune cell will be utilised as an in situ offset for the vegetation impacted.

As part of the works, it has been assessed a clearing permit is required which includes an accompanying revegetation plan. The purpose of the revegetation plan is to:

- Reduce the footprint of the trampling area from 1,460m² to ~150m².
- Restore the dunes for the purpose of habitat.
- Detail the approach to undertaking revegetation works.
- Provide key milestones and timeframes for revegetation works.

This revegetation plan is related to clearing application **CPS 10923/1**. The plan was developed by City of Stirling Officers: Coordinator Conservation & Wildlife, Murray Woods, Senior Environmental Officer, Jacob Long and Environmental Officer, Ryan Flint. Murray holds a Bachelor of Environmental Science and has over 15 years' experience as a restoration ecologist in Quindalup coastal dune systems. Jacob and Ryan each hold a Bachelor of Conservation Biology and have over 7 years' experience as restoration ecologists in Quindalup coastal dune systems respectively.



Figure 1 – Map of South Trigg Dune Cell and Reference Site

Background of revegetation site

The dune cell is located within Coastal Reserve 368 West Coast Drive, Trigg, WA 6029, which is Crown Land managed by the City of Stirling for the purpose (H219490) of Recreation under Title Number LR3145 576. The land is zoned for Public Open Space under the MRS. Specific land details below:

Item	Detail
Land Number	260787
Lot Number	8
Plan Number	240238
Folio	576
Volume	3145
Reserve Number	12992
Landgate Land ID	3341505

Table 1 – South Trigg Dune Cell Land details

The area is partially located within the boundary of Bush Forever site 308 and is managed by the City for public recreation and conservation. The dune cell forms part of the Quindalup Dune System, which extends east through Trigg Bushland in this part of the Swan Coastal Plain due to parabolic dune systems interspersing with Spearwood dune systems, contributing to the high conservation value of the region.

The City manages the conservation values in the site in accordance with the City's Strategic Community Plan 2022-32, Local Biodiversity Strategy 2010 and Trigg Bushland Reserve Management Plan 2015. Further to this, historical vegetation surveys have been completed in partnership with the local friends group. Baseline vegetation surveys were undertaken in 2014 undertaken by Fisher Research Pty Ltd. These surveys and found the following:

2014 Weed Cover Values:

Undertaken by Fisher Research Pty Ltd, the majority of the site was noted to have 61-80% weeds, with the area adjacent to the lawn having 81-100% weeds due to grass invasion.

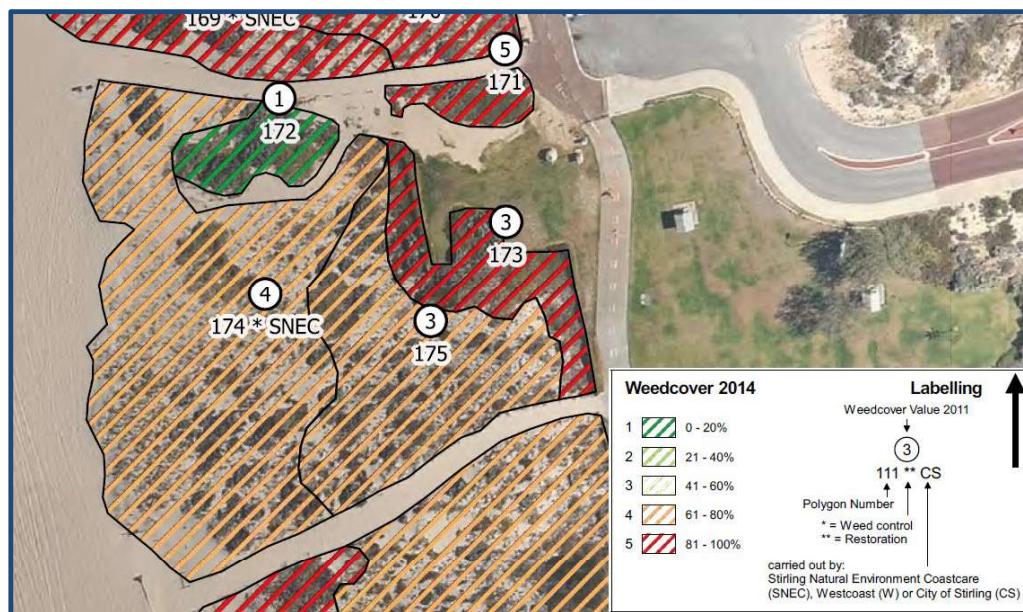


Figure 2 – Map of 2014 Weed Cover Values of South Trigg Dune Cell

2025 Weed Cover Values:

Undertaken by the City on 9 May 2025, the majority of the site was noted to have 81-100% weeds on the western side of the Dune Cell and weed issues adjacent to the lawned areas to the east of the pocket, with the weed cover noted as 0-20% throughout the centre of the dune cell due to current restoration works being undertaken by the City and conservation volunteer group.

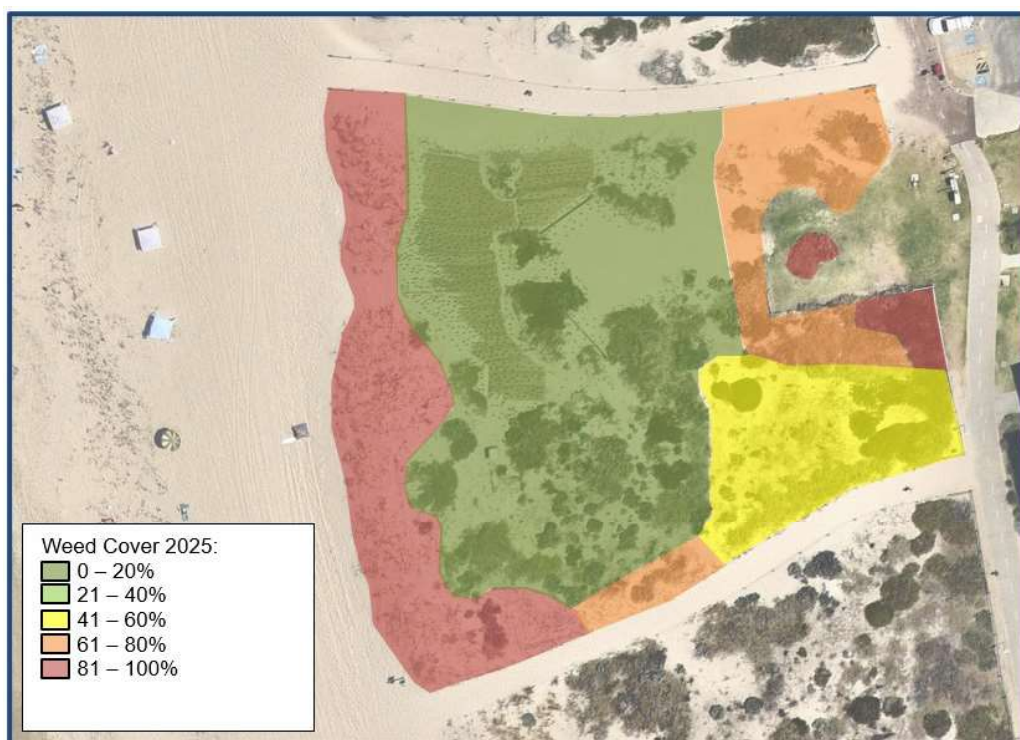


Figure 3 – Map of 2025 Weed Cover Values of South Trigg Dune Cell

2014 Flora Assessment:

In February 2014, Fisher Research Pty Ltd undertook a survey of the entire coast. 20 species were recorded within the Dune Cell including 8 native species and 12 weed species. See table 2.

2025 Flora Assessment:

On 9 May 2025, City Environmental Officers undertook a field survey which assessed for flora species, vegetation types and vegetation condition as per Keighery Vegetation Condition Assessment. 25 species were recorded within the Dune Cell including 15 local native species to the region and 10 weed species. This is a larger species richness from 2014. This is due to planting of local native species by the City and conservation volunteer group. See table 2.

Naturalised Status	Species	Common Name	Cons Code	2014	2025
Native to Western Australia	<i>Acanthocarpus preissii</i>	Prickle Lily	Not threatened		x
	<i>Carpobrotus virescens</i> **	Coastal Pigface	Not threatened		?
	<i>Conostylis candicans</i>	Grey Cottonhead	Not threatened		x
	<i>Crassula colorata</i>	Dense Stonecrop	Not threatened		x
	<i>Facinia nodosa</i>	Knotted Club Rush	Not threatened	x	x
	<i>Lepidosperma gladiatum</i>	Coast Sword-sedge	Not threatened		x
	<i>leucophyta brownii</i> (Canal Rocks form)	Cushion Bush	Not threatened		x
	<i>Myoporum insulare</i>		Not threatened		x
	<i>Olearia axillaris</i>	Coastal Daisybush	Not threatened	x	x
	<i>Rhagodia baccata</i>	Berry Saltbush	Not threatened	x	x
	<i>Scaevola crassifolia</i>	Thick-leaved Fan-flower	Not threatened	x	x
	<i>Spinifex xalterniflorus</i> Nees		Not threatened		x
	<i>Spinifex hirsutus</i>	Hairy Spinifex	Not threatened	x	x
	<i>Spinifex longifolius</i>	Beach Spinifex	Not threatened	x	x
	<i>Spyridium globulosum</i>	Basket Bush	Not threatened	x	
	<i>Threlkeldia diffusa</i>	Coast Bonefruit	Not threatened	x	x
Alien to Western Australia	<i>Ammophila arenaria</i>	European Marram Grass		x	x
	<i>Carpobrotus edulis</i> **	Pigface		x	?
	<i>Cenchrus clandestinus</i> (<i>Pennisetum clandestinum</i>)	Kikuyu grass		x	x
	<i>Cynodon dactylon</i>	Couch Grass		x	x
	<i>Erigeron bonariensis</i>	Fleabane			x
	<i>Euphorbia paralias</i>	Sea Spurge		x	
	<i>Oenothera drummondii</i>	Beach Evening Primrose		x	
	<i>Pelargonium capitatum</i>	Rose Pelargonium		x	x
	<i>Tetragonia decumbens</i>	Sea Spinach		x	x
	<i>Thinopyrum distichum</i>	Sea Wheatgrass		x	x
	<i>Trachyandra divaricata</i>	Dune Onion Weed		x	x
	<i>Trifolium repens</i>	White Clover			x
	<i>Unidentifiable grasses</i>			x	x

Table 2 – 2014 & 2025 Flora Survey in South Trigg Dune Cell

** Due to historical hybridisation [research](#) between native *Carpobrotus virescens* and weedy *Carpobrotus edulis* by DBCA the pigface on site was noted as *C. edulis* in 2014. The City believe remnant pigface on the site is native *C. virescens*.

Vegetation Descriptions:

On 9 May 2025, City Environmental Officers undertook a field survey which assessed for vegetation types. A total of two vegetation types were recorded within the survey area. *Olearia axillaris* shrubland and **Ammophila arenaria* tussock grassland (OaSAaG) was recorded towards the western boundary with *Olearia axillaris* and *Scaevola crassifolia* shrubland (OaScS) recorded to the eastern boundary adjacent to the lawned area and pedestrian shared path. Description and location are as follows:

Location	Description	Cons Code
Foredune	<i>Olearia axillaris</i> shrubland and * <i>Ammophila arenaria</i> tussock grassland	OaSAaG
Primary Swale	<i>Olearia axillaris</i> and <i>Scaevola crassifolia</i> shrubland	OaScS

Table 3 – Reference Site Vegetation Descriptions

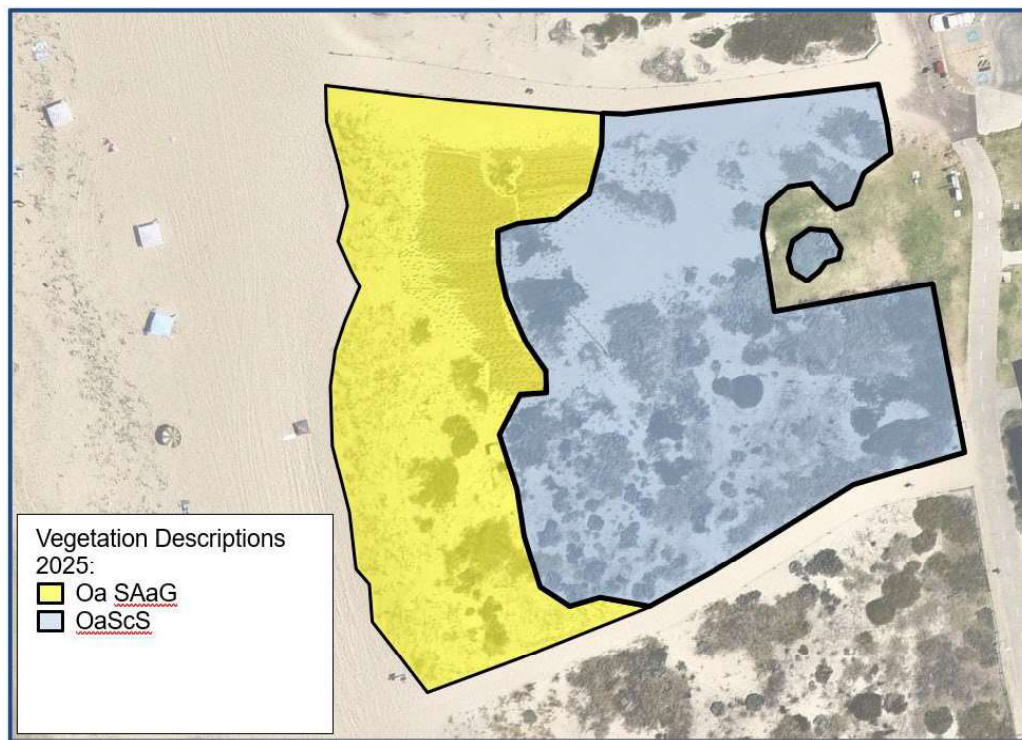


Figure 4 – Map of South Trigg Dune Cell Vegetation Descriptions

Condition Assessment:

On 9 May 2025, City Environmental Officers undertook a field survey which assessed for vegetation condition as per Keighery Vegetation Condition Assessment. Vegetation condition on site ranged from completely degraded to very good. The vegetation OaSAaG recorded to the west of the survey area was in a degraded to completely degraded condition due to the vegetation being comprised of high abundances of introduced **Ammophila arenaria*.

Degraded vegetation was also recorded within the areas adjacent to the lawned areas due to impacts from ingress of grasses into the conservation area. Vegetation within the primary swale was noted to be in good to very good condition as they were not impacted by weeds. Some of the areas noted with very good condition were subject to significant trampling, only offset by recent planting which was in place to maintain the vegetation structure.

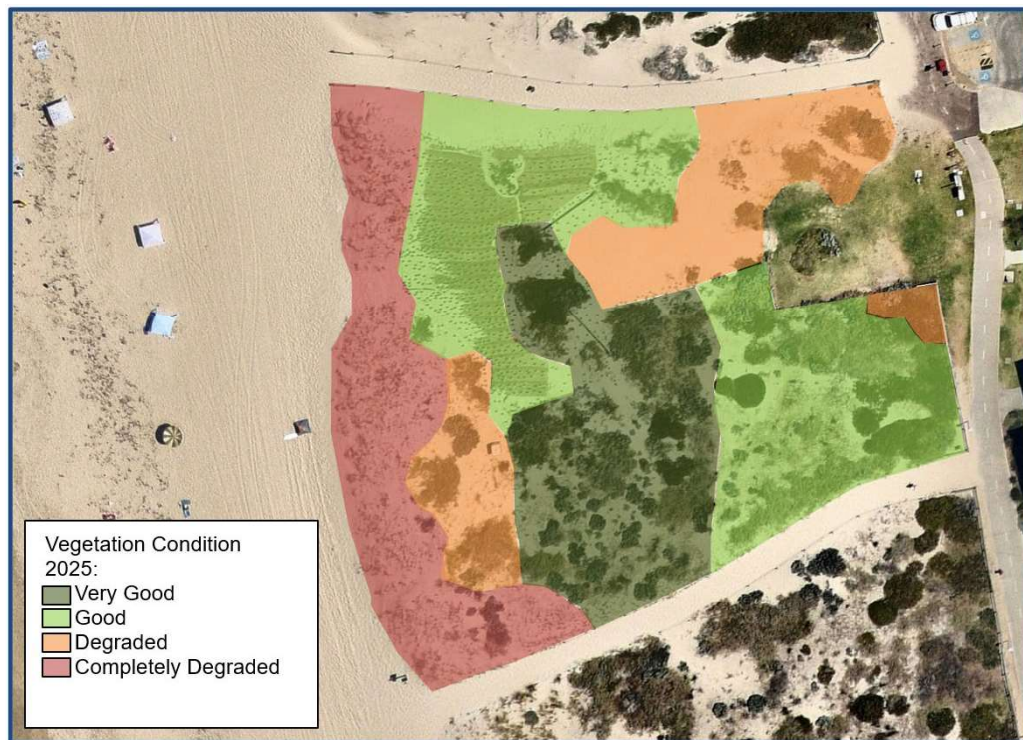


Figure 5 – Map of South Trigg Dune Cell Keighery Vegetation Condition

Observations of Fauna:

On 9 May 2025, the following species were observed on site while undertaking the field survey.

Species	Common Name
<i>Falco cenchroides</i>	Australian Kestrel (Nankeen Kestrel)
<i>Gavicalis virescens</i>	Singing Honeyeater
<i>Gymnorhina tibicen</i>	Australian Magpie
<i>Hirundo neoxena</i>	Welcome Swallow
<i>Ocyphaps lophotes</i>	Crested Pigeon
<i>Rhipidura leucophrys</i>	Willie Wagtail

Table 4 – Observations of Fauna

Drainage & Topography:

The South Trigg Dune Cell ranges from 4-8m AHD elevation. The site does not have any stormwater drainage held within it. There is a natural depression on the southern side of the dune cell with an elevated portion to the north of the site where windblown sand has accrued, captured by native vegetation.

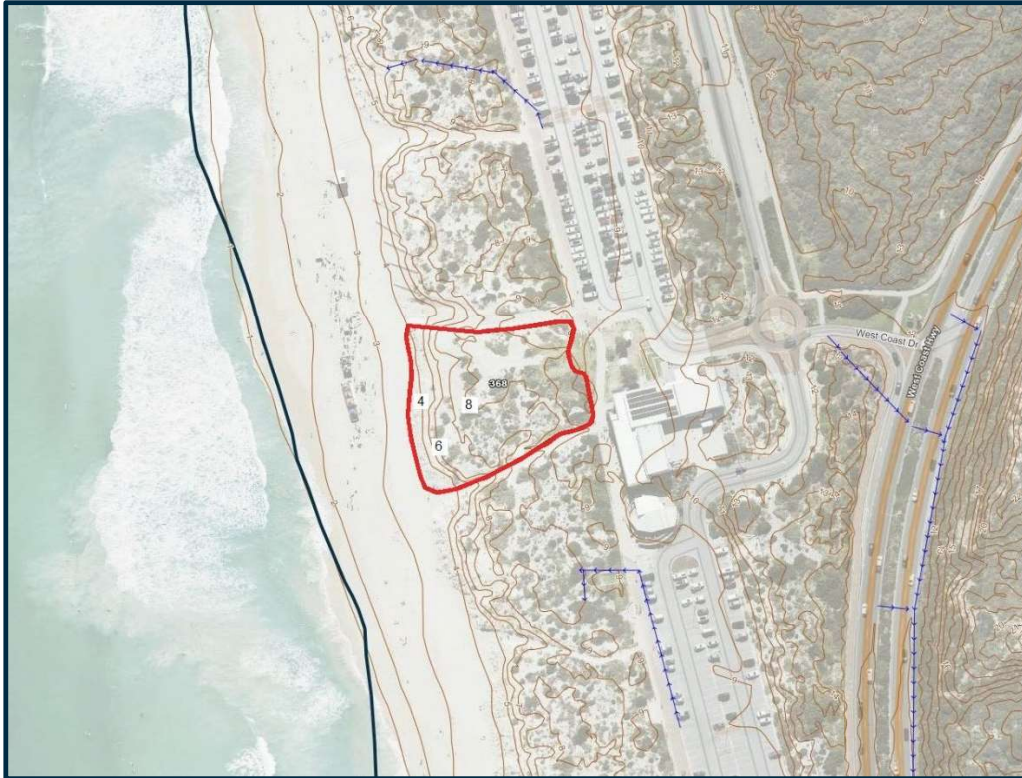


Figure 6 – Map of South Trigg Dune Cell 1m Topography and Drainage

Site Photos and Photo-monitoring Points:

Site photos of the vegetation contained within the dune cell were taken on 9 June 2025. These photos are located in Appendix 1 and 2.

Current disturbance and threats

The primary threat to the health and vitality of the dune systems remains persistent trampling by the community. As indicated above, it is estimated 40% of the dune area (1,460m²) remains subject to persistent trampling, impacting the habitat value of the dune cell. Further to this, the trampling causes subsequent threats of dune destabilisation and sand inundation.

Other threats are weeds, specifically, the grasses from the east of the dune. Currently, there is no barrier in place to prevent ingress of the grass into the dunes. Heavy community use and high wind conditions makes chemical controls and mechanical controls rarely useable.

Seasonal extremes also present a risk to successful restoration of the site. Specifically, recent history of unprecedented hot summers has proven to be a threat to plant survival. Restoration timeframes will need to consider and accommodate an extension of the planting program should adverse seasons persist in Perth. Other seasonal risks due to coastal storm surge have potential impacts, however, are more unlikely.

Revegetation commitments

The City's goal as part of the works is to prevent persistent trampling by the community and re-establish functional dune habitat for local biodiversity. The City will ensure restoration remains viable by facilitating safe and effective alternatives to community members which persistently trample the dunes, providing them an incentive to do the right thing by the conservation areas. The City will undertake revegetation of 3,500m² of coastal dunes with local native species, installing ecologically resilient landscapes which provide ecological niches for local native wildlife. The site will be the revegetation offset location for clearing application **CPS 10923/1**.



Figure 7 – Map of South Trigg Dune Cell Revegetation Offset Location

Reference site floristic data collection

The reference site chosen for this project is a dune cell in South Trigg, located approximately 250m from the Dune Cell as per Figure 1. It is situated to the west of Bournemouth Parade. It is bordered by West Coast Highway to the east, Trigg Car Parks to

the north and West Coast Highway underpass track to the south. The reference dune cell is 1.6Ha in size and contains primary dune, primary swale and secondary dune. It was actively restored by the City between 2017 to 2021, resulting in the dune cell being in good to very good condition.

This site is chosen as it has the same vegetation types in the primary dune and swale. The Reference Site forms an example for the vegetation assemblages and habitat value aspired to install in the South Trigg Dune Cell. The City also has access to a recent environmental surveys for this area undertaken by Natural Area Consulting Management Services for UDLA in May 2025. The survey noted the dune has the following:

Location	Vegetation Type Description	Vegetation Type Code
Foredune	Olearia axillaris shrubland and *Ammophila arenaria tussock grassland	OaSAaG
Primary Swale	Olearia axillaris and Scaevola crassifolia shrubland	OaScS
Secondary Dune	Acacia rostellifera, Olearia axillaris and Spyridium lobulosum shrubland over Lepidosperma gladiatum sedgeland	ArOaSgSLgS

Table 5 – Reference Site Vegetation Descriptions

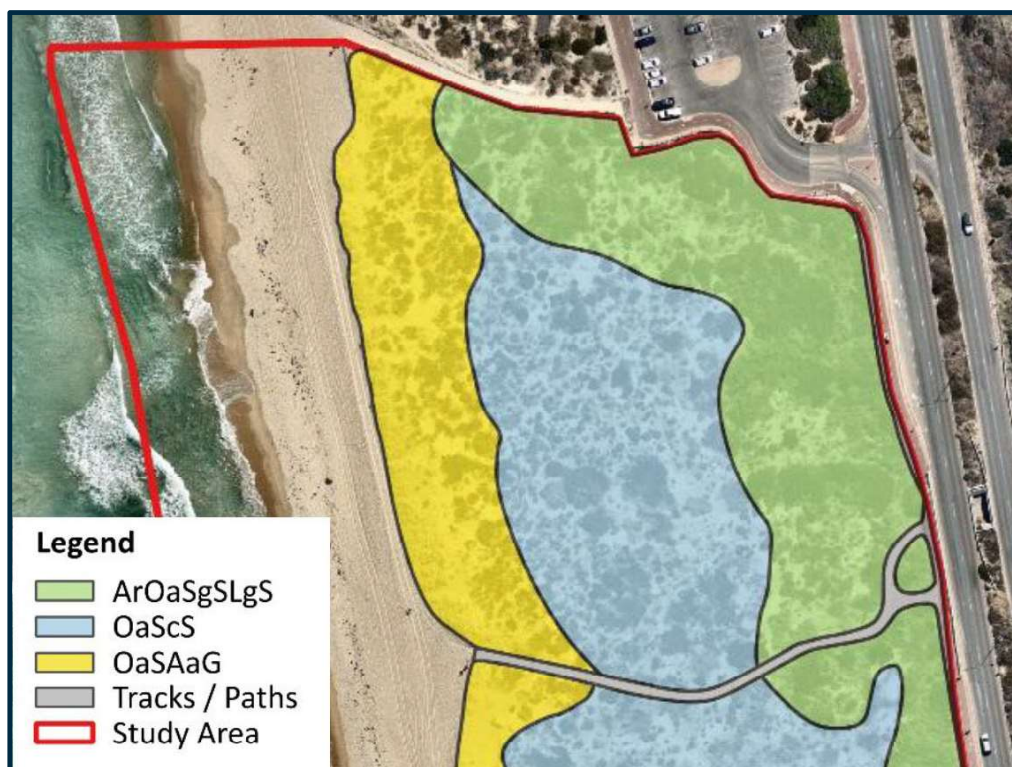


Figure 8 – Map of Reference Site Vegetation Types

The reference site was assessed as having good to very good vegetation condition throughout the primary swale and degraded to completely degraded vegetation condition on the primary foredune due to the presence of Marram Grass.



Figure 9 – Map of Reference Site Keighery Vegetation Condition

Targets and completion criteria

The revegetation targets for the South Trigg Dune Cell are as follows:

- Target all environmental weeds except Marram and Sea Wheat and reduce weed cover to 0-20% throughout the primary swale (figure 10).
- Maintain Marram & Sea Wheat to front 15m of the foredune to ensure integrity of frontal dune while integrating native species within the foredune including local native *Spinifex longifolia* and/or *Spinifex hirsutus*.
- Plant and establish local native species to >35% native vegetation cover in primary swale of dune cell. This excludes the front 15m foredune area as per Figure 10.
- Establish a healthy and functioning native vegetation structure to improve the condition of mapped areas from Degraded to Good or Very Good condition (figure 11).

These targets are chosen as they allow a functional habitat to be instituted in the dune cell whilst being realistic with the need for retaining foredune weed species to ensure dune stability. It also allows the vegetation to act as a barrier to impede trampling by people.



Figure 10 – Map of Target Weed Cover Values



Figure 11 – Map of Target Vegetation Condition

Species list compilation and revegetation techniques

Planting of native tube stock will occur in winter after the first rains to take advantage of natural soil moisture, followed by summer supplementary watering. Some species will be fitted with plant guards to support growth and prevent trampling. Tube stock will be sourced from local seed/cuttings material.

Species chosen for revegetation are to be consistent with species found in vegetation types OaSAaG and OaScS (Table 3). Species planted will primarily be the following species: *Acacia huegelii*, *Acanthocarpus preissii*, *Conostylis candicans*, *Ficinia nodosa*, *Gastrolobium nervosum*, *Leucopyhta brownii*, *Lomandra maritima*, *Myoporum insulare*, *Olearia axillaris*, *Rhagodia baccata*, *Scaevola crassifolia*, *Spinifex hirsutus* and *Spinifex longifolius*.

Site preparation

Site preparation will be minimal to protect the natural coastal environment. No ripping or grading will be done. Weeds will be removed by hand, as chemical control is often ineffective in these areas. Restoration signage will be placed on-site to inform the public. No dieback is currently suspected, standard hygiene measures will be followed.

Maintenance and contingency measures

Maintenance will focus on supporting plant establishment and addressing any issues that arise. Post-planting weed control will be assessed monthly as part of an inspection regime. Remedial planting will be assessed in late winter, with infill planting scheduled the following season if needed. Fencing will be installed as a contingency if trampling from foot traffic is observed, to protect vulnerable areas. Erosion will be monitored during site visits, and any issues will be addressed using stabilisation methods. Other maintenance tasks, such as replacing damaged plant guards or signage, will be carried out as needed during routine inspections.

Schedule and budget

Stage	Actions	Timing	Responsibility	25/26	26/27	27/28	Cost	Funding Source
COMPLETION CRITERIA	Site surveys	Winter	City officers	x				City funding
	Annual works planning & budget estimations	Summer	City officers	x	x			City funding
SITE PREPERATION	Mechanical weed control	Spring	City contractor & friends group	x	x		\$8,800	City funding
	Installation of weed barrier walls	Spring	City contractor	x				City funding
	Fencing	Spring	City contractor	x				City funding
VEGETATION ESTABLISHMENT	Place tubestock orders with nursery	Winter	City officers	x	x		\$2,860	City funding
	Planting tubestock	Winter	City contractors, friends group & general community	x	x		\$5,600	City funding
	Plant watering	Nov-Apr	City contractor	x	x		\$10,800	City funding

MONITORING	Monthly site inspections	All year	City officers	x	x			City funding
	Bi-annual photo monitoring	Spring and autumn	City officers	x	x	x		City funding
	Vegetation monitoring for success rate	Autumn	City officers and contractors	x	x	x		City funding
MAINTENANCE & CONTINGENCY	Monthly works planning	All year	City officers					City funding
	Monthly site works	All year	City contractor					City funding
REPORTING	Revegetation plan		City officers	x				City funding
	Annual progress report	30 April each year	City officers	x	x	x		City funding

Table 6 – Revegetation Plan Schedule & Budget

Monitoring and analysis

Monthly Site Inspections

As project managers, City officers will conduct site inspections at the end of each month, taking note of:

- a. Weeds (species, coverage, growth stage)
- b. Condition of revegetation plants
- c. Significant erosion

From these inspections, maps will be developed for contractors to undertake works in the following month. Some mechanical weed control will also be undertaken by coastcare volunteers.

Annual Monitoring

City officers will undertake annual monitoring to assess the site against the targets and completion criteria. Annual monitoring will include weed cover analysis, native vegetation density, and vegetation condition as per Keighery Vegetation Condition Assessment.

Bi-Annual Photo monitoring

This will be conducted twice per year (spring and autumn). The primary purpose is to provide a visual record of progress, allowing for easy comparison and assessment of changes in vegetation condition, weed cover and erosion. This can be used to track both short-term changes, such as those resulting from specific interventions, and long-term changes resulting from natural processes or management actions.

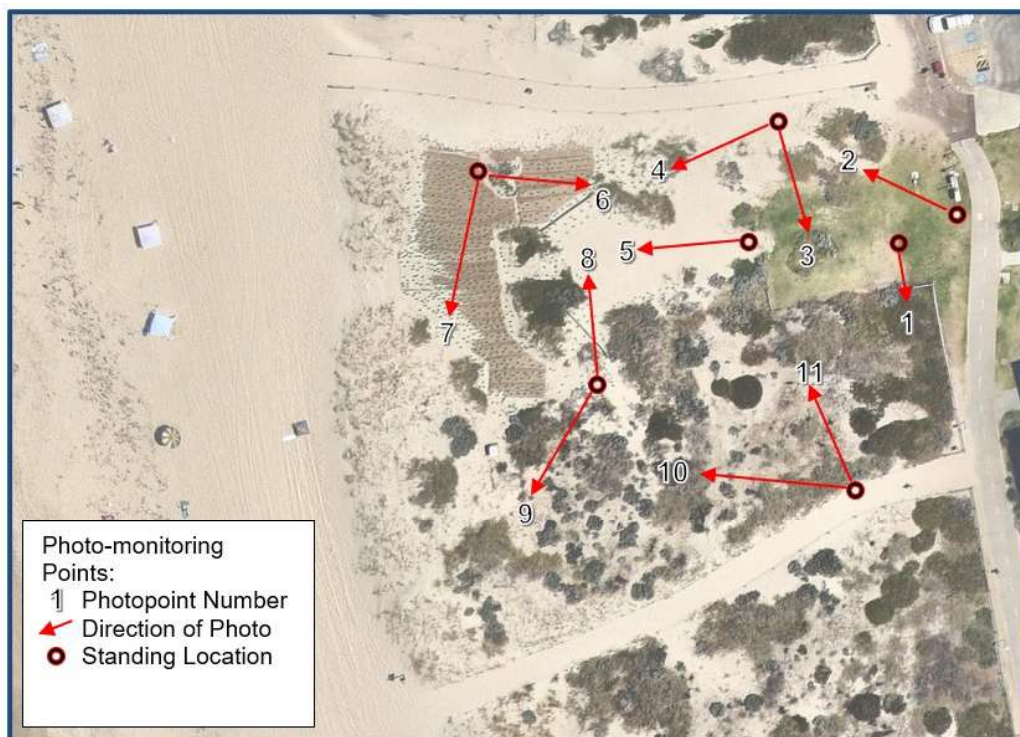


Figure 11 – Photo-monitoring points

References and appendices

Appendix 1 – Baseline Photo Monitoring Images



Photopoint 1



Photopoint 2



Photopoint 3



Photopoint 4



Photopoint 5



Photopoint 6



Photopoint 7



Photopoint 8



Photopoint 9



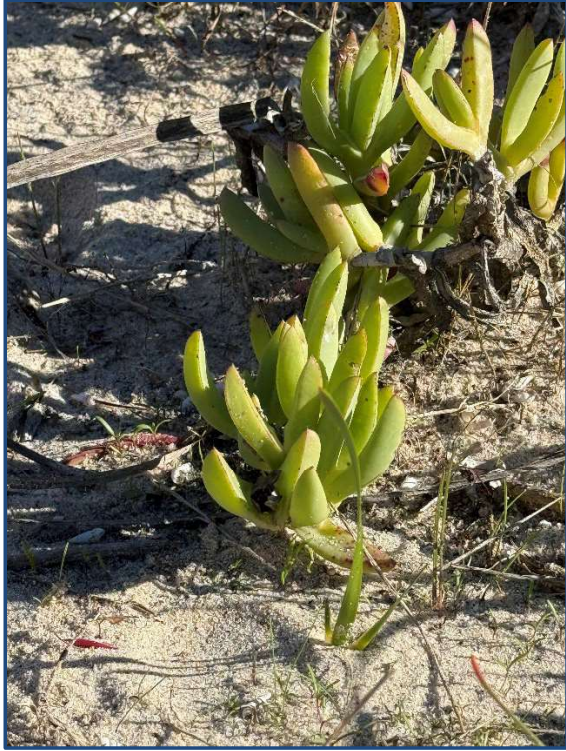
Photopoint 10



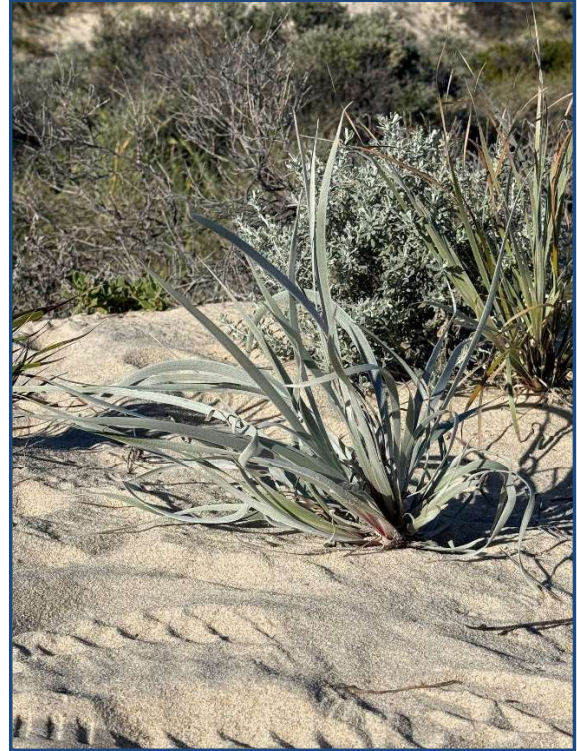
Photopoint 11

Appendix 2 – Flora Survey Images

Selection of native species identified during field survey on 9 June 2025.



*Carpobrotus virescens***



Conostylis candicans



Crassula colorata



Ficinia nodosa



Lepidosperma gladiatum



Myoporum insulare



Leucophyta brownii (Canal Rocks form)



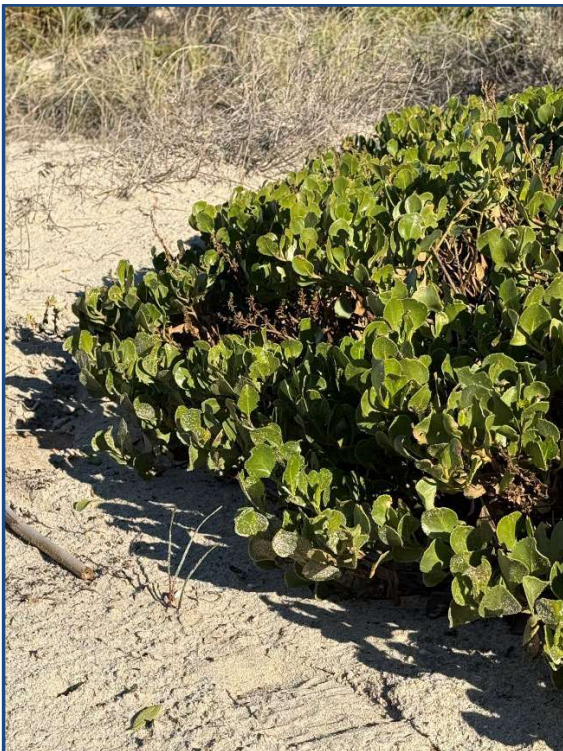
Olearia axillaris



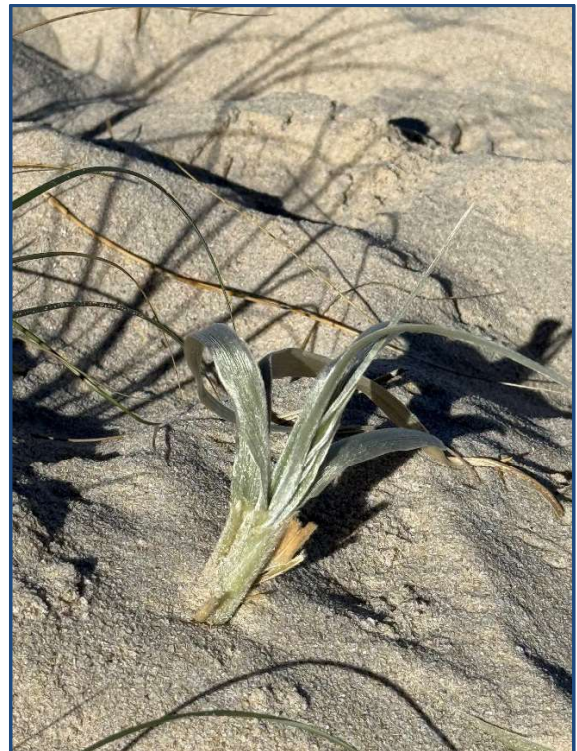
Rhagodia baccata



Spinifex xalterniflorus Nees



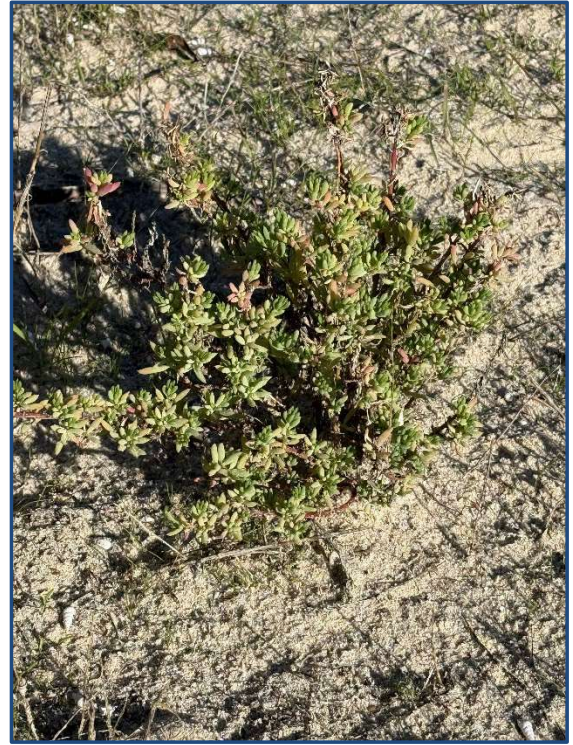
Scaevola crassifolia



Spinifex hirsutus



Spinifex longifolius



Threlkeldia diffusa

