

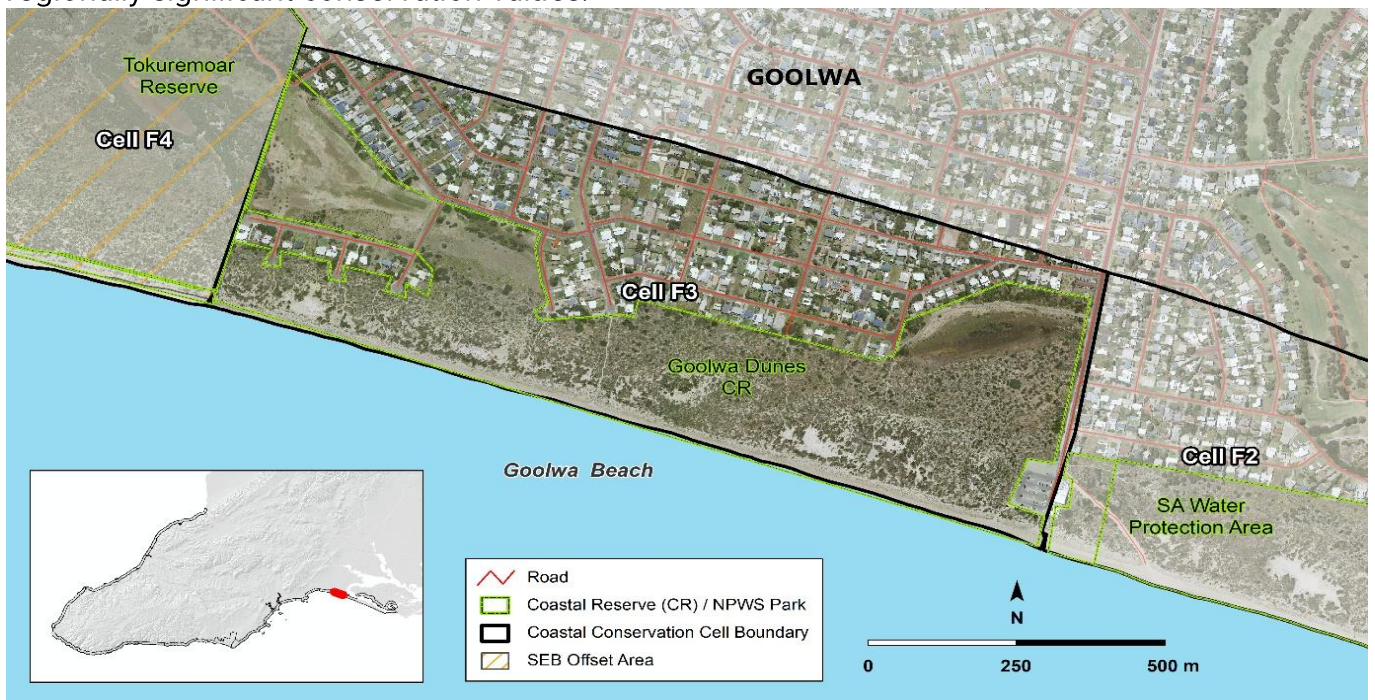
## Goolwa (Kutiangk): Beach Road to Treleaven Place

### Cell F3

#### Overview

This cell has substantial dune areas across its length, with important areas of remnant and revegetated species present. A substantial heritage agreement covers most of the dune area. The area is an important buffer and wildlife corridor to Tokuremoar Conservation Reserve (cell F4) and has direct connectivity eastwards to the Sir Richard Peninsula dunes (cell F2), both supporting regionally significant conservation values.

High levels of visitation and multiple access points traverse the dunes via pedestrian access paths and Off-Road Vehicle (ORV) entrance to Goolwa Beach is located at the eastern end of the cell. Weed incursion through garden escapes, upkeep of keyhole carpark pedestrian pathway fencing and stormwater management issues need addressing in this cell.



## Cell detail

This cell extends from the eastern boundary of Tokuremoar Reserve (Trevelan Place, Goolwa) approximately 1.5 km to Beach Road, Goolwa. This cell is in the Alexandrina Council local government area.

## Tenure, Land Use and Values

Suburban residential development is spread over the coastal plain and into the rear of the dunes. Despite of some degradation and encroachment, it is some of the last remaining frontal dune system along this stretch of coastline. Dedicated as Crown Land under care and control by Alexandrina Council, a large portion of this cell was placed under heritage agreement (HA1618) in October 2020 (see below), providing long term protection of this 32 ha heritage site and extending the coastal connectivity between Middleton and the Coorong and Lower Lakes Alexandrina and Albert Ramsar Wetland. Since 2012, the waters surrounding this cell are within the boundaries of the Encounter Marine Park.



*Goolwa Dunes Heritage agreement HA1618 boundary (28.81Ha)*

Native title has been determined for Ngarrindjeri people over land and sea Country within this cell under the *Native Title Act 1993 (Cth)*.

The majority of this cell is a coastal reserve with a sizeable sand dune complex, still retaining some vestiges of dune biodiversity values. There is a heavily used recreation beach and extensive car parking (levelled dune surface, now bituminised), kiosk/ café, Surf Life Saving Club and toilets within the Goolwa Beach Carpark at the termination of Beach Road, Goolwa Beach. Open space within the Cell experiences high tourism visitation, comprising a wide range of activities that can include swimming, surfing, surf schools, beach and dog walking (on and off leash), fishing, recreational Goolwa Cockle/Pipi (*Plebidonax deltoides*) gathering (west of the Murray Mouth to Middleton). Access to the beach is facilitated by several walkways through the dunes.

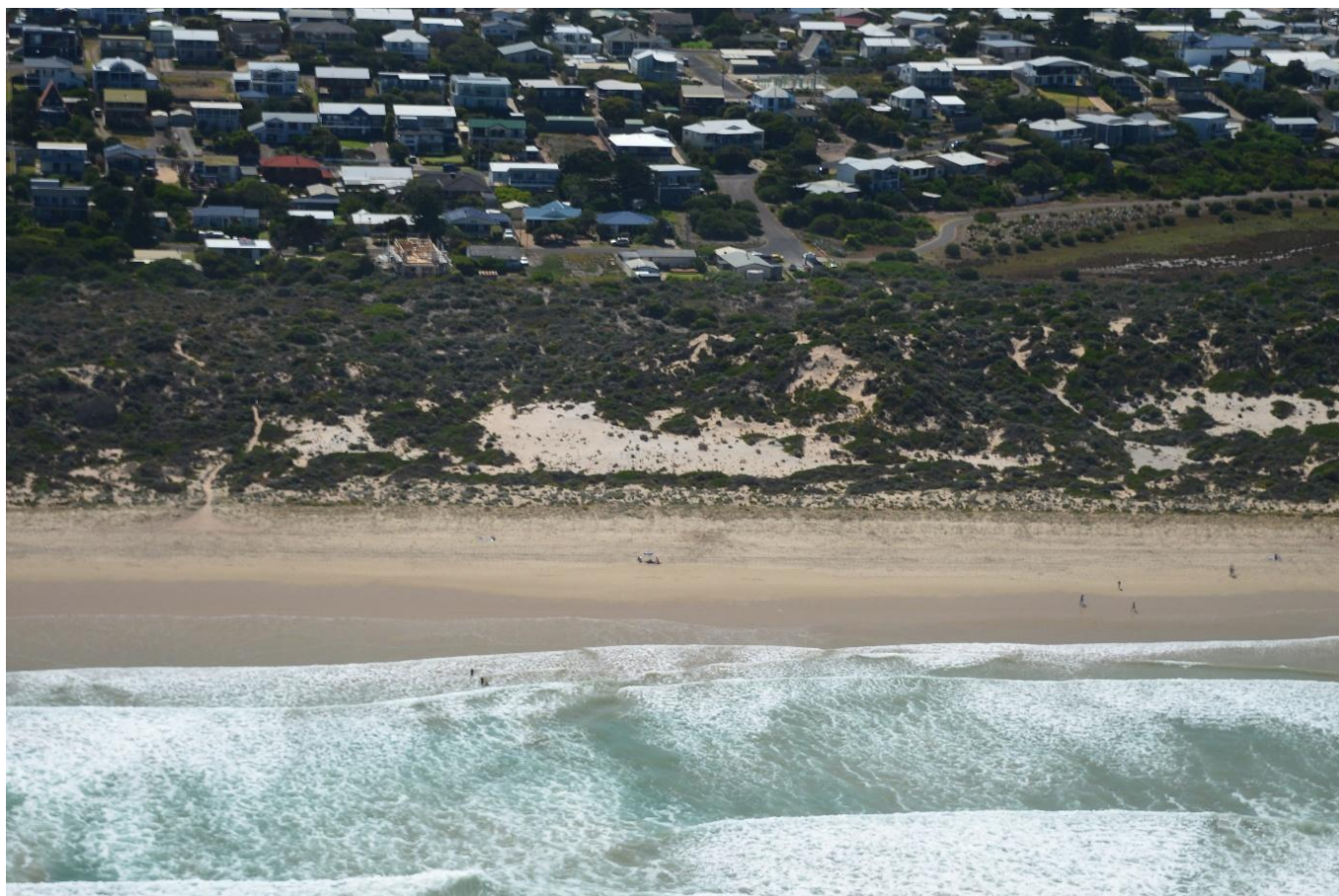
Access for vehicles (including horses) to Goolwa beach is provided north of the Surf Life Saving Club. No Off-road vehicle (ORV) access is approved for public access west of Beach Road. Horses are exercised on the beach, with riders and cars only using the section of Goolwa Beach to the east of the Goolwa Beach Car Park towards the Murray Mouth (cell F2).

The heritage agreement site has significant Aboriginal cultural heritage values. Ngarrindjeri Aboriginal Corporation (NAC) have worked closely with Second Nature Conservancy (formerly GWLAP) and Alexandrina Council to protect the natural and cultural values of the Goolwa Dunes.

Local Goolwa Coastcare Group volunteers have undertaken continued on-ground restoration efforts within this cell for the past 18 years. Efforts continue across this area and neighbouring cells and are making a substantial contribution to the conservation and protection of areas through valuable on-ground bushcare, revegetation and community awareness activities. Friends of the Hooded Plover and Fairy Terns Fleurieu Peninsula (supported by BirdLife Australia) and Team Oystercatcher volunteers (SA Shorebird Foundation) monitor and raise awareness of beach nesting and shorebird species within the cell.

## Landforms

This entire beach is composed of fine sand and exposed to waves averaging over 2 m. These break across a 500 m wide double bar surf zone, characterised by numerous spilling breakers and substantial wave set-up and set-down at the shoreline and, during lower wave conditions, widely spaced rips (Short, 2001, p.98). Barrier dunes (c. 100m wide); undulating coastal plain, appears as a former aeolianite surface (Caton et al 2007).



*Goolwa, immediately west of Beach Road (Coast Protection Board, March 2024)*

## First Nations cultural heritage and connection to land and sea Country

This cell holds high cultural value and significance for the Ramindjeri people of the Ngarrindjeri Nation. It forms part of their Dreaming stories and contains numerous stories, places, and artefacts of cultural importance. Ramindjeri cultural heritage is present throughout the entire cell, everywhere you tread. The Ramindjeri lived, hunted, played, swam, and danced here. Those working within and restoring these areas may encounter artefacts or evidence of cultural significance to the Ramindjeri people and the broader Ngarrindjeri Nation. These areas must be known, recognised, respected, and protected.

Creeks, wetlands, estuaries, dunes, cliff lines, islands and coastal areas are important gathering places that support a variety of habitats and food sources essential for sustaining and protecting Nga:tji. Nga:tji are the personal totems of the Ngarrindjeri people. They embody deep cultural values, symbolising kinship, spiritual protection, and an embedded responsibility to care for the land, waters, and ecosystems they inhabit.

Landscape features and culturally significant sites within this cell include many fishing grounds for Kutli (Goolwa Cockles/Pipi), camping and meeting places, Dreaming and midden sites, stone tools, fish bones and artefacts throughout the sandhills. Fireplaces were used as ovens (or hearths) in many areas within this cell.

This cell is also a particularly important site in the Ngurunderi Creation and Dreaming story, which tells of the Ngarrindjeri people's creation of the land and waters, including the River Murray and its mouth, Kandukang (west) and Tapalwora (east). This ancestral narrative extends westward along the southern coast of the Fleurieu Peninsula, encompassing the rugged shoreline, estuaries, and coastal landscapes all the way to Cape Jervis (Parrewar-angk). These areas hold deep cultural and spiritual significance for the Ramindjeri people, with Dreaming tracks, songlines, and important sites embedded throughout the region.

The coastline with its cliffs, beaches, and native vegetation reflects Ngurunderi's journey as he shaped the land, rested at key locations, and followed the tracks of his wives. Cape Jervis (Parrewar-angk) marks an important point in this story, serving as both a physical and spiritual place in the landscape. It connects the mainland to Kangaroo Island (Ngurungau), continuing the cultural narrative of creation, movement, and connection to Country.

Within this cell, the Dreaming story tells how Ngurunderi followed the tracks of his wives, he rested at Kutiangk (Goolwa), while his wives passed ahead toward Ratalang (near Port Elliot).

*Please respect that cultural concepts and content included in this plan are the Aboriginal Cultural and Intellectual property (ACIP) of the Ramindjeri people of the Ngarrindjeri Nation (provided by Cedric Varcoe, Ramindjeri Cultural Leader living on Country) (cells 1-20). They may not be used or adapted by any other parties without consent.*

## Terrestrial biodiversity

### Whole cell

The Goolwa dunes provide essential habitat and protection for a variety of flora and fauna of conservation significance, including regionally vulnerable and rare plant species, as well as a variety of native birds, mammals, reptiles and insects (Caton 2007).

Coast Bush-everlasting (*Ozothamnus turbinatus*) Shrubland covers relatively small areas in the primary dune, including a small yet substantial patch just west of the Goolwa Beach Carpark, starting near the Surf Life Saving tower. Many of these areas appear to be in the same areas as middens. Coast Bush-everlasting (*Ozothamnus turbinatus*) is locally uncommon and generally restricted to one zone of the dunes (Simon and Bain 2015).



*Coast Bush-everlasting (Ozothamnus turbinatus) Shrubland is found in a small area of the Goolwa dunes (B Simon)*

Beaded Samphire (*Salicornia quinqueflora* ssp. *quinqueflora*) +/- Black-seed Samphire (*Tecticornia pergranulata* ssp. *pergranulata*) Shrubland is found at the Beach Road swamp area in the north eastern end of this cell and the Council reserve north of Boulton Street. These areas were once connected, extending from Tokuremoar Reserve, east behind the dunes, through the now South Lakes Golf Course, to the Murray River Channel. "The golf course had a small creek-line running through to the South Lakes Golf Course known as Aggies Creek and there are still relics of this community found on the Goolwa South Lakes Golf Course, which was previously a salt paperbark swamp" (G. Lundstrom pers. comm. in Simon and Bain 2015). Several patches have plants not found elsewhere and form

important insights into the wider diversity of this community, which once extended along low-lying areas of the backdune (Simon and Bain 2015). Other locally significant species in this cell include Salt Angianthus (*Angianthus preissianus*), Trailing Hemichroa (*Hemichroa pentandra*), Coast Picris (*Picris angustifolia* ssp. *angustifolia*), Triglochin sp., Coast blown-grass (*Lachnagrostis billardierei* ssp. *billardierei*) and Silky Wilsonia (*Wilsonia humilis*) (Simon and Bain 2015). The endangered Squat Picris (*Picris squarrosa*) is prevalent in this cell within the remnant coastal shrublands (B. Simon pers comm. 2025).



*Beach Road Swamp with a variety of saltmarsh and samphire species that are uncommon and high conservation significance within the region (R Lewis)*

Several of the species recorded in the Beach Road swamp area (and potentially the Boulton St Reserve) form a vegetation association that could potentially be considered as part of the Beaded Samphire (*Salicornia quinqueflora* ssp. *quinqueflora*) Low Shrublands that may be part of the Nationally Vulnerable community *Subtropical and temperate coastal saltmarsh*, as listed in the *Environmental Protection and Biodiversity and Conservation Act 1999* (EPBC). The EPBC ecological community is the assemblage of plants, animals and micro-organisms associated with saltmarsh in coastal regions of sub-tropical and temperate Australia (DCCEEW 2013). To be considered for listing, this community needs to be under regular or intermittent tidal influence, including rarely inundated supratidal areas, intermittently opened or closed lagoons, or groundwater tidal influences. The tidal connection includes areas that are inundated by astronomical tides and also by weather assisted tides (i.e. storm surges). The plant assemblage comprises salt-tolerant herbs, succulent shrubs or grasses, and may include large areas of bare sediment. Recent flora surveys for Alexandrina Council confirm the presence of many of the species present at the Beach Road site to be consistent with those found in the EPBC-listed *Subtropical and temperate coastal saltmarsh* ecological community. Currently the site lacks a regular or intermittent tidal connection—including storm-surge inundation of supratidal areas and therefore could not be considered under the EPBC Act listing requirements. Any connection of this area to groundwater incursion is currently unknown.



*Coastal dunes with Coast Daisy-bush (Olearia axillaris) +/- Coastal Wattle (Acacia longifolia ssp. sophorae) +/- Coast Beard-heath (Leucopogon parviflorus) Low Coastal Shrubland overlooking the saltmarsh habitats that exist in the low-lying areas the back of the dunes to Beach Road (R Lewis)*



*Elegant Parrot (Neophema elegans) (M Stokes)*

The nationally vulnerable Hooded Plover (*Thinornis cucullatus cucullatus*) has considerable potential for breeding within this area, while Pied Oystercatcher (*Haematopus longirostris*) and Elegant Parrot (*Neophema elegans*) have been recorded (Caton 2007). The native Swamp Rat (*Rattus lutreolus*) is listed as rare and protected under the *National Parks and Wildlife Act 1972*. Coastal Shrubland-dependant Painted Dragon (*Ctenophorus pictus*) is recorded and known to persist within coastal habitats within the dunes and low-lying areas, along with one State-rated butterfly species, the Mottled Grass Skipper (*Anisynta cynone cynone*) (Caton 2007).



*Painted Dragon (Ctenophorus pictus) is a small and cryptic coastal dragon species (M Stokes)*

Hooded Plovers (*Thinornis cucullatus cucullatus*) are regular breeders along the oceanic beach of neighbouring Youngusband Peninsula, which is recognised as an “Area of International Importance” for this species in South Australia (Watkins 1993), as well as and to the west of this cell at Middleton, extending to the metropolitan Adelaide coastline. Prior to the 1950’s, this species also bred on the Sir Richard Peninsula (Strathalbyn Naturalists 2000). More recent records indicate that on the eastern Goolwa Beach, nesting opportunities for Hooded Plovers (*Thinornis cucullatus cucullatus*) and Pied Oystercatchers (*Haematopus longirostris*) are now non-existent, due to increased human disturbance (ORVs, Dogs (unleashed) (K Jones, pers comms), based on BirdLife Australia monitoring Hooded Plover (*Thinornis cucullatus cucullatus*) biennial surveys since 2008 and regular volunteer monitoring of Oystercatchers by SA Shorebirds. Hooded plovers (*Thinornis cucullatus cucullatus*) now only rarely sighted during non-breeding, flocking season). Some Red-capped Plovers (*Charadrius ruficapillus*) do breed closer to the Murray mouth (cell F2). Oystercatchers - Pied (*Haematopus longirostris*) and Sooty (*Haematopus fuliginosus fuliginosus*); both species with conservation rating of rare in SA, now only use the beach as an important foraging site for Goolwa Cockles (*Plebidonax deltoides*) and other marine invertebrates (beach worms).

Local dune systems provide refuge and likely valued habitat for a range of seabird species, including the White-bellied Sea Eagle (*Haliaeetus leucogaster*), Eastern Osprey (*Pandion haliaetus cristatus*), Little Black Cormorant (*Phalacrocorax sulcirostris*), Black-faced Cormorant (*Phalacrocorax fuscescens*), Pacific Gull (*Larus pacificus georgii*), Silver Gull (*Chroicocephalus novaehollandiae*) and Kelp Gull (*Larus dominicanus*). Irregular sightings of a range of pelagic birds are also reported in this cell, including Albatrosses, Petrels, Shearwaters and Gannets.

The NPWSA Act vulnerable listed Brown Quail (*Synoicus ypsilophorus*) has been regularly sighted and heard calling in the Goolwa dunes (cell F3) by the Goolwa Coastcare Group from 2020-2026 during working bees in the reserve area (Goolwa Coastcare Group Pers Com.)

Butterfly species of conservation concern known to exist within the cell include Mottled Grass Skipper (*Anisynta cynone cynone*), as well as historical records of Yellowish Sedge-skipper (*Hesperilla flavescens*) and multiple common species that are observed across the Fleurieu Peninsula (Stolarski 2024). The Mottled Grass Skipper (*Anisynta cynone cynone*) is very localised and restricted to coastal areas where its larval food plants, *Poaceae* (Grasses), both native and introduced, are present. Mottled Grass Skipper (*Anisynta cynone cynone*) has a patchy

distribution within the region, occurring at; Hindmarsh Island, Sir Richard Peninsula, Goolwa foreshore, Surfers to Goolwa Dunes, Port Elliot, Victor Harbor including Granite Island, and Newland Head CP (Stolarski 2024).

## Vegetation Communities

There are four vegetation communities within this cell (Simon and Bain 2015), including:

### Foredune vegetation

Rolling Spinifex (*Spinifex hirsutus*) +/- \* Sea Spurge (*Euphorbia paralias*) +/- \* Sea Wheat-grass (*Thinopyrum junceiforme*) Grasslands form the dominant vegetation community between Beach Road Goolwa and Treleven Place along what is now considered the foredune.

Occasional emergent shrubs of Coast Saltbush (*Atriplex cinerea*) and Coast Bush-everlasting (*Ozothamnus turbinatus*) and patches of the near threatened Coast Sow-thistle (*Actites megalocarpus*) are scattered along the length of the foredune.

### Primary and Secondary Dune vegetation

Coast Daisy-bush (*Olearia axillaris*) +/- Coastal Wattle (*Acacia longifolia* ssp. *sophorae*) +/- Coast Beard-heath (*Leucopogon parviflorus*) Low Coastal Shrubland forms the dominant vegetation community across the current existing primary and secondary dune areas.

### Low lying Saline areas

Beaded Samphire (*Salicornia quinqueflora* ssp. *quinqueflora*) +/- Black Seed-Samphire (*Tecticornia pergranulata* ssp. *pergranulata*) Shrubland is found at the Beach Road swamp area

## Nearshore Habitats

This cell forms part of the Encounter Marine Park. The marine areas cell F3 are within a Habitat Protection Zone (HPZ-7) and make up part of the nursery grounds for the endangered Southern Right Whale and is part of the designated Encounter Bay Whale Nursery Protection Area from the Murray Mouth to The Bluff, Victor Harbor (see fig 3.1).

The National Benthic Mapping layer indicates that the offshore benthic habitat is predominantly bare sand (NatureMaps). No mapped areas of seagrass or reef occur within this cell. The inshore bare sand is characterised by a high energy beach system with a 500m wide dissipative surf zone and fine sand (Short 2001).

The cell is regionally significant due to the beach (bare sand) habitat.



*Southern Eagle Rays (Myliobatis tenuicaudatus) are typically found in sandy-bottom and seagrass habitats, where their foraging for benthic invertebrates creates shallow pits that contribute to sediment turnover and broader ecosystem functions (A Burnell)*

No recognised estuaries occur in this cell.

Haig et al. (2006) undertook video surveys and made limited specimen collections from grab samples in the region. Bryars (2003) listed ten fish and three macroinvertebrate fisheries taxa for the surf beach habitat between Middleton Beach and Goolwa Beach. However, no habitat condition or systematic biological surveys appear to have been undertaken on the habitat within this cell.



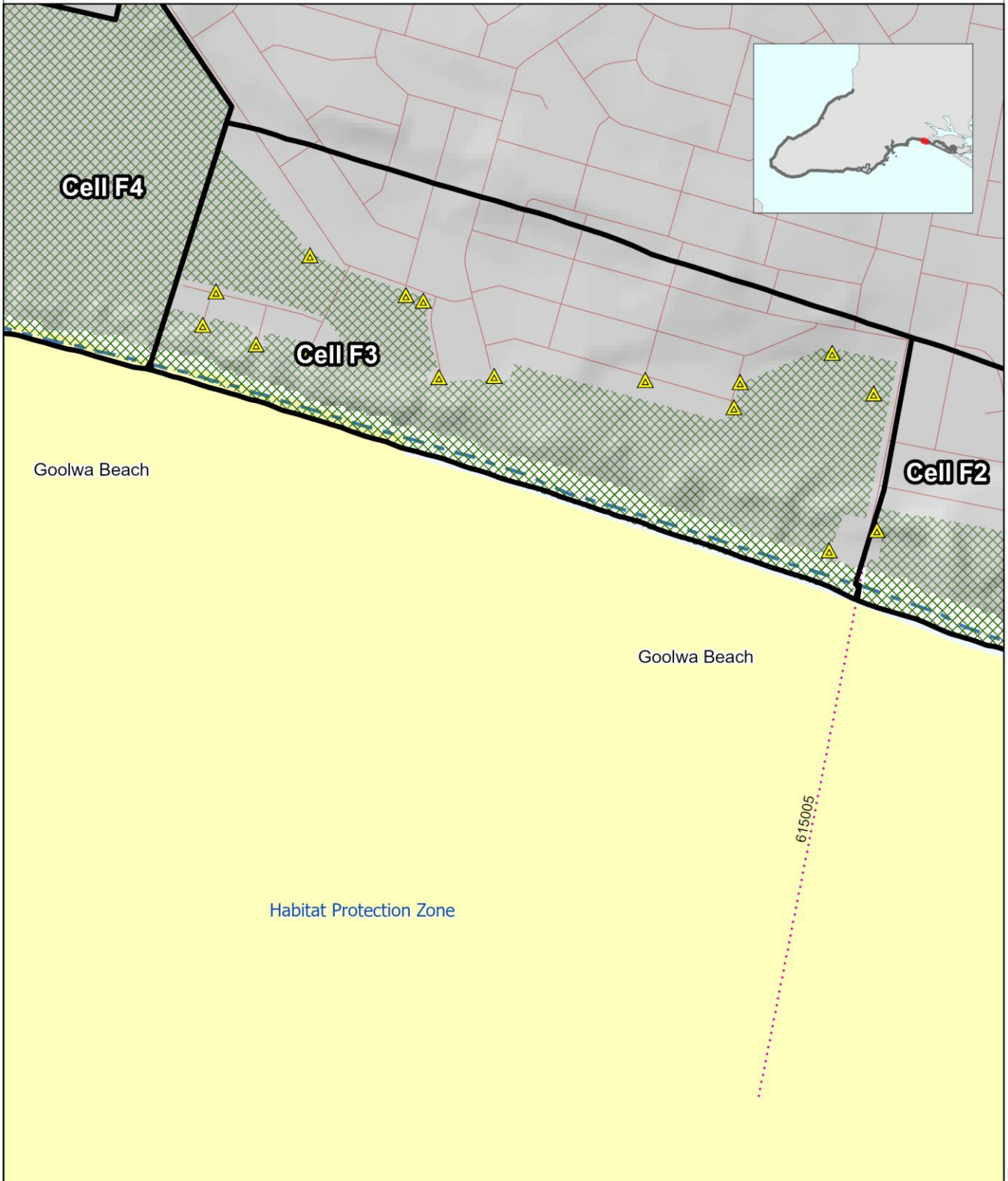
*Smooth Toadfish (Tetractenos glaber) are a common inshore species, typically found over sandy and seagrass-fringed substrates. They are easily recognised by their rounded body, mottled patterning, and distinctive toad-like face, and they often rest motionless on the seabed where their colouring provides effective camouflage. (A Burnell)*

The SA Coast Protection Board's Beach Profile Survey Program was first established in 1977 along the Fleurieu Peninsula to monitor and evaluate changes in beach and seabed level, with a network of over 600 profiles maintained across the state. Profiles are usually established perpendicular to the shoreline and may extend 1 to 10 km offshore. Erosion hotspots are monitored annually to identify risks to natural assets and infrastructure. Profiles are also used to monitor a range of coastal ecosystems and landforms including saltmarsh and mangroves, seagrass, sand dunes and cliff profiles and provide a rare, long-term dataset which informs evidence-based decision making and coastal adaptation planning. The Program utilises a range of terrestrial and hydrographic survey techniques involving high precision GPS equipment and at some locations, topographic and photogrammetry drone survey is undertaken, which uses overlapping photos to create 2D and 3D digital surface model to map detailed changes to the coastal landforms over time.

There is one beach profile monitoring site within this cell located on Beach Road (profile 615005 established in 1977) on the boundary of cell F2 and F3, to monitor beach-dune and nearshore dynamics over time.

Hesp et al (2025) analysis of profile 615005, highlights the prograding (i.e. extends seaward) and accreting trend since around 1983 but particularly since 1989. This may be because sediment is being delivered to this portion of the coast alongshore from Middleton or from the Murray mouth region or both. The period of accretion also corresponds with the invasion of environmental weed Sea Wheat Grass (*Thinopyrum junceiforme*) into the region and the foredune is a monoculture of this grass with very little native *Spinifex* present. The beach has prograded ~ 42m, and the backshore prograded ~18m post-1983. The dune volume has increased by 100m<sup>3</sup>/m in the period 1984-2024. Without the presence of *T. junceiforme*, native *Spinifex sp.* dune geomorphology presents as a 'hummocky' dune while *T. junceiforme* tends to build the dune upwards and seawards than native *Spinifex* and displaces *Spinifex sp.* This results in an incipient foredune that is higher, steeper, more uniform and densely vegetated dune face all along the Goolwa to Sir Richard Peninsula. With *T. junceiforme* foredune developing seaward and is more prone to storm surge events and the profile shows this response to erosion and scarping following storm events.

# Nearshore Habitats: Cell F3



- Unconsolidated Bare Substrate
- Coastal Reserves / NPWS Parks
- Coastal Conservation Cell
- Marine Park Zones
- Beach Profile Monitoring
- Stormwater Discharge
- Watercourse
- Roads

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**LANDSCAPE SOUTH AUSTRALIA HILLS AND FLEURIEU**

**Government of South Australia**

Fig 3.1: Nearshore habitats of cell F3

## Threats

### Whole cell

Increased visitation and permanent population growth exacerbates pressure upon natural environments (e.g. increased formal and informal access, dogs on beaches, drone use, cockle harvesting, litter etc.). Foot damage to the dunes, shown by multiple tracks, increases dune instability and weed distribution. Revegetation, weed control and restricted access to the dunes have been undertaken in this area to manage threats, reduce erosion and enhance biodiversity. Substantial areas of dune erosion and blowouts exist within the cell. Efforts to repair damage by the Goolwa Coastcare group and land managers using brush and jute netting (Simon and Bain, 2015) has been successful but need ongoing efforts to prevent further sand movement and long-term destabilisation.



***BEFORE:** substantial erosion front and mobile sand within the Goolwa dunes (B Simon)*



***AFTER:** Laying of brush material and woven geotextile cloth to provide stability and trap moving sands (B Simon)*



*Erosion and suppression of mobile sands within Goolwa Dunes (B Simon)*

Incursion of residential development exists into dune in Eastern corner of the cell. Part of the inner edge of the dunes on the western part of the cell is zoned residential; houses have been built within the dunes, with a destabilising impact. Informal camping, development zoning, land ownership and use, vegetation block size, shape and isolation all impact on this cell. The threat of land ownership and land use identifies some land parcels as potential threats to coastal areas due to factors like proximity to the coast or vulnerability to hazards. This highlights land parcels for potential intervention, such as zoning changes, restrictions or land purchase, to mitigate risks like erosion, inundation (storm surges, or sea-level rise), or the potential impact of current or future land use on coastal ecosystems, such as development or agriculture.

Concern from the Goolwa Coastcare Group is reported regarding the visual decline of significant individual specimens of Coast Everlasting (*Ozothamnus turbinatus*) near the foredune for much of its length between 2022 and presently in 2025.



*Coastal shrublands within the Goolwa Dunes (R Lewis)*

Off-leash dogs are permitted on this beach, which may deter Hooded Plover and other beach nesting birds through frequent use and disturbance. Vehicle patrols on beaches by SLSC volunteers on beach with quad bikes/vehicles can increase disturbance to birds. General ORV use is not permitted in this cell, however access to the beach (in cell F2) is gained from Beach Road carpark at its eastern most end. Sea Wheat-grass (*Thinopyrum junceiforme*) is well established in the Goolwa and peninsula foredunes and has altered dune geomorphology, creating a wall of taller dunes which impacts beach nesting bird and potential Hooded Plover habitat. Dunes with introduced grasses develop steeper and higher dune heights due to their growth habits than those dominated with local native spinifex plants. Hooded Plovers need a relatively open beach/foredune area to be able to breed, roost and feed. Dunes with high and densely planted areas are not favourable to hooded plovers and put them at greater risk to predators such as Silver Gulls, ravens, foxes and other species.

Diseases, such as Avian Cholera, are a threat to waterbirds in the cell (sea bird, shorebirds, waterfowl, penguin). Zoonotic threats from marine wildlife to humans. Refer to National Wildlife health and biosecurity plans (Wildlife Health Australia 2018 and 2022).

Weed distribution and threat is considered high for this cell, including a high proportion of exotic plant species. The following red alert weeds have been found within this cell: Pyp Grass (*Ehrharta villosa*), Gazania (*Gazania linearis*), African Boxthorn (*Lycium ferocissimum*), Sea Spurge (*Euphorbia paralias*), Soursob (*Oxalis pes-caprae*), False Caper (*Euphorbia terracina*), Olives (*Olea europaea* ssp. *Europaea*), Boneseed (*Chrysanthemoides monilifera* ssp. *Monilifera*) and Coast Tea-tree (*Gaudium laevigatum*), Marram Grass (*Ammophila arenaria*), Onion Weed (*Asphodelus fistulosus*), Kikuyu (*Cenchrus clandestinus*), Common Iceplant (*Mesembryanthemum crystallinum*), Bladder Campion (*Silene vulgaris*). Garden escapes, including Gazania (*Gazania linearis*).



*Gazania (Gazania linearis) is a common and declared coastal weed, commonly planted in gardens (C Taylor)*

Coast Tea-tree (*Gaudium laevigatum*) and White Arctotis (*Arctotis stoechadifolia*) from local residences threaten high conservation coastal dunes by degrading condition and habitat values.

Illegal rubbish dumping and unauthorised camping on the beach and within the dunes threatens biodiversity values and increases introduced weeds, vegetation damage, trampling and removal of plants.

Recreational cockle harvesting and vehicles on beaches can impact shorebird feeding and habitats through sediment compaction, reduced beach wrack, and food sources for beach nesting birds and migratory shore birds. Commercial and recreational cockle harvesting for human consumption has increased since the 1990's (Durante 2022) and could impact feeding and habitats through reduced food sources for beach nesting and migratory shore birds. Maintain and improve recreational fishing and beach access information for the general public and targeted community groups.

Several butterfly and skipper species that have localised populations are limited in capacity for dispersal and/or colonisation of new sites. The lack of suitable habitats, weed invasion and interconnectivity between habitats prohibits movements and, therefore, creates localised isolation of populations. Urbanisation of coastal areas reduces the efficiency of species movements that could otherwise occur. Several species are now restricted to pockets of isolated habitats, resulting in some being vulnerable to population collapse (Stolarski 2024).

Pest animal threats to coastal fauna and flora from foxes (*Vulpes vulpes*), cats (*Felis catus*) and rabbits (*Oryctolagus cuniculus*). Coordinated collaboration between landowners and managers is required to manage pest animals (refer to Regional Pest Management Strategies).



*Rabbits (Oryctolagus cuniculus) are prevalent across coastal areas particularly in built up and highly populated townships where gardens provide refuge and reliable food source.*

A sighting of the declared pest Common Myna (*Acridotheres tristis*) in Encounter Bay (on the coastal slopes adjacent to cell F12) was reported in 2024, and this is the only known location of the bird in South Australia. This aggressive invasive species, also known as the Indian Myna, is established throughout eastern Australia and poses a threat by evicting native birds from their nests, destroying eggs, and killing chicks. They also damage crops and orchards and are a nuisance for residents. A pest alert remains in place for any sightings to be reported via MynaScan to aid eradication efforts.

Hesp et al. (2025) report the beach profile has experienced significant seaward progradation and dune accretion since 1983, particularly after 1989, likely due to sediment transport from Middleton and/or the Murray Mouth. This period also saw the spread of the invasive Sea Wheat Grass (*Thinopyrum junceiforme*), which has replaced native *Spinifex*, altering dune morphology. The beach advanced ~42 m and the backshore ~18 m, with dune volume increasing by 100 m<sup>3</sup>/m between 1984 and 2024. The resulting foredunes are higher, steeper, more uniform, and more seaward, making them more susceptible to storm surge erosion.

Stormwater management and flood mitigation is a substantial issue connected to this cell, with prior flooding and ground water incidents affecting local housing and reserves. Increased car parking capacity at Goolwa Beach has increased stormwater volume directed onto beach, the vehicle beach access track, and the construction of a new stormwater outlet discharging flow directly into the western side dune. This has the potential to harbor introduced pest plants, increase weed incursion, cause erosion, increase eutrophication, undermine infrastructure and cause changes to the beach profile. Areas effected will need to be monitored and control actions undertaken to prevent further spread and damage to the dunes.



*Stormwater outlet directing run off from the carpark at Beach Road into sand dunes, Goolwa (C Taylor)*

## Opportunities

Manage visitor numbers and impacts to ensure coastal areas can support growing demand, while maintaining and improving the quality of experiences without diminishing the values of the cell. Investigate informal camping issues, vehicle impacts in dunes and beach habitat, improve infrastructure and fencing to ensure for environmentally sensitive path formalisation and low-impact walking trails, and further opportunities to reduce impacts on the coastal environment. Education, restrictions and compliance regarding off road vehicle and informal camping. Work with First Nation communities, tourism operators and agencies to support visitor education about coastal ecological and cultural values and appropriate behaviors.

Community education opportunities regarding:

- Migratory and residential shorebirds and sea birds (dogs on leads, nesting sites, citizen science projects, managing visitor disturbance), through interpretive signage at high use areas.
- Fragile nature of coastal areas that are sensitive to foot traffic, soil compaction and erosion.
- Education and targeted communications regarding Marine Parks and nearshore habitats.
- Increased cultural awareness training and knowledge of culturally appropriate processes to respect known cultural heritage sites for land managers and coastal community groups.
- Citizen science monitoring to contribute to intertidal reef monitoring, Seagrass restoration, dolphin watch, beach pole monitoring, Fleurieu seabird monitoring program and beach nesting birds.
- Coastal gardens and resident/business owner education
- Local coastal values, responsible beach use and reducing human impact on dunes.

Explore opportunities with local recreational and commercial fisheries (marine algae, scalefish fisheries, Pipi) to collaborate and raise awareness of supporting valuable habitats, species of conservation concern and monitoring. Explore opportunities to review fisheries management plans across the Murray Mouth, Lakes, and Coorong regions

to help strengthen wild catch monitoring efforts for coastal fauna species and potential pressures on conservation listed species.



*Goolwa Cockle/Pipi (Plebidonax deltoides) (DEW)*

Support implementation of the Goolwa Dunes & Tokuremoar Reserve Environmental Action Plan (Simon and Bain 2015), in collaboration with local community and land managers. Ongoing investment in control of high priority weeds and maintaining conservation values for this cell are critical to the maintenance of and improvement of native vegetation condition and wildlife habitat values. There is opportunity for coastal dunes in this cell to act as a “buffer” for the adjacent high value Tokuremoar dunes, through weed control and habitat connectivity.

Weed management is a key priority to help retain the biodiversity values of the cell. Declared and red alert weeds are a high priority for control, as they actively invading intact native vegetation and displacing or choking out native plant species. Undertake high priority weed control to maintain conservation values of the dune system.

Fencing of foredune to restrict access has been seen to be good for dune accretion by preventing foot access. Maintenance and upgrades of fencing across cell need to be maintained for continued protection.



*Access paths through the dunes using a dutch ladder construction method that can be lifted and replaced on the surface if buried by sand. Low impact and prevents erosion from multiple walking paths (B Simon)*

Targeted interventions for threatened / rare plant species and communities, including weed control and reintroductions and translocations of rare plants. Engagement and collaboration with private landowners of high value remnant vegetation communities and opportunities for increased protection from weed incursion and potential future development.

Maintain and expand coastal restoration actions including revegetation with local native plants and priority weed control. Increase suitable habitat for coastal butterfly populations including planting of host plants (including *Gahnia filum* and *Poa spp.*) in coastal areas to increase habitat suitability for local introductions.



*Mottled Grass Skipper (Anisynta cynone cynone) is recorded in this cell (M Endacott)*

This cell is important for coastal raptors, and ongoing monitoring and management is critical to minimise visitor disturbance and to support habitat condition for raptor populations. Investigate opportunities to support and implement the recovery plan for Eastern Osprey and White-bellied Sea Eagles (2022). Monitor, maintain and improve the quality of vegetation for the provision of wildlife habitat for priority species.

Hooded Plovers have not been recorded to nest in this cell despite suitable habitat. Improved knowledge and management of beach nesting birds can support policy around beach visitation and conservation. Actions to support Hooded Plover and Oystercatcher conservation include management of 4WD use on beach (reduction in vehicle numbers, closure or exclusion zones), and education for beach users and dog owners.

As part of the *Coastal Dune and Clifftop Vegetation Surveys (1995–1997)* (Opperman 1999), long-term monitoring sites were established across South Australia and the Southern Fleurieu region to assess the structure and composition of coastal dune and clifftop plant communities, and their relationships to regional and environmental factors. Given that nearly 30 years have passed since these surveys were undertaken, there is strong potential for shifts in geographical range and changes in species composition due to the long-term impacts of climate change. The *Survey of Remnant Vegetation of the Southern Fleurieu Peninsula* involved biological surveys conducted between 1987 and 1991 to establish baseline data on remnant vegetation and swamps in the region south of Adelaide, South Australia.

During the development of this plan, and through the assessment of flora and fauna (both native and introduced) species lists available via the Biological Database of South Australia (BDBSA), significant gaps were identified between recorded species and known species distributions within cells. To address these data deficiencies and improve the accuracy of long-term ecological records, both above foundational vegetation survey projects should be repeated and incorporated into an ongoing monitoring program. Fauna assessments across cells to establish population baselines, update existing records and species distribution, particularly of underrepresented groups (reptiles and invertebrates) should be undertaken.

There are opportunities for collaboration between partners, such as National Parks, Marine Parks, First Nations, landscape boards, volunteer groups, community and nature-based tourism operators, for monitoring of sea bird, coastal raptors, marine mammals and other wildlife.

Supporting community volunteer, First Nations and private landowner efforts to undertake priority restoration and conservation work in this cell. Strengthening partnerships with adjoining landowners, volunteer organisations, researchers, and the wider community to foster collaboration and long-term management benefits for biodiversity protection and restoration.

Opportunity to work with nature-based tourism operators to increase education and stewardship of local coastal environments. Investigate opportunities for coastal wildlife (shorebirds, seabirds and marine mammals) management to be included in permitting for major community events and nature-based tourism operations.

Determine the Pipi wildcatch requirement for shorebirds and continue monitoring of commercial and recreational fishing areas to ensure bag limits maintain adequate food supplies for wild populations.

Investigate improved stormwater and flood mitigation strategies while maintaining integrity of the dune system (WSUD). Support initiatives to collect and reuse stormwater (e.g. Alexandrina Council's Stormwater Detention and Retention Standards). Undertake development of stormwater management plan for Goolwa and surrounding coastal areas to reduce impacts of land-based eutrophication, sediment loads and impacts on nearshore marine waters. Consider a wetland system at the rear of the dunes providing connectivity with areas east of Beach Road (natural flows).

Collaborate with the SA Climate Ready Coasts program to enhance, resource, and implement coastal management initiatives and accelerate coastal hazard adaptation planning across South Australia. This program supports the development and delivery of Coastal Hazard Adaptation Plans (CHAPs), led by the Local Government Association (LGA) of South Australia in partnership with the SA Coast Protection Board, the Department for Environment and Water, the Adelaide Coastal Councils Network, and the SA Coastal Councils Alliance.

## Climate change threats to coastal biodiversity (see BMT 2025)

### Potential Climate Change Threats

Cell F3 includes a relatively narrow section of dunes. The dunes support native vegetation of importance for flora and fauna, the beach is an important nesting area for birds, and the intertidal areas support infauna on which birds feed.

Biodiversity Assets potentially vulnerable to climate change in this cell include:

- Coastal dunes
- Bird nesting habitats
- Native vegetation

These ecosystems may be particularly vulnerable to the direct impacts of climate change, particularly sea level rise, coastal erosion, increased drought, higher temperatures and more intense storms.

Over time increasing aridity will slow natural recovery from damage to dune vegetation. Rising sea levels will see increased storm damage to foredunes; Bruun Rule calculations of beach recession could be compromised by active littoral drift values here. However, recession of the order 10 – 20m over 50 years could be likely, given current IPCC forecasts. Likely increases in the low period swell component of wave climate and a possible increase in the magnitude of peak storm events increase the uncertainty in seasonal changes of beach state.

Sea-flood and routine high tide modelling indicates increased impact on dunes. Erosion assessment is difficult and estimates of shoreline recession is up to 100m by 2100, impacting dunes (Western et al. 2019).

## Cell Action Table

Component	Issue	Proposed Action	Priority	Key Players
Whole cell	Threats and opportunities to improve protection of cultural heritage within cell.	Cultural consultation and collaboration to appropriately manage cultural heritage within this area.  Prevent damage, disturbance, or interference to cultural heritage by adhering to the Aboriginal Heritage Act 1988.	High (cons/ threat)	NAC, Council, LHF, Coastal Community groups, Aboriginal Affairs and Reconciliation - Department of Premier and Cabinet
	Increased permanent population, visitation and recreational pressure on dunes and viewing points due to increased local population and tourist promotion.	Assess increased visitation capacity at known sites, repair or upgrade fencing to restrict unauthorised access and review car parking capacity. Manage visitor numbers within sustainable limits in ecologically and culturally sensitive and significant areas - consult with First Nations groups.	High (cons/ threat)	Council, land managers, NAC.
		Investigate opportunities for community education and engagement regarding unique and valuable coastal landscape and fragile nature of coastal areas. Dedicated cultural education and training for land managers, agency staff and land stewards	High (Cons/ Soc)	DEW, NPWSSA, SA Water, Council, LHF, NAC, Community groups
		Development of consistent signage and messaging for coastal values and compliance for conservation areas (public managed lands, coastal reserves) across the Fleurieu Peninsula coast. Co-design signage with First Nations/ knowledge holders.	Medium (Soc/ Cons)	Council, land managers, Second Nature Conservancy, NAC, NPWSSA, coastal community groups
		Opportunity to work with nature-based tourism operators to enhance education and stewardship of local coastal environments, including opportunities to partner with First Nations groups who hold cultural obligations and authority to Sea Country	Medium (Cons)	Council, land managers, tourism operators, NPWSSA, NAC, coastal community groups
		Collaborate and manage access with beach-based users and businesses (e.g. SLSC, Surfing SA, surf/paddle boarders, swim/surf schools), to ensure protection of coastal areas and groups do not impact conservation and cultural value areas and species.	Medium (threat)	Council, DEW, land managers, NAC, coastal community groups, beach users and businesses
		Events on beaches and coastal habitats must not impact on natural values, especially listed threatened species and communities, in the area or vicinity of events. Event organisers should be informed, where appropriate via permits, on their obligations to not inflict environmental harm and to undertake actions in accordance with relevant legislation and by-laws.	Medium (threat)	Council, DEW, NPWSSA, BirdLife Australia, event managers
		Increase in illegal camping.	Monitor public land, reserves and undertake compliance where required. Seek resourcing to support implementation.	High (threat)
	Increase public awareness of legal camping areas and responsible use. Support areas set aside for free camping and correct information.  Seek resourcing and build partnerships to support implementation.		Medium (threat)	Council, tourism bodies, Crown Lands, DEW
	Threat to coastal fauna and flora from pest animals (rabbits, foxes and cats).	Coordinated collaboration between landowners and managers is required to manage pest animals.	High (threat)	Councils, land owners, LHF, NAC business/ contractors/rangers, Second Nature Conservancy.
		Report sightings of feral animals (deer, fox, rabbit, cat and declared species) through the feral scan pest animal recording and management tool.	High (threat)	Land managers, community, NAC business/ contractors/rangers, coastal community groups
	Increasing grazing pressure from native and introduced species.	Coordinate with regional grazing pressure programs to monitor populations and control as required.	High (threat)	NPWSSA, DEW, PIRSA, LHF, NAC business/ contractors/rangers, Council, Second Nature Conservancy

Component	Issue	Proposed Action	Priority	Key Players
Whole cell	Protection of significant flora and fauna.	Protect existing populations through targeted weed control and restoration of habitats with local coastal species.	High (Cons/ threat)	Council, land managers, LHF, NAC business/ contractors/rangers, Second Nature Conservancy, coastal community groups
		Propagate local plants for reintroduction to other sites to maintain genetic diversity and increase source populations.	High (cons)	Council, land managers, LHF, NAC business/ contractors/rangers, coastal community groups, local coastal plant nurseries
		Monitor changes to high conservation areas through BushRAT or similar monitoring to measure condition assessment and change.	High (cons)	Council, LHF, coastal community groups
	Limited protection and awareness of EPBC listed Threatened ecological community – Subtropical and temperate Coastal Saltmarsh.	Increased protection from weed incursion, development and disturbance through site restoration and increased community awareness.	High (cons)	Council, coastal community group, LHF
	Valuable habitat for coastal raptors (White-bellied Sea Eagle and Eastern Osprey)	Ongoing monitoring and management of high values nesting and foraging areas.	High (cons)	NPWSSA, DEW, LHF, NAC business/ contractors/rangers,
		Implement the recovery plan for Eastern Osprey and White-bellied Sea Eagles (2022).	High (cons)	DEW, NPWSSA, LHF
	Butterfly habitats and host plant protection.	Identify locations of potential butterfly habitats and host plants with the cell.	High (cons)	DEW, LHF, Second Nature Conservancy, coastal community groups
		Extension of existing habitats and reintroduction of locally extinct butterfly species.	Medium (cons)	DEW, LHF, NAC business/ contractors/rangers, Second Nature Conservancy, coastal community groups
		Undertake weed management and enhance habitat for <i>Anisynta cynone cynone</i>	Medium (cons)	Council, coastal community groups
	Coordinated approach to monitoring of coastal wildlife.	Collaboration between land manager and stakeholders to support research and citizen science of beach-nesting birds, seabird, coastal raptors, marine mammals and other wildlife.	Medium (cons)	DEW, NPWSSA, Birdlife Aust, LHF, NAC business/ contractors/rangers, Council.
	Aged baseline data and significant gaps in recorded flora and fauna species across the Southern Fleurieu region.	Repeat and integrate historical vegetation surveys into a long-term monitoring program to update records and address data deficiencies.	Medium (cons/ threat)	DEW, LHF, councils, coastal community groups
		Undertake fauna assessments across cells to establish baselines, update records and species distribution, particularly of underrepresented groups (reptiles and invertebrates).	Medium (cons/ threat)	DEW, LHF, councils, coastal community groups
		Identify potential funding sources to repeat these long-term flora monitoring sites and fauna assessments.	High (cons/ threat)	DEW, LHF, councils.
	Monitoring of wild catch requirements for coastal fauna including conservation rated species and related fisheries activities.	Explore opportunities to review fisheries management plans to help strengthen wild catch monitoring efforts and native species resource needs.	Medium (cons)	PIRSA, DEW, NAC business/ contractors/rangers,
	Diseases, such as, Avian cholera are a threat to waterbirds in the cell (sea bird, water fowl, penguin). Zoonotic threats to marine wildlife from humans (and vice versa).	Implement actions in National Wildlife Health and biosecurity plans to minimise risk of infection and spread.	High (threat)	DEW, NPWSSA, PIRSA LHF, Council
Multiple community groups and volunteers across coastal areas.	Acknowledge significant value, contribution and knowledge of coastal community groups. Facilitate opportunities for increased coordination and sharing of skills and information between community groups and volunteers to support landscape scale approach to coastal conservation and management.	High (cons)	Council, land managers, LHF, NAC business/ contractors/rangers, Second Nature Conservancy, coastal community groups	

Component	Issue	Proposed Action	Priority	Key Players
Beach	Increased recreational cockle harvesting can impact shorebirds and beach nesting birds.	Increase community awareness of impacts to beach-nesting and shorebirds through recreational fishing.	Medium (cons)	PIRSA, Council, NPWSSA
		Explore and assess the wild catch requirements of Pipi populations to support dependent wildlife populations	Medium (cons)	PIRSA, DEW, NAC business/contractors/rangers
		Monitoring of pipi population in recreational and commercial areas to ensure adequate supply for wildcatch dependent populations.	High (cons)	PIRSA, DEW, NAC business/contractors/rangers,
Beach and Dune	Impact of foot traffic and dogs challenges the stability of the dunes.	Explore opportunities to better manage foot traffic impacts in dunes and rehabilitate damaged areas as required. Maintain existing fencing to protect valuable areas.	Medium (threat)	Council, SA Water, LHF, NAC business/contractors/rangers, coastal community groups
		Pursue opportunities for community education to reduce the impacts on the Beach Road dunes.	Medium (threat)	
	Areas of dune erosion and blow outs resulting in sand movement and ongoing erosion within dunes.	Continue restoration efforts to limit spread of erosion and revegetation to stabilise sand.	High (cons)	Council, Second Nature Conservancy, coastal, LHF, NAC business/contractors/rangers, community groups,
		Reinstate dune fencing paths to keep people off and out of dunes.	High (threat)	
	Increased stormwater volume directed onto beach and at rear of dunes, increasing weed incursion, erosion, undermining infrastructure and changing beach profile.	Investigate improved stormwater and flood mitigation strategies across all of cell while maintaining integrity of the dune system (WSUD).	High (cons)	Council, LHF
		Review stormwater plan for Goolwa Beach carpark to consider water sensitive urban design options to reduce volume on speed of flow entering dunes and beach areas.	Medium (threat)	Council, land managers
		Consider establishment of wetland system at the rear of the dunes and connectivity with areas east of Beach Road to re-establish flow across isolated patches of high conservation areas.	Medium (cons)	Council
	Stormwater management issues and flood mitigation	Seasonal pooling of water behind dunes prevented from natural flow due to Beach Road. Undertake development of stormwater management plan for Goolwa including coastal areas.	High (cons/threat)	Council, LHF, Stormwater Management Authority
		Support initiatives to collect and reuse stormwater (e.g. Alexandrina Council's Stormwater Detention and Retention Standards)	High (cons)	Council
	Weed control and threat to coastal biodiversity.	Continue implementation and resourcing of the Goolwa Dunes & Tokuremoar Reserve Environmental Action Plan.	High (cons/ threat)	Council, LHF, NAC business/contractors/rangers, Second Nature Conservancy, land managers, coastal community groups
		Support Council and coastal community group campaigns to continue targeted control of weed species including red alert weeds (Coastal Tea-tree, Gazania, Pyp Grass).	High (threat)	coastal community groups, Second Nature Conservancy, Council, LHF, NAC business/contractors/rangers,
		Research and targeted propagation of uncommon species or those in local decline, particularly in the primary and secondary dune areas.	High (cons)	coastal community groups, Council, LHF.
Weed control and threat to coastal biodiversity.	Ongoing weed control and restoration in this cell will protect high biodiversity values in adjoining cells including Tokuremoar Reserve in adjacent cell and Sir Richard Peninsula.	High (threat)	Council, Second Nature Conservancy, LHF, NAC business/contractors/rangers, coastal community groups, land managers	
	Ongoing problems in weed control and reinfestation.	High (Soc / Econ)	LHF, Council, Coastal community group	
	Leverage funding opportunities based on previous investment and in-kind contributions from coastal community groups.	Medium (cons)	Coastal community groups, Second Nature Conservancy, LHF, Council	

Component	Issue	Proposed Action	Priority	Key Players
Beach and Dune	Beach and dune systems are vulnerable to recession or change under ongoing climate-change pressures.	Continuation of monitoring of cross-shore dune, beach and nearshore sand level profiles and topographic and photogrammetry drone surveys to provide detailed 2D and 3D digital surface models to monitor changes to the coastal landforms over time in response to climate change including more frequent and intense storm surge events and changes in wave climate and sea level rise.	Low (Hazard) Medium (cons/threat)	DEW CPB, Research Institutions, Universities.
		Update DEW Coastal Hazard Mapping spatial layer identifying the change in extent and stability of coastal dunes across South Australia since the previous hazard mapping was undertaken approximately 20 years ago	Medium (hazard)/cons/ threat	DEW, CPB, Research Institutes, Universities
	Physical changes on the coast and natural assets from sea level rise (such as coastal squeeze, erosion, vegetation loss, marine turbidity and light reduction).	Implementation of the Coastal Adaptation Plan, including key locations, recommendations and priorities for funding.  Support partnerships for ongoing investigation and monitoring in the coastal zone, working with the Coast Protection Board to identify adaptation options and pathways for the future.	High (Cons. Threat)	DEW, CPB, Council, community, university and research agencies, consultancies, Climate Ready Coasts Program
Intertidal and supratidal saltmarsh communities	These tide dependent habitats are threatened by climate change induced accelerated sea level rise. Some of the saltmarsh communities are rare in South Australia.	Review of buffer zone provisions to allow for species migration within the Planning, Development and Infrastructure Act 2016. Also review of flood hazard issues for shacks.	High (Cons / Threat)	PlanSA, DEW, CPB, Council, Department for Housing and Urban Development (DHUD)
		Update DEW Coastal Saltmarsh/Mangrove Habitat spatial mapping to capture changes in the extent and different habitat types of saltmarsh ecosystems in South Australia since the original mapping was undertaken over 20 years ago.	High (Cons/threat)	DEW, CPB, Universities and research institutes
		Data layer to be made publicly available on NatureMaps		
Beach-nesting birds	Disturbance to birds on beaches are limiting nesting activity	Provide education opportunities to raise awareness and protection of Migratory, resident shorebirds, beach-nesting birds, (dogs on leads, nesting sites, citizen science projects, managing visitor).	High (threat)	Council, DEW, NPWWSA, LHF, NAC business/contractors/rangers, Council, BirdLife Australia, Friends of the Hooded Plover, Fleurieu Peninsula volunteers, coastal community groups, Oystercatcher monitoring volunteers
		Compliance of effected areas where illegal activities are reported, including off leash dogs, disturbance.	High (threat)	Council, NPWSSA, DEW
		Regional pest control strategies (particularly foxes and cats) implemented and seasonal protection of breeding sites.	High (threat)	Council, NPWSSA, LHF, NAC business/contractors/rangers, BirdLife Australia
	Limited community knowledge of local conservation values and threats	Provide education opportunities to raise awareness and protection of beach-nesting birds, such as Hooded Plovers and Sooty Oystercatchers (dogs on leads, nesting sites, citizen science projects, managing visitor and vehicle patrol disturbance).	High (cons)	Council, BirdLife Australia, LHF, Friends of the Hooded Plover, Fleurieu Peninsula volunteers, coastal community groups, Oystercatcher monitoring volunteers
	Protection of natural assets of high conservation value	Support the introduction and implementation of Council by-laws related to dogs on lead in high value areas.	High (threat)	Council, Land owners, community, coastal community groups
	Incursion of multiple dune grass weed species is limiting suitable habitat for beach-nesting birds	Support the staged removal of introduced weedy grasses and restoration of spinifex dunes.	High (threat)	Council, Land managers, LHF, NAC business/contractors/rangers, coastal Community groups, Friends of the Hooded Plover, Fleurieu Peninsula volunteers
		Increase community awareness of habitat needs for beach-nesting bird species.	Medium (cons)	Council, Land managers, LHF, coastal community groups, Friends of the Hooded Plover, Fleurieu Peninsula volunteers

Component	Issue	Proposed Action	Priority	Key Players
Climate (Beach and Dunes)	Increased sea levels and more intense storms and higher winds can contribute to more frequent and intense wave action, which accelerates beach and dune erosion.	Restrict public access to fragile dunes.	High (cons/threat)	Council, coastal community groups
		Implement restoration of native plant species.	High (cons)	Council, NAC business/contractors/rangers, coastal community groups, LHF
	Predicted increases in aridity can lead to reduced vegetation cover and increased dune drift and dune mobility.	Monitor recession rate of beaches and sand dunes.	Medium (threat)	CPB, DEW, Council
		Monitoring of cross-shore dune, beach and nearshore sand level profiles.	Low (Hazard) Medium (cons/threat)	DEW CPB, Research Institutions, Universities.
	Update DEW Coastal Hazard Mapping spatial layer identifying the change in extent and stability of coastal dunes across South Australia since the previous hazard mapping was undertaken approximately 20 years ago	Medium (hazard) Medium (cons/threat)	DEW, CPB, Research Institutes, Universities	
	Beach and dune topographic and photogrammetry drone surveys to provide detailed 2D and 3D digital surface models for monitoring changes to the coastal landforms over time in response to climate change.	Medium (Hazard) Medium (cons/threat)	DEW CPB, Research Institutions, Universities.	
	Support cultural monitoring and communications to protect significant known heritage sites	High (threat)	NAC, First nations business/contractors/ rangers, Council, DEW, LHF, coastal community groups	

## Relevant management plans

- Alexandrina Council Environmental Action Plan 2030. (2023), Alexandrina Council.
- Goolwa Beach Car Park and Environs Master Plan 2022. Alexandrina Council
- Heritage Agreement 1618 for the Tokuremoar Reserve / Goolwa Dunes (AH 13389078)
- Simon, B and Bain, S., (2015) Goolwa Dunes & Tokuremoar Reserve Environmental Action Plan 2015. Goolwa to Wellington LAP. Prepared for Natural Resources Adelaide and Mount Lofty Ranges.
- Caton B. Fotheringham D. Lock C. Royal M, Sandercock R. Taylor R. (2007). Southern Fleurieu Coastal Action Plan and Conservation Priority Study. Prepared for Adelaide and Mount Lofty NRM Board, Alexandrina Council, City of Victor Harbor, District Council of Yankalilla, Goolwa to Wellington Local Action Plan and Department for Environment and Heritage.
- Landscapes Hills and Fleurieu (2024) Hills and Fleurieu Regional Pest Plant and Animal Strategy 2024 - 2029.
- South Australian Recovery Plan for Eastern Osprey and White-bellied Sea Eagle (2022) Department for Environment and Water
- Ngarrindjeri Nation (2007) Ngarrindjeri Nation Yarlular-Ruwe Plan. Caring for Ngarrindjeri Sea Country and Culture. (Ngarrindjeri Tendi, Ngarrindjeri Heritage Committee and Ngarrindjeri Native Title Management Committee, Ngarrindjeri Land and Progress Association, Meningie).
- Ngarrindjeri and Others Native Title Claim (Part A) settlement Indigenous Land Use Agreement (ILUA) (2017) Government of SA Attorney General's Department
- Kungun Ngarrindjeri Yunnan Agreement (2009) between South Australian Government and the Ngarrindjeri Regional Authority (NRA).
- Wavelength (2022) Coastal Adaptation Plan prepared for Alexandrina Council.
- Western, M, Hesp, P, Bourman, R 2019, Coastal Adaptation Study for Alexandrina Council, Integrated Coasts, South Australia
- Encounter Marine Park Management Plan (2012, amended 2020). Department for Environment and Water.
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- Coorong Migratory Shorebird Site Action Plan (2021), Prepared by Ferenczi, M., Formby, M., Kidd, L., Weller, D., Rhodes, L. and Klose, S. (BirdLife Australia) for the Limestone Coast Landscape Board.
- Biodiversity Plan for the South Australian Murray-Darling Basin, Department for Environment and Heritage, South Australia 2001

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- Haig J., Russell B. and Murray-Jones S. (2006). Offshore marine habitat mapping and near-shore marine biodiversity within the Coorong bioregion. Report to Murray-Darling Basin NRM Board. 74 pp. Department for Environment and Heritage, Adelaide.
- Hesp, P.A., Corbett, E., Reiger, E., Werner, A., Miot da Silva, G., 2025. Coastal beach-dune dynamics and historical changes in the Victor Harbor to Kingston region, South Australia. A report prepared for the Goyder Institute for Water Research CLLMM Research Centre, Goolwa
- Opperman, A., 1999, A Biological Survey of the South Australian Coastal Dune and Cliff-top Vegetation, Environment Protection Agency, Department for Environment, Heritage and Aboriginal Affairs, Adelaide.
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- Short, A.D. (2001) Beaches of the South Australian Coast and Kangaroo Island: A guide to their nature, characteristics, surf and safety. Australian Beach Safety and Management Program, Sydney.
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- Western, M, Hesp, P, Bourman, R 2019, Coastal Adaptation Study for Alexandrina Council, Integrated Coasts, South Australia
- Wildlife Health Australia (2018) National Wildlife Biosecurity Guidelines, Sydney NSW.
- Wildlife Health Australia (2020) National Guidelines for Management of Disease in Free-ranging Australian Wildlife, Sydney NSW.

## Cell Biota (Flora and Fauna)

Lists provided are specific to this cell from Biological Database of South Australia (BDBSA), technical updates, review of publications and local input. Conservation ratings (National, State and Sub regional) are included for flora and fauna.

Note: Restricted species as per Department for Environment and Water (DEW) specifications have been omitted from the tables due to the size of cells and requirement for 10km<sup>2</sup> buffering of data. However, records are included in the total species numbers per cell. Please contact DEW directly for restricted data requests.

### FLORA Summary

<b>Vegetation Block Metrics</b>	Coastal reserve of Alexandrina Council Dedicated Heritage Agreement (ref HA 1618) covers all of dunes in cell			
<b>Terrestrial Habitat Description/s</b>	See Terrestrial biodiversity vegetation communities in cell description.			
<b># Flora in cell</b>	63			
<b># Native Flora in cell</b>	39			
<b># Introduced Flora in cell</b>	24			
<b># Conservation Rated Flora in cell</b>	2 (0 national, 2 state)			
<b># Threatened Ecological Communities (EPBC Act)</b>	1 (Subtropical and Temperate Saltmarsh) (to be confirmed by survey)			
<b>Conservation Rated Flora</b>	<b>Species</b>	<b>Common Name</b>	<b>EPBC Act Status</b>	<b>NPW Status</b>
	<i>Picris squarrosa</i> <sup>^</sup>	Squat Picris		R
	<i>Senecio pinnatifolius</i> var. <i>pinnatifolius</i>			R

### All Native Flora in cell

<b>Species</b>	<b>Common Name</b>	<b>EPBC Status</b>	<b>NPW Act Status</b>	<b>Subregional Status*</b>
<i>Abutilon cryptopetalum</i> ssp.				
<i>Acacia longifolia</i> ssp. <i>sophorae</i>	Coastal Wattle			LC
<i>Acaena echinata</i>	Sheep's Burr			LC
<i>Actites megalocarpus</i>	Coast Sow-thistle			NT
<i>Angianthus preissianus</i> <sup>^</sup>	Salt Angianthus			LC
<i>Apium prostratum</i> var. <i>filiforme</i>	Native Celery			LC
<i>Atriplex cinerea</i>	Coast Saltbush			LC
<i>Austrostipa flavescens</i>	Coast Spear-grass			LC
<i>Carpobrotus rossii</i>	Native Pigface			LC
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			LC
<i>Distichlis distichophylla</i>	Emu-grass			LC
<i>Enchylaena tomentosa</i> var.	Ruby Saltbush			
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush			LC
<i>Ficinia nodosa</i>	Knobby Club-rush			LC
<i>Geranium potentilloides</i> var. <i>potentilloides</i>	Downy Geranium			LC
<i>Hemichroa pentandra</i> <sup>^</sup>	Trailing Hemichroa			LC
<i>Lachnagrostis billardierei</i> ssp. <i>Billardierei</i> <sup>^</sup>	Coast Blown-grass			RA
<i>Lepidosperma gladiatum</i>	Coast Sword-sedge			LC
<i>Leucopogon parviflorus</i>	Coast Beard-heath			LC
<i>Lotus australis</i>	Austral Trefoil			LC
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum			LC

Species	Common Name	EPBC Status	NPW Act Status	Subregional Status*
<i>Myoporum insulare</i>	Common Boobialla			LC
<i>Olearia axillaris</i>	Coast Daisy-bush			LC
<i>Oxalis perennans/exilis</i>	Native Oxalis			
<i>Ozothamnus turbinatus</i>	Coast Bush-everlasting			LC
<i>Pelargonium australe</i>	Austral Stork's-bill			LC
<i>Picris angustifolia ssp. Angustifolia</i> <sup>^</sup>	Coast Picris			
<i>Picris squarrosa</i> <sup>^</sup>	Squat Picris		R	
<i>Pimelea serpyllifolia ssp. serpyllifolia</i>	Thyme Riceflower			LC
<i>Rhagodia candolleana ssp.</i>	Sea-berry Saltbush			
<i>Rhagodia candolleana ssp. candolleana</i>	Sea-berry Saltbush			LC
<i>Salicornia quinqueflora ssp. quinqueflora</i> <sup>^</sup>	Beaded Samphire			LC
<i>Senecio pinnatifolius var. pinnatifolius</i>	Rock Groundsel		R	
<i>Spinifex hirsutus</i>	Rolling Spinifex			LC
<i>Tecticornia pergranulata ssp. pergranulata</i> <sup>^</sup>	Black-seed Samphire			LC
<i>Tetragonia implexicoma</i>	Bower Spinach			LC
<i>Threlkeldia diffusa</i>	Coast Bonefruit			LC
<i>Triglochin sp.</i> <sup>^</sup>				
<i>Wilsonia humilis</i> <sup>^</sup>	Silky Wilsonia			NT

<sup>^</sup> denotes records from technical updates, review of publications and local input

\*See Appendices for subregional map

Regional Conservation status, Mount Lofty Ranges IBRA (Interim Biogeographical Regionalisation for Australia) subregion (Gillam & Urban (2014). Regional Species Conservation Assessment Project, Phase 1 Report - Regional Species Status Assessments, Adelaide and Mount Lofty Ranges NRM Region. DEWNR: SA)

RE = Regionally Extinct    CR = Critically Endangered    EN = Endangered  
 VU = Vulnerable    RA = Rare    NT = Near Threatened  
 LC = Least Concern    DD = Data Deficient    NE = Not Evaluated

### All Introduced Flora in cell

Species	Common Name	Red Alert Weeds	Declared Weeds	WONS
<i>Ammophila arenaria</i>	Marram Grass	HP		
<i>Arctotis stoechadifolia</i> <sup>*</sup>	White Arctotis	IC		
<i>Asphodelus fistulosus</i>	Onion Weed	HP		
<i>Cakile maritima ssp. maritima</i>	Two-horned Sea Rocket			
<i>Cenchrus clandestinus</i>	Kikuyu	HP		
<i>Chrysanthemoides monilifera ssp. monilifera</i>	Boneseed	IC	Yes	Yes
<i>Cynodon dactylon var. dactylon</i>	Couch			
<i>Ehrharta villosa</i>	Pyp Grass	IC		
<i>Euphorbia paralias</i>	Sea Spurge	HP		
<i>Euphorbia terracina</i>	False Caper	HP	Yes	
<i>Gaudium laevigatum</i>	Coast Tea-tree		Yes	
<i>Gazania linearis</i>	Gazania	IC	Yes	
<i>Hypochaeris glabra</i>	Smooth Cat's Ear			
<i>Hypochaeris radicata</i>	Rough Cat's Ear			
<i>Lagurus ovatus</i>	Hare's Tail Grass			

<i>Lycium ferocissimum</i>	African Boxthorn	IC	Yes	Yes
<i>Mesembryanthemum crystallinum</i>	Common Iceplant	HP		
<i>Olea europaea ssp. europaea</i>	Olive	IC		
<i>Oxalis pes-caprae</i>	Soursob			
<i>Plantago coronopus ssp. coronopus</i>	Bucks-horn Plantain			
<i>Reichardia tingitana</i>	False Sowthistle			
<i>Silene vulgaris*</i>	Bladder Champion	HP	Yes	
<i>Sonchus oleraceus</i>	Common Sow-thistle			

**WONS** = Weeds of National Significance.

**Declared** = Declared under the Landscape South Australia Act 2019. Pest plants that are a significant threat to agriculture, the natural environment and public health and safety are called declared plants. Land owners have a legal responsibility to manage these plants.

**Red Alert** = Weed Threat Level of four or greater out of nine. Plants in this category are either designated as requiring immediate control (IC – 6-9) or as a high priority for control (HP – 4-5). See Department for Environment and Water (2024)

**Reference** – Department for Environment and Water (2024). Threatening Processes - Environmental and Priority Weed Species. Southern Fleurieu Coastal Action Plan Review 2024. Prepared by SA Herbarium

## FAUNA Summary

# Fauna in cell	53
# Native Fauna in cell	46
# Introduced Fauna in cell	7
# Conservation Rated Fauna in cell	13 (4 national, 13 state)

Conservation Rated Fauna				
Species Name	Common Name	Class	EPBC Act Status	NPW Act Status
<i>Coturnix ypsilophora australis</i> <sup>^</sup>	Brown Quail	AVES		V
<i>Gallinago hardwickii</i> <sup>^</sup>	Latham's Snipe	AVES	VU	R
<i>Haematopus fuliginosus fuliginosus</i> <sup>^</sup>	Sooty Oystercatcher	AVES		R
<i>Haematopus longirostris</i> <sup>^</sup>	Pied Oystercatcher	AVES		R
<i>Haliaeetus leucogaster</i> <sup>^</sup>	White-bellied Sea Eagle	AVES		E
<i>Larus dominicanus dominicanus</i> <sup>^</sup>	Kelp Gull	AVES		R
<i>Neophema elegans elegans</i> <sup>^</sup>	Elegant Parrot	AVES		R
<i>Pandion haliaetus cristatus</i> <sup>^</sup>	Eastern Osprey	AVES		E
<i>Thinornis cucullatus cucullatus</i>	Hooded Plover	AVES	VU	V
<i>Zanda funerea whiteae</i> <sup>^</sup>	Yellow-tailed Black Cockatoo	AVES		V
<i>Pteropus poliocephalus</i> <sup>^</sup>	Grey-headed Flying-fox	MAM	VU	R
<i>Rattus lutreolus</i> <sup>^</sup>	Swamp Rat	MAM		R
<i>Tachyglossus aculeatus</i> <sup>^</sup>	Short-beaked Echidna	MAM	ssp	ssp

## All Native Fauna in cell

Species Name	Common Name	Class	EPBC Act Status	NPW Act Status	Subregional Status
<i>Crinia signifera</i>	Common Froglet	AMP			NT
<i>Limnodynastes dumerilii</i>	Banjo Frog	AMP			NT
<i>Limnodynastes tasmaniensis</i>	Spotted Marsh Frog	AMP			NT
<i>Neobatrachus pictus</i>	Burrowing Frog	AMP			NT
<i>Rawlinsonia calliscelis</i>	South Australian Tree Frog (MLR MN)	AMP			NT
<i>Rawlinsonia ewingi</i> (NC) <sup>^</sup>	Brown Tree Frog	AMP			
<i>Charadrius ruficapillus</i> <sup>^</sup>	Red-capped Plover	AVES			RA
<i>Chroicocephalus novaehollandiae novaehollandiae</i>	Silver Gull	AVES			LC
<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike	AVES			LC
<i>Coturnix ypsilophora australis</i> <sup>^</sup>	Brown Quail	AVES		V	
<i>Gallinago hardwickii</i> <sup>^</sup>	Latham's Snipe	AVES	VU	R	RA
<i>Gavialis virescens</i>	Singing Honeyeater	AVES			LC
<i>Haematopus fuliginosus fuliginosus</i> <sup>^</sup>	Sooty Oystercatcher	AVES		R	VU
<i>Haematopus longirostris</i> <sup>^</sup>	Pied Oystercatcher	AVES		R	VU
<i>Haliaeetus leucogaster</i> <sup>^</sup>	White-bellied Sea Eagle	AVES		E	EN
<i>Larus dominicanus dominicanus</i> <sup>^</sup>	Kelp Gull	AVES		R	RA
<i>Larus pacificus georgii</i> <sup>^</sup>	Pacific Gull	AVES			LC
<i>Neophema elegans elegans</i> <sup>^</sup>	Elegant Parrot	AVES		R	RA
<i>Pandion haliaetus cristatus</i> <sup>^</sup>	Eastern Osprey	AVES		E	
<i>Phalacrocorax fuscescens</i> <sup>^</sup>	Black-faced Cormorant	AVES			NT
<i>Phalacrocorax sulcirostris</i> <sup>^</sup>	Little Black Cormorant	AVES			LC
<i>Thinornis cucullatus cucullatus</i>	Hooded Plover	AVES	VU	V	EN
<i>Zanda funerea whiteae</i> <sup>^</sup>	Yellow-tailed Black Cockatoo	AVES		V	RA
<i>Anisynta cynone cynone</i> <sup>^</sup>	Mottled Grass Skipper	INV			
<i>Danaus petilia</i> <sup>^</sup>	Lesser Wanderer	INV			

Species Name	Common Name	Class	EPBC Act Status	NPW Act Status	Subregional Status
<i>Danaus plexippus plexippus</i> ^	Monarch	INV			
<i>Hesperilla flavescens</i> ^	Yellowish Sedge-skipper	INV			
<i>Junonia villida calybe</i> ^	Meadow Argus	INV			
<i>Lampides boeticus</i> ^	Long-tailed Pea-blue	INV			
<i>Nacaduba biocellata biocellata</i> ^	Two-spotted Line-blue	INV			
<i>Ocybadistes walkeri hypochlora</i> ^	Southern Grass-dart	INV			
<i>Pieris rapae rapae</i> ^	Cabbage White	INV			
<i>Taractrocera papyria papyria</i> ^	White-banded Grass-dart	INV			
<i>Theclinesstes miskini miskini</i> ^	Wattle Blue	INV			
<i>Theclinesstes serpentatus serpentatus</i> ^	Salt-bush Blue	INV			
<i>Vanessa itea</i> ^	Australian Admiral	INV			
<i>Vanessa kershawi</i> ^	Australian Painted Lady	INV			
<i>Zizina otis labradus</i> ^	Common Grass-blue	INV			
<i>Austronomus australis</i>	White-striped Free-tailed Bat	MAM			LC
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	MAM			LC
<i>Hydromys chrysogaster</i> ^	Water Rat	MAM			NT
<i>Mormopterus planiceps</i>	Southern Free-tailed Bat	MAM			
<i>Pteropus poliocephalus</i> ^	Grey-headed Flying-fox	MAM	VU	R	
<i>Rattus lutreolus</i> ^	Swamp Rat	MAM		R	RA
<i>Tachyglossus aculeatus</i> ^	Short-beaked Echidna	MAM	ssp	ssp	
<i>Ctenophorus pictus</i> ^	Painted Dragon	REP			

**Class:** **ACT** = Actinopteri, **AMP** = Amphibia, **AVES** = Aves, **INV** = Invertebrates, **MAM** = Mammalia, **REP**= Reptilia

#### All Introduced Fauna in cell

Species	Common Name
<i>Columba livia</i> ^	Feral Pigeon
<i>Felis catus</i> ^	Domestic Cat (Feral Cat)
<i>Mus musculus</i> ^	House Mouse
<i>Oryctolagus cuniculus</i> ^	Rabbit (European Rabbit)
<i>Sturnus vulgaris vulgaris</i> ^	Common Starling
<i>Vulpes vulpes</i> ^	Fox (Red Fox)
<i>Acridotheres tristis</i> ^	Common Myna



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