

Southern Fleurieu Coastal Action Plan

Carrickalinga Creek (Karrapootungga)¹ to Carrickalinga (Karrakalingga) Head

Cell F25

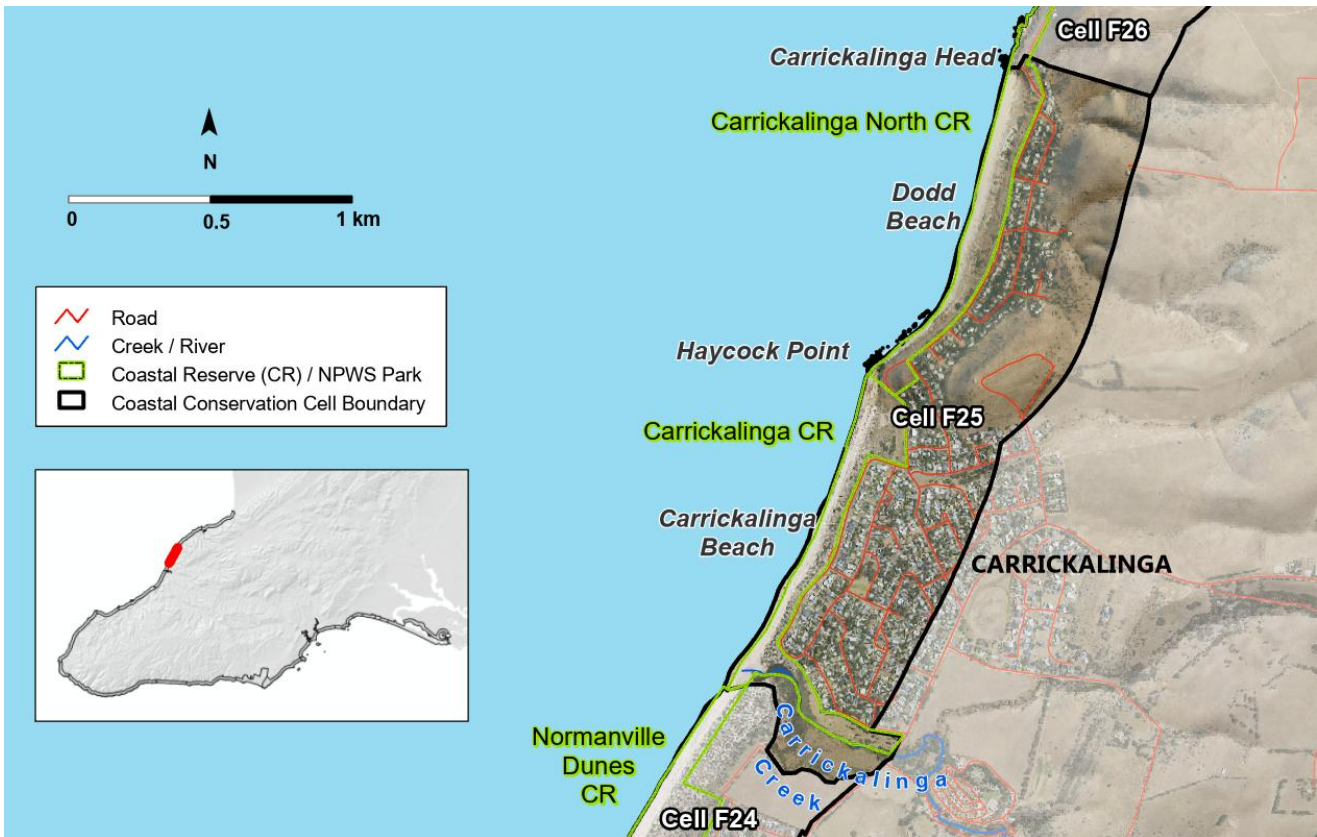
Overview

This cell has high biodiversity and conservation values at Carrickalinga Creek estuary and the coastal dunes. The estuary supports a diverse range of habitats, flora and fauna species, and ecological communities of local, state and national significance. Development of an estuary action and management plan is required.

Regionally rare Silver Banksia (*Banksia marginata*) low woodlands are persisting in very small patches of remnant vegetation and need greater protection and restoration. Coastal dunes provide protection from coastal

storm surge and erosion and require weed control and active restoration.

Impacts of development and increasing visitation that peaks sharply during summer months, places pressure on infrastructure and ecological values in this cell. Stormwater and catchment management can be improved to decrease erosion and sediment reaching the estuary and restricting connectivity with marine environments. In the nearshore, diverse assemblages of marine flora and fauna are locally abundant and regionally important. Further investigations of land-based impacts to the nearshore marine habitats are required.



¹“Karrapootungga River, to the north of Pangkarla, was the earliest recorded traditional language word (Kurna Meyunna), in 1840 and good water could be found there most of the year. Karrakalingga was recorded around the same time” (Karl Winda Telfer, personal communications, December 2025).

Traditional Owner and First Nations cultural heritage and connection to land and sea Country

This cell is of high cultural value and significance to the Kurna Patpangga Meyunna people. The Country is part of several Dreaming stories, including Tjilbruke/Tjirbuki, which is a coast and sea songline story. The area features places, artefacts, plants and animals of high cultural and human value, including caves, fish traps and fishing grounds, seasonal campgrounds, sleeping places, and places of creation story and spiritual practices. This cell includes registered and un-registered Aboriginal heritage sites; more broadly, all the lands and waters are of importance to the Kurna Patpa and Mullawirra Meyunna.

Please respect that cultural concepts and content included in this plan are the Aboriginal Cultural and Intellectual property (ACIP) of Karl Winda Telfer of the Mullawirra Meyunna (Kurna Meyunna) (cells 20-27). They may not be used or adapted by any other parties without consent.

Cell detail

This cell extends from Carrickalinga Creek estuary (including upper reaches where seawater incursion occurs during tidal inflows), approximately 2.5km to Carrickalinga Head. This cell is in the District Council of Yankalilla local government area.

Tenure, Land Use and Values

A series of linear council and Crown Lands reserves along the coastline, with a small wider dune area immediately south of Haycock Point. Flood plain of the Lower Carrickalinga Creek is divided by a Council reserve (north of creek), and Private land holder (south of creek). Holiday home and residential development directly behind dunes to the cell boundary at southern end of cell. Northern end of cell has narrower development backed by private grazing land on steep slopes and crests. Since 2012, the waters surrounding this cell are within the boundaries of the Encounter Marine Park.

Native title has not been established for this cell. The Federal Court did not determine native title for Kurna Yerta Aboriginal Corporation over the lands south of Myponga to the edge of the Ngarrindjeri determination (3.5km northeast of Cape Jervis). Kurna Patpangga Meyunna maintain cultural and historical connections to this region, the formal determination was limited to areas from Lower Light in the north to Myponga in the south.

Foreshore access facilitated by car parks, steps and defined access through dunes. The presence of a functional beach – dune sedimentary system is valuable and well utilised by this settlement and tourist population. The rock pools and rocky shores stretching from Hancock Point north to Carrickalinga Head are popular spots for exploring and discovering pocket swimming holes.

Bryars (2013) notes the cell is utilised for recreational fishing, boating, surfing, swimming, walking and diving/snorkelling. Carrickalinga Reef (offshore from the end of Lyddon Road) is a recognised recreational diving site. The beach is an important habitat and fishing area for species such as Southern School /Yellowfin Whiting (*Sillago bassensis*, *Sillago schomburgkii*) and Yelloweye Mullet (*Aldrichetta forsteri*) (Bryars 2013).

Local volunteer groups, including Friends of Carrickalinga Creek, volunteers from the Fleurieu Environment Centre and the Fleurieu Coast Community Nursery, have helped to conserve and revegetate the cell and will continue to play a supporting role in conservation and public awareness. There is not a dedicated volunteer group that works across the Normanville dunes, despite the high conservation value and species diversity. Friends of the Hooded Plover Fleurieu Peninsula (supported by BirdLife Australia) monitor and raise awareness of beach-nesting and shorebird species within the cell.

Landforms

Beach composed of pure silica white Holocene sands. Low tide terrace beach; intermediate to low energy, with waves usually less than 1m. Steep beach face to low tide, then flat terrace of flattened bar to approximately 50 metres. Low barrier dunes <2m, 50 to 100m wide, very narrow north of Haycock Point. Talus slope at base of c.25° hillslope (Caton et al 2007).

The southern-most dune areas in this cell at Carrickalinga Creek estuary are part of the Normanville Sand Dunes (geological monument 1109), displaying undifferentiated Holocene aeolian sediments that are the last major relics of similar coastal dunes that once existed along the east coast of Gulf St Vincent. The dunes provide information on the processes of shoreline development during the Holocene (5,000 years), forming a double crested system, with younger foredunes to seaward and older dunes inland (Geological Society of Australia 2002). These dunes are also

an important source for the replenishment of beach sand, and a protective feature of the inland areas that are very low lying. The Normanville dunes are recognised for their geological and biodiversity values, are listed under the Australian Heritage Commission, the South Australian Heritage Register (reference 175586, 14041, 17035) and have been accepted as a Geological Monument (no 1109) by the Geological Monuments Sub-committee of the South Australian Division of the Geological Society of Australia Limited.

The northern end of this cell lies the Carrickalinga Head Geological monument (reference 11199), which is part of the Kanmantoo Group, Normanville Group, Heatherdale Shale, Carrickalinga Head Formation.



Carrickalinga, showing narrow dune, wider coastal reserve (Carrickalinga rotunda) and Carrickalinga Creek estuary (far right) (Coast Protection Board, March 2024)

Terrestrial biodiversity

Whole cell

The southern end of the cell is part of the heritage listed Normanville dunes and is of high biodiversity and conservation value. Adjoining the southern dunes, the Carrickalinga Creek estuary supports a range of valuable habitats and potentially vegetation associations of state and national significance, as part of the *subtropical and temperate saltmarsh* threatened ecological community. Pockets of remnant vegetation also exist throughout the various estuary and dune reserves within this cell, including Silver Banksia (*Banksia marginata*) Low woodland and Coast Daisy-bush (*Olearia axillaris*) + Coast Beard-heath (*Leucopogon parviflorus*) mid open shrubland within the coastal dunes.

Other conservation values within the cell are for rare plant associations in South Australia and for bird habitat. However, within the regional context, biodiversity values are low, with a relatively small number of flora and fauna species.

Fauna species of conservation significance recorded in this cell include Cape Barren Goose (*Cereopsis novaehollandiae novaehollandiae*), Hooded Plover (*Thinornis cucullatus cucullatus*), Elegant Parrot (*Neophema elegans elegans*), and Common Sandpiper (*Actitis hypoleucos*). The diversity of habitats within this cell supports and provides suitable habitat for multiple fauna species.

The coastal slopes within this cell have been largely cleared, but small pockets or individual species from the Drooping Sheoak (*Allocasuarina verticillata*) low woodland vegetation association still persist.

Multiple common butterfly species that are observed across the Fleurieu Peninsula are found in this cell, including Southern Grass-dart (*Ocybadistes walkeri hypochlora*), White-banded Grass-dart (*Taractrocera papyria papyria*), Meadow Argus (*Junonia villida calybe*), Australian Painted Lady (*Vanessa kershawi*), Australian Admiral (*Vanessa itea*), Lesser Wanderer (*Danaus petilia*), Monarch (*Danaus plexippus plexippus*), Long-tailed Pea-blue (*Lampides boeticus*), Two-spotted Line-blue (*Nacaduba biocellata biocellata*), Wattle Blue (*Theclinessthes miskini miskini*), Salt-bush Blue (*Theclinessthes serpentatus serpentatus*) and Common Grass-blue (*Zizina otis labradus*) (Stolarski 2024). Many of the species of conservation significance do not occur in this cell as their host plants are not present or are in low numbers and unable to support reintroduction from neighbouring cells.

The Hooded Plover (*Thinornis cucullatus cucullatus*), vulnerable in South Australia successfully nest and forage across Carricklainga beach (including the estuary). Red-capped Plovers (*Charadrius ruficapillus*) that are semi-colonial nesters are also recorded in this cell. The beaches and exposed rocky shores in this cell provide foraging habitats for shorebirds, including Sooty Oystercatchers (*Haematopus fuliginosus fuliginosus*), Caspian Tern (*Hydroprogne caspia*) and Greater Crested Terns (*Thalasseus bergii cristatus*), Silver Gulls (*Chroicocephalus novaehollandiae novaehollandiae*) and Pacific Gulls (*Larus pacificus georgii*).



Red-capped Plover (Charadrius ruficapillus) and chicks (A Lamanna)

Seagrass wrack (also known as Beach cast wrack) found regularly on beaches has an important ecological function recycling nutrients back to coastal waters as well as protection and stabilisation of the shoreline and coastal dunes by acting as a trap that binds drifting sands and reduces sand erosion during winter (PIRSA 2014). Beach wrack also provides an important role as habitat and shelter for Hooded Plovers (*Thinornis cucullatus cucullatus*) and Pied Oystercatcher (*Haematopus longirostris*) and Sooty Oystercatchers (*Haematopus fuliginosus fuliginosus*) as well as other shorebirds and juvenile fish. Beach cast wrack collection within Encounter Marine Park is prohibited in all zones except general managed use zones. Therefore, no removal of beach wrack is permitted in this cell.

The coastal dunes and slopes are valued habitat for a range of seabirds species including the White-bellied Sea Eagle (*Haliaeetus leucogaster*), Eastern Osprey (*Pandion haliaetus cristatus*), Little Black Cormorant, (*Phalacrocorax sulcirostris*), Little Pied Cormorant (*Microcarbo melanoleucos melanoleucos*), Black-faced Cormorant (*Phalacrocorax fuscescens*), Pacific Gull (*Larus pacificus georgii*) and Kelp Gull (*Larus dominicanus dominicanus*).

Silver Banksia (*Banksia marginata*) low woodland

This vegetation community is likely to have always been of minor occurrence within coastal areas of the region (HFLB 2025). It previously occurred in areas adjoining the Carrickalinga Creek and the nearby Normanville area, which have now largely been cleared. Any remnant plants and patches within the cell are, therefore, of high conservation value locally and regionally. Two small patches of this association are mapped under pre-European conditions either side of the upper reaches of the estuary, with the northern patch historically occupying the area behind the dunes, stretching north to Hancock Point midway in this cell.



Silver Banksia (Banksia marginata) (C Taylor)

Estuary (Carrickalinga Creek)

Carrickalinga Creek is a recognised estuary (DEH 2007).

The Carrickalinga Creek estuary is part private land (southern boundary dunes and sedgelands), and part managed the District Council of Yankalilla, from the front of the sand dunes along the northern estuary edge to Carrickalinga Road. The estuary is a significant conservation zone for the region, with high value intact remnant wetlands being areas of *Fleurieu Peninsula swamp* (Harding 2005, Abley 2007).

Coastal shrubland dominated by Coastal Wattle (*Acacia longifolia* ssp. *sophorae*) and Rolling Spinifex (*Spinifex hirsutus*) with Coastal Daisy-bush (*Olearia axillaris*), buffers the estuary from the sea by a wide strip along the coast. Behind this shrubland, on the low-lying flats, is a patchwork of sedgeland that would once have been dominated by Thatching Grass (*Gahnia filum*). Today, this area has remnant patches of Thatching Grass (*Gahnia filum*), Knobby Club Rush (*Ficinia nodosa*), Flat Sedge (*Cyperus* sp.) and Sea Rush (*Juncus kraussii*).

Closer to the riparian zone, the sedgeland becomes dominated by Common Reed (*Phragmites australis*) and in patches by Silky Tea-tree (*Leptospermum lanigerum*) shrubland with an overstory of River Red Gum (*Eucalyptus camaldulensis* spp. *camaldulensis*). The saline estuary zone supports low open samphire shrubland dominated by Beaded Samphire (*Salicornia quinqueflora* ssp. *quinqueflora*) with Lignum (*Duma florulenta*) in patches (Abley 2007).



Carrickalinga Creek estuary with coastal dunes and diverse riparian and saltmarsh habitats (Coast Protection Board, March 2024)

Beaded Samphire (*Salicornia quinqueflora* ssp. *quinqueflora*) Low Shrublands are part of the Nationally Vulnerable community “Subtropical and temperate coastal saltmarsh”, as listed in the *Environmental Protection and Biodiversity and Conservation (EPBC) Act 1999*. This is further supported by the presence of Thatching Grass (*Gahnia filum*) and Sea Rush (*Juncus kraussii*) habitats within the estuary. These habitats or ecological communities represent the assemblage of plants, animals and micro-organisms associated with saltmarsh in coastal regions of sub-tropical and temperate Australia (DCCEE 2013).

The estuary also supports vegetation associations aligned as being areas of *Fleurieu Peninsula Swamp* and potential Mount Lofty Ranges Southern Emu Wren (*Stipiturus malachurus intermedius*) habitat (Abley 2007, Harding 2005).

The estuary provide habitat for a range of woodland and wetland birds, including Red-rumped Parrot (*Psephotus haematonotus*), Welcome Swallow (*Hirundo neoxena neoxena*), Singing Honeyeater (*Gavicalis virescens*), White-faced Heron (*Egretta novaehollandiae*), Superb Fairywren (*Malurus cyaneus*), Australian Reed Warbler (*Acrocephalus australis australis*), Little Wattlebird (*Anthochaera chrysoptera*), Grey Shrikethrush (*Colluricincla harmonica*), Great Egret (*Ardea alba modesta*), Nankeen Kestrel (*Falco cenchroides cenchroides*), Dusky Moorhen (*Gallinula tenebrosa tenebrosa*) and Black Swan (*Cygnus atratus*) (Abley 2007).

Fish biodiversity and water quality monitoring surveys have been undertaken at the estuary and lower reaches of the Carrickalinga River. These surveys indicate it supports a range of fish species, including Common Galaxias (*Galaxias maculatus*), Climbing Galaxias (*Galaxias brevipinnis*), Congolli (*Pseudaphritis urvillii*), Mountain Galaxias (*Galaxias olidus*), Big-headed Gudgeon (*Philypnodon grandiceps*), Dwarf Flathead Gudgeon (*Philypnodon macrostomus*), Western Bluespot Gudgeon (*Pseudogobius olorum*), Black Bream (*Acanthopagrus butcheri*), Bridled Goby (*Arenigobius bifrenatus*), Yelloweye Mullet (Aldrichetta *forsteri*), Eastern Australian Salmon (*Arripis trutta*) and introduced species Eastern Gambusia (*Gambusia holbrooki*) and Redfin Perch (*Perca fluviatilis*) (Schmarr et al. 2022).



Black Bream (Acanthopagrus butcheri) have been recorded in Carrickalinga Creek estuary (D Schmarr)

Estuarine Habitats: Carrickalinga Creek



- Channel
- Beach
- Dune
- Estuarine Flat
- Floodplain
- Intertidal Flat
- Riparian
- Estuarine Sedges
- Samphire
- Estuary Extent



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Fig 25.1 Carrickalinga Creek estuarine habitats

Vegetation Communities

Coastal Slopes and watercourses

River Red Gum (*Eucalyptus camaldulensis* spp. *camaldulensis*) Woodland

- River Red Gum (*Eucalyptus camaldulensis* spp. *camaldulensis*) Woodland over an open understorey of sedges, rushes, grasses and herbs.

Drooping Sheoak (*Allocasuarina verticillata*) low woodland

- Drooping Sheoak (*Allocasuarina verticillata*) Low Woodland over an open grassy and herbaceous understorey Hard Mat-rush (*Lomandra multiflora* ssp. *dura*) + Scented Mat-rush (*Lomandra effusa*) + Wallaby Grass (*Rytidosperma* spp.) + Spear Grass (*Austrostipa* spp.)

Coastal dunes and Shrubland

Coast Daisy-bush (*Olearia axillaris*) + Coast Beard-heath (*Leucopogon parviflorus*) mid open shrubland

- Coast Daisy-bush (*Olearia axillaris*) + Coast Beard-heath (*Leucopogon parviflorus*) + Coastal Wattle (*Acacia longifolia* ssp. *sophorae*) +/- Common Boobialla (*Myoporum insulare*) mid open shrubland over Sea-berry Saltbush (*Rhagodia candolleana* ssp. *candolleana*) low shrubs over Thyme Riceflower (*Pimelea serpyllifolia* ssp. *serpyllifolia*) + Bower Spinach (*Tetragonia implexicoma*) +/- Coastal Climbing Lignum (*Muehlenbeckia gunnii*) +/- Short-stem Flax-lily (*Dianella brevicaulis*)

Drooping Sheoak (*Allocasuarina verticillata*) low woodland

- Drooping Sheoak (*Allocasuarina verticillata*) low woodland over Coast Daisy-bush (*Olearia axillaris*) +/- Coast Wallowa (*Acacia nematophylla*) +/- Umbrella Bush (*Acacia ligulata*) +/- Sea Box (*Alyxia buxifolia*) +/- Coast Beard-heath (*Leucopogon parviflorus*) +/- Cup Wattle (*Acacia cupularis*) mid shrubs over Sea-berry Saltbush (*Rhagodia candolleana* ssp. *candolleana*) low shrubs over *Hare's Tail Grass (*Lagurus ovatus*) + Pimpernel (*Lysimachia arvensis*) +/- Coast Bitter-bush (*Adriana quadripartita*) +/- Coast Sword-sedge (*Lepidosperma gladiatum*)

Silver Banksia (*Banksia marginata*) low woodland

- Silver Banksia (*Banksia marginata*) low woodland +/- Southern Cypress Pine (*Callitris gracilis*) + Drooping Sheoak (*Allocasuarina verticillata*) over open mixed shrub understorey

Estuary (Carrickalinga Creek)

Low open samphire shrubland

- Beaded Samphire (*Salicornia quinqueflora* ssp. *quinqueflora*) +/- Lignum (*Duma florulenta*)

Riparian sedgeland

- Bullrush (*Typha orientalis*) + Common Reed (*Phragmites australis*) + Silky Tea-tree (*Leptospermum lanigerum*) +/- River Red Gum (*Eucalyptus camaldulensis* spp. *camaldulensis*)
- Sea Rush (*Juncus kraussii*) +/- *Dense Flat-sedge (*Cyperus congestus*)
- Thatching Grass (*Gahnia filum*) sedgeland
- Knobby Club-rush (*Ficinia nodosa*) sedgeland

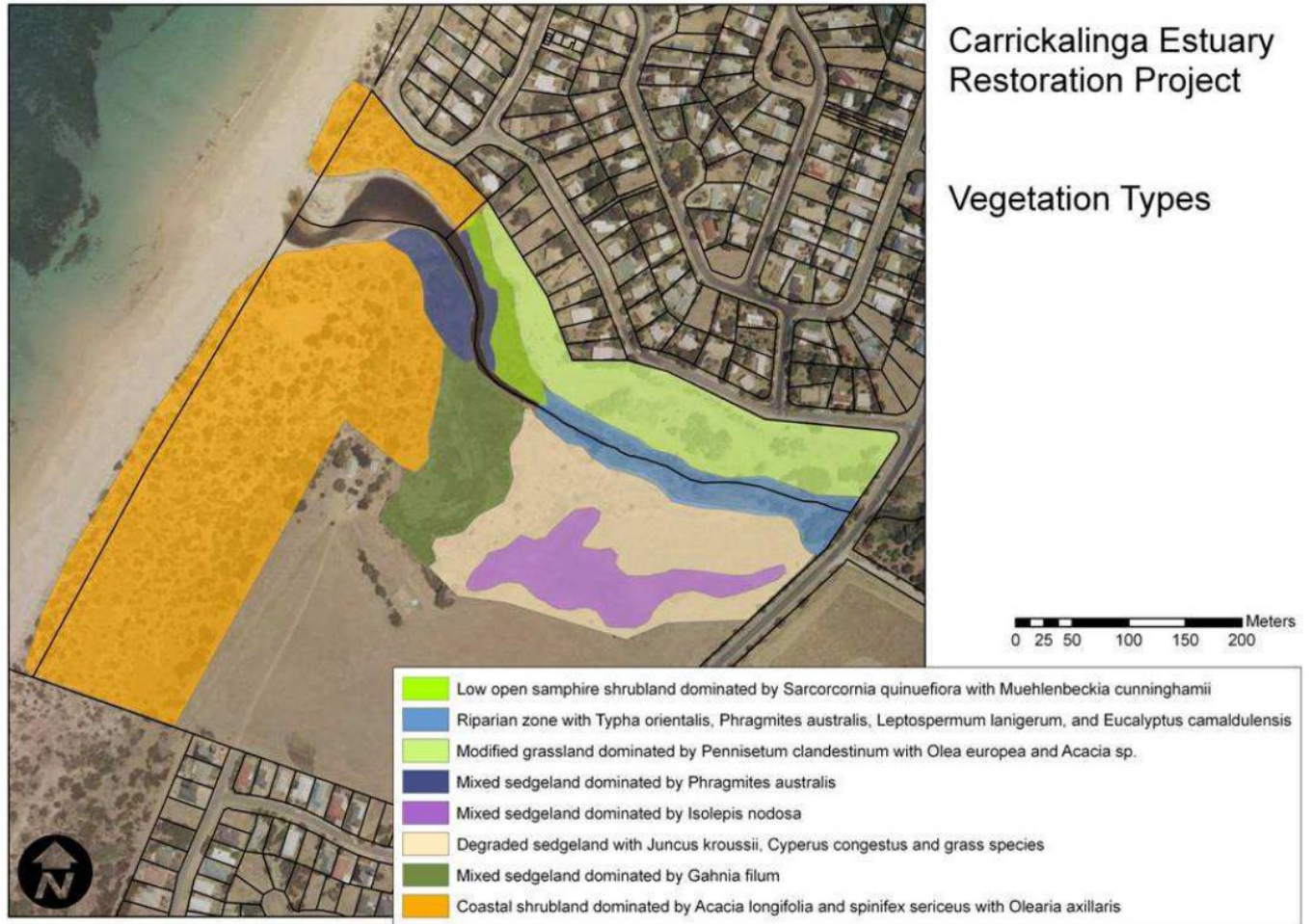


Fig 25.2 Vegetation communities of Carrickalinga Creek Estuary (Abley 2007)

Nearshore habitats

This cell forms part of the Encounter Marine Park. The marine areas of cell F25 are within a Habitat Protection Zone (HPZ-5).

Clear sand to approximately 200m then extensive dense seagrass. Cobble patch reefs throughout the area; inshore reef at Haycock Point.

Bryars (2013) describes this cell as dominated by bare sand both offshore and inshore, with significant areas of continuous low profile reef inshore and continuous/patchy seagrass midshore (Figure 25.3).

Subtidal reefs in the area are composed of limestone or metamorphic rock with a cover of macroalgae and sessile invertebrates (Turner et al. 2007, DEH 2008, Baker et al. 2009, Brook and Bryars 2014, Brook et al. 2020, Brock et al. 2023). The inshore bare sand is characterised by a low-energy, low tide terrace beach system from Carrickalinga Creek to Haycock Point and a low to moderate-energy, reflective beach system at Carrickalinga Beach (Short 2001).

The cell is regionally significant due to its complexity of habitat types and existence of the Carrickalinga Creek estuary (Bryars 2013).

Subtidal reefs

Surveys of the subtidal reef at Carrickalinga and Haycock Point have found a high diversity of fishes, invertebrates and macroalgae (Edgar et al. 2006, Turner et al. 2007, DEH 2008, Brook and Bryars 2014, Brook et al. 2020, Brock et al. 2023). The cell lies within a region of low macroalgal species diversity. However, this is probably partly due to a low level of collection effort (see Baker and Gurgel 2010).

The reef ecosystem baseline study (Brook et al. 2020), and current study by Brock *et al.* (2023) assessing the trends in the condition of rocky reef ecosystems of the greater Adelaide and Fleurieu Peninsula region, found that the overall status of rocky reefs was stable or improving, based on several key indicators of condition (e.g. fish and macroinvertebrate species richness, community structure, large fish biomass, macroalgae percentage cover, and reef thermal index). The Central Fleurieu subregion comprises 24 long term monitoring survey reef sites, with three sites found within the cell. These sites include Carrickalinga Creek, and Carrickalinga and Haycock Points. Combined reef surveys in this subregion indicate that macroinvertebrate and fish species richness, large fish biomass and the percentage cover of canopy-forming algae has remained stable or is increasing (Brock *et al.* 2023). Marine species in the Central Fleurieu subregion include 143 bony fish, 12 sharks and rays, 104 species of marine invertebrate, and 20 species of crustacean (Brock et al. 2023, Edgar and Barrett (2012), Edgar and Stuart-Smith (2014), Edgar et al. (2020)).



Southern Rock Lobster (Jasus edwardsii) (S Bryars)

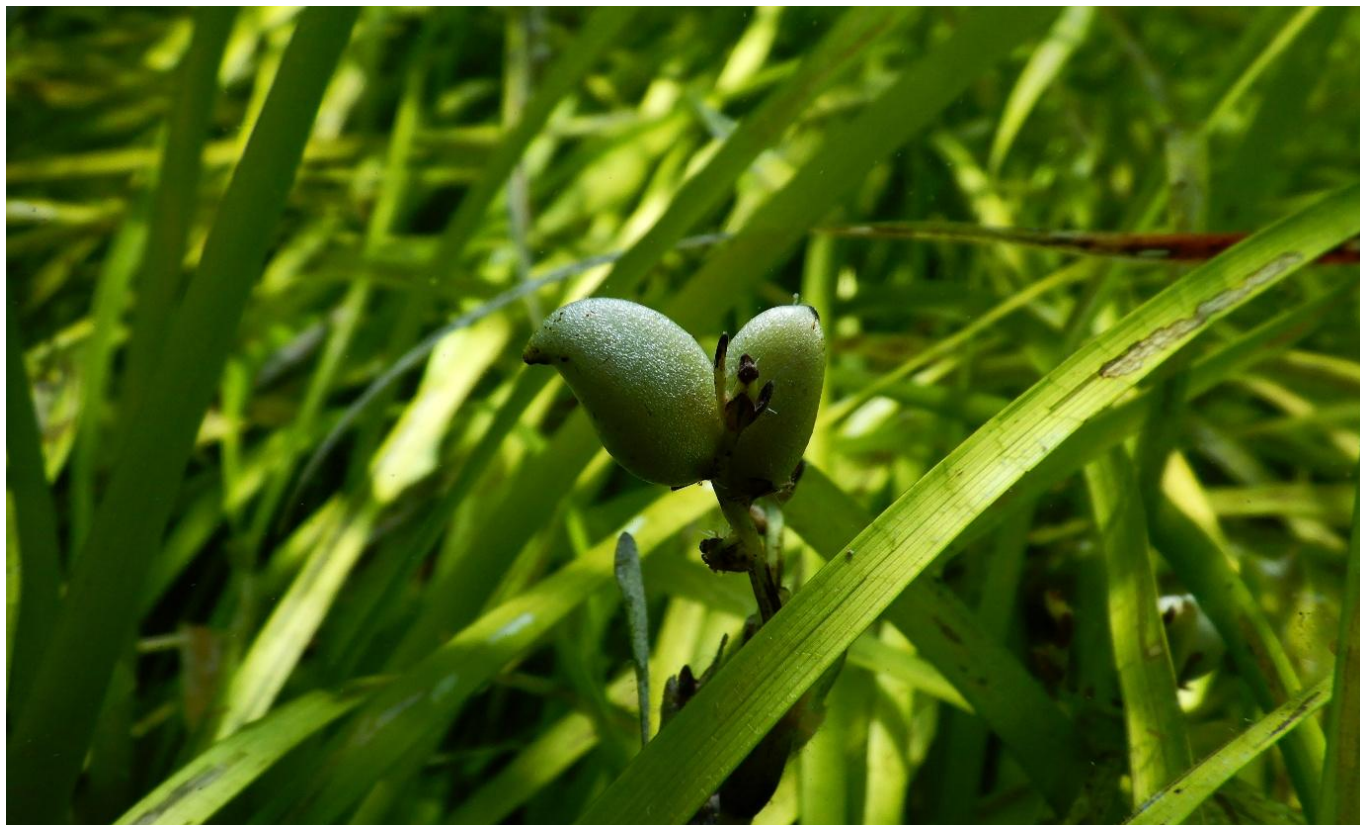
Seagrass

The inshore seagrasses in this part of Yankalilla Bay are dominated by *Amphibolis antarctica*, with some *Posidonia* spp. and *A. griffithii* (Murray-Jones et al. 2009). For the inshore waters (<500m offshore) of Yankalilla Bay between Lady Bay and Carrickalinga, Bryars (2014) documented a mixture of *Amphibolis antarctica*, *A. griffithii*, *Posidonia sinuosa*, *P. angustifolia* and mixed *Amphibolis/Posidonia* seagrass meadows, patches of macroalgal reef, and scattered sand holes amongst the seagrass and reef.

Species diversity

Bryars (2003) listed 10 fish and two macroinvertebrate species for the sheltered beach habitat between Carrickalinga Head and Lady Bay, 12 fish and four macroinvertebrate species for the seagrass habitat between Sellicks Beach and Rapid Head, 14 fish and six macroinvertebrate species for the unvegetated soft bottom habitat between Sellicks Beach and Rapid Head, and 14 fish and six macroinvertebrate species for the reef habitat between Sellicks Beach and Rapid Head.

While the seagrass and bare sand habitats are likely to support a range of species (e.g. see Bryars 2003), apart from mapping studies that have characterised the seafloor (Shepherd and Sprigg 1976, Tanner 2002, DEH 2008, Tanner et al. 2012), no biological surveys appear to have been undertaken on these habitats within Cell F25.



Narrow leaf Tapeweed (Posidonia sinuosa) (M Sierp)

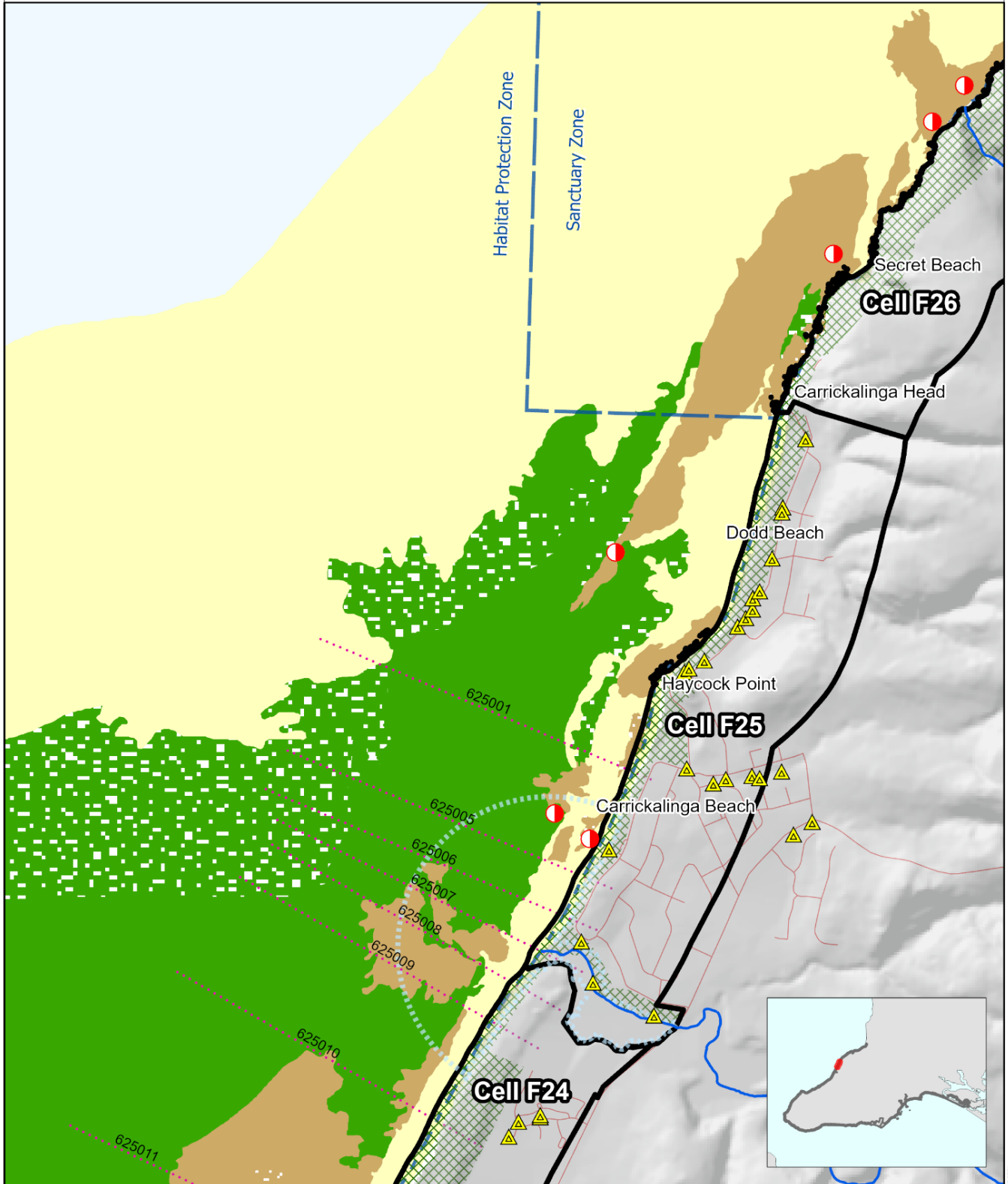
The SA Coast Protection Board's Beach Profile Survey Program initiative, undertaken by Coast Unit, DEW, was first established in 1977 along the Fleurieu Peninsula to monitor and evaluate changes in dune, beach and nearshore seabed levels, with a network of over 600 profiles maintained across the state. 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 historical cross-shore beach profile monitoring site within this cell (profile 625001 established in 1977 below Haycock Point to monitor trends in beach-dune and nearshore dynamics over time. The profile features periodic erosion in response to storm events and subsequent accretion during calm wave conditions. Similarly, there is variability over time in beach level and nearshore active zone in response to storm events.

In addition, three seagrass profiles within this cell (625007, 625006, 625005) established by Coast DEW as part of a study (Murray-Jones et al 2009) in partnership with the South Australian Research and Development Institute (SARDI) Aquatic Sciences and the AMLR NRM Board (now Green Adelaide) to monitor seagrass condition where baseline bathymetric data was collected in 2009. This is an important baseline data set from which to monitor future condition of seagrass conditions as well as changes in seabed bathymetry in response to changes in seagrass cover with historical links between seagrass loss and seabed erosion and deepening off other urban populations (Tanner et al, 2012 and 2019). This survey was undertaken on the basis that Yankalilla Bay is home to extensive areas of seagrass in the region with the potential to be impacted by settlements with growing urban populations.

Nearshore Habitats: Cell F25



Low Profile Reef - Continuous	Marine Park Zones	<p>Produced by Landscapes Hills and Fleurieu Date Date Saved: 28/11/2025 8:08 PM Projection GDA 2020 South Australia</p> <p>© Crown in right of the State of South Australia, Hills and Fleurieu Landscape Board. The HFLB does not guarantee that this map is error free. Use of the map is at the user's sole risk and the information contained on the map may be subject to change without notice.</p>
Low Profile Reef - Patchy	Beach Profile Monitoring	
Seagrass - Continuous	Stormwater Discharge	<p>LANDSCAPE SOUTH AUSTRALIA HILLS AND FLEURIEU</p> <p> Government of South Australia</p>
Seagrass - Patchy	Reef Survey Sites	
Unconsolidated Bare Substrate	Estuary Extent	
Unmapped	Watercourse	
Coastal Reserves / NPWS Parks	Roads	
Coastal Conservation Cell		

Figure 25.3 Nearshore habitats of Cell F25.

Threats

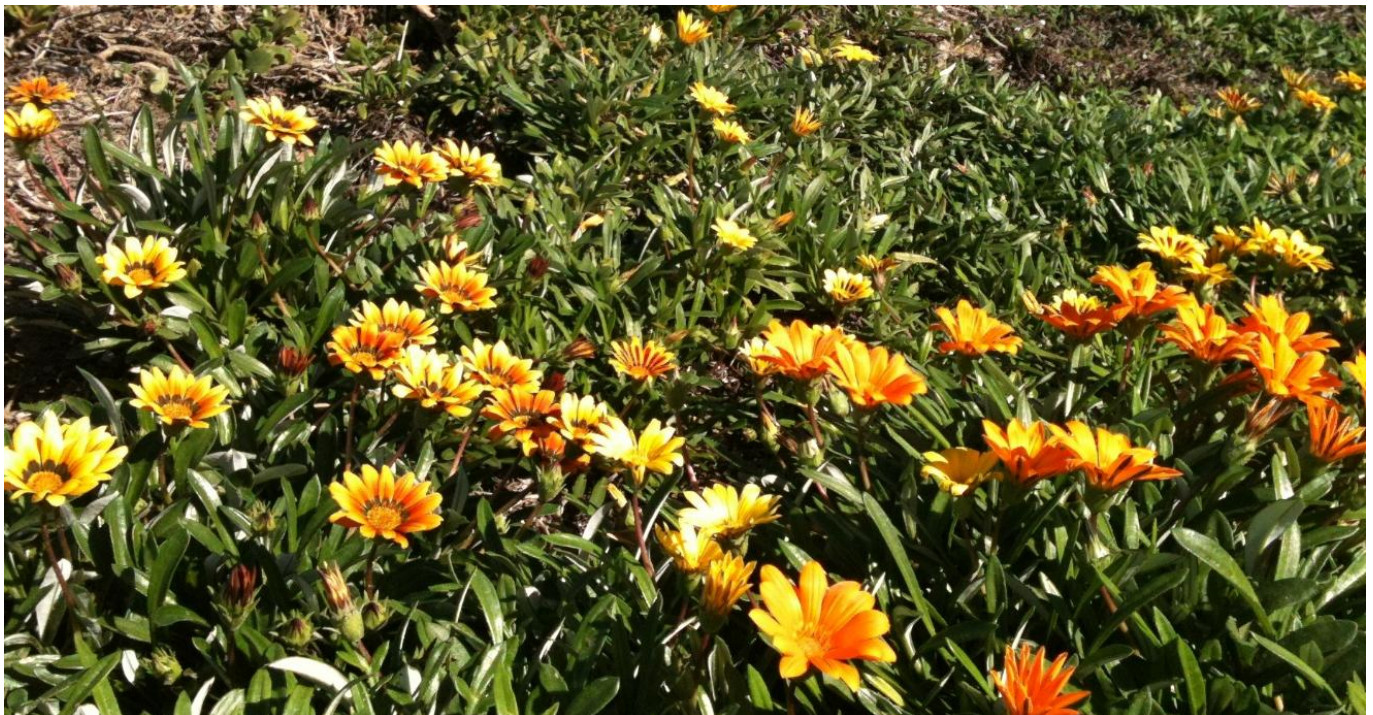
Whole cell

The region is one of the strongest areas for growth in South Australia. In the summer holiday season, the local population more than doubles in size, putting additional pressure on infrastructure, services and the environment (AECOM 2010, DCY 2019, AWE 2020). Usage of coastal environments via visitor/tourism pressures, walkers, camp groups, and major events have the potential to increase weed incursions, damage vegetation, introduce litter, and disturb native fauna. Despite relatively defined paths that are heavily utilised, unintended foot traffic wanders off tracks, which results in creation of unauthorised access tracks within and across the dunes, and damage to native vegetation.

Other threats identified for this cell include land ownership and land use, development zoning, vegetation block degradation, viewshed and viewscape (Caton et al 2007). 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.

Weed threats from a variety of species exist on both public and private lands within this cell and include Gazania (*Gazania linearis*), Fountain Grass (*Cenchrus setaceus*), Western Coastal Wattle (*Acacia cyclops*) and Tufted Honeyflower (*Melianthus comosus*). Other declared and red alert species include African Boxthorn (*Lycium ferocissimum*), Coast Tea-tree (*Gaudium laevigatum*), Salvation Jane (*Echium plantagineum*), Olives (*Olea europaea ssp. Europaea*), White Arctotis (*Arctotis stoechadifolia*), Coastal Galenia (*Aizoon pubescens*), Marram Grass (*Ammophila arenaria*), Kikuyu (*Cenchrus clandestinus*), Feather-top (*Cenchrus longisetus*), Broad-leaf Cotton-bush (*Gomphocarpus cancellatus*), Pigface (*Ruschia tumidula*), Soursob (*Oxalis pes-caprae*), Hottentot Fig (*Carpobrotus edulis ssp. edulis*), Perennial Veldt Grass (*Ehrharta calycina*), Coastal Galenia (*Aizoon pubescens*), and Sea Wheat-grass (*Thinopyrum junceiforme*).

Encroachments into the dunes from garden weed escapes, dumping of garden waste and intentional planting of non-local plants are a threat (Telfer and Milne 2016, Caton et al 2007), spreading from local residences including New Zealand Mirror-bush (*Coprosma repens*), assorted succulents (Tree Aloe (*Aloe arborescens*), Century Plant (*Agave americana*), Cotyledon (*Cotyledon orbiculata var.*), Aeonium spp.), Tenerife Daisy (*Argyranthemum frutescens ssp. foeniculaceum*), Geranium (*Geranium sp.*), Cape Marguerite (*Dimorphotheca ecklonis*) and Gazania (*Gazania linearis*).



Gazania (Gazania linearis) is a common garden escape and declared weed (C Taylor)

The Carrickalinga dunes is a site where hybridisation of Native Pigface (*Carpobrotus rossii*) is occurring, with introduced Hottentot Fig (*C. edulis*) reducing the genetic integrity of the native species (Waycott 2016). As detailed Southern Fleurieu Coastal Action Plan 2026

by Waycott (2016) hybrid formation between an invasive species and a closely related species that is native to a region can be particularly problematic due to the potential for:

- Genetic swamping of the local populations of the native species.
- The generation of hybrids with 'hypervigour' or hybrids with very poor vigour.
- Changing the ecological function of *Carpobrotus* species in the landscape.



Hottentot Fig (Carpobrotus edulis ssp. edulis) is a hybrid weed variety of the native species Native Pigface (Carpobrotus rossii). This yellow, orange or pink spink easily hybridises with the native species and threatened species diversity throughout the region (LHF)

Pest animal threats to coastal fauna and flora from rabbits (*Oryctolagus cuniculus*), foxes (*Vulpes vulpes*), and cats (*Felis catus*). There is a need to monitor and control Fallow Deer (*Cervus dama*) incursions. Coordinated collaboration between landowners and managers is required to manage pest animals (refer to Regional Pest Management Strategies). Total grazing pressure within the cell, particularly the dunes, exists through introduced and native species, as well as stock from adjacent land impacting on vegetation through limiting regeneration and revegetation activities. Telfer and Milne (2016) note Western Grey Kangaroo (*Macropus fuliginosus*) frequent the open grazing areas adjacent to the dunes, and also are able to emerge from sheltered areas of remnant vegetation at dusk to graze in the open, but then retreat to these remnants at other times.

Areas of dune blowout have occurred at multiple locations, likely to have occurred from the mid 1940s due to ongoing grazing pressure (Telfer and Milne 2016, Geological Society of Australia 2002). Previous damage from sandboarding in blowouts and on the foredune are still evident.

Pressure exists to infill areas behind the dunes, as demand for housing is experienced locally. Pockets of undeveloped land are rare within coastal areas and offer opportunity for coastal retreat of dune systems and important habitats that are under increasing pressures and impending climate change impacts.

Bechervaise (2004) notes the last house on the northern headland at Carrickalinga appears to have privatised public open space, and the walking trail north to Secret Beach headland is poorly defined and experiencing substantial use, resulting from increased awareness and promotion of the beach. The large lawned area at Carrickalinga North Bay is now managed by Council and sign posted as public land, but still appears to be a private encroachment as there is no delineation with the adjacent house.



Houses at northern headland and informal access paths to Secret Beach at Carrickalinga (Coast Protection Board, March 2024)

Stormwater outfalls along the dunes system to the west of Gold Coast Drive discharge to informal channels, or directly to the coast and may pose significant erosion and scouring risks in the area (AWE 2020). While some of the stormwater at Carrickalinga is directed via the underground stormwater network, or formal/informal roadside swales to a detention basin, runoff is primarily being discharged directly into the marine environment, with only a couple of outfalls draining into the Carrickalinga Creek (AWE 2020).

Several butterfly and skipper species with 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. Several species are now restricted to pockets of isolated habitats, resulting in some being vulnerable to population collapse (Stolarski 2024).

On the beach and dunes, Sea Wheat-grass (*Thinopyrum junceiforme*) and *Euphorbia* spp (*Euphorbia paralias* and *E. terracina*) are limiting Hooded Plover habitat and require management. Dunes with introduced grasses develop steeper and higher dune heights than those dominated with local native spinifex plants, due to their growth habits. 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. Hooded Plover nesting sites are also impacted by dogs off leashes and disturbance, with limited fledging success as a result. Predation is another management issue and reflected in low fledging rates over several years across this cell, despite ongoing breeding attempts.

Coastal raptors are recorded to utilise habitats within the cell, including Wedge-tailed Eagles (*Aquila audax audax*) that have established foraging and breeding territories locally. Current and potential future threats include disturbance, recreational and industrial use of drones, wind-farms and spread of urban development (Rowe et al 2018).

Estuary (Carrickalinga Creek)

Limited flow from upper catchments and a high sand bar at the mouth of the estuary restricts connectivity of Carrickalinga Creek with the marine environment, particularly during summer months. Flow regimes have changed, so waters are no longer slowed through long and broad watercourses, but flow along incised, eroded channels, and the ephemeral pools that once formed during dry periods are uncommon. The estuary has not received the same number or quantum of flows when compared to historical conditions, resulting in a loss or reduction in linkage between the systems, and a decrease in the available water for water dependent ecosystems (AWE 2020). Altered mouth opening and closing regimes (including the artificial opening and closing of the estuary) can have dramatic effects on the estuary, as well as the adjacent reef and seagrass environs (AECOM 2010, AWE 2020).

Pressures of local population increases (in peak times that doubles in size) places additional pressure on infrastructure, services and the environment, along with past urban and agricultural development leading to a decline in the ecological character of Carrickalinga Creek.

Weed threat is an issue across estuary habitats, whilst efforts from coastal community groups and land managers have reduced threat of some species, many threats still remain. The loss of riparian vegetation through grazing pressures, predominately in the upstream of estuary habitats, has decreased bank stability and increased sedimentation flowing down to the estuary (AWE 2020).

There are currently three stormwater outfalls discharging untreated stormwater directly to the estuary.

Nearshore habitats

Bryars (2013) describes the coastline as having a significant coastal settlement at Carrickalinga, with significant intermittent freshwater input via Carrickalinga Creek. Carrickalinga Creek is directly connected to the sea only during the wetter months from about April to October. It is unknown if groundwater exchange occurs between the estuary water and the adjacent seawater during times when the river mouth is closed.

Carrickalinga Creek collects rural catchment water and stormwater from the Carrickalinga settlement. Stormwater in general is a recognised issue within the Yankalilla area, and a stormwater management plan (which addresses both urban and rural sources) has been developed that encompasses the Yankalilla River, Bungala River and Carrickalinga Creek catchments (AWE and SARDI 2020). Local reports of turbid plumes of discharge water from Carrickalinga Creek that spread along the inshore waters of Yankalilla Bay are common. Stormwater management is also an issue for existing developments behind the foreshore dunes and is seen as a potential problem with any future developments in the area. It is unknown if stormwater entering the aquifer behind the foreshore dunes could make its way into the marine environment.(Bryars 2013, AWE 2020)

Caton et al. (2007) identified that poor water quality in Carrickalinga Creek is an issue for the estuary itself. However, it is unclear what threat any intermittent outflows from the estuary pose to nearshore reef and seagrass habitats. Inshore reef adjacent Carrickalinga Creek has sediment, mussels, and turfing macroalgae (Bryars 2013), which could be indicative of nutrient and sediment impacts.

Despite the apparent threat, two separate studies concluded that seagrasses within the cell appeared in general to be in good condition, with no indication that Carrickalinga Creek was impacting on nearshore seagrasses (Murray-Jones et al. 2009, Tanner et al. 2012). Epiphyte cover on seagrasses was not increased around the Carrickalinga Creek mouth (Tanner et al. 2012). It is possible that even with increased nutrient inputs to the inshore waters of Yankalilla Bay, wave energy in the area has a cleaning effect on seagrass epiphytes (cf. Bryars 2009).

In contrast to other seagrass studies, Bryars (2014) documented unhealthy *Amphibolis* seagrass, high epiphyte loads in some areas, widespread erosion scarps and blowouts, and presented evidence for historical inshore seagrass loss in Yankalilla Bay, particularly adjacent to the Bungala River. Bryars (2014) suggested that seagrass loss might be linked to freshwater inputs from the Yankalilla River, Bungala River and Carrickalinga Creek, but also noted that groundwater freshwater upwellings were occurring in parts of Yankalilla Bay.

Surveys using video transects were conducted by Tanner and Theil (2019) across Yankalilla Bay, encompassing south of Bungala River to North of Carrickalinga Creek, to determine the health of seagrass community data using the same methods and data established in 2009. It indicated a seagrass decline from south to north. The study noted epiphyte loads greater in northern seagrass compared to the southern, possibly indicating greater nutrient and stress loads. Nutrients were suspected to be a localized cause of seagrass epiphyte loads documented south of Bungala River.

Sierp (2025) conducted an assessment of benthic habitat conditions near the Carrickalinga Creek and Bungala River estuaries in Yankalilla Bay, focusing on the potential for seagrass rehabilitation. This work built on earlier surveys, particularly Bryars (2014), which documented significant erosion and declining seagrass health in the area. The

investigation aimed to evaluate changes in ecosystem condition and inform future restoration strategies, recognizing both the ecological value of seagrass meadows and the increasing feasibility of restoration in Gulf St Vincent.

The Sierp (2025) survey found seagrass meadows to be in generally good condition, with patchy but dense canopy cover and low to very low epiphyte loads, lower than those reported by Bryars (2014). However, high turbidity during the survey, possibly linked to the 2025 algal bloom, limited visibility and prevented diving assessments. Despite these challenges, video and sonar data were sufficient for species comparison with the 2014 baseline. Seagrass communities near the Bungala estuary showed more signs of degradation than those at Carrickalinga, including unhealthy *Amphibolis* and reduced recruitment, potentially influenced by local riverine inputs. Evidence of erosion scarps and blowouts persisted, particularly near Normanville, indicating ongoing stress in nearshore habitats. A newly observed blackening of *Posidonia* leaves may signal environmental stress, though its cause remains unclear. Overall, the findings suggest a decline in seagrass health at Bungala since 2014.



Sea Nymph (Amphibolis antarctica) seagrass in the nearshore habitats at Normanville (M Sierp)

Bryars (2013) considered the risk ratings for identified threats to seagrass and reef ranged from low to high, while no measurable threats to sand were identified.

Bryars (2013) described there is a major source of catchment water and stormwater discharging to the coast, and all of the relatively small total area of reef lies inshore where contact with these flows is most likely. It was considered that a severe consequence for reef may occasionally occur, hence the risk rating was high. In contrast, Bryars (2013) notes the relative area of seagrass is much greater than reef and most of it occurs further offshore. Therefore, it was considered possible that there would be a minor consequence for seagrass and the risk rating was low.

It is worth noting that the risk ratings made by Bryars (2013) were made prior to the studies in 2014 (Bryars) and 2019 (Tanner et al 2019), and these ratings may need to be reviewed, considering the impacts (epiphyte loads in some areas, widespread erosion scarps and blowouts) documented on inshore seagrass.

Marine debris surveys

Long term bioregional monitoring (Fleurieu Peninsula, Yorke Peninsula, Gulf St Vincent, Kangaroo Island) of beach litter has been conducted at Carrickalinga Bay beach since 2010 by the previous AMLRNRM Board, and currently by Green Adelaide's marine debris program. Carrickalinga is one of nine survey locations designated for biennial litter assessments on the Eastern beaches of Gulf St Vincent. Litter items recovered from the site comprise plastic fragments, plastic packaging (food wrappers and bags), drink bottles, lids and caps, rope pieces and recreational fishing debris (Peters and Flaherty, 2013).

Opportunities

Whole cell

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, 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 tourism operators and agencies to support visitor education about coastal values and appropriate behaviors.

Community education opportunities regarding:

- Unique and valuable coastal landscape (for example, wildflowers, birds, and mammals)
- Fragile nature of coastal areas that are sensitive to foot traffic, soil compaction and erosion.
- Coastal gardens and resident/business owner education
- Community education and targeted communications regarding Marine Parks, nearshore habitats and estuary values.
- Beach-nesting birds, such as Hooded Plovers (dogs on leash, nesting sites, citizen science projects, managing visitor disturbance)
- Citizen science monitoring to contribute to intertidal reef monitoring, seagrass restoration, dolphin watch, beach pole monitoring, Fleurieu seabird monitoring program and beach-nesting birds.
- Consistency of signage regarding coastal values and for compliance purposes, including possibility for consistency of signage around conservation areas (public managed lands, coastal reserves) across the Fleurieu Peninsula coast.

This cell is experiencing increased visitation, litter, trampling of plants and increased erosion and stormwater management requirements, as well as pressure to construct more holiday accommodation.

Review strategic planning to enable targeted actions and the opportunity to guide and prioritise management effort that enhance coastal resilience and environmental protection. These include reviewing and restricting development in high-risk zones, acquiring vulnerable or ecologically valuable land to conserve sensitive coastal environments and managing private land use to safeguard coastal habitats and support long-term ecological health. Consider opportunities and the best mechanisms for greater long-term conservation status and protection of this area (conservation outcomes and ongoing ability to access current funding and resources) and connectivity with cells F23-F25.

Future development in the region, particularly in close proximity to the Carrickalinga Estuary, needs to incorporate the principles of ecologically sustainable development and water sensitive urban design (WSUD) to treat stormwater run-off, to improve stormwater quality and biodiversity in the area and actively manage future stormwater impacts on the coast and marine environment (AWE 2020).

Limitations are needed on further subdivision and housing development adjoining the foreshore to limit additional road and stormwater infrastructure (Caton 2007). Where development does occur, define suitable riparian, dune and estuarine habitat buffer zones for rehabilitation and staged retreat of habitats. Seek increased protection and minimum setbacks of these areas through planning and development processes.

Weed management is a key priority to help retain the biodiversity values within the cell across the parcels of Council, Crown and private lands. Targeted control of declared and red alert weeds, including Olive (*Olea europaea* ssp. *europaea*), African Boxthorn (*Lycium ferocissimum*), Coast Tea-tree (*Gaudium laevigatum*), Golden Wreath Wattle (*Acacia saligna*) and Western Coastal Wattle (*Acacia cyclops*), is a high priority, as they are actively invading intact native vegetation and displace or choke out native plant species. Ongoing monitoring for, and mapping of, new weed infestations should also be undertaken as part of an ongoing weed control program, which is critical to addressing high priority weeds and maintaining conservation values for the cell. Garden escape weeds require ongoing monitoring, control, and education for local residents on the impact of coastal garden weeds that spread to coastal reserves.

Maintain and expand coastal restoration actions, including revegetation with local native plants and priority weed control, including reducing the impact of invasive Hottentot Fig (*Carpobrotus edulis* ssp. *edulis*) on the Native Pigface (*Carpobrotus rossii*) and the environment.



*Carrickalinga North dunes and coastal slope with low front dune which has supported multiple community planting days
(C Taylor)*

Monitor the impacts and effects of total grazing pressure that are causing impacts on native vegetation and revegetation programs, reducing plant diversity and habitat quality for other important and conservation rated species. Implement measures to reduce grazing pressure and erosion on creek lines, estuaries and high conservation value pockets of remnant vegetation. Replace, repair and maintain existing fencing with private land to restrict stock access to the dunes and areas of conservation values.

Efforts to maintain and, where possible, expand remnant Silver Banksia (*Banksia marginata*) woodland species within coastal reserves in this cell should be encouraged. Much of the area where this woodland would have occurred is now housing, opportunities may exist within public land, roadsides, reserves or through greater education or awareness of local residents, to plant local native species.

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

Pest animal threats to coastal fauna and flora from rabbits, foxes, and cats. There is a need to monitor deer incursions and kangaroo numbers and control through coordinated collaboration between landowners and managers to manage pest animals (refer to Regional Pest Management Strategies).



Feral rabbits are a pest species across coastal areas particularly around coastal settlements where residential gardens and coastal dunes provide regular feed and shelter (LHF)

Assessment and rehabilitation of access tracks and dune blowouts (and previous sand mining sites) are needed, while addressing continuing access control issues, with visitor pressure on tracks through dunes. From a conservation and biodiversity perspective, it is desirable that no further beach access points are created in the Normanville Dunes (Telfer and Milne 2016, Caton et al 2007). Continue to manage the large blowout areas following substantial efforts within the dune near the South Shores development (F23), where management intervention (fencing and revegetation) has been very successful in helping to stabilise this area.

Restoration and revegetation efforts at Normanville and Carrickalinga Dunes should focus on supplementing existing habitat, using appropriate species for the vegetation community, and planting at appropriate (natural) densities. Telfer and Milne (2016) identified that the vegetation already present in the foredune and dune shrubland areas provides a good benchmark for the appropriate target structure and floristic composition.

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 in coastal areas to increase habitat suitability for local introductions.

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.

Continue to support collaborative efforts to protect and conserve Hooded Plover breeding habitats within this cell. Implement actions to support Hooded Plover conservation, including signage for dogs on leash on beach, opportunities for collaboration to manage foxes, and increase suitable habitat by replacing introduced Sea Wheat-grass with native Spinifex vegetation associations to support Hooded Plover populations. Maintain Council beach controls to support Hooded Plover protection efforts.



Rolling Spinifex (spinifex hirsutus) in foredunes where treatment has been undertaken for Sea Wheat-grass (Thinopyrum junceiforme) and Euphorbia spp (Euphorbia paralias and E. terracina). Note dune at top of image has not had control and is densely dominated by Sea wheat-grass (C Jackson)

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 is opportunity for collaboration between partners, such as National Parks, Marine Parks, Traditional Owners, First Nations, landscape boards, volunteer groups, community and nature-based tourism operators for monitoring of seabirds, coastal raptors, marine mammals and other wildlife.

Support community volunteer and private landowner efforts to undertake priority restoration and conservation work in this cell. Strengthen partnerships with Traditional Owners, First Nations, lessees, adjoining landowners, volunteer organisations, researchers, and the wider community to foster collaboration and long-term management benefits for biodiversity protection and restoration. Continuing to develop and maintain good relationships with privately owned land neighbours.

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.

Estuary (Carrickalinga Creek)

Undertake riparian restoration works on public and private lands for stock exclusion (and fence repair), weed control of priority species, and revegetation with appropriate local coastal/riparian species along the Carrickalinga Creek and estuary, which is crucial to the ecological integrity of the area.

Protection from weed incursion, development, disturbance, increased restoration and community awareness of local value of vegetation communities related to the EPBC Act Threatened ecological communities – *subtropical and temperate coastal saltmarsh and swamps of the Fleurieu Peninsula* – at Carrickalinga Creek estuary. Further assessment of these areas, through formal classification and listing on the national register of Matters of National Environmental Significance (MNES), needs to be undertaken.

Monitor populations of introduced aquatic species Eastern Gambusia (*Gambusia holbrooki*) and Redfin Perch (*Perca fluviatilis*) and assess options for reduction and removal from watercourses where possible.

Develop formal rehabilitation plan for Carrickalinga Creek watercourse, wetland and estuary (AWE 2020, Abley 2007). This should include reducing the impacts of stormwater through environmentally sensitive stormwater management to remove gross pollutants and reduce discharge velocity into estuary, dunes and marine environment (Caton et al 2007, AWE 2020). Monitor current performance of drainage path in providing initial/informal stormwater improvements against current water quality targets for stormwater discharging into the bay. Implement formal treatment strategies if required water quality targets are not met (AWE 2020).

Improvement to the estuarine flora and fauna habitats and connectivity with marine environments can be achieved through the development and employment of an Estuary Entrance Management Support System (EEMSS). This would include a framework for decision makers, considering both the ecological and infrastructure/amenity concerns. Improved management of estuaries within the region (and across the state) is required for a more strategic planning and management approach to deliver positive and coordinated outcomes for estuary habitats. Improved monitoring of ecological communities, connectivity with marine systems and water quality conditions within the estuary will allow more effective adaptive management; being aware of conditions and responding as required.

Maintenance of natural conditions in creeks and estuaries depends on integrated catchment management. Land use that minimises the negative impacts to the stream, including limited water extraction, the reestablishment of native vegetation following priority weed control, and exclusion of stock from creek lines, should be encouraged within the cell and throughout the catchment.

Nearshore habitats

Bryars (2013) recommends biological surveys of the seagrass and sand habitats are required to better understand habitat values and compile meaningful species lists for the cell.

Climate change threats to coastal biodiversity (see BMT 2025)

Potential climate change threats to coastal biodiversity

Cell F25 includes sandy beach, low dunes and an estuarine and creek ecosystem of the Carrickalinga Creek. This cell contains extensive dense seagrass ecosystems, as well as inshore reef and intertidal ecosystems. The dunes are supported by native vegetation, including dune shrubland and grasses.

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

- Native dune vegetation
- Creek and estuary ecosystems
- Coastal cliffs
- Intertidal and reef ecosystems
- Beach-nesting birds

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.

Acceleration of current sea level rise will see increased storm damage to foredunes. Bruun Rule calculations of beach change suggest a recession of the order 5 – 30m over 50 years could be likely, given current IPCC sea level forecasts. CSIRO forecasts suggest fewer storms, but a small increase in storm magnitude, increasing the level of unpredictability of seasonal beach change. Rising sea levels threaten tidal inundation of low-lying land adjacent to Carrickalinga Creek (Caton et al 2007).

All climate models project drier conditions for southern South Australia, together with increased evapotranspiration. It is clear that in some years soil field capacity may not be reached in winter and seasonal run-off in the Carrickalinga Creek may be greatly reduced. However, fast run-off from intense storms in summer may give irregular flows. Over time increasing aridity will slow natural recovery from damage to dune vegetation (Caton et al 2007).

Marine heatwaves place further stress temperate reefs and seagrasses, reducing biodiversity. Higher atmospheric temperatures will lead to increased marine heatwaves, loss of species in the intertidal with longer than experience to grow back due to increased stressors; e.g. loss of sediment. Higher sea surface temperatures increase the potential for algal blooms.

Changes in ocean temperatures, salinity, and acidity (from increased CO₂ levels) can directly affect the health of temperate reefs. Warmer waters and increased acidification may hinder the growth of calcareous organisms, such as marine molluscs and phytoplankton.

Cell Action Table

Component	Issue	Proposed Action	Priority of Action	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)	Traditional Owners, First Nations, Council, LHF, coastal community groups, Aboriginal Affairs and Reconciliation - Department of Premier and Cabinet
	Increased visitation and recreational pressure on dunes and viewing points due to increased local population and tourist promotion.	Assess increased visitation capacity at known sites, ensure infrastructure is sufficient to meet the demands of increasing visitor numbers. Manage visitor numbers within sustainable limits in ecologically and culturally sensitive and significant areas - consult with Traditional Owners.	High (cons/ threat)	Council, DEW, land managers, Traditional Owners, First Nations
		Investigate opportunities for community education and engagement regarding unique and valuable coastal landscape and fragile nature of coastal areas. Structured cultural education and training for land managers, agency staff and land stewards.	High (Cons/ Soc)	Council, LHF, DEW, NPWSSA, Traditional Owners, First Nations, coastal community groups, Community groups
		Opportunity to work with nature-based tourism operators to increase education and stewardship of local coastal environments. Support opportunities for Traditional Owner-led tourism and cultural education.	Medium (Cons)	Council, land managers, Traditional Owners, First Nations, NPWSSA, coastal 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 with Traditional Owner knowledge holders through collaborative process.	Medium (Soc/ Cons)	Council, land managers, Traditional Owners, First Nations, NPWSSA, coastal community groups
		Collaborate and manage access with event managers to ensure protection of coastal areas and groups do not impact high conservation value areas, or cultural heritage in consultation with Traditional Owners.	High (threat)	Council, Traditional Owners, First Nations, coastal community groups
		Monitor aquatic activities (boating, paddleboard and jet skis) for increased pressures on local coastal habitats and fauna species interactions.	High (threat)	Council and land managers, NPWSSA, coastal community groups
		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 informal camping.	Monitor Crown and Council 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
	New weed incursions in reserves adjacent to residential areas.	Monitor for new weed incursions, record incursions via public database (e.g. BDBSA) and control new incursions as a priority.	High (threat)	Council, land managers, coastal community groups
	Weed species threat to significant flora and fauna habitats.	Ongoing control and investment in weed control (particularly WONS and Red Alert Species) to protect and maintain high conservation areas including is difficult to access areas.	High (threat)	Council, land managers, coastal community group, LHF, Traditional Owners, First Nations business/ contractors/ rangers

Component	Issue	Proposed Action	Priority of Action	Key Players
Whole Cell	Weed species threat to significant flora and fauna habitats.	Monitor new and existing incursions of Gazania (<i>Gazania linearis</i>), Fountain Grass (<i>Cenchrus setaceus</i>), and Tufted Honey-flower (<i>Melianthus comosus</i>). Remove hybrid varieties of Hottentot Fig (<i>Carpobrotus edulis ssp. edulis</i>) which threaten the Native Pigface (<i>Carpobrotus rossii</i>).	High (threat)	Council, LHF, Traditional Owners, First Nations business/ contractors/ rangers, coastal community groups
		Targeted interventions for threatened/rare plant species and communities.	High (cons)	DEW, NPWSSA, LHF, Traditional Owners, First Nations business/ contractors/ rangers, coastal community groups
		Monitor changes to dunes through BushRAT or similar monitoring to measure condition assessment and change.	High (cons/ threat)	Council, DEW, LHF, Community Groups.
	Ongoing weed incursions and weed control.	Leverage funding opportunities based on previous investment and in-kind contributions from coastal community groups.	High (Cons)	Council, LHF, coastal community groups
	Residential encroachment to coastal reserve.	Assessment of boundaries, education and compliance.	High (Threat/ Soc)	Council
		Control and monitoring of garden escape weeds from local residences and intentional plantings within the dunes. Target residences with educational materials, with regard to weeds.	High (Soc / Econ)	Council, coastal community groups
		Removal of introduced non-local species and restoration of pathways and erosion with local native coastal species.	High (threat)	Council, LHF, coastal community groups
		Monitor and support compliance resourcing for illegal dumping of garden waste and lawn clippings in the dunes and natural environments.	High (threat)	Council, coastal community groups
	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, Traditional Owners, First Nations business/ contractors/ rangers, coastal community groups
		Revegetation programs to improve the conservation prospects of threatened species.	High (cons)	DEW, land managers, LHF, Traditional Owners, First Nations business/ contractors/ rangers, 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, Traditional Owners, First Nations business/ contractors/ rangers, coastal community groups, local coastal plant nurseries
		Improve knowledge of fauna and flora through increased monitoring, mapping and reporting to better inform conservation management.	High (cons)	DEW, land managers, LHF, Council, Traditional Owners, First Nations business/ contractors/ rangers, coastal community groups
	Improve connectivity, strategic planning and protection of large, high value remnant vegetation blocks.	Investigate opportunities for formal conservation agreement/protection of high biodiversity conservation areas within cell and connectivity of the Normanville Dunes from Yankalilla River to Carrickalinga Creek.	Medium (cons)	CPB, DEW, NPWSSA, LHF, NAC business/ contractors/rangers Council

Component	Issue	Proposed Action	Priority of Action	Key Players
Whole Cell	Limited Coastal Banksia Woodland habitat.	Maintain remnant and where possible expand Silver Banksia (<i>Banksia marginata</i>) woodland species within coastal reserves, public land, roadsides and gardens.	High (cons)	Council, LHF, residents, coastal community groups
	Butterfly habitats and host plant protection.	Identify locations of potential butterfly habitats and host plants with the cell.	High (cons)	DEW, LHF, Council, Traditional Owners, First Nations business/ contractors/ rangers, coastal community groups
		Extension of existing habitats and reintroduction of locally extinct butterfly species.	Medium (cons)	DEW, LHF, Council, Traditional Owners, First Nations business/ contractors/ rangers, coastal community groups
	Valuable habitat for coastal raptors (White-bellied Sea Eagle, Wedge-tailed Eagles and Eastern Osprey)	Ongoing monitoring and management of high values nesting and foraging areas. Partner with Traditional Owners to understand cultural value and obligations associated with local raptors.	High (cons)	NPWSSA, DEW, Traditional Owners, First Nations, LHF
		Implement the recovery plan for Eastern Osprey and White-bellied Sea Eagles (2022).	High (cons)	DEW, NPWSSA, LHF
		Investigate opportunities for establishment of nesting towers on private land for additional habitat.	Medium (cons)	DEW, LHF, land owners
	Coordinated approach to monitoring of coastal wildlife.	Collaboration between land manager and stakeholders to support research and citizen science of beach-nesting birds, seabirds, coastal raptors, marine mammals and other wildlife.	Medium (cons)	DEW, NPWSSA, BirdLife Australia, LHF, Council, SA Whale Centre, Encounter Whales, ecotourism operators, coastal community groups, Traditional Owners, First Nations business/ contractors/ rangers.
	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.
	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. Ensure control methods refer to cultural heritage protocols.	High (threat)	Councils, land owners, LHF, CPB Traditional Owners, First Nations business/ contractors/ rangers.
		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, coastal community groups
	Increasing grazing pressure from native and introduced species.	Coordinate with regional grazing pressure programs (kangaroos, deer and goats) to monitor populations and control as required to protect remnant vegetation and revegetation efforts.	High (threat)	NPWSSA, DEW, PIRSA, LHF Traditional Owners, First Nations business/ contractors/ rangers.
		Fencing of remnant and high value vegetation communities on private and Crown land.	High (Cons / Threat)	DEW, LHF, land owners
	Impacts of marine debris on coastal habitats and species.	Continue long term bioregional monitoring of marine debris at priority sites.	High (threat)	Landscape Boards, coastal community groups, Council

Component	Issue	Proposed Action	Priority of Action	Key Players
Whole Cell	Multiple community groups and volunteers across coastal areas.	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, Traditional Owners, First Nations business/ contractors/ rangers, coastal community groups, FLEC
		Implement program of structured cultural education and training for land managers, agency staff and land stewards.		
	Development pressures to infill areas behind the dunes for housing.	Continue to support community efforts to undertake priority restoration and conservation work in this cell.	High (cons)	Council, LHF, DEW, FLEC
		Investigate opportunities to protect areas of undeveloped land behind the dunes from increasing development pressure and climate change impacts.	High (threat)	Council, CPB
		Investigate opportunities for coastal dune retreat under future climate change scenarios. Ensure appropriate natural buffers between dune environments and future development.	High (threat/ Cons/ Hazard/ Soc/Econ)	Council, CPB, DEW, LHF
	Resilience to climate change effects across landscape.	Review current development zoning of Normanville to Carrickalinga for greater levels of protection.	High (Threat/ Soc)	Council, CPB, Planning SA, Department for Housing and Urban Development (DHUD)
		Strengthen connectivity between coastal ecosystems and nature corridors (Normanville and Carrickalinga dunes and Carrickalinga creek).	Medium (Cons)	Council, land managers, DEW, LHF, coastal community groups
	Stormwater impacts from inland development are likely to impact marine intertidal habitats and may accelerate seabed deepening and coastal erosion. Turbidity from suspended sediments and nutrients are a significant threat to reef and seagrass habitats.	Implementation of the Yankalilla, Normanville and Carrickalinga Stormwater Management Plan (2022). Consider locations within existing open space to install/retrofit sedimentation or detention areas increasing water quality and improve biodiversity values.	High (Cons/ threat)	Council, LHF
		Monitor and manage stormwater to minimise impacts in the coast and marine environment. Improvements in the stormwater system to reduce gross pollutants and erosive impact of stormwater discharge into the dunes. Implement Water Sensitive Urban Design (WSUD).	High (Threat)	Council, LHF, CPB, Water Sensitive SA
		Develop guidelines for projects within Council areas to support improved stormwater management and reduce land-based impacts on coastal and nearshore marine environments.	Medium (cons/ threat)	Council, LHF, DEW, Stormwater Management Authority
Physical changes on the coast and natural assets from sea level rise (such as coastal squeeze on tidal habitats, erosion, vegetation loss, marine turbidity and light reduction)	Development of a council wide Coastal Hazard 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 for the future.	High (Cons. Threat)	CPB, Council, community, university and research agencies, Climate Ready Coast Program	
Tjilbruke / Tjirbruki cairn (monument) and Dreaming story sites within cell	Significant cultural marker impacted by car parking and opportunities to increase community cultural education through reconciliation.	Continue Tjilbruke / Tjirbruki cairn restoration efforts led by southern Traditional Owner. Support existing Traditional Owner cultural walks and communications to build broader community education.	High (cons/ threat)	Traditional Owners, First Nations, Council, LHF, coastal community groups, community

Component	Issue	Proposed Action	Priority of Action	Key Players
Tjilbruke / Tjirbruki cairn (monument) and Dreaming story sites within cell	Significant cultural marker impacted by car parking and opportunities to increase community cultural education through reconciliation.	Support cultural monitoring and communications to protect significant known heritage sites. Support Traditional Owner aspirations to care for Country and provide cultural education for the dunes and estuary.	High (cons/threat)	Traditional Owners, First Nations, Council, LHF, coastal community groups, community
		Traditional Owner-led cultural mapping to document cultural values of the river estuary and surrounds.	High (cons/threat)	Traditional Owners, First Nations, Council, LHF, coastal community groups, community
Dunes	Access control issues with multiple pathways throughout dunes impacting geomorphology and stability.	Assessment of access points and pathways to beach throughout dunes.	Medium (threat)	Council, coastal community groups.
		Erosion control works and revegetation of closed pathways.	High (threat)	Council, Traditional Owners, First Nations business/contractors/rangers, coastal community groups
	Damage to foredunes by sandboarding.	Maintain Council effort to inform public of the damage and impact of sandboarding on dunes.	Medium (threat)	Council.
	Dunes impacted by previous sand mining activities.	Undertake restoration and revegetation of areas previously mined.	Medium (threat)	Council, Traditional Owners, First Nations business/contractors/rangers, coastal community groups
Carrickalinga Head	Public access to Secret beach north of Carrickalinga beach.	Assessment of alignment and suitability of existing public walkway north of Carrickalinga Headland to Secret Beach headland. Signage and awareness of lack of access to beach is needed.	Medium (threat/Soc/Hazard)	Council, DEW
Carrickalinga Creek estuary	Improve strategic planning and management approach to deliver positive and coordinated outcomes for estuary habitats.	Development of Carrickalinga Creek Estuary strategic management plan across agencies and land managers addressing the need for improved monitoring of ecological communities, connectivity with marine systems and water quality conditions within the Estuary. Undertake southern Traditional Owner-led cultural mapping to document cultural values of the Carrickalinga Creek estuary and surrounds. Support Traditional Owner aspirations to care for Country and provide cultural education for the Carrickalinga Creek estuary.	High(Cons /Threat)	Council, LHF, DEW, Traditional Owners, First Nations business/contractors/rangers, Community.
	Weed incursion within estuary reducing biodiversity values.	Active control of weed populations within estuary areas.	High (threat)	Landowners, managers DEW, Traditional Owners, First Nations business/contractors/rangers, CPB, LHF,
	Introduced aquatic pests	Monitor populations of introduced species (Eastern Gambusia and Redfin Perch) and assess options for reduction and removal from watercourses.	Medium (threat)	DEW, Landscape Boards, PIRSA
	Bank instability and multiple areas of erosion evident within estuary.	Undertake restoration activities to improve bank stabilisation and revegetation to reduce further erosion and weed cover.	High (threat)	Land owners, Council, LHF, Traditional Owners, First Nations business/contractors/rangers, coastal community groups
	Stock grazing leading to erosion, bank instability and reduced water quality.	Maintain and improve fencing of estuaries and riparian land against stock.	High (Threat)	Landowners, DEW, LHF

Component	Issue	Proposed Action	Priority of Action	Key Players
Carrickalinga Creek estuary	Estuary entrance currently opened / closed by Council largely for recreational/amenity reasons.	Develop an Estuary Entrance Management Support System (EEMSS). (1), including a framework for decision makers considering both the ecological and infrastructure/amenity concerns. Include impacts to beach-nesting birds during breeding season and disturbance.	High (Cons / Soc / Econ)	Council. DEW, CPB, LHF, Traditional Owners, First Nations business/ contractors/ rangers, EPA
	Limited protection and awareness of EPBC listed Threatened ecological community – subtropical and temperate coastal saltmarsh and swamps of the Fleurieu Peninsula at Carrickalinga estuary.	Increased protection from weed incursion, development and disturbance through site restoration and increased community awareness	High (threat)	Council, coastal community group, Traditional Owners, First Nations business/ contractors/ rangers, LHF
		Formal assessment of vegetation communities to be listed on the national register of protected sites.	High (cons)	Council, LHF, DEW, coastal community group,
	Concern over fall in river flow and reduced seasonal connection to the Gulf.	Review opportunities to increase environmental flow opportunities through Water Allocation Planning (WAP), low flow bypass on farm dams and other local opportunities.	High (cons/ threat)	Council. DEW, LHF
	Limited monitoring data of estuary flow and opening and closing durations exist for these estuaries.	Consider monitoring of estuaries to determine the connectivity and functionality with marine ecosystems.	High (cons/ threat)	CPB, LHF, DEW
	Poor water quality, with potential effects on nearshore habitats including seagrass beds.	Catchment management to reduce sediment and nutrient load to Bungala estuary.	Medium (threat)	Land owners, Council, LHF, Traditional Owners, First Nations business/ contractors/ rangers, DEW, SA Water, EPA, community, Marine Parks.
Beach-nesting birds	Hooded Plover nests and breeding areas threatened by disturbance by walkers and dogs.	Community monitoring, fences to mark nests. Signage and awareness raising activities to alert dog walkers.	High (Cons / threat)	Council, BirdLife Australia, LHF, Friends of the Hooded Plover, Fleurieu Peninsula volunteers, coastal community groups, Oystercatcher monitoring volunteers, Traditional Owners, First Nations business/ contractors/ rangers.
	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, Red-capped Plovers and Sooty Oystercatchers (dogs on leads, nesting sites, citizen science projects, managing visitor 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 values.	Support the introduction and implementation of Council by-laws related to dogs on lead in estuaries and high value conservation 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, Traditional Owners, First Nations business/ contractors/ rangers, coastal community groups, Friends of the Hooded Plover, Fleurieu Peninsula volunteers

Component	Issue	Proposed Action	Priority of Action	Key Players
Beach-nesting birds	Incursion of multiple dune grass weed species is limiting suitable habitat for beach-nesting birds.	Increase community awareness of habitat needs for beach-nesting bird species.	High (threat/cons)	Council, land managers, LHF, coastal community groups, Friends of the Hooded Plover, Fleurieu Peninsula volunteers
Nearshore habitats (Reef, Seagrass)	Sediments and nutrients from Carrickalinga Creek.	Support the implementation of the stormwater management plan for Yankalilla Bay (AWE and SARDI 2012).	High (threat)	Council, LHF
		Minimise the impact development has on flooding and water quality within catchments and receiving environments;	High (threat)	Council, land managers, LHF
		Catchment management to reduce sediment and nutrient load to Carrickalinga Estuary.	High (threat)	LHF, Council, land owners, coastal community groups
		Monitor catchment and stormwater impact on nearshore habitats and reefs across the cell.	High (Threat)	Council, DEW, EPA, SA Water, Landscape Boards
	Lack of knowledge of seagrass condition and species diversity in cell.	Collaboration between government agencies, researchers, and community to monitor seagrass cover, species diversity, condition and inform active management.	Medium cons/(threat)	DEW, SARDI, EPA, SA Water, LHF, NPWSSA, universities, Council, community
		Investigate opportunities to support reduction of land based impacts to avoid further loss, promote natural recovery of seagrasses and investigate potential for assisted restoration of seagrass habitats with community.	High (cons/threat)	DEW, LHF, SARDI, NPWSSA, Council
Caring for Sea Country	Culturally significant Sea Country, including fish traps and marine life, are neglected and require Traditional Owner access and self determination to care for Country.	Support Traditional Owner mapping of southern Sea Country. Support establishment of Traditional Owner-led caring for Sea Country program. Traditional Owner led restoration of Sea Country and known significant places.	High (cons/threat)	Traditional Owners, First Nations, NPWSSA, DEW, Council, LHF, coastal community groups
Climate (Cliffs)	More intense rainfall events likely to increase soil erosion.	Restoration of native plant species to assist soil stabilisation.	High (Cons/threat)	Land owners, coastal community groups, Council, LHF
	Increased aridity likely to make growing conditions less suitable to native vegetation fragments.	Restoration of native plant species to assist soil stabilisation.	High (Cons/threat)	Land owners, Council, coastal community groups, LHF
Climate (Creek/ Estuary)	More intense rainfall events likely to lead to increased pollutants, nutrients and sediments washed into the estuary especially during first flush from the landward end.	Monitor stormwater quality and estuary/creek condition.	Medium (threat)	Council, DEW, LHF, land owners, EPA
	Higher temperatures likely to lead to increased algal blooms with impacts on estuarine fauna.	Monitor stormwater quality and estuary / creek condition.	Medium (threat)	Council, DEW, LHF, land owners, EPA
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.	Medium (threat)	Council, Council, coastal community groups, LHF
		Implement restoration of native plant species.	Medium (threat)	Council, Coastal community groups, LHF
	Predicted increases in aridity can lead to reduced vegetation cover and increased dune drift and dune mobility. 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.	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

Component	Issue	Proposed Action	Priority of Action	Key Players
Climate (Beach and dunes)	Predicted increases in aridity can lead to reduced vegetation cover and increased dune drift and dune mobility.	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)	Council, coastal community groups, LHF, Traditional Owners, First Nations business/contractors/rangers.
Climate (Macroalgal reefs and seagrasses)	More intense rainfall events likely to lead to increased pollutants, nutrients and suspended sediments washed into coastal waters especially during first flush.	Monitor stormwater quality and creek condition.	Medium (threat)	Council, DEW, LHF, land owners
	Increased storm surge can cause dislodgment of algae and seagrasses.	Monitor stormwater quality and creek condition.	Medium (threat)	Council, DEW, LHF, land owners
	Higher temperatures can lead to increased incidence and persistence of marine heatwaves and increased stress on temperate reefs and seagrasses, reducing biodiversity.	Monitor stormwater quality and creek condition.	Medium (threat)	Council, DEW, LHF, land owners
	Ocean acidification can impact the life history of marine species.	Monitor stormwater quality and creek condition.	Medium (threat)	Council, DEW, LHF, land owners
		Undertake benthic flora mapping to determine areas or opportunities for restoration.	Medium (threat)	DEW, council, LHF, land owners
Climate (whole cell)	Coastal Hazard Adaptation Planning	Investigate future funding opportunities to undertake coastal adaptation plan for DC Yankalilla to improve understanding of coastal risk, to inform coastal hazard adaptation planning and for evidence-based decisions and investments in the coast.	Medium (threat)	Council, CPB, Climate Ready Coasts Program, LGA, SACCA, DEW, consultancies, research institutions

- (1) An Estuary Entrance Management Support System (EEMSS) has been developed by Deakin University and a number of Victorian Catchment Boards. This system takes into account a number of uses (including recreation use), conservation and hydrological factors in assisting with the decision to open or close an entrance (Arundel (2006) also refer to Appendix 15 in Caton et al 2007).

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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 10km² buffering of data. However, records are included in the total species numbers per cell. Please contact DEW directly for restricted data requests.

FLORA Summary

Vegetation Block Metrics	Carrickalinga Creek estuary Coastal Reserve (Council and Private) Carrickalinga Coastal Reserve (Crown land and Council) Carrickalinga North Coastal Reserve (Crown land and Council)			
Terrestrial Habitat Description/s	See Terrestrial biodiversity vegetation communities in cell description.			
# Flora in cell	109			
# Native Flora in cell	47			
# Introduced Flora in cell	62			
# Conservation Rated Flora in cell	0			
# Threatened Ecological Communities (EPBC Act)	2 (Vegetation associations aligned with Nationally Critically Endangered ecological community "Swamps of the Fleurieu Peninsula" and Beaded Glasswort- <i>Salicornia quinqueflora</i> saltmarsh nationally Vulnerable "Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Community" (pending assessment)			
Conservation Rated Flora	Species	Common Name	EPBC Act Status	NPW Status

All Native Flora in cell

Species	Common Name	EPBC Status	NPW Act Status	Subregional Status*
<i>Acacia cupularis</i>	Cup Wattle			RA
<i>Acacia ligulata</i> [^]	Umbrella Bush			RA
<i>Acacia longifolia ssp. sophorae</i>	Coastal Wattle			LC
<i>Acacia nematophylla</i> [^]	Coast Wallowa			CR
<i>Adriana quadripartita</i> [^]	Coast Bitter-bush			NT
<i>Allocasuarina verticillata</i> [^]	Drooping Sheoak			LC
<i>Alyxia buxifolia</i> [^]	Sea Box			RA
<i>Atriplex cinerea</i>	Coast Saltbush			LC
<i>Austrostipa spp.</i> [^]	Spear Grass			
<i>Banksia marginata</i> [^]	Silver Banksia			LC
<i>Boerhavia dominii</i>	Tar-vine			
<i>Callitris gracilis</i> [^]	Southern Cypress Pine			LC
<i>Carpobrotus rossii</i>	Native Pigface			
<i>Chloris truncata</i>	Windmill Grass			LC
<i>Cyperus sp.</i> [^]	Flat Sedge			
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			LC
<i>Dilophus fastigiatus</i>				
<i>Duma florulenta</i> [^]	Lignum			VU
<i>Einadia nutans ssp. nutans</i>	Climbing Saltbush			LC

Species	Common Name	EPBC Status	NPW Act Status	Subregional Status*
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush			LC
<i>Eucalyptus camaldulensis</i> ssp. <i>camaldulensis</i> [^]	River Red Gum			
<i>Eucalyptus gracilis</i>	Yorrell			RA
<i>Ficinia nodosa</i>	Knobby Club-rush			LC
<i>Gahnia filum</i> [^]	Thatching Grass			VU
<i>Heliotropium europaeum</i>	Common Heliotrope			LC
<i>Juncus kraussii</i>	Sea Rush			LC
<i>Lepidosperma gladiatum</i>	Coast Sword-sedge			NT
<i>Leptospermum lanigerum</i> [^]	Silky Tea-tree			RA
<i>Leucopogon parviflorus</i>	Coast Beard-heath			LC
<i>Lomandra effusa</i> [^]	Scented Mat-rush			LC
<i>Lomandra multiflora</i> ssp. <i>dura</i> [^]	Hard Mat-rush			LC
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum			LC
<i>Myoporum insulare</i>	Common Boobialla			LC
<i>Olearia axillaris</i>	Coast Daisy-bush			LC
<i>Phragmites australis</i>	Common Reed			LC
<i>Pimelea serpyllifolia</i> ssp. <i>serpyllifolia</i> [^]	Thyme Riceflower			LC
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			LC
<i>Rytidosperma</i> spp. [^]	Wallaby Grass			
<i>Salicornia quinqueflora</i> ssp. <i>quinqueflora</i>	Beaded Samphire			NT
<i>Samolus repens</i>	Creeping Brookweed			NT
<i>Senecio pinnatifolius</i> group	Variable Groundsel			
<i>Setaria constricta</i>	Knotty-butt Paspalidium			NT
<i>Spinifex hirsutus</i>	Rolling Spinifex			
<i>Sporobolus virginicus</i>	Salt Couch			LC
<i>Tetragonia implexicoma</i>	Bower Spinach			LC
<i>Threlkeldia diffusa</i>	Coast Bonefruit			NT
<i>Typha orientalis</i> [^]	Bullrush			

[^] 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>Acacia cyclops</i> *	Western Coastal Wattle	IC		
<i>Acacia saligna</i>	Golden Wreath Wattle	HP		
<i>Aeonium haworthii</i>				
<i>Aeonium spp.*</i>	Tree Houseleek			
<i>Agave americana</i> *	Century Plant	HP		
<i>Aizoon pubescens</i>	Coastal Galenia	IC		
<i>Aloe arborescens</i> *	Tree Aloe			
<i>Amaranthus muricatus</i>	Rough-fruit Amaranth			
<i>Ammophila arenaria</i>	Marram Grass	HP		
<i>Arctotis stoechadifolia</i>	White Arctotis	IC		
<i>Argyranthemum frutescens ssp. foeniculaceum</i> *	Teneriffe Daisy	HP		
<i>Atriplex prostrata</i>	Creeping Saltbush			
<i>Avena barbata</i>	Bearded Oat			
<i>Brassica tournefortii</i>	Wild Turnip			
<i>Bromus diandrus</i>	Great Brome			
<i>Bromus madritensis</i>	Compact Brome			
<i>Bromus rubens</i>	Red Brome			
<i>Cakile maritima ssp. maritima</i>	Two-horned Sea Rocket			
<i>Carpobrotus edulis ssp. edulis</i>	Hottentot Fig	HP		
<i>Cenchrus clandestinus</i>	Kikuyu	HP		
<i>Cenchrus longisetus</i>	Feather-top	HP		
<i>Cenchrus setaceus</i>	Fountain Grass	IC	Yes	
<i>Coprosma repens</i> *	New Zealand Mirror-bush	IC	Yes	
<i>Cotyledon orbiculata var.*</i>	Cotyledon			
<i>Cynodon dactylon var. dactylon</i>	Couch			
<i>Cyperus congestus</i> *	Dense Flat-sedge			
<i>Dimorphotheca ecklonis</i> *	Cape Marguerite			
<i>Dysphania multifida</i>	Scented Goosefoot			
<i>Echium plantagineum</i>	Salvation Jane		Yes	
<i>Ehrharta calycina</i>	Perennial Veldt Grass	HP		
<i>Ehrharta longiflora</i>	Annual Veldt Grass			
<i>Eragrostis cilianensis</i>	Stink Grass			
<i>Euphorbia paralias</i> *	Sea Spurge	HP		
<i>Euphorbia serpens</i>	Matted Sandmat			
<i>Euphorbia terracina</i> *	False Caper	HP	Yes	
<i>Gaudium laevigatum</i>	Coast Tea-tree		Yes	
<i>Gazania linearis</i>	Gazania	IC	Yes	
<i>Geranium sp.*</i>	Geranium			
<i>Gomphocarpus cancellatus</i>	Broad-leaf Cotton-bush	HP		
<i>Hypochoeris radicata</i>	Rough Cat's Ear			
<i>Lagurus ovatus</i>	Hare's Tail Grass			
<i>Lycium ferocissimum</i>	African Boxthorn	IC	Yes	Yes
<i>Lysimachia arvensis</i>	Pimpernel			
<i>Medicago polymorpha</i>	Burr-medic			
<i>Melianthus comosus</i>	Tufted Honey-flower	IC		

Species	Common Name	Red Alert Weeds	Declared Weeds	WONS
<i>Oenothera stricta ssp. stricta</i>	Common Evening Primrose			
<i>Olea europaea ssp. europaea</i>	Olive	IC		
<i>Oxalis pes-caprae</i>	Soursob			
<i>Plantago coronopus ssp. coronopus</i>	Bucks-horn Plantain			
<i>Plantago lanceolata var. lanceolata</i>	Ribwort			
<i>Polygonum aviculare</i>	Wireweed			
<i>Reichardia tingitana</i>	False Sowthistle			
<i>Rumex crispus</i>	Curled Dock			
<i>Ruschia tumidula</i>	Pigface	HP		
<i>Salvia verbenaca var.</i>	Wild Sage			
<i>Sonchus oleraceus</i>	Common Sow-thistle			
<i>Tetragonia decumbens</i>	Sea Spinach			
<i>Thinopyrum junceiforme</i>	Sea Wheat-grass	IC		
<i>Tribulus terrestris</i>	Caltrop		Yes	
<i>Trifolium arvense var. arvense</i>	Hare's-foot Clover			
<i>Trifolium scabrum</i>	Rough Clover			
<i>Vulpia fasciculata</i>	Sand Fescue			

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 categorised 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	111
# Native Fauna in cell	98
# Introduced Fauna in cell	13
# Conservation Rated Fauna in cell	14 (5 national, 12 state)

Conservation Rated Fauna				
Species	Common Name	Class	EPBC Act Status	NPW Act Status
<i>Actitis hypoleucos</i> [^]	Common Sandpiper	AVES		R
<i>Anthochaera chrysoptera</i> [^]	Little Wattlebird	AVES	ssp	
<i>Cereopsis novaehollandiae novaehollandiae</i>	Cape Barren Goose	AVES		R
<i>Haematopus fuliginosus fuliginosus</i> [^]	Sooty Oystercatcher	AVES		R
<i>Haematopus longirostris</i> [^]	Pied Oystercatcher	AVES		R
<i>Haliaeetus leucogaster</i> [^]	White-bellied Sea Eagle	AVES		E
<i>Larus dominicanus dominicanus</i> [^]	Kelp Gull	AVES		R
<i>Neophema elegans elegans</i> [^]	Elegant Parrot	AVES		R
<i>Pandion haliaetus cristatus</i> [^]	Eastern Osprey	AVES		E
<i>Platycercus elegans</i>	Crimson Rosella	AVES	ssp	
<i>Thinornis cucullatus cucullatus</i>	Hooded Plover	AVES	VU	V
<i>Zanda funerea whiteae</i> [^]	Yellow-tailed Black Cockatoo	AVES		V
<i>Pteropus poliocephalus</i> [^]	Grey-headed Flying-fox	MAM	VU	R
<i>Tachyglossus aculeatus</i> [^]	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>Acanthopagrus butcheri</i> [^]	Black Bream	ACT			
<i>Aldrichetta forsteri</i> [^]	Yelloweye Mullet	ACT			
<i>Arenigobius bifrenatus</i> [^]	Bridled Goby	ACT			
<i>Arripis trutta</i> [^]	Eastern Australian Salmon	ACT			
<i>Galaxias brevipinnis</i> [^]	Climbing Galaxias	ACT			
<i>Galaxias maculatus</i> [^]	Common Galaxias	ACT			VU
<i>Galaxias olidus</i> [^]	Mountain Galaxias	ACT			
<i>Philypnodon grandiceps</i> [^]	Big-headed Gudgeon	ACT			LC
<i>Philypnodon macrostomus</i> [^]	Dwarf Flathead Gudgeon	ACT			LC
<i>Pseudaphritis urvillii</i> [^]	Congolli	ACT			EN
<i>Pseudogobius olorum</i> [^]	Swan River Goby	ACT			LC
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	AVES			LC
<i>Acanthiza reguloides australis</i>	Buff-rumped Thornbill	AVES			
<i>Accipiter fasciatus fasciatus</i>	Brown Goshawk	AVES			LC
<i>Acrocephalus australis australis</i> [^]	Australian Reed Warbler	AVES			LC
<i>Actitis hypoleucos</i> [^]	Common Sandpiper	AVES		R	RA
<i>Anthochaera carunculata</i>	Red Wattlebird	AVES			LC
<i>Anthochaera chrysoptera</i> [^]	Little Wattlebird	AVES	ssp		LC
<i>Anthus australis</i>	Australian Pipit	AVES			LC
<i>Aquila audax audax</i> [^]	Wedge-tailed Eagle	AVES			RA
<i>Ardea alba modesta</i>	Great Egret	AVES			RA
<i>Aythya australis</i>	Hardhead	AVES			LC
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	AVES			

Species Name	Common Name	Class	EPBC Act Status	NPW Act Status	Subregional Status
<i>Cacatua sanguinea gymnopsis</i>	Little Corella	AVES			LC
<i>Cacatua tenuirostris</i>	Long-billed Corella	AVES			
<i>Cacomantis flabelliformis flabelliformis</i>	Fan-tailed Cuckoo	AVES			LC
<i>Calidris ruficollis</i>	Red-necked Stint	AVES			NT
<i>Cereopsis novaehollandiae novaehollandiae</i>	Cape Barren Goose	AVES		R	
<i>Charadrius ruficapillus</i> [^]	Red-capped Plover	AVES			RA
<i>Chlidonias hybrida javanicus</i>	Whiskered Tern	AVES			LC
<i>Chroicocephalus novaehollandiae novaehollandiae</i>	Silver Gull	AVES			LC
<i>Cincloramphus cruralis</i>	Brown Songlark	AVES			LC
<i>Colluricincla harmonica</i> [^]	Grey Shrikethrush	AVES			LC
<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike	AVES			LC
<i>Corvus mellori</i>	Little Raven	AVES			LC
<i>Cygnus atratus</i> [^]	Black Swan	AVES			LC
<i>Egretta novaehollandiae</i>	White-faced Heron	AVES			LC
<i>Elanus axillaris</i>	Black-shouldered Kite	AVES			LC
<i>Eolophus roseicapilla</i>	Galah	AVES			LC
<i>Eudyptula minor novaehollandiae</i>	Little Penguin	AVES			
<i>Falco cenchroides cenchroides</i>	Nankeen Kestrel	AVES			LC
<i>Gallinula tenebrosa tenebrosa</i>	Dusky Moorhen	AVES			RA
<i>Gavialis vireescens</i>	Singing Honeyeater	AVES			LC
<i>Glossopsitta concinna</i>	Musk Lorikeet	AVES			LC
<i>Grallina cyanoleuca cyanoleuca</i>	Magpielark	AVES			LC
<i>Gymnorhina tibicen</i>	Australian Magpie	AVES			LC
<i>Haematopus fuliginosus fuliginosus</i> [^]	Sooty Oystercatcher	AVES		R	VU
<i>Haematopus longirostris</i> [^]	Pied Oystercatcher	AVES		R	VU
<i>Haliaeetus leucogaster</i> [^]	White-bellied Sea Eagle	AVES		E	EN
<i>Hirundo neoxena neoxena</i>	Welcome Swallow	AVES			LC
<i>Hydroprogne caspia</i>	Caspian Tern	AVES			LC
<i>Larus dominicanus dominicanus</i> [^]	Kelp Gull	AVES		R	RA
<i>Larus pacificus georgii</i> [^]	Pacific Gull	AVES			LC
<i>Malurus cyaneus</i> [^]	Superb Fairywren	AVES			LC
<i>Melithreptus lunatus</i>	White-naped Honeyeater	AVES			RA
<i>Microcarbo melanoleucos melanoleucos</i>	Little Pied Cormorant	AVES			LC
<i>Morus serrator</i>	Australasian Gannet	AVES			NT
<i>Neophema elegans elegans</i> [^]	Elegant Parrot	AVES		R	RA
<i>Ocyphaps lophotes lophotes</i>	Crested Pigeon	AVES			LC
<i>Pandion haliaetus cristatus</i> [^]	Eastern Osprey	AVES		E	
<i>Parvipsitta porphyrocephala</i>	Purple-crowned Lorikeet	AVES			LC
<i>Pelecanus conspicillatus</i>	Australian Pelican	AVES			LC
<i>Petrochelidon nigricans</i>	Tree Martin	AVES			LC
<i>Phalacrocorax fuscescens</i>	Black-faced Cormorant	AVES			NT
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	AVES			LC
<i>Phalacrocorax varius hypoleucos</i>	Australian Pied Cormorant	AVES			LC
<i>Phaps chalcoptera</i>	Common Bronzewing	AVES			LC
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	AVES			LC
<i>Platycercus elegans</i>	Crimson Rosella	AVES	ssp		LC
<i>Psephotus haematonotus</i>	Red-rumped Parrot	AVES			LC
<i>Rhipidura leucophrys leucophrys</i>	Willie Wagtail	AVES			LC
<i>Sericornis frontalis rosinae</i>	White-browed Scrubwren (MLR)	AVES			
<i>Strepera versicolor melanoptera</i>	Black-winged Currawong (MLR, MM, SE)	AVES			
<i>Thalasseus bergii cristatus</i>	Greater Crested Tern	AVES			LC
<i>Thinornis cucullatus cucullatus</i>	Hooded Plover	AVES	VU	V	EN

Species Name	Common Name	Class	EPBC Act Status	NPW Act Status	Subregional Status
<i>Threskiornis molucca molucca</i>	Australian White Ibis	AVES			LC
<i>Trichoglossus moluccanus moluccanus</i>	Rainbow Lorikeet	AVES			LC
<i>Vanellus miles</i>	Masked Lapwing	AVES			LC
<i>Zanda funerea whiteae</i> [^]	Yellow-tailed Black Cockatoo	AVES		V	RA
<i>Zosterops lateralis</i>	Silvereeye	AVES			LC
<i>Danaus petilia</i> [^]	Lesser Wanderer	INV			
<i>Danaus plexippus plexippus</i> [^]	Monarch	INV			
<i>Delias aganippe</i> [^]	Wood White	INV			
<i>Heteronympha merope merope</i> [^]	Common Brown	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>Macropus fuliginosus</i> [^]	Western Grey Kangaroo	MAM			LC
<i>Pteropus poliocephalus</i> [^]	Grey-headed Flying-fox	MAM	VU	R	
<i>Tachyglossus aculeatus</i> [^]	Short-beaked Echidna	MAM	ssp	ssp	

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

All Introduced Fauna in cell

Species	Common Name
<i>Carduelis carduelis britannica</i>	European Goldfinch
<i>Cervus dama</i> [^]	Fallow Deer
<i>Columba livia</i>	Feral Pigeon
<i>Felis catus</i> [^]	Domestic Cat (Feral Cat)
<i>Gambusia holbrooki</i> [^]	Eastern Gambusia
<i>Mus musculus</i> [^]	House Mouse
<i>Oryctolagus cuniculus</i> [^]	Rabbit (European Rabbit)
<i>Passer domesticus domesticus</i>	House Sparrow
<i>Perca fluviatilis</i> [^]	Redfin Perch
<i>Spilopelia chinensis</i>	Spotted Dove
<i>Sturnus vulgaris vulgaris</i>	Common Starling
<i>Turdus merula merula</i>	Common Blackbird
<i>Vulpes vulpes</i> [^]	Fox (Red Fox)



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