A BIOLOGICAL SURVEY OF KANGAROO ISLAND SOUTH AUSTRALIA IN NOVEMBER

1989 and 1990

Editors

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Kangaroo Island Biological Survey

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Cover Photograph
Sugar Gum woodland on the DeMolle River in Cape Torrens Conservation Park
Photo: A. C. Robinson

PREFACE

A Biological Survey of Kangaroo Island, South Australia is a further component of the Biological Survey of South Australia

The program of systematic biological surveys to cover the whole of South Australia arose out of a realisation that an effort was needed to increase our knowledge of the remaining vascular plants and vertebrate fauna of the state and to encourage its conservation.

Over the last fifteen years, there has been a strong commitment to the Biological Survey by Government and an impressive dedication from hundreds of volunteer biologists.

It is anticipated that the Biological Survey will achieve complete statewide coverage by 2015 and will be an achievement for which we can be very proud. Biologists in the future will be able to measure the direction of long-term ecological change, and we will have substantially improved our knowledge of the biodiversity of South Australia and our ability to adequately manage nature conservation into the future.

MRS DOROTHY KOTZ MP

MINISTER FOR ENVIRONMENT AND HERITAGE

ABSTRACT

A vegetation survey was carried out on Kangaroo Island in November 1989 which sampled 341 quadrats. This was followed by a vertebrate survey in October-November 1990 that sampled a sub-set of 120 quadrats. These sites aimed to sample representative areas of all the remaining natural vegetation on the island in proportion to the broad habitat variability of these areas. In addition, at least one sampling site was located in all of the 17 reserves under the National Parks and Wildlife Act on the island at that time. The total number of records contributed to the Biological Survey Database as a result of this survey were: 10 370 plants, 255 amphibians, 967 reptiles, 4 804 birds and 1 463 mammals.

An analysis of the plant quadrat data resulted in the description of 10 broad communities that were divided into 36 more detailed floristic units. Using this analysis as a basis, a vegetation map of the island was produced comprising 37 major vegetation groups based on the dominant upperstorey plant. Within these 37 major groups, 132 sub-groups have been identified and mapped.

Because of the relatively low number of different species of vertebrates and their tendency to exhibit broader habitat preferences on Kangaroo Island, pattern analyses tended to show poor patterning. Consequently, only the bird analysis is presented here. This resulted in the recognition of seven bird communities, some of which appeared to have more ecological integrity than others.

The survey results were combined with previous records from Kangaroo Island to produce consolidated total species lists.

Kangaroo Island supports 1179 distinct plant taxa, with 10 species being added as a result of this survey. A total of 652 taxa or 55% of the total species now known from the island were recorded during the survey. Of the taxa recorded on the survey, 89 (15.8 %) are alien. Kangaroo Island supports a surprisingly rich and diverse flora for its size. There are currently 45 vascular plant taxa recognised as being endemic to Kangaroo Island. A further 11 taxa are ‘almost endemic’, having only a minor part of their distribution in an adjoining region. This is a relatively high level of regional endemism, comparable with that of the Grampians in Victoria, which is well known for its endemic flora.

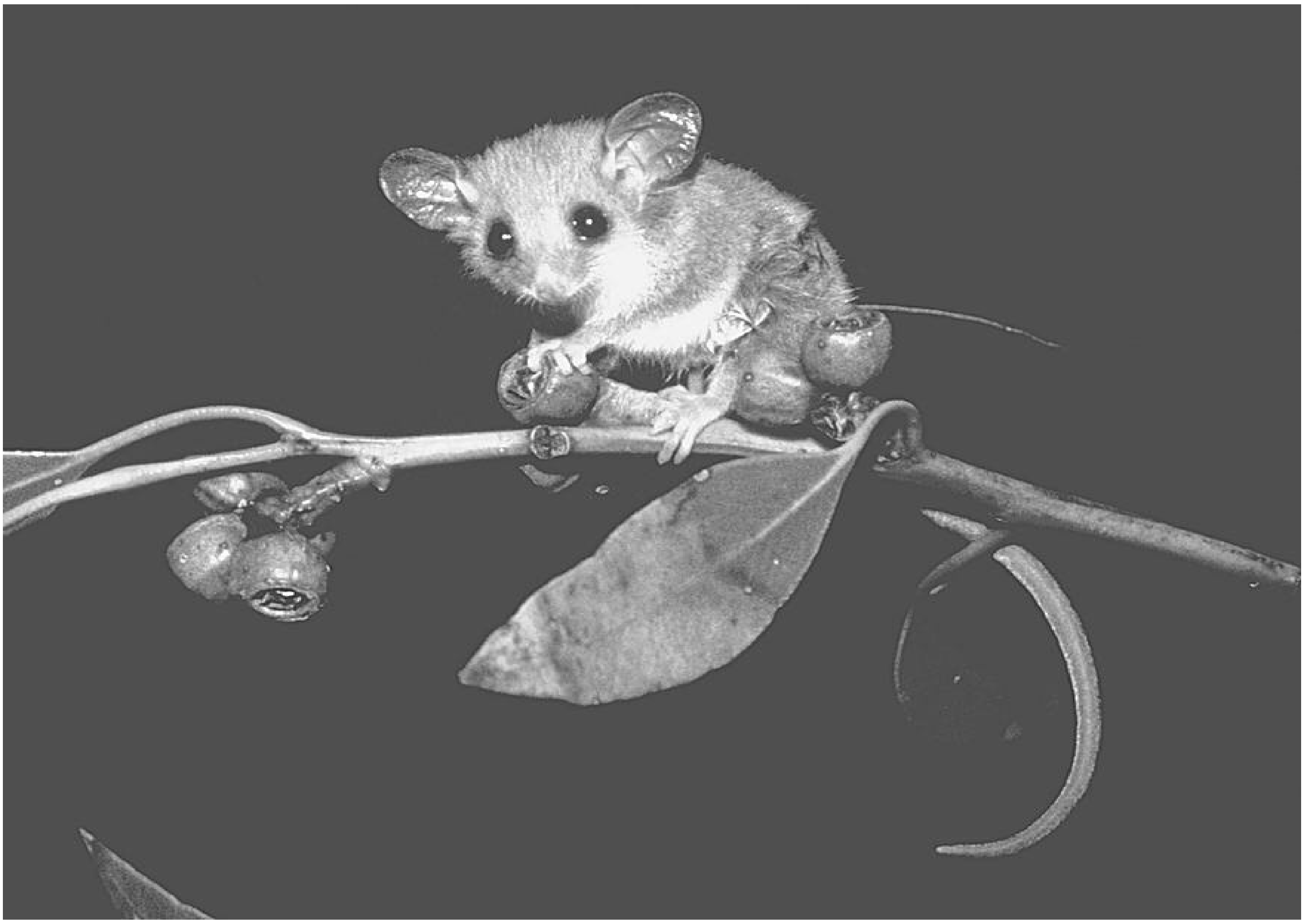
There are six species of amphibians recorded from the island, all appear to be widespread and common and no endemic island forms are currently recognised.

Of the twenty species of reptiles known from the island, two (the Eastern Bearded Dragon and Common Long-necked Tortoise) have been introduced since European settlement. No endemic island forms are recognised, but populations of the Heath Goanna and the Pygmy Copperhead are significant for the overall conservation of these species.

Two hundred and sixty-seven species of birds have now been recorded from Kangaroo Island and its surrounding waters, while reports of a further seven species await confirmation. This includes sixteen Australian species deliberately introduced to the island, of which four have established feral populations. Five species of domestic game fowl have taken advantage of the fox-free environment to establish free-range, possibly self-sustaining populations. Six exotic species have reached the island apparently unaided. Eighty-eight (74%) of the 119 land birds on Kangaroo Island were recorded during this survey. Kangaroo Island's one endemic species, the Kangaroo Island Emu was extirpated soon after European settlement. Six endemic subspecies are currently accepted.

Bird species of conservation significance on Kangaroo island include: the Glossy Black Cockatoo and Bush Stone Curlew, considered endangered in South Australia. Vulnerable species include the Painted Button Quail, Brown Quail, Leewin’s Rail, Latham’s Snipe and the Yellow-tailed Black Cockatoo.

Twenty-five species of non-marine mammals (including bats) are now known to occur on Kangaroo Island. Eight of these are introduced. At least two species thought to be present on the island at the time of European settlement (an unknown Quoll species and the Brush-tailed Phascogale) are almost certainly extinct while several of the introductions appear to have failed. There is one endemic species the Kangaroo Island Dunnart, which is known from a limited number of localities and may be threatened.



The Western Pygmy-possum *Cercartetus concinnus* is very common in the heathlands and forests of Kangaroo Island where it feeds on insects and nectar.
Photo: A. Robinson

Evening light through the Sugar Gums in Flinders Chase National Park.
Photo: A. Robinson

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ACKNOWLEDGEMENTS

A large part of the funding for this project originated with a grant from the 1989/90 National Estate Grants Program (Australian Heritage Commission) the remaining financial support was from the Government of South Australia.

Unlike previous biological surveys in this series the data contained in this report was collected in two stages. The initial vegetation survey in November 1989 followed in November 1990 by the vertebrate survey. Numerous people took part, some in both stages of the fieldwork. Each made a notable contribution in their field of expertise and to the overall effectiveness of the survey.

1. Project co-ordination and report preparation - D. Armstrong and A. Robinson

2. Survey Fieldwork
   (a)Vegetation Survey
   G. Ashman, R. Barret, C. Baxter, D. Canty, P. Canty, P. Copley, P. Coulls, T. Croft, T.Dennis, D. Fotheringham, R. Furner, C. Halstead, M. Hodder, D. Kraehenbuehl, P. Lang, A. Maguire, B. Overton, J. Overton, A. Robinson, A. Zepf.
   (b)Vertebrate Survey
   Each of six groups contained a representative biologist in three taxonomic groups, birds (B), mammals (M), reptiles (R). They were: D. Armstrong (R). C. Baxter (B), P. Canty (R), G. Carpenter (B), K. Casperson (B), B. Cohen (B), P. Copley (M), P. Dempsey (M), T. Dennis (M), G. Frederick (R), P. Horton (B), G. Johnston (R), C. Kemper (M), C. Macdonald (M), T. Moore (R), D. Peake-Jones (R), A. Robinson (M), B. St John (B).

   Other National Parks and Wildlife Service officers and interested local volunteers were involved for varying lengths of time in many areas. These people who provided much appreciated support to the biologists listed above included; K. Dennis, R. Furner, C. Halstead, I. & G. Jackson, A. Maguire, P. Seager, J. & J. Smith, A. Zepf.

3. Specimen Identification and verification (in addition to the above people) - P. Lang, D. Kraehenbuehl and the staff of the State Herbarium; SA Museum staff- C. Kemper, L. Queale (Mammals), people nominated above and P. Horton (Birds), D. Armstrong, A. Edwards, M. Hutchinson (Reptiles and Amphibians)

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7. Photography - D. Armstrong , P. Canty A. Robinson, N. Draper, Mines and Energy, South Australia, and survey workers.

8. Administration Assistance - G. Madaer

9. We are also grateful for the permission received from the numerous landowners in the area to establish sites on their properties and for their advice regarding access. We particularly thank those who assisted with accommodation. Karatta School, M. McKelvey at Pelican Lagoon, Adelaide University Study Centre at Rocky River, D. Cinzio at the NPWS accommodation at Cape Borda, E. and C. Oldfield at Stokes Bay, T. Williams and J. Renwick at American River, B. Tydeman, Hillfarm Hostel, Kingscote, Australian Odysseys, ‘Toad Hall’, American River, the NPWS accommodation at Hawks Nest and G. and J. Rees at the Vivonne Bay Outdoor Education Centre

INTRODUCTION

by A. C. Robinson[1]

BACKGROUND AND AIMS

For some years now the South Australian National Parks and Wildlife Service and the South Australian Museum have been carrying out a series of systematic surveys of the vegetation and vertebrate fauna of large regions of South Australia. Before the present survey, biological surveys had been carried out of the States Offshore Islands (excluding Kangaroo Island) (1971 - 1982), the South-East Coast (1982 - 1983), Cooper Creek (1983, 1991), the Nullarbor Plain (1984), The Gawler Ranges (1985) and the Yellabinna area (1987). With the exception of the Offshore Island surveys, the regional boundaries of these surveys have been based on the Environmental regions and the Environmental Associations described and mapped for South Australia by Laut *et al.* (1977).

The present survey covered the Kangaroo Island Environmental Region (3.1) an area of 4430 Km^2. The basic drainage pattern of the island is shown in Fig. 1. The 1:50 000 topographic map coverage of Kangaroo Island is shown in Fig. 2. The field work which covered 341 vegetation sample sites was carried out from 6 to 20 November 1989. Vertebrate field sampling of a sub-set of 120 of these sites was carried out from 21 October to 17 November 1990. The Kangaroo Island study area together with the vegetation and vertebrate sample sites is shown in Figures 3 and 4. The Kangaroo Island Environmental Region consists of eight environmental associations (Fig. 5). The island is characterised by an undulating upland plain with an extensive laterite cover which gives rise to mottled- yellow duplex soils. The plain rises to an average height of 100 - 150m and is bounded by a densely dissected scarp falling steeply to the cliffed coastline. Along the southern coastline some dunes are developed but otherwise these are rare. A characteristic feature of the eastern, somewhat lower-lying part of the island is the occurrence of numerous rounded salt lakes and depressions, which may be due to the solution processes in the calcrete cover. Shallow red sands occur on the intervening plains. In the eastern part of the island mallee was the dominant vegetation. Due to extensive clearing in areas suitable for agriculture most of the mallee has disappeared. On deeper soils in the wetter, western part of the island, the mallee is replaced by low open forest, or in sheltered positions, by open forest. Scattered stands of these forests occur as uncleared blocks in the central section of the island, but in the west large tracts remain in conservation reserves managed by the National Parks and Wildlife, South Australia.

The landscape of Kangaroo Island is characterised by contrasts between open paddocks with roadside trees and large tracts of native forest and scrub. The coastline also has many attractive features including sandy beaches, varied rock formations and sheer cliffs.

Examples of the range of environments on Kangaroo Island are shown in Figs. 6-17. Kangaroo Island, the third largest island off the Australian coast, is without doubt the most important area for nature conservation in the higher rainfall areas of South Australia. It retains the largest proportion of uncleared natural vegetation in any of the agricultural districts of the State but even more importantly it has never suffered from the introduction of those two scourges of the mainland wildlife, the rabbit and the fox. In addition to the islands' conservation value as a whole, many of its natural areas particularly the colony of Australian Sea-lions at Seal Bay Conservation Park are of international significance.

As a result of these factors there has been a considerable amount of scientific research carried out on the natural areas of Kangaroo Island and these projects are summarised in Appendix V. This biological survey however is the first time that a systematic overview of the vegetation and vertebrate communities of the whole island has been attempted. The survey was planned by the South Australian Biological Survey Coordinating Committee which at the time consisted of the following representatives: Dr Tony Robinson, Chairman, Senior Wildlife Research Officer, National Parks and Wildlife Service - Dr Chris Watts, Chief Scientist, South Australian Museum - Dr Cath Kemper, Curator of Mammals,

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South Australian Museum - Mr David Maschmedt, Land Evaluation Officer, Department of Agriculture - Mr David Goodwins, Head, Geographic Information Section, Department of Environment & Planning - Mr Keith Casperson, Scientific Officer, National Parks and Wildlife Service - Mr Rodger Tynan, Scientific Officer, Outback Management Branch, Department of Lands - Dr Bob Inns, Senior Scientific Officer, Native Vegetation.

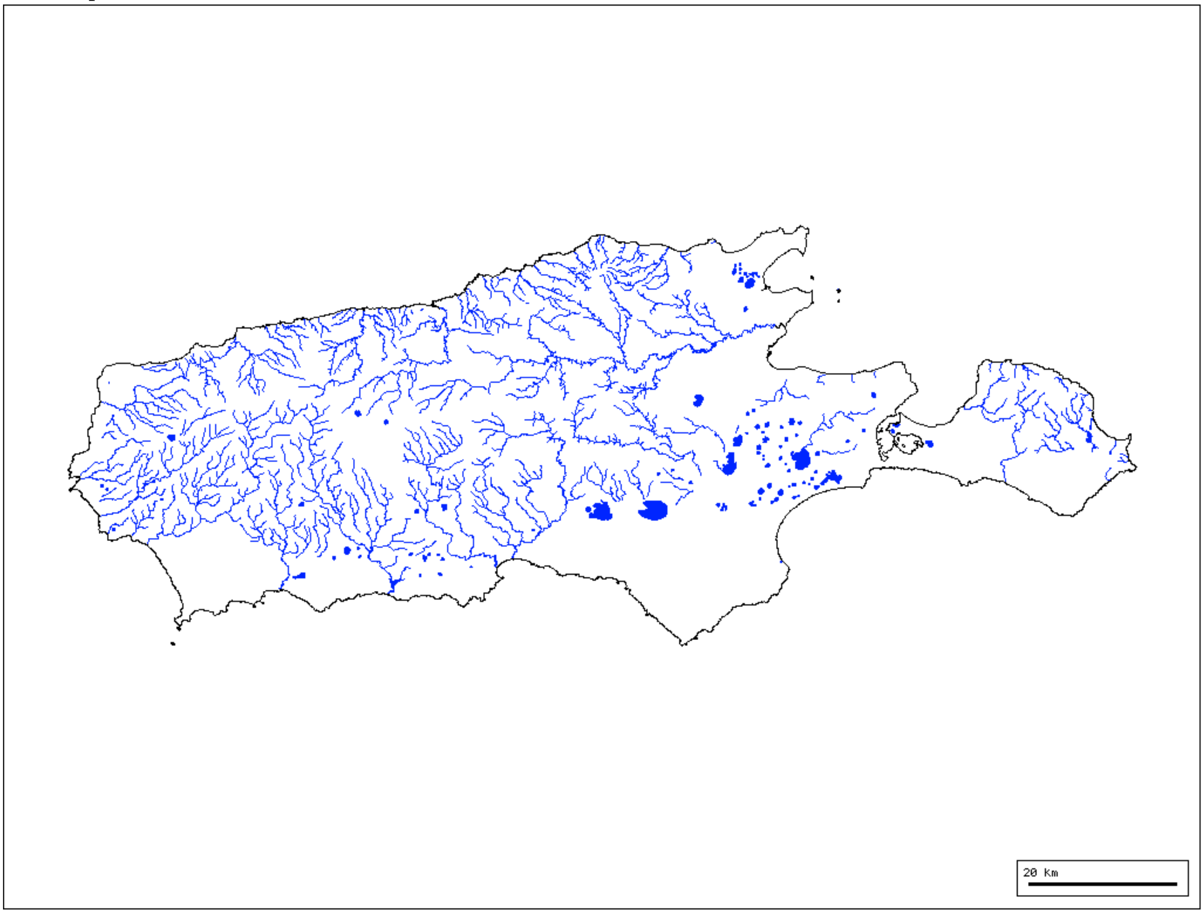


Figure 1.
Drainage patterns on Kangaroo Island.

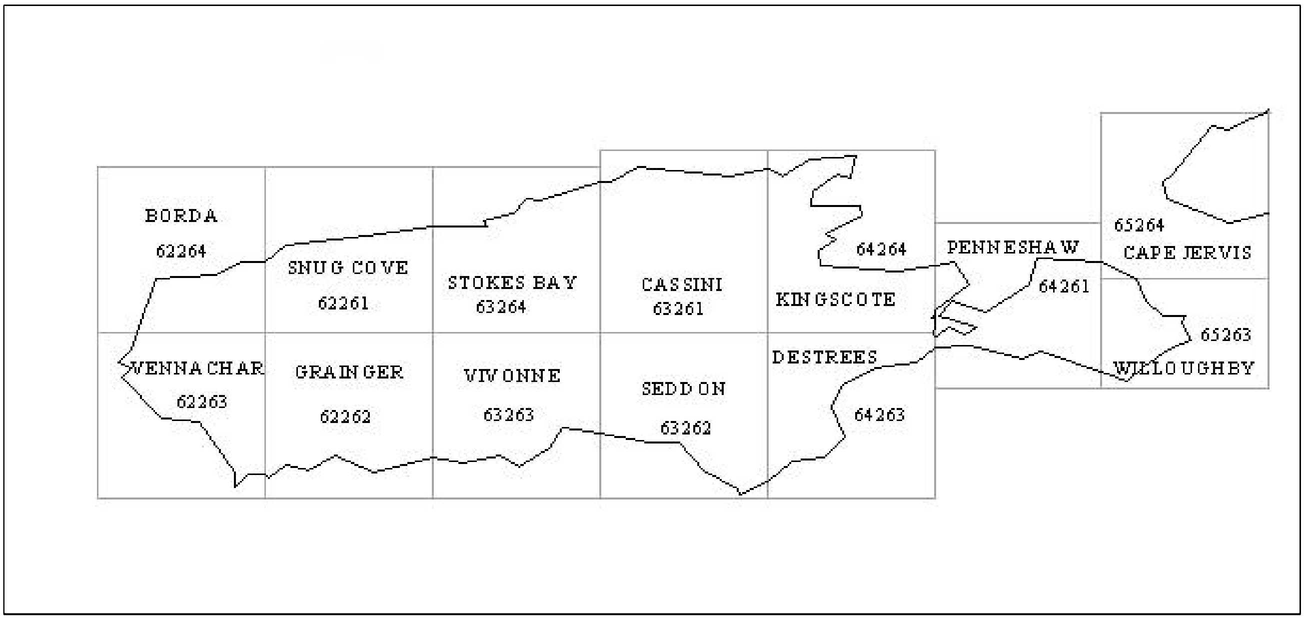


Figure 2..
1:50 000 map coverage of Kangaroo Island.

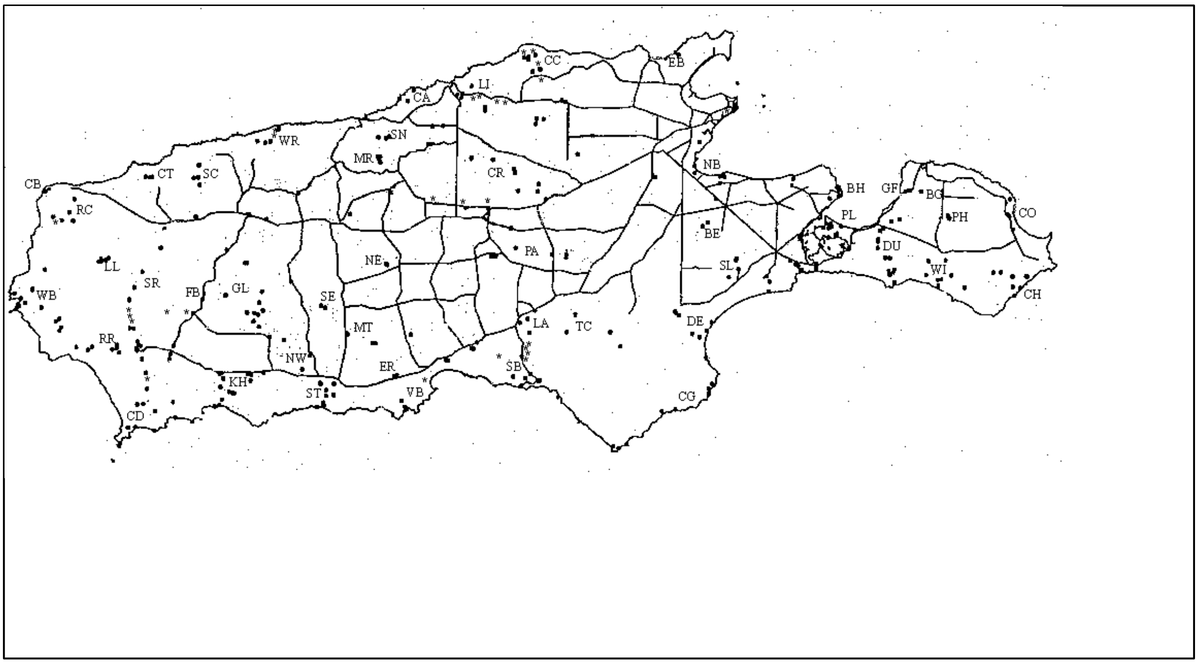


Figure 3.
The study area showing vegetation sampling sites.
WB West Bay, CB Cape Borda, RC Ravine des Casoars, LL Larrikan Lagoon, RR Rocky River, CD Cape du Couedic, SR Shackle Road, CT Cape Torrens, SC Snug Cove, FB Flinders Chase Boundary, KH Kelly Hill, GL Gosse Lands, WR Western River, NW North West River, ST Stunsail Boom, SE South East River, MT Mount Taylor, HR Harriet River, ER Eleanor River, VB Vivonne Bay, NE North East River, MR Middle River, SN Snelling Beach, CA Cape Dutton, LI Lathami, CR Cygnet River, PA Parndana, LA Lake Ada, SB Seal Bay, TC Timber Creek, CG Cape Gantheaume, DE D'Estree Bay, BE Beyeria, SL Salt Lagoon, NB Nepean Bay, EB Emu Bay, FC Flour Cask Bay, PL Pelican Lagoon, BH Ballast Head, DU Dudley, BG, Blue Gum Gully, GF Grassy Flat, WI Wilson River, PH Pigs Head Corner, CO Cape Coutts, CH Cape Hart, * Sooty Dunnart Survey (SD).

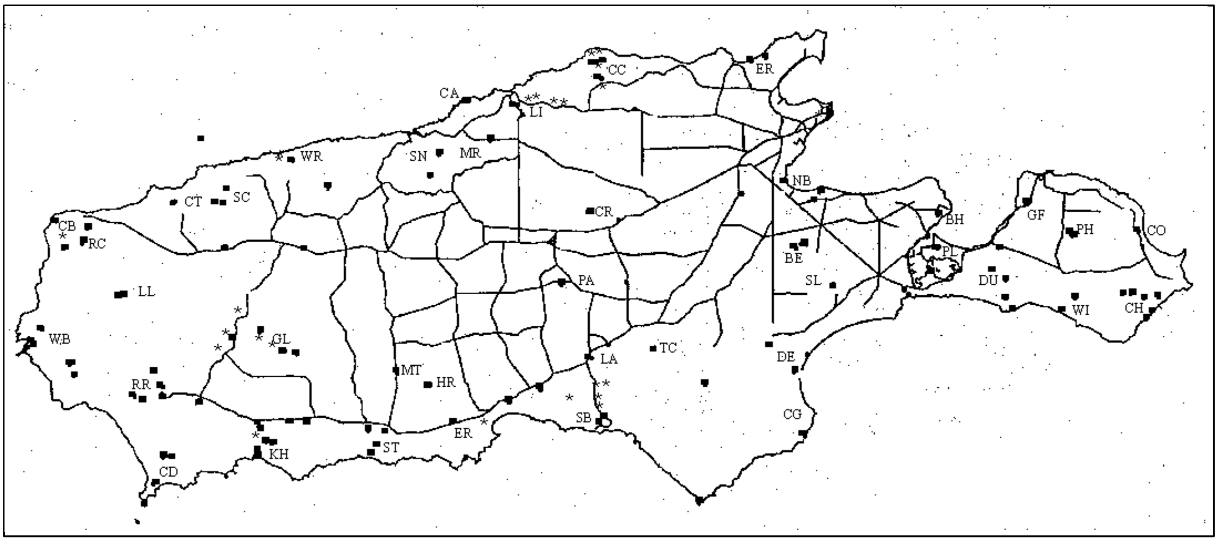


Figure 4..
The Study Area showing vegetation and vertebrate sampling sites.
WB West Bay, CB Cape Borda, RC Ravine des Casoars, LL Larrikan Lagoon, RR Rocky River, CD Cape du Couedic, CT Cape Torrens, SC Snug Cove, FB Flinders Chase Boundary, KH Kelly Hill, GL Gosse Lands, WR Western River, ST Stunsail Boom, MT Mount Taylor, HR Harriet River, ER Eleanor River, VB Vivonne Bay, MR Middle River, SN Snelling Beach, CA Cape Dutton, LI Lathami, CR Cygnet River, PA Parndana, LA Lake Ada, SB Seal Bay, TC Timber Creek, CG Cape Gantheaume, DE D'estree Bay, BE Beyeria, SL Salt Lagoon, NB Nepean Bay, EB Emu Bay, PL Pelican Lagoon, BH Ballast Head, DU Dudley, GF Grassy Flat, WI Wilson River, PH Pigs Head Corner, CO Cape Coutts, CH Cape Hart, * Sooty Dunnart Survey (SD).

Figure 5.

The Study Area showing Laut *et al*. (1977) environmental associations.

3.1.1Gantheaume (825 km ^{2}). Undulating calcarenite plain with overlying dunes: coastal cliffs, lakes and beaches. Mallee scrub with some open patches.
3.1.2 Parndana (2135 km^2). Low laterite hills with shallow lakes and coastal cliffs. Mixed parkland with sown pasture understorey, low open mallee forest and woodland.
3.1.3 Stokes Bay (400 km^2). Dissected margin of a laterite surface. Open eucalypt parkland with soen pasture understorey.
3.1.4 Mt Marsden (60 km^2). Undulating calcarenite and liomestone plain with low coastal cliffs and tidal flats. Open parkland with pasture understorey, large area of coastal mallee scrub.
3.1.5 Amberley (480 km^2). Plains and hills with coastal cliffs. Open parkland with sown pasture understorey, remnants of open shrubland.
3.1.6 Cygnet (95 km^2). Gently undulating alluvial plain. Open parkland with sown pastures and occasional cereal crop understorey, remnants of woodland.
3.1.7 MacGillivray (145 km^2). Gently undulating sandy plain. Open parkland with sown pasture and cereal crop understorey.
3.1.8 Coranda (190 km^2). Undulating to hilly laterite surface with coastal lakes, tidal flats and low cliffs. Parkland with understorey of sown pastures and cereal crops, remnants of open scrub.

Figure 6.
Aerial view of the Southern Coast.
Photo: P. Canty

Figure 7.
The Southern Coast, the mouth of South West River.
Photo: G. Johnston

Figure 8.
Aerial view of the Laterite Plateau.
Photo: P. Canty

Figure 9.
The Laterite Plateau, Sugar gum woodland along the De Molle River, Cape Torrens Conservation Park.
Photo: A. Robinson

Figure 10.
Aerial view of the North Coast.
Photo: P. Canty

Figure 11.
The North Coast, sheoak woodland and cleared land, Stokes Bay
Photo: D. Armstrong

Figure 12.
Aerial view of Estuarine Environments.
Photo: P. Canty

Figure 13.
Estuarine environments, fringing saltmarsh Pelican Lagoon.
Photo: A. Robinson

Figure 14.
Aerial view of Lagoons.
Photo: P. Canty

Figure 15.
Lagoon environment at Murray lagoon, Cape Gantheaume Conservation Park.
Photo: A. Robinson

Figure 16.
Aerial view of northern Dudley Peninsula.
Photo: P. Canty

Figure 17.
Northern Dudley Peninsula, remnant vegetation in farmland.
Photo: A. Robinson

The rationale behind these regional biological surveys has been explained in detail by McKenzie and Robinson (1987) for combined vegetation and vertebrate surveys in the semi-arid and arid zones and by Robinson and Canty (1984) for the offshore islands surveys. The Kangaroo Island biological survey was the first of the series to be conducted in the agricultural districts of South Australia where the natural vegetation and its associated vertebrate fauna has been fragmented by clearance and substantial habitat modification for agriculture. This necessitated a number of alterations to the methods adopted in the extensive areas of natural vegetation covered by previous regional surveys.

In spite of these largely logistic and sampling intensity differences the basic site data collected was directly comparable with previous broad-scale surveys and the overall aims of the survey were the same. The biological survey of Kangaroo Island was designed with the following aims;

1. To observe, collect and identify the species of plants and vertebrates present in the study area in 1989-1990.

2. To document the patterns of species and communities across the study area and their relationship with parameters of the physical environment.

3. To select and sample an array of fixed quadrats representing the biological diversity of Kangaroo Island and provide a data base amenable to analyses involving direct ecological comparisons between assemblages (quadrats). The data base format is to be capable of expansion with subsequent sessions of sampling to provide a measure of seasonal effects, less predictable disturbances such as fire, or ongoing ecological processes - a data base appropriate for future monitoring programmes.

4. To evaluate the conservation status of species and communities typical of Kangaroo Island as a basis for recommending, where appropriate, amendments to the existing South Australian conservation reserve system.

5. To provide the State Herbarium and South Australian Museum with collections representative of the diversity of plants and vertebrates in the study area circa 1989-1990 and to provide material for taxonomic and other scientific studies relevant to wildlife protection.

6. To consolidate, in the form of an extensive bibliography, previous biological information on the Kangaroo Island study area within a single report.

7. To detail the biological significance (biogeographic affinities) of the study area in relation to the surrounding natural districts.

The theme of this study is to define 'what lived where on Kangaroo Island in 1989-1990.

Since the original surveys in 1989, 90 there has been quite a large amount of ecological study carried out on Kangaroo Island and this report therefore also draws on some data collected since the field survey.

In particular, there has been work to refine the original vegetation survey and develop a vegetation map for the island (Ball, 1994) and this is incorporated into the vegetation chapter.

In addition, a search for the Sooty Dunnart (Herbert, 1996) resulted in the sampling of an additional 29 quadrats using standard Biological Survey of South Australia techniques and data from these has also been included in this report.

PREVIOUS BIOLOGICAL STUDIES

Islands are always attractive places on which to conduct biological studies. They have a self-contained ecosystem isolated from outside influences by the sea. Evolution and natural selection on islands tends to reduce the total number of species per unit area when compared with equivalent areas on the mainland. Often this results in the development of particular island adapted forms, sometimes to the species level, depending on the length of isolation of the island. There is often less predation pressure on island animal populations and this results in animals which are more approachable by humans. Finally, because of the reduction in species diversity, the smaller number of species often occur at much higher population densities and they are often found in a wider range of habitats than their mainland equivalents. All these factors together with the large area of natural vegetation remaining (by South Australian standards) have made Kangaroo Island the site of a wide range of biological studies since the earliest development of science in the State.

The first published descriptions of the flora and vegetation of Kangaroo Island were those of Tepper (1884, 1887 and 1888) and of Tate (1883, 1884 and 1889). Wood (1930) developed this study further in his important work comparing the vegetation of Kangaroo Island with that of the adjacent peninsulas and this early ecological work contributed to his important book on the vegetation of South Australia (Wood 1937). The next significant vegetation studies were those of Baldwin and Crocker (1941), Cleland

and Black (1927, 1941, 1952), Cleland (1970) and Cleland and Sims (1970). At the time of these early vegetation studies, work was proceeding on the collection and description of the fauna of the island.

There are no early published accounts of the islands mammals apart from brief mentions in the journals of explorers Flinders and Baudin. Significant new discoveries of the Little Pigmy Possum (Aitken, 1970, 1974) and the Sooty Dunnart (Aitken, 1972) are the only published works on the composition of the mammal fauna.

Early published accounts of birds include work on the extinct Kangaroo Island Emu, (Howchin, 1926), while Cleland, (1906, 1925a,b, 1930, 1942a, b, 1948) and Sutton (1923, 1926a, 1926b) began the accumulation of bird species lists for the island. Long-term island resident Allan Lashmar has made an outstanding contribution to our knowledge of the island's birds (Lashmar 1935, 1936, 1937a,b, 1938, 139a,b, 1942, 1946a,b, 1972a,b,c, 1978, 1984, 1987, 1988, 1989)

The reptile and amphibian fauna was first described by Waite (1927) with additions by Condon (1941).

The publication by the Royal Society of South Australia of "The Natural History of Kangaroo Island" (Tyler, Twidale and Ling 1974) put together in a convenient volume all the biological knowledge to that date on Kangaroo Island with contributions on : Vegetation: (Lange 1979), Mammals; (Inns, Aitken and Ling 1979), Birds; (Ford 1979) and Reptiles and Amphibians; (Houston and Tyler, 1979).

Although the Fauna and Flora Board had from its very earliest days encouraged biological research on Kangaroo Island, particularly on Flinders Chase, a significant increase in research occurred with the establishment at Rocky River in 1966 of the University of Adelaide Zoology Department Field Station. This facility, together with the opening in 19? of the Pelican Lagoon Research Station, have provided convenient bases to carry out modern scientific studies. An extremely wide variety of research has been carried out and all the projects conducted since 1982 under the computerised Scientific Permit system administered by the South Australian National Parks and Wildlife Service are detailed in Appendix VI. More detailed summaries of these projects can be found in Robinson and Canty, (1985), Canty (1987, 1988, 1989a,b, 1991, 1994, 1998). Many of these projects are still in progress but some projects from which published results are available include:

Plant Studies: Maiden, 1908; Berry, 1922; Ising, 1923,a,b, 1933; Ising and Ham, 1923; Cleland and Black 1927, 1941; Cleland 1958, 1968, 1970; Kraehenbuehl 1957; Specht and Cleland 1961, 1963, Cleland and Sims, 1970; Kenny, 1970; Hall and Brooker, 1970a,b,c; Brittan, 1971, Specht, 1972; Jackson, 1971a,b, 1972, 1974, 1976, 1981a,b; Osterstock, 1974,; Specht, Roe and Boughton, 1974; Bates, 1976, 1977, 1981; Heddle, 1976; Nelson, 1978; Boomsma and Lewis, 1980; Davies, 1982, 1983, 1985a,b; Mowling and Barritt, 1981; Overton, McKelvey and Overton, 1988; Overton, McKelvey and Schawner, 1988; Overton and Overton 1989; Overton, McKelvey and Overton, 1989; Overton, Overton and McKelvey, 1989.

Mammal Studies: On Echidnas, many studies have involved physiological as well as field ecological studies due to the high density echidna population on Kangaroo Island allowing small numbers to be taken from the wild for experimental work; Griffiths, McKintosh and Coles, 1969; Griffiths, 1968a,b; Elliott, Leckie and Schoefl, 1973; Baird, Hales and Lang, 1974; Augee, Ealey and Price, 1975; Augee, 1976, 1978, 1983, Djakiew and Jones, 1981, 1982a,b, 1983; Griffiths, Green, Leckie, Messer and Newgrain, 1984; Green, Griffiths and Newgrain, 1985; McKelvey, 1987; Griffiths, Kristo, Green, Fogarty and Newgrain, 1988. On Tammar Wallabies, including many physiological studies conducted on captive animals which were originally captured in Kangaroo Island; Andrewartha and Barker, 1969; Lintern, 1970; Murphy and Smith, 1970; Murphy, 1971; Renfree and Tyndale-Biscoe, 1973, 1977; Renfree, 1976, 1977a,b, 1979, 1980, 1983; Renfree and Heap, 1977; Smales and Mawson, 1978a,b; Renfree and Young, 1979a,b; Renfree, Green and Young, 1979; Young and Renfree, 1979; Inns, 1980; Heap, Renfree and Burton, 1980; Flint and Renfree, 1982; Findlay, Ward and Renfree, 1983; Randall, Gannon, Runciman and Baudinette, 1984; Short, Flint and Renfree, 1985; Shaw and Renfree, 1986; Baudinette, Gannon, Runciman and Wells, 1987; Baudinette, Runciman, Frappell and Gannon, 1988. On the Koala; Gosse, 1939; Philpott, 1965; Eberhard, 1972; Robinson, 1978; Brown and Carrick, 1981; Martin, Handasyde and Lee, 1987; Robinson, Spark and Halstead, 1989. On Australian Sea-lions; Stirling, 1971; Ling and Walker 1976, 1977, 1978, 1979; Ling, 1981a,b; Day, Footner, Morrison and Ryan, 1979; Schutz, 1985; Best, 1986; Robinson and Dennis, 1988; Bacon, 1989; Higgins, 1990; Reddacliff and Lim, 1990. On New Zealand Fur-seals; Goldsworthy, 1989, 1990, 1991; Shaughnessy, 1989;

Bird Studies: On Little Penguins, Baudinette and Gill, 1985; Baudinette, Gill and O'Driscoll, 1986. On Hooded Plovers, Buick, 1985; Buick and Paton, 1989; Bransbury, 1983, 1988, 1990, 1991. On Albatrosses, Lashmar, 1984, 1990. On Glossy Black Cockatoos, S.A.O.A., 1979; Joseph, 1981c, 1982a,b. On Honeyeater ecology, Ford, 1976; Ford and Paton, 1976, 1986; Paton and Ford, 1977; Paton, 1986.

CLIMATE

by A C Robinson[1]

The climate of Kangaroo Island is discussed in detail in Burrows (1979) - He noted that: "The moderating influence of the surrounding ocean, together with the small size and low elevation of the island means that Kangaroo Island has a more equable climate than most other parts of South Australia". It has a winter rainfall maximum and there is a significant east-west rainfall gradient ranging from 500 to 900 mm (Figs. 20, 21). A rainfall map following Burrows (1979) is shown in Fig. 19. Rainfall has been recorded at the lighthouse at Cape Borda since 1868 and is shown in Fig. 18. It can be seen at the western end of the island the rainfall fluctuates comparatively little around the mean of 631 mm.

. There have however been periods of drought on the island and Burrows (1979) using a system where annual rainfall totals were below the 10 percentile value for the total rainfall record has suffered that drought occurred over much of Kangaroo Island in 1869, 1876, 1888, 1891, 1897, 1902, 1914, 1936, 1959, 1961 and 1967

Figure 22 shows the rainfall at Kingscote prior to the 1989 vegetation survey and the 1990 vertebrate survey discussed in this report and it can be seen that in both 1989 and 1990 winter rainfall preceding the surveys was slightly above average in 1989 and about average in 1990.

Maximum and minimum temperatures recorded during the vertebrate survey in 1990 are shown in Appendix II

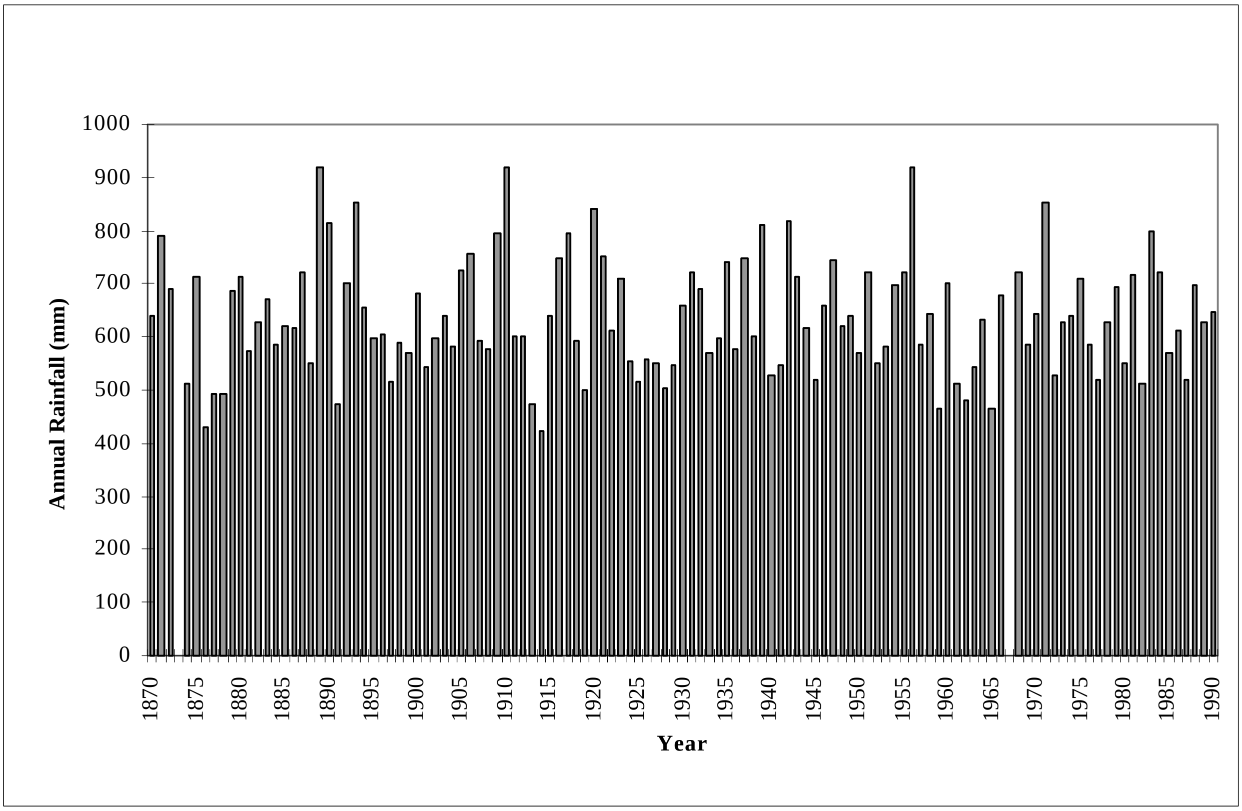


Figure 18.
Annual rainfall at Cape Borda 1868 – 1990.

[1] A. C. Robinson, SA Department for Environment Heritage and Aboriginal Affairs, PO Box 1047, ADELAIDE, SA 5001

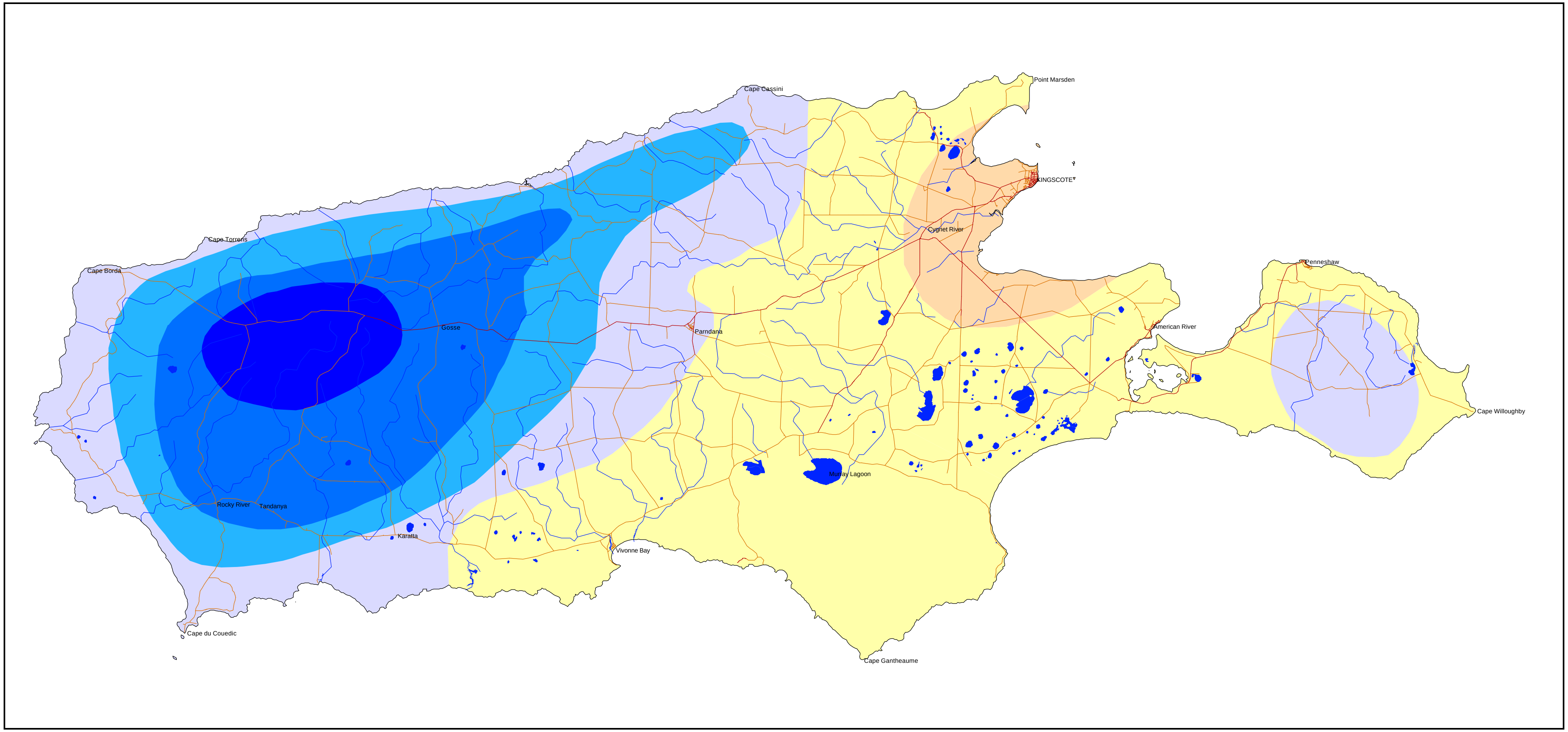
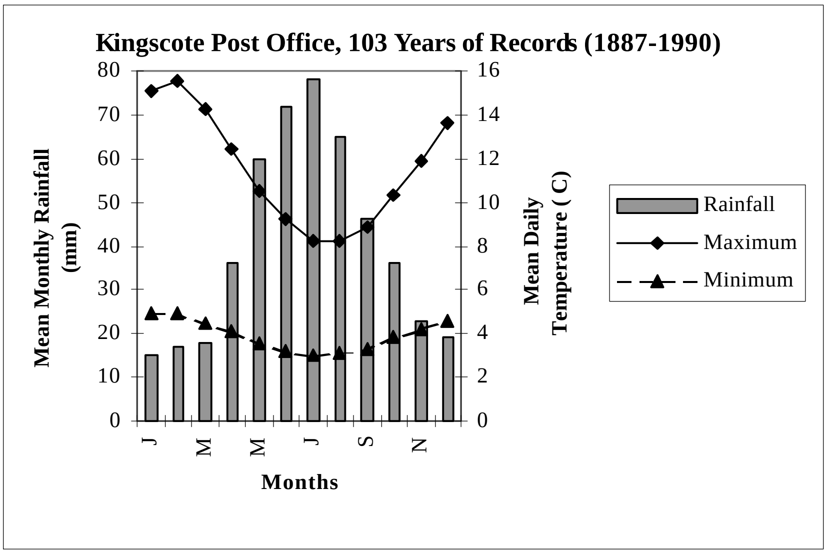
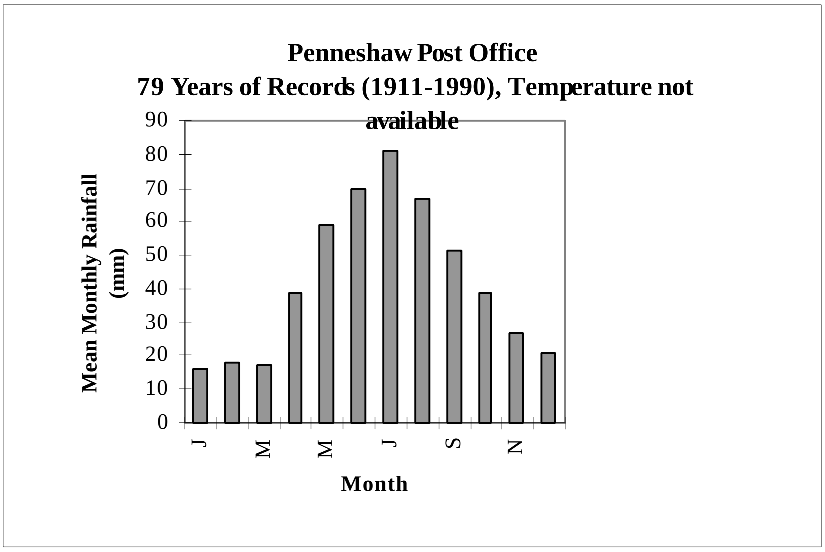


Figure 19.
Isohyets of mean annual rainfall in mm (after Burrows, 1979) Shading from light to dark indicates rainfall from <600 to >900 mm.





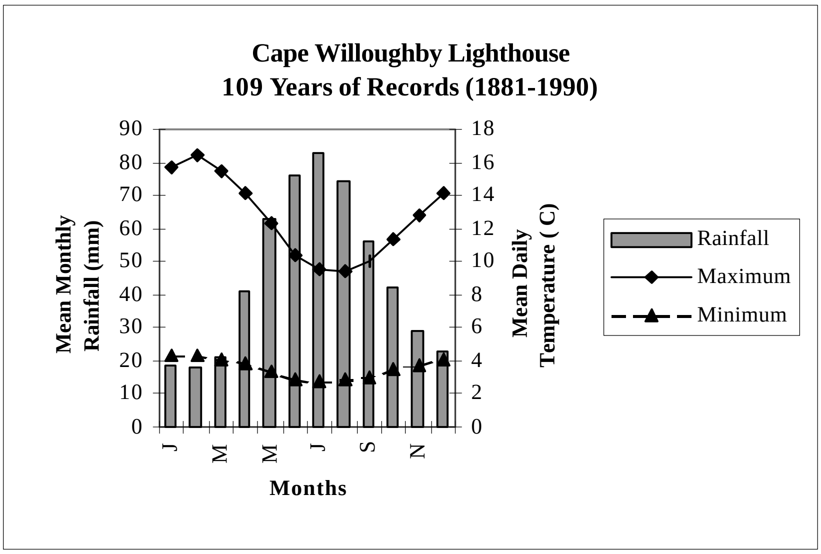
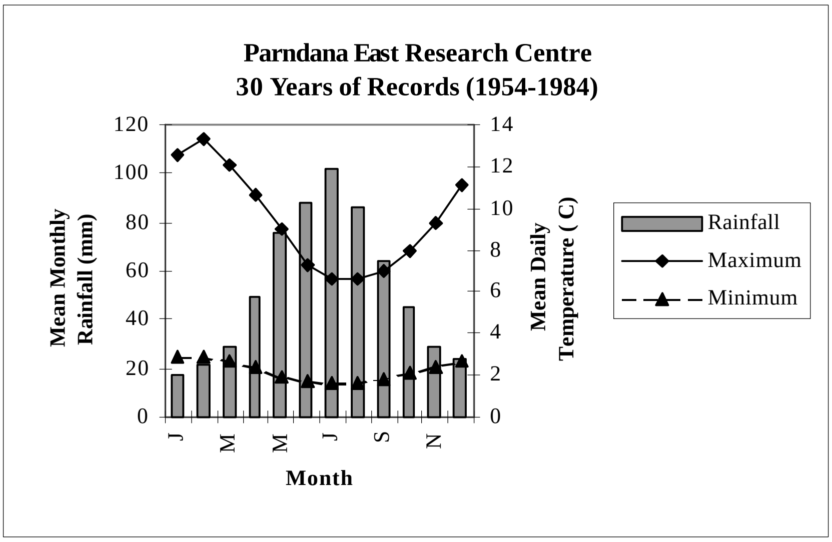
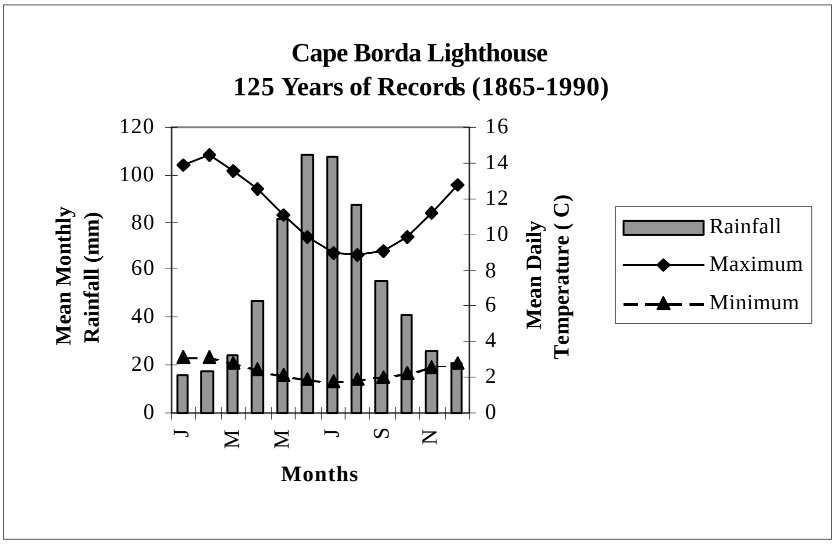


Figure 20.
Variation in mean rainfall and temperature across the Kangaroo Island study area.





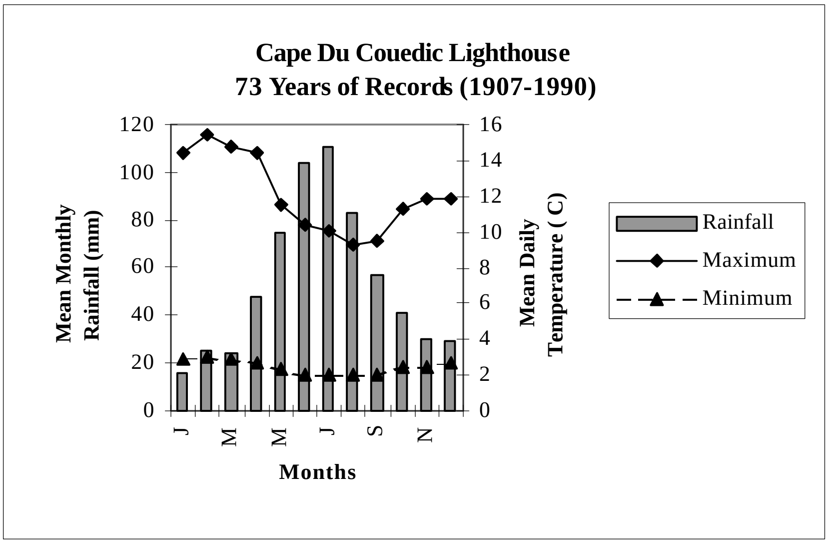


Figure 21.
Variation in mean rainfall and temperature across the Kangaroo Island study area.

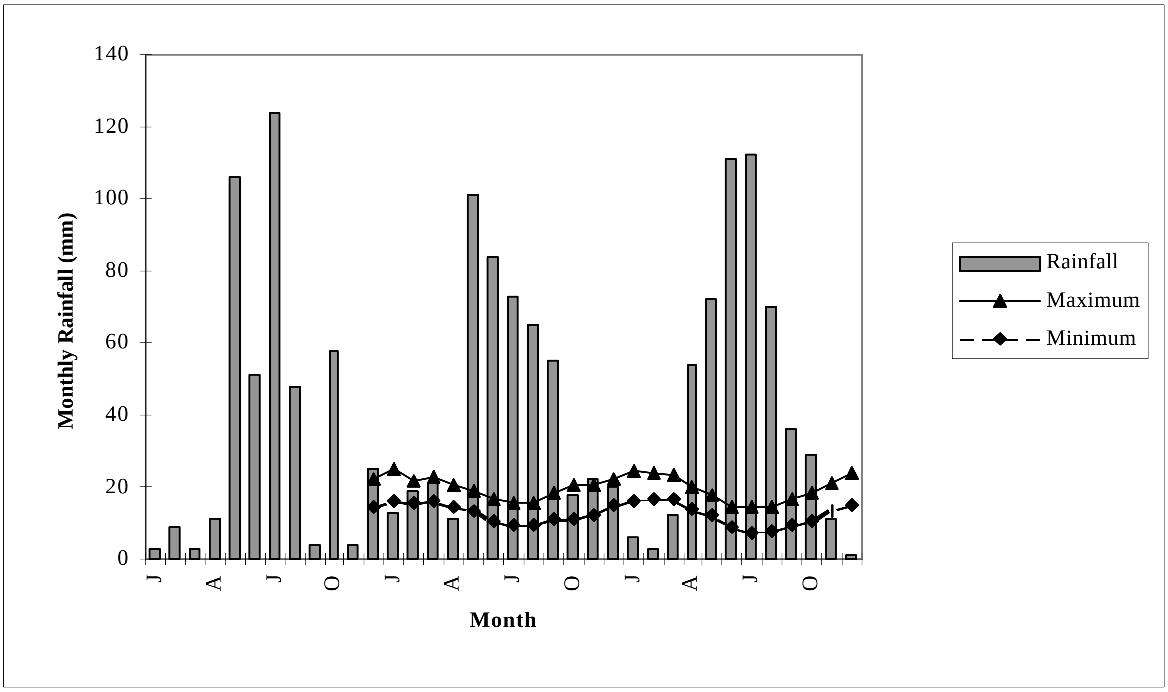


Figure 22.
Rainfall at Kingscote 1988 – 1990.

GEOMORPHOLOGY AND GEOLOGY

by A.P. Belperio[2] and R.B. Flint[2]

INTRODUCTION

Kangaroo Island comprises a diverse association of both rocks and landforms that reflect a long and varied geological history. The geological record on the Island, though fragmented and incomplete, spans the time interval from early Proterozoic to the present.

Systematic geological investigations of the Island were undertaken by H.Y.L. Brown in 1898 and R.C. Sprigg in 1954, with the present phase of re-mapping currently (1991), being undertaken by the authors. Daily *et al*. (1979) compiled the first comprehensive account of the Island's geology, while numerous other investigators have concentrated on particular aspects of the diverse geology. Some of the more important contributions have been those of Connard (1967), Daily and Milnes (1971, 1972), Daily *et al*. (1980), Flint (1978), Flint and Grady (1979) and Milnes *et al*. (1982, 1983).

Only limited resource exploration has been undertaken, largely as a result of the Island's isolation, and consequently little subsurface data are available. In addition, much of the outcrop on the island is veneered by soils, palaeosols and Quaternary sediments, with useful exposures of older rocks generally restricted to the coastal cliffs.

The generalised tectonic and geological maps (Figs 23 and 24) indicate that the framework of the island is based on Cambrian rocks now deformed into an arcuate belt that is a contiguous extension of Fleurieu Peninsula. The stratigraphic column (Fig. 25), indicates a number of subsequent episodes of continental and marine sedimentation separated by periods of subaerial exposure and erosion. The geological strata, their nature, distribution and evolution, are all collectively important in influencing the broad geomorphology and landforms of the Island.

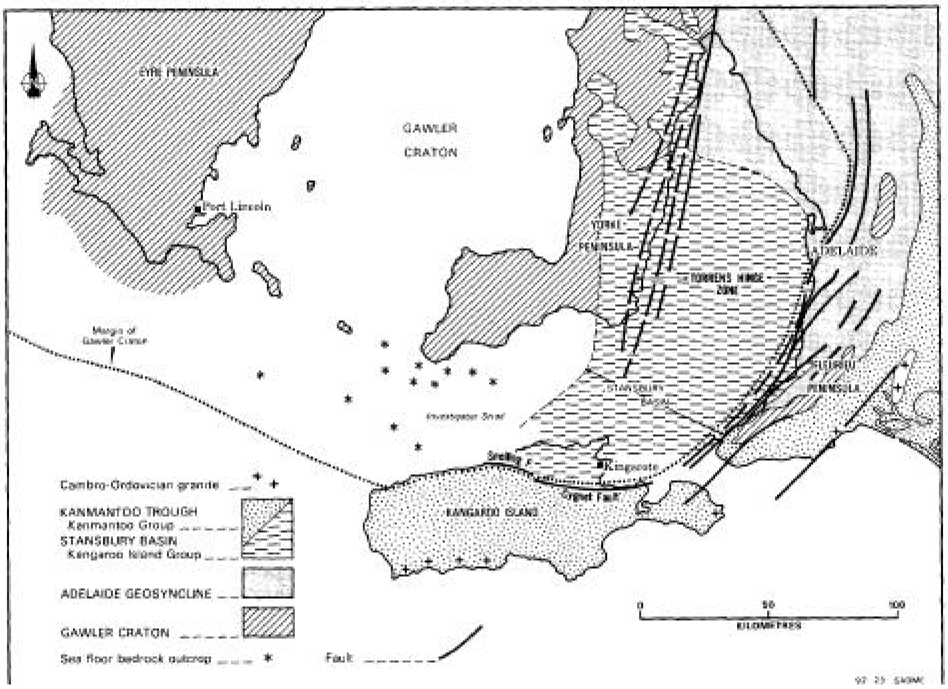


Figure 23.
Tectonic framework of Kangaroo Island.

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GEOLOGICAL HISTORY

Early Precambrian

One of the major Precambrian tectonic provinces in South Australia is the Gawler Craton, and exposures of crystalline basement include occurrences on southern Yorke Peninsula and various islands and knolls on the sea floor within Investigator Strait. Rock types are predominantly orthogneisses, including deformed megacrystic granite, charnockite, granodiorite, leucogranite and aplite forming part of the Donington Granitoid Suite of the Lincoln Complex (Rankin *et al*., 1991). The emplacement age for these intrusive granitoid bodies is 1 843$\pm$2 Ma (Mortimer et al., 1986).

No exposures of Lincoln Complex crystalline basement occur on Kangaroo Island, though its existence at depths of 200 to 2000 m beneath the north coast has been interpreted from magnetic and gravity data (Van der Stelt *et al.*, 1992; Belperio and Flint, 1992). Though concealed now, the Gawler Craton had a major influence on late Precambrian to Cambrian sedimentation and orogenesis.

Late Precambrian

The oldest exposed units on Kangaroo Island are late Precambrian strata of the Adelaide Geosyncline. Exposed only in the core of a regional anticline on Dudley Peninsula, their distribution elsewhere on the island is not known due to concealment by younger sediments.

Strata include equivalents of the Sturt Tillite, Tapley Hill Formation, Brighton Limestone and Marino Group, but they represent only a thin sequence in comparison to the thicker and more complete record elsewhere in the Adelaide Geosyncline.

Cambrian

During the early Cambrian, marine sediments were deposited over all of Kangaroo Island (Daily *et al*., 1979). The Cygnet-Snelling fault zone, which delineates the tectonic margin to the Gawler Craton, was a major influence in controlling sedimentary facies (Fig. 25). To the north, basement of the Gawler Craton was exposed and being eroded. River systems and deltas fed clastic detritus into a shallow marine shelf (Stansbury Basin) resulting in conglomerates, sandstones, shales and minor limestones of the Kangaroo Island Group. South of the Cygnet-Snelling fault zone, water depths were generally greater and turbidites and sandstones of the Kanmantoo Group were deposited in outer continental shelf, continental slope and ocean basin environments.

The Kangaroo Island Group has a maximum thickness of c 2 500m and consists, in ascending order, of the Mount McDonnell Formation, Stokes Bay Sandstone, Smith Bay Shale, White Point Conglomerate, Emu Bay Shale and Boxing Bay Formation. Clastic sediments predominate and include feldspathic and micaceous sandstones, poorly sorted conglomerates and micaceous shale and siltstones, whereas limestone horizons are thin and rare. Fossils are common, though, including trilobites, worm burrows and Archaeocyatha. Bedding structures are well preserved, with cross bedding, plane bedding and ripple bedding indicative of major east-west currents during deposition.

The Kanmantoo Group consists of 8 units - Carrickalinga Head Formation, Talisker Calcsiltstone, Tapanappa Formation, Tunkalilla Formation, Balquidder Formation, Petrel Cove Formation and Middleton Sandstone (in ascending stratigraphic sequence). The total thickness is unknown, but is considerably more than the 2500m for equivalent units north of the Cygnet-Snelling fault zone. The sequence is characterised by rapidly deposited, poorly sorted sandstones, often with interbedded siltstones and mudstones. Pebbly horizons and fossils are rare. The sandstones are massive to well bedded, and along with channel and fill structures, flame structures, cross bedding and abundant convoluted bedding, indicate strong palaeocurrents to the east.

Cambrian - Ordovician

Sedimentation within the Stansbury Basin and Kanmantoo Trough ceased in the late Cambrian to early Ordovician with the onset of major deformation during the Delamerian Orogeny. Several episodes of compression and metamorphism (Fig. 27), and intrusion of granite magmas complexly folded and deformed the sedimentary sequences. The sediments have been variably deformed with the Cygnet-Snelling fault zone again defining the transitional boundary. To the north, orogenesis was relatively weak with broad and open folds, very low greenschist facies metamorphism and good preservation of sedimentary structures and fossils. To the south, deformation was more intense producing complex fold patterns, the metamorphic grade was higher reaching mid-amphibolite facies, and metamorphism was associated with development of migmatites and granite intrusions. The Cygnet-Snelling fault zone displays evidence of ductile and brittle deformation, containing both mylonites and fault breccias. The basic geological framework or foundation of Kangaroo Island was established during the Delamerian Orogeny. Subsequent marine transgressions, continental sedimentation, weathering and volcanism have resulted in thin veneers on the deformed, Cambrian and Precambrian sequences. These younger events have been very important in determining landscape development

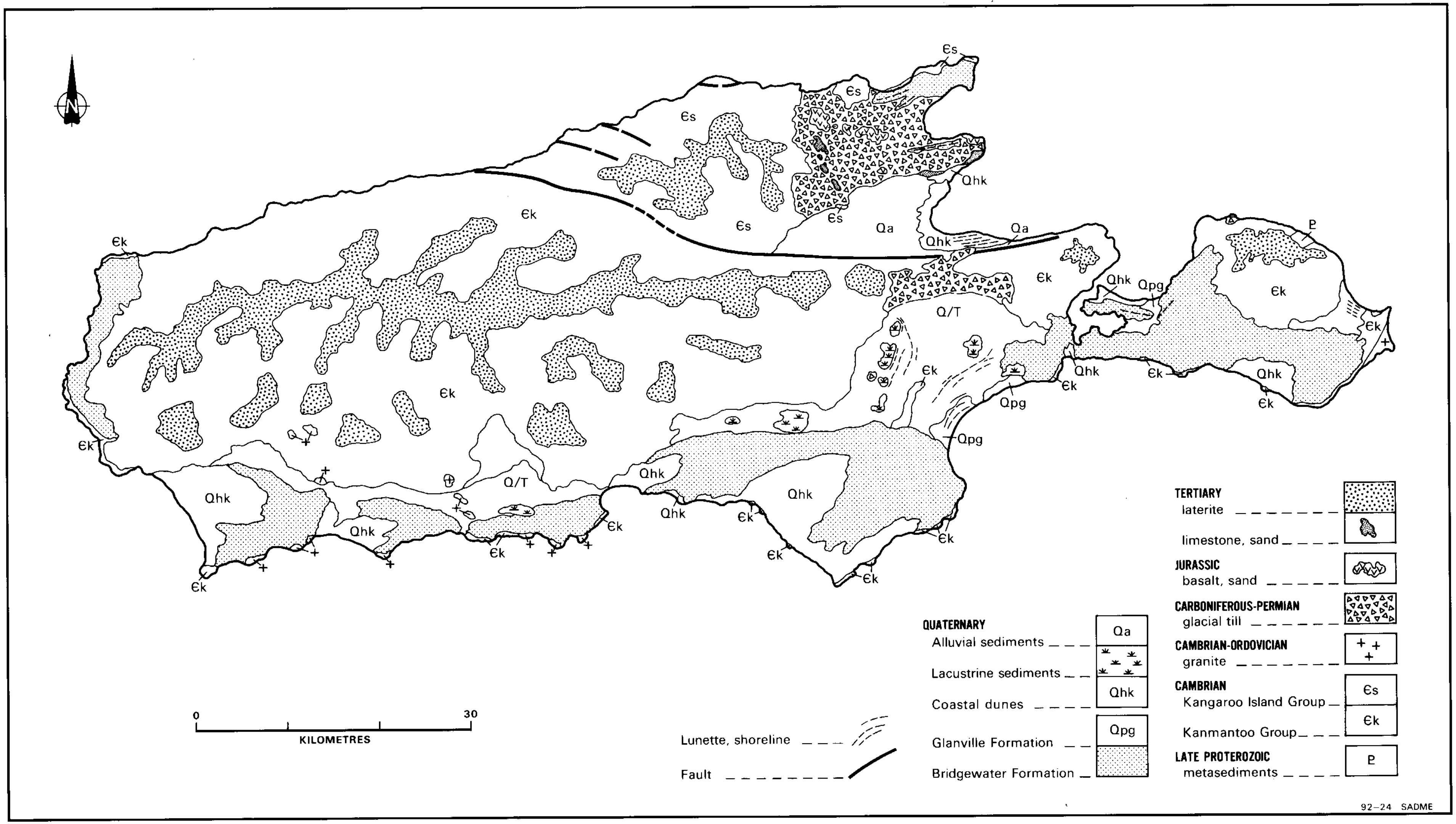

Figure 24.
Generalised geological map of Kangaroo Island.

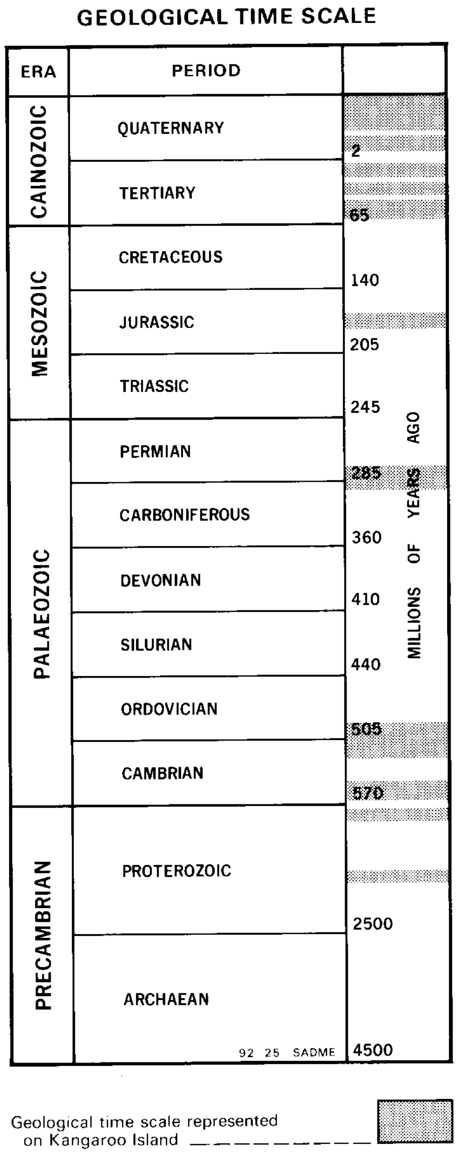

Figure 25.
Stratigraphic column and the geological record for Kangaroo Island.

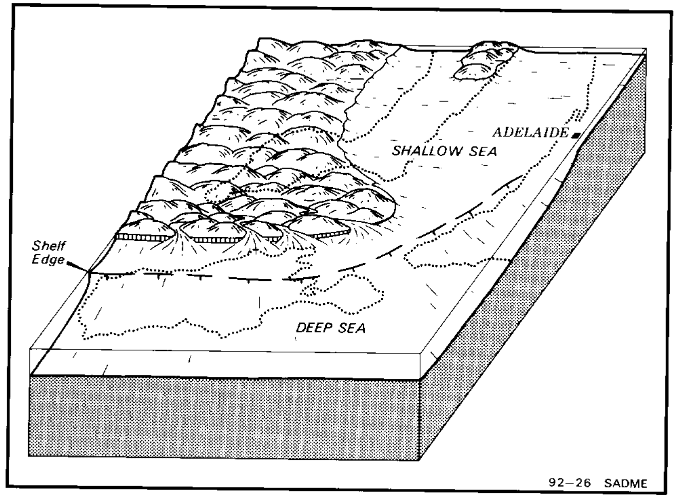

Figure 26.
Palaeogeography of the Kangaroo Island region during the early Cambrian.

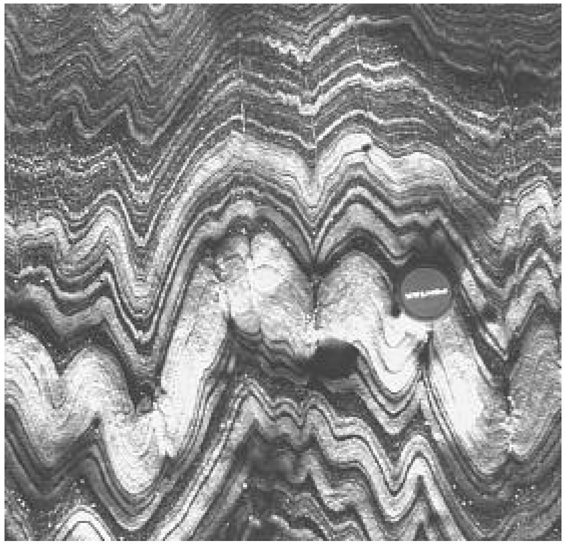

Figure 27.
Intense deformation within Kanmantoo Group metapelites and metasandstones at Harveys Return. **Photo P.I.R.S.A.**

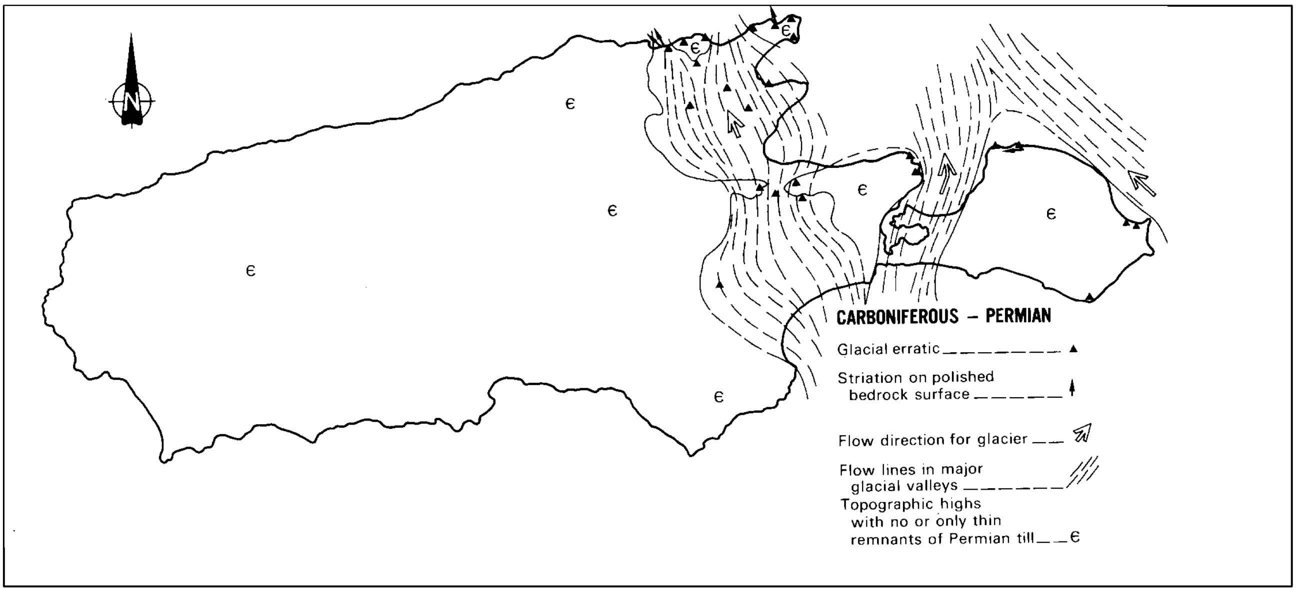

Figure 28.
Permian palaeogeography, Kangaroo Island.

Figure 29.
Residual granite erratics weathered out of Permian glacigene sediments, Christmas Cove, Penneshaw.
Photo: P.I.R.S.A.

Carboniferous -Permian

Following the Delamerian Orogeny was a period of tectonic quiescence and erosion which lasted until the late Carboniferous to early Permian. At this time, Australia was still part of Gondwanaland and had drifted to within 12^{o} of the south rotational pole resulting in widespread glaciation. Glaciers carved deep valleys into the bedrock, principally in Backstairs Passage and the Pelican Lagoon area where a buried glacial valley is interpreted to be more than 500 m deep. Polished and striated bedrock surfaces indicate a northwestward flow direction for the glaciers. Huge boulders and abundant till were dumped not only within the glacial valleys but also across the glaciated land surface (Fig.. 28). Sediments deposited were greenish clay, sandy clay, boulder clay and diamictite. Erratic boulders (Fig. 29), up to 3 m in length, are mostly granite, porphyry and sandstone. These glacial sediments are uncompacted and easily eroded.

Jurassic

Sedimentation again occurred on Kangaroo Island during the middle Jurassic. Erosion of a former highland in the Smith Bay area formed a prominent river valley draining east-southeasterly through Kingscote and Nepean Bay (Fig. 30). Sediments deposited include coarse gravelly sand and micaceous siltstone. Sedimentation was associated with intense kaolinitic weathering of the landscape.

The Jurassic for Kangaroo Island is also characterised by extrusion of tholeiitic basalts with a distinctive geochemical signature. Basalts infilled the river valley near Kingscote (Fig. 31), and also occur as an isolated remnant on Dudley Peninsula. The basalt sheet is relatively thin, up to12 m thick, and exhibits excellent hexagonal columnar jointing. Volcanism occurred in response to major tectonism and rifting associated with initial breakup of Gondwanaland (Milnes et al., 1982). Complete separation of Australia and Antarctica did not occur until the early Tertiary.

Tertiary

The separation of Australia and Antarctica permitted access for open marine environments to southern South Australia. A major marine embayment (St Vincent Basin) developed in the Adelaide - St Vincent Gulf area with connections to the Southern Ocean via Investigator Strait, Backstairs Passage and through the Nepean Bay - Pennington Bay area (Fig. 32). Throughout much of the Tertiary, Dudley Peninsula and western Kangaroo Island were separate islands. Onlapping the highland areas at different elevations are various occurrences of fossiliferous limestones indicating episodic marine transgressions palaeontologically dated at late Eocene - late Oligocene, Miocene, early Pliocene and late Pliocene (Milnes *et al*., 1983; Lindsay, 1983).Within the oldest sequence of late Eocene - late Oligocene strata, three discrete marine pulses are evident. Lithologically distinguishable units are lowermost echinoid-rich limestone and molluscan conglomerate progressively overlain by bioclastic limestone and a well-bedded to flaggy bioclastic limestone. Collectively defining the Kingscote Limestone, the sediments are <5 m thick (in exposures) and occur just above present day sea level. Flint, of late Oligocene age, is washed up as pebbles on various beaches but is not known from any exposure.

Limestone and calcarenites containing Miocene microfauna occur widely at high topographic levels, including up to 120 m above present-day sea level. Preservation of fossils is poor. It is not known whether the sediments truly reflect another major marine transgression or reworking by aeolian processes into younger calcarenite, or a combination of both events.

Both early and late Pliocene fossiliferous limestones are widely distributed over eastern Kangaroo Island. Occurring up to 30 m above present-day sea level, the white sandy limestones to brown micritic limestones host a molluscan-rich fauna. Immediately inland of these marine sediments are thick veneers of clayey sand and sand which probably indicate considerable reworking of detritus derived from unconsolidated Carboniferous -Permian glacial till.

The nature and distribution of Tertiary terrestrial sediments are poorly known, and considerable controversy has surrounded the interpreted age for the laterite which is so widespread and prominent. The laterite is a deep weathering profile consisting of sand underlain by a zone enriched in nodular iron and aluminium oxides which in turn overlies mottled and pallid sandy clays with dispersed aggregates of iron oxides. A probably Triassic - early Jurassic age was interpreted by Daily *et al*. (1979). However the complete absence of detrital casts of laterite within early Tertiary, marginal marine conglomeratic sediments and development of intense ferruginisation within sands intimately associated with Pliocene sediments infer a late Tertiary (Pliocene) age for the laterisation and peneplanation.

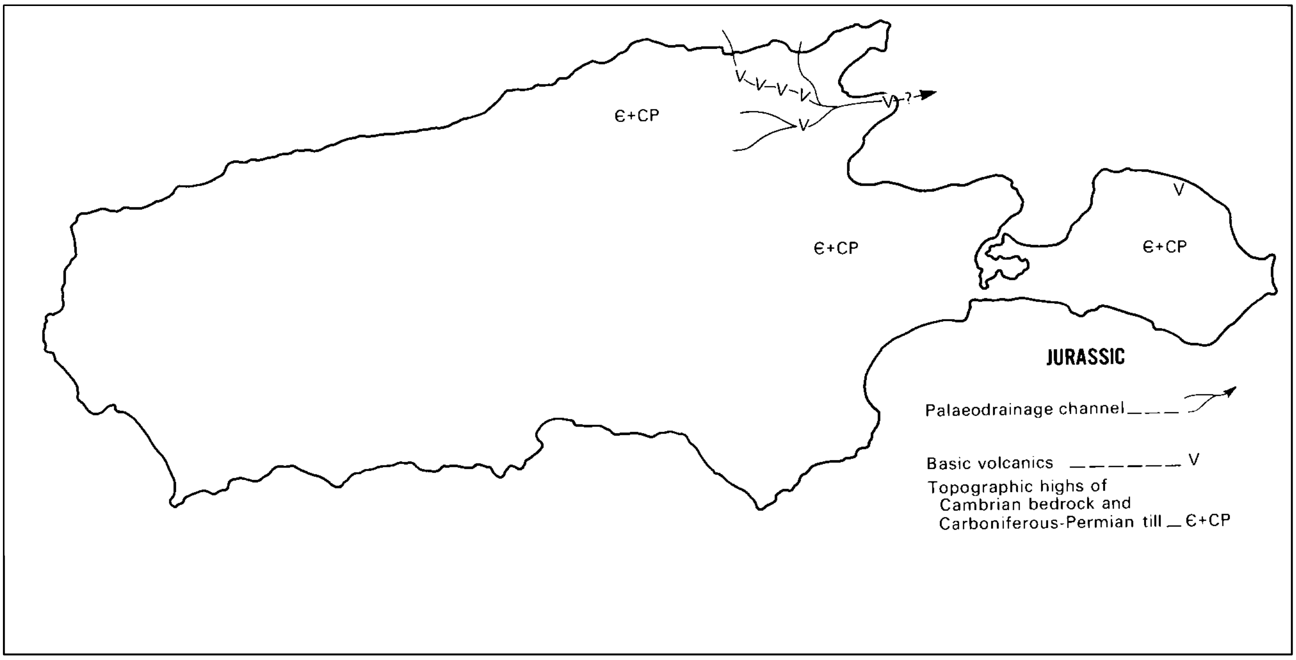

Figure 30.
Jurassic palaeogrography, Kangaroo Island.

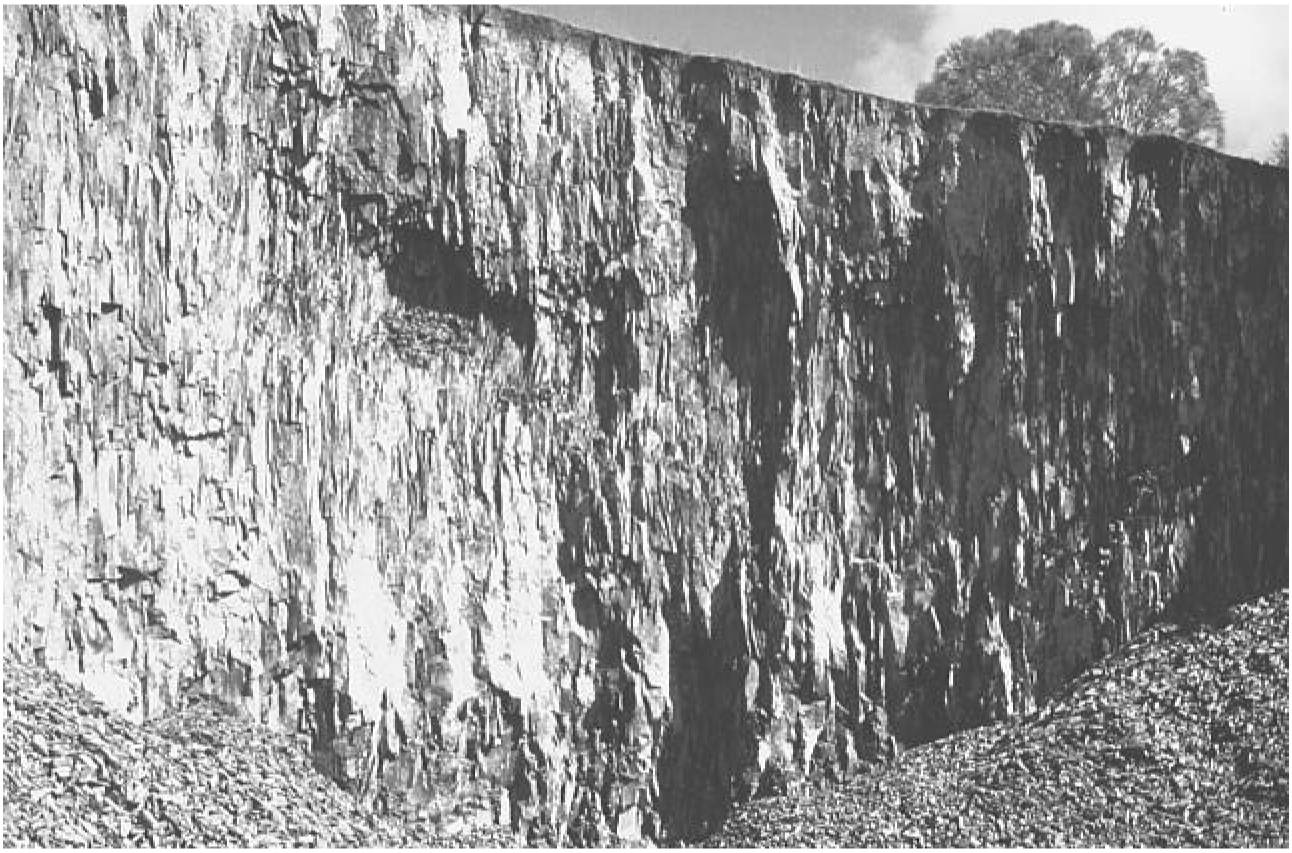

Figure 31.
Columnar jointing in Jurassic basalt, Kingscote.
Photo: P.I.R.S.A

Quaternary

The Quaternary is characterised by generally increasing aridity coupled with global climatic oscillations that resulted in repeated transgressions and regressions of the oceans around Kangaroo Island. Denudation characterised much of the upland area of the island, but localised lacustrine sedimentation with lunette development occurred in the lowlands of Nepean and D'Estrees Bays. Only minor fluviatile sedimentation occurred, primarily in the Cygnet embayment, although swamp deposits containing *Diprotodon* and *Protemnodon* remains are also known from Rocky River.

During episodes of high sea level, Kangaroo Island was intermittently separated from the mainland. Two of the high stands exceeded present sea level and their fossiliferous sediments (Point Ellen Formation, Glanville Formation) are found around the present coastal margins. Each of the Quaternary high stands was accompanied by large coastal sand dunes (aeolianite of the Bridgewater Formation), that migrated well inland and blanketed much of the western and southern parts of the island. Dudley Peninsula was joined to the main part of Kangaroo Island in the late Pleistocene when transgressive dune sands infilled much of the Pelican Lagoon area. The aeolianites are composed of comminuted calcareous bioclasts and are generally interbedded with, and capped by, carbonate palaeosols and calcretes. Beneath their calcrete carapace, the aeolianites are weakly cemented, easily erodable, and hence were multiply reworked. They form a prominent part of the contemporary coastal landscape (Fig. 33).

The Holocene transgression isolated the island from Yorke and Fleurieu Peninsulas about 8 900 years ago, and the sea reached its present level 7,500 years ago. Rocky wave-cut platforms and beache with associated coastal dune sands developed on the more exposed coasts while in Nepean Bay, low-energy beach-ridge plains and intertidal swamps were established. Some remobilisation of Pleistocene aeolianites occurred, but in general progressive denudation of the higher landscape continued.

LANDFORMS AND LANDSCAPE DEVELOPMENT

The varied landscape of Kangaroo Island is largely inherited from the underlying geology, modified by weathering and erosion. Enhanced seismicity evident throughout the Flinders Ranges continues beneath the Island, as does long-term isostatic rebound and uplift. Eleven principal landforms have been identified (Fig. 34) and their relationship to the geology is briefly discussed below.

1. The main plateau is the dominant landform of the inland. It is a truncated laterite palaeosol that dates back to a humid, tropical climatic episode in the Pliocene. Now tilted and dissected, its elevation decreases from about 300 m in the west, to about 100 m towards the east and south. Remnants of this surface occur over much of the island, including Dudley Peninsula.
2. Around the peripheries of the plateau and its residual elements, denudation has resulted in a landscape dominated by dissected bedrock hills of resistant Cambrian metasediments. Slopes are generally convex and soils are thinly developed, as little aggradation is occurring in the stream courses.
3. The steep scarp associated with the Cygnet and Snelling Faults is a prominent topographic feature that separates the northern part of the island from the main plateau. It delimits the southern margin of the Cygnet Lowlands and controls the orientation and ruggedness of cliffs along the northwestern coastline.
4. The coastal cliffs from Cape Dutton to Point Marsden are characterised by red and green hues in gently-inclined strata which form ledges and benches that reflect on the weak deformation these rocks have undergone (Fig 35). Minor thrusting to the north has tilted and rotated some strata.
5. The Cygnet Lowlands are coincident with weakly indurated Permian glacigene sediments. Lakes with associated lunettes are developed where the Permian sediments are particularly clayey and impervious. Marine transgressions, including the Recent, have left a thin and patchy record. Residual mesas of Jurassic basalt attest to prolonged denudation and lowering of the landscape.
6. The D'Estrees Lowlands also coincide with an area of unconsolidated Permian glacigene sediments. Modern lakes and lunettes are developed in areas of poor permeability, as well as older lacustrine systems behind stranded Pliocene and Pleistocene shorelines. Thin marine limestones form discontinuous veneers across the region.
7. The western and southern cliffs show a variability of form reflecting more complex folding and deformation of the Kanmantoo Group bedrock (Fig 36). The often near-vertical dips of the metasediments result in a series of rugged ridges and clefts. Differential weathering of near vertical basic dykes creates spectacular re-entrants at Cape Hart and Cape Gantheaume.

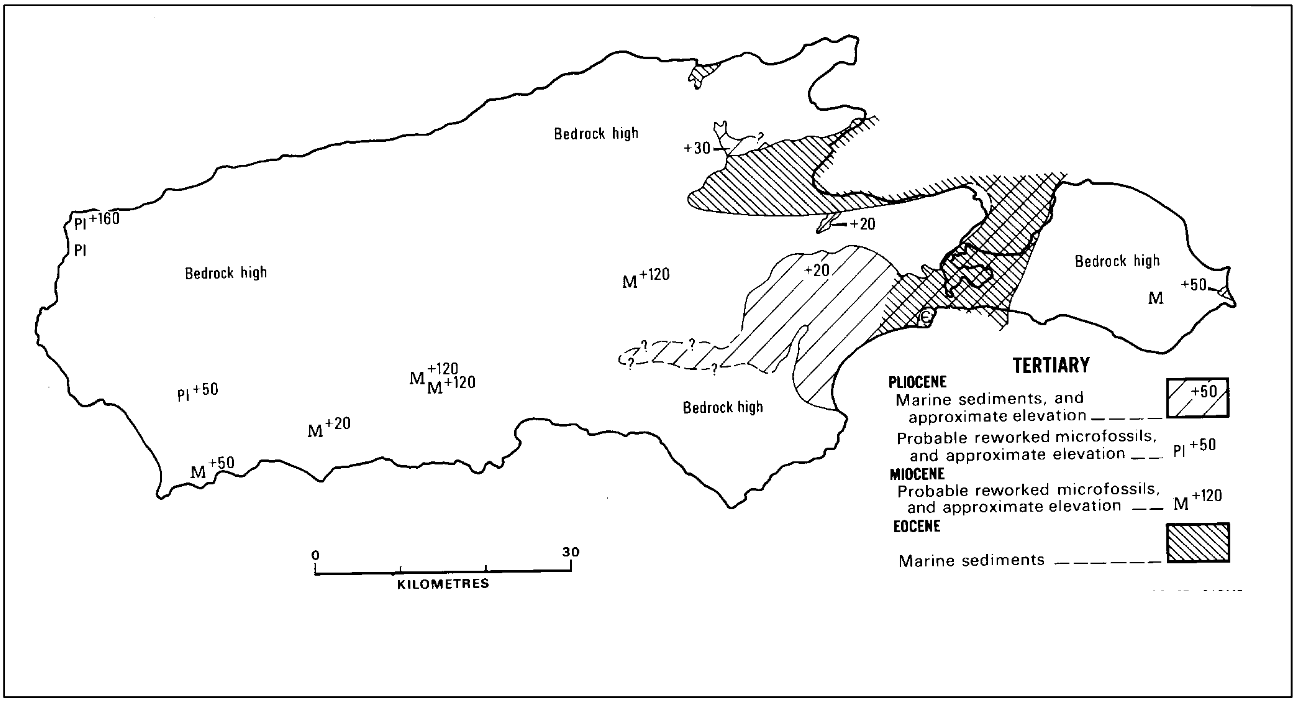

Figure 32.
Tertiary Palaeogeography, Kangaroo Island.

Figure 33.
Sea caves formed in karstic Pleistocene aeolian calcarenite -Baudin's Cave, Ravine de Casoars.
Geomorphic province 10.
Photo: P.I.R.S.A.

8. The granite landscape displays the typical spheroidal weathering forms (Fig. 37), flared slopes, tors and tafoni associated with this rock type. In cliff faces, a blocky appearance results from associated jointing and veining (Fig. 38).

9. The Wisanger mesas are fragmented remnants of Jurassic basaltic volcanics. The surficial sheets slope downwards from west to east, possibly reflecting the original palaeovalley along which the lava flowed.

10. Calcareous aeolianites dominate the southern landscape with dune forms well preserved by surficial hardpan development. Former multiple episodes of dune migration are evident from the succession of calcrete horizons visible in the cliff faces. Karst features are well developed, including major and minor caves, sea caves, karren and dolines. In coastal sections, weathering has resulted in both steep cliffs and well-developed shore platforms.

11. Transgressive dune fields occur along the south coast where the coastline is oriented normal to the dominant southwest wind. These may be mobile features, or stabilised by vegetation. Much of the sand has been reworked from intimately associated Pleistocene aeolianites.

The varied landforms contribute much to the scenic qualities of Kangaroo Island. Many of the geologically-related scenic features such as Remarkable Rocks, Cape du Couedic, Harveys Return and Little Sahara are incorporated as geological monuments under the National Estate program (Fig. 33). Scrymgour and Riley (1991) list the geological monumen t details as well as important geological type section locations

ECONOMIC GEOLOGY

The varied rock types are host to a diverse range of economic mineral indicators. The Island's isolation though, has limited the commercial exploration for minerals. Previous mineral exploration is summarised by McCallum (1991) and a summary of known mineral occurrences is presented in Figure 39. No major metalliferous deposits have been discovered on the island, but the general geological and tectonic setting, especially for Cambrian strata, are potentially favourable for mineralisation.

Many of the known metallic mineral occurrences, including lead, zinc, copper and gold mineralisation, are associated with the Cygnet and Snelling Faults. Gold was extracted from the Kohinoor Mine and lead and silver from the Western River Mine at around the turn of the century (Brown, 1898). Recent geological investigations have confirmed the close association of mineralisation with the fault systems (McCallum, 1991; Crooks, 1991). Alluvial gold worked from the Eleanor River also probably originated from mineralisation associated with this structure.

Materials quarried to meet local requirements include ironstone, basalt, calcrete and sandstone for aggregate, construction sand from lunettes and beach ridges, and also lime sand (aeolianite). Slate has been quarried for use as flagstone, and potential exists for granite and migmatite for use as building and ornamental stone. Commercial production of salt and gypsum from Salt Lake and New Lake has occurred since 1907, but these operations have now ceased. Stockpiles of gypsum at these sites, and at the Ballast Head loading facilities, are expected to last until 1998 (Dubowski *et al*., 1989).

Concentrations of heavy mineral sands occur at several stratigraphic levels, reflecting multiple reworking. Heavy mineral-rich bands occur as foreset concentrations within the crossbedded Middleton Sandstone of the Kanmantoo Group. These, and the Permian glacigene sediments, are the primary source of other heavy mineral concentrations in Quaternary lunettes and Holocene beach sediments. From Morrison Beach in Nepean Bay, 1200 tonnes of rutile and 190 tonnes of zircon were recovered during operations between 1971 and 1976 (Morris, 1980).

Gem-quality tourmaline was discovered in 1903 from within a pegmatite on Dudley Peninsula. The deposit is one of only a few recorded occurrences of gem tourmaline in Australia, and was certainly the largest producer. Blue, green and some pink crystals were extracted, including a 43 carat clean, dark blue crystal 47.5 mm long by 10 mm wide. The pegmatite was also worked for ceramic-grade feldspar, silica and kaolin (Keeling and Townsend, 1988).

Hydrocarbon strandings occur intermittently along the south and west coast of the Island, but these originate offshore, from natural seepages from continental shelf basins. The source-rock potential of the Mount McDonnell Formation for hydrocarbons is currently being assessed as a guide to the petroleum prospectivity of the Stansbury Basin.

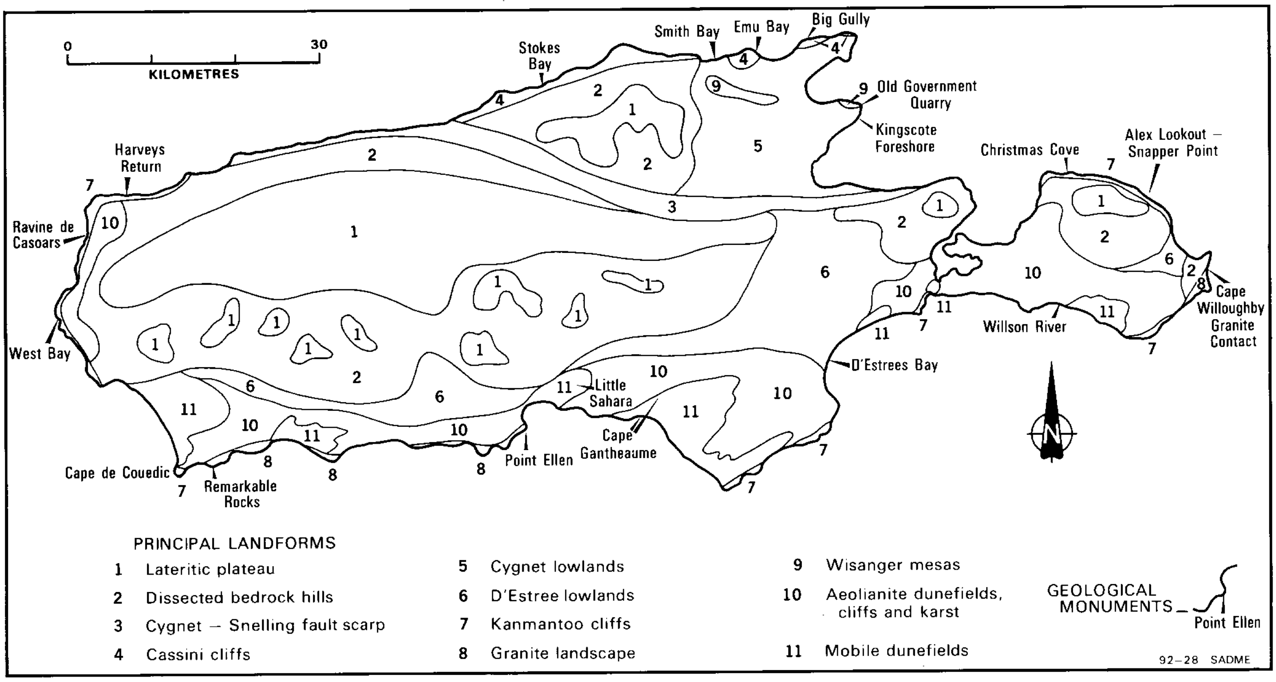

Figure 34.
Principal landforms of Kangaroo Island and location of geological monuments.

Figure 35.
Gently dipping strata of the Kangaroo Island Group, west of Cape Cassini, characteristic of Geomorphic province 4.
Photo: P.I.R.S.A.

Figure 36.
Near vertically dipping metasandstones of the Kanmantoo Group, False Cape, producing a rugged shore platform typical for Geomorphic province 7.
Photo: P.I.R.S.A.

Figure 37.
Cavernous and spheroidal weathering in granite, Remarkable Rocks Geomorphic province 8.
Photo: P.I.R.S.A.

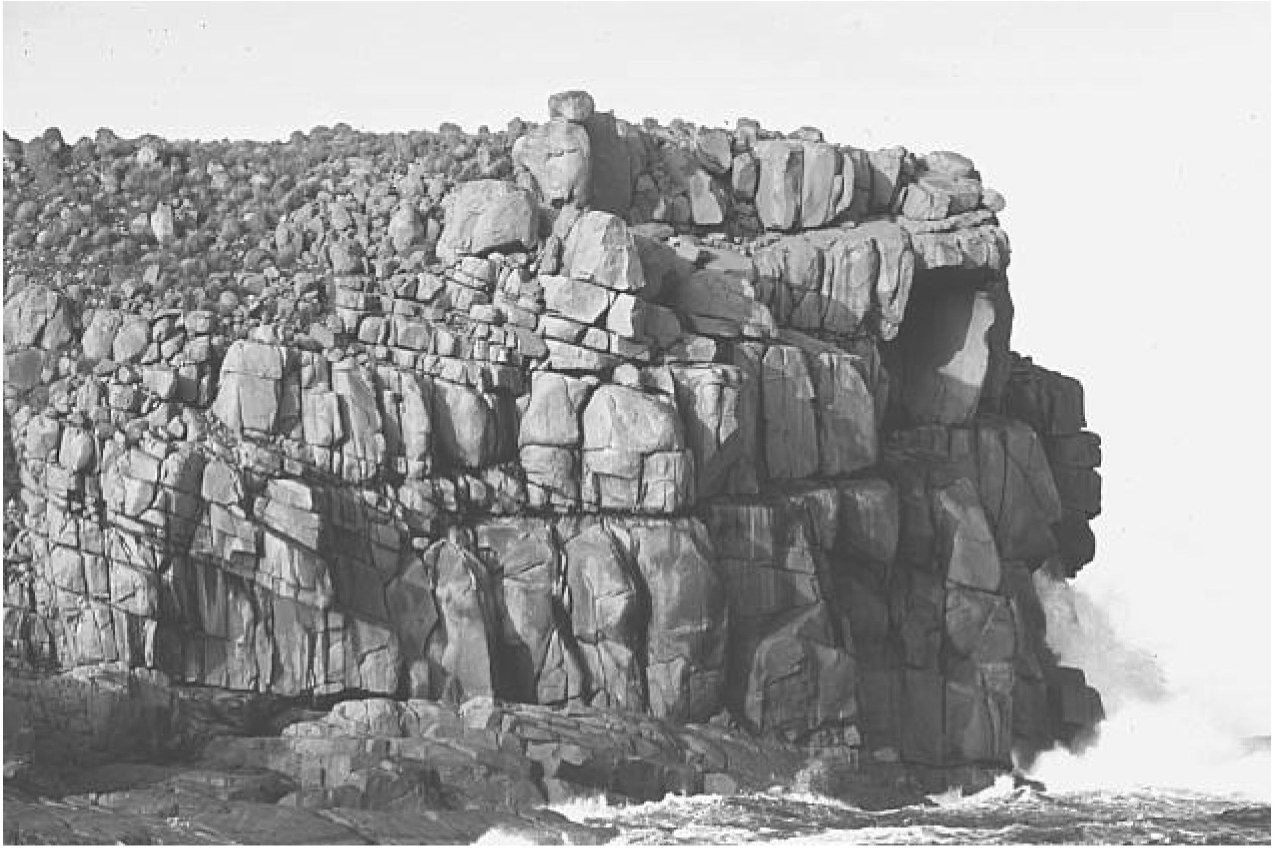

Figure 38.
Blocky weathering highlighting intersecting joints in Cambrian granite, Cape Willoughby. Geomorphic Province 8.
Photo: P.I.R.S.A.

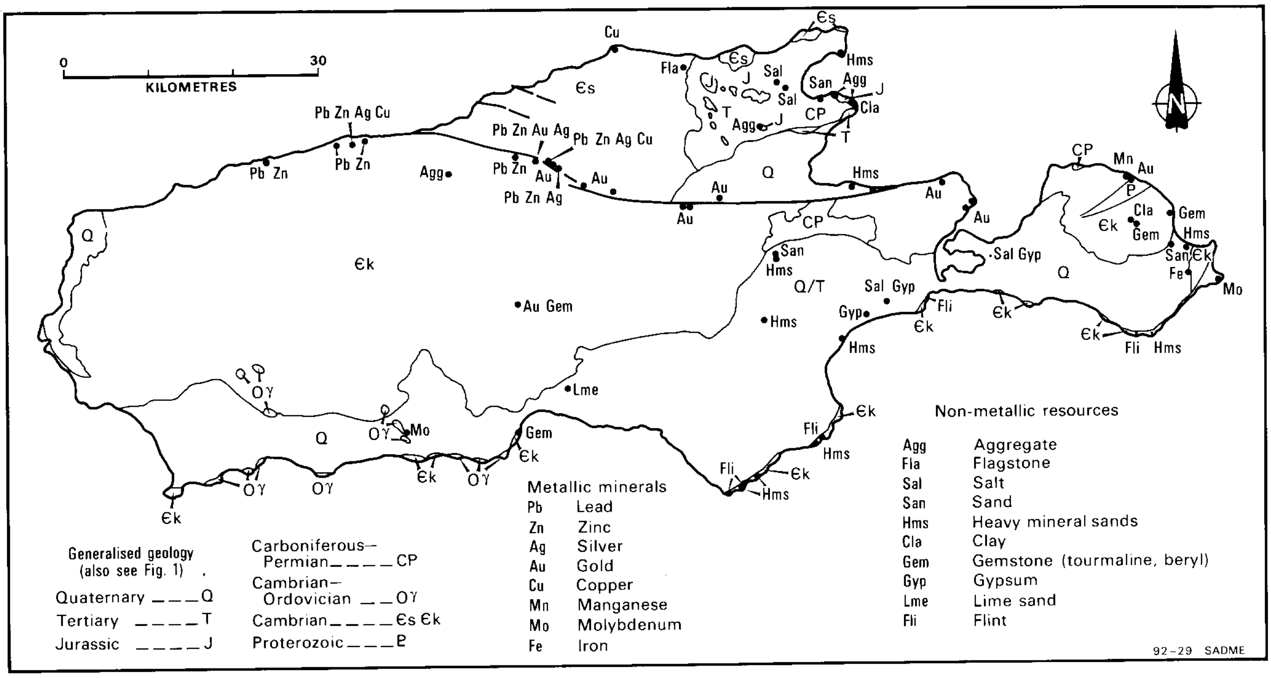

Figure 39.
Mineral occurrences on Kangaroo Island.

LAND-USE HISTORY

THE HISTORY OF ABORIGINAL LAND USE ON KANGAROO ISLAND.

by N Draper[3]

It is not known when Kangaroo Island was first inhabited. Aboriginal people certainly were present during the last glacial maximum, with a radiocarbon date of 16 110 $\pm$ 100 BP (years before present) for the earliest human occupation of Seton rockshelter (Lampert, 1981). At this time, the ice-age sea levels were as much as 200m lower than the present day, and Kangaroo Island was a highland area approximately 15km inland from the Australian coastline, adjacent to the extended course of the Murray River (Fig. 40). The island was severed from the mainland once more by the rising post-glacial seas with the flooding of Backstairs Passage. Based on current seabed topography, this occurred approximately 9 500 years ago (Lampert, 1981). Alternatively, the swift currents of this well-scoured passage may have removed substantial amounts of sediments from the sea floor, masking a more recent cut-off date from the mainland.

In either case, this transition appears to be commemorated in the Ngurunderi Dreaming of the Ngarrindjeri people of the Lower Murray and Coorong region, and the Ramindjeri people of Encounter Bay and the southern Fleurieu Peninsula. In this Aboriginal creation history, the Ancestral Being Ngurunderi pursued his two errant wives westwards from the Murray mouth along the Encounter Bay coast. They attempted to evade him by wading across the shallows to Kangaroo Island, but he detected them, and in his rage commanded the ocean to rise up to flood the passage. Ngurunderi's wives were drowned, becoming the Pages Islands (see Berndt, 1940; SA Film Corporation, 1987). Ngurunderi then crossed to Kangaroo Island, resting under a large Casuarina tree near Kingscote, before travelling to the far end of the island. At Admiral's Arch he threw his spears into the sea, creating the Casuarina Islets (Berndt, 1940; Draper 1988, 1991 Fig 1.6). Finally, he cleansed himself in the ocean and passed on to the spirit world, decreeing that the souls of the deceased would follow him. Thus, Ngarrindjeri, Ramindjeri, and Kaurna people in recent times have viewed the island as a spirit place - "Karta"(literally "lap"), the island of the dead. Traditional burials of the Narrindgeri, Ramindjeri and Kaurna (Adelaide Plains) people tend to be orientated with the head towards the island.

Early in 1802, a French naval expedition commanded by Baudin and a British expedition under Flinders crossed paths at Encounter Bay. Both expeditions landed on the island to explore and replenish supplies, and their leaders commented on the lack of human presence. There was no smoke in the air (a ubiquitous sign of Aboriginal presence all along the Australian coastline) and the island's vegetation was overgrown and untended by "firestick farming". The seals and kangaroos appeared unused to human presence, and the sailors were able to approach and club them, obtaining substantial supplies of fresh meat without firing a shot. The dwarf emu pursued by Baudin's landing party at the Ravine des Casoars ("Ravine of the Cassowaries") were more wary (Lampert, 1981; Tindale and Maegraith, 1931; Tyler *et al*, 1979). By about 1805, there were European sealers and whalers (including escaped convicts) on the island, as well as some Aboriginal women from Tasmania and from the nearby mainland coast who had accompanied or been kidnapped by them (Pattison, 1942; Cumpston, 1970). The sealers were driven from the island by European colonization in the 1830's. Some Aboriginal women were repatriated to the mainland, while a few of them were living at the eastern end of the island and receiving government rations from the lighthouse keeper at Cape Willoughby until 1861 (Pattison, 1942). Consequently, our knowledge of prehistoric Aboriginal occupation of Kangaroo Island comes from the archaeological record of their use of its landscape and resources.

Howchin (1903) reported the presence of Aboriginal stone artefacts on the island, but this was not followed up until Tindale and Maegraith (1931) recorded several archaeological sites around the stranded shorelines of Murray Lagoon as agricultural clearing began. The evidence consisted of surface assemblages of large stone tools, made both from water-worn cobbles and local outcrops of quartzite and quartz. The most common artefact forms were flaked cobble choppers, discoidal "horsehoof"cores, thick flake tools ("steep scrapers"), "waisted axes", and pitted hammers and anvils (Lampert, 1981). This pattern of archaeological discovery continued for several decades, with the discovery of more than 100 sites.

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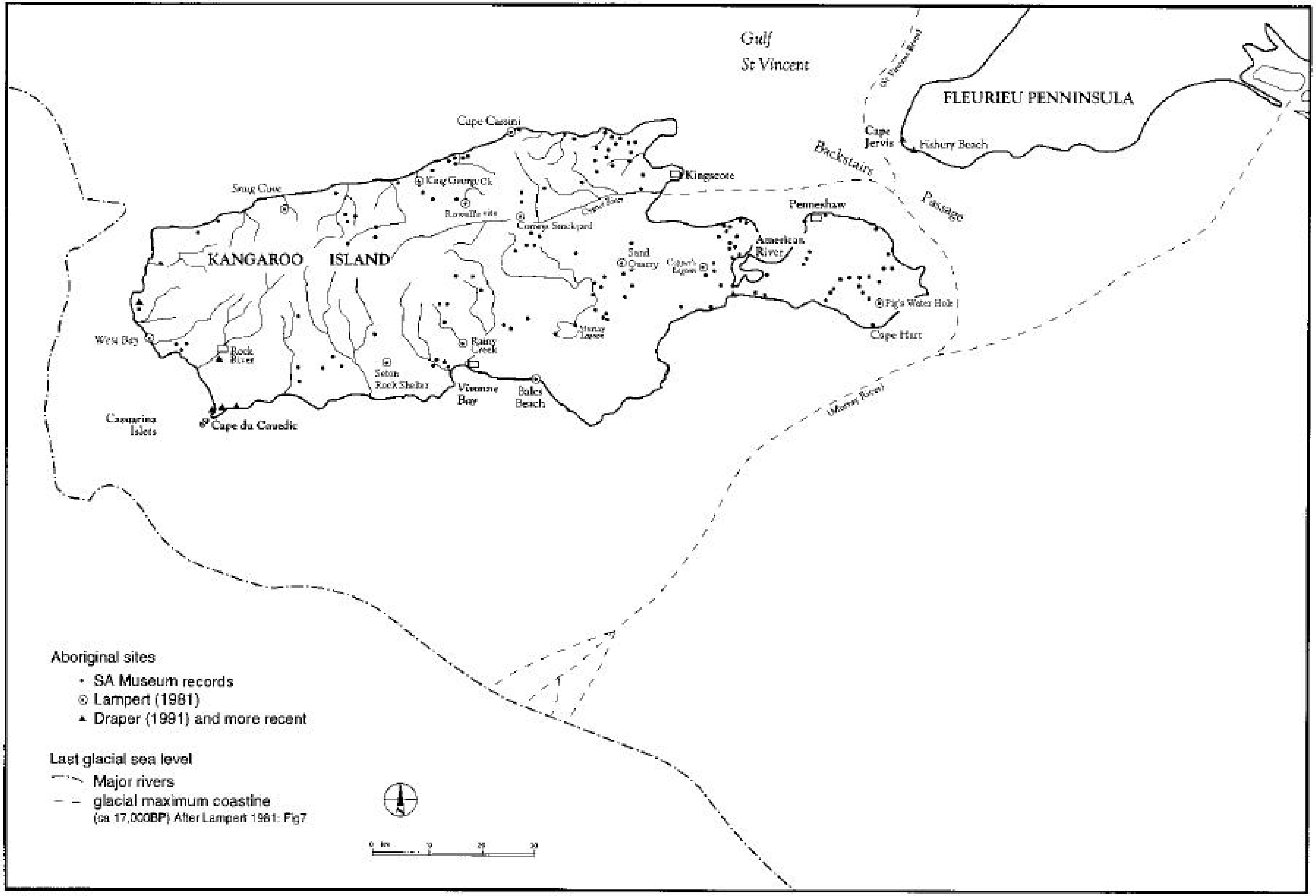

Figure 40.
Map of Kangaroo Island showing known Aboriginal archaeological sites, and the last Glacial low sea level coastline.

The majority of finds consisted of large stone tools from recently cleared and ploughed land (Bauer, 1959, 1970; Cooper, 1943, 1960, 1966, 1968; Tindale, 1937, 1957, 1968, 1974, 1981).Even after the advent of radiocarbon dating in 1950, these disturbed surface sites provided no fireplaces or middens with datable charcoal or bone. Tindale (1957) characterized this archaeological record as the "Kartan Industry", and argued on typological grounds that the artefacts were different from, and therefore older than the excavated sequence of artefact assemblages from Devon Downs and Tartanga on the Murray River (Hale and Tindale 1930). He also compared the "Kartan" cobble choppers to similar artefacts from surface sites in Indonesia, then thought to be of Middle Pleistocene age (now considered much later - see Bartstral 1982, Bartstral *et al* 1988). From this comparison, Tindale concluded that the Kangaroo Island assemblages thus represented the toolkit of the earliest people to migrate from southeast Asia to Australia. This view became widely accepted in Australian archaeology (e.g., Flood 1989), though not without some misgivings regarding the lack of a secure chronology (White and O'Connell 1982).

An intensive program of archaeological research was conducted on Kangaroo Island and adjacent, mainland coastal regions during the 1970s by Lampert (1972, 1975, 1977, 1979, 1981, 1983a, b). Lampert recorded and collected artefacts from several newly discovered "Kartan" sites on the island's northern plateau. At one of them, King George Creek, he conducted test excavations in the recently ploughed site to determine whether part of it had remained intact below the plough zone, but found only more, scattered artefacts similar to those exposed on the surface, without any datable organic material (Lampert, 1981). Several other sites investigated by Lampert were quite different, at Rowell's Site on the Cygnet River flats, Pigs Water-hole in a small valley near the eastern end of the island, and Rainy Creek, Sand Quarry, and Seton Rockshelter along the southern lowland corridor of the island. Excavations at these sites produced assemblages of stone artefacts made from quartzite, quartz, and occasionally chert (or "flint"), consisting of a wide variety of flakes and cores, many of them quite small by comparison with the "Kartan" tools. Cobble tools are rare in these assemblages, although flakes produced from cobbles (identified by the presence of the smooth, outer cortex of the cobble) often are present in large numbers. Radiocarbon dates from charcoal associated with these assemblages range in age from approximately 16,000 BP and 11,000 BP at Seton, and dates ranging from just under 8,000 BP to just over 4,000 BP at the other sites (summarized in Table 1). This was the most recent dating for prehistoric Aboriginal occupation of Kangaroo Island at the time. However, Clark and Lampert 1981:188) argued that a distinct change in the fire regime of Kangaroo Island at about 2,500 BP was indicated from charcoal in pollen cores from Lashmars Lagoon, and that this might indicate the cessation of Aboriginal firestick farming on the island at this time. In fact, when the frequency of charcoal from this core sample is "corrected" by charting it in ratio with pollen concentrations (Clark and Lampert, 1981: Fig. 76), the trend may just as readily be interpreted as one of gradual change from Casuarinas to more xerophytic Acacias and Eucalypts, accompanied by increasing frequencies and/or intensities of fires (Clark and Lampert, 1981: Fig. 74; Noble, 1986).

Lampert characterized the archaeological sites that he had dated as representing the "Kangaroo Island Small Tool Industry", the successor of the "Kartan Industry". By implication, the Kartan sites were thought to be older than the 16 000 year old, small-tool assemblage from Seton rockshelter, though they remained undated.

More recently, excavations at Cape Du Couedic rockshelter and Rocky River have revealed assemblages containing both large "Kartan" artefacts and a wide range of smaller pieces, including a substantial component of quartz and chert microliths. Radiocarbon dates for these assemblages range from approximately 7,500 BP to perhaps 350-400 BP (Draper, 1987, 1988, 1991). In fact, the entire range of Kangaroo Island stone artefacts represents a single, long-standing technological tradition, remarkable both in its efficiency and its flexibility (Draper, 1987, 1988, 1991, see also Lampert and Hughes, 1988). As the bulk of archaeological evidence regarding Aboriginal lifeways on Kangaroo Island consists of assemblages of stone artefacts, the nature of these assemblages is briefly described.

A range of quartzite artefacts from Kangaroo Island is illustrated in Figure 41. Quartzite cobbles were acquired from beach deposits, both on the current coastline and around older, stranded shores such as those around Murray Lagoon (once an inlet from the open sea - A. McGuire, NP&WSA pers.comm.), and from some exposures of ancient glacial till on the northern plateau. Depending on shape and consistency, such cobbles were used as hammerstones and anvils, or flaked as chopper/cores. The cobble chopper/cores were multi-functional artefacts. Each functioned as a hand-held, heavy-duty tool for cutting and chopping. Such tools required regular resharpening and reshaping of the cutting edge by striking off further flakes with a hammerstone. The larger flakes produced in this way were used as cutting and scraping tools. As the chopper/cores had a relatively long use-life, the manufacturing flakes for a particular tool may have been discarded at the cobble source, the chopper flakes and smaller resharpening (or "retouch" flakes) discarded at a variety of activity sites, with the core finally discarded at a final location, or recycled as a number of flake implements

Table 1.
Summary of radiocarbon dates for Aboriginal archaeological sites on Kangaroo Island.

SITE NAME	SITE SETTING	C14 DATE	DESCRIPTION
Pigs Waterhole *	basin between hills, east end of island, 4 km from coast	3100 + 90 BP (ANU 1785)	minimum date for occupation of site; quartz, quartzite, chert flakes & cores, 28 whole or broken cobble choppers
Seton Rock Shelter	rockshelter in limestone ridge near small freshwater lagoon	16110 + 100 BP (ANU 1221)	Unit III, earliest occupation
	6 km from coast	10940 + 60 BP (ANU 925)	Unit I, main occupation; (Seton: 4700 artefacts:quartz 82.4%, chert 16.7%, limestone 0.8%, quartzite 0.1% - flakes, cores, and flake tools, no cobble tools. Large faunal assemblage)
Rainy Creek *	stream flood plain in small valley, 3 km from coast	7890 + 170 BP (ANU 1748)	Tindale (1937) collection "Kartan"artefacts, Lampert excavation of quartz & quartzite flake & core assemblage
Sand Quarry *	occupation horizon in Holocene dune adjacent to	4310 + 90 BP (ANU 1650)	occupation horizon in buried palaeosol, mechanically excavated & screened. Quartz &
	stream course & lagoon, 12 km from coast	7170 + 110 BP (ANU 1787)	quartzite artefacts, cobbles rare.
Rowell's Site *	Cygnet R. flat, 17 km from coast	5250 + 80 BP (ANU 1786)	Close to several "Kartan"sites. Mechanical & hand excavation. 4 large core tools from dozer
		5310 + 90 BP (ANU 1787)	trench only. 540 quartz & quartzite artefacts
Cape du Couedic Rock Shelter	in high cliffs above small bay, SW coast	5810 + 130 BP (Wk 1982)	hearth in upper occupation layer (Level 1), containing cobble chopper/core, Trench One
		7320 + 100 BP (CS 495)	refuse midden under rock ledge at rear of shelter, Trench One
		7450 + 100 BP (CS 496)	hearth at base of lower occupation layer (Level 3), Trench One
		6810 + 80 BP (CS 610)	shallow refuse pit, surface of cooking area (Trench Two)
		6870 + 270 BP (Wk 1984)	shallow hearth, base of Trench Two (should be older than Wk 1983 cf. stratigraphy)
		7270 + 70 BP (Wk 1983)	small cooking pit extending down from surface, main cooking area (Trench Two)
Rocky River	sandy shoreline approx 50 metres around shoreline of intermittent swamp/lagoon, 10 km inland	400 + 50 BP (Beta 30176)	test pit 1, 3rd unit (60cm depth). Five rescue test pits dug before road upgraded. Five stratigraphic units (1st is most recent) to 1 metre depth contain quartz, quartzite (including cobble) and chert flakes, cores, and retouched tools,with wide variation in depth of each unit. Dating inconsistencies reveal some disturbance of sandy sediments, and the mixing effects of an ancient pit feature (test pit 3). All dates associated with stone artefacts in horizontally bedded sediments
		2340 + 130 BP (SUA 2835)	test pit 1, base of 4th unit (90cm depth)
		2360 + 70 BP (CS 891)	test pit 3, 3rd unit (35cm depth)
		6110 + 90 BP (CS 892)	test pit 3, near base of 3rd unit, at top of pit feature which extends down to base of 5th unit (55cm depth)
		3110 + 180 BP (CS 893)	test pit 3, bottom of pit feature near base of 4th unit (75cm depth)
		1080 + 60 BP (CS 895)	test pit 4, 2nd unit (15cm depth)
Rocky River (Tindale megafauna site)	old lagoon/swamp shoreline, Approx. 100 metres from Rocky River site (above)	1280 + 140 BP (SUA 2836)	55cm depth, at base of upper, sandy layer and darker, compacted peaty layer. Immediately beneath quartzite cobble chopper
		1380 + 80 BP (Beta 30175)	55cm depth, at base of upper layer, 50cm from first dating sample, adjacent 2 quartz flakes * Data from Lampert (1981)

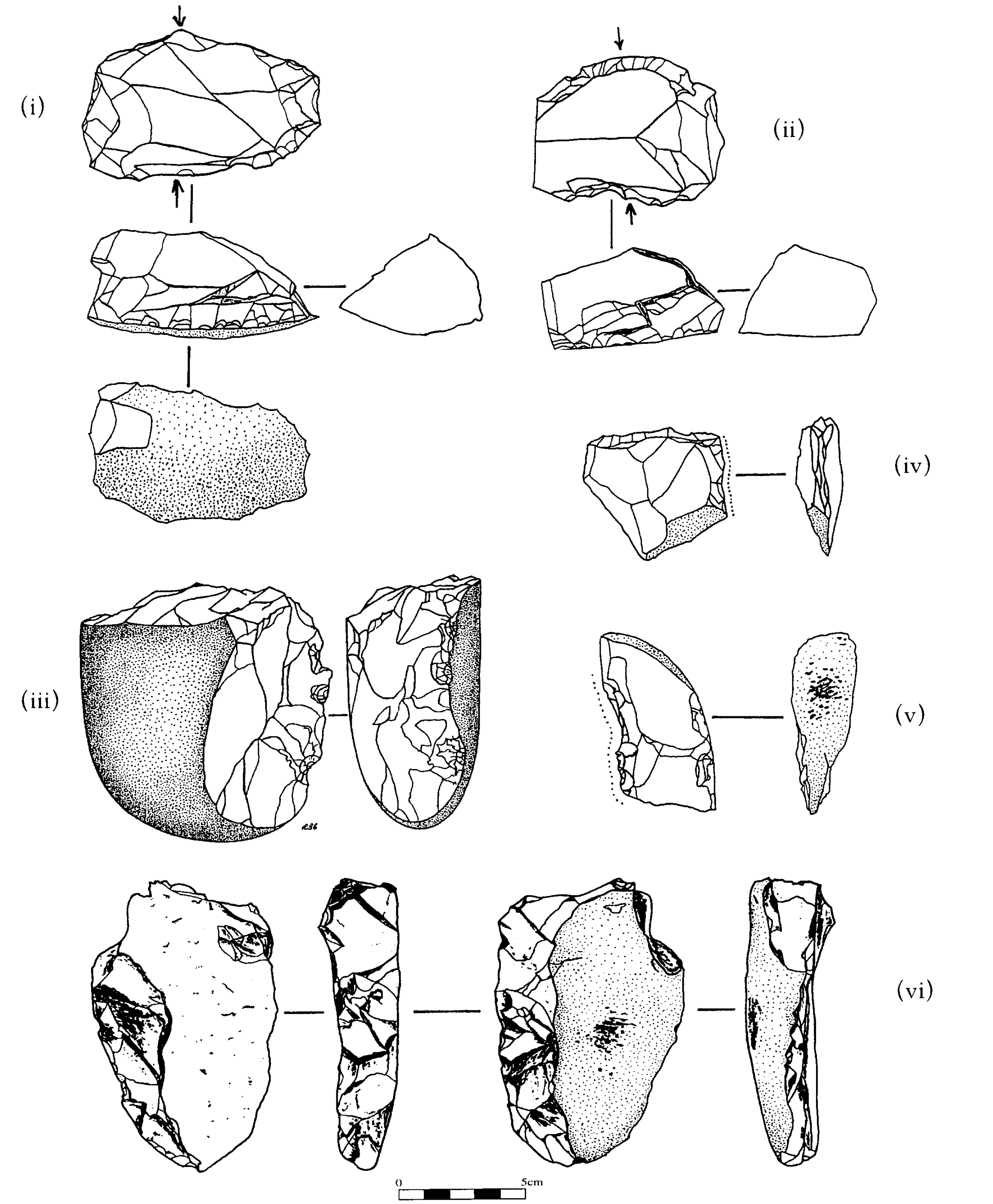

Figure 41.
The range of quartzite artefacts from Kangaroo Island.
(1) cobble chopper/core from Hawks Nest Station, Murray Lagoon (arrows indicate location of cross-section); (ii) "horsehoof" style chopper/core, Murray Lagoon; (iii) cobble chipper/dore, Cape du Coedic Rock Shelter; (iv & v) retouched chopper flakes from Cape du Couedic Rock Shelter, with retouched cutting edges indicated by dotted lines, and with battered pits visible on the cortex of (v) from use of the original cobble as a hammer; (vi) a cobble chipper from Cape du Couedic Rock Shelter made from a flattish cobble segment with two cutting edges on opposite sides, and battered pits from use of the original cobble as an anvil (for flaking small quartz cores).

Although it is not practical to attempt to trace individual chopper/cores and their by-products in this manner, the general pattern of artefact manufacture, use, and discard across the landscape may be identified. Frequently, chopper/cores also show evidence of use as hammers and/or anvils as well. Blocks of quartzite from outcrops across the northern plateau were also used as chopper/cores, usually of the horsehoof" configuration (see Fig. 41), or simply as cores for the production of sharp flakes.

A variety of quartz artefacts from Cape du Couedic rock shelter is shown in Figure 42. Quartz is both the most common and the hardest stone for cutting purposes available in the region, but its use is restricted by the small size of relatively unflawed pieces and the difficulty of controlling its fracture during tool manufacture. Although there are some larger, hand-held tools and cores of quartz, most quartz artefacts are very small, and were manufactured and maintained by flaking them on an anvil, rather than by freehand percussion. Because quartz is very hard, the hammers rapidly developed "tracks" of impact pits around their margins, while the anvils developed deep pits or dimples. Flattish quartzite cobbles, including chopper/cores, were widely used for these manufacturing tasks (see Figure 45). Quartz tends to have a very flat fracture in addition to the artefacts being mostly small, so that these artefacts commonly are misidentified, or simply overlooked in situations where there is a "background" of natural quartz pieces at an archaeological site. The very frequent, small artefacts are characterized as products of "microblade" technology (e.g., Witter 1988, Draper 1991). Their small size indicates that they often were hafted (mounted in handles) for use. Many of the small, thin, fingernail-shaped flakes probably functioned as spear barbs. The small cores from which they were removed frequently exhibit retouch and use wear from their complementary role as cutting and wood working tools (similar to the hafted adzes and chisels used by Aboriginal Australians in recent times). Except for the small size of most of the quartz artefacts, this practice of maintaining steep-edged core tools by removing broad, thin flakes for other purposes during the edge resharpening process, or of using cores for flake production additionally as heavy duty cutting tools, is very similar to the way in which the much larger quartzite cobbles and blocks were used. In addition, the heavily pitted hammers and anvils used to flake the small quartz cores were previously thought to belong to a distinct, older "Kartan Industry". Instead, they now may be recognized as the varied components of a single technology, which served the demand for small, shaped flakes for composite tools and weapons, a variety of medium sized flake cutting tools, as well as large chopping and pounding tools.

Partially silicified limestone from cliffs, caves, and rock shelters also was used in abundance for stone cutting tools (Fig. 42), but only at activity sites near to the source of supply. The attraction of limestone as a raw material was that it often occurs in large quantities and large sizes, it is easy to flake, and it produces very sharp edges. It is also relatively soft, and cutting edges readily blunt or break. This obviously presented no problem for activities conducted near an abundant supply of the material, but there is no evidence that limestone was used for the kinds of curated tools which had long use-lives and were carried around from place to place. The less common, highly silicified limestone, or chert, provided tougher, more useful stone for flaked tools. Chert supplies are mostly restricted to nodules on several beaches, derived from adjacent, pre-Pleistocene limestone exposures around the eastern coasts (e.g., near Kingscote and Cape Hart). Consequently, most chert artefacts are small, and have been worked by microblade techniques to conserve the material. Frequently, these artefacts have curated, retouched cutting edges, and often more than one utilized edge per artefact (Fig. 44).

The variations among stone artefact assemblages at Kangaroo Island's archaeological sites reflect the patterns of supply and demand for tools in the past. Demands for different kinds of tools varied from place to place and in different situations. The supply of tools varied according to the availability of different kinds of stone in the vicinity of the site, the availability of artefacts already present at the site from previous visits, and also the kinds of artefacts and raw materials carried to the site by people in anticipation of their future requirements. The many "Kartan" sites fringing the island's lagoons and streams contain cores and core tools of quartzite and quartz derived from local outcrops of the northern plateau, cobble chopper/cores carried in from scattered coastal and inland sources, and large flake implements derived from these cores. Lampert's "small tool" sites tend to be near water sources along the southern sandy corridor, and furthest from both the plateau outcrops of metamorphic rocks and the beach cobble sources where these outcrops occur as wave-cut coastal platforms. Large artefacts of any kind are relatively rare - but by no means absent - in these sites. Quartz, which is the most widely distributed raw material, and which produced by far the greatest proportion of useful cutting edge per weight of material of any of the available stone types, is the most frequent raw material for artefacts on these sites. There are many quartzite artefacts as well, mostly flakes and smaller, variably-shaped cores. This is the result of demand exceeding supply, at least by comparison with the "Kartan" sites, where the supply was more plentiful and the larger artefacts were not generally reduced to flakes and small cores. This is the same technology in each case, but differing supply and demand situations.

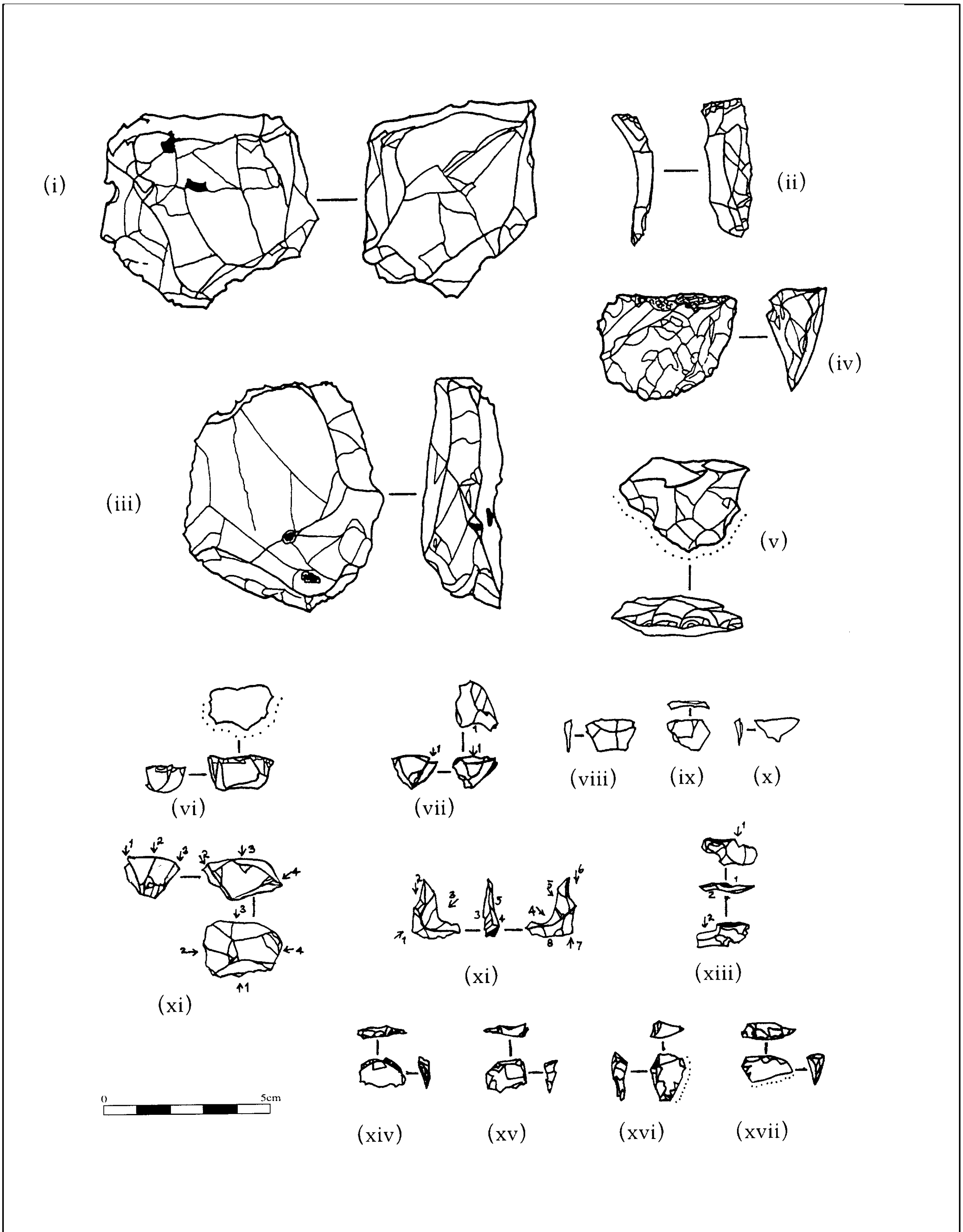

Figure 42.
A variety of quartz artefacts from Cape du Couedic rock shelter.
(i) multi-directionally flaked "horsehoof" core (ii) thin, parallel-sided flake (or "blade"); (iii) large steep scraper/cutting tool, with mineral inclusions; (iv & v) adzes, designed to be hafted in a wooden handle; (vi & vii) small microblade cores, flaked by the bipolar technique (ie resting the core on an anvil in order to strike it with a hammer stone, to remove flakes); (viii, ix & x) microblade flakes struck from small bipolar cores; (xi) radially-flaked microblade core (the arrowed numbers indicate specific flake removals and the direction from which they were struck); (xii & xiii) "fishtail" microblade cores, where the removal of flakes form opposite sides of small cores (made from a larger flake) has reduced them to a sinuously-shaped remnant (xiv to xvii) "backed blades" produced by microblade flaking, with the back opposite the sharp edge blunted by fine chipping (like the blade of a pocket knife).

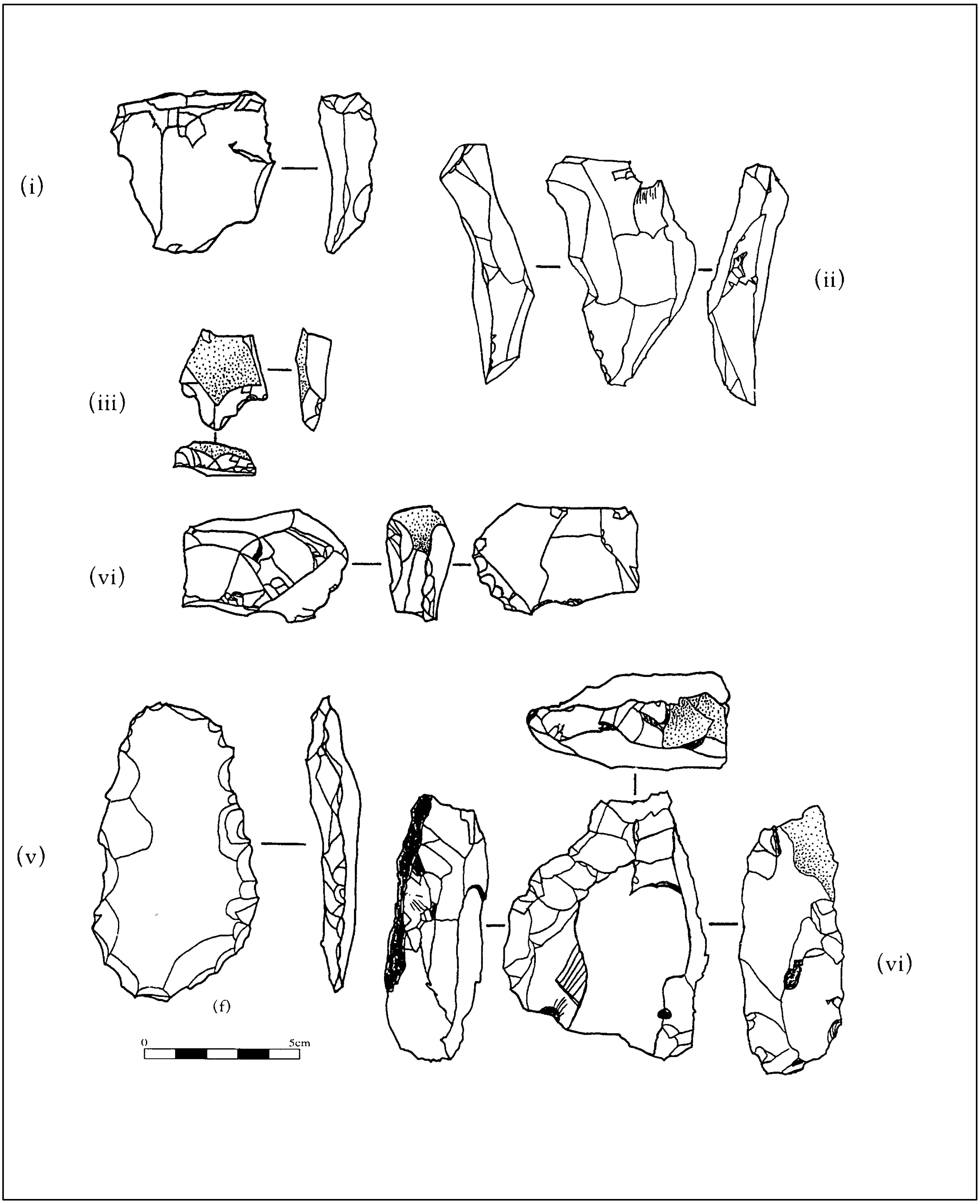

Figure 43.
Limestone artefacts from the Cape du Coudic rockshelter.
(i), (iii), (iv) retouched flakes; (ii) a microblade core made on a large, thick flake, from which long, parallel-sided flakes or "blades" were struck from both ends; (v) a long flat flake "knife" retouched around its entire margin, manufactured from a heat-spalled flake (e.g. from a limestone block at the edge of a fireplace); (vi) a chopper or large "steep scraper" - also used as a core to produce flakes manufactured from a block of partially silicified limestone with fossil inclusions.

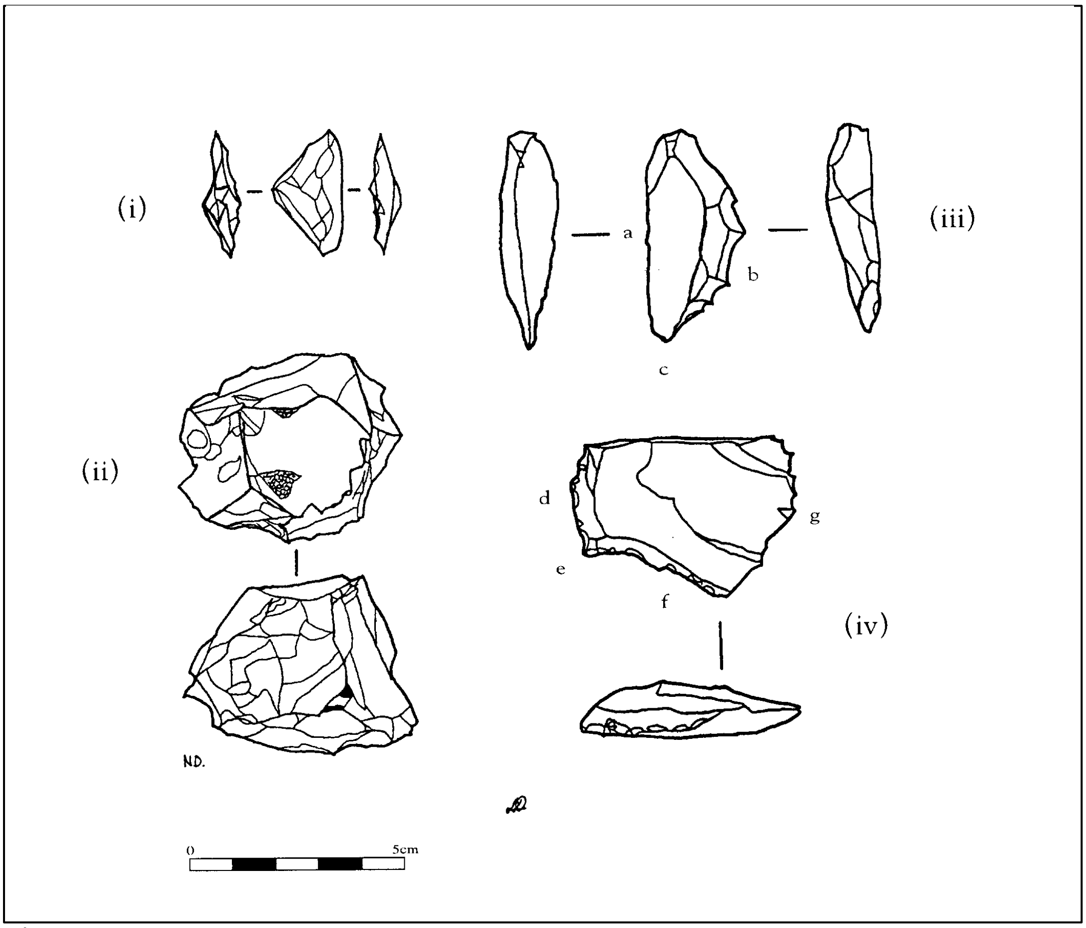

Figure 44.
Chert? artefacts from the the Cape du Couedic rockshelter.
(i) brown chert utilised flake; (ii) small multi-platform "horsehoof" core, brown chert with micro-fossil inclusions; (iii) silicified limestone retouched flake with three working edges; (a) straight cutting edge, utilised, (b) convex retouched cutting edge with use damage and adhering residue (not identified), (c) "beak" shaped edge used as a drill or as an awl with adhering residue; (iv) silicified limestone retouched flake with four working edge, (d) convex retouched steep scraping/cutting edge with use damage, (e) retouched "beak" edge used for awling or engraving, (f) retouched, concave cutting edge with use damage, (g) utilised, irregularly-shaped "wavy" cutting edge.

Figure 45.
Hammer/anvil and "waisted axes" from the central plateau of Kangaroo Island. Photo N. Draper.
A classic, "dimpled" hammer/anvil and three "waisted axes" recovered from ploughed fields on Mr Doug Bowden's property on the central plateau of Kangaroo Island. The two artefacts on the left side are limestone, the two on the right are quartzites. (Doug Bowden's collection. Scale in centimetres

Seton rockshelter (Lampert, 1981) also fits the "small tool" pattern, except for the use of the shelter - probably as a camp during wet and/or cold weather (which is the pattern among hunter-gatherers generally). Cape du Couedic rockshelter was similarly a haven from the frequently wild weather of the southwest corner of Kangaroo Island (and more likely a winter camp because of that). It was also a different kind of site in terms of the overall system of stone artefact procurement, use, transport, and discard practised by the Aboriginal inhabitants. Quartz was introduced from possible sources ranging from five to fifteen kilometres away for use at this locality; limestone was used in large quantities for "instant tools", but only rarer pieces of partially silicified limestone were frequently retouched and curated for longer term use. Even these were seldom carried away for use at inland sites, as they seldom occur on such sites. Quartzite cobbles were available from a beach at the foot of the cliffs near the shelter. Flakes from these cobbles are abundant in the archaeological deposit, and more particularly, flakes and flake tools (among them a 7,500 year old "knife" with a grass-tree resin handle) derived from the manufacture and resharpening of cobble chopper/cores. However, there are few, completed cobble chopper/cores represented in the excavated assemblage. This is one of the places where the chopper cores were produced and subsequently exported to inland sites as people anticipated their future needs and outfitted themselves accordingly before they moved on. Of course, the corollary of this site is the typical "Kartan" site, where there is no local cobble source, many heavily worked and reduced chopper/cores, and very few of the flakes created during their manufacture and use.

As described above, an understanding of the stone-working technology and the general distribution of archaeological sites and stone sources can be used to derive information concerning prehistoric land-use patterns, as well as the kind of forward planning involved in maintaining the toolkit used to harvest resources and fashion other tools.

The general range of functions carried out with these tools may be researched by reference to the physical properties of each kind of stone (e.g., hardness, fracture), combined with the mechanical capabilities of various combinations of artefact weight, shape, and working edge characteristics, as well as by the nature of the damage (frequently microscopic) sustained by the working edge(s) during use, and more rarely, from residues of worked materials remaining on the working edge or surface. The most general functional categories are cutting, and hammering or pounding. In this context, it appears most likely that the blunt-edged "waisted axes" made from limestone or quartzite (Fig. 43) were pounding tools, well suited to the processing of fibrous rhizomes (e.g., bracken or bulrush) for "flour". Tools which are variations on this theme are common throughout the southern and eastern coastal regions of Australia. Because size and weight affect the ways in which a tool may be held and the force that may be applied with it, it is relatively simple to contrast the heavy-duty, hand-held chopping tools and other, medium-to-large sized cutting tools (e.g., more than 5cm long) from the microlithic tools which must have been hafted as cutting tools and spear barbs in order to function at all.

A study of 1164 stone artefacts of quartz, quartzite, limestone, and chert from the Cape du Couedic rockshelter excavations, with a total of 1607 recorded working edges has provided the functional data summarised in Table 2. A range of basic, descriptive categories of damage to artefact working edges was recorded from examination of each piece under a low-power stereo microscope (10X to 80X magnification). To produce Table two, these edge damage patterns were compared with a wide range of experimental data concerning the specific damage patterns produced by working a range of materials (e.g., hardwood, softwood, hide, meat, bone, bark and plant foods) by a range of techniques (e.g., chopping, slicing, scraping, adzing, sawing, drilling, awling, engraving) using the appropriate kinds of stone (Draper, 1991). The study of apparent residues preserved on some of the artefact edges is still in progress at the time of writing, and may further resolve these patterns.

Further information concerning past Aboriginal land use patterns on Kangaroo Island may be derived from studying the locations of the archaeological sites in terms of their resource catchments. Most sites occur on slightly elevated, well-drained land close to freshwater lagoons or streams. The basic camp-site requirements of fresh water, firewood, and proximity to a food supply are met. In addition, such locations provide access to water birds and their eggs, a wide variety of plant foods, and any animals which came to drink at these water sources. Murray Lagoon, with its resource-rich wetlands and fringing forest provides an outstanding example, ringed with archaeological sites containing the full range of quartzite and quartz artefacts recorded from the island. Campsites located in the vegetated dunes perched above the cliffs which line the southern and western coastline of Kangaroo Island were placed to offer access to shoreline resources such as shellfish and sea lion, as well as a wide variety of other local plant and animal foods. Often in these coastal locations, water sources were limited or only seasonally available (e.g., rock pools or small springs).

In rare cases, there is more direct evidence of the food resources used at particular sites. In the coastal sandhills near Pelican Lagoon, Cooper and Condon (1947) reported an eroding camp-site with a surface scatter of emu eggshell, at least eight species of marine mollusc shells, and a range of animal bones including the skull of a rat kangaroo (*Potorous platyops* - as *P. morgani*).

"All these food remains were scattered thickly on mounds showing traces of fire, together with considerable quantities of quartz flakes and also burnt hearthstones. In close proximity were hammerstones and stone implements, the latter mostly comprising characteristic examples of the Kangaroo Island large hand-chopper, which is almost invariably derived from a water-worn quartzite pebble." (Cooper and Condon, 1947).

The bones and shells were preserved in this site because of the calcareous, partially consolidated sand dune in which it was buried. As such faunal remains are exposed through erosion, they rapidly decay and disappear. Other camp-sites preserved within consolidated, calcareous dunes also have been recorded at West Bay, Little West Bay, Cape du Couedic, and Pennington Bay. All of these sites have stone artefacts of quartz and quartzite (both large and small), fireplaces and shellfish remains (but no animal bones have been observed).

The other excavated faunal assemblages recorded from the island come from Seton and Cape du Couedic rockshelters. These sandy-floored limestone rock shelters have protected from the weather the bones of food animals, birds, shellfish, etc., which were consumed and discarded there. In the case of Seton, a relatively small rockshelter (approximately seven metres wide and three metres deep), the site also functioned as a *Sarcophilus* (Tasmanian Devil) lair in between human visits (Lampert, 1981; Hope *et al.*, 1977). These animals also contributed to the faunal assemblage in the shelter and probably even re-worked some of the bone refuse left by humans. Fortunately there are a number of distinguishing characteristics which identify this carnivore/scavenger activity, including a concentration on small animals, the breakage of bones into small, uniform-sized pieces, tooth marks, and an absence of burning. The range of species represented in the Seton faunal assemblage is listed in Table 3. One extinct genus of kangaroo, *Sthenurus*, is represented in the lower occupation layer of the site, and suggests that the local extinction of these animals took place somewhere between 16 00 and 11 000 years ago. The tentative identification of red kangaroo (*Macropus rufus*) in the early occupation layer would seem to indicate a much drier and more open, grassy landscape during the last glacial maximum, when the island was a plateau, with Seton some twenty kilometres inland from the low sea level coastline. The wide range of mammals, birds, reptiles and molluscs present in the assemblage otherwise reflect the fauna of the surrounding mallee and low sclerophyll forests of more recent times, as well from the nearby freshwater lagoon.

Cape du Couedic rockshelter was occupied occasionally from approximately 7 500 to 6 000years ago (Table 2). Apart from pieces of carbonized grass-tree (*Xanthorrhoea* sp.) trunk in many of the fireplaces and cooking pits, and rare leaves and twigs (which may have blown in), plant remains have not been preserved. The introduced *Xanthorrhoea* pieces may have resulted from a number of uses: resin used as glue and for handles on stone tools, or as a yellow pigment, or as an antiseptic, as food (the inner part of the trunk), or as an fragrant inhalant and incense (trunk or leaves). These uses are widely known in South Australian Aboriginal cultures.

The Cape du Couedic faunal assemblage has been analyzed in Draper (1991). Bone and shell are well preserved in the calcareous sand of the archaeological deposit, particularly in the midden extending along much of the back wall of the shelter, below a low, overhanging rock ledge (Figs 46, 47). People camped in this shelter while hunting and collecting food resources along the cliff coast, beaches, and adjacent forests. This period of use appears to have coincided with the presence of a sea lion (*Neophoca cinerea*) colony at the base of the cliff, at a time when the rising post-glacial seas provided a broad beach at the head of the nearby cove. Before 7,500 years ago, the shore was out at the mouth of the cove or beyond, while after 6,000 years ago, the final stage of sea level rise had reduced the beach to a narrow strip of sand and cobbles at the foot of the cliffs. By this time, the sea lions had moved on, and Aboriginal use of the rockshelter ceased.

Sea lions of all ages and both genders were captured. The frequencies of skeletal parts represented in the excavated assemblage, indicate that most of the butchering and cooking, as well as part of the consumption of these animals was performed outside of the shelter, and probably just inland at the margin of the mallee scrub, where firewood and deeper sand for digging earth ovens was available.

Kangaroo (*Macropus fuliginosus*) and wallaby (*M. eugenii*) were hunted, and also cooked and partially consumed away from the shelter. From the regular placement of cut marks on the macropod bones that were introduced to the shelter, it is clear that the furskins were removed for use, probably in the manufacture of cloaks similar to those used on the adjacent mainland in recent times.

Table 2.

The General range of functions consistent with edge damage patterns on stone artefacts from Cape du Couedic Rock Shelter, derived from comparison with tool-use experiments.

Raw Materials: L=limestone, Q=quartz, Z=quartzite, C=chert. (After Draper 1991: Table 4.6)

ACTIVITIES CONSISTENT WITH DAMAGE PATTERNS	adze	anvil	backed blade		broken flake				chopper		chopper flake	core			flake				hammer	
	Q	Z	L	Q	L	Q	Z	C	L	Z	Z	L	Q	Z	L	Q	Z	C	L	Z
chopping wood									X	X		X		X	X					
cutting and sawing wood				X	X	X			X	X	X	X	X	X	X	X	X	X		
scraping wood	X		X	X		X	X			X	X									
adzing/scraping wood (hafted)	X		X	X		X	X						X		X	X	X			
graving wood			X			X									X	X	X			
drilling/piercing wood			X			X									X	X	X	X		
cutting plant fibres			X	X		X	X	X	X	X		X			X	X	X			
cutting plant fibres + sand	X		X			X						X			X	X	X			
drilling/piercing bark													X		X	X	X	X		
butchering (bone contact)	X		X	X		X	X	X	X	X	X	X	X	X	X					
heavy duty butchering (chopping meat + bone)	X								X	X		X		X	X	X	X			
sawing bone							X									X	X			
graving bone							X			X			X	X		X	X			
drilling bone								X							X	X	X			
working animal hide			X			X	X					X		X	X	X	X			
workingl hide + sand			X			X		X				X			X	X	X			
light, non-diagnostic use						X	X					X	X							
battering/pounding		X														X			X	X
backing" or blunting	X		X	X											X		X			
trampling, other post-depositional disturbance						X	X					X	X							
striking platform damage										X		X	X							
edge resharpening?	X									X										

Table 3.

The General range of functions consistent with edge damage patterns on stone artefacts from Cape du Couedic Rock Shelter, derived from comparison with tool-use experiments.

Raw Materials: L=limestone, Q=quartz, Z=quartzite, C=chert. (After Draper 1991: Table 4.6)

ACTIVITIES CONSISTENT WITH DAMAGE PATTERNS	point	Retouch chopper flake	ridge flake	retouched core		retouched flake			retouch segment	rubber	segment		steep scraper	
chopping wood		X		X				X					X	
cutting and sawing wood	X	X	X	X	X	X	X	X			X	X	X	X
scraping wood	X	X	X	X	X	X	X	X	X		X	X	X	X
adzing/scraping wood (hafted)				X	X	X	X	X	X		X	X	X	X
graving wood	X				X	X	X				X	X	X	
drilling/piercing wood					X	X	X				X	X	X	
cutting plant fibres				X		X	X	X			X	X	X	
cutting plant fibres + sand				X		X	X	X	X		X	X	X	
drilling/piercing bark		X				X	X		X		X	X	X	
butchering (bone contact)	X		X	X	X	X	X	X	X		X	X	X	X
heavy duty butchering (chopping meat + bone)	X	X		X		X		X					X	
sawing bone		X				X	X					X		
graving bone	X	X	X		X		X	X	X			X		X
drilling bone	X				X		X					X		
working animal hide				X		X	X				X	X	X	
workingl hide + sand		X		X							X	X	X	
light, non-diagnostic use	X					X	X				X	X		X
abrasion										X				
backing" or blunting													X	X
trampling, other post-depositional disturbance	X						X				X	X		
striking platform damage		X					X	X			X	X		X
edge resharpening?		X		X	X	X	X	X	X				X	X

There is a regular pattern in the range of skeletal parts of large mammals introduced to the site, referable to regular practices of animal processing and consumption throughout the period when the site was in use. Although the body parts brought back to the camp were generally high meat yielding parts, they were not the highest ranking parts from this perspective. For all large mammals, both the most marginal food value parts (e.g., feet or flippers) as well as the highest food value parts (the lumbar-pelvic "saddle" of both macropods and sea lions, macropod tails) are rare to absent in the site. For macropods, the parts most regularly introduced were those high in both meat and marrow value, and all long bones have been smashed open on an anvil to extract the marrow. The heads of both macropods and sea lions were regularly introduced - not for their miniscule meat value, but for roasting and extraction and consumption of the brains. There is a definite emphasis on returning these special "baby" or "geriatric" foods to the site - highly nutritious, easily masticated and digested foods particularly suited to the dietary needs of pregnant or nursing women, children being weaned, or elderly people with few teeth. These also are the least mobile people in a hunter-gatherer society, and are most likely to have remained at camp for the hunting and foraging parties to return with food. Consequently, this site was very probably occupied by family groups which included less mobile elderly people and/or women with young babies.

This interpretation is supported by the wide range of both hunted and gathered foods represented at the site, which suggests that both male and female task groups were operating from the site.

Other gathered foods at the site include a wide range of small mammals, birds, reptiles, and rocky shore shellfish. All of these species are present in the vicinity today, with the exception of the Tasmanian Devil, which is only represented in the faunal assemblage by a small number of juvenile jaws. Marine resources such as fish, crayfish, and deeper water shellfish such as abalone were not exploited for food at this site. Neither were they reported by Cooper and Condon (1947) from the only additional site from which faunal remains (apart from shellfish) have been reported. Certainly the Kangaroo Islanders were living fairly high up the food chain, with numerous unexploited food options still available.

This consideration brings us full circle, to the question of the abandonment of Kangaroo Island by its prehistoric Aboriginal inhabitants. There is no sign in the archaeological record of over-population or nutritional stress. There is no sign of epidemic disease - in fact, no human skeletal remains at all have been discovered on the island to date, and the burial places and practices of the ancient inhabitants remain a mystery. Neither is the archaeological record one of short-term seasonal visits, but of a permanent population who were "mapped on" to the island's geographic and resource variability in detail, though with a considerable margin available for the kind of economic intensification which occurred along the heavily populated lower Murray River, lakes, and Coorong in the last few thousand years.

The most recent dates for Aboriginal occupation of the island so far come from Rocky River (Table 2). There are some inconsistencies among the radiocarbon dates from Rocky River. In the case of Test Pit Three, it appears that a cooking pit dug by Aboriginal people in the past has displaced older charcoal to the surface of the feature, and more recent charcoal to its base. Other disturbances may have been caused through wind and water erosion reworking the unconsolidated sandy earth, and by farming activities over the last century though this could only have affected the upper 30-40cm). Despite these ambiguities, there can be no doubt that Aboriginal people still camped at Rocky River (including the nearby "Tindale megafauna site" - see Tindale *et al*, 1935, Pledge, 1979) only a thousand years ago, and very possibly as recently as 350-400 years ago. The range of stone artefacts present at the Rocky River sites include local quartz, quartzite cobble artefacts originating from the southwest coast, as well as numerous chert artefacts from the eastern end of the island - evidence of the continuity of an island-wide land use pattern to the very end.

Consequently, it appears that permanent Aboriginal occupation of Kangaroo Island ceased only a few hundred years before Flinders and Baudin explored its deserted coastline in 1802, and the archaeological record so far has provided no clues to suggest a cause for this catastrophic abandonment. This element of "the Great Kartan Mystery" (Lampert, 1981) persists, despite several decades of archaeological investigation. Perhaps the abandonment was prompted by catastrophic bushfires or destructive storms, which drove out the population and established its reputation as the "island of the dead", but the effects of which were only dimly apparent to the first European explorers (see Flinders, 1814, Leigh, 1839)

As mentioned at the beginning, ‘Karta’ is a most sacred place for Ngarindjeri, Ramindjeri and Kaurna people from the adjacent mainland. Elders of these tribes maintain their own oral history and traditions pertaining to the island. This cultural knowledge is largely confidential to these people, and has never been researched in detail. It would therefore be a mistake to consider that Kangaroo Island has been in any way divorced from living Aboriginal culture, despite its mysterious past.

Figure 46.
Interior view of Cape du Couedic Rock Shelter. Photo N. Draper.
Showing the excavation of a shell midden/cooking area/stone artefact workshop in the foreground (gridded in 1 x 1 metre squares), and the surface of the midden under the ledge of the rear wall of the shelter, in the background.

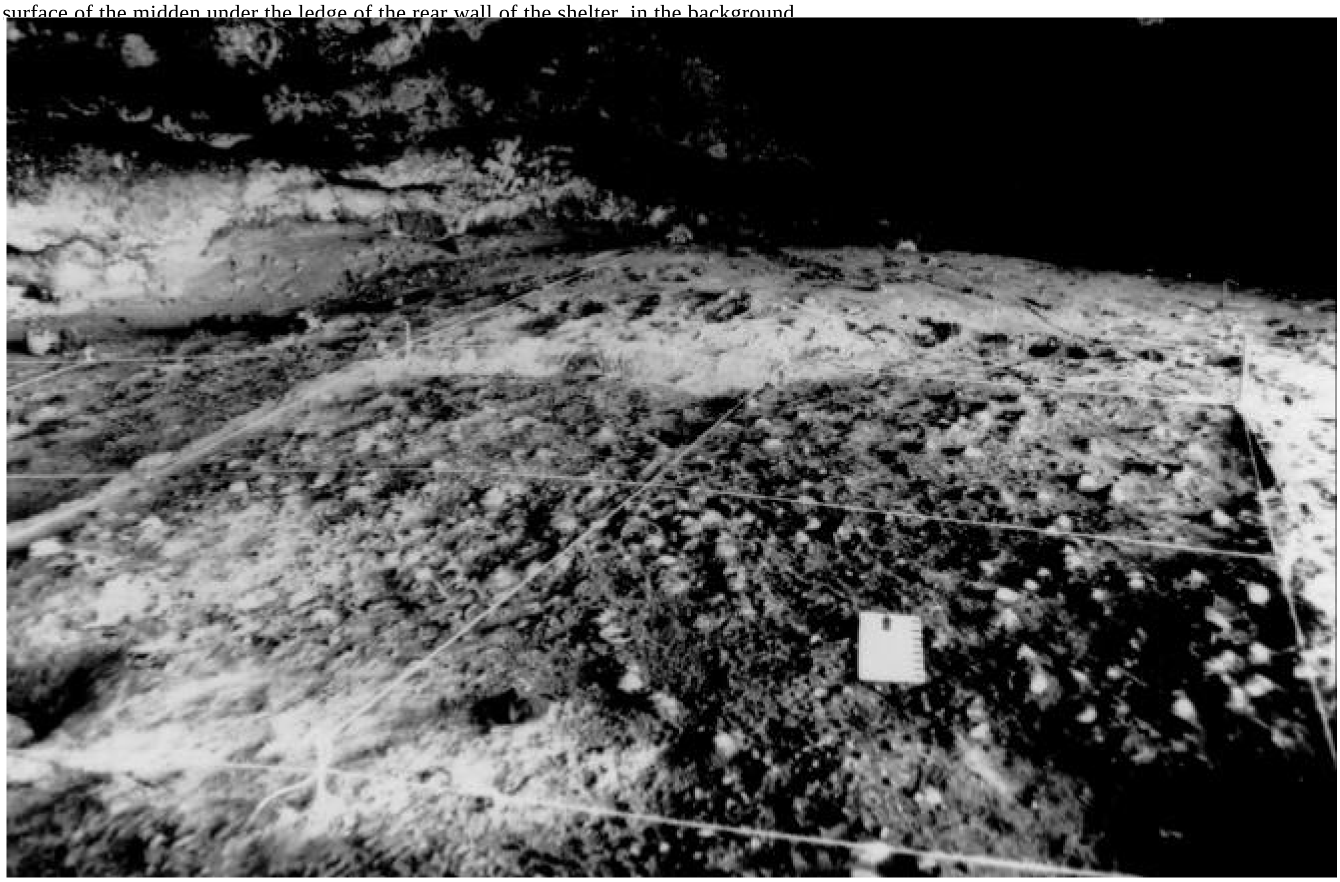

Figure 47.
Sea-lion skull and articulated vertebrae from Cape du Couedic Rock Shelter. Photo N. Draper.
Together with other animals bones and shells, in the midden beneath a ledge along the rear wall of the shelter. (scale in centimetres).

Table 3.

The range of fauna species represented in the Seton Rock Shelter excavations. (data from Lampert 1981: Tables 29-32, Hope *et al*. 1977. Species names updated to current taxonomy)

ORDER	FAMILY	Scientific Name	Common Name
MAMMALS	DASYURIDAE	*Sminthopsis* sp.	Dunnart
		Antechinus cf. *flavipes*	Yellow-footed Antechinus
		Dasyurus cf. *goffroyi/viverrinus*	Westewrn/Eastern
		Dasyurus maculatus	Tiger Quoll
		Sarcophilus harrisii	Tasmanian Devil
	PERAMELIDAE	*Perameles bougainville*	Western Barred Bandicoot
		Isoodon obesulus	Southern Brown Bandicoot
	VOMBATIDAE	*Lasiorhinus latifrons*	Southern Hairy-nosed Wombat
	BURRAMYIDAE	*Cercartetus lepidus*	Little Pygmy Possum
	PHALANGERIDAE	*Trichosurus vulpecula*	Common Brushtail
	POTOROIDAE	*Potorous platyops*	Broad-faced Potoroo
		Bettongia lesueur	Burrowing Bttong
		Bettongia penicillata	Brush-tailed Bettong
		Lagorchestes leporides	Eastern Hare Wallaby
	MACROPODIDAE	*Macropus greyi*	Toolache Wallaby
		Macropus rufogriseus	Red-necked Wallaby
		Macropus cf. *fuliginosus*	Western Grey Kangaroo
		Macropus rufus	Red Kangaroo
		Sthenurus cf. *gillii*	Broad-faced Kangaroo
	MURIDAE	*Rattus fuscipes*	Southern Bush Rat
		Rattus lutreolus	Swamp Rat
		Mastacomys fuscus	Broad-toothed Rat
		Pseudomys occidentalis	Western Mouse
		Pseudomys shortridgei	Heath Rat
		Hydromys chrysogaster	Water Rat
BIRDS		*Pacyptila* cf. *salvinii*	Medium-billed Prion
		Puffinus sp.	Shearwater
		Threskiornis molucca	White Ibis
		cf. *Anseranus semipalmata*	Pied Goose
		Tadorna tadornoides	Mountain Duck
		Anas cf. *superciliosa*	Pacific Black Duck
		Anas cf. *castanea*	Chestnut Teal
		Malacorhynchus membranaceous	Pink-eared Duck
		Hieraetus morphnoides	Little Eagle
		Falco berigora	Brown Falcon
		Coturnix cf. *pectoralis*	Stubble Quail
		Turnix varia	Painted Button Quail
		Rallus phillippensis	Banded Land Ril
		Rallus pectoralis	Lewins Water Rail
		Porzana cf. *fluminea*	Spotted Crake
		Gallinula cf. *mortieri*	Tasmanian Native Hen
		Gallinula cf. *ventralis*	Black-tailed Native Hen
		Burhinus magnirostris	Bush Stone Curlew
		Galinago hardwickii	Japanese Snipe
		Larus novaehollandiae	Silver Gull
		Sterna cf. *nereis*	Fairy Tern
		Ocyphaps lophotes	Crested Pigeon
		Pezoporus wallicus	Ground Parrot
		Lathamus discolor	Swift Parrot
		Hirundo cf . tahitica	Pacific Swallow
		Pterochelidion nigricans	Tree Martin
	MELIPHAGIDAE		Honeyeaters
		Cinclorhamphus cruralis	Brown Songlark
		Grallina cynoleuca	Magpie Lark
		Gymnorhina tibicen	Australian Magpie
		Strepera gracullina	Grey Currawong
		Corvus sp.	Crow/Raven
REPTILES	SCINCIDAE	*Trachydosaurus rugosus*	Shingleback
		Tiliqua nigrolutea	Blotched Bluetongue
		cf. *Egernia whitei*	White's Skink
		Varanus sp.	Goanna
		Ctenophorus sp.	Dragons
	ELAPIDAE		Snakes
MOLLUSCS	GLYCEMERIDAE	*Tucetona flabellatus*	
	MYTILLIDAE	*Brachydontes rostratus*	
		Mytilus planulatus	
	VENERIDAE	*Katelysia* sp.	
	MACTRIDAE	*Donacilla* sp.	
	PATELLIDAE	*Cellana* sp.	
	TROCHIDAE	*Clanculus* sp.	
	ENDODONTIDAE	*Paralaoma* sp.	
		Charopa sp.	
	HYDROBIIDAE	*Potamopyrgus* sp.	
		Pupiphyx sp.	
		Coxiella sp.	
	PLANORBIDAE	*Physastra* sp.	
		Bullinus sp.	
		Gryraulus sp.	
	SUCCINIEDAE	*Australosuccinea* sp.	

EUROPEAN HISTORY

by A C Robinson[1]

INTRODUCTION

Detailed accounts of the European history of Kangaroo Island can be found in a number of sources. Cumpston (1970) details the early years of settlement, South Australian Department of Environment & Planning, National Parks and Wildlife Service (1986) outlines the history of conservation.Agricultural development is covered in Gill (1909), London (1925), Bauer (1952), (1966, 1968), Bowes (1968), Catt (1970) and Cordes (1980) while a fascinating photographic series from 1802-1986 can be seen in Cordes (1986). The built heritage of Kangaroo Island is catalogued in Dallwitz, Marsden and Marsden (1986).

The following brief account covers the main points of the historical sequence while dealing in more detail with the development of conservation and the potential impact of the developing tourist industry.

EARLY EXPLORATION

It is believed that the first European sighting of Kangaroo Island was by Matthew Flinders who reached the north-east coast of the island on his sloop *Investigator* on 20 March 1802. He charted this portion of the coast naming such features as Nepean Bay and Point Marsden. Shore parties noted the very large number of exceptionally tame and easily killed kangaroos, a welcome addition to the seaman's diet and Flinders comments:

"The whole ship's company was employed this afternoon in skinning and cleaning the Kangaroos; and a delightful regale they afforded, after four months privations from almost any fresh provisions ... In gratitude for so seasonable a supply I named this southern land Kangaroo Island". (Flinders, 1814)

Although he did not discover Kangaroo Island; it was Nicholas Baudin in *Le Geographe* who first circumnavigated the island and made several landings. The French place names on the southern and western coasts of the island such as Cape du Couedic and Ravine des Casoars derive from Baudin's voyage but his name for the island - Borda Island - was displaced by the priority of Flinders' Kangaroo Island.

SEALING

Informed by Baudin at King Georges Sound of a large island along the southern coast frequented by a plentiful supply of seals, an American expedition led by Captain Pendleton in the *Union* headed for Kangaroo Island. In February 1803 a party from the vessel landed at what became known as American River and constructed a small whaling boat of 30 ton burthen called the *Independence*.

Within several years after 1803, and until formal settlement in 1836, Kangaroo Island attracted over 500 individual sealers who sought mainly the prized fur-seal skins and seal oil from the sea lion.

“The visitors to Kangaroo Island were almost all from Sydney, Hobart Town and Launceston. There were usually gangs of men employed under Articles of Agreement by merchants from those centres to procure such items as seal-skins, kangaroo skins, salt and wallaby skin rugs, which were to be sold in the business houses in London, Canton, Calcutta... The Articles of Agreement were for a limited period, usually one year of less .. Odd individuals became attracted to the life and settled for a number of years on Kangaroo Island .. A few had aboriginal wives” (Cumpston, 1970).

By the latter half of the nineteenth century, seal numbers had been seriously depleted by excessive harvesting. The last major shipment of fur-seal skins from the island was in 1880 when 5,000 skins were exported. Due to the near extinction of the New Zealand Fur-seal (*Arctocephalus forsteri*) early this century, the South Australian Ornithological Association expressed concern for the safety of one of the few surviving colonies, that on the Casuarina Islets off the south-west coast of Kangaroo Island which was then in nowhere near the numbers observed by Flinders and Baudin.

As a result, on 6 May 1900, the outermost Casuarina Islet was declared a Closed Area in Respect to Birds and Mammals under the Birds Protection Act of 1900. Since that time both the fur-seal and the sea-lion populations have gradually recovered but have still not returned to their pre-sealing numbers

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THE SOUTH AUSTRALIAN COMPANY AND FIRST FORMAL SETTLEMENT ON KANGAROO ISLAND

In the early months of 1836, members of the private syndicate, the South Australian Company, with a group of emigrants on board, set sail for Nepean Bay, Kangaroo Island, with the intention of establishing a settlement. The first ships which embarked were the *John Pirie* and the *Duke of York*, and the latter was the first to arrive at the colony. On board this vessel was the tough operator Samuel Stephens, Colonial Manager of the company. The first settlement of Kingscote was established on 27 July 1836 and the earlier settlers, such as the sealer "Governor" Wally, were soon displaced from their unofficial lands.

The Kingscote settlement can rightfully claim to take precedence over Adelaide as the first 'official' European settlement in South Australia but it soon began to suffer problems, the most important of which was the lack of a reliable water supply. On 2 August 1836 the British settlement contingent which included surveyor Colonel William Light arrived at Kingscote in the brig *Rapid* and after surveying the adjacent coast Light selected the location near the River Torrens as the site for the capital of the Province of South Australia.

Stephens' little community at Kingscote did not prosper and in less than a year there were reports of misbehaviour and drunkenness among the Company's undentured labourers and there was little return from the quantities of stock and equipment imported to the island. In 1837 David McLaren was appointed to replace Stephens but conditions did not greatly improve and by 1840 most of the original settlers had moved back to the mainland.

A few farmers stayed on the island however supplementing their fluctuating agricultural and pastoral income with sealing, whaling and the sale of possum and wallaby skins. As sealing and whaling declined a variety of new pursuits were developed ranging from basalt and gypsum mining to the extraction of resin from the leaf bases of the yacca and the distillation of eucalyptus oil.

The island sheep however continued to suffer from a mysterious ailment known as "coast disease" and crops did not flourish. It was not until the 1930s, with the introduction of superphosphate fertilisers and the discovery by CSIRO scientists that "coast disease" was caused by soil deficiencies in cobalt and copper, that the land was at last opened for real development in primary industry.

Then, soon after the second World War, the initiation of land improvement schemes and a soldier-settlement programme around the inland township of Parndana increased land yield dramatically. By the end of the 1950s the island's population had nearly doubled and the agricultural output was trebled.
The subsequent development of agriculture is graphically shown in the maps in Figure 48 which documents the decline in the area of native vegetation on the island from the time of the first aerial photographs in 1945 to the present time.

The proclamation of the Native Vegetation Management Act in 1990 has essentially ended broad-acre vegetation clearance throughout South Australia and the great challenge facing the island's farming community today is to utilize the agricultural land cleared up to now in a sustainable way into the future.

In the most recent published summary of the economy of Kangaroo Island (Working Party, 1984) includes estimates of primary production including livestock production, cereals, horticulture and fishing. In 1981-82 450 primary producers on the island are estimated to have produced goods worth $23 million. The island sheep population was approximately 1 million mainly producing wool but with some concentration on fat lambs. Beef cattle numbers were 19,000 after peaking at 57,000 in 1973. There were about 1,000 pigs and 140 dairy cattle supplying milk to the local market. Thirteen thousand hectares of land were devoted to cereal production, predominantly oats for stock feed and barley. There was also a small amount of horticulture around Cygnet River supplying the local market. The small Kangaroo Island fishing industry employed about 60 people, many of whom worked in fishing seasonally.

The gypsum deposits from Salt Lake near Pennington Bay are still being mined but are nearing the end of their productive life. There are a number of small manufacturing and construction industries who essentially maintain the buildings and equipment on the island.

In 1981 Agriculture and Fishing employed 40% of the islands workforce and there had been a 17% decline since 1976. The secondary sector employed 43% an increase of 2% since 1976.

TOURISM

Tourism has developed as the second most important industry on Kangaroo Island. Figures are patchy but in 1982/83 it was estimated that tourism contributed $7 million to the islands economy (Working Party, 1984). Numbers of visitors to the island have grown from 19,000 in 1970/71 to 56,000 in 1982/93 to 65,000 in 1984/85 (SEA 1985) and 100 000 in 1992/93 (Kangaroo Island Sustainable Development Strategy, 1995). Based on 1995 projections, visitation is expected to reach at least 180 000 by the year 2000. Tourism to Kangaroo Island is largely dependent on the *natural* resources of the island and people's perception of the quality of these resources. These tourism resources include:

• the large proportion of the island under natural vegetation
• the diversity of habitats and the ease of viewing some animals
• the harmonious juxtaposition of different land uses
• the puzzling Aboriginal record
• the European heritage
• the range of recreation opportunities in the natural environment

A detailed discussion of the profile of Kangaroo Island tourists and an analysis of trends in tourism growth can be found in SEA (1985), SATC (1996) and Mandis Roberts Consultants (1997). It is interesting to note however that 65% of visitors come from South Australia with a majority of these living in metropolitan Adelaide, the average length of stay is 5-6 nights. Day trips however account for approximately 50 000 additional visits annually. Nearly half the visitors are in the 20-39 year age range. Most visitors stay in conventional tourist accommodation with less than 10% choosing to camp. Interstate visitors make up 18% of the total. The majority of International visitors, who also make up 18% of the total, come to the island between October and March. International visitors come from: other European Countries (32%), Germany (21%), USA/Canada (20%), UK/Ireland (11%), Japan (6%), Other Asia (6%) and New Zealand (3%). A comprehensive visitor exit survey is available in KIDB (1998).

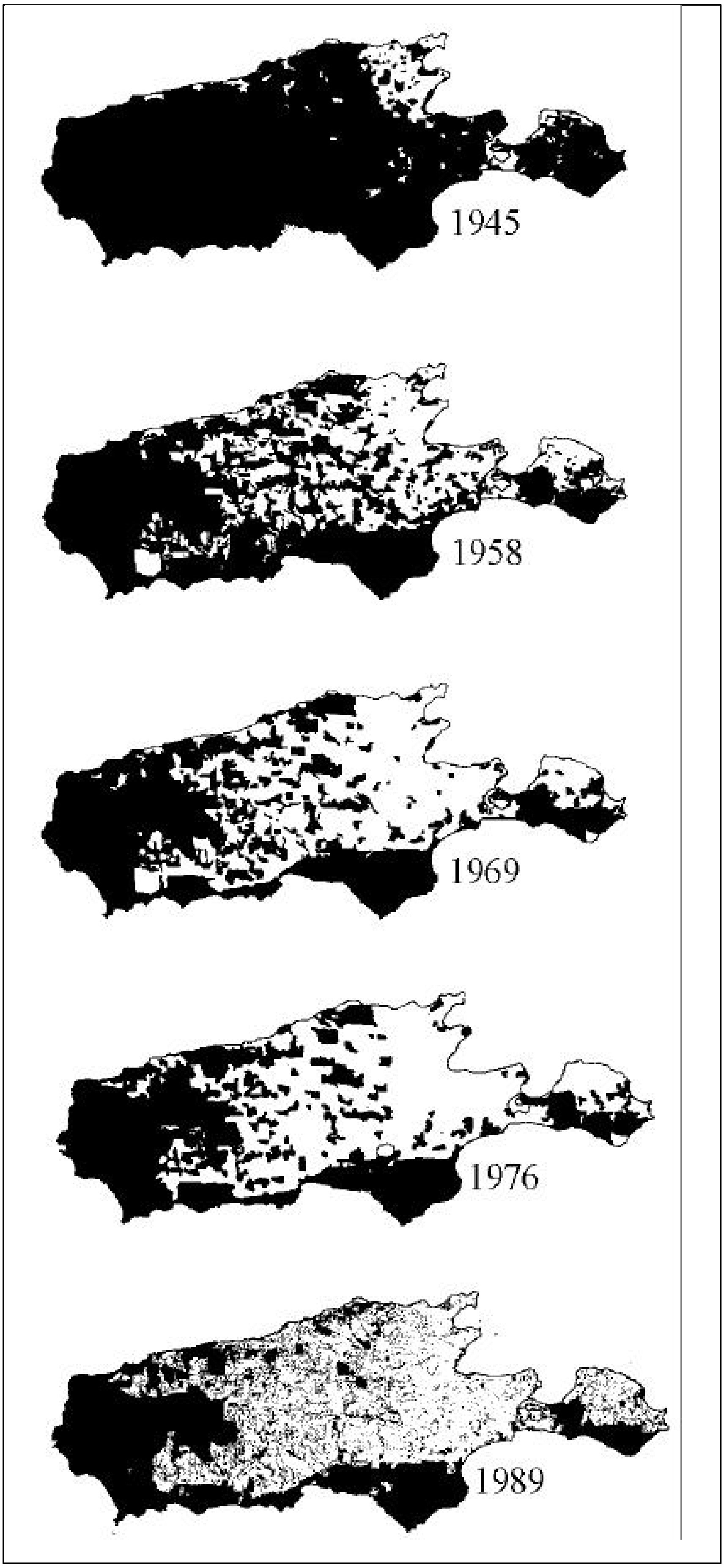

Figure 48.
The clearance of native vegetation from 1945 to 1989 on Kangaroo Island.
Note: data for 1989 is more detailed than for previous years as a result of vegetation mapping associated with this survey.

Table 4.
Animals introduced to Flinders Chase National Park between 1911 and 1957 (S.A.D.E.P., NPWS 1986).
The comments indicate the present status of those introductions which are known to still be present in 1999.

YEAR	NO.	COMMON NAME	SCIENTIFIC NAME	COMMENTS
1911	17	Malleefowl	*Leipoa ocellata*	
1923	2	Malleefowl	*Leipoa ocellata*	
	6	Koalas	*Phascolarctos cinereus*	successful introduction
	2	Cape Barren Geese	*Cereopsis novaehollandiae*	successful introduction c.400 breeding pairs (Baxter 1989)
1924	2	Malleefowl	*Leipoa ocellata*	
	2	Burrowing Bettongs	*Bettongia lesueuri*	
1925	12+yng	Koalas	*Phascolarctos cinereus*	
1926	4	Laughing Kookaburras	*Dacelo novaeguineae*	Small breeding population along Cygnet River (Baxter 1989) this population may be derived from a self-introduction (Ford 1979).
	2	Burrowing Bettongs	*Bettongia lesueuri*	
	1	Hairy-nosed Wombat	*Lasiorhinus latifrons*	
	15	Common Ringtails	*Pseudocheirus peregrinus*	present (1992)
	50	Shingle-backs	*Trachydosaurus rugosus*	
	2	Emus	*Dromaius novaehollandiae*	1 Individual remains (1999)
1928	2	Emus	*Dromaius novaehollandiae*	
	3	Platypus	*Ornithorhynchus anatinus*	successful introduction
1929	2	Cape Barren Geese	*Cereopsis novaehollandiae*	
1932	2	Cape Barren Geese	*Cereopsis novaehollandiae*	
1936	3	Cape Barren Geese	*Cereopsis novaenollandiae*	
	1	Wombat	Prob. *Lasiorhinus latifrons*	
	2	Brush Turkeys	*Alectra lathami*	successful introduction
	6	Malleefowl	*Leipoa ocellata*	Last reported 1947 when thought to have become established (Anon. 1948)
1937	12	Crested Pigeons	*Ocyphaps lophotes*	Last reported 1966 (Condon 1968).
	12	Peaceful Doves	*Geopelia placida*	
	2	Common Wallaroos	*Macropus robustus*	
	4	Common Bronzewings	*Phaps chalcoptera*	Widespread breeding species on KI ?already present on island
	12	Zebra Finches	*Poephila guttata*	Last reported 1937 (DEP 1986).
	4	Diamond Doves	*Geopelia cuneata*	Last reported in Flinders Chase in the early 1980s (DEP 1986).
1940	4	Bar-shouldered Doves	*Geopelia humeralis*	Last reported 1940 (DEP 1986)
	2	Magpie Geese	*Anseranas semipalmata*	Last reported 1940 (DEP 1986)
	2	Spinifex Pigeons	*Geophaps plumifera*	Last reported 1947 (DEP 1986)
	10	Peaceful Doves	*Geopelia placida*	Last reported 1940 (Cleland 1942)
	8	Gang-gang Cockatoos	*Callocephalon fimbriatum*	Small breeding population in Flinders Chase (Baxter 1989)
1941	6	Platypus	*Ornithorhynus anatinus*	
	2	Northern Rosellas	*Platycercus venustus*	
1946	6	Platypus	*Ornithorhynchus anatinus*	
	4	Wonga Pigeons	*Leucosarchia melanoleuca*	Last reported 1947 (Anon. 1948)
	2	Tortoises	*Species unknown*	
1948	3	Malleefowl	*Leipoa ocellata*	
1956	16	Gang-gang Cockatoos	*Callocephalon fimbriatum*	
1957	3	Emus	*Dromaius novaehollandiae*	

CONSERVATION

Kangaroo Island has a most important place in the history of the development of nature conservation in South Australia. A detailed account of conservation history in general can be found in Harris (1974, 1977) while South Australia, DEP, NPWS (1986) describes the establishment of Flinders Chase National Park. The driving force behind the establishment of Flinders Chase, the second National Park in the State was the Field Naturalists Section of the Royal Society of South Australia. Having achieved the successful creation of Belair National Park in 1891 the Field Naturalists turned their attention to the establishment of a major reserve for the conservation of native flora and fauna on Kangaroo Island. The struggle to create this reserve spanned twenty-seven years and culminated in November 1919 with the passing of the Fauna and Flora Reserve Act which created the Flinders Chase National Park. A lively account of the battle can be read in Dixon (1920). Just as the history of the Belair National Park records the changing attitudes to recreation management in the South Australian community over one hundred years, the history of Flinders Chase National Park reflects changing attitudes to wildlife management over a similar period.

Between 1920 and 1972, Flinders Chase was managed by the Fauna and Flora Board, and from its earliest days the area was seen as a place where mainland species of fauna which were considered to be threatened with extinction could be "propagated to contribute to their preservation". There were many proposals for the proper management of the reserve including as a "perfect sanatorium or health resort for future generations of South Australians", for extensive planting of softwood forests or for the establishment of a fur production programme. Only the last of these management options was actually taken up and the trapping of wallabies and possums for their skins by the park ranger paid for a significant proportion of the parks running costs until about 1950. The major activities of the Fauna and Flora Board however consisted of the introduction of fauna. The impact of these introductions is discussed in more detail in subsequent chapters but a list of all known introductions is given in Table 5.

In 1972, management responsibility for Flinders Chase National Park passed to the newly established National Parks and Wildlife Service.

There was also an early interest in the preservation of wildlife on areas of Kangaroo Island other than Flinders Chase. The depredation of the sealing industry described earlier was recognised late last century and in an attempt to preserve the remaining fur-seals on the island, the South Australian Ornithological Association lobbied to preserve the Casuarina Islands off Cape Du Couedic. Accordingly, in 1900 the outermost Casuarina Island was declared a Closed Area with Respect to Birds and Mammals under the Birds Protection Act of 1900. In 1955 following concern that seals on the innermost island were being shot at from Cape Du Couedic this island was also protected. Similar action was taken with the seabird breeding areas at the entrance to the Bay of Shoals on Beatrice and Busby Islets which were protected in 19?/. In 1953 the Field Naturalists Society began work to ensure the proper protection and management of the sea-lions on the south coast of the Kangaroo Island. At this time the island's tourist industry was just beginning and a visit to Seal Bay was then, as now, a mandatory part of any visit to Kangaroo Island. In 1954 Seal Beach became a protected area for sea-lions and in 1967 the area was re-dedicated as a Fauna Reserve under the Fisheries Act. Further details of the development of conservation management for this magnificent area can be found in South Australia, DE., NPWS (1976 1978), Robinson and Dennis (1988).

Many other areas of natural vegetation with conservation significance have now been reserved on Kangaroo Island but perhaps the most notable was the addition of the "Gosse Lands" to Flinders Chase National Park in 1982. As with the original proclamation of Flinders Chase there was a protracted, and at times bitter, battle to achieve this which began in 1978. As the largest intact piece of natural vegetation remaining on Kangaroo Island the addition of the Gosse Lands to Flinders Chase National Park was an extremely significant achievement for conservation in South Australia.

There are now 23 conservation reserves on Kangaroo Island covering 32% of the islands total area and 68% of the remaining area of natural vegetation. Details of the Kangaroo Island reserve system are given in Table 6 and shown in Fig. 49.

Table 5.
A list of the twenty three Conservation Reserves on Kangaroo Island with their date of first establishment and their approximate areas.
W.P.A. is Wilderness Protection Area, C.P is Conservation Park, N.P. is National Park. Dates in brackets indicate year of establishment as conservation parks before conversion to Wilderness Protection Areas in 1993.

NAME	YEAR OF ESTABLISHMENT	APPROXIMATE AREA (ha)
Beatrice Islet C.P.	1967	10
Beyeria C.P.	1987	184
Busby Islet C.P.	1967	10
Cape Gantheaume C.P.	1971	4 220
Cape Gantheaume W.P.A.	1993 (1971)	20 100
Cape Hart C.P.	1971	1 030
Cape Torrens W.P.A.	1993 (1971)	751
Dudley C.P.	1970	1 122
Flinders Chase N.P.	1919	32 600
Ravine des Casoars W.P.A.	1993 (1919)	41 320
Kelly Hill C.P.	1971	2 180
Cape Bouger W.P.A.	1993 (1971)	5 530
Lashmar C.P.	193	188
Lathami C.P.	1987	1 190
Mt Taylor C.P.	1970	18
Nepean Bay C.P.	1974	30
Parndana C.P.	1968	426
Pelican Lagoon C.P.	1967	365
Seal Bay C.P.	1967	1911
Seddon C.P.	1971	23
Vivonne Bay C.P.	1971	1481
Western River C.P.	1971	167
Western River W.P.A.	1993 (1971)	2 373

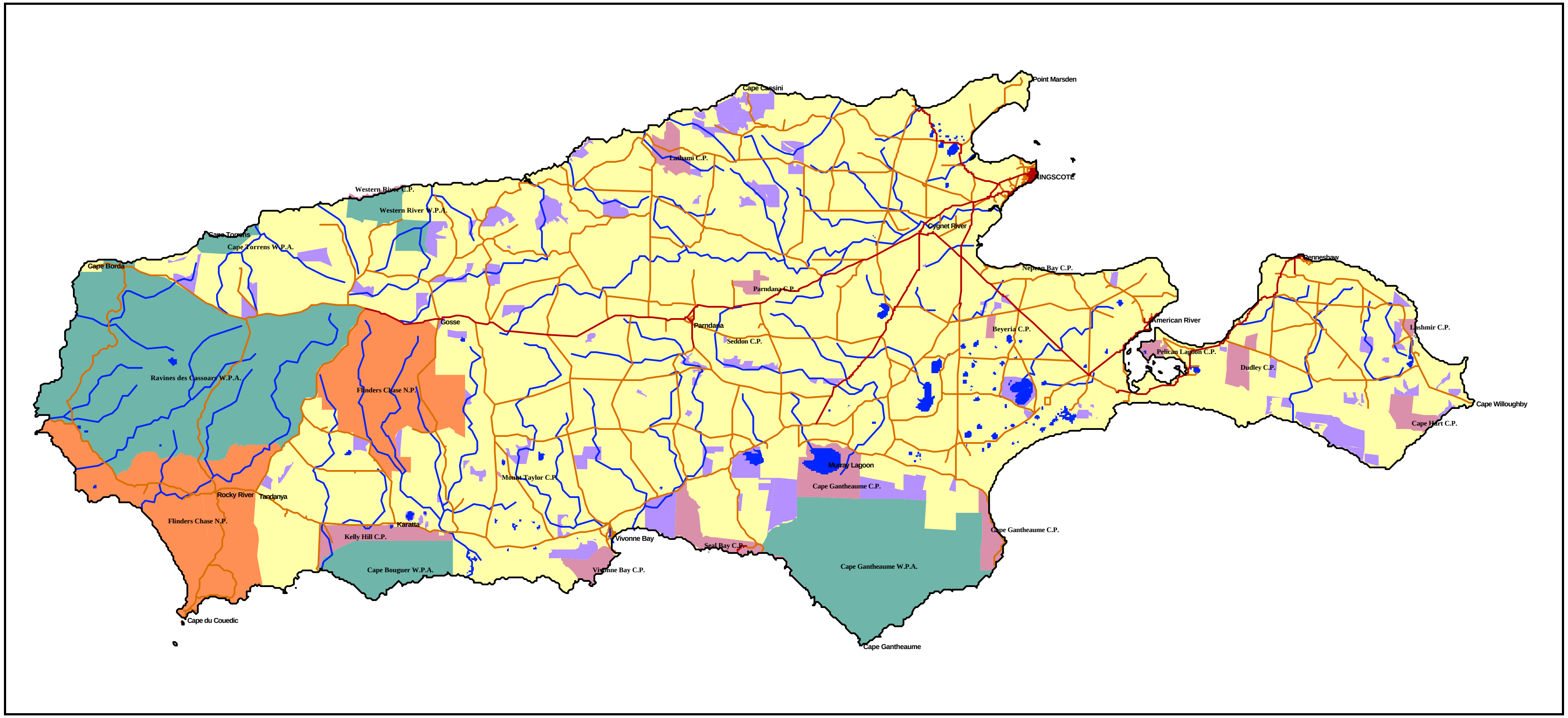

Figure 49.

Location of conservation land on Kangaroo Island. National Parks, Conservation Parks and Wilderness Protection Areas are named, Other shading shows Heritage Agreement Areas

METHODS

By D. M. Armstrong[1] and A. C. Robinson[1]

SITE SELECTION AND NOMENCLATURE

The fundamental concept behind all the regional surveys conducted as part of the Biological Survey of South Australia to date has been that they are based on intensive sampling at a series of SITES selected to represent the biological and geographical diversity of the study area. As the Kangaroo Island survey was the first to be carried out in the agricultural rather than the pastoral lands of South Australia some changes were made to the site selection process. In 1989 a series of 47 sites were selected throughout the island for vegetation sampling. There are eight Environmental Associations (Laut *et al* 1977) recognised for Kangaroo Island and within these there are 14 land units namely: Beach, Cliff, Dune, Interdune Low, Tidal Flat, Undulating Plain, Plain, Lake, Lunette, Floodplain, Hillslope, Crest, Hill and Footslope. Natural vegetation has been cleared to different degrees in each of these Environmental Associations but, within these constraints the sites were selected to include representative natural vegetation proportional in each Environmental Association and covering as many of the Land Units where vegetated sites were still available. Sites were also spaced to give as wide a geographic coverage of the island as possible. Adjustments were made to ensure that there were sample sites located in all the islands National and Conservation Parks and the majority of the Heritage Agreement Areas on private land. All landowners were contacted before the survey to obtain permission to sample and find out details of access and eventually from the 47 sites chosen, 340 quadrats were sampled during the vegetation survey carried out from 6 to 20 November 1989. An additional 29 vegetation quadrats were sampled using the same methods during the Sooty Dunnart survey in February and March 1995 (Herbert 1996).

The survey sampling sites were classified in a systematic manner and the best way to illustrate this is to provide an actual example. SITES are named after towns or geographical features in the vicinity and are referred to with two letter abbreviations. Within a particular Environmental Region (and on a given regional survey) site codes are never duplicated so that by using the hierarchical numbering system developed by Laut *et al* (1977) the complete and unique code for the Kelly Hill site becomes 3.1.1 KH. All the sites in this biological survey are within the Kangaroo Island Environmental Region and so in this publication sites are simply referred to by their letter codes alone. The 47 sites are shown on Fig. 1.

At each of the sites a series of sample QUADRATS were selected. Unlike previous surveys where quadrat sizes of 1 km x 1 km were used, quadrat size in agricultural district surveys was reduced to 30 x 30 m. At each site quadrats were selected to represent the range of habitat variation in the area. The third QUADRAT at the Kelly Hill SITE therefore becomes KH 03. The final level of discrimination is the PATCH TYPE. In the case of agricultural district surveys with 30 x 30 in quadrats the quadrats were generally chosen to fall completely within one habitat PATCH. In coastal foreshore environments and along lagoon and river fringes however even these relatively small sample quadrats were sometimes divided into patches. In the case of KH 03 on the edge of Grassdale Lagoon three patch types were being sampled, the vegetation fringing the lagoon, the emergent water plants and the floodplain woodland. The full designation for the sample site at Kelly Hill Quadrat Three would therefore be:
KH 03 01 Lagoon edge, KH 03 02 Emergent vegetation, KH 03 03 Floodplain woodland

The increased time and effort needed to sample the vertebrate fauna to the standards developed for the Biological Survey of South Australia meant that only a sub-set of 120 of the 340 vegetation quadrats could be sampled. They were selected on the following basis:
i) They provided a roughly even proportion of the number of quadrats within each of the 14 floristic

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groups indicated by a preliminary analysis of the vegetation survey data (Robinson 1990)

ii) They were distributed so as to achieve unbiased representation across the eight Environmental Associations on Kangaroo Island (Laut *et al* 1977)

iii) At least one quadrat was located within the boundaries of all National and Conservation Parks on the island.

An additional 29 quadrats were sampled for vertebrates during the Sooty Dunnart survey in February and March 1995.

The distribution of the vertebrate survey sample quadrats is shown in Fig. 2.

SAMPLING TEAMS

The vegetation survey was carried out over two weeks in November 1989 using eight teams each of two field botanists. Different teams stayed in accommodation throughout the island (Table 7) to reduce the distance to quadrats and provide a place where plant specimens could be processed and data sheets completed each evening.

Table 6.
Location of base camps for the Kangaroo Island vegetation survey.

GROUPS	WEEK 1	WEEK 2	WEEK 3	WEEK 4
A	Cape Borda	Cape Borda		
B	Cape du Couedic	Vivonne Bay		
C	Cape du Couedic	Vivonne Bay		
D	Rocky River	Rocky River		
E			Pelican Lagoon	Pelican Lagoon
F			Pelican Lagoon	Pelican Lagoon
G			Murrays Lagoon	Murrays Lagoon
H			Kingscote	Kingscote

The vertebrate survey was carried out over two consecutive two week blocks in October - November 1990. Each of ten quadrats per week were sampled over four days and four nights. During each fortnight there were three teams of three specialist biologists, a mammalogist, an ornithologist and a herpetologist. Two vehicles were available for each team to enable the ten quadrats to be visited as early as possible each morning. As with the vegetation survey the teams stayed in accommodation spread over the island. (Table 8)

Table 7.
Location of base camps for the Kangaroo Island vertebrate survey.

GROUPS	WEEK 1 21-26 Oct	WEEK 2 27 Oct- 3 Nov	WEEK 3 4-9 Nov	WEEK 4 10-16 Nov
1 + 4	Rocky River	Rocky River	Rocky River	Rocky River
2 + 5	Cape Borda	American River	American River	American River
3 + 6	Stokes Bay	Stokes Bay	Murrays Lagoon	Murrays Lagoon

Examples of sampling techniques in use in the field are shown in Figs 52-55

DATA COLLECTION

On the vegetation survey, standard data sheets were filled out which included a standard description of the location and physical environment and the vegetation within the area of each quadrat. All vascular plants present in the quadrat were recorded and each survey team collected a herbarium specimen of each species encountered during their week of sampling. All specimens were lodged with the State Herbarium for identification or checking of field identifications and, depending on specimen quality, as many specimens as possible were incorporated into the Herbarium collection. Soil sampling and description was carried out at the majority of the sample quadrats selected for the vertebrate survey. On the vertebrate survey each quadrat was sampled using a 50 m long line of six fenced pitfall traps. Traps used consisted of 455 mm x 380 mm sheet of white high impact polystyrene sheet joined into a cylinder using a slotted H section plastic strip (HM12). This resulted in a pitfall trap 125 mm in diameter and 380 mm deep. Using this system the hole depth could be cut when impenetrable rock was encountered. At only six quadrats (LI0401, CC0401, NB0201, LL0201, CD0701 and CG0801) on coastal sheet limestone or waterlogged ground was it not possible to establish a line of pitfall traps.

Figure 50.
Setting up a harp trap for collecting bats at Emu Bay.
Photo: D. Armstrong.

Figure 51.
David Peake-Jones examining a tiny skink.
Photo: B. St John.

Figure 52.
Cath Kemper wading in Larrikan Lagoon.
Photo: G. Carpenter.

Figure 53.
One of the numerous Brushtail Possums caught in cage traps during the vertebrate survey.
Photo: D. Armstrong.

A separate line of 15 Elliott traps was run in association with each pitfall line sampling the same habitat within the quadrat, and a possum/cat size trap was placed at each end. Reptiles and mammals were also sampled by searching each of the ten quadrats at least once during the sampling period.

Birds were recorded for each quadrat (or within each patch for the few quadrats with multiple patches). Observers spent from one to several hours during the best bird observation times of early morning and late afternoon and recorded all birds within or flying over the quadrat during the search period. An attempt was made to put the same amount of search effort into each quadrat during the best observation times. At each site all species of birds seen or heard were recorded. Each observation was noted separately, taking care not to recount individuals or groups of individuals. Care was also taken to exclude those species not associated with the site (e.g. species calling from adjacent vegetation types. If possible, sites were also visited at night to record nocturnal species. Twelve observers were responsible for ten sites each, at a rate of five sites per week.

Due to logistical difficulties the birds of seven sites were not surveyed during the study, leaving 113 sites to analyse.

A permanent photographic monitoring point was established at each quadrat using two 1.4 m long galvanised steel posts set 10m apart. The standard photographs are in Appendix I.

On both the vegetation and vertebrate surveys plants and vertebrates (especially birds and bats) encountered outside quadrats were recorded on special "opportunistic" data sheets. On Kangaroo Island because of the large amount of driving between widely scattered quadrats a large number of opportunist observations of birds and also road kills were recorded.

These opportunistic records were collected to allow:

i) A more thorough inventory of the biota between quadrats, taking in habitats not represented by quadrats (particularly cleared farmland) and allowing some assessment of species' habitat utilisation of a greater array of habitats

ii) Some assessment of variation in biota within habitats beyond that provided by the selected quadrats

iii) Sampling of certain vertebrate groups for which systematic quadrat-based methods are inappropriate, e.g. bats. The limited time for sampling may prevent any exhaustive inventories of bat communities; bats were mostly collected from sites such as pools and dams and other places where they congregate; e.g. flyways. Locations near or within' quadrats were favoured. Mist-nets and harp traps were used for bat sampling

At least the first specimen of each small mammal and reptile species recorded in each quadrat was preserved as a museum specimen. In the case of larger species (ie. *Trichosurus vulpecula*, or *Notechis scutatus*) which had been extensively collected in the past and did not present any identification problems only a few road kill specimens were collected. In addition, to minimise the risk of the less easily distinguished species being overlooked, all captured specimens were examined by the appropriate specialist before being released. Larger series of taxonomically or biogeographically interesting species were taken, as required by the relevant curator at the South Australian Museum.

A small amount of vehicle and walking spotlight searching was carried out both on the quadrats and opportunistically, but the demands of quadrat sampling and specimen processing did not allow this to be carried out systematically.

Samples of liver tissue were taken from all specimens collected and stored in liquid nitrogen. The technique of allozyme electrophoresis was used to help identify difficult groups such as *Vespadelus* and *Sminthopsis.* Tissue samples from all mammals and reptiles are permanently stored at the SA Museum.

Invertebrates were collected from pitfall traps or opportunistically around each quadrat. These samples were lodged with the South Australian Museum. Examples of the field work in progress are shown in Figs 52-55. A summary of the sampling effort over the whole survey is given in Table 8.

The total number of observations of plants and vertebrates during the survey are shown in Table 9. It is this data base which forms the basis for the community analyses presented in this report.

Table 8
Trapping and spotlighting effort during the Kangaroo Island vertebrate survey

Group	Week	Site	Pit Trap Nights	Elliot Trap Nights	Cage Trap Nights	Vehicle Spotlight Hours	Foot Spotlight Hours	Mistnet Hours	Harp Trap Nights
1	1	Rocky River	294	735	98	2	1	0	0
	2	Rocky River	240	600	80	1.5	0	0	2
2	1	Cape Borda	246	645	73	1.5	2	0	3
	2	American River	300	750	85	1	0	0	5
3	1	Stokes Bay	192	600	80	3.5	0	3	3
	2	Kingscote	192	560	72	0	0	3	4
4	3	Rocky River	240	600	80	2	0	4	1
	4	Rocky River	222	660	88	1.5	1	10	5
5	3	American River	290	750	99	4	0	0	0
	4	American River	300	750	100	1	0	0	4
6	3	Murray Lagoon	318	864	116	0	0	0	3
	4	Vivonne Bay	252	625	84	1.5	0	0	0
TOTAL			3086	8139	1055	19.5	4	20	30

Table 9
Total number of individual observations on the survey

TAXON	Quadrats	Opportune	TOTAL
Plants	10275	95	10370
Mammals	1207	256	1463
Birds	3874	930	4804
Reptiles	851	116	967
Amphibians	245	10	255

DATA ANALYSIS

i) Vegetation Classification

Vegetation types and trends were determined using classification and ordination techniques described in Robinson et al (1988) , Copley and Kemper (1992) and Belbin (1991). These techniques were modified to take advantage of the additional site survey data collected for the Kangaroo Island survey. The digital mapping of all native vegetation remnants also enabled further geometric analyses of patch sizes, fragmentation and distribution of mapped vegetation types within and outside the current reserve system.

The Kangaroo Island vegetation data was analysed using the PATN software package to analyse patterns and trends in the data (Belbin 1987), MINITAB statistical software package to investigate the probability that observed trends and groupings occur by chance, and ESRI's ARC/INFO Geographical Informations System software to dispaly species and group distributions and analyse geographic trends in the data.

For a more comprehensive discussion of PATN procedures refer to Belbin (1987, 1991).

Table 10
Cover abundance scores from field data and the equivalent weighting used in the PATN analysis.

Cover Abundance Score	Weighting used in analysis
+	0.1
1	1
2	2
3	3
4	4
5	5

ii) Mammals

The mammal community analysis was carried out on the complete quadrat data set with the exception of the few bat observations and those of introduced species encountered inconsistently and largely by sign on quadrats such as goats, cats, pigs and sheep. The introduced House Mouse, which was sampled consistently in the quadrats, was however included.

iii) Birds

Because birds were sampled by direct observation and often included species such as galahs, corvids and birds of prey flying overhead which could not easily be assigned to a particular habitat, these species were left out of the community analysis. In addition, water birds and shore birds and waders were removed as were species which could only be identified to genus. This reduced the original number of 111 taxa recorded on quadrats to 61 for the final analysis.

iv) Reptiles

Reptiles were recorded by a combination of pitfall trapping and quadrat searches and although the search effort varied to some extent because of time constraints and observer searching skill, the only reptiles not included in the community analysis were snakes, *Aprasia striolata* and *Varanus rosenbergi*.

VEGETATION MAPPING

The vegetation was mapped from 1991 1:40 000 colour aerial photography. Additional information included the use of vegetation information obtained during DEP's (Department of Environment and Planning) vegetation and fauna surveys on KI in 1989, along with 1994 ground truthing of accessible areas of the island. The smallest mappable unit is approximately one hectare, and this is due to the scale of the aerial photographs used.

As much of the island's vegetation is remote with respect to access, there was a significant reliance placed on aerial photo interpretation. Interpretations are never completely accurate and variations from the descriptions may occur in local areas. A considerable amount of remnant vegetation on KI, particularly that occurring along roadsides and creeklines, was too narrow to map at the 1:40,000 scale and is therefore not represented.

Vegetation units were drafted onto 1:40,000 scale mylar film from the aerial photographs and then digitised and stored in ESRI's Arc/Info GIS software. This vegetation data is stored and maintained as part of the Environmental Database of South Australia in the Information and Data Analysis Branch, Planning SA.

COMPILATION OF BIOLOGICAL DATA

Information from a variety of published and unpublished sources on Kangaroo Island was consulted to prepare the introductory sections of this report. As Kangaroo Island is one of the State Herbarium's plant distribution regions, data on all species recorded up to the time of the survey was available. Information on distribution of the more interesting species and on potential taxonomic problems however were checked by consulting the Herbarium collections. The mammal and reptile collections at the South Australian Museum are computerised and specimen records for Kangaroo Island were extracted. Distribution data for some bird species was retrieved by hand. The RAOU Australian Bird Atlas computer file was also available as a source of bird records for the island.

RESULTS

VEGETATION

VEGETATION
by Kinnear, A[1], Carruthers, S.,[1] Goodwins, D.[1], Lang, P.[2] and Robinson, A.[2]

INTRODUCTION

There have been plant collections from Kangaroo Island since the earliest days of South Australian settlement and prior to this survey, the collections of the State Herbarium contained 1052 taxa (named forms including species, subspecies, varieties and introduced species) (Appendix II). A further 10 species were added to these collections as a result of this survey. Notable contributions to the development of our understanding of the island's flora include: Ising, 1923 b; Cleland and Black, 1927, 1941, 1952; Cleland, 1970, and Cleland and Sims, 1970:

The vegetation of Kangaroo Island and its relationship to that on the adjacent mainland has been quite extensively studied. Major contributions were made by Tate, 1883; Wood, 1930, 1939; Baldwin and Crocker, 1941; Northcote and Tucker, 1949; Bauer, 1959; Specht, 1972; 1979; Boomsma and Lewis, 1980; Mowling and Barritt, 1981 and Davies, 1982. This literature lists at least 30 vegetation associations or communities for the island in at least 7 major structural categories.

Attempts to map the vegetation can be found in Wood, 1930, 1936; Baldwin and Crocker, 1941; Northcote and Tucker, 1949; Bauer, 1959 and Fauna and Flora Board, Adelaide, 1979. None of these maps however show all the associations that have been recognised or reconciled the differences in vegetation interpretation between these authors. Lange (1979) has discussed these conflicting interpretations in some detail and has concluded that the vegetation map with 13 units recognised by Bauer (1959) represents the best general treatment of the body of earlier work.

The aim of the present survey was to systematically sample the whole of the remaining vegetation on Kangaroo Island in enough detail to enable a solid floristic vegetation classification to be derived for the total area of remaining vegetation.

TOTAL PLANT SPECIES

A complete list of all plant taxa recorded from the Kangaroo Island in the current and previous studies is detailed in Appendix VI. The total list contains 1179 distinct plant taxa for Kangaroo Island from records in the FLORA database (based largely on collections at the State Herbarium) and on the present survey. The discovery of 10 species not previously known from the island (Table 11), given the broad scale sampling used for this survey suggests that further taxa remain to be discovered. In particular, there is likely to be a number of introduced species and wetland or aquatic species still to be detected on the Island.

A total of 648 taxa or 55% of the total species now known from the island were recorded during the survey at survey sites and a further 4 taxa were recorded opportunistically outside quadrats. Of the 652 taxa recorded, 89 (15.8 %) are alien.

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TABLE 11 Appraisal of apparent new KI records from the Survey as reported in 1989.

Scientific name	In 1989 Census	In 1993 Census	FLORA database 1999	Voucher no or site ID	New KI Record?	Comments
Arenaria leptoclados	N	Y	Y	NPKI 40656	VALID?	Probable new KI record. Recorded as *A. serpyllifolia*.
Asperula conferta	N	N	N	NPKI 20248	VALID	First and only KI collection incorporated at State Herbarium (AD).
Caladenia filamentosa ssp. filamentosa	N	N	N	2 observations PID:4655, 4656	REJECT	Inappropriate name applied to 'dry' material in the field. Probable taxon = ***C.* aff. *filamentosa***
Calandrinia brevipedata	N	Y	Y	NPKI 40820	VALID	First KI collection incorporated at State Herbarium (AD). One other collection made in 1990.
Centrolepis cephaloformis ssp. murrayi	N	N	N	NPKI 20403	REJECT	Misidentification. Redetermined as ***Trithuria submersa*** in 1992.
Critesion murinum ssp. glaucum	N	Y (?)	Y (?)	NPKI 40722	VALID?	Probable new KI record. Determined in 1990 as '*Hordeum? glaucum* Steudel "Anthers pale + fairly long "'
Cyrtostylis reniformis	N	N		Observation at PID 4666	REJECT	Probable misidentification of 'dry' field specimen. Taxon not on KI, but probably refers to similar ***C. robusta***.
Eleocharis acuta	N	Y	Y	NPKI 40132 & observation at PID 4732	VALID	First KI collection incorporated in State Herbarium (AD). Now also represented by four subsequent collections.
Frankenia foliosa	N	N	N	NPKI 40768	REJECT?	Specimen not located at State Herbarium (AD) in 1999. Significant disjunction from main distribution. Unreliable determination in 1990; identity requires confirmation.
Gahnia clarkei	Y	N	N	NPKI 20266	REJECT	Misidentification. Redetermined as ***G. sieberiana*** in 1990.
Gahnia filum	N	N	Y	NPKI 10188	REJECT	Misidentification. Redetermined as ***G. sieberiana*** in 1993.
Gahnia lanigera	N	N	Y	NPKI 20421	REJECT	Misidentification. Redetermined as ***G. deusta*** in 1993.
Galium binifolium	N	N	N	NPKI 40655	REJECT?	Specimen not located at State Herbarium (AD) in 1999. Determination in 1991 recorded as '*Galium* **aff**. *binifolium*'.
Galium gaudichaudii	N	N	N	NPKI 20678	VALID	First and only KI collection incorporated in State Herbarium (AD).
Glycine latrobeana	N	N	N	NPKI 30066	REJECT?	Specimen not located at State Herbarium (AD) in 1999. Unreliable determination in 1990; identity requires confirmation.
Hibbertia exutiacies	N	Y	Y	NPKI 20602	VALID?	Possible first KI collection incorporated at State Herbarium (AD), but collections not located at State Herbarium (AD) in 1999. Taxon is on KI and valid subsequent records exist.
Holcus lanatus	N	N	N	NPKI 20605 NPKI 10791	VALID	First KI collections incorporated in State Herbarium (AD). Now also represented by several subsequent collections.

Scientific name	In 1989 Census	In 1993 Census	FLORA database 1999	Voucher no or site ID	New KI Record?	Comments
Isolepis australiensis	N	N	N	NPKI 10549	REJECT	Misidentification. Specimen NPKI 10549 redetermined as ***I. stellata*** in 1993; specimen NPKI 40789 redetermined as ***I. platycarpa*** in 1994.
Juncus effusus	N	N	N	NPKI 20613	REJECT	Misidentification. Redetermined as ***J. pauciflorus*** in 1993.
Juncus procerus	N	N	N	Observation at PID 4546	REJECT	Field identification unreliable. Taxon not on KI.
Lepidobolus drapetocoleus	N	N	N	Observation at PID 4494	REJECT	Field identification unreliable. Taxon not on KI.
Lobelia pratioides	N	N	N	NPKI 40539	REJECT	Misidentification. Redetermined as ***Comesperma volubile*** in 1990.
Logania linifolia	N	Y	Y	NPKI 30315 NPKI 30555	REJECT	Occurrence on KI already well established by prior collections at State Herbarium (AD).
Lomandra collina	N	N	Y	NPKI 40214	VALID	First and only KI collection incorporated at State Herbarium (AD).
Lotus cruentus	N	N	N	NPKI 40766	REJECT?	Specimen not located at State Herbarium (AD) in 1999. Unreliable determination in 1990; identity requires confirmation.
Medicago minima var. minima	N	N	N	NPKI 40558 & observation at PID 4653	REJECT	Occurrence on KI already established by one prior collection at State Herbarium (AD) made in 1986. Survey collection not located in 1999.
Medicago polymorpha var. polymorpha	N	Y	Y	Observation at PID 4626	REJECT	Occurrence on KI already established by four prior collections at State Herbarium (AD) made in 1985.
Oxalis corniculata ssp. corniculata	N	N	N	Observation at PID 4613	REJECT	Field identification unreliable. Taxon not on KI. Presumed misidentification of similar ***Oxalis perennans***.
Pomaderris oraria	Y	Y+	Y+	15 records	REJECT	Nomenclatural artefact; misapplied name. +Recorded on KI as ***Pomaderris paniculosa***.
Pultenaea largiflorens	N	Y	Y	NPKI 10284 NPKI 40950	REJECT	Occurrence on KI already established by two prior collections at State Herbarium (AD) made in 1987 and 1988. Survey collections represent 3rd and 4th of only 4 collections incorporated at State Herbarium (AD).
Ranunculus inundatus	N	N	N	NPKI 20303	REJECT	Determined as *Ranunculus*? *inundatus* in 1994. Material inadequate for definite determination (submerged growth, lacking fruit).
Ranunculus sessiliflorus var. pilulifer	N	N	N	NPKI 20375	REJECT	Specimen not located at State Herbarium (AD) in 1999. Unreliable determination in 1990; identity requires confirmation.
Ranunculus papulentus	N	N	N	NPKI 20303 & observation at PID 4507	REJECT	Voucher misidentified. Redetermined as '***Ranunculus*? *inundatus*** "submerged growth"' in 1994. Observation at next site presumably based on this voucher.

Scientific name	In 1989 Census	In 1993 Census	FLORA database 1999	Voucher no or site ID	New KI Record?	Comments
Ranunculus pentandrus var. platycarpus	N	N	N	NPKI 20314	REJECT	Specimen not located at State Herbarium (AD) in 1999. Significant disjunction from main distribution. Unreliable determination in 1990; identity requires confirmation.
Rhamnus alaternus	N	N	N	NPKI 40569	VALID	First KI collection incorporated in State Herbarium (AD). Now also represented by several subsequent collections, but populations subject to extermination/control to prevent establishment as a significant bushland weed.
Schoenus deformis	N	Y	Y	NPKI 40215	REJECT	Occurrence on KI already established by one prior collection at State Herbarium (AD) made in 1988. Represents the second record of only two incorporated at AD.
Selaginella gracillima	N	Y		NPKI 30725	VALID	First KI collection incorporated at State Herbarium (AD).
Senecio biserratus	N	N	N	NPKI 40057	REJECT	Misidentification. Redetermined as ***S. minimus*** in 1990
Senecio hispidulus var. hispidulus	N	Y	Y	NPKI 20576 & observation at PID 4552	REJECT	Occurrence on KI already well established by seven prior collections at State Herbarium (AD) dating from 1929.
Stipa densiflora	N	Y	Y	NPKI 40102	REJECT	Occurrence on KI already established by one prior collection at State Herbarium (AD) made earlier in 1989.
Thysanotus baueri	N	N	Y	NPKI 20130 NPKI 20816	REJECT?	One specimen not located at State Herbarium (AD) in 1999. The other, determined as *Thysanotus* sp. in 1990, possibly represents this species but is atypical, and further material is required for confirmation.
Thysanotus nudicaulis	N	N	N	NPKI 20861	REJECT	Misidentification. Redetermined as ***Thysanotus sp.*** in 1990 and possibly represents ***T. baueri*** (qv.).
Tricostularia pauciflora	N	N	N	NPKI 10162 NPKI 10850 NPKI 10888	REJECT	Misidentification. All three collections redetermined as ***Tetraria capillaris*** in 1993.
Trifolium arvense	N	N	N	NPKI 20636 NPKI 40314	REJECT	Occurrence on KI already established by one prior collection at State Herbarium (AD) made in 1986.
Trifolium stellatum	N	Y	Y	NPKI 30270 NPKI 40253	REJECT	Occurrence on KI already established by one prior collection at State Herbarium (AD) made in 1986.
Trigonella suavissima	N	N	N	NPKI 40554	REJECT	Misidentification. Redetermined as ***Melilotus indica*** in 1999
Veronica arvensis	N	N	N	NPKI 30080	REJECT?	Specimen not located at State Herbarium (AD) in 1999.

RELATIVE ABUNDANCE OF PLANT SPECIES

Because of the systematic nature of this survey, it is possible to obtain a quantitative indication of the relative abundance of plant species across the whole study area. The most abundant plant species (occurring in twenty or more quadrats) and their relative abundance during the survey are given in Table12. The fact that only 13 (18%) of the 172 most abundant plant species in the remaining areas of natural vegetation sampled on Kangaroo Island are introduced indicates that the native vegetation is substantially intact with only limited invasion by alien species.

Table 12
The relative abundance of the 172 plant species occurring at 20 or more sample quadrats in the total of 10,275 observations during the Kangaroo Island vegetation survey in 1989. Introduced species are marked with an asterisk; (nv) indicates non-current application of a name. Plant names are shown as applied in 1989 (Appendix VI provides a cross reference to current (1999) nomenclature).

SPECIES	Number	%
Melaleuca gibbosa	155	1.5
Xanthorrhoea semiplana ssp. tateana	134	1.3
Eucalyptus diversifolia	124	1.2
Hibbertia riparia	111	1.1
Correa sp. aff. calycina	108	1.1
Petrophile multisecta	108	1.1
Hakea rostrata	104	1.0
Orthrosanthus multiflorus	101	1.0
Melaleuca lanceolata	98	1.0
Acacia paradoxa	95	0.9
Allocasuarina striata	95	0.9
Banksia marginata	91	0.9
Isopogon ceratophyllus	86	0.8
Astroloma conostephioides	85	0.8
Leucopogon parviflorus	85	0.8
Calytrix glaberrima	80	0.8
Daucus glochidiatus	80	0.8
Acrotriche depressa	78	0.8
Hibbertia aspera (nv)	77	0.7
Eucalyptus cosmophylla	72	0.7
Dianella revoluta var. brevicaulis	71	0.7
Lasiopetalum schulzenii	71	0.7
Astroloma humifusum	70	0.7
Leucopogon concurvus	65	0.6
Hibbertia sericea var. sericea	64	0.6
Calytrix tetragona	63	0.6
Micrantheum demissum	63	0.6
Prostanthera spinosa	60	0.6
Choretrum glomeratum	60	0.6
Poranthera microphylla	60	0.6
Cassytha glabella forma dispar	59	0.6
Hakea muelleriana	59	0.6
Boronia filifolia	58	0.6
Gonocarpus mezianus	58	0.6
Beyeria lechenaultii	57	0.6
Goodenia varia	57	0.6
Acrotriche cordata	56	0.6
Eucalyptus cladocalyx	54	0.5
Adenanthos terminalis	53	0.5

Melaleuca uncinata	53	0.5
* *Anagallis arvensis*	52	0.5
Logania ovata	52	0.5
Tetratheca halmaturina	52	0.5
Acacia myrtifolia (nv)	51	0.5
Billardiera uniflora	51	0.5
SPECIES	Number	%
Drosera auriculata	51	0.5
Lepidosperma viscidum	51	0.5
Leptospermum continentale	51	0.5
Veronica hillebrandii	51	0.5
Boronia edwardsii	50	0.5
Carpobrotus rossii	50	0.5
Dillwynia sericea	50	0.5
Leucopogon rufus	50	0.5
Danthonia setacea var. setacea	49	0.5
Wahlenbergia gracilenta	49	0.5
Daviesia asperula ssp. asperula	48	0.5
* *Vulpia myuros forma myuros*	48	0.5
Eucalyptus rugosa	47	0.5
Eutaxia microphylla var. microphylla	47	0.5
Glischrocaryon behrii	47	0.5
Wahlenbergia gracilenta	47	0.5
Acacia leiophylla	46	0.4
Drosera macrantha ssp. planchonii	46	0.4
* *Lagurus ovatus*	46	0.4
Oxalis perennans	46	0.4
Dodonaea humilis	45	0.4
Banksia ornata	44	0.4
Lepidosperma semiteres	44	0.4
Acrotriche patula	43	0.4
Platylobium obtusangulum	43	0.4
Pultenaea acerosa	43	0.4
* *Aira caryophyllea*	42	0.4
Mitrasacme paradoxa	41	0.4
Eucalyptus baxteri	39	0.4
Cassytha pubescens	38	0.4
Daviesia brevifolia	38	0.4
Gompholobium ecostatum	38	0.4
Thysanotus patersonii	38	0.4
Myoporum insulare	37	0.4
Viola sieberana	37	0.4
Allocasuarina muelleriana ssp. notocolpica	36	0.4
* *Briza minor*	36	0.4
Leptospermum myrsinoides	36	0.4
Phyllota pleurandroides	36	0.4
Senecio lautus	36	0.4
Senecio odoratus var. odoratus	36	0.4
Comesperma calymega	36	0.4
Rhagodia candolleana ssp. candolleana	36	0.4
Baeckea ramosissima ssp. ramosissima	35	0.3
* *Cerastium glomeratum*	35	0.3
Eucalyptus cneorifolia	35	0.3
Pimelea glauca	35	0.3
Isolepis nodosa	34	0.3
Pultenaea viscidula	34	0.3

Sonchus oleraceus	34	0.3
Lepidosperma laterale	33	0.3
Stackhousia aspericocca ssp.”One-sided inflorescence”(W.R.Barker 697)	33	0.3
Olearia ramulosa	32	0.3
Pelargonium littorale	32	0.3
Stipa flavescens	32	0.3
Stipa hemipogon	32	0.3
Microtis frutetorum	31	0.3
Pomaderris obcordata	30	0.3
** Desmazeria rigida*	29	0.3
Eucalyptus fasciculosa	29	0.3
Hibbertia prostrata	29	0.3
SPECIES	Number	%
Leptomeria aphylla	29	0.3
Olearia axillaris	29	0.3
Swainsona lessertiifolia	29	0.3
Thomasia petalocalyx	29	0.3
Bulbine semibarbata	28	0.3
Comesperma volubile	28	0.3
Acacia retinodes var. retinodes	27	0.3
** Centaurium spicatum*	27	0.3
Clematis microphylla	27	0.3
Dodonaea viscosa ssp. angustissima	27	0.3
Helichrysum leucopsideum	27	0.3
Pimelea serpyllifolia ssp. serpyllifolia	27	0.3
Samolus repens	27	0.3
Schoenus breviculmis	27	0.3
Stipa exilis	27	0.3
Allocasuarina verticillata	26	0.3
Conospermum patens	26	0.3
Drosera whittakeri	26	0.3
Grevillea pauciflora ssp. pauciflora (nv)	26	0.3
Lepidosperma carphoides	26	0.3
Leucopogon costatus	26	0.3
** Trifolium campestre*	26	0.3
Acacia spinescens	25	0.2
Callistemon rugulosus var. rugulosus	25	0.2
Centrolepis strigosa	25	0.2
Darwinia micropetala (nv)	25	0.2
Goodenia blackiana	25	0.2
Grevillea quinquenervis	25	0.2
Hakea vittata	25	0.2
Pimelea stricta	25	0.2
** Aira cupaniana*	24	0.2
Centrolepis strigosa	24	0.2
Drosera pygmaea	24	0.2
Grevillea ilicifolia var. ilicifolia	24	0.2
Melaleuca brevifolia	24	0.2
Podotheca angustifolia	24	0.2
Adenanthos macropodiana	23	0.2
Apium annuum	23	0.2
Muehlenbeckia adpressa	23	0.2
Sebaea ovata	23	0.2
Acrotriche affinis	22	0.2
Bertya rotundifolia	22	0.2

Cassytha melantha	22	0.2
Caustis pentandra	22	0.2
Dichondra repens	22	0.2
Galium migrans	22	0.2
* *Hypochoeris glabra*	22	0.2
Parietaria debilis	22	0.2
Phyllanthus australis	22	0.2
Spyridium halmaturinum var. integrifolium	22	0.2
Acacia retinodes var. uncifolia	21	0.2
Baumea juncea	21	0.2
Cerastium semidecandrum	21	0.2
Correa decumbens	21	0.2
* *Galium murale*	21	0.2
Lasiopetalum discolor	21	0.2
* *Vulpia bromoides*	21	0.2
Acrotriche affinis	20	0.2
Billardiera cymosa	20	0.2
Eucalyptus lansdowneana ssp. albopurpurea	20	0.2
Poa halmaturina	20	0.2
SPECIES	Number	%
Pomaderris oraria (nv)	20	0.2
Spyridium phylicoides	20	0.2
Rostraria sp.	20	0.2
Tetratheca insularis	20	0.2
Thysanotus juncifolius	20	0.2

Kangaroo Island supports a surprisingly rich and diverse flora for its size. Families which are well represented on Kangaroo Island are those characteristic of the higher rainfall areas of South Australia in general such as Leguminosae, Myrtaceae, Cyperaceae, Orchidaceae, Liliaceae, Epacridaceae, Rhamnaceae, and Umbelliferae. The families Gramineae and Compositae are well represented throughout South Australia regardless of rainfall while the Chenopodiaceae are more characteristic of lower rainfall areas such as on Eyre Peninsula.

Given this apparent diversity, an alternative view of the adequacy of the sampling can be obtained by examining a species acquisition curve for the sites and comparing it with the known total species for the region. The curve for this data set is represented in Figure 54. Of the 1179 vascular plant taxa species recorded for the island, 652or 55% were collected on the survey. As shown by Figure 54 a 10-fold increase in sampling intensity would be required to sample each species.

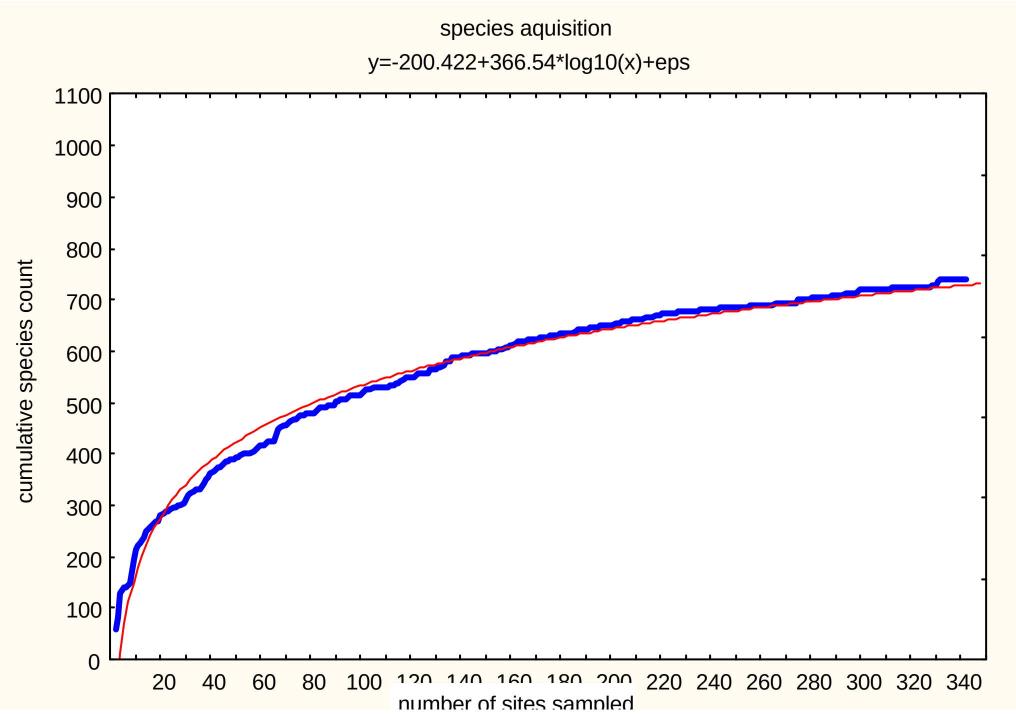


Figure 54 Accumulation of unique species records for each site.
The equation for the fitted curve (thin line) enables the calculation of the number of sites that would be required to sample each of the known plant species for the island. In this case in excess of 340 sites would be required to sample each species at least once.

Table 13 details the representation of species records for selected families found on Kangaroo Island. This table indicates that major Families are well represented in the survey sample data set.

Table 13
Comparison of observations of selected plant families with the known Flora (based on 1989 census data)

FAMILY	Total # Species in this Family found on KI	# species from each family recorded	# records in the Survey
Leguminosae	81	63	987
Myrtaceae	47	41	1233
Cyperaceae	62	47	423
Orchidaceae	67	42	223
Liliaceae	31	21	390
Epacridaceae	23	22	664
Rhamnaceae	25	21	180
Umbelliferae	27	17	174
Gramineae	107	67	716
Compositae	103	65	517
Chenopodiaceae	29	13	89

PLANT SPECIES DIVERSITY BY SITE
On average, 30 plants were recorded at each site surveyed. Some sites were much more diverse whilst others contained fewer species. At the most diverse site, 84 species were recorded. The least diverse sites, which were saline wetlands near Pelican Lagoon, had 4 plant species.

This data is represented in Figure 55

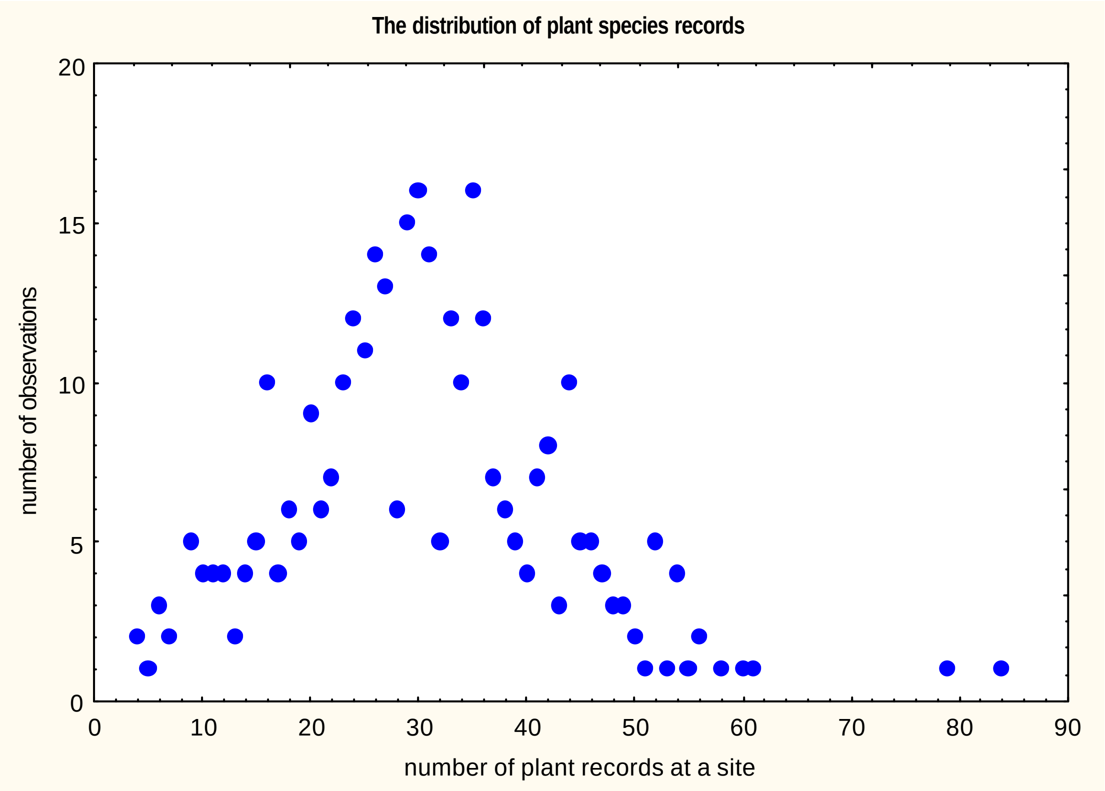


Figure 55.
Plant species diversity of survey sites in the Kangaroo Island biological survey.

The data indicates that the Island's vegetation contains relatively few exotic species, however the sampling methodology is such that sites are likely to have been placed in the "best" areas of vegetation and for this reason exotic species are likely to be under-represented. In total, less that 1% of the Survey's site records were of exotics whilst in terms of unique species, the figure is approximately 14%. Figure 56 shows that the majority of exotic species occur quite rarely with few found at more than 40 of the 341 sites. The most commonly encountered exotic was *Anagallis arvensis* (Pimpernel) (52 records). *Myrsiphyllum asparagoides* (Bridal Creeper) which occurred at 18 sites, is probably the most significant of the exotics in that it has a demonstrated potential to severely degrade the natural values of native vegetation. Additional weed species are almost certainly present in areas of pasture or cropland.

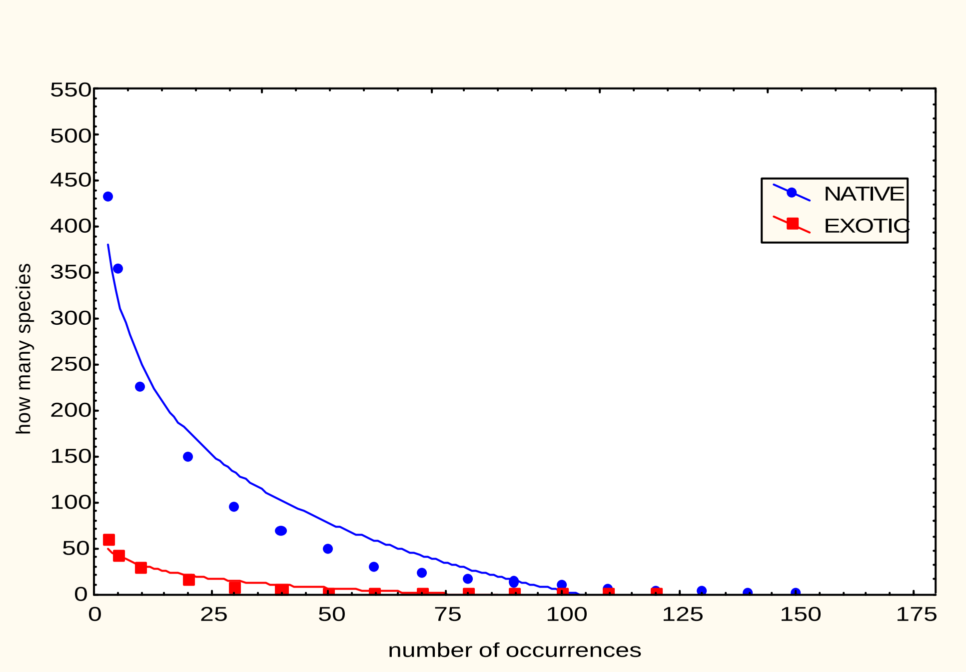


Figure 56.
Distribution of native and exotic species in the Kangaroo Island Biological Survey dataset.

A similar pattern of distribution within the data is shown by the native species. Most occurred infrequently whilst a small number occurred quite frequently. Ten common plant species account for approximately 10% of all plant records and less than 25 species for 20% of the records.

There are a number of hypotheses that could explain the predominance within the dataset of species such as *Melaleuca gibbosa* (155 records), *Xanthorrhoea semiplana* ssp. *tateana* (134 records), *Eucalyptus diversifolia* (124 records) or even *Acacia paradoxa* (95 records). It could be that these species are exceptionally good generalists that are able to tolerate a wide range of variation within such environmental factors as soil type, soil water availability, slope, aspect, pH, subsurface geology etc and this is reflected by their abundance within a diverse range of floristic units. Alternatively the habitats and plant communities for which they are adapted, could occupy the majority of the uncleared land remaining on the island and their prominence in the data reflects this.

SIGNIFICANT SPECIES

Species endemic to Kangaroo Island

There are currently 45 vascular plant taxa recognised as being endemic to Kangaroo Island (Table14) A further 11 taxa are 'almost endemic', having only a minor part of their distribution in an adjoining region (Table15) This is a relatively high level of regional endemism, comparable to that of the Grampians in Victoria, which is well known for its endemic flora.

Many Kangaroo Island taxa also exhibit quite obvious morphological differentiation from their populations on the mainland (for example the Island populations of *Zieria veronicea* have smaller flowers than in the mainland form). It is likely that some of the more distinct forms will be described as separate, endemic taxa in the future.

Table 14.
Vascular plant taxa endemic to Kangaroo Island.

Scientific Name	Common name
Acacia myrtifolia var. angustifolia	narrow-leaf myrtle wattle
Achnophora tatei	Kangaroo Island river daisy
Acrotriche halmaturina	Kangaroo Island ground-berry
Adenanthos macropodiana	Kangaroo Island gland-flower
Allocasuarina muelleriana ssp. notocolpica	Kangaroo Island oak-bush
Asperula euryphylla var. tetraphylla	broad-leaf woodruff
Bertya rotundifolia	round-leaf bertya
Beyeria subtecta	Kangaroo Island turpentine bush
Brachyloma ericoides ssp. bicolor	Kangaroo Island brush heath
Calytrix smeatoniana	Kangaroo Island heath-myrtle
Cheiranthera volubilis	twining hand-flower
Correa backhouseana var. orbicularis	Kangaroo Island round-leaf correa
Correa calycina var. halmaturorum	De Mole River correa
Correa reflexa var. insularis	
Cryptandra waterhousii	
Dampiera lanceolata var. insularis	Kangaroo Island dampiera
Eucalyptus remota	Kangaroo Island mallee ash
Gahnia hystrix	spiky saw-sedge
Grevillea muricata	rough spider-flower
Grevillea quinquenervis	five-veined grevillea
Grevillea rogersii	Rogers' spider-flower
Hakea aenigma	enigma hakea
Hibbertia "humilis" (H.R.Toelken 9196):	
Hibbertia obtusibracteata	
Irenepharsus phasmatodes	Kangaroo Island cress
Leionema equestre	Kangaroo Island phebalium
Logania insularis	Kangaroo Island logania
Logania scabrella	rough logania
Olearia ciliata var. squamifolia	Kangaroo Island fringed daisy-bush
Olearia microdisca	small-flower daisy-bush
Petrophile multisecta	Kangaroo Island conesticks
Pimelea macrostegia	Kangaroo Island riceflower
Platysace heterophylla var. tepperi	Kangaroo Island platysace
Pultenaea insularis	Beyeria bush-pea
Pultenaea teretifolia var. brachyphylla	short-leaf bush-pea
Pultenaea trifida	Kangaroo Island bush-pea
Pultenaea villifera var. glabrescens	splendid bush-pea
Spyridium bifidum var. integrifolium	
Spyridium eriocephalum var. glabrisepalum	MacGillivray spyridium
Spyridium halmaturinum var. integrifolium	Flinders Chase spyridium
Spyridium halmaturinum var. scabridum	rough spyridium
Stylidium tepperianum	Kangaroo Island trigger-plant
Tetratheca halmaturina	leafless Kangaroo Island tetratheca
Tetratheca insularis	Kangaroo Island tetratheca
Thysanotus fractiflexus	zig-zag fringe-lily

Table 15.

Vascular plant taxa largely confined to Kangaroo Island.

Scientific Name	Common name
Asterolasia muricata	rough star-bush
Calytrix glaberrima	smooth heath-myrtle
Correa decumbens	spreading correa
Daviesia asperula ssp. asperula	Kangaroo Island bitter-pea
Eucalyptus cneorifolia	Kangaroo Island narrow-leaf mallee
Eucalyptus phenax ssp. 'Kangaroo Island'	
Hibbertia 'confundens'	
Hibbertia empetrifolia ssp. radians	
Hydrocotyle crassiuscula	spreading pennywort
Lepyrodia valliculae	Kangaroo Island scale-rush
Pultenaea viscidula	dark bush-pea

To further examine the level of endemism in the Kangaroo Island flora it is useful to consider the adjacent regions on Eyre, Yorke and Fleurieu Peninsula which, together with Kangaroo Island, make up what may be referred to as the Southern Gulfs Region. These four regions, isolated by sea and also, in the case of the peninsulas, adjoining areas of more arid land, contain similar edaphic and climatic zones with areas of relatively high rainfall, extensive areas of lateritic soils (excepting Yorke Peninsula) and sheet limestone (more limited on Fleurieu Peninsula). They are represented here by the Herbarium regions KI, EP, YP and SL.

Kangaroo Island is the region with the greatest number of endemic vascular plant taxa (45). It is followed by Eyre Peninsula, much larger in area, which has 39 endemic taxa (but at least 6 of these taxa are confined to the semi-arid northern Gawler Ranges and should be excluded from the comparison). The Southern Lofty region, despite its greater topographic relief (providing potential refugia as a stepping stone for speciation), has only 13 endemic taxa and Yorke Peninsula has none.

Overall, 134 taxa (amended to exclude the 6 Gawler Ranges taxa) are endemic to the Southern Gulfs Region, and of these 81 (60%) occur in KI, compared to 58 (43%) in EP, 38 (28%) in SL and 12 (9%) in YP. Table 16 lists the 81 Southern Gulf endemic plants that occur on Kangaroo Island. The region that shares the most Southern Gulf endemic plants with Kangaroo Island is SL (22) followed by EP (9) and YP (5). This data is consistent with the fact that southern Eyre Peninsula has been isolated the most from Kangaroo Island and the other regions by rising sea levels (leading to relatively high regional endemism), whereas the closest (and most frequent) connection has been between Kangaroo Island and Fleurieu Peninsula (SL) reflected in the large number of shared endemic taxa.

Table 16.
Taxa endemic to the Southern Gulfs Region that occur on Kangaroo Island and adjacent mainland region(s).

Scientific name	Common name	Distribution
Eucalyptus lansdowneana ssp. albopurpurea	purple-flowered mallee box	EP KI
Hibbertia paeninsularis	peninsula guinea-flower	EP KI
Lasiopetalum "Cordate-leaved"(H.P.Vonow 810)	heart-leaf velvet-bush	EP KI
Olax obcordata		EP KI
Ptilotus beckerianus	ironstone mulla mulla	EP KI
Senecio odoratus var. longifolius	narrow-leaf scented groundsel	EP KI
Thryptomene ericaea	heath thryptomene	EP KI
Wurmbea decumbens	trailing star-lily	EP KI
Billardiera uniflora	one-flower apple-berry	EP SL KI
Micrantheum demissum	dwarf micrantheum	EP SL KI
Pultenaea trinervis	three-nerve bush-pea	EP SL KI
Acacia triquetra	mallee wreath wattle	EP YP KI
Caladenia aff. filamentosa	crimson daddy-long-legs	EP YP KI
Pultenaea rigida var. rigida	rigid bush-pea	EP YP KI
Logania crassifolia	coast logania	EP YP SL KI
Podolepis rugata var. littoralis	coast copper-wire daisy	EP YP SL KI
Xanthorrhoea semiplana ssp. tateana	Tate's grass-tree	EP YP SL KI
Acrotriche fasciculiflora	Mount Lofty ground-berry	SL KI
Asterolasia muricata	rough star-bush	SL KI
Caladenia ovata	Kangaroo Island spider-orchid	SL KI
Calytrix glaberrima	smooth heath-myrtle	SL KI
Correa calycina		SL KI
Correa decumbens	spreading correa	SL KI
Cryptandra hispidula	rough cryptandra	SL KI
Derwentia derwentiana ssp. anisodonta	Kangaroo Island speedwell	SL KI
Derwentia derwentiana ssp. homalodonta	Mt Lofty speedwell	SL KI
Drosera praefolia	early sundew	SL KI
Eucalyptus cneorifolia	Kangaroo Island narrow-leaf mallee	SL KI
Eucalyptus phenax ssp. 'Kangaroo Island'		SL KI
Hibbertia empetrifolia ssp. radians	scrambling guinea-flower	SL KI
Hydrocotyle crassiuscula	spreading pennywort	SL KI
Lepyrodia valliculae	Kangaroo Island scale-rush	SL KI
Paracaleana aff. nigrita	black-beak duck-orchid	SL KI
Pultenaea viscidula	dark bush-pea	SL KI

Finally, the Kangaroo island flora is of interest because it supports a number of interstate taxa that do not occur elsewhere in South Australia (Table 17). It is puzzling as to why these relicts of previously more widespread taxa were able to persist on Kangaroo Island but not in the Southern Mount Lofty Ranges.

Table 17.
Biogeographically significant occurrences on Kangaroo Island (taxa with their sole South Australian occurrence on Kangaroo Island and disjunct occurrences outside South Australia).

Scientific Name	Common name	Distribution outside KI
Asperula pusilla	alpine woodruff	NSW VIC TAS
Asperula euryphylla+	broad-leaf woodruff	NSW VIC
Asterolasia phebalioides	downy star-bush	VIC
Bauera rubioides	wiry bauera	QLD NSW VIC TAS
Chenopodium erosum	papery goosefoot	QLD NSW TAS New Zealand
Hibbertia empetrifolia+		NSW VIC TAS
Hydrocotyle diantha	Kangaroo Island pennywort	WA
Myriophyllum pedunculatum	mat milfoil	TAS VIC
Nymphoides geminata	Entire marshwort	QLD NSW VIC New Guinea
Pultenaea villifera+		NSW
Rhytidosporum procumbens	white rhytidosporum	QLD NSW VIC TAS
Zostera capricorni	eel-grass	QLD NSW

+ indicates infraspecific taxon endemic to Kangaroo Island.

DESCRIPTIONS OF SELECTED SIGNIFICANT SPECIES

Asterolasia phebalioides **Downy star-bush** (Fig. 99)

A slender, sparingly branched shrub to 1m high with velvety grey stems and leaves, and bearing conspicuous star-shaped bright yellow flowers.

This species was only discovered on Kangaroo Island in 1985 by Beverley Overton in heathy vegetation on the Playford Highway. It was hitherto regarded as endemic to the Grampians and Little Desert region of Victoria (Overton & McKelvey (1990b). The sole South Australian population is contained within an area of c. 1600m x 400m, most of it falling within the northern part of Flinders Chase National Park. This population, comprising an estimated 50,000 plants, was almost entirely burnt out by bushfire in 1990. The post-fire recovery and other ecological aspects of *A. phebalioides* have been studied by Overton (1998).

Asterolasia phebalioides occurs in Floristic Group 20 Kangaroo Island mallee ash *Eucalyptus remota* Low mallee (over *Banksia ornata* Heath). It was not recorded on this survey.

***Correa calycina* var. *halmaturorum* De Mole River correa**

A medium-sized shrub with a rusty tomentum, soft leaves, and green tubular flowers. Known only from the de Mole River where it grows along the riverbanks in sugar gum (Eucalyptus cladocalyx) forest. This variety was only recently described and split from the mainland taxon (var. calycina) which is confined to the Fleurieu Peninsula (Wilson, 1998).

***Derwentia derwentiana* ssp. *anisodonta* Kangaroo Island speedwell**

A leafy, herbaceous to softly woody perennial plant to 2m high, bearing dense, terminal, erect spikes of small white to pale-lilac flowers. The subspecies epithet *anisodonta* refers to the uneven-sized teeth on the leaf margin, the principal feature distinguishing it from ssp. *homalodonta,* which is virtually confined to the Mount Lofty Ranges

Occurs sporadically, usually as widely scattered or isolated individual plants along stream banks.
No records of this taxon were made during the survey.

Hakea aenigma **enigma hakea**

An erect shrub to 2.5 m tall with strap-like leaves and small globular clusters of white flowers borne along the stem in the leaf axils.

This rare species is endemic to the northwestern end of Kangaroo Island where it occurs in heathy vegetation on the upper parts of the lateritic plateau. It is an intriguing plant that has sterile pollen, lacks a nectar gland, and never forms a fruit. It reproduces only by suckers, and thus lacks the genetic resilience of sexually reproducing species. *Hakea aenigma* was described as a new species by Haegi & Barker (1985). The authors made the following comment. 'Despite the limited capacity of *H. aenigma* to spread because of its reliance on suckering from horizontal roots, it has attained a range of approximately 30 x 15 km. Effectively a single clone, the species could represent one of the oldest plants known.' It was recorded once on this survey.

Leionema equestre **Kangaroo Island phebalium**
(Until recently known as ***Phebalium*** *equestre*.)

A dwarf, densely tangled shrub to 30 cm tall, with unusual tiny saddle-shaped leaves. The small starry flowers are white above and pinkish below.

Leionema equestre is endemic to Kangaroo Island and very restricted in its distribution, occupying a range of c. 15 km in the MacGillivray plains area in the Hundred of Haines. It is allied to two other South Australian endemic species of *Leionema* on the mainland, *L. brachyphylla* and *L. hillebrandii*, and was confused with these until it was recognised as distinct species by Cooke (1987).

The typical plant community corresponds to Floristic group 1 (*Eucalyptus diversifolia* over *Melaleuca uncinata*), although the species was not sampled in this survey.

The highest densities of *L. equestre* occur in disturbed native vegetation along road verges and fencelines. The species is seriously threatened by roadworks, competition from Veldt grass (*Ehrharta calycina*) and bridal creeper (*Myrsiphyllum asparagoides*), and possibly dryland salinity in the longer term (Lang, 1992).

The conservation status, biology, and management of this species has been studied by Jusaitis (1999), Overton, Overton & McKelvey (1990a), Overton & Overton (1992a) and Davies (1992).

Petrophile multisecta **Kangaroo Island conesticks**

A prickly shrub to 60 cm tall with a dense cushiony habit and cream flowers clustered in cones towards the summit of branches.

This species is of particular interest as a Kangaroo Island endemic species. It is puzzling that this species is so widespread and abundant on the Island (it is represented by 109 records in this survey) but is completely absent on the mainland despite the presence of much similar habitat on Fleurieu Peninsula.

Rhytidosperma procumbens **white marianth**
(Until recently known as ***Billardiera*** *procumbens* in SA)

An unobtrusive, erect subshrub to 5 to 30 cm tall with small white flowers superficially resembling those of *Leionema equestre*. It is readily distinguishable from *Billardiera* by its erect habit, small leaves and its fruit which is a capsule rather than a berry.

Found in the high rainfall zone on the western end of the Island in the Hundred of Gosse, growing in leached lateritic soils. Field observations suggest that it is actually quite prevalent in the understorey of stringybark forest, but is probably overlooked because of its small size and inconspicuous appearance. It was only recorded once during this survey.

The Kangaroo Island populations are biogeographically significant being the only South Australian occurrence of the species. This is a substantial disjunction from extensive occurrences in eastern Australia spanning Tasmania, Victoria, New South Wales and Queensland.

Selaginella gracillima **tiny selaginella**

A small moss-like, spore-bearing vascular plant only 2-8 cm high. A single collection was made during the survey representing the first record of this taxon on Kangaroo Island. Growing in damp mud at the base of a rocky outcrop near the western shore of Murray's Lagoon.

Examples of other significant Kangaroo Island plant taxa are shown in Figs 94-99.

Figure 94.
Silverbush (*Adenanthos macropodiana*) is an attractive pink-flowered shrub, which is endemic to the heathlands of Kangaroo Island. **Photo A. Robinson**

Figure 95.
Kangaroo Island riceflower (*Pimelea macrostegia*) has the largest flower-heads of any South Australian *Pimelea*. **Photo: A. Robinson**

Figure 96.
Kangaroo Island trigger-plant (*Stylidium tepperanum*) is a rare dwarf perennial plant growing in limestone crevices at sparsely scattered sites along the southern coastline. Themoss-like foliage bears erect sprays of pink to magenta flowers. Photo: A. Robinson

Figure 97.
Rigid speedwell (*Veronica hillebrandii*) is a relatively widespread species in South Australia that is also associated with coastal limestone. The flowers are purplish-blue and white.
Photo: A. Robinson

Figure 98.
Rough star-bush (*Asterolasia muricata*), confined to Kangaroo Island apart from minor occurrences on Fleurieu Peninsula, has rough (muricate) leaves and bright yellow flowers. **Photo: A. Robinson**

Figure 99.
Downy star-bush (*Asterolasia phebalioides*), from Kangaroo Island and western Victoria, has densely hairy/velvety leaves and bright yellow flowers. **Photo A. Robinson**

FLORISTIC ANALYSIS

Classification

An analysis was conducted on 350 'consistently detectable' species, all of which occurred at least twice, from the 341 quadrats. Braun Blanquet cover scores for the species were used to weight the data matrix thus indicating dominance.

This analysis resulted in the definition of 10 broad communities. These communities are divided into 36 more detailed floristic units in which the individual members share common characteristics. The 10 major floristic groups and 36 subgroups are listed in Table 18 as they appear down the dendrogram. The floristic group assigned to individual quadrats is listed in Appendix I.

The 36 Floristic Vegetation Groups

Each of the floristic vegetation groups derived by subdivision of the broad communities is described below. The description comprises a group name based on consistent, dominant overstorey species and structural description and a summary of associated biological and physical attributes. A map shows the location of the sites that represent the group and a typical site (or sites) is represented with a photograph.

The dominant overstorey species and dominant understorey species listed for each group were selected using criteria detailed in the methods chapter. Structural characteristics were obtained by examining field data describing the overall cover of each structural element found at each site in conjunction with site photographs. They represent, in the absence of quantitative data that has been collected in all surveys that followed this one, a "best guess".

Introduced species are annotated with '*'.

The average number of plant species found per quadrat is given with the range of values. This information, in conjunction with the total number of unique records is given to show the range of plant species diversity within the group..

Descriptions of the landforms associated with the sites within each group (collected during the survey) are summarised wherever possible to show which were the most common elements.

A brief description of each group contains comments concerning distribution, the strength of the group, relationships to other groups, understorey structure and composition, and any other information thought to be of interest.

The group species list shows the frequency of cover/abundance categories recorded for each species at quadrats within the group. (Table 10). This species list shows all species that occurred at greater than one third of the quadrats in that vegetation group (ie proportion of occurrence > 3) and is listed in order of proportion of occurrence (ie most common species first). [The proportion of occurrence is the proportion of quadrats in the group at which that species was recorded (eg a species with a prop occur. = 1 occurred at all sites in that group].

Species are listed for each group with their cover abundance scores, proportion of occurrence within the group, mean Kruskal Wallis value and the number of groups in which the species occurs. All species listed in the table occurred in at least 40% of the sites in the group. The cover/abundance categories (T, 1, 2, 3, 4, 5) are explained in Table 10. Mean Kruskal Wallis values are calculated within the group statistics module of PATN (the package used to analyse the data). They provide an indication of the contribution of any particular species to the group and can be compared both within a group and between groups. The higher the value the more important the presence of that species is in defining the group. The species are ranked in this order in the listings. As this value provides no indication of the cover/abundance of the species, a definition embodying dominance, such as is used to name each group, needs to consider frequency of occurrence within the group and median cover scores for each species.

The number of other groups in which the species occurs is also listed to give an indication of the uniqueness of each species to the group.

An alphabetical listing of scientific names and common names can be found in Appendix VI.

Table 18
Floristic vegetation groups resulting from the PATN analysis

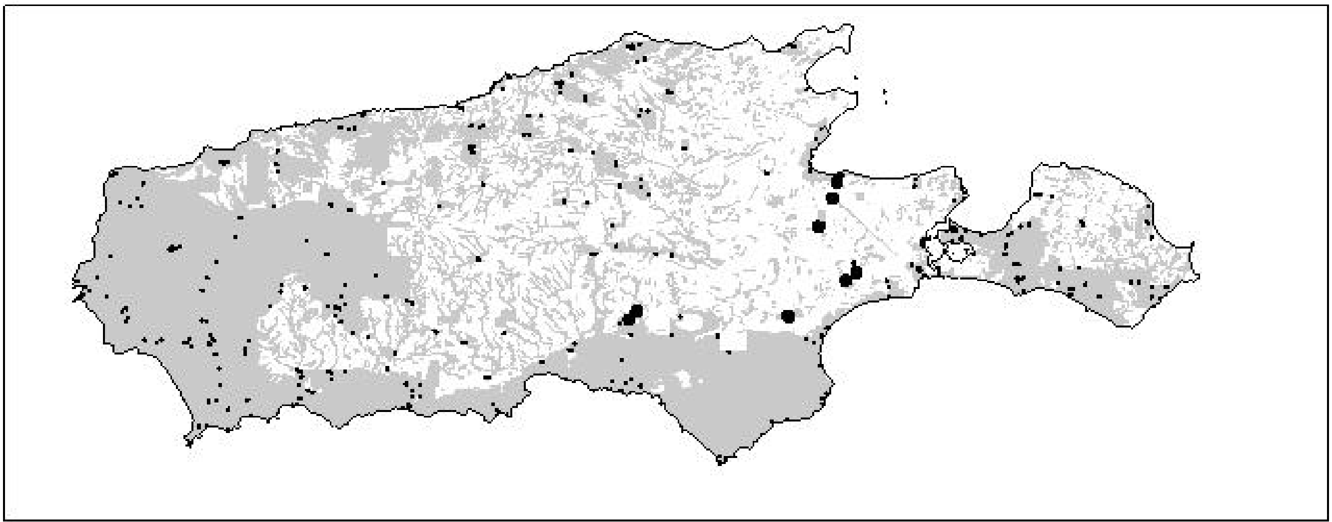
Groups are listed in order of appearance on the dendrogram

NO	FLORISTIC COMMUNITIES	MAJOR GROUPS
1	*Eucalyptus diversifolia Mallee (9 quadrats)*	COASTAL WHITE MALLEE
2	*Eucalyptus cneorifolia, Melaleuca uncinata* Mallee (11 quadrats)	COASTAL WHITE MALLEE –
3	*Acacia paradoxa* Tall open shrubland (4 quadrats)	BROOMBUSH(1)
4	*Eucalyptus cneorifolia, Acacia paradoxa* Mallee (6 quadrats)	KANGAROO ISLAND NARROW LEAF MALLEE (2)
5	*Melaleuca gibbosa, Hakea muelleriana* Tall shrubland (10 members)	
6	*Melaleuca brevifolia* Shrubland (3 quadrats)	
7	*Melaleuca uncinata* Tall shrubland (7 quadrats)	
8	*Eucalyptus leucoxylon* +/- *E. cosmophylla* Open forest (6 quadrats)	SLENDER HONEY MYRTLE –
9	*Acacia retinodes* var. *retinodes* Woodland (7 members)	PRICKLY TEA-TREE SHRUBLANDS(3)
10	*Leptospermum continentale, Melaleuca squamea* Tall open shrubland (3 quadrats)	
11	*Eucalyptus obliqua* var. *obliqua*, +/- *E. cladocalyx* Open forest (7 quadrats)	
12	*Eucalyptus cladocalyx* Open forest (24 quadrats)	SUGAR GUM WOODLAND AND
13	*Eucalyptus cladocalyx*, +/- *E. fasciculosa* Woodland (8 quadrats)	FOREST (4)
14	*Allocasuarina verticillata* Low woodland (5 quadrats)	SHE-OAK COMMUNITIES (5)
15	*Eucalyptus baxteri*, +/- *E. cosmophylla* Low woodland (27 quadrats)	
16	*Eucalyptus cosmophylla* Very low woodland (25 quadrats)	
17	*Allocasuarina striata*, +/- *Eucalyptus diversifolia* Tall open shrubland (17 quadrats)	HEATH AND MALLEE HEATH (6)
18	*Leptospermum myrsinoides* Open shrubland (6 quadrats)	
19	*Xanthorrhoea semiplana* ssp. *tateana, Allocasuarina striata* Low open shrubland (9 quadrats)	
20	*Eucalyptus remota* Low mallee (18 quadrats)	
21	*Eucalyptus diversifolia* Mallee (23 quadrats)	
22	*Eucalyptus diversifolia*, +/- *E. lansdowneana* ssp. *albopurpurea*, +/- *E. rugosa* Mallee (7 quadrats)	MALLEE AND MALLEE SHRUBLANDS (7)
23	*Eucalyptus diversifolia, Melaleuca lanceolata*, +/- *E. rugosa* Open mallee (29 quadrats)	
24	*E. lansdowneana* ssp. *albopurpurea* Open low mallee (4 quadrats)	
25	*Melaleuca lanceolata* Low open shrubland (8 quadrats)	
26	*Melaleuca lanceolata* Open shrubland (6 quadrats)	
27	*Leucopogon parviflorus* Open shrubland (10 quadrats)	
28	*Isolepis nodosa* Very open sedgeland (2 quadrats)	
29	*Eucalyptus diversifolia* Very open mallee (9 quadrats)	
30	*Tetragonia implexicoma, Rhagodia candolleana* ssp. *candolleana* Open shrubland (3 quadrats)	COASTAL SHRUBLANDS GROUP 1 (8)
31	*Melaleuca halmaturorum* Very low open forest (1 quadrat)	
32	*Melaleuca acuminata* Shrubland (1 quadrat)	
33	*Eucalyptus diversifolia, Melaleuca halmaturorum* Tall open shrubland (1 quadrat)	
34	*Baumea arthrophylla* Very open sedgeland (1 quadrat)	
35	*Olearia axillaris, Leucopogon parviflorus* Low open shrubland (17 quadrats)	COASTAL SHRUBLANDS GROUP 2 (9)
36	*Sarcocornia quinqueflora, Maireana oppositifolia* Low very open shrubland (7 quadrats)	SAMPHIRES (10)

COASTAL WHITE MALLEE – BROOMBUSH COMMUNITIES

Floristic Group 1 *Eucalyptus diversifolia* (Coastal White Mallee) */ Melaleuca uncinata (*Broombush) Mallee

9 members



Dominant Overstorey Species:

Eucalyptus diversifolia (Coastal White Mallee)

Sub-dominant Overstorey and dominant Understorey Species:

Melaleuca uncinata
Petrophile multisecta
Bertya rotundifolia
Calytrix glaberrima
Xanthorrhoea semiplana ssp. tateana

Average Number of Plant Species (& range):

43 (33-58)

BE00101
DE00501
DE00701
LA00101
LA00301
NB00701
NB00901
SL00101
SL00201

Environmental Parameters:

Landform Patterns/Systems: Plains, rises
Landform Elements: Plains

Quadrat(s):

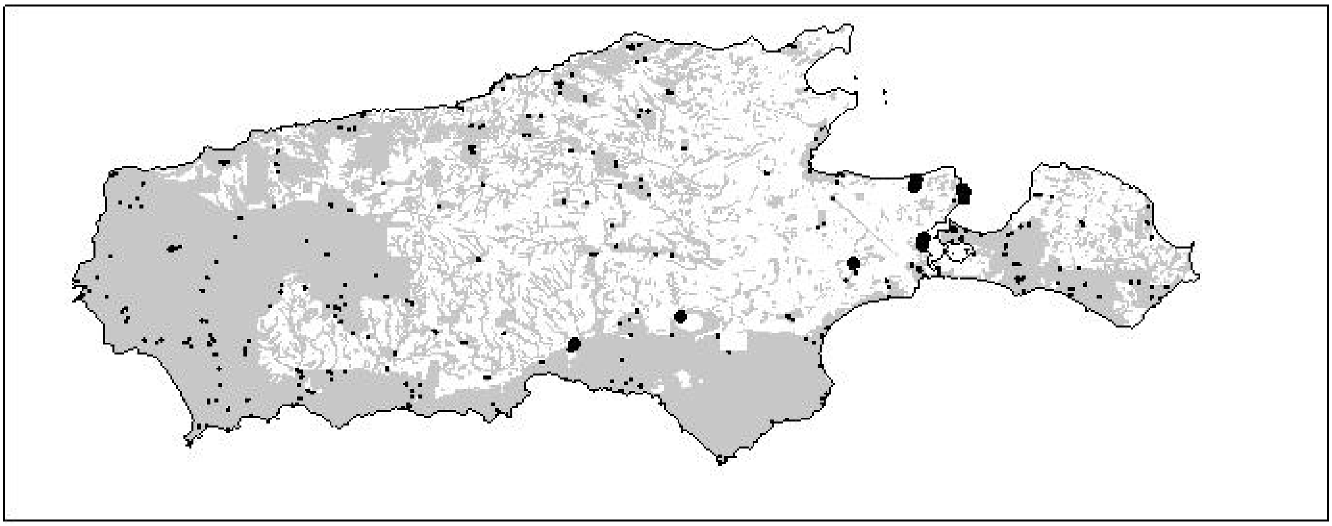
Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Eucalyptus diversifolia	0	4	4	1	0	0	9	1	1.67	22
Melaleuca uncinata	0	6	1	2	0	0	9	1	1.56	16
Petrophile multisecta	0	8	1	0	0	0	9	1	1.11	13
Bertya rotundifolia	0	8	0	0	0	0	8	0.89	0.89	7
Calytrix glaberrima	0	8	0	0	0	0	8	0.89	0.89	15
Glischrocaryon behrii	0	8	0	0	0	0	8	0.89	0.89	8
Xanthorrhoea semiplana ssp. tateana	1	6	1	0	0	0	8	0.89	0.9	18
Astroloma conostephioides	0	7	0	0	0	0	7	0.78	0.78	20

Boronia filifolia	0	7	0	0	0	0	7	0.78	0.78	13
Hakea rostrata	0	7	0	0	0	0	7	0.78	0.78	13
Baeckea ericaea	0	6	0	0	0	0	6	0.67	0.67	5
Cassytha glabella forma dispar	4	2	0	0	0	0	6	0.67	0.27	14
Comesperma calymega	1	5	0	0	0	0	6	0.67	0.57	10
Dillwynia sericea	0	6	0	0	0	0	6	0.67	0.67	10
Hibbertia virgata	0	6	0	0	0	0	6	0.67	0.67	9
Leptospermum myrsinoides	0	6	0	0	0	0	6	0.67	0.67	11
Leucopogon rufus	0	6	0	0	0	0	6	0.67	0.67	14
Melaleuca gibbosa	0	6	0	0	0	0	6	0.67	0.67	30
Acacia spinescens	0	5	0	0	0	0	5	0.56	0.56	11
Banksia marginata	0	5	0	0	0	0	5	0.56	0.56	18
Calytrix tetragona	0	5	0	0	0	0	5	0.56	0.56	17
Hypolaena fastigiata	0	5	0	0	0	0	5	0.56	0.56	7
Lepidosperma concavum	0	5	0	0	0	0	5	0.56	0.56	7
Leucopogon costatus	0	5	0	0	0	0	5	0.56	0.56	7
Acrotriche depressa	0	4	0	0	0	0	4	0.44	0.44	19
Allocasuarina muelleriana ssp. notocolpica	0	4	0	0	0	0	4	0.44	0.44	11
Baeckea crassifolia	1	3	0	0	0	0	4	0.44	0.34	3
Banksia ornata	0	4	0	0	0	0	4	0.44	0.44	8
Cryptandra leucophracta	0	4	0	0	0	0	4	0.44	0.44	3
Eucalyptus cosmophylla	0	3	1	0	0	0	4	0.44	0.56	14
Micrantheum demissum	0	4	0	0	0	0	4	0.44	0.44	11

Figure 63.
***Eucalyptus diversifolia* Mallee at quadrat NB0701.**

Floristic Group 2 *Eucalyptus cneorifolia* (Kangaroo Island Narrow-leaf Mallee), *Melaleuca uncinata (*Broombush) Mallee

11 members



Dominant Overstorey Species:

Eucalyptus cneorifolia Kangaroo (Island Narrow-Leaf Mallee)
*Melaleuca uncinata (*Broombush)

Sub-dominant Overstorey and dominant Understorey Species:

Melaleuca gibbosa
Acrotriche depressa
Astroloma humifusum

Average Number of Plant Species (& range):

26 (16 – 46)

Quadrat(s):

BH00101
BH00201
BH00301
CG00401
ER01101
NB01201
NB01301
PL00101
PL00201
PL00301
SL00302

Environmental Parameters:

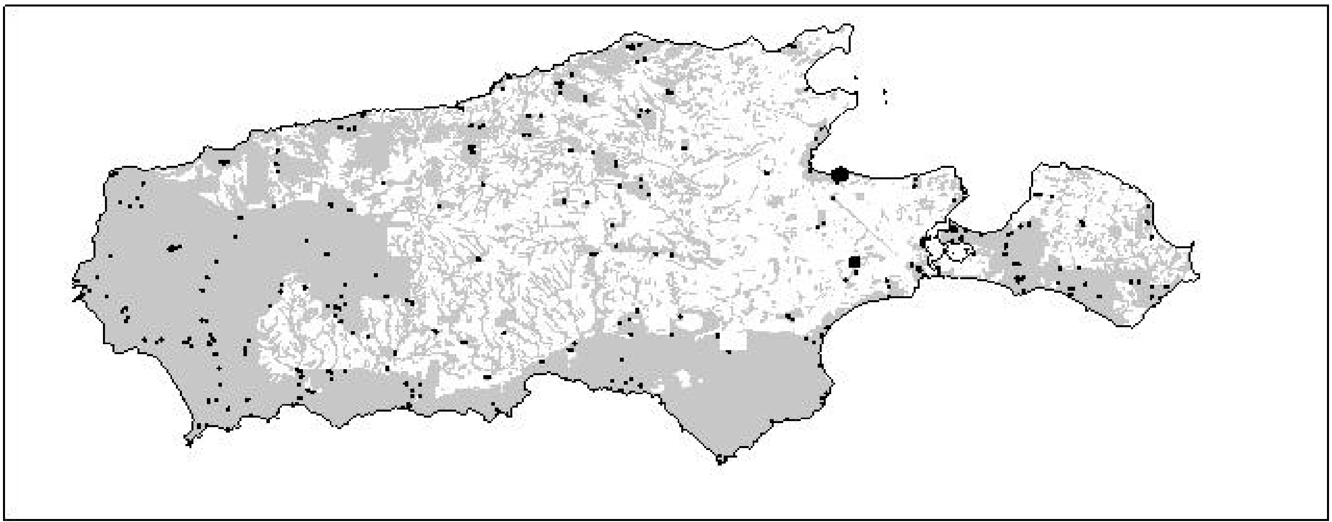
Landform Patterns/Systems: Low hills, rises
Landform Elements: Plains, hill slopes

Species	Cover / Abundance						No. of	Prop.	Mean	No.
	T	1	2	3	4	5	Quad.	Occur.	(KW)	Gps
Melaleuca uncinata	0	5	2	2	0	0	9	0.82	1.36	16
Acrotriche depressa	0	8	0	0	0	0	8	0.73	0.73	19
Astroloma humifusum	0	8	0	0	0	0	8	0.73	0.73	21
Eucalyptus cneorifolia	0	5	3	0	0	0	8	0.73	1	11
Acacia paradoxa	0	7	0	0	0	0	7	0.64	0.64	23
Calytrix tetragona	0	6	1	0	0	0	7	0.64	0.73	17
Melaleuca gibbosa	1	5	0	1	0	0	7	0.64	0.74	30
Thryptomene ericaea	0	7	0	0	0	0	7	0.64	0.64	9
Orthrosanthus multiflorus	1	5	0	0	0	0	6	0.55	0.46	22
Stipa flavescens	0	6	0	0	0	0	6	0.55	0.55	10

Figure 64.
***Eucalyptus cneorifolia Melaleuca uncinata* Mallee at quadrat PL0201.**

Floristic Group 3 *Acacia paradoxa (*Kangaroo Thorn) Tall open shrubland

4 members



Dominant Overstorey Species:

*Acacia paradoxa (*Kangaroo Thorn)

Sub-dominant Overstorey and dominant Understorey Species:

Bertya rotundifolia
Leucopogon rufus
Orthrosanthus multiflorus
Thryptomene ericaea

Average Number of Plant Species (& range):

23 (16 – 33)

Quadrat(s):

NB00401
NB00501
NB00601
SL00301

Environmental Parameters:

Landform Patterns/Systems: Rises
Landform Elements: Plains, lunettes

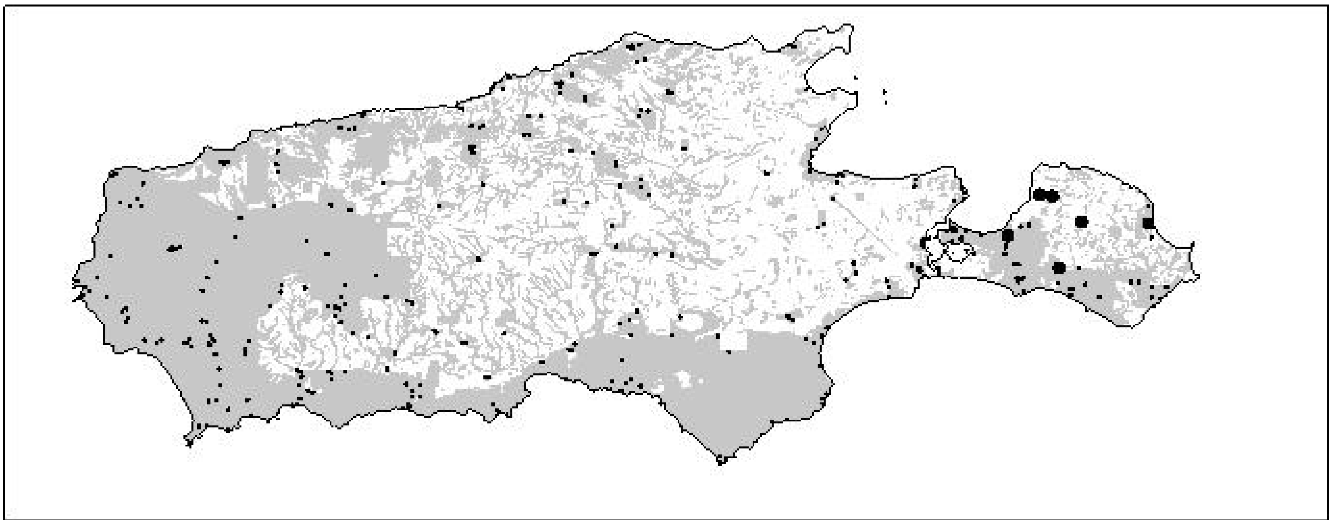
Species	**Cover / Abundance**						**No. of**	**Prop.**	**Mean**	**No.**
	T	**1**	**2**	**3**	**4**	**5**	**Quad.**	**Occur.**	**(KW)**	**Gps**
Acacia paradoxa	0	4	0	0	0	0	4	1	1	23
Bertya rotundifolia	0	4	0	0	0	0	4	1	1	7
Leucopogon rufus	0	4	0	0	0	0	4	1	1	14
Orthrosanthus multiflorus	0	4	0	0	0	0	4	1	1	22
Melaleuca lanceolata	0	3	0	0	0	0	3	0.75	0.75	18
Thryptomene ericaea	0	1	2	0	0	0	3	0.75	1.25	9
Acrotriche depressa	0	2	0	0	0	0	2	0.5	0.5	19
Allocasuarina verticillata	0	2	0	0	0	0	2	0.5	0.5	14
Astroloma conostephioides	0	2	0	0	0	0	2	0.5	0.5	20
Brachyloma ericoides ssp. bicolor	0	2	0	0	0	0	2	0.5	0.5	10
Callitris preissii	0	2	0	0	0	0	2	0.5	0.5	5
Calytrix glaberrima	0	2	0	0	0	0	2	0.5	0.5	15
Dianella revoluta var. revoluta	0	2	0	0	0	0	2	0.5	0.5	9
Dodonaea viscosa ssp. angustissima	0	2	0	0	0	0	2	0.5	0.5	12
Eucalyptus lansdowneana ssp. albopurpurea	0	2	0	0	0	0	2	0.5	0.5	11

Figure 65.
***Acacia paradoxa* Tall open shrubland at quadrat NB0601.**

KANGAROO ISLAND NARROW LEAF MALLEE COMMUNITY

Floristic Group 4 *Eucalyptus cneorifolia* (Kangaroo Island Narrow-leaf Mallee), *Acacia paradoxa (*Kangaroo Thorn) Malleee

6 members



Dominant Overstorey Species:

Eucalyptus cneorifolia (Kangaroo Island Narrow-Leaf Mallee)
Acacia paradoxa (Kangaroo Thorn)

Sub-dominant Overstorey and dominant Understorey Species:

Average Number of Plant Species (& range):

47 (13 – 79)

Quadrat(s):
G00101
CO00201
DU00401
GF00101
PH00101
WI00202

Environmental Parameters:

Landform Patterns/Systems: Low hills
Landform Elements: Hill slopes, various

Species	**Cover / Abundance**						**No. of**	**Prop.**	**Mean**	**No.**
	T	**1**	**2**	**3**	**4**	**5**	**Quad.**	**Occur.**	**(KW)**	**Gps**
Eucalyptus cneorifolia	0	0	5	1	0	0	6	1	2.17	11
Acacia paradoxa	4	0	0	0	0	0	4	0.67	0.07	23
Acrotriche depressa	4	0	0	0	0	0	4	0.67	0.07	19
Astroloma humifusum	4	0	0	0	0	0	4	0.67	0.07	21
Dianella revoluta var. brevicaulis	4	0	0	0	0	0	4	0.67	0.07	19
Acacia leiophylla	3	0	0	0	0	0	3	0.5	0.05	15
Clematis microphylla	3	0	0	0	0	0	3	0.5	0.05	8
Comesperma volubile	3	0	0	0	0	0	3	0.5	0.05	13
Danthonia setacea var. setacea	3	0	0	0	0	0	3	0.5	0.05	19
Dodonaea viscosa ssp. angustissima	3	0	0	0	0	0	3	0.5	0.05	12
**Hypochaeris radicata*	3	0	0	0	0	0	3	0.5	0.05	10
Melaleuca lanceolata	3	0	0	0	0	0	3	0.5	0.05	18
Myoporum insulare	3	0	0	0	0	0	3	0.5	0.05	11
Orthrosanthus multiflorus	3	0	0	0	0	0	3	0.5	0.05	22
Pimelea stricta	3	0	0	0	0	0	3	0.5	0.05	12

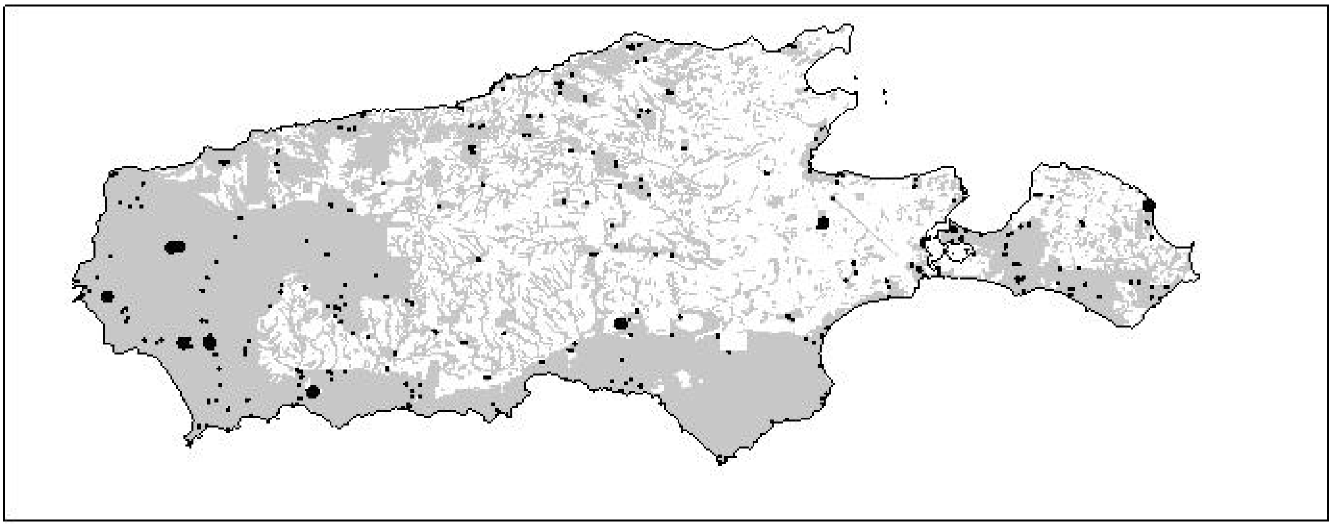
Poa crassicaudex	3	0	0	0	0	0	3	0.5	0.05	6
Sporobolus virginicus	3	0	0	0	0	0	3	0.5	0.05	7

Figure 66.
***Eucalyptus cnoerifolia, Acacia paradoxa* Mallee at quadrat DU0401.**

SLENDER HONEY MYRTLE – PRICKLY TEA-TREE SHRUBLAND COMMUNITIES

Floristic Group 5 *Melaleuca gibbosa* (Slender Honey-myrtle), *Hakea muelleriana (*Heath Needlebush) Tall shrubland

10 members



Dominant Overstorey Species:
Melaleuca gibbosa (Slender Honey-Myrtle)
Hakea muelleriana (Heath Needlebush)

Sub-dominant Overstorey and dominant Understorey Species:

Eutaxia microphylla var. microphylla
Astroloma conostephioides
Hakea rugosa

Average Number of Plant Species (& range):

22 (9 – 33)

Quadrat(s):

BE00201
CO00301
KH00301
LA00201
LL00101
LL00201
RR00101
RR00201
RR00601
WB00601

Environmental Parameters:

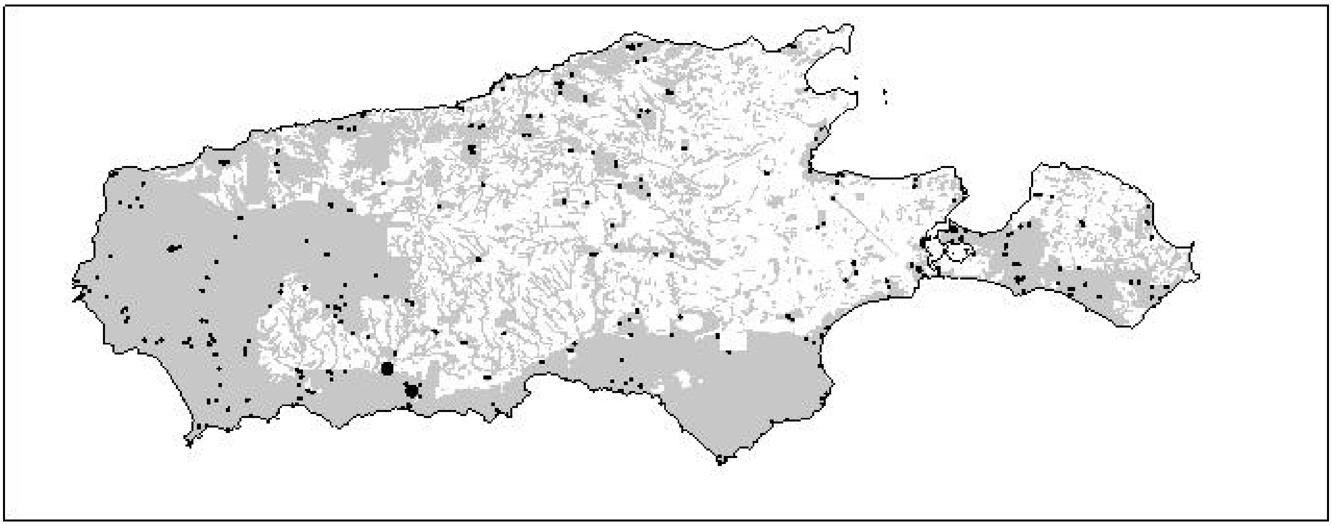
Landform Patterns/Systems: Low hills, plains, rises
Landform Elements: Hill slopes, plains, lakes

Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Melaleuca gibbosa	0	0	4	6	0	0	10	1	2.6	30
Hakea muelleriana	0	3	3	1	0	0	7	0.7	1.2	23
Eutaxia microphylla var. microphylla	4	2	0	0	0	0	6	0.6	0.24	17
Astroloma conostephioides	2	2	0	0	0	0	4	0.4	0.22	20
Hakea rugosa	1	2	0	1	0	0	4	0.4	0.51	9

Figure 67.
***Melaleuca gibbosa, Hakea muelleriana* Tall shrubland at quadrat RR0201.**

Floristic Group 6 *Melaleuca brevifolia* (Short-leaf Honey-myrtle) Shrubland

3 members



Dominant Overstorey Species:

Melaleuca brevifolia (Short Leaf Honey Myrtle)

Sub-dominant Overstorey and dominant Understorey Species:

Amphibromus nervosus
Callistemon rugulosus var. rugulosus
Eutaxia microphylla var. microphylla
Hakea rugosa

Average Number of Plant Species (& range):

26 (20 – 34)

Quadrat(s):

NW00101
NW00102
ST00601

Environmental Parameters:

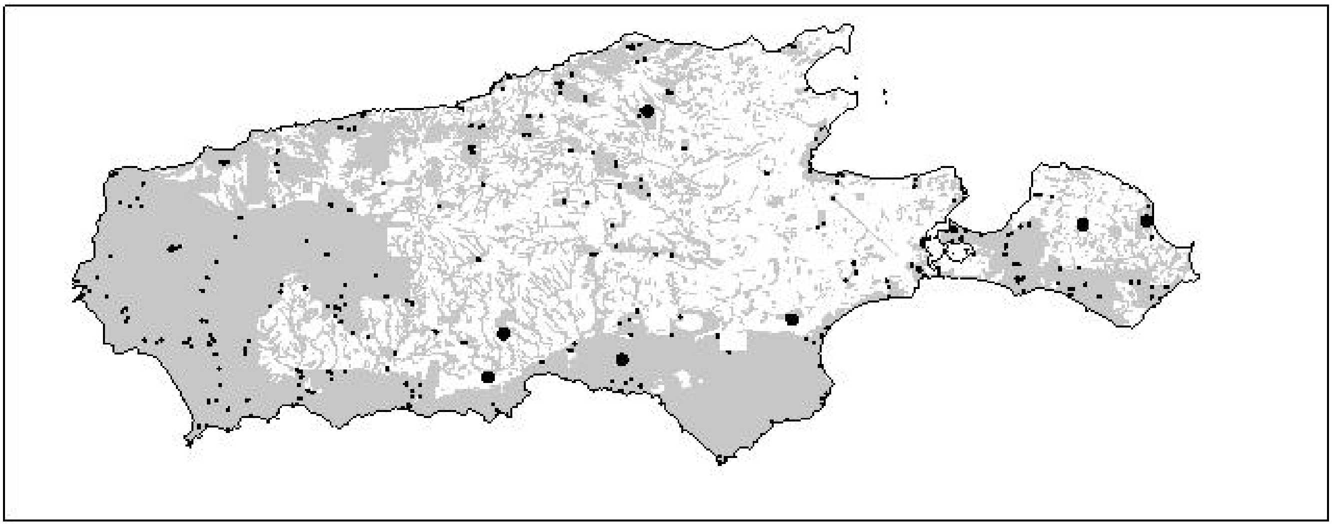
Landform Patterns/Systems: n/a
Landform Elements: Plains

Species	**Cover / Abundance**						**No. of**	**Prop.**	**Mean**	**No.**
	T	**1**	**2**	**3**	**4**	**5**	**Quad.**	**Occur.**	**(KW)**	**Gps**
Gahnia trifida	3	0	0	0	0	0	3	1	0.1	10
Melaleuca brevifolia	0	2	1	0	0	0	3	1	1.33	12
Melaleuca gibbosa	0	3	0	0	0	0	3	1	1	30
Amphibromus nervosus	2	0	0	0	0	0	2	0.67	0.07	1
Callistemon rugulosus var. rugulosus	2	0	0	0	0	0	2	0.67	0.07	12
Eutaxia microphylla var. microphylla	1	1	0	0	0	0	2	0.67	0.37	17
Hakea rugosa	2	0	0	0	0	0	2	0.67	0.07	9
Villarsia reniformis	2	0	0	0	0	0	2	0.67	0.07	5

Figure 68.
***Melaleuca brevifolia* Shrubland at quadrat NB0701.**

Floristic Group 7 *Melaleuca uncinata* (Broombush) Tall shrubland

7 members



Dominant Overstorey Species:

Melaleuca uncinata (Broombush)

Sub-dominant Overstorey and dominant Understorey Species:

Melaleuca gibbosa
Allocasuarina striata
Petrophile multisecta
Xanthorrhoea semiplana ssp. tateana

Average Number of Plant Species (& range):

32 (23 – 45)

Quadrat(s):

CC01001
CO00101
DE00401
HR00701
HR00801
PH00201
SB00601

Environmental Parameters:

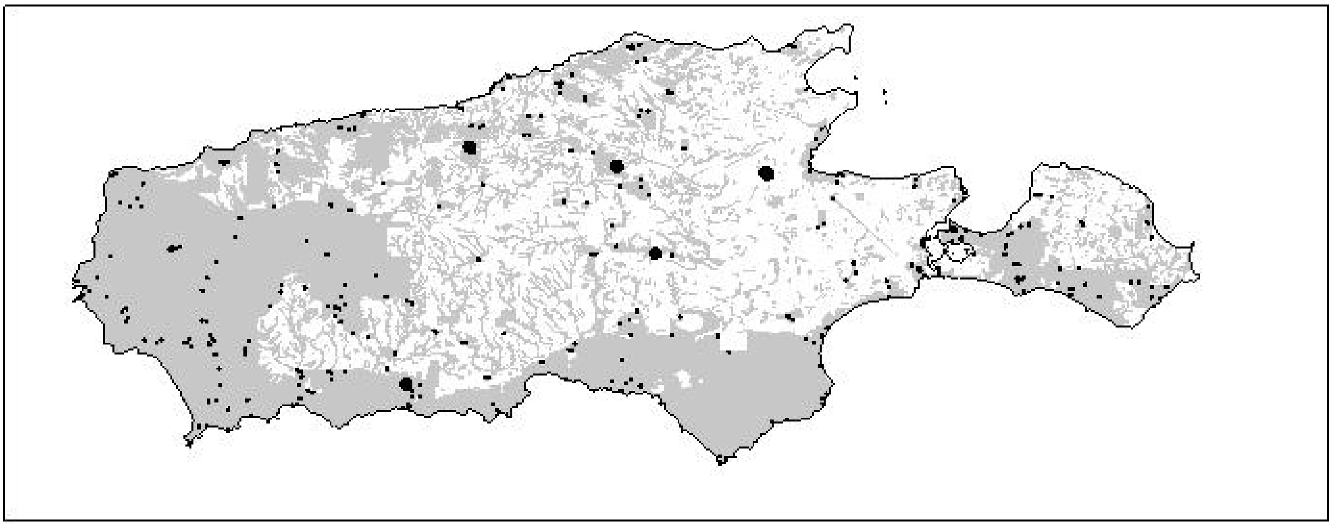
Landform Patterns/Systems: Low hills, rises
Landform Elements: Hill slopes, plains

Species	Cover / Abundandance						No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
	T	1	2	3	4	5				
Melaleuca gibbosa	4	2	1	0	0	0	7	1	0.63	30
Melaleuca uncinata	0	0	6	1	0	0	7	1	2.14	16
Allocasuarina striata	2	3	1	0	0	0	6	0.86	0.74	15
Petrophile multisecta	4	1	0	0	0	0	5	0.71	0.2	13
Xanthorrhoea semiplana ssp. tateana	5	0	0	0	0	0	5	0.71	0.07	18
Eucalyptus cosmophylla	2	2	0	0	0	0	4	0.57	0.31	14
Astroloma conostephioides	3	0	0	0	0	0	3	0.43	0.04	20
Darwinia micropetala	2	0	1	0	0	0	3	0.43	0.31	9
Eucalyptus diversifolia	3	0	0	0	0	0	3	0.43	0.04	22
Hakea muelleriana	1	1	1	0	0	0	3	0.43	0.44	23
Hakea rugosa	2	1	0	0	0	0	3	0.43	0.17	9
Melaleuca brevifolia	0	0	3	0	0	0	3	0.43	0.86	12
Schoenus breviculmis	3	0	0	0	0	0	3	0.43	0.04	7

Figure 69.
***Melaleuca uncinata* Tall shrubland at quadrat CO0101.**

Floristic Group 8 *Eucalyptus leucoxylon* (South Australian Blue Gum), +/- *E. cosmophylla* (Cup Gum) Open forest

6 members



Dominant Overstorey Species:

Eucalyptus leucoxylon (South Australian Blue Gum)
+/- E. cosmophylla (Cup Gum)

Sub-dominant Overstorey and dominant Understorey Species:

Callistemon rugulosus var. rugulosus
Juncus pallidus
Acacia paradoxa
Acacia retinodes var. retinodes
Melaleuca gibbosa

Average Number of Plant Species (& range):

34 (11 – 61)

Quadrat(s):

CR00601
CR01201
CR01301
MR00501
SE00601
ST00701

Environmental Parameters:

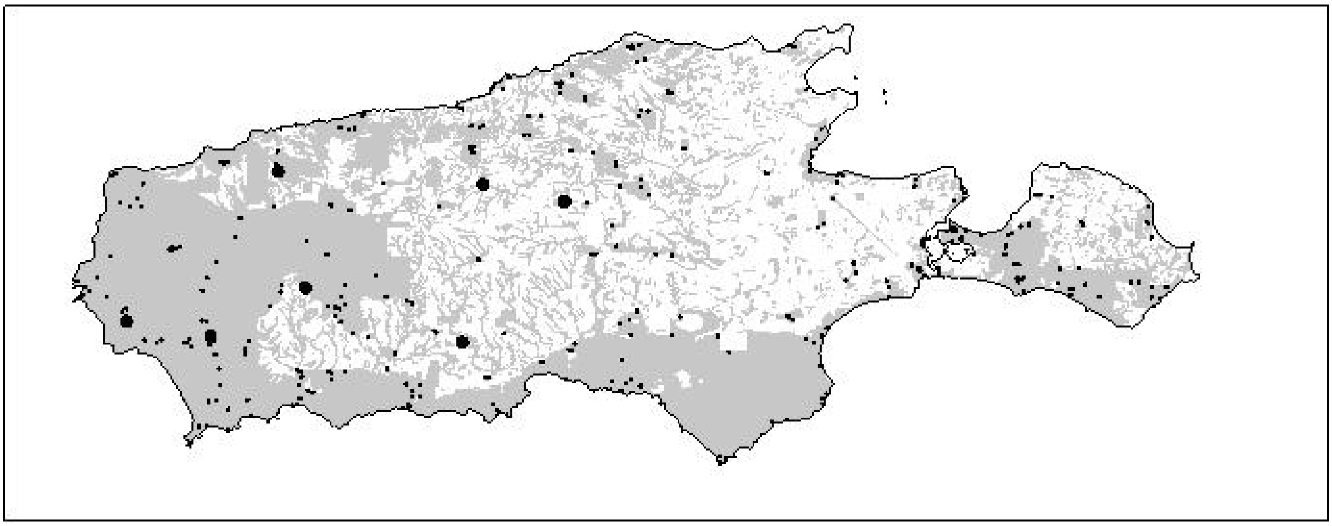
Landform Patterns/Systems: Low hills, plains
Landform Elements: various

Species	**Cover / Abundance**						**No. of**	**Prop.**	**Mean**	**No.**
	T	**1**	**2**	**3**	**4**	**5**	**Quad.**	**Occur.**	**(KW)**	**Gps**
Callistemon rugulosus var. rugulosus	0	3	2	0	0	0	5	0.83	1.17	12
Eucalyptus leucoxylon	0	0	4	1	0	0	5	0.83	1.83	8
Juncus pallidus	5	0	0	0	0	0	5	0.83	0.08	7
Acacia paradoxa	1	3	0	0	0	0	4	0.67	0.52	23
Acacia retinodes var. retinodes	0	3	1	0	0	0	4	0.67	0.83	11
Bertya rotundifolia	3	1	0	0	0	0	4	0.67	0.22	7
Melaleuca gibbosa	2	2	0	0	0	0	4	0.67	0.37	30
Thomasia petalocalyx	3	1	0	0	0	0	4	0.67	0.22	13
Acrotriche depressa	2	1	0	0	0	0	3	0.5	0.2	19
Cassytha pubescens	3	0	0	0	0	0	3	0.5	0.05	16
Correa decumbens	1	1	1	0	0	0	3	0.5	0.52	8
Eucalyptus cosmophylla	1	2	0	0	0	0	3	0.5	0.35	14
Gonocarpus mezianus	2	1	0	0	0	0	3	0.5	0.2	18
Lasiopetalum schulzenii	1	1	1	0	0	0	3	0.5	0.52	20
Triglochin procerum var. procerum	2	0	1	0	0	0	3	0.5	0.37	6

Figure 70.
***Eucalyptus leucoxylon*, +/- *E. cosmophylla* Open forest at quadrat SE0601.**

Floristic Group 9 *Acacia retinodes* var. *retinodes* (Swamp Wattle) WOODLAND

7 members



Dominant Overstorey Species:
Acacia retinodes var. *retinodes* (Swamp Wattle)

Sub-dominant Overstorey and dominant Understorey Species:

Leptospermum continentale
Leptospermum lanigerum
Melaleuca gibbosa
Pteridium esculentum

Average Number of Plant Species (& range):

26 (15 – 45)

Quadrat(s):
R00101
ER00201
GL00101
HR00501
SC00201
SR00801
WB00301

Environmental Parameters:

Landform Patterns/Systems:
Landform Elements:

Environmental Parameters:

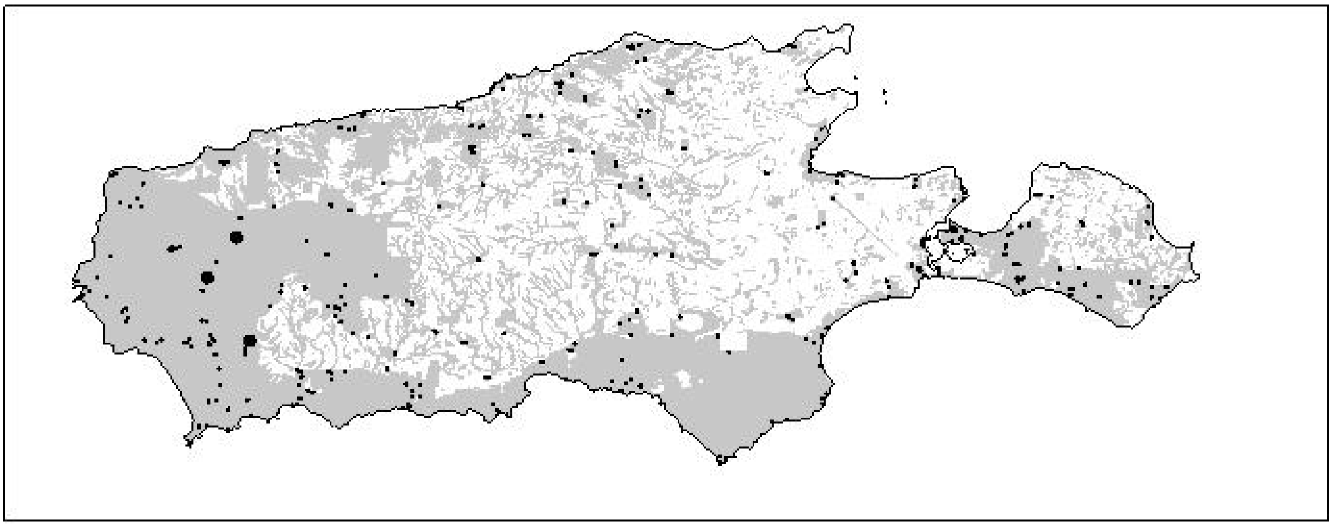
Landform Patterns/Systems: Low hills, rises
Landform Elements: Hill footslopes, various

Species	**Cover / Abundandance** T	**1**	**2**	**3**	**4**	**5**	**No. of Quad.**	**Prop. Occur.**	**Mean (KW)**	**No. Gps**
Leptospermum continentale	1	2	4	0	0	0	7	1	1.44	15
Acacia retinodes var. *retinodes*	1	3	1	1	0	0	6	0.86	1.16	11
Leptospermum lanigerum	0	0	4	1	0	0	5	0.71	1.57	3
Melaleuca gibbosa	3	1	1	0	0	0	5	0.71	0.47	30
Pteridium esculentum	1	1	2	1	0	0	5	0.71	1.16	4
Gahnia trifida	2	1	1	0	0	0	4	0.57	0.46	10
Banksia marginata	3	0	0	0	0	0	3	0.43	0.04	18
Prostanthera spinosa	2	1	0	0	0	0	3	0.43	0.17	12

Figure 71.
***Acacia retinodes* var. *retinodes* Woodland at quadrat HR0501.**

Floristic Group 10 *Leptospermum continentale* (Prickly Tea-tree), *Melaleuca squamea* (Swamp Honey-myrtle). Tall open shrubland

3 members



Dominant Overstorey Species:

Leptospermum continentale (Prickly Tea-Tree)
Melaleuca squamea (Swamp Honey-Myrtle)

Sub-dominant Overstorey and dominant Understorey Species:

Bauera rubioides
Gahnia sieberiana
Hakea rugosa
Isopogon ceratophyllus
Leptocarpus tenax
Petrophile multisecta
Platylobium obtusangulum
Sprengelia incarnata

Average Number of Plant Species (& range):

18 (11 – 29)

Quadrat(s):

FB00801
SR00201
SR00401

Environmental Parameters:

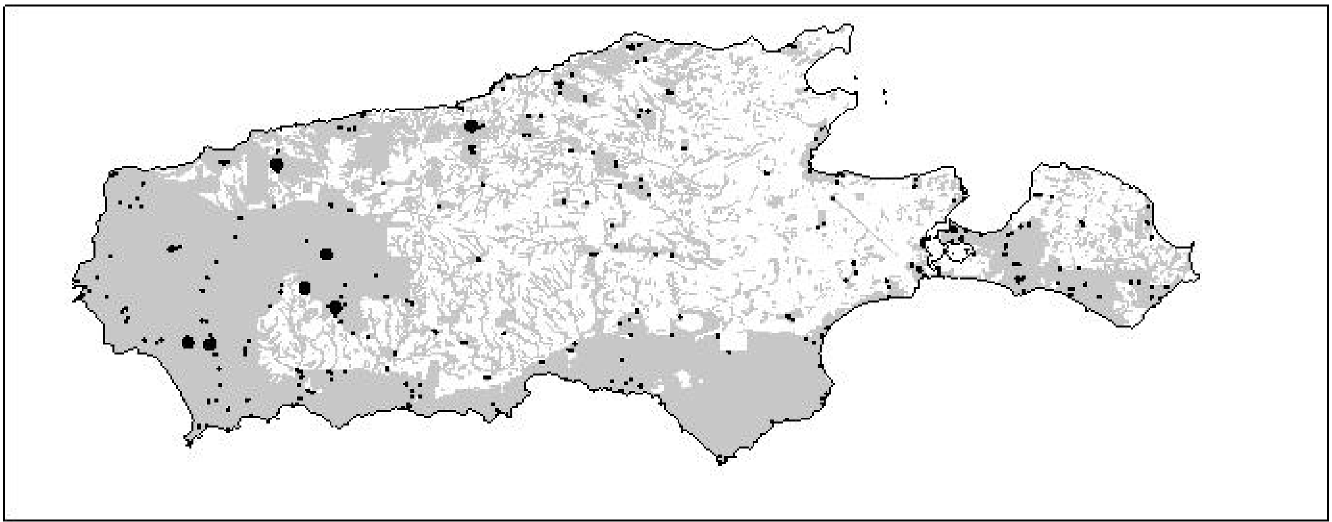
Landform Patterns/Systems: n/a
Landform Elements: Plains

Species	Cover / Abundance						**No. of**	**Prop.**	**Mean**	**No.**
	T	**1**	**2**	**3**	**4**	**5**	**Quad.**	**Occur.**	**(KW)**	**Gps**
Leptospermum continentale	0	1	2	0	0	0	3	1	1.67	15
Melaleuca squamea	0	1	0	2	0	0	3	1	2.33	4
Bauera rubioides	1	1	0	0	0	0	2	0.67	0.37	3
Gahnia sieberiana	0	2	0	0	0	0	2	0.67	0.67	4
Hakea rugosa	0	1	1	0	0	0	2	0.67	1	9
Isopogon ceratophyllus	2	0	0	0	0	0	2	0.67	0.07	16
Leptocarpus tenax	2	0	0	0	0	0	2	0.67	0.07	4
Petrophile multisecta	2	0	0	0	0	0	2	0.67	0.07	13
Platylobium obtusangulum	2	0	0	0	0	0	2	0.67	0.07	12
Sprengelia incarnata	1	0	1	0	0	0	2	0.67	0.7	3

Figure 72.
***Leptospermum continentale, Melaleuca squamea* Tall open shrubland at quadrat SR0201.**

Floristic Group 11 *Eucalyptus obliqua var. obliqua* (Messmate Stringybark), +/- *E. cladocalyx* (Sugar Gum) Open forest

7 members



Dominant Overstorey Species:
Eu*calyptus obliqua var. obliqua* (Messmate Stringybark)
+/- E. cladocalyx (Sugar Gum)

Sub-dominant Overstorey and dominant Understorey Species:

Pteridium esculentum
Acacia paradoxa

Average Number of Plant Species (& range):

24 (15 – 31)

Quadrat(s):

GL00201
GL00401
GL01001
MR01101
RR00102
RR00301
SC00301

Environmental Parameters:

Landform Patterns/Systems: Rises
Landform Elements: Hill footslopes, various

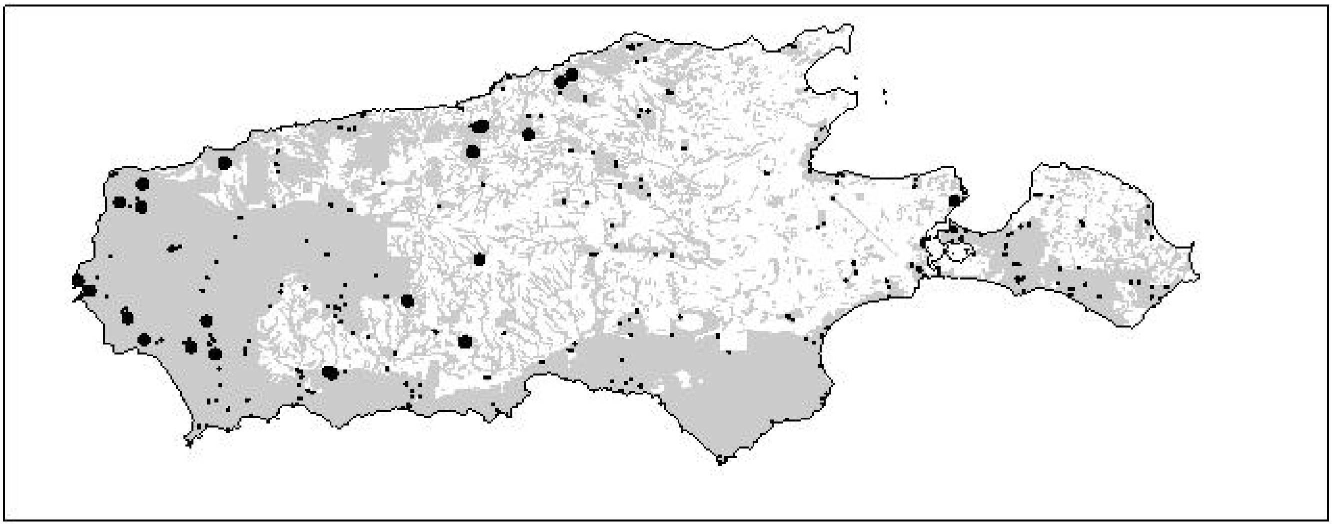
Species	Cover / Abundance						No. of	Prop.	Mean	No.
	T	1	2	3	4	5	Quad.	Occur.	(KW)	Gps
Pteridium esculentum	0	2	3	2	0	0	7	1	2	4
Acacia paradoxa	1	2	1	0	0	0	4	0.57	0.59	23
Eucalyptus obliqua var. obliqua	0	0	1	3	0	0	4	0.57	1.57	5
Acrotriche fasciculiflora	3	0	0	0	0	0	3	0.43	0.04	1
Billardiera bignoniacea	3	0	0	0	0	0	3	0.43	0.04	8
Eucalyptus cladocalyx	2	0	1	0	0	0	3	0.43	0.31	12
Xanthorrhoea semiplana ssp. tateana	1	2	0	0	0	0	3	0.43	0.3	18

Figure 73.
***Eucalyptus obliqua var obliqua, E. cladocalyx* Open forest at quadrat SC0301.**

SUGAR GUM WOODLAND AND FOREST COMMUNITIES

Floristic Group 12 *Eucalyptus cladocalyx* (Sugar Gum) Open forest

24 members



Dominant Overstorey Species:
Eucalyptus cladocalyx (Sugar Gum)

Sub-dominant Overstorey and dominant Understorey Species:

Prostanthera spinosa
Acacia paradoxa
Xanthorrhoea semiplana ssp. tateana

Average Number of Plant Species (& range):

27 (7 – 44)

Quadrat(s):

BH00401
CA00701
CD01001
CT00301
HR00201
HR00301
HR00401
KH01101
KH01201
LI00601
LI00701
MR00401
MR00901
MR01001
NE00201
RC00101
RC00301
RC00501
RR00501
SR00701
WB00101
WB00202
WB00701
WB01101

Environmental Parameters:

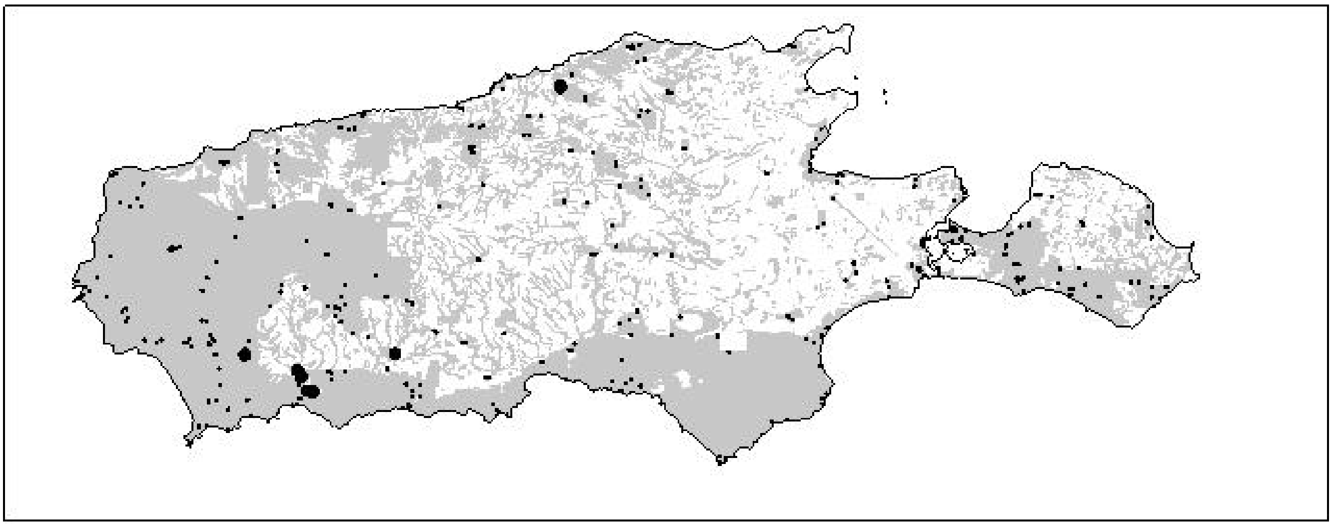
Landform Patterns/Systems: Low hills, rises
Landform Elements: Hill footslopes, Hill slopes, plains

Species	T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
	Cover / Abundance									
Eucalyptus cladocalyx	0	0	11	13	0	0	24	1	2.54	12
Prostanthera spinosa	6	7	4	0	0	0	17	0.71	0.65	12
Acacia paradoxa	5	4	5	2	0	0	16	0.67	0.85	23
Xanthorrhoea semiplana ssp. tateana	6	6	0	2	0	0	14	0.58	0.52	18
Billardiera uniflora	12	0	0	0	0	0	12	0.5	0.05	12
Melaleuca gibbosa	3	8	1	0	0	0	12	0.5	0.43	30
Acrotriche depressa	7	3	0	0	0	0	10	0.42	0.15	19
Gonocarpus mezianus	9	1	0	0	0	0	10	0.42	0.08	18
Hakea rostrata	7	1	2	0	0	0	10	0.42	0.24	13

Figure 74.
***Eucalyptus cladocalyx* Open forest at quadrat CT0301.**

Floristic Group 13 ***Eucalyptus cladocalyx*** **(Sugar Gum)„** ***+/- E. fasciculosa*** **(Pink Gum) Woodland**

8 members



Dominant Overstorey Species:
Eucalyptus cladocalyx (Sugar Gum)
+/- E. fasciculosa (Pink Gum)

Sub-dominant Overstorey and dominant Understorey Species:

Melaleuca lanceolata
Acacia retinodes var. retinodes

Average Number of Plant Species (& range):

40 (27 – 54)

Quadrat(s):

BH00401
CA00701
CD01001
HR00201
HR00301
HR00401
KH01101
KH01201

Environmental Parameters:

Landform Patterns/Systems: Plains
Landform Elements: Hill footslopes, plains

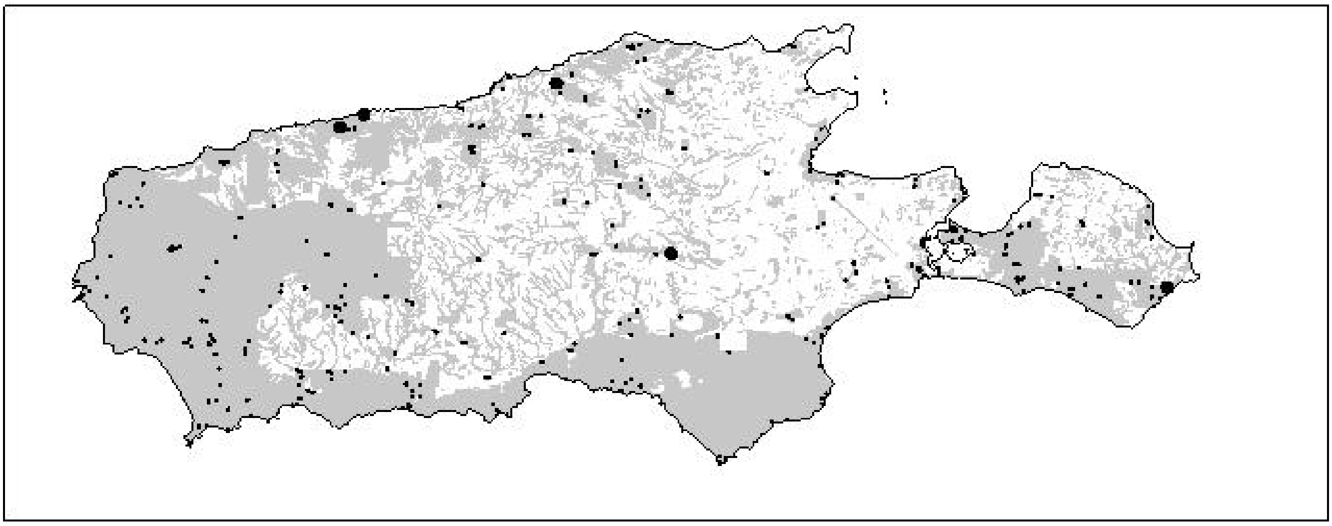
Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Eucalyptus cladocalyx	1	5	2	0	0	0	8	1	1.14	12
Acacia paradoxa	5	1	0	0	0	0	6	0.75	0.19	23
Eucalyptus fasciculosa	3	2	0	0	0	0	5	0.62	0.29	9
Melaleuca lanceolata	2	3	0	0	0	0	5	0.62	0.4	18
Acacia retinodes var. retinodes	2	2	0	0	0	0	4	0.5	0.28	11
Acrotriche depressa	3	1	0	0	0	0	4	0.5	0.16	19
Bursaria spinosa	2	2	0	0	0	0	4	0.5	0.28	6
Dianella revoluta var. brevicaulis	4	0	0	0	0	0	4	0.5	0.05	19
Hibbertia aspera	3	1	0	0	0	0	4	0.5	0.16	22
Hibbertia prostrata	4	0	0	0	0	0	4	0.5	0.05	13
Leptospermum continentale	3	1	0	0	0	0	4	0.5	0.16	15
Pteridium esculentum	4	0	0	0	0	0	4	0.5	0.05	4

Figure 75.
***Eucalyptus cladocalyx, +/- E. fasciculosa* Woodland at quadrat CA0701.**

SHE-OAK COMMUNITIES

Floristic Group 14 *Allocasuarina verticillata* (Drooping Sheoak) Low woosland

5 members



Dominant Overstorey Species:
Allocasuarina verticillata (Drooping Sheoak)

Sub-dominant Overstorey and dominant Understorey Species:

Acacia paradoxa
Acacia dodonaeifolia
Melaleuca uncinata

Average Number of Plant Species (& range):

26 (15 – 42)

Quadrat(s):

FB01001
KH00201
KH00303
KH00501
KH00502
KH00701
LI00501
NW00201

Environmental Parameters:

Landform Patterns/Systems: Low hills
Landform Elements: Hill slopes, various

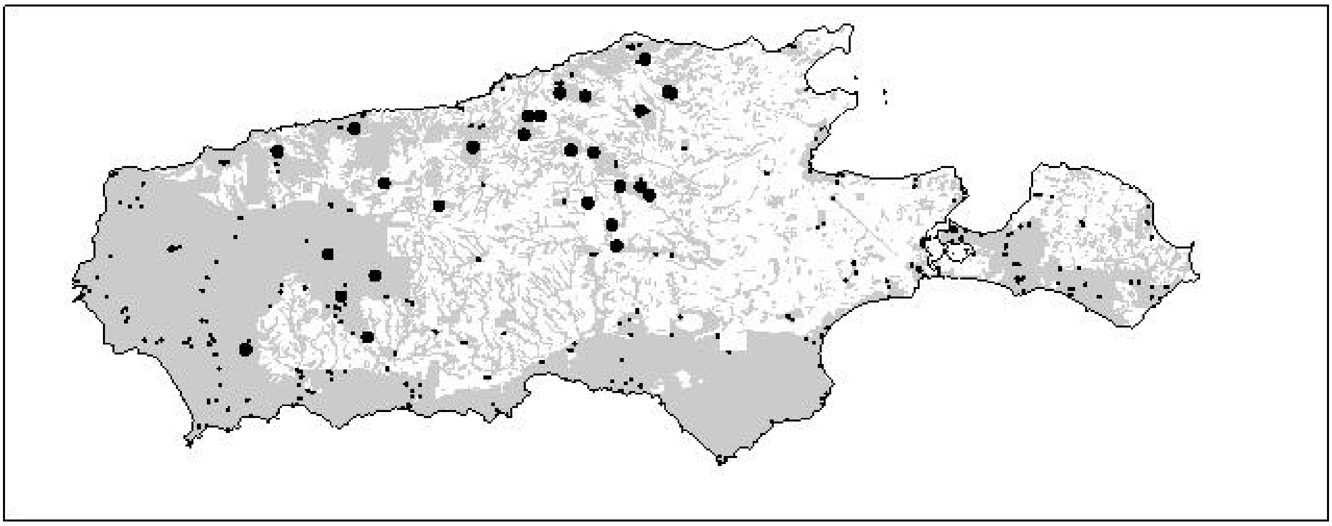
Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Allocasuarina verticillata	1	0	1	3	0	0	5	1	2.22	14
Acacia paradoxa	1	0	2	0	0	0	3	0.6	0.82	23
Acacia dodonaeifolia	1	1	0	0	0	0	2	0.4	0.22	2
Acrotriche depressa	2	0	0	0	0	0	2	0.4	0.04	19
Astroloma conostephioides	2	0	0	0	0	0	2	0.4	0.04	20
Galium migrans	2	0	0	0	0	0	2	0.4	0.04	12
Gonocarpus mezianus	1	1	0	0	0	0	2	0.4	0.22	18
Lissanthe strigosa	2	0	0	0	0	0	2	0.4	0.04	8
Melaleuca uncinata	2	0	0	0	0	0	2	0.4	0.04	16
Pimelea stricta	2	0	0	0	0	0	2	0.4	0.04	12
Prostanthera spinosa	1	1	0	0	0	0	2	0.4	0.22	12

Figure 76.
***Allocasuarina verticillata* Low woodland at quadrat KH0701.**

HEATH AND MALLEE HEATH COMMUNITIES

Floristic Group 15 *Eucalyptus baxteri* (Brown Stringybark)„ +/- *E. cosmophylla* (Cup Gum) Low woodland

27 members



Dominant Overstorey Species:
Eucalyptus baxteri (Brown Stringybark)
+/- E. cosmophylla (Cup Gum)

Sub-dominant Overstorey and dominant Understorey Species:

Xanthorrhoea semiplana ssp. tateana
Hakea rostrata
Petrophile multisecta
Isopogon ceratophyllus
Banksia marginata
Boronia edwardsii

Average Number of Plant Species (& range):

34 (14 – 48)

Quadrat(s):

CA00501
CA00601
CA00801
CC00501
CC00701
CC00801
CC00901
CR00201
CR00401
CR00501
ER00101
FB00901
GL00701
GL00901
GL01401
GL01601
LI00101
LI00301
MR00101
MR00801
PA00101
PA00301
PA00401
SC00101
SE00401
SE00501
WR00501

Environmental Parameters:

Landform Patterns/Systems: Low hills, rises
Landform Elements: Hill slopes, various

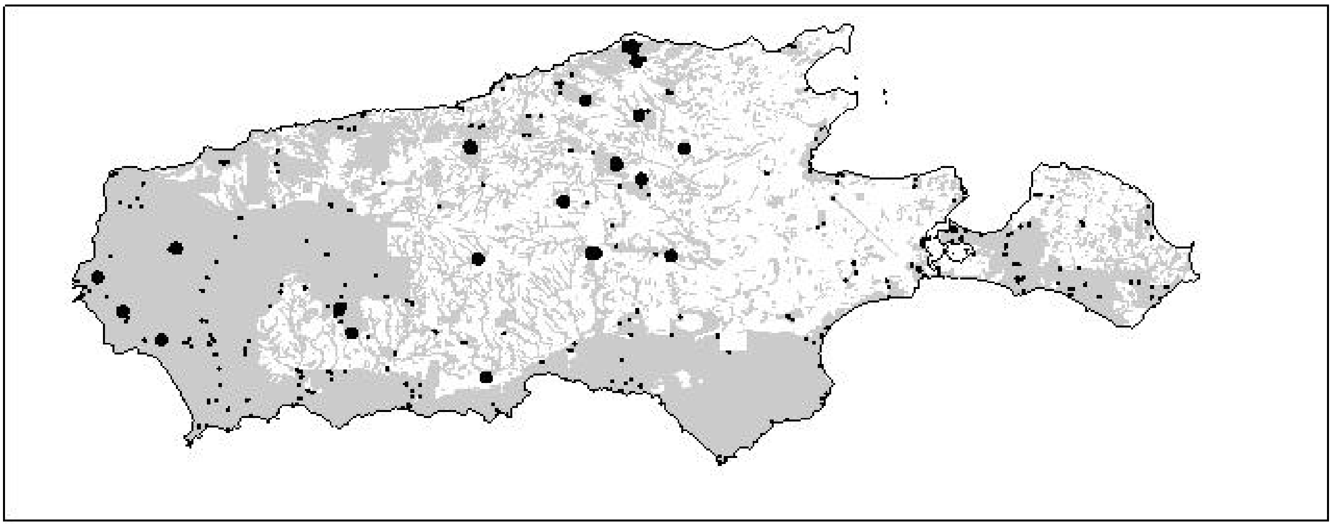
Species	**Cover / Abundance**						**No. of**	**Prop.**	**Mean**	**No.**
	T	**1**	**2**	**3**	**4**	**5**	**Quad.**	**Occur.**	**(KW)**	**Gps**
Xanthorrhoea semiplana ssp. tateana	7	16	3	0	0	0	26	0.96	0.84	18
Hakea rostrata	6	17	2	0	0	0	25	0.93	0.8	13
Petrophile multisecta	19	5	1	0	0	0	25	0.93	0.33	13

Isopogon ceratophyllus	22	2	0	0	0	0	24	0.89	0.16	16
Banksia marginata	4	16	3	0	0	0	23	0.85	0.83	18
Boronia edwardsii	20	2	0	0	0	0	22	0.81	0.15	8
Eucalyptus baxteri	0	6	14	2	0	0	22	0.81	1.48	7
Micrantheum demissum	20	2	0	0	0	0	22	0.81	0.15	11
Allocasuarina striata	3	12	5	0	0	0	20	0.74	0.83	15
Eucalyptus cosmophylla	3	9	6	0	0	0	18	0.67	0.79	14
Acacia myrtifolia	10	6	1	0	0	0	17	0.63	0.33	13
Cassytha glabella forma dispar	17	0	0	0	0	0	17	0.63	0.06	14
Leucopogon concurvus	13	4	0	0	0	0	17	0.63	0.2	10
Gompholobium ecostatum	14	2	0	0	0	0	16	0.59	0.13	6
Calytrix glaberrima	8	7	0	0	0	0	15	0.56	0.29	15
Daviesia asperula ssp. asperula	7	7	1	0	0	0	15	0.56	0.36	10
Pultenaea viscidula	5	7	2	1	0	0	15	0.56	0.54	11
Viola sieberiana	14	0	0	0	0	0	14	0.52	0.05	12
Baeckea ramosissima ssp. ramosissima	13	0	0	0	0	0	13	0.48	0.05	7
Lepidosperma semiteres	11	2	0	0	0	0	13	0.48	0.11	13
Adenanthos terminalis	11	1	0	0	0	0	12	0.44	0.08	8
Astroloma conostephioides	11	1	0	0	0	0	12	0.44	0.08	20
Tetratheca halmaturina	11	1	0	0	0	0	12	0.44	0.08	7
Daviesia brevifolia	11	0	0	0	0	0	11	0.41	0.04	8
Glischrocaryon behrii	11	0	0	0	0	0	11	0.41	0.04	8
Lepidosperma viscidum	11	0	0	0	0	0	11	0.41	0.04	15
Tetratheca insularis	10	1	0	0	0	0	11	0.41	0.07	6

Figure 77.
***Eucalyptus baxteri, E. cosmophylla* Low woodland at quadrat SC0101.**

Floristic Group 16 *Eucalyptus cosmophylla* (Cup Gum) Very low woodland

25 members



Dominant Overstorey Species:
Eucalyptus cosmophylla (Cup Gum)

Sub-dominant Overstorey and dominant Understorey Species:

Xanthorrhoea semiplana ssp. tateana
Hakea rostrata
Melaleuca gibbosa
Petrophile multisecta
Astroloma conostephioides

Average Number of Plant Species (& range):

34 (22 – 47)

Quadrat(s):

CC00101
CC00201
CC00401
CC00601
CC01101
CR00701
CR00801
CR00901
ER00301
GL00501
GL01301
HR00101
HR00601
LI00201
LL00301
MR00601
MR00701
PA00201
RR00701
SE00101
SE00301
TC00101
WB00501
WB01201
WB01301

Environmental Parameters:

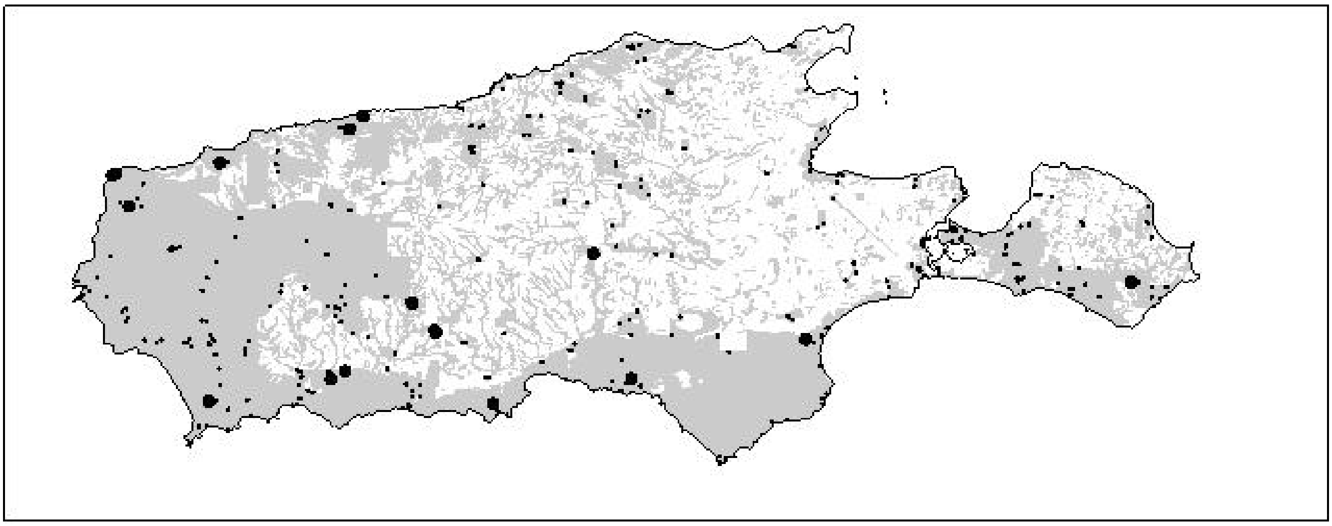
Landform Patterns/Systems: Low hills, rises
Landform Elements:

Species	Cover / Abundance						No. of	Prop.	Mean	No.
	T	1	2	3	4	5	Quad.	Occur.	(KW)	Gps
Xanthorrhoea semiplana ssp. tateana	1	16	6	0	0	0	23	0.92	1.12	18
Eucalyptus cosmophylla	2	11	8	1	0	0	22	0.88	1.21	14
Hakea rostrata	4	14	3	0	0	0	21	0.84	0.82	13
Melaleuca gibbosa	5	14	1	0	0	0	20	0.8	0.66	30
Petrophile multisecta	17	3	0	0	0	0	20	0.8	0.19	13
Astroloma conostephioides	13	3	0	0	0	0	16	0.64	0.17	20
Allocasuarina muelleriana ssp. notocolpica	0	7	4	3	0	0	14	0.56	0.96	11
Gonocarpus mezianus	14	0	0	0	0	0	14	0.56	0.06	18
Hibbertia sericea var. sericea	14	0	0	0	0	0	14	0.56	0.06	15
Prostanthera spinosa	6	7	1	0	0	0	14	0.56	0.38	12
Allocasuarina striata	1	9	2	1	0	0	13	0.52	0.64	15
Isopogon ceratophyllus	11	2	0	0	0	0	13	0.52	0.12	16
Acrotriche depressa	11	1	0	0	0	0	12	0.48	0.08	19
Calytrix glaberrima	9	3	0	0	0	0	12	0.48	0.16	15
Daviesia asperula ssp. asperula	11	1	0	0	0	0	12	0.48	0.08	10
Boronia edwardsii	11	0	0	0	0	0	11	0.44	0.04	8
Astroloma humifusum	10	0	0	0	0	0	10	0.4	0.04	21
Banksia marginata	6	4	0	0	0	0	10	0.4	0.18	18
Calytrix tetragona	10	0	0	0	0	0	10	0.4	0.04	17
Lepidosperma viscidum	8	2	0	0	0	0	10	0.4	0.11	15
Leucopogon concurvus	5	5	0	0	0	0	10	0.4	0.22	10

Figure 78.
***Eucalyptus cosmophylla* Very low woodland at quadrat WB0501.**

Floristic Group 17 *Allocasuarina striata* (Stalked Oak-bush), +/- *Eucalyptus diversifolia* (Coastal White Mallee) Tall open shrubland.

17 members



Dominant Overstorey Species:

Allocasuarina striata (Stalked Oak-Bush)
+/- Eucalyptus diversifolia (Coastal White Mallee)

Sub-dominant Overstorey and dominant Understorey Species:

Calytrix glaberrima
Xanthorrhoea semiplana ssp. tateana
Melaleuca gibbosa
Petrophile multisecta
Banksia marginata

Average Number of Plant Species (& range):

30 (22 – 47)

Quadrat(s):

CB00201
CB00301
CD00201
CH00301
CT00201
DE00601
KH01301
KH01501
MT00101
MT00201
NE00101
RC00401
SB00701
SE00201
VB00301
WR00201
WR00401

Environmental Parameters:

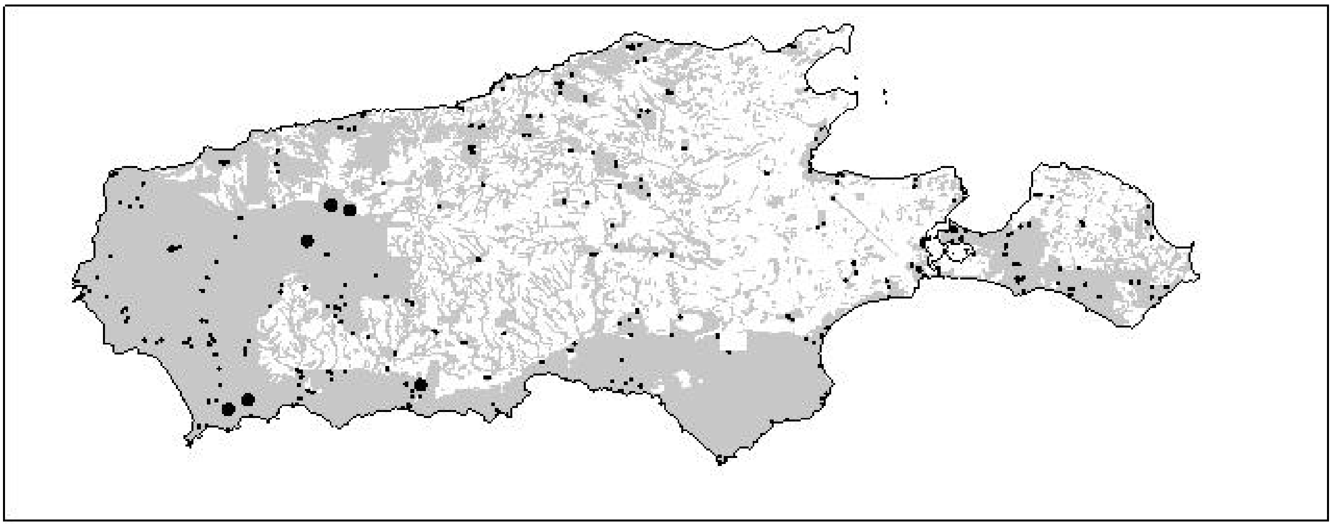
Landform Patterns/Systems: Low hills, various
Landform Elements: Hill slopes, hill crests, plains

Species	Cover / Abundance						No. of	Prop.	Mean	No.
	T	1	2	3	4	5	Quad.	Occur.	(KW)	Gps
Allocasuarina striata	4	3	9	0	0	0	16	0.94	1.26	15
Calytrix glaberrima	11	4	0	0	0	0	15	0.88	0.3	15
Xanthorrhoea semiplana ssp. tateana	8	5	2	0	0	0	15	0.88	0.58	18
Melaleuca gibbosa	12	2	0	0	0	0	14	0.82	0.19	30
Petrophile multisecta	11	0	2	0	0	0	13	0.76	0.3	13
Banksia marginata	8	3	1	0	0	0	12	0.71	0.34	18
Eucalyptus diversifolia	2	2	5	3	0	0	12	0.71	1.25	22
Boronia filifolia	11	0	0	0	0	0	11	0.65	0.06	13
Hakea muelleriana	8	1	1	0	0	0	10	0.59	0.22	23
Hakea rostrata	9	0	0	0	0	0	9	0.53	0.05	13
Acacia myrtifolia	5	3	0	0	0	0	8	0.47	0.21	13
Astroloma conostephioides	8	0	0	0	0	0	8	0.47	0.05	20
Hibbertia sericea var. sericea	8	0	0	0	0	0	8	0.47	0.05	15
Leucopogon concurvus	5	3	0	0	0	0	8	0.47	0.21	10
Leucopogon rufus	7	0	0	0	0	0	7	0.41	0.04	14

Figure 79.
***Allocasuarina striata, +/- Eucalyptus diversifolia* Tall open shrubland at quadrat KH1501.**

Floristic Group 18 *Leptospermum myrsinoides* (Heath Tea-tree) Open shrubland.

6 members



Dominant Overstorey Species:

Leptospermum myrsinoides (Heath Tea-Tree)

Sub-dominant Overstorey and dominant Understorey Species:

Dillwynia sericea
Leucopogon costatus
Phyllota pleurandroides

Average Number of Plant Species (& range):

40 (31 – 53)

Quadrat(s):

CD00401
FB00201
FB00301
FB00401
FB01101
ST01001

Environmental Parameters:

Landform Patterns/Systems: Plains, rises
Landform Elements: Plains

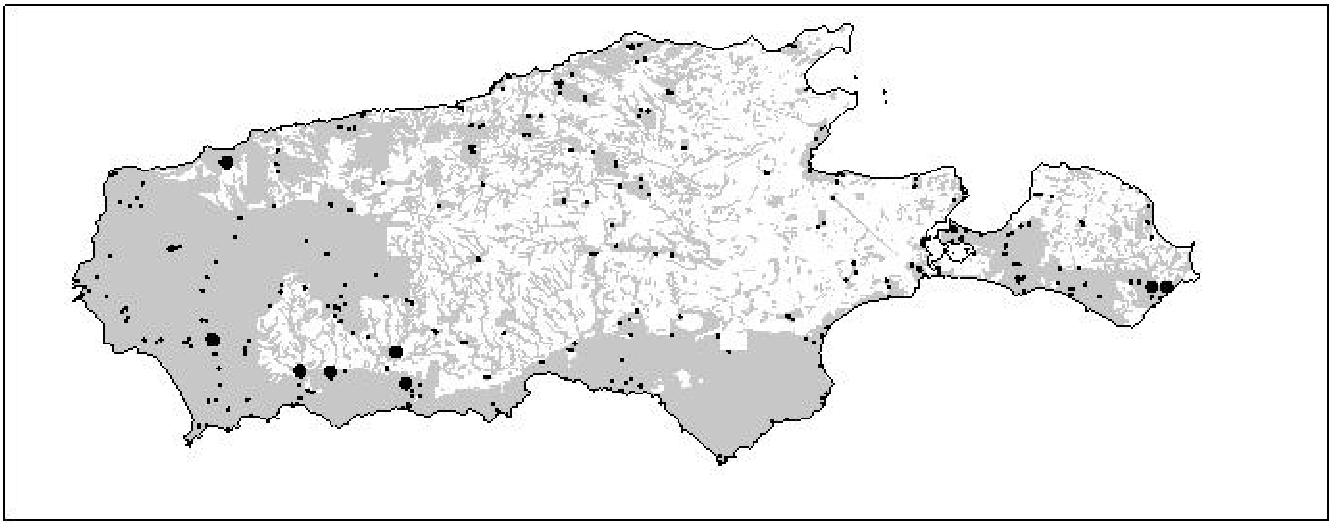
Species	**Cover / Abundandance**						**No. of**	**Prop.**	**Mean**	**No.**
	T	**1**	**2**	**3**	**4**	**5**	**Quad.**	**Occur.**	**(KW)**	**Gps**
Dillwynia sericea	5	1	0	0	0	0	6	1	0.25	10
Leptospermum myrsinoides	2	3	0	0	0	1	6	1	1.37	11
Leucopogon costatus	6	0	0	0	0	0	6	1	0.1	7
Phyllota pleurandroides	1	5	0	0	0	0	6	1	0.85	8
Adenanthos macropodiana	3	2	0	0	0	0	5	0.83	0.38	9
Banksia ornata	3	2	0	0	0	0	5	0.83	0.38	8
Boronia filifolia	5	0	0	0	0	0	5	0.83	0.08	13
Calytrix glaberrima	2	3	0	0	0	0	5	0.83	0.53	15
Cassytha glabella forma dispar	5	0	0	0	0	0	5	0.83	0.08	14
Conospermum patens	5	0	0	0	0	0	5	0.83	0.08	6
Hakea rostrata	5	0	0	0	0	0	5	0.83	0.08	13
Hibbertia sericea var. sericea	4	1	0	0	0	0	5	0.83	0.23	15
Hypolaena fastigiata	5	0	0	0	0	0	5	0.83	0.08	7
Isopogon ceratophyllus	4	1	0	0	0	0	5	0.83	0.23	16
Leptospermum continentale	5	0	0	0	0	0	5	0.83	0.08	15
Melaleuca gibbosa	3	2	0	0	0	0	5	0.83	0.38	30

Petrophile multisecta	5	0	0	0	0	0	5	0.83	0.08	13
Allocasuarina striata	4	0	0	0	0	0	4	0.67	0.07	15
Caustis pentandra	4	0	0	0	0	0	4	0.67	0.07	5
Daviesia brevifolia	4	0	0	0	0	0	4	0.67	0.07	8
Eucalyptus baxteri	3	1	0	0	0	0	4	0.67	0.22	7
Eucalyptus cosmophylla	4	0	0	0	0	0	4	0.67	0.07	14
Lepidosperma semiteres	2	2	0	0	0	0	4	0.67	0.37	13
Leucopogon concurvus	4	0	0	0	0	0	4	0.67	0.07	10
Micrantheum demissum	4	0	0	0	0	0	4	0.67	0.07	11
Stylidium graminifolium	4	0	0	0	0	0	4	0.67	0.07	3
Tetratheca halmaturina	4	0	0	0	0	0	4	0.67	0.07	7
Xanthorrhoea semiplana ssp. tateana	4	0	0	0	0	0	4	0.67	0.07	18
Baeckea ericaea	3	0	0	0	0	0	3	0.5	0.05	5
Banksia marginata	3	0	0	0	0	0	3	0.5	0.05	18
Darwinia micropetala	3	0	0	0	0	0	3	0.5	0.05	9
Glischrocaryon behrii	3	0	0	0	0	0	3	0.5	0.05	8
Grevillea quinquenervis	3	0	0	0	0	0	3	0.5	0.05	7
Hakea muelleriana	3	0	0	0	0	0	3	0.5	0.05	23
Leptocarpus tenax	3	0	0	0	0	0	3	0.5	0.05	4
Patersonia fragilis	3	0	0	0	0	0	3	0.5	0.05	5
Platylobium obtusangulum	3	0	0	0	0	0	3	0.5	0.05	12
Viola sieberiana	3	0	0	0	0	0	3	0.5	0.05	12

Figure 80.
***Leptospermum myrsinoides* Open shrubland at quadrat FB0401.**

Floristic Group 19 *Xanthorrhoea semiplana* ssp. *tateana* (Tate's grass-tree), *Allocasuarina striata* (Stalked Oak-bush) Low open shrubland

9 members



Dominant Overstorey Species:

Xanthorrhoea semiplana ssp. tateana (Tate's Grass Tree)
Allocasuarina striata (Stalked Oak-Bush)

Sub-dominant Overstorey and dominant Understorey Species:

Daviesia asperula ssp. asperula
Micrantheum demissum
Isopogon ceratophyllus
Astroloma conostephioides
Astroloma humifusum
Calytrix glaberrima
Dillwynia sericea
Hakea rostrata

Average Number of Plant Species (& range):

37 (16 – 47)

Quadrat(s):

CH00601
CH00701
CT00101
KH00601
KH01401
NW00301
SR00901
SR01001
ST00801

Environmental Parameters:

Landform Patterns/Systems: Low hills, rises
Landform Elements: Hill crests, hill slopes, plains

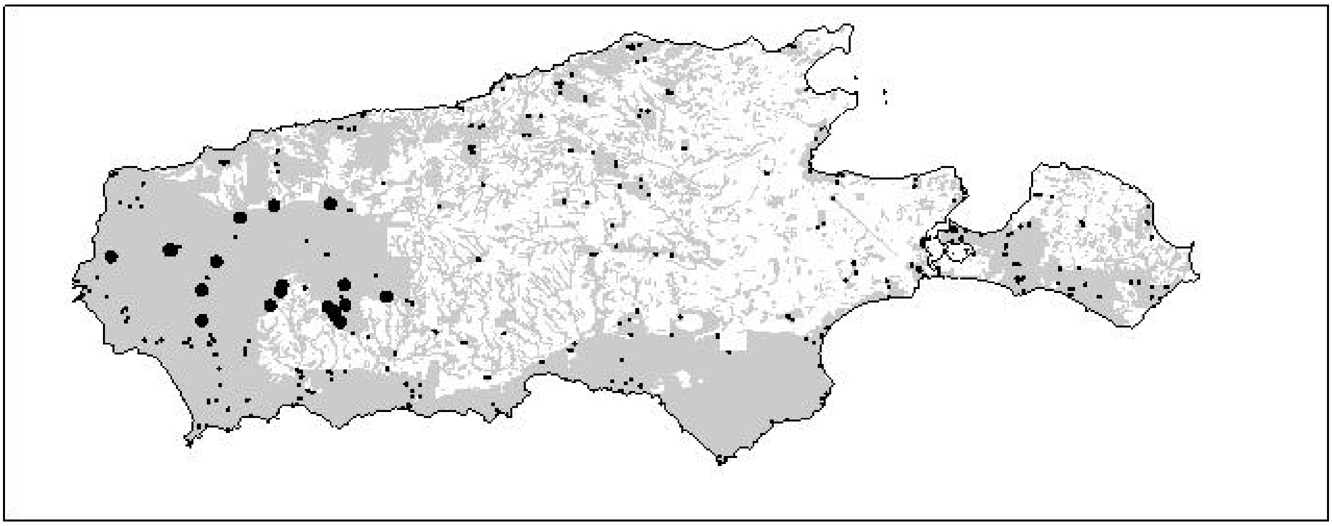
Species	Cover / Abundance						No. of	Prop.	Mean	No.
	T	1	2	3	4	5	Quad.	Occur.	(KW)	Gps
Daviesia asperula ssp. asperula	9	0	0	0	0	0	9	1	0.1	10
Xanthorrhoea semiplana ssp. tateana	8	1	0	0	0	0	9	1	0.2	18
Micrantheum demissum	8	0	0	0	0	0	8	0.89	0.09	11
Isopogon ceratophyllus	7	0	0	0	0	0	7	0.78	0.08	16
Allocasuarina striata	6	0	0	0	0	0	6	0.67	0.07	15
Astroloma conostephioides	4	2	0	0	0	0	6	0.67	0.27	20
Astroloma humifusum	6	0	0	0	0	0	6	0.67	0.07	21
Calytrix glaberrima	5	1	0	0	0	0	6	0.67	0.17	15
Dillwynia sericea	6	0	0	0	0	0	6	0.67	0.07	10

Hakea rostrata	6	0	0	0	0	0	6	0.67	0.07	13
Acrotriche depressa	5	0	0	0	0	0	5	0.56	0.06	19
Adenanthos terminalis	5	0	0	0	0	0	5	0.56	0.06	8
Eucalyptus diversifolia	5	0	0	0	0	0	5	0.56	0.06	22
Hibbertia aspera	5	0	0	0	0	0	5	0.56	0.06	22
Melaleuca gibbosa	4	1	0	0	0	0	5	0.56	0.16	30
Petrophile multisecta	4	0	1	0	0	0	5	0.56	0.27	13
Acacia spinescens	4	0	0	0	0	0	4	0.44	0.04	11
Baeckea ramosissima ssp. ramosissima	4	0	0	0	0	0	4	0.44	0.04	7
Banksia marginata	4	0	0	0	0	0	4	0.44	0.04	18
Comesperma calymega	4	0	0	0	0	0	4	0.44	0.04	10
Eucalyptus cosmophylla	4	0	0	0	0	0	4	0.44	0.04	14
Eucalyptus fasciculosa	4	0	0	0	0	0	4	0.44	0.04	9
Glischrocaryon behrii	4	0	0	0	0	0	4	0.44	0.04	8
Gompholobium ecostatum	4	0	0	0	0	0	4	0.44	0.04	6
Gonocarpus mezianus	4	0	0	0	0	0	4	0.44	0.04	18
Hibbertia sericea var. sericea	4	0	0	0	0	0	4	0.44	0.04	15
Lepidosperma semiteres	4	0	0	0	0	0	4	0.44	0.04	13
Leucopogon rufus	4	0	0	0	0	0	4	0.44	0.04	14
Melaleuca uncinata	4	0	0	0	0	0	4	0.44	0.04	16
Platylobium obtusangulum	3	1	0	0	0	0	4	0.44	0.14	12
Tetratheca halmaturina	4	0	0	0	0	0	4	0.44	0.04	7
Thomasia petalocalyx	4	0	0	0	0	0	4	0.44	0.04	13

Figure 81.
***Xanthorrhoea semiplana ssp. tateana, Allocasuarina striata* Low open shrubland at quadrat CT0101.**

Floristic Group 20 *Eucalyptus remota* (Kangaroo Island Mallee ash) Low mallee

18 members



Dominant Overstorey Species:

Eucalyptus remota (Kangaroo Island Mallee Ash)

Sub-dominant Overstorey and dominant Understorey Species:

Banksia ornata
Tetratheca halmaturina
Banksia marginata
Boronia filifolia
Leucopogon concurvus
Petrophile multisecta
Adenanthos terminalis
Xanthorrhoea semiplana ssp. tateana

Average Number of Plant Species (& range):

32 (21 – 50)

Quadrat(s):

FB00101
FB00501
FB00601
FB00701
GL00301
GL00601
GL00801
GL01101
GL01201
GL01501
LL00401
LL00501
SC00401
SR00101
SR00301
SR00501
SR00601
WB01401

Environmental Parameters:

Landform Patterns/Systems: Low hills
Landform Elements: Hill slopes, plains

Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Banksia ornata	5	8	5	0	0	0	18	1	1.03	8
Tetratheca halmaturina	18	0	0	0	0	0	18	1	0.1	7
Banksia marginata	4	11	2	0	0	0	17	0.94	0.86	18
Boronia filifolia	17	0	0	0	0	0	17	0.94	0.09	13
Leucopogon concurvus	15	2	0	0	0	0	17	0.94	0.19	10
Petrophile multisecta	17	0	0	0	0	0	17	0.94	0.09	13
Adenanthos terminalis	16	0	0	0	0	0	16	0.89	0.09	8
Xanthorrhoea semiplana ssp. tateana	9	5	2	0	0	0	16	0.89	0.55	18

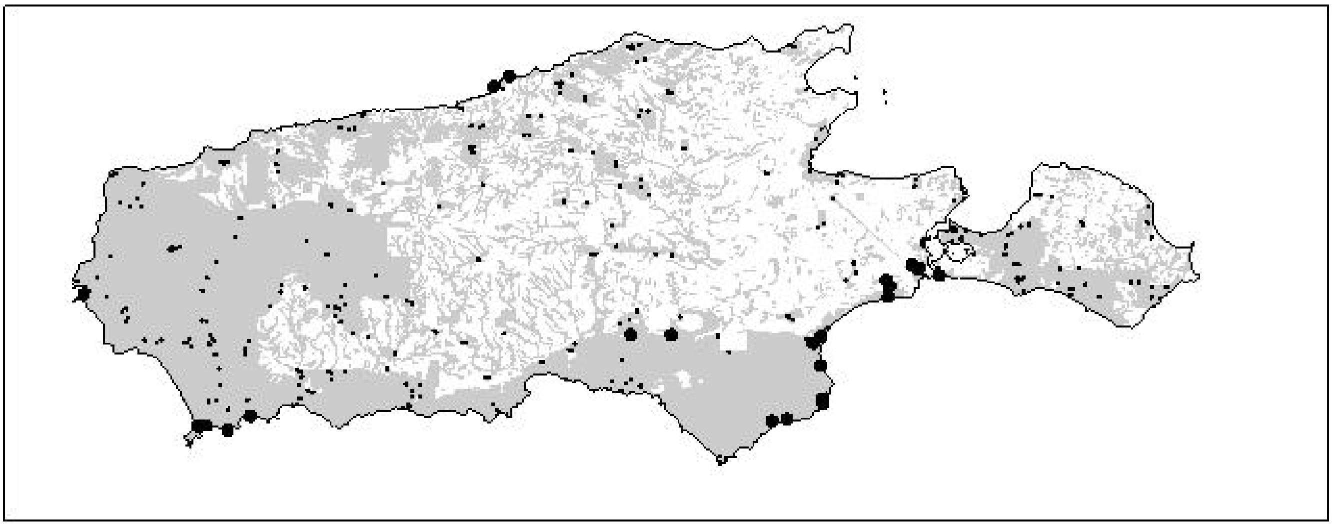
Eucalyptus remota	2	7	3	3	0	0	15	0.83	1.23	2
Hakea rostrata	7	3	5	0	0	0	15	0.83	0.76	13
Conospermum patens	14	0	0	0	0	0	14	0.78	0.08	6
Dillwynia sericea	14	0	0	0	0	0	14	0.78	0.08	10
Lepidosperma carphoides	13	1	0	0	0	0	14	0.78	0.13	6
Phyllota pleurandroides	10	3	1	0	0	0	14	0.78	0.33	8
Caustis pentandra	13	0	0	0	0	0	13	0.72	0.07	5
Daviesia brevifolia	12	0	0	0	0	0	12	0.67	0.07	8
Grevillea quinquenervis	9	3	0	0	0	0	12	0.67	0.22	7
Allocasuarina striata	5	0	4	2	0	0	11	0.61	0.81	15
Glischrocaryon behrii	11	0	0	0	0	0	11	0.61	0.06	8
Isopogon ceratophyllus	11	0	0	0	0	0	11	0.61	0.06	16
Micrantheum demissum	11	0	0	0	0	0	11	0.61	0.06	11
Gompholobium ecostatum	10	0	0	0	0	0	10	0.56	0.06	6
Cassytha glabella forma dispar	9	0	0	0	0	0	9	0.5	0.05	14
Hibbertia sericea var. sericea	9	0	0	0	0	0	9	0.5	0.05	15
Schoenus breviculmis	9	0	0	0	0	0	9	0.5	0.05	7
Hibbertia stricta	8	0	0	0	0	0	8	0.44	0.04	6
Lepidosperma viscidum	7	1	0	0	0	0	8	0.44	0.09	15

Figure 82.
Eucalyptus remota **Low mallee at quadrat GL1201.**

MALLEE AND MALLEE SHRUBLAND COMMUNITIES

Floristic Group 21 *Eucalyptus diversifolia* (Coastal White Mallee) Mallee

23 members



Dominant Overstorey Species:

Eucalyptus diversifolia (Coastal White Mallee)

Sub-dominant Overstorey and dominant Understorey Species:

Goodenia varia
Melaleuca lanceolata
Leucopogon parviflorus
Dodonaea humilis

Average Number of Plant Species (& range):

33 (17 – 56)

Quadrat(s):

CA00101
CA00301
CD00101
CD00501
CD00601
CG00101
CG00501
CG00701
CG00801
CG00901
CG01001
DE00101
DE00301
FB01203
FC00101
FC00201
FC00301
LA00401
PL00501
PL00601
PL00701
PL01101
WB00801

Environmental Parameters:

Landform Patterns/Systems: Rises
Landform Elements: Cliffs, plains, hill slopes

Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Goodenia varia	5	15	1	0	0	0	21	0.91	0.76	13
Eucalyptus diversifolia	1	5	6	7	0	0	19	0.83	1.66	22
Melaleuca lanceolata	0	15	3	1	0	0	19	0.83	1.04	18
Leucopogon parviflorus	1	14	3	0	0	0	18	0.78	0.87	15
Dodonaea humilis	4	11	2	0	0	0	17	0.74	0.67	9
Beyeria lechenaultii	1	11	4	0	0	0	16	0.7	0.83	13
Melaleuca gibbosa	0	12	4	0	0	0	16	0.7	0.87	30
Acrotriche cordata	2	12	1	0	0	0	15	0.65	0.62	14
Pimelea glauca	4	10	0	0	0	0	14	0.61	0.45	13
Eucalyptus rugosa	1	5	3	4	0	0	13	0.57	1	12
Pomaderris obcordata	4	9	0	0	0	0	13	0.57	0.41	11
Veronica hillebrandii	8	5	0	0	0	0	13	0.57	0.25	12
Stipa flavescens	6	6	0	0	0	0	12	0.52	0.29	10
Lasiopetalum schulzenii	2	8	1	0	0	0	11	0.48	0.44	20
Olearia ramulosa	4	7	0	0	0	0	11	0.48	0.32	13
Dianella revoluta var. brevicaulis	6	4	0	0	0	0	10	0.43	0.2	19
Lasiopetalum discolor	3	6	1	0	0	0	10	0.43	0.36	7
Orthrosanthus multiflorus	5	5	0	0	0	0	10	0.43	0.24	22
Pultenaea acerosa	1	8	1	0	0	0	10	0.43	0.44	17

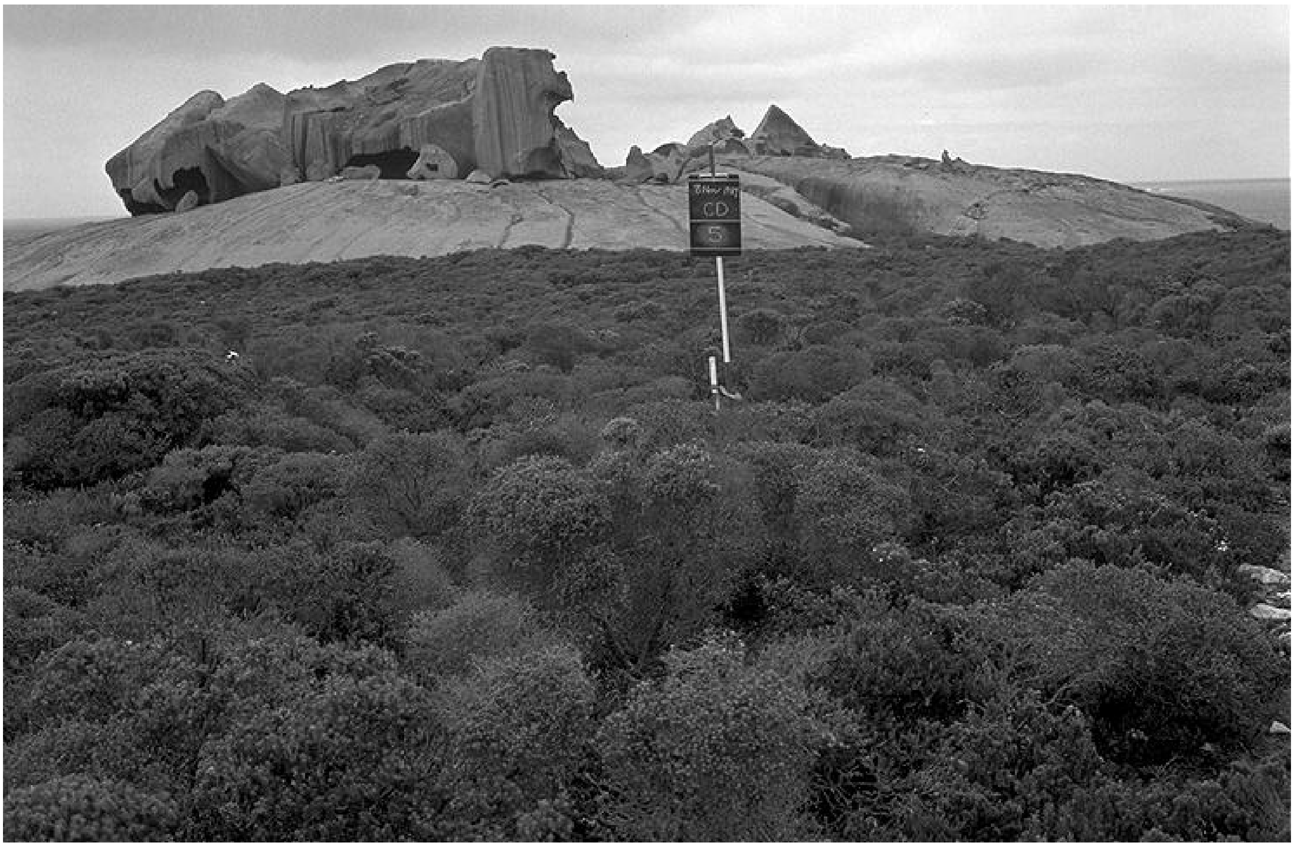
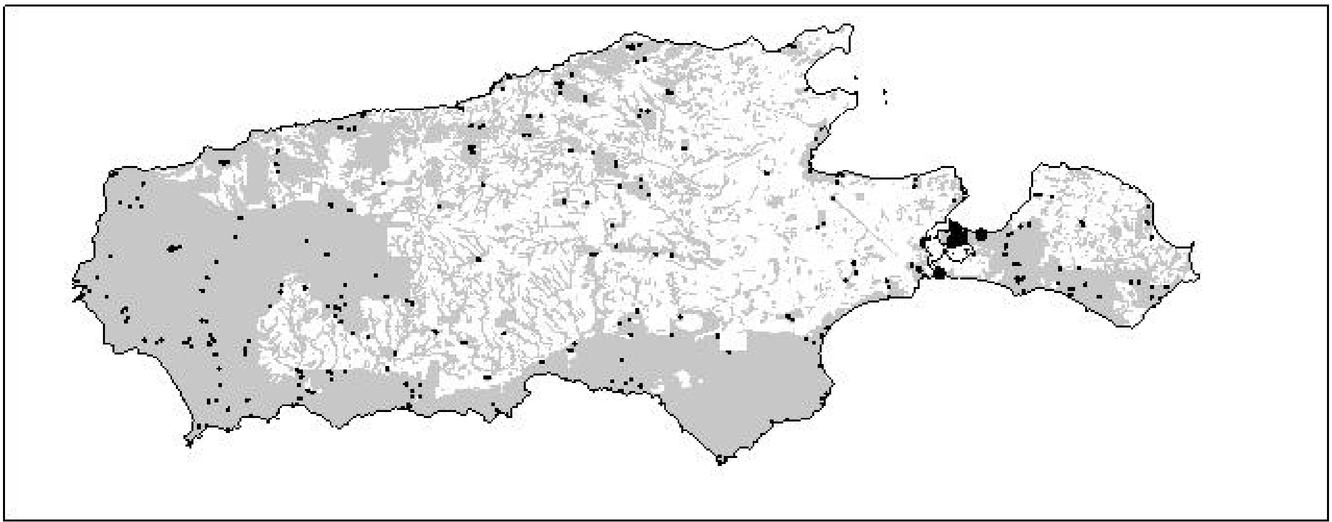


Figure 83.
***Eucalyptus diversifolia* Mallee at quadrat CD0501.**

Floristic Group 22 *Eucalyptus diversifolia* (Coastal White Mallee), +/- *E. lansdowneana* ssp. *albopurpurea* (Purple-Flowered Mallee Box), +/- *E. rugosa* (Kangaroo Island Mallee-ash) Mallee

7 members



Dominant Overstorey Species:

Eucalyptus diversifolia (Coastal White Mallee)
+/- *E. lansdowneana* ssp. *albopurpurea* (Purple-Flowered Mallee Box)
+/- *E. rugosa* (Coastal White Mallee)

Sub-dominant Overstorey and dominant Understorey Species:

Acrotriche patula
Orthrosanthus multiflorus
Stipa exilis
Clematis microphylla
Leucopogon parviflorus

Average Number of Plant Species (& range):

23 (18 – 29)

Quadrat(s):

PL01001
PL01401
PL01501
PL01601
PL01701
PL01801
PL02201

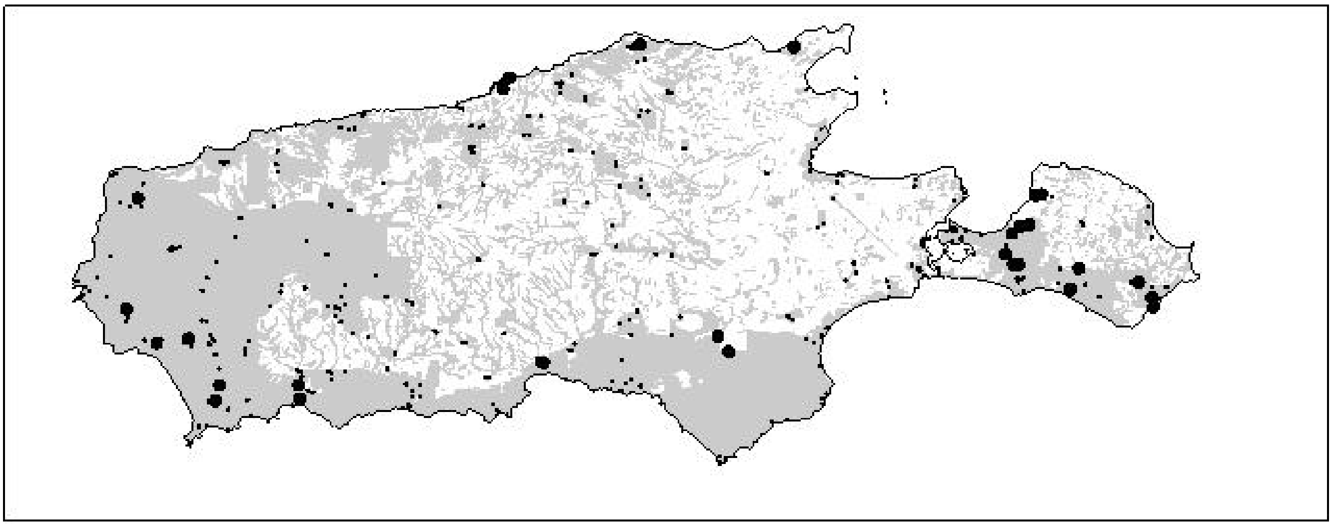
Environmental Parameters:

Landform Patterns/Systems: Dunefields
Landform Elements: Hill slopes, plains, dunes

Species	Cover / Abundance						No. of	Prop.	Mean	No.
	T	1	2	3	4	5	Quad.	Occur.	(KW)	Gps
Acrotriche patula	0	7	0	0	0	0	7	1	1	11
Orthrosanthus multiflorus	0	7	0	0	0	0	7	1	1	22
Stipa exilis	0	6	0	0	0	0	6	0.86	0.86	14
Clematis microphylla	0	5	0	0	0	0	5	0.71	0.71	8
Eucalyptus diversifolia	0	1	4	0	0	0	5	0.71	1.29	22
Leucopogon parviflorus	0	5	0	0	0	0	5	0.71	0.71	15
Senecio odoratus var. odoratus	0	5	0	0	0	0	5	0.71	0.71	11
Acacia leiophylla	1	2	1	0	0	0	4	0.57	0.59	15
Carpobrotus rossii	0	3	0	0	0	0	3	0.43	0.43	11
Dianella revoluta var. brevicaulis	0	3	0	0	0	0	3	0.43	0.43	19

Figure 84.
***Eucalyptus diversifolia, +/- E. landsdowneana* ssp. *albopurpurea, +/- E.rugosa* Mallee at quadrat PL1501.**

Floristic Group 23 *Eucalyptus diversifolia* (Coastal White Mallee), *Melaleuca lanceolata* (Dryland Tea-tree), +/- *E. rugosa* (Kangaroo Island Mallee-ash) Open mallee
29 members



Dominant Overstorey Species:

Eucalyptus diversifolia (Coastal White Mallee)
Melaleuca lanceolata (Dryland Tea-Tree)
+/- E. rugosa

Sub-dominant Overstorey and dominant Understorey Species:

Orthrosanthus multiflorus
Acacia leiophylla
Choretrum glomeratum var. glomeratum

Average Number of Plant Species (& range):

30 (11 – 49)

Quadrat(s):

CA00201
CA00401
CC00301
CD00301
CD00801
CG00201
CG00301
CH00101
CH00201
CH00501
DU00101
DU00201
DU00301
DU00701
DU00801
DU00901
EB00201
ER00601
ER00701
GF00201
GF00301
KH00101
KH00801
RC00201
RR00401
RR00801
WB00401
WI00401
WI00801

Environmental Parameters:

Landform Patterns/Systems: Low hills, rises
Landform Elements: Hill crests, hill slopes, dunes, plains

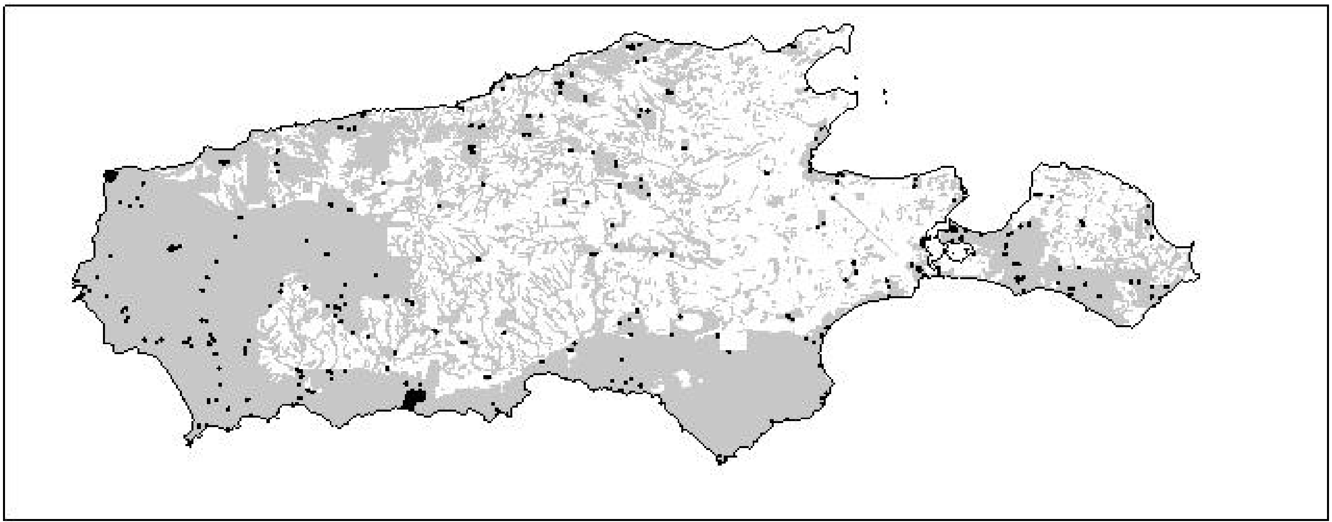
Species	Cover / Abundandance						No. of	Prop.	Mean	No.
	T	1	2	3	4	5	Quad.	Occur.	(KW)	Gps
Eucalyptus diversifolia	1	1	20	7	0	0	29	1	2.14	22
Melaleuca lanceolata	13	7	2	1	0	0	23	0.79	0.53	18
Orthrosanthus multiflorus	18	1	0	0	0	0	19	0.66	0.1	22
Eucalyptus rugosa	4	2	9	2	0	0	17	0.59	0.91	12
Acacia leiophylla	12	2	0	0	0	0	14	0.48	0.11	15
Choretrum glomeratum var. glomeratum	13	1	0	0	0	0	14	0.48	0.08	18
Lasiopetalum schulzenii	8	2	3	0	0	0	13	0.45	0.3	20
Leucopogon parviflorus	9	3	1	0	0	0	13	0.45	0.2	15
Dianella revoluta var. brevicaulis	12	0	0	0	0	0	12	0.41	0.04	19

Figure 85.
***Eucalyptus diversifolia Melaleuca lanceolata +/- E. rugosa* Open mallee at quadrat CD0301.**

COASTAL SHRUBLANDS GROUP 1 COMMUNITIES

Floristic Group 24 *Eucalyptus lansdowneana* ssp. *albopurpurea* (Purple-Flowered Mallee box) Open low mallee

4 members



Dominant Overstorey Species:

Eucalyptus lansdowneana ssp. *albopurpurea* (Purple-Flowered Mallee Box)

Sub-dominant Overstorey and dominant Understorey Species:

Hibbertia aspera
Beyeria lechenaultii
Calytrix tetragona
Danthonia setacea var. setacea
Eutaxia microphylla var. microphylla
Lasiopetalum schulzenii
Melaleuca lanceolata
Orthrosanthus multiflorus

Average Number of Plant Species (& range):
30 (19 – 39)

Quadrat(s):

CB00101
ST00201
ST00501
ST00901

Environmental Parameters:

Landform Patterns/Systems: Dunefields, rises
Landform Elements: Plains

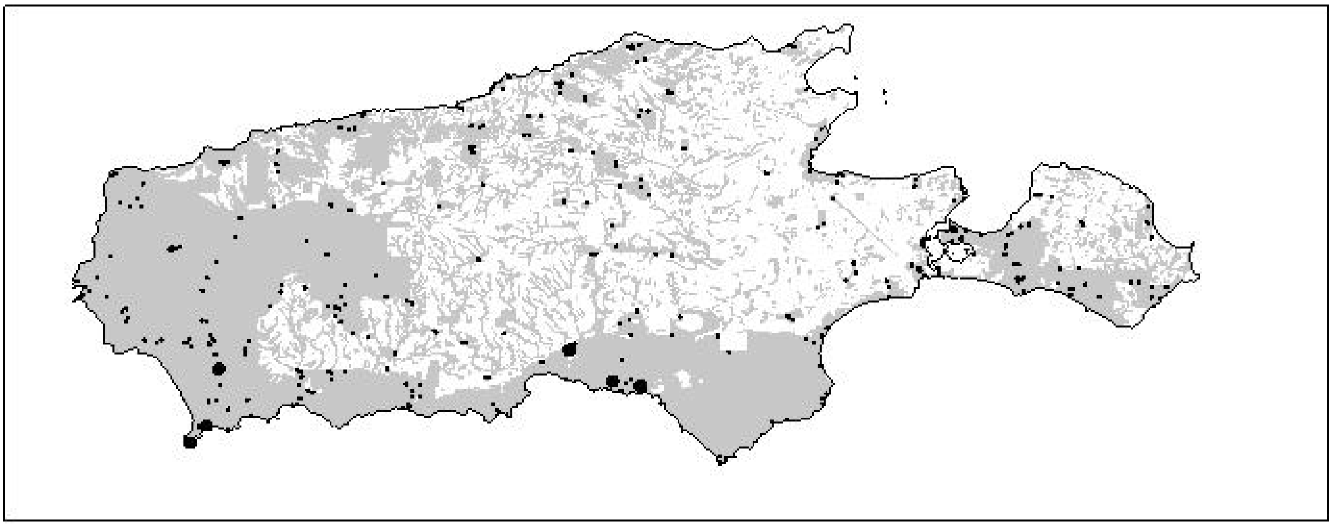
Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Hibbertia aspera	4	0	0	0	0	0	4	1	0.1	22
Beyeria lechenaultii	3	0	0	0	0	0	3	0.75	0.08	13
Calytrix tetragona	1	2	0	0	0	0	3	0.75	0.52	17
Danthonia setacea var. setacea	3	0	0	0	0	0	3	0.75	0.08	19
Eucalyptus lansdowneana ssp. albopurpurea	1	1	1	0	0	0	3	0.75	0.77	11
Eutaxia microphylla var. microphylla	3	0	0	0	0	0	3	0.75	0.08	17

Lasiopetalum schulzenii	2	1	0	0	0	0	3	0.75	0.3	20
Melaleuca lanceolata	3	0	0	0	0	0	3	0.75	0.08	18
Orthrosanthus multiflorus	3	0	0	0	0	0	3	0.75	0.08	22
Acrotriche cordata	1	1	0	0	0	0	2	0.5	0.28	14
Acrotriche patula	2	0	0	0	0	0	2	0.5	0.05	11
Goodenia varia	2	0	0	0	0	0	2	0.5	0.05	13
Grevillea pauciflora ssp. pauciflora	2	0	0	0	0	0	2	0.5	0.05	10
Hakea muelleriana	2	0	0	0	0	0	2	0.5	0.05	23
Hakea vittata	2	0	0	0	0	0	2	0.5	0.05	7
Leptomeria aphylla	2	0	0	0	0	0	2	0.5	0.05	13
Melaleuca brevifolia	1	1	0	0	0	0	2	0.5	0.28	12
Melaleuca gibbosa	2	0	0	0	0	0	2	0.5	0.05	30
Olearia ramulosa	2	0	0	0	0	0	2	0.5	0.05	13
Pimelea glauca	2	0	0	0	0	0	2	0.5	0.05	13
Spyridium halmaturinum var. integrifolium	2	0	0	0	0	0	2	0.5	0.05	9
Veronica hillebrandii	2	0	0	0	0	0	2	0.5	0.05	12

Figure 86.
***Eucalyptus landsdowneana* ssp. *albopurpurea* Open low mallee at quadrat ST0201.**

Floristic Group 25 *Melaleuca lanceolata* (Dryland Tea-tree) Low open shrubland

8 members



Dominant Overstorey Species:

Melaleuca lanceolata (Dryland Tea-Tree)

Sub-dominant Overstorey and dominant Understorey Species:

Beyeria lechenaultii
Eutaxia microphylla var. microphylla
Orthrosanthus multiflorus

Average Number of Plant Species (& range):

27 (15- 47)

Quadrat(s):

CD00602
CD00701
CD00901
ER00801
ER00901
SB00401
SB00801
SB00901

Environmental Parameters:

Landform Patterns/Systems: Dunefields, Low hills
Landform Elements: Hill slopes, interdune low, dunes

Species	Cover / Abundance						No. of	Prop.	Mean	No.
	T	1	2	3	4	5	Quad.	Occur.	(KW)	Gps
Beyeria lechenaultii	1	3	3	0	0	0	7	0.88	1.14	13
Melaleuca lanceolata	5	2	0	0	0	0	7	0.88	0.31	18
Eutaxia microphylla var. microphylla	6	0	0	0	0	0	6	0.75	0.08	17
Orthrosanthus multiflorus	4	2	0	0	0	0	6	0.75	0.3	22
Hibbertia aspera	5	0	0	0	0	0	5	0.62	0.06	22
Microcybe pauciflora	0	4	1	0	0	0	5	0.62	0.75	5
Acacia acinacea	2	2	0	0	0	0	4	0.5	0.28	7
Acrotriche patula	3	1	0	0	0	0	4	0.5	0.16	11
Gahnia deusta	1	3	0	0	0	0	4	0.5	0.39	6
Pultenaea acerosa	3	1	0	0	0	0	4	0.5	0.16	17
Veronica hillebrandii	4	0	0	0	0	0	4	0.5	0.05	12

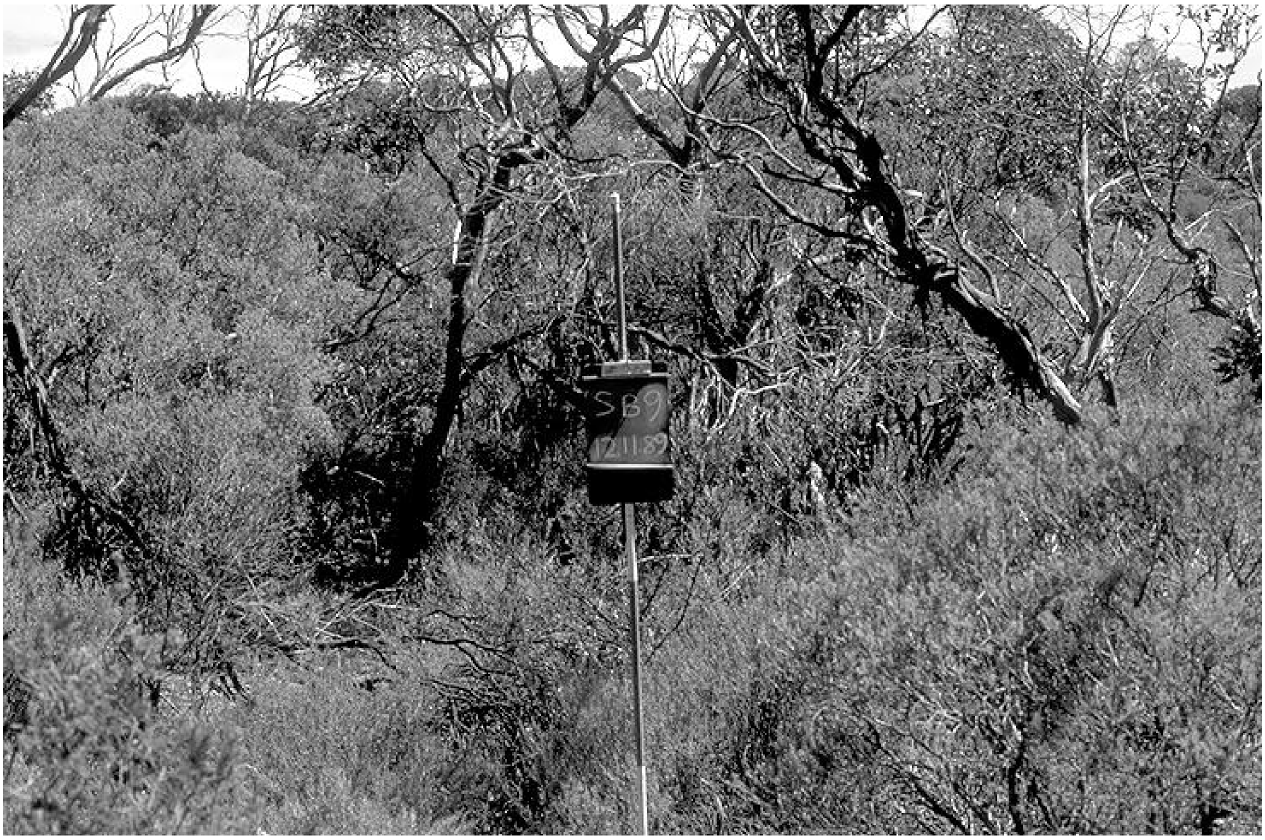
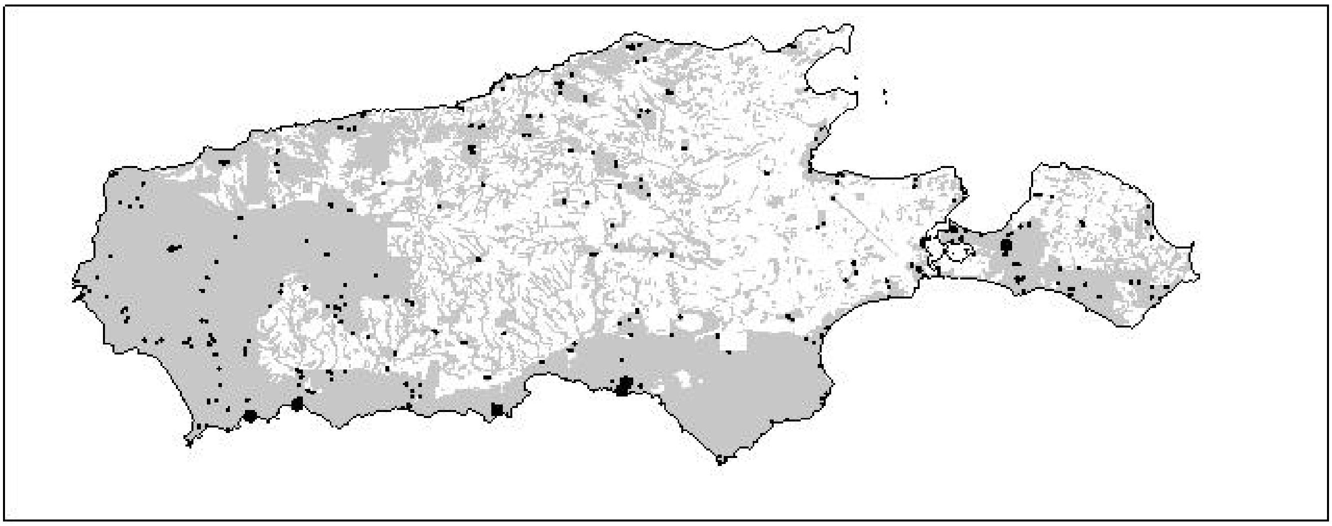


Figure 87.
Melaleuca lanceolata **Low open shrubland at quadrat SB0901.**

Floristic Group 26 *Melaleuca lanceolata* (Dryland Tea-tree) Open shrubland

6 members



Dominant Overstorey Species:

Melaleuca lanceolata (Dryland Tea-Tree)

Sub-dominant Overstorey and dominant Understorey Species:

Acrotriche cordata
Dodonaea humilis
Eucalyptus diversifolia
Grevillea pauciflora ssp. pauciflora
Lasiopetalum schulzenii
Leucopogon parviflorus
Orthrosanthus multiflorus
Pultenaea acerosa

Average Number of Plant Species (& range):
22 (7 – 36)

Quadrat(s):

DU00501
FB01201
KH01003
SB00301
SB00501
VB00201

Environmental Parameters:

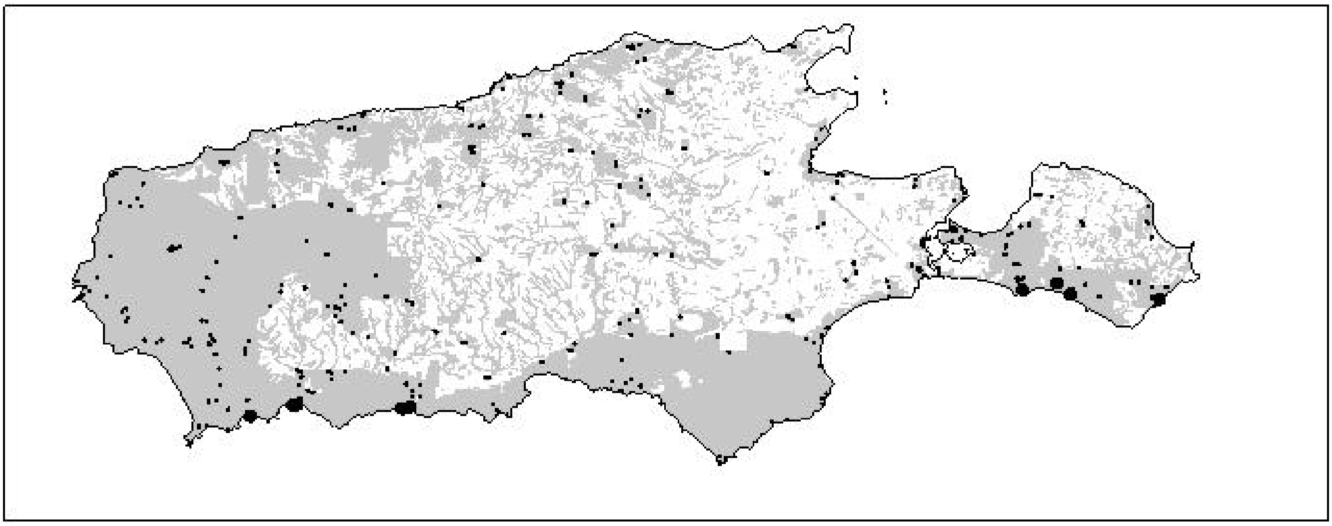
Landform Patterns/Systems: Dunefields
Landform Elements: Hill slopes, cliffs, dunes

Species	**Cover / Abundance**						**No. of**	**Prop.**	**Mean**	**No.**
	T	**1**	**2**	**3**	**4**	**5**	**Quad.**	**Occur.**	**(KW)**	**Gps**
Melaleuca lanceolata	0	0	6	0	0	0	6	1	2	18
Acrotriche cordata	3	0	0	0	0	0	3	0.5	0.05	14
Dodonaea humilis	3	0	0	0	0	0	3	0.5	0.05	9
Eucalyptus diversifolia	2	1	0	0	0	0	3	0.5	0.2	22
Grevillea pauciflora ssp. pauciflora	3	0	0	0	0	0	3	0.5	0.05	10
Lasiopetalum schulzenii	3	0	0	0	0	0	3	0.5	0.05	20
Leucopogon parviflorus	1	2	0	0	0	0	3	0.5	0.35	15
Orthrosanthus multiflorus	3	0	0	0	0	0	3	0.5	0.05	22
Pultenaea acerosa	2	1	0	0	0	0	3	0.5	0.2	17

Figure 88.
***Melaleuca lanceolata* Open shrubland at quadrat FB1201.**

Floristic Group 27 *Leucopogon parviflorus* (Coast Beard-heath) Open shrubland

10 members



Dominant Overstorey Species:

Leucopogon parviflorus (Coast Beard-Heath)

Sub-dominant Overstorey and dominant Understorey Species:

Carpobrotus rossii
Dianella revoluta var. brevicaulis
Isolepis nodosa
Senecio lautus

Average Number of Plant Species (& range):

41 (16 – 52)

Quadrat(s):

CH00401
DU01401
FB01202
KH00901
KH01001
ST00101
ST00301
ST00401
WI00101
WI00301

Environmental Parameters:

Landform Patterns/Systems: Dunefields
Landform Elements: Dunes, plains

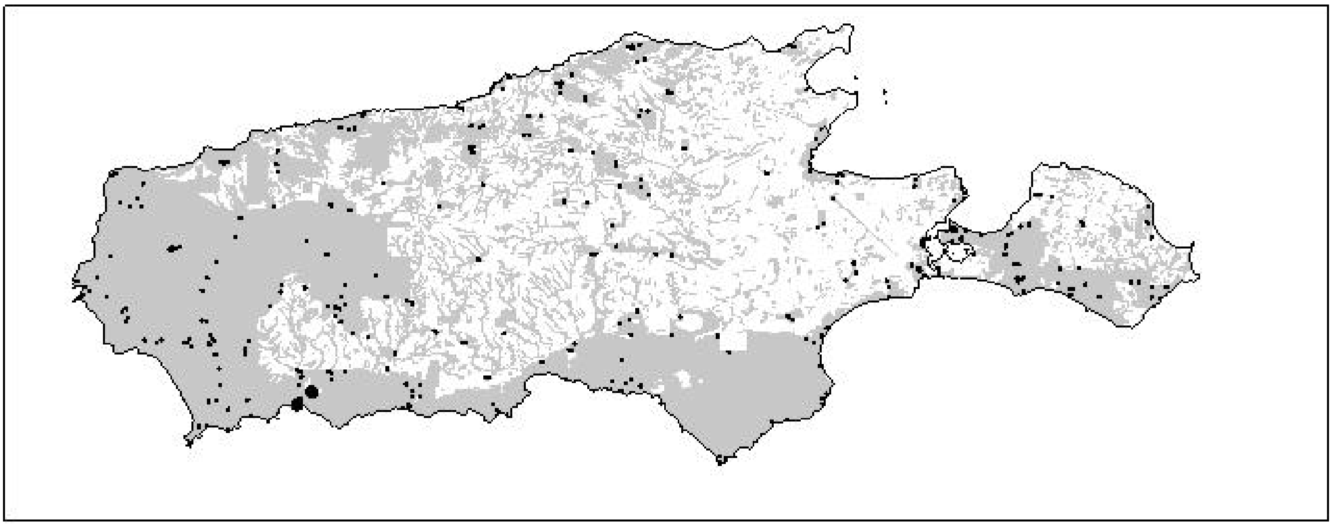
Species	**Cover / Abundance** T	1	2	3	4	5	**No. of Quad.**	**Prop. Occur.**	**Mean (KW)**	**No. Gps**
Carpobrotus rossii	9	1	0	0	0	0	10	1	0.19	11
Leucopogon parviflorus	6	3	1	0	0	0	10	1	0.56	15
Dianella revoluta var. brevicaulis	9	0	0	0	0	0	9	0.9	0.09	19
Isolepis nodosa	9	0	0	0	0	0	9	0.9	0.09	13
Senecio lautus	9	0	0	0	0	0	9	0.9	0.09	8
Helichrysum leucopsideum	6	0	0	0	0	0	6	0.6	0.06	7
Ixiolaena supina	6	0	0	0	0	0	6	0.6	0.06	5
Melaleuca gibbosa	3	3	0	0	0	0	6	0.6	0.33	30
Myoporum insulare	6	0	0	0	0	0	6	0.6	0.06	11
Rhagodia candolleana ssp. candolleana	6	0	0	0	0	0	6	0.6	0.06	11
Stipa stipoides	6	0	0	0	0	0	6	0.6	0.06	6
Veronica hillebrandii	6	0	0	0	0	0	6	0.6	0.06	12

Acrotriche cordata	5	0	0	0	0	0	5	0.5	0.05	14
Calytrix tetragona	5	0	0	0	0	0	5	0.5	0.05	17
Eutaxia microphylla var. microphylla	5	0	0	0	0	0	5	0.5	0.05	17
Olearia axillaris	5	0	0	0	0	0	5	0.5	0.05	7
Samolus repens	5	0	0	0	0	0	5	0.5	0.05	12
Beyeria lechenaultii	4	0	0	0	0	0	4	0.4	0.04	13
Dichondra repens	4	0	0	0	0	0	4	0.4	0.04	12
Euphrasia collina ssp. tetragona	4	0	0	0	0	0	4	0.4	0.04	4
Goodenia varia	4	0	0	0	0	0	4	0.4	0.04	13
Hibbertia aspera	4	0	0	0	0	0	4	0.4	0.04	22
Lasiopetalum discolor	4	0	0	0	0	0	4	0.4	0.04	7
Lasiopetalum schulzenii	2	2	0	0	0	0	4	0.4	0.22	20
Leucophyta brownii	4	0	0	0	0	0	4	0.4	0.04	3
Melaleuca lanceolata	4	0	0	0	0	0	4	0.4	0.04	18
Olearia ramulosa	4	0	0	0	0	0	4	0.4	0.04	13
Orthrosanthus multiflorus	4	0	0	0	0	0	4	0.4	0.04	22
Pomaderris oraria	4	0	0	0	0	0	4	0.4	0.04	8
Pultenaea acerosa	4	0	0	0	0	0	4	0.4	0.04	17
Sonchus megalocarpus	4	0	0	0	0	0	4	0.4	0.04	3
Swainsona lessertiifolia	4	0	0	0	0	0	4	0.4	0.04	10

Figure 89.
***Leucopogon parviflorus* Open shrubland at quadrat WI101.**

Floristic Group 28 *Isolepis nodosa* (Knobby Club-rush) Very open sedgeland

2 members



Dominant Overstorey Species:

Isolepis nodosa (Knobby Club-rush)

Sub-dominant Overstorey and dominant Understorey Species:

Carpobrotus rossii
Juncus pallidus
Leucophyta brownii
Melaleuca gibbosa
Myriophyllum simulans
Olearia axillaris
Ottelia ovalifolia
Pimelea serpyllifolia ssp. serpyllifolia
Potamogeton tricarinatus
Sonchus megalocarpus
Spinifex sericeus

Average Number of Plant Species (& range):

9 (9)

Quadrat(s):

KH00401
KH01002

Environmental Parameters:

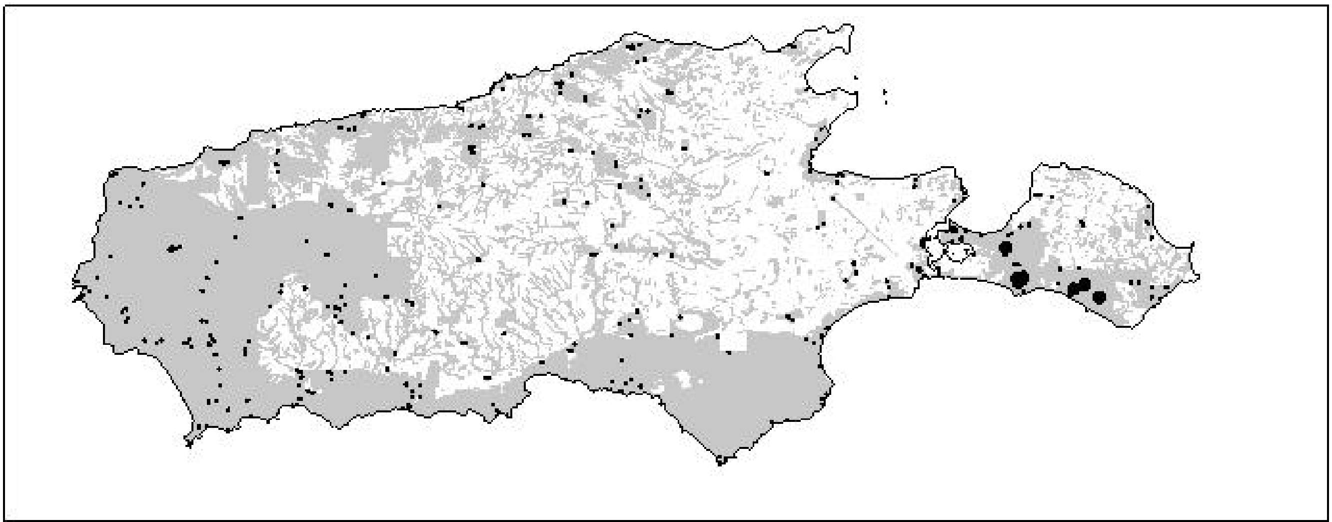
Landform Patterns/Systems: n/a
Landform Elements: Dunes, hill slopes, interdune low

Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Isolepis nodosa	2	0	0	0	0	0	2	1	0.1	13
Carpobrotus rossii	1	0	0	0	0	0	1	0.5	0.05	11
Juncus pallidus	1	0	0	0	0	0	1	0.5	0.05	7
Leucophyta brownii	1	0	0	0	0	0	1	0.5	0.05	3
Melaleuca gibbosa	1	0	0	0	0	0	1	0.5	0.05	30
Myriophyllum simulans	1	0	0	0	0	0	1	0.5	0.05	4
Olearia axillaris	1	0	0	0	0	0	1	0.5	0.05	7
Ottelia ovalifolia	1	0	0	0	0	0	1	0.5	0.05	2
Pimelea serpyllifolia ssp. serpyllifolia	1	0	0	0	0	0	1	0.5	0.05	9
Potamogeton tricarinatus	1	0	0	0	0	0	1	0.5	0.05	3
Sonchus megalocarpus	1	0	0	0	0	0	1	0.5	0.05	3
Spinifex sericeus	1	0	0	0	0	0	1	0.5	0.05	3

Figure 90.
***Isolepis nodosa* Very open sedgeland at quadrat KH1002.**

Floristic Group 29 *Eucalyptus diversifolia* (Coastal White Mallee) Very open mallee

9 members



Dominant Overstorey Species:

Eucalyptus diversifolia (Coastal White Mallee)

Sub-dominant Overstorey and dominant Understorey Species:

Dodonaea humilis
Eucalyptus diversifolia
Orthrosanthus multiflorus
Senecio odoratus var. odoratus
Veronica hillebrandii

Average Number of Plant Species (& range):

40 (28 – 54)

Quadrat(s):

DU00601
DU01001
DU01101
DU01201
DU01202
DU01301
WI00501
WI00601
WI00701

Environmental Parameters:

Landform Patterns/Systems: Dunefields
Landform Elements: Plains, various

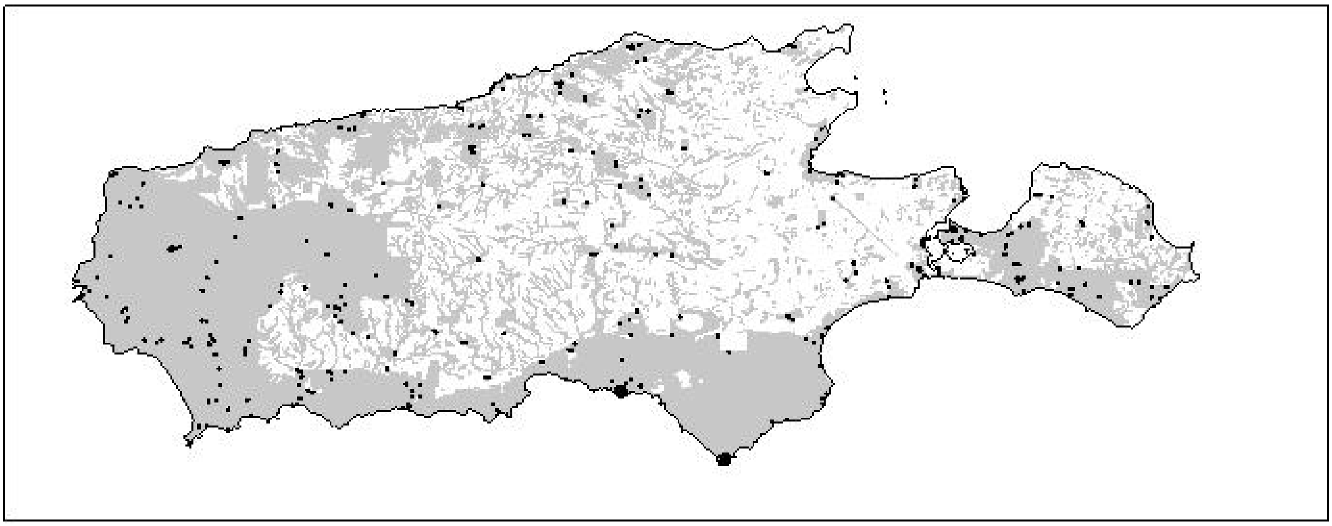
Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Dodonaea humilis	8	0	0	0	0	0	8	0.89	0.09	9
Eucalyptus diversifolia	8	0	0	0	0	0	8	0.89	0.09	22
Orthrosanthus multiflorus	6	0	1	0	0	0	7	0.78	0.29	22
Senecio odoratus var. odoratus	7	0	0	0	0	0	7	0.78	0.08	11
Veronica hillebrandii	7	0	0	0	0	0	7	0.78	0.08	12
Acrotriche patula	6	0	0	0	0	0	6	0.67	0.07	11
Danthonia setacea var. setacea	6	0	0	0	0	0	6	0.67	0.07	19
Eucalyptus rugosa	6	0	0	0	0	0	6	0.67	0.07	12
Hibbertia aspera	6	0	0	0	0	0	6	0.67	0.07	22
Leucopogon parviflorus	6	0	0	0	0	0	6	0.67	0.07	15
Acacia retinodes var. uncifolia	5	0	0	0	0	0	5	0.56	0.06	12
Carpobrotus rossii	5	0	0	0	0	0	5	0.56	0.06	11
Cassytha melantha	5	0	0	0	0	0	5	0.56	0.06	7
Goodenia varia	5	0	0	0	0	0	5	0.56	0.06	13

Goodia lotifolia var. lotifolia	5	0	0	0	0	0	5	0.56	0.06	3
Melaleuca lanceolata	5	0	0	0	0	0	5	0.56	0.06	18
Olearia rudis	5	0	0	0	0	0	5	0.56	0.06	1
Pomaderris oraria	5	0	0	0	0	0	5	0.56	0.06	8
Acacia leiophylla	4	0	0	0	0	0	4	0.44	0.04	15
Acacia ligulata	4	0	0	0	0	0	4	0.44	0.04	5
Choretrum glomeratum var. glomeratum	4	0	0	0	0	0	4	0.44	0.04	18
Logania ovata	4	0	0	0	0	0	4	0.44	0.04	16
Senecio lautus	4	0	0	0	0	0	4	0.44	0.04	8
Stipa hemipogon	4	0	0	0	0	0	4	0.44	0.04	15
Swainsona lessertiifolia	4	0	0	0	0	0	4	0.44	0.04	10

Figure 91.
Eucalyptus diversifolia Very open mallee at quadrat DU1301.

Floristic Group 30 *Tetragonia implexicoma* (Bower Spinach), *Rhagodia conolleana* ssp. *canolleana* (Seaberry Saltbush) Open shrubland.

3 members



Dominant Overstorey Species:

Tetragonia implexicoma (Bower Spinach)
Rhagodia conolleana ssp. canolleana (Seaberry Saltbush)

Sub-dominant Overstorey and dominant Understorey Species:

Carpobrotus rossii
Senecio odoratus var. odoratus
Swainsona lessertiifolia
Threlkeldia diffusa

Average Number of Plant Species (& range):
8 (4 – 11)

Quadrat(s):

CG01301
SB00101
SB00201

Environmental Parameters:

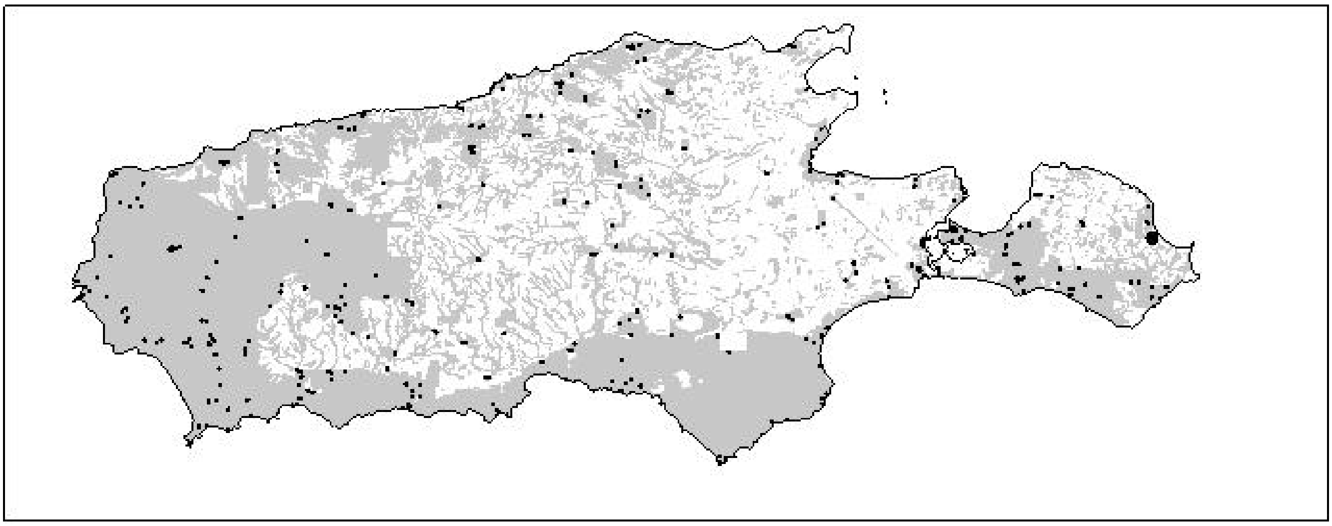
Landform Patterns/Systems: n/a
Landform Elements: dunes, hill slopes, interdune low

Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Tetragonia implexicoma	0	2	0	1	0	0	3	1	1.67	5
Carpobrotus rossii	2	0	0	0	0	0	2	0.67	0.07	11
Rhagodia candolleana ssp. candolleana	1	1	0	0	0	0	2	0.67	0.37	11
Senecio odoratus var. odoratus	2	0	0	0	0	0	2	0.67	0.07	11
Swainsona lessertiifolia	2	0	0	0	0	0	2	0.67	0.07	10
Threlkeldia diffusa	2	0	0	0	0	0	2	0.67	0.07	5

Figure 92.
***Tetragonia implexicoma Rhagodia candolleana ssp. candolleana* Open shrubland at quadrat CG1301.**

Floristic Group 31 *Melaleuca halmaturorum* (Swamp Paper-bark) Very low open forest

1 member



Dominant Overstorey Species:

Melaleuca halmaturorum (Swamp Paper-Bark)

Sub-dominant Overstorey and dominant Understorey Species:

Average Number of Plant Species (& range):

33 (33)

Quadrat(s):

CO00401

Environmental Parameters:

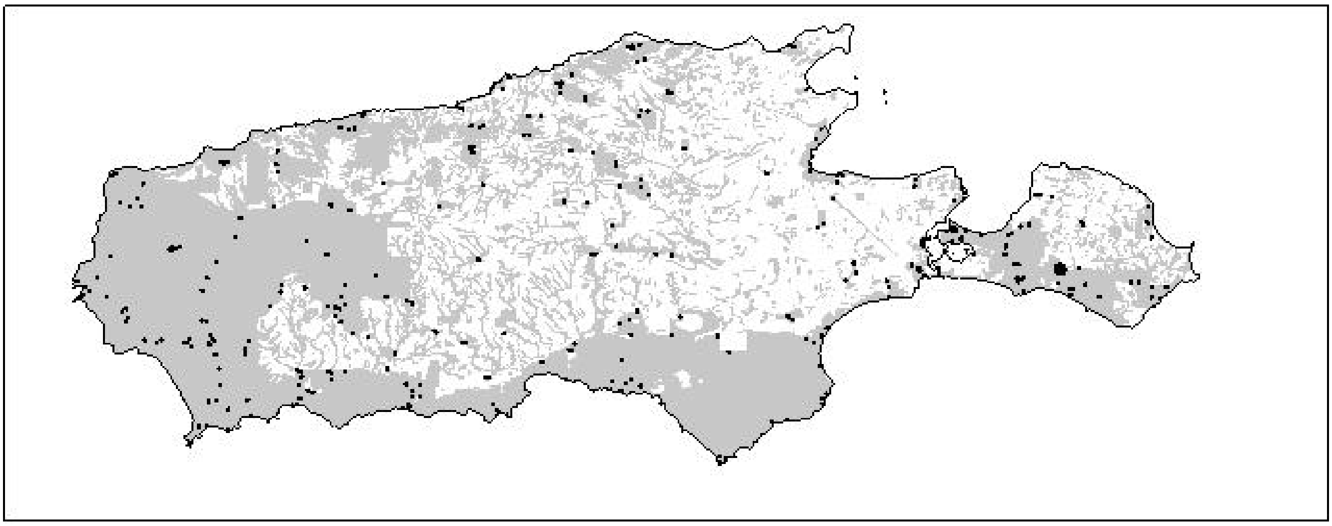
Landform Patterns/Systems: Plain
Landform Elements: Plain

Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Acacia ligulata	1	0	0	0	0	0	1	1	0.1	5
Acacia paradoxa	1	0	0	0	0	0	1	1	0.1	23
Adriana klotzschii	1	0	0	0	0	0	1	1	0.1	5
Cassytha melantha	1	0	0	0	0	0	1	1	0.1	7
Comesperma volubile	1	0	0	0	0	0	1	1	0.1	13
Dianella revoluta var. brevicaulis	1	0	0	0	0	0	1	1	0.1	19
Hemichroa pentandra	1	0	0	0	0	0	1	1	0.1	2
Isolepis nodosa	1	0	0	0	0	0	1	1	0.1	13
Leucopogon parviflorus	1	0	0	0	0	0	1	1	0.1	15
Melaleuca gibbosa	1	0	0	0	0	0	1	1	0.1	30
Melaleuca halmaturorum	0	0	0	1	0	0	1	1	3	4
Myoporum insulare	1	0	0	0	0	0	1	1	0.1	11
**Plantago lanceolata var. lanceolata*	1	0	0	0	0	0	1	1	0.1	2
Pomaderris oraria	1	0	0	0	0	0	1	1	0.1	8
Samolus repens	1	0	0	0	0	0	1	1	0.1	12
Sarcocornia quinqueflora	1	0	0	0	0	0	1	1	0.1	3
Selliera radicans	0	0	1	0	0	0	1	1	2	3
Sporobolus virginicus	1	0	0	0	0	0	1	1	0.1	7
Stipa flavescens	1	0	0	0	0	0	1	1	0.1	10
Triglochin striatum	1	0	0	0	0	0	1	1	0.1	2

Figure 93.
***Melaleuca halmaturorum* Very low open forest at quadrat CO0401.**

Floristic Group 32 *Melaleuca acuminata* (Mallee Honey-myrtle) SHRUBLAND

1 member



Dominant Overstorey Species:

Melaleuca acuminata (Mallee Honey-Myrtle)

Sub-dominant Overstorey and dominant Understorey Species:

Acrotriche cordata
Astroloma humifusum
Billardiera cymosa
Comesperma volubile
Galium migrans
Geranium retrorsum
Hibbertia aspera
Leucopogon parviflorus
Pultenaea tenuifolia
Veronica hillebrandi

Quadrat(s):

WI00201

Environmental Parameters:

Landform Patterns/Systems: n/a
Landform Elements: Hill slope

Average Number of Plant Species (& range):

43 (43)

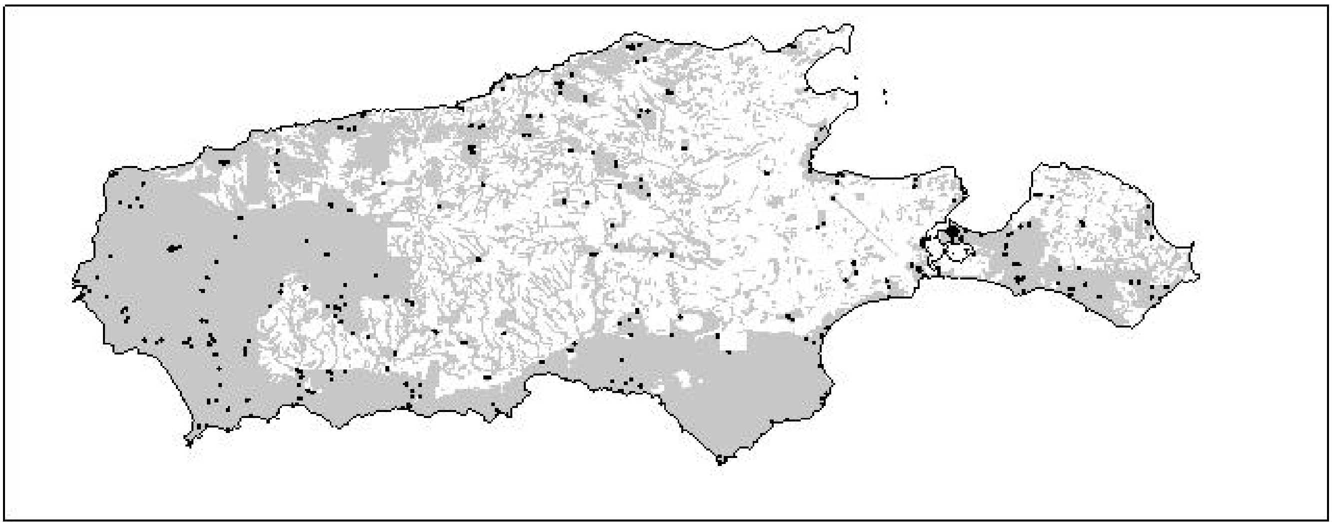
Species	Cover / Abundance						No. of	Prop.	Mean	No.
	T	1	2	3	4	5	Quad.	Occur.	(KW)	Gps
Acacia acinacea	1	0	0	0	0	0	1	1	0.1	7
Acacia ligulata	1	0	0	0	0	0	1	1	0.1	5
Acacia paradoxa	1	0	0	0	0	0	1	1	0.1	23
Acrotriche cordata	0	0	1	0	0	0	1	1	2	14
Acrotriche patula	1	0	0	0	0	0	1	1	0.1	11
Adriana klotzschii	1	0	0	0	0	0	1	1	0.1	5
Astroloma humifusum	0	0	1	0	0	0	1	1	2	21
Billardiera cymosa	0	0	1	0	0	0	1	1	2	10
Comesperma volubile	0	0	1	0	0	0	1	1	2	13
Danthonia setacea var. setacea	1	0	0	0	0	0	1	1	0.1	19
Dianella revoluta var. brevicaulis	1	0	0	0	0	0	1	1	0.1	19
Galium migrans	0	0	1	0	0	0	1	1	2	12

Geranium retrorsum	0	0	1	0	0	0	1	1	2	9
Hakea muelleriana	1	0	0	0	0	0	1	1	0.1	23
Hibbertia aspera	0	0	1	0	0	0	1	1	2	22
Leucopogon parviflorus	1	0	0	0	0	0	1	1	0.1	15
Logania ovata	1	0	0	0	0	0	1	1	0.1	16
Melaleuca acuminata	0	0	0	1	0	0	1	1	3	6
Melaleuca gibbosa	1	0	0	0	0	0	1	1	0.1	30
Muehlenbeckia adpressa	1	0	0	0	0	0	1	1	0.1	14
Olearia ramulosa	1	0	0	0	0	0	1	1	0.1	13
Orthrosanthus multiflorus	1	0	0	0	0	0	1	1	0.1	22
Pimelea stricta	1	0	0	0	0	0	1	1	0.1	12
Pultenaea acerosa	1	0	0	0	0	0	1	1	0.1	17
Pultenaea tenuifolia	0	0	1	0	0	0	1	1	2	4
Veronica hillebrandii	0	0	1	0	0	0	1	1	2	12
Westringia eremicola	1	0	0	0	0	0	1	1	0.1	3

Figure 94.
***Melaleuca acuminata* Shrubland at quadrat WI0201.**

Floristic Group 33 *Eucalyptus diversifolia* (Coastal White Mallee), *Melaleuca halmaturorum* (Swamp Paper-bark) Tall open shrubland

1 member



Dominant Overstorey Species:

Eucalyptus diversifolia (Coastal White Mallee)
Melaleuca halmaturorum (Swamp Paper-bark)

Sub-dominant Overstorey and dominant Understorey Species:

Average Number of Plant Species (& range):

2 (2)

Quadrat(s):

PL02401

Environmental Parameters:

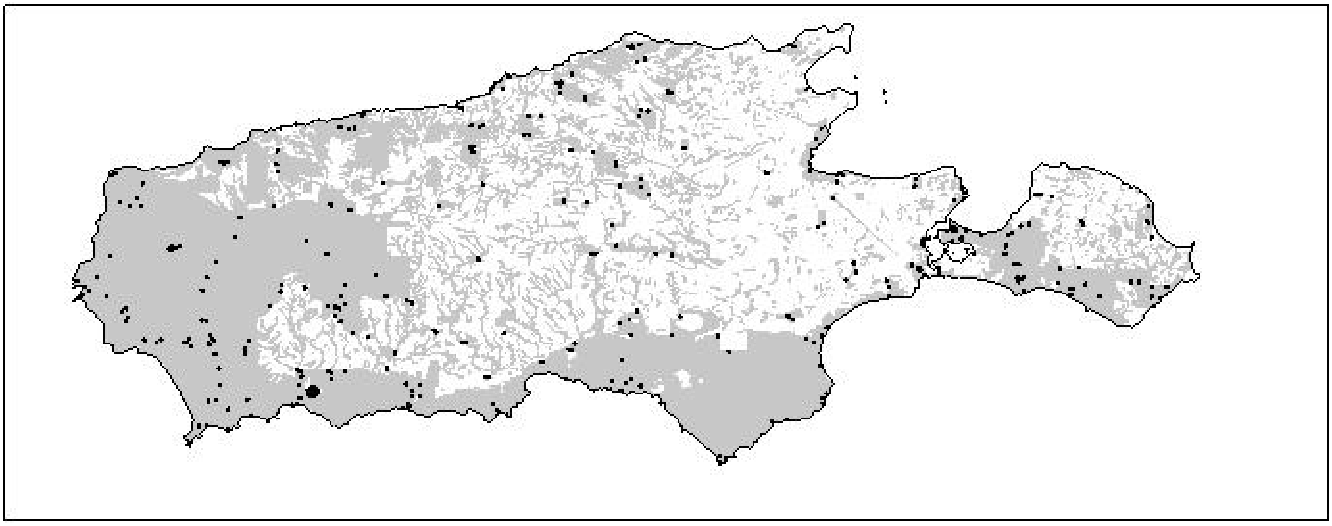
Landform Patterns/Systems: Dunefield
Landform Elements: Sandy plain

Species	**Cover / Abundance T**	**1**	**2**	**3**	**4**	**5**	**No. of Quad.**	**Prop. Occur.**	**Mean (KW)**	**No. Gps**
Eucalyptus diversifolia	1	0	0	0	0	0	1	1	0.1	22
Melaleuca halmaturorum	1	0	0	0	0	0	1	1	0.1	4

Figure 95.
Eucalyptus diversifolia, Melaleuca halmaturorum **Tall open shrubland at quadrat PL2401.**

Floristic Group 34 *Baumea arthrophylla* (Swamp Twig-rush) Very open sedgeland

1 member



Quadrat(s):

KH00302

Dominant Overstorey Species:

*Baumea arthrophylla (*Swamp Twig-Rush)

Environmental Parameters:

Landform Patterns/Systems: n/a
Landform Elements: Plain

Sub-dominant Overstorey and dominant Understorey Species:

Average Number of Plant Species (& range):

5 (5)

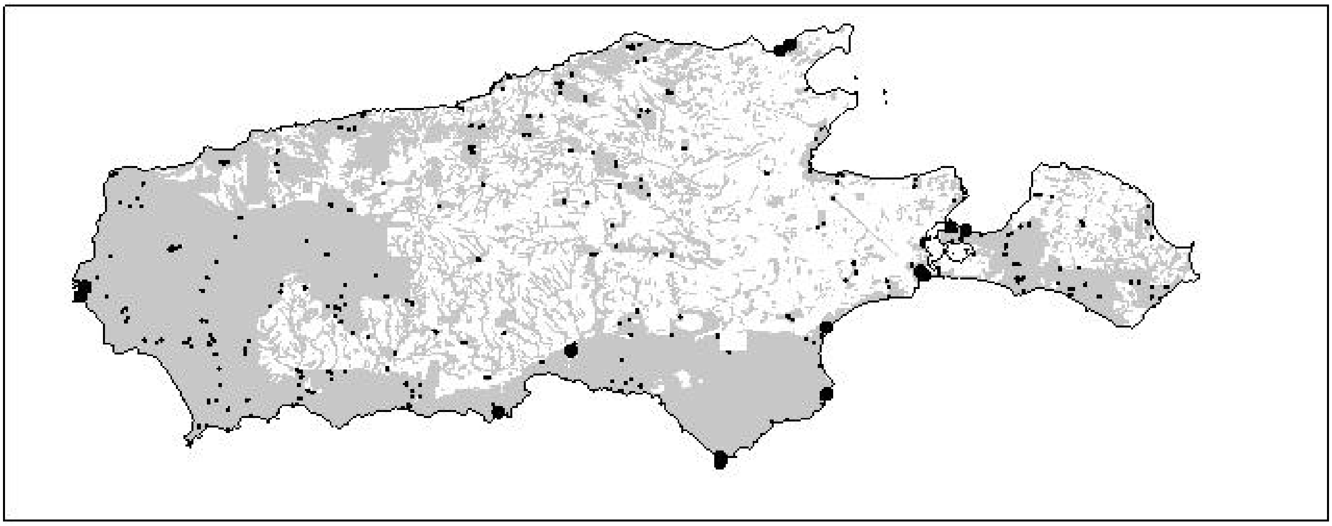
Species	Cover / Abundance T	1	2	3	4	5	No. of Quad.	Prop. Occur.	Mean (KW)	No. Gps
Baumea arthrophylla	0	1	0	0	0	0	1	1	1	3
Montia australasica	1	0	0	0	0	0	1	1	0.1	3
Myriophyllum muelleri	1	0	0	0	0	0	1	1	0.1	4

Figure 96.
***Baumea arthrophylla* Very open sedgeland at quadrat KH0301.**

COASTAL SHRUBLANDS GROUP 2 COMMUNITY

Floristic Group 35 *Olearia axillaris* (Coast Daisy Bush), *Leucopogon parviflorus* (Coast Beard-heath) Low open shrubland

17 members



Dominant Overstorey Species:

Olearia axillaris (Coast Daisy Bush)
Leucopogon parviflorus (Coast Beard-heath)

Sub-dominant Overstorey and dominant Understorey Species:

Carpobrotus rossii
Myoporum insulare
Rhagodia candolleana ssp. candolleana

Average Number of Plant Species (& range):

27 (6 – 52)

Quadrat(s):

CG00601
CG01101
CG01201
DE00201
EB00101
EB00301
ER01001
PL00401
PL00801
PL00901
PL01901
PL02101
VB00101
WB00901
WB00902
WB01001
WB01002

Environmental Parameters:

Landform Patterns/Systems: Low hills, dunefields, rises
Landform Elements: dunes, interdune lows, cliffs, hill slopes

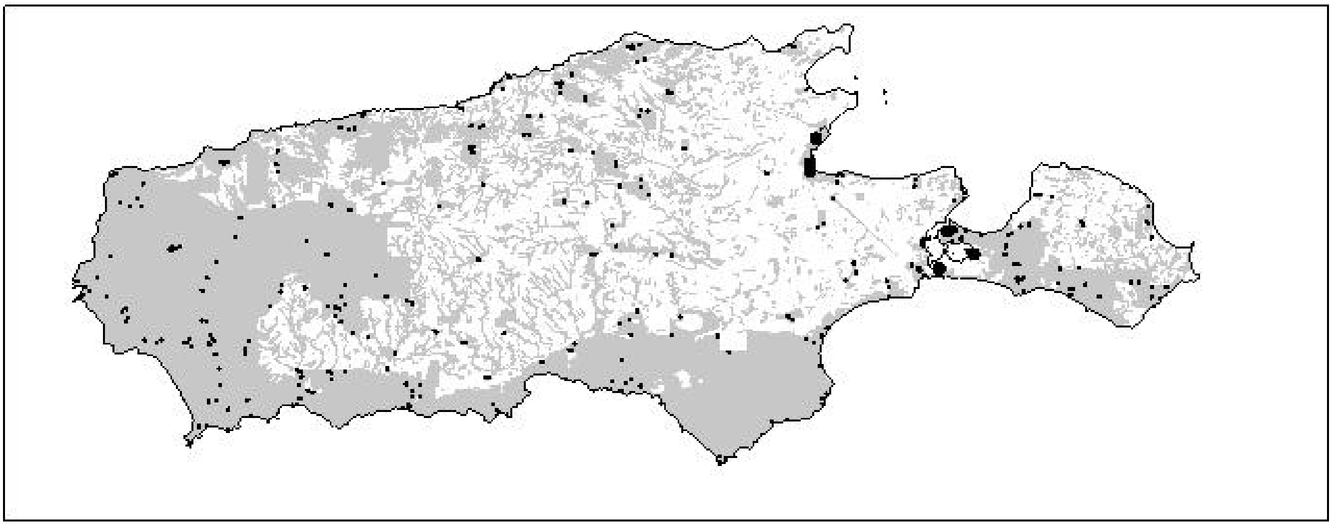
Species	Cover / Abundance						No. of	Prop.	Mean	No.
	T	1	2	3	4	5	Quad.	Occur.	(KW)	Gps
Olearia axillaris	0	10	6	1	0	0	17	1	1.47	7
Carpobrotus rossii	5	9	2	0	0	0	16	0.94	0.79	11
Leucopogon parviflorus	1	11	3	0	0	0	15	0.88	1.01	15
Myoporum insulare	2	10	1	1	0	0	14	0.82	0.89	11
Rhagodia candolleana ssp. candolleana	3	11	0	0	0	0	14	0.82	0.66	11
Isolepis nodosa	3	6	1	0	0	0	10	0.59	0.49	13
Senecio lautus	5	5	0	0	0	0	10	0.59	0.32	8
Dianella revoluta var. brevicaulis	4	5	0	0	0	0	9	0.53	0.32	19
Pimelea serpyllifolia ssp. serpyllifolia	2	7	0	0	0	0	9	0.53	0.42	9
Tetragonia implexicoma	3	5	1	0	0	0	9	0.53	0.43	5
Swainsona lessertiifolia	6	2	0	0	0	0	8	0.47	0.15	10
Threlkeldia diffusa	4	4	0	0	0	0	8	0.47	0.26	5
Clematis microphylla	4	3	0	0	0	0	7	0.41	0.2	8
Goodenia varia	3	4	0	0	0	0	7	0.41	0.25	13

Figure 97.
Olearia axillaris, Leucopogon parviflorus **Low open shrubland at quadrat WB1002.**

SAMPHIRE COMMUNITIES

Floristic Group 36 *Sarcocornia quinqueflora* (Beaded Samphire), *Maireana oppositifolia* (Salt Bluebush Low very open shrubland

7 members



Dominant Overstorey Species:

Sarcocornia quinqueflora (Beaded Samphire)
Maireana oppositifolia (Salt Bluebush)

Sub-dominant Overstorey and dominant Understorey Species:

Samolus repens
Sclerostegia arbuscula
Suaeda australis

Average Number of Plant Species (& range):

9 (4 – 15)

Quadrat(s):

NB00101
NB00201
NB00301
PL01201
PL01202
PL01301
PL02001

Environmental Parameters:

Landform Patterns/Systems: Plains
Landform Elements: Plains, tidal flats

Species	**Cover / Abundance** T	1	2	3	4	5	**No. of Quad.**	**Prop. Occur.**	**Mean (KW)**	**No. Gps**
Samolus repens	0	7	0	0	0	0	7	1	1	12
Sarcocornia quinqueflora	0	7	0	0	0	0	7	1	1	3
Sclerostegia arbuscula	0	2	5	0	0	0	7	1	1.71	1
Suaeda australis	0	7	0	0	0	0	7	1	1	1
Maireana oppositifolia	0	5	1	0	0	0	6	0.86	1	1
Frankenia pauciflora var. fruticulosa	1	4	0	0	0	0	5	0.71	0.59	3
Hemichroa pentandra	0	4	0	0	0	0	4	0.57	0.57	2

Figure 98.
***Sarcocornia quinqueflora, Maireana oppositifolia* Low very open shrubland at quadrat PL1202.**

Ordination

Ordination and gradient analysis techniques are used: to summarise plant community data and provide an indication of the nature of variation of the vegetation under study; or to provide information describing the variation of sets of vegetation samples which can be correlated with environmental controls to define environmental gradients. (Kent and Coker, 1992).

The dendrogram showing the clusters of sites provides some insight into the relationships between the floristic groups. Sites which are similar cluster together and in a linear manner groups which are similar also will be found near each other. The extremes of the dendrogram represent least similar sites and/or the least similar groups. In all cases these comparisons are made relative to the first site and the relationship is a best fit within a two dimensional description.

Ordination techniques enable quadrat data to be portrayed in three dimensions independent of a starting point. In a graphical display those points which fall closely together are considered to be similar and increasing separation taken to indicate increasing dissimilarity. The axes of the graphical display provide a measure of variation of environmental parameters and trends shown by the data in this context can be used to generate hypotheses regarding the responses of the vegetation to these gradients.

Figure 93 displays a graphical output describing the outcome of the ordination of the 10 major communities, of which the 36 described communities are grouped into (refer to T4), using Semi-Strong-Hybrid multi-dimensional scaling or SSH (see methods chapter).

Data describing the ‘centroids’ or a median summarising description for each community was created in PATN. The ordination shows a number of interesting features. The most obvious, is the clearly distinct nature of the samphire community (community 10). With the exception of the coastal shrubland community (community 8) the other communities show slight separation from each other, with a number of communities appearing to be closely related. The Heath and Sclerophyll forest community (community 5) occupies similar space to that utilised by the Forest group.(community 3). Similarly the second mallee community (community 6) and Coastal mallee (community 9) are close.

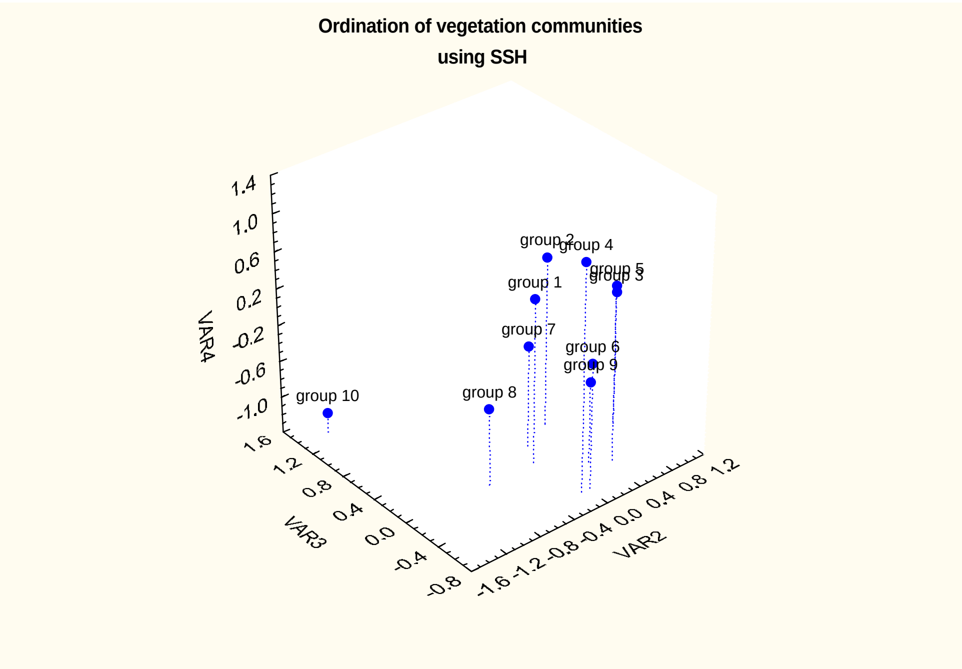


Figure 93.
Ordination of the 10 major groups identified in PATN

VEGETATION MAPPING

by D. Ball[1] and S. Carruthers[2]

SUMMARY OF VEGETATION UNITS

Area estimates have been calculated for each vegetation type along with amounts formally protected in National Parks and Wildlife (NPW) Reserves (current at date of publication) and Heritage Agreements (current to December 1998) GIS layers. The areas were calculated using the vegetation, NPW Reserves and Heritage Agreement GIS layers. These layers are current at the date of publication. These statistics will change as additions to the NPW Reserves system occur and new Heritage Agreements are formalised

Native vegetation covers approximately 206,000 hectares, or 47% of KI, and of this approximately two thirds is conserved within NPW Reserves or Heritage Agreements. A total of 37 major vegetation groups based on the dominant upperstorey plant species have been identified and mapped for the Island. Within these 37 major groups, 132 sub-groups have been identified and mapped. In addition a series of 7 one-off categories were also defined. Area estimates of cleared and native vegetation cover are shown in Table 1, along with an estimate of the area that is protected in NPW Reserves and Heritage Agreements.

Table 19
Area Estimates for Native Vegetation and Cleared Areas for Kangaroo Island.

Landcover	Hectares (Approx)	% of Island Area (Approx)
Cleared Area	227,754	51
Native Vegetation	206,376	47
Area Formally Protected	140,391	32

The coding system for the mapping is based on identifying and labelling each major vegetation group by its tallest overstorey species (Table 20). This creates some difficulties when the tallest stratum species is not the most abundant species for the area. On KI, this is particularly true of the sugar gum, *Eucalyptus cladocalyx*, which is often present as scattered isolates or clumps which are significantly taller but less common than the more abundant second level overstorey. Table 21 shows the major overstorey species groups identified and the area they occupy on Kangaroo Island, together with the area of each group that is protected in NPW Reserves or Heritage Agreements.

[1] c/-Post Office PENNESHAW, SA 5222
[2] Geographic Analysis and Research Unit, Planning SA, Department of Transport, Urban Planning and the Arts, GPO Box 1782, ADELAIDE 5001.

Table 20.
Area Estimates for Primary Overstorey species in Native Vegetation and Cleared Areas on Kangaroo Island.

Group	Primary Overstorey Species	Area (ha)	% of Island Area	Area (ha) protected	% of Group Protected
1	*Eucalyptus remota*	39,292	9	35,331	90
2	*Eucalyptus diversifolia*	76,830	17.5	51,313	67
3	*Eucalyptus baxteri*	24,740	5.6	12,938	52
4	*Eucalyptus rugosa*	3,748	0.9	1,038	28
5	*Eucalyptus cladocalyx*	32,242	7.3	17,549	54
6	*E. cosmophylla*	6,826	1.6	4,410	65
7	*Eucalyptus fasciculosa*	1,031	< 0.5	477	46
8	*Eucalyptus lansdowneana* ssp. *albopurpurea*	535	< 0.5	236	44
9	*Eucalyptus viminalis* ssp. *cygnetensis*	158	< 0.5	15	10
10	*Eucalyptus leucoxylon* ssp. *leucoxylon*	746	< 0.5	230	31
11	*Eucalyptus cneorifolia*	5,582	1.3	1,005	18
12	*Myoporum insulare*	85	< 0.5	0	0
13	*Melaleuca lanceolata*	3,383	< 1	2,500	74
14	*Eucalyptus ovata*	106	< 0.5	85	80
15	*Banksia marginata*	166	< 0.5	166	100
16	*Beyeria leschenaultii*	408	< 0.5	360	88
17	*Eucalyptus camaldulensis* var. *camaldulensis*	154	< 0.5	6	4
18	*Sclerostegia arbuscula*	1,281	< 0.5	19	2
19	*Allocasuarina verticillata*	1,632	< 0.5	526	32
20	*Leucopogon parviflorus*	1,455	< 0.5	544	37
21	*Melaleuca gibbosa*	888	< 0.5	592	67
22	*Melaleuca brevifolia*	592	< 0.5	318	54
23	*Melaleuca halmaturorum*	959	< 0.5	514	54
24	*Callistemon rugulosus* var. *rugulosus*	301	< 0.5	254	84
25	*Leptospermum continentale*	1,580	< 0.5	1,149	73
26	*Acacia retinodes* var. *retinodes*	134	< 0.5	1	1
27	*Acacia retinodes* var. *retinodes*	90	< 0.5	84	93
28	Eucalyptus obliqua	616	< 0.5	552	90
29	*Olearia axillaris*	82	< 0.5	10	12
30	*Hakea muelleriana*	23	< 0.5	2	8
31	*Acacia paradoxa*	471	< 0.5	75	16
32	*Acacia dodonaeifolia*	90	< 0.5	0	0
33	*Pteridium esculentum*	48	< 0.5	22	46
34	*Callitris preissii*	10	< 0.5	3	30
35	*Allocasuarina muelleriana* ssp. *notocolpica*	10	< 0.5	0	0
36	*Bursaria spinosa*	11	< 0.5	0	0
37	*Melaleuca acuminata*	23	< 0.5	0	0
55	Beaches, lakes and swamp types				
60 - 66	Special one off categories.				

While the dominant overstorey species provide a major vegetation unit for mapping, smaller mappable units with different overstorey species variations exist within these. These sub-groups better describe the plant assemblages and communities found on the Island. The dominant overstorey groups have been labelled using a numerical coding system. Sub-groups within the dominant group are indicated using an alphabetical coding system. For example where *Eucalyptus diversifolia* is the primary overstorey species the number indicating this is 1 with the sub-groups ranging from 1A to 1F. In some cases the dominant group may contain only one sub-group.

There is often, but not necessarily, a link between sub-groups within the same dominant group, with respect to their physical parameters. In some cases they share much of the same plant assemblage but differ in geology or rainfall categories, while in others the difference is solely related to variations in understorey or structural form. In all cases the aim was to group areas that were ecologically, visually and taxonomically similar.

In particular within Group 2, several of the *E. diversifolia* sub-groups, have close relationships within the divisions. These include:

2A,2K,2M,2O,2P,2V.	All clay based associations.
2B,2J,2N,2R,2S,2T.	All on Tertiary limestone with fossil clay horizons.
2C,2H.	Both in areas of deep neutral sands over limestone.
2D,2E,2F,2G,2L,2Q,2U.	All on Recent or Tertiary limestone or alkaline sands.

At the most basic level, each classification attempts to group areas of similar ecological uniformity in terms not just of species, but also physical environment.

Each of the groups and sub-groups have been described according to their overstorey species and structural definition. For example Group 1 is described as *E. remota* Open low mallee, and sub-group 1A is described as *E. remota*, *E. cosmophylla*, +/- *E. baxteri* Open low mallee. For description purposes Group 1 is described as Open low mallee, as this is the structural definition which describes the largest portion of the sub-groups it contains. In reality this definition varies from Open low mallee to Very open mallee to Open mallee. Where +/- indicates that a species may be either present or absent from the group.

The broad vegetation map presented in the back pocket of this report shows the dominant overstorey groups only. Subdivisions within each primary species group are best viewed at a smaller scale such as 1:50,000. Standard 1:50,000 maps for KI showing the detailed plant community mapping discussed here are available on request from the IDA Branch, Planning SA.

With regard to the special one-off categories ranging from 60 to 66. These have been distinguished as unique one-off sub-groups for various reasons. For broad mapping purposes, some of these have been included within the main 1 to 37 primary species groups. Sub-groups 60A, 63A and 65A all contain the primary species of *E. diversifolia* and these have been therefore been included within the group 2 *E. diversifolia* mapping category in the broad vegetation map. Sub-group 62A, with primary species *E. leucoxylon* ssp. *leucoxylon* has been included in group 10 *E. leucoxylon* ssp. *leucoxylon* mapping category. Lastly sub-group 64A with primary species of *E. viminalis* ssp. *cygnetensis* has been included in the group 9 *E. viminalis* ssp. *cygnetensis* mapping category in the broad vegetation map (see map in back pocket of report).

A detailed description of the mapping group descriptions can be found in Ball (1997).

STRUCTURAL DESCRIPTIONS

The structure was described by using a visual estimate of the projective foliage cover and overstorey height estimate. The descriptions are based on a table adapted from Specht (1972) and Muir (1977). The table is shown in Appendix III.

Structural definitions have been revised since the KI mapping was completed, and a Statewide structural description table now exists, (Heard and Channon 1997). This updated structural description table is shown in Appendix IV. Where possible the structural descriptions have been updated to coincide with these more recent descriptions now in use. In particular, the KI descriptions have been updated to better describe the mallee categories. At the time of mapping these were categorised using the earlier table (Appendix III), which classed the mallees into woodland rather than mallee categories. For example Group 1A's form description was originally recorded as Low to very low woodland, and this has been revised to be Open low mallee.

VEGETATION DISTRIBUTION

In overall terms the islands' vegetation distribution is determined largely by five major factors. These are the underlying geology, rainfall, the coastal influence of high winds and saline drift, historical legacy and geomorphology.

The pre-eminent factor is the underlying geology, and in particular, the presence or absence of clays and the resultant pH level. The bulk of the island is made up of four major provinces. The upland plateau regions contain two of these. The central plateaux are derived from heavily leached Tertiary laterite surfaces while the deeply dissected slopes along the north coast have more fertile soils derived from more recent weathering processes of the underlying Cambrian sandstone from which the laterite itself was also derived. The central low lying plains around and to the south of Kingscote are a mixture of alkaline clays derived from Permian tillite and Quaternary alluvium. The southern coastal section contains extensive areas of Tertiary limestone which have an erratic but significant presence of embedded fossil clay horizons. The interplay between these clay and limestone surfaces is a major factor in adding diversity to this limestone province. Minor limestone accretions are also found along the north coast.

In terms of the remaining four factors, geomorphology is the most significant because it creates the drainage patterns, which in turn, determines the exposure of the underlying geology. This is particularly true in areas that would be otherwise covered with laterite. Rainfall also carries implications for both winter and summer water tables and this also interacts with drainage structures. Historical legacy includes both past clearing and burning regimes and also the important factor of long term accidental proximity. Both *Eucalyptus baxteri* and *E. diversifolia* occupy territory at their common boundaries that the other could well inhabit but for interspecific competition. *E. cladocalyx, E. baxteri* and *E. cosmophylla* are not found on the Dudley Peninsula even though they could be expected to occur there on habitat criteria alone.

A number of dominant species have very specific geological requirements and this is the principal factor in their distribution. *Allocasuarina verticillata* is entirely restricted to areas of near surface Cambrian sandstone. *A. muelleriana* ssp. *notocolpica* is somewhat less restricted but is prominent in areas where the surfaces are stony. *E. cladocalyx* is commonly found in areas where the soils are derived directly from non laterite weathering of Cambrian sandstones but it also occurs in laterite, usually in areas where the laterite surface has been heavily eroded. *E. baxteri, E. obliqua* and *E. remota* are largely restricted to laterite clay surfaces. All three do have depauperate forms along the north coast in stony sandstone areas. *E. cneorifolia* is clay dependent, although pH appears to determine its distribution as it is principally found in the alkaline clays of the Permian tillite. On the Dudley Peninsula, *E. cneorifolia* occupies areas of laterite clays. Presumably this is due to the local absence of stringy barks.

E. rugosa and *E. oleosa* are predominantly found on high pH soils, usually on limestone or alkaline sands. *E. viminalis* ssp. *cygnetensis* (Manna gum), is only found along major rivers and then only in areas of substantial alluvial deposition. These areas often correspond to pinched loops within the river course and usually lead to small isolated pockets of Manna gum rather than continuous or large populations. Near Pioneer Bend on the Cygnet River Manna Gum was once much more widespread and some remnant trees do occur away from the river course. *E. ovata* only occurs within the NPWS reserve system near Hanson Bay and Rocky River. *E. leucoxylon* ssp. *leucoxylon* is usually found in more fertile areas which in the main, but not exclusively, correspond to the major water courses. On the Dudley Peninsula it occupies the areas that *E. cladocalyx* could otherwise be expected to inhabit.

Three tree species show less geologic specificity. *E. diversifolia*, *E. cosmophylla* and *E. fasciculosa* all occur in widely differing physical habitats. The latter two are never found in areas of limestone but do have an affinity with well watered to waterlogged areas. *E. diversifolia* is the most widespread species on the island as it occupies both clay and limestone areas. Its distribution on clay is perhaps determined by the presence of aeolian alkaline sands blown inland from the south over the acid laterite clays, perhaps neutralising the pH.

E. lansdowneana ssp. *albopurpurea* occupies the intergrade areas between acid and alkaline provinces as well as being prominent in the MacGillivray Plain where acid sands overlay alkaline clays.

E. conglobata is closely associated with *E. cneorifolia* where the latter occurs on alkaline clays. *E. leptophylla* is usually found where *E. lansdowneana* ssp. *albopurpurea* occurs, but is probably rare west of Vivonne Bay. Only minor populations of *E. gracilis* were found and only in areas of limestone. *E. odorata* is also only present in small numbers and mainly in the better soils of the north coast.

There are considerable areas of shrubland on the island. The coastal shrub zone is highly variable in width, ranging from a few metres to 400 or 500 metres. Estuarine samphire swamps occur mainly on the eastern north coast. On stony surfaces within the laterite plateau and along the north coast there are extensive shrublands, usually dominated by *Allocasuarina muelleriana* ssp. *notocolpica* and or *Melaleuca uncinata* with *A. striata* also a dominant along the north coast. In the main, these latter shrublands are classified as sub-groups within the *E. cosmophylla* or *E. cladocalyx* groups.

VEGETATION MAPPING UNITS : DESCRIPTIONS

A description of each of the sub-groups that fall within each primary species group is given below. Following the sub-group descriptions, summary tables are provided. These tables list the primary overstorey species group, associated sub-groups, the number of individuals patches (or polygons) comprising these groups, the total area, and the percentage of area of the island the sub-group occupies. In each case the hectares covered by each group has been rounded to the nearest hectare and the percentages have been rounded to the nearest whole percent. These groups are described in order of those covering the largest aerial extent of the island to those covering least.

Group 2: *Eucalyptus diversifolia* Open mallee

Group 2A: *E. diversifolia, E. cosmophylla, +/-E. baxteri, +/- E. fasciculosa* Open mallee
The canopy cover ranges from open, at times very open mallee, to occasionally mallee. Located on clay

soils derived from laterite, usually with a siliceous sand overlay. The group is widespread on the perimeter of the Gosse and Seddon plateaux with the most extensive areas along the southern and western perimeters. West of Mt. Taylor road, the understorey is usually dominated by *Banksia marginata* and *Allocasuarina striata* with variable *B. ornata, Xanthorrhoea semiplana* ssp. *tateana, Hakea muelleriana*, *A. muelleriana* ssp. *notocolpica* and *H. rostrata.* East of Mt. Taylor road, it is variably dominated by *Melaleuca uncinata, A. muelleriana* ssp. *notocolpica, A. striata* or less often by *B. ornata,* usually with *X. semiplana* ssp. *tateana* and *H. rostrata* with variable *H. muelleriana*.

Group 2B*: E. diversifolia, +/- E. lansdowneana* ssp. *albopurpurea, E. rugosa* Mallee
The canopy cover ranges from mallee, to (at times) very low mallee. Located in deep to shallow acid to neutral sands usually overlying limestone. Found mainly inland from the south coast at the western end of the island. The understorey is usually complex, and often dense, of very variable components. Often with *Melaleuca lanceolata*, *Lasiopetalum schulzenii* and *Acacia retinodes* var. *uncifolia* with variable *Hakea vittata*, *H. muelleriana*, *Banksia marginata*, *A. myrtifolia* var. *myrtifolia*, *Pultenaea rigida*, *Correa reflexa*, *Xanthorrhoea semiplana* ssp. *tateana* and *Pomaderris obcordata*.

Group 2C: *E. diversifolia, +/- E. lansdowneana* ssp. *albopurpurea*, *+/- E. rugosa, E. cladocalyx, E. fasciculosa* Very open mallee
The canopy cover ranges from a very open mallee upper storey over a mallee second storey. Located in deep to shallow acid to neutral sands usually overlying limestone or in areas adjacent to a laterite province. Found at the far western end of the island. The understorey is usually complex, and often dense, of very variable components. Often with *Melaleuca lanceolata*, *Lasiopetalum schulzenii* and *Acacia retinodes* var. *uncifolia* with variable *Hakea vittata*, *H. muelleriana, Banksia marginata*, *A. myrtifolia* var. *myrtifolia*, *Pultenaea rigida*, *Correa reflexa*, *Xanthorrhoea semiplana* ssp. *tateana* and *Pomaderris obcordata*.

Group 2D: *E. diversifolia, E. rugosa, +/- E. oleosa* Open mallee
The canopy ranges from open mallee to very open mallee. Located on alkaline sands on consolidated dunes or on limestone often with a sand overlay. This group is widespread along the southern coast with pockets along the north coast, mainly near Stokes Bay. The understorey is at times sparse. Often with *Melaleuca lanceolata, Acacia retinodes* var. *uncifolia, Lasiopetalum schulzenii* and *Orthrosanthus multiflorus* with variable *Correa reflexa, Pomaderris paniculosa* ssp. *paniculosa, Senecio odoratus* and *Myoporum insulare.* Also at times with *A. paradoxa.*

Group 2E: *E. diversifolia* Low mallee
The canopy ranges from mallee, which is at times closed. Usually located in massive sheet limestone in exposed high wind coastal situations. The group is scattered along the southern and western coast. The understorey usually contains *Melaleuca lanceolata*. Sparse on massive limestone with *Hakea vittata* and *M. gibbosa;* as at Sandy Creek on the far west coast. In more sandy areas with *Pomaderris paniculosa* ssp. *paniculosa*, *Acrotriche patula* and *Lasiopetalum schulzenii* and variable *L. discolor.*

Group 2F: *E. diversifolia, Melaleuca lanceolata, +/- E. rugosa* Very open mallee
The canopy ranges from very open mallee, to at times a sparse shrubland. Located on deep alkaline sands on partially stabilised beach dunes. The group is widespread along the southern coast. The understorey is at times sparse. Often with *Melaleuca lanceolata*, with variable *Acacia retinodes* var. *uncifolia, Leucopogon parviflorus*, *Myoporum insulare, Correa reflexa, M. gibbosa, Pomaderris paniculosa* ssp. *paniculosa* and *A. longifolia* var. *sophorae.*

Group 2G: *E. diversifolia, +/- E. rugosa, +/- E. cosmophylla* Very open low mallee
The canopy ranges from very open low mallee, at times an open mallee with pockets of mallee. Located on Tertiary limestone with embedded fossil clay horizons. In part, also a patchy broken limestone surface unconformably overlying Cambrian sandstone bedrock. This group is found along the west and north coast. The understorey is in areas of more pure limestone with *Melaleuca lanceolata*, *Lasiopetalum schulzenii* and *M. gibbosa* otherwise in areas of clay or sandstone with *Banksia marginata*, *B. ornata*, *Allocasuarina striata* and *Hakea rostrata* with variable *H. muelleriana*.

Group 2H: *E. diversifolia, +/- E. lansdowneana* ssp. *albopurpurea*, *E. rugosa* Open mallee
The canopy cover ranges from open mallee to open low mallee, at times very open, with areas of low mallee. Located on deep to shallow acid to neutral sands usually overlying limestone. This group is found along the south coast at the western end of the island. The understorey is usually complex, only at times dense, and of very variable components. Often with *Melaleuca lanceolata, Lasiopetalum schulzenii* and *Acacia retinodes* var. *uncifolia* with variable *Hakea vittata*, *H. muelleriana*, *Banksia marginata*, *A. myrtifolia* var. *myrtifolia*, *Pultenaea rigida*, *Correa reflexa, Xanthorrhoea semiplana* ssp. *tateana* and *Pomaderris obcordata*.

Group 2J: *E. diversifolia, E. remota, E. cosmophylla, +/- E. baxteri* Very open mallee
The canopy cover ranges from very open mallee to very open low mallee. Located on laterite surfaces adjacent to limestone provinces. This group is found

on the far north western end of the island near Harveys Return. The understorey is typically dominated by *Banksia ornata* and or *B. marginata* with *Hakea rostrata* and *Allocasuarina striata* and variable *A. muelleriana* ssp. *notocolpica* and *Xanthorrhoea semiplana* ssp. *tateana*

Group 2K: *E. diversifolia, Allocasuarina muelleriana* ssp. *notocolpica, E. cosmophylla* Very open mallee
The canopy cover ranges from very open mallee to very open low mallee, with patches of extensive shrubland. Located in those areas where the Cambrian sandstone bedrock is at or near the surface when west of Mt. Taylor road. East of Mt. Taylor road the presence of bedrock is less apparent and this classification is in part subsumed within 2A. This group is found in the scattered areas in the south central region from the Eleanor river to the west coast. The understorey is usually singularly dominated by *Allocasuarina muelleriana* ssp. *notocolpica* with variable *A. striata*, *Banksia marginata* and *Hakea rostrata*.

Group 2L: *E. diversifolia, E. cosmophylla* Very open mallee
Located on Tertiary limestone, "island" prominences, surrounded by laterite clays. This group is confined to Mt. Taylor and a nearby ridge. The understorey is open but diverse dominated by *Xanthorrhoea semiplana* ssp. *tateana*, *Allocasuarina striata*, *Pultenaea rigida*, *Spyridium halmaturinum* var. *halmaturinum, Acacia myrtifolia* var. *myrtifolia, Hakea muelleriana, Banksia marginata* and *H. rostrata*.

Group 2M: *E. diversifolia, E. lansdowneana* ssp. *albopurpurea, +/- E. cneorifolia, +/-E. cosmophylla, +/-E. fasciculosa* Open mallee
The canopy cover ranges from open mallee to very open mallee. Located on acid laterite clays with a variable overlay of siliceous sands. This group is found around the eastern perimeter of the Seddon plateau. The understorey is often dense and variably dominated by *Melaleuca uncinata, Allocasuarina muelleriana* ssp. *notocolpica* and *A. striata*, with variable *Xanthorrhoea semiplana* ssp. *tateana, Hakea rostrata, Melaleuca gibbosa* and *Acacia myrtifolia* var. *myrtifolia.* Where significant *E. cneorifolia* is present, usually also with *Thryptomene ericaea, Correa reflexa* and *Grevillea ilicifolia* var. *ilicifolia.*

Group 2N: *E. diversifolia, E. rugosa, +/- E. lansdowneana* ssp. *albopurpurea, +/- E. oleosa* Open mallee
The understorey ranges from open mallee to very open mallee. Located on Tertiary limestone with fossil clay horizons. This group covers the peninsula of Cape Ganthaume from Seal Bay to Destrees Bay. The understorey is a mosaic of areas of more dense and complex vegetation where the clay influence is more marked, within a wider more open association, at times sparse, and variably dominated by *Melaleuca lanceolata* and or *Beyeria leschenaultii* with variable *Pomaderris obcordata, Correa reflexa, Acrotriche cordata* and *Logania ovata.* In areas of more clay influence, dominated by *Hakea muelleriana* with *H. vittata, Acacia myrtifolia* var. *myrtifolia, Pultenaea acerosa, Grevillea ilicifolia* var. *ilicifolia., Calytrix tetragona and C. glaberrima* and lesser but variable *Xanthorrhoea semiplana* ssp. *tateana*

Group 2O: *E. diversifolia, E. lansdowneana* ssp. *albopurpurea, +/- E. cneorifolia, +/- E. fasciculosa* Open mallee
The canopy ranges from open mallee to very open mallee. Located on acid laterite clays with a variable overlay of siliceous sands. This group is found on the southern perimeter of the Dudley Plateau. The understorey is often dense and variably dominated by *Melaleuca uncinata, Allocasuarina muelleriana* ssp. *notocolpica* and *A. striata*, with variable *Xanthorrhoea semiplana* ssp. *tateana, Hakea rostrata, M. gibbosa* and *Acacia myrtifolia* var. *myrtifolia.* Where significant *E. cneorifolia* is present, usually also with *Thryptomene ericaea, Correa reflexa* and *Grevillea ilicifolia* var. *ilicifolia.*

Group 2P: *E. diversifolia, E. lansdowneana* ssp. *albopurpurea, E. leptophylla, +/- E. cneorifolia, +/- E. cosmophylla* Open mallee
The canopy cover ranges from open mallee to very open mallee. Located on alkaline clays of tillite origin with an overlay of siliceous sands. This group is found throughout the Macgillivray plain. The understorey is an open but complex understorey, often with *Leptospermum myrsinoides, Bertya rotundifolia* and *Adenanthos macropodiana* and with variable *Banksia marginata, Acacia myrtifolia* var. *myrtifolia, Melaleuca uncinata, Thryptomene ericaea, Xanthorrhoea semiplana* ssp. *tateana, Hakea rostrata, Lasiopetalum schulzenii* and *Grevillea ilicifolia* var. *ilicifolia.* Occasionally with *H. muelleriana, Allocasuarina muelleriana* ssp. *notocolpica* and or *A. striata.* Also occasionally with *Phebalium equestre.*

Group 2Q: *E. diversifolia, E. lansdowneana* ssp. *albopurpurea, E. leptophylla, +/-E. cneorifolia* Open mallee
The canopy cover ranges from open mallee to very open mallee. Located on stranded Tertiary limestone ridges in an otherwise alkaline clay province. The group is found throughout the southern Macgillivray Plains. The understorey is an open, usually sparse, understorey, often with *Melaleuca lanceolata, Lasiopetalum schulzenii Correa reflexa* and *Grevillea ilicifolia* var. *ilicifolia* with variable *Hakea vittata, M. uncinata, Acacia myrtifolia* var. *myrtifolia* and *Xanthorrhoea semiplana* ssp. *tateana*

Group 2R: *E. diversifolia +/-E. rugosa, +/-E. cneorifolia, +/-E. lansdowneana* ssp. *albopurpurea, +/-E. oleosa* Open mallee
The canopy cover ranges from open mallee to very open mallee. Located on Tertiary limestone with fossil clay horizons. This group is confined to the southern Dudley Peninsula from Browns Beach to Black Point. In recently burnt, and particularly in repeatedly burnt, vegetation, *Acacia paradoxa* is prominent in the understorey but recedes markedly as the vegetation ages. In more mature aged stands the understorey is often absent with just twig and leaf litter. Otherwise, in pure limestone, with scattered *Melaleuca lanceolata, M. acuminata* and *Acrotriche patula*, or, in areas of lesser water stress or more prevalent clay, a wider more complex association, usually with *M. lanceolata* and *Lasiopetalum schulzenii* and variable *M. acuminata ,Choretrum glomeratum* var. *glomeratum, Beyeria leschenaultii, Pomaderris obcordata, Correa reflexa, Dodonaea humilis, Acrotriche cordata, Hakea vittata, Leucopogon parviflorus, Grevillea ilicifolia* var. *ilicifolia.* and *Acacia leiophylla.* Also with *Trymalium wayae* between Mouth Flat and Black Point.

Group 2S: *E. diversifolia, +/- E. cneorifolia, E. lansdowneana* ssp. *albopurpurea, +/- E. rugosa* Open mallee
The canopy cover ranges from open mallee to very open mallee. Located on Tertiary sheet limestone with fossil clay horizons and a variable alkaline sand overlay. This group is confined to the southern Dudley Peninsula near Cape Hart. The understorey is highly variable reflecting the influences of intermingled clay, limestone and sand. Mainly complex, but rarely dense. Usually with *Logania ovata* and *Choretrum glomeratum* var. *glomeratum.* throughout, often dominated by *Acacia myrtifolia* var. *myrtifolia* with variable *Hakea muelleriana, Correa reflexa, Lasiopetalum schulzenii, H. vittata, Pultenaea acerosa, Grevillea ilicifolia* var. *ilicifolia, G. linearifolia, Calytrix glaberrima* and occasional *Xanthorrhoea semiplana* ssp. *tateana.* Also in more clay rich areas with *Banksia marginata, Allocasuarina striata* and *Melaleuca gibbosa.* In areas with significant *E. cneorifolia*, also with *Thryptomene ericaea* and *M. uncinata.*

Group 2T: *E. diversifolia*, +/- *E. cneorifolia* Closed low mallee
The canopy cover ranges from closed low mallee with areas of closed shrubland. Located on granite with a variable presence of limestone. This group is confined to the windswept coastal clifftops between Cape Hart and Cape Willoughby. The understorey is absent in places, but contains variable shrub pockets of *Melaleuca uncinata* and *M. gibbosa* with *Thryptomene ericaea, Hakea muelleriana* and *Allocasuarina striata* elsewhere.

Group 2U: *E. diversifolia, +/-E. cneorifolia, E. lansdowneana* ssp. *albopurpurea, E. rugosa, +/- Callitris preissii* Open mallee
The canopy cover ranges from open mallee to very open mallee. Located on Quaternary stranded shoreline deposits of the Glanville Formation and spreading to recent coastal sand dunes. This group is confined to the southern Dudley Peninsula from American River inlet to Browns Beach. The understorey is usually complex but rarely dense, with variable *Melaleuca lanceolata, Dodonaea viscosa* ssp. *angustissima, Correa reflexa Pomaderris paniculosa* ssp. *paniculosa, Acrotriche patula, Lasiopetalum schulzenii, Beyeria leschenaultii, Prostanthera aspalathoides, Pomaderris obcordata, Acrotriche cordata, Leucopogon parviflorus,* and *Acacia leiophylla.*

Group 2V: *E. diversifolia, E. cosmophylla, +/-E. cneorifolia* Very open mallee
The canopy cover ranges from very open mallee to very open low mallee over a tall closed shrubland. Located on alkaline clays with variable sand overlay. This group is confined to low lying but not usually inundated swamps in the MacGillivray Plains. The understorey is dense and tall, usually dominated by *Allocasuarina muelleriana* ssp. *notocolpica* with variable *A. striata, Melaleuca uncinata, Callistemon rugulosus* var. *rugulosus, M. gibbosa* and *A. striata.* Also with *Thryptomene ericaea.* in areas of *E. cneorifolia.*

Table 21.
The extent of the sub-groups of *Eucalyptus diversifolia* Open mallee.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus diversifolia Open mallee	2		76,829	17
	2A	272	7,024	1.6
	2B	19	4,838	1.1
	2C	7	1,145	<0.5
	2D	49	15,144	3.4
	2E	7	67	<0.5
	2F	23	3,595	< 1
	2G	2	286	<0.5
	2H	39	11,695	2.66
	2J	4	276	< 0.5
	2K	14	223	<0.5
	2L	2	28	< 0.5
	2M	106	1,007	< 0.5
	2N	17	22,409	5.1
	2O	11	121	< 0.5
	2P	92	1,390	< 0.5
	2Q	11	86	< 0.5
	2R	26	5,132	1.2
	2S	31	1,869	< 0.5
	2T	2	80	< 0.5
	2U	8	409	< 0.5
	2V	1	6	< 0.5

Group 1:*Eucalyptus remota* Open low mallee

Group 1A: *E. remota, E. cosmophylla, +/- E. baxteri* Open low mallee
The canopy cover ranges from open mallee to open low mallee to often very open mallee with patches of extensive shrubland when a very open woodland. Located on hilltops and slopes in the laterite plateau. This group is found mainly west of Mt.Taylor road & north of the South Coast road. The understorey is typically dominated by *Banksia ornata* and or *B. marginata* with *Hakea rostrata* and *Allocasuarina striata* and variable *Xanthorrhoea semiplana ssp. tateana* and *A. muelleriana* ssp. *notocolpica*. Usually with a substorey rarely without *Phyllota pleurandroides* and often with variable *Daviesia brevifolia* and *Calytrix tetragona*.

Group 1B: *E. remota, E. diversifolia, E. cosmophylla* Open low mallee
The canopy cover ranges from open mallee to at times a open low mallee to often very open mallee. Located on laterite plateau surfaces on the far west of the island where a coastal influence of aeolian shell sands creates an interface zone between laterite and limestone. This group occurs on the far west coast of the island. The understorey is typically dominated by *Banksia ornata* and or *B. marginata* with *Hakea. rostrata* and *Allocasuarina striata* and variable *Xanthorrhoea. semiplana* ssp. *tateana* and *A. muelleriana* ssp. *notocolpica*. Usually with a substorey rarely without *Phyllota pleurandroides* and often with variable *Daviesia brevifolia* and *Calytrix tetragona*.

Group 1C: *E. remota, Allocasuarina muelleriana* ssp. *notcolpica, +/-E. diversifolia, E. cosmophylla* Very open mallee
The canopy cover ranges from very open mallee to very open low mallee, with patches of extensive shrubland. Located on hilltops and slopes within the laterite province but in areas where the Cambrian sandstone bedrock is at or near the surface. This group is restricted to west of Mt. Taylor road & north of the South Coast road. The understorey is typically, singularly dominated by *Allocasuarina muelleriana* ssp. *notocolpica* with variable *A. striata, Banksia marginata* and *Hakea rostrata*.

Group 1D: *E. remota, +/- E. baxteri, +/- E. obliqua, E. cosmophylla* Very open mallee
The canopy cover ranges from very open mallee to very open low mallee, with scattered local areas of open mallee. Located on flat, poorly drained areas of laterite. This group is restricted to the upper catchment of the south flowing rivers, west of the Gosse-Ritchie road. The understorey is typically dominated by *Banksia ornata* and or *B. marginata* with *Hakea rostrata* and *Allocasuarina striata* and variable *Xanthorrhoea semiplana* ssp. *tateana* and *A. muelleriana* ssp. *notocolpica*. Usually with a substorey rarely without *Phyllota pleurandroides* and often with variable *Daviesia brevifolia* and *Calytrix tetragona*.

Group 1E: *E. remota, E. cosmophylla, +/-E. baxteri* Open mallee
The canopy ranges from open mallee to very open mallee. Located on stony slopes and ridges in Cambrian sandstone bedrock. This group is restricted to the area of Cape Torrens and Western River National Parks. The understorey is usually dominated by *Allocasuarina striata* with *Xanthorrhoea semiplana* ssp. *tateana Banksia marginata, Hakea rostrata* and variable *B. ornata* and *A. muelleriana* ssp. *notocolpica*.

Group 1F: *E. remota, E. baxteri, E. obliqua, E. cosmophylla* Open mallee
Located in laterite, bordering the Cambrian sandstone bedrock. This group is mainly restricted to the area between the Playford Highway and Cape Torrens and Western River National Parks. The understorey is usually dominated by *Allocasuarina striata*, *Xanthorrhoea semiplana* ssp. *tateana*, *Banksia ornata* and *B. marginata* with variable *Acacia myrtifolia*, *Daviesia asperula* ssp. *asperula* and *D. pectinata*.

Table 22.
The extent of the sub-groups of *Eucalyptus remota* Open low mallee.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus remota Open low mallee	1		39,292	9
	1A	135	31,417	7
	1B	14	2,357	<1
	1C	32	852	<0.5
	1D	6	2,119	<1
	1E	4	729	<0.5
	1F	14	1,818	<0.5

Group 5: *Eucalyptus cladocalyx* Woodland

Group 5A: *E. cladocalyx, E. fasciculosa, E. obliqua, +/-E. baxteri, +/-E. leucoxylon* ssp. *leucoxylon, E. cosmophylla, +/-E. viminalis* ssp. *cygnetensis* Woodland
The canopy cover ranges from woodland to open forest, occasionally a tall woodland. Located on alluvial loams and well weathered Cambrian sandstones, usually within a laterite province. This group occurs mainly along permanent water courses on the western half of the island. The understorey is variably sparse to complex, rarely dense. Usually with *Pteridium esculentum, Bursaria spinosa* and *Leptospermum lanigerum* near to the water with *Xanthorrhoea semiplana* ssp. *tateana, Prostanthera spinosa* and *Acacia paradoxa* away from the stream bank.

Group 5B: *E. cladocalyx, +/-E. obliqua, +/-E. baxteri, E. cosmophylla* Woodland
Woodland, occasionally tall but also low. Located on alluvium derived from laterite or laterite itself. This group occurs mainly along dry water courses on the western half of the island. the understorey is mainly open to sparse, at times complex. Usually with *Xanthorrhoea semiplana* ssp. *tateana* and *Hakea rostrata* and variable *Banksia marginata* and *Daviesia asperula* ssp. *asperula* .

Group 5C: *E. cladocalyx, E diversifolia, +/-E. fasciculosa, E. cosmophylla, +/-E. lansdowneana* ssp. *albopurpurea, +/-E. leucoxylon* ssp. *leucoxylon* Woodland
The canopy cover ranges from woodland, occasionally tall but grading to open at the margins. Located mainly in deep neutral to acid sands and usually adjacent to a limestone province on the west and south west of the island but in acid clays centrally. This group occur on flats and dry water courses on the edge of the laterite plateau in the south west or western end of the island but also in creeklines of the north coast, the central escarpment and southern Seddon plateau . The understorey is mainly open to sparse, at times complex. In sandy or alluvial areas, usually with *Melaleuca lanceolata* and variable *Hakea muelleriana, Xanthorrhoea semiplana* ssp. *tateana, Acacia myrtifolia* var. *myrtifolia* and *Banksia marginata*. In clay based creeklines, usually dominated by *B. marginata* and *Allocasuarina striata* or by *M. uncinata* with variable *B. ornata, X. semiplana* ssp. *tateana, H. muelleriana, A. muelleriana* ssp. *notocolpica* and *H. rostrata.*

Group 5D: *E. cladocalyx, Allocasuarina verticillata, E. fasciculosa* Woodland
The canopy cover ranges from woodland to open woodland, occasionally a tall woodland. Located on areas of near surface Cambrian sandstone. This group usually occurs in the lower reaches of water courses or more centrally in areas of minimal residual laterite presence from American River to Cape Borda. The understorey is mainly open to sparse, rarely complex. Usually with *Acacia paradoxa* and *Prostanthera spinosa.*

Group 5E: *E. cladocalyx* Very open woodland
This group consists of remnant trees that have been left in pasture paddocks. Located on areas of well weathered Cambrian sandstone or alluvium in cleared water courses or rocky slopes. This group occurs from American River to the West End Highway. The understorey is mainly introduced pasture species or regrowth *Acacia paradoxa, Xanthorrhoea semiplana* ssp. *tateana a*nd or *Pteridium esculentum*.

Group 5F: *E. cladocalyx, A. muelleriana* ssp. *notcolpica, E. cosmophylla* Open woodland
The canopy cover includes open woodland with extensive areas of tall shrubland. Located on areas of near surface Cambrian sandstone. This group is found on the lower slopes of valleys on the western half of the island. The understorey is mainly dense and predominantly an *Allocasuarina muelleriana* ssp. *notocolpica* shrubland with variable *A. striata* and *Xanthorrhoea semiplana* ssp. *tateana.*

Group 5G: *E. cladocalyx, E. cosmophylla, A. verticillata, +/-E. fasciculosa, +/-E. leucoxylon* ssp. *leucoxylon* Open woodland
Located on alluvial loams and well weathered Cambrian sandstones. This group occurs mainly along permanent water courses and adjacent slopes and hill tops in the northern half of the central and western region. The understorey is variably sparse to complex, at times dense, with scattered *Allocasuarina verticillata* throughout. Usually with *Acacia paradoxa Bursaria spinosa* and *Pteridium esculentum* in the valley bottoms. On slopes and ridges often dominated by *Allocasuarina striata, A.*

muelleriana ssp. *notocolpica* and *Xanthorrhoea semiplana* ssp. *tateana.*
Group 5H: *+/-E. cladocalyx, +/-E. diversifolia, +/-E. cneorifolia, A. verticillata* Open woodland
The canopy cover varies from open woodland with extensive areas of very low open woodland. Located on laterite with near surface Cambrian sandstones. This group is confined to the coastal hinterland of Ballast Head but not along the coastal slopes. The understorey is variably dense but not very complex, usually dominated separately or jointly by *Melaleuca uncinata* and or *Allocasuarina muelleriana* ssp. *notocolpica* with *Thryptomene ericaea, Hibbertia riparia, M. gibbosa* and *Xanthorrhoea semiplana* ssp. *tateana*

Table 23.
The extent of the sub-groups of *Eucalyptus cladocalyx* Woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus cladocalyx Woodland	5		32,241	7.3
	5A	112	12,813	2.9
	5B	101	4,928	1.1
	5C	62	2,077	< 0.1
	5D	51	2,566	< 0.1
	5E	133	1,240	< 0.5
	5F	27	779	< 0.5
	5G	120	7,333	1.7
	5H	10	506	< 0.5

Group 3: *Eucalyptus baxteri* Low woodland

Group 3A: *E. baxteri, E. obliqua, E. cosmophylla* Low woodland

Group 3B: *E. baxteri, +/-E. obliqua, +/-E. cladocalyx, E. cosmophylla* Low woodland
The canopy cover ranges from low to low open woodland, to at times a woodland and occasionally a very low open woodland. Located on areas of laterite or alluvial flats derived from laterite. This group is widespread over the western half of the island, usually away from the coast. The understorey is usually dense, except where a very low open woodland, and variably dominated by *Allocasuarina striata, Banksia marginata* or *B. ornata,* the latter often absent east of Mt. Taylor road, with variable *Hakea rostrata, A. muelleriana* ssp. *notocolpica, H. muelleriana* and *Xanthorrhoea semiplana* ssp. *tateana*

Group 3C: *E. baxteri, E. obliqua, E. cosmophylla, +/- E. remota* Very low open woodland
The canopy cover ranges from very low open woodland to low open woodland or low woodland. Located on variably weathered Cambrian sandstone slopes and hilltops. This group is found on the deeply dissected north western coast area. The understorey is usually complex and dominated by *Allocasuarina striata* and *Xanthorrhoea semiplana* ssp. *tateana,* with *Hakea rostrata* and *Banksia marginata* and variable *A. muelleriana* ssp. *notocolpica* and *B. ornata*.

Group 3D: *E. baxteri, +/-E. obliqua, E. cosmophylla, E. remota* Low woodland
The canopy ranges from low, to at times open, woodland. Located on laterite slopes and hilltops. This group is found between Church road and the South Coast road at the western end of the island. The understorey is usually dense, except where a very low open woodland, and variably dominated by *Allocasuarina striata*, *Banksia marginata* or *B. ornata* with variable *Hakea rostrata, A. muelleriana* ssp. *notocolpica, H. muelleriana* and *Xanthorrhoea semiplana* ssp. *tateana.*

Group 3E: *E. baxteri, E. remota, +/-E. obliqua, E. cosmophylla* Low open woodland
The canopy ranges from low to very low open woodland with local areas of woodland. Located on flat poorly drained areas of laterite. This group is found near the upper reaches of the south flowing streams near the Playford Highway and west of the Gosse- Ritchie road. The understorey is typically dominated by *Banksia ornata* and or *B. marginata* with *Hakea rostrata* and *Allocasuarina striata* and variable *Xanthorrhoea semiplana ssp. tateana* and *A. muelleriana* ssp. *notocolpica*. Usually with a substorey rarely without *Phyllota pleurandroides* and often with variable *Daviesia brevifolia* and *Calytrix tetragona*.

Table 24.
The extent of the sub-groups of *Eucalyptus baxteri* Low woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus baxteri Low woodland	3		24,739	5.6
	3A	613	10,448	2.3
	3B	280	9,293	2.1
	3C	16	772	< 0.5
	3D	46	522	< 0.5
	3E	13	3,705	< 1

Group 6: *Eucalyptus cosmophylla* Very open mallee

Group 6A: *E. cosmophylla, A. muelleriana* ssp. *notocolpica, +/-E. fasciculosa* Very open low mallee
The canopy cover ranges from very open low mallee to closed shrubland. Located on surface or near surface Cambrian sandstones, at times in an otherwise laterite province. This group occurs on the western half of the island. The understorey is typically made up of a dense *Allocasuarina muelleriana* ssp. *notocolpica* shrubland with a variable *A. striata*, *Xanthorrhoea semiplana* ssp. *tateana* and *Melaleuca uncinata* occurrence.

Group 6B: *E. cosmophylla, E. fasciculosa,* Very open mallee
The canopy cover varies from very open mallee to a shrubland which varies from open to closed and low to tall. Located on laterite surfaces or sandy to alluvial loams. This group occurs throughout the island. The understorey is dominated variably by *Allocasuarina striata*, *Banksia marginata*, *B. ornata* and *Hakea muelleriana* with variable *H. rostrata*, *A. muelleriana* ssp. *notocolpica* and lesser *H. rugosa*. *Melaleuca uncinata* is also prominent east of Mt. Taylor road.

Group 6C: *E. cosmophylla, E. fasciculosa* Very open mallee
Located on stony Cambrian sandstone surfaces. This group is restricted to the deeply dissected hillslopes and ridges of the north coast. The understorey is usually a dense and complex association dominated by *Allocasuarina striata* and *Xanthorrhoea semiplana* ssp. *tateana*, at times with a codominance of *A. muelleriana* ssp. *notocolpica,* with variable *Banksia marginata*.

Group 6D: *E. cosmophylla, +/-E. remota, +/-E.diversifolia* Very open mallee
The canopy cover ranges from very open mallee to closed shrubland. Located in low lying, or seepage areas with near surface expressions of Cambrian sandstone bedrock, with adjacent laterite provinces. This group occurs to the north and northwest of West Bay within Flinders Chase National Park. The understorey consists of a dense understorey either singularly dominated by *Allocasuarina muelleriana* ssp. *notocolpica* or by *A. striata* with *Banksia marginata*. *Leptospermum continentale*, *Hakea muelleriana* and *H. rugosa* likely to be present in numbers.

Group 6E: *E. cosmophylla, E. fasciculosa, +/-E. cladocalyx, +/-A. verticillata* Very open mallee
The canopy cover ranges from very open mallee to closed shrubland. Located on stony creeks, slopes and hilltops on Cambrian sandstones at times with shallow laterite overlying same. This group occurs mainly in the central plateau region west of Parndana. The understorey is variable with three major dominant shrub groupings, only occasionally blended together. Where the singular dominant is *Allocasuarina muelleriana* ssp. *notocolpica* the classification of 6F is used instead of 6E. Where the singular dominant is *Melaleuca uncinata* the classification of 6G is used. Otherwise the understorey is made up a mosaic of the two above classes or a dense *A. striata* association with *Banksia marginata, Hakea rostrata* and *Xanthorrhoea semiplana* ssp. *tateana* and *Daviesia asperula* ssp. *asperula*.

Group 6F: *E. cosmophylla, E. fasciculosa, +/-E. cladocalyx, +/-A. verticillata* Very open mallee *over A. muelleriana* ssp. *notcolpica*
The canopy cover ranges from very open mallee to closed shrubland. Located on stony creeks, slopes and hilltops on Cambrian sandstones at times with shallow laterite overlying same. This group occurs mainly in the central plateau region west of Parndana. The understorey is usually dense, singularly dominated by *Allocasuarina muelleriana* ssp. *notocolpica* with *Xanthorrhoea semiplana* ssp. *tateana.*

Group 6G: *E. cosmophylla, E. fasciculosa, E. cladocalyx, Allocasuarina verticillata* Very open mallee *over Melaleuca uncinata*
The canopy cover ranges from very open low mallee to closed shrubland. Located on stony creeks, slopes and hilltops on Cambrian sandstones at times with shallow laterite overlying same. This group occurs mainly in the central plateau region west of Parndana. The understorey is dense and singularly dominated by *Melaleuca uncinata* often with *Calytrix tetragona* and *Eriostemon angustifolia* var. *angustifolia* and variable *Allocasuarina muelleriana* ssp. *notocolpica.*

Table 25.
The extent of the sub-groups of *Eucalyptus cosmophylla* Very open mallee.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus cosmophylla Very open mallee	6		6,825	1.55
	6A	15	495	< 0.5
	6B	17	1,390	< 0.5
	6C	17	296	< 0.5
	6D	2	279	< 0.5
	6E	61	3,880	< 1
	6F	10	254	< 0.5
	6G	13	231	< 0.5

Group 11: *Eucalyptus cneorifolia* Open mallee

Group 11A: *E. cneorifolia, E. conglobata, +/-E. diversifolia, +/-E. rugosa* Open mallee
The canopy cover ranges from open mallee, to often mallee, at times a woodland. Located on alkaline or acid clays with a variable sand overlay. This group occurs mainly along the northern section of the island from just west of Rose Cottage road to just east of Penneshaw. The understorey is sparse and often absent, with just twig and leaf litter, or variable *Xanthorrhoea semiplana* ssp. *tateana, Acacia paradoxa, Correa reflexa, Ozothamnus retusus* and *Rhagodia candolleana* ssp. *candolleana.* In swampy areas also with *Callistemon rugulosus* var. *rugulosus* and *Melaleuca gibbosa.* Also at times with *M. uncinata, Thryptomene ericaea* and *Grevillea ilicifolia* var. *ilicifolia.*

Group 11B: *E. cneorifolia, E. cladocalyx* Open mallee
The canopy cover ranges from open mallee to mallee, usually with a scattered taller woodland overstorey. Located on the upper slopes of the Wisanger hills in tillite unconformably overlain by flow basalts or within the basalts on the hill tops. This group is confined to the Wisanger Hills between Emu Bay and Rose Cottage road. The understorey is sparse with variable *Acacia paradoxa.*

Group 11C: *E. cneorifolia, E. diversifolia, E. rugosa* Mallee
The canopy cover ranges from mallee to open mallee, at times a very open mallee. Located on areas of Tertiary limestone with fossil clay horizons. This group occurs between Bay of Shoals and Emu Bay and also smaller occurrences near the Dudley national park. The understorey is variable sparse or absent with scattered *Melaleuca lanceolata, Acacia paradoxa, Prostanthera aspalathoides, Correa reflexa, Choretrum glomeratum* var. *glomeratum.* and *Grevillea ilicifolia* var. *ilicifolia.*

Group 11D: *E. cneorifolia, E. lansdowneana* ssp. *albopurpurea, E. diversifolia, +/-E. cosmophylla* Open mallee
The canopy cover ranges from open mallee to very open mallee. Located on mainly alkaline clays. This group occurs mainly in the MacGillivray or Haines areas. The understorey is variably complex, and at times dense, mainly with *Melaleuca uncinata, Thryptomene ericaea, Grevillea ilicifolia* var. *ilicifolia. and Correa reflexa* with variable *G. rogersii, Adenanthos terminalis, Allocasuarina striata* and *Xanthorrhoea semiplana* ssp. *tateana,* occasionally, also with prominent *A. muelleriana* ssp. *notocolpica.* In part this association contains examples of the rare *Beyeria subtecta* and *Phebalium equestre.*

Group 11E: *E. cneorifolia, +/-E. rugosa, +/-E. conglobata* Very open mallee
The canopy cover ranges from very open mallee to at times an open woodland. Located on alkaline or acid clays. This group occurs mainly along the northern sector of the eastern end of the island. The understorey is predominantly pasture grasses or odd areas of *Melaleuca uncinata.*

Group 11F: *E. cneorifolia, E. lansdowneana* ssp. *albopurpurea, E. conglobata, E. diversifolia, +/-E. cosmophylla* Open mallee
The canopy cover ranges from open mallee, to often mallee, and at times a woodland. Located on both acid and alkaline clays with a variable sand overlay. This group occurs mainly within the Cygnet River flood plain and MacGillivray Plains. Also on the Dudley Plateau. The understorey is at times sparse or absent otherwise usually dominated by *Melaleuca uncinata* with *Thryptomene ericaea, Grevillea ilicifolia* var. *ilicifolia, Xanthorrhoea semiplana* ssp. *tateana* and *Correa reflexa.* In swampy areas also with *Callistemon rugulosus* var. *rugulosus* and *M. gibbosa.*

Group 11G: *E. cneorifolia, E. diversifolia, E. lansdowneana* ssp. *albopurpurea, +/-E. fasciculosa, E. cosmophylla* Open mallee
The canopy cover ranges from open mallee, at times mallee. Located on river floodplain alluvium. This group is confined to near the Kingscote airport in low lying poorly drained areas of the Cygnet River flood plain. The understorey is variably dense and complex, usually dominated by *Melaleuca brevifolia, M. gibbosa and Acacia calamifolia* in swampy areas, also with *Callistemon rugulosus* var. *rugulosus a*nd *Hakea rugosa.* On better drained areas, usually with *M. uncinata, Thryptomene ericaea, Grevillea ilicifolia* var. *ilicifolia.* and *A. paradoxa.*

Group 11H: *E. cneorifolia, E. conglobata* Open mallee
The canopy cover ranges from open mallee, often mallee, at times a woodland. Located on laterite acid clays with a variable sand overlay. This group occurs on the Haines plateau. The understorey is sparse and usually absent with just twig and leaf litter or scattered *Melaleuca uncinata, Acacia paradoxa* and *Choretrum glomeratum* var. *glomeratum.*

Group 11I: No group

Group 11J: *E. cneorifolia, E. lansdowneana* ssp. *albopurpurea, +/-E. conglobata, +/-E. diversifolia* Open mallee
The canopy cover ranges from open mallee, to often a mallee, to at times a woodland. Located on acid laterite clays with a minor sand overlay. This group is confined to the Dudley Plateau. The understorey is at times sparse or absent otherwise usually dominated by *Melaleuca uncinata* with *Thryptomene ericaea,*

Grevillea ilicifolia var. *ilicifolia, Xanthorrhoea semiplana* ssp. *tateana* and *Correa reflexa.* In swampy areas also with *Callistemon rugulosus* var. *rugulosus* and *Melaleuca gibbosa.*

Table 26.
The extent of the sub-groups of *Eucalyptus cnoerifolia* Open mallee.

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Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus cneorifolia Open mallee	11		5,581	1.27
	11A	213	1,2289	< 0.5
	11B	33	201	< 0.5
	11C	21	340	< 0.5
	11D	86	1,037	< 0.5
	11E	11	39	< 0.5
	11F	104	695	< 0.5
	11G	6	70	< 0.5
	11H	39	440	< 0.5
	11J	133	1,531	< 0.5

<u>Group 4: Eucalyptus rugosa Open mallee</u>

Group 4A: *E. rugosa, E. diversifolia, +/-E. oleosa* Open mallee
The canopy cover ranges from an open mallee, at times a woodland and also at times mallee. Located on broken sheet limestone ridges, at times with an alkaline sand overlay. This group occurs mainly along the south coast of the western half of the island. The understorey is often only twig and leaf litter with spasmodic *Melaleuca lanceolata, Acrotriche patula, Dodonaea humilis* and *Lasiopetalum schulzenii*.

Group 4B: *E. rugosa, +/-E. diversifolia, +/-E. oleosa, M. lanceolata* Open mallee
The canopy cover ranges from open mallee to very open mallee. Located on alkaline dunes often with a presence of limestone. This group occurs mainly along the south coast. The understorey is usually open with *Melaleuca lanceolata*, *Acacia retinodes* var. *uncifolia Leucopogon parviflorus, A. longifolia* var. *sophorae* with variable *M. acuminata, M. insulare* and *Correa reflexa*.

Group 4C: *E. rugosa, +/-E. diversifolia, +/-E. lansdowneana* ssp. *albopurpurea* Very open mallee
Located on recent alluvial clays probably overlaying a limestone base. This group is restricted to the Vivonne Bay area. The understorey is very variable with *Melaleuca uncinata, Hakea muelleriana*, *Banksia marginata* and *Xanthorrhoea semiplana* ssp. *tateana.*

Group 4D: *E. rugosa, E. cneorifolia, M. lanceolata, E. conglobata* Very open mallee
Located on laterite acid clays, usually with limestone present. This group occurs mainly along the north coast from east of Rose Cottage road to Cape Willoughby. The understorey is often sparse to absent or with variable *Melaleuca uncinata, M. insulare, Ozothamnus retusus* or *Rhagodia candolleana* ssp. *candolleana.*

Group 4E: *E. rugosa* Very open mallee
This group represents a remnant very open mallee where numbers of trees have been left in pasture paddocks. Located in areas of alkaline tillitic clays often with limestone. Occasionally in areas of acid clays with limestone. It occurs throughout the Menzies plain and parts of the Dudley peninsula. The understorey consists of mainly introduced pasture species or tree form *Melaleuca lanceolata*.

Group 4F: *E. rugosa, E. diversifolia, +/-E. oleosa, +/-E. cneorifolia, +/-E. gracilis* Open mallee
The canopy cover ranges from open mallee, to at times a woodland and also at times a mallee. Located on broken sheet limestone ridges, at times with an alkaline sand overlay. This group occurs mainly along the south coast. The understorey is often only twig and leaf litter in mature stands with spasmodic *Melaleuca lanceolata, Acrotriche patula*, *Dodonaea humilis* and *Lasiopetalum schulzenii*. Usually more complex in recently burnt vegetation with *Leucopogon parviflorus* and *Acacia retinodes* var. *uncifolia* also present.

Table 27.
The extent of the sub-groups of *Eucalyptus rugosa* Open mallee.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus rugosa Open mallee	4		3,748	0.9
	4A	7	830	< 0.5
	4B	5	283	< 0.5
	4C	1	98	< 0.5
	4D	56	583	< 0.5
	4E	3	14	< 0.5
	4F	47	1,940	< 0.5

<u>Group 13: *Melaleuca lanceolata* Low open shrubland</u>

Group 13A: *Melaleuca lanceolata, +/-E. diversifolia* Open shrubland
The canopy cover ranges from open shrubland, to at times a tall open shrubland. Located on foredunes and unconsolidated sand dunes in near coastal situations. This group occurs intermittently along the entire

coastline. The understorey is usually open, often with *Leucopogon parviflorus,* and at times subdominant to it, with *Olearia axillaris, Acacia longifolia* var. *sophorae.* and variable *A. retinodes* var. *uncifolia, Correa reflexa, Melaleuca gibbosa* and *Pomaderris paniculosa* ssp. *paniculosa.*

Group 13B: *Melaleuca lanceolata, +/-E. diversifolia* Low open shrubland
Located on coastal cliff tops in pot holed sheet limestone, at times with a variable cover of aeolian alkaline sand. This group occurs along almost the entire southern and western coastline and in pockets along the northern. The understorey is typically a complex shrub association including *Melaleuca gibbosa, Correa reflexa, Pultenaea acerosa, Beyeria leschenaultii, Eutaxia microphylla* ssp. *microphylla, Spyridium phylicoides* and *S. halmaturinum* var. *halmaturinum.*

Group 13C: *Melaleuca lanceolata, E. diversifolia, +/- E. rugosa* Low open woodland
The canopy cover ranges from low open woodland to very low woodland. Located on unconsolidated coastal dunes in more protected areas or in more low lying areas of limestone. This group occurs intermittently along the entire coastline. The understorey is usually sparse with variable *Leucopogon parviflorus Acacia longifolia* var. *sophorae, A. retinodes* var. *uncifolia,* and lesser *Myoporum insulare.*

Group 13D: *+/-Melaleuca lanceolata, Melaleuca halmaturorum, M. brevifolia* Low open woodland
The canopy cover ranges from low open woodland to shrubland. Located in a low lying drainage area in Quaternary stranded shoreline deposits. This group occurs south of Rocky Point and west of Browns Beach. The understorey is dense in places but not complex, with minor *Eutaxia microphylla* ssp. *microphylla, Melaleuca acuminata, M. gibbosa, Acacia paradoxa* and *Leucopogon parviflorus.*

Table 28.
The extent of the sub-groups of *Melaleuca lanceolata* Low open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Melaleuca lanceolata Low open shrubland	13		3,383	< 1
	13A	17	380	< 0.5
	13B	27	2,962	< 1
	13C	5	27	< 0.5
	13D	1	15	< 0.5

<u>Group 7: *Eucalyptus fasciculosa* Low open woodland</u>

Group 7A: *E. fasciculosa, E. cosmophylla* Open woodland
Canopy cover ranges from very open woodland, to at times a low open woodland. Located in low lying poorly drained areas or alluvial flats. This is widespread in small localised patches throughout the western end of the island. The understorey is typically dense, at times tall, with a variable dominance of *Melaleuca gibbosa*, *Leptospermum continentale* and *M. brevifolia*. With variable *Banksia marginata, Hakea rugosa, L. myrsinoides*, *Xanthorrhoea semiplana* ssp. *tateana* and *H. rostrata*.

Group 7B: *E. fasciculosa, E. cosmophylla, E. diversifolia, E. lansdowneana* ssp. *albopurpurea, E. baxteri* Open woodland
The canopy cover ranges from open woodland, to occasionally a very open woodland. Located in low lying poorly drained areas or sandy swales of alluvial flats. This group is widespread throughout the island. The understorey is typically dense, at times open and often tall, of variable *Banksia marginata, Leptospermum continentale, Hakea rostrata* and *Allocasuarina striata* with *B. ornata, Melaleuca gibbosa* and *L. myrsinoides*.

Group 7C: *E. fasciculosa* Low woodland
The canopy cover ranges from low woodland to woodland, at times very open. Located usually in water courses. This group is widespread throughout the island. The understorey is very variable.

Group 7D: *+/-E. fasciculosa, E. cosmophylla, +/-E. leucoxylon* ssp. *leucoxylon* Low open woodland
The canopy cover ranges from low open woodland to open woodland. Located on stony Cambrian sandstone slopes and hilltops with a variable laterite clay overlay. This group occurs mainly Salong the upper reaches of the Cygnet River catchment. The understorey is complex with variable dominants usually with *Allocasuarina striata, Xanthorrhoea semiplana* ssp. *tateana, Acacia paradoxa, A. retinodes* var. *retinodes, Leptospermum myrsinoides* and *Daviesia asperula* ssp. *asperula.*

Group 7E: *E. fasciculosa, +/-E. cladocalyx, +/-E. leucoxylon* ssp. *leucoxylon* Open woodland
Usually located in water courses. This group is widespread throughout the island. The understorey consists of introduced pasture plants or occasionally regrowth shrubs.

Group 7F: *E. fasciculosa, E. cosmophylla, +/-E. lansdowneana* ssp. *albopurpurea, +/-E. diversifolia, +/-E. leucoxylon* ssp. *leucoxylon* Low open woodland
Located on the foothills of the escarpment of the Cygnet fault in clay soils. This group occurs in the eastern valley section of Bark Hut road. The

understorey is complex, at times dense, with variable *Melaleuca uncinata, M. gibbosa, Hakea rostrata, Allocasuarina striata* and *Xanthorrhoea semiplana* ssp. *tateana.*

Table 29.
The extent of the sub-groups of *Eucalyptus fasciculosa* Low open Woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus fasciculosa Low open woodland	7		1,031	< 0.5
	7A	2	180	< 0.5
	7B	11	160	< 0.5
	7C	3	70	< 0.5
	7D	13	506	< 0.5
	7E	8	105	< 0.5
	7F	2	10	< 0.5

Group 8: *Eucalyptus lansdowneana* ssp. *albopurpurea* Open mallee

Group 8A: *E. lansdowneana* ssp. *albopurpurea, E. diversifolia, +/-E. fasciculosa* Open mallee
The canopy cover ranges from open mallee, to at times a woodland. Located on neutral to acid sands overlying limestone or in transition zones between laterite and limestone provinces. This group occurs mainly along the south coast but inland from the sea. The understorey is usually complex but rarely dense, often with *Melaleuca lanceolata* when near limestone with variable *Xanthorrhoea semiplana* ssp. *tateana*, *Hakea rostrata*, *H. muelleriana*, *Allocasuarina striata* and *Banksia marginata*.

Group 8B: *E. lansdowneana* ssp. *albopurpurea, E. diversifolia, E. leptophylla, +/-E. fasciculosa, +/-E. cosmophylla, +/-E. cneorifolia* Open mallee
The canopy cover ranges from open mallee, to at times mallee. Located on alkaline clays or in a transition zone between laterite and limestone provinces. This group occurs mainly along the south coast on the extreme southern perimeter of the Seddon Plateau and also in the MacGillivray Plains. The understorey is usually complex but rarely dense, often with *Melaleuca uncinata* and variable *Grevillea ilicifolia* var. *ilicifolia, Correa reflexa, Choretrum glomeratum* var. *glomeratum, Bertya rotundifolia, B. marginata* and *Xanthorrhoea semiplana* ssp. *tateana* In areas near limestone also with *M. lanceolata.*

Group 8C: *E. lansdowneana* ssp. *albopurpurea, E. cosmophylla, +/-E. diversifolia, E. fasciculosa* Open mallee
The canopy cover ranges from open mallee, at times mallee. Located on acid clays of laterite origin. This group occurs along the foot slopes of the Cygnet fault at the eastern end of Bark Hut road. The understorey is usually complex but rarely dense, often with *Melaleuca uncinata* and variable *Allocasuarina muelleriana* ssp. *notocolpica, Xanthorrhoea semiplana* ssp. *tateana, Hakea rostrata, H. muelleriana, A. striata* and *Banksia marginata.*

Group 8D: Not used

Group 8E: *E. lansdowneana* ssp. *albopurpurea, E. diversifolia, E. cneorifolia* Open mallee
Located mainly in neutral to acid sands overlying alkaline clays. This group occurs east of Rose Cottage road and Vivonne Bay. The understorey consists predominantly of pasture grasses.

Table 30
The extent of the sub-groups of *Eucalyptus lansdowneana* ssp. *albopurpurea* Open mallee.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus lansdowneana ssp. *albopurpurea* Open mallee	8		534	< 0.5
	8A	7	128	< 0.5
	8B	18	348	< 0.5
	8C	9	31	< 0.5
	8E	8	28	< 0.5

Group 9: *Eucalyptus viminalis* ssp. *cygnetensis* Low open woodland

Group 9A: *E. viminalis ccp. cygnetensis. E. fasciculosa, +/-E. leucoxylon* ssp. *leucoxylon, E. obliqua, +/-E. cladocalyx* Woodland
The canopy cover ranges from woodland, to at times open woodland. Located on deep riverine loams in permanent water courses. This group is confined to the Rocky river at Scotch Thistle flat or in small patches along the Cygnet and Middle rivers. The understorey contains *Pteridium esculentum* and variable *Bursaria spinosa* and *Acacia paradoxa.*

Group 9B: *E. viminalis* ssp. *cygnetensis, E. diversifolia, +/-E. lansdowneana* ssp. *albopurpurea, +/-E. leucoxylon* ssp. *leucoxylon* Low open woodland
Located on alkaline sands over Tertiary limestone with fossil clay horizons. This group is confined to a low lying area near Cape Hart on the Dudley Peninsula. the understorey is highly variable depending on the clay or limestone dominance with *Banksia marginata, Acacia paradoxa, Callistemon rugulosus* var. *rugulosus*, *Allocasuarina striata* and *Xanthorrhoea semiplana* ssp. *tateana* at one extreme and *Logania ovata, Acacia paradoxa, Ozothamnus retusus,*

Melaleuca acuminata, Choretrum glomeratum var. *glomeratum, Beyeria leschenaultii* and *Pultenaea acerosa* at the other.

Group 9C: *E. viminalis* ssp. *cygnetensis, E. diversifolia, +/-E. lansdowneana* ssp. *albopurpurea* Very low open woodland
The canopy cover ranges from very low open woodland with extensive areas of, at times tall, shrubland. Located on Alkaline sands over clay. This group is confined to two swampy areas near Cape Hart on the Dudley Peninsula. The understorey is very dense in parts and dominated by both *Banksia marginata* and *Allocasuarina striata* with variable *Leptospermum myrsinoides, Acacia myrtifolia* var. *myrtifolia* and *Xanthorrhoea semiplana* ssp. *tateana.*

Table 31.
The extent of the sub-groups of *Eucalyptus viminalis* ssp. *cygnetensis* Low open woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus viminalis ssp. *cygnetensis* Low open woodland	9		157	< 0.5
	9A	1	14	< 0.5
	9B	1	120	< 0.5
	9C	2	24	< 0.5

<u>Group 10: *Eucalyptus leucoxylon* ssp. *leucoxylon* Open woodland</u>

Group 10A: *E. leucoxylon* ssp. *leucoxylon, E. fasciculosa, E. lansdowneana* ssp. *albopurpurea, E. diversifolia* Open woodland
Located on Riverine loams in usually permanent water courses. This group occurs in spasmodic locations along south and east flowing rivers from Antechamber Bay to Vivonne Bay. The understorey is variable, often with *Melaleuca lanceolata*, at times with *Acacia paradoxa* and variable *Bursaria spinosa* but also in places with dense *M. gibbosa* and *Leptospermum continentale.*

Group 10B: *E. leucoxylon* ssp. *leucoxylon, E. cosmophylla, E. fasciculosa, +/-E. viminalis* ssp. *cygnetensis, +/-E. lansdowneana* ssp. *albopurpurea* Open woodland
Located on exposed massive Cambrian sandstones with variable sandy loam deposits. This group occurs in the middle reaches of the Cygnet river east of Pioneer Bend in a steep narrow valley. The understorey consists of variable *Bursaria spinosa, Acacia retinodes* var. *retinodes, Callistemon rugulosus* var. *rugulosus, A. paradoxa, Leptospermum continentale* and *Melaleuca gibbosa.*

Group 10C: *E. leucoxylon* ssp. *leucoxylon, E. cneorifolia* Low open woodland
The canopy cover ranges from low to very low open woodland. Located on stony Cambrian sandstones surfaces. This group occurs near Antechamber Bay. The understorey is complex, at times dense, with *Melaleuca uncinata, Acacia paradoxa, Thryptomene ericaea, Hibbertia riparia, Acrotriche depressa, M. gibbosa* and scattered *Xanthorrhoea semiplana* ssp. *tateana*

Group 10D: *E. leucoxylon* ssp. *leucoxylon, E. cneorifolia, E. lansdowneana* ssp. *albopurpurea, +/-E. viminalis* ssp. *cygnetensis* Open woodland
Located on Riverine loams in areas of Cambrian sandstone. This group occurs in and near the Chapman and Willson rivers on the Dudley Peninsula. The understorey usually contains *Acacia paradoxa, Pomaderris halmaturina* ssp. *halmaturina* and *Bursaria spinosa* with variable *Melaleuca uncinata* and *Thryptomene ericaea.*

Group 10E: *E. leucoxylon* ssp. *leucoxylon, +/-E. fasciculosa* Open woodland
Located on Riverine loams or fertile valley slopes in areas of near surface, well weathered Cambrian sandstones. This group occurs in spasmodic locations along the major rivers east of Mt. Taylor road. The understorey consists of pasture grasses or odd areas of *A. paradoxa* regrowth.

Table 32
The extent of the sub-groups of *Eucalyptus leucoxylon* ssp. *leucoxylon* Open woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus leucoxylon ssp. *leucoxylon* Open woodland	10		746	< 0.5
	10A	10	135	< 0.5
	10B	5	89	< 0.5
	10C	7	205	< 0.5
	10D	4	52	< 0.5
	10E	37	264	< 0.5

<u>Group 12: *Myoporum insulare* Tall open shrubland</u>

Group 12A: *Myoporum insulare, Leucopogon parviflorus, Olearia axillaris, Acacia leiophylla* Tall open shrubland
The canopy cover ranges from tall open shrubland to tall shrubland. Located on alkaline sand dunes. This group occurs intermittently along the coastline of the agricultural areas. The understorey is either sparse or contains *Pimelea flava* ssp. *flava, Orthrosanthus*

multiflorus and at times with *Acacia longifolia* var. *sophorae.* and *Pomaderris paniculosa* ssp. *paniculosa.*

Table 33.
The extent of the sub-groups of *Myoporum insulare* Tall open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Myoporum insulare Tall open shrubland	12A	4	85	< 0.5

Group 14: *Eucalyptus ovata* Low open woodland

Group 14A: *E. ovata, +/-E. lansdowneana* ssp. *albopurpurea* Low open woodland
Located in acid to neutral sands with a variable limestone presence. This group occurs south of the Flinders Chase H.Q. at Rocky River. In part, along the road to Cape Couedic. The understorey comprises a low shrubland with scattered *Melaleuca lanceolata* and *Acacia retinodes* var. *uncifolia* over *Beyeria leschenaultii, Orthrosanthus multiflorus and Calytrix tetragona.*

Group 14B: *E. ovata, E. cladocalyx, +/-E. lansdowneana* ssp. *albopurpurea, E. fasciculosa* Woodland
The canopy cover ranges from woodland to open forest. Located on alluvial loams and sands. This group occurs immediately adjacent to, and running west from, the Flinders Chase H.Q. at Rocky River. The understorey is typically sparse and open with scattered *Melaleuca lanceolata* and *Acacia retinodes* var. *uncifolia* over *Orthrosanthus multiflorus.*

Group 14C: *E. ovata. E. obliqua, E. cosmophylla, +/-E. baxteri, +/-E. viminalis* ssp. *cygnetensis* Open woodland
Located on shallow alluvial loams. This group occurs in the headwaters of the Western River - South Branch, on Section 37, Hd. of Gosse. The understorey is variable *Acacia retinodes* var. *retinodes* over dense *Leptospermum continentale* and *Melaleuca gibbosa* with variable *Grevillea sieberiana, Xanthorrhoea semiplana* ssp. *tateana, Acacia paradoxa* and *Leptospermum lanigerum.*

Table 34.
The extent of the sub-groups of *Eucalyptus ovata* Low open woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus ovata Low open woodland	14		106	< 0.5
	14A	3	72	< 0.5
	14B	2	13	< 0.5
	14C	1	21	< 0.5

Group 15: *Banksia marginata* Open shrubland

Group 15A: *Banksia marginata, E. cosmophylla, +/-E. diversifolia* Open shrubland
Located on Cambrian sandstone unconformably overlain with a patchy mosaic of broken thin sheet limestone. This group is restricted to the peninsula west of Sandy Creek in Flinders Chase National Park. The understorey is usually a complex, at times dense association, with *Melaleuca lanceolata* and *Hakea vittata* on limestone outcrops and *Allocasuarina striata*, *H. muelleriana*, *Banksia ornata* on bedrock surfaces with *M. brevifolia* in wash lines.

Table 35.
The extent of the sub-groups of *Banksia marginata* Low open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Banksia marginata Open shrubland	15A	3	166	< 0.5

Group 16: *Beyeria leschenaultii* Low open shrubland

Group 16A: *Beyeria leschenaultii, +/-E. diversifolia, +/-E. rugosa, +/-E. lansdowneana* ssp. *albopurpurea* Low open shrubland
Located on mainly alkaline sandy swales with or without a clay component. This group occurs intermittently along the south coast. The understorey is usually complex, rarely dense, with variable *Melaleuca acuminata, Pultenaea acerosa, Spyridium phylicoides, Calytrix tetragona, Calytrix glaberrima, Microcybe pauciflora, Pomaderris obcordata* and *Grevillea pauciflora.*

Table 36.
The extent of the sub-groups of *Beyeria leschenaultii* Low open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Beyeria leschenaultii Low open shrubland	16A	14	409	< 0.5

Group 17: *Eucalyptus camaldulensis* var. *camaldulensis* Woodland

Group 17A: *E. camaldulensis* var. *camaldulensis, E. fasciculosa,* Open woodland
The canopy cover ranges from open woodland to woodland. Located on river alluvium. This group occurs in the lower Middle river. The understorey contains dense *Pteridium esculentum.*

Group 17B: *E. camaldulensis* var. *camaldulensis, E. leucoxylon* ssp. *leucoxylon, +/-E. fasciculosa, +/-E. cladocalyx, +/-E. viminalis* ssp. *cygnetensis, E. cneorifolia* Woodland
The canopy cover ranges from woodland, to at times either an open woodland or an open forest. Located on river alluvium. This group occurs in the lower reaches of the Cygnet river from just north of Bark Hut road to just west of Hog Bay road. The understorey usually consists of *Pteridium esculentum* and at times with *Acacia paradoxa.*

Table 37.
The extent of the sub-groups of *Eucalyptus camaldulensis var. camaldulensis* Woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus camaldulensis var. *camaldulensis* Woodland	17		154	< 0.5
	17A	2	6	< 0.5
	17B	11	148	< 0.5

Group 18: *Sclerostegia arbuscula* Low shrubland

Group 18A: *Sclerostegia arbuscula, +/-Suaeda australis, +/-Sarcocornia quinqueflora, +/-S. blackiana, +/-Maireana oppositifolia* Low shrubland
The canopy cover ranges from shrubland to open shrubland. Located on estuarine sands and clay pans. This group occurs in coastal river outfalls from Bay of Shoals eastward and also Vivvone Bay. Mainly around Western Cove and Pelican lagoon. The understorey is sparse.

Group 18B: *Sclerostegia arbuscula, Suaeda australis, Sarcocornia quinqueflora, S. blackiana* Low shrubland
The canopy cover ranges from Shrubland to Open shrubland. Located on estuarine sands and clay pans. This group occurs in coastal river outfalls from Bay of Shoals to Western Cove. The understorey is sparse.

Table 38.
The extent of the sub-groups of *Sc;erostegia arbuscula* Low shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Sclerostegia arbuscula Low shrubland	18		1,281	< 0.5
	18A	8	523	< 0.5
	18B	3	759	< 0.5

Group 19: *Allocasuarina verticillata* Low open forest

Group 19A: *Allocasuarina verticillata, +/-E. cladocalyx* Low open forest
Located on areas of near surface Cambrian sandstone. This group usually occurs in near coastal cliffs or the lower reaches of water courses opening to the sea. Also in more inland valleys where formerly laterite surfaces have been reduced to a thin residual only. The understorey is mainly absent with isolated *Acacia paradoxa, Prostanthera spinosa* and *Hibbertia riparia.*

Group 19B: *Allocasuarina verticillata* Low woodland
The canopy cover ranges from low woodland, at times a low open forest. Located on areas of near surface Cambrian sandstone. This group occurs along the north coast in usually near coastal slopes. The understorey is predominantly leaf litter or pasture grasses.

Group 19C: *Allocasuarina verticillata, +/-E. diversifolia, +/-E. cosmophylla* Low open woodland
Located in areas of near surface Cambrian sandstone with a variable overlay of sheet limestone. This group usually occurs in near coastal cliff tops along the west coast. The understorey is variable depending on the presence of limestone with *Acacia paradoxa* and *Prostanthera spinosa* in acid areas or species appropriate to 13B in limestone.

Group 19D: *Allocasuarina verticillata, +/-E. diversifolia, +/-E. cneorifolia* Low open woodland
Located on areas of near surface Cambrian sandstone, at times with a variable presence of limestone. This group is confined to the Dudley Peninsula, mainly along the north coast or in a creek line within Cape Hart Conservation Park. The understorey is mainly

absent with variable *Acacia paradoxa, Melaleuca uncinata, Dodonaea viscosa* ssp. *angustissima.* Near Cape Hart, also with *M. gibbosa* and *Allocasuarina striata.*

Table 39.
The extent of the sub-groups of *Allocasuarina verticillata* Low open forest.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Allocasuarina verticillata Low open forest	19		1,632	<0.5
	19A	43	940	< 0.5
	19B	31	238	< 0.5
	19C	6	151	< 0.5
	19D	19	303	< 0.5

Group 20: *Leucopogon parviflorus* Open shrubland

Group 20A: *Leucopogon parviflorus Myoporum insulare, Olearia axillaris, +/-Melaleuca lanceolata, +/-Acacia retinodes* var. *uncifolia* Open shrubland
The canopy cover ranges from open shrubland, to at times a tall shrubland or tall open shrubland. Located on unconsolidated sand dunes in near coastal situations. This group occurs intermittently along the entire coastline. The understorey is usually open, with variable *Kunzea pomifera, Pomaderris paniculosa* ssp. *paniculosa, Pimelea flava* ssp. *flava* and *Dodonaea viscosa* ssp. *angustissima.*

Group 20B: *Leucopogon parviflorus, Olearia axillaris* Open shrubland
Located on coastal limestone cliff tops with a thin alkaline sand cover. This group occurs along almost the entire southern and western coastline and in pockets along the northern. The understorey is open, usually with *Scaevola crassifolia, Pimelea flava* ssp. *flava, Pultenaea acerosa, Stipa stipoides* and *Leucophyta brownii.*

Group 20C: *Leucopogon parviflorus, E. diversifolia, E. cneorifolia, E. landsdowneana* ssp. *albopurpurea, Callitris preissii* Open shrubland
The canopy cover ranges from open shrubland, to at times a tall open shrubland with areas of low open woodland. Located on unconsolidated coastal sand dunes and areas of Quaternary stranded shoreline deposits. This group occurs from the American River inlet to Island Beach. The understorey is variably complex, at times dense, with variable *Pomaderris paniculosa* ssp. *paniculosa, Acacia leiophylla, Olearia axillaris, Myoporum insulare, Acacia longifolia* var. *sophorae, Acrotriche patula, Pultenaea flava* ssp. *flava, Dodonaea viscosa* ssp. *angustissima and Kunzea pomifera,*

Group 20D: *Leucopogon parviflorus, E. rugosa, E. cneorifolia* Open shrubland
The canopy cover ranges from open shrubland with areas or low open woodland. Located on Tertiary limestone ridges. This group occurs near the southeast corner of Pelican Lagoon. The understorey is mainly open with variable *Acacia leiophylla, Acrotriche patula, Myoporum insulare* and extensive areas of *Orthrosanthus multiflorus.*

Table 40.
The extent of the sub-groups of *Leucopogon parviflorus* Open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Leucopogon parviflorus Open shrubland	20		1,454	< 0.5
	20A	8	676	< 0.5
	20B	4	123	< 0.5
	20C	4	310	< 0.5
	20D	3	346	< 0.5

Group 21: *Melaleuca gibbosa* Shrubland

Group 21A: *Melaleuca gibbosa, +/-Allocasuarina verticillata* Shrubland
Usually located on stony Cambrian sandstone. This group is restricted to the north coast. The understorey is usually a complex and dense association, with *Acacia paradoxa* and *Prostanthera spinosa*.

Group 21B: *Melaleuca gibbosa, M. brevifolia, +/-Callistemon rugulosus* var. *rugulosus, +/- Hakea rugosa* Shrubland
The canopy cover ranges from shrubland to tall shrubland. Located on alluvial clay loams. This group occurs throughout the eastern half of the island, within clay provinces, in water courses with a usually low gradation slope. The understorey contains variable *Melaleuca uncinata, Hakea muelleriana* and *Leptospermum myrsinoides.*

Group 21C: *Melaleuca gibbosa, E. diversifolia* Low shrubland
The canopy cover ranges from Low shrubland to Low closed shrubland. Located on granite and granitic gravels. This group is restricted to the coastal cliff face and cliff tops between Cape Hart and Cape Willoughby on the Dudley Peninsula. The understorey is at times, singularly dominated by *M. gibbosa*, but nearer the sea with a complex association including association including *Hakea muelleriana, Correa reflexa, Pultenaea acerosa, Beyeria leschenaultii, Eutaxia microphylla* ssp. *microphylla, Spyridium spathulatum* and *Acacia paradoxa.*

Table 41.
The extent of the sub-groups of *Melaleuca gibbosa* Shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Melaleuca gibbosa Shrubland	21		888	< 0.5
	21A	2	66	< 0.5
	21B	36	779	< 0.5
	21C	1	43	< 0.5

Group 22: *Melaleuca brevifolia* Shrubland

Group 22A: *Melaleuca brevifolia, M. gibbosa, +/-M. halmaturorum* Shrubland
The canopy cover ranges from shrubland to tall shrubland. Located in permanent or ephemeral lakes and swamps in neutral to alkaline clays; often saline. This group is widespread in low lying areas east of Mt. Taylor road. There is little understorey present.

Table 42.
The extent of the sub-groups of *Melaleuca brevifolia* Shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Melaleuca brevifolia Shrubland	22A	21	592	< 0.5

Group 23: *Melaleuca halmaturorum* Tall open shrubland

Group 23A: *Melaleuca halmaturorum, M. brevifolia* Tall open shrubland
The canopy cover ranges from tall open to dense shrubland. Located in permanent lakes and swamps in neutral to alkaline clays. This group is restricted to the major fresh and salt water lakes on the eastern half of the island. There is very little understorey present.

Group 23B: *Melaleuca halmaturorum, +/-M. brevifolia, Sclerostegia arbuscula* Tall open shrubland
The canopy cover includes tall open shrubland with extensive areas of low shrubland. Located in estuarine or saline samphire swamps. This group is mainly restricted to the eastern half of the island. The understorey contains a range of samphires including *Suaeda australis Sarcocornia blackiana* and *S. quinqueflora*.

Group 23C: *Melaleuca halmaturorum, +/-Sclerostegia arbuscula* Low woodland
The canopy cover includes low woodland with areas of low shrubland. Located in low lying swampy areas variably subject to inundation. This group occurs near Pelican Lagoon an in Lashmars Lagoon. The understorey usually contains samphires and in some cases nothing.

Table 43.
The extent of the sub-groups of *Melaleuca haalmaturorum* Tall open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Melaleuca halmaturorum Tall open shrubland	23		958	< 0.5
	23A	36	828	< 0.5
	23B	4	60	< 0.5
	23C	7	71	< 0.5

Group 24: *Callistemon rugulosus* var. *rugulosus* Tall closed shrubland

Group 24A: *Callistemon rugulosus* var. *rugulosus, +/-Melaleuca halmaturorum, +/-Hakea rugosa* Tall closed shrubland
Located in flat, low lying areas, subject to water logging, also in creeks and swamp surrounds. This group is scattered throughout the island but usually in areas too small to map. The understorey is predominantly absent.

Table 44.
The extent of the sub-groups of *Calistemon rugulosus var. rugulosus* Tall closed shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Callistemon rugulosus var. *rugulosus* Tall closed shrubland	24A	4	302	< 0.5

Group 25: *Leptospermum continentale* Shrubland

Group 25A: *Leptospermum continentale, Acacia retinodes* var. *retinodes, E. cosmophylla, E. baxteri* Shrubland
The canopy cover ranges from shrubland, to at times tall shrubland. Located on laterite surfaces. This group occurs in hanging swamps in the upper reaches of creeks mainly restricted to the western end of the island but perhaps more widespread prior to land clearance. The understorey is usually a complex and dense association with *Gahnia sieberiana* and *Hakea rugosa* in the central swamp zone and *Melaleuca squamea, Sprengelia incarnata* and *H. rostrata* often present around the perimeter.

Group 25B: *Leptospermum continentale, Acacia retinodes* var. *retinodes, E. cosmophylla* Shrubland
The canopy cover ranges from shrubland, to variably tall or open shrubland. Located in swamps and poorly drained areas in neutral to acid loams and clays. This group occurs around lagoons or in occasionally inundated swamps over much of the island. The understorey is usually a complex and dense association with variable *Hakea muelleriana*, *Banksia marginata*, *Leptospermum myrsinoides*, *Banksia ornata* and *Allocasuarina striata* with variable *Darwinia micropetala.*

Group 25C: *Leptospermum continentale, Acacia retinodes* var. *retinodes, E. cosmophylla, E. baxteri* Shrubland
The canopy cover ranges from shrubland, to at times tall shrubland. Located on laterite surfaces. This group occurs in hanging swamps in the upper reaches of creeks that have been subject to extensive clearing. Widespread in the western agricultural plateau region. The understorey is usually a complex and dense association with variable *Gahnia sieberiana* and *Hakea rugosa* in the central swamp zone.

Group 25D: *Leptospermum continentale, Melaleuca gibbosa, +/-M. brevifolia, +/-M. uncinata* Tall shrubland
Located on alluvial soils or clays. This group occurs along fresh and saline water courses throughout the agricultural areas of the island. The understory species are often the same as the overstorey species.

Table 45.
The extent of the sub-groups of *Leptospermum continentale* Shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Leptospermum continentale Shrubland	25		1,580	< 0.5
	25A	139	1,120	< 0.5
	25B	11	128	< 0.5
	25C	35	329	< 0.5
	25D	2	3	< 0.5

<u>Group 26: *Acacia retinodes* var. *retinodes* Low open woodland</u>

Group 26A: *Acacia retinodes* var. *retinodes, +/-E. cosmophylla* Low open woodland
The canopy cover ranges from low open woodland, to often with extensive areas of closed shrubland. Located on alluvial soils on clays. This group occurs along water courses throughout the agricultural areas of the island. The understorey is typically dense, usually with *Gahnia sieberiana* and variable *Melaleuca gibbosa, M. brevifolia, M. uncinata* and *Leptospermum continentale.*

Table 46.
The extent of the sub-groups of *Acacia retinodes var retinodes* Tall very open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Acacia retinodes var. *retinodes* Low open woodland	26A	21	134	< 0.5

<u>Group 27: *Acacia retinodes* var. *retinodes* Tall very open shrubland</u>

Group 27A: *Acacia retinodes* var. *retinodes, +/-E. rugosa* Tall very open shrubland
The canopy cover ranges from tall sparse to tall open shrubland. Located on alkaline sands in partially consolidated dunes or low swales. This group occurs along the south coast. The understorey is often in association with *Leucopogon. parviflorus, Melaleuca lanceolata*, and *Adriana klotchii*.

<u>Group 28: *Eucalyptus obliqua* Very low open woodland</u>

Group 28A: *E. obliqua, E. baxteri, E. cosmophylla, +/-E. remota* Very low open woodland
The canopy cover ranges from very low open woodland to low open woodland or low woodland. Located on variably weathered Cambrian sandstone slopes and hilltops with a variable thin laterite residual. This group occurs in the deeply dissected north western coast area. The understorey is usually complex and dominated by *Allocasuarina striata* and *Xanthorrhoea semiplana* ssp. *tateana*, with *Hakea rostrata* and *Banksia marginata* and variable *A. muelleriana* ssp. *notocolpica* and *B. ornata*.

Group 28B: *E. obliqua, E. baxteri, E. cosmophylla, +/-E. remota* Very low open woodland
The canopy cover ranges from very low open woodland to low open woodland or low woodland. Located in variably weathered Cambrian sandstone slopes and hilltops with a variable thin laterite residual. This group occurs in the deeply dissected north western coast area. The understorey is usually complex and dominated by *Allocasuarina striata* and *Xanthorrhoea semiplana* ssp. *tateana,* with *Hakea rostrata, Melaleuca gibbosa, Banksia marginata, Spyridium spathulatum* and variable *A. muelleriana* ssp. *notocolpica* and *B. ornata*.

Group 28C: *E. obliqua, +/-E. baxteri, E. cosmophylla, +/-E. cladocalyx* Low woodland
The canopy cover ranges from low woodland to woodland, to at times an open forest. Located on laterite surfaces. This group occurs on slopes and hilltops also in water courses in the western half of the island. The understorey is a more open version of 3B. Often with *Xanthorrhoea semiplana* ssp. *tateana*, *Hakea rostrata* and *Banksia marginata* with variable *B. ornata* away from creeklines and *Daviesia asperula* ssp. *asperula* in them.

Table 47.
The extent of the sub-groups of *Eucalyptus obliqua* Very low open woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus obliqua Very Low open woodland	28		616	< 0.5
	28A	2	324	< 0.5
	28B	1	17	< 0.5
	28C	4	275	< 0.5

Group 29: *Olearia axillaris* Open shrubland

Group 29A: *Olearia axillaris* Open shrubland
The canopy cover ranges from open to sparse shrubland, at times also tall. Located on unconsolidated coastal foredunes. This group occurs intermittently throughout the island coast line. The understorey is usually an open association with variable *Euphorbia paralias, Myoporum insulare* and *Acacia longifolia* var. *sophorae.* and also occasionally with boxthorns. Also in more stable dunes with *Spinifex sericeus.*

Group 29B: *Olearia axillaris, Leucopogon parviflorus* Open shrubland
The canopy cover ranges from open shrubland, to at times tall shrubland. Located on usually consolidated coastal dunes. This group occurs mainly near Bay of Shoals and Emu Bay but also intermittently throughout the island coast line. The understorey usually contains *Leucopogon parviflorus, Myoporum insulare , Acacia longifolia* var. *sophorae.* and *Rhagodia candolleana* ssp. *candolleana.*

Table 48.
The extent of the sub-groups of *Olearia axillaris* Open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Olearia axillaris Open shrubland	29		83	< 0.5
	29A	6	13	< 0.5
	29B	8	70	< 0.5

Group 30: *Hakea muelleriana* Open shrubland

Group 30A: *Hakea muelleriana E. diversifolia, E. lansdowneana* ssp. *albopurpurea, E. rugosa, E. leptophylla* Open shrubland
The canopy cover ranges from open shrubland to closed shrubland. Located on fossil clay pans associated with Tertiary sheet limestone. This group occurs from Seal Bay to cape Willoughby along the south coast. The understorey is variably dense, usually with *Melaleuca gibbosa* and variable *Acacia paradoxa Beyeria leschenaultii* and *Banksia marginata.*

Group 30B: *Hakea muelleriana, +/-E. cneorifolia, +/-E. diversifolia* Open shrubland
The canopy cover ranges from open shrubland to closed shrubland. Located in an area of either previous clearance or possibly natural seepage on the edge of a Tertiary limestone province. This group occurs near Browns Beach on the Dudley Peninsula. The understorey is variably dense to complex with *Acacia paradoxa Melaleuca lanceolata, Lasiopetalum schulzenii, M. gibbosa* and variable *Spyridium halmaturinum* var. *halmaturinum, Beyeria leschenaultii* and *Banksia marginata.*

Table 49.
The extent of the sub-groups of *Hakea muelleriana* Open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Hakea muelleriana Open shrubland	30		22	< 0.5
	30A	1	5	< 0.5
	30B	2	17	< 0.5

Group 31: *Acacia paradoxa* Open shrubland

Group 31A: *Acacia paradoxa, +/-E. cladocalyx, Pteridium esculentum* Open shrubland
The canopy cover ranges from open shrubland to closed shrubland. Located on well weathered Cambrian sandstones. This group is confined to the north coast. The understorey is usually dense with

variable *Pteridium esculentum* and *Xanthorrhoea semiplana* ssp. *tateana* with both at times as dominants.

Group 31B: *Acacia paradoxa* Closed Shrubland
Located on well weathered Cambrian sandstones and also areas of sand over clays. This group is scattered throughout the areas of *E. cneorifolia* woodlands. There is usually no understorey present.

Group 31C: *Acacia paradoxa, Melaleuca uncinata, M. gibbosa* Shrubland
Located on Cambrian sandstone cliff faces. This group occurs near Cape St Albans. The understorey contains *Thryptomene ericaea.*

Table 50.
The extent of the sub-groups of *Acacia paradoxa* Open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Acacia paradoxa Open shrubland	31		471	< 0.5
	31A	15	416	< 0.5
	31B	4	33	< 0.5
	31C	3	22	< 0.5

Group 32: *Acacia dodonaeifolia* Tall open shrubland

Group 32A: *Acacia dodonaeifolia, Allocasuarina verticillata* Tall open shrubland
Located on well weathered Cambrian sandstones, at times with a limestone presence. This group is confined to the north coast from Western River eastward. The understorey is usually often only pasture grasses, at times with *Acacia paradoxa.*

Table 51.
The extent of the sub-groups of *Acacia dodonaeifolia* Tall open shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Acacia dodonaeifolia Tall open shrubland	32A	19	90	< 0.5

Group 33: *Pteridium esculentum* Fernland

Group 33A: *P. esculentum* Fernland
Located on well weathered Cambrian sandstones or in river alluvium. This group occurs mainly on the north coast hinterland or major rivers in agricultural districts. The understorey at contains times *Acacia paradoxa* or *Xanthorrhoea semiplana* ssp. *tateana* when on hillslopes.

Table 52.
The extent of the sub-groups of *Pteridium esculentum* Fernland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Pteridium esculentum Fernland	33A	5	48	<0.5

Group 34: *Callitris preissii* Low woodland

Group 34A: *C. preissii, E. diversifolia, +/-E. cneorifolia, +/-E. rugosa* Low woodland
Located on deep alkaline sands mainly in Quaternary stranded beach-line deposits. This group occurs in coastal areas on the eastern section of the island; mainly around the eastern extremity of the isthmus. The understorey is often a Moss ground cover or with scattered *Leucopogon parviflorus, Acrotriche patula* and *Rhagodia candolleana* ssp. *candolleana.* Occasionally patches of *L. parviflorus.*

Table 53.
The extent of the sub-groups of *Callitris preissii* Low woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Callitris preissii Low woodland	34A	2	10	< 0.5

Group 35: *Allocasuarina muelleriana* ssp. *notocolpica* Tall shrubland

Group 35A: *Allocasuarina muelleriana* ssp. *notocolpica, M. uncinata, E. cneorifolia, A. verticillata* Tall shrubland
The canopy cover ranges from tall shrubland, to at times tall closed shrubland. Located on stony surface Cambrian sandstone. This group occurs near Cape Willoughby. The understorey is sparse with variable *Thryptomene ericaea, Hibbertia riparia, Acacia paradoxa* and *Calytrix tetragona*.

Table 54.
The extent of the sub-groups of *Allocasuarina muelleriana ssp. notocolpica* Tall shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Allocasuarina muelleriana ssp. *notocolpica* Tall shrubland	35A	2	10	< 0.5

Group 36: *Bursaria spinosa* Low woodland

Group 36A: *Bursaria spinosa, E. cneorifolia, E. lansdowneana* ssp. *albopurpurea* Low woodland
The canopy cover ranges from low woodland to tall open shrubland. Located on areas of near surface Cambrian sandstone. This group occurs on the Dudley Peninsula in near coastal areas; mainly near Antechamber bay. The understorey is complex but not dense with variable *Acacia paradoxa, Pomaderris halmaturina* ssp. *halmaturina, P. paniculosa* ssp. *paniculosa, Exocarpos cupressiformis, Adriana klotschii and Myoporum insulare.*

Table 55.
The extent of the sub-groups of *Bursaria spinosa* Low woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Bursaria spinosa Low woodland	36A	2	11	< 0.5

Group 37: *Melaleuca acuminata* Tall shrubland

Group 37A: *Melaleuca acuminata, M. lanceolata, Hakea muelleriana, E. diversifolia* Tall shrubland
The canopy cover ranges from tall shrubland to at times closed shrubland. Located on Tertiary limestone with areas of near surface Cambrian sandstone. This group occurs on the Dudley Peninsula near the Willson River outlet. The understorey is variably complex and variably dense with *Acacia paradoxa, Leucopogon parviflorus, Melaleuca gibbosa, Lasiopetalum schulzenii, Goodenia varia* and *Orthrosanthus multiflorus.*

Table 56.
The extent of the sub-groups of *Melaleuca acuminata* Tall shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Melaleuca acuminata Tall shrubland	37A	2	23	< 0.5

Group 60: *Eucalyptus diversifolia* Open mallee

Group 60A: *Eucalyptus diversifolia, E. fasciculosa* Open mallee
The canopy cover ranges from open mallee to tall shrubland. Located on acid to neutral sands and clay loam overlying limestone. This group occurs in the south east corner of Rocky River Head Quarters, Flinders Chase National Park. The understorey usually consists of *Orthrosanthus multiflorus*, or is sparse under the *E. diversifolia* and *E. fasciculosa* . The shrubland is mainly very tall containing *Banksia marginata*, *Hakea muelleriana* and *Acacia retinodes* var. *uncifolia*

Table 57.
The extent of the sub-groups of *Eucalyptus diversifolia* Open mallee.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus diversifolia Open mallee	60A	1	102	< 0.5

Group 61: *Hakea muelleriana* Shrubland

Group 61A: *Hakea muelleriana* Shrubland
Located on a low, laterite clay basin with variable neutral to alkaline sand overlay. This group occurs on Yacca flat near Remarkable Rocks. The understorey is a highly complex association of *Hakea muelleriana, Leptospermum myrsinoides*, *Banksia marginata*, *Xanthorrhoea semiplana* ssp. *tateana*, *B. ornata*, *Adenanthos macropodiana* and *Callistemon rugulosus* var. *rugulosus.*

Table 58.
The extent of the sub-groups of *Hakea muelleriana* Shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Hakea muelleriana Shrubland	61A	2	181	< 0.5

Group 62: *Eucalyptus leucoxylon* ssp. *leucoxylon* Open woodland

Group 62A: *E. leucoxylon* ssp. *leucoxylon, E. fasciculosa, +/-E. cladocalyx, +/-E. ovata, +/-E. lansdowneana* ssp. *albopurpurea, E. cosmophylla, +/- E. diversifolia* Open woodland
The canopy cover ranges from open woodland to woodland. Located on alluvial sandy loams. This group occurs at "Grassdale" Kelly Hill National Park. The understorey is a highly variable association of *Acacia retinodes* var *retinodes, Pteridium esculentum, Banksia marginata, Hakea muelleriana, Bursaria spinosa* and *Allocasuarina striata* near the main river bed with dense *Melaleuca gibbosa, Hakea rugosa* and *Callistemon rugulosus* var. *rugulosus* or *M. uncinata* near the lagoons and swamps.

Table 59.
The extent of the sub-groups of *Eucalyptus leucoxylon ssp. leucoxylon* Open woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus leucoxylon ssp. *leucoxylon* Open woodland	62A	1	70	< 0.5

Group 63: *Eucalyptus diversifolia* Mallee

Group 63A: *E. diversifolia, , E. lansdowneana* ssp. *albopurpurea, E. rugosa* Mallee
The canopy cover ranges from a mosaic of mallee, at times low, with areas of open mallee to very open mallee. Located in part, on acid clays and also limestone with neutral sand overlay. This group occurs immediately south east of Flinders Chase main entrance. The understorey is similar to that for groups 2A, 2B and 2H.

Table 60.
The extent of the sub-groups of *Eucalyptus diversifolia* Mallee.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus diversifolia Mallee	63A	1	453	< 0.5

Group 64: *Eucalyptus viminalis* ssp. *cygnetensis* Low open woodland

Group 64A: *Eucalyptus viminalis* ssp. *cygnetensis, +/- E. oleosa, +/-E. rugosa, +/-E. diversifolia* Low open woodland
Located on low lying alluvial clays with alkaline sand overlay. This group occurs in Little Sahara just east of Vivonne Bay. The understorey consists of *Melaleuca acuminata, Microcybe pauciflora, Beyeria leschenaultii* and *Pultenaea acerosa.*

Table 61.
The extent of the sub-groups of *Eucalyptus viminalis ssp. cygnetensis* Low open woodland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Eucalyptus viminalis ssp. *cygnetensis* Low open woodland	64A	1	20	< 0.5

Group 65: *E. diversifolia* Very open mallee

Group 65A: *E. diversifolia, E. cneorifolia, M. lanceolata, Pittosporum phylliraeoides* var. *microcarpa* Very open mallee
Located on alkaline sands over alkaline clay. This group occurs in the North western Bay of Shoals with minor occurrences in Pelican Lagoon National Park The understorey consists of *Myoporum insulare, Beyeria leschenaultii* and *Leucopogon parviflorus.*

Table 62.
The extent of the sub-groups of *Eucalyptus diversifolia* Very open mallee.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
E. diversifolia Very open mallee	65A	1	2	< 0.5

Group 66: *Dodonaea viscosa* ssp. *angustissima* Closed shrubland

Group 66A: *Dodonaea viscosa* ssp. *angustissima, A. paradoxa* Closed shrubland
Located on alkaline sands over alkaline clays. This group occurs at the point where Min-oil road joins the coast going eastward. The understorey is very dense and complex *with Thryptomene ericaea, Adenanthos macropodiana Leucopogon parviflorus, Acacia pycnantha, A. calamifolia and Bertya rotundifolia.*

Table 63.
The extent of the sub-groups of *Dodonaea viscosa* ssp. *angustissima* Closed shrubland.

Primary species group	Group Code	No of Discrete Patches	Ha	% of Total Area
Dodonaea viscosa ssp. *angustissima* Closed shrubland	66A	1	3	< 0.5

COMPARISON WITH OTHER WORKS

Table 65 shows comparisons of the current mapping descriptions with those of previous mapping studies of the Island. Only those units from the current mapping that correspond with earlier descriptions are listed. Of the 37 main overstorey groups described in Table 20, eleven have common descriptions with earlier literature and corresponding vegetation maps of the island. These 11 groups in total cover 41% of the total island area or equate to 87% of the remnant vegetation of KI. The remaining 26 overstorey groups were probably not mapped by earlier studies as they represent plant communities of small aerial extent not possible to map at a broad island wide scale.

Bauer (1959), and Specht (1972), contain broad vegetation maps of Kangaroo Island, Baldwin & Crocker (1941), have mapped the central 6 hundreds of the island, and Northcote and Tucker (1948), contains a vegetation map for the hundreds of Seddon and MacGillivray and also provides vegetation association descriptions for the island summarised from earlier studies.

Table 64.
Comparison of the 1995 Kangaroo Island Mapping Descriptions with earlier studies.

Ball (1998)	Baldwin & Crocker (1941)	Northcote & Tucker (1948)	Bauer (1959)	K.I. Specht (1972)
Allocasuarina verticillata Low open forest			*Casuarina stricta* Open to closed scrub	
E. cladocalyx Woodland	*E. cladocalyx* Savannah woodland	*E. cladocalyx* Savannah woodland	*E. cladocalyx* Savannah woodland	*E. cladocalyx* Woodland to Open forest
E. *leucoxylon* ssp. *leucoxylon* Open woodland		*E. leucoxylon* - *E. cladocalyx* Savannah woodland or *E. leucoxylon* Savannah woodland		
E. fasciculosa Open woodland		*E. fasciculosa* Savannah woodland		
E. remota Open mallee	*E. remota* Sclerophyllous scrub		*E. remota* Sclerophyllous mallee scrub	
E. diversifolia Open mallee	*E. diversifolia - E cosmophylla* Sclerophyllous scrub or *E diversifolia - E. rugosa* Sclerophyllous mallee scrub	*E. diversifolia* - E cosmophylla Low sclerophyllous scrub or E. diversifolia - E. rugosa Sclerophyllous mallee scrub	*E. diversifolia E. rugosa* Sclerophyllous mallee scrub	*E. diversifolia* Open scrub
E. baxteri Low woodland	*E. baxteri - E. cosmophylla* Sclerophyllous scrub or *E. baxteri - E. diversifolia* Sclerophyllous scrub	*E. baxteri - E. cosmophylla* Sclerophyllous scrub or *E. baxteri - E. diversifolia* - E. cosmophylla Sclerophyllous scrub or *E. baxteri* Low sclerophyllous scrub	*E. baxteri E. diversifolia E. cosmophylla* Sclerophyllous scrub	*E. baxteri, E fasciculosa, E. cosmophylla, E. remota, E. diversifolia* Open scrub
E. rugosa Open mallee	*E. rugosa* Sclerophyllous mallee scrub	*E. rugosa* Sclerophyllous mallee scrub	*E. rugosa* Sclerophyllous mallee scrub	
E. cneorifolia Open mallee	*E. cneorifolia - E. rugosa* Mallee scrub or *E. cneorifolia - Melaleuca uncinata* Sclerophyllous scrub		*E. cneorifolia Melaleuca uncinata* Mallee scrub or *E. cneorifolia* E. rugosa Mallee scrub	*E. cneorifolia, Melaleuca uncinata* Open scrub
E. obliqua Low woodland	*E. obliqua* Dry sclerophyll forest	*E. obliqua - E. baxteri - E. cosmophylla* Dry sclerophyll forest	*E. baxteri E obliqua E cosmophylla* Dry sclerophyllous forest	*E. obliqua, E. baxteri, E fasciculosa* Low open forest to Woodland
E. cosmophylla Very open mallee	*E. cosmophylla - Melaleuca uncinata* Sclerophyllous scrub	*E. cosmophylla - Melaleuca uncinata - M. gibbosa* Low sclerophyll scrub	*E. cosmophylla* Sclerophyllous forest or scrub or *E. cosmophylla Melaleuca uncinata* Sclerophyllous scrub	

MAMMALS

by A C Robinson[1] and C M Kemper[2]

INTRODUCTION

Kangaroo Island was named by Matthew Flinders in 1802 after he noted on landing that "a number of dark-brown kanguroos (sic) were seen feeding upon a grass flat by the side of the wood and our landing gave them no disturbance". This abundance of easily approached mammals has attracted biologists to the island over many years. Since Flinders' time there have been significant changes in the mammal fauna of Kangaroo Island. Clearance of the natural vegetation and establishment of introduced grass and legume pasture has clearly increased the potential habitat of grazing species such as the Western Grey Kangaroo, Tammar Wallaby and Common Brushtail Possum. On the other hand, some species such as the Brush-tailed Phascogale and one of the quolls have become extinct. Successful introductions of the Koala, Platypus, Black Rat and Feral Cat have caused other ecological changes, some of which are discussed later in the chapter.

In addition to the terrestrial mammal fauna, marine species for which Kangaroo Island is of great importance include the Australian Sea-lion and the New Zealand Fur-seal while the waters surrounding the island are home to many species of whales and dolphins and strandings of these species have added much to our knowledge of these elusive creatures.

APPRAISAL OF SPECIES' RECORDS PRIOR TO THE SURVEY

At the time of European settlement there appear to have been 12 species of terrestrial mammals (not including bats) on Kangaroo Island. In addition, Finlayson (1938) described a potoroo from an undated cave deposit at Kelly Hill on Kangaroo Island and this species was also collected by Cooper and Condon (1947) from an undated Aboriginal campsite in sand dunes on the island and in sub-fossil material from Kelly Hill Caves. This animal, originally described as *Potorous morgani* is now considered to be synonymous with *P. platyops* (Ride, 1970; Calaby and Richardson 1988). Since *P. platyops* is known only as a living animal from the south-west of Western Australia at the time of European settlement and no sightings were recorded of animals that fit its description, it is likely that it was already extinct on Kangaroo Island at that time.

Records of quolls (*Dasyurus* spp.) from Kangaroo Island are based on collections of bone material from cave deposits which includes both the Eastern Quoll (*D.viverrinus* and the Tiger Quoll (*D. maculatus*). That quolls were extant on the island at the time of European settlement is shown by Wood-Jones (1925) who stated that "On Kangaroo Island it appears to have been always more or less of a rarity; but from the accounts of old wallaby trappers there seems to be no doubt as to its existence on the island". Wood-Jones (1923) thought that this animal was the Eastern Quoll (*Dasyurus viverrinus*). Since no whole specimens were collected, we do not know which species was on the island at the time of colonisation.

The record of the Brush-tailed Phascogale (*Phascogale tapoatafa*) is based on an 1839 newspaper account, but no specimens were ever collected from the island and it is now believed to be extinct.

The other 10 species of terrestrial mammals recorded for Kangaroo Island are backed by museum specimens. The distribution of these collections (and bats) prior to this survey are shown in Fig. 100.

The bat fauna of Kangaroo Island has been summarised by Reardon and Flavel (1987). There are two records of vagrant Little Red Flying-foxes (*Pteropus scapulatus*) (1936 and 1946), while there is a single record of the White-striped Mastiff Bat (*Tadarida australis*).

Many intentional introductions of mammals to Kangaroo Island between 1923 and 1946 (see Table 4) have complicated our understanding of the original mammal fauna. This is particularly the case in relation to the Common Ringtail (*Pseudocheirus peregrinus*). In 1926 15 Common Ringtails were introduced to Flinders Chase National Park. The species is still

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present on the island although probably in low numbers. It was only recorded at only a single site on the north coast (CA00401) during the present survey. There is no evidence of a natural population of ringtails at the time of European settlement

The failure of the Burrowing Bettong (*Bettongia lesueur*) to become established is rather ironic as it is the only native mammal species introduced to Kangaroo Island for conservation reasons that is now considered seriously endangered elsewhere in Australia.

CURRENT MAMMAL FAUNA

Twenty-five species of non-marine mammals (including bats but not the vagrant *Pteropus scapulatus*) are now known to occur on Kangaroo Island (Appendix VII). Eight of these are introduced. There were 377 specimen records of non-marine mammals in the South Australian Museum prior to this survey and this has now increased to 687 records. The current (mid 1998) distribution of these records is shown in Fig 100

Marine mammals include 17 species of whales and dolphins, three species of eared seals (Otariidae) and records of vagrants of three species of ‘true’ sea;l (Phocidae).

No new species of mammals were added during the present survey but it did produce a dramatic increase in our understanding of the distribution of these species throughout the island.

RELATIVE ABUNDANCE OF MAMMAL SPECIES

The relative abundance of all mammal species observed during quadrat sampling on the survey is shown in Table 65

Table 65.
Relative abundance of the 1207 mammals observed in quadrats on the Kangaroo Island vertebrate survey in 1990. Introduced species are marked with an asterisk.

Species	Number	%
Rattus fuscipes	341	33.2
Trichosurus vulpecula	228	22.2
**Mus domesticus*	179	14.8
Macropus fuliginosus	158	13.1
Tachyglossus aculeatus	86	7.1
Cercartetus concinnus	76	6.3
Species	Number	%
Macropus eugenii	74	6.1
**Phascolarctos cinereus*	9	0.7
**Felis catus*	8	0.7
**Capra hircus*	7	0.6
Vespadelus regulus	6	0.5
Isoodon obesulus	5	0.4
Nyctophilus geoffroyi	4	0.3
**Sus scrofa*	4	0.3
**Ovis aries*	2	0.2
Cercartetus lepidus	1	0.1
Pseudocheirus peregrinus	1	0.1
Rattus lutreolus	1	0.1
Sminthopsis aitkeni	1	0.1

In areas of native vegetation sampled during this survey, the Bush Rat, Common Brushtail Possum, introduced House Mouse and Western Grey Kangaroo were by far the most widespread and abundant species recorded. Rather surprisingly, the Echidna and Western Pygmy Possum were as abundant as the Tammar Wallaby. The surveys trapping highlighted the relative rarity of all the other species of small ground mammals on the island: only five records of the Southern Brown Bandicoot and single records of the Little Pygmy Possum, Swamp Rat and Kangaroo Island Dunnart. These species are discussed in more detail later in this chapter. It is not possible to comment on the abundance of bats as systematic sampling was not carried out.

Figure 100.
Distribution of mammal specimens (South Australian Museum) collected on Kangaroo Island to mid-1997.

SPECIES PATTERNS

To identify patterns of species relative to quadrat and vegetation type, presence/absence data for 13 mammal species recorded from both the 1990 biological survey and the 1995 Kangaroo Island Dunnart survey were used. The data set included a number of quadrats having only a single mammal species. The analysis was performed on 115 quadrats from the main survey and 27 Kangaroo Island Dunnart survey sites. The two way table (Table 66) shows limited patterning. The groups were essentially divided on the basis of only five species The PATN analysis revealed that group 3 is essentially a sub-group of group 2 whereas the large group 1 is significantly different. Group 1 contains the only record of *Sminthopsis aitkeni*, Group 2 contains the single *Pseudocheirus peregrinus* and the small number of records of *Phascolarctos cinereus* while group 3 contains single records of *Cercartetus lepidus* and *Rattus lutreolus.* As expected from an island mammal fauna, community distinctions and habitat preferences are not as clear as in similar habitats on the mainland. Much more sampling will be required to specify the precise habitat preferences of the uncommon species that dominated this PATN analysis.

Table 66.
Two-way table of mammal species analysis showing groups of quadrats by species.

```
                                                      Group 1                                      |          Group 2              |      Group 3

                          BDPMMYYMMMRRRHSMMMRYYYCCWMKRSLCCWRWSCPWWDDCKNPSCCFCENSDDLPSCEPSFWPEEKSCWMRRYYGRYY|BCCCHKKRBSWGLVCCCCPRCPPPSCEGHCCRKK|CCCDWCMRLCLPSWSFWWRRGRLMNSS
                          EEALLEELLLRRRRTLLLREEEADBRHRRABHBCBTGLIIUUCHBLBCCBABBEUUILTDRATBBLBRHCGBLRREELREE|EACORHHRHLBFIBHHHHHCOHLLCGRLRRTRHH|DDGERHRCLTLLRBCBBBRRLRATBBE
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                          111111111111111111111111111111111111112111111112111111111111111111111111111111111|1111131112111111111111111111111111|111111111111111111111111111
                                                                                                           |                                  |
Cercartetus concinnus            ******                           **       *****************    ***********|                   *          ****|               ************
Sminthopsis aitkeni                                                        *                               |                                  |
Mus domesticus            ************************************************ **   **** ******************    |        **** *           *        |
Isoodon obesulus                                                              *                            |                *                 |
Macropus eugenii                                ****          *****************   ***                      |*********** *************     ****|
Trichosurus vulpecula                           ********                    ********************           | *************  ************* ** *|*********           *******
Macropus fuliginosus                            *** *** ************            ***                        |       ******************     *** |     *  *     ***   **
Tachyglossus aculeatus                                       * *  **            *****      *           *   |        ****  **************  *   |     ***       *
Phascolarctos cinereus                                                                                     |       *                     *****|
Pseudocheirus peregrinus                                                                                   | *                                |
Cercartetus lepidus                                                                                        |                                  |              *
Rattus fuscipes           *************         ***********   **   *     ***     *       ***               |      **      * ****              |***************************
Rattus lutreolus                                                                                           |                                  |        *
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SPECIES OF PARTICULAR INTEREST

Platypus *(Ornithorhynchus anatinus)*

In the 1920s the Flora and Fauna Board were concerned that the Platypus was in serious decline on the Australian mainland and decided to introduce it to the sanctuary of Flinders Chase. A total of 15 animals from Healesville, Victoria were introduced in 1928, 1941 and 1946. On each date animals were released into the permanent pools of the Rocky River near the park headquarters and in the 1941 introduction, they were also released into Breakneck River and Ravine des Casoars. Today they seem to be well established throughout suitable habitat in the Rocky River with smaller populations in the Breakneck and South West Rivers. The Breakneck and Rocky Rivers are now the only streams remaining in South Australia which have the whole of their catchment areas contained within relatively undisturbed natural vegetation and the aquatic ecosystems that they support are of great importance. Unfortunately we know nothing of the influence of the Platypus populations on the freshwater invertebrate fauna on which they feed. In addition, the large freshwater crayfish, the Marron (*Cherax tenuimanus*), native to the south-west of Western Australia has now been introduced to all of the streams on Kangaroo Island, further disrupting these ecosystems. A preliminary study comparing the aquatic ecosystem of the Rocky River (with 50 years of occupation by Platypus with those of the South West River (thought to have been only recently colonised naturally by Platypus) indicated that there are significant differences between the two. Most of these were more likely to be due to clearance of vegetation in the upper reaches of the South West River than to the effects of Platypus populations or lack of them (John, Johnson and Taylor, 1990). Detailed studies of the Kangaroo Island Platypus populations have now begun and preliminary results are reported in Serena and Williams (1997).

The best information on platypus biology, distribution and management is found in Grant (1984), Grant and Denny (1991). This reports work done in their main area of distribution in eastern Australia. The latest information on the distribution and management of the platypus throughout Australia can be found in Grant and Denny (1991). On Kangaroo Island the normally solitary Platypus probably mates (in the water) in September and the female then lays two eggs in a special chamber at the end of her burrow. She incubates the eggs by holding them against her belly with her tail and the eggs hatch within 1-2 weeks. She then feeds them for 4-5 months on milk which is secreted from numerous ducts on her abdomen. During this long period the young remain in the burrow while their mother goes out to forage. The weaned young Platypus enter the Rocky River to learn to forage for themselves in mid-summer and as the flow rate declines and the pools get smaller these young animals are displaced, presumably by resident adults, and are occasionally found in March or April wandering well away from water. Between 1988 and 1990 six of these young animals, four females and two males were captured and transferred to a stream and dam developed as a Platypus habitat in Warrawong Sanctuary in the Adelaide Hills. In 1990 and then in 1991 amid much publicity a young male platypus was produced at Warrawong, the first to have been bred "in captivity" since David Fleay bred one at Healesville Sanctuary, Victoria in 1943. In 1999 two young were produced at Healesville (Holland and Fisk 1999).

At present the Rocky River Platypus population even though introduced and outside its natural range at the time of European settlement, is the only wild population known in South Australia. Platypus occasionally been reported in the River Murray, upstream from Renmark, but the status of this population is not known. There are also recent unconfirmed records from the lower Murray. It may be possible in the future to re-establish wild platypus populations in their former haunts in mainland rivers such as the Torrens and the Onkaparinga. If these derive, even in part, from Kangaroo Island animals, then the good intentions of the original Flora and Fauna Board introduction will have finally been realised.

Short-beaked Echidna (*Tachyglossus aculeatus*)

The echidna population on Kangaroo Island is considered to belong to a distinctive sub-species *Tachyglossus aculeatus multiaculeatus*. It was described by Rothschild in 1905 from a specimen in the British Museum which was said to have been collected form the "extreme south of South Australia". Griffiths (1968a) believes that this type specimen came from Kangaroo Island since it fits the description of echidnas there (more numerous, longer, thinner and paler spines then those on the Australian mainland). Although echidnas are one of the most widespread of Australia's native mammals, the Kangaroo Island population appears to be particularly abundant and comparatively easy to observe. Many of the important ecological and physiological studies on echidnas have been done on Kangaroo Island. The first radio-tracking study of echidnas was carried out on the echidnas around the Rocky River research station in Flinders Chase National Park (Augee, Ealey and Price, 1975) and work on this population has continued intermittently since then. The definitive published study of echidnas is that of Griffiths (1968a), who gathered much of his data on annual visits to Kangaroo Island over many years. More recently (Rismiller 1991: Rismiller and Seymour ,1991) radio-tagged echidnas have been followed over very long periods using volunteers from the Earthwatch program and have finally uncovered some of the real secrets of their rather bizarre life history (Rismiller 1999).

During the breeding period from mid-May to early September male echidnas actively search out females over unknown distances and form "trains" of between two and seven animals, following each other in a line. After a female with a radio transmitter attached had been part of a train for 14 days she was finally observed relaxed with her body flat against the ground. One male lay directly next to her while the others nudged her with their snouts. The males kept moving round the passive female digging dirt out from around her until they formed a circular trench which Rismiller and Seymour (1991) described as a "mating rut". Eventually the largest male pushed his competing males out of the mating rut trench and, with the female to himself and after digging more dirt out from under her tail, succeeded in placing his cloaca against hers. Mating then took place which lasted for about an hour. Female echidnas lay a single egg which is carried in a pouch developed only during the breeding season. No one has ever observed how the egg gets into the pouch. After about 10 days' incubation the egg hatches. The tiny pouch young feeds on milk which it licks from a special milk patch in the pouch. It grows at a rapid rate increasing in weight by as much as 400 grams in 60 days. As the pouch young begins to develop spines (Fig. 101) the mother leaves it in a specially constructed breeding burrow and returns at intervals to feed it. The fact that it is only now in the 1990s that these basic observations on the life of the echidna are being made shows just how much we still have to learn about this fascinating animal.

Figure 101.
A young echidna found in a breeding burrow on Cape Hart Conservation Park. Photo P. Canty

Kangaroo Island Dunnart (*Sminthopsis aitkeni*) (Fig. 103)

In April and again in June 1969, a dog owned by Mr Percy Tiggerman caught two male dunnarts which were escaping from the bases of recently felled Yaccas in mallee heath on the north-central portion of Kangaroo Island. These two animals were placed in the South Australian Museum where Aitken (1972) described them as *Sminthopsis murina* and noted that they represented a new record for Kangaroo Island. At that time the species known as *S. murina* had an extremely wide geographic distribution from Western Australia, across the southern part of the continent and then north to north-eastern Queensland. Studies of this species have since divided it into several species, including *S. aitkeni* (Baverstock, Adams and Archer, 1984, Kitchener, Stoddart and Henry 1984)

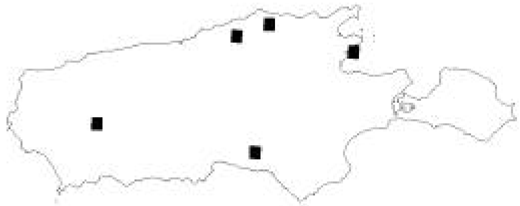

Figure 102.
Distribution of the Kangaroo Island Dunnart based on South Australian Museum records.

Since its original discovery in 1969, *S. aitkeni* has proved to be rather elusive. There have been a number of attempts to discover additional populations and try to learn something more of its distribution and habitat preferences. To date only eight specimens are known from five locations. There are also several locations where animals have been observed but not collected for positive identification. The total known distribution is shown in Fig. 102. On the present survey, only a single specimen of *S. aitkeni* was captured even though the trapping was extensive (over 3000 pitfall trap nights and over 8000 Elliott trap nights (Table 9). A targeted survey in 1995 (Herbert 1996) put in 3348 Elliott trap nights and 1013 pitfall nights and captured no *S. aitkeni*. Since the 1990 survey, a further two individuals have been captured in permanent traplines in Flinders Chase National Park. It appears that *S. aitkeni*, Kangaroo Island's only endemic mammal species, is either extremely difficult to catch or is genuinely rare.

Figure 103.
The single Kangaroo Island Dunnart captured on the present survey on the eastern boundary of Flinders Chase National Park. **Photo A. Robinson**

Southern Brown Bandicoot (*Isoodon obesulus*) (Fig. 105)

The Southern Brown Bandicoot is considered to be a South Australian species that is vulnerable to extinction. There are two sub-species, a small insular form *Isoodon obesulus nauticus* which is now found only on St Francis and the Franklin Islands and the larger mainland form *I. o. obesulus* which has three geographically distinct populations (Mount Lofty Ranges, the South East and Kangaroo Island) (Kemper 1990). Paull (1990) has examined distribution and status in the three areas. In both the South East and the Mt Lofty Ranges it now has a very fragmented distribution confined to sites which receive high rainfall and support dense vegetation in the understorey. In both areas there appears to have been a reduction in both distribution and population numbers. The major influence in this decline was the clearance of natural vegetation for agriculture and the fragmentation of the remaining vegetation patches. This now prevents movement between the remaining populations and makes them very vulnerable to the effects of severe wildfires and predation by introduced predators, particularly the fox. On the mainland *I. obesulus* has disappeared completely from drier and more open habitats and it is only on Kangaroo Island where, presumably due to the absence of fox predation, it can still be found in this type of habitat.

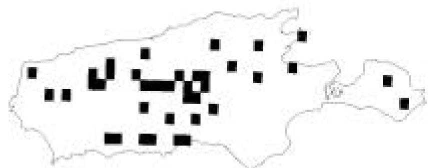

Figure 104.
Distribution of Southern Brown Bandicoots based on South Australian Museum records.

Trapping bandicoots on Kangaroo Island is difficult because of the abundant and easily-caught Common Brushtail Possum and Bush Rat get to traps before the bandicoots. Hart (1987) found this while trying to study *I. obesulus* in Pelican Lagoon Conservation Park. At 66 sites specifically selected as being potentially suitable bandicoot habitat (2339 trap nights) Paull (1990) captured only six bandicoots at four sites. On the present survey, where the 120 sites were selected to broadly represent the full range of vegetation variation over the island, 9194 trap nights resulted in the capture of only five bandicoots. In addition, a roadkill specimen of *I. obesulus* was collected on the Playford Highway. The total known distribution of *I. obesulus* on Kangaroo Island is shown in Figure 104. The absence of foxes on Kangaroo, St Francis and the Franklin islands may be very important for maintaining viable populations of Southern Brown Bandicoot in South Australia into the future. Management and retention of the natural vegetation that remains on Kangaroo Island with the appropriate understorey and invertebrate faunas is equally important. There may also be a need to re-establish some of the lost links between the now isolated blocks of native vegetation.

Figure 105.
A Southern Brown Bandicoot captured in Cape Hart Conservation Park during the survey. Photo P. Canty

Koala (***Phascolarctos cinereus***) (Fig. 106)

Of all the well-intentioned introductions to Kangaroo Island by the Fauna and Flora Board, that of the Koala has arguably had the most severe adverse impact on the island's natural ecosystems. In 1923 a group of six koalas from Victoria was released into a wire netting enclosure near Rocky River homestead on Flinders Chase and in 1925 an additional six males and six females were released in the same area (Gosse, 1939). These animals eventually escaped from the inadequate enclosure and in 1948 the ranger reported that "koalas were present in hundreds and evidence of them is seen everywhere". Little was recorded on the expansion of this population until the major fire of 1958, which burnt virtually the whole of Flinders Chase National Park as it existed at that time. In 1955, 1956 and then after the 1958 fire at least 20 Koalas were translocated from Flinders Chase to the Cygnet River valley, the only other major area of their favoured food tree the Rough-barked Manna Gum *Eucalyptus viminalis* ssp. *cygnetensis*. In 1965 an Honours thesis on the Koalas of Flinders Chase showed that trouble was looming (Philpott 1965). At the old apiary area, Philpott reported that 45 Koalas were living in this area and, of the 771 manna gums, 65% had severe or extreme defoliation due to Koala browsing. Further upstream on the Rocky River he showed that 43% of 503 manna gums sampled were defoliated.

These same Koala populations were studied in more detail between 1966 and 1967 by Eberhard (1972, 1978). He also found that the distribution of Koalas was centred on manna gums. Koalas bred in summer and early autumn and a high population of females successfully raised their single young to independence. Many animals lived within home ranges and independent young were faithful to their mothers home range until their second or third years. They then became part of the nomadic section of the population moving widely and, because they had to disperse away from territorial adults in the manna gum areas they presumably had greatly reduced chances of survival at this stage in their lives.

In 1970, all the manna gums on the river flats round the old apiary site were burnt in a wildfire and, presumably because they were severely defoliated, they died. Where there had been nearly 800 mature manna gums none remained. Needless to say, very few Koalas use this formerly prime habitat today. Koalas have now spread, with and without assistance, to all areas of suitable habitat along the river valleys of Kangaroo Island. They pose a severe problem to the long-term maintenance of these important Kangaroo Island ecosystems and some possible management solutions were discussed in Robinson, Spark and Halstead (1989). An assessment of Koala numbers and tree condition in 1994 indicated that the total population on the island was around 5000 and again confirmed that over-browsing of trees was leading to tree damage and death. It was recognised that if the Koala population was not managed to limit numbers, over-browsing would not only continue to kill trees and cause degradation of the riparian habitats but could also result in food shortage for the koala population leading to starvation for many animals.

Figure 106.
A Koala in the upper branches of a large Manna Gum near Rocky River. **Photo A. Robinson**

A Koala Management Task Force was established in early 1996 to provide recommendations on management strategies. The Task Force recommended that Koala numbers should be reduced through a culling program, that a limited number be translocated to the South East of South Australia, that a fertility control program be established and a habitat protection and restoration program be developed. The South Australian Government rejected the option of culling, in response to National and International concerns, and a management program was developed focussing on fertility control, translocation and habitat protection and restoration.

The management program began in early 1997 and during the next 18 months over 2 500 koalas were sterilised and 850 were re-located to the lower South East. By late 1998 there were signs of success as in some areas the birth-rate was down and some trees in heavily browsed areas showed signs of recovery.

Koala numbers, however, have increased in other areas of the island not subject to the intensive fertility control program. Tree health has continued to decline at these sites. There is also concern that the Brown Stringybark (*Eucalyptus baxteri*) also appears to be declining in condition due to a combination of factors including koala and possum browsing and insect attack.

The management program will be continued for some time in order to ensure that the Koala population is reduced through natural mortality until a sustainable level can be achieved.

Little Pygmy-possum (***Cercartetus lepidus***)

In November 1964 Mrs I S Davis captured a juvenile male pygmy possum escaping from scrub being burnt on `Brookland Park' at the western end of Kangaroo Island. The animal was kept in captivity until it died in December 1965 and was subsequently lodged in the South Australian Museum where it was identified as the first living record of the Little Pygmy Possum (*Cercartetus lepidus*) outside Tasmania (Aitken, 1967). At that time *C. lepidus* was known from the Australian mainland from only fossil and sub-fossil cave deposits from Wombeyan Caves, New South Wales and Buchan, Victoria. Some Australian mammalogists regarded *C. lepidus* as an example of an animal that had become extinct on the Australian mainland as the climate became drier and changed much of the wet sclerophyll forest of eastern Australia to dry sclerophyll forest. Aitken (1967) disputed this interpretation, pointing out that the mallee heath collection site for *C. lepidus* on Kangaroo Island was one of the "driest sclerophyll communities found in South Australia". It was even suggested that the animal had accidentally been transported from Tasmania at some stage. Intensive searches on Kangaroo Island brought to light two additional specimens together with another held in the Western Australian Museum collected sometime before 1961 from Flinders Chase National Park (Aitken 1974).

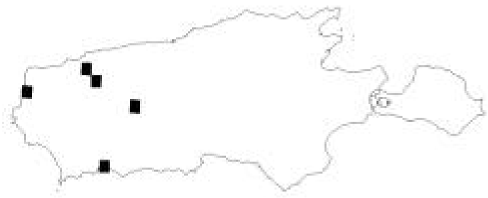

Figure 107.
Distribution of the Little Pygmy-possum based on South australian Museum records.

Since that time *C. lepidus* has been found in mallee-heath communities of north-western Victoria and south-eastern South Australia. Little is known of the ecological separation between *C. lepidus* and the much more abundant Western Pygmy-possum (*C. concinnus)* (Frontispiece, Fig. 113) and the two species are often captured in the same trapline. Some indication of the relative abundance is shown on the present survey where over 3 000 pitfall trap nights resulted in the capture of 76 *C. concinnus* and one *C. lepidus* (Table 65). The distribution of the two species on Kangaroo Island is shown in Figs. 107.108.

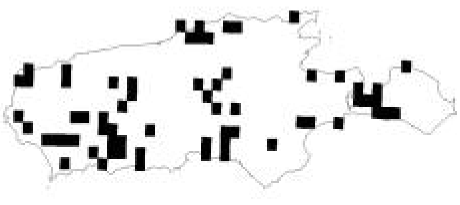

Figure 108.
Distribution of the Western Pigmy-possum based on South Australian Museum records.

Tammar Wallaby (***Macropus eugenii decres***)

In 1963 a study began of the Tammar Wallabies living around the Rocky River area of Flinders Chase National Park (Andrewartha and Barker, 1969). This resulted in the gradual build up of a pool of individually-marked animals and as data accumulated, methods were worked out for age determination of pouch young and juvenile wallabies (Murphy and Smith, 1970). Also examined in wild animals was the interesting reproductive cycle of this species. After giving birth in January and early February the females all mate again and the fertilized egg resulting from this mating develops into a sphere of cells called a blastocyst which then lies dormant in the uterus. If the pouch young is lost, the dormant blastocyst implants on the uterus wall and the embryo resumes development and is born 26-27 days later. The blastocyst does not begin to develop if the pouch young is lost between June and December. A normally developing pouch young will remain in the pouch for 8-9 months and emerge around October. A few days after the longest day of the year the dormant blastocyst implants, begins normal development and is born a month later.

Radio-tracking studies around the Rocky River park headquarters (Inns, 1980) revealed that each wallaby has a well-defined home range which overlaps with the home ranges of several other wallabies. They spend the day lying up under thick bushes at the core of their home ranges emerging at dusk and travelling up to 1.2 km to their night-time feeding areas.

In late 1982 study of this Tammar Wallaby population began again and hundreds of individual wallabies were captured and marked both at Rocky River and in a comparative population around '*Grassdale'* within Kelly Hill Conservation Park. Some marked animals from the earlier studies which were recaptured showing that individuals can live for at least 10 years and that they probably occupy the same home range for their adult life.

There has been a large number of studies of the reproductive physiology of these fascinating wallabies and much of this work has been done on captive colonies derived from Kangaroo Island stock (see also Hind *et al*. 1989) Although the details of these studies are well beyond the scope of this report there is no doubt that we now know more about reproductive control mechanisms in the Tammar Wallaby than any other marsupial and that these studies have contributed significantly to our understanding of marsupial reproduction.

Because Tammar Wallabies are so abundant on Kangaroo Island that local residents tend to take them for granted and the farming community regards them as significant agricultural pests. Staff of National Parks and Wildlife South Australia on Kangaroo Island issue pest destruction permits annually. At the time of European settlement Tammars were found on the mainland between the eastern slopes of the Mt Lofty Ranges and the western side of Eyre Peninsula and in the south-west of Western Australia (Poole, Wood and Simms, 1991). They were regarded as abundant but they are now believed to be extinct on the South Australian mainland, four of its islands and are reduced to a few small threatened populations in the south-west of Western Australia. The most recent South Australian island extinction was Flinders Island sometime between 1968 and 1974. A combination of clearance for agriculture, fire and a population of feral cats was implicated in their extinction. In the last decade, extensive fox-baiting in the jarrah forests of SW Western Australia has seen a significant recovery of numbers there. Populations are also still found on five Western Australian islands. Kangaroo Island Tammar Wallabies now probably represent the largest remaining natural population of this species. They also represent a distinctive subspecies, and, given the presence of feral cats on the island, they are not necessarily as secure in the long-term as their present abundance suggests.

Kangaroo Island Kangaroo (***Macropus fuliginosus fuliginosus***)

The type specimen of the Western Grey Kangaroo *Macropus fuliginosus* was collected in January 1803, from just west of the present town of Penneshaw by the crew of Nicholas Baudin's vessel *Geographe*. In addition to eating his share of the animals collected, Baudin reported that he kept at least 19 kangaroos alive in an attempt to return them to France. When the confused taxonomy of Australia's grey kangaroos was sorted out by Kirsch and Poole (1972), it was recognised that the correct designation of the Kangaroo Island subspecies was *Macropus fuliginosus fuliginosus* while that of the adjacent South Australian mainland was *M. f. melanops*.

Although these distinctive kangaroos have been known for so long, their only interest in the early days of settlement of Kangaroo Island was as a source of food and skins for the Adelaide skin trade. The only scientific studies undertaken to date are those of Poole (1976). By examining animals collected from the wild from Kangaroo Island and through detailed observations on a captive colony, he found that although young are born throughout the year there is a pronounced peak in the summer months. In keeping with other species of grey kangaroos, but unlike the Tammar Wallaby, the Kangaroo Island Kangaroo does not come into oestrus after giving birth and therefore does not mate and produce an un-implanted blastocyst. It carries the young in the pouch for just over 300 days and oestrus only occurs again toward the end of pouch life, at between 213 and 272 days. The young males and females become sexually mature from the age of 20 months and continue this cycle of virtually continuous breeding.

The tameness of the Kangaroo Island Kangaroo has become an important part of the experience of visitors to the Island. The animals around the Flinders Chase National Park headquarters at Rocky River and other tourist accommodations are a major attraction. Stopp (1987) carried out a preliminary study to try and determine if this virtually sedentary population around the Rocky River tourist area differed in their behaviour and their parasite load from kangaroos living a more natural existence away from the park visitors. She found that the tourist animals were certainly significantly more approachable, less mobile and living at a higher population density than their wild cousins and that they supported higher loads of both external and internal parasites. It is therefore important that tourist interaction with these animals continues to be properly managed.

In the 1920s Wood Jones (1925) wrote of the Kangaroo Island Kangaroo "It is an animal that South Australians should be proud of and do all in their power to protect and keep in perpetuity on its island sanctuary". This sentiment was reinforced by Poole (1976) who pointed out that "A continuing conservation programme with retention of sufficient suitable habitat is essential to ensure the survival of this distinct and historic kangaroo".

Swamp Rat (***Rattus lutreolus***)

The Swamp Rat has a patchy distribution in periodically inundated habitats from the South-East and the southern Mt Lofty Ranges. On Kangaroo Island, most of the areas of natural vegetation support populations of the Southern Bush Rat (*Rattus fuscipes*) (Fig. 109, 114). *Rattus lutreolus* is much rarer.

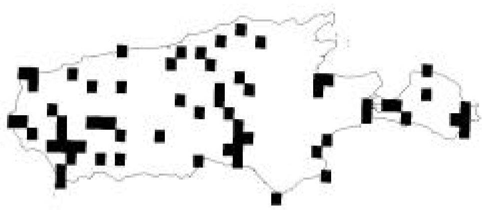

Figure 109.
The distribution of the Southern Bush Rat based on South Australian Museum records.

Barritt (1981) reported four records of *R. lutreolus,* all from swampy areas on the western end of the island. In his survey of the then Gosse Crown Lands, which were subsequently added to Flinders Chase National Park, he said that, "Runs and digs almost certainly of this species were recorded in swamps or streamside vegetation on tributaries of both the North-West and North-East rivers". During the present survey, a fifth population was discovered in the dense sedgelands fringing Larrikan Lagoon. The known distribution on Kangaroo Island is shown in Fig. 110.

Figure 110.
The distribution of the Swamp Rat based on South Australian Museum records.

Targeted searches for this species in appropriate swampy areas with dense sedge vegetation would undoubtedly reveal more populations of this species around the swamps and rivers in the higher rainfall areas on the western half of Kangaroo Island.

Australian Sea-lion (***Neophoca cinerea***) (Figs, 111, 112).

The Australian Sea-lion, which is found only around the southern Australian coast from Houtman Abrolhos in Western Australia to The Pages in South Australia, has long been regarded as one of the world's 'rarer' seal species. Despite this, until recently, it has been little studied. One of the great difficulties has been to develop an accurate estimate of the total population and its overall distribution, and more particularly where it breeds and the extent of breeding at each site.

Figure 111.
A female sea-lion with her well-grown pup on Seal Bay. Note the plastic flipper tag on the pup. These are no longer used and pups are now marked with implanted transponders. Photo A. Robinson

Robinson and Dennis (1988) collated a series of sea-lion counts accumulated between 1977 and 1987 and estimated the South Australian population at 2800. Western Australian numbers had previously been estimated at 700 (Abbott 1979). From December 1989 to March 1990 a major effort was made to visit and count all sea-lion colonies from Albany in Western Australia to The Pages in South Australia (Gales *et al.* ,1994). This survey documented a total of 50 island breeding colonies, (27 in Western Australia and 23 in South Australia). A possible 19 additional islands may support breeding colonies. In addition there are small but significant breeding sites along the length of the Great Australian Bight coast from Wilson Bluff to Twin Rocks (Dennis and Shaughnessy 1996) and at Point Labatt. Pup production is estimated at approximately 2500 from a total adult population of approximately 10 500. Approximately 75% of the total population and pup production is in South Australia.

With the exception of colonies at The Pages, Dangerous Reef and Kangaroo Island, pupping sites have been found to support relatively small populations, all producing less than 100 pups per season and most less than 50.

Figure 112.
Australian Sea-lions (*Neophoca cinerea*) provide a world class tourist drawcard to Seal Bay Conservation Park. Photo: P. Canty

The well-known colony of Australian Sea-lions at Seal Bay on Kangaroo Island is the third largest breeding colony of this species. Sea-lions are resident at Seal Bay throughout the year their numbers fluctuate seasonally. There have been regular counts at Seal Bay since 1962 and this data, up to 1986, has been presented by Robinson and Dennis (1988). Although the early counts are less reliable than those of more recent years there seems to have been a gradual increase in numbers at Seal Bay until 1975 and since then the maximum yearly population appears to have stabilised at around 400 animals. The first scientific studies of the sea-lions at Seal Bay began in 1975 (Ling and Walker, 1976, 1977, 1979) and as observations accumulated on a marked population of animals, it became apparent that the 'pupping season' was highly variable with births occurring in any month of the year. There were however, discernible peaks of pup production. These peaks occurred at roughly 18- month intervals for nine generations of pups recorded by Robinson and Dennis (1986). Observations by Ling and Walker (1978) on three individually- marked female seal-lions at Seal Bay have shown periods of 17 and 18 months between the birth of successive pups. This is much longer than the general 10 to 11 months period for other seal species. The discovery of an un-implanted blastocyst in the uterus of a female Australian Sea-lion confirms that, as with some other seal species, delayed implantation and an extended period of embryonic diapause occurs. Anatomical details of this process have been described by Tedman (1991). Research has also been carried out using hormone assays of blood samples from females with known previous birth dates within the Seal Bay population to determine just when implantation occurs within this unique 18- month breeding cycle. This study was made possible through the work of Higgins (1990) who examined female attendance and pup growth in a series of individually marked females at Seal Bay over three breeding seasons between 1986-1990. She discovered that breeding females choose sites to give birth spread throughout the Prohibited Areas. In these breeding areas females spent about two days on a pupping site before giving birth and at least some of the females returned to the same site in subsequent years. Births took between 15 minutes and 1¼ hours. After birth the pups retreated into holes near the birth site because when they were young (less than 2 months), they are susceptible to attacks from adult males (Higgins and Tedman 1990). About seven days after birth the female came into oestrus and copulated before departing on their first foraging trip following the birth.

Within the parts of Seal Bay used as pupping sites, adult males held territories which varied considerably in size and in the amount of time they were occupied. It is these territorial males who mate with the females at their post-partum oestrus. Having a pregnant or near oestrous female in his territory caused the male to stay in attendance constantly for up to 16 days. Fighting over territories and access to females does occur in Australian Sea-lions but because of the extended and sporadic appearance of pregnant females over the breeding season territorial disputes are not as intense as in many other seal species. It is possible that the availability of 'pup holes' where the young pups can escape the attentions of the territorial males may be limiting the number of females that breed at Seal Bay (Higgins 1990). If this is the case then Australian Sea-lions with their unique 18 month breeding cycle and the ability of the males to adapt to the females breeding behaviour represent a significant example of an alternative breeding strategy compared with all the other species of sea-lions in the world.

The other aspects of sea-lion behaviour that have been studied now that relatively sophisticated time-depth recorders are available, are the diving and foraging patterns of this species. In keeping with other unusual aspects of its biology, this research is showing significant differences from other species of sea-lion.

The experience of being able to walk among the sea-lions on Seal Bay is, as mentioned in the introductory chapter of this report, a tourist attraction not only of great importance for Kangaroo Island, but is by world standards one of the great 'wildlife encounters' available to tourists. Management strategies to minimise the disturbance of the sea-lions were outlined in Robinson and Dennis (1988) and Robinson (1989). They incorporated information from studies on human - sea-lion interactions (Schulz 1985), the influence of tuberculosis in wild and captive sea-lions (Reddacliff and Lim 1990) and interpretive methods to enhance the visitor experience at Seal Bay (Van Mook and Wallace 1986, Winchester 1986). More recently, management of the site has been discussed by Twyford and Vickery (1998)

Clearly there is a continuing need to study both the biology of the sea-lions and the management of visitors to Seal Bay if this very special place is to continue to give pleasure to future generations of visitors to Kangaroo Island.

New Zealand Fur-seal (*Arctocephalus forsteri*)

The New Zealand Fur-seal has a discontinuous distribution around the Southern Ocean - it occurs in New Zealand, at Macquarie Island and on the southern coastline of Australia from Eclipse Island on the Recherche Archipelago in the west, to Casuarina Islands in the east. The Australian Fur-seal *Arctocephalus pusillus doriferus* is found from Lady Julia Percy Island in Victoria, east through the Bass Strait islands and Tasmania, and north to Port Stephens in New South Wales. Occasionally Australian Fur-seals (often juveniles) have been recorded on beaches in the South East of South Australia, presumably from the colony on Lady Julia Percy Island in Victoria. Since 1988 male *A. pusillus* have been recorded in the large *A. forsteri* breeding colonies at Cape Du Couedic and Cape Gantheaume on Kangaroo Island. Both species of fur-seals favour broken rocky outcrops close to very rough breaking waves for both hauling-out and breeding sites. In South Australia, the New Zealand Fur-seal is never seen far from the water's edge unlike sea-lions, which are quite often found on top of islands or in sand dunes well away from the sea. Both species of fur-seal were extensively hunted by sealers and many colonies were severely reduced.

The Sub-Antarctic Fur-seal is an occasional visitor to Kangaroo Island. As is also the case for the South Australian mainland, most records are of juvenile animals, often in poor condition.

Because of their preference for rough rocky sites with lots of caves and ledges, New Zealand Fur-seals are extremely difficult to accurately count. Counts of fur-seal colonies that have been made between 1971 and 1987, including all the data from the National Parks and Wildlife Service surveys are given in Robinson and Dennis (1988).

Fur-seals are present in both breeding and non-breeding colonies at all times of the year but total numbers and the proportions of the different sex and age classes vary with season. Robinson and Dennis (1988) estimated that there are at least 2 000 *A. forsteri* in South Australia, but since then the estimates have increased. More accurate counts have been obtained during the breeding season by a series of mark-release-recapture studies of pups. Once the number of pups is known the total population can be estimated by multiplying pup numbers by between 3.4 and 4.5 depending on whether the population is stable or increasing (Shaughnessy *et al*. 1995). This work suggests that the total South Australian population is more than 13 500 (Shaughnessy *et al*. 1994)..

Observations on the South Neptune Islands in 1969-70 by Stirling (1972 a,b) and on Cape Gantheaume (Goldsworthy 1989, 1990, 1991), show that *A. forsteri* has a well-defined summer breeding season, although some adult males remained on the South Neptunes throughout the year defending large, loosely defined territories from mid-October. With the influx of adult males, more permanent territories are well established by the latter half of November. Fighting between adult males is highly ritualised and although the fights can look spectacular, serious injuries are rare. Although adult males defend territories, individual females have no bonds to specific males and may pass relatively freely between territories. The average ratio of males to females in a particular territory is 1:4.5 although up to fourteen females were recorded associated with one particular male. As an example of how mobile the females are, this particular male only had a single female associated with him the next day.

The pups are born between late November, and mid-January, in areas that are easily accessible to sea pools and access to high rocks behind the colony so that females and pups can escape wave action during heavy seas. Within two weeks of birth the females mate, after which the males lose interest in them. There is some evidence to suggest that females return to the same areas in subsequent years to give birth. Pups can swim at birth, one even having been observed being born under water, when its mother was chased into the sea by a male. Females stay with their pups for a few days following birth, but after a week will leave them for up to two hours while they go to sea to cool off and feed. By the second week, pups begin to associate with each other in small groups and by three to four weeks swim regularly in rock pools, playing with others in their age group. Pups are suckled for nearly a year, then just before the next breeding season the mothers forcibly wean them. Adult males and females are intolerant of yearling animals in breeding colonies and they are forced to congregate in other areas.

The well-developed set of steps and boardwalks at Admirals Arch provides visitors to Flinders Chase National Park with exceptional close-up views of these normally very shy animals. Given the rapid rate of increase of New Zealand Fur-seals observed around Cape Du Couedic, this quality visitor experience seems assured into the future.

Figure 113.
The Western Pygmy Possum (*Cercartetus concinnus*) was commonly trapped during the biological survey. **Photo: A. Robinson**

Figure 114.
The Southern Bush Rat (*Rattus fuscipes*) is the commonest small mammal on Kangaroo Island. It uses many habitats provided there is a dense understorey. **Photo A. Robinson**

WHALES AND DOLPHINS (CETACEA)

There have been 18 species of whales and dolphins recorded from the waters around Kangaroo Island. Many have stranded or washed up (Kemper and Ling 1991), others have been recorded only from sightings of live animals at sea.

Kangaroo Island is in an excellent geographic position to be visited by, or home to, a wide variety of species: its north coast is at the entrance to the shallow gulfs and its south coast is relatively close to deep water and the edge of the continental shelf. Oceanic species such as Sperm Whales (*Physeter macrocephalus*) and pilot whales (*Globicephala* spp.) have stranded or washed up on several occasions, especially on the south coast. Blue Whales (*Balaenoptera musculus*) have been sighted on the south western coast off Cape du Couedic. Perhaps because there are several seal colonies on the south coast, Killer Whales (*Orcinus orca*) have been frequently sighted close inshore (Ling 1991). The Murray Canyons, to the south east of Kangaroo Island, may be important feeding locations for beaked whales (Family Ziphiidae) and may explain why several species of this family have been recorded from the island. The smallest of the baleen whales, the Pygmy Right Whale (*Caperea marginata*) has stranded several times on the island, especially on the north east coast. Recent sighting records in the Island Beach have shed light on our poor knowledge of this elusive species.

Kangaroo Island is home to at least two species of dolphin. The Bottlenose Dolphin, *Tursiops truncatus*, may be represented by two types—the larger 'offshore' form has stranded *en masse* at least once and the smaller 'inshore' form which has been recorded from the coast facing the gulfs. The recent (March 1999) stranding of about 45 Bottlenose Dolphins was quite an event and all but one of the animals survived the ordeal. Common Dolphins (*Delphinus delphis*) are sometimes seen off the west coast in pods containing many thousands of individuals

Southern Right Whales (*Eubalaena australis*) are regularly seen close inshore during the winter and spring, and are a spectacular sight for Kangaroo Islanders and visitors alike. These whales are likely to be seen off Penneshaw, Vivonne Bay, Remarkable Rocks, Cape Borda and many other areas. Unlike some mainland viewing areas, right whales do not tend to stay in one spot around Kangaroo Island for more than a few days. Contrary to general belief, the right whales that visit Kangaroo Island are not always heading for the Head of the Great Australian Bight to calve. It is quite possible that some calves are born off the island, although this has not yet been confirmed. There are an estimated 800 southern right whales that live off the southern Australian coast, mostly off the western half of the continent (Kemper et al. 1997). There were probably thousands of these whales in south eastern Australia, many around Kangaroo Island, before whaling depleted their numbers drastically during the 19th century and although their populations do seem to be recovering, there is still a long way to go.

BIRDS

by G. Carpenter[1] & P. Horton[2]

INTRODUCTION

Fascination with Kangaroo Island's bird life began with the independent discovery by maritime explorers Baudin and Flinders of the now extinct Kangaroo Island Emu *Dromaius baudinianus*, in the summer of 1801-1802 (Howchin 1926). Birds on islands are interesting because they often support endemic taxa and lack species that are common on the adjacent mainland. Kangaroo Island demonstrates both these features and now has probably the best documented bird fauna of any region in South Australia, with reviews by Abbott (1974), Ford (1979) and Baxter (1989, revised 1995). Baxter's (1989) "Annotated list of the birds of Kangaroo Island" draws upon accounts of numerous visits to the island, extensive contributions by residents and personal observations to comprehensively describe the past and present status, distribution, habitats and abundance of all species positively recorded from the island and adjacent seas.

Johnston (1936) summarised the earliest reports on the natural history of Kangaroo Island. Serious investigations on birds began in October 1905 with the first 'camp-out' of the Australasian Ornithologists' Union (Anon., 1906; Campbell 1906), followed by extensive field excursions by Mellor (1909), White (1913) and McGilp (1920) (and refer to Appendix 2 of Abbott, 1974). A long-term resident, A.F.C.Lashmar, meticulously documented the birds of eastern Kangaroo Island in numerous publications from 1935 to 1996 (Lashmar, 1935 – 1990; Dennis and Lanhmar, 1996). Recent interest in Kangaroo Island's land birds followed the publication of the "Theory of Island Biogeography " (MacArthur & Wilson, 1967). The theory proposed that islands support fewer species than an equivalent area of mainland, and that the difference was proportional to the size of the island, its distance from the mainland and its period of isolation. Comparison with mainland birds then provides information on species' ecology and population dynamics (Abbott, 1974, Ford, 1979).

The bird fauna on Kangaroo Island reflects its isolation from the mainland for the last c.10,000 years and period without the influence of Aboriginal land management (Lampert 1981, Draper, this report).

Kangaroo Island's one endemic species, *Dromaius baudinianus* (Parker 1984), was extirpated soon after European settlement (Ashby 1924, Parker *et al.*, 1979, Parker 1984). Twenty-two endemic subspecies have been described, although Parker & Horton (1990) accepted only six (Appendix IX).

The accurate taxonomic status of many species awaits further collecting and banding studies. For example, Paton (1988) suggested that several species of honeyeater which have been observed in flocks to follow the coast around the tip of Fleurieu Peninsula could reach Kangaroo Island. This could clearly influence the degree of isolation of a number of Kangaroo Island honeyeaters that have been described as insular forms.

About fifty species of birds which have populations on the nearby parts of the mainland either do not occur or are vagrant to Kangaroo Island (Ford 1979, and see Table 67 adapted from Blakers *et al*. 1984 and Baxter 1989). The differences in the bird faunas have been debated (Abbott, 1974 ; 1976, Ford & Paton ,1975; Ford, 1979) and probably result from three factors:

1. species have become extinct on Kangaroo Island after it was isolated from the mainland due to a rise in the sea level about 10,000 years ago (Lampert, 1981, see Hope *et al*. 1977 for subfossil records);

2. new species have colonized the mainland adjacent to Kangaroo Island after its isolation; and

3. these new species, which may have reached Kangaroo Island over the last 10,000 years, have not established because of lack of appropriate habitat (Ford, 1979).

Conversely Kangaroo Island has (or had) breeding populations of Glossy Black-Cockatoo *Calyptorhynchus lathami*, Crimson Rosella *Platycercus elegans elegans*, White-eared Honeyeater *Meliphaga leucotis* and Kangaroo Island Emu which are absent from the adjacent mainland.

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Table. 67.
Birds absent as breeding species from Kangaroo Island which occurred in similar habitats on the adjacent mainland at the time of European settlement.

subfossil = subfossil remains have been identified from Kangaroo Island (Hope *et al*. 1984)
habitat marginal = habitat on Kangaroo Island is considered to be marginally suitable (e.g. grassy woodlands)
sibling = closely related sibling species on Kangaroo Island

KI=Kangaroo Island; FP=Fleurieu Peninsula (14km distant);
YP=Yorke Peninsula (40km distant); EP=Eyre Peninsula (100km distant)

Common Name	Scientific Name	Mainland distribution	Comments
Emu	*Dromaius novaehollandiae*	FP,EP,YP	sibling
Whistling Kite	*Haliastur sphenurus*	FP,EP	habitat marginal
Little Eagle	*Hieraaetus morphnoides*	FP	subfossil
Malleefowl	*Leipoa ocellata*	YP,EP	unsuccessfully introduced
Peaceful Dove	*Geopelia placida*	FP	habitat marginal unsuccessfully introduced
Musk Lorikeet	*Glossopsitta concinna*	FP,EP	
+Eastern Rosella	*Platycercus eximius*	FP	habitat marginal
Adelaide Rosella	*Platycercus elegans "adelaidae"*	FP	sibling
Mallee Ringneck	*Barnardius barnardi barnardi*	YP	
Port Lincoln Ringneck	*Barnardius barnardi zonarius*	EP	
Red-rumped Parrot	*Psephotus haematonotus*	FP	habitat marginal
Mulga Parrot	*Psephotos varius*	YP	
Ground Parrot	*Pezoporus wallicus*	FP	subfossil
Bluebonnet	*Northiella haematogaster*	YP	habitat marginal
Pallid Cuckoo	*Cuculus pallidus*	FP	habitat marginal
*Tawny Frogmouth	*Podargus strigoides*	FP,EP,YP	
Laughing Kookaburra	*Dacelo novaeguineae*	FP,EP	successfully introduced
Azure Kingfisher	*Ceyx azurea*	FP	
White-browed Babbler	*Pomatostomus superciliosus*	FP,EP,YP	
Buff-rumped Thornbill	*Acanthiza reguloides*	FP	
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	EP,YP,FP	habitat marginal
Chestnut-rumped Thornbill	*Acanthiza uropygialis*	EP,YP	habitat marginal
Weebill	*Smicrornis brevirostris*	FP,YP,EP	
Southern Whiteface	*Aphelocephala leucopsis*	EP,YP	habitat marginal
Crested Bellbird	*Oreoica gutturalis*	YP	
Singing Bushlark	*Mirafra javanica*	FP	habitat marginal
Rufous Fieldwren	*Calamanthuss c. campestris*	FP	
Rufous Fieldwren	*Calamanthus c. ethelae*	YP,EP	
Chestnut-rumped Heathwren	*Hylacola pyrrhopygius*	FP	
White-throated Treecreeper	*Cormobates leucophaea*	FP	
Brown Treecreeper	*Climacteris picumnus*	FP	habitat marginal
Spotted Quailthrush	*Cinclosoma punctatum*	FP	
Crested Shriketit	*Falcunculus frontatus*	FP	habitat marginal
Rufous Whistler	*Pachycephala rufiventris*	FP,EP,YP	
Varied Sittella	*Daphoenositta chrysoptera*	FP,EP,YP	
Western Gerygone	*Gerygone fusca* ssp.	EP	
Red-capped Robin	*Petroica goodenovii*	EP,YP	
Southern Scrub-robin	*Drymodes brunneopygia*	EP,YP	
Western Yellow Robin	*Eopsaltria griseogularis*	EP	
Hooded Robin	*Melanodryas cucullata*	FP,YP	

Common Name	Scientific Name	Mainland distribution	Comments
Jacky Winter	*Microeca leucophaea*	FP	habitat marginal
Variegated Fairy-wren	*Malurus lamberti*	YP	
Blue-breasted Fairy-wren	*Malurus pulcherrimus*	EP	
Spiny-cheeked Honeyeater	*Acanthagenys rufogularis*	EP,YP	
Yellow-throated Miner	*Manorina flavigula*	YP	
Noisy Miner	*Manorina melanocephala*	FP	habitat marginal
Singing Honeyeater	*Lichenostomus virescens*	FP,EP,YP	
Yellow-faced Honeyeater	*Lichenostomus chrysops*	FP	
White-plumed Honeyeater	*Lichenostomus penicillatus*	FP	habitat marginal
Black-chinned Honeyeater	*Melithreptus gularis*	FP	habitat marginal
Mistletoebird	*Dicaeum hirundinaceum*	FP,YP	habitat marginal
Diamond Firetail	*Stagonopleura guttata*	FP,EP,YP	
Zebra Finch	*Taeniopygia guttata*	FP	habitat marginal unsuccessfully introduced
White-winged Chough	*Corcorax melanorhamphos*	FP,EP	
Grey Butcherbird	*Cracticus torquatus*	FP,EP,YP	

*a sight record from Kangaroo Island (Ford 1979), and a specimen (feather) collected in September 1995 suggests there may be a small resident population.
+ Parker (1988) suggested the Fleurieu Peninsula population may not have established until the 1930s.
The Crested Pigeon has been excluded from this list, having established on FP, YP and EP in the 1930s (Condon, 1969).

Not only has its isolation enabled a distinctive land avifauna to evolve, but also the impacts associated with European settlement are less severe on Kangaroo Island. In contrast with other areas of similar rainfall in South Australia where clearance of native vegetation and feral predators continue to decimate the avifauna (e.g. Ford & Howe, 1980), the island is free from foxes, agricultural development occurred mostly since 1950 and much (over 25%) of its native vegetation still remains. The threats faced by the mainland fauna were recognised by early this century, which led to the Flinders Chase sanctuary proclaimed over the western part of the Island. Various mainland birds were introduced to Flinders Chase between 1911 and 1957 (Sutton, 1926; Anon., 1948; see Table 4 and Appendix VII). Of these, the Gang-gang Cockatoo and Laughing Kookaburra are still reported and the Australian Brush-turkey is widespread in the south-west (Baxter, 1989, this survey).

The cleared agricultural parts of the island support breeding populations of the Australian Wood Duck, Brown Falcon, Black-shouldered Kite, Nankeen Kestrel, Stubble Quail, Galah, Little Corella, Barn Owl, Richard's Pipit, Willie Wagtail, Magpie-lark, Australian Magpie and Little Raven. These have either substantially increased or have established since European settlement. Introduced species that presumably colonised from Fleurieu Peninsula are the House Sparrow, European Goldfinch, Skylark, Common Blackbird, Spotted Turtledove, Common Starling and Rock Dove. Feral or free-ranging domestic populations of Indian Peafowl, Domestic Goose, Wild Turkey, Common Pheasant and Helmeted Guineafowl also occur on the east of the island (Lashmar, 1988; Baxter,, 1989, this survey).

Kangaroo Island also has many wetlands (e.g. Murray's Lagoon, Lashmar's Lagoon, Cygnet River) which in total support up to tens of thousands of waterbirds, many breeding locally (Baxter, 1989). Its exposure to the Southern Ocean has led to reports of many species of seabirds, either as inshore sightings or beach-washed specimens (Parker *et al*,,. 1979;Baxter, 1989).

The habitats of birds on Kangaroo Island have been described by C.Baxter, based on extensive personal observations (Department of Environment & Planning, 1986; Baxter, 1989). This report identifies the bird communities and their habitats on Kangaroo Island, South Australia, from a survey of native vegetation conducted in 1990.

TOTAL BIRD FAUNA

Two hundred and sixty-seven species of birds have now been recorded from Kangaroo Island and its surrounding waters, while reports of a further seven species await confirmation (Appendix VII). Confirmed species include sixteen Australian species deliberately iintroduced to the island by the Flora and Fauna Board, of which four have established feral populations. Five species of domestic game fowl have taken advantage of the fox-free environment to establish free-range, possibly self-sustaining populations. Six exotic species have reached the island apparently unaided.

Clearly the bird fauna of Kangaroo Island, in keeping with islands elsewhere in the world is changing rapidly in response to man's influence with new species becoming established and, others, regrettably, nearing extinction.

The present survey did not add any new species to the total known bird fauna of the island but it did significantly increase our understanding of the distribution and habitat preference of many species.

RELATIVE ABUNDANCE OF BIRD SPECIES

The systematic nature of quadrat sampling during the present survey allows the relative abundance of each bird species on the island to be calculated. Although collected in a less systematic manner the Bird Atlas survey conducted from 1971 to 1981 by volunteers supported by the Royal Australian Ornithological Union (R.A.O.U) provides another data set to allow the calculation of relative abundance. Only 62 of the 114 species in the R.A.O.U's database were recorded in the course of the survey. The majority of those unrecorded were either waterbirds, shorebirds or oceanic birds, all groups not adequately sampled in a survey such as this. There are however five species of land birds which were recorded at a low level over the ten years of the R.A.O.U. survey which appear to be genuinely uncommon on Kangaroo Island. These include White’s Thrush (*Zoothera lunulata)*,the Barn Owl (*Tyto alba*), the Sacred Kingfisher (*Halcyon sancta),* the Singing Honeyeater (*Meliphaga virescens*) and the introduced Rock Dove (*Columba livia*).
Only the Feral Peacock (*Pavo cristatus*) and the five observations of the Red-browed Finch (*Aegintha temporalis*) were recorded in the quadrat survey but not during the RAOU sampling.

One hundred and five bird species were recorded from the survey sites. A further 30 species were recorded elsewhere on Kangaroo Island during the survey as opportunistic reports (Appendix VIII).

Bird species in decreasing order of both occurrence and total number of observations within the 108 sites are shown in Table 68. The Red Wattlebird was recorded from the most sites (76%). The Silvereye was most often recorded (12.0% of total observations), followed by the New Holland Honeyeater (6.1%), Superb Fairy-wren (5.3%) and Brown Thornbill (5.2%). Twenty-nine (27%) of the species recorded from survey sites were recorded on 30 or more occasions during the survey.

Table 68. Common birds of native vegetation on Kangaroo Island.
Relative abundance of bird species recorded at survey sites, listed in descending order of both number (%) of sites recorded (total 108 sites) and number of observations (total 3874 observations). Waterbirds and species recorded from less than 5 sites are excluded.

SPECIES	NUMBER OF SITES	% 0F SITES	OBSERVATIONS (% OF TOTAL)
Red Wattlebird	82	76	4.8
Golden Whistler	78	72	3.8
Superb Fairy-wren	77	71	5.3
New Holland Honeyeater	76	70	6.1
Silvereye	74	69	12.0
Grey Currawong	69	64	2.9
White-browed Scrub-wren	67	62	3.3
Grey Shrike-thrush	62	57	4.9
Brown Thornbill	60	56	5.2
Crescent Honeyeater	53	49	2.6
Eastern Spinebill	53	49	2.5
Rainbow Lorikeet	47	44	2.2
Fan-tailed Cuckoo	47	44	2.1
Striated Pardalote	46	43	3.0
Welcome Swallow	45	42	2.3
Galah	42	39	2.2
Striated Thornbill	40	37	2.9
Grey Fantail	39	36	1.9
Purple-gaped Honeyeater	38	35	2.5
Purple-crowned Lorikeet	38	35	1.8
Australian Magpie	35	32	3.5
Scarlet Robin	35	32	1.5
Horsfield's Bronze-Cuckoo	32	30	1.1
Crimson Rosella	30	28	3.2
Brush Bronzewing	29	27	1.0
Tawny-crowned Honeyeater	28	26	1.1

SPECIES	NUMBER OF SITES	% 0F SITES	OBSERVATIONS (% OF TOTAL)
Australian Raven	27	25	1.1
Little Raven	27	25	1.1
Brown-headed Honeyeater	26	24	0.9
Tree Martin	24	22	0.9
Little Wattlebird	21	19	0.8
Black-faced Cuckoo-shrike	21	19	0.7
White-fronted Chat	18	17	0.8
White-eared Honeyeater	17	16	1.3
Yellow-rumped Pardalote	16	15	0.4
*Common Starling	15	14	0.6
Nankeen Kestrel	15	14	0.5
Shy Heathwren	13	12	0.6
Beautiful Firetail	12	11	0.4
Wedge-tailed Eagle	11	10	0.3
Shining Bronze-Cuckoo	10	9	0.4
Yellow-tailed Black-Cockatoo	10	9	0.3
Western Whipbird	10	9	0.3
*European Goldfinch	10	9	0.3
Dusky Woodswallow	10	9	0.3
Southern Emu-wren	9	8	0.3
Common Bronzewing	9	8	0.2
Willie Wagtail	7	6	0.3
Masked Lapwing	6	6	0.6
*Indian Peafowl	6	6	0.2
Southern Boobook	6	6	0.2
Magpie-lark	6	6	0.2
*Skylark	5	5	0.3
Red-browed Finch	5	5	0.2
Little Grassbird	4	4	0.2
Bush Stone-curlew	4	4	0.2
Little Corella	4	4	0.2
Restless Flycatcher	4	4	0.2

*denotes species foreign to Australia

BIRD COMMUNITIES

Sites were grouped according to the similarity of their bird species using PATN analysis (Belbin 1987 & see Methods chapter). PATN analysis groups sites with similar bird species which can then be correlated with variables such as vegetation type, disturbance and location. Groups are best defined where these variables have distinct boundaries.

Unlike previous surveys of this type in South Australia (Robinson *et al*., 1988; Copley & Kemper, 1992), species heard only were included in the analysis. Heard-only records contributed to almost half of the species reported from many sites because birds were often concealed in the dense vegetation. Unfortunately including heard-only records introduces an observer bias because the experience of observers in the survey varied widely.

Excluded from the analysis were species not closely associated with native vegetation (waterbirds, seabirds and waders), species recorded only once, species recorded to genus only (*Corvus*, *Pardalotus*, *Neophema*, *Phaps*), highly degraded sites (recently cleared or burnt) and sites where fewer than five species were recorded. This left 67 species from 108 sites to analyse.

Species	GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5	GROUP 6	GROUP 7
Crescent Honeyeater	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Golden Whistler	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Grey Currawong	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Grey Shrikethrush	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New Holland Honeyeater	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Red Wattlebird	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Silvereye	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Superb Fairy Wren	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purple-gaped Honeyeater	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Rainbow Lorikeet	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Shy Heathwren	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Tawny-crowned Honeyeater	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Eastern Spinebill	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Welcome Swallow	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
White-browed Scrubwren	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Australian Magpie	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Australian Raven	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Horsfield's Bronze Cuckoo	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Beautiful Firetail	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Black-faced Cuckooshrike	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Blackbird	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Brown-headed Honeyeater	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Brush Bronzewing	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Bush Stone-curlew	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Common Bronzewing	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Common Starling	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Crimson Rosella	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Dusky Woodswallow	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Little Grassbird	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Little Raven	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Little Wattlebird	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Restless Flycatcher	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Richard's Pipit	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nankeen Kestrel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Skylark	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Shining Bronze Cuckoo	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Southern Emu-wren	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Tree Martin	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Western Whipbird	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
White-eared Honeyeater	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
White-fronted Chat	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
White-naped Honeyeater	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Willie Wagtail	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Brown Falcon	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Elegant Parrot	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
White-bellied Sea-Eagle	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Swamp Harrier	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Yellow-tailed Black-cockatoo	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Yellow-tailed Pardalote	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Striated Thornbill	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Striated Pardalote	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Rock Parrot	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Brown Thornbill	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Scarlet Robin	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purple-crowned Lorikeet	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Grey Fantail	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fan-tailed Cuckoo	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Galah	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Magpie-lark	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 69.
Two-way table of bird species analysis showing groups of quadrats by species.

Using a site dissimilarity of 0.7, seven groupings can be identified from the dendrogram produced by the similarity analysis. The relatively low dissimilarity value, the few species significantly associated with each group and the high number of species represented in all groups shows the bird communities are poorly defined (Table 70). Groups 1-4 are distinct from Groups 5-7 at a site dissimilarity of 1.0. Groups 1-3 are clustered, as are Groups 5 & 6. Group 2 has two well defined subgroups (2a and 2b). Each group has been named according to the characteristics of its bird fauna.

Bird species which characterise each of the seven groups are listed in order of their Chi-square value. A higher Chi-square value indicates that the species is more important in defining the group. A Chi-square value of 0.4 or more indicates that at species is significantly associated with that group at the 90% confidence level. Frequently occurring bird species are also listed to help characterise each group.

Most of the seven groups are widely and evenly distributed across the Island except Group 5 which is confined to the coast. Details of the group compositions are shown below.

GROUP 1. Birds of low woodlands and mallee with a heathy understorey.
29 sites

Species	Chi-square	Frequency (%)
Brown-headed Honeyeater	0.8	42
Common Bronzewing	0.8	23
Scarlet Robin	0.6	42
New Holland Honeyeater		100
Golden Whistler		92
White-browed Scrubwren		88
Red Wattlebird		85
Superb Fairy-wren		73
Silvereye		65

Birds of low open woodlands with a heathy understorey characterise this group, whose sites are widely and evenly distributed across Kangaroo Island. The Owlet-nightjar (in *E.baxteri* associations in the west) is also likely to be associated with the group.

GROUP 2. Birds of semicleared areas.
6 sites

Species	Chi-square	Frequency (%)
Australian Raven	1.8	100
Australian Magpie	0.5	75
Golden Whistler		100

Group 4 includes sites with degraded native vegetation where birds associated with paddocks (ravens and Australian Magpie) are more prominent than species of native habitats.

GROUP 3. Birds of inland heaths.
14 sites

Species	Chi-square	Frequency (%)
Dusky Woodswallow	1.5	50
Magpie-lark	1.1	33
Black-faced Cuckoo-shrike	0.8	67
Little Raven	0.6	67
Willie Wagtail	0.6	33
Silvereye		100
New Holland Honeyeater		83
Tawny-crowned Honeyeater		67

Group 6 is defined by birds of inland heaths and low open woodlands with a heathy understorey. Because the group is defined by a small number of sites, some birds occurring at low frequencies have high chi-square values (e.g. Magpie-lark) and should probably be disregarded.

GROUP 4. Birds of shrubland subject to flooding.
4 sites

Species	Chi-square	Frequency (%)
Little Grassbird	4.1	100
Swamp Harrier	2.4	50
White-fronted Chat	1.7	100
Elegant Parrot	1.7	50
Brown Falcon	1.3	50
White-browed Scrubwren		100
Superb Fairy-wren		100

Group 4 is a small but well defined group of birds associated with low vegetation subject to flooding. The two sites are the flooded heath of Larrikin Lagoon in Flinders Chase and tidal samphire at Pelican Lagoon.
The bird species which characterise Group 7 are sufficiently mobile to exploit temporarily flooded areas.

GROUP 5. Birds of coastal heaths.
10 sites

Species	Chi-square	Frequency (%)
Southern Emu-wren	3.4	83
Australian Kestrel	1.8	83
White-bellied Sea-eagle	1.7	33
Striated Pardalote	0.6	67
Common Starling	0.6	67
Welcome Swallow	0.5	100
Silvereye		100
White-browed Scrubwren		100

GROUP 6. Birds of woodlands and low woodlands with an open understorey.
31 sites

Species	Chi-square	Frequency (%)
Rainbow Lorikeet	0.8	71
Purple-gaped Honeyeater	0.5	67
Red Wattlebird		90
Grey Currawong		76
New Holland Honeyeater		76
Superb Fairywren		67
Grey Shrike-thrush		62

Group 1 is characterised by birds which feed in eucalypt canopies and are common and widespread in woodlands and low woodlands with an open or semi-cleared understorey. The sites are widely distributed on Kangaroo Island wherever native vegetation is confined to small degraded remnants in agricultural land. The group also includes inadequately surveyed or disturbed sites where only the more common species were recorded. The inclusion of the Skylark reflects the close proximity of cleared land. Other infrequently recorded species likely to be associated with this group are the Restless Flycather, Willie Wagtail and European Goldfinch.

GROUP 7. Birds of (a) low open forests and (b) open forests with an open understorey.
19 sites

Species	Chi-square	Frequency (%)
Grey Fantail	1.4	63
Scarlet Robin	1.2	56
White-eared Honeyeater	1.0	33
Crimson Rosella	0.9	53
Grey Currawong	0.8	91
Fan-tailed Cuckoo	0.7	65
Brown Thornbill	0.6	88
Eastern Spinebill	0.6	65
Superb Fairy-wren		81
Golden Whistler		81
Red Wattlebird		79
Silvereye		74
Grey Shrike-thrush		74
Crescent Honeyeater		63

Group 7 comprises bird species of wetter forested habitats with an open understorey. It includes birds which exploit a range of feeding areas from canopy to leaf litter. The group is broadly divided into 2a (*E.cneorifolia - E.diversifolia* low open forests in the east) and 2b (*E.cladocalyx* open riverine forests of the south and west coasts). The Fan-tailed Cuckoo, Crimson Rosella, White-eared Honeyeater and Scarlet Robin are more prominent in subgroup 2b. Other infrequently recorded species likely to be associated with this group are Gang-gang Cockatoo, Southern Boobook, White's Thrush and Spotted Pardalote.

Birds of coastal heaths and shrublands make up this small but well defined group. Because the group is defined by a small number of sites, some birds occurring at low frequencies have high chi-square values. All sites in the group are immediately adjacent to the coast.

ASSOCIATION WITH VEGETATION TYPES

For each of the ten major structural vegetation types on Kangaroo Island the total number of bird species recorded and the mean number of bird species per site was calculated as a measure of diversity.

Eucalyptus woodland and open forest vegetation types had a higher bird species diversity than the open scrubs and shrublands.

The eight vegetation types recorded from at least five sites and 58 bird species recorded from at least four sites were selected for further analysis. For each bird species a percentage of occurrence was calculated for each vegetation type. To compare between closely related or similar species, a profile over the eight vegetation types was then constructed by dividing each percentage by the maximum for each species

(Emison & Bren 1989). This compensates for interspecific differences in abundance.
The use of vegetation types by small honeyeaters, large honeyeaters, flycatchers-robins and wrens is of particular interest on Kangaroo Island. Small honeyeaters are widespread in all of the major types of vegetation surveyed, with the White-eared Honeyeater more in open forests, woodlands and low open forests and the Tawny-crowned and Purple-gaped Honeyeaters in low open woodlands, open scrubs, shrublands and open heaths. Red Wattlebirds occurred evenly in all vegetation types, while the Little Wattlebird was less evident as canopy height decreased. Robins and flycatchers were most prevalent in vegetation types with a taller canopy with the Grey Fantail and Scarlet Robin evenly distributed, while the Restless Flycatcher and Willie Wagtail showed uneven use of vegetation types. White-browed Scrubwrens and Superb Fairy-wrens occurred evenly, while the Southern Emu-wren became more prevalent as canopy height decreased and the Shy Hylacola was mostly in low open woodlands and open scrubs. Among the small leaf-gleaners, the Brown Thornbill and Striated Pardalote were evenly distributed, while the Yellow-rumped Pardalote was scarce in forests and woodlands and the Striated Thornbill was scarce in mallee-heath and heath vegetation types.

Any positive association between the eight vegetation types and the 58 bird species was tested by calculating the Chi-square statistic from sets of 2x2 contingency tables with Yates correction (Zar 1984).

In the following tables, bird species are listed in descending order of association (Chi-square >1.0) and frequency of occurrence (>50% of sites). Chi-square = 3.8 for P=95%.

***Eucalyptus diversifolia* - *E. cosmophylla* - *E. cneorifolia* low woodland.**
7 sites

Species	Chi-square	Frequency (%)
European Goldfinch	15.7	57
Masked Lapwing	13.7	43
Skylark	5.1	29
Black-faced Cuckoo-shrike	4.4	57
Indian Peafowl	3.9	29
Purple-crowned Lorikeet	3.4	71
Grey Currawong	3.3	100
Australian Magpie	3.1	71
Superb Fairy-wren		100
Silvereye		100
Red Wattlebird		100
Rainbow Lorikeet		71
Golden Whistler		71
New Holland Honeyeater		71
Little Raven		57

Species common to semi-cleared areas or the margins of farmland (Masked Lapwing, Australian Magpie) and introduced species (European Goldfinch, Skylark, Indian Peafowl) characterise this group. Many species feed and or nest in grassed areas. This was because most of the sites surveyed in this vegetation type were close to farmland. It is also possible that the vegetation type is an artifact resulting from the partial clearance for agricultural use of mallee vegetation types.

***Melaleuca brevifolia* open heath +/- *E. camaldulensis* - *E. leucoxylon* woodland.**
8 sites

Species	Chi-square	Frequency (%)
Red-browed Firetail	5.8	25
Little Corella	5.8	25
Restless Flycatcher	5.8	25
Rainbow Lorikeet	5.6	88
White-eared Honeyeater	3.9	38
Grey Shrike-thrush		75
Superb Fairy-wren		75
Crescent Honeyeater		75
Eastern Spinebill		75

Few birds characterise this vegetation type. Because there are a small number of sites, some birds occurring at low frequencies have high chi-square values.

***Eucalyptus cladocalyx* open forest.**
13 sites

Species	Chi-square	Frequency (%)
Fan-tailed Cuckoo	13.9	92
Southern Boobook	13.6	31
White-eared Honeyeater	8.5	38
Scarlet Robin	7.6	69
Brown Thornbill	7.4	92
Tree Martin	6.6	54
Eastern Spinebill	6.4	85
Striated Thornbill	5.8	69
Golden Whistler	4.9	92
Striated Pardalote	4.3	69
Crimson Rosella	4.1	85
Crescent Honeyeater	4.0	77
Grey Shrike-thrush	3.8	85
Grey Fantail	3.8	62
Grey Currawong		85
Red Wattlebird		77

This vegetation type, which occurs in the wettest parts of Kangaroo Island, contains the largest number of significantly associated bird species. It includes birds which exploit a range of feeding areas, especially the upper branches and leaf litter. Sugar gums also support numerous hollows which are used as nesting and or roosting sites by several species.

***Eucalyptus baxteri* - *E. cosmophylla* low woodland.**
17 sites

Species	Chi-square	Frequency (%)
Tawny-crowned Honeyeater	10.4	59
Beautiful Firetail	10.0	35
Dusky Woodswallow	7.7	29
New Holland Honeyeater	4.6	94
Golden Whistler		76
Red Wattlebird		76
Superb Fairy-wren		71
Silvereye		71

Birds which characterise this vegetation type are associated with a dense shrub layer, with or without emergent trees.

***Banksia ornata* etc open heath +/- *E. remota* low open woodland.**
15 sites

Species	Chi-square	Frequency (%)
New Holland Honeyeater	3.6	93
Australian Raven	2.8	47
Golden Whistler		80
Superb Fairy-wren		67

The New Holland Honeyeater, a common species on Kangaroo Island, characterises this group. Its abundance probably reflects the flowering of Desert banksia.

Banksia marginata.***E. cneorifolia* open scrub.**
3 sites

Species	Chi-square	Frequency (%)
Red Wattlebird		100
Grey Currawong		100
Striated Thornbill		67
Eastern Spinebill		67
White-eared Honeyeater		67
Brown-headed Honeyeater		67
Scarlet Robin		67
Silvereye		67

This vegetation type is unique to Kangaroo Island but contains too few members to identify any characteristic bird species.

***E. diversifolia* - *E. rugosa* open scrub.**
17 sites

Species	Chi-square	Frequency (%)
Purple-gaped Honeyeater	15.1	76
Western Whipbird	3.6	24
Golden Whistler		76
Silvereye		76
Superb Fairy-wren		71
Grey Currawong		71
Grey Shrike-thrush		65
Striated Thornbill		65
Eastern Spinebill		65
New Holland Honeyeater		65

Birds which characterise this vegetation type inhabit dense mallee-heath.

***E. diversifolia* - *E. landsdowneana* - *M. lanceolata* tall shrubland.**
17 sites

Species	Chi-square	Frequency (%)
Purple-gaped Honeyeater	5.7	65
Silvereye	3.5	94
Red Wattlebird		71
New Holland Honeyeater		71
Welcome Swallow		65

This vegetation type has a similar bird fauna to the *E. diversifolia/ E.rugosa* open scrub

***Olearia axillaris* shrubland.**
8 sites

Species	Chi-square	Frequency (%)
Silvereye	2.7	100
Welcome Swallow		75

DISCUSSION

Total bird fauna

Eighty-eight (74%) of the 119 land birds listed for Kangaroo Island by Baxter (1995) were recorded during this survey, with evidence of breeding for 26 species. No new species were recorded for the Island. The Baillon's Crake (breeding at Larrikin Lagoon) had not been reported on the island since 1936 (Parker & Lashmar, 1976; Carpenter, 1996).

Terrestrial birds which breed or are presumed to breed on Kangaroo Island (Baxter 1995) but not recorded during the survey were those associated with farmland

(Feral Pigeon, Sulphur-crested Cockatoo) or wetlands (Brown Quail, Spotless Crake, Buff-banded Rail, Dusky Moorhen, Purple Swamphen, Fairy Martin), or are represented by few records on the island (Gang-gang Cockatoo [introduced], Tawny Frogmouth, Spotted Nightjar, Sacred Kingfisher, Rainbow Bee-eater, Yellow Thornbill and Spotted Pardalote).

The survey confirmed that the Australian Brush-turkey, Indian Peafowl and Common Turkey, all deliberately introduced to Kangaroo Island, still have breeding populations there. Given that only one pair of brush-turkeys was liberated in April 1936 (Anon., 1948), the genetics of the population would make an interesting study. Other species which are now prevalent (among the twenty most common species in native vegetation on Kangaroo Island) are the Galah and Australian Magpie. These have either substantially increased or have colonised the Island since European settlement. As Ford (1979) and Department of Environment & Planning (1986) have pointed out, other farmland birds such as the Crested Pigeon, Yellow-rumped Thornbill and introduced Spotted Turtledove and European Greenfinch are likely to become common species on the Island in future.

The native bird fauna of Kangaroo Island is typical of that part of south-eastern Australian where rainfall is between 500 and 900mm per annum. Although it is most similar to the Mount Lofty Ranges (Abbott, 1974) included in its avifauna are the Crimson Rosella *Platycercus elegans elegans* and White-eared Honeyeater *Meliphaga leucotis novaenorciae* which are absent from the nearby parts of the mainland. The latter is particularly interesting because unlike on the mainland it uses forested habitats on Kangaroo Island (e.g. riverine *E.cladocalyx*) and has calls more similar to the nominate subspecies of south-eastern Australia (see Pizzey, 1980).

Interesting exceptions to the typically south-eastern Australian bird fauna among the common species on Kangaroo Island (Table 68) are the Purple-gaped Honeyeater, Shy Heathwren, Western Whipbird and Yellow-rumped Pardalote. These are essentially mallee species, which are thought to have their origins in Western Australia, colonising eastwards since the last glaciation (Schodde, 1990).

Major differences between the bird fauna of Kangaroo Island and the nearby mainland are the absence of some common birds of stringybark vegetation types (White-throated Treecreeper, Buff-rumped Thornbill, Varied Sittella, Chestnut-rumped Hylacola, Yellow-faced Honeyeater, White-naped Honeyeater) from Kangaroo Island compared with the Mount Lofty Ranges, the absence of some common birds of coastal shrublands (White-browed Babbler, Spiny-cheeked Honeyeater, Singing Honeyeater and Grey Butcherbird) compared with the mainland and the scarcity of grassy eucalypt woodlands (*Eucalyptus leucoxylon, E. porosa, E.microcarpa, E.odorata*) and their associated birds (Ford & Paton 1975). The absence of the Weebill is also interesting because it occurs in both mallee and woodland habitats on the adjacent mainland

Bird Communities

The bird communities on Kangaroo Island are poorly defined compared with those of previous regional surveys in South Australia, where a dissimilarity between sites of 1.0 was sufficient to derive several groups (Robinson *et al*., 1988; Copley & Kemper, 1992). At this level of dissimilarity, Kangaroo Island's birds are divided into only two communities; those of vegetation types where the prominent upperstorey is 3m or above (open and low open forests, woodlands and low woodlands and open scrubs) and those where t he prominent upperstorey is 3m or less (open heaths, shrublands and low shrublands, plus low open woodlands widely distributed on the Island's less fertile, shallow or waterlogged soils or coastal sites exposed to salty winds; Baldwin & Crocker, 1941, Chapter x). The Island's bird communities are unlikely to be well defined because most of its native vegetation is structurally similar, predominated by eucalypt open scrubs and low woodlands with a dense, heathy understorey. Abbott (1974) suggested that Kangaroo Island's land-bird fauna comprises native habitat generalists, widespread throughout the island. He also proposed that some of the Island's birds may have adapted to exploit a wider range of habitats compared with populations on the adjacent mainland. Because birds specialised for feeding from bark (e.g. Varied Sittella, Crested Shriketit, treecreepers *Climacteris* and *Cormobates*) do not occur on Kangaroo Island, Keast (1968), Abbott (1974) and Ford (1976) have suggested some of the Island's populations of honeyeaters may have adapted both behaviourly and morphologically to better access this food resource. For example, on Kangaroo Island the Crescent Honeyeater, Eastern Spinebill, New Holland Honeyeater and Brown-headed Honeyeater have a longer bill while that of the Purple-gaped Honeyeater is shorter compared with mainland populations(Campbell 1906, Keast, 1968; Abbott, 1974; Ford, 1976).

The wide and even use of habitats by many species was demonstrated during the survey although similar surveys have not yet been conducted on the adjacent mainland for comparison. The most obvious example is the Purple-gaped Honeyeater, which is confined to mallee-heath vegetation types on the mainland, but inhabits (albeit infrequently) the riverine forests on Kangaroo Island. (Abbott, 1974; Ford & Paton, 1976; Baxter, 1989).

Alternatively, the lack of well defined bird communities on Kangaroo Island may reflect the comprehensiveness of the data. Few obvious groups are likely to be defined using data from only 113 sites. Secondly, many species on Kangaroo Island are likely to have been overlooked because of their secretive habits and the thickness of the vegetation. Although experienced observers are more likely to record them because they are familiar with calls (heard-only records contributed to almost half of their data and one third of the total bird records made during the survey), less experienced observers are more likely to record only the easily observed and ubiquitous species. Many of the difficult to observe birds are also rarer species with specialised habitats. In a region such as Kangaroo Island where the vegetation is relatively homogeneous, these species are important to define bird communities. In future surveys of birds in native vegetation within the agricultural regions of South Australia it will be important to employ observers competent to identify the calls of most of the species present.

Until similar surveys are conducted on Eyre and Yorke Peninsulas, the Mount Lofty Ranges and South-east of South Australia it is not possible to determine whether the bird communities on Kangaroo Island differ significantly from the mainland.

Association with vegetation types

One of the most useful aspects of the survey was to associate bird species with vegetation types. Unlike the bird communities derived from the PATN analysis, these associations are much easier to conceive and apply to the field.

Most of the common vegetation types on Kangaroo Island have bird species which are significantly associated with them. Disregarding *Eucalyptus diversifolia - E. cosmophylla - E. cneorifolia* low woodland, which is influenced by the proximity of cleared land, Sugar gum *E. cladocalyx* open forest has the most distinctive land bird fauna of the vegetation types on Kangaroo Island. *E. cladocalyx* is especially important because it supports extralimital (e.g. southern Flinders Ranges) or outlying (e.g. Eyre Peninsula – Carpenter in prep.) populations of south-eastern Australian birds in the drier parts of South Australia.

Relationships found between bird species or bird communities and vegetation types on Kangaroo Island were obscured because the selection of survey sites did not adequately take into account the mobility of birds. Survey sites were often located either within a vegetation type which covered only a small area, or near the edge (less than 100m), rather than in the centre of an extensive area. Hence the birds recorded were more often associated with the adjoining vegetation type or were ubiquitous species without specific habitat preferences (i.e. the sites selected did not adequately represent the less common species with specialised habitats). To ensure that the bird fauna is properly documented, future surveys should attempt to locate bird survey sites more towards the centre of a large area of each vegetation type.

SPECIES OF CONSERVATION SIGNIFICANCE

Only one species is known to have become extinct on Kangaroo Island, unfortunately its only endemic. Two others are considered endangered in South Australia. A further five species which inhabit native vegetation are considered vulnerable, one indeterminate and six rare.

Species extinct in South Australia

Kangaroo Island Emu (*Dromaius baudinianus*).

Recently renamed following some confusion over its taxonomy (Parker 1979 & 1984), *D.baudinianus* is extinct. Observed and collected by explorer Nicholas Baudin in summer 1801-2, the species was no doubt easily persecuted because of its tameness (in the absence of predators) and dependence on freshwater for drinking, a resource limited during extended dry periods (Ashby 1924). Sealers who lived on the island before the official European settlement of South Australia seem to have hunted this species to extinction, as none were observed following settlement of the island in 1836.

Species endangered in South Australia

Glossy Black Cockatoo (*Calyptorhynchus lathami*) (Fig. 115).

Recently described to sub-species (Schodde *et al*. 1993), *C. lathami halmaturina* breeds only on Kangaroo Island and once visited the adjacent Fleurieu Peninsula and southern Eyre Peninsula during summer in search of food (seeds of Drooping sheoak *Allocasuarina verticillata*). Joseph (1982) estimated the population at 150 including 30 breeding pairs. It favours steep gullies with Sugar gum *E. cladocalyx* and South Australian Blue gum *E. leucoxylon* for nest sites and disperses over the rest of the island to feed. Competition for suitable nest sites with other cockatoos (Little Corellas have increased up to several hundred since the first report in the 1970s - Baxter 1989) and feral honeybees is a major concern. The species' conservation requirements, particularly breeding success and food availability, are subject to ongoing study.
During the survey *C. lathami* was recorded at two survey sites, two birds roosting in Sugar gums at Breakneck River (WB03) and three on the eastern boundary of Flinders Chase (FB02). Incidental records were also from American River.

In 1993, work began to develop a species recovery plan for the Glossy Black Cockatoos on Kangaroo Island. The most recent version of this plan (Garnett *et al*., (1998) has the following overall objectives:

1) To ensure that a viable population of Glossy Black Cockatoos persists in South Australia
2) To shift the status of the Glossy Black Cockatoo from Critically Endangered to vulnerable within 10 years (ie. By 2009).

This is to be achieved by efforts:

1) To protect all known Glossy Black Cockatoo nest sites from nest predators and competitors
2) To establish a group of volunteers with skills necessary to support the recovery process.
3) To increase the Glossy Black Cockatoo Population to 250 individuals by 2004.
4) To protect existing and expand potential feeding and nesting habitat.

Further details are beyond the scope of this report, but annual censuses of the population suggest that recovery is beginning. Monitoring in 1996 and 1997 showed no decline in the population and a very slight percentage increase to slightly over 200 birds. The most recent monitoring in 1998 was very encouraging with 39 chicks successfully fledged and approximately 240 birds counted. Post-fledging mortality is known to be high in the birds first year, but everything seems at present to be heading in the right direction for successful recovery of this special Kangaroo Island bird.

Figure 115.
A pair of Glossy Black Cockatoos (*Calyptorhynchus lathami*) feeding in the canopy of a Drooping Sheoak tree. Photo L. Pedlar.

Figure 116.
A Bush Stone-curlew (*Burhinus magnirostris*) stands guard over its chick. **Photo NP&WSA**

Bush Stone-curlew(*Burhinus magnirostris*) (Fig 116).

Once widely distributed on mainland Australia, *B.magnirostris* has declined so dramatically since European settlement, probably due mainly to habitat loss and predation by foxes, that it is now considered endangered in South Australia. Kangaroo Island's population is not known to have declined and remains the largest in the State, probably because of the absence of foxes and presence of large patches of scrub for day-time cover (Baxter, 1989).
During the survey stone-curlews were recorded at four survey sites (in Sugar gum open forest) and also frequently observed on roads at night. This habit may explain that sixteen of the South Australian Museum's 30 South Australian specimens of this species are recent road-kills from Kangaroo Island. Research work is currently in progress on the ecology of the population on Kangaroo Island (Gates pers. comm., 1999)

Species vulnerable in South Australia

Painted Button-quail (*Turnix varia*).

With the absence of foxes from Kangaroo Island it is surprising that *T.varia* was reported only twice, at site DU12 on Dudley Peninsula and near Tandanya in the west. Baxter (1989) found the species widespread on the island wherever large tracts of mallee still remain.

Its preferred woodland habitats, now much reduced and degraded on the adjacent mainland, are not common on Kangaroo Island.

Brown Quail (*Coturnix ypsilophora*).
.
The status on Kangaroo Island of this secretive species of swampy areas is poorly known. It has been recently reported (mostly by call) in Flinders Chase National Park (Baxter 1989). It was not reported during the survey.

Lewin's Rail (*Rallus pectoralis*).

R. pectoralis is a secretive species of dense freshwater swamps. On Kangaroo Island there are several reports from swamp vegetation, mostly in Flinders Chase National Park (Baxter, 1989). During the survey (7/11/90) a bird flushed by a bushfire sheltered under a vehicle adjacent Shackle Road in Flinders Chase National Park

Figure 117.
A Yellow-tailed Black Cockatoo (*Calyptorhynchus funereus*) on its nesting tree, a fire-killed stringybark. **Photo P. Canty.**

Figure 118.
The Rock Parrot (*Neophema petrophila*) is common around the coast of Kangaroo Island. Photo P. Canty.

Latham's Snipe (*Gallinago hardwickii*).

Small numbers of this non-breeding migrant feed in muddy areas dense vegetation associated with freshwater swamps and rivers on Kangaroo Island, especially in Flinders Chase National Park (Baxter, 1989). During the survey (21/10/90) a snipe was flushed from a dense Prickly teatree *Leptospermum continentale* swamp 5.5 km SE Cape Forbin (Site SC05).

Yellow-tailed Black-Cockatoo (*Calyptorhynchus funereus*) (Fig 117).

Although threatened generally in South Australia due to competition for nest sites, a low recruitment rate and clearance of habitat, the population on Kangaroo Island is probably secure at this stage.

Recorded at 11 survey sites across the island, *C. funereus* was characteristic of low woodlands and mallee with a heathy understorey (Group 3) but was not significantly associated with any particular vegetation type. During summer it breeds in riverine Sugar gum open forest in the west, later dispersing to vegetation types where banksias (a major food source) are common, especially the stringybark associations of the lateritic plateau (Baxter 1989). Flights across Backstairs Passage to the southern Mount Lofty Ranges have been observed during winter (Blakers *et al*. 1984).

Species indeterminate in South Australia

Elegant Parrot (*Neophema elegans*).

Although widely reported from South Australia, the status of *N. elegans* is obscure due to its secretive nesting habits, irregular seasonal movements and misidentification with similar members of the genus. Reports of small numbers from September - March led Baxter & Parker (1981) to suspect *N. elegans* breeds on the lateritic plateau of western Kangaroo Island.

Most identifications during the survey lack adequate supporting information, possibly being confused with *N. petrophila* (Fig 17), a regular post-breeding visitor to the island's coast (Baxter 1989). Records of small numbers during the survey at Larrikin Lagoon and Vivonne Bay provided no evidence of breeding.

Species rare in South Australia

Cape Barren Goose (*Cereopsis novaehollandiae*).

Populations of Cape Barren Geese were reduced to low numbers early this century due to human persecution (Robinson *et al*. 1982). Baxter (1989) cites one record of *C. novaehollandiae* on Kangaroo Island prior to the deliberate introduction of pinioned birds to a cleared area around Rocky River HS at Flinders Chase from 1923 to 1935 (Condon 1948, Robinson *et al*. 1982, Parker *et al*. 1985). This free-flying population now numbers about 800, dispersing to eastern end of the island and the lower Murray region during summer (Parker *et al*. 1985, Baxter 1989, Delroy *et al*. 1989). Banding recoveries also reveal that some birds from the Sir Joseph Banks group east of Port Lincoln disperse to Kangaroo Island (Delroy *et al*. 1989).

Baillon's Crake (*Porzana pusilla*).

A nest with four eggs at Larrikin Lagoon (Carpenter 1996) during the survey is the third breeding record from the Island and the first outside Lashmar's Lagoon on Dudley Peninsula. The record suggests that *P. pusilla* is a regular breeding visitor to Kangaroo Island.

Shining Bronze-cuckoo (*Chrysococcyx lucidus*).

A spring-summer visitor to the wetter parts of South Australia, *C. lucidus* favours the forest and tall mallee vegetation types on Kangaroo Island (Baxter 1989). In the absence of supporting information some Horsfield's Bronze-cuckoos *C. basilis* were probably mis-identified during the survey as *C. lucidus*. Of the nine records from survey sites, three were from *E. cladocalyx* open forest and three from *E. baxteri - E. cosmophylla* low woodland vegetation types.

White's Thrush (*Zoothera lunulata*) (Fig. 119).
Reported only once during the survey (an opportunistic record from Rocky River in Flinders Chase), *Z.lunulata* is relatively widespread along the forested river margins in the west and in taller coastal mallee with an open understorey, but is easily overlooked due to its secretive habits (Baxter 1989). With the absence of foxes, scarcity of the closely related Common Blackbird (recorded at only one site, CR12, during the survey) and extensive areas of suitable habitat reserved in Flinders Chase, the Kangaroo Island population remains the most secure in South Australia.

Western Whipbird (*Psophodes nigrogularis*) (Fig. 120).

Rediscovered in South Australia by Hal Crouch on Kangaroo Island in 1967, Western Whipbirds were subsequently found (based on their loud, distinctive call) to be widespread in undisturbed parts of Kangaroo Island (Condon 1966). Its longer bill and deeper grey plumage distinguish the endemic Kangaroo Island subspecies *P. n. lashmari* (Schodde & Mason 1991). Rarely observed, whipbirds were heard at ten survey sites, with incidental reports from Cape Gantheume and Vivonne Bay on the south coast. Its significant association with *E. diversifolia - E. rugosa* open scrub with a dense shrub understorey concurs with Baxter's (1989) description of its main habitat on the Island.

Southern Emu-wren (*Stipiturus malachurus*).

Although not recognised by Parker & Horton (1990), Schodde (1982) lists four morphologically distinct subspecies in southern South Australia, with *S. m .halmaturina* endemic to Kangaroo Island. Reported from eight survey sites, this subspecies characterises the bird community of coastal heaths (this survey, Baxter 1989) which are well conserved on the island.

Beautiful Firetail (*Stagonopleura bella*).

Reported at 12 widely distributed survey sites, *S. bella* probably has its largest population in South Australia on Kangaroo Island. Its significant association with *Eucalyptus baxteri-E. cosmophylla-E. remota* low woodlands - open scrubs of the inland plateau concur with the major habitats described by Baxter (1989).

Figure 119.
White's Thrush (*Zoothera lunulata*), a delicately marked bird and secretive bird. Photo SAOA.

Figure 120
The Western Whipbird (*Psophodes nigrogularis*) is rarely seen but can be identified by its distinctive call. **Photo SAOA**.

Species whose status is poorly known on Kangaroo Island

Further field surveys are needed to assess the status on Kangaroo Island of the following species, most of which are relatively common on the nearby parts of Fleurieu Peninsula.

White-naped Honeyeater (*Melithreptus lunatus*).

Reports of small numbers of White-naped Honeyeaters at Cygnet River (site CR12) and Stunsail Boom (site ST05) supports Baxter's (1989) observations, but does not reveal any further detail on the species on the Island.

Spotted Pardalote (*Pardalotus punctatus*).

P. punctatus intergrades with *P. xanthopygus* over much of 500 - 800mm rainfall areas of South Australia, including Kangaroo Island. Although *P. xanthopygus* is widespread through mallee habitats on the island (Baxter, 1989; this survey), Baxter (1989) also lists *P. punctatus* from Kangaroo Island based on specimen records. This species was not positively identified on the survey.

Tawny Frogmouth (*Podargus strigoides*).

P.strigoides has been reported only once from Kangaroo Island, in Flinders Chase (Ford, 1979; Baxter, 1989). Its subspecific status is unknown.

Spotted Nightjar (*Eurostopodus argus*).

Baxter (1989) lists three records (including a specimen in the SA Museum) of *E. argus*, all from Dudley Peninsula.

Sacred Kingfisher (*Halcyon sancta*)

Mostly a spring-summer visitor in low numbers to Kangaroo Island (Baxter, 1989), *H. sancta* was but not reported during the survey.

Yellow Thornbill (*Acanthiza nana*).

Baxter (1989) lists a few reports of *A. nana* from Drooping sheoak *Allocasuarina verticillata* low woodland from eastern Kangaroo Island, but none were observed during the survey.

Other species of conservation significance on Kangaroo Island

Several other birds of conservation significance occur in habitats on Kangaroo Island not specifically included in this survey, comprising waterbirds (Blue-billed Duck, Eastern Reef Egret, Sanderling, Eastern Curlew, Hooded Plover, Fairy Tern, Australasian Shoveler and Freckled Duck) and cliff-nesting raptors (White-bellied Sea-Eagle, Peregrine Falcon, Osprey). Their status and abundance on the Island are discussed by Baxter (1989). Further details are provided for the following:

Freckled Duck (*Stictonetta naevosa*).

S. naevosa occurs mostly as a non-breeding summer visitor to the south of South Australia, occasionally in large numbers (Parker *et al.*, 1985; Norman & Horton, 1993). Up to 2,800 occurred on a small freshwater lagoon 35km SSW Kingscote from July to December 1980 (Baxter 1981).

Hooded Plover (*Charadrius rubricolllis*) (Fig 121).

Kangaroo Island supports a breeding population estimated at 50-60 pairs (Bransbury 1988) which are distributed throughout 125km of sandy beaches. Because the species mostly nests on the foreshore between November - December, increasing recreational use of sandy beaches can reduce breeding success (Buick & Paton, 1989).

White-bellied Sea-Eagle (*Haliaeetus leucogaster*).

Kangaroo Island supports about 16 (33%) of South Australia's breeding pairs of White-bellied Sea-eagles (Dennis & Lashmar 1996). Falkenberg *et al*. (1991) investigated a possible link between apparent reduced productivity of coastal raptors on the island and organochlorines. Although high levels of organochlorine contamination were found in potential prey (Feral Pigeon and Silver Gull), levels in raptor egg-shells were not sufficient to reduce breeding success. Disturbing nests, particularly when eggs were present (November-December), was most detrimental to breeding success.

Figure 121.
At least one pair of Hooded Plovers (*Charadrius rubricollis*) can be seen on most of the sandy beaches around the coast of Kangaroo Island. **Photo P. Canty.**

REPTILES & AMPHIBIANS

by D. M. Armstrong[1]

INTRODUCTION

Although it is a relatively large island, the reptile fauna if Kangaroo Island is not as diverse as the adjacent mainland. Some species however occur at significantly higher population densities, making Kangaroo Island particularly important for their conservation.

APPRAISAL OF SPECIES RECORDS PRIOR TO THE SURVEY

Prior to this survey the collections of the South Australian Museum contained 980 specimen records of 19 species of reptiles. This has now increased to 1331 records. The current (mid 1998) distribution of these records is shown in Fig. 122.

Figure 122.
Distribution of reptile specimens collected on Kangaroo Island to mid-1998.

The earliest published account of the reptile and amphibian fauna of Kangaroo Island is that of Waite (1925). Since that time there have been a large number of taxonomic changes and our overall understanding of the biogeography of the South Australian fauna has increased enormously. Houston and Tyler (1979) updated the taxonomy of Waite's species list and commented on some of his more doubtful records. In addition to the original natural reptile fauna of the island the Fauna and Flora Board attempted to introduce three species, the Shingleback (*Tiliqua rugosa*) the Common Blue-tongue (*Tiliqua scincoides*) and an unknown species of tortoise. Only the first of these introductions appears to have had limited success but no Shinglebacks have been reported on Kangaroo Island since the 1960's. A more recent probable introduction is that of the Bearded Dragon (*Pogona barbata*) to the Kingscote district.

While the 1990 biological survey did not record any new hepetological species for the region, it did greatly expand knowledge of the distribution of most species within the island and assist in clarifying their status.

TOTAL REPTILE AND AMPHIBIAN FAUNA

Kangaroo Island is now known to support 20 species of reptiles, two of which are introduced, and six species of amphibians (Appendix X). The assemblage of reptile species consists of two snakes, two dragon lizards (one native, one introduced), two geckoes, one legless lizard, eleven skinks, one goanna and one tortoise species (introduced). Three species of marine turtle are regarded as occasional visitors to the seas around the island.

PATN analysis was performed on the survey data, but due to the relatively low number of species present and the wide range of habitats in which at least some species were found, the results were uninformative and are not presented here. The following summary will therefore concentrate on updating the previous understanding of the Kangaroo Island herpetofauna as presented by Waite (1927) and Houston (1979), to incorporate current taxonomy and the records gathered during the 1990 survey.

Prior to this survey, herpetological records had largely been gathered during visits to the island by a handful of collectors concentrating on the more easily accessible areas of the island. These included the area around American River and Pelican Lagoon in the east (Schwaner and McKelvey in the 1980's), and along the main road to the southern areas of Flinders Chase. These collectors also often targeted particular species. The systematic approach of the 1990 survey, was significantly different and has therefore greatly increased the number and distribution of records for most species.

Because there are such a small number of reptile species recorded for the island, a full account of each species has been provided below.

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SNAKES

Elapidae (Front-fanged Snakes)

Pygmy Copperhead (***Austrelaps labialis***) (Fig. 123)
This species is widespread and relatively common on Kangaroo Island, in contrast with the remainder of its range, in the southern Mount Lofty ranges and Fleurieu Peninsula, where habitat destruction through land clearing for farming and urban development has led to it becoming increasingly rare.

Figure 123.
The Kangaroo Island populations of the Pygmy Cpperhead (*Austrelaps labialis*) are important for the conservation of this endemic South Australian species. **Photo A. Robinson.**

Tiger Snake (***Notechis ater***)

Growing up to 1.5 m this is the largest of the three snake species currently confirmed as resident on Kangaroo Island. It is common and widespread throughout and may be found in most habitat types. Whilst the islands populations of tiger snakes are highly variable, the majority of specimens encountered are of the melanistic or black form. Pending a review of the taxonomy of Tiger Snakes, all are presently regarded as one species.

Little Whip Snake (*Suta flagellum*)

Two specimens of *Suta flagellum* from Kangaroo Island, were claimed to exist by Houston and Tyler (1979). Recent investigation has found that in fact there is only one specimen in the records of the South Australian Museum, and that it was collected, or at least registered in 1913, from near Hog Bay. There is no evidence to substantiate the existence of the second specimen, stated to be from Kelly Hill. Strangely, Waite (1927) made no mention of the existence of S. *flagellum* on Kangaroo Island, so was apparently unaware of the existence of the Hog Bay specimen. In 1980 or 1981, an experienced observer (S. Berris pers. comm.) observed two individuals of this species on his property just E of Salt Lagoon. One was on the lawn and the other was under a heap of timber. This part of the island needs to be properly searched and a representative modern specimen of this species should be lodged in the collections of the South Australian Museum.

LIZARDS

Agamidae (Dragons)

Tawny Dragon (***Ctenophorus decresii***)

This specialist rock dweller appears to be largely confined to the western end of the island, where it may be seen along the rocky coastal cliffs and in the steep ravines which lead inland along the larger water courses of Flinders Chase. One record at Stokes Bay on the north coast, indicates a wider distribution

Eastern Bearded Dragon (*Pogona barbata*)

This species is a recent introduction to Kangaroo Island. All known recordings have been in the general area of the largest human occupation centre at Kingscote, since the late 1970's. Escaped or released pets appear to have established a self sustaining wild population in the farmland surrounding Kingscote, which closely resembles the open woodland preferred by *P. barbata* on the adjacent mainland. Much less of this habitat existed on Kangaroo Island prior to land clearing for farming, mostly by soldier settlers, following the Second World War. No specimens have been observed in the uncleared areas of the island, or at any great distance from Kingscote (Cygnet River being the furthest to date). It is highly unlikely that this large, active, diurnal species could have remained undetected for so long, a human assisted introduction therefore seems the logical conclusion. Certainly, *P. barbata* must now be considered an established Kangaroo Island resident.

Geckonidae (Geckoes)

Marbled Gecko (*Phyllodactylus marmoratus*)

This is the only arboreal species of the two geckoes known from Kangaroo Island. However it is most commonly found, often in large numbers, in association with coastal areas of exposed limestone where as many as seven individuals have been discovered sheltering under a single large rock. While *P.marmoratus* may be found under bark on larger trees, such areas are not extensive on the island. It is rarely found in the dense low scrub of the western parts of the island, except in association with rock outcrops.

Barking Gecko (*Nephrurus milii*)

In similar fashion to the more arboreal *P.marmoratus*, this larger terrestrial gecko is most often found in association with large areas of exposed limestone, particularly on the coast. It is likewise less common inland, where it occurs in the drier more open areas, away from the wetter western plateau.

Pygopodidae (Legless Lizards)

Lined Worm-lizard (*Aprasia striolata*) (Fig. 124)

This is the only species of legless lizard recorded for Kangaroo Island. It is a small cryptic species that is rarely encountered unless actively searched for, when it can be found sheltering under stones, litter or fallen timber. Although called the Lined Worm-lizard a large proportion of Kangaroo Island specimens are plain or unmarked. While it has a broad distribution across the island, with no apparent barriers to its east-west distribution created by altitude or rainfall, it is scarce in the extreme north of the island. It was only recorded north of the Kingscote to Cape Borda road, for the first time, during the 1990 survey. Possibly this relates to the shallow drier soils associated with the more open woodland and sparse ground cover, which is more prevalent in this northern area.

Figure 124.
The Lined Worm-lizard (*Aprasia striolata*) is one of the most widespread reptiles on Kangaroo Island. **Photo A. Robinson.**

Scincidae (Skinks)

Eastern Three-lined Skink (*Bassiana duperreyi*)

Previously listed as *Leiolopisma trilineata* (Houston 1979), recent taxonomic revision has redescribed eastern Australian populations as *B. duperreyi*. Known from only a handful of specimens collected on the island prior to the 1990 survey, when a further 15 locations were recorded, this species is now known to be more common, particularly in the southern and western areas of the island, where the larger areas of undisturbed native vegetation occur.

Bull Skink (***Egernia multiscutata***)

Known from only four locations prior to the 1990 survey, during which a further seven locations were recorded. These were mostly in coastal areas with compacted soils providing suitable substrate for digging the burrow systems in which *E. multiscutata* lives. This species is abundant in similar habitat on many smaller off-shore islands. It is therefore another Kangaroo Island species for which further investigation of suitable habitat may considerably extend its distribution on the island.

White's Skink (*Egernia whitii*)

Similar in body shape and size to *E. multiscutata*, but slightly more slender and with a longer tail and less robust head. This species is found in a much wider variety of habitats, often sheltering under rocks. It is therefore more commonly seen and more widely distributed across the island.

Three-toed Earless Skink (***Hemiergis decresiensis***) (Fig. 125)

The 1990 survey tripled the number of recorded locations for this species on Kangaroo Island to 21, almost all in the northern parts of the island. However it still remains far less common and more restricted in distribution than the slightly larger *H. peronii*. This pattern is duplicated on the adjacent mainland where *H. decresiensis* is common in the Mount Lofty Ranges, but *H. peronii* is found throughout most of the remainder of the agricultural lands in South Australia, and is the only species present on many of the smaller offshore islands. The mainland areas where *H. decresiensis* is abundant and the recorded locations an Kangaroo Island are predominantly open "parkland" style woodland with grassland understorey. It therefore appears that *H. decresiensis* prefers more open habitat, which historically was rare on the island, whilst *H. .peronii* is more at home in denser understorey types.

Figure 125.
The Three-toed Earless Skink (*Hemiergis decresiensis*) is less common than the closely related *H. peronii* on Kangaroo Island. **Photo A. Robinson.**

Four-toed Earless Skink (***Hemiergis peronii***) (Fig. 126)

This crepuscular skink is extremely common and widespread on Kangaroo Island. It is found in a variety of habitats, under rocks and fallen timber, and amongst plant litter of all types, most often in well vegetated areas.

Figure 126.
The Four-toed Earless Skink (*Hemiergis peronii*) is widespread and found in a variety of habitats, living in litter and inside rotting timber. **Photo A. Robinson.**

Garden Skink (*Lampropholis guichenoti*)

This is by far the most commonly observed and widely distributed of the smaller skinks seen on the island. It is found in most heathland and shrubland communities and the understorey of most denser woodland communities. Examination of several specimens previously attributed to L. delicata, which is extremely similar in most characteristics, has determined that they are in fact *L. guichenoti*, resulting in the removal of *L. delicata* from the list of reptile species on Kangaroo Island.

Bougainville's Skink (***Lerista bougainvillii***)

In similar fashion to the *Hemiergis* species , this second genera of slender crepuscular skinks is represented on Kangaroo Island by two species, one widespread and abundant (*L. bougainvillii*), the other more restricted and poorly known (*L. dorsalis*), particularly prior to the 1990 survey. In this case *L.bougainvillii* is the more common. It is found under rocks or fallen timber, and in leaf litter in areas of generally well drained soils. The reduced limbs and flexible body of this species makes it well adapted to its life in loose soil and among the leaf litter. Its mode of reproduction was first investigated by Smyth and Smith (1974) who reported that it was oviparous, in other words it laid eggs. As currently understood the species *Lerista bougainvillii* ranges from extreme southern Eyre Peninsula eastwards across southern South Australia, Victoria and up the western slopes of the dividing range to Bundarra in north-eastern New South Wales. It is also found on a number of islands including Kangaroo and Tasmania. Examination of museum specimens from a part of this range (Qualls et al. 1995) found that populations from mainland South Australia and western Victoria were oviparous as reported by Smyth and Smith (1974) for the Adelaide population. Populations from the eastern Bass Strait islands and Tasmania however appear to give birth to live young, they are viviparous. Examination of gravid females from Kangaroo Island showed that young were enveloped in the transparent membranes indicating viviparity.

Southern Four-toed Slider (***Lerista dorsalis***)

The first Kangaroo Island specimen, and species paratype, was collected in 1971. Together with two other locations from the 1980's, *L. dorsalis* was only known from the area around the neck of the Dudley Peninsula, until the survey of 1990. The eight further locations from this survey, and four others recorded by A. Herbert in 1995, have all been in deep loose coastal sand in the eastern half of the island. Apart from two locations on the north coast, the majority have been in the south, between Vivonne Bay and Seal Bay on one side, and D'Estrees Bay on the other side of Cape Gantheume. This suggests that the largely inaccessible areas of sand dunes in the Cape Gantheume Conservation Park may well be ideal habitat for this species.

Dwarf Skink (***Menetia greyi***)

The fact that this smallest of all Australian skink species should not have been recorded on Kangaroo Island until 1980, is as much due to the lack of visits to the island by keen herpetologists, as to it's diminutive size. However, it's current known distribution, with specimens recorded in two separate clusters, around Pelican Lagoon, and in the central north of the island, reflects the distribution of the naturally occurring grassland and open woodland with grassland understorey, on well drained soils, which are the preferred habitat of *M.greyi*. An observation of *M.greyi* by Schwaner and Miller at Harvey's Return at the north-western end of the island indicates that further investigation of similar habitat will undoubtedly extend it's distribution on the island.

Mallee Snake-eye (***Morethia obscura***)

Whilst similar in size and basic feeding behavior to *L guichenoti*, in that it is also a small ground foraging skink, amongst surface litter, often in the open, it is less widely distributed. Usually it is found in drier, more open woodland. On Kangaroo Island this holds true, with all locations recorded in lower rainfall areas, the majority in the southern and eastern areas, away from the higher rainfall and more densely vegetated areas of the western plateau.

Southern Grass Skink (***Pseudemoia entrecasteauxii***)

This is the least known reptile species recorded on Kangaroo Island, with only six specimens known from five locations. All but one were collected during the 1980's. The first was collected by members of the Tate Society of the University of Adelaide, somewhere in Flinders Chase in 1940, when it was claimed to be a new record for the island. No new locations were found during the 1990 survey, nor have any been recorded since.

In other areas on the mainland, where this species is common, it is frequently found in native grasslands and dense low vegetation bordering swampy ground. It is possible that such areas were under represented during the 1990 survey and future investigation of remnants of this habitat may provide further locations.

Varanidae (Goannas)

Heath Goanna (***Varanus rosenbergi***) (Fig. 127)

Very common and frequently encountered on Kangaroo Island, where it is the largest endemic terrestrial predator and may often be seen crossing or scavenging along roads. Again, as mentioned for the Pygmy Copperhead, this is in stark contrast with the remainder of its range on mainland South Australia, the south-east and southern Eyre Peninsula, where it is now extremely rare, largely due to extensive clearing of its preferred heathland habitat.

In November 1966 a two year field study was begun of water and electrolyte metabolism of the population of monitors (then known as *Varanus gouldii*) around the rocky River research station in Flinders Chase (Green 1969, 1972). This involved the use of two techniques that were then quite new, the measurement of water turnover in the field by the use of a known injection of tritiated water, and the attachment of a radio transmitter. This enabled the marked *V. rosenbergii* to be recaptured. Their rate of water turnover could then be measured in a blood-sample by the dilution of radioactivity from the original tritiated water injection. As might be expected it was found that rates of water loss showed a marked seasonal cycle with rates of water loss being highest in summer and lowest in winter.

Figure 127.
The Heath Goanna (*Varanus rosenbergii*) population on Kangaroo Island is extremely important for the conservation of this species which has suffered significant declines on the mainland of South Australia. **Photo D. Armstrong.**

Work on this study area was continued by King (1977) and this resulted in the accumulation of a significant amount of data on movements of a number of marked *V. rosenbergii* which were tracked for varying periods between 1967 and 1972. These data were synthesized by Green and King (1978). They found that individual *V. rosenbergii* sheltered in one of several shallow burrows during the night. On Kangaroo Island thirteen individuals that had been captured at least five times revealed that home range size varied considerably but the mean value was relatively small for a lizard of this size at about 20 ha. There was considerable overlap between home ranges and, the same burrow was often used by different animals on different nights. The animals were found active outside their burrows during the day throughout the year in suitable weather although the duration of activity periods was greatest during summer.

Work on *V. rosenbergii* is continuing on Kangaroo Island, and it has recently been found that, as in the Lace Monitor (*Varanus varius*), at least some individuals lay their eggs in active termite mounds. This raises the intriguing possibility that the newly hatched young, may have to be dug out by their mother.

Tortoises

Chelidae (Fresh -water Tortoises)

Common Long-necked Tortoise (*Chelodina longicollis*)

The records of the Fauna and Flora Board show that two tortoises of unknown species were introduced to Flinders Chase in 1946. Minutes from an earlier Fauna and Flora Board meeting, on October the 9th 1934, mention a report of a tortoise on Border Road, although there was no record of their introduction at that time.

In more recent years reports of long-necked tortoises have come from National Parks and Wildlife Service rangers, working in Flinders Chase. These include a hatchling seen at Fire-tail Flat in the early 1980’s, and an adult observed laying eggs at Rocky River Water Hole in December 1997 (C. Baxter, pers.com.). Whatever their origin, although it does seem that the Fauna and Flora Board had some hand in it, and despite the absence of museum voucher specimens, *C. longicollis* is certainly established in some of the more permanent waterways of Flinders Chase.

FROGS

Tthe six species of frogs known from Kangaroo Island are found in broadly distributed locations across the island, and have extensive distributions in southern and south-eastern Australia. Prior to the 1990 survey most were only officially recorded from a relatively small number of sites on the island. The number of recorded locations for the most extreme example, *Neobatracus pictus* (the Painted frog), increased from four to 21. Despite the increase in recorded locations for each species, their cross island distribution and seasonal breeding activity, means that the frequency with which each species was encountered during the survey is not necessarily indicative of their relative abundance or status. However, when combined with all other known records of Kangaroo Island frogs, all six can be regarded as widespread and secure there. Notes on their general habits and behaviour are found in Houston and Tyler (1979).

DISCUSSION

None of the above reptile species are unique to the island. All are found on the adjacent mainland. In fact there are more species of reptiles present in similar sized mainland areas. This is largely due to the timing of the separation of Kangaroo Island from the mainland, following the most recent glacial period, approximately 10,000 years ago, when the current adjacent mainland species diversity did not exist. The majority of these adjacent mainland species not found on the island are more arid adapted and have diversified and extended into the area as more xeric conditions which have developed since the glacial period. The absence of any of the numerous species of the skink genus Ctenotus and the paucity of dragons, both of which reach their greatest species densities in much hotter climates is indicative of this.

Whilst most of the Kangaroo Island reptile species were confirmed by the 1990 survey to be common and widespread or at least common in areas of suitable habitat and should be considered secure there, several species are worthy of further interest. Both *A.labialis* and *V.rosenbergi* are significant in having by far their highest population densities on Kangaroo Island. This is due in most part to the greater proportion of intact habitat still remaining, and particularly in the case of *V.rosenbergi* to the absence of the fox as both a predator and competitor.

The status and distribution of *P.entrecasteauxii* and to a lesser extent the restricted distribution of *C.decresii* are in need of further investigation. However, location and searching of areas of their preferred habitat should improve this situation.

Clarification of the extent of the current distribution of the introduced *P.barbata* and *C.longicollis* and monitoring of their future expansion should be considered. Likewise, the potential for other non resident reptile species to establish feral populations on the island should be assessed, with a view to preventing their occurrence.

Whilst it seems highly doubtful that any other indigenous Kangaroo Island species could now be discovered, the possibility should no be totally discounted. Examination of records indicates that at least two large areas on the island are still in need of more thorough investigation. The sand dunes of Cape Gantheume and the central areas of Flinders Chase are only accessible on foot and as yet have received no systematic trapping or sampling effort.

OTHER REPTILE RECORDS

Several other species of reptiles that have been mentioned in the literature or recorded as occurring on Kangaroo Island, can now not be substantiated. Some of these (Waite 1927) were obviously incorrect identifications or have been the subject of taxonomic changes, or even attributed to incorrect locations during the early part of the 1900's. Others listed by Houston and Tyler (1979) are discussed below with explanations for their removal or absence from the list of recognised Kangaroo Island herpetofauna.

Tympanocryptis lineata (the Five-lined Earless Dragon) was included amongst Kangaroo Island fauna by Waite (1927) on the basis of a reference published in the Catalogue of the British Museum in 1885. It was also listed by Houston and Tyler (1979), with a question mark against it, probably on the basis of Waite's reference. Considering the effort put into pitfall trapping and physically searching for reptiles and other small vertebrates, both during the 1990 survey and since, with no specimens of *T.lineata* being found, the original reference must be considered in error and it should be removed from the list of Kangaroo Island reptiles.

In the same fashion, *Eulamprus quoyii* (the Eastern Water-skink) was listed by both Waite (1927) and Houston and Tyler (1979), without any supporting specimens by both, and with a question mark by the later. Likewise, due to the lack of specimens, despite considerable search effort in recent years, it to must also be deleted from the list of Kangaroo Island species.

As has previously been stated, examination of specimens in the South Australian Museum, originally identified as *L. delicata* (the Delicate Skink) from Kangaroo Island, have recently been determined to be of the similar *L.guichenoti* (the Garden Skink). Identification of the considerable number of skinks of this type encountered during the 1990 survey as *L.guichenoti* adds weight to the decision to also remove *L.delicata* from any list of Kangaroo Island species.

Two well known species of large skinks, common on the adjacent mainland were thought to be possibly present on Kangaroo Island by Houston and Tyler (1979), resulting from introductions to Flinders Chase by the Fauna and Flora Board. These authors, based on information from Waite (1927) stated that about 100 *Tiliqua rugosa* (the Sleepy Lizard) were introduced to Flinders Chase in 1926. Examination of a "Summary of the Biologically Relevant Sections of the Minutes of the Fauna and Flora Board of South Australia 1920-72", confirmed that 50 specimens were released in 1926. It was intended at that time to release more at a later date, although whether this further release ever occurred is not known. The ranger's report dated 12th February 1948 stated that they were "still there, seen every summer."

Recent inquiries with National Parks and Wildlife Service staff who have worked at Flinders Chase since that time have confirmed that they in fact were seen around the Rocky River Homestead up into the early 1960's. They were known to have bred there until around that time, juveniles being observed on a regular basis. (George and Joyce Lonzar, pers. com.). Why they have disappeared is unknown, but none have been sighted in recent years, despite the large increase in park staff and visitation since then.

Houston and Tyler (1979) also stated that "Bluetongues were apparently introduced at some time later." Unfortunately, no evidence to support this was found in the Fauna and Flora Board minutes, and no National Parks and Wildlife Service staff could recall seeing *Tiliqua scincoides* (the Eastern Bluetongue) in Flinders Chase. It would therefore appear that this introduction did not occur, or if it did that it was not successful to any notable degree. However, there have been two specimens collected and several others seen by National Parks and Wildlife Service staff in the Kingscote area in the 1990's. These are almost certainly escaped pets and it seems probable that they could establish a self sustaining "feral" population in the same manner as *P.barbata*, if this is not already the case. As yet there is insufficient information to include *T.scincoides* as a resident of Kangaroo Island.

Houston and Tyler (1927) suggested the possible existence of *Delma molleri* (the Adelaide Snake-lizard) on Kangaroo Island, based on the inclusion of *Pseudodelma impar* by Waite (1927) as "the only member of the family identified from the island." Considering the general similarity of *P.impar* to *A. striolata*, and the primitive state of reptile taxonomy in Waite's time, it is more likely that he confused the two and was in fact referring to *A.striolata*, and that there are therefore no grounds for any *Delma* species occurring on the island. That no specimens were found during the 1990 survey, or at any other time, confirms this.

Examination of the single South Australian Museum specimen of *Pseudechis porphyriacus* (the Red-bellied Black Snake) from Kangaroo Island, by Schwaner (1984), discovered that it was in fact a colour variant of *N.ater*. Further inquiries with all other Australian museums, and examination of other similar snakes on the island also failed to provide any specimens of *P.porphyriacus* , leading Schwaner to conclude that ed-bellied black snakes on Kangaroo Island are not *P.porphyriacus* but red-bellied melanistic tiger snakes (*Notechis scutatus/ater* complex)."

In 1982 a single specimen of *Demansia reticulata* (the Desert Whipsnake) was collected in a garden in Kingscote. This must certainly have arrived on the island with human assistance, either as a pet or possibly an unknown passenger in a vehicle. That it is a species which does not naturally occur on the adjacent mainland adds weight to this theory and removes any consideration of it being listed as a Kangaroo Island resident.

One further Kangaroo Island reptile anomaly of note is the recent observation of a short-necked tortoise at Brownlow (T. Dennis, pers. com.), a short distance south along the coast from Kingscote. Probably an *Emydura macquarii* (Murray River Tortoise), which is a popular pet species, again this is probably an escape, or possibly even a deliberate release, which may become a Kangaroo Island "feral" species.

Figure 128.
The Brown Froglet (*Crinia signifera*) is a tiny frog that can be extremely common at the base of grass tussocks on the edge of pools even in cleared farm land. **Photo A. Robinson**

Figure 129.
The largest of the frogs on Kangaroo Island is the Banjo Frog (*Limnodynastes dumerili*). Males make the resonant 'bonk' commonly heard from farm dams during the winter breeding season.
Photo A. Robinson.

CONCLUSIONS AND RECOMMENDATIONS

A.C. Robinson[1]

INTRODUCTION

Kangaroo Island at 4 500 square kilometres, is Australia's third largest Island after Tasmania and Melville Island. In spite of this large size, being an island means that it has a number of special biological characteristics. Many of these characteristics are discussed and illustrated in detail in the book South Australia's Offshore Islands (Robinson *et al*. 1996), which covers all of our remaining 150 odd smaller islands. Kangaroo Island, like all the others, is a continental island. This means that it is the eroded remnants of the continental landmass that formerly extended seaward from the present coastline. It was connected to the mainland at the height of the most recent glaciation (Ice Age) about 17 000 years ago, and has been isolated by rising sea levels since then. Kangaroo Island appears to have been finally severed from Fleurieu Peninsula about 10 500 years ago. Isolated on Kangaroo Island was an ecosystem with all the plants and animals also remaining on the nearby mainland. Over the succeeding 10 000 years significant biological adjustment took place, as evidenced by the extinction of a number of animals such as the Tiger Quoll and the Tasmanian Devil which are well known in sub-fossil deposits on the island. Clearly these carnivorous marsupials were not able to maintain viable populations on a land mass the size of Kangaroo Island. Other species of plants and animals undoubtedly shared the same fate. This process was driven by what has become known as the 'species area relationship' where a given area of land can only support a particular number of plant and animal species. At the same time, animals and plants with good powers of over-water dispersal continued to make the short journey across Backstairs Passage, and some of these undoubtedly established new populations, perhaps displacing existing Kangaroo Island species. Some sort of equilibrium was no doubt reached where the altered Kangaroo Island ecosystem was able to sustain a significantly altered flora and fauna from the nearby mainland.

Compounding these biological changes was the Aboriginal population which was also isolated on the island. Archaeological evidence to date indicates that they were present from at least 16 000 years to possibly as recently as 4-600 years ago (see Land-Use History chapter). When Flinders and Baudin landed on the island they commented on the lack of smoke, a sure sign of Aboriginal populations elsewhere around Australia, and on the unusual density of the islands vegetation. Clearly, after a long period of significant influence in shaping the ecology of Kangaroo Island some disaster had overtaken the Aboriginal population and they had followed the Tasmanian Devil into extinction.

In biological terms, isolation for 10 000 years is a comparatively short time, but there is now considerable evidence that small populations of plants and animals isolated on islands may evolve more rapidly, than their much larger source populations on the adjacent mainland. This is shown on Kangaroo Island, by the present recognition of different taxa of plants at either the specific or sub-specific level, and, among the vertebrates, in the distinctive Kangaroo Island Emu and the Sooty Dunnart together with a number of distinctive sub-species of birds. In addition, when we understand more of the invertebrate fauna, many more distinctive island forms over and above those discussed by Gross *et al*. (1979), will undoubtedly be recognised.

When Flinders and Baudin saw Kangaroo Island in 1802 therefore, they saw an ecosystem shaped by the twin pressures of island isolation and a long period of Aboriginal occupation. It still possessed some of the biological characteristics of its island heritage, and they commented in particular on the tameness of the local kangaroos, which could easily be knocked down to provide a welcome change from their monotonous shipboard diet of salt beef and biscuits. Many species were present in significant abundance in comparison with the more varied mainland ecosystems, another characteristic of island species, and one that makes Kangaroo Island such a good place for visitors to view its present limited range of plants and animals. More recently, ecologists have noted another island induced

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characteristic of Kangaroo Island, species seem to have rather broader habitat tolerances than their mainland equivalents. This means that the ecological patterns are rather ‘blurred’ with many common species being found over a broad range of habitats.

Kangaroo Island is therefore a very special place biologically for all Australians, but of course it has not remained over the succeeding 200 years in the state in which those first explorers found it. First the sealers decimated the large populations of fur-seals and sea-lions around the coast and probably drove the distinctive Kangaroo Island Emu to extinction. Whalers ruthlessly hunted the Southern Right Whales that came to calve in sheltered bays while more permanent settlers cleared the natural vegetation for agriculture. Many new species of plants and animals were introduced either accidentally or deliberately. Most importantly however, the island has, up to now, remained free of those twin scourges of mainland Australia, the rabbit and the fox.

THE FLORA AND FAUNA TODAY

The vegetation mapping associated with this survey recognised 36 major vegetation groups based on the dominant upperstorey plant species. The absence of rabbit grazing on Kangaroo Island has meant that these plant communities, where also un-grazed by domestic stock, represent the closest approximation to the pre-European vegetation of the wetter areas of South Australia and, as such, represent a significant bench mark against to assess the condition of similar communities on the South Australian mainland.

These communities have developed from the original flora of Kangaroo Island. As presently understood, Kangaroo Island supports approximately 1178 plant taxa (Appendix VI). Of these 277 taxa are considered to have been introduced to the island since European settlement Kangaroo Island therefore supports a total of 901 native plant taxa. While the majority of these plants are also found on the adjacent South Australian mainland there are 45 taxa (Table 14) that are endemic to the island. In addition a further 11 taxa are ‘almost endemic’, having only a minor part of their distribution in an adjoining region (Table15).

Twenty-five species of non-marine mammals (including bats and excluding the vagrant *Pteropus scapulatus*) are now known to occur on Kangaroo Island (Appendix VI). Eight of these are introduced. Only the Kangaroo Island Dunnart is endemic to the island at the species level, but a number of other species have distinctive island forms, some of which are recognised at the sub-specific level. These include the Kangaroo Island Kangaroo, Tammar Wallaby, Common Brushtail Possum and Echidna.

Two hundred and sixty-seven species of birds have now been recorded from Kangaroo Island and its surrounding waters (Appendix VII). Only one of these, the Kangaroo Island Emu is known to be extinct. Ten species of a total of fifteen which have been introduced still survive as breeding populations on the island. There a number of distinctive island forms and these are listed in Appendix IX..

Kangaroo Island is now known to support 20 species of reptiles and two of these are introduced. It also has six species of amphibians (Appendix X). None of these are considered to be endemic to the island, but some such as Rosenberg’s Goanna and the Pygmy Copperhead represent populations of significance for conservation of the species in South Australia.

CONSERVATION MANAGEMENT ISSUES

Habitat Fragmentation

Although Kangaroo Island has significantly greater areas of natural vegetation remaining uncleared than anywhere else in the agricultural districts of South Australia, there are still significant problems with the over-clearing of particular vegetation associations on the land judged better for agriculture. The few remaining patches of these vegetation types are now small, fragmented and isolated from other areas of natural vegetation. The re-establishment of links between the more significant of these limited vegetation associations is a high priority. Even at the level of the vegetation map presented with this report, there are four major vegetation associations which are still not conserved either in the Government conservation reserve system or under a Heritage Agreement (see Table 20 for details). Clearly community conservation priorities and re-vegetation programs should be focussed on these key vegetation associations with their associated flora and fauna. These key vegetation communities should be the focus for community and Government working in partnership to improve formal protective measures.

Threatened Species

Island populations of plants and animals have been widely demonstrated to be at greater risk of extinction than larger and more extensive populations on the mainland. It is therefore essential that the species known to be threatened on Kangaroo Island be given a high priority for conservation management. There have been some notable success stories in the recovery of threatened species on Kangaroo Island, beginning with the establishment of Flinders Chase National Park in 1919. Since then, the recovery of the population of the Australian Sea-lion at Seal Bay since active management began in 1954, and, more recently, the successes with the Glossy Black Cockatoo with work beginning in 1993 when it was first described as a distinctive Kangaroo Island sub-species. These and other threatened species management require an on-going commitment of both time and funding, and, most importantly, a sense of community pride and ownership in the successes and a willingness to learn from and adapt management as a result of the inevitable failures.

Introduced Species

Kangaroo Island is particularly vulnerable to the effects of introduced species. You need look no further than the large population of feral cats which are preying on many of the islands birds, reptiles and mammals. The koala population, introduced for the best of perceived conservation reasons in 1923 has expanded to the point where it seriously threatens the integrity of an entire island ecosystem, the Riverine woodlands dominated by the Rough-barked Manna Gum *Eucalyptus viminalis* ssp. *cygnetensis.* This has necessitated the development of the koala management program described in the mammal chapter. The many other introductions, both of species native to Australia and of those introduced to this country have all undoubtedly had some effect on the islands ecosystems, even if these effects are not as clearly demonstrated as those of feral cats and koalas. There is a need to guard against any further introductions of species which are not part of the natural flora and fauna of the island. There will still be some species such as birds and plants which will get to the island on their own and perhaps establish feral populations there. It is clear however that strict impact assessment procedures must be implemented before any deliberate new introduction is contemplated if we are to avoid more of the mistakes of the past. The vigilance, which is currently applied to stop rabbits and foxes from becoming established must be applied to a much wider range of potential introductions. Clearly, any practical methods of effectively controlling or, ideally, eradicating already introduced species (such as feral pigs and goats or particularly invasive weeds such as Bridal Creeper) must be pursued with vigour.

Pests and Diseases

Both the natural and the agricultural systems on an island are potentially more vulnerable to pests and diseases than areas of the mainland. The introduction of the root rot fungi *Phytophthora* spp. onto the island, where it was first recorded in 1994, has serious consequences for a wide range of plant species and vegetation associations (Vickery 1997, Furner 1998, Furner and Twyford, 1998). There is no practical method available for eradication of this serious threat to the natural areas of the island but the management aimed at limiting its spread from the known infected areas must be continued

Fire Management

The issue of fire management for areas of natural vegetation on Kangaroo Island has been subject to considerable discussion. There is clearly a requirement to protect developed assets and surrounding land, but at the same time, the biological effects of fire must also be taken into account. Wildfire is a natural occurrence in the ecosystems of Kangaroo Island, but management of the frequency, extent and intensity of natural fire in an ecological sense is poorly understood for all of the islands ecosystems. The fire history of the whole of Kangaroo Island has been documented by Overton

(1994, 1997), and these reports provide a significant resource to try to understand both natural and human induced fires on the island over the last century. Until we understand more of the long-term biological effects of fire on the distinctive ecosystems of Kangaroo Island, a conservative fire management policy is required. Significant efforts should be made to retain as wide a variety of fire ages as possible in the more extensive areas of natural vegetation while striving to avoid burning very large areas in a single fire. Practical implementation of this aim in the designated Wilderness Protection Areas on the island in particular, poses a major challenge (Twyford 1999).

Tourism Management

Tourism to Kangaroo Island is largely dependent on the natural resources of the island and people's perception of the quality of these resources. The concept of a 'clean and green' image for the island is very dependent on a well-managed natural environment. Tourists perceive the natural attractions of the island to be the large proportion of the island under natural vegetation, the diversity of habitats and the ease of viewing some animals together with the range of recreation opportunities in the natural environment. Clearly any expansion of tourist numbers to the island must be carried out with great sensitivity so as not to damage the very features that attract them in the first place. With tourism now providing more income to the island than agriculture, this is an important challenge for all South Australians.

CONCLUSIONS AND RECOMMENDATIONS

Kangaroo Island will clearly be best managed into the future using a coordinated approach, where management of its important natural assets is closely integrated into all forms of land use. The first stage in this process will be the preparation of a Regional Biodiversity Plan, which will clearly identify these natural assets (Willoughby, 1999).

Ongoing land management for the island can then evolve using a coordinated approach known as an Integrated Natural Resource Management Strategy. Conservation programs will encourage and assist landowners and the local community to actively participate, and be an essential element of, the conservation of biodiversity on Kangaroo Island. NPWSA will have a key role in encouraging linkages and cooperation between conservation projects, particularly those funded by national programs such as Landcare, Coastcare and Bushcare. This will link biodiversity expertise into projects to achieve Landcare and biodiversity outcomes. It will promote a coordinated and integrated approach by community groups, Local Government, Soil Conservation Boards, Catchment Water Management Boards, Animal and Plant Control Boards and other government departments.

The aim of this type of land management will be the maintenance and restoration of functioning ecological communities on Kangaroo Island. This will contribute significantly to the health of the landscape, which feeds back into long term economic viability and community support for industry and land utilisation in the region. The Island can promote and market itself as a place where the community plays a central role in the conservation of biodiversity.

The Integrated Regional Natural Resource Management Strategy for Kangaroo Island will be used to set regional biodiversity and natural resource priorities. All land managing and support agencies will contribute to this process. On-ground actions to implement biodiversity conservation components of the Strategy will include:

- fencing and management of remnant vegetation;
- revegetation to provide corridors;
- control of environmental weeds / weeds with potential for invading native vegetation;
- weed control associated with the protection of threatened plants;
- management of Total Grazing Pressure (introduced and native species);
- control of feral animals (feral cats, goats and pigs) to protect populations of threatened species;
- preparation of recovery plans for threatened plants and animals;
- cooperative management between Protected Areas and adjacent lands;
- fire management;
- management of plant pathogens such as phytophthora;
- provision of information to land managers;
- management of water resources to provide for sustainable use and environmental flows.

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RESOURCES AND BIBLIOGRAPHY

MAPS

1:1 000 000 Aeronautical

Pt Augusta	SI	53	1977
Adelaide	SI	54	1977
Du Couedic	SJ	53	
Hamilton	SJ	54	

1:250 000 Topographic

Kingscote	SI	15-16	1982
Barker	SI	54-13	1982

1:100 000 Topographic

Borda	6226	1971
Vivonne	6326	1971
Kingscote	6426	1971
Jervois	6526	1982
Du Couedic	6225	1971
Kersaint	6325	1971
Linois	6425	1971

1:50 000 Topographic

Sims Cove	6226 -	I	1987
Grainger	6226 -	II	1986
Vennacher	6226 -	III	1986
Borda	6226 -	IV	1987
Cassini	6326 -	I	1988
Seddon	6326 -	II	1987
Vivonne	6326 -	III	1988
Stokes Bay	6326 -	IV	1988
Penneshaw	6426 -	I & II	1984
Destrees	6426 -	III	1986
Kingscote	6426 -	IV	1982
Willoughby	6526 -	III & IV	1984

1:250 000 Geological

Kingscote	1954 (Actual scale 1:253 440)
Barker	1964 reprint 1974

AERIAL PHOTOGRAPHS

The most recent complete coverage of Kangaroo Island is given. The photograph scale, survey number, photo numbers and date of photography are provided. All photo coverage is on the Kingscote 1:250 000 map sheet.

1:40 000	svy 3999	Photos 4-39	(14 January 1989)
1:40 000	svy 4000	Photos 6-84	(14 January 1989)
1:40 000	svy 4001	Photos 0-118	(23 January 1989)
1:40 000	svy 4007	Photos 4-7	(23 January 1989)

BIBLIOGRAPHY

Abbott, I. (1974). The avifauna of Kangaroo Island and causes of its impoverishment. *Emu*. **74** (3): 124.

Abbott, I. (1976). Is the avifauna of Kangaroo Island impoverished because of unsuitable habitat? *Emu*. **76** (1): 43.

Abbott, I. (1979). The past and present distribution and status of Sea- lions and Fur-seals in Western Australia. *Records of the Western Australian Museum*. **7**: 375-390.

Aitken, P.F. (1970). *Cercartetus lepidus* (Thomas) and addition to the fauna of Kangaroo Island. *Records of the South Australian Museum*. **15** (3):575-576.

Aitken, P.F. (1972). *Sminthopsis murina* (Waterhouse) 1838. A new record from Kangaroo Island, South Australia. *South Australian Naturalist.* **46**: 36-37.

Aitken, P.F. (1974). The Little Pigmy Possum *(Cercartetus lepidus*) (Thomas) on Kangaroo Island, South Australia. *South Australian Naturalist*. **48** (3).

Andrewartha, H.G. and Barker, S. (1969). Introduction to a study of the ecology of the Kangaroo Island Wallaby *Proteminodon eugenii* (Desmarest) within Flinders Chase, Kangaroo Island, South Australia. *Transactions of the Royal Society of South Australia*. **93**: 127-133.

Anon. (1902). The Flinders Centenary Kangaroo Island (discovery of). Proceedings of the *Royal Geographical Society of Australia South Australian Branch*. **5:** 52-54

Anon. (1906) Camp-outing on Kangaroo Island. *Emu* 5:129-139.

Anon. (1918). *Flinders Chase : A reserve for fauna and flora.* W.K. Thomas. Adelaide.

Anon. (1936). *Official Civic Record of South Australia Centenary Year*, 1936. (History of Dudley: pp. 542-543. History of Kingscote: pp. 630-632) Adelaide. Universal Publicity Co.

Anon. (1948a) Flinders Chase, Kangaroo Island. *South Australian Ornithologist* **18**: 76-77.

Anon. (1948b). Birds introduced onto Kangaroo Island. *South Australian Ornithologist.* **18** (8): 78.

Anon. (1974). *Visitor survey at Flinders Chase National Park, Kangaroo Island, 12-20 May 1979.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Anon. (1976). *Vegetation Clearance in South Australia*. Department for the Environment. Adelaide.

Anon. (1981). Animals liberated on Flinders Chase, Kangaroo Island. *South Australian Parks and Conservation*. **4** (1): 8.

Ashby, E. (1924) Notes on extinct or rare Australian birds, with suggestions as to some of the causes for their disappearance. *Emu* **24**: 178-183.

Ashdown, M. (1979). *The Koala population in Flinders Chase, Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Augee, M.L. (1976). Heat tolerance of Monotremes. *Journal of Thermal Biology*. **1**: 181-184.

Augee, M.L. (1978). Monotremes and the evolution of homeothermy. *Australian Zoologist*. **20**: 111-119.

Augee, M.L. (1983). Echidna, *Tachyglossus aculeatus,* **In** Strahan, R. (Ed). *The Australian Museum Complete Book of Australian Mammals,* Angus and Robertson, Sydney. pp 8-9.

Augee, M.L., Ealey, E.H.M. and Price, I.P. (1975). Movements of Echidnas *Tachyglossus aculeatus*, determined by marking recapture and radio-tracking. *Australian Wildlife Research*. **2**: 93-101.

Ayliffe, M.J. (1952). *Flinders Land of the South: early and later history of Kangaroo Island.* Penneshaw (K.I.), the Author.

Ayre, J. (1980). *Compilation of biological and geological data from Murray's Lagoon and Lake Ada, Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Bacon, C.E. (1989). *Organochloine levels in seals from the Arctic, the Antarctic, California and Australia.* Senior Thesis, University of California, Santa Cruz. (Unpublished).

Baird, J.A., Hales, J.R.S. and Lang, W.J. (1974). Thermorgulatory responses to the injection of monoamines, acetylcholine and prostaglandins into the lateral cerebral ventricle of the echidna. *Journal of Physiology*. **236**: 539-548.

Baird, R.F. (1986). Historical records of the Glossy Black-cockatoo *Calyptorhynchus lathami* and Red-tailed Black-cockatoo *C. magnificus* in south-eastern Australia. *South Australian Ornithologist*. **30**: 38-45.

Baldwin, J.G. and Crocker, R.L. (1941). The soils and vegetation of portion of Kangaroo Island, S.A. *Transactions of the Royal Society of South Australia.* **65** (2): 263-275.

Ball, D. and Trebeck, M. (1984). *Baseline study of Pelican Lagoon Conservation Park, Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Ball, D. (1994). *Kangaroo Island Vegetation Classifications*. Biological Survey of South Australia, Department of Environment and Natural Resources, South Australia.

Ball D. (1998). *Kangaroo Island Vegetation Mapping*. Edited by S. Carruthers. Information and Data Analysis Branch, Planning SA.

Barker, S. (1975). Revision of the Genus *Astraeus* Leporte and Gory (Coleoptera : Buprestidae). *Transactions of the Royal Society of South Australia*. **99**: 105-141.

Barker, S. (1979). New species and a catalogue of *Stigmodera (Castiarina)* (Coleoptera : Buprestidae). *Transactions of the Royal Society of South Australia*. **103**: 1-23.

Barker, S. (1980). New species and new synonyms of *Stigmodera (Castiarina)* (Coleoptera : Buprestidae). *Transactions of the Royal Society of South Australia*. **104**: 1-7.

Barker, S. (1983). New synonyms and new species of *Stigmodera (Castiarina)* (Coleoptera : Buprestidae). *Transactions of the Royal Society of South Australia*. **104**: 139-169.

Barker, S. (1986). *Stigmodera (Castiarina)* (Coleoptera : Buprestidae). Taxonomy, New species and a checklist. *Transactions of the Royal Society of South Australia*. **110**: 1-36.

Barker, S. (1987). Eighteen new species of *Stigmodera (Castiarina)* (Coleoptera : Buprestidae). *Transactions of the Royal Society of South Australia*. **111**: 133-146.

Barker, S. (1988). Contributions to the taxonomy of *Stigmodera (Castiarina)* (Coleoptera : Buprestidae). *Transactions of the Royal Society of South Australia*. **112**: 133-142.

Barker, S. (1989). Contributions to the taxonomy of Australian Buprestidae (Coleoptera): New species of *Astraeus* and *Stigmodera (Castiarina)* and a key to Astraeus (s.s.) *Transactions of the Royal Society of South Australia*. **113**: 185-194.

Barker, S. (1990). New species of *Castiarina* (Coleoptera : Buprestidae) and redescriptions of *C. diversa* (Keremans) and *C. elderi* (Blackburn). *Transactions of the Royal Society of South Australia*. **114**: 169-178.

Barker, S., Lintern, S.M. and Murphy, C.R. (1970). The effect of water restriction on urea retention and nitrogen excretion in the Kangaroo Island Wallaby, *Potemnodon eugenii*. *Comparative Biochemistry and Physiology*. **34**: 883-893.

Barritt, M.K. (1981). *The vertebrate fauna of the Gosse Crown Land on Kangaroo Island. Part I.* Nature Conservation Society of South Australia. Adelaide.

Barritt, M.K. (1982a). *The vertebrate fauna of the Gosse Crown Land on Kangaroo Island, Part 2.* Nature Conservation Society of South Australia. Adelaide. (Unpublished report).

Barritt, M.K. (1982b). *A rapid appraisal survey of some natural areas on Kangaroo Island, South Australia.* Nature Conservation Society of South Australia. Adelaide.

Barritt, M.K. (1984). *Notes on the lagoons of Kangaroo Island*. Nature Conservation Society of South Australia. Adelaide.

Bartstra, G. J. (1982). *Homo erectus*: The Search for his artefacts. *Current Anthropology*. **23** (3): 318-320.

Bartstra, G. J., Soegondho, S. and van der Wijk, A. (1988). Ngandong man: age and artifacts. *Journal of Human Evolution*. **17**: 325-337.

Bates, R. (1976). Miniature orchids of the genus *Corybas (C. dilatatus* on Kangaroo Island.). *Journal of the Society for Growing Australian Plants, S.A.* **7** (2): 32-34.

Bates, R. (1977). No.5 in a series on rare or endemic South Australian orchids (in Flinders Chase). *South Australian Naturalist*. **52** (2): 31.

Bates, R.J. (1981). *Ixodia (I. achilleoides* on Kangaroo Island). *Journal of the Society for Growing Australian Plants, S.A.* **8** (12): 276-281.

Baudinette, R.V. and Gill, P. (1985). The energetics of 'flying' and 'paddling' in water : Locomotion in penguins and ducks. *Journal of Comparative Physiology*. **155**: 373-180

Baudinette, R.V., Gill, P., and O'Driscoll, M. (1986). Energetics of the Little Penguin, *Eudyptula minor* : Temperature regulation, the calorigenic effect of food and moulting. *Australian Journal of Zoology*. **155**: 373-380.

Baudinette, R.V., Gannon, B.J., Runciman, W.B. and Wells, S. (1987). Do cardiorespiratory frequencies show entrainment with trapping the Tammar Wallaby? *Journal of Experimental Biology*. **129**: 251-263.

Baudinette, R.V., Runciman, S.I.C., Frappell, P.F. and Gannon, B.J. (1988). Development of the Marsupial Cardiorespiratory system, **In**: Tyndale-Biscoe, C.H. and Janssen, P.A. (eds.). *The Developing Marsupial, Models for Biomedical Research*, Springer-Verlag, Berlin.

Bauer, F.J. (1952). Government land development on Kangaroo Island, South Australia. *Royal Geographical Society of Australia, South Australian Branch*. **53**:

Bauer, F.J. (1959). *The regional geography of Kangaroo Island, South Australia*. (Unpublished) Australian National University, Canberra, Ph.D. thesis.

Bauer, F.J. (1963). *Kangaroo Island, South Australia, a short guide*. (3rd ed.) Adelaide. S.A. Govt. Tourist Bureau.

Bauer, F.H. 1970 The Kartans of Kangaroo Island: a puzzle in extinction. **In** Pilling, R.A. and Waterman, R.A. (eds.). *Diprotodon to Detribalization: studies of change among the Australian Aborigines*.pp. 198-216. East Lansing, Michigan State University Press.

Baverstock, P.R., Adams, M. and Archer, M. (1984). Electrophoretic resolution of species boundaries in the *Sminthopsis murina* complex (Dasyuridae). Australian Journal of Zoology **32**: 823-832.

Baxter, C.I. (1981a). Flinders Chase National Park, A ranger's view. *South Australian Parks and Conservation*. **4** (1): 14-15.

Baxter, C.I. (1981b). Some remarks on the birds of Kangaroo Island. *South Australian Ornithologist*. **28** (7): 172-174.

Baxter, C.I. (1983). Black-faced Woodswallows on Kangaroo Island. *South Australian Ornithologist*. **29** (3): 72.

Baxter, C. (1989) *An annotated list of the birds of Kangaroo Island*. National Parks & Wildlife Service, Kingscote.

Baxter, C. (1995). *An annotated list of the birds of Kangaroo Island (2nd Edition)* Department of Environment and Natural Resources, South Australia

Baxter, C.I. and Parker, S.A. (1981). The status of the Elegant Parrot and the S.A. Rock Parrot of Kangaroo Island. *South Australian Ornithologist*. **26** (6): 164-165.

Belbin, L. (1987a). *PATN, Pattern Analysis Package, Reference Manual.* CSIRO Division of Wildlife & Rangelands Research, Canberra.

Belbin, L. (1987b). *PATN, Pattern Analysis Package, Command Manual.* CSIRO Division of Wildlife & Rangelands Research, Canberra.

Belbin, L. (1987c). *PATN, Pattern Analysis Package, Users Manual.* CSIRO Division of Wildlife & Rangelands Research, Canberra.

Bell, H. (1926). *Kangaroo Island Caves, the Story of their Discovery and Exploration*. **In** J.F. Bradley & H. Bell (Eds), 'Glorious Kangaroo Island, the Holidaymakers' Paradise' Thomas, Adelaide.

Belperio, A.P. (Compiler), in preparation. The Quaternary -Chapter 11. **In**: R.K. Johns (Ed.). *Geology of South Australia. South Australia. Geological Survey. Bulletin* 54.

Belperio, A.P. and Flint, R.B. (1992). The southeastern margin of the Gawler Craton. *Australian Journal of Earth Sciences*. **39** in press.

Berndt, R.M. (1940). Some aspects of Jaralde culture, South Australia. *Oceania*. **11** (2): 164-185.

Berry, P.A. (1922). An investigation of the essential oil from *Eucalyptus cneorifolia,* D.C. *Transactions of the Royal Society of South Australia.* **46**: 207-221.

Black, A. (1981). Kangaroo Island: Parks for many or pastures for few. *Red Gum*. **4** (4): 4-6.

Blakers, M., Davies, S.J.J.F. and Reilly, P.N. (1984). *The atlas of Australian birds.* Royal Australian Ornithological Union. Melbourne University Press, Melbourne.

Boehm, E.F. (1947). Oological desiderata in South Australia. (Ref. to Kangaroo Island Emu). **18** (7): 68-70.

Bonython, C.W. and Daily, B. (1964). National Parks and Reserves in South Australia. *Proceedings of the Royal Geographical Society Australia, South Australian Branch.* **65**, 5-15.

Boomsma, C.D. and Lewis, N.B. (1980). *The Native Forest and Woodland Vegetation of South Australia*. Bulletin. **25**. Woods & Forests Department, South Australia.

Bowes, K.R. (1968). *Land settlement in South Australia 1857-1890*. Adelaide, Libraries Board of S.A.

Boyes, M.K. (1970). A hard look at Kangaroo Island. *Issue* **10** (May).

Bradley, J.F. and Bell, H. (1926). *Glorious Kangaroo Island* : *its caves and beauty spots.* Adelaide.

Braithwaite, R.W. (1983). Southern Brown Bandicoot, *Isoodon obesulus,* **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals*. Angus and Robertson, Sydney. pp. 94-98.

Bransbury, J. (1983). *A study of the Hooded Plover in the South-east of South Australia*. Final report to the Department of Environment and Planning, Adelaide.

Bransbury, J. (1988) *The status and distribution of the Hooded Plover in South Australia*. Report to Department of Environment & Planning, Adelaide.

Bransbury, J. (1990). A late breeding record of the Hooded Plover. *South Australian Ornithologist*. **31**: 55-56.

Bransbury, J. (1991). *Biology and Behaviour of Breeding Hooded Plovers.* A study of Hooded Plovers on Kangaroo Island, South Australia, carried out in 1989-90. Final report to the Department of Environment and Planning.

Brewster, E. (1973). Winter day at Kangaroo Island, South Australia. *Victorian Naturalist*. **90** (11): 310-311.

Briggs, J.D. and Leigh, J.H. (1988). *Rare or Threatened Australian Plants.* (revised edition). Special Publication 14, Australian National Parks and Wildlife Service, Canberra.

Brittan, N.H. (1971). *Thysanotus fractiflexus* sp. nov. (Liliaceae), endemic to Kangaroo Island, South Australia. *Transactions of the Royal Society of South Australia*. **95** (2): 109-111.

Brown, A.G. and Carrick, F.N. (1981). Report on the *Reproductive status of the koala (Phasolarctos cinereus) in Flinders Chase National Park and Cleland Conservation Park, South Australia*. (Unpublished).

Brown, H.Y.L. (1898). Report by the Government Geologist. *South Australia, Parliamentary Paper* **36.** 5pp.

Buick, A.M. (1985). *The behavioural ecology of the Hooded Plover (Charadrius rubricollis) on the Coorong during the non-breeding season.* BSc. (Hons) thesis, University of Adelaide, Adelaide.

Buick, A.M. and Paton, D.C. (1989). Impact of off road vehicles on the nesting success of Hooded Plovers *Charadrius rubicollis* in the Coorong region of South Australia. *Emu*. **89**: 159-172.

Burrows, K. (1979). Climate, **In** Tyler, M.J., Twidale, C.R. & Ling, J.K. (Eds.). *Natural History of Kangaroo Island*. Transactions of the Royal Society of South Australia, Adelaide, pp. 53-64.

Buick, A.M. and Paton, D.C. (1989) Impact of off-road vehicles on the nesting success of Hooded Plovers *Charadrius rubricollis* in the Coorong region of South Australia. *Emu* **89**: 159-172.

Calaby, J.H. and Richardson, B.J. (1988). Potoroidae, **In** Walton, D.W. (Ed.) *Bureau of Flora and Fauna, Canberra: Zoological Catalogue of Australia, Vol. 5 Mammalia.* Australian Government Publishing Service, Canberra.

Campbell, A.G. (1906) Report on the birds of Kangaroo Island: a comparison with mainland forms. *Emu* **5**: 139-145

Campbell, M. (1976). Kangaroo Island field trip 11th-13th October. *Journal of the Society for Growing Australian Plants, South Australia*. **6** (16): 358-365.

Canty, P.D. (1987). (Ed.). *Wildlife Research in South Australia: Scientific Permits Valid 1985-1986.* National Parks and Wildlife Service, Department of Environment and Planning, South Australia.

Canty, P.D. (1988). (Ed.). *Wildlife Research in South Australia: Scientific Permits Valid 1986-1987.* National Parks and Wildlife Service, Department of Environment and Planning, South Australia.

Canty, P.D. (1989a). (Ed.). *Wildlife Research in South Australia: Scientific Permits Valid 1987-1988.* National Parks and Wildlife Service, Department of Environment and Planning, South Australia.

Canty, P.D. (1989b). (Ed.). *Wildlife Research in South Australia: Scientific Permits Valid 1988-1989.* National Parks and Wildlife Service, Department of Environment and Planning, South Australia.

Canty, P.D. (1991). (Ed.). *Wildlife Research in South Australia: Scientific Permits Valid 1989-1990.* National Parks and Wildlife Service, Department of Environment and Planning, South Australia.

Canty, P. D. (Ed) (1994). *Wildlife Research in South Australia, Scientific Permits Issued 1991-93.* Department of Environment and Natural Resources, South Australia

Canty, P. D. (Ed) (1998). *Wildlife Research in South Australia, Scientific Permits Issued 1993-95.* Department of Environment, Heritage and Aboriginal Affairs, South Australia

Carpenter, G.A. (1996) Recent nesting of Baillon's Crake on Kangaroo Island. *South Australian Ornithologist* **32**: 84.

Carpenter, G.A. (in prep.) Native habitats of birds on Eyre Peninsula, South Australia.

Carpenter, G. and Reid, J. (1997). *The Habitats and Status of Native Birds in South Australia's Agricultural Regions* (unpublished Database) Native Vegetation Management Branch, Department of Environment and Natural Resources, South Australia.

Carrick, F.N. (1923). Platypus, *Ornithorhynchus anatinus*, **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals*. Angus and Robertson, Sydney, pp. 5-6.

Catt, C.C. (1970). *An economic analysis of war service land settlement farms on Kangaroo Island*. M. Ag. Ec. thesis - Univ. of New England. (Unpublished).

Cavanagh, M. (1986). *An Interpretive Programme for Murray's Lagoon, Kangaroo Island*. Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished Report).

Cawthorne, W.A. (1926). *The Kangaroo Islanders. A story of South Australia before colonization*. Adelaide. Rigby.

Christidis, L. and Boles, W. E. (1994). *The taxonomy and species of birds of Australia and it's territories*. Royal Australian Ornithological union Monograph 2, Melbourne

Christidis, L., Schodde, R. and Baverstock, P.R. (1988). Genetic and morphological differentiation and phylogeny in the Australian-Papuan scrubwrens (*Sericornis, Acanthizidae*). *Auk*. **105**: 616-629.

Christidis, L and Schodde, R (1993). Relationships and radiations in the meliphagine honeyeaters, *Meliphaga, Lichenostomus* and *Xanthotis* (Aves: Meliphagidae): protein evidence and its integration with morphology and ecogeography *Australian Journal of Zoology* **41:**293-316.

Clark, R.L. (1976). *Vegetation history and the influence of the sea at Lashmar's Lagoon, Kangaroo Island, South Australia, 3000 BP to the present day*. BSc. (Hons.) Thesis, Department of Botany, Monash University. (Unpublished).

Clark, R.L. (1983). *Fire history from fossil charcoal in lake and swamp deposits.* PhD. Thesis. Australian National University, Canberra. (Unpublished).

Cleland, J.B. (1906). Birds of Kangaroo Island. *Emu*. **5** (4): 207-208.

Cleland, J.B. (1926a). Notes on the birds of Kangaroo Island Bird. *South Australian Ornithologist*. **8** (7): 233-239.

Cleland, J.B. (1926b). Bird notes (Musk duck sighted on Kangaroo Island). *South Australian Ornithologist*. **10** (3): 84.

Cleland, J.B. (1930). List of birds seen between Kingscote and Flinders Chase, Kangaroo Island. *South Australian Ornithologist*. **10** (6): 214.

Cleland, J.B. (1940). Behaviour of emus (at Flinders Chase). *South Australian Ornithologist*. **15** (7): 109.

Cleland, J.B. (1942a). Birds seen on Kangaroo Island by members of the Ralph Tate Society. *South Australian Ornithologist*. **16** (2): 19-21.

Cleland, J.B. (1942b). Birds seen on Kangaroo Island by members of the Ralph Tate Society (continued). *South Australian Ornithologist*. **16** (3): 31-33.

Cleland, J.B. (1948). Bird notes. (Birds noted at Kangaroo Island.) *South Australian Ornithologist*. **19** (1): 9.

Cleland, J.B. (1958). The fire in Flinders Chase (Feb. 1958): regeneration commencing. *South Australian Ornithologist*. **39** (4): 61-63.

Cleland, J.B. (1968). Plant notes. (*Euphorbia paralias* on Kangaroo Island.) *South Australian Naturalist*. **42** (4): 105-109.

Cleland, J.B. (1970). The vascular plants of the Encounter Bay district and of Kangaroo Island. *South Australian Naturalist*. **44** (3): 50-52.

Cleland, J.B. and Black, J.M. (1927). An enumeration of the vascular plants of Kangaroo Island. *Transactions of the Royal Society of South Australia*. **51** (3): 84.

Cleland, J.B. and Black, J.M. (1941). An enumeration of the vascular plants of Kangaroo Island. Additions and corrections. *Transactions of the Royal Society of South Australia*. **65** (2): 244-248.

Cleland, J.B. and Black, J.M. (1952). An enumeration of the vascular plants of Kangaroo Island. Second list of additions and corrections. *Transactions of the Royal Society of South Australia*. **75** (2): 22-24.

Cleland, J.B. and Sims, E. (1970). Additions to the flora of Kangaroo Island and Flinders Chase. *South Australian Naturalist*. **44** (3): 50.

Close, D.H. (1981). The Kelp Gull in South Australia (record from Kangaroo Island). *South Australian Ornithologist*. **28** (6): 155-156.

Close, D. and Newman, O.M.G. (1984). The decline of the Eastern Curlew in South-eastern Australia. *Emu*. **84** (1): 38-39.

Clough, A. and Pappenfus, D. (1986). *Natures Magic Revealed : A report on the management strategies involved in the production of a Summer Holiday Program on Kangaroo Island*. Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Coastal Management Branch. (1978). *Kangaroo Island Coast Protection District, Study Report*. Department of Environment and Planning, South Australia.

Cogger, H.G. (1986). *Reptiles and Amphibians of Australia.* A.H and A.W. Reed, Sydney

Cogger, H. G., Cameron, E. E., Sadlier, R. A. and Eggler, P. (1993). *The Action Plan for Australian Reptiles.* Australian Nature Conservation Agency, Canberra.

Condon, H.T. (1936). Notes on the albatrosses occurring in South Australian waters. *South Australian Ornithologist*. **13** (5): 141-161.

Condon, H.T. (1941). Further records of lizards and frogs from Kangaroo Island. *Records of the South Australian Museum*. **7** (1): 111-116.

Condon, H.T. (1947). The White-breasted Cormorant (*Phalacrocorax fuscescens*) (on Kangaroo Island). *South Australian Ornithologist*. **18** (4): 31.

Condon, H.T. (1948). Kangaroo Island emu. *South Australian Ornithologist*. **18** (8): 78.

Condon, H.T. (1948). Notes on the birds of South Australia: occurrence, distribution and taxonomy. *South Australian Ornithologist*. **20** (3-6): 26-68.

Condon, H.T. (1966) The Western Whipbird. *South Australian Ornithologist* **24**:78-92.

Condon, H.T. (1967). Kangaroo Island and its vertebrate land fauna. *Australian Natural History*. **15** (12): 409-412.

Condon, D. (1968a) (no title) *South Australian Ornithologist* **25**:36.

Condon, H.T. (1968b). *A Handlist of the birds of South Australia.* South Australian Ornithological Association, Adelaide.

Connard, P.D. (1967). *The Cambrian stratigraphy of Kangaroo Island in relation to the hydrocarbon potential of O.E.L. 24 (St. Vincent Gulf).* University of Adelaide. B.Sc. Honours thesis (unpublished).

Cook, M., Knibbs, P. and Wickham, C. (1986). *Interpretive Activities for Rocky River Homestead and the Cape du Couedic Area - Flinders Chase National Park, Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Cook, V.H.J. (1978). *Biography of Vincent Herbert Fuller Cook, 1868-1940*. (Pioneer on Kangaroo Island.) Victor Harbour, the Author.

Cooke, D.A. (1987). A new *Phebalium* (Rutaceae) endemic to Kangaroo Island. *Journal of the Adelaide Botanic Garden* **10**(2):241-44.

Cooper, H.M. (1943). Large stone implements from South Australia. *Records of the South Australian Museum*. **7**: 343-369.

Cooper, H.M. (1960). The archaeology of Kangaroo Island, South Australia. *Records of the South Australian Museum*. **13**: 481-803.

Cooper, H.M. (1968). A further description of large stone implements from South Australia. *Records of the South Australian Museum*. **15**: 581-603.

Cooper, H.M. 1966 Archaeological stone implements from a lagoon bed, Kangaroo Island, South Australia. Records of the South Australian Museum 15: 309-327.

Cooper, H.M. and Condon, H.T. (1947). On some fragments of emu egg-shell from an ancient camp-site on Kangaroo Siland. *South Australian Ornithologist. 18* (7): 66-68.

Cooper, J.M. (1947). Some notes on Kangaroo Island birds. *South Australian Ornithologist*. **18** (5): 48.

Cooper, J.M. (1947). Currawongs on Kangaroo Island. *South Australian Ornithologist*. **22** (5-6): 67.

Cooper, H.M. and Condon, H.T. (1947). On some fragments of emu egg-shell from an ancient camp-site on Kangaroo Island. *South Australian Ornithologist*. **18** (7): 66-68.

Copley, P.B. and Kemper, C.M. (eds.). (1992). *A Biological Survey of the Yellabinna Dunefield, South Australia in October 1987.* South Australian National Parks and Wildlife Service, and South Australian Museum, Adelaide.

Cordes, N. (1980). *Discovering Kangaroo Island*. Island Newspapers, Kingscote

Cordes, N. (1986). *Kangaroo Island's Great Years : A history in photographs 1802-1986.* The Island Press.

Cornell, C. (1974). *The Journal of Nicolas Baudin ... translation*. Adelaide: Libraries Board of S.A.

Costa, D.P. (1990). Reproductive and foraging energetics of high latitude penguins, albatrosses and pinnipeds: implications for life history patterns. *American Zoologist* **30**(4): 247-291.

Costa, D.P., Fadley, B.S. and Dann, P. (1988). Energy expenditure and travelling speeds of free-ranging Little Penguins (*Eudyptula minor*). Abstract of paper presented at the 1st International Conference on Penguins,University of Otago, Dunedin, New Zealand, 16-19 August 1988.

Cox, J.B. (1976). A review of the *Procellariiformes* occurring in South Australian waters. *South Australian Ornithologist.* **27** (5): 179.

Cox, J.B. (1977). White-fronted terns in South Australia and notes on the identification of similar terns. *South Australian Ornithologist.* **27** (5): 179-184.

Cox, J.B. (1978). The distribution and seasonal occurrence of gannets off the South Australian coast. *South Australian Ornithologist.* **28** (1): 18-20.

Crawley, M. C. and Wilson, G. R. (1976). The natural history and behaviour of the New Zealand Fur-seal (*Arctocephalus forsteri*). *Tuatara* **22**: 1-29.

Crawley, M.C. (1983). New Zealand Fur-seal *Arctocephalus forsteri*, **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals.* Angus and Robertson, Sydney. pp. 464-465.

Creighton, E. G. and Krutzsch, P.H. (1987a). Reproductive biology of the male Little Mastiff Bat, *Mormopterus planiceps* (Chiroptera : Molossidae) in Southeast Australia. *The American Journal of Anatomy*. **178**: 352-368.

Creighton, E. G. and Krutzsch, P.H. (1987b). Reproductive anatomy of the female Little Mastiff Bat, *Mormopterus planiceps* (Chiroptera : Molossidae) in Southeast Australia. *The American Journal of Anatomy*. **178**: 369-386.

Crocker, R.K. and Wood, J.G. (1947). Some historical influences on the development of South Australian vegetation communities and their bearing on concepts and classification in ecology. *Transactions of the Royal Society of South Australia.* **71** (1): 91-136.

Crooks, A.F. (1991). Mineral occurrences of Kangaroo Island: A MINDEP database pilot project. *South Australia. Department of Mines and Energy. Report Book* 91/34.

Cumpston, J.S. (1970). *Kangaroo Island* 1800-1836. Roebuck Society Publishers, Canberra.

Daily, B. and Milnes, A.R. (1971). Discovery of Late Precambrian tillites (Sturt Group) and younger metasediments (Marino Group) on Dudley Peninsula, Kangaroo Island, South Australia. *Search* **2:** 431-433.

Daily, B. and Milnes, A.R. (1972). Revision of the stratigraphic nomenclature of the Cambrian Kanmantoo Group, South Australia. *Geological Society of Australia Journal* 19:197-202.

Daily, B., Firman, J.B., Forbes, B.G. and Lindsay, J.M. (1976). Geology, **In** Twidale, C.R., Tyler, M.J. and Webb, B.P. (Eds.). *Natural History of Adelaide region*. Royal Society of South Australia, Adelaide, pp. 5-42.

Daily, B., Milnes, A.R., Twidale, C.R., and Bourne, J.A. (1979). Geology and Geomorphology, **In** Tyler, M.J., Twidale, C.R. and Ling, J.K. (Eds.). *Natural history of Kangaroo Island*. Royal Society of South Australia, Adelaide, pp. 1-38.

Daily, B., Twidale, C.R., and Milnes, A.R. (1979). The age of the lateritised summit surface on Kangaroo Island and adjacent areas of South Australia. *Journal of the Geological Society of Australia.* **21**: 387-392.

Daily, B., Moore, P.S. and Rust, B.R. (1980). Terrestrial -marine transition in the Cambrian rocks of Kangaroo Island, South Australia. *Sedimentology*. **27**: 379-399.

Dallwitz, J., Marsden, A. and Marsden, S. (1986). *Heritage of Kangaroo Island.* Department of Environment and Planning, South Australia.

Dann, P and Jessop, R (1992). Second International Conference on Penguins Abstracts. *Corella* **16(5)**: 137-154.

Daniels, J. (1980). *The soil types of Murray's Lagoon, Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished).

Davies, R.J.P. (1982). *The Conservation of major plant associations in South Australia*. Adelaide : Conservation Council of South Australia Inc.

Davies, R.J.P. (1983). *Surviving populations of South Australia's most threatened plant associations.* Conservation Council of South Australia. Adelaide.

Davies, R.J.-P. (1986). *Threatened plant species of Kangaroo Island and the Mount Lofty Range region of South Australia*. Conservation Council of South Australia. Adelaide.

Davies, R.J.-P. (1992). *Threatened plant species of the Murray Mallee, Mt Lofty Ranges and Kangaroo Island regions of South Australia.* Conservation Council of South Australia. Adelaide.

Davies, R. J.-P. (1996). *Threatened Plant Species on Roadsides: Kangaroo Island, South Australia*. Department of Environment and Natural Resources, South Australia.

Day, C., Footner, P.B., Morrison, R. and Ryan, G.C. (1979). *Observations on the population size and behaviour of the Australian Sea-lion colony <u>Neophoca cimerea</u> (Pinnepidia) at Seal Bay, Kangaroo Island*. Associate Diploma in Wildlife and Park Management, Salisbury C.A.E. (Unpublished).

Delroy, L.R., Robinson, A.C. and Waterman, M.H. (1989). Monitoring of Cape Barren Goose Populations in South Australia. II The 1987 Breeding Season and further banding recoveries. *South Australian Ornithologist.* **30**: 184-189.

Dennis, T. (1989). The Australian Sea-lion in South Australia. *Australian Ranger Bulletin* **5**: 16-17.

Dennis, T.E. and Lashmar, A.F.C. (1996) Distribution and abundance of the White-bellied Sea-Eagle in South Australia. *Corella* **20**: 93-102.

Dennis, T. D. and Shaughnessy, P. D. (1996). Status of the Australian Sea-lion in the Great Australian Bight. *Wildlife Research* **23:** 741-754.

Department of Environment & Planning (1986) *Flinders Chase draft management plan*. Department of Environment & Planning, Adelaide.

Diamond, A.I. (1952). Problems in the South Australian Company's settlement on Kangaroo Island. B.A. (Hons.) thesis - history. University of Adelaide. (Unpublished).

Dixon, S. (1911). Farewell address to the Field Naturalists' Section-Royal Society. Flinders Chase. *Transactions of the Royal Society of South Australia*. **35**: 251-252.

Dixon, S. (1920). *The full story of Flinders Chase, Kangaroo Island*. Adelaide. Field Naturalists Society, S.A.

Djakiew, D. and Jones, R.C. (1981). Structural differentiation of the male genital ducts of the echidna (*Tachyglossus aculeatus*). *Journal of Anatomy*. **132** (2): 187-202.

Djakiew, D. and Jones, R.C. (1982a). Stereological analysis of the epididymus of the Echidna, *Tachyglossus aculeatus* and Wistar Rat. *Australian Journal of Zoology*. **32**: 865-875.

Djakiew, D. and Jones, R.C. (1982b). Ultrastructure of the ductus epididymus of the echidna *Tachyglossus aculeatus*. *Journal of Anatomy*. **135**: 625-634.

Djakiew, D. and Jones, R.C. (1983). Sperm maturation, fluid transport and secretion and absorption of protein in the epididymus of the echidna *Tachyglossus aculeatus*. *Journal of Reproductive Fertility*. **68**: 445-456.

Draper, N. (1987). Context for the Kartan: a preliminary report on excavations at Cape du Couedic rockshelter, Kangaroo Island. *Archaeology in Oceania*. **22**: 1-8.

Draper, N. (1988). Stone Tools and Cultural Landscapes: Investigating the Archaeology of Kangaroo Island. *South Australian Geographic Journal*. **88**: 15-36.

Draper, N. (1991). *Cape du Couedic Rockshelter and the Aboriginal Archaeology of Kangaroo Island, South Australia*. Ph.D. dissertation. Albuquerque, Department of Anthropology, University of New Mexico.

Dubowski, E.A., Olliver, J.G. and Downie, I. (1989). The gypsum industry of Kangaroo Island - historical development, production and geology of gypsum deposits at Salt lake and New Lake. *South Australia. Department of Mines and Energy. Report Book*. 89/55.

Dunbabin, T. (1960). New York pioneers of Kangaroo Island. *The Chronicle.* (August). Adelaide.

Eardley, C.M. (1945). Plant colonisation of a sandspit, Kangaroo Island. *South Australian Naturalist*. **23** (1): 2.

Eberhard, L.H. (1972). *Ecology of the Koala, Phascolarctos cinereus (Goldfuss), on Flinders Chase, Kangaroo Island*. Ph.D. Thesis, University of Adelaide. (Unpublished).

Eberhard, L.H. (1978). *Ecology of the Koala, Phascolarctos cinereus (Goldfuss)* Marsupialia Phascolarctidae in Australia. **In** Montgomery, G.G. (ed.) *The Ecology of Arboreal Folivores*. Smithsonian Institution Press, Washington DC. pp. 315-328.

Eckert, J. (1977). The distribution of the emu-wrens *Stipiturus malachurus* and *S. ruficeps mallee* in South Australia. *South Australian Ornithologist.* **27** (5): 186-187.

Edmondson, E.A. (1974). *Biogeographic analysis of a Pleistocene faunal deposit on Kangaroo Island, South Australia*. B.A. (Geog.) thesis. Monash University. (Unpublished).

Edwards, A. and Tyler, M.J. (1990). Reptiles and Amphibians. **In**: Watts, D.H.S. (ed). *A list of the vertebrates of South Australia*. Biological coordinating Committee and Department of Environment and Planning, South Australia.

Emison W.B. & Bren W.M. (1989) Common birds of the mallee region of northwestern Victoria**. In**: Noble, J.C. & Bradstock, R.A.(eds) *Mediterranean landscapes in Australia: mallee ecosystems and their management***.** CSIRO, Australia.

Ewen, K.R., Temple-Smith, P.D., Bowden, D.K., Marinopoulos, J., Renfree, M.B. and Yan, H. (1993). DNA-fingerprinting shows that male dominance does not determine paternity in the tammar wallaby (Macropus eugenii). *J Reprod Fert* **99**: (in press).

Falkenberg, I.D., Dennis, T.E. and Williams, B. (1991). *Organochlorine contamination in White-bellied Sea Eagle, Osprey, Peregrine Falcon and Prey Species in South Australia.* Report to Wildlife Conservation Fund Research Grant 1988. (Unpublished report).

Fargher, J. (1970). *Agricultural change on Kangaroo Island*, 1920-1970. B.A. (Geog.) thesis. Flinders University. (Unpublished).

Findlay, L., Ward, K.L. and Renfree, M.B. (1983). Mammary gland lactose, plasma progesterone and lactogenesis in the marsupial *Macropus eugenii*. *Journal of Endocrinology.* **97**: 425-436.

Finlayson, H.H. (1938). On a new species of *Potorous* (Marsupialia) from a cave deposit on Kangaroo Island, South Australia. *Transactions of the Royal Society of South Australia.* **62**: 132-140.

Finlayson, H.H. (1963). The brush-tailed possum of Kangaroo Island, South Australia. *Transactions of the Royal Society of South Australia*. **87**: 17-22.

Finnis, J.M. (1958). History of Flinders Chase. **In** R.A. Brown (Ed.). *Hiking in Flinders Chase Kangaroo Island*. The Boy Scouts Assoc. S.A. Branch. Adelaide.

Flinders, M. (1814). *A Voyage to Terra Australis*. Long, Nicol, London.

Flint, D.J. (1978). Deep sea fan sedimentation of the Kanmantoo Group. Kangaroo Island. *Transactions of the Royal Society of South Australia*. **102**: 203-222.

Flint, D.J. and Grady, A.E. (1979). Structural geology of the Kanmantoo Group, Kangaroo Island. *Transactions of the Royal Society of South Australia.* **103**: 45-56

Flint, A.P.F. and Renfree, M.B. (1982). Oestradiol 17b in the blood during seasonal reactivation of the diapausing blastocyst in a wild population of tammar wallabies. *Journal of Endocrinology*. **95**: 293-300.

Flood, J. (1989). *Archaeology of the Dreamtime*. (Second Edition). Collins, Sydney,.

Ford, H. (1976). The honeyeaters of Kangaroo Island. *South Australian Ornithologist.* **27** (4): 134-138.

Ford, H. (1979). Birds. **In** M.J. Tyler, C.R. Twidale, and J.K. Ling, (Eds.). *Natural History of Kangaroo Island*. Royal Society of South Australia, Adelaide, pp. 103-114.

Ford, H.A. & Howe, R.W. (1980) The future of birds in the Mount Lofty Ranges. *South Australian Ornithologist* 28:85-89.

Ford, H.A. and Paton, D.C. (1975). Impoverishment of the avifauna of Kangaroo Island. *Emu*. **75** (3): 155-156.

Ford, H. and Paton, D.C. (1976). Resource partitioning and competition in honeyeaters of the genus *Meliphaga. Australian Journal of Ecology*. **1**: 281-287.

Ford, H. A. and Paton, D.C. (eds.) (1986). *The Dynamic Partnership Birds and Plants in Southern Australia*. Government Printer, Adelaide.

Fraser, T. (1980). Breeding of the Rainbow Bee-eater on Kangaroo Island. *South Australian Ornithologist.* **28**: 218.

Furner, R. (1998). Managing *Phytophthora* on Kangaroo Island. *Ranger, a Journal for Conservation Managers* **44**: 20-21.

Furner, R.T. and Twyford, K.L. (1998). Case Study 11: Management of *Phytophthora cinnamomi* on Kangaroo Island. **In** Worboys, G., DeLacy, T. and Lockwood, M. (eds) (in prep) *Protected Area Management (Principles and Practices)* NSW NPWS. Sydney

Gales, N.J. (1989). *A study of the "Reproductive Biology of the Australian Sea-lion (Neophoca cinerea)"*. Progress report to South Australian Wildlife Conservation Fund. (Unpublished).

Gales, N. J., Shaughnessy, P. and Dennis, T. E. (1994). Distribution, abundance and breeding cycle of the Australian Sea-lion *Neophoca cinerea* (Mammalia: Pinipedia). *Journal of Zoology, London*. **234**: 353-370.

Garnett, S. (1992). *The Action Plan for Australian Birds*. Australian National Parks and Wildlife Service, Canberra.

Garnett, S. T., Crowley, G. M., Pedler, L. P., Prime, W., Twyford, K. L. and Maguire, A. (1998*). Recovery Plan for the South Australian Subspecies of the Glossy Black Cockatoo (Calyptorhynchs lathami halmaturinus): 1993-2003*. Version 3.0 (unpublished) Department of Environment, Heritage and Aboriginal Affairs, South Australia.

Gill, T. (1909). A cruise in the S.S. "Governor Musgrave". (With notes on the physical geography and early history of Kangaroo Island and some of the Islands in Spencer's Gulf. Also reports on the ornithology, botany, geology and on the aborigines of the localities visited. *Proceedings of the Royal Geographical Society of Australasia South Australian Branch*. **10**: 90-184.

Glade-Wright, J. (1978). *A planning strategy for the coastal zone with particular reference to Kangaroo Island, South Australia.* M. Town Plan. thesis **-** University of Adelaide. (Unpublished).

Golding, N. (1979). Bicycle tour of Kangaroo Island. *Red Gum*. **3** (3), 6-7, 18.

Goldsworthy, S.D. (1989). *Maternal Care and diet of New Zealand Fur-seals Arctocephalus forsteri at Cape Gantheaume Kangaroo Island*. Progress Report June 1989 to South Australian Wildlife Conservation Fund. (Unpublished).

Goldsworthy, S.D. (1990). *Attendance Behaviour feeding ecology and pup growth in the New Zealand Fur-seal Arctocephalus forsteri*. First Quarterly Report to South Australian Wildlife Conservation Fund. (Unpublished).

Goldsworthy, S.D. (1991). *Feeding Ecology of New Zealand Fur-seals, Arctocephalus forsteri in South Australia*. Preliminary Report to South Australian Wildlife Conservation Fund. (Unpublished).

Good, I. and Schram, I. (1983). *Waterfowl and their Habitat, Murray's Lagoon, Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished).

Gosse, J.H. (1939). The Flinders Chase Sanctuary. *The Koala Magazine*. **1** (3): 12-13.

Grant, T. (1984). *The Platypus*. New South Wales University Press, Sydney.

Grant, T.R. and Denny, M.J.S. (1991). *Distribution of the Platypus in Australia with Guidlines for Management*. Report to Australian National Parks and Wildlife Service. (Unpublished). Mt King Ecological Surveys. NSW.

Green, B. (1969). *Water and electrolyte balance in the Sand Goanna (Varanus gouldii)*. PhD. Thesis, University of Adelaide. (Unpublished).

Green, B. (1972). Water losses of the Sand Goanna (*Varanus gouldii*) in its natural environment. *Ecology*. **53**: 452-457.

Green, B., Griffiths, M. and Newgrain, K. (1985). Intake of milk by suckling echidnas (*Tachyglossus aculeatus*) *Comparative Biochemistry and Physiology*. **81A**: 441-444.

Green, B. and King, D. (1978). Home Range and Activity patterns of the Sand Goanna *Varanus gouldii* (Reptilia Varanidae). *Australian Journal of Wildlife Research*. **5**: 417-424.

Green, R.H. (1983). Little Pigmy Possum *Cercartetus lepidus.* **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals*. Angus and Robertson, Sydney, pp. 164-165.

Griffiths, M. (1968a). *Echidnas*, Pergamon Press, Oxford.

Griffiths, M. (1968b). *Biology of Monotremes*. Arcademic Press, New York.

Griffiths, M., Elliott, M.A., Leckie, R.M.C. and Schoefl, G.I. (1973). Observations of the comparative anatomy and ultrastrutive of mammary glands and on the fatty acids of the triglycerides in platypus and echidna milk fats. *Journal of Zoology London*. **169**: 255-279.

Griffiths, M., Green, B., Leckie, R.M.C., Messer, M. and Newgrain, E.C.W. (1984). Constituents of Platypus and Echidna milk with particular reference to the fatty acid complement of the triglycerides. *Australian Journal of Biological Science*. **37**: 323-329.

Griffiths, M., Kristo, F., Green, B., Fogarty, A.C. and Newgrain, K. (1988). Observations on free-living, lactating echidnas *Tachyglossus aculiatus* (Monotremata : Tachyglossidae), and sucklings. *Australian Mammalogy*. **11**: 135-143.

Griffiths, M., McIntosh, D.L. and Coles, R.E. A. (1969). The mammary glands of the echidna, *Tachyglossus aculeatus* with observations on the incubation of the egg of the newly born young. *Journal of Zoology London.* **158**: 371-386.
Grose, M. and Rennison, M. (1973). Kangaroo Island Tour. *Journal of the Society for Growing Australian Plants, S.A.* **5** (16): 12-18.
Gross, G. F., Lee, D. C. and Zeidler, W. (1979). Invertebrates. **In** Tyler, M.J., Twidale, C.R. and Ling, J.K. (Eds.). *Natural History of Kangaroo Island*. Royal Society of South Australia, Adelaide, pp. 129-138.
Hale, H.M., and Tindale, N. B. (1930). Notes on some human remains in the lower Murray valley, South Australia. *Records of the South Australian Museum*. **4**: 145-218.
Hale, H. M. and Sommerville, J. D. (1942). The Platypus in South Australia. *South Australian Naturalist*. **21**: 11-12.
Hall, N. and Brooker, I. (1974a). Kingscote mallee, *Eucalyptus rugosa* R. Br. ex Blakely (Forest tree series; no. 127). Canberra, A.G.P.S.
Hall, N. and Brooker, I. (1974b). Kangaroo Island mallee ash, *Eucalyptus remote* Blakely. (*Forest tree series; no. 130*). Canberra, A.G.P.S.
Hall, N. and Brooker, I. (1974c). Kangaroo Island narrow-leaved mallee, *Eucalyptus cneorifolis D.C.* (*Forest tree series; no. 130).* Canberra A.G.P.S.
Hardy, O. (1978). *Island in the sun: Kangaroo Island in verse and sketches.* Holdfast Press, Glenelg.
Harris, C.R. (1974). *The National Parks and Reserves of South Australia*. Ph.D. thesis, University of Adelaide. (Unpublished).
Harris, C.R. (1977). Towards a historical perspective. **In** National Parks in South Australia: a symposium. *Proceedings of the Royal Geographical Society of Australasia South Australia Branch*. **78**: 55-71.
Harris, C.R. (1981). Flinders Chase National Park. A brief history. *South Australian Parks and Conservation*. **4** (1): 4-7.
Hart, M. (1987). *The suitability of Pelican Lagoon Conservation Park for supporting a population of Short-nosed Bandicoots*. Department of Wildlife and Park Management, South Australian College of Advanced Education. (Unpublished report).
Haska, J. (1985). (Ed.) *Wildlife Research in South Australia : Grants from the Wildlife Conservation Fund 1976-77 to 1979-80.* Community Information Service, Department of Environment and Planning, South Australia.
Haska, J. (1988). (Ed.) *Wildlife Research in South Australia : Grants from the Wildlife Conservation Fund 1980-81*. Community Information Service, Department of Environment and Planning, South Australia.
Hatch, J.H. (1977). Further notes on the birds of Kangaroo Island. *South Australian Ornithologist.* **27** (5): 193-194.
Heap, R.B., Renfree, M.B. and Burton, R.D. (1980). Steroid Metabolism in the yolk sac placenta and endometrium of the Tammar Wallaby, *Macropus eugenii*. *Journal of Endocrinology*. **87**: 339-349.
Heard L. and Channon B. Eds. 1997. *Guide to a Native Vegetation Survey Using The Biological Survey of South Australia Methodology*. First Edition. Geographic Analysis and Research Unit, Information and Data Analysis Branch, Department of Housing and Urban Development.
Heddle, E.M. (1976). *Effects of man on the vegetation in the national parks of South Australia*. Ph.D. thesis. University of Adelaide. (Unpublished).
Herbert, A. (1996). *Distribution, Habitat Preference and Status of the Kangaroo Island Dunnart (Sminthopsis aitkeni*). Nature Conservation Society of South Australia
Higgins, L.V. (1990). *Reproductive Behaviour and Maternal investment of Australian Sea-lions*. Ph.D. thesis, University of California, Santa Cruz. (Unpublished).
Higgins, L.V. (1993). The nonannual, nonseasonal breeding cycle of the Australia sea lion *Neophoca cinerea*. *Journal of Mammalogy* **74**: 270-274.
Higgins, L.V. and Gass, L. (1993). Birth to weaning: parturition, duration of lactation, and attendance cycles in Australian sea lions (*Neophoca cinerea*). *Canadian Journal of Zoology* **71**: 2047-2055.
Higgins, L.V. and Tedman, R.A. (1990). Effect of attacks by male Sea-lions *Neophoca cinerea* on mortality of pups. *Journal of Mammalogy*. **71**: 617-619.
Hind, L.A., Pook, W.E., Tyndale-Biscoe, C.J., Van Oorschot, R.A.H. and Cooper, D.W. (1989). Reproductive biology and the potential for genetic studies in the tammar wallaby *Macropus eugenii*. *Australian Journal of Zoology.* **37**: 223-234.
Hobbs, A. and French, A. (1981). Seal studies on Kangaroo Island. *Prince Alfred College Science Journal,* (1981): 46-48.
Holland, N and Fisk. (1999). Breeding Platypus in Captivity. *Thylacinus*. **23**: 24-28.
Holliday, I., Overton, B. and Overton, D. (1994). *Kangaroo Island's Native Plants*. Swift Printing Service, Adelaide, South Australia.
Hope, J. (1976). An uninhabited island upon an unknown coast. *Etruscan*. **25**: 18-23.

Hope, J.H. et al (1977). Late Pleistocene faunal remains from Seton Rock shelter, Kangaroo Island, South Australia. *Journal of Biogeography*. **4** (4): 363.

Hope, J.H., Lampert, R.J., Edmondson, E., Smith, M.J. and van Tets, G.F. (1977). Late Pleistocene faunal remains from Seton Rockshelter, Kangaroo Island, South Australia. *Journal of Biogeography*. **4** (4): 363-385.

Houston, T.F. (1978). *Dragon lizards and goannas of South Australia*. Special Education Series of the South Australian Museum, Adelaide.

Houston, T.F. (1979). Sea turtles in South Australia. *South Australian Naturalist.* **53** (3): 42-46.

Houston, T.F., and Tyler, M.J. (1979). Reptiles and amphibians. **In** Tyler M.J., Twidale, C.R. and Ling, J.K. (Eds.). *Natural History of Kangaroo Island*. Royal Society of South Australia, Adelaide, pp. 115-122.

How, R.A. (1983). Common Brushtail Possum *Trichosurus vulpecula*. **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals.* Angus and Robertson, Sydney, pp. 147-148.

Howchin, W. (1903). Further notes on the geology of Kangaroo Island. *Transactions of the Royal Society of South Australia*. **27**: 75-90.

Howchin, W. (1926). Some references to the literature concerning the extinct emus of Kangaroo Island and elsewhere. *South Australian Ornithologist.* **8** (7): 244-253.

Hutchinson, M. (1998). Checklist of Common Names of South Australian Reptiles and Amphibians (unpublished 1998 update) South Australian Museum.

Hutchinson, M.N., Donnellan, S.C., Baverstock, P.R., Kreig, M., Simms, S. and Burgin, S. (1990). Immunological Relationships and Genetic Division of the Australian lizards assigned to the Genus *Leiolopisma* (Scincidae : Lygosominae). Australian Journal of Zoology. **38**: 535-554.

Hutson, J.M., Shaw, G., Wai Sum, O., Short, R.V. and Renfree, M.B. (1988) Muellerian inhibiting substance production and testicular migration and descent in the pouch young of a marsupial. *Development*. **104**: 549-556.

Inns, R.W. (1980). *Ecology of the Kangaroo Island Wallaby Macropus eugenii (Desmarest) in Flinders Chase National Park, Kangaroo Island*. PhD. thesis, University of Adelaide. (Unpublished).

Inns, R.W., Aitken, P., and Ling, J.K. (1979). Mammals. **In** Tyler, M.J., Twidale, C.R. and Ling, J.K. (Eds.). *Natural History of Kangaroo Island*. Royal Society of South Australia, Adelaide, pp. 91-102.

Ising, E.H. (1923a). Some field naturalists on Kangaroo Island. *South Australian Naturalist*. **4** (2): 106-108.

Ising, E.H. (1923b). List of native plants in flower, collected on Kangaroo Island from Dec. 28th, 1922 to Jan. 9th, 1923. *South Australian Naturalist*. **4** (2): 109-111.

Ising, E.H. (1933). On the occurrence of the genus *Loranthus* on Kangaroo Island. *South Australian Naturalist*. **14** (4): 127.

Ising, E.H. and Ham, W. (1923). Ecology of the coast of Kangaroo Island. *South Australian Naturalist*. **4** (2): 105-106.

Jackson, G. (1978). *Birds of Kangaroo Island*. Kingscote, Islander Newspapers.

Jackson, I. (1971a). *Kangaroo Island wildflowers illustrated.* Islander Newspapers, Kingscote.

Jackson, I. (1971b). The flora of Kangaroo Island. *Journal of the Society for Growing Australian Plants, S.A.* **5** (7): 3-4.

Jackson, I. (1972). *Cyperus vaginatus* [on Kangaroo Island]. *Journal of the Society for Growing Australian Plants, S.A.* **5** (12): 7.

Jackson, I. (1974). *Leucopogon parviflorus* [on Kangaroo Island]. *Journal of the Society for Growing Australian Plants, S.A.* **6** (4): 93.

Jackson, I. (1976). *Kangaroo Island orchids*. Islander Newspapers, Kingscote.

Jackson, I. (1981a). The vegetation of Kangaroo Island. *South Australian Parks and Conservation.* **4** (1): 11-13.

Jackson, I (1981b). *Apium prostratum* [on Kangaroo Island]. *Journal of the Society for Growing Australian Plants, S.A.* **8** (12): 286.

Jaensch, R. (1980). Great crested grebe on Kangaroo Island. *South Australian Ornithologist*. **28** (4): 111.

Jeffrey, A. (1957). Birds of Flinders Chase, Kangaroo Island. *South Australian Ornithologist*. **22** (4): 49-52.

Jessop, J.P. (1989). A list of the vascular plants of South Australia (Edition III). *Journal of the Adelaide Botanic Gardens*. **12** (1): 1-163.

Jessop, J.P. (1993). *A list of the vascular plants of South Australia (Edition IV).* Botanic Gardens, State Herbarium of South Australia,

Jessop, J.P. and Toelken, H.R. (Eds.). (1986). *Flora of South Australia*. Government Printer, South Australia.

John, J., Johnson, L and Taylor, S. (1990). *An investigation of the Ecology of South West and Rocky River, Kangaroo Island, with reference to suitability for Platypus habitation.* Report to Department of Environment and Planning, South Australia. (Unpublished).

Johnston, T.H. (1936) A hundred years of zoology in South Australia. *Transactions of the Royal Society of South Australia* **60**: 41-55.

Johnston, T.H. and Mawson, P.M. (1941). Some nematodes from Kangaroo Island, South Australia. *Records of the South Australian Museum*. **7** (1): 145-148.

Jones, R.C. and Djakiew, D. (1978). The role of the excurrent ducts from the testes of testiconid mammals. *The Australian Zoologist*. **20** (1): 201-210.

Jones, R.C. and Djakiew, D. (1982). Evolution of the mammalian epididymus. **In**: Andre, J. (ed.). *The Sperm Cell, fertilizing power, surface properties, motility, nucleus, acrosome and evolutionary aspects*. Martins Nijhoff Publishing, The Hague, pp. 415-518.

Joseph, L. (1981a). *Some Genetical aspects of the Crimson Rosella complex.* Honour Thesis, Department of Genetics, University of Adelaide. (Unpublished).

Joseph, L. (1981b). The significance of Kangaroo Island to bird conservation in South Australia. *South Australian Parks and Conservation*. **(1)**: 16-17.

Joseph, L. (1981c). *Report on studies of the Red-tailed Black-cockatoo and Glossy Black-cockatoo conducted for the Department for Environment, South Australia in 1979-1980.* Report to the Reserves Advisory Committee. (Unpublished).

Joseph, L. (1982a). The origin of the population of the Glossy Black Cockatoo on Kangaroo Island. *South Australian Naturalist*. **56** (3):46-47.

Joseph, L. (1982b). The Glossy Black cockatoo on Kangaroo Island. *Emu*. **82** (1): 46-49.

Joseph, L. (1988). A Review of the Conservation Status of Australian Parrots in 1987. *Biological Conservation*. **46**: 261-280.

Joseph, L. (1991). A retrospective look at the discovery of the Western Whipbird in the mallee of Victoria and South Australia. *Victorian Naturalist*. **108**: 115-117.

Joseph R and Griffiths M. (1992). Whey proteins in early and late milks of Monotremes (Monotremata: Tachyglossidae, Ornithorhynchidae) and of the Tammar Wallaby (*Macropus eugenii*, Marsupialia: Macropodidae). *Australian Mammalogy* **15**: 125-127.

Jusaitis, M. (1999). The ecology, biology and conservation of endangered *Phebalium* species in South Australia. Final Report. Wildlife Conservation Fund Project No. 1377. (Plant Biodiversity Centre, Adelaide.)

Kangaroo Island Sustainable Development Committee. (1995). *Kangaroo Island Sustainable Development Strategy, 1995/1996*. Kingscote, South Australia.

Keast, J.A. (1968) Competitive interactions and the evolution of ecological niches as illustrated by the Australian honeyeater genus *Melithreptus* (Meliphagidae). *Evolution* **22**: 762-784.

Keast, J.A. and Condon, H.T. (1968). Honeyeaters relative to nectar feeding on Kangaroo Island. *Records of the South Australian Museum*. **15** (4): 699-703.

Kitchener, D., Stoddart, D. and Henry, J. (1984). A taxonomic revision of the *Sminthopsis murina* complex, Marsupialia: Dasyuridae in Australia including description of four new species. *Records of the Western Australian Museum*. **11**: 201-248.

Keeling, J.L. and Townsend, I.J. (1988). Gem tourmaline on Kangaroo Island. The *Australian Gemmologist*. **16**: 455-458.

Keene, L.R. (1971). Kangaroo Island trip. *Journal of the Society for Growing Australian Plants.* **5** (9): 18-20.

Kelly, P.P. (1979). *Walking the Kangaroo Island coastline.* Islander Newspapers, Kingscote.

Kemper, C.M. (1990). Status of Peramelidae in South Australia. **In** Seebeck, J.H., Brown, R.L., Wallace, R.L. and Kemper, C.M. (eds.) . *Bandicoots and Bilbies*. Surrey Beatty and Son, Sydney.

Kemper, C.M. and Queale, L. (1990). Mammals. **In** : Watts, C.H.S. (ed.). *A list of the vertebrates of South Australia*. Biological Survey Coordinating Committee and Department of Environment and Planning, South Australia.

Kemper, C.M. and Ling, J.K. (1991). Whale strandings in South Australia (1881-1989). *Transactions of the Royal Society of South Australia*. **115**, 37-52.

Kemper, C.M., Mole, J., Warneke, R.M., Ling, J.K., Needham, D.J. and Wapstra, J.E. (1997). Southern Right Whales in southeastern Australia – aerial surveys during 1991-93 and incidental information from 1904. **In** Hindell, M. and Kemper, C.M. (eds) *Marine Mammal Research in the Southern Hemisphere. Volume 1: Status, Ecology and Medicine*. Surrey Beatty and Sons, Chipping Norton. pp. 40-55

Kenny, M. (1970). *Rhamnaceae.* [Incl. *Spyridium thymifolium* and *S. coactilifolium* from Kangaroo Island]. *Journal of the Society for Growing Australian Plants.* **5** (1): 11.

Kenny, J. (1980). *Kangaroo Island field study : mammals and birds of Cape Gantheaume, June 1980.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

King, D. (1977). *Temperature regulation in the Sand Goanna Varanus gouldii (Gray).* PhD. Thesis, University of Adelaide. (Unpublished).

King, J.E. (1983). *Seals of the World 2nd Edition*. University of Queensland Press, St. Lucia.

Kirsch, J.A.W. and Poole, W.E. (1972). Taxonomy and distribution of the grey kangaroos, *Macropus giganteus* Shaw and *Macropus fuliginosus* Desmarest, and their subspecies (Marsupialia : Macropodidae). *Australian Journal of Zoology*. **20**: 315-339.

Kitchener, D., Stoddart, D. and Henry, J. (1984). A taxonomic revision of the *Sminthopsis murina* complex, Marsupialia : Dasyuridae in Australia including description of four new species. *Records of the Western Australian Museum.* **11** (3): 201-248.

Kloot, P. M. (1987). The invasion of Kangaroo Island by alien plants. *Australian Journal of Ecology*. **12**: 263-266.

Koch, D. and Trapnell, J. (1980). *Waterfowl population at Murray's Lagoon, July 1980, Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Kraehenbuehl, D.N. (1957). The King Fern, *Todea barbara* [on Kangaroo Island]. *South Australian Naturalist*. **32** (1): 11.

Lampert, R.J. (1972). A carbon date for the Aboriginal occupation of Kangaroo Island, South Australia. *Mankind*. **8**: 223-4.

Lampert, R.J. (1975). A preliminary report on some waisted blades found on Kangaroo Island, South Australia. *Australian Archaeology*. **2**: 45-48.

Lampert, R.J. (1977). Kangaroo Island and the Antiquity of Australians. **In** Wright, R.V.S. (ed.). *Stone Tools as Cultural Markers*. pp. 213-218. Australian Institute of Aboriginal Studies, Canberra.

Lampert, R.J. (1979). Aborigines. **In** Tyler, M.J., Twidale, C.R. and Ling, J.K. (eds.). *Natural history of Kangaroo Island*. Royal Society of South Australia. Adelaide, pp. 81-90.

Lampert, R.J. (1981). The Great Kartan Mystery. *Terra Australis*. **5.** (Department of Prehistory, Research School of Pacific Studies, Australian National University: Canberra).

Lampert, R.J. (1983a). Kangaroo Island 18+ 2KA. **In** Chappell, J.M.A. and Grindrod, A. (eds.). *CLIMANZ. A symposium of results and discussions concerned with late Quaternary climatic history of Australia, New Zealand and surrounding seas*. p 63. Department of Biogeography and Geomorphology, Research School of Pacific Studies, Australian National University, Canberra.

Lampert, R.J. (1983b). The Kartan mystery revisited. *Australian Archaeology*. **16**: 175-177.

Lampert, R.J., and Hughes, P.J. (1988). Early human occupation of the Flinders Ranges. *Records of the South Australian Museum*. **22**: 139-168.

Lang, P.J. (1992).South Australia **In** Leigh, J.H. and Briggs, J.D. ‘Threatened Australian Plants. Overview and Case Studies.’ P. 40. (Australian National Parks and Wildlife Service, Canberra).

Lang, P.J. and Kraehenbuehl, D.N. (1987). *Plants of particular conservation significance in South Australia's Agricultural Regions.* Department of Environment and Planning, South Australia.

Lang, P.J. & Kraehenbuehl, D.N. (1999). Plants of Particular Conservation Significance in South Australia’s Agricultural Regions. (April, 1999 update of unpublished database). Department for Environment, Heritage & Aboriginal Affairs.

Lange, R.T. (1979). Native Vegetation. **In** Tyler, M.J., Twidale, C.R. and Ling, J.K. (Eds.). *Natural History of Kangaroo Island.* Department of Environment and Planning, South Australia.

Lashmar, A.F.C. (1935). Birds noted in the eastern portion of Kangaroo Island. *South Australian Ornithologist.* **13** (1): 5-8.

Lashmar, A.F.C. (1936). Birds noted in the eastern portion of Kangaroo Island. *South Australian Ornithologist.* **13** (7): 200-203.

Lashmar, A.F.C. (1937a). Nesting activities in the eastern portion of Kangaroo Island - Season 1936-7. *South Australian Ornithologist.* **14** (3): 59-64.

Lashmar, A.F.C. (1937b). Bird notes (Golden whistler on Kangaroo Island.). *South Australian Ornithologist.* **14** (4): 103.

Lashmar, A.F.C. (1938). Notes on birds found in the eastern portion of Kangaroo Island. *South Australian Ornithologist.* **14** (7): 183-185.

Lashmar, A.F.C. (1939a). Further notes from Kangaroo Island. *South Australian Ornithologist.* **15** (1): 13.

Lashmar, A.F.C. (1939b). Migratory waders on Kangaroo Island. *South Australian Ornithologist.* **15** (2): 30.

Lashmar, A.F.C. (1942). Nesting activities and notes from the eastern portion of Kangaroo Island for the year 1939. *South Australian Ornithologist.* **16** (4): 37-40.

Lashmar, A. et al. (1946a). Bird notes (Kangaroo Island sightings). *South Australian Ornithologist.* **18** (3): 21.

Lashmar, A.F.C. (1946b). Birds noted on the eastern portion of Kangaroo Island. *South Australian Ornithologist.* **18** (3): 28-30.

Lashmar, A.F.C. (1972a). Beautiful firetails on Kangaroo Island. *South Australian Ornithologist.* **26** (2): 36.

Lashmar, A.F.C. (1972b). Western whipbirds nesting on Kangaroo Island. *South Australian Ornithologist.* **26** (2): 39.

Lashmar, A.F.C. (1972c). White-browed Wood-swallow on Kangaroo Island. *South Australian Ornithologist.* **26** (2): 36.

Lashmar, A.F.C. (1978). Dollarbird on Kangaroo Island. *South Australian Ornithologist.* **28** (1): 28.

Lashmar, A.F.C. (1984). Albatross Studies Kangaroo Island, South Australia. Summary of Progress, 1971-1983. *Corella*. **8**: 46-48.

Lashmar, A.F.C. (1987). Silvereyes *Zosterops lateralis* on Kangaroo Island, South Australia. *Corella*. **11** (2): 44-51.

Lashmar, A.F.C. (1988). Introduced and feral birds on the Dudley Peninsula, Kangaroo Island. *South Australian Ornithologist.* **30**: 154-155.

Lashmar, A.F.C. (1990). Albatross Studies - Kangaroo Island, South Australia : A Complete summary 1971-1988. *Corella*. **14**: 44-50.

Laut, P., Heylingers, P.C., Keig, G., Loffler, E., Margules, C., Scott, R.M. and Sullivan, M.E. (1977). *Environments of South Australia*. *Province 3. Mt. Lofty Block*. Canberra: CSIRO Division of Land Use Research.

Lawson, P.F. (1950). A reconstruction of the Kangaroo Island Emu (*Dromaius diemenianus*). *Records of the South Australian Museum*. **9** (3): 309-312.

Leak, B. (1981). *Kangaroo Island : A conflict of management, tourists, conservation and farming.* (film). Department of Wildlife and Park Management. South Australian College of Advanced Education, Salisbury.

Leak, B. and Svetec, F. (1981). *Kangaroo Island : A Conflict? The conflict of management between Tourists, Conservation and Farming on Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Lees, A.F. (1975). First record of Grey Petrel for South Australia (at Vivonne Bay, K.I.). *South Australian Ornithologist.* **27** (1): 10.

Leigh, J., Briggs, J.D. and Hartley, W., (1981). *Rare or threatened Australian Plants.* Australian National Parks and Wildlife Service, Canberra. Special publication No. 7.

Leigh, W.H. (1839). *Reconnoitring Voyages and Travels, with Adventures in the new Colonies of South Australia*. Smith, Elder and Co. Cornhill, London,

LeLacheur, H. (1966). *Soldier settlement.* M.A. thesis - politics. University of Adelaide. (Unpublished).

Lendon, A.A. (1925). Kangaroo Island. The tragedy of Dr. Slater and Mr Osborne. A story of ninety years ago. *Royal Geographical Society of Australasia, South Australian Branch*. **26**: 67-84.

Lesslie, R. G. (1981). *Wilderness. An inventory methodology and preliminary survey of South Australia*. Thesis submitted as part of the requirement of Master of Environmental Studies, University of Adelaide. (Unpublished).

Lesslie, R., Maslen, M. Canty, D., Goodwins, D. and Sheilds, R. (1991). *Wilderness on Kangaroo Island*. (Unpublished). Department of Geography, University of Adelaide, and Information Systems Branch, Department of Environment and Planning, South Australia.

Lewis, J. (1921). Flinders Chase: a great national park on Kangaroo Island. (In the Annual Address to the Society). *Proceedings of the Royal Geographical Society of Australasia, South Australian Branch*. **21**: 45-49.

Lewis, P.R., Fletcher, T.P. and Renfree, M.B. (1986). Prostaglandin in the peripheral plasma of tammar wallabies during parturition. *Journal of Endocrinology*. **111**: 103-109.

Lindsay, H.A. (1961). *American settlement on Kangaroo Island, 1803*. Adelaide, the Author.

Lindsay, J.M. (1983). Late Eocene to Late Oligocene age of the Kingscote Limestone, Kangaroo Island, S.A. *Royal Society of South Australia. Transactions*. **107**: 127-128.

Ling, J. (1978). The status of endangered marine mammals. **In** Tyler, M.J. (ed.). *The Status of Endangered Australasian Wildlife.* Royal Zoological Society of South Australia. Adelaide.

Ling, J. (1981b). Seals of the Chase. *South Australian Parks and Conservation*. **4** (1): 9-10.

Ling, J.K. (1987). New Zealand Fur-seal, *Arctocephalus forsteri* (Lesson) in South Australia. **In** Croxall, J.P. and Gentry, R.L. (Eds.). *Status biology and ecology for fur seals: Proceedings of an International symposium and workshop, Cambridge, England, 23-27 April 1984.* NOAA Technical Report.

Ling, J.K. and Walker, G.E. (1976). Seal studies in South Australia: progress report for the year 1975. *South Australian Naturalist*. **50** (4): 59-68, 72.

Ling, J.K. and Walker, G.E. (1977). Seal studies in South Australia: progress report for the period January 1976 to March 1977. *South Australian Naturalist.* **54** (2): 18,20-27,30.

Ling, J.K. and Walker, G.E. (1978). An 18 month breeding cycle in the Australian Sea-lion. *Search.* **9**: 464-465.

Ling, J.K. and Walker, G.E. (1979). Seal studies in South Australia: progress report for the period April 1977 to July 1979. *South Australian Naturalist.* **54** (2): 68-78.

Lintern, S.M. (1970). *Aspects of nitrogen metabolism in the Kangaroo Island Wallaby, Protemnodon eugenii* (Desmarest). Ph.D. thesis - University of Adelaide. (Unpublished).

Lothian, J.A. (1984). A cost benefit study of National Parks on Kangaroo Island, South Australia. **In** *Proceedings of Conservation and the Economy Conference, Sydney, October, 1984.*

Lothian, T.R.N. (1962). *Calostemma luteum* Sims. Rediscovery of *Stylidium tepperanum* "Kangaroo Island trigger plant", and *Scilla hyacinthoides* on Kangaroo Island. *South Australian Naturalist.* **36** (4): 45-46.

Lothian, T.R.N. (1969). Tepper's trigger plant: *Stylidium tepperianum* [on Kangaroo Island]. *South Australian Naturalist.* **43** (4): 104-106.

Lunney, D. (1983). Bush Rat, *Rattus fuscipes*. **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals.* Angus and Robertson, Sydney, pp. 443-445.

Lunney, D. (1983). Swamp Rat, *Rattus lutreolus*. **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals.* Angus and Robertson, Sydney, pp. 447-448

MacArthur, R.H. & Wilson, E.O. (1967) *The theory of island biogeography*. Princeton University Press, Princeton.

McGilp, J.N. (1920) A fortnight on Kangaroo Island (South Australia). *South Australian Ornithologist* **5**: 24-28.

McCallum, W.S. (1991). Geological investigations and drilling, Parndana area, Kangaroo Island 1989-1990. *South Australia. Department of Mines and Energy. Report Book*. 91/23.

McGilp, J.N. (1920). A fortnight on Kangaroo Island (South Australia). *South Australian Ornithologist.* **5** (1): 24-28.

McGilp, J.N. (1947). The Southern Stone-Curlew (*Burhinus magnirostris*) (on Kangaroo Island). *South Australian Ornithologist.* **18** (5): 44-46.

McKay, G.M. (1983). Common Ringtail Possum *Pseudocheirus peregrinus*, **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals*. Angus and Robertson, Sydney. pp. 126-127.

McKelvey, M. (1975). *Kangaroo Island*. Rigby, Adelaide.

McKelvey, M. (1987). Field observations of the Echidna, *Tachyglossus aculeatus* from Kangaroo Island, South Australia. *South Australian Naturalist.* **61**: 46-47.

McKelvey M, Rismiller P (1992). Echidna research: tracking a survivor. *Melbourne Zoo News* **June 1992**: 3.

McKelvey M, Rismiller P (1992).Land for Learning - Pelican Lagoon Research Centre. *Australiasian Science Magazine* **2**: 7-15.

McKenzie, N.L. and Robinson, A.C. (eds.). (1987). *A Biological Survey of the Nullarbor Region, South and Western Australia in 1984.* S.A. Department of Environment and Planning, W.A. Department of Conservation and Land Management, Australian National Parks and Wildlife Service.

McKenzie, N.L., Robinson, A.C. and Belbin, L. (1991). Biogeographic Survey of the Nullarbor District. **In** Margules, C.R. and Austin, M.P. (Eds.). *Nature Conservation : Cost Effective Biological Surveys and Data Analysis.* CSIRO, Australia.

McKinlay, B.J. (1970). Island of the kangaroo. *Educational Magazine*. **27** (June).

Maiden, J.H. (1908). A contribution to the botany of South Australia. *Transactions of the Royal Society of South Australia*. **32**: 253-258.

Major, R.B. and Vitolis, V. (1973). The geology of Vennachar and Borda 1:50,000 map areas, Kangaroo Island. *Mineral Resources Review, South Australia.* **134**: 38-51.

Mallack, E.H. (1905). *Kangaroo Island, Adelaide's sanatorium*. W.K. Thomas, Adelaide.

Mandis Roberts Consultants (1997). *Developing a Tourism Optimisation Management Model (TOMM), a model to monitor and manage tourism on Kangaroo Island.* South Australia. Final Report, South Australian Tourism Commission, Adelaide

Mann, P. (1988). Kangaroo Island, The pirate fortress that retains its free spirit. *Australian Geographic.* **10**: 26-43.

Manthorpe, R. (1980). *Coastal geology, Bales Bay to D'Estrees Bay, Kangaroo Island.* Department of Wildlife and Park Management. South Australian College of Advanced Education, Salisbury. (Unpublished report)

Marlow, B.J. (1983). Australian Sea-lion *Neophoca cinerea.* **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals*. Angus and Robertson, Sydney. pp. 460-461.

Martin, R. W. (1983). Koala *Phascolarctos cinereus,* **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals*. Angus and Robertson, Sydney. pp. 112-115.

Martin, R.W., Handsyde, K.A. and Lee, A.K. (1987). *Survey of the incidence of Chlamydial infection in the koala population on Kangaroo Island*. Department of Zoolgy, Monash University. (Unpublished).

Masterman, M. (1950). *Flinders Chase, Kangaroo Island, South Australia*. Georgian House, Melbourne.

Masterman, M. (1972). *Flinders Chase revisited*. Griffen Press, Adelaide.

Matheson, W.E. (1974). The irruption of native hens in South Australia in 1972-73. *South Australian Ornithologist.* **26** (7): 151-156.

Matthew, J. (1994). The status, distribution and habitat of the Slender-billed Thornbill, *Acanthiza iredalei*, in South Australia. *South Australian Ornithologist* **32**: 1-19.

Matthews, G. (1912) A reference list to the birds of Australia. *Novitates Zoologicae* **18**:171-455.

Maxwell, S., Burbidge, A. A. and Morris, K. (Eds). (1996). *The 1996 Action Plan for Australian Marsupials and Monotremes*. Wildlife Australia, Canberra.

Mellor, J.W. (1909). Ornithological notes of an expedition to Kangaroo Island and Spencer's Gulf, in January 1907. *Royal Proceedings of the Geographical Society of Australasia South Australian Branch* . **10** : 185-199.

Mellor, J.W. (1912). Kangaroo Island reserve. *Emu*. **12** (1): 39-40.

Mellor, J.W. (1920). Native Companions on Kangaroo Island. *South Australian Ornithologist*. **5** (1): 29.

Miles, J.A.R. (1953). Peregrine Falcon on Kangaroo Island. *South Australian Ornithologist.* **21** (1): 12.

Milnes, A.R. Cooper, B.J. and Cooper, J.A. (1982). The Jurassic Wisanger Basalt of Kangaroo Island, South Australia. *Transactions of the Royal Society of South Australia*. **106**:1-13.

Milnes, A.R., Ludbrook, N.H., Lindsay, J.M. and Cooper, B.J. (1983). The succession of Cainozoic marine sediments on Kangaroo Island, South Australia. *Transactions of the Royal Society of South Australia*. **107**: 1-35.

Morgan, A.M. (1906). The birds of Kangaroo Island. *Emu*. **5** (4): 224-225.

Morgan, A.M. (1926). Kangaroo Island birds. *South Australian Ornithologist.* **8** (7): 239-240.

Morgan, A.M. (1929). Bird notes. (Trip to Kangaroo Island). *South Australian Ornithologist.* **10** (4): 132-133.

Morgan, A.M. (1932). Notes on some species seen on a trip to Kangaroo Island from 24th February to 7th March 1932. *South Australian Ornithologist.* **11** (7): 203-204.

Morgan, A.M. and Sutton, J. (1928). A critical description of some recently discovered bones of the extinct Kangaroo Island Emu, *Dromaius diemenianus*. *Emu*. **28** (1): 1-19.

Moroney, D. (undated). *Cape Gantheaume Conservation Park visitor information activities brochure, Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Eduction, Salisbury. (Unpublished report).

Morris, B.J. (1980). Heavy-mineral sands : a resume of South Australian occurrences. *Mineral Resources Review, South Australia*. **148**: 26-40.

Mortimer, G.E., Cooper, J.A. and Oliver, R.L. (1986). The geochronological and geochemical evolution of the Proterozoic Lincoln Complex, Eyre Peninsula. *Geological Society of Australia. Abstracts*. **15**: 140-141.

Mowling, F.A. and Barritt, M.K. (1981). *The natural vegetation of Kangaroo Island*. Nature Conservation Society of South Australia. Adelaide.

Muir B.G. 1977. Biological Survey of the Western Australian Wheatbelt. Pt 2:Vegetation and Habitat Bendering Reserve. *Records of the Western Australian Museum, Supplement No: 3,* WA Museum, Perth .

Murphy, C.R. (1971). *Haematological studies on the Kangaroo Island Wallaby, Protemnodon eugenii (Desmarest).* M. Sc. thesis **-** University of Adelaide. (Unpublished).

Murphy, C.R. and Smith, J.R. (1970). Age determination of pouch young and juvenile Kangaroo Island Wallabies. *Transactions of the Royal Society of South Australia.* **94**: 15-20.

Nagel, C. (1986). *Summer interpretive programs for Hansen Bay, Kangaroo Island, South Australia.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Native Fauna and Flora Protection Committee (1919). 30th annual report. Flinders chase (Kangaroo Island Reserve). *Transactions of the Royal Society of South Australia.* **43**: 450.

* Nelson, E.C. (1978). A revision of Adenanthos, *Brunonia*. **1**

Neagle, N. (1995*). An update of the Conservation Status of the Major Plant Associations of South Australia*. Department of Environment and Natural Resources, South Australia.

Newnham, W.H. (1975). *Kangaroo Island sketchbook*. Rigby, Adelaide.

Nicolle, D. (1997). *Eucalypts of South Australia*. Dean Nicolle, South Australia.

Noble, I.R. (1986). Fire **In** Wallace, J.R. (Ed.). *The Ecology of the Forests and Woodlands of South Australia*. Government Printer, Adelaide.

Norman, F.I. & Horton, P. (1993) Notes on Freckled Duck *Stictonetta naevosa* shot at Bool Lagoon, South Australia, in 1980. *Records of the South Australian Museum* **26**: 149-172

North, A.J. (1904-1906) *Nests and eggs of birds found breeding in Australia and Tasmania*. Australian Museum, Sydney.

Northcote, K.H. (1946). Soil survey and land use potential of the Hundred of Duncan, Kangaroo Island, South Australia. *Soils and Land Use Series. No. 2.* Division of Soils, CSIRO, Canberra.

Northcote, K.H. (1950). A soil survey of the Hundred of Newland, Kangaroo Island, South Australia. *Divisional Report 1/50.* Division of Soils, CSIRO, Canberra.

Northcote, K.H. (1979). Soils, **In** Tyler, M.J., Twidale, C.R. and Ling, J.K. (Eds.). *Natural history of Kangaroo Island*. Adelaide. Royal Society of South Australia. pp. 39-46.

Northcote, K.H. and Tucker, B.M. (1948). A soil survey of the Hundred of Seddon and part of the Hundred of MacGillivray, Kangaroo Island, South Australia. *Bulletin of the Council of Scientific and Industrial Research. No. 233.*

Nunn, J. M. (1989). *This Southern Land. A Social History of Kangaroo Island* 1800-1890. Investigator Press, Adelaide.

O'Callaghan, M.G. and Moore, R. (1986). Parasite and Serlogical Survey of the Common Brushtail Possum *(Trichosurus vulpecula*) from Kangaroo Island, South Australia. *Journal of Wildlife Diseases*. **22** (4): 589-591.

Oster, S. (undated). *Macropod survey, Murray's Lagoon, Cape Gantheaume Conservation Park, Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury.

Osterstock, A. (1973). *Time on Kangaroo Island*. The Author, Adelaide.

Osterstock, A. (1974). *Wildflowers of Kangaroo Island.* Austaprint, Adelaide.

Osterstock, A. (1975). *The story of Kangaroo Island*. Austaprint, Adelaide.

Osterstock, A. (1979). *The Duncow report.* Austaprint, Adelaide.

Overton, B. (1992*). Record of the distribution of five species of rare flora on Kangaroo Island.* (Unpublished) Report on Wildlife Conservation Fund Grant to the Reserves Advisory Committee. Department of Environment and Planning, South Australia.

Overton, B. (1995a). A new endemic pea plant for Kangaroo Island. *South Australian Naturalist*. **69**: 18-20.

Overton, B. (1995b). *Irenepharsus phasmatodes*, a rarely seen endemic on Kangaroo Island. *South Australian Naturalist*. **69**: 23-26.

Overton, B. M. (1994). Fire History of Western Kangaroo Island. West of and including the Hundreds of Duncan and Newland. Unpublished Report to the Native Vegetation Council, Department of Environment and Natural Resources, South Australia.

Overton, B. M. (1997). Fire History of Eastern Kangaroo Island. (east of and including the Hundreds of Cassini, Menzies, Haines, McGillivray, Dudley and Seddon, with special reference to the habitat of the Glossy Black Cockatoo). Unpublished report to the Glossy Black Cockatoo Recovery Team, Department of Environment and Natural Resources, South Australia.

Overton, B. M. (1998). Post Fire Ecology of Flinders Chase National Park specifically *for Asterolasia phebalioides*, *Logania insularis* and *Olax obcordata*, Kangaroo Island, South Australia, November 1994 to April 1998. Unpublished report for Wildlife Conservation Fund Grant.

Overton, B.M., McKelvey, M.W. and Overton, D.S. (1988). Distribution of *Australasia phebaloides*, a Victorian endemic on Kangaroo Island, September. *Journal of the Society for Growing Australian Plants.* August 1988, p. 303.

Overton, B.M. and Overton, D.S. (1989). *Apalochlamys spectabilis* an early coloniser following soil disturbance or fire. *South Australian Naturalist.* **64**: 35-37.

Overton, B. M., McKelvey, M. W. and Overton, D. S. (1988). Distribution of *Asterolasia phebaloides*, a Victorian endemic on Kangaroo Island, South Australia. *South Australian Society for Growing Australian Plants Journal* **10**: 303.

Overton, B.M., McKelvey, M.W. and Overton, D.S. (1989). Distribution of *Stylidium tepperanum* (Kangaroo Island Trigger Plant) on Kangaroo Island, South Australia. *South Australian Society for Growing Australian Plants Journal*. **10**: 384-386.

Overton, B.M., McKelvey, M.W. and Schwaner, J.D. (1988). A list of native and alien flowering plants in islets in Pelican Lagoon, Kangaroo Island. *South Australian Naturalist.* **63** (2): 44-50.

Overton, B.M., Overton, D.S. and McKelvey, M.W. (1989). *Map and record of the distribution of five of Kangaroo Island's flora: Stylidium tepperanum, Eremophila weldii, Phebalium equestre, Eremophila behriana and Asterolasia phebaloides.* Final Report on a Wildlife Conservation Fund Grant. (Unpublished).

Overton, B.M., Overton, D.S. and M.W. McKelvey (1990a). *Final Report. 1988 Wildlife Conservation Fund Grant.* Department of Environment and planning, Adelaide (Unpublished).

Overton, B.M., Overton, D.S. and M.W. McKelvey (1990b). Field notes on *Asterolasia phebalioides* F Muell (Rutaceae).*South Australian Naturalist* **66**: 39-48

Overton, B and Overton, D (1992a). Field notes on a new endemic plant for Kangaroo Island, *Phebalium equestre*, Rutaceae, no common name. *South Australian Naturalist* **66**:52-58.

Overton, B and Overton, D (1992b). Field notes on *Pultenaea teretifolia* var *brachyphylla* (HB Williamson),LEGUMINOSAE, Kangaroo Island grooved bush-pea. *South Australian Naturalist* **67**:

Overton, B. and Overton, D. (1993). Presumed Extinct Plants on Kangaroo Island. *South Australian Naturalist*. **68**: 24-27.

Owen Smyth, C.E. (1906). Frenchman's (Baudin's) Rock, Kangaroo Island. *Royal Geographical Society of Australasia, South Australian Branch Proceedings*. **8** : 55-58.

Palmer, D. and Lewis, S. (1987). *Mapping of Roadside Vegetation in South Australia.* Department of Environment and Planning, South Australia.

Palmer, D. and Lewis, S. (1987). *Mapping of Roadside Vegetation in South Australia, Extract No. 2 : Kangaroo Island and Mt Lofty Ranges.* Department of Environment and Planning, South Australia.

Parker, P., Altmann, R., Freas, K., Lovejoy, E., Lovejoy, K., Ranney, A. and Royal, T. (1986). *Koalas occupying the Eucalyptus viminalis Plantation at the Ranger's Headquarters at Flinders Chase National Park, Activity Patterns and Tree Utilisation 25 July - 1 August 1986*. (Unpublished Report).

Parker, S.A. (1977). The distribution and occurrence in South Australia of owls of the genus *Tyto. South Australian Ornithologist.* **27** (6): 207-215.

Parker, S.A. (1980). An early breeding record of the Sooty tern from Kangaroo Island. *South Australian Ornithologist.* **28** (5): 139-140.

Parker, S.A. (1984). The extinct Kangaroo Island Emu, a hitherto-unrecognised species. *Bulletin of the British Ornithological Union*. **104**: 19-22.

Parker, S.A. (1988) The origin of populations of the Eastern Rosella inhabiting the Mount Lofty Ranges and Adelaide Plains, South Australia. *South Australian Ornithologist* **30**: 132.

Parker, S.A. and Lashmar, A.F.C. (1976). Some notes on the birds of Kangaroo Island. *South Australian Ornithologist.* **27** (4): 123-124.

Parker, S.A. and Horton, P. (1990). Birds, **In** Watts, C.H.S. (ed.). *A list of the vertebrates of South Australia*. Biological Survey Coordinating Committee and Department of Environment and Planning, South Australia.

Parker, S.A. Eckert, H.J. & Ragless, G.B. (1985) *An annotated checklist of the birds of South Australia. Part 2A: Waterfowl.* South Australian Ornithological Association, Adelaide.

Parker, S.A. Reid, N.C.H. (1979) *An annotated checklist to the birds of South Australia. Part 1: Emus -spoonbills***.** South Australian Ornithological Association, Adelaide.

Parry, LJ and Renfree, MB.(1993). Immunohistochemical localisation of relaxin in a marsupial, the tammar wallaby. *Journal of Reproductive Fertility Abstract Series*, **11**: 10.

Parry, LJ, Renfree, MB and Shaw, G. (1993). Infusion with an oxytocin receptor antagonist delays parturition in a marsupial, the tammar wallaby. *Biol Reprod Suppl*, **48**: 484.

Parsons, F.E. (1920). New sub-species of Emu Wren. *(Stipiturus malachurus halmaturina.* Kangaroo Island Emu Wren). *South Australian Ornithologist.* **5** (1): 15-17.

Parsons, F.E. (1926). Some notes re Kangaroo Island birds. *South Australian Ornithologist.* **8** (7): 240.

Paton, D.C. (1986). Evolution of bird pollination in Australia. **In** Ford, H.A. and Paton, D.C. (eds.). *The Dynamic Partnership: Birds and Plants in South Australia*. Government Printer, Adelaide, pp. 32-41.

Paton, D.C. (1988) Migratory flocks of honeyeaters at Cape Jervis, South Australia. *South Australian Ornithologist* **30**:133-134.

Paton, D. C. and Ford, H.A. (1977). Pollination by birds of native plants in South Australia. *Emu*. **77**: 73-85.

Pattison, G. (1942). Some History of Kangaroo Island, South Australia. *South Australian Naturalist.* **21**: 4-5.

Paull, D.J. (1990). *The Distribution and Conservation Status of the Southern Brown Bandicoot (Isoodon obesulus) in South Australia.* A Report prepared for World Wildlife Fund, Australia. (Unpublished Report).

Paull, D. J. (1995). The Distribution of the Southern Brown Bandicoot (*Isoodon obesulus obesulus*) in South Australia. *Wildlife Research*. **22**: 585-600.

Pepper, J. W. (1992). *An assessment of the impact of the November 1991 fire on the Glossy Black Cockatoo in Flinders Chase* (Unpublished). Department of Environment and Planmning, South Australia.

Pedler, L. and Thomas, B. (1996). Bird Notes. *South Australian Ornithological Association Newsletter* **159**.

Philpott, C.M. (1965). *The ecology of the koala Phascolarctos cinereus (Goldfuss) on Flinders Chase, Kangaroo Island*. Honours Thesis, University of Adelaide. (Unpublished).

Pizzey, G. (1980) *A field guide to the birds of Australia*. Collins, Sydney.

Pledge, N.S. (1979). Fossil Vertebrates. **In** Tyler, M.J., Twidale, C.R. and Ling, J.K. (eds.). *Natural History of Kangaroo Island.* pp. 123-7 . Royal Society of South Australia, Adelaide.

Poole, W.E. (1976). Breeding biology and current status of the Grey Kangaroo *Macropus fuliginosus* of Kangaroo Island, South Australia. *Australian Journal of Zoology*. **24**: 169-187.

Poole, W.E. (1983). Western Grey Kangaroo, *Macropus fuliginosus*, **In** Strahan, R. (Ed.). *The Australian Museum Complete Book of Australian Mammals.* Angus and Robertson, Sydney, pp. 248-249.

Poole, W.E. (1986). *Summary Progress Report 1985 - Population dynamics of the Tammar Wallaby, Kangaroo Island.* Unpublished report to the National Parks and Wildlife Service, South Australia.

Poole, W.E., Wood, J.T. and Simms, N.G. (1991). Distribution of the Tammar, *Macropus eugenii* and the Relationships of Populations as Determined by Cranial Morphometrics. *Wildlife Research.* **18**: 625-639.

Prescott, A. (1988). *Its Blue with Five Petals; Wildlflowers of the Adelaide Region.* Lutheran Publishing House, South Australia.

Prescott, J.A. (1929). The vegetation map of South Australia. *Transactions of the Royal Society of South Australia*. **53** : 7-9.

Price, R.D. and Emerson, K.C. (1988). *Menacanthus dennisi* (Mallophaga : Menoponidae). A new species from the Grey Currawong (Passeriformers : Cracticidae) in South Australia. *The Florida Entomologist.* **71**: 202-204.

Qualls, C. P., Shine, R., Donnellan, S. and Hutchinson, M. (1995). The evolution of viviparity within the Australian scincid lizard, *Lerista bougainvillii*. *Journal of Zoology London* **237**: 13-26.

Randall, D., Gannon, B., Runciman, S. and Baudinette, R.V. (1984). Gas transfer by the neonate in the pouch of the tammar wallaby *Macropus eugenii*, **In** Seymour, R.S. (ed.). *Respiration and metabolism of embryonic vertebrates.* Dr W. Junk, London, pp. - 435.

Rankin, L.R., Flint, R.B. and Belperio, A.P. (1991). Precambrian Geology of islands in the Investigator Strait Area, South Australia. *South Australia. Department of Mines and Energy. Report Book*. 91/57.

Rawlinson, P.A. (1991). Taxonomy and distribution of the Australian Tiger Snakes (*Notechis*) and Copperheads (*Austrelaps*) (Serpentes, Elapidae). *Proceedings of the Royal Society of Victoria.* **103**: 125-135.

Readers Digest. (1986). *Complete book of Australian birds.* 2nd Edition. Readers Digest Services, New South Wales.

Reardon, T. B. and Flavel, S.C. (1987). *A Guide to the Bats of South Australia*. South Australian Museum and Field Naturalists Society of South Australia. Adelaide.

Reddacliff, G. and Lim, L. (1990). *Infectious disease monitoring in captive and wild pinnipeds.* Report to the Australian National Parks and Wildlife Service Project 8889/23. (Unpublished).

Reid, J. and Carpenter, G.A. (1987). *A regional guide to areas of conservation significance for native birds in South Australia's agricultural districts.* Native Vegetation Management Branch, Department of Environment and Planning. (Unpublished report)

Reid, N. and Vincent, D.J. (1979). *Report of an ornithological survey of South Australian National Conservation and Recreation Parks and Game Reserves, with comments on the adequacy of bird conservation in South Australia.* South Australia Ornithilogical Association, Adelaide. (Unpublished Report)

Renfree, M.B. (1976). Embryonic diapause and delayed implantation in mammals. *Bibliophy. Reproduction* **28**: 353-358 and 447-451.

Renfree, M.B. (1977a). Embryonic diapause in mammals - a developmental strategy, **In** Clutter, M.E. (ed.). *Mechanisms of Dormancy and Developmental Arrest*. Academic Press, New York.

Renfree, M.B. (1977b). Feto-placental influences in marsupial gestation, **In** Calaby, J.G. and Tyndale-Biscoe, C.H. (eds.). *Reproduction and Evolution*. Australian Academy of Science, Canberra.

Renfree, M.B. (1979). Initiation of development of diapausing embryo by mammary denervation during lactation in a marsupial. *Nature*. **278**: 549-551.

Renfree, M.B. (1980). Signals exchanged between the Blastocyst and Endometrium in the period leading to implantation. *Progress in Reproductive Biology*. **7**: 1-13.

Renfree, M.B. (1983). Marsupial reproduction : the choice between placentation and lactation. *Oxford Reviews of Reproductive Biology*. **5**: 23-29.

Renfree, M.B. and Tyndale-Biscoe, C.H. (1973). Intra-uterine development after diapause in the marsupial *Macropus eugenii*. *Developmental Biology*. **32**: 28-40.

Renfree, M.B. and Tyndale-Biscoe, C.H. (1977). Manipulation of marsupial embryos, **In** Daniel, J.C. (ed.). *Methods in Mammalian Reproduction*. Academic Press, New York.

Renfree, M.B. and Heap, R.B. (1977). Steroid metabolism in the placenta, corpus luteum and endometrium of the marsupial *Macropus eugenii*. *Theriogenology*. **8**: 164.

Renfree, M.B. and Young, I.R. (1979a). Growth of the corpus luteum and its progesterone content during pregnancy in the tammar wallaby *Macropus eugenii. Journal of Reproductive Fertility*. **57**: 131-136.

Renfree, M.B. and Young, I.R. (1979b). Steroids in pregnancy and parturition in the marsupial *Macropus eugenii. Journal of Steroid Biochemistry*. **1**: 515-522.

Renfree, M.B., Green, S.W. and Young, I.R. (1979). Growth of the corpus luteum and its progesterone content during pregnancy in the tammar wallaby, *Macropus eugenii*. *Journal of Reproductive Fertility*. **57**: 131-136.

Renfree, M.B. and Short, R.B. (1988). Sex determination in marsupials: evidence for a marsupial - eutherian dichotomy. *Philosophical Transactions of the Royal Society of London*. **322**: 41-53.

Renfree, M.B., Wilson, J.D., Short, R.V., Shaw, G. and George, F.W. (1992). Steroid hormone content of the gonads of the tammar wallaby during sexual differentiation. *Bioogical Reproduction* **47**: 644-647.

Renfree, M.B., Shaw, G., Clark, J., Short, R.V and Kerr, J.B. (1992). Morphology of the developing urogential system of the tammar wallaby, *Macropus eugenii.Journal of Reproductive Fertility Abstract Series* **9**, 134.

Renfree, M.B, Parry, LJ and Shaw, G.(1992). A role for oxytocin in parturition in the tammar wallaby. *Proceedings of the Australian Society for Reproductive Biology, Adelaide. Abstract* 137

Renfree, M.B., Parry, L.J. and Shaw, G. (1993). Infusion with an oxytocin receptor antagonist delays parturition in a marsupial, the tammar wallaby. *J Reprod Fert Abstr Ser,* **11**: 75.

Ride, W.D.L. (1970). *A Guide to the Native Mammals of Australia*. Oxford University Press, Melbourne.

Rismiller, P.D. (1991). Echidna Research, 100 years ago and today. *Australian Science Magazine,* **4**: 16-22.

Rissmiller, P.D. (1999*). The Echidna, Australia's Enigma*. Hugh Levin Associates, Inc. Hong Kong.

Rismiller, PD and Seymour, R.S. (1991). The echidna. *Scientific American* **February 1991:** 96-103.

Rix, C.E. (1938). A trip to eastern Kangaroo Island. *South Australian Ornithologist.* **14** (6): 165-169.

Robinson, A.C. (1978). The Koala in South Australia. **In** T.J.Bergin, (Ed.). *The Koala. Proceedings of the Taronga Symposium on Koala Biology, Management and Medicine, Sydney March 1976.* Zoological Parks Board of NSW, Sydney, pp. 132-143.

Robinson, A.C. (1988). Flinders Chase : Natural Treasure. *Australian Geographic,* **10**: 40.

Robinson, A.C. (1989). Island Management in South Australia, **In** Burbidge, A.A. (ed.). Australian and New Zealand Islands: *Nature Conservation values and management, Proceedings of a Technical Workshop, Barrow Island, Western Australia. 1985.* Occasional Paper 2/89 Department of Conservation and Land Management, Western Australia.

Robinson, A.C. (1990). *A floristic vegetation classification for Kangaroo Island: Preliminary Results.* National Parks and Wildlife Service. Department of Environment and Planning, South Australia. (Unpublished report).

Robinson, A.C., Delroy, L.B., and Jenkins, R.B. (1982). *The conservation and management of the Cape Barren Goose, Cereopsis novaehollandiae, Latham, in South Australia*. National Parks and Wildlife Service. Special Publication Number 1. Adelaide.

Robinson, A.C. and Canty, P.D. (1984). Biological survey of South Australia's offshore islands, **In** Myers, K., Margules, C.R. and Musto, I. (eds.). *Survey Methods for Native Conservation Proceedings of a Workshop held at Adelaide University, 31 August - 2 September 1983.* CSIRO Division of Land and Water Resources, Canberra, pp. 298-318.

Robinson, A.C. and Canty, P.D. (1985). (Eds.). *Wildlife Research in South Australia : Scientific Permits Issued 1984-85.* National Parks and Wildlife Service. Department of Environment and Planning, South Australia.

Robinson, A.C., Casperson, K.D., Canty, P.C. and Macdonald, C.A. (1988). *A biological survey of the Gawler Ranges, South Australia in October 1985.* South Australian National Parks and Wildlife Service and South Australian Museum, Adelaide.

Robinson, A.C., Spark, R. and Halstead, C. (1989). The distribution and management of the Koala (*Phascolarctos cinereus*) in South Australia. *South Australian Naturalist.* **64** (1): 4-24.

Robinson, A.C. and Dennis, T.D. (1988). The status and management of seal populations in South Australia. **In** Augee, M.L. (ed.), *Marine Mammals of Australasia*. Surrey Beatty Pty. Ltd., Sydney, pp. 87-109.

Robinson, A.C., Canty, P., Mooney, P.A. and Rudduck, P. (1996). *South Australia's Offshore Islands.* Department of Environment and Natural Resources, South Australia, Australian Heritage Commission.

Rogers, R.S. (1909). Notes on the orchids of Kangaroo Island, together with a description of two new species. *Transactions of the Royal Society of South Australia.* **33**: 11-17.

Royal Australasian Ornithological Union (1995) *.Recommended common names for Australian birds*. RAOU, Melbourne.

Royal Society of South Australia (1908). 20th annual report of the Native Fauna and Flora Protection Committee of the Field Naturalists' Section. The Kangaroo Island Reserve. *Transactions of the Royal Society of South Australia.* **32**: 418-419.

Royal Society of South Australia (1909). 21st annual report of the Native Fauna and Flora Protection Committee of the Field Naturalists' Section. The Kangaroo Island Reserve. *Transactions of the Royal Society of South Australia.* **33**: 371-372.

Royal Society of South Australia (1910). 22nd annual report of the Native Fauna and Flora Protection Committee of the Field Naturalists' Section. The Kangaroo Island Reserve. *Transactions of the Royal Society of South Australia.* **34**: 276-277.

Royal Society of South Australia (1911). 23rd annual report of the Native Fauna and Flora Protection Committee of the Field Naturalists' Section. The Kangaroo Island Reserve. *Transactions of the Royal Society of South Australia.* **35**: 245-246.

Ruediger, W.J. (1980). *Border's land. Kangaroo Island 1802-1836.* Lutheran Publishing House, Adelaide.

Schmitt, L.H. and White, R.J. (1979). A Comparison of metric and protein variation in the Australian Bush-rat, *Rattus fuscipes greyii*. *Australian Journal of Zoology*. **27**: 547-559.

Schodde, R. (1982b). *The Fairy Wrens*: *A monograph of the Maluridae*. Lansdowne, Melbourne.

Schodde, R. (1990). The bird fauna of the mallee - its biogeography and future, **In** Noble, J.C., Joss, P.J. and Jones, G.K. (eds.). *The Mallee Lands: a conservation perspective.* CSIRO, Melbourne.

Schodde, R. and Mason, I.J. (1991). Subspeciation in the Western Whipbird *Psophodes nigrogularis* and its Zoogeographical Significance, with Descriptions of Two New Subspecies. *Emu*. **91**: 133-144.

Schodde, R, Mason, I.J. & Wood, JT (1993). Geographical differentiation in the Glossy Black-cockatoo *Calyptorhynchus lathami* (Temminck) and its history. *Emu* **93:** 156-66.

Schulz, M. (1985). *Notes on census results and behavioural observations of the Australian Sea-lion (Neophoca cinerea Peron) population at Seal Bay, Kangaroo Island.* Department of Wildlife and Park Management. South Australian College of Advanced Education, Salisbury. (Unpublished report).

Schwaner, T.D. (1984). The identity of Red-bellied Black Snakes on Kangaroo Island. *Transactions of the Royal Society of South Australia.* **108**: 137.

Schwaner, T.D. (1985). Population structure of Black Tiger Snakes, (*Notchis ater niger*), on offshore islands in South Australia. **In** Grigg, G., Shine, R. and Ehmann, H. (eds). *Biology of Australian Frogs and Reptiles*. Royal Zoological Society of NSW, Sydney.

Schwaner, T.D. and Miller, T. (1985). Range extensions of reptiles in South Australia. *Transactions of the Royal Society of South Australia.* **108** (4): 215-216.

Scrymgour, J.M. and Risely, B.G. (1991). *Important Geological Sites in South Australia with Maps*. The South Australian Museum and the Geological Society of Australia, SA Division, Adelaide.

Seaton, S.J. (1951). Kangaroo Island in early Spring. *Victorian Naturalist.* **68** (8): 139.

Selway, W.H. (1910). The National Parks and Forest Reserves of Australia. (Kangaroo Island). *Transactions of the Royal Society of South Australia.* **34**: 284-286.

Serena, M. and Williams, G.A. (1997). Population attributes of Platypus (*Ornithorhynchus anatinus*) in Flinders Chase National Park, Kangaroo Island. *South Australian Naturalist* **72**: 28-34.

Serventy, D.L. (1939). Observations on South Australian sea birds. *South Australian Ornithologist.* **15** (4): 51-54.

Serventy, D.L. (1941). Observations on South Australian sea birds - II. *South Australian Ornithologist.* **15** (8): 128-130.

Seymour, J. (1978). Spotless Crake in Flinders Chase (Bird notes). *South Australian Ornithologist.* **27** (8): 288.

Shaughnessy, P.D. (1989). *Abundance of New Zealand Fur-seals Arctocephalus forsteri at Cape Gantheaume and other colonies in South Australia.* Final Report, December 1989 to South Australian Wildlife Conservation Fund. (Unpublished).

Shaughnessy, P.D. (1991). *New Zealand Fur-seals Arctocephalus forsteri on Kangaroo Island, South Australia: abundance at three breeding colonies in 1990/91.* Report, December 1991 to South Australian Wildlife Conservation Fund. (Unpublished).

Shaughnessy, P. D. (1998a). Managed Tourism no threat to colony. *Ecos* **96**: 7.

Shaughnessy, P.D. (1998b). *Seals in South Australia 1997/98: Abundance of pups of the New Zealand Fur-seal on Kangaroo Island, South Australia.* (Unpublished), Department of Environment and Natural Resources, South Australia.

Shaughnessy, P. D., Gales, N. J., Dennis, T. E. and Goldsworthy, S. D. (1994). Distribution and abundance of New Zealand Fur-seals, *Arctocephalus forsteri*, in South Australia and Western Australia. *Wildlife Research* **21**: 667-695.

Shaughnessy, P. D., Goldsworthy, S. D. and Libke, J. A. (1995). Changes in the abundance of New Zealand Fur-seals, *Arctocephalus forsteri*, on Kangaroo Island, South Australia. *Wildlife Research*. **22**: 201-215.

Shaw, G. and Renfree, M.B. (1986). Uterine and embryonic metabolism after diapause in the tammar wallaby, *Macropus eugenii*. *Journal of Reproductive and Fertility*. **76**: 339-347.

Shaw, G., Renfree, M.B., Short, R.V. and Wai Sum, O. (1988). Experimental manipulation of sexual differentiation in wallaby pouch young treated with exogenous steroids. *Development*. **104**: 689-701.

Short, R.V., Flint, A.P.F. and Renfree, M.B. (1985). Influence of passive immunization against Gn RH on pregnancy and parturition in the tammar wallaby, *Macropus eugenii*. *Journal of Reproductive Fertility*. **75** : 567-575.

Smales, L.R. and Mawson, P.M. (1978a). Nematode parasites of the Kangaroo Island Wallaby, *Macropus eugenii* (Desmarest). 1. Seasonal and geographical distribution. *Transactions of the Royal Society of South Australia.* **102** (1): 9-15.

Smales, L.R. and Mawson, P.M. (1978b). Nematode and other helminth parasites of the Kangaroo Island Wallaby, *Macropus eugenii* (Desmarest). 2 Site selection within the stomach. *Transactions of the Royal Society of South Australia.* **102** (3): 79-83.

Smith, M.J. (1983). Tammar Wallaby, *Macropus eugenii*, **In** Strahan, R. (ed.). *The Australian Museum Complete Book of Australian Mammals*. Angus and Robertson, Sydney, pp. 232-233.

Smith, M.J. (1983). Western Pigmy Possum, *Cercartetus concinnus*, **In** Strahan, R. (ed.). *The Australian Museum Complete Book of Australian Mammals.* Angus and Robertson, Sydney, pp. 162-163.

Smyth, J. (1978). Kangaroo Island and Conservation. *Red Gum*. **2** (3): 6-7.

Smyth, M. and Smith, M.J. (1974). Aspects of the natural history of three Australian skinks, *Morethia boulengeri*, *Menetia greyii* and *Lerista bougainvilli*. *Journal of Herpetology.* **8**: 329-335.

Social and Ecological Assessment Pty. Ltd. (1986). *Environmental Implications of increased tourism on Kangaroo Island, South Australia.* Department of Environment and Planning, South Australia.

South Australia Department for the Environment, National Parks and Wildlife Service. (1976). *Draft Management Plan. Seal Bay and Cape Gantheaume Conservation Parks, Kangaroo Island, South Australia.* Government Printer, Adelaide.

South Australia Department for the Environment, National Parks and Wildlife Service. (1978). *Management Plan - Seal Bay and Cape Gantheaume Conservation Parks, Kangaroo Island, South Australia.* Government Printer, Adelaide.

South Australia Department of Environment and Planning, National Parks and Wildlife Service. (1984). *Draft Management Plan - Conservation Parks of Kangaroo Island: Beatrice Islet, Busby Islet, Cape Hart, Cape Torrens, Dudley, Mount Taylor, Nepean Bay, Parndana, Pelican Lagoon, Seddon, Vivonne Bay, Western River.* Government Printer, Adelaide.

South Australia Department of Environment and Planning, National Parks and Wildlife Service. (1986). *Draft Management Plan - Flinders Chase National Park, Kangaroo Island, South Australia*. Government Printer, Adelaide.

South Australia Department of Environment and Planning, National Parks and Wildlife Service. (1987). *Conservation Parks of Kangaroo Island*: *Beatrice Islet, Busby Islet, Cape Hart, Cape Torrens, Dudley, Mount Taylor, Nepean Bay, Parndana, Pelican Lagoon, Seddon, Vivonne Bay, Western River, Management Plan*. Government Printer, Adelaide.

South Australia Department of Environment and Planning, National Parks and Wildlife Service. (1990). *Draft Management Plan - Conservation Parks of Kangaroo Island, Beyeria and Lathami Supplement*. Government Printer, Adelaide.

South Australia Department of Tourism, Recreation and Sport (Tourist Bureau Division). (1975). *Kangaroo Island Tourist Development Survey.* Government Printer, Adelaide.

South Australia Division of Tourism. Research and Development Branch. (1978). *Kangaroo Island Region of South Australia Tourism Research Survey.* Government Printer, Adelaide.

South Australia Government Tourist Bureau. (1970). *Features of Kangaroo Island, South Australia.* Government Printer, Adelaide.

South Australia State Planning Authority. (1970). *Kangaroo Island Planning Area - Development Plan.* Government Printer, Adelaide.

South Australian Country Women's Association, Kingscote Branch. (1951). *Kangaroo Island, past and present.* The Association, Kingscote.

South Australian Film Corporation. (1987). *Ngurunderi: a Ngarrindjeri Dreaming.* (VHS video). Adelaide.

South Australian Ornithological Association. (1979). *Report of a survey of the Glossy Black Cockatoo, (Calyptorhynchus lathami) on Kangaroo Island*. (Unpublished).

South Australian Tourism Commission (1996). *Kangaroo Island Tourism Profile*. South Australian Tourism Commission and Tourism Kangaroo Ialand, Adelaide.

Specht, R.L. (1972). *The vegetation of South Australia.* (2nd, ed.). Government Printer, Adelaide.

Specht, R.L. and Cleland, J.B. (1961). Flora conservation in South Australia. Part I. The preservation of plant formations and associations recorded in South Australia. *Transactions of the Royal Society of South Australia.* **85**: 177-196.

Specht, R.L. and Cleland, J.B. (1963). Flora conservation in South Australia. Part II. The preservation of species recorded in South Australia. *Transactions of the Royal Society of South Australia.* **87**: 63-92.

Specht, R.L., Roe, E.M. and Boughton, V.H. (eds.). (1974). Conservation of major plant communities in Australia and Papua New Guinea. *Australian Journal of Botany Supplementary Series. No. 7.*

Sprigg, R.C. (1954). KINGSCOTE map sheet. *South Australia. Geological Survey. Geological Atlas*. **1**: 253 440. *Series*, Sheet SI 53-16.

Stirling, I. (1972a). Observations on the Australian sea-lion *Neophoca cinerea* (Peron*). Australian Journal of Zoology.* **20**: 271-279.

Stirling, I. (1972b). *The Economic value and management of seals in South Australia.* South Australian Department of Fisheries Publication. **2**: 1-11.

Stopp, B.A. (1984). *Cetacean Strandings in South Australia 1881-1984.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Strahan, R. (Ed.). (1995). *The Mammals of Australia*. Australain Museum, Reed Books.

Sutton, J. (1923). Birds of South Australia. *South Australian Ornithologist.* **7** (4): 92-107.

Sutton, J. (1926a) Malleefowl (*Leipoa ocellata*) on Kangaroo Island. *South Australian Ornithologist* **8**: 241-242.

Sutton, J. (1926b). A trip to Kangaroo Island. *South Australian Ornithologist.* **8** (8): 253-272.

Sutton, J. (1926c). The birds of Kangaroo Island. *South Australian Ornithologist.* **8** (8): 273-277.

Swanson, N. (1973). Status, latitudinal and seasonal occurrences of albatross species in Kangaroo Island waters (South Australia). *South Australian Ornithologist.* **26** (4): 75-77.

Tate, R. (1883). The botany of Kangaroo Island, prefaced by a historical sketch of its discovery and settlement, and by notes on its geology. *Transactions of the Royal Society of South Australia.* **6**: 116-171.

Tate, R. (1884). Botanical notes. I. Kangaroo Island. *Transactions of the Royal Society of South Australia.* **7**: 74-75.

Tate, R. (1889). A revision of the flora of Kangaroo Island and other botanical notes relating thereto. *Transactions of the Royal Society of South Australia.* **12**: 62-66.

Taylor, B.M. (1972). Green mouse sighted (at Emu Bay, K.I.). *South Australian Naturalist.* **47** (2): 47.

Tedder, J. (1980). Current issues; Kangaroo Island. *Red Gum*. **4** (3): 11.

Tedman, R.A. (1991). The female reproductive tract of the Australian Sea-lion, *Neophoca cinerea* (Peron, 1816) (Carnivora : Otariidae). *Australian Journal of Zoology*. **39**: 351-372.

Tepper, J.G.O. (1883-85). Physiognomy of Kangaroo Island. *Garden and Field*. **9**: 165; **10**; 75,99.

Tepper, J.G.O. (1884). Plants of Kangaroo Island. *Transactions of the Royal Society of South Australia.* **7**: 50-53.

Tepper, J.G.O. (1887). Additions to the flora of Kangaroo Island. *Transactions of the Royal Society of South Australia.* **9**: 114-115.

Tepper, J.G.O. (1888). Notes on and additions to the flora of Kangaroo Island. *Transactions of the Royal Society of South Australia.* **10**: 288-292.

Terrill, S.E. and Rix, C.E. (1950). The birds of South Australia; their distribution and habitat. *South Australian Ornithologist.* **19** (6-8): 53-100.

Thomas, C.A. *comp.* (1950). *Birth of American River, 1802. Kangaroo Island*, the Author.

Tindale, N.B. (1937). Relationship of the extinct Kangaroo Island culture with cultures of Australia, Tasmania and Malaya. *Records of the South Australian Museum*. **6**: 39-60.

Tindale, N.B. (1957). Culture succession in south eastern Australia from late Pleistocene to the present. *Records of the South Australian Museum*. **13**: 1-49.

Tindale, N.B. (1968). Nomenclature of archaeological cultures and associated implements in Australia. *Records of the South Australian Museum*. **15**: 615-640.

Tindale, N.B. (1974). *Aboriginal Tribes of Australia*. University of California Press, Los Angeles,

Tindale, N.B. (1981). Prehistory of the Aborigines: some interesting considerations. **In** Keast, A. (ed.). *Ecological Biogeography of Australia*, pp. 1761-1797. W. Junk, The Hague.

Tindale, N.B. and Maegraith, B.G. (1931). Traces of an extinct Aboriginal population on Kangaroo Island. *Records of the South Australian Museum*. **4**: 275-289.

Tindale, N.B., Fenner, F.J. and Hall, F.J. (1935). Mammal bone beds of probable Pleistocene age, Rocky River, Kangaroo Island. *Transactions of the Royal Society of South Australia*. **59**: 103-6.

Touche Ross Services Pty (1984). *Kangaroo Island National Parks Cost Benefit Study*. Department of Environment and Planning, South Australia.

Towers, P.A., Shaw, G. and Renfree, M.B. (1986). Urogenital vasculature and local steroid concentrations in the uterine branch of the ovarian vein of the female tammar wallaby (*Macropus eugenii*). *Journal of Reproductive Fertility*, **78**: 37-47.

Trebeck, M. and Ball, D. (n.d.). *Baseline study of Pelican Lagoon Conservation Park, Kangaroo Island. Wildlife and Park Management Field Study.* South Australian College of Advanced Education, Salisbury. (Unpublished report).

Turner, E.K. *et al* (1974). F.N.C.V. excursion to Kangaroo Island, South Australia. 1-9 September, 1974. *Victorian Naturalist.* **91** (12): 312-321.

Twyford, K.L. (1999). Implications of a large Areal Wildfire on Biodiversity Conservation within the Cape Gantheaume Protected Areas, Kangaroo island. **In** *Bushfire 99: Australian Bushfire Conference Proceedings*, Albury, Australia.

Twyford, K.L. and Vickery, F.J. (1998). Case Study 13: Balance on the Beach: Sustainable tourism and threatened wildlife management at Seal Bay Conservation Park, Kangaroo Island. **In** Worboys, G., DeLacy, T. and Lockwood, M. (eds) (in prep) *Protected Area Management (Principles and Practices)* NSW NPWS. Sydney

Tyler, M. J. (1978). *Amphibians of South Australia*. Government Printer, Adelaide.

Tyler, M.J., Twidale, C.R. and Ling, J.K. (1979). (eds.) *Natural history of Kangaroo Island*. Royal Society of South Australia. Adelaide.

Tyndale-Biscoe, C.H. and Renfree, M.B. (1987). *Reproductive Physiology of Marsupials*, Cambridge University Press.

United Farmers and Stockowners. (1986). *Kangaroo Island - Zone 14 Position Paper, Tourism on Kangaroo Island.* (Unpublished).

Van der Stelt, B., Belperio, A.P. and Flint, R.B. (1991). Geophysical appraisal of northern Kangaroo Island. *South Australia. Department of Mines and Energy. Report Book*. 92/2

Van Mook, V. and Wallace, R. (1986). *Seal Bay and Bales Beach Summer Programme Study*. Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Vickery, F.J. (1996). Park management and ecotourism. *Ranger* **34**: 18-21

Vickery, F.J. (1997). *The Distribution of Phytophthora cinnamomi on Kangaroo Island*. MSc Thesis, University of New England, Armidale.

Vickery, F.J. (1998). Last chance for Kangaroo Island. *Environment South Australia*. **7**(1): 26-27.

Vincent, D.J. (1971). Beautiful firetails on Kangaroo Island. *South Australian Ornithologist.* **26** (1): 4.

Vincent, D.J. (1981). West Bay. *South Australian Parks and Conservation*. **4** (1):18.

Wade, W.D. (1938). Kangaroo Island plants collected, May, 1937. *South Australian Naturalist.* **19** (1): 15.

Waite, E.R. (1927). Fauna of Kangaroo Island, South Australia. 3. The reptiles and amphibians. *Transactions of the Royal Society of South Australia.* **51**: 322.

Waite, E.R. and Wood Jones, F. (1927). The fauna of Kangaroo Island, South Australia. No. 2 - The mammals. *Transactions of the Royal Society of South Australia*. **51**: 322-325.

Watts, C. H. S. (Ed.). (1990) *A List of the Vertebrates of South Australia*. Department of Environment and Planning, South Australia.

Watts, C.H.S. and Aslin, H.J. (1981). *The Rodents of Australia.* Angus and Robertson Publishers, Sydney.

Webb, A.W., Thomson, B.P., Blissett, A.H., Daly, S.J., Flint, R.B. and Parker, A.J. (1986). Geochronology of the Gawler Craton, South Australia. *Australian Journal of Earth Sciences*. **33**: 119-143.

Wells, G.E. (1978). *Kangaroo Island South Australia*: *cradle of a colony.* Islander Newspapers, Kingscote.

West, V. (1986). *Interpretive programs for Flinders Chase National Park - Remarkable Rocks, Admirals Arch.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Wheeler, J.R. (1960). The R.A.O.U. camp-out at Kangaroo Island, South Australia. 1959. *Emu.* **60** (4): 265-280.

Wheeler, J.R. (1970). *The ecology of Rattus fuscipes greyii on Kangaroo Island, South Australia*. Ph.D. thesis - University of Adelaide. (Unpublished).

Whibley, D.J.E. (1980). *Acacias of South Australia*. Government Printer, Adelaide.

Whickham, C. Kangaroo Island – nature lover’s paradise. *Tread Lightly* **2**: 2-4.

White, S.A. (1913) Field ornithology in South Australia: Kangaroo Island. *Emu* **12**: 262-270.

White, J.P. and O'Connell, J.F. (1982). *A Prehistory of Australia, New Guinea and Sahul.* Sydney, Academic Press.

Williams, B. (1986). *Interpretive Productions for Boat Visitors to Eastern Cove and Pelican Lagoon, Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).

Williams, M. (1974). *The making of the South Australian landscape.* London, Academic Press.

Willoughby, N. (1999*). Preliminary to the Biodiversity Plan for Kangaroo Island, South Australia.*. Biodiversity Policy and Planning, Department for Environment Heritage and Aboribinal Affairs, South Australia.
Wilson, J.G. (1908). *Kangaroo Island*: *its progress and prospects.* "Art and Trade Industry", Adelaide.
Wilson, P.G. (1998). Notes on the genus *Correa* (Rutaceae). *Nuytsia* **12**(1): 89-105.
Winchester, G. (1986). *The planning of an Interpretive talk : A Seals eye view of Kangaroo Island.* Department of Wildlife and Park Management, South Australian College of Advanced Education, Salisbury. (Unpublished report).
Witter, D.C. (1988a). From butchering caribou to butchering stone. **In** Meehan, B. and Jones, R. (eds.). *Archaeology with Ethnography: an Australian Perspective*. pp. 33-41. Department of Prehistory, Research School of Pacific Studies, Australian National University, Canberra.
Wood, J.G. (1929). Floristics and ecology of the mallee. *Transactions of the Royal Society of South Australia.* **53**: 359-378.
Wood, J.G. (1930). An analysis of the vegetation of Kangaroo Island and the adjacent Peninsulas. *Transactions of the Royal Society of South Australia.* **54**: 105-139.
Wood, J.G. (1937). *The Vegetation of South Australia.* Government Printer, Adelaide.
Wood Jones, F. (1925). *The Mammals of South Australia.* Government Printer, Adelaide.
Woolnouth, Miss. (1939). A fight between a Giant Petrel and a Dog (at Kingscote, Kangaroo Is.). *South Australian Ornithologist.* **15** (4): 58.
Working Party. (1984). *Tourism development and management on Kangaroo Island.* Department of Tourism, South Australia.
Young, I.R. and Renfree, M.B. (1979). The effects of corpus luteum removal during gestation of parturition in the tammar wallaby *(Macropus eugenii*). *Journal of Reproductive Fertility* **56**: 249-254.
Zar J.H. (1984) *Biostatistical analysis***.** 2nd edn. Prentice-Hall, New Jersey.

Appendix I

KANGAROO ISLAND SURVEY QUADRAT LOCATIONS

Quadrat locations are listed under the 1:50,000 mapsheets (Fig. 2) that they are located on.
Detailed location data, physical environmental information and floristic vegetation groups as defined by both the PATN analysis and the mapping are listed for each quadrat.

Fauna survey quadrats where permanent photographic monitoring points were established are shown in bold on the list

Site area codes (i.e. the two letter prefix of the quadrat codes) were as follows:

WB West Bay	CA Cape Dutton
CB Cape Borda	LI Lathami
RC Ravine des Casoars	CR Cygnet River
LL Larrikan Lagoon	PA Parndana
RR Rocky River	LA Lake Ada
CD Cape du Couedic	SB Seal Bay
SR Shackle Road	TC Timber Creek
CT Cape Torrens	CG Cape Gantheaume
SC Snug Cove	DE D’Estree Bay
FB Flinders Chase Boundary	BE Beyeria
KH Kelly Hill	SL Salt Lagoon
GL Gosse Lands	NB Nepean Bay
WR Western River	EB Emu Bay
NW North West River	FC Flour Cask Bay
ST Stunsail Boom	PL Pelican Lagoon
SE South East River	BH Ballast Head
MT Mount Taylor	DU Dudley
HR Harriet River	BG, Blue Gum Gully
ER Eleanor River	GF Grassy Flat
VB Vivonne Bay	WI Wilson River
NE North East River	PH Pigs Head Corner
MR Middle River	CO Cape Coutts
SN Snelling Beach	CH Cape Hart

SURVEY QUADRAT ON THE SNUG COVE MAPSHEET (6226-01)

Quadrat	Latitude (,',\" S)	Longitude (,',\" N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
FB00101	35,47,07	136,53,47	290	7.0	WNW	GOSSE OVAL	plain	20	3E
FB00201	35,47,31	136,55,28	277	4.7	WNW	GOSSE OVAL	plain	18	1D
FB00301	35,47,13	136,53,52	290	7.0	WNW	GOSSE OVAL	plain	18	1D
FB00401	35,49,44	136,51,52	260	11.5	WSW	GOSSE OVAL	plain	18	3E
MR00101	35,45,36	136,58,20	245	0.4	NE	TELEPHONE EXCHANGE (ON WESTERN RIVER RD)	plain	15	
SC00101	35,43,32	136,49,12	145	2.7	SW	SNUG COVE	plain	15	3B
SC00201	35,44,58	136,49,18	125	4.7	SW	SNUG COVE	other	9	5G
SC00301	35,44,27	136,49,09	112	4.0	SW	SNUG COVE	plain	11	5G
SC00401	35,47,19	136,48,59	290	9.0	SSW	SNUG COVE	plain	20	1A
SR00101	35,48,12	136,46,07	295	16.0	N	ROCKY RIVER PARK H.Q.	plain	20	1A
SR00201	35,49,34	136,45,49	230	14.0	N	ROCKY RIVER PARK H.Q.	plain	10	1A
WR00101	35,41,48	136,54,32	150	5.7	WSW	WESTERN RIVER H.S.	cliff	14	5D
WR00201	35,41,55	136,55,16	250	4.7	WSW	WESTERN RIVER H.S.	hill crest	17	28A
WR00301	35,40,53	136,56,30	145	2.6	WNW	WESTERN RIVER H.S.	hill slope	14	19A
WR00401	35,40,59	136,56,26	165	2.7	W	WESTERN RIVER H.S.	hill crest	17	5D
WR00501	35,41,50	136,55,45	205	4.0	WSW	WESTERN RIVER H.S.	hill crest	15	28A

SURVEY QUADRAT ON THE GRAINGER MAPSHEET (6226-02)

Quadrat	Latitude (,'," S)	Longitude (,'," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
CB00101	35,45,26	136,34,58	95	0.9	WSW	CAPE BORDA LIGHTHOUSE	plain	24	13B
CD00401	36,01,31	136,45,25	35	2.6	N	REMARKABLE ROCKS	plain	18	2A
CD00501	36,02,59	136,45,23	50	4.7	ENE	CAPE DU COUEDIC LIGHTHOUSE	hill slope	21	
CD00601	36,02,41	136,43,34	130	2.5	NE	CAPE DU COUDIC LIGHTHOUSE	plain	21	2H
CG01301	36,04,14	137,28,02	20	1.0	NE	CAPE GANTHEAUME	hill slope	30	
FB00501	35,52,51	136,49,48	190	9.0	NNE	TANDANYA KITCHEN	plain	20	1A
FB00601	35,53,17	136,49,41	170	8.3	NNE	TANDANYA KITCHEN	hill slope	20	1A
FB00701	35,54,17	136,48,51	170	6.0	NNE	TANDANYA KITCHEN	plain	20	1A
FB00801	35,56,44	136,47,06	90	4.5	ENE	ROCKY RIVER PARK H.Q.	plain	10	3A
FB00901	35,57,20	136,46,47	90	0.8	WSW	TANDANYA KITCHEN	plain	15	3A
FB01001	35,57,43	136,46,43	80	1.0	SW	TANDANYA KITCHEN	plain	13	2B
FB01101	36,00,51	136,47,04	50	2.5	E	YACCA FLAT (FLINDERS CHASE NP)	plain	18	2B
FB01201	36,01,59	136,47,17	20	3.0	SE	YACCA FLAT (FLINDERS CHASE NP)	plain	26	13B
FB01202	36,01,59	136,47,17	20	3.0	SE	YACCA FLAT (FLINDERS CHASE NP)	cliff	27	13B
FB01203	36,01,59	136,47,17	20	3.0	SE	YACCA FLAT (FLINDERS CHASE NP)	plain	21	13B
GL00101	35,52,59	136,51,48	175	1.2	NE	BROOKLAND PARK H.S.	hill slope	9	5B
GL00201	35,52,59	136,51,44	180	1.2	NE	BROOKLAND PARK H.S.	hill slope	11	5B
GL00301	35,54,15	136,53,46	150	2.0	NW	WINGARA H.S.	hill slope	20	1A
GL00401	35,54,18	136,54,26	150	2.0	N	WINGARA H.S.	hill slope	11	5A
GL00501	35,54,24	136,54,46	100	2.0	N	WINGARA H.S.	hill slope	16	5A
GL00601	35,54,07	136,55,13	170	2.7	NE	WINGARA H.S.	hill/mountain	20	1A
GL00801	35,52,43	136,55,07	200	5.0	N	WINGARA H.S.	hill/mountain	20	1A
GL00901	35,50,38	136,53,40	170	9.0	N	WINGARA H.S.	hill slope	15	3B
GL01001	35,50,38	136,53,33	165	9.0	N	WINGARA H.S.	plain	11	5A
GL01101	35,54,54	136,54,22	155	1.0	NW	WINGARA H.S.	plain	20	1A
GL01201	35,55,19	136,54,51	145	0.3	E	WINGARA H.S.	hill slope	20	1A
GL01301	35,56,04	136,55,52	55	0.3	N	DOUBLE S H.S.	hill slope	16	5A
GL01401	35,56,18	136,57,12	85	1.5	S	BONNIE DOONE H.S.	plain	15	3D
GL01501	35,53,28	136,58,44	160	2.0	NW	HILLVIEW H.S.	plain	20	1A
GL01601	35,52,02	136,57,46	200	6.0	N	HILLVIEW H.S.	plain	15	1A
KH00101	36,00,40	136,51,31	20	5.0	NE	CAPE YOUNGHUSBAND	hill slope	23	4A
KH00201	36,00,07	136,52,10	10	6.5	NE	CAPE YOUNGHUSBAND	plain	13	62A
KH00301	36,00,13	136,52,38	10	7.0	NE	CAPE YOUNGHUSBAND	plain	5	62A
KH00302	36,00,13	136,52,38	10	7.0	NE	CAPE YOUNGHUSBAND	plain	34	62A
KH00303	36,00,13	136,52,38	10	7.0	NE	CAPE YOUNGHUSBAND	hill footslope	13	62A
KH00401	36,00,13	136,52,30	10	6.8	NE	CAPE YOUNGHUSBAND	plain	28	55B
KH00501	35,59,09	136,51,37	10	7.2	NE	CAPE YOUNGHUSBAND	plain	13	5A
KH00502	35,59,09	136,51,37	10	7.2	NE	CAPE YOUNGHUSBAND	other	13	5A
KH00601	35,58,47	136,51,28	30	7.2	NE	CAPE YOUNGHUSBAND	hill crest	19	3A
KH00701	35,58,44	136,51,16	20	4.4	NNE	HANSON BAY	plain	13	5A
KH00801	35,59,45	136,51,22	15	2.5	NNE	HANSON BAY	plain	23	4A
KH00901	36,01,10	136,50,52	20	3.7	NE	CAPE YOUNGHUSBAND		27	13B
KH01001	36,01,06	136,51,16	10	4.3	NE	CAPE YOUNGHUSBAND	dune/consolidated dune	27	
KH01002	36,01,06	136,51,16	10	4.2	NE	CAPE YOUNGHUSBAND	dune/consolidated dune	28	
KH01003	36,01,06	136,51,16	10	4.2	NE	CAPE YOUNGHUSBAND	dune/consolidated dune	26	

Quadrat	Latitude (,'," S)	Longitude (,'," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
CB00101	35,45,26	136,34,58	95	0.9	WSW	CAPE BORDA LIGHTHOUSE	plain	24	13B
KH01101	35,58,48	136,53,56	30	3.5	W	KARATTA	plain	12	6B
KH01201	35,58,54	136,54,12	30	3.0	W	KARATTA	hill slope	12	5C
KH01301	35,59,17	136,54,09	50	3.2	W	KARATTA	plain	17	2H
KH01401	35,58,48	136,54,04	40	3.0	W	KARATTA	plain	19	6B
KH01501	35,58,43	136,55,20	30	1.2	W	KARATTA	plain	17	6B
NW00101	35,58,30	136,58,55	30	3.0	E	KARATTA	plain	6	
NW00102	35,58,30	136,58,55	30	3.0	E	KARATTA	plain	6	
NW00201	35,57,28	136,59,34	15	5.0	NE	KARATTA	plain	13	5A
NW00301	35,57,21	136,59,37	0	5.0	NE	KARATTA	hill slope	19	5A

SURVEY QUADRAT ON THE VENNACHAR MAPSHEET (6226-03)

Quadrat	Latitude (,'," S)	Longitude (,'," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
CD00101	36,02,45	136,42,55	140	1.6	NE	CAPE DU COUEDIC LIGHTHOUSE	hill slope	21	2F
CD00201	36,01,00	136,43,44	85	4.8	NE	CAPE DU COUEDIC LIGHTHOUSE	hill slope	17	2B
CD00301	36,00,58	136,44,18	35	0.5	SSE	BUNKER HILL	hill slope	23	5C
CD00602	36,02,41	136,43,34	130	2.5	NE	CAPE DU COUEDIC LIGHTHOUSE	cliff	25	2H
CD00701	36,03,54	136,42,12	30	0.5	S	CAPE DU COUEDIC LIGHTHOUSE	hill slope	25	
CD00801	35,59,51	136,44,39	0	5.2	S	ROCKY RIVER PARK H.Q.	hill slope	23	2B
CD00901	35,58,43	136,44,33	120	3.0	SSE	ROCKY RIVER PARK H.Q.	interdune low	25	2H
CD01001	35,57,42	136,44,12	85	1.1	S	ROCKY RIVER PARK H.Q.	hill slope	12	27A
GL00701	35,53,32	136,54,52	160	3.5	N	WINGARA H.S.	hill/mountain	15	1A
LL00101	35,50,17	136,40,59	220	0.1	E	LARRIKIN LAGOON TRACK END	plain	5	25A
LL00201	35,50,21	136,40,19	220	0.0		LARRIKIN LAGOON TRACK END	plain	5	5A
LL00301	35,50,23	136,40,43	220	0.3	W	LARRIKIN LAGOON TRACK END	plain	16	5A
LL00401	35,50,30	136,40,19	210	0.7	W	LARRIKAN LAGOON TRACK END	plain	20	1A
LL00501	35,50,30	136,40,07	220	0.9	W	LARRIKAN LAGOON TRACK END	plain	20	1A
RR00101	35,57,00	136,43,43	56	0.4	W	ROCKY RIVER PARK H.Q.	plain	5	7A
RR00102	35,57,03	136,43,43	0	1.0	W	ROCKY RIVER PARK H.Q.	hill slope	11	14B
RR00201	35,56,54	136,43,39	55	0.7	W	ROCKY RIVER PARK H.Q.	plain	5	7A
RR00301	35,56,55	136,41,51	45	3.0	W	ROCKY RIVER PARK H.Q.	plain	11	5A
RR00401	35,56,39	136,41,55	80	3.0	W	ROCKY RIVER PARK H.Q.	hill slope	23	3A
RR00501	35,57,14	136,42,07	55	3.5	W	ROCKY RIVER PARK H.Q.	hill slope	12	5A
RR00601	35,56,59	136,41,27	45	4.7	W	ROCKY RIVER PARK H.Q.	hill slope	5	7B
RR00701	35,56,47	136,39,35	60	1.0	E	SNAKE LAGOON	plain	16	2A
RR00801	35,57,01	136,39,12	75	0.2	W	SNAKE LAGOON	plain	23	2A
SR00301	35,51,16	136,44,11	210	11.0	N	ROCKY RIVER PARK H.Q.	plain	20	1A
SR00401	35,52,24	136,43,25	190	9.0	N	ROCKY RIVER PARK H.Q.	plain	10	25A
SR00501	35,53,17	136,42,58	165	7.0	N	ROCKY RIVER PARK H.Q.	plain	20	1A
SR00601	35,55,23	136,43,01	115	3.2	NW	ROCKY RIVER PARK H.Q.	plain	20	1A
SR00701	35,55,26	136,43,25	65	3.1	NW	ROCKY RIVER PARK H.Q.	other	12	5A
SR00801	35,56,24	136,43,46	65	1.5	NW	ROCKY RIVER PARK H.Q.	plain	9	5A
SR00901	35,56,40	136,43,54	60	1.5	NW	ROCKY RIVER PARK H.Q.	plain	19	5A
SR01001	35,56,44	136,44,03	70	1.0	NW	ROCKY RIVER PARK H.Q.	hill crest	19	7A
WB00101	35,56,49	136,38,07	15	0.1	SW	SANDY CREEK TURNOFF, WEST BAY ROAD	hill slope	12	5D
WB00202	35,55,19	136,36,42	70	0.4	N	BREAKNECK RIVER BRIDGE	hill slope	12	2A
WB00301	35,55,32	136,36,34	10	0.0	SW	BREAKNECK RIVER BRIDGE, WEST BAY ROAD	hill footslope	9	2B
WB00401	35,54,40	136,36,33	50	0.2	N	BREAKNECK RIVER BRIDGE	hill slope	23	5C
WB00501	35,54,50	136,36,13	85	1.0	N	BREAKNECK RIVER CROSSING	plain	16	5C
WB00601	35,53,49	136,34,52	75	0.7	S	WEST BAY TURN OFF	lake	5	55A
WB00701	35,53,28	136,33,24	30	0.7	W	WEST BAY	plain	12	19A
WB00801	35,53,41	136,32,52	41	0.5	WSW	WEST BAY CAR PARK	hill slope	21	13B
WB00901	35,53,51	136,32,37	30	1.0	SW	WEST BAY CAR PARK	cliff	35	13B
WB00902	35,53,51	136,32,33	20	0.0	SW	WEST BAY CAR PARK	cliff	35	13B
WB01001	35,53,09	136,32,60	50	0.4	N	WEST BAY CAR PARK	hill slope	35	13A
WB01002	35,53,09	136,32,56	10	0.4	NW	WEST BAY CAR PARK	dune/consolidated dune	35	13A
WB01101	35,52,46	136,32,23	60	1.7	N	WEST BAY TURN OFF	hill slope	12	13B
WB01201	35,52,29	136,34,03	41	2.5	N	WEST BAY INTERSECTION	plain	16	5C
WB01301	35,52,32	136,34,03	86	4.4	N	WEST BAY INTERSECTION	plain	16	25A
WB01401	35,51,04	136,35,09	103	5.7	N	WEST BAY INTERSECTION	plain	20	1B

SURVEY QUADRAT ON THE BORDA MAPSHEET (6226-04)

Quadrat	Latitude (,'," S)	Longitude (,'," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
CB00201	35,45,23	136,35,08	110	0.5	WSW	CAPE BORDA LIGHTHOUSE	plain	17	2H
CB00301	35,45,16	136,35,26	130	0.1	NW	CAPE BORDA LIGHTHOUSE	plain	17	2H
CT00101	35,44,23	136,44,55	130	3.0	SE	CAPE TORRENS TRIG POINT	hill slope	19	5G
CT00201	35,44,23	136,44,18	180	2.4	SE	CAPE TORRENS TRIG POINT	hill crest	17	1E
CT00301	35,44,25	136,44,42	120	4.7	SE	CAPE TORRENS TRIG POINT	hill footslope	12	5G
RC00101	35,45,58	136,37,46	85	2.5	S	CAPE BORDA CEMETERY	plain	12	6B
RC00201	35,46,57	136,37,21	125	4.3	SE	CAPE BORDA CEMETERY	hill slope	23	2C
RC00301	35,47,34	136,37,40	75	4.4	S	CAPE BORDA CEMETERY	hill slope	12	5G
RC00401	35,47,32	136,36,38	130	4.7	SE	CAPE BORDA CEMETERY	plain	17	2C
RC00501	35,47,16	136,35,50	100	4.5	SE	CAPE BORDA CEMETARY	hill slope	12	5C

SURVEY QUADRAT ON THE CASSINI MAPSHEET (6326-01)

Quadrat	Latitude (,'," S)	Longitude (,'," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
CC00101	35,35,45	137,18,49	170	2.0	SW	CAPE CASSINI	hill crest	16	6E
CC00201	35,35,54	137,19,13	190	2.0	S	CAPE CASSINI	hill slope	16	6F
CC00301	35,35,34	137,19,52	100	2.5	SE	CAPE CASSINI	hill slope	23	6E
CC00401	35,35,41	137,19,13	0	1.5	S	CAPE CASSINI	hill slope	16	6E
CC00501	35,36,35	137,20,18	230	4.0	SE	CAPE CASSINI	hill crest	15	28A
CC00601	35,36,46	137,19,39	220	4.0	SW	CAPE CASSINI	hill slope	16	28A
CC00701	35,38,55	137,22,41	160	6.0	S	DASHWOOD BAY	hill slope	15	3A
CC00801	35,38,49	137,22,21	180	6.0	S	DASHWOOD BAY	hill crest	15	3A
CC00901	35,40,10	137,20,04	183	2.6	SE	`CALANA' H.S.	hill slope	15	
CC01001	35,40,12	137,20,40	148	3.4	SE	`CALANA' H.S.	other	7	6E
CC01101	35,40,33	137,19,57	128	2.8	SE	`CALANA' H.S.	other	16	5A
CR00501	35,43,09	137,16,07	140	8.0	N	PARNDANA	hill slope	15	6E
CR00601	35,44,06	137,18,08	70	7.5	NE	PARNDANA	hill footslope	8	6E
CR00701	35,43,59	137,18,08	110	8.0	NE	PARNDANA	hill slope	16	
CR00801	35,43,49	137,18,03	120	8.0	NE	PARNDANA	hill slope	16	6E
CR00901	35,42,44	137,23,52	90	10.0	W	KINGSCOTE AIRPORT	plain	16	2M
ER00101	35,46,41	137,15,45	140	2.2	N	PARNDANA	hill slope	15	3A
LI00101	35,39,17	137,15,20	200	5.0	SE	STOKES BAY	hill crest	15	6E
LI00201	35,39,33	137,15,21	165	5.0	SE	STOKES BAY	other	16	5G
PA00101	35,46,02	137,20,58	160	8.0	NE	PARNDANA TOWNSHIP	hill crest	15	
PA00201	35,44,55	137,20,17	80	8.5	NE	PARNDANA	hill slope	16	5A
PA00301	35,45,26	137,18,26	180	5.5	NE	PARNDANA	hill crest	15	3A
PA00401	35,45,27	137,20,14	140	8.0	NE	PARNDANA	hill slope	15	3A
SE00401	35,48,09	137,17,51	60	4.0	NW	PARNDANA	plain	15	3A
SE00501	35,49,36	137,18,17	120	5.6	NW	PARNDANA	hill slope	15	5A
TC00201	35,50,03	137,22,57	100	6.8	SW	BIRCHMORE LAGOON	hill slope	14	

SURVEY QUADRAT ON THE SEDDON MAPSHEET (6326-02)

Quadrat	Latitude (,'," S)	Longitude (,'," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
CG00101	35,55,41	137,23,07	20	5.5	WSW	HAWKS NEST	plain	21	2N
CG00201	35,55,42	137,27,07	45	3.0	S	HAWKS NEST	hill slope	23	2N
CG00301	35,56,46	137,28,04	45	4.5	SE	HAWKS NEST	hill slope	23	2N
CG00401	35,54,25	137,23,53	10	5.0	W	HAWKS NEST	plain	2	23A
CG01101	36,04,05	137,27,34	50	0.8	SE	CAPE GANTHEAUME	dune/consolidated dune	35	2D
CG01201	36,04,31	137,27,35	45	0.2	N	CAPE GANTHEAUME	cliff	35	
LA00101	35,54,43	137,19,30	2	8.0	NE	SEAL BAY CONSERVATION PARK	plain	1	7B
LA00201	35,55,00	137,18,47	5	7.5	N	SEAL BAY CONSERVATION PARK	plain	5	8A
LA00301	35,54,07	137,20,09	35	9.5	NE	SEAL BAY CONSERVATION PARK	plain	1	2M
LA00401	35,55,45	137,19,40	20	6.5	N	SEAL BAY CONSERVATION PARK	plain	21	
SB00101	35,59,42	137,18,55	20	0.2	N	SEAL BAY	dune/consolidated dune	30	13A
SB00201	35,59,42	137,18,55	20	0.1	N	SEAL BAY	interdune low	30	13A
SB00301	35,59,39	137,18,59	30	0.2	N	SEAL BAY	dune/consolidated dune	26	2D
SB00401	35,59,01	137,18,14	60	2.0	NW	SEAL BAY	hill slope	25	2N
SB00501	35,59,06	137,19,22	20	1.0	N	SEAL BAY	hill slope	26	16A
SB00601	35,57,29	137,18,59	30	4.0	N	SEAL BAY	plain	7	2N
SB00701	35,58,49	137,19,49	20	2.0	N	SEAL BAY	hill slope	17	2N
SB00801	35,59,18	137,20,34	30	2.5	NE	SEAL BAY	dune/consolidated dune	25	2N
SB00901	35,59,18	137,20,38	30	2.5	NE	SEAL BAY	interdune low	25	2N
SE00101	35,50,11	137,16,07	130	6.0	S	PARNDANA	hill slope	16	
SE00201	35,50,11	137,16,19	100	6.0	SE	PARNDANA	gully	17	7D
SE00301	35,50,11	137,16,31	110	6.0	SE	PARNDANA	hill slope	16	6F
SE00601	35,50,05	137,21,37	10	10.0	SE	PARNDANA	stream channel	8	5A
TC00101	35,50,13	137,22,57	80	6.5	NE	BIRCHMORE LAGOON	hill slope	16	

SURVEY QUADRAT ON THE VIVONNE MAPSHEET (6326-03)

Quadrat	Latitude (,',"S)	Longitude (,',"N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
ER00701	35,57,50	137,12,16	30	3.0	NE	VIVONNE BAY	dune/consolidated dune	23	2F
ER00801	35,56,56	137,14,27	10	7.0	NE	VIVONNE BAY	dune/consolidated dune	25	2D
ER00901	35,56,55	137,14,31	10	7.0	NE	VIVONNE BAY	interdune low	25	4B
ER01001	35,56,59	137,14,35	10	7.0	NE	VIVONNE BAY	dune/consolidated dune	35	4B
ER01101	35,56,29	137,14,54	10	7.0	NE	VIVONNE BAY	plain	2	
HR00101	35,50,45	137,06,30	175	16.0	NW	VIVONNE BAY	plain	16	3B
HR00201	35,50,48	137,06,38	180	16.0	NW	VIVONNE BAY	plain	12	
HR00301	35,56,33	137,05,35	10	9.0	NW	VIVONNE BAY	hill slope	12	5A
HR00401	35,56,33	137,05,27	70	9.0	NW	VIVONNE	hill slope	12	5A
HR00501	35,56,33	137,05,19	60	9.0	NW	VIVONNE	other	9	5A
HR00601	35,58,57	137,07,23	40	5.0	W	VIVONNE BAY	hill slope	16	
HR00701	35,58,57	137,07,35	40	5.0	W	VIVONNE BAY	plain	7	6B
HR00801	35,55,54	137,08,50	80	6.0	NW	VIVONNE BAY	plain	7	3B
MT00101	35,55,47	137,02,54	100	13.0	NW	VIVONNE BAY	hill slope	17	2L
MT00201	35,55,53	137,03,03	130	16.0	NW	VIVONNE BAY	hill crest	17	2L
NE00101	35,53,55	137,00,56	120	12.0	NE	KARATTA	hill slope	17	
NE00201	35,53,46	137,00,32	100	12.0	NE	KARATTA	hill slope	12	5D
ST00101	36,01,14	137,00,15	20	11.0	ESE	KARATTA	hill slope	27	
ST00201	36,00,54	137,00,51	20	12.0	ESE	KARATTA	plain	24	2H
ST00301	36,01,07	137,00,55	30	12.5	SE	KARATTA	dune/consolidated dune	27	13B
ST00401	36,01,10	137,00,47	30	12.5	SSE	KARATTA	cliff	27	
ST00501	36,00,24	137,01,06	10	11.0	SE	KARATTA	plain	24	2H
ST00601	35,59,59	137,01,05	10	12.0	ESE	KARATTA	plain	6	
ST00701	35,59,31	137,00,35	20	12.0	E	KARATTA	plain	8	2H
ST00801	35,59,30	137,00,32	20	12.0	E	KARATTA	plain	19	2H
ST00901	36,00,21	137,01,46	10	12.0	E	KARATTA	plain	24	2A
ST01001	35,59,33	137,01,48	25	12.0	E	KARATTA	plain	18	2A
VB00101	36,01,22	137,08,31	20	6.0	SW	VIVONNE BAY	cliff	35	13B
VB00201	36,01,12	137,08,22	30	6.0	SW	VIVONNE BAY	hill slope	26	2H
VB00301	36,00,46	137,08,02	40	5.0	SW	VIVONNE BAY	plain	17	2H

SURVEY QUADRAT ON THE STOKES BAY MAPSHEET (6326-04)

Quadrat	Latitude (,'," S)	Longitude (,'," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
CA00101	35,38,43	137,07,30	60	2.0	SW	CAPE DUTTON	cliff	21	
CA00201	35,38,52	137,08,18	65	2.0	S	CAPE DUTTON	hill crest	23	
CA00301	35,37,59	137,08,49	40	1.0	E	CAPE DUTTON	cliff	21	
CA00401	35,38,06	137,08,49	0	0.5	SW	CAPE DUTTON	hill slope	23	19A
CA00501	35,40,42	137,11,32	140	2.0	W	AMEN CORNER	plain	15	3A
CA00601	35,40,43	137,10,33	130	3.5	W	AMEN CORNER	plain	15	3A
CA00701	35,42,01	137,10,35	210	4.0	SW	AMEN CORNER	hill slope	12	5G
CA00801	35,42,01	137,10,11	220	4.5	SW	AMEN CORNER	hill crest	15	3A
CR00101	35,45,33	137,06,46	180	15.0	W	PARNDANA	swamp	9	26A
CR00201	35,47,07	137,03,05	240	18.0	W	PARNDANA	plain	15	3A
CR00401	35,43,02	137,14,11	180	4.5	SE	AMEN CORNER	hill slope	15	
ER00201	35,46,37	137,13,45	145	3.4	NW	PARNDANA	other	9	3B
ER00301	35,46,37	137,13,41	155	3.5	NW	PARNDANA	hill slope	16	3B
LI00301	35,39,06	137,13,09	160	3.0	SE	STOKES BAY	hill slope	15	2A
LI00401	35,38,24	137,12,48	100	2.0	SW	STOKES BAY	hill slope	14	
LI00501	35,38,37	137,13,12	100	2.0	SW	STOKES BAY	other	13	19A
LI00601	35,37,47	137,14,06	60	3.0	E	STOKES BAY	hill footslope	12	5F
LI00701	35,38,21	137,13,16	120	2.5	SE	STOKES BAY	hill slope	12	6F
MR00401	35,43,21	137,05,50	160	16.0	NW	PARNDANA	hill slope	12	3A
MR00501	35,42,58	137,05,34	150	17.0	NW	PARNDANA	gully	8	5A
MR00601	35,42,55	137,05,34	150	17.0	NW	PARNDANA	hill slope	16	5A
MR00701	35,43,05	137,05,42	160	16.0	NW	PARNDANA	hill slope	16	5A
MR00801	35,42,58	137,05,50	180	16.0	NW	PARNDANA	hill slope	15	6A
MR00901	35,41,29	137,06,39	160	19.0	NW	PARNDANA	hill slope	12	5G
MR01001	35,41,36	137,06,19	170	19.0	NW	PARNDANA	hill slope	12	5G
MR01101	35,41,30	137,05,39	70	20.0	NW	PARNDANA	gully	11	31A

SURVEY QUADRAT ON THE PENNESHAW MAPSHEET (6426-01)

Quadrat	Latitude (,',\" S)	Longitude (,',\" N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
BG00101	35,45,20	137,55,21	110	4.3	SSW	PENNESHAW P.O.	other	4	11A
BH00101	35,45,02	137,47,37	60	1.0	SE	BALLAST HEAD	hill slope	2	5H
BH00201	35,45,15	137,47,49	60	0.8	S	BALLAST HEAD	hill slope	2	5H
BH00301	35,45,41	137,47,48	60	0.5	SW	ALONGSIDE BALLAST HEADS QUARRY	hill slope	2	5H
BH00401	35,45,52	137,46,59	60	1.9	WSW	BALLAST HEAD	hill slope	12	5H
DU00101	35,47,22	137,53,26	80	8.8	SW	PENNESHAW P.O.	plain	23	2R
DU00201	35,47,31	137,52,41	70	9.6	SW	PENNESHAW P.O.	hill slope	23	4F
DU00301	35,48,01	137,51,58	50	10.9	SW	PENNESHAW P.O.	hill slope	23	2R
DU00401	35,48,11	137,51,38	50	7.1	SW	PENNESHAW P.O.	hill slope	4	2R
DU00501	35,48,50	137,51,30	80	12.5	SW	PENNESHAW P.O.	hill slope	26	2R
DU00601	35,49,00	137,51,28	50	12.9	SW	PENNESHAW P.O.	other	29	2R
DU00701	35,49,28	137,51,27	70	13.6	SW	PENNESHAW P.O.	plain	23	2R
DU00801	35,50,10	137,52,11	90	14.4	SW	PENNESHAW P.O.	other	23	2R
DU00901	35,50,10	137,52,36	80	14.0	SW	PENNESHAW P.O.	dune/consolidated dune	23	2D
DU01001	35,51,07	137,52,31	90	15.5	SW	PENNESHAW P.O.	plain	29	2D
DU01101	35,51,09	137,52,57	80	15.5	SW	PENNESHAW P.O.	dune/consolidated dune	29	2D
DU01201	35,51,23	137,52,37	60	16.0	SW	PENNESHAW P.O.	plain	29	2D
DU01202	35,51,23	137,52,38	60	16.0	SW	PENNESHAW P.O.	plain	29	2D
DU01301	35,51,01	137,53,00	70	17.0	SW	PENNESHAW P.O.	plain	29	2D
DU01401	35,51,56	137,53,02	50	17.0	SW	PENNESHAW P.O.	cliff	27	13B
GF00101	35,45,15	137,54,15	95	4.1	SW	PENNESHAW P.O.	hill/mountain	4	11A
GF00201	35,45,19	137,53,56	95	5.3	SW	PENNESHAW P.O.	hill slope	23	11A
GF00301	35,45,15	137,54,23	102	4.7	SW	PENNESHAW P.O.	hill slope	23	11A
PH00101	35,47,04	137,57,52	100	7.6	SE	PENNESHAW P.O.	other	4	10D
PH00201	35,47,15	137,58,01	135	8.0	SE	PENNESHAW P.O.	hill slope	7	11J
PL01001	35,50,57	137,45,54	20	2.0	E	MT THISBY	plain	22	4F
PL01101	35,51,03	137,45,54	20	2.0	E	MT THISBY	plain	21	2D
PL01201	35,50,37	137,45,53	1	2.0	E	MT THISBY	tidal flats	36	
PL01202	35,50,37	137,45,51	1	2.0	E	MT THISBY	tidal flats	36	
PL01301	35,49,33	137,48,47	5	6.5	SE	AMERICAN RIVER	tidal flats	36	18A
PL01401	35,47,55	137,47,11	8	1.5	SE	AMERICAN RIVER	plain	22	34A
PL01501	35,48,26	137,47,42	20	4.0	SE	MIKE MCKELVEYS RESEARCH STATION	plain	22	20D
PL01601	35,48,33	137,47,30	20	0.5	NE	MIKE MCKELVEYS RESEARCH STATION	plain	22	4F
PL01701	35,48,44	137,46,55	25	3.0	SSE	AMERICAN RIVER	hill slope	22	4F
PL01801	35,48,10	137,49,21	5	5.0	SE	AMERICAN RIVER	dune/consolidated dune	22	20C
PL01901	35,47,54	137,48,03	5	3.0	SE	AMERICAN RIVER	dune/consolidated dune	35	20C
PL02001	35,47,59	137,46,27	5	2.5	S	AMERICAN RIVER	tidal flats	36	18A
PL02101	35,47,42	137,46,43	5	2.0	SE	AMERICAN RIVER	dune/consolidated dune	35	20C
PL02201	35,47,45	137,47,05	5	2.0	SE	AMERICAN RIVER	plain	22	20C
PL02401	35,48,02	137,46,55	6	2.5	S	AMERICAN RIVER	sandy plain	33	23C
WI00101	35,51,23	137,55,58	20	16.0	S	PENNESHAW P.O.	dune/consolidated dune	27	
WI00201	35,50,24	137,56,12	35	13.4	S	PENNESHAW P.O.	hill slope	32	37A
WI00202	35,50,19	137,56,08	20	13.3	S	PENNESHAW P.O.	other	4	10A
WI00301	35,52,10	137,57,08	50	16.7	SSE	PENNESHAW P.O.	dune/consolidated dune	27	20A
WI00401	35,51,45	137,57,05	85	16.0	SSE	PENNESHAW P.O.	hill slope	23	4F
WI00501	35,51,43	137,57,25	0	15.7	SSE	PENNESHAW P.O.	other	29	2D
WI00601	35,51,24	137,58,20	110	16.0	SE	PENNESHAW P.O.	hill/mountain	29	2D
WI00701	35,52,16	137,59,36	100	17.5	SSE	PENNESHAW P.O.	hill crest	29	4F

Quadrat	Latitude (,'," S)	Longitude (,'," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
WI00801	35,50,19	137,57,46	82	13.4	SSE	PENNESHAW P.O.	hill slope	23	2R

SURVEY QUADRAT ON THE DESTREES MAPSHEET (6426-03)

Quadrat	Latitude (,'," S)	Longitude (,'," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
CG00501	35,57,34	137,35,57	8	1.0	NW	PT TINLINE SHACKS	plain	21	2N
CG00601	35,59,30	137,36,33	25	4.0	N	PT TINLINE SHACKS	dune/consolidated dune	35	2D
CG00701	35,59,50	137,36,13	6	2.5	N	PT TINLINE SHACKS	plain	21	2N
CG00801	36,00,13	137,36,14	18	5.5	N	PT TINLINE SHACKS	hill slope	21	13B
CG00901	36,01,30	137,31,57	60	9.0	NE	PT TINLINE SHACKS	hill slope	21	2D
CG01001	36,01,22	137,33,13	70	8.2	NE	PT TINLINE SHACKS	cliff	21	13B
DE00101	35,56,01	137,35,18	10	3.0	NNW	NNW POINT TINLINE SHACKS	plain	21	2N
DE00201	35,54,55	137,36,24	5	5.0	N	N OF POINT TINLINE SHACKS	dune/consolidated dune	35	2N
DE00301	35,55,31	137,35,57	15	3.5	N	PT TINLINE SHACKS	plain	21	2N
DE00401	35,54,26	137,33,27	15	1.5	NNE	`D'ESTREES' H.S.	plain	7	2P
DE00501	35,54,14	137,33,07	20	1.2	NE	`D'ESTREES' H.S.	plain	1	2P
DE00601	35,55,46	137,34,38	12	3.2	SE	`D'ESTREES' H.S.	plain	17	2N
DE00701	35,54,10	137,33,03	10	1.3	NE	`D'ESTREES' H.S.	hill slope	1	2P
FC00101	35,52,38	137,41,36	40	0.8	SSE	SALT LAKE (SOUTHERN END)	dune/consolidated dune	21	2D
FC00201	35,51,56	137,41,39	10	0.2	E	SALT LAKE (NORTH-EAST END)	plain	21	2D
FC00301	35,51,32	137,41,24	20	0.5	NE	SALT LAKE (NORTH SHORE)	plain	21	2P
PL00401	35,50,48	137,44,16	40	1.5	S	MT THISBY	dune/consolidated dune	35	2D
PL00501	35,50,24	137,43,33	60	2.0	NE	MT THISBY	hill slope	21	4F
PL00601	35,50,40	137,44,01	65	1.0	W	MT THISBY	hill slope	21	4F
PL00701	35,50,35	137,44,09	70	1.0	NW	MT THISBY	plain	21	4F
PL00801	35,51,07	137,44,30	0	0.8	S	MT THISBY	dune/consolidated dune	35	20A
PL00901	35,51,06	137,44,36	10	0.8	S	MT THISBY	interdune low	35	20A
SL00101	35,51,37	137,37,55	15	0.2	S	SALT LAGOON	plain	1	2P
SL00201	35,51,03	137,38,47	20	0.5	E	SALT LAGOON	plain	1	2P
SL00301	35,50,19	137,38,36	10	0.1	E	SALT LAGOON	lunette	3	2P
SL00302	35,50,24	137,38,32	10	0.0		SALT LAGOON	lunette	2	55B

SURVEY QUADRAT ON THE KINGSCOTE MAPSHEET (6426-04)

Quadrat	Latitude (,'," S)	Longitude (,'," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
BE00101	35,47,58	137,35,26	20	7.0	S	NEPEAN BAY SOUTH	plain	1	11D
BE00201	35,47,41	137,35,53	20	7.0	S	NEPEAN BAY SOUTH	lake	5	2V
CR01201	35,44,23	137,31,00	10	14.0	SW	KINGSCOTE	plain	8	17B
CR01301	35,44,16	137,30,48	10	14.0	SW	KINGSCOTE	plain	8	
EB00101	35,35,46	137,31,48	5	2.1	E	EMU BAY	dune/consolidated dune	35	13A
EB00201	35,35,31	137,32,59	90	4.0	E	EMU BAY	hill crest	23	4D
EB00301	35,35,22	137,32,39	30	3.5	E	EMU BAY	cliff	35	55E
NB00101	35,41,48	137,35,02	2	6.0	SW	KINGSCOTE	plain	36	18B
NB00201	35,43,34	137,34,36	2	8.0	SSW	KINGSCOTE	plain	36	18A
NB00301	35,44,03	137,34,37	9	10.0	SW	KINGSCOTE	plain	36	18A
NB00401	35,44,19	137,36,57	3	7.0	SSW	KINGSCOTE	plain	3	2P
NB00501	35,44,10	137,37,17	3	8.0	SSW	KINGSCOTE	plain	3	2P
NB00601	35,44,20	137,37,22	3	8.0	S	KINGSCOTE	plain	3	2P
NB00701	35,44,49	137,36,58	9	9.0	S	KINGSCOTE	plain	1	2P
NB00901	35,45,56	137,36,36	30	11.5	S	KINGSCOTE	plain	1	2P
NB01201	35,44,27	137,43,41	30	5.0	NW	AMERICAN RIVER	hill slope	2	11H
NB01301	35,44,56	137,43,34	40	5.0	NW	AMERICAN RIVER	hill slope	2	11H
PL00101	35,48,33	137,44,27	30	5.0	WSW	AMERICAN RIVER	hill slope	2	19A
PL00201	35,49,02	137,44,22	40	5.0	NE	AMERICAN RIVER	hill slope	2	11D
PL00301	35,48,44	137,44,19	0	5.0	W	AMERICAN RIVER	hill slope	2	11D

SURVEY QUADRAT ON THE WILLOUGHBY MAPSHEET (6526-03)

Quadrat	Latitude (,',," S)	Longitude (,',," N)	Alt (m)	km		Location	Landform Element	PATN Gp	Map Gp.
CH00101	35,52,49	138,04,14	95	8.5	SW	CAPE WILLOUGHBY LIGHTHOUSE	hill slope	23	
CH00201	35,51,08	138,02,56	90	7.9	SW	CAPE WILLOUGHBY LIGHTHOUSE	hill slope	23	2S
CH00301	35,51,09	138,02,15	50	8.6	SW	CAPE WILLOUGHBY LIGHTHOUSE	plain	17	2S
CH00401	35,52,16	138,04,44	70	5.7	SW	CAPE WILLOUGHBY LIGHTHOUSE	hill slope	27	2T
CH00501	35,52,10	138,04,04	90	6.4	SW	CAPE WILLOUGHBY LIGHTHOUSE	plain	23	2S
CH00601	35,51,26	138,04,01	95	6.0	SW	CAPE WILLOUGHBY LIGHTHOUSE		19	2S
CH00701	35,51,25	138,05,15	90	4.2	SW	CAPE WILLOUGHBY LIGHTHOUSE	hill slope	19	2S
CH00801	35,51,26	138,05,21	80	4.1	SW	CAPE WILLOUGHBY LIGHTHOUSE	other	14	19D
CO00101	35,46,53	138,03,24	95	6.7	NW	CAPE ST ALBANS LIGHTHOUSE	hill slope	7	11J
CO00201	35,47,03	138,03,35	70	6.2	NW	CAPE ST ALBANS LIGHTHOUSE	hill slope	4	11J
CO00301	35,45,48	138,03,34	120	7.5	NW	CAPE ST ALBANS LIGHTHOUSE	hill slope	5	11J
CO00401	35,48,01	138,03,55	5	5.3	WNW	CAPE ST ALBANS LIGHTHOUSE	plain	31	23C

Appendix II

DAILY TEMPERATURES (°C) RECORDED DURING THE KANGAROO ISLAND VERTEBRATE FAUNA SURVEY, 22 OCTOBER TO 17 NOVEMBER 1990

Location	**Temperature**	**Dates**					
		22/10	23/10	24/10	25/10	26/10	27/10
Cape Borda	**Sun** max	-	31	32	29	32	34
	min	14	6	8	10	11	12
	Shade max	-	21	18	18	26	26
	min	18	2	9	10	13	15
Rocky River	**Sun** max		22	25	27	34	36
	min		0	2	3	10	11
	Shade max		15	17	19	24	27
	min		4	5	7	10	15
		Dates					
		28/10	29/10	30/10	31/10	1/11	2/11
Rocky River	**Sun** max	37	31	23	22	25	21
	min	12	12	12	10	10	11
	Shade max	27	24	19	18	18	16
	min	14	14	13	13	13	14
American River	**Sun** max	42	39	39	27	32	39
	min	10	15	9	8	5	8
	Shade max	21	21	20	19	19	18
	min	8	15	13	9	11	11
		Dates					
		3/11	4/11	5/11	6/11	7/11	8/11
Rocky River	**Sun** max	29	24	23	28	36	32
	min	13	12	11	14	10	8
	Shade max	21	18	18	23	28	28
	min	11	14	13	15	12	10
American River	**Sun** max	41	43	24	-	-	-
	min	9	10	22	-	-	-
	Shade max	21	22	26	33	30	21
	min	19	9	15	15	14	12
Murray Lagoon	**Sun** max			28	37	37	26
	min			9	14	14	7
	Shade max			24	35	32	23
	min			9	13	12	9
		Dates					
		9/11	10/11	11/11	12/11	13/11	14/11
Rocky River	**Sun** max	28	23	19	25	30	34
	min	8	10	5	0	6	5
	Shade max	23	19	14	19	19	29
	min	11	12	9	2	8	7
American River	**Sun** max	-	-	-	-	-	-
	min	-	-	-	-	-	-
	Shade max	26	19	23	28	31	21
	min	11	10	10	14	11	11
Murray Lagoon	**Sun** max	25	22				
	min	11	12				
	Shade max	25	20				
	min	11	11				

Vivonne Bay	**Sun** max			22	29	37	30
	min			11	1	9	10
	Shade max			20	22	30	30
	min			13	2	10	11
		Dates					
		15/11	16/11	17/11			
Rocky River	**Sun** max	34	25				
	min	-1	1				
	Shade max	18	18				
	min	2	0				
American River	**Sun** max	-	-				
	min	-	-				
	Shade max	21	23				
	min	11	10				
Vivonne Bay	**Sun** max	26	28	24			
	min	2	5	7			
	Shade max	20	22	22			
	min	5	4	6			

Appendix III

SOUTH AUSTRALIAN NATIVE VEGETATION MAPPING PROGRAM
STRUCTURAL FORMATIONS

Life Form and Height of Tallest Stratum	Foliage Projective Cover of Tallest Stratum			
	(Dense) 100-70%	(Mid-dense) <70-30%	(Sparse) <30-10%	(Very sparse) <10%
Trees > 30m	Tall closed-forest	Tall open-forest	Tall woodland	Tall open-woodland
Trees 10-30m	Closed-forest	Open-forest	Woodland	Open-woodland
Trees 5-10m	Low closed forest	Low open-forest	Low woodland	Low open-woodland
Trees < 5m	Very low closed-forest	Very low open-forest	Very low woodland	Very low open-woodland
Shrubs>2m	Tall closed-shrubland	Tall shrubland	Tall open-shrubland	Tall sparse-shrubland
Shrubs<2m	Closed-shrubland	Shrubland	Open-shrubland	Sparse-shrubland
Hummock grasses		Hummock grassland	Open-hummock grassland	Sparse-hummock grassland
Graminoides and grasses	Closed (tussock) grassland	(Tussock) grassland	Open (tussock) grassland	
Sedges	Closed-sedgeland	Sedgeland	Open-sedgeland	
Herbs	Closed-herbland	Herbland	Open-herbland	
Ferns	Closed-fernland	Fernland		
Reeds/Rushers	Closed-reedland	Reedland		

Source: Adapted from:

Specht (1972) The Vegetation of South Australia. Government Printer, Adelaide

Specht, R.L., Roe, E.M., and V.H. Boughton (1974) Conservation of major plant communities in Australia and Papua New Guinea. *Australian Journal of Botany, Supplementary Series, Supplement No: 7*

Muir B.G. (1977) Biological Survey of the Western Australian Wheatbelt. Pt 2:Vegetation and Habitat Bendering Reserve. *Records of the Western Australian Museum, Supplement No: 3*, WA Museum, Perth)

Note: This table has been superseded by Forward and Robinson (1996) shown in Appendix IV.

Appendix IV

SOUTH AUSTRALIAN VEGETATION STRUCTURAL FORMATIONS [ADAPTED FROM FORWARD & ROBINSON (1996)]

Life Form/Height Class	**Projective Foliage Cover of Tallest Stratum**			
	Dense (70-100%)	**Mid-dense (30-70%)**	**Sparse (10-30%)**	**Very sparse (<10%)**
Trees > 30m	Tall closed forest	Tall open forest	Tall woodland	Tall open woodland
Trees 10-30m	Closed forest	Open forest	Woodland	Open woodland
Trees 5-10m	Low closed forest	Low open forest	Low woodland	Low open woodland
Trees <5m	Very low closed forest	Very low open forest	Very low woodland	Very low open woodland
Mallee (>3m)	Closed mallee	Mallee	Open mallee	Very open mallee
Low Mallee (<3m)	Closed low mallee	Low mallee	Open low mallee	Very open low mallee
Shrubs > 2m	Tall closed shrubland	Tall shrubland	Tall open shrubland	Tall very open shrubland
Shrubs 1-2m	Closed shrubland	Shrubland	Open shrubland	Very open shrubland
Shrubs < 1m	Low closed shrubland	Low shrubland	Low open shrubland	Low very open shrubland
Mat plants	Closed mat plants	Mat plants	Open mat plants	Very open mat plants
Hummock grasses	Closed Hummock grassland	Hummock grassland	Open hummock grassland	Very open hummock grassland
Tussock grasses	Closed (tussock) grassland	(Tussock) grassland	Open (tussock) grassland	Very open (tussock) grassland
Sedges	Closed sedgeland	Sedgeland	Open sedgeland	Very open sedgeland
Herbs	Closed herbland	Herbland	Open herbland	Very open herbland
Ferns	Closed fernland	Fernland	Open fernland	Very open fernland

[Note: Table originally derived from Specht (1972) and Muir (1977)]

Trees - woody; perennial; erect; canopy raised well above the ground. Depth of canopy is usually less than or equal to two thirds of the total tree height. Single stemmed, or if multistemmed, fewer than five individual trunks resulting from branching of a single short trunk, that is not a mallee-like lignotuber. Height usually >2m.
Mallees - genus *Eucalyptus***;** multi-stemmed, trunks arising from lignotuber. Low mallee - < 3m. Mallee - > 3m
Shrubs- woody; perennial; erect, procumbent or weeping; foliage occupies all or part of total plant height; multiple stems and branches arising from a rootstock or very short common trunk; generally <5m tall.
Mat Plants - Herbaceous or woody plants of prostrate habit, with major stems growing along the ground. Rarely exceeds 10 cm in height. Examples of mat plants are *Kunzea pomifera*, *Myoporum parvifolium*, *Carpobrotus rossi* and *Mimulus repens*. .
Hummock Grass - Genera *Triodia* or *Plectrachne* only.
Grasses (tussock) - family Poaceae (Graminae); leaf sheath always split.
Sedges - herbaceous, usually perennial, erect, generally tufted; arise from stolons, tubers, bulbs, rhizomes or seeds. Leaf sheath never split. Includes Cyperaccae, Juncaceae, Restionaceae, Typhaceae and Xyridaceae and other sedge-like forms.
Herbs - herbaceous or slightly woody; annual or sometimes perennial; erect or creepers; rarely exceeds 0.5m height**.**
Ferns - Ferns and fern allies, i.e. non-vascular cryptogams of classes Filicopsida and Lycopsida. This category includes *Ophioglossum* spp., *Lycopodium* spp., *Selaginella* spp. and *Isoetes* spp.

Source: Heard and Channon (1997) Appendix 3G.
Adapted from Forward, L.R., and Robinson, A.C. (eds) (1996). *A Biological Survey of the South Olary Plain South Australia*., 1991 - 1992. Biological Survey and Research, Natural Resources Group, Department of Environment and Natural Resources, South Australia.

Appendix V

SCIENTIFIC RESEARCH PROJECTS CONDUCTED ON KANGAROO ISLAND 1973 TO MID 1996

The following list includes the title, initial and surname of the researcher followed by the date the scientific permit was valid from and then the title of the research project. The list is sorted by year then in date order within year and alphabetically by researchers surname within each month. Further details of any of these projects after July 1984 can be found in Robinson and Canty (1985) and Canty (1987, 1988, 1989, a,b, 1991, 1994, 1998). Note that lists of projects prior to 1982 when the scientific permit system was computerised are incomplete.

1973
Dr S Barker 150873 Growth and nutrition of the Tammar Wallaby (*Macropus eugenii*) and the Brush-tailed Possum (*Trichosurus vulpecula*).

Mr E C Nelson 081073 Biogeography, taximetry and ecology of *Adenanthos* (Proteaceae).

1974
Prof C C von der Borch 070274 Research and teaching material for geological, oceanographical, geophysical, hydrological and meteorological phenomena.

Dr S Barker 290774 Digestive physiology of the Tammar Wallaby, Hairy-nosed Wombat, Stubble Quail and Brush-tailed Possum.

Dr H A Ford 020774 The comparative ecology of honeyeaters in South Australia.

Dr M Westerman 041274 Population cytology and DNA composition of two grasshopper geenra - *Phaulacridium* and *Monistria*

1975
Dr I Beveridge 130675 Investigations into hydatid disease in marsupials.

1977
Mr J R E Hardyn 190977 Aphid migration.

1978
Mr J R E Hardy 260778 Aphid migration.

Mr P De Deckker 070878 Ecology and palaeoecology of ostracods from inland waters.

Mr A Smith-White 101278 A genecological survey of the halophytic perennial grass *Sporobolus virginicus*.

Mr G P Browning 130379 The taxonomy of *Myrmecia*.

Ms K S Shurcliff 270479 Ecosociology of Sea lions and visitors at Seal Bay Conservation Park

Mr L G Joseph 150679 The taxonomic status of the Kangaroo Island Emu (*Dromaius baudinianus*).

Mr L G Joseph 161279 Evolutionary genetics of the Scrubwren *Sericornis frontalis*.

1980
Mr N Forde 130480 Feeding ecology of birds.

Mr L G Joseph 121180 Genetics of the Crimson Rosella
Complex in South Australia.

Mr N Forde 200781 Feeding ecology of birds.

Mr R H Fisher 021081 Study of butterflies in South Australia.

Mr S C Flavel 021081 Microchiroptera of South Australia.

1982
Dr B J Gannon 150282 Gas transfer by the neonate in the marsupial pouch.

Mr A F C Lashmar 090782 Banding of albatrosses, petrels, waders and raptors on Kangaroo Island.

Ms R H Searle 260782 Matriculation biology options camp.

Mr D A Smith 200782 A study of the Southern Emu-wren in the field and captivity.

Mr N Forde 190882 Feeding ecology of birds.

Mr N Forde 190882 Feeding ecology of honeyeaters.

Dr S Enrody-Younga 010982 Historic biogeography of southern Africa.

Mr R H Fisher 051082 Study of butterflies in South Australia.

Dr R S Seymour 101082 Physiology of avian embryos.

Mr J R W Reid 051182 Biological survey of Flinders Chase.

Dr M B Renfree 071182 Reproductive physiology of marsupials.

Dr T D Schwaner 071182 SA Museum Collection.

Ms J Thurmer 011182 Adelaide University Biology Club/South Australian Museum collecting excursion to Kangaroo Island.

Ms J Thurmer 011182 Bird and insect collection from Kangaroo Island for the South Australian Museum.

Mr D J Bedford 201282 A revision of Xanthorrhoea for publication in 'Flora of Australia'.

Dr G D Brown 201282 Population dynamics of the Tammar Wallaby (*Macropus eugenii*).

1983
Dr R V Baudinette 140183 Bioenergetics of the Little Penguin.

Mr T B Reardon 040183 Taxonomic studies of the genus *Sminthopsis*.

Mr T B Reardon 040183 Taxonomy of Australian Microchiroptera.

Dr R V Baudinette 040283 Gas transfer by the neonate in the marsupial pouch.

Mr D J Cooper 250283 Microbial control of the sheep blowfly.

Mr F Geiser 140283 Physiological and biochemical adaptations for torpor in small marsupials.

Dr R D Sharrad 040283 Fauna survey of Rocky River: a tour for trainee teachers to Flinders Chase to practice ecological surveys.
Dr R D Sharrad 140283 Electrophoretic studies of small mammals.

Dr C A Henley 190383 Preparation of an animal encyclopaedia and fungi field guide.

Dr P W Hochachka 280483 The burrowing metabolism of Echidnas

Mr D F Blaxell 100583 Revision of the genus *Eucalyptus*.

Dr D L Hayman 120583 Chromosome study of sperm formation in Echidnas

Mr D A Smith 270783 Study of the Southern Emu-wren in field and captivity.

Dr S Barker 150883 Taxonomy of Buprestid beetles.

Dr N Forde 090883 Feeding ecology of birds with particular reference to honeyeaters.

Ms B L Penglis 110883 Studies of the paralysis-causing ticks of the subgenus *Sternalixodes*.

Ms R Pratt 090883 Feeding ecology of birds.

Mr V G Rattley 090883 Feeding ecology of birds.

Mr R J Watkins 030883 Effects of Phalaris acquatica on Macropods.

Dr M E Griffiths 060983 Consumption of milk and growth of echidna young.

Ms B L Penglis 160983 Studies on the paralysis causing ticks of the subgenus Sternalixodes

Mr M W McKelvey 011183 Systematics and evolution of island populations of tiger snakes.

Mr M W McKelvey 011183 Marine mammal strandings on Kangaroo Island: data and specimen collection.

Mr M W McKelvey 011183 Baseline data survey of Pelican Lagoon Conservation Park with Salisbury CAE.

Mr M W McKelvey 011183 Small mammal survey of Section 492, Hundred of Dudley, Kangaroo Island.

Mr N Trebeck 231183 Baseline study of Pelican Lagoon.

Mr S C Flavel 021283 Microchiroptera of South Australia.

Dr G D Brown 260184 Population dynamics of the Tammar Wallaby.

1984

Dr T D Schwaner 170184 The ecology of Island Reptiles.
Mr R H Fisher 170284 Study of Butterflies in South Australia.

Dr R D Sharrad 070284 Fauna studies in Flinders Chase National Park.
Mr T J Bradley 070384 Population studies of birds in the northern Mount Lofty Ranges.

Dr J K Ling 130384 Census of sea-lions and fur-seals on Kangaroo Island.

Mr W J Tagell 070384 Population studies of birds in the northern Mount Lofty Ranges.

Miss D Wiesner 070384 Population studies of birds in the northern Mount Lofty Ranges.

Mr N Draper 100584 The Kartan mystery revisited: further research on the archaeology of Kangaroo Island, South Australia.

Mr W A Harvey 150584 Mammal survey of Kelly Hill Conservation Park.

Mr R J Watkins 070584 Effects of *Phalaris acquatica* on Macropods.

Mr M G O'Callaghan 230784 Significance of the Brush-tailed Possum (*Trichosurus vulpecula*), as a host for trichostrongylid nematodes in sheep.

Mr C I Baxter 020884 Banding Cape Barren Geese (*Cereopsis novaehollandiae*) under the CSIRO Australian Bird Banding Scheme.

Dr M E Griffiths 090884 Consumption of milk and growth of echidna young.

Mr R C Weston 140884 Plant specimen collections from Flinders Chase National Park for the Australian National Botanic Gardens.

Mr G R Brown 010984 Taxonomy of Australian Flower Wasps (Hymenoptera: Tiphiidae)

Mr N Forde 020984 Feeding ecology of birds.

Prof P H Krutzsch 020984 Reproductive biology of male Chiroptera and mechanisms ofsperm storage in bats.

Miss M Hart 301084 The suitability and feasibility of reintroducing the Short-nosed Bandicoot (*Isoodon obesulus*) to Pelican Lagoon Conservation Park.

Dr R D Sharrad 041084 Behavioural observations on native fauna.

Dr J M Watson 301084 Gene location and the characteristics of the chromosome complement in the Echidna (Tachyglossus aculeatus).

Dr G G Ganf 291184 A preliminary survey of the flora of freshwater lagoons in Flinders Chase National Park and Kelly Hill Conservation Park.

Dr I Lansbury 221184 A study of the aquatic and semi-aquatic Hemiptera-Heteroptera (Insecta) in Australia.
Mr S C Flavel 181284 Microchiroptera of South Australia.

Mr J G Joseph 201284 Feeding ecology of birds.

Mr K E Matters 201284 Feeding ecology of birds.
Mr G R Pink 201284 Feeding ecology of birds.

Ms R Pratt 201284 Feeding ecology of birds.

Dr T D Schwaner 121284 The ecology of island reptiles.

Dr J M Watson 031284 Gene location and the characteristics of the chromosome complementin the Echidna (Tachyglossus aculeatus).

1985
Dr G D Brown 110185 Population dynamics of the Tammar Wallaby (*Macropus eugenii*).

Dr D G Smith 210185 Filming Echidna reproduction.

Dr N A Locket 080285 Nervous system of the Echidna (*Tachyglossus aculeatus*).

Dr M B Renfree 010285 Reproductive physiology of marsupials.

Dr R D Sharrad 040285 Ecological studies in Flinders Chase.

Mr T J Bradley 150385 Population studies of birds in the Mount Lofty Ranges.

Mr W J Tagell 150385 Population studies of birds in the Mount Lofty Ranges and on Kangaroo Island.

Miss D Wiesner 150385 Population studies of birds in the Mount Lofty Ranges.

Ms C Shanahan 090485 Cytogenetic studies of Australian scorpions.

Dr G A Solem 100485 Carraenid land snails of Kangaroo Island.

Dr B D Cooke 170585 Search for Sminthopsis aitkeni, Kangaroo Island

Prof R C Jones 160585 The method of transport of the male hormones (androgens) from the testis to the epididymis in the Short-beaked Echidna (*Tachyglossus aculeatus*).

Mrs B M Overton 250685 General collection of plant specimens on Kangaroo Island for the State Herbarium.

Dr D G Smith 060685 Filming Echidna reproduction.

Mr C I Baxter 140885 Cape Barren Goose and raptor banding on Kangaroo Island under the ANPWS Australian Bird & Bat Banding Scheme.

Mr C I Baxter 140885 *Sminthopsis aitkeni* on Kangaroo Island.

Dr T C Burton 160885 Bird banding in the Adelaide Hills, Murray Mallee and Kangaroo Island regions under the ANPWS Australian Bird & Bat Banding Scheme.

Ms P A Paton 140885 Bird banding in the Adelaide Hills, the Murray Mallee and Kangaroo Island regions under the ANPWS Australian Bird & Bat Banding Scheme.
Dr D C Paton 010885 Reproductive strategies of native plants.

Mr D J Williams 160885 Bird banding in the Adelaide Hills, Murray Mallee and Kangaroo Island regions under the ANPWS Australian Bird & Bat Banding Scheme.

Mr P S Beaumont 020985 Feeding ecology of birds.

Mr J G Joseph 020985 Feeding ecology of birds.

Mr K E Matters 020985 Feeding ecology of birds.

Mr G R Pink 020985 Feeding ecology of birds.

Ms R Pratt 020985 Feeding ecology of birds.

Mr C R Ribbons 230985 Feeding, breeding and migratory patterns of birds.

Mr M Schulz 170985 Variables influencing census of sea lions at Seal Bay - Kangaroo Island.

Dr K A Christian 031085 Activity patterns and exercise training in lizards.

Mr L Costermans 031085 Collection of botanical reference specimens.

Mr T E Dennis 031085 Bird banding on Kangaroo Island under the ANPWS Australian Bird & Bat Banding Scheme.

Dr B F Green 031085 Water and energy metabolism in echidnas (*Tachyglossus aculeatus*) and Rosenberg's Goannas (*Varanus rosenbergi*).

Mr A F C Lashmar 031085 Bird banding on Kangaroo Island under the ANPWS Australian Bird & Bat Banding Scheme.

Dr R D Sharrad 011085 Vertebrate behavioural ecology in Flinders Chase National Park.

Prof D W Cooper 121185 Immunology of marsupials, especially the pouch young.

Dr B F Green 071185 Evolution of tolerance to fluoroacetate (Compound 1080) in native fauna in Australia.

Ms L Jansen 261185 Bat banding on Kangaroo Island.

Dr C R Jenkin 281185 Movement of passerines in the Mount Lofty Ranges.
Dr C M Kemper 071185 Evolution of tolerance to fluoroacetate (Compound 1080) in native fauna in Australia.
Mr D M Peake-Jones 281185 Population dynamics of selected passerines in the Mount Lofty Ranges.

Mr S Roffey 271185 Research trials on ALCOA mine rehabilitation areas.

Mr A F C Lashmar 191285 Taxonomy of the Grey Currawong (*Strepera versicolor*) and the Western Whipbird (*Psophodes nigrogularis*).

Ms B J St John 121285 Mammal survey of 'Sandhurst', Kangaroo Island.

1986
Dr G D Brown 210186 Population dynamics of the Tammar Wallaby (*Macropus eugenii*).

Ms L V Higgins 280186 Behaviour and ecology of the Australian Sea-lion (*Neophoca cinerea*) on Kangaroo Island.

Mr B Robertson 080186 Population studies of the Pacific Gull (*Larus pacificus*) in south eastern Australia.

Dr T D Schwaner 170186 The ecology of island reptiles.

Dr R D Sharrad 160186 Ecological studies in Flinders Chase National Park.

Dr D C Paton 240286 Movement of animals along corridors of vegetation in South Australia.

Prof R C Jones 210386 Regulation of the functions of the initial segment of the epididymis in the Tammar Wallaby (Macropus eugenii).

Mr W J Tagell 170386 Population studies of birds in the Mount Lofty Ranges and on Kangaroo Island.

Mr N Draper 280486 Cape du Couedic Rockshelter and the archaeology of Kangaroo Island, South Australia.

Mr A T D Bennett 120586 Bird banding under the Australian National Parks and Wildlife Service Australian Bird Banding Scheme.

Mr T J Bradley 260586 Population studies of birds in the Mount Lofty Ranges.

Ms L Jansen 010586 Ecology of insectivorous bats.

Mrs N T G Ridley 260586 Confirmation of the first record of the orchid *Cryptostylis subulata* on Kangaroo Island.

Miss D Wiesner 260586 Population studies of birds in the Mount Lofty Ranges.

Mr N J Speck 020686 Bird banding in the Mt Lofty Ranges, Murray Mallee and Kangaroo Island regions under the ANPWS Australian Bird & Bat Banding Scheme.
Mr C I Baxter 020786 Bird Banding on Kangaroo Island under the Australian National Parks and Wildlife Service Australian Bird & Bat Banding Scheme.

Mr C I Baxter 090786 *Sminthopsis aitkeni* on Kangaroo Island.

Dr T C Burton 070786 Bird banding in the Mt Lofty Ranges, Murray Mallee and Kangaroo Island regions under the ANPWS Australian Bird and Bat Banding Scheme.

Mr T E Dennis 040786 Bird banding on Kangaroo Island under the Australian National Parks & Wildlife Service Australian Bird & Bat Banding Scheme.

Ms L V Higgins 300786 Reproductive and maternal behaviour of the Australian Sea Lion (*Neophoca cinerea*).

Ms L V Higgins 300786 Physiological measures of maternal investment in *Neophoca cinerea*.

Mr A F C Lashmar 040786 Bird banding on Kangaroo Island under the Australian National Parks and Wildlife Service Australian Bird & Bat Banding Scheme.

Mr C M Leigh 080786 The role of sperm storage in *Hemiergis peronii* and *H decresiensis*.

Mrs B M Overton 040786 General collection of plant specimens on Kangaroo Island for the State Herbarium.

Dr P J Parker 240786 Time/activity budgets of koalas in Flinders Chase National Park.

Ms P A Paton 070786 Bird banding in the Mt Lofty Ranges, Murray Mallee and Kangaroo Island regions under the ANPWS Australian Bird and Bat Banding Scheme.

Dr D C Paton 070786 Reproductive strategies of native plants.

Mr J Vandenbeld 070786 Filming Echidna reproduction.

Mr D J Williams 070786 Bird banding under the Australian National Parks and Wildlife Service Australian Bird Banding Scheme.

Dr W B Sherwin 120886 Genetic variability of House Mice (*Mus domesticus*) on islands in Pelican Lagoon, Kangaroo Island, and adjacent populations.

Mr J G Joseph 010986 Feeding ecology of birds.

Mr K E Matters 010986 Feeding ecology of birds.

Dr D C Paton 090986 Population dynamics and behavioural studies of birds inhabiting Flinders Chase National Park.

Mr D M Peake-Jones 090986 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.
Mr G R Pink 010986 Feeding ecology of birds.

Ms R Pratt 010986 Feeding ecology of birds.

Mr J Redfern 220986 Sedimentology and basin evolution of the Troubridge and Arckaringa Basins, South Australia.

Dr D G Smith 240986 Echidna reproduction: footage for "The Nature of Australia".

Dr S Barker 171086 Revision of the Stigmodera (Castiarina).

Mr P S Beaumont 271086 Feeding ecology of birds.

Prof R F Mark 131086 Development of the visual systems in marsupials.

Mr R W Martin 241086 Survey for the prevalence of chlamydiosis in native populations of the Koala (*Phascolarctos cinereus*) in south-eastern Australia.

Dr W B Sherwin 171086 Genetic variation of South Australian populations of the Koala (*Phascolarctos cinereus*).

Mr D N Wigzell 161086 Population studies of birds in the Mount Lofty Ranges.

Dr C R Jenkin 121286 Movement of passerines in the Mount Lofty Ranges.

1987
Mr R G Simms 150187 Research into the life cycle and distribution of cave crickets on Kangaroo Island.

Dr R V Baudinette 020287 Respiration in juvenile and adult Tammar Wallabies.

Mr A M Buick 090287 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr C R Jenkin 090287 Movement of passerines in the Mount Lofty Ranges and on Kangaroo Island.

Mr J S Matthew 090287 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr P J Parker 010287 Use of *Eucalyptus viminalis* and *E. ovata* by Koalas (*Phascolarctos cinereus*) in a planted grove at Flinders Chase National Park.

Dr T D Schwaner 180287 The ecology of island reptiles.

Mr C C Wilson 060287 Late Tertiary and Quaternary calcarenite complexes of coastal southern Australia.

Mr P S Beaumont 030387 Population dynamics and feeding ecology of birds.

Mr S M Bosch 090387 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.
Mr G A Carpenter 030387 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr L E Conole 310387 Small mammal survey of Kangaroo Island.

Mr N Forde 030387 Feeding ecology of birds.

Mr J G Joseph 030387 Feeding ecology of birds.

Dr C M Kemper 160387 Mammal surveys of NPWS reserves on Kangaroo Island.

Mr K E Matters 030387 Feeding ecology of birds.

Mr G R Pink 030387 Feeding ecology of birds.

Ms R Pratt 030387 Feeding ecology of birds.

Dr K A Christian 230487 Activity patterns and exercise training in lizards.

Dr R A Tedman 300487 Comparative anatomy of the Australian Sea-lion (*Neophoca cinerea*).

Mr C Evans 010587 Population studies of birds in the Mount Lofty Ranges.

Dr W B Sherwin 190587 Genetic variability of House Mice (*Mus domesticus*) on islands in Pelican Lagoon, Kangaroo Island, and adjacent populations.

Mrs B M Overton 300687 On-going base data collection of all plant species from Kangaroo Island for the State Herbarium.

Mrs N T G Ridley 300687 Confirmation of the first record of the orchid *Cryptostylis subulata* on Kangaroo Island.

Dr R S Seymour 290687 Respiration of echidna eggs.

Mr R Ashendon 010787 The subspecific status of the Kangaroo Island Grey Currawong.

Mr C I Baxter 060787 *Sminthopsis aitkeni* on Kangaroo Island.

Mr C I Baxter 060787 Banding of Cape Barren Geese, Hooded Plovers and coastal raptors on Kangaroo Island under the ANPWS Australian Bird Banding Scheme.

Mr A T D Bennett 080787 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T.J. Bradley.

Mr T J Bradley 030787 Population studies of birds in the Mount Lofty Ranges.

Mr T E Dennis 060787 Banding of giant petrels, albatrosses, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.
Ms L V Higgins 010787 Physiological measures of maternal investment in *Neophoca cinerea*.
Mr A F C Lashmar 060787 Banding of giant petrels, albatrosses, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Dr D C Paton 080787 Population dynamics and behavioural studies of birds inhabiting Flinders Chase National Park.

Mr N R Swanson 060787 Banding of albatrosses, giant petrels, waders and hawks on Kangaroo Island under the ANPWS Australian Bird Banding Scheme.

Miss D Wiesner 030787 Population studies of birds in the Mount Lofty Ranges.

Ms J B Woodman 030787 Flora of the coastal regions of South Australia.

Mr A M Buick 200887 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr G A Carpenter 200887 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr P Dann 250887 Breeding, survival and movements of Little Penguins (*Eudyptula minor*)in south-eastern Australia.

Mr J S Matthew 200887 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr M W McKelvey 250887 Breeding, survival and movements of Little Penguins (*Eudyptula minor*)in south-eastern Australia.

Mr M R Newnham 220887 Volatile leaf oils in stringybark eucalypts.

Ms D J Patkin 200887 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Ms P A Paton 200887 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr R S Seymour 310887 Respiration of echidna eggs.

Mr N J Speck 200887 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr W J Tagell 270887 Population studies of birds in the Mount Lofty Ranges and on Kangaroo Island.

Mr J Vandenbeld 270887 Echidna reproduction: footage for the "Nature of Australia".

Mr D J Williams 200887 Population dynamics of birds: various projects under the Australian National Parks and Wildlife Service Australian Bird and Bat Banding Scheme.
Mr A J Bransbury 010987 A survey to determine the distribution and status of the Hooded Plover (*Charadrius rubricollis*) in South Australia.

Dr K A Christian 300987 Activity patterns in lizards.

Mr M Clark 110987 Feeding ecology of birds.

Dr H T Imai 140987 Karyological survey of the Australian ant *Myrmecia pilosula* complex.

Mr C R Ribbons 170987 Feeding, breeding and migratory patterns of birds: collection of eggs and observations for the South Australian Museum.

Mr P G Seager 110987 Feeding ecology of birds.

Mr S M Bosch 011087 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr D H Cato 011087 Australian Sea-lion (*Neophoca cinerea*) vocalisations.

Dr D P Costa 011087 Energetics and diving patterns of female Australian Sea-lions.

Dr G F Gross 271087 Building up the state reference collections of insects, arachnids and other land invertebrates.

Ms L V Higgins 011087 Breeding behaviour of Australian Sea-lions.

Dr P Weinstein 061087 Bionomics of host-parasite interactions in Trigonalid wasps.

Mr T E Dennis 021187 An assessment of pesticide contamination in coastal raptors and common prey species from the central regions of South Australia and Kangaroo Is.

Mr I D Falkenberg 021187 An assessment of pesticide contamination in coastal raptors and common prey species from the central regions of South Australia and Kangaroo Is.

Dr M E Griffiths 051187 Lactose synthetase system of echidnas, *Tachyglossus aculeatus multiaculeatus*.

Miss J D Taylor 111187 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr S Barker 221287 Revision of the Stigmodera (Castiarina).

1988
Dr P D Shaughnessy 070188 Distribution and abundance of New Zealand Fur-Seals (*Arctocephalus forsteri*) in southern Australia.

Dr R S Seymour 150288 Thermoregulation in Black Tiger Snakes.

Mr D Ball 260488 Waterfowl ecology on Kangaroo Island.

Miss P J Dempsey 190488 Genetic variation in populations of House Mice (*Mus domesticus*) on islets in Pelican Lagoon Conservation Park, Kangaroo Island.

Prof R C Jones 260488 Regulation of the functions of the initial segment of the epididymis.

Ms L M Mumaw 280488 Australian Sea-lion (*Neophoca cinerea*) rehabilitation and population study programme.

Dr R S Seymour 280488 Respiration in Cape Barren Goose eggs.

Dr P D Shaughnessy 190488 Fur-seals on the southern coast of Australia: feeding ecology and population identification.

Mr C C Wilson 080488 Late Tertiary and Quaternary calcarenite complexes of coastal southern Australia.

Dr P R Baverstock 260588 Evolutionary relationships of marsupials and monotremes.

Ms P Benzies 030588 Ecology of Little Penguins on Kangaroo Island, South Australia.

Dr S C Donnellan 120588 Population structure of the gecko *Phyllodactylus marmoratus*.

Mr P S Beaumont 060788 Population dynamics and feeding ecology of birds.

Mr A T D Bennett 280788 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr S M Bosch 280788 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr A M Buick 280788 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr G A Carpenter 280788 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr D P Costa 220788 Reproductive energetics of the Australian Sea Lion (*Neophoca cinerea*).

Mr J S Matthew 280788 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mrs B M Overton 080788 On-going base data collection of all plant species for the South Australian Herbarium and reference collection.

Ms D J Patkin 280788 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr D C Paton 280788 Population dynamics and behavioural studies of birds inhabiting Flinders Chase National Park.
Mrs N T G Ridley 110788 Collection of orchid specimens for the Canberra Botanic Gardens and Adelaide State Herbarium.

Mr N J Speck 280788 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Miss J D Taylor 280788 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr D J Williams 280788 Population dynamics of birds: various projects under the Australian National Parks and Wildlife Service Australian Bird Banding Scheme.

Mr C I Baxter 020888 Banding of Cape Barren Geese and Australian Pelicans on Kangaroo Island under the ANPWS Australian Bird Banding Scheme.

Mr T E Dennis 020888 Banding of giant petrels, albatrosses, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Mr N Forde 220888 Feeding ecology of birds.

Dr C R Jenkin 230888 Movement of passerines in the Mount Lofty Ranges and on Kangaroo Island.

Mr A F C Lashmar 020888 Banding of albatrosses, giant petrels, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Mr N R Swanson 020888 Banding of albatrosses, giant petrels, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Dr R A Tedman 230888 Comparative anatomy of the Australian Sea-lion (*Neophoca cinerea*).

Dr B F Green 160988 Water and energy metabolism in echidnas (*Tachyglossus aculeatus*) and Rosenberg's Goannas (Varanus rosenbergi).

Mr G Masuhara 150988 Investigation of orchid mycorrhiza.

Dr M B Renfree 181088 Reproductive physiology of marsupials.

Mr P G Seager 111088 Feeding ecology of birds.

Dr P Weinstein 131088 Bionomics of host-parasite interactions in Trigonalid wasps.

Dr M A Whalen 111088 Pollination ecology and breeding systems in a mallee woodland community.

Mr S A Crowhurst 151188 Feeding ecology of birds.

Dr N Gales 151188 Reproductive biology of the Australian Sea Lion (*Neophoca cinerea*).

Mr S D Goldsworthy 151188 Maternal care and diet of New Zealand Fur-seals.
Ms L V Higgins 121288 Breeding behaviour of Australian Sea-lions.

Mr W J Tagell 221288 Population studies of birds in the Mount Lofty Ranges and on Kangaroo Island.

1989
Ms L V Higgins 040189 Physiological measures of maternal investment in *Neophoca cinerea*.

Mr J L Read 170189 Ecology of the Pygmy Copperhead Snake (*Austrelaps sp*).

Dr R S Seymour 270289 Respiration in Cape Barren Goose eggs.

Dr R S Seymour 270289 Respiration of echidna eggs.

Dr R S Seymour 270289 Thermoregulation in Black Tiger Snakes.

Dr R S Seymour 270289 Thermoregulation in Black Tiger Snakes.

Dr S Barker 150389 Revision of the Stigmodera (Castiarina) (Coleoptera: Buprestidae).

Mr A J Bransbury 280389 A study of the Hooded Plover (*Charadrius rubricollis*) on Kangaroo Island.

Dr B T Firth 280389 Thermal sensitivity of circadian rhythms of melatonin secretion in the echidna (*Tachyglossus aculeatus*).

Dr M E Longmore 160389 Third year geography field exercise in remote sensing; Flinders Chase National Park.

Mr T J Bradley 150589 Population studies of birds in the Mount Lofty Ranges.

Ms L V Higgins 150589 Breeding behaviour of Australian Sea-lions.

Mr C I Baxter 290689 Search for *Sminthopsis aitkeni* on Kangaroo Island.

Mr C I Baxter 290689 Banding of Cape Barren Geese on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Mr A T D Bennett 070689 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr A M Buick 070689 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr G A Carpenter 080689 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr B F Green 090689 Ecophysiology of *Varanus rosenbergi*.

Ms D J Patkin 070689 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.
Ms P A Paton 070689 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr D C Paton 070689 Population dynamics and behavioural studies of birds inhabiting Flinders Chase National Park.

Mrs N T G Ridley 280689 Collection of orchid specimens for the Canberra Botanic Gardens.

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Mr N J Speck 080689 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Miss J D Taylor 080689 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.
Mr D J Williams 070689 Population dynamics of birds: various projects under the Australian National Parks and Wildlife Service Australian Bird and Bat Banding Scheme.

Mr P S Beaumont 260789 Population dynamics and feeding ecology of birds.

Mr T E Dennis 260789 Banding of giant petrels, albatrosses, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

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Mr A F C Lashmar 260789 Banding of giant petrels, albatrosses, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Mr A F C Lashmar 260789 Banding of albatrosses, giant petrels, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Mr M W McKelvey 270789 Movements of terrestrial birds on Kangaroo Island.

Mrs B M Overton 260789 On-going base data collection of all plant species for the South Australian Herbarium and reference collection.

Dr D C Paton 270789 Movements of terrestrial birds on Kangaroo Island.

Dr D C Paton 270789 Interactions between honeybees and native biota.

Mr N R Swanson 260789 Banding of albatrosses, giant petrels, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.
Mr B J Brock 110889 Feeding ecology of birds.

Mr M Clark 110889 Feeding ecology of birds.

Mr N Forde 110889 Feeding ecology of birds.

Mr T W Fuhlbohm 110889 Feeding ecology of birds.

Mr D Hawes 110889 Feeding ecology of birds.

Ms L Jansen 030889 The ecology and population dynamics of birds: various projects under the direction of Dr D C Paton.

Mr J G Joseph 110889 Feeding ecology of birds.

Ms L Oaten 110889 Feeding ecology of birds.

Mr G R Pink 110889 Feeding ecology of birds.

Ms R Pratt 110889 Feeding ecology of birds.

Dr M B Renfree 080889 Reproductive physiology of marsupials.

Mr P G Seager 110889 Feeding ecology of birds.

Dr M E Griffiths 060989 Lactation in echidnas (*Tachyglossus aculeatus*).

Dr R Hnatiuk 280989 General plant collections: herbarium specimens and living material.

Dr R Hnatiuk 280989 General plant collections: herbarium specimens and living material.

Dr K F Walker 110989 Limnological survey of known and potential platypus habitats in Rocky River and Southwest River, Kangaroo Island.

Mr M R Newton 271089 Introduction of sciomyzid flies for biological control of exotic helicid land snails.

Prof H B S Womersley 111089 The marine benthic flora of southern Australia part III - Rhodophyta.

Dr D P Costa 011189 Foraging and reproductive energetics of the Australian Sea-lion (*Neophoca cinerea*).

Mr P Dann 131189 Breeding, survival and movements of Little Penguins (*Eudyptula minor*)in south-eastern Australia.

Dr M E Griffiths 271189 Lactation in echidnas (*Tachyglossus aculeatus*).

Mr M W McKelvey 131189 Breeding, survival and movements of Little Penguins (*Eudyptula minor*)in south-eastern Australia.

Dr R Schodde 031189 Biodiversity and phylogenetic radiation of Australian wildlife; the position of Kangaroo Island.

Dr R A Tedman 291189 Comparative anatomy of the Australian otariids, *Neophoca* and *Arctocephalus*.
Dr W G Breed 041289 Investigation of the evolution of sperm morphology in mammals.
Dr N Gales 061289 Reproductive biology of the Australian Sea Lion (*Neophoca cinerea*).

Mr S D Goldsworthy 121289 Maternal attendance, feeding ecology and pup growth in New Zealand Fur-seals (*Arctocephalus forsteri*).

Dr P D Rismiller 121289 Ecology of island reptiles.

Dr P D Shaughnessy 061289 Distribution and abundance of New Zealand Fur-seals (*Arctocephalus forsteri*) in southern Australia.
1990

Dr R V Baudinette 230190 Maximum aerobic metabolism and factorial scope.

Mr R B Coles 060290 Recording of archaeological sites on Kangaroo Island.

Mr D J Paull 150290 Populations of the Southern Brown Bandicoot (*Isoodon obesulus*) in South Australia.

Dr R S Seymour 010290 Respiration of echidna eggs.

Mr B Gunn 070390 Collection of seed for trials of Australian tree plantations in Morocco.

Prof H B S Womersley 070390 The marine benthic flora of southern Australia part III - Rhodophyta.

Dr M E Longmore 030490 Remote sensing monitoring of Flinders Chase National Park and adjacent agricultural land.

Mr A Sutherland 030490 Revegetation of farmland in South Australia.

Dr B T Firth 280590 Thermal sensitivity of circadian rhythms of melatonin secretion in the echidna (*Tachyglossus aculeatus*).

Mr P R Foster 280590 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr C I Baxter 190790 Search for *Sminthopsis aitkeni* on Kangaroo Island.

Mr C I Baxter 190790 Banding of Cape Barren Geese on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Mr T E Dennis 190790 Banding of giant petrels, albatrosses, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Mr A F C Lashmar 190790 Banding of giant petrels, albatrosses, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Ms L Oaten 050790 Feeding ecology of birds.

Mrs B M Overton 190790 On-going base data collection of all plant species for the South Australian Herbarium and reference collections.
Ms D Padley 050790 Petroleum geochemistry of the Otway and Duntroon Basins.

Mrs N T G Ridley 190790 General collection of plant, and in particular, orchid specimens for the State Herbarium and the Canberra Botanic Gardens.

Mr P G Seager 050790 Feeding behaviour of the Glossy Black Cockatoo (*Calyptorhynchus lathami*) on Kangaroo Island.

Mr P G Seager 050790 Feeding ecology of birds.

Mr N R Swanson 190790 Banding of albatrosses, giant petrels, waders and hawks on Kangaroo Island under the ANPWS Australian Bird and Bat Banding Scheme.

Dr J M Watson 040790 The use of molecular and cytogenetic techniques to deduce the chromosomal basis of sex determination in the monotremes.

Mr A T D Bennett 060890 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr B J Brock 220890 Feeding ecology of birds.

Mr G A Carpenter 060890 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr L A Craven 280890 Taxonomic studies of *Melaleuca* and its allies (Myrtaceae).

Mr N Forde 220890 Feeding ecology of birds.

Mr T W Fuhlbohm 220890 Feeding ecology of birds.

Mr D Hawes 220890 Feeding ecology of birds.

Mr J G Joseph 220890 Feeding ecology of birds.

Mr B J Luxton 290890 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr C P Madden 280890 Morphological deformities in chironomid larvae (Insecta: Diptera) as an indicator of pesticide and heavy metal pollution in water catchments.

Ms D J Patkin 060890 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Ms P A Paton 060890 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Dr D C Paton 060890 Movements of terrestrial birds on Kangaroo Island.

Dr D C Paton 060890 Population dynamics and behavioural studies of birds inhabiting Flinders Chase National Park.

Dr D C Paton 060890 Interactions between honeybees and native biota.
Mr G R Pink 220890 Feeding ecology of birds.

Ms R Pratt 220890 Feeding ecology of birds.

Prof R Shine 230890 Evolution of viviparity in *Lersita bougainvillii*.

Mr N J Speck 060890 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Miss J D Taylor 060890 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

Mr D J Williams 060890 Population dynamics of birds: various projects under the Australian National Parks and Wildlife Service Australian Bird and Bat Banding Scheme.

Mr T J Bradley 190990 Population studies of birds in the Mount Lofty Ranges.

Mr A R Dowd 190990 Koala habitat on Kangaroo Island.

Dr D P Costa 051090 Diving physiology and energetics of Little Penguins (*Eudyptula minor*).

Mr P Dann 031090 Breeding, survival and movements of Little Penguins (*Eudyptula minor*)in south-eastern Australia.

Dr N A Locket 021090 Studies on echidna.

Ms S Robinson 031090 Breeding, survival and movements of Little Penguins (*Eudyptula minor*)in south-eastern Australia.

Mr R Wilkinson 231090 Characterisation of all aspects of the humoral and cell-mediated immune systems of the koala.

Mr P S Beaumont 011190 Population dynamics and feeding ecology of birds.

Mr M R Newton 221190 Introduction of sciomyzid flies for biological control of exotic helicid land snails.

Dr P D Shaughnessy 221190 Distribution and abundance of New Zealand Fur-seals (*Arctocephalus forsteri*)in southern Australia.

Dr B F Green 131290 Lactation in the New Zealand Fur-seal (*Arctocephalus forsteri*).

Ms L V Higgins 131290 Behavioural ecology and maternal investment in Australian Sea-lions.

Mr M W McKelvey 141290 Movements of terrestrial birds on Kangaroo Island.

1991

Dr H F Beyrle 080191 Biochemical characteristic and parasitic interactions between orchids and mycorrhizal fungi.

Dr N Gales 230191 Reproductive biology of the Australian Sea Lion (*Neophoca cinerea*).
Mr D McGlennon 110191 Impact of freshwater crustaceans on Kangaroo Island.

Mr M W McKelvey 080191 Breeding, survival and movements of Little Penguins (*Eudyptula minor*)in south-eastern Australia.

Dr P D Rismiller 150191 Ecology of island reptiles.

Dr P D Rismiller 150191 The ecology of the Kangaroo Island Echidna (*Tachyglossus aculeatus multiaculeatus*).

Dr R D Sharrad 230191 Teaching exercise in field ecological techniques at north-western Kangaroo Island.

Dr M Messer 130291 Lactation in echidnas (*Tachyglossus aculeatus*).
Mrs B M Overton 140291 Life-history studies of five species of rare plants (and associates) on Kangaroo Island.

Mrs B M Overton 140291 Botanical specimens for participants in the President Eisenhower USA University Student Program on Kangaroo Island.

Mr S D Goldsworthy 060391 Maternal attendance, feeding ecology and pup growth in New Zealand Fur-seals (*Arctocephalus forsteri*).

Mr J Pepper 060391 Field study of the biology and social behaviour of the Glossy Black Cockatoo.

Dr R Schodde 070391 Biodiversity and phylogenetic radiation of Australian wildlife; the position of Kangaroo Island.

Dr R Spencer 100491 Development of a native botanic garden annex to the Royal Botanic Gardens, Melbourne.

Dr D M Spratt 110491 Parasites of small mammals on Kangaroo island.

Dr W Forstreuter 100591 Anatomical studies in santalales seedlings (Santalaceae).

Mr T J Bradley 180691 Population studies of birds in the Mount Lofty Ranges.

Ms W A D'Amore 170691 Breeding, survival and movements of Little Penguins (*Eudyptula minor*) in south-eastern Australia.

Mr M W McKelvey 170691 Breeding, survival and movements of Little Penguins (*Eudyptula minor*)in south-eastern Australia.

Mr G A Carpenter 120791 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.
Mr P M Goonan 120791 Population dynamics of birds: various projects under the direction of Dr D C Paton and Mr T J Bradley.

1992

Dr BT Firth 010292 Function of the pineal gland in lizards.

Dr DR King 010292 Captive breeding of Varanus rosenbergi.

Mr GP Armstrong 050392 Reptile and amphibian distribution and status in South Australia.

Miss EK Lawson 050392 Collection of plant specimens from around South Australia for the State Herbarium and development of a teachers' identification aid package.

Dr MN Hutchinson 010592 General collection permit issued to the Curator of Reptiles, South Australian Museum.
Mr AA Flaherty 150592 Opportunistic vertebrate collections for the South Australian Museum.

Mrs SK Blair 010692 Bird Care & Conservation Society rescued raptor trauma project.

Ms KDM Dean 180692 Reproductive endocrinology of the Echidna, Tachyglossus aculeatus.

Dr R Byard 010792 Comparative testing of immunohistochemical staining patterns between human and marsupial tissue.

Mr ID Falkenberg 010792 A study of Falconiformes in South Australia.

Mr N Forde 010792 Feeding ecology of birds.

Mr B Foreman 010792 The relationship of bird numbers (species and individuals) to habitat status.

Dr CO Fuller 010792 Banding of rehabilitated birds under the Australian National Parks and Wildlife Service Australian Bird and Bat Banding Scheme.

Mr WA Head 010792 General surveys of the mammals of South Australia by the Field Naturalists' Society, Mammal Club.

Mr WL Klau 010792 Bird movement in the Mid and Upper North, and Eyre Peninsula areas of South Australia.

Dr L Christidis 010892 Evolutionary genetics of the Australasian avifauna.

Mr ID Falkenberg 010892 An assessment of pesticide contamination in breeding Peregrine Falcons (Falco peregrinus) in South Australia.

Mr M Adams 270892 Evolution and speciation in Australian vertebrates.

Dr PJ Lang 010992 Reference collections for 'Plants of Conservation Significance in SA' and personal use.

Mr RJ Burrell 050992 Cryptosporidiosis in wild reptile populations.

Mr LA Craven 010992 Taxonomic studies of Melaleuca and its allies (Myrtaceae).

Mr WM Jenner 011092 Population dynamics and activity patterns in Kangaroo Island Pygmy Copperheads (Austrelaps sp).

Mr TE Dennis 071092 Bird banding projects directed at migratory waders and off-shore species, coastal raptors, Hooded Plovers and pelicans.

Dr I Gibbins 081092 Autonomic nerves controlling thermoregulation in lizards.

Dr CM Bull 011192 Ecology of large lizards and their ticks.

Dr CB Daniels 011192 Pulmonary-type surfactant and the evolution of air-breathing.

Dr BF Green 271292 Field biology of Varanus rosenbergi.

1993

Dr J Chappill 010193 Revision of the plant family Sterculiaceae for the Flora of Australia.

Dr S Conaghty 010293 Investigation of the organism mycoplasma in the respiratory tract of captive and free-ranging Little Penguins (Eudyptula minor).

Miss EK Lawson 010393 Collection of plant specimens from around South Australia for the State Herbarium and development of a teachers' identification aid package.

Mr GP Armstrong 010395 Reptile and amphibian distribution and status in South Australia.

Mr RJ Bates : 130393 Taxonomic research in the Orchidaceae and general botanical collection for the State Herbarium.

Dr BT Firth 130393 Function of the pineal gland in lizards.

Dr WG Breed Valid: 050493 An investigation into the sperm chromatin organisation in marsupials.

Dr MN Hutchinson 010593 General collection permit issued to the Curator of Reptiles, South Australian Museum.

Dr D Beardsell 110593 Establishment of national seed orchards for native trees.

Mr TE Dennis 010693 Bird banding projects directed at migratory waders and off-shore species, coastal raptors, Hooded Plovers and pelicans.

Ms KDM Dean 010693 Reproductive endocrinology of the Echidna, Tachyglossus aculeatus.

Mr P Dann 010693 Breeding, survival and movements of Little Penguins (Eudyptula minor) in south-eastern Australia.

Mrs SK Blair 010793 Rehabilitation and release banding program for South Australian bats.

Mrs G Briggs 010793 Aspects of field botany in South Australia: surveys by FNSSA Botany Club.

Mr N Forde 010793 Feeding ecology of birds.

Dr CO Fuller 010793 Banding of rehabilitated birds under the Australian National Parks and Wildlife Service Australian Bird and Bat Banding Scheme.

Mr B Foreman 010893 The relationship of bird numbers (species and individuals) to habitat status.

Mrs SK Blair 040893 Bird Care & Conservation Society rescued raptor trauma project.

Mr LE Conole 010993 Bat survey on Kangaroo Island.

Mr DL Jones 010993 Revision of the Orchidaceae for publication in the 'Flora of Australia'.

Dr WG Breed 100993 Comparative study of oocyte structure in marsupials.

Ms VM Cruickshank 100993 Plant paintings for illustrated guidebooks.

Dr PJ Lang 010993 Reference collections for 'Plants of Conservation Significance in SA' and personal use.

Mr M Jurisevic 230993 Factors governing sound perception and sound production in Australian birds-of-prey and corvids.

Mr ID Falkenberg 240993 A study of Falconiformes in South Australia.
Mr ID Falkenberg 240993 An assessment of pesticide contamination in breeding Peregrine Falcons (Falco peregrinus) in South Australia.

Mr WM Jenner 011093 Population dynamics and activity patterns in Kangaroo Island Pygmy Copperheads (Austrelaps sp).

Dr CM Kemper 011193 General collection permit issued to the Curator of Mammals, South Australian Museum.

Mr HJ Eckert 061093 The status and distribution of South Australian birds.

Ms SF Ivory 121093 Plant voucher collection for the 'Plant and Animal Diversity' sectionof the Natural Resource Management course.

Ms FC Harriss 141093 The genetic consequences of habitat fragmentation: island populations of Bush Rats (Rattus fuscipes).

Mr M Adams 191093 Evolution and speciation in Australian vertebrates.
Mr PS Beaumont 281093 General bird banding under the ANPWS Australian Bird and Bat Banding Scheme.

Dr CM Bull 011193 Ecological interactions of ticks and large skinks.

Dr CB Daniels 011193 The dynamics of fluid flow in the cardio-pulmonary system of ectotherms: are the alveoli wet or dry?

Ms D Hellbrugge 011193 Revision of the genus Pelargonium.

Mr WA Head 291193 General surveys of the mammals of South Australia by the Field Naturalists' Society, Mammal Club.

Dr CM Bull 141293 Social organisation in skinks.

Dr HF De Lisle 151293 Ecological equivalents - lizards from South Australia and southern California.

1994

Miss EK Lawson 010394 Collection of plant specimens from around South Australia for the State Herbarium and development of a teachers' identification aid package.

Dr BF Green 080394 Field biology of Varanus rosenbergi.

Mr GP Armstrong 010394 Reptile and amphibian distribution and status in South Australia.

Mr AA Flaherty 080494 Opportunistic vertebrate collections for the South Australian Museum.

Dr MN Hutchinson 010594 General collection permit issued to the Curator of Reptiles, South Austalian Museum.

Mr N Forde 010794 Feeding ecology of birds.

Mr WL Klau 010794 Bird movement in the Mid and Upper North, and Eyre Peninsula areas of South Australia.

Dr CM Kemper 010894 Aerial survey and photographic identification of Southern Right Whales (Eubalaena australis) in South Australian waters east of Adelaide.

Mrs E Facelli 250894 Effect of mycorrhizal infection on plant competition.

Mr RJ Bates : 260894 Taxonomic research in the Orchidaceae and general botanical collection for the State Herbarium.

Dr EM Bennett 300894 Revision of the tribe Lasiopetalae (Sterculiaceae).

Dr G Barendse 010994 World reference collection of Solanaceae seeds and plants.

Mr GT Chandler 010994 Taxonomic revision of the Gorse Bitter-pea Daviesia ulicifolia.

Mr DL Jones 010994 Revision of the Orchidaceae for publication in the 'Flora of Australia'.

Ms VM Cruickshank 040994 Plant paintings for illustrated guidebooks.

Mr ID Falkenberg 240994 A study of Falconiformes in South Australia.

Mr ID Falkenberg 240994 An assessment of pesticide contamination in breeding Peregrine Falcons (Falco peregrinus) in South Australia.

Mr P Dann 091094 Breeding, survival and movements of Little Penguins (Eudyptula minor) in south-eastern Australia.

Mr WM Jenner 011094 Population structure and activity patterns in Kangaroo Island Pygmy Copperheads (Austrelaps labialis).

Mr M Jurisevic 011094 Vocal ontogeny and the metabolic cost of begging calls in three Australian passerines: the Little Raven, Australian Magpie and White-winged Chough.

Mr BJ Lepschi 041094 Taxonomic studies in Melaleuca and its allies (Myrtaceae).

Mr WA Head 091094 General surveys of the mammals of South Australia by the Field Naturalists' Society, Mammal Club.

Mr HJ Eckert 271094 The status and distribution of South Australian birds.

Mr AC Exner 271094 The relationship of bird numbers (species and individuals) to habitat status.

Dr CM Bull 011194 Ecological interactions of ticks and large skinks.

Dr CM Bull 011194 Social organisation in skinks.

Dr BT Firth 221194 Function of the pineal gland in lizards.

Mr MJ Bayly 301294 Cladistic biogeography of Eriostemon and related genera.

1995

Dr BJ Coman 010295 An investigation of potential pathogens in Australian possums.

Ms BD Kranz 010295 Eusociality in Australian gall thrips.

Mr AR Herbert 140295 The distribution and conservation status of the Kangaroo Island Dunnart.

Dr R Byard 070395 Comparative testing of immunohistochemical staining patterns between human and marsupial tissue.

Mr A Allanson 010495 Native revegetation projects in South Australia.

Ms JL Cutten 070495 Mount Lofty Ranges Emu-wren (Stipiturus malachurus intermedius) Recovery Plan actions - banding, monitoring and genetic studies.

Mr WL Klau 230595 Bird movement in the Mid and Upper North, and Eyre Peninsula areas of South Australia.

Mr WA Head 070695 General surveys of the mammals of South Australia by the Field Naturalists' Society, Mammal Club.

Mr TE Dennis 200695 Bird banding projects directed at migratory waders and off-shore species, coastal raptors, Hooded Plovers and pelicans.

Ms KDM Dean 210695 Reproductive endocrinology of the Echidna, Tachyglossus aculeatus.

Ms JL Chivell 010795 The effect of habitat fragmentation on the pollination biology of Grevillea species.

Miss SJ Kroker 220895 Variation in vegetative and reproductive structures of 4 species of Frankenia and their response to stresses because of varying environments.

Mr DF Kirkley 230895 Bat houses/Bat population "Feral occupied vs. Feral free habitat".

Mr F Grossbechler 250895 Propagation of Kangaroo Island endemic plant species.

Ms VM Cruickshank 100995Plant paintings for illustrated guidebooks.

Mr M Adams 110995 Evolution and speciation in Australian vertebrates.

Mr DL Jones 260995 Revision of the Orchidaceae for publication in the 'Flora of Australia'.

Mr WM Jenner 011095 Population structure and activity patterns in Kangaroo Island Pygmy Copperheads (Austrelaps labialis).

Ms I Dobrzinski 311095 Plant collections to aid mineral and petroleum licence audits.

Dr CM Bull 011195 Ecological interactions of ticks and large skinks.

Dr BF Green 071195 Field biology of Varanus rosenbergi.

Mr HJ Eckert 101195 The status and distribution of South Australian birds.

1996

Ms I Dobrzinski 010196 Plant collections to aid mineral and petroleum licence audits.

Mr DR Grocke 010196 Stable isotope abundances of flora, fauna and soil from selected localities on Kangaroo Island.

Mr P Dann 240196 Breeding, survival and movements of Little Penguins (Eudyptula minor) in south-eastern Australia.

Dr BT Firth 240196 Function of the pineal gland in lizards.

Mr CM Leigh 240196 Comparative morphology of vertebrates.

Dr CA Crawford 210296 Threatened plant and general botanical surveys.

Miss EK Lawson 010396 Collection of plant specimens from around South Australia for the State Herbarium and development of a teachers' identification aid package.

Ms BD Kranz 130396 Eusociality in Australian gall thrips.

Mr T Dennis 010696 Bird banding projects directed at migratory waders and off-shore species, coastal raptors, Hooded Plovers, osprey and pelicans.

Ms JL Cutten 040696 Mount Lofty Ranges Emu-wren (Stipiturus malachurus intermedius) Recovery Plan actions - banding, monitoring and genetic studies.

Mrs M Barnett 240696 Indigenous plant species of Southern Lofty Ranges (in particular, Adelaide Hills, Fleurieu Peninsula and Kangaroo Island).

Ms JL Chivell 010796 The effect of habitat fragmentation on the pollination biology of Grevillea species.

Mr H Ehmann 010796 Ecological and biogeographic studies of reptiles, frogs, mammals and birds (general and opportunistic) & detailed studies of the Penalty Knob-tailed Gecko (Nephrurus deleani).

Mr WL Klau 010796 Bird movement in the Mid and Upper North, and Eyre Peninsula areas of South Australia.

Dr GC Kirby 160796 Pilot study of biodiversity of fungal endophytes of native plants.

Dr MIH Brooker 260796 Eucalyptus taxonomy.

Dr CM Bull 010996 Social organisation in skinks.

Ms JM Hart 010996 The Revision of the Australian Apiaceae.

Ms A Ben Kahn 010996 Ecology and Genetics of several rare orchid species (Caladena) in South Australia.

Mr WM Jenner 011096 Population structure and activity patterns in Kangaroo Island Pygmy Copperheads (Austrelaps labialis).

Dr T Lowrey 021096 Molecular systems of Tetramolopium, Vittadinia and related genera in the Asteraceae.

Appendix VI

PLANT SPECIES RECORDED FROM KANGAROO ISLAND
List of vascular plant taxa occurring on Kangaroo Island showing conservation sratus and sampling frequency in the Kangaroo Island Survey.

Plant taxonomy and nomenclature follows Jessop (1993) as updated by the FLORA database in April 1999. It also includes includes some recent taxonomic changes still awaiting incorporation in FLORA. Common names are from Jessop and Toelken (1986) and/or the FLORA database.

KEY

I Indigenous/alien designation. Naturalised alien species are designated by an asterisk (*).

SU No. of Survey site (quadrat) records

OP No. of Opportunistic records on Survey

Va Validity as an accepted, unique taxon on KI.

N = Not accepted name/ entity for KI
R = Redundant/replicated name (taxon included as a more precise/complete name)

(NC) Designated as a non-current name in the FLORA database 1999. A non-current name represents a previous taxonomic circumscription corresponding to one or more currently recognised taxa. Non current names are linked to one or more current names.

Conservation Status

AUS Australian status according to Briggs & Leigh (1996) (multi-letter codes) or Lang & Kraehenbuehl (1999) (single letter codes)
SA South Australian Status Lang & Kraehenbuehl (1999).
KI Regional status for Kangaroo Island (Lang & Kraehenbuehl) (1999).

SA and Regional Codes

X **Extinct**/Presumed extinct: not located despite thorough searching of all known and likely habitats; known to have been eliminated by the loss of localised population(s); or not recorded for more than 50 years from an area where substantial habitat modification has occurred.
E **Endangered**: rare and in danger of becoming extinct in the wild.
T **Threatened**: likely to be either Endangered or Vulnerable but insufficient data for a more precise assessment.
V **Vulnerable**: rare and at risk from potential threats or long term threats which could cause the species to become endangered in the future.
K **Uncertain**: likely to be either Threatened or Rare but insufficient data for a more precise assessment.
R **Rare**: has a low overall frequency of occurrence (may be locally common with a very restricted distribution or may be scattered sparsely over a wider area). Not currently exposed to significant threats, but warrants monitoring and protective measures to prevent reduction of population sizes.
U **Uncommon**: less common species of interest but not rare enough to warrant special protective measures.
Q Not yet assessed but flagged as being **of possible significance**.

Australian Status Codes

Where the Australian status is indicated by a single letter code it follows the definitions on the preceding page.

Where the Australian status is indicated by a three or four letter code (eg 2RCi) it is derived from Briggs, J.D., & Leigh, J.H. (1996). "Rare or Threatened Australian Plants, 1995 Revised Edition." (CSIRO, Australia). These codes comprise the following elements.

***Distribution categories*:**
1 species known from type collection only; or from a single location only
2 species with a very restricted distribution in Australia and with a maximum geographic range of less than 100 km
3 species with a range of at least 100 km but occurring only in small populations (often restricted to highly specific and localised habitats

Conservation categories
X **Presumed extinct**: species that have either not been found in recent years despite thorough searching, or have not been collected for at least 50 years and were known only from now intensively settled areas.
E **Endangered**: in serious risk of disappearing from the wild state within one or two decades if present land use and other causal factors continue to operate.
V **Vulnerable**: not presently Endangered but at risk of disappearing from the wild over a longer period (20-50 years), or which largely occur on sites likely to experience changes in land use that would threaten the survival of the species in the wild.
R **Rare**: species which are rare in Australia but which overall are not considered Endangered or Vulnerable. Such species may be represented by a relatively large population in very restricted area, or by smaller populations spread over a wider range or some intermediate combination of distribution pattern.
K Poorly known: species that are suspected, but not definitely known, to belong to any of the above categories

Reservation categories
C known to present within a national park or other conservation reserve
a adequately reserved with a total of at least 1000 plants known to occur in reserves.
i in adequately reserved, with a total of less than 1000 plants in reserves
t total known populations are in reserves

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Acacia "Strathalbyn" (D.Murfet 147): M.O'Leary								previously referred to as *Acacia* aff. *halliana*
	Acacia acinacea	wreath wattle			E	13			
	Acacia aff.halliana	Hall's wattle	K	K	E			N	= *Acacia* "Strathalbyn" (D.Murfet 147): M.O'Leary
	Acacia brachybotrya	grey mulga-bush			V	1	1		
	Acacia calamifolia	wallowa				1			
	Acacia cupularis	cup wattle				10			recorded as *Acacia ligulata*
	Acacia cyclops	western coastal wattle			V				doubtfuly native on KI (Whibley & Symon, 1992)
	Acacia dodonaeifolia	hop-bush wattle	3RCa	R	K	3			
	Acacia farinosa	mealy wattle			V				
	Acacia leiophylla	coast golden wattle				46			
	Acacia ligulata (NC)	umbrella bush				10		N	presumed to be *Acacia cupularis*
*	*Acacia longifolia var. longifolia*	sallow wattle							
	Acacia longifolia var. sophorae	coastal wattle				7			
	Acacia myrtifolia (NC)	myrtle wattle				51		R	refers to either variety
	Acacia myrtifolia var. angustifolia	narrow-leaf myrtle wattle							
	Acacia myrtifolia var. myrtifolia	myrtle wattle							
	Acacia paradoxa	kangaroo thorn				95			
	Acacia pycnantha	golden wattle				9			
	Acacia retinodes var. retinodes (NC)	wirilda				27		N	presumed to be swamp form
	Acacia retinodes var. retinodes (swamp form)	swamp wattle				27			recorded as *Acacia retinodes* var. *retinodes* (NC)
	Acacia retinodes var. uncifolia	coast silver wattle		U	U	21			
	Acacia rupicola	rock wattle			R	1			
*	*Acacia saligna*	golden wreath wattle							
	Acacia spinescens	spiny wattle				25	1		
	Acacia triquetra	mallee wreath wattle			Q	14			
	Acacia verticillata	prickly Moses				6			
	Acaena echinata	sheep's burr							
	Acaena novae-zelandiae	biddy-biddy				9			
	Acaena x anserovina	hybrid burr				3			
*	*Acetosella vulgaris*	sorrel							
*	*Achillea tomentosa*	woolly yarrow							
	Achnophora tatei	Kangaroo Island river daisy	2RCa	R	R	2			
	Acianthus caudatus var.	mayfly orchid					1	R	
	Acianthus caudatus var. caudatus	mayfly orchid				19			

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Acianthus caudatus var. pallidus	green mayfly orchid							
	Acianthus pusillus	mosquito orchid							
	Acianthus sp.	mosquito orchid				3		R	
	Acrotriche affinis	ridged ground-berry				20			
	Acrotriche cordata	blunt-leaf ground-berry				56			
	Acrotriche depressa	native currant		U	U	78	1		
	Acrotriche fasciculiflora	Mount Lofty ground-berry		U	R	3			
	Acrotriche halmaturina	Kangaroo Island ground-berry		U	U	19			
	Acrotriche patula	prickly ground-berry				43			
	Acrotriche serrulata					1			
	Actinobole uliginosum	flannel cudweed							
	Adenanthos macropodiana	Kangaroo Island gland-flower				23	1		
	Adenanthos terminalis	yellow gland-flower				53			
	Adiantum aethiopicum	common maiden-hair			R	3	1		
	Adriana klotzschii	coast bitter-bush				9			
*	*Aeonium castello-paivae*								
	Agrostis aemula	blown-grass							
	Agrostis avenacea var. avenacea	common blown-grass				1			
	Agrostis billardieri var. billardieri	coast blown-grass				6			
*	*Aira caryophyllea*	silvery hair-grass				42		N	
*	*Aira caryophyllea/cupaniana*	hair-grass				66		R	distinction between *A. carophyllea* & *A. cupaniana* is unclear and unrelaible
*	*Aira cupaniana*	small hair-grass				24		N	
*	*Aira elegantissima ssp. elegantissima*	delicate hair-grass				2			
	Ajuga australis form A	Australian bugle							
	Ajuga australis form B	lesser bugle			V				
*	*Albizia lophantha*	Cape Leeuwin wattle		V					
*	*Allium neapolitanum*	Naples onion							
*	*Allium triquetrum*	three-cornered garlic							
*	*Allium vineale*	crow garlic							
	Allocasuarina muelleriana ssp.	common oak-bush					1	N	presumed to be ssp. *notocolpica*
	Allocasuarina muelleriana ssp. notocolpica	Kangaroo Island oak-bush				36	1		
	Allocasuarina striata	stalked oak-bush				95			
	Allocasuarina verticillata	drooping sheoak				26	1		
*	*Alopecurus pratensis*	meadow fox-tail							
	Alternanthera denticulata	lesser joyweed			R				

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			AUS	SA	KI				
	Alyxia buxifolia	sea box				8			
*	*Ammophila arenaria*	marram grass				1			
	Amphibolis antarctica	sea nymph							
	Amphibromus nervosus	veined swamp wallaby-grass		U		2			
	Amyema melaleucae	tea-tree mistletoe			V				
*	*Anagallis arvensis*	pimpernel				52			
	Angianthus preissianus	salt angianthus				6			
	Anogramma leptophylla	annual fern		R	K				
*	*Anthoxanthum odoratum*	sweet vernal grass							
	Apalochlamys spectabilis	showy firebush		U	U	2	1		
	Aphanes australiana	Australian piert			U				
	Aphelia gracilis	slender aphelia		Q	R	2			
	Aphelia pumilio	dwarf aphelia			K	8			
	Aphelia sp.					4			
	Apium annuum	annual celery				23			
	Apium prostratum ssp. prostratum var. filiforme	native celery				5	1		
	Arabidella trisecta	shrubby cress							doubtful occurrence on KI
*	*Arctotheca calendula*	Cape weed				16			
*	*Arctotis stoechadifolia*	white arctotis							
*	*Arenaria leptoclados*	lesser thyme-leaved sandwort				1			recorded as *Arenaria serpyllifolia*
*	*Arenaria serpyllifolia (NC)*	thyme-leaved sandwort				1		N	= *A. leptoclados*
	Argentipallium obtusifolium	blunt everlasting			R	2			
*	*Argyranthemum frutescens ssp. foeniculaceum*	Teneriffe daisy							
*	*Artemisia arborescens*	silver wormwood							
	Arthropodium fimbriatum	nodding vanilla-lily			E				
	Arthropodium strictum	common vanilla-lily			K	5			
	Asperula conferta					1			
	Asperula euryphylla var. tetraphylla	broad-leaf woodruff		V	V	1			
	Asperula pusilla	alpine woodruff		X	X				
*	*Asphodelus fistulosus*	onion weed							
	Asplenium flabellifolium	necklace fern			K				
	Asterolasia asteriscophora	lemon star-bush						N	not accepted as valid occurrence on KI
	Asterolasia muricata	rough star-bush	2RCa	R	R	3			
	Asterolasia phebalioides	downy star-bush	3VCa	V	V				

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			AUS	SA	KI				
	Astroloma conostephioides	flame heath				85			
	Astroloma humifusum	cranberry heath				70			
	Atriplex cinerea	coast saltbush				1			
	Atriplex paludosa ssp. cordata	marsh saltbush				1			
	Atriplex semibaccata	berry saltbush							
	Atriplex suberecta	lagoon saltbush							
	Austrofestuca littoralis	coast fescue			R				
	Austrostipa curticoma	short-crest spear-grass		Q	T				= *Austrostipa curticoma*
	Austrostipa densiflora	foxtail spear-grass		R	K	2			recorded as *Austrostipa densiflora*
	Austrostipa elegantissima	feather spear-grass			T				= *Austrostipa elegantissima*
	Austrostipa exilis	heath spear-grass				27			recorded as *Austrostipa exilis*
	Austrostipa flavescens	coast spear-grass				32			recorded as *Austrostipa flavescens*
	Austrostipa hemipogon	half-beard spear-grass				32			recorded as *Austrostipa hemipogon*
	Austrostipa macalpinei	annual spear-grass		U	U				= *Austrostipa macalpinei*
	Austrostipa mollis	soft spear-grass				6			recorded as *Stipa mollis*
	Austrostipa muelleri	tangled spear-grass		R	X				= *Stipa muelleri*
	Austrostipa multispiculis		3RC-	R	T	2			recorded as *Stipa multispiculis*
	Austrostipa nitida	Balcarra spear-grass			T				= *Stipa nitida*
	Austrostipa nodosa	tall spear-grass			T				= *Stipa nodosa*
	Austrostipa scabra ssp. falcata	slender spear-grass							= *Stipa scabra* ssp. *falcata*
	Austrostipa semibarbata	fibrous spear-grass				1			recorded as *Stipa semibarbata*
	Austrostipa sp.	spear-grass				19	1	R	recorded as *Stipa* sp.
	Austrostipa stipoides	coast spear-grass				14			recorded as *Stipa stipoides*
	Austrostipa tenuifolia			R					= *Stipa tenuifolia*
*	*Avellinia michelii*	avellinia				5			
*	*Avena barbata*	bearded oat				17			
*	*Avena sativa*	cultivated oat							
	Baeckea crassifolia	desert baeckea				6			
	Baeckea ericaea	mat baeckea			U	15			
	Baeckea ramosissima ssp. ramosissima	rosy baeckea				35	1		
	Banksia marginata	silver banksia				91	1		
	Banksia ornata	desert banksia				44			
*	*Batrachium trichophyllum*	water buttercup							
	Bauera rubioides	wiry bauera		R	R	6			
	Baumea acuta	pale twig-rush		R	R				
	Baumea arthrophylla	swamp twig-rush			U	3			

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			AUS	SA	KI				
	Baumea gunnii	slender twig-rush		R	E				
	Baumea juncea	bare twig-rush			R	21			
	Baumea laxa	lax twig-rush		R	K				
	Baumea rubiginosa	soft twig-rush		U	R				
	Baumea tetragona	square twig-rush		U	R				
	Bertya rotundifolia	round-leaf bertya				22			
*	*Beta vulgaris ssp. maritima*	sea beet							
	Beyeria lechenaultii	pale turpentine bush				57			
	Beyeria subtecta	Kangaroo Island turpentine bush	2VCa	V	V	1			
	Billardiera bignoniacea	orange bell-climber		U	U	16			
	Billardiera cymosa	sweet apple-berry				20			
	Billardiera sp.	apple-berry				4		R	
	Billardiera uniflora	one-flower apple-berry				51			
	Billardiera versicolor	yellow-flower apple-berry		U	R	11			
	Blechnum minus	soft water-fern		U					
	Blechnum nudum	fishbone water-fern		R	R	4			
	Blechnum wattsii	hard water-fern		R	R	1			
	Boronia coerulescens ssp. coerulescens	blue boronia			R	2			
	Boronia edwardsii	Edwards' boronia				50			
	Boronia filifolia	slender boronia				58			
	Boronia parviflora	swamp boronia		R	R				
	Brachycome cuneifolia	wedge-leaf daisy		U	E	1			
	Brachycome exilis	slender daisy			U	1			
	Brachycome goniocarpa	dwarf daisy			U				
	Brachycome lineariloba	hard-head daisy							
	Brachycome uliginosa	wet-heath daisy		R	E	1			
	Brachyloma ericoides ssp. bicolor	Kangaroo Island brush heath				19			
*	*Brachypodium distachyon*	false brome				3			
	Bracteantha bracteata	golden everlasting			R	1			
*	*Brassica tournefortii*	wild turnip							new record on KI
*	*Briza maxima*	large quaking-grass				10			
*	*Briza minor*	lesser quaking-grass				36			
	Bromus arenarius	sand brome			E				
*	*Bromus diandrus*	great brome				14			
*	*Bromus hordeaceus ssp. hordeaceus*	soft brome				15			
*	*Bromus lanceolatus*	Mediterranean brome							

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			AUS	SA	KI				
*	*Bromus madritensis*	compact brome				2			
*	*Bromus rigidus*	rigid brome				3			
*	*Bromus rubens*	red brome							
	Brunonia australis	blue pincushion			E				
*	*Buglossoides arvensis*	sheepweed							
	Bulbine semibarbata	small leek-lily				28			
*	*Bupleurum semicompositum*	hare's ear							
	Burchardia umbellata	milkmaids			U	15			
	Bursaria spinosa	sweet bursaria				12			
	Caesia calliantha	blue grass-lily			R				
*	*Cakile edentula*	American sea rocket							
*	*Cakile maritima ssp. maritima*	two-horned sea rocket				3	1		
	Caladenia aff. filamentosa	crimson daddy-long-legs				4			recorded as *Caladenia filamentosa* var. *filamentosa* (NC)
	Caladenia bicalliata		3RC-	R	E				
	Caladenia cardiochila	heart-lip spider-orchid			R				
	Caladenia carnea var. carnea	pink fingers				18			
	Caladenia cleistogama			V	V				
	Caladenia dilatata complex	green-comb spider-orchid				1		R	
	Caladenia filamentosa var. filamentosa (NC)					4		N	= *Caladenia* aff. *filamentosa*
	Caladenia filamentosa var. tentaculata	wispy spider-orchid			R	6			
	Caladenia latifolia	pink caladenia				12			
	Caladenia minor	pigmy caladenia		R	R	1			
	Caladenia ovata	Kangaroo Island spider-orchid	3VCa	V	E				
	Caladenia prolata	shy caladenia			K	1			
	Caladenia reticulata	veined spider-orchid		U					
	Caladenia sp.	spider-orchid				6		R	
	Caladenia stricta	upright caladenia		U	K				
	Caladenia tensa	inland green-comb spider-orchid							
	Caladenia tentaculata	King spider-orchid							
	Caladenia valida	robust spider-orchid	3RC-	R	R	4			
	Calandrinia brevipedata	short-stalked purslane		U	R	1			
	Calandrinia calyptrata	pink purslane			K	2			
	Calandrinia corrigioloides	strap purslane			K	1			
	Calandrinia granulifera	pigmy purslane							
	Calandrinia sp.	purslane/parakeelya					1	R	

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			AUS	SA	KI				
	Callistemon rugulosus var. rugulosus	scarlet bottlebrush				25			
	Callitris canescens	scrubby cypress pine			Q	1			
	Callitris preissii	southern cypress pine			U	7	1		
	Callitris rhomboidea	Oyster Bay pine		U	U	8			
	Calochilus campestris	plains beard-orchid		R	E				
	Calochilus paludosus	red beard-orchid		V	E				
	Calochilus robertsonii	purplish beard-orchid			V	1			
	Calystegia sepium	large bindweed		Q					
	Calytrix glaberrima	smooth heath-myrtle				80	1		
	Calytrix smeatoniana	Kangaroo Island heath-myrtle	2RC-	R	R	6	1		
	Calytrix tetragona	common fringe-myrtle				63			
*	*Capsella bursapastoris*	shepherd's purse							
*	*Cardamine hirsuta*	hairy bitter-cress							
	Cardamine paucijuga	annual bitter-cress		V	V	1			
*	*Cardaria draba*	hoary cress							
*	*Carduus tenuiflorus*	slender thistle				9	1		
	Carex appressa	tall sedge			R	3			
	Carex breviculmis	short-stem sedge			K	2			
	Carex fascicularis	tassel sedge		U	R	1			
	Carex gaudichaudiana	fen sedge		U	K				
	Carex inversa var. inversa	knob sedge		R	K				
	Carex inversa var. major	knob sedge		R	K				
	Carex sp.	sedge				1		R	
*	*Carpobrotus edulis*	Hottentot fig							
	Carpobrotus rossii	native pigface				50			
*	*Carthamus glaucus*	glaucous star-thistle							
	Cassinia uncata	sticky cassinia				1			
	Cassytha glabella forma dispar	slender dodder-laurel				59	1		
	Cassytha melantha	coarse dodder-laurel				22			
	Cassytha peninsularis var. peninsularis	peninsula dodder-laurel				3			
	Cassytha pubescens	downy dodder-laurel				38			
	Cassytha sp.	dodder-laurel				7		R	
	Caustis pentandra	thick twist-rush				22			
*	*Centaurea melitensis*	Malta thistle							
*	*Centaurium erythraea*	common centaury							
*	*Centaurium maritimum*	sea centaury							

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			AUS	SA	KI				
*	*Centaurium spicatum*	spike centaury				27			
*	*Centaurium tenuiflorum*	branched centaury							
	Centella cordifolia s. str.	native centella		U	R				(excludes *C. asiatica*)
	Centipeda cunninghamii	common sneezeweed			R				
	Centipeda minima	spreading sneezeweed			R				
	Centrolepis aristata	pointed centrolepis				11			
	Centrolepis cephaloformis ssp.						1		
	Centrolepis cephaloformis ssp. cephaloformis	cushion centrolepis		R	K				
	Centrolepis cephaloformis ssp. murrayi					1			redetermined as *Trithuria submersa*
	Centrolepis fascicularis	tufted centrolepis		U	R	2			
	Centrolepis glabra	smooth centrolepis		R	R				
	Centrolepis polygyna	wiry centrolepis				10			
	Centrolepis sp.					1		R	
	Centrolepis strigosa	hairy centrolepis				24			
*	*Cerastium balearicum*	chickweed							
*	*Cerastium diffusum*	mouse-ear chickweed							
*	*Cerastium glomeratum*	common mouse-ear chickweed				35			
*	*Cerastium semidecandrum (NC)*	small mouse-ear chickweed				21		N	may refer to *C. balearicum* or *C. diffusum*
*	*Cerastium sp.*	chickweed				21		R	
*	*Cestrum parqui*	green poison-berry							
	Chamaescilla corymbosa var. corymbosa	blue squill			U	8			
*	*Chasmanthe floribunda var. floribunda*	African corn-flag							
	Cheilanthes austrotenuifolia	annual rock-fern				16			
	Cheiranthera alternifolia	hand-flower			E				
	Cheiranthera volubilis	twining hand-flower	2VCa	V	V	2	1		
	Chenopodiaceae sp.	goosefoot family							
*	*Chenopodium album*	fat hen							
	Chenopodium desertorum ssp. desertorum	frosted goosefoot							
	Chenopodium erosum	papery goosefoot		K	K				
*	*Chenopodium glaucum*	glaucous goosefoot							
*	*Chenopodium murale*	nettle-leaf goosefoot							
	Chenopodium pumilio	clammy goosefoot							
	Chenopodium sp.	goosefoot				2		R	

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			AUS	SA	KI				
*	*Chenopodium vulvaria*	stinking goosefoot							
	Choretrum glomeratum var. glomeratum	white sour-bush				60			
	Choretrum sp.					2		R	
	Choretrum spicatum	spiked sour-bush	R	R	R	4			
	Chorizandra enodis	black bristle-rush			U	5			
	Chrysocephalum apiculatum	common everlasting				1			
	Chrysocephalum baxteri	white everlasting			E				
	Chrysocephalum semipapposum	clustered everlasting			K				
*	*Cichorium intybus*	chicory							
	Cirsium sp.					1		R	unreliable identification
*	*Cirsium vulgare*	spear thistle							
	Clematis microphylla	old man's beard				27	1		
*	*Coleonema pulchellum*	diosma							
	Comesperma calymega	blue-spike milkwort				36	1		
	Comesperma polygaloides	mauve milkwort		U	E				
	Comesperma volubile	love creeper				29			
*	*Conium maculatum*	hemlock							
	Conospermum patens	slender smoke-bush				26			
*	*Convolvulus arvensis*	field bindweed							
	Convolvulus erubescens	Australian bindweed							
	Convolvulus remotus	grassy bindweed			R				
	Convolvulus sp.					1		R	
*	*Coprosma repens*	New Zealand mirror-bush							
*	*Coronopus didymus*	lesser swine's-cress							
	Correa aemula (NC)	hairy correa				3		N	= *Correa aemula* s. str.
	Correa aemula sister.	hairy correa		R	R				recorded as *Correa aemula* (NC)
	Correa backhousiana var. coriacea								
	Correa backhousiana var. orbicularis								
	Correa calycina		2VCi	V	V			N	= *Correa calycina* ssp. *halmaturorum*
	Correa calycina ssp. halmaturorum	De Mole River correa							
	Correa decumbens	spreading correa		U	U	21			
	Correa glabra	rock correa		U	K			N	not on KI
	Correa pulchella	salmon correa				14			
	Correa reflexa var. coriacea	thick-leaf correa						N	= *Correa backhousiana* var. *coriacea*
	Correa reflexa var. insularis								
	Correa reflexa var. nummulariifolia	round-leaf correa						N	misapplied to *C. reflexa* var. *insularis* (and some *C. backhousiana* var. *orbicularis*)

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	Correa reflexa var. reflexa	common correa						N	misapplied to *Correa reflexa* var. *scabridula*
	Correa reflexa var. scabridula								
	Correa sp. aff. calycina					108		N	misapplied name. Most of these records probably refer to *C. reflexa* var. *insularis* and intergrades
	Corybas despectans	coast helmet-orchid			U				
	Corybas dilatatus	common helmet-orchid							
	Corybas expansus	dune helmet-orchid		U	K				
	Corybas incurvus	slaty helmet-orchid		U					
	Corybas sp.	helmet-orchid				13		R	
	Corybas unguiculatus	small helmet-orchid		R	R				
	Cotula australis	common cotula				3			
*	*Cotula bipinnata*	ferny cotula							
*	*Cotula coronopifolia*	water buttons				11			
	Cotula vulgaris var. australasica	slender cotula			Q				
*	*Cotyledon orbiculata var. orbiculata*	cotyledon							
	Craspedia glauca	billy-buttons			T	1			
	Crassula closiana	stalked crassula				5			
	Crassula decumbens var. decumbens	spreading crassula				7			
	Crassula helmsii	swamp crassula			K				
*	*Crassula natans var. minus*	water crassula				3			
	Crassula peduncularis	purple crassula		Q	Q	1			
	Crassula sieberiana ssp. tetramera	Australian stonecrop				19			
*	*Crepis pusilla*	dandelion crepis							
*	*Crepis vesicaria ssp. haenseleri*	bladder hawksbeard							
*	*Critesion hystrix*	Mediterranean barley-grass				5			
*	*Critesion marinum*	sea barley-grass				2			
*	*Critesion murinum ssp. glaucum*	blue barley-grass				2			
*	*Critesion murinum ssp. leporinum*	wall barley-grass				3			
	Cruciferae sp.	cress family				1		R	
	Cryptandra hispidula	rough cryptandra		U	U				
	Cryptandra leucophracta	white cryptandra				6		N	= *Stenanthemum leucophractum*
	Cryptandra tomentosa	heath cryptandra			T				
	Cryptandra waterhousii	Waterhouse's cryptandra	2RC-	U	U	7			
	Cryptostylis subulata	moose orchid		V	E				
*	*Cucumis myriocarpus*	paddy melon							
	Cyanicula deformis	bluebeard orchid				3			

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			AUS	SA	KI				
	Cymbonotus preissianus	austral bear's-ear		U	K				
	Cynoglossum australe	Australian hound's-tongue			K				
*	*Cynosurus echinatus*	rough dog's-tail grass				6			
	Cyperaceae sp.	sedge family				12		R	(includes 2 records as *Scirpus* sp.)
	Cyperus involucratus								
	Cyperus sp.	flat-sedge				1		R	
	Cyperus tenellus	tiny flat-sedge			U	10			
	Cyperus vaginatus	stiff flat-sedge			K	1			
	Cyphanthera myosotidea	small-leaf ray-flower			V	2			
	Cyrtostylis reniformis					1		N	not on KI, presumed misidentification of *C. robusta*
	Cyrtostylis robusta	robust gnat-orchid				4			(incl. one record as *C. reniformis*)
*	*Dactylis glomerata*	cocksfoot				1			
	Dampiera lanceolata var. insularis	Kangaroo Island dampiera		U	U	5	1		
	Danthonia caespitosa	common wallaby-grass			K	1			
	Danthonia geniculata	kneed wallaby-grass			U	5			
	Danthonia pilosa var. pilosa	velvet wallaby-grass		Q	K				
	Danthonia racemosa var. racemosa	slender wallaby-grass			R	2			
	Danthonia setacea var. setacea	small-flower wallaby-grass				49			
	Danthonia sp.	wallaby-grass				2		R	
	Darwinia micropetala	small darwinia				25			recorded as *Darwinia micropetala* (NC)
	Darwinia micropetala (NC)	small darwinia				25		N	= *Darwinia micropetala* (excludes *D. salina*)
*	*Datura stramonium*	common thorn-apple							
	Daucus glochidiatus	native carrot				80			
	Daviesia arenaria	sand bitter-pea		U	V				
	Daviesia asperula ssp. asperula	Kangaroo Island bitter-pea				54			(incl. 6 records as *D. benthamii* ssp. *humilis*)
	Daviesia benthamii ssp. humilis					6		N	probable misidentifications; very rare & localised/extinct; taken to refer to *D. asperula*
	Daviesia brevifolia	leafless bitter-pea				38			
	Daviesia leptophylla	narrow-leaf bitter-pea			R	5	1		
	Daviesia ulicifolia	gorse bitter-pea			U	1		N	= *D. ulicifolia* ssp. *ulicifolia* on KI
	Daviesia ulicifolia ssp. ulicifolia	gorse bitter-pea			U	1			Recorded as *D. ulicifolia*
	Derwentia derwentiana ssp. anisodonta	Kangaroo Island speedwell	3KC-	R	R	3			presumed from *Parahebe derwentiana* (NC)
	Derwentia derwentiana ssp. homalodonta	Mt Lofty speedwell	3KC-	E					
*	*Desmazeria rigida*	rigid fescue				29			
	Deyeuxia minor	small bent-grass		K	K				
	Deyeuxia quadriseta	reed bent-grass			K				

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Dianella brevicaulis	short-stem flax-lily				71			
	Dianella revoluta (NC)						1	R	may refer to *D. brevicaulis* or *D. revoluta* var. *revoluta*
	Dianella revoluta var. revoluta	black-anther flax-lily				15			
	Dichelachne crinita	long-hair plume-grass			K	10			
	Dichelachne micrantha	short-hair plume-grass		Q	K				
	Dichondra repens	kidney weed				22	1		
	Digitaria ciliaris	summer grass							
*	*Digitaria sanguinalis*	crab grass							
	Dillwynia glaberrima					9		N	not on KI; presumed misidentification of *Dillwynia hispida*
	Dillwynia hispida	red parrot-pea				23			(incl 9 records as *D. glaberrima*)
	Dillwynia sericea	showy parrot-pea				50	1		
*	*Diplotaxis muralis var. muralis*	wall rocket							
*	*Diplotaxis tenuifolia*	Lincoln weed				2			
*	*Dipogon lignosus*	lavatory creeper							
	Disphyma crassifolium ssp. clavellatum	round-leaf pigface				5			
	Distichlis distichophylla	emu-grass			R				
*	*Dittrichia graveolens*	stinkweed							
	Diuris aff. corymbosa	wallflower donkey-orchid				2			
	Diuris brevifolia	short-leaf donkey-orchid	3RCa	R	R				
	Dodonaea baueri	crinkled hop-bush			K	1			
	Dodonaea hexandra	horned hop-bush			K				
	Dodonaea humilis	dwarf hop-bush				45			
	Dodonaea viscosa ssp. angustissima	narrow-leaf hop-bush				27			
	Dodonaea viscosa ssp. spatulata	sticky hop-bush				6			
	Drosera auriculata	tall sundew				51			
	Drosera binata	forked sundew		R	R	2			
	Drosera glanduligera	scarlet sundew				1			
	Drosera macrantha ssp. planchonii	climbing sundew				46			
	Drosera peltata	pale sundew			U	18	1		
	Drosera praefolia	early sundew		R	R				
	Drosera pygmaea	tiny sundew				24			
	Drosera sp.	sundew				1		R	
	Drosera whittakeri (NC)	scented sundew				26		R	excludes *D. whittakeri* var. *aberrans*, but may include *D. praefolia*
	Drosera whittakeri ssp. whittakeri					26			recorded as *Drosera whittakeri* (NC)
	Dysphania glomulifera ssp. glomulifera	globular crumbweed							
*	*Echinochloa utilis*	Japanese millet							

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			AUS	SA	KI				
	Echinopogon ovatus var. ovatus	rough-beard grass		R	R				
*	*Echium plantagineum*	Salvation Jane							new record on KI
*	*Ehrharta calycina*	perennial veldt grass				1			
*	*Ehrharta longiflora*	annual veldt grass				6			
	Einadia nutans ssp. nutans	climbing saltbush							
	Eleocharis acuta	common spike-rush			E	2			
	Eleocharis gracilis	slender spike-rush		U	T				
	Eleocharis sphacelata	tall spike-rush		R	R	1			
	Elymus scabrus var. scabrus	native wheat-grass			T				
*	*Emex australis*	three-corner jack							
	Empodisma minus	tangled rope-rush		U	R	4			
	Enchylaena tomentosa var. tomentosa	ruby saltbush				2			
	Epacris impressa	common heath				10			
	Epilobium billardierianum ssp. billardierianum	robust willow-herb			K				
	Epilobium billardierianum ssp. cinereum	variable willow-herb			E	4			
	Epilobium billardierianum ssp. x intermedium	variable willow-herb							
*	*Epilobium ciliatum*	glandular willow-herb							
*	*Eragrostis cilianensis*	stink grass							
	Eremophila behriana	rough emubush			K				
	Eremophila glabra ssp. glabra	tar bush			E				
	Eremophila weldii	purple emubush			X				
	Eriochilus cucullatus	parson's bands			U				
	Eriochlamys behrii	woolly mantle			K				
	Eriostemon angustifolius ssp. angustifolius	narrow-leaf wax-flower		R	R	5		N	= *Philotheca angustifolia* ssp. *angustifolia*
	Eriostemon pungens	prickly wax-flower			T			N	= *Philotheca pungens*
*	*Erodium botrys*	long heron's-bill				4			
*	*Erodium cicutarium*	cut-leaf heron's-bill				1			
*	*Erodium moschatum*	musky herons-bill							
	Erodium sp.	heron's-bill/crowfoot				3		R	
	Eryngium vesiculosum	prostrate blue devil		R	R				
	Eucalyptus 'anceps'	sessile-fruit white mallee			R			N	misapplied name, refers to *E. phenax* ssp. 'Kangaroo Island'
	Eucalyptus arenacea	dune stringybark				1			

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			AUS	SA	KI				
	Eucalyptus arenacea/baxteri intergrade	brown stringybark						R	
	Eucalyptus baxteri	brown stringybark				39	1		most are probably *Eucalyptus arenacea/baxteri* intergrades
	Eucalyptus camaldulensis var. camaldulensis	river red gum			R	2			
	Eucalyptus cladocalyx	sugar gum				54			
	Eucalyptus cneorifolia	Kangaroo Island narrow-leaf mallee				35			
	Eucalyptus conglobata					4		N	not on KI; misidentifiaction, presumed to be *E. phenax* ssp. 'Kangaroo Island'
	Eucalyptus cosmophylla	cup gum				72			
	Eucalyptus diversifolia	coastal white mallee				124			
	Eucalyptus fasciculosa	pink gum				29			
	Eucalyptus gracilis	yorrell			V				
	Eucalyptus lansdowneana ssp. albopurpurea	purple-flowered mallee box				20			
	Eucalyptus leptophylla	narrow-leaf red mallee			R	4			
	Eucalyptus leucoxylon (NC)	South Australian blue gum				17		R	
	Eucalyptus leucoxylon ssp. leucoxylon	South Australian blue gum			U	22			recorded as *E. leucoxylon* (NC) (17), E. l. ssp. l*eucoxylon* (NC) (2) & *E. l.*ssp. *megalocarpa* (3)
	Eucalyptus leucoxylon ssp. leucoxylon (NC)	South Australian blue gum				2		R	
	Eucalyptus leucoxylon ssp. megalocarpa	large-fruit blue gum		R		3		N	not on KI; refer to *Eucalyptus leucoxylon* ssp. *leucoxylon*
	Eucalyptus obliqua	messmate stringybark							recorded as *E.oblliqua* var. *obliqua*
	Eucalyptus obliqua var. obliqua (NC)	messmate stringybark				17		R	= *Eucalyptus obliqua*
	Eucalyptus odorata	peppermint box			K	3			
	Eucalyptus oleosa	red mallee			R	17			incl. 2 records as *E. socialis*
	Eucalyptus ovata	swamp gum			V	3			
	Eucalyptus paludicola	Mount Compass swamp gum	3VCi	V	V				
	Eucalyptus phenax ssp. 'Kangaroo Island'					4			recorded as *E. conglobata*
	Eucalyptus remota	Kangaroo Island mallee ash		U	U	16			
	Eucalyptus rugosa	coastal white mallee				47	1		
	Eucalyptus socialis						2	N	not on KI; probably refers to *E.oleosa*
	Eucalyptus viminalis ssp. cygnetensis	rough-bark manna gum			R	2			
	Euchiton ensifer (NC)					3		N	= *Euchiton gymnocephalus*
	Euchiton gymnocephalus	creeping cudweed				3			recorded as *Euchiton ensifer* (NC)
	Euchiton involucratus	star cudweed							
	Euchiton sphaericus	annual cudweed				11			

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*	*Euphorbia paralias*	sea spurge				3	1		
*	*Euphorbia peplus*	petty spurge				1			
*	*Euphorbia terracina*	false caper							
	Euphrasia collina ssp. osbornii	Osborn's eyebright	3EC-	E	E				
	Euphrasia collina ssp. tetragona	coast eyebright				8			
	Eutaxia diffusa	large-leaf eutaxia		U	E				
	Eutaxia microphylla var. microphylla	common eutaxia				47			
	Exocarpos aphyllus	leafless cherry			R	5			
	Exocarpos cupressiformis	native cherry			U	7			
*	*Ferraria crispa ssp. crispa*	black flag							
	Fimbristylis sp.					2		N	not on KI; identity unknown
*	*Foeniculum vulgare*	fennel							
	Frankenia foliosa					2			not previously recorded on KI; identity requires confirmation
	Frankenia pauciflora var. fruticulosa	southern sea-heath				8			
	Frankenia pauciflora var. gunnii	southern sea-heath							
*	*Freesia hybrid*	freesia							
*	*Fumaria capreolata ssp. capreolata*	white-flower fumitory							
*	*Fumaria muralis*	wall fumitory							
	Gahnia clarkei					1		N	redetermined as *G. sieberiana*
	Gahnia deusta	limestone saw-sedge				11			(incl. 1 record as *G. lanigera*)
	Gahnia filum	smooth cutting-grass			K				(one record redetermined as *G. sieberiana*)
	Gahnia hystrix	spiky saw-sedge	2RCa	R	R	10			
	Gahnia lanigera	black grass saw-sedge			K				(one record redetermined as *G. deusta*)
	Gahnia sieberiana	red-fruit cutting-grass		U	R	9			(incl. one record as *G. clarkei* and one as *G. filum*)
	Gahnia trifida	cutting grass			U	19	2		
	Galium australe	tangled bedstraw				1			
	Galium binifolium					1			
	Galium compactum	compact bedstraw				6			
*	*Galium divaricatum*	slender bedstraw				4			
	Galium gaudichaudii					1			
	Galium migrans	loose bedstraw				22			
*	*Galium murale*	small bedstraw				21			
	Galium sp.	bedstraw				3		R	
	Gastrodia sesamoides	potato orchid		R	K	3			
	Geijera linearifolia	sheep bush			E	1			
*	*Genista monspessulana*	Montpellier broom							

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			AUS	SA	KI				
	Genoplesium nigricans	black midge-orchid				1			
	Genoplesium nigricans/rufum	midge-orchid						R	
	Genoplesium rufum	red midge-orchid			U				
	Geraniaceae sp.	geranium family						R	
*	*Geranium molle var. molle*	soft geranium				2			
	Geranium potentilloides var. potentilloides	downy geranium				3			
	Geranium retrorsum	grassland geranium				18			
	Geranium solanderi var. solanderi	austral geranium				6			
	Geranium sp.	geranium						N	
*	*Gladiolus carneus*	broad-leaf painted lady							
*	*Gladiolus communis ssp. byzantinus*	Byzantine gladiolus							
*	*Gladiolus sp.*	gladiolus						N	
*	*Gladiolus tristis*	evening-flower gladiolus							
*	*Gladiolus undulatus*	wild gladiolus				1			
	Gleichenia microphylla	coral fern		R	R	2			
	Glischrocaryon behrii	golden pennants				47	1		
	Glossostigma diandrum	two-anther mud-mat			R				
	Glossostigma drummondii	desert mud-mat							
	Glyceria australis	Australian sweet-grass							
	Glycine clandestina var. sericea	twining glycine			T				
	Glycine latrobeana					1		N	probable mis-identifiaction; no KI collections seen at AD; identity needs confirmation
	Gnaphalium indutum	tiny cudweed				1			
	Gompholobium ecostatum	dwarf wedge-pea				38			
	Gonocarpus mezianus	broad-leaf raspwort				58			
	Gonocarpus micranthus ssp. micranthus	creeping raspwort		R	R				
	Gonocarpus tetragynus	small-leaf raspwort				2			
	Goodenia amplexans	clasping goodenia		U	U	1			
	Goodenia blackiana	native primrose				25			
	Goodenia geniculata	bent goodenia				14	2		
	Goodenia ovata	hop goodenia				10			
	Goodenia sp.	goodenia				1		R	
	Goodenia varia	sticky goodenia				57			
	Goodenia willisiana	silver goodenia							
	Goodia lotifolia var. (NC)						1	N	= *Goodia medicaginea*
	Goodia lotifolia var. lotifolia (NC)	golden-tip				7		N	= *Goodia medicaginea*

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	Goodia medicaginea	western golden-tip				7	1		recorded as *G. lotifolia* var. NC and *G. lotifolia* var. *lotifolia* (NC)
	Gramineae sp.	grass family				23		R	
	Gratiola peruviana	austral brooklime			U				
	Gratiola pubescens	glandular brooklime		R	E				
	Gratiola sp.					1		R	
	Grevillea ilicifolia var.						1	R	= *G. ilicifolia* var. *ilicifolia*
	Grevillea ilicifolia var. ilicifolia	holly-leaf grevillea				24	1		(incl. 1 record as *G. ilicifolia* var.)
	Grevillea linearifolia	prickly grevillea		U	U	13			
	Grevillea muricata	rough spider-flower	2RCa	R	R				
	Grevillea pauciflora ssp. pauciflora	few-flower grevillea		U	U	26			recorded as *G. pauciflora* ssp. *pauciflora* (NC)
	Grevillea pauciflora ssp. pauciflora (NC)	Port Lincoln grevillea				26		N	= *G. pauciflora* ssp. *pauciflora*
	Grevillea quinquenervis	five-veined grevillea		U	U	25			
	Grevillea rogersii	Rogers' spider-flower	2RC-	R	R	3			
*	*Gynandriris setifolia*	thread iris							
	Gyrostemon australasicus	buckbush wheel-fruit							
	Gyrostemon thesioides	broom wheel-fruit		U	U	1			
*	*Hainardia cylindrica*	common barb-grass				1			
	Hakea aenigma	enigma hakea	2RCa	R	R	1			
	Hakea carinata	erect hakea			X	1			
*	*Hakea laurina*	pincushion hakea							
	Hakea muelleriana	heath needlebush				59			
	Hakea rostrata	beaked hakea				104	1		
	Hakea rugosa	dwarf hakea				18			
	Hakea vittata	limestone needlebush				25			
	Halophila australis	paddle weed							
	Haloragis acutangula forma acutangula	smooth raspwort				1			
	Haloragis acutangula forma tetraptera	smooth raspwort							
	Haloragis aspera	rough raspwort			Q				
	Haloragis brownii	swamp raspwort		R	R	1			
	Haloragis eichleri	Eichler's raspwort	3RCa	R	R				
	Haloragis sp.	raspwort				6		R	
	Halosarcia halocnemoides ssp.						1	R	= *H. halocnemoides* ssp. *halocnemoides*
	Halosarcia halocnemoides ssp. halocnemoides	grey samphire			K		1		

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	Halosarcia pergranulata ssp. pergranulata	black-seed samphire			K	1			
	Halosarcia sp.	samphire					1	R	
	Halosarcia syncarpa	fused samphire		Q	K				
	Hardenbergia violacea	native lilac			R	15			
*	*Hedypnois rhagadioloides*	Cretan weed				7			
	Helichrysum adenophorum var. adenophorum	branched everlasting		U	U				
	Helichrysum leucopsideum	satin everlasting				27			
*	*Heliotropium europaeum*	common heliotrope							
	Hemarthria uncinata var. uncinata	mat grass							
	Hemichroa diandra	mallee hemichroa			X				
	Hemichroa pentandra	trailing hemichroa		U	E	5			
	Herb sp.					6		R	
	Heterozostera tasmanica	Tasman grass-wrack							
	Hibbertia "confundens" ms H.R.Toelken								probably recorded as *H. sericea* var. *major* (NC) or *H. sericea* var. *sericea*
	Hibbertia "humilis" (H.R.Toelken 9196): H.R.Toelken								possibly included in *H.riparia*
	Hibbertia "platyphylla"				Hib				probably recorded as *H. sericea* var. *major* (NC) or H. *sericea* var. *sericea*
	Hibbertia '"australioides" ms H.R.Toelken								possibly included in *H. riparia* or *H. stricta* (NC)
	Hibbertia acicularis	prickly guinea-flower		R	R	5		N	= *H. obtusibracteata*
	Hibbertia aspera (NC)					77		R	includes *H. empetrifolia* ssp. *radians* (majority) and *H. pallidiflora*
	Hibbertia australis								possibly included in *H. stricta* (NC)
	Hibbertia empetrifolia ssp. radians					3	1		four records as *Hibbertia* sp. B, plus more (unvouchered) included in *H. aspera* (NC)
	Hibbertia exutiacies	prickly guinea-flower			T	2			
	Hibbertia fasciculata ssp. "prostrata" ms H.R. Toelken					29			recorded as *H. prostrata*
	Hibbertia glandulosa					8			8 records as *H.riparia* (glabriuscula), plus (unvouchered) as *H. riparia* [s. lat.] or *H. stricta* (NC)
	Hibbertia incana								included in *H. sericea* var. *sericea*
	Hibbertia obtusibracteata					5			recorded as *H. acicularis*
	Hibbertia paeninsularis	peninsula guinea-flower	3RCa	U	U	2			
	Hibbertia pallidiflora					14			recorded as *Hibbertia* sp. C, plus possibly others also as *H. aspera* (NC)
	Hibbertia prostrata	bundled guinea-flower				29		N	= *Hibbertia fasciculata* ssp. "prostrata" ms H.R. Toelken
	Hibbertia riparia (glabriuscula)					8		N	= *H. glandulosa*

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	Hibbertia riparia (long-leaved aff. H. stricta)	bristly guinea-flower						N	= *H. riparia* s. str.
	Hibbertia riparia [s. lat.]	guinea-flower				111		R	identity ambiguous; probably refers mainly to *H. glandulosa*, but also *H. riparia*
	Hibbertia riparia [s. str.]								included in *H. riparia* [s. lat] and/or *H. stricta* (NC)
	Hibbertia sericea					2			recorded as *H. sericea* var. *scabrifolia;* most likely other (unvouchered) records
	Hibbertia sericea var. major (NC)	large guinea-flower				2		R	likely to be *H.* 'platyphylla' or *H.* "confundens"
	Hibbertia sericea var. scabrifolia	rough-leaf guinea-flower				2		N	= *H. sericea*
	Hibbertia sericea var. sericea	silky guinea-flower				64		R	probably refer in part to *H. incana*, *H.confundens*, *H. platyphylla*
	Hibbertia sp.	guinea-flower				4		R	
	Hibbertia sp. B	scrambling guinea-flower				3	1	N	= *H. empetrifolia* ssp. *radians*
	Hibbertia sp. C	round-leaf guinea-flower			U	14		N	= *H. pallidiflora*
	Hibbertia stricta (NC)				E	15		R	may include *H. australis*, *H. glandulosa* or *H. riparia*
	Hibbertia stricta var. stricta	stalked guinea-flower							= *H. australis*
	Hibbertia virgata	twiggy guinea-flower				17			
*	*Hirschfeldia incana*	hoary mustard							
	Histiopteris incisa	bat's-wing fern		E	E				
	Holcus lanatus					1			
*	*Holcus setosus*	annual fog				1			
*	*Homeria flaccida*	one-leaf Cape tulip							
	Hyalosperma demissum	dwarf sunray							
	Hybanthus floribundus ssp. floribundus	shrub violet							
	Hydrocotyle callicarpa	tiny pennywort				10			
	Hydrocotyle capillaris	thread pennywort							
	Hydrocotyle comocarpa	fringe-fruit pennywort	3RCi	R	K	4			
	Hydrocotyle crassiuscula	spreading pennywort	3KCa	R	R	1			
	Hydrocotyle diantha	Kangaroo Island pennywort		X	X				
	Hydrocotyle foveolata	yellow pennywort				4			
	Hydrocotyle hirta	hairy pennywort		U	R	1			
	Hydrocotyle laxiflora	stinking pennywort			K	1			
	Hydrocotyle muscosa	mossy pennywort			R	2			
	Hydrocotyle sp.	pennywort				7		R	
	Hydrocotyle tripartita	three-part pennywort							
*	*Hymenolobus procumbens*	oval purse							
	Hypericum gramineum	small St John's wort			R				
	Hypericum japonicum	matted St John's wort		K	K				
*	*Hypochaeris glabra*	smooth cat's ear				22			

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*	*Hypochaeris radicata*	rough cat's ear				16			
*	*Hypochaeris sp.*	cat's ear				1		R	
	Hypolaena fastigiata	tassel rope-rush				19			
	Hypolepis rugosula	ruddy ground-fern		R	R	2			
	Hypoxis glabella var. glabella	tiny star							
	Irenepharsus phasmatodes	Kangaroo Island cress	2RCa	R	R				
*	*Iris germanica*	flag iris							
	Isoetes drummondii ssp. drummondii	plain quillwort		R	R				
*	*Isolepis aff. hookeriana*	grassy club-rush							
	Isolepis australiensis					2		N	not on KI; redetermined as *I. stellata* and *I. platycarpa*
	Isolepis cernua	nodding club-rush			U				
	Isolepis fluitans	floating club-rush		U	U	9			
	Isolepis hookeriana	grassy club-rush		U	K	1			recorded as *I. platycarpa*
	Isolepis hookeriana (NC)	grassy club-rush			K	3		R	may refer to **I.* aff. Hookeriana or *I. hookeriana*
*	*Isolepis hystrix*	awned club-rush							
	Isolepis inundata	swamp club-rush			R				
	Isolepis marginata	little club-rush				15			
	Isolepis nodosa	knobby club-rush				34			
	Isolepis platycarpa	flat-fruit club-rush			U	2			(1 collection redetermined as *I. hookeriana*)
	Isolepis producta	nutty club-rush		R	R	1			
	Isolepis stellata	star club-rush		R	R	2			
	Isopogon ceratophyllus	horny cone-bush				86			
*	*Ixia polystachya*	variable ixia							
	Ixiolaena supina	coast plover-daisy				16			
	Ixodia achillaeoides ssp. achillaeoides	coast ixodia				12			
	Ixodia achillaeoides ssp. alata	hills daisy				7			
*	*Juncus articulatus*	jointed rush							
	Juncus bufonius	toad rush				5			
	Juncus caespiticius	grassy rush			R				
*	*Juncus capitatus*	dwarf rush				7			
	Juncus effusus					1		N	not on KI; redetermined as *J. pauciflorus*
	Juncus kraussii	sea rush				7			
	Juncus pallidus	pale rush				13			
	Juncus pauciflorus	loose-flower rush				7			
	Juncus planifolius	broad-leaf rush			R	5			
	Juncus procerus					2	1	N	not on KI; unvouchered (sight) record; presumed as *Juncus* sp.

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Juncus sp.	rush				4	1	R	
	Juncus subsecundus	finger rush			R				
	Kennedia prostrata	scarlet runner				14			
*	*Kickxia elatine ssp. crinita*	twining toadflax							
	Kunzea pomifera	muntries				9			
*	*Lactuca saligna*	willow-leaf lettuce							
*	*Lactuca serriola*	prickly lettuce							
	Lagenifera huegelii	coarse bottle-daisy			R				
	Lagenifera stipitata var. stipitata	spreading bottle-daisy				10			
*	*Lagurus ovatus*	hare's tail grass				46			
	Lasiopetalum "Cordate-leaved"(H.P.Vonow 810)	heart-leaf velvet-bush							recorded as *L. schulzenii*
	Lasiopetalum baueri	slender velvet-bush				6			
	Lasiopetalum behrii	pink velvet-bush			E				
	Lasiopetalum discolor	coast velvet-bush				21			
	Lasiopetalum schulzenii	drooping velvet-bush				71			includes *Lasiopetalum* "Cordate-leaved"(H.P.Vonow 810)
	Lasiopetalum x tepperi	Tepper's velvet-bush							
*	*Lavatera arborea*	tree mallow							
	Lavatera plebeia	Australian hollyhock			U				
	Lawrencia glomerata	clustered lawrencia							
	Lawrencia spicata	salt lawrencia		U	U	1			
	Lawrencia squamata	thorny lawrencia			K				
	Laxmannia orientalis	dwarf wire-lily				10			
	Leionema equestre								was *Phebalium equestre*
	Lemna trisulca	ivy-leaf duckweed							
*	*Lepidium africanum*	common peppercress							
	Lepidium desvauxii	bushy peppercress		R	R				
	Lepidium foliosum	leafy peppercress			K				
	Lepidium pseudotasmanicum	shade peppercress		K	Q				
	Lepidobolus drapetocoleus					1			not previously recorded on KI; sight record only
	Lepidosperma canescens	hoary rapier-sedge				4			
	Lepidosperma carphoides	black rapier-sedge				26			
	Lepidosperma concavum	spreading sword-sedge				11			
	Lepidosperma congestum	clustered sword-sedge				3			
	Lepidosperma gladiatum	coast sword-sedge				4			
	Lepidosperma laterale (NC)					33		R	*Lepidosperma laterale* s.str. Not on KI; refers in part to *L. concavum* & *L. congestum*

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Lepidosperma longitudinale	pithy sword-sedge			R				
	Lepidosperma semiteres	wire rapier-sedge			U	44			
	Lepidosperma sp.	sword-sedge/rapier-sedge				4		N	
	Lepidosperma viscidum	sticky sword-sedge				51			
	Lepilaena cylindrocarpa	long-fruit water-mat							
	Lepilaena marina	sea water-mat							
	Lepilaena patentifolia	spreading water-mat							
	Leporella fimbriata	fringed hare-orchid				3			
	Leptocarpus tenax	slender twine-rush			U	9			
	Leptoceras menziesii	hare orchid			R				
	Leptomeria aphylla	leafless currant-bush		U	U	29			
	Leptorhynchos squamatus	scaly buttons			R	1			
	Leptorhynchos waitzia	button immortelle			R				
	Leptospermum continentale	prickly tea-tree				51	1		
	Leptospermum lanigerum	silky tea-tree				8			
	Leptospermum myrsinoides	heath tea-tree				36	1		
	Lepyrodia valliculae	Kangaroo Island scale-rush	2RCa	R	R	3			
	Leucophyta brownii	coast cushion bush				11			
	Leucopogon clelandii	Cleland's beard-heath		R	R				
	Leucopogon concurvus	scrambling beard-heath				65			
	Leucopogon costatus	twiggy beard-heath				26			
	Leucopogon hirsutus	hairy beard-heath		R	R	2			
	Leucopogon lanceolatus	lance beard-heath		U	R	3			
	Leucopogon parviflorus	coast beard-heath				85			
	Leucopogon rufus	ruddy beard-heath		U	U	50			
	Leucopogon sp.					1		R	
	Leucopogon virgatus	common beard-heath			R				
	Leucopogon woodsii	nodding beard-heath		U	U	3			
	Levenhookia dubia	hairy stylewort			R				
	Levenhookia pusilla	tiny stylewort							
	Lichen sp.					26		N	non-vascular plants; not consistently recorded
	Lilaeopsis polyantha	Australian lilaeopsis		Q	R				
	Liliaceae sp.	lily family				2		R	
*	*Limonium binervosum*	dwarf sea-lavender							
*	*Limonium companyonis*	sea-lavender							
*	*Limonium lobatum*	winged sea-lavender							

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Limosella australis	Australian mudwort			U				
	Lindsaea linearis	screw fern		U	R	2			
*	*Linum strictum ssp. strictum*	upright yellow flax							
*	*Linum trigynum*	French flax							
	Lissanthe strigosa	peach heath				14			
	Lobelia alata	angled lobelia				2			
	Lobelia gibbosa	tall lobelia				13			
	Lobelia pratioides					1		N	not on KI; redetermined as *Comesperma volubile*
	Lobelia rhombifolia	tufted lobelia		U	U				
	Logania crassifolia	coast logania				8			
	Logania insularis	Kangaroo Island logania	2VCa	V	V	2			
	Logania linifolia	flax-leaf logania			K	2			
	Logania ovata	oval-leaf logania				52			
	Logania recurva	recurved logania		U				N	not on KI; previous records refer to *L. scabrella*
	Logania scabrella	rough logania	R	R	R				
	Logania sp.					2		R	
*	*Lolium loliaceum*	stiff ryegrass				16			
*	*Lolium rigidum*	Wimmera ryegrass				11			
*	*Lolium sp.*	ryegrass				1		R	
*	*Lolium temulentum var. temulentum*	beared ryegrass							
*	*Lolium x hubbardii*								
	Lomandra collina	sand mat-rush			K	1			
	Lomandra juncea	desert mat-rush			R				
	Lomandra micrantha ssp. micrantha	small-flower mat-rush			K				
	Lomandra micrantha ssp. tuberculata	small-flower mat-rush			T	1			
	Lomandra sororia	sword mat-rush		U	K				
	Lotus australis	austral trefoil				7			
	Lotus cruentus					1			record needs confirmation; not previously recorded on KI; no collection seen at AD
	Loxocarya fasciculata	bundled cord-rush		V	E				
	Luzula densiflora	dense wood-rush		U	R	2			recorded as *L. flaccida*
	Luzula flaccida					2		N	not on KI; previous records redetermined as *L. densiflora*
	Luzula meridionalis	common wood-rush			R				
*	*Lycium ferocissimum*	African boxthorn				4			
	Lycopodiella lateralis	slender clubmoss		R	R	1			
	Lysiana exocarpi ssp. exocarpi	harlequin mistletoe							
	Lythrum hyssopifolia	lesser loosestrife				2			

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Maireana enchylaenoides	wingless fissure-plant			K				
	Maireana oppositifolia	salt bluebush				6			
*	*Malva nicaeensis*	mallow of Nice							
*	*Malva parviflora*	small-flower marshmallow							
*	*Marrubium vulgare*	horehound					1		
	Marsilea costulifera	narrow-leaf nardoo			Q				
	Marsilea hirsuta	short-fruit nardoo			T				
*	*Matthiola incana*	common stock							
	Medicago minima var. minima					3			records need confirmation; not previously recorded on KI
*	*Medicago polymorpha var. polymorpha*	burr-medic				1			
*	*Medicago sp.*	medic							
*	*Medicago truncatula*	barrel medic				2			
	Melaleuca acuminata	mallee honey-myrtle				6	1		
	Melaleuca brevifolia	short-leaf honey-myrtle				24			
	Melaleuca cuticularis	western swamp-paperbark		V	V				
	Melaleuca decussata	totem-poles							
	Melaleuca gibbosa	slender honey-myrtle				155			
	Melaleuca halmaturorum ssp. halmaturorum	swamp paper-bark				4			
	Melaleuca lanceolata ssp. lanceolata	dryland tea-tree				98			
	Melaleuca squamea	swamp honey-myrtle		R	R	6			
	Melaleuca uncinata	broombush				53			
	Melaleuca wilsonii	Wilson's honey-myrtle		R	X				
*	*Melilotus indica*	King Island melilot				18			
*	*Mentha pulegium*	pennyroyal							
	Mentha satureioides	native pennyroyal		R					
*	*Mesembryanthemum crystallinum*	common iceplant							
	Micrantheum demissum	dwarf micrantheum				63	1		
	Microcybe pauciflora	yellow microcybe			U	11			
	Microlaena stipoides var. stipoides	weeping rice-grass			R	2			
	Microlepidium pilosulum	hairy shepherd's-purse	3KCa	R	R				
	Microseris lanceolata	yam daisy				7			
	Microtis arenaria	notched onion-orchid				31			recorded as *M. frutetorum*
	Microtis atrata	yellow onion-orchid		R	R				
	Microtis frutetorum					31		N	not on KI; refers to *M. arenaria*
	Microtis orbicularis	swamp onion-orchid		R	R	5			

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Microtis parviflora	slender onion-orchid		U					
	Microtis rara	sweet onion-orchid		R	R				
	Millotia muelleri	common bow-flower			R				
	Millotia myosotidifolia	broad-leaf millotia			R	1			
	Millotia sp.	millotia/bow-flower							
	Millotia tenuifolia var. tenuifolia	soft millotia				2			
	Mimulus repens	creeping monkey-flower			R	1			
*	*Minuartia mediterranea*	slender sandwort				1			
*	*Misopates orontium*	lesser snapdragon							
	Mitrasacme paradoxa (NC)	wiry mitrewort				41		N	KI records refer to *Phyllangium divergens*
*	*Monopsis debilis var. depressa*								
	Montia australasica	white purslane		R	K	3			
*	*Moraea vegeta*								
	Moss sp.					71		N	non-vascular plants; not consistently recorded
	Muehlenbeckia adpressa	climbing lignum				23			
	Muehlenbeckia gunnii	coastal climbing lignum				4			
	Myoporum brevipes	warty boobialla			R	1			
	Myoporum insulare	common boobialla				37			
	Myoporum parvifolium	creeping boobialla		R	R				
	Myoporum viscosum	sticky boobialla		U		3	1		
	Myosotis australis	austral forget-me-not			U	5			
	Myriocephalus rhizocephalus var. rhizocephalus	woolly-heads		U	T				
	Myriophyllum amphibium	broad milfoil		R	K				
	Myriophyllum integrifolium	tiny milfoil		R	R	2			
	Myriophyllum muelleri	hooded milfoil		Q	U	4			
	Myriophyllum pedunculatum	mat milfoil		Q	Q				
	Myriophyllum salsugineum	lake milfoil		Q	K				
	Myriophyllum simulans	amphibious milfoil		Q	R	4			
	Myriophyllum sp.	milfoil				1		R	
	Myriophyllum variifolium	varied milfoil		K	K				
*	*Myrsiphyllum asparagoides*	bridal creeper				18			
*	*Myrsiphyllum declinatum*								
*	*Narcissus tazetta*	polyanthus narcissus							
	Neurachne alopecuroidea	fox-tail mulga-grass			Q				
*	*Nicotiana glauca*	tree tobacco							

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Nicotiana maritima	coast tobacco							
	Nitraria billardierei	nitre-bush							
*	*Nothoscordum gracile*								
	Nymphoides geminata	entire marshwort		V	V				
*	*Oenothera stricta ssp. stricta*	common evening primrose							
	Olax obcordata			R	V				
*	*Olea europaea ssp. europaea*	olive				1			
	Olearia axillaris	coast daisy-bush				29			
	Olearia ciliata var. ciliata	fringed daisy-bush				6			
	Olearia ciliata var. squamifolia	Kangaroo Island fringed daisy-bush		U	U	15			
	Olearia microdisca	small-flower daisy-bush	2ECa	E	E				
	Olearia ramulosa	twiggy daisy-bush				32	1		
	Olearia rudis	azure daisy-bush		U	U	5	1		
	Olearia teretifolia	cypress daisy-bush		U	U	13			
	Opercularia ovata	broad-leaf stinkweed		U	R				
	Opercularia scabrida	stalked stinkweed				2			
	Opercularia turpis	twiggy stinkweed				5			
	Opercularia varia	variable stinkweed				10	1		
	Ophioglossum lusitanicum	austral adder's-tongue			K				
	Orchidaceae sp.	orchid family				2		R	
*	*Ornithogalum arabicum*	star of Africa							
	Orthoceras strictum	horned orchid		U	R	2			
	Orthrosanthus multiflorus	morning flag				101			
	Osteospermum sp.					1			
	Ottelia ovalifolia	swamp lily		R	K	2			
	Oxalis corniculata ssp. corniculata					1		N	not on KI; unvouchered (sight) record; presumed as *O. perrenans*
	Oxalis perennans	native sorrel				47			(incl. one record as *O. corniculata* ssp. *corniculata*)
*	*Oxalis pes-caprae*	soursob				1			
*	*Oxalis purpurea*	one-o'clock							
	Ozothamnus retusus	notched bush-everlasting		Q	R	1			
*	*Papaver aculeatum*	bristle poppy				6			
*	*Papaver rhoeas*	field poppy							
	Paracaleana "aff. nigrita": D.L.Jones	black-beak duck-orchid		E	E				
	Parahebe derwentiana (NC)	Derwent speedwell				3		N	refers to *Derwentia derwentiana* ssp. *anisodonta*
*	*Parapholis incurva*	curly ryegrass				6			
*	*Parentucellia latifolia*	red bartsia				2			

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
*	*Parentucellia viscosa*	yellow bartsia							
	Parietaria cardiostegia	mallee smooth-nettle							
	Parietaria debilis	smooth-nettle				22			
	Paspalidium jubiflorum	Warrego summer-grass							
*	*Paspalum dilatatum*	paspalum							
	Patersonia fragilis	short purple-flag		U	U	7			
	Patersonia occidentalis	long purple-flag		U	K				
	Pelargonium australe	australian pelargonium				8			
	Pelargonium littorale	native pelargonium				32			
*	*Pennisetum clandestinum*	kikuyu							
*	*Pennisetum villosum*	feather-top							
	Persicaria prostrata	creeping knotweed		U	R				
	Petrophile multisecta	Kangaroo Island conesticks				108	1		
*	*Petrorhagia nanteuilii*								
*	*Petrorhagia velutina*	velvet pink				5			
*	*Petroselinum crispum*	parsley							
*	*Phacelia tanacetifolia*	tansy phacelia							
*	*Phalaris aquatica*	phalaris							
*	*Phalaris minor*	lesser canary-grass							
*	*Phalaris paradoxa*	paradox canary-grass							
*	*Phalaris sp.*	canary grass							
	Phebalium equestre	Kangaroo Island phebalium	2ECa	E	E			N	= *Leionema equestre*
	Philotheca angustifolia ssp. angustifolia					5			recorded as *Eriostemon angustifolius* ssp. a*ngustifolius*
	Philotheca pungens								(was *Eriostemon pungens*)
	Phragmites australis	common reed							observed on KI, but no collections seen at AD
	Phyllangium distylis	tiny mitrewort		R	R	3			
	Phyllangium divergens	wiry mitrewort				41			recorded as *Mitrasacme paradoxa*
	Phyllanthus australis	southern spurge				22			# new name?
	Phyllanthus saxosus	rock spurge		U	K				
	Phyllanthus sp.						1	R	
	Phylloglossum drummondii	pigmy clubmoss		R	V	1			
	Phyllota pleurandroides	heathy phyllota				36			
	Phyllota remota	slender phyllota		U		1			
	Picris angustifolia ssp. angustifolia	coast picris		Q	X				
	Pilularia novae-hollandiae	austral pillwort		R	K				
	Pimelea flava ssp. dichotoma	diosma riceflower				11			

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Pimelea flava ssp. flava	yellow riceflower				9			
	Pimelea glauca	smooth riceflower				35	1		
	Pimelea macrostegia	Kangaroo Island riceflower		U	U	19	1		
	Pimelea micrantha	silky riceflower			T	1			
	Pimelea octophylla	woolly riceflower				18	1		recorded as *P. octophylla* ssp. (NC)
	Pimelea octophylla ssp. (NC)						1	N	= *P. octophylla*
	Pimelea phylicoides	heath riceflower				15	1		
	Pimelea serpyllifolia ssp. serpyllifolia	thyme riceflower				27			
	Pimelea sp.	riceflower				1		R	
	Pimelea stricta	erect riceflower				25			
	Pittosporum phylliraeoides var. microcarpa	native apricot			V				
*	*Plantago coronopus ssp. coronopus*	bucks-horn plantain							
	Plantago hispida	hairy plantain				2			
*	*Plantago lanceolata var. lanceolata*	ribwort				2			
	Plantago sp. B	little plantain							
	Platylobium obtusangulum	holly flat-pea				43			
	Platysace heterophylla var. heterophylla	slender platysace				1			
	Platysace heterophylla var. tepperi	Kangaroo Island platysace	2RCa	R	R	1			
	Pleurosorus rutifolius	blanket fern							
*	*Poa annua*	winter grass							
*	*Poa bulbosa*	bulbous meadow-grass							
	Poa crassicaudex	thick-stem tussock-grass			R	12			
	Poa fax	scaly poa		R	R	2			
	Poa halmaturina	Kangaroo Island poa	3RC-			20			
	Poa poiformis	coast tussock-grass				3			
*	*Poa pratensis*	Kentucky blue-grass							
	Poa sp.	meadow-grass/tussock-grass				6		R	
	Poa tenera	slender tussock-grass		Q	Q	1			
	Podolepis canescens					1			
	Podolepis jaceoides	showy copper-wire daisy		R	R	1			
	Podolepis rugata var. littoralis	coast copper-wire daisy		U	U	8			
	Podolepis rugata var. rugata	pleated copper-wire daisy							
	Podotheca angustifolia	sticky long-heads				24			
	Pogonolepis muelleriana	stiff cup-flower							
*	*Polycarpon tetraphyllum*	four-leaf allseed				2			

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
*	*Polygonum aviculare*	wireweed							
*	*Polypogon maritimus*	coast beard-grass				4			
*	*Polypogon monspeliensis*	annual beard-grass				3			
	Pomaderris halmaturina ssp. halmaturina	Kangaroo Island pomaderris	3VC-	V	E	3			
	Pomaderris myrtilloides							N	doubtful occurrence on KI
	Pomaderris obcordata	wedge-leaf pomaderris				30			
	Pomaderris oraria (NC)					20		N	refers to P. paniculosa ssp.(either subspecies)
	Pomaderris paniculosa ssp.					20		R	recorded as *Pomaderris oraria* (NC)
	Pomaderris paniculosa ssp. paniculosa	mallee pomaderris							(included in *P. paniculosa* ssp.)
	Pomaderris paniculosa ssp. paralia	coast pomaderris				5			
	Pomaderris sp.					1		R	
	Poranthera ericoides	heath poranthera				6			
	Poranthera microphylla	small poranthera				60			
	Poranthera triandra	three-petal poranthera			Q				
	Portulaca oleracea	common purslane							
	Posidonia angustifolia	narrow-leaf tape-weed							
	Posidonia australis	southern tapeweed							
	Posidonia coriacea	leathery tapeweed							
	Posidonia sinuosa	narrow-leaf tape-weed							
	Potamogeton ochreatus	blunt pondweed		R	R				
*	*Potamogeton pectinatus*	fennel pondweed							
	Potamogeton tepperi	Tepper's pondweed			K				
	Potamogeton tricarinatus	floating pondweed				4			
	Prasophyllum aff. truncatum								
	Prasophyllum australe	austral leek-orchid		R	R				
	Prasophyllum calcicola	limestone leek-orchid	R	V	T				
	Prasophyllum elatum	tall leek-orchid			U	4			
	Prasophyllum occidentale	plains leek-orchid							
	Prasophyllum occultans	hidden leek-orchid	R	R	K				
	Prasophyllum odoratum	scented leek-orchid			K				
	Pratia platycalyx	salt pratia		U	E				
	Prostanthera aspalathoides	scarlet mintbush			R	8			
	Prostanthera behriana	downy mintbush		U	E				
	Prostanthera chlorantha	green mintbush	R	R	V	2			(including one record as *P. serpyllifolia* ssp. *serpyllifolia*)

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Prostanthera serpyllifolia ssp. microphylla	small-leaf mintbush			R	9			
	Prostanthera serpyllifolia ssp. serpyllifolia					1		N	Not on KI; probably refers to *P. chlorantha*
	Prostanthera spinosa	spiny mintbush				60			
	Pseudanthus micranthus	fringed pseudanthus	2RCa	R	R				
	Pseudognaphalium luteoalbum	Jersey cudweed				4			
	Pteridium esculentum	bracken fern				18			
	Pterostylis aff. nana "mallee"	mallee dwarf greenhood							
	Pterostylis alata	tall shell-orchid		U	U	2	1		
	Pterostylis erythroconcha	red shell-orchid			U				
	Pterostylis furcata	forked greenhood		E	E	1			
	Pterostylis longifolia	tall greenhood				6	1		
	Pterostylis nana	dwarf greenhood				7	1		
	Pterostylis nutans	nodding greenhood			R				
	Pterostylis pedunculata	maroon-hood				4			
	Pterostylis plumosa	bearded greenhood			U	6			
	Pterostylis sanguinea	blood greenhood				4			includes 2 records as *P. vitatta* (NC)
	Pterostylis vittata (NC)					2		N	= *Pterostylis sanguinea*
	Ptilotus beckerianus	ironstone mulla mulla	3VCa	V	V				
	Ptilotus exaltatus var. exaltatus	pink mulla mulla							
	Ptilotus spathulatus forma spathulatus	pussy-tails							
	Puccinellia stricta var. stricta	Australian saltmarsh-grass				3			
	Pultenaea acerosa	bristly bush-pea				43			
	Pultenaea canaliculata var. canaliculata	soft bush-pea				10			
	Pultenaea canaliculata var. latifolia	soft bush-pea							
	Pultenaea daphnoides	large-leaf bush pea			U	19			
	Pultenaea densifolia	dense bush-pea		U	U	1			
	Pultenaea dentata	clustered bush-pea		R	T				
	Pultenaea graveolens	scented bush-pea		U	X				
	Pultenaea insularis	Beyeria bush-pea	E	E	E				
	Pultenaea largiflorens	twiggy bush-pea			K	2			
	Pultenaea laxiflora	loose-flower bush-pea			R				
	Pultenaea rigida var.						1	R	= var. *rigida* on KI
	Pultenaea rigida var. rigida	rigid bush-pea				15			includes 1 record as '*P. rigida* var.'

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			AUS	SA	KI				
	Pultenaea scabra	rough bush-pea		R	R				
	Pultenaea tenuifolia	narrow-leaf bush-pea				4	1		
	Pultenaea teretifolia var. brachyphylla	short-leaf bush-pea	2RC-	R	R				
	Pultenaea trifida	Kangaroo Island bush-pea	2RCa	U	U	7			
	Pultenaea trinervis	three-nerve bush-pea	N		R	2			
	Pultenaea vestita	feather bush-pea		U	U	12			
	Pultenaea villifera var. glabrescens	splendid bush-pea	2VCi	V	V	2			
	Pultenaea viscidula	dark bush-pea				34			
	Pyrorchis nigricans	black fire-orchid				9			
	Ranunculus amphitrichus	small river buttercup		U	R				
	Ranunculus inundataus					2			not previously recorded on KI; recorded as *R. papulentus*; uncertain identification
	Ranunculus papulentus					2		N	vouchered record redetermined as *R. ?inundatus*
	Ranunculus pentandrus var. platycarpus					1			
	Ranunculus pumilio var. pumilio	ferny buttercup			K				
	Ranunculus sessiliflorus var. pilulifer					8			
	Ranunculus sessiliflorus var. sessiliflorus	annual buttercup				1			
	Ranunculus sp.	buttercup				2		R	
*	*Raphanus raphanistrum*	wild radish							
	Restio complanatus	flat cord-rush		V	V				
	Rhagodia candolleana ssp. candolleana	seaberry saltbush				35			
	Rhagodia crassifolia	fleshy saltbush				1			
	Rhagodia preissii ssp. preissii	mallee saltbush							
	Rhamnaceae sp.					3		R	recorded as *Spyridium tricolor*
*	*Rhamnus alaternus*					1			
	Rhytidosporum procumbens	white rhytidosporum		R	R	1			
*	*Ricinus communis*	castor oil plant							
*	*Romulea minutiflora*	small-flower onion-grass							
*	*Romulea rosea var. australis*	common onion-grass				1			
*	*Rosa rubiginosa*	sweet briar							
*	*Rostraria cristata*	annual cat's-tail				21			includes 20 records as *Rostraria* sp.
	Rostraria sp.					20		R	only *R. cristata* on KI
	Rubus parvifolius	native raspberry		U	X				
	Rumex brownii	slender dock							
*	*Rumex crispus*	curled dock							
*	*Rumex pulcher ssp. pulcher*	fiddle dock							

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	Rumex sp.	dock				2		R	
	Ruppia megacarpa	widgeon grass							
	Ruppia polycarpa	widgeon grass							
	Ruppia sp.	water-tassel				2		R	
	Ruppia tuberosa	widgeon grass							
	Rutidosis multiflora	small wrinklewort				1			
*	*Sagina apetala*	annual pearlwort							
*	*Sagina maritima*	sea pearlwort				1			
	Salsola kali	buckbush							
*	*Salvia verbenaca form A*	wild sage							
	Samolus repens	creeping brookweed			Q	27			
	Sarcocornia blackiana	thick-head samphire				3			
	Sarcocornia quinqueflora	beaded samphire				9			
*	*Scabiosa atropurpurea*	pincushion							
	Scaevola aemula	fairy fanflower				11	1		
	Scaevola albida	pale fan-flower			R				
	Scaevola angustata	coast fanflower				2	1		
	Scaevola crassifolia	cushion fanflower				7			
	Scaevola linearis ssp. confertifolia	bundled fanflower		U	U	12			
*	*Schismus barbatus*	Arabian grass							
	Schizaea bifida	forked comb-fern		V	E				
	Schizaea fistulosa	narrow comb-fern		V	V				
	Schoenoplectus validus	river club-rush			R				
	Schoenus apogon	common bog-rush				6	1		
	Schoenus breviculmis	matted bog-rush				27			
	Schoenus carsei	wiry bog-rush		U	K				
	Schoenus deformis	small bog-rush			K	1			
	Schoenus discifer	tiny bog-rush	3RCa	R	R				
	Schoenus fluitans	floating bog-rush		U	R				
	Schoenus laevigatus			R	E				
	Schoenus lepidosperma ssp. lepidosperma	slender bog-rush		R	E				
	Schoenus maschalinus	leafy bog-rush		U	R				
	Schoenus nanus					1			
	Schoenus nitens	shiny bog-rush			R	1			
	Schoenus sculptus	gimlet bog-rush		R	R				

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	Schoenus sp.	bog-rush				1		R	
	Schoenus tesquorum	grassy bog-rush		R	K				
*	*Scilla hyacinthoides*	hyancinth bluebell							
	Scirpus sp. (NC)					2			= *Cyperaceae* sp.
	Scleranthus pungens	prickly knawel			R				
	Sclerolaena uniflora	small-spine bindyi							
	Sclerostegia arbuscula	shrubby samphire				7			
	Sclerostegia tenuis	slender samphire							
	Scutellaria humilis	dwarf skullcap		R	R				
	Sebaea ovata	yellow sebaea				23			
	Selaginella gracillima	tiny selaginella		U	V	1			
	Selliera radicans	shiny swamp-mat			R	3			
	Senecio biserratus					1		N	not on KI; specimen redetermined as *S. minimus*
	Senecio glomeratus	swamp groundsel			K				
	Senecio glossanthus	annual groundsel			K	2			
	Senecio hispidulus (NC)					2			= *S. hispidulus* var. *hispidulus*
	Senecio hispidulus var. hispidulus	rough groundsel		U	K				recorded as *S. hispidulus* (NC)
	Senecio lautus	variable groundsel				36			
	Senecio magnificus	showy groundsel			E				
	Senecio minimus var. minimus	fine-tooth groundsel		U	K	1			recorded as *S. biserratus*
	Senecio odoratus var. longifolius	narrow-leaf scented groundsel		R	R	3			
	Senecio odoratus var. odoratus	scented groundsel				36			
	Senecio picridioides	purple-leaf groundsel				8			
*	*Senecio pterophorus var. pterophorus*	African daisy							
	Senecio quadridentatus	cotton groundsel			R	1			
	Senecio sp.	groundsel				3		R	
*	*Senecio vulgaris*	common groundsel							
*	*Setaria verticillata*	whorled pigeon-grass							
*	*Sherardia arvensis*	field madder				1			
	Sigesbeckia orientalis ssp. orientalis	oriental sigesbeckia		Q					
*	*Silene gallica var. gallica*	French catchfly							
*	*Silene nocturna*	Mediterranean catchfly				12			
*	*Silene vulgaris*	bladder campion							
*	*Sinapis arvensis*	charlock							
*	*Sisymbrium orientale*	Indian hedge mustard				1			
	Solanum capsiciforme	capsicum kangaroo-apple			K				

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	Solanum laciniatum	cut-leaf kangaroo-apple							
*	*Solanum linnaeanum*	apple of Sodom							
*	*Solanum nigrum*	black nightshade							
	Solanum opacum	green-berry nightshade		Q	Q				
*	*Solanum pseudocapsicum*	Jerusalem cherry							
	Solanum simile	Kangaroo apple					1		
	Solenogyne dominii	smooth solenogyne		U	X				
*	*Sonchus asper ssp. asper*	rough sow-thistle							
*	*Sonchus asper ssp. glaucescens*	rough sow-thistle				4			
	Sonchus hydrophilus	native sow-thistle				1			
	Sonchus megalocarpus	coast sow-thisle				9			
*	*Sonchus oleraceus*	common sow-thistle				34			
	Sonchus sp.	sow-thistle				3		R	
*	*Sorghum halepense*	Johnson grass							
*	*Sparaxis bulbifera*	sparaxis				1			recorded as *Sparaxis* sp.
	Sparaxis sp.					1		R	presumed to be *S. bulbifera*
*	*Spergularia marina*	salt sand-spurrey				2			
*	*Spergularia media*	coast sand-spurrey				1			
*	*Spergularia rubra*	red sand-spurrey							
	Sphaerolobium minus	leafless globe-pea		R	T				
	Spinifex sericeus	rolling spinifex				5	1		
	Spiranthes sinensis ssp. australis	austral lady's tresses		R	E				
*	*Sporobolus indicus var. capensis*	rat-tail grass							
	Sporobolus virginicus	salt couch				10			recorded as *S. virginicus* (NC)
	Sporobolus virginicus (NC)	salt couch				10		N	= *S. virginicus*
	Sprengelia incarnata	pink swamp-heath		R	R	4			
	Spyridium bifidum var. integrifolium		K	K	K	4			recorded as *S. bifidum* var. *integrifolium* (NC)
	Spyridium bifidum var. integrifolium (NC)					4			= *S. bifidum* var. *integrifolium*
	Spyridium eriocephalum (NC)					1		R	may be either variety
	Spyridium eriocephalum var. eriocephalum	heath spyridium			K				
	Spyridium eriocephalum var. glabrisepalum	MacGillivray spyridium	2VC-	V	V				
	Spyridium halmaturinum var. halmaturinum	Kangaroo Island spyridium				10	1		

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	Spyridium halmaturinum var. integrifolium	Flinders Chase spyridium		U	U	22			
	Spyridium halmaturinum var. scabridum	rough spyridium	2KC-	R	R	1			
	Spyridium nitidum	shining spyridium		U	U	5			
	Spyridium parvifolium	dusty miller							
	Spyridium phylicoides	narrow-leaf spyridium				20	1		
	Spyridium spathulatum	spoon-leaf spyridium	3RCa	R	R	12			
	Spyridium thymifolium	thyme-leaf spyridium				12			
	Spyridium tricolor					3			not on KI; transferred to Rhamnaceae sp. ; (possibly = *Stenanthemum leucophractum)*
	Spyridium vexilliferum var. latifolium	winged spyridium				10			
	Spyridium vexilliferum var. vexilliferum					2			
*	*Stachys arvensis*	stagger weed							
	Stackhousia aspericocca (NC)					1		N	= *Stackhousia aspericocca* ssp.
	Stackhousia aspericocca ssp.	bushy candles				3		R	may refer to either subspecies (includes one record as *S. apericocca* (NC)
	Stackhousia aspericocca ssp. "Cylindrical inflorescence"(W.R.Barker 1418)	bushy candles				9			
	Stackhousia aspericocca ssp. "One-sided inflorescence"(W.R.Barker 697)	one-sided candles				33			
	Stackhousia monogyna	creamy candles			E				
	Stackhousia sp.						1	R	
	Stackhousia spathulata	coast candles			U	1	1		
	Stellaria caespitosa	starwort		V	K				
*	*Stellaria media*	chickweed				2			
	Stellaria multiflora	rayless starwort		R	R				
*	*Stellaria palustris var. palustris*	swamp starwort				2			
*	*Stenotaphrum secundatum*	buffalo grass							
	Stipa curticoma	short-crest spear-grass		Q	T			N	= *Austrostipa curticoma*
	Stipa densiflora	foxtail spear-grass		R	K	2		N	= *Austrostipa densiflora*
	Stipa elegantissima	feather spear-grass			T			N	= *Austrostipa elegantissima*
	Stipa exilis	heath spear-grass				27		N	= *Austrostipa exilis*
	Stipa flavescens	coast spear-grass				32		N	= *Austrostipa flavescens*
	Stipa hemipogon	half-beard spear-grass				32		N	= *Austrostipa hemipogon*
	Stipa macalpinei	annual spear-grass		U	U			N	= *Austrostipa macalpinei*
	Stipa mollis	soft spear-grass				6		N	= *Austrostipa mollis*
	Stipa muelleri	tangled spear-grass		R	X			N	= *Austrostipa muelleri*

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	Stipa multispiculis		3RC-	R	T	2		N	= *Austrostipa multispiculis*
	Stipa nitida	Balcarra spear-grass			T			N	= *Austrostipa nitida*
	Stipa nodosa	tall spear-grass			T			N	= *Austrostipa nodosa*
	Stipa scabra ssp. falcata	slender spear-grass						N	= *Austrostipa scabra* ssp. *falcata*
	Stipa semibarbata	fibrous spear-grass				1		N	= *Austrostipa semibarbata*
	Stipa sp.	spear-grass				19	1	R	= *Austrostipa* sp.
	Stipa stipoides	coast spear-grass				14		N	= *Austrostipa stipoides*
	Stipa tenuifolia			R				N	= *Austrostipa tenuifolia*
	Stuartina muelleri	spoon cudweed				1			
	Stylidium beaugleholei	Beauglehole's trigger-plant		R	R				
	Stylidium calcaratum	spurred trigger-plant			U	6			recorded as *S. calacaratum* (NC)
	Stylidium calcaratum (NC)					6		N	= *S. calcaratum* on KI
	Stylidium despectum	small trigger-plant				3			
	Stylidium graminifolium	grass trigger-plant			U	6			
	Stylidium inundatum	hundreds and thousands			U	5			
	Stylidium perpusillum	tiny trigger-plant		U	R	1	1		
	Stylidium tepperianum	Kangaroo Island trigger-plant	2RCa	R	R	5			
	Styphelia exarrhena	desert heath				7			
	Suaeda australis	austral seablite				7			
*	*Sutherlandia frutescens*	bladder senna							
	Swainsona lessertiifolia	coast swainson-pea				29			
*	*Taraxacum officinale*	dandelion							
	Templetonia retusa	cockies tongue				13			
	Tetragonia implexicoma	bower spinach				16			
	Tetraria capillaris	hair sedge				3			recorded as *Tricostuaria pauciflora*
	Tetratheca halmaturina	leafless Kangaroo Island tetratheca				52			
	Tetratheca insularis	Kangaroo Island tetratheca				20			
	Thelymitra antennifera	lemon sun-orchid				3			
	Thelymitra aristata	great sun-orchid							
	Thelymitra benthamiana	leopard sun-orchid		U	U	9			
	Thelymitra canaliculata	azure sun-orchid		U	R	4			
	Thelymitra flexuosa	twisted sun-orchid		R	R	5			
	Thelymitra grandiflora	great sun-orchid		U	E				
	Thelymitra longifolia (NC)					6		N	presumed to be *T. nuda* (but may include some *T. pauciflora*)
	Thelymitra luteocilium	yellow-tuft sun orchid				2			
	Thelymitra matthewsii	spiral sun-orchid	3VCi	E	E				

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	Thelymitra mucida	plum sun-orchid		R	R				
	Thelymitra nuda	scented sun-orchid				6			recorded as *T. longifolia* (NC)
	Thelymitra pauciflora	slender sun-orchid				1			
	Thelymitra rubra	salmon sun-orchid							
	Thelymitra sp.	sun-orchid				5		R	
	Thelymitra x macmillanii	crimson sun-orchid							
	Thomasia petalocalyx	paper-flower				29	1		
	Threlkeldia diffusa	coast bonefruit				14			
	Thryptomene ericaea	heath thryptomene				19	1		
	Thysanotus baueri	mallee fringe-lily			K	1			probable new record for KI (identification requires confirmation)
	Thysanotus fractiflexus	zig-zag fringe-lily		U		11			
	Thysanotus juncifolius	rush fringe-lily				20	1		
	Thysanotus nudicaulis					1		N	not on KI; transferred to *Thysanotus* sp.
	Thysanotus patersonii	twining fringe-lily				38			
	Thysanotus sp.	fringe-lily				3			includes 1 record as *T. nudicaulis*
	Todea barbara	king fern		E	E			N	not on KI; original record based on photo of *Hypolepis rugosula*
*	*Torilis nodosa*	knotted hedge-parsley							
	Trachymene pilosa	dwarf trachymene				16			
*	*Tribulus terrestris*	caltrop							
	Tricoryne elatior	yellow rush-lily							
	Tricoryne elatior (NC)	yellow rush-lily				5		R	may refer to *T. elatior* or *T. tenella*
	Tricoryne sp.	yellow rush-lily				5		R	recorded as *T. elatior* (NC)
	Tricoryne tenella	tufted yellow rush-lily			R				
	Tricostularia pauciflora					3		N	not on KI; 3 specimens redetermined as *Tetraria capillaris*
*	*Trifolium angustifolium*	narrow-leaf clover				1			
	Trifolium arvense var. arvense					3			
*	*Trifolium campestre*	hop clover				26			
*	*Trifolium cernuum*	drooping-flower clover							
*	*Trifolium dubium*	suckling clover				3			
*	*Trifolium glomeratum*	cluster clover				10			
*	*Trifolium sp.*	clover				7		R	
*	*Trifolium stellatum*	star clover				4			
*	*Trifolium subterraneum*	subterranean clover				4			
*	*Trifolium tomentosum*	woolly clover				1			
	Triglochin alcockiae	Alcock's water-ribbons		R	K				
	Triglochin centrocarpum	dwarf arrowgrass							

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	Triglochin mucronatum	prickly arrowgrass		Q					
	Triglochin procerum	water-ribbons							
	Triglochin procerum var. procerum (NC)	water-ribbons				10		R	may refer to *T. procerum* or *T. alcockiae*
	Triglochin sp.	arrowgrass/water-ribbons						R	recorded as *T. procerum* var. *procerum* (NC)
	Triglochin striatum	streaked arrowgrass			U	2			
	Trigonella suavissima					1		N	probable mis-identification (transferred to Unidentified sp.)
	Trithuria submersa	trithuria				1			recorded as *Centrolepis cephaliformis* ssp. *murrayi*. Herbarium specimen redetermined.
*	*Tritonia lineata*	lined tritonia							
*	*Tropaeolum majus*	nasturtium							
	Trymalium wayae	grey trymalium		U	R	5			
	Typha domingensis	narrow-leaf bulrush				1			
	Typha orientalis	broad-leaf bulrush							
*	*Ulex europaeus*	gorse							
	Unidentified sp.					1		R	one record as *Trigonella suavissima*
*	*Urospermum picroides*	false hawkbit							
	Urtica incisa	scrub nettle		U	R	1			
*	*Urtica urens*	small nettle							
	Utricularia dichotoma	purple bladderwort		U	R	3			recorded as *U. dichotoma* (NC)
	Utricularia dichotoma (NC)	purple bladderwort				3		N	= *U. dichotoma* on KI
	Utricularia lateriflora	small bladderwort		V	V				
	Utricularia tenella	pink bladderwort		U	R	6	1		
*	*Valerianella discoidea*	lesser corn-salad							
	Vallisneria spiralis	river eel-grass		U	K				
*	*Vellereophyton dealbatum*	white cudweed				4			
*	*Verbascum creticum*	Cretan mullein							
	Veronica arvensis					1			
	Veronica calycina	hairy speedwell		U	K	1			
	Veronica hillebrandii	rigid speedwell				51			
*	*Vicia cracca*	tufted vetch							
*	*Vicia sativa ssp. nigra*	narrow-leaf vetch							
*	*Vicia sativa ssp. sativa*	common vetch							
	Villarsia reniformis	running marsh-flower			R	9			
	Villarsia sp.	marsh-flower				2		R	
	Villarsia umbricola var. umbricola	lax marsh-flower		U	R				
	Viminaria juncea	native broom		R	R				

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*	*Vinca major*	blue periwinkle							
	Viola hederacea	ivy-leaf violet			K	2			
	Viola sieberiana	tiny violet				37	1		
	Vittadinia australasica var. australasica	sticky New Holland daisy				10			
	Vittadinia cuneata var. cuneata forma cuneata	fuzzy New Holland daisy							
	Vittadinia gracilis	woolly New Holland daisy							
	Vittadinia sp.					4		R	
*	*Vulpia bromoides*	squirrel-tail fescue				19			
*	*Vulpia fasciculata*	sand fescue							
*	*Vulpia myuros forma megalura*	fox-tail fescue				5			
*	*Vulpia myuros forma myuros*	rat's-tail fescue				48			
*	*Vulpia sp.*	fescue				4		R	
	Wahlenbergia gracilenta	annual bluebell				47			
	Wahlenbergia multicaulis	Tadgell's bluebell			K	1			
	Wahlenbergia stricta ssp. stricta	tall bluebell							
*	*Watsonia meriana cv. Bulbillifera*	bulbil watsonia							
	Westringia dampieri	shore westringia				2			
	Westringia eremicola	slender westringia			R	3	1		
	Wilsonia backhousei	narrow-leaf wilsonia			V				
	Wilsonia humilis var. humilis	silky wilsonia				1			
	Wilsonia rotundifolia	round-leaf wilsonia			R				
	Wurmbea centralis (NC)	inland Nancy				1		N	redetermined as *W. latifolia* ssp. *vanessae*
	Wurmbea decumbens	trailing Nancy	R	R	K				
	Wurmbea dioica ssp. dioica	early Nancy			Q				
	Wurmbea dioica ssp. dioica (NC)	early Nancy			R	2		R	may refer to *W. dioica, W. decumbens* or *W. latifolia* ssp. *vanessae;* transferred to *Wurmbea* sp.
	Wurmbea latifolia (NC)	broad-leaf Nancy							
	Wurmbea latifolia ssp. vanessae		R	R	R	2			one recorded as *W. centralis* (NC) and the other as '*Wurmbea dioica* ? ssp. *dioica*'
	Wurmbea sp.					2		R	recorded as *W. dioica* ssp. *dioica* (NC)
	Xanthorrhoea semiplana ssp. tateana	Tate's grass-tree				134	1		
	Xanthosia dissecta var. floribunda	cut-leaf xanthosia				8			
	Xanthosia pusilla	hairy xanthosia				8			
	Xanthosia tasmanica	southern xanthosia		R	V	2			
	Xyris operculata	tall yellow-eye		R	R	1			
*	*Zaluzianskya divaricata*	spreading night-phlox							
*	*Zantedeschia aethiopica*	white arum lily							observed on KI, but no collections seen at AD

I	Scientific name	Common name	Cons. Status			SU	OP	Va	Comment
			AUS	SA	KI				
	Zieria veronicea	pink zieria		R	R	1			
	Zostera capricorni	eel-grass							
	Zostera mucronata	garweed	3K	K	K				
	Zostera muelleri estuarine variety	dwarf grass-wrack							
	Zostera muelleri var. muelleri	dwarf grasswrack							
	Zoysia matrella	Manila grass		R	R				
	Zygophyllum billardierei	coast twinleaf							
	Zygophyllum billardierei (NC)	coast twinleaf				5		R	may refer to *Z. billardierei* or *Z. flavum*; transferred to *Zygophyllum* sp.
	Zygophyllum flavum	coast twinleaf		Q	Q				
	Zygophyllum sp.					5		R	recorded as *Z. billardierei* (NC)

Appendix VII

MAMMAL SPECIES RECORDED FROM KANGAROO ISLAND.

Mammal taxonomy follows Kemper and Queale (1990). Species records are shown from the collections of the South Australian Museum as at July 1998 and do not include specimens collected during the present survey. Separate columns list species recorded on quadrats and opportunistically during this survey.

Introduced species are indicated with an asterisk.

Single or interesting records are indicated in the ‘other’ column.

SPECIES		SOURCE			
SCIENTIFIC NAME	COMMON NAME	SA MUSEUM	THIS SURVEY		OTHER
			Quad	Opp	
BALAENIDAE					
Eubalaena australis	Southern Right Whale				X
BALAENOPTERIDAE					
Balaenoptera acutorostrata	Minke Whale	X			
Balaenoptera musculus	Blue Whale	X			Sighting
Megaptera novaeangliaee	Humpback Whale				Stranding, but no specimen at SAM.
BOVIDAE					
**Capra hircus*	Goat	X	X		
BURRAMYIDAE					
Cercartetus concinnus	Western Pygmy-possum	X	X	X	
Cercartetus lepidus	Little Pygmy-possum	X	X		
DASYURIDAE					
Dasyurus spp.	Quoll				X Fossil and Wood Jones (1925)
Phascogale tapoatafa	Brush-tailed Phascogale				X 1800's sighting
Sminthopsis aitkeni	Kangaroo Island Dunnart	X	X		
DELPHINIDAE					
Delphinus delphis	Common Dolphin	X			
Globicephala melas	Long-finned Pilot Whale	X			
Globicephala macrorhynchus	Short-finned Pilot Whale	X			
Grampus griseus	Risso's Dolphin				X Stranding, no specimen
Lagenorhynchus obscurus	Dusky Dolphin				Sighting only
Orcinus orca	Killer Whale	X			
Tursiops truncatus	Bottlenose Dolphin	X			
FELIDAE					
**Felis catus*	Cat	X	X	X	
MACROPODIDAE					
Macropus eugenii	Tammar Wallaby	X	X	X	
Macropus fuliginosus fuliginosus	Kangaroo Island Kangaroo	X	X	X	
MOLOSSIDAE					
Mormopterus planiceps	Southern Freetail-bat	X			
Tadarida australis	White-striped Freetail-bat	X			
MURIDAE					
**Mus domesticus*	House Mouse	X	X		
Rattus fuscipes	Bush Rat	X	X		
Rattus lutreolus	Swamp Rat	X	X		
**Rattus rattus*	Black Rat	X			
NEOBALAENIDAE					
Caperea marginata	Pygmy Right Whale	X			
ORNITHORHYNCHIDAE					
**Ornithorhynchus anatinus*	Platypus	X		X	
OTARIIDAE					
Arctocephalus forsteri	New Zealand Fur-seal	X			
Arctocephalus pusillus doriferus	Australian Fur-seal	X			
Arctocephalus tropicalis	Subantarctic Fur-seal	X			
Neophoca cinerea	Australian Sea-lion	X			

SPECIES		SOURCE			
SCIENTIFIC NAME	COMMON NAME	SA MUSEUM	THIS SURVEY		OTHER
			Quad	Opp	
PERAMELIDAE					
Isoodon obesulus	Short-nosed Bandicoot	X	X		
PETAURIDAE					
**Pseudocheirus peregrinus*	Common Ringtail Possum	X	X		
PHALANGERIDAE					
Trichosurus vulpecula	Common Brushtail Possum	X	X	X	
PHASCOLARCTIDAE					
**Phascolarctos cinereus*	Koala	X	X	X	
PHOCIDAE					
Hydrurga leptonyx	Leopard Seal				X Inns et al. (1979)
Leptonychotes weddellii	Weddell Seal				X Inns et al. (1979)
Mirounga leonina	Southern Elephant Seal				X Inns et al. (1979)
PHYSETERIDAE					
Physeter macrocephalus	Sperm Whale	X			
POTOROIDAE					
**Bettongia lesueur*	Burrowing Bettong				X (see Table 4)
PTEROPODIDAE					
Pteropus scapulatus	Little Red Flying-fox	X			
SUIDAE					
*Sus scrofa	Pig	X	X	X	
TACHYGLOSSIDAE					
Tachyglossus aculeatus	Short-beaked Echidna	X	X	X	
VESPERTILIONIDAE					
Chalinolobus gouldii	Gould's Wattled Bat	X			
Chalinolobus morio	Chocolate Wattled Bat	X			
Vespadelus darlingtoni	Large Forest Eptesicus	X		X	
Vespadelus regulus	King River Bat	X	X	X	
Nyctophilus geoffroyi	Lesser Long-eared Bat	X	X	X	
ZIPHIIDAE					
Berardius arnuxii	Arnoux's Beaked Whale				X
Mesoplodon bowdoini	Andrew's Beaked Whale	X			
Mesoplodon grayi	Gray's Beaked Whale	X			
Mesoplodon layardii	Strap-toothed Whale	X			

Appendix VIII

BIRD SPECIES RECORDED FOR KANGAROO ISLAND AND ITS ADJACENT SEAS.

Taxonomy and sequence follows Christidis and Boles (1994). Common names follow Royal Australasian Ornithological Union (1995). Current status follows Baxter (1995) and refer to footnotes.

Current Status:
X=extinct as a breeding species or visitor on KI
V=vagrant to KI
?V=records on KI require confirmation
N=regular non-breeding visitor to KI
B=resident on KI (breeding implicit)
?B=breeding status uncertain on KI
I=deliberate introduction to KI

This Survey:
S=site record
O=opportunistic record only
B=evidence of breeding
-=not recorded

* denotes species foreign to Australia

SPECIES		**STATUS on KANGAROO ISLAND**	
COMMON NAME	SCIENTIFIC NAME	CURRENT	THIS SURVEY
Emu	*Dromaius novaehollandiae*	I?B	O
Kangaroo Island Emu	*Dromaius baudinianus*	X	-
Australian Brush-turkey	*Alectura lathami*	IB	SB
Malleefowl	*Leipoa ocellata*	IX	-
Stubble Quail	*Coturnix novaezelandiae*	B	S
Brown Quail	*Coturnix australis*	?B	-
*Common Pheasant	*Phasianus colchicus*	I?B_1	-
*Indian Peafowl	*Pavo cristatus*	IB	S
*Wild Turkey	*Melegris gallopavo*	IB_1	OB
*Helmeted Guineafowl	*Numida melegris*	I?B_1	-
Blue-billed Duck	*Oxyura australis*	B	S
Musk Duck	*Biziura lobata*	B	S
Freckled Duck	*Stictonetta naevosa*	N	-
Black Swan	*Cygnus atratus*	B	SB
Cape Barren Goose	*Cereopsis novaehollandiae*	N and IB	SB
Magpie Goose	*Anseranas semipalmata*	IX	-
*Domestic Goose	*Anser sp.*	IB_1	-
Australian Shelduck	*Tadorna tadornoides*	B	S
Australian Wood Duck	*Chenonetta jubata*	B	S
Pacific Black Duck	*Anas superciliosa*	B	S
Australasian Shoveler	*Anas rhynchotis*	B	S

SPECIES		STATUS on KANGAROO ISLAND	
COMMON NAME	SCIENTIFIC NAME	CURRENT	THIS SURVEY
Grey Teal	*Anas gracilis*	B	S
Chestnut Teal	*Anas castanea*	B	OB
Garganey	*Anas querquedula*	?V	-
Pink-eared Duck	*Malacorhynchus membranaceus*	B	-
Hardhead	*Aythya australasica*	N	-
Australasian Grebe	*Tachybaptus novaehollandiae*	B	S
Hoary-headed Grebe	*Poliocephalus poliocephalus*	B	S
Great Crested Grebe	*Podiceps cristatus*	V	-
Fiordland Penguin	*Eudyptes pachyrhynchus*	V	-
Little Penguin	*Eudyptula minor*	B	SB
South Georgian Diving-petrel	*Pelecanoides georgicus*	V_2	-
Common Diving-petrel	*Pelecanoides urinatrix*	V	-
Southern Giant Petrel	*Macronectes giganteus*	N	-
Northern Giant Petrel	*Macronectes halli*	V	-
Southern Fulmar	*Fulmarus glacialoides*	V	-
Cape Petrel	*Daption capense*	N	-
Kerguelen Petrel	*Lugensa brevirostris*	V	-
Great-winged Petrel	*Pterodroma macroptera*	V	-
White-headed Petrel	*Pterodroma lessonii*	V	-
Blue Petrel	*Halobaena caerulea*	V	-
Broad-billed Prion	*Pachyptila vittata*	V	-
Salvin’s Prion	*Pachyptila salvini*	V	-
Antarctic Prion	*Pachyptila desolata*	V	-
Slender-billed Prion	*Pachyptila belcheri*	V	-
Fairy Prion	*Pachyptila turtur*	N	-
White-chinned Petrel	*Procellaria aequinoctialis*	V	-
Grey Petrel	*Procellaria cinerea*	V	-
Fleshy-footed Shearwater	*Puffinus carneipes*	N	-
Short-tailed Shearwater	*Puffinus tenuirostris*	B	SB
Fluttering Shearwater	*Puffinus gavia*	N	-
Hutton’s Shearwater	*Puffinus huttoni*	V	-
Wandering Albatross	*Diomedea exulans*	V	-
Royal Albatross	*Diomedea epomophora*	V	-
Black-browed Albatross	*Diomedea melanophrys*	N	O
Shy Albatross	*Diomedea cauta*	N	-
Grey-headed Albatross	*Diomedea chrysostoma*	V	-
Yellow-nosed Albatross	*Diomedea chlororhynchos*	N	O
Sooty Albatross	*Phoebetria fusca*	V	-
Light-mantled Sooty Albatross	*Phoebetria palpebrata*	V	-
Wilson's Storm-petrel	*Oceanites oceanicus*	V	-
White-faced Storm-petrel	*Pelagodroma marina*	B	-
Red-tailed Tropicbird	*Phaethon rubricauda*	V	-
Australasian Gannet	*Sula serrator*	N	O
Darter	*Anhinga melanogaster*	V	-
Little Pied Cormorant	*Phalacrocorax melanoleucos*	B	S
Black-faced Cormorant	*Phalacrocorax fuscescens*	B	O

SPECIES		STATUS on KANGAROO ISLAND	
COMMON NAME	SCIENTIFIC NAME	CURRENT	THIS SURVEY
Pied Cormorant	*Phalacrocorax varius*	B	S
Little Black Cormorant	*Phalacrocorax sulcirostris*	B	O
Great Cormorant	*Phalacrocorax carbo*	N	O
Australian Pelican	*Pelecanus conspicillatus*	B	O
White-faced Heron	*Ardea novaehollandiae*	B	S
Little Egret	*Ardea garzetta*	N	-
Eastern Reef Egret	*Botaurus poiciloptilis*	B	O
White-necked Heron	*Ardea pacifica*	V	-
Great Egret	*Ardea alba*	N	-
Cattle Egret	*Bulbulcus ibis*	N	-
Nankeen Night Heron	*Nycticorax caledonicus*	?B	-
Australasian Bittern	*Botaurus poiciloptilis*	V	-
Glossy Ibis	*Plegadis falcinellus*	N	-
Australian White Ibis	*Threskiornis aethiopicus*	B	S
Straw-necked Ibis	*Threskiornis spinicollis*	N	O
Royal Spoonbill	*Platalea regia*	V	-
Yellow-billed Spoonbill	*Platalea flavipes*	B	-
Osprey	*Pandion haliaetus*	B	SB
Black-shouldered Kite	*Elanus notatus*	B	O
Letter-winged Kite	*Elanus scriptus*	V	-
Square-tailed Kite	*Lophoictinia isura*	V	-
Black Kite	*Milvus migrans*	V	-
Whistling Kite	*Haliastur sphenurus*	V	-
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	B	S
Spotted Harrier	*Circus approximans*	V	O
Swamp Harrier	*Circus aeruginosus*	B	S
Brown Goshawk	*Accipiter fasciatus*	B	S
Collared Sparrowhawk	*Accipiter cirrhocephalus*	B	S
Wedge-tailed Eagle	*Aquila audax*	B	S
Little Eagle	*Hieraaetus morphnoides*	V	-
Brown Falcon	*Falco berigora*	B	S
Australian Hobby	*Falco longipennis*	?B	O
Black Falcon	*Falco subniger*	V	-
Peregrine Falcon	*Falco peregrinus*	B	S
Nankeen Kestrel	*Falco cenchroides*	B	S
Brolga	*Grus rubicundus*	V	-
Buff-banded Rail	*Rallus phillippensis*	B	-
Lewin's Rail	*Rallus pectoralis*	B	S
Baillon's Crake	*Porzana pusilla*	B	OB
Australian Spotted Crake	*Porzana fluminea*	B	O
Spotless Crake	*Porzana tabuensis*	B	-
Purple Swamphen	*Porphyrio porphyrio*	B	-
Dusky Moorhen	*Gallinula tenebrosa*	B	-
Black-tailed Native-hen	*Gallinula ventralis*	B	O
Eurasian Coot	*Fulica atra*	B	S
Painted Button-quail	*Turnix varia*	B	S
Little Button-quail	*Turnix velox*	?V	-

SPECIES		STATUS on KANGAROO ISLAND	
COMMON NAME	SCIENTIFIC NAME	CURRENT	THIS SURVEY
Latham's Snipe	*Gallinago hardwickii*	N	S
Black-tailed Godwit	*Limosa limosa*	V	-
Bar-tailed Godwit	*Limosa lapponica*	N	-
Whimbrel	*Numenius phaeopus*	V	-
Eastern Curlew	*Numenius madagascariensis*	N	-
Marsh Sandpiper	*Tringa stagnatilis*	N	-
Common Greenshank	*Tringa nebularia*	N	-
Wood Sandpiper	*Tringa glareola*	V	-
Terek Sandpiper	*Tringa terek*	V	-
Common Sandpiper	*Tringa hypoleucos*	N	-
Grey-tailed Tattler	*Heteroscelus brevipes*	N	-
Ruddy Turnstone	*Arenaria interpres*	N	O
Red Knot	*Calidris canutus*	V	-
Sanderling	*Calidris alba*	V	-
Red-necked Stint	*Calidris ruficollis*	N	-
Long-toed Stint	*Calidris subminuta*	V	-
Pectoral Sandpiper	*Calidris melanotus*	V	-
Sharp-tailed Sandpiper	*Calidris acuminata*	N	O
Curlew Sandpiper	*Calidris ferruginea*	N	-
Painted Snipe	*Rostratula benghalensis*	V	-
Bush Stone-curlew	*Burhinus magnirostris*	B	SB
Pied Oystercatcher	*Haematopus longirostris*	B	S
Sooty Oystercatcher	*Haematopus fuliginosus*	B	O
Black-winged Stilt	*Himantopus himantopus*	B	OB
Banded Stilt	*Cladorhynchus leucocephalus*	N	O
Red-necked Avocet	*Recurvirostra novaehollandiae*	B	-
Pacific Golden Plover	*Pluvialis fulva*	N	-
Grey Plover	*Pluvialis squatarola*	N	-
Red-capped Plover	*Charadrius ruficapillus*	B	S
Double-banded Plover	*Charadrius bicinctus*	N	-
Lesser Sand-plover	*Charadrius mongolus*	V	-
Greater Sand-plover	*Charadrius leschenaultii*	V	-
Black-fronted Dotterel	*Charadrius melanops*	B	O
Hooded Plover	*Charadrius rubricollis*	B	S
Red-kneed Dotterel	*Erythrogenys cinctus*	?B	O
Banded Lapwing	*Vanellus tricolor*	B	SB
Masked Lapwing	*Vanellus miles*	B	SB
Great Skua	*Catharacta skua*	N	-
Pomarine Jaeger	*Stercorarius pomarinus*	N	-
Arctic Jaeger	*Stercorarius parasiticus*	N	-
Pacific Gull	*Larus pacificus*	B	O
Kelp Gull	*Larus dominicanus*	V	-
Silver Gull	*Larus novaehollandiae*	B	S
Gull-billed Tern	*Sterna nilotica*	V	-
Caspian Tern	*Hydroprogne caspia*	B	S
Crested Tern	*Sterna bergii*	B	O
White-fronted Tern	*Sterna striata*	N	-

SPECIES		STATUS on KANGAROO ISLAND	
COMMON NAME	SCIENTIFIC NAME	CURRENT	THIS SURVEY
Common Tern	*Sterna hirundo*	V	-
Antarctic Tern	*Sterna vittata*	V_3	-
Fairy Tern	*Sterna nereis*	B	-
Sooty Tern	*Sterna fuscata*	V	-
Whiskered Tern	*Chlidonias hybridus*	N	-
*Rock Dove (Feral Pigeon)	*Columba livia*	B	-
*Spotted Turtledove	*Streptopelia chinensis*	B	S
Common Bronzewing	*Phaps chalcoptera*	B	S
Brush Bronzewing	*Phaps elegans*	B	S
Crested Pigeon	*Ocyphaps lophotes*	IX	-
Spinifex Pigeon	*Geophaps plumifera*	IX	-
Diamond Dove	*Geopelia cuneata*	IX	-
Peaceful Dove	*Geopelia placida*	IX	-
Bar-shouldered Dove	*Geopelia humeralis*	IX	-
Wonga Pigeon	*Leucosarcia melanoleuca*	IX	-
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	B	S
Yellow-tailed Black-Cockatoo	*Calyporhynchus funereus*	B	S
Gang-gang Cockatoo	*Callocephalon fimbriatum*	IB	-
Galah	*Cacatua roseicapilla*	B	SB
Little Corella	*Cacatua sanguinea*	B	SB
Sulphur-crested Cockatoo	*Cacatua galerita*	B	-
Rainbow Lorikeet	*Trichoglossus haematodus*	B	S
Musk Lorikeet	*Glossopsitta concinna*	V_4	-
Purple-crowned Lorikeet	*Glossopsitta porphyrocephala*	B	S
Crimson Rosella	*Platycercus elegans*	B	S
Northern Rosella	*Platycercus venustus*	IX	-
Budgerigar	*Melopsittacus undulatus*	V	-
Elegant Parrot	*Neophema elegans*	?B	S
Rock Parrot	*Neophema petrophila*	N	S
Pallid Cuckoo	*Cuculus pallidus*	V	-
Fan-tailed Cuckoo	*Cuculus pyrrhophanus*	B	S
Horsfield's Bronze-Cuckoo	*Chrysococcyx basalis*	B	S
Shining Bronze-Cuckoo	*Chrysococcyx lucidus*	B	S
Southern Boobook	*Ninox novaeseelandiae*	B	S
Barn Owl	*Tyto alba*	?B	O
Tawny Frogmouth	*Podargus strigoides*	?B	-
Spotted Nightjar	*Caprimulgus guttatus*	?B	-
Australian Owlet-nightjar	*Aegotheles cristatus*	B	S
White-throated Needletail	*Hirundupas caudacutus*	N	-
Fork-tailed Swift	*Apus pacificus*	N	-
Laughing Kookaburra	*Dacelo novaeguineae*	IB	S
Sacred Kingfisher	*Halcyon sancta*	B	-
Rainbow Bee-eater	*Merops ornatus*	B	-
Dollarbird	*Eurystomus orientalis*	V	-
Superb Fairy-wren	*Malurus cyaneus*	B	S
Southern Emu-wren	*Stipiturus malachurus*	B	S
Spotted Pardalote	*Pardalotus punctatus*	B	-

SPECIES		STATUS on KANGAROO ISLAND	
COMMON NAME	SCIENTIFIC NAME	CURRENT	THIS SURVEY
Yellow-rumped Pardalote	*Pardalotus p. xanthopygus*	B	S
Striated Pardalote	*Pardalotus striatus*	B	SB
White-browed Scrubwren	*Sericornis frontalis*	B	SB
Shy Heathwren	*Hylacola cauta*	B	S
Brown Thornbill	*Acanthiza pusilla*	B	S
Yellow Thornbill	*Acanthiza nana*	?B	-
Striated Thornbill	*Acanthiza lineata*	B	S
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	?V	-
Red Wattlebird	*Anthochaera carunculata*	B	S
Little Wattlebird	*Anthochaera chrysoptera*	B	S
Spiny-cheeked Honeyeater	*Acanthogenys rufogularis*	V	-
Regent Honeyeater	*Xanthomyza phrygia*	V	-
Singing Honeyeater	*Lichenostomus virescens*	?V	-
White-eared Honeyeater	*Lichenostomus leucotis*	B	SB
Purple-gaped Honeyeater	*Lichenostomus cratitia*	B	S
White-plumed Honeyeater	*Lichenostomus penicillatus*	V	-
Brown-headed Honeyeater	*Melithreptus brevirostris*	B	S
White-naped Honeyeater	*Melithreptus lunatus*	?B	S
Crescent Honeyeater	*Phylidonyris pyrrhoptera*	B	S
New Holland Honeyeater	*Phylidonyris novaehollandiae*	B	S
White-fronted Honeyeater	*Phylidonyris albifrons*	V	-
Tawny-crowned Honeyeater	*Phylidonyris melanops*	B	S
Eastern Spinebill	*Acanthorhynchus tenuirostris*	B	S
Crimson Chat	*Ephthianura tricolor*	V	-
White-fronted Chat	*Ephthianura albifrons*	B	SB
Scarlet Robin	*Petroica multicolor*	B	S
Flame Robin	*Petroica phoenicia*	V	-
Western Whipbird	*Psophodes nigrogularis*	B	S
Crested Bellbird	*Oreioca guttata*	?V	-
Golden Whistler	*Pachycephala pectoralis*	B	S
Rufous Whistler	*Pachycephala rufiventris*	?V	-
Grey Shrike-thrush	*Colluricincla harmonica*	B	S
Satin Flycatcher	*Myiagra cyanoleuca*	V	-
Restless Flycatcher	*Myiagra inquieta*	B	S
Magpie-lark	*Grallina cyanoleuca*	B	S
Grey Fantail	*Rhipidura fuliginosa*	B	S
Willie Wagtail	*Rhipidura leucophrys*	B	S
Spangled Drongo	*Dicrurus bracteatus*	V	-
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	B	SB
Olive-backed Oriole	*Oriolus sagittatus*	V_5	-
Masked Woodswallow	*Artamus personatus*	V	-
White-browed Woodswallow	*Artamus superciliosus*	V	-
Black-faced Woodswallow	*Artamus cinereus*	V	-
Dusky Woodswallow	*Artamus cyanopterus*	B	SB
Australian Magpie	*Gymnorhina tibicen*	B	S
Grey Currawong	*Strepera versicolor*	B	S
Australian Raven	*Corvus coronoides*	B	S

SPECIES		STATUS on KANGAROO ISLAND	
COMMON NAME	SCIENTIFIC NAME	CURRENT	THIS SURVEY
Little Raven	*Corvus mellori*	B	S
Singing Bushlark	*Mirafra javanica*	?B	-
*Skylark	*Alauda arvensis*	B	S
Richard's Pipit	*Anthus novaeseelandiae*	B	S
*House Sparrow	*Passer domesticus*	B	S
Zebra Finch	*Poephila guttata*	IX	-
Red-browed Finch	*Neochmia temporalis*	B	SB
Beautiful Firetail	*Stagonopleura bella*	B	SB
*European Goldfinch	*Carduelis carduelis*	B	S
Welcome Swallow	*Hirundo neoxena*	B	SB
Tree Martin	*Cecropis nigricans*	B	SB
Fairy Martin	*Cecropis ariel*	B	-
Clamorous Reed-warbler	*Acrocephalus stentoreus*	B	S
Little Grassbird	*Megalurus gramineus*	B	S
Brown Songlark	*Cinclorhamphus cruralis*	V	-
Silvereye	*Zosterops lateralis*	B	S
Bassian (White's) Thrush	*Zoothera lunulata*	B	O
*Common Blackbird	*Turdus merula*	B	S
*Common Starling	*Sturnus vulgaris*	B	SB

1 listed by Lashmar (1993) as possible free-ranging feral populations

2 specimen in South Australian Museum (beach-washed at Elaenor River mouth, Vivonne Bay, on 8/1/1985, collected by P. Coulls. Originally identified as Common Diving-petrel, reidentified 1996)

3 specimen in South Australian Museum (dead bird at South Casuarina Islets, collected by A.C. Robinson on 23/11/1982)

4 flock of about 25 birds at American River in May 1996 reported by Pedler (1994)

5 one bird observed by L. Pedler in early 1999 (pers. comm.)

Appendix IX

BIRDS DESCRIBED AS SPECIES OR SUBSPECIES ENDEMIC TO KANGAROO ISLAND AND THEIR CURRENT TAXONOMIC STATUS (after Parker & Horton 1990 unless otherwise stated)

(+) indicates currently recognised endemic taxa.

TAXON DESCRIBED AS ENDEMIC TO KANGAROO ISLAND	CURRENT NAME
+*Dromaius baudinianus* Parker, 1984	
+*Calyptorhynchus lathami halmaturinus* Mathews, 1912 (see Schodde *et al*. 1993)	
Platycercus elegans melanoptera North, 1906	*P. e. elegans*
+[1]*Ninox novaeseelandiae halmaturina* Mathews, 1912	
+*Acanthiza lineata whitei* Mathews, 1912	
+*Acanthiza pusilla zietzi* North, 1904	
Hylacola cauta halmaturina Mathews, 1912	*H. cauta*
Sericornis frontalis ashbyi Mathews, 1912	*S. maculatus osculans*
+*Psophodes nigrogularis lashmari* Schodde & Mason, 1991	
Pachycephala pectoralis halmaturina Campbell, 1906	*P. p. fuliginosa*
Petroica multicolor halmaturina (Campbell, 1906)	*P. multicolor boodang*
Rhipidura fuliginosa tasmanicus (?)	*P. fuliginosa alisteri*
Malurus cyaneus ashbyi Mathews, 1912	*M. c. cyanochlamys*
Stipiturus malachurus halmaturinus Parsons, 1920	*S. malachurus*
Anthochaera carunculata clelandi (Mathews, 1923)	*A. c. carunculata*
Anthochaera chysoptera halmaturina (Mathews, 1912)	*A.c.chrysoptera*
Gliciphila melanops braba Mathews, 1912	*G.melanops*
Meliphaga cratitia halmaturina (Mathews 1912)	*M.cratitia*
[2]*Meliphaga leucotis thomasi* (Mathews, 1912)	*M. leucotis novaenorciae*
Melithreptus brevirostris magnirostris North, 1905	*M. b. leucogenys*
Phylidonyris novaehollandiae halmaturina (Campbell, 1906)	*P. n. novaehollandiae*
Phylidonyris pyrrhoptera halmaturina (Campbell, 1906)	*P. pyrrhoptera*
Emblema bellum samueli (Mathews, 1912)	*E. bellum*
+*Strepera versicolor halmaturina* Mathews, 1912	
Corvus mellori halmaturinus Mathews, 1912	*C. mellori*

[1] One specimen record from Fleurieu Peninsula (Parker & Horton 1990).

[2] The subspecific status of *M. leucotis* in South Australia needs to be reviewed. Parker & Horton (1990) have listed *M. l. novaenorciae* for all but the south-east of the State.

Appendix X

AMPHIBIANS AND REPTILES RECORDED FROM KANGAROO ISLAND

Reptile taxonomy follows Edwards and Tyler (1990) with the exception of the recognition of *Bassiana duperreyi* following Rawlinson (1991) and of *Austrelaps labialis* and *Notechis ater* following Hutchinson et al 1990. Specimen records from the South Australian Museum are up to July 1990 but exclude specimens collected on the present survey. Species formerly recorded from Kangaroo Island excluded from this list include:

Tympanocryptis lineata, recorded by Waite (1927) but no museum specimen is available.

Pseudechis porphyriacus, recorded by Houston and Tyler (1979) but shown by Schwaner (1984) to refer to a particular colour form of the tiger snake *Notechis ater*.

Delma sp. recorded by Waite (1927) but no museum specimen is available.

Sphenomorphus quoyi, recorded by Waite (1927) but no museum specimen is available.

Tiliqua scincoides, said by Houston and Tyler (1979) to have been introduced to Rocky River, Flinders Chase National Park "at some later time" **-** after the 1926 introduction of 50 *Tiliqua rugosa*.

Lampropholis delicata, Now considered to be *L. guichenoti*

Introduced species are marked with an asterisk.

SCIENTIFIC NAME	COMMON NAME			THIS SURVEY	
		Houston & Tyler	SAM	Quad	Opp
AGAMIDAE					
Ctenophorus decresii	Tawny Dragon	X	X		X
*Pogona barbata	Eastern Bearded Dragon		X		X
CHELONIIDAE					
Caretta caretta	Loggerhead Turtle	X			
Chelonia mydas	Green Turtle	X			
CHELIDAE					
*Chelodina longicollis	Common Long-necked Tortoise				
DERMOCHELYIDAE					
Dermochelys coriacea	Leathery Turtle	X			
ELAPIDAE					
Austrelaps labialis	Pigmy Copperhead	X	X	X	X
Notechis ater	Tiger Snake	X	X	X	X
Suta flagellum	Little Whip Snake	X	X		
GEKKONIDAE					
Nephrurus millii	Thick-tailed Gecko	X	X	X	X
Phyllodactylus marmoratus	Marbled Gecko	X	X	X	X
HYLIDAE					
Litoria ewingi	Brown Tree Frog	X	X	X	X
LEPTODACTYLIDAE					
Limnodynastes dumerilii	Bull Frog	X	X	X	
Limnodynastes tasmaniensis	Marbled Frog	X	X	X	
Neobatrachus pictus	Painted Frog	X	X	X	
Pseudophryne bibroni	Brown Toadlet	X	X	X	
Crinia signifera	Brown Froglet	X	X	X	X
PYGOPODIDAE					
Aprasia striolata	Lined Worm-lizard	X	X	X	X
SCINCIDAE					
Bassiana duperreyi	Eastern Three-lined Skink	X	X	X	X
Egernia multiscutata	Bull Skink	X	X	X	X
Egernia whitii	White's Skink	X	X	X	X
Hemiergis decresiensis	Three-toed Earless Skink	X	X	X	
Hemiergis peronii	Four-toed Earless Skink	X	X	X	X
Lampropholis guichenoti	Garden Skink	X	X	X	X
Lerista bougainvillii	Bougainville’s Skink	X	X	X	X
Lerista dorsalis	Southern Four-toed Slider		X	X	
Menetia greyi	Dwarf Skink		X	X	X
Morethia obscura	Mallee Snake-eye	X	X	X	X
Pseudemoia entrecasteauxii	Southern Grass Skink		X		
VARANIDAE					
Varanus rosenbergi	Heath Goanna	X	X	X	X