3 Conservation Themes

3.1 Flora

3.1.1 Native Vegetation Cover

A pre-European vegetation map in the Atlas of South Australia (Giffen and McCaskill 1986) shows the study area covered 100% by "coastal succession" which represents a variety of coastal dune and clifftop and salt marsh plant communities. Mangroves have never been recorded within the study area.

In addition to vegetation clearance for agriculture and urban settlements, disturbance created by European settlement undoubtedly has caused changes to both the structure and species composition of the SE coastal plant communities. Stock grazing, rabbit and weed invasion have all caused significant impacts to the native vegetation cover. The rapid decline of aboriginal occupation and their use and manipulation of the land through fire and food gathering is another factor that would also have caused change. Dune instability caused by European settlement activities also contributed to vegetation loss.

Overall 43444 hectares of remnant vegetation has been mapped within the SE coastal boundary. Approximately 69% of the remnant vegetation is located with reserves protected by the NPWSA Act 1972 or are within Heritage Agreement areas.

3.1.2 Floristic Communities

Regional floristic mapping

The SE coastal boundary is covered by floristic mapping. This forms part of the SA Vegetation Database which is managed by DENR. The mapping is available at different levels based on over story species, alliances, and structural formation. At the most detailed level (SAVeg_ID1) 52 plant communities have been mapped within the coastal boundary. At the broad level, Major Veg Sub Group (MVSB) 12 units have been mapped.

Table 3.1 shows as percentage cover in the coastal boundary the major vegetation sub groups (MVSB). Shrubland communities predominate comprising 82% of the vegetation cover. 21 shrubland communities are described. Less than 10% of the cover is forest or woodland. This reflects the large extent of exposed coast subject to strong salt laden winds which prevents trees from establishing or growing above shrub height.

Table 3.1. Broad vegetation classes showing % cover within the SE coastal boundary.

Major Veg Sub-Group Type	Hectares	Percentage cover
Casuarina and Allocasuarina forests and woodlands	2.12	0.01
Chenopod shrublands	37.59	0.10
Eucalyptus open woodlands with shrubby understorey	2.50	0.01
Eucalyptus woodlands with a shrubby understorey	400.30	1.06
Mallee heath and shrublands	2670.30	7.06
Melaleuca open forests and woodlands	336.83	0.89
Melaleuca shrublands and open shrublands	5071.48	13.40
Mixed chenopod, samphire or forblands	3081.79	8.15

Other shrublands	22935.97	60.62
Other tussock grasslands	1342.91	3.55
Temperate tussock grasslands	285.70	0.76
Wet tussock grassland, herbland, sedgeland or rushland	1666.23	4.40
		100.00

Coastal dune and cliff-top vegetation survey

Oppermann (1999) described the results of a statewide survey of the coastal dune and cliff-top habitats in South Australia between October 1995 and November 1997. The survey also used site data from previous surveys for the analysis. A major purpose of this survey was to describe and measure the structure and composition of the coastal dune and cliff-top communities. Another objective was to identify sites, plants and communities of conservation significance. Survey methodology conformed to the Biological Survey Program standards detailed by Heard and Channon 1997. Within the South East coastal boundary as defined by Oppermann 296 quadrat sites were surveyed and a total of 1072 sites were used state wide for the analysis. Cluster analysis was used to determine meaningful floristic groupings. Floristic groupings were described using a Specht/Muir derived structural table shown in Appendix 7 (Specht 1972; Muir 1977). No mapping was undertaken. Table 3.2 shows the 11 floristic communities identified as occurring in the coastal dune and cliff-top habitats along the South East coast study area. There are four floristic communities where greater than 50% of the known sites are found within the study area. Four communities have 20 or less records for SA. Information about each of the 11 floristic groups has been summarised below (Figures 5.1 to 5.10) from the information compiled by Oppermann (1999).

Table 3.2. Floristic groups in coastal dune and cliff-top habitats*

Structural Class	Floristic community	Sites in SA	Sites in SE	% SA total in SE
Grassland	*Spinifex sericeus / Euphorbia paralias*	42	20	47.6
Mallee	*Eucalyptus diversifolia/Clematis microphylla*	36	3	8.3
Sedgeland	***Gahnia trifida***	2	1	50
Sedgeland	***Juncus krausii***	5	4	80
Sedgeland	*Lepidosperma gladiatum*	8	1	12.5
Shrubland	*Atriplex cinerea*	20	1	5
Shrubland	*Leucopogon parviflorus*	16	3	18.7
Shrubland	***Leucopogon parviflorus/Olearia axillaris***	150	86	57.3
Shrubland	***Olearia axillaris/ Leucopogon parviflorus***	65	62	95.3
Shrubland	*Olearia axillaris/Rhagodia candolleana ssp candolleana*	64	3	4.6
Shrubland	*Olearia axillaris/Tetragonia implexicoma*	42	4	9.5

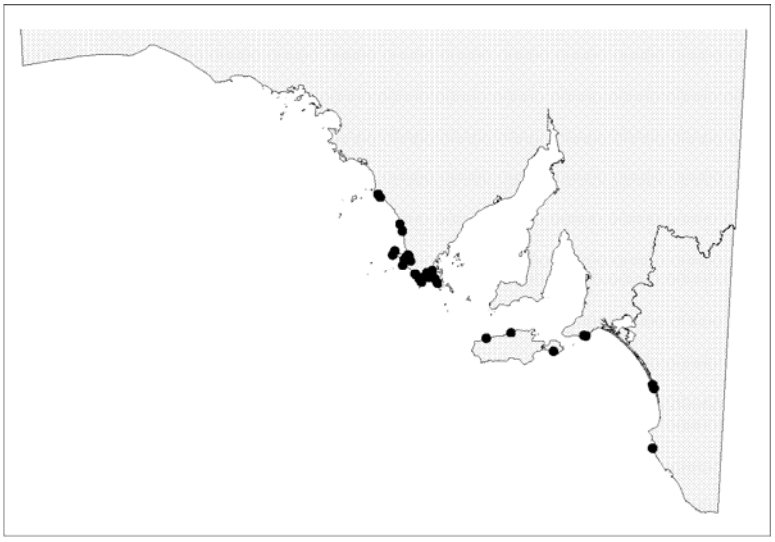
* Oppermann (1999) study area

Bold = 50%+ sites found along SE coast

Shaded = less than 20 sites recorded along SA coast

Eucalyptus diversifolia / *Clematis microphylla* Mallees

Description:
Predominantly located on Quaternary dunefields. There is a distinctive overstorey with few understorey species in common.



Number of plant species:

Min	Max	Average
4	38	17.89

Dominant overstorey species:
Eucalyptus diversifolia

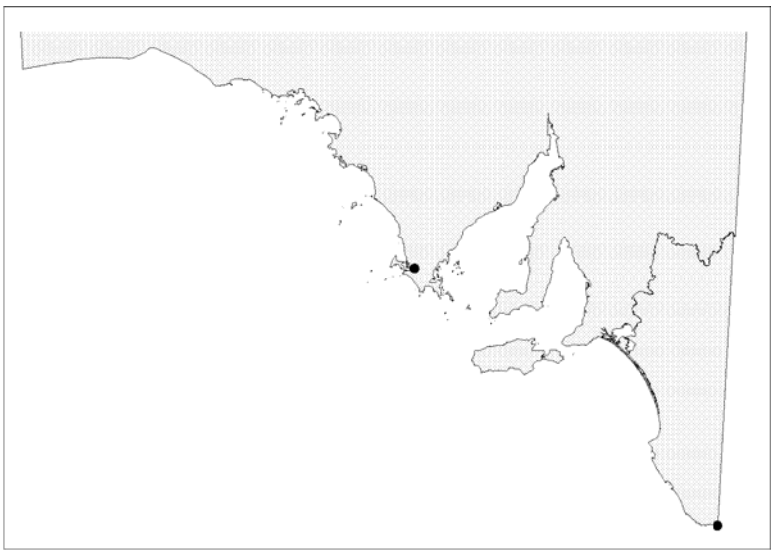
Dominant understorey species:
Clematis microphylla

Sub-dominant species:
Melaleuca lanceolata

Figure 3.1. *Eucalyptus diversifolia* / Clematis microphylla Mallees on dunerock at quadrat ROB00305 (SOE14946).

Gahnia trifida Sedgeland

Description:
A very small strong group located in flat, very low lying swampy areas. A mixture of the dominant species with sparse herbs, grasses and shrubs.



Number of plant species:

Min	Max	Average
5	21	13.00

Dominant species:
Gahnia trifida
Samolus repens

Figure 3.2. *Gahnia trifida* Sedgeland at quadrat GAM00303 (SOE15259).

Juncus kraussii Sedgeland

Description:
A very strong group located predominantly in the south east. A tall sedgeland which is found in flat, relatively low lying wet areas of dunefields. There are moderate to low numbers of perennial species.

Number of plant species:

Min	Max	Average
6	15	11.60

Dominant species:
Juncus kraussii

Sub-dominant species:
Isolepis nodosa

Indicator Species:
Acaena novae-zelandiae
Epilobium billardierianum ssp. x intermedium
Sporobolus virginicus

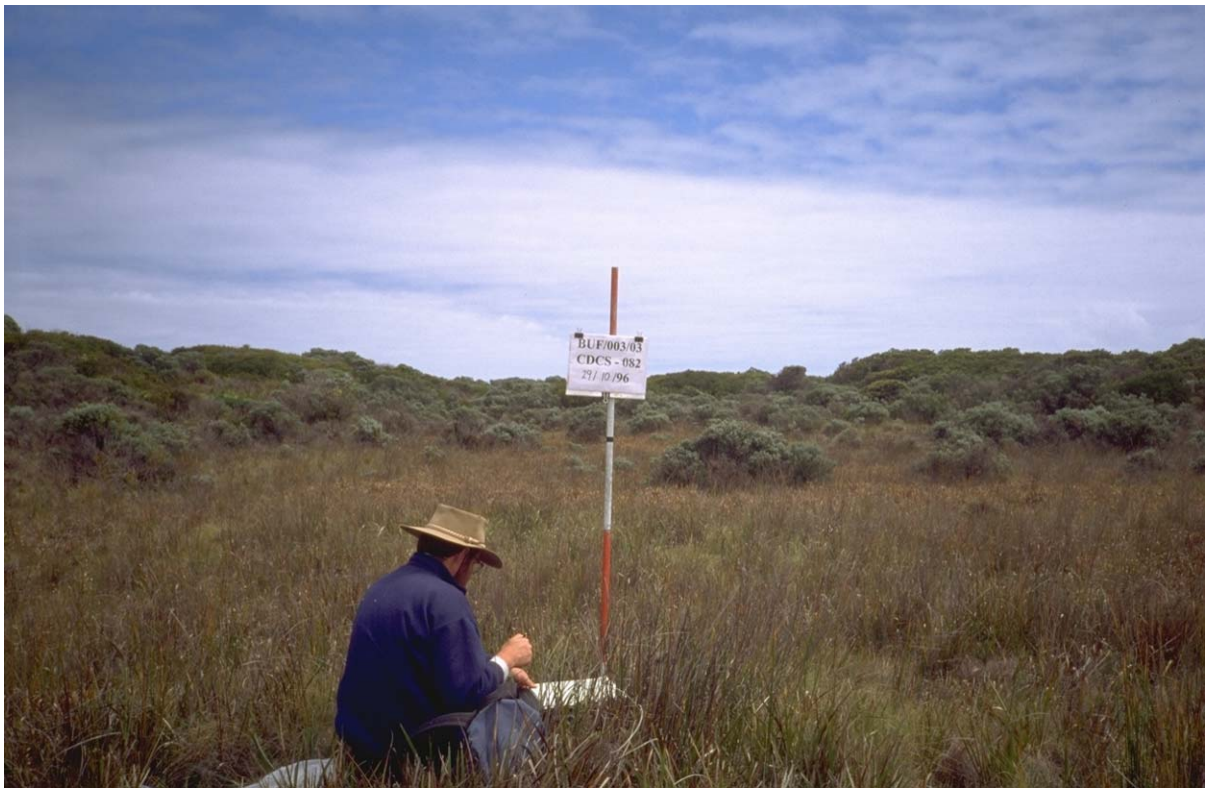


Figure 3.3. *Juncus kraussii* Sedgeland at quadrat BUF00303 (SOE14925).

Lepidosperma gladiatum Sedgelands

Description:
A very strong group located in the eastern part of the coastline on dunefields. There are low proportions of many of the lifeforms in the plant communities

Number of plant species:

Min	Max	Average
8	25	16.63

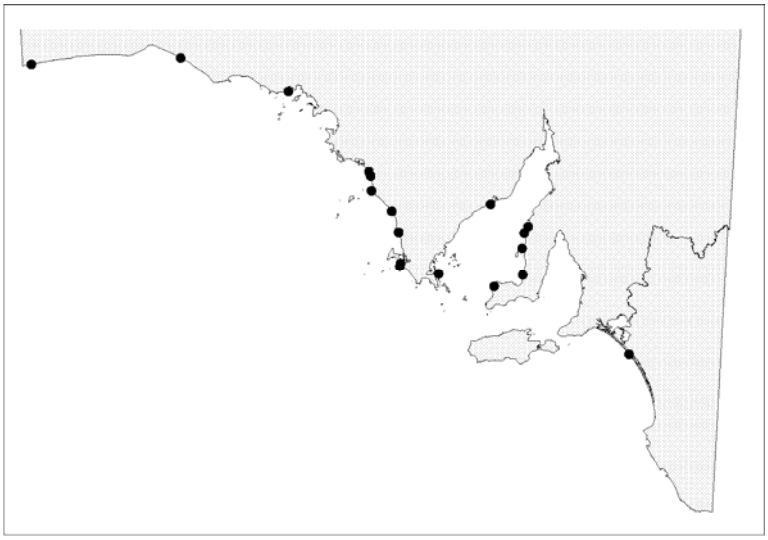
Dominant species:
Lepidosperma gladiatum

Indicator species:
Acacia nematophylla

Figure 3.4. *Lepidosperma gladiatum* Sedgelands at quadrat ROB00102 (SOE14934).

Atriplex cinerea Shrublands

Description
Mainly an overstory found at the back of beaches and on semi-stable dunes .



Number of plant species

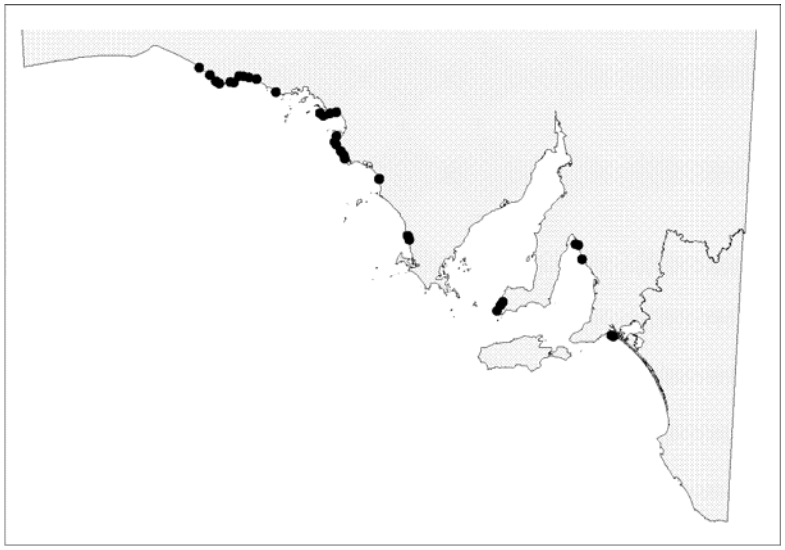
Min	Max	Average
4	27	14.25

Dominant overstorey species
Atriplex cinerea
Olearia axillaris

Figure 3.5. Atriplex cinerea shrublands at the back of a beach.

Olearia axillaris/Tetragonia implexicoma Shrublands

Description
Located in dunes.



Number of plant species

Min	Max	Average
6	22	13.50

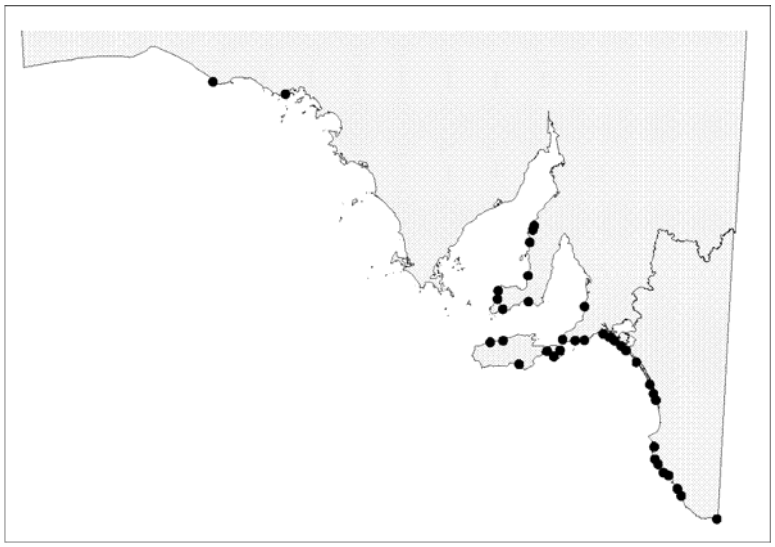
Dominant overstorey species
Olearia axillaris

Dominant understorey species
Tetragonia implexicoma

Figure 3.6. *Olearia axillaris/Tetragonia implexicoma* shrublands at quadratGOO00103 (COO15956).

Spinifex hirsutus/Euphorbia paralias Grasslands (shrublands)

Description
A strong group located mainly on fore-dunes, predominantly in the eastern part of the coastline. The average number of species is moderately low with an unusually high proportion of herbs and grasses.



Number of plant species

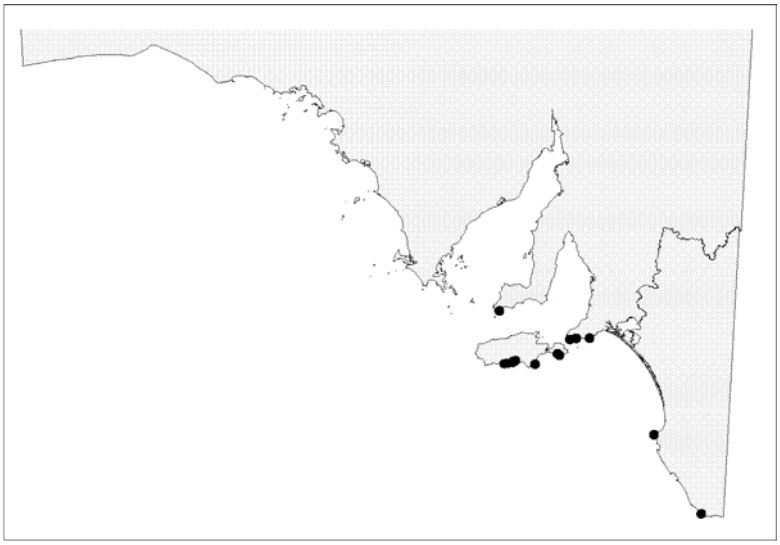
Min	Max	Average
3	19	10.52

Dominant species
Euphorbia paralias
Spinifex hirsutus

Figure 3.7. *Spinifex hirsutus/Euphorbia paralias* grasslands at quadrat BUF00301 near Beachport (SOE14923).

Leucopogon parviflorus Shrublands

Description:
A very strong group located on cliffs and dunefields along the eastern part of the coastline. There is a distinctive overstorey with very high abundances on all quadrats and with very common species as part of the plant communities.



Number of plant species:

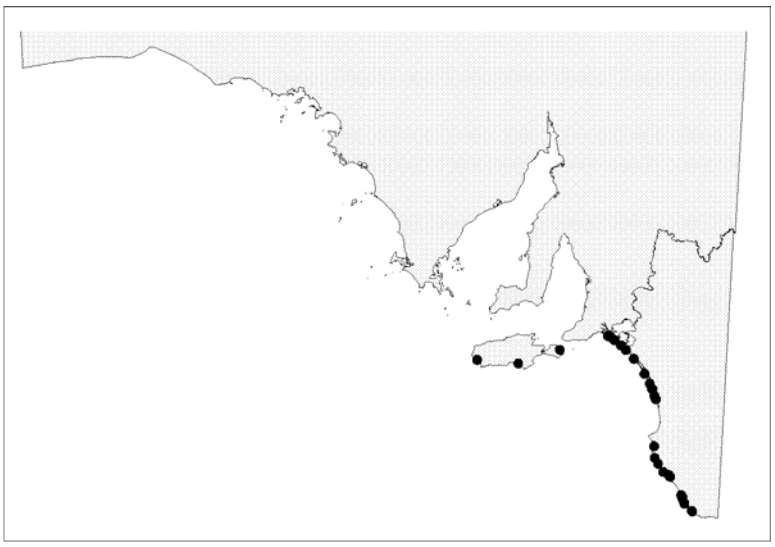
Min	Max	Average
9	39	22.13

Dominant overstorey species:
Leucopogon parviflorus

Figure 3.8. *Leucopogon parviflorus* Shrublands.

Olearia axillaris / Leucopogon parviflorus Shrublands

Description:
A strong group located on dunefields predominantly in the south-east of the coastline with higher rainfall. There is a distinctive overstorey with common species as understorey.



Number of plant species:

Min	Max	Average
5	28	19.02

Dominant overstorey species:
Leucopogon parviflorus
Olearia axillaris

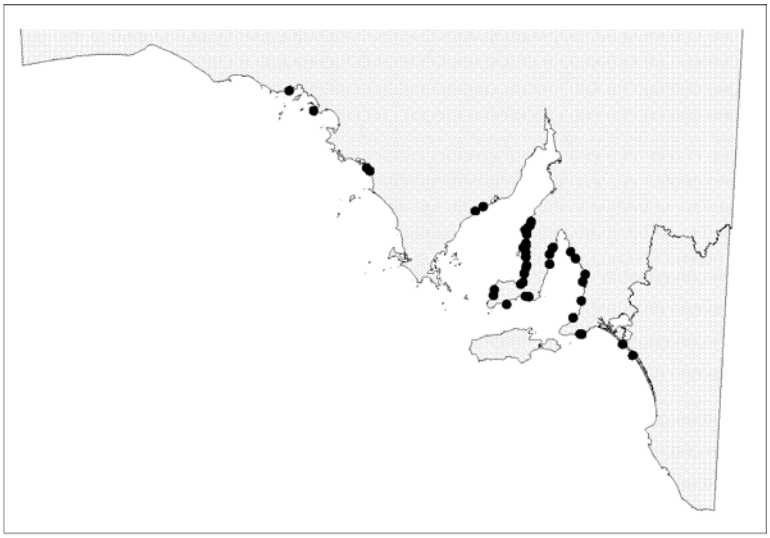
Dominant understorey species:
Carpobrotus rossii
Exocarpos syrticola
Isolepis nodosa
Pimelea serpyllifolia ssp. serpyllifolia
Rhagodia candolleana ssp. candolleana

Sub-dominant species:
Acacia longifolia var. sophorae
Myoporum insulare

Figure 3.9. *Olearia axillaris / Leucopogon parviflorus* Shrublands at quadrat BEN00401 (SOE15227).

Olearia axillaris / Rhagodia candolleana ssp. candolleana Shrublands

Description:
A large moderately strong group located along the coastline on predominantly dunefields.



Number of plant species:

Min	Max	Average
9	31	19.50

Dominant overstorey species:
Olearia axillaris

Dominant understorey species:
Rhagodia candolleana ssp. candolleana
Tetragonia implexicoma
Threlkeldia diffusa

Sub-dominant species:
**Lagurus ovatus*

Figure 3.10. *Olearia axillaris / Rhagodia candolleana* ssp. *candolleana* Shrublands at quadrat MAG00302 (COO14764).

3.1.3 Salt marsh Communities

Extensive salt marsh communities occur along the Coorong shoreline. Two smaller complexes are located at Maria Creek and Lake George. These have been mapped as part of the state-wide salt marsh habitat mapping program. In total there is 4285 hectares of mapped salt marsh habitat. The habitat classes are outlined by Canty and Hille 2002. Two levels of classification are used detailed (long description) and broad (short description). At the detailed level 69 habitat classes are defined based on landform, tidal class, estuarine class, vegetation cover and condition. At the broader level which is used for State of Environment reporting purposes these are combined into 10 habitat classes. Within the SE coastal boundary 14 long description and 8 short description habitat classes have been mapped.

Table 3.4. Habitat classes (short description) found within the SE coastal boundary. Total area, relative % cover within the study area and % of the SA total.

Habitat Class (short description)	Area (Hectares)	%	% SA Total
Intertidal Melaleuca	5.72	0.14	24.83
Intertidal Samphire	425.71	10.43	1.87
Intertidal Sedges	418.02	10.24	97.96
Stranded Tidal Samphire	86.29	2.11	0.96
Supratidal Melaleuca	1472.15	36.06	85.64
Supratidal Samphire	1432.13	35.08	5.79
Supratidal Sedges	242.64	5.94	90.21
Total	4082.66	100.00	

Table 3.4 shows as an area and also percentage the relative abundance of the 7 short description communities. Supratidal communities represent 70% of the cover. The table also shows the representation of the habitat classes as a percent of the SA total. This shows that 4 communities have very significant representation in the SE, Intertidal Melaleuca, Intertidal sedges, Supratidal Melaleuca and Supratidal sedges. All four reflect estuarine conditions which outside of drought periods prevail at the locations where the salt marshes in the SE are found. The health of these estuarine marshes would have suffered during the recent drought.

Information about the Coorong, Maria Creek and Lake George salt marsh complexes is provided in Figures 3.11 to 3.15.

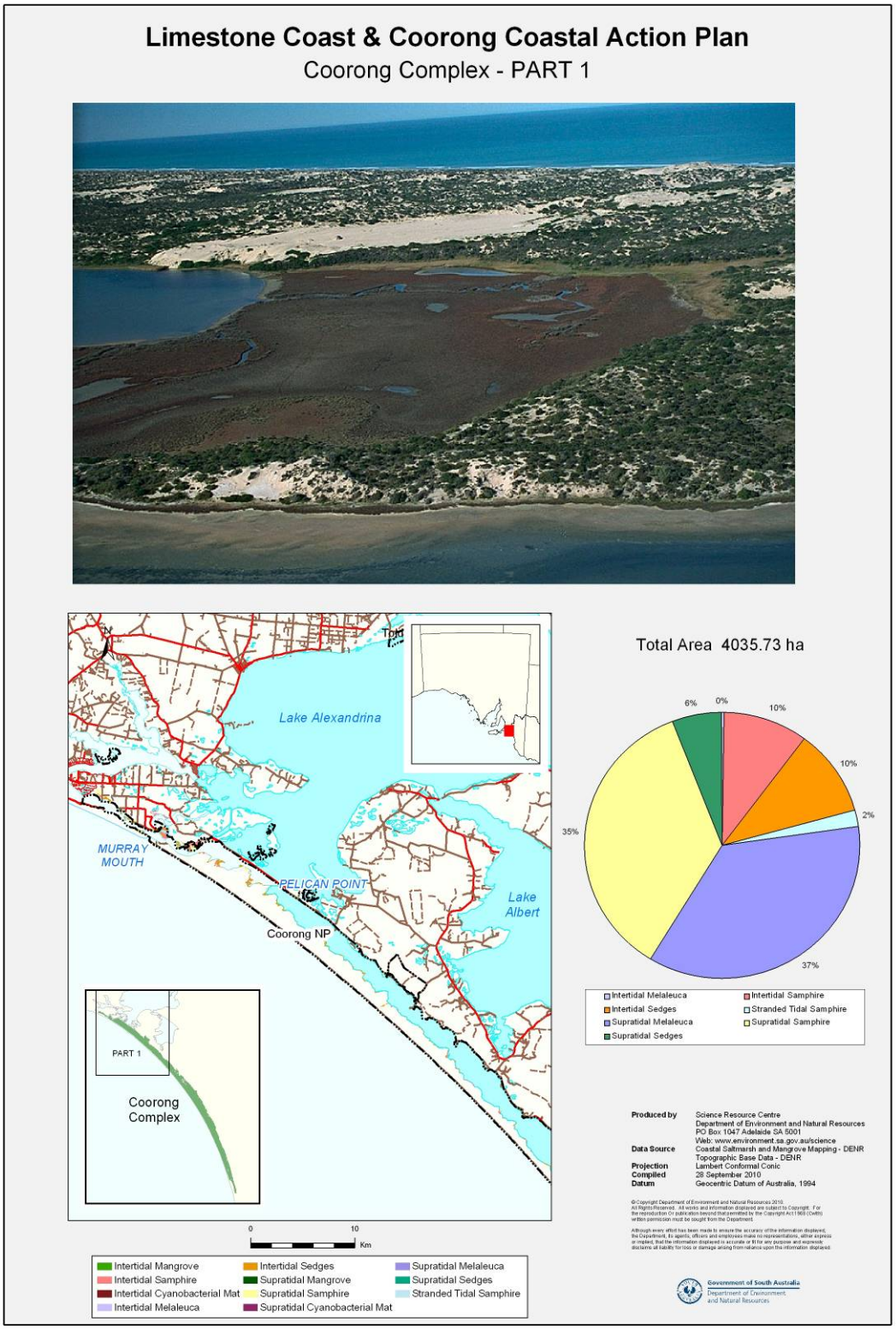


Figure 3.11. Coorong salt marsh complex - 1.

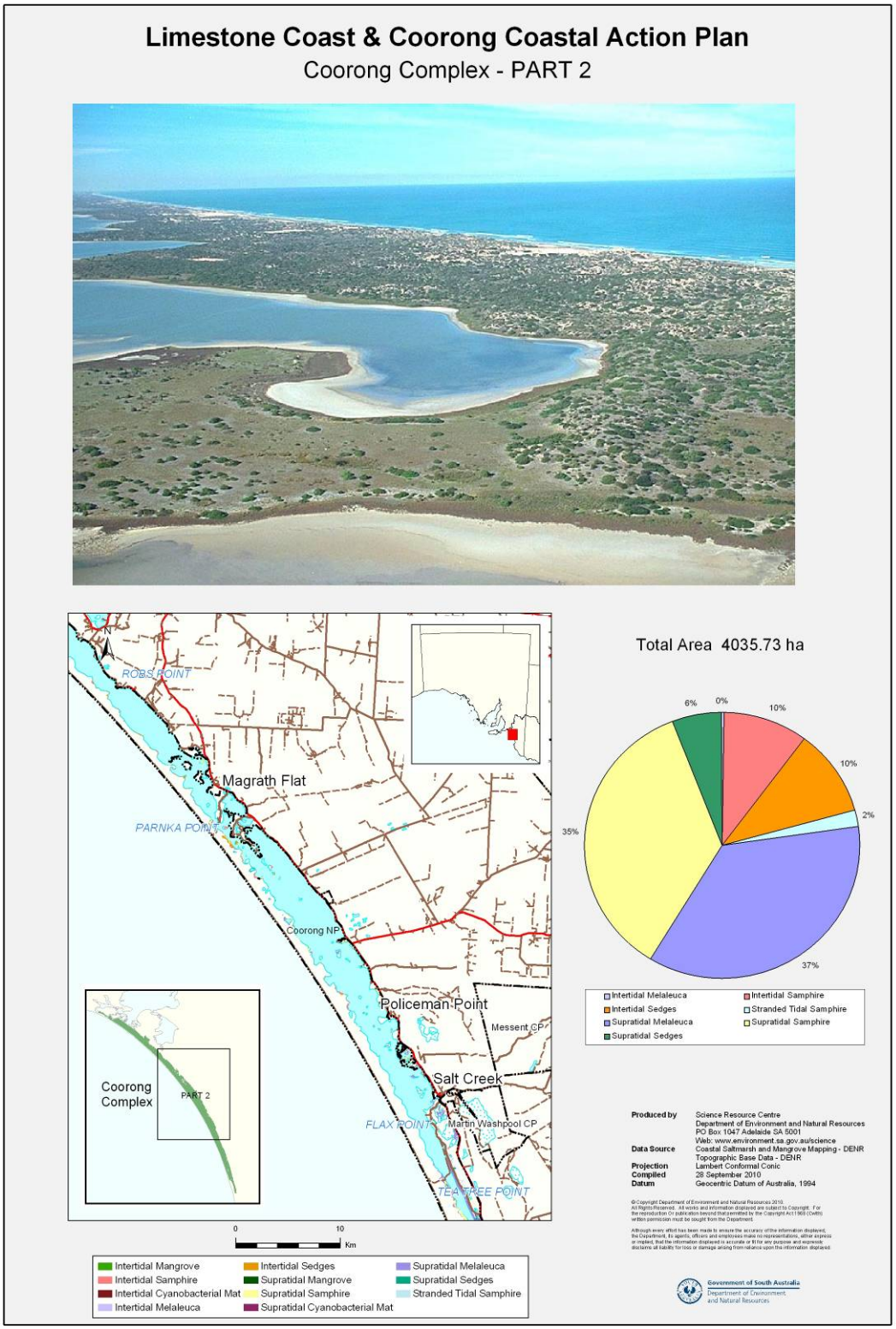


Figure 3.12. Coorong salt marsh complex - 2.

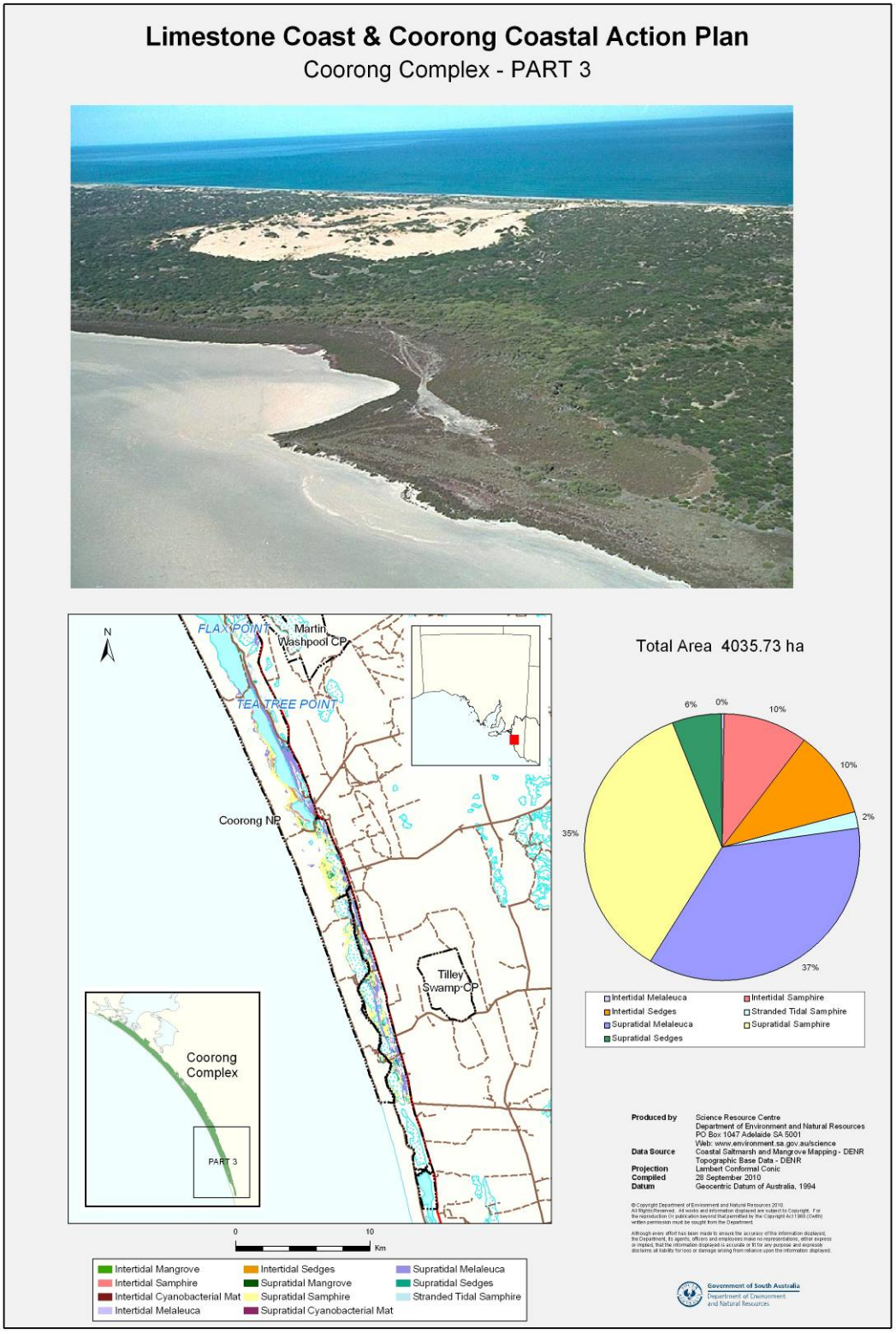


Figure 3.13. Coorong salt marsh complex – 3.

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Figure 3.14. Maria Creek salt marsh complex.

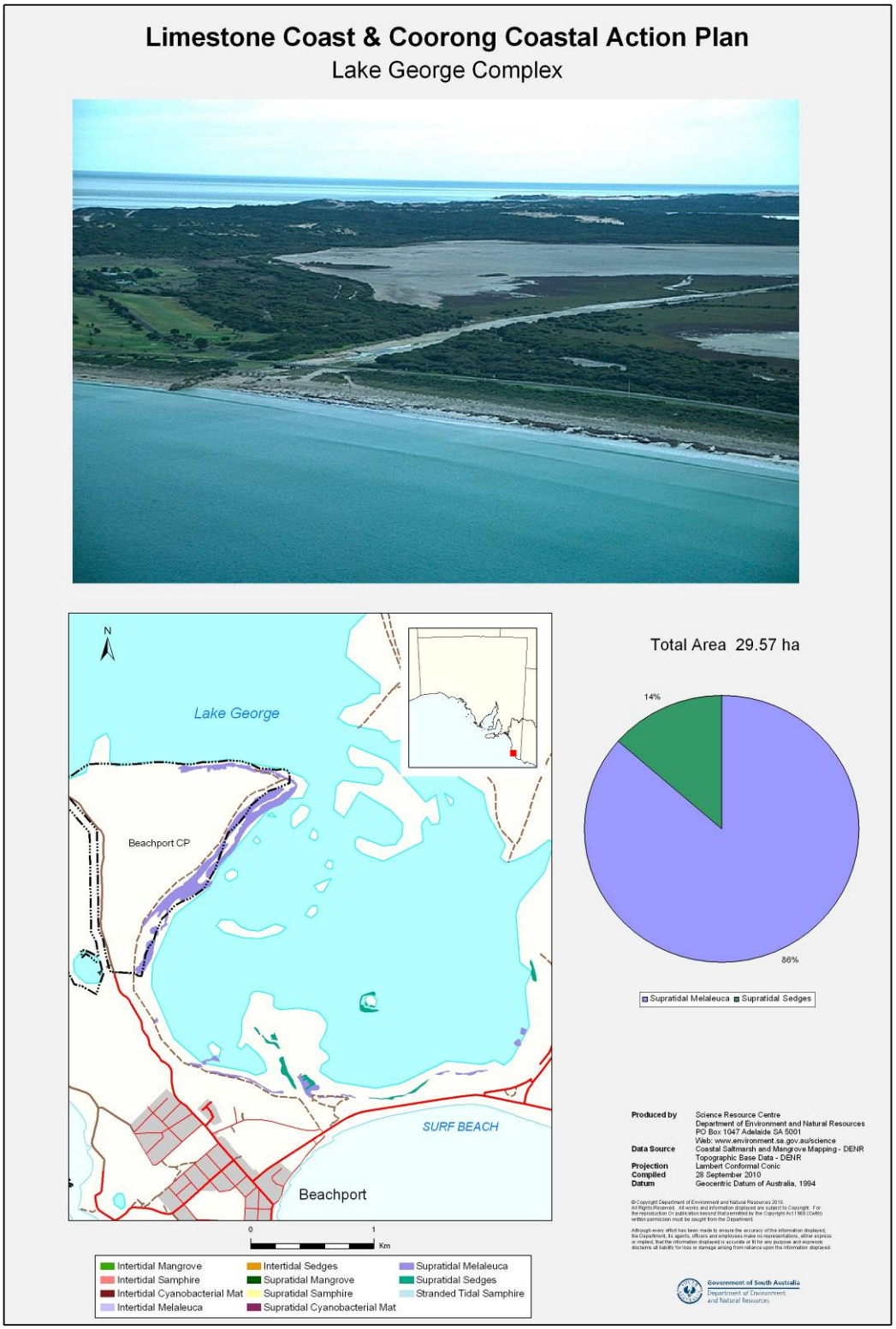

Figure 3.15. Lake George salt marsh complex.

3.1.4 Plant Species

Coastal plant species

A list of vascular plants within the South East coast boundary has been compiled from the DENR plant record database, which is derived from herbarium and vegetation survey collection data including opportunistic surveys. On the South East coast, 1143 vascular plant species have been recorded, out of a total of 4666 species recorded in SA in the 2005 census. 350 species are non native to the SE region compared with a total of 1288 non native species are recorded for SA (2005 census).

Seventy six species found within the South East coast boundary have a threatened status under the National Parks and Wildlife Act (1972). Twelve of these are also listed under the Environment, Protection and Biodiversity Act 1999 (Table 3.5).

Table 3.5. National and State Conservation rated plants recorded within the South East coast study area

No.	Species name	Common name	EPBC status	NPWSA status
1	*Caladenia audasii*		E	E
2	*Caladenia colorata*		E	E
3	*Caladenia conferta*		E	E
4	*Cladenia richardsioum*		E	E
5	*Glycine latrobeana*		V	V
6	*Ixodia achillaeides ssp arenicola*		V	E
7	*Pomaderris halmaturina ssp. halmaturina*		V	V
8	*Pterostylis arenicola*		V	V
9	*Pterosylis tenuissima*		V	V
10	*Prasophyllum frenchii*		E	E
11	*Senecio psilocarpus*		V	V
12	*Thelymetra epipactoides*		E	E

R: (Rare): has a low frequency of occurrence; not currently threatened but warrants monitoring and protective measures to prevent reduction of population size.

E: (Endangered): Species, populations & ecosystems rare and danger of becoming extinct in the wild.

V: (Vulnerable) : Species, populations & ecological communities rare & at risk from potential threats or long term threats which could cause the species to become endangered in the future.